California High-Speed Rail Authority

San Jose to Merced Project Section

Final Environmental Impact Report/ Environmental Impact Statement

Volume II: Technical Appendices

February 2022

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

California High-Speed Rail Project

San Jose to Merced Project Section

FINAL
ENVIRONMENTAL IMPACT REPORT/
ENVIRONMENTAL IMPACT STATEMENT

VOLUME 2: TECHNICAL APPENDICES

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CEQA: This document has been prepared pursuant to the California Environmental Quality Act. The California High-Speed Rail Authority is the state lead agency.

NEPA: The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding (MOU) dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California. Pursuant to the MOU, the California High-Speed Rail Authority is the federal lead agency. Prior to the July 23, 2019 MOU, the FRA was the federal lead agency.

TABLE OF CONTENTS

Volume II: Technical Appendices

2-A Roadway Crossings, Modifications, and Closures

2-B Railroad Crossings

2-C Operations and Service Plan Summary

2-D Applicable Design Standards

2-E Project Impact Avoidance and Minimization Features Analysis

2-F PG&E Network Upgrades

2-G Summary of Requirements for Operations and Maintenance Facilities

2-H Emergency and Safety Plans

2-I Alternatives Considered During Alternatives Screening Process

2-J Regional and Local Plans and Policies

2-K Policy Consistency Analyses

2-L Constructability Assessment Report – Record PEPD

- Appendix A: Monterey Highway Viaduct, Typical Section Installation – Full Span Precast
- Appendix B: Monterey Highway Viaduct, Balanced Cantilever Installation
- Appendix C: Monterey Highway Viaduct, Precast Box Girder Yard Dimensions
- Appendix D: San Jose Station Approach Constructability Analysis
- Appendix E: Potential Contract Packages and Schedule
- Appendix F: Potential Construction Sequence at I-280
- Appendix G: Potential Construction Sequence at Monterey Highway
- Appendix H: Track Shift Works

2-M Gilroy LMF Option Consideration and Elimination

3.1-A Parcels within the HSR Project Footprint

3.2-A Transportation Data on Roadways, Freeways, and Intersections

3.2-B Vehicle Miles Traveled Forecasting

3.2-C Traffic Mitigation Measure Screening

3.3-A Air Quality and Greenhouse Gases Technical Report

- Appendix A: CalEEMod Outputs for Station and Maintenance Facility Operation, MOWF Calculations, East Gilroy Transit Calculations
- Appendix B: CALINE4 Outputs for CO Hot-Spot Analysis
- Appendix C: Construction Emission and Cumulative HRA Assumptions

- Appendix D: Ballast Hauling Memorandum
- Appendix E: Localized Impacts from Construction
- Appendix F: Potential Impact from Induced Winds
- Appendix G: Council on Environmental Quality Provisions Covering Incomplete or Unavailable Information

3.3-B Draft Federal General Conformity Determination

3.3-C Changes to Project Benefits Based on 2018 Business Plan

3.4-A Noise and Vibration Technical Report

- Appendix A: Measurement Site Photographs
- Appendix B: Noise Measurement Data
- Appendix C: Vibration Propagation Measurement Data

3.4-B Noise and Vibration Mitigation Guidelines

3.4-C Noise Impact Locations

3.5-A Preconstruction Electromagnetic Measurement Survey along the San Jose to Merced Project Section

3.6-A Public Utilities and Energy Facilities

3.6-B Existing Plus Project Conditions Energy Analysis

3.6-C Water Use Assessment

3.6-D Energy Analysis Memorandum

3.7-A Special-Status Species Subject to Project Impacts

3.7-B Scientific Nomenclature

3.7-C HSR Guideway Enclosure for the Grasslands Ecological Area

3.7-D Supplemental Species Habitat Model Descriptions

3.7-E Supplemental Noise Analysis on Terrestrial Wildlife Species

3.7-F Supplemental Artificial Light Analysis on Terrestrial Wildlife Species

3.8-A Waterbodies Crossed by the Project Alternatives

3.8-B Summary of Hydraulic Modeling for Existing and Proposed Conditions

3.8-C Basin Plan Water Quality Impact Assessment

3.11-A Safety and Security Data

3.11-B Airport Obstructions

3.12-A Relocation Assistance Documents

3.13-A General Plan Land Use Maps—San Jose to Central Valley Wye Project Extent RSA

3.14-A Parcels Containing Important Farmland in the San Jose to Central Valley Wye Project Resource Study Area

3.14-B Results and Findings of Land Evaluation and Site Assessment Pursuant to the Farmland Preservation Policy Act

- Attachment 1: Natural Resources Conservation Service Land Evaluation Explanations and Calculations for Santa Clara County
- Attachment 2: Natural Resources Conservation Service Land Evaluation Explanations and Calculations for San Benito County
- Attachment 3: Natural Resources Conservation Service Land Evaluation Explanations and Calculations for Merced County

3.14-C Remnant Parcel Analysis

3.14-D Induced Wind Impacts: Effects on Pollination; Blossoms and Dust

3.14-E Williamson Act Compliance Data

3.17-A Correspondence

3.17-B Cultural Resources-San Jose to Merced Project Section Tribal Outreach and Consultation Efforts 2009-2021

3.17-C Archaeological and Built Resources

3.17-D Programmatic Agreement among the FRA, the ACHP, the SHPO, and the Authority regarding Compliance with Section 106 of the NHPA, as It Pertains to the California High-Speed Rail Project

3.18-A RIMS II Modeling Details

- Attachment 1: RIMS II Modeling Details

3.19-A Cumulative Nontransportation Plans and Projects Lists

3.19-B Cumulative Transportation Projects List

4-A Concurrence Letter

5-A Environmental Justice Outreach Plan

5-B Environmental Justice Engagement Summary Report

- Attachment A: Environmental Justice Outreach Plan
- Attachment B: List of Outreach Meetings Held for the Project
- Attachment C: Biannual Environmental Justice Outreach Reports
- Attachment D: Environmental Justice Outreach, September 2021

5-C Environmental Justice Development of Community Improvements

- Attachment A: Profiles of Potential Community Improvements

5-D Preferred Alternative, Maps of Disproportionately High and Adverse Effects Before Consideration of Community Improvements

6-A San Jose to Merced Project Section: PEPD Record Set Capital Cost Estimate Report

6-B High-Speed Rail Operating and Maintenance Cost for Use in EIR/EIS Project-Level Analysis

9-A Public and Agency Meeting List

APPENDIX 2-A: ROADWAY CROSSINGS, MODIFICATIONS, AND CLOSURES

APPENDIX 2-A ROADWAY CROSSINGS, MODIFICATIONS, AND CLOSURES

Table 1 Proposed Roadway Crossings of High-Speed Rail, Modifications, and Closures

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
Existing	1	Viaduct to I-880	Scott Blvd	Aerial	No change	Below	N/A	N/A	N/A	Santa Clara	Santa Clara
Existing	1	Viaduct to I-880	Lafayette Street	Trench/cut	No change	Above	N/A	N/A	N/A	Santa Clara	Santa Clara
Existing	1	Viaduct to I-880	De La Cruz Boulevard	Aerial	No change	Below	N/A	N/A	N/A	Santa Clara	Santa Clara
Existing	1	Viaduct to I-880	Nimitz Freeway (I-880)	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	West Hedding Street	Aerial	Aerial	Below	N/A	N/A	Bridge replacement	San Jose	Santa Clara
New Bike/Ped. Crossing	1	Viaduct to I-880	College Park Station Ped. Underpass	N/A	N/A	Above	N/A	N/A	New ped. underpass through retained fill	San Jose	Santa Clara
Road Closure	1	Viaduct to I-880	Stockton Street	N/A	N/A	N/A	N/A	Yes	Stockton St. converted to cul-de-sac	San Jose	Santa Clara
Road Closure	1	Viaduct to I-880	University Avenue	N/A	N/A	N/A	N/A	Yes	Converted to cul-de-sac	San Jose	Santa Clara
Road Closure	1	Viaduct to I-880	Emory St.	N/A	N/A	N/A	N/A	Yes	Converted to cul-de-sac	San Jose	Santa Clara
Road Closure	1	Viaduct to I-880	Chestnut St.	N/A	N/A	N/A	N/A	Yes	Realigned, closed from Asbury St. to W. Taylor St.	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	West Taylor Street	Trench/cut	No change	Above	N/A	N/A	Depress W. Taylor to accommodate new bridge for UPR T-13, UPRR MT1, Caltrain MT2	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	Cinnabar Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	North Montgomery Street	At-grade	No change	Above	N/A	N/A	Realign roadway, extend to provide property access	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	West Julian Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	West Santa Clara	Trench/cut	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Roadway Modification	1	Viaduct to I-880	Stover St.	N/A	N/A	N/A	N/A	N/A	Extend Stover St. from S. Montgomery St. to Autumn St.	San Jose	Santa Clara
Roadway Modification	1	Viaduct to I-880	Crandal St.	N/A	N/A	N/A	N/A	N/A	Extend from S. Montgomery St. to Autumn St.	San Jose	Santa Clara
Roadway Modification	1	Viaduct to I-880	Cahill Street	N/A	N/A	N/A	N/A	N/A	Roadway modification – extend to Park Ave; convert to transit only lanes	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	Park Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	West San Carlos Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	Royal Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	Auzerais Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	Bird Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	I-280 NB on ramp	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	I-280	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	1	Viaduct to I-880	I-280 SB off ramp	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	I-280 on ramp	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	I-280 on ramp	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	SR 87 Interchange	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	SR 87 Connector	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Bike/Ped. Crossing	1	Viaduct to I-880	Guadalupe River Trail	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	West Virginia Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	Willow Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	SR 87 on ramp	At-grade	No change	Above	N/A	N/A	Ramp realingment	San Jose	Santa Clara
New Bike/Ped. Crossing	1	Viaduct to I-880	Highway 87 Bikeway	At-grade	No change	Above	N/A	N/A	Realignment to avoid viaduct columns	San Jose	Santa Clara
New Road Crossing	1	Viaduct to I-880	West Alma Avenue	Trench/cut	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Existing	2, 3	Viaduct to Scott Blvd	Scott Blvd	N/A	N/A	Below	N/A	N/A	N/A	Santa Clara	Santa Clara
Existing	2, 3	Viaduct to Scott Blvd	Lafayette Street	N/A	N/A	Above	N/A	N/A	N/A	Santa Clara	Santa Clara
New Bike/Ped. Crossing	2,3	Viaduct to Scott Blvd	Lafayette Street	Aerial	Below grade	Above	N/A	N/A	Change from over- to underpass	Santa Clara	Santa Clara
Road Closure	2,3	Viaduct to Scott Blvd	Grant St.	N/A	N/A	N/A	N/A	Yes	Road shortened.	Santa Clara	Santa Clara
Road Modification	2, 3	Viaduct to Scott Blvd	De La Cruz Boulevard	Aerial	Trench/Cut	Above	Y	N/A	Grade Separation	Santa Clara	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	Nimitz Freeway (I-880)	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Road Modification	2, 3	Viaduct to Scott Blvd	West Hedding Street	Aerial	Trench/Cut	Above	Y	N/A	Grade Separation	San Jose	Santa Clara
Road Closure	2, 3	Viaduct to Scott Blvd	Stockton Street	N/A	N/A	N/A	N/A	Yes	Converted to cul-de-sac	San Jose	Santa Clara
Road Closure	2, 3	Viaduct to Scott Blvd	University Avenue	N/A	N/A	N/A	N/A	Yes	Converted to cul-de-sac	San Jose	Santa Clara
Road Closure	2, 3	Viaduct to Scott Blvd	Emory St.	N/A	N/A	N/A	N/A	Yes	Converted to cul-de-sac	San Jose	Santa Clara
Road Closure	2, 3	Viaduct to Scott Blvd	Chestnut St.	N/A	N/A	N/A	N/A	Yes	Realigned	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	West Taylor Street	Trench/cut	No change	Above	N/A	N/A	Realign W/B Taylor Street to N/B Chestnut Street	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	2, 3	Viaduct to Scott Blvd	Cinnabar Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	West Julian Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	North Montgomery Street	At-grade	No change	Above	N/A	N/A	Realign roadway, extend to provide property access	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	West Julian Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	West Santa Clara	Trench/cut	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Roadway Modification	2, 3	Viaduct to Scott Blvd	Stover St.	N/A	N/A	N/A	N/A	N/A	Extend Stover St. from S. Montgomery St. to Autumn St.	San Jose	Santa Clara
Roadway Modification	2, 3	Viaduct to Scott Blvd	Crandal St.	N/A	N/A	N/A	N/A	N/A	Extend from S. Montgomery St. to Autumn St.	San Jose	Santa Clara
Roadway Modification	2, 3	Viaduct to Scott Blvd	Cahill Street	N/A	N/A	N/A	N/A	N/A	Roadway modification – extend to Park Ave; convert to transit only lanes	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	Park Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	West San Carlos Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	Royal Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	Auzerais Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	Bird Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	I-280 NB on ramp	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	I-280	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	I-280 SB off ramp	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	I-280 on ramp	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	I-280 on ramp	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	SR 87 Interchange	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	SR 87 Connector	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Bike/Ped. Crossing	2, 3	Viaduct to Scott Blvd	Guadalupe River Trail	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	West Virginia Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	Willow Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	SR 87 on ramp	At-grade	No change	Above	N/A	N/A	Ramp realingment	San Jose	Santa Clara
New Bike/Ped. Crossing	2, 3	Viaduct to Scott Blvd	Highway 87 Bikeway	At-grade	No change	Above	N/A	N/A	Realignment to avoid viaduct columns	San Jose	Santa Clara
New Road Crossing	2, 3	Viaduct to Scott Blvd	West Alma Avenue	Trench/cut	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	Scott Blvd	Aerial	No change	Below	N/A	N/A	N/A	Santa Clara	Santa Clara
Existing	4	Blended, At Grade	Lafayette Street	Trench/cut	No change	Above	N/A	N/A	N/A	Santa Clara	Santa Clara
Existing	4	Blended, At Grade	De La Cruz Boulevard	Aerial	No change	Below	N/A	N/A	N/A	Santa Clara	Santa Clara
Existing	4	Blended, At Grade	Nimitz Freeway (I-880)	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	West Hedding Street	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	West Taylor Street	At-grade	No change	Above	N/A	N/A	Depress W. Taylor to accommodate new bridge for UPR T-13, UPRR MT1, Caltrain MT2	San Jose	Santa Clara
Existing	4	Blended, At Grade	West Taylor Street	At-grade	UP aerial	UP above	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	West Julian Street	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	West Santa Clara	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Roadway Modification	4	Blended, At Grade	Cahill Street	N/A	N/A	N/A	N/A	N/A	Roadway modification – extend to Otterson; convert to transit only lanes	San Jose	Santa Clara
Existing	4	Blended, At Grade	Park Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	West San Carlos Street	At-grade	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	Auzerais Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Jose	Santa Clara
Existing	4	Blended, At Grade	Bird Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	I-280	At-grade	No change	Above	N/A	N/A	MT1 and MT2	San Jose	Santa Clara
New Road Crossing	4	Blended, At Grade	I-280	At-grade	No change	Above	N/A	N/A	MT3 on a new bridge structure	San Jose	Santa Clara
Existing	4	Blended, At Grade	W. Virginia St.	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Jose	Santa Clara
Existing	4	Blended, At Grade	Bird Avenue	At-grade	No change	Aerial	N/A	N/A	Replace Bird Ave. underpasses	San Jose	Santa Clara
Existing	4	Blended, At Grade	Delmas Avenue	At-grade	No change	Aerial	N/A	N/A	Replace Delmas Ave. underpasses	San Jose	Santa Clara
Existing	4	Blended, At Grade	Prevost St.	At-grade	No change	Aerial	N/A	N/A	MT1 and MT2	San Jose	Santa Clara
New Road Crossing	4	Blended, At Grade	Prevost St.	At-grade	No change	Aerial	N/A	N/A	MT3 on a new bridge structure	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
Road Modification	4	Blended, At Grade	Fuller Ave.	N/A	N/A	N/A	N/A	N/A	Realignment of Fuller Ave. dead end	San Jose	Santa Clara
Existing	4	Blended, At Grade	SR 87	At-grade	No change	Above	N/A	N/A	MT1 and MT2	San Jose	Santa Clara
New Road Crossing	4	Blended, At Grade	SR 87	At-grade	No change	Above	N/A	N/A	MT3 on a new bridge structure	San Jose	Santa Clara
Bike/Ped. Crossing	4	Blended, At Grade	Guadalupe River Trail	At-grade	No change	Above	N/A	N/A	MT1 and MT2	San Jose	Santa Clara
New Bike/Ped. Crossing	4	Blended, At Grade	Guadalupe River Trail	At-grade	No change	Above	N/A	N/A	MT3 on a new bridge structure	San Jose	Santa Clara
Existing	4	Blended, At Grade	Willow Street	At-grade	No change	Above	N/A	N/A	MT1 and MT2	San Jose	Santa Clara
New Road Crossing	4	Blended, At Grade	Willow Street	At-grade	No change	Above	N/A	N/A	MT3 on a new bridge structure	San Jose	Santa Clara
Existing	4	Blended, At Grade	West Alma Avenue	At-grade	No change	Above	N/A	N/A	MT1 and MT2	San Jose	Santa Clara
New Road Crossing	4	Blended, At Grade	West Alma Avenue	At-grade	No change	Above	N/A	N/A	MT3 on a new bridge structure	San Jose	Santa Clara
Monterey Corridor											
New Road Crossing	1, 3	Viaduct	Almaden Road	N/A	N/A	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Almaden Expressway	N/A	N/A	Below	N/A	N/A	Roadway modification – Realign SR 87 on ramp	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Curtner Avenue	N/A	N/A	Below	N/A	N/A	N/A	San Jose	Santa Clara
Bike/Ped. Modification	1, 3	Viaduct	Communication Hill	N/A	N/A	Below	N/A	Yes	Remove ped . Bridge	San Jose	Santa Clara
Roadway Modification	1,3	Viaduct	SB Monterey	At-grade	No change	Above	N/A	N/A	Road widening for bus turn out, road realignment.	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Capitol Expressway	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Road Closure	1, 3	Viaduct	Monterey Highway	N/A	N/A	N/A	N/A	2 lanes	Reduction from 6 to 4 lanes from Southside Dr. to between Blossom Hill and Ford Rd.	San Jose	Santa Clara
Road Closure	1, 3	Viaduct	Monterey Highway between Senter Road and Skyway Drive	N/A	N/A	N/A	N/A	1 lane	Removal of southbound left turn lane into shopping center	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Skyway Drive Intersection	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Branham Lane Intersection	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Roeder Road/Chynoweth Avenue Intersection	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Road Closure	1, 3	Viaduct	Monterey Highway between Roeder Road/Chynoweth Avenue and Blossom Hill Road	N/A	N/A	N/A	N/A	1 lane	Removal of southbound left turn lane into shopping center	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Blossom Hill Road	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Bike/Ped. Crossing	1, 3	Viaduct	Xander's Crossing Pedestrian Bridge	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Road Modification	1, 3	Viaduct	Flintwell Way	N/A	N/A	N/A	N/A	N/A	Widen Monterey at Flintwell Way	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	SR 85/West Valley Freeway	N/A	N/A	Above	N/A	N/A	N/A	San Jose	Santa Clara
Road Closure	1, 3	Viaduct	Hicks Ln.	N/A	N/A	N/A	N/A	1 lane	Removal of southbound left turn lane	San Jose	Santa Clara
Road Modification	1,3	Viaduct	Bernal Road on/off ramps to Monterey	N/A	N/A	N/A	N/A	N/A	Widen roadway	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct	Bernal Road	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2	At Grade	Almaden Road	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2	At Grade	Almaden Expressway	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
New Road Crossing	2	At Grade	Curtner Avenue	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Bike/Ped. Modification	2	Viaduct	Communication Hill	N/A	N/A	Below	N/A	Yes	Remove ped. bridge	San Jose	Santa Clara
Roadway Modification	2	At Grade	Monterey Rd. from Southside Dr. to Bernal Way	N/A	N/A	N/A	N/A	N/A	Realignment to the east of HSR.	San Jose	Santa Clara
Roadway Modification	2	At Grade	Monterey Highway north of Fehren	N/A	N/A	N/A	N/A	N/A	Widen roadway for bus turn out	San Jose	Santa Clara
Road Closure	2	At Grade	N/A	N/A	N/A	N/A	N/A	2 lanes	Reduction from 6 to 4 lanes from Fehren Dr. to Blossom Hill.	San Jose	Santa Clara
New Road Crossing	2	At Grade	Capitol Expressway	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Roadway Modification	2	At Grade	Capitol Expressway	N/A	N/A	Below	N/A	N/A	Bridge modification	San Jose	Santa Clara
Road Closure	2	At Grade	Monterey Highway between Senter Road and Skyway Drive	N/A	N/A	N/A	N/A	1 lane	Removal of southbound left turn lane into shopping center	San Jose	Santa Clara
New Road Crossing	2	At Grade	Skyway Drive	At-grade	Below grade	Above	Y	N/A	Grade separation	San Jose	Santa Clara
Road Modification	2 var. b	At Grade	Monterey Rd. at Skyway Drive	At-grade	Below grade	N/A	N/A	N/A	Variant A depress Skyway Drive and realign ramp return to Monterey Road; Variant B depress Skyway Drive and Monterey Road	San Jose	Santa Clara
New Road Crossing	2	At Grade	Branham Lane	At-grade	Below grade	Above	Y	N/A	Grade Separation	San Jose	Santa Clara
New Bike/Ped. Crossing	2	At Grade	Pedestrian Bridge	At-grade	Aerial	Below	N/A	N/A	Pedestrian bridge over Monterey and HSR	San Jose	Santa Clara
Road Closure	2	At Grade	Monterey Highway and Rice Way Intersection	N/A	N/A	N/A	N/A	Yes	Access from Rice Way to Monterey closed	San Jose	Santa Clara
Road Closure	2	At Grade	N/A	N/A	N/A	N/A	N/A	Yes	Close access from Waterfall Ct. to Chynoweth	San Jose	Santa Clara
Roadway Modification	2	At Grade	N/A	N/A	N/A	N/A	N/A	N/A	Extend Waterfall Ct. to Broken Lance Ct.	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	2	At Grade	Roeder Road/Chynoweth Avenue	At-grade	Below grade	Above	Y	N/A	Grade Separation – depressed roadway	San Jose	Santa Clara
Road Closure	2	At Grade	Monterey Highway between Roeder Road/Chynoweth Avenue and Blossom Hill Road	N/A	N/A	N/A	N/A	1 lane	Removal of southbound left turn lane into shopping center	San Jose	Santa Clara
New Road Crossing	2	At Grade	Blossom Hill Road	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Roadway Modification	2	At Grade	Blossom Hill Road Southbound Ramp from Monterey Highway to Blossom Hill Road	N/A	N/A	N/A	N/A	N/A	Roadway modification and realignment	San Jose	Santa Clara
New Bike/Ped. Crossing	2	At Grade	Xander's Crossing Pedestrian Bridge	Aerial	No change	Below	N/A	N/A	Stair well modification	San Jose	Santa Clara
Bike/Ped. Modification	2	At Grade	Hitachi Pedestrian Bridge	N/A	N/A	N/A	N/A	N/A	Ramp and stairwell relocation	San Jose	Santa Clara
New Bike/Ped. Crossing	2	At Grade	Blossom Hill Pedestrian Bridge	N/A	Aerial	Below	N/A	N/A	New pedestrian overcrossing	San Jose	Santa Clara
New Road Crossing	2	At Grade	SR 85/West Valley Freeway	Aerial	No change	Below	N/A	N/A	New crash wall under SR85/W. Valley Freeway	San Jose	Santa Clara
New Road Crossing	2	At Grade	Bernal Road	Aerial	No change	Below	N/A	N/A	New crash wall under Bernal Rd.	San Jose	Santa Clara
New Road Crossing	4	Blended, At Grade	Almaden Road	At-grade	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	Almaden Expressway	At-grade	No change	Below	N/A	N/A	New crash wall	San Jose	Santa Clara
Existing	4	Blended, At Grade	Curtner Avenue	Aerial	No change	Below	N/A	N/A	New crash walls	San Jose	Santa Clara
Existing Bike/Ped. Crossing	4	Blended, At Grade	Communication Hill Pedestrian Overpass	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
New Bike/Ped. Crossing	4	Blended, At Grade	Capitol Caltrain Pedestrian Overpass	At-grade	Aerial	Below	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	Capitol Expressway	Aerial	No change	Below	N/A	N/A	New crash walls	San Jose	Santa Clara
Roadway Modification	4	Blended, At Grade	Capitol Expressway	N/A	N/A	Below	N/A	N/A	Bridge modification	San Jose	Santa Clara
Existing	4	Blended, At Grade	Skyway Drive	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Jose	Santa Clara
Existing	4	Blended, At Grade	Branham Lane	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Jose	Santa Clara
Existing	4	Blended, At Grade	Chynoweth Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Jose	Santa Clara
Existing Bike/Ped. Crossing	4	Blended, At Grade	Blossom Hill Road on-ramp from Monterey Rd.	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	Blossom Hill Road	Aerial	No change	Below	N/A	N/A	New crash walls	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
Existing Bike/Ped. Crossing	4	Blended, At Grade	Xander's Crossing Pedestrian Bridge	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Bike/Ped. Modification	4	Blended, At Grade	Hitachi Pedestrian Bridge	Aerial	No change	Below	N/A	N/A	Replace with pedestrian overpass further south	San Jose	Santa Clara
Road Modification	4	Blended, At Grade	Great Oaks Parkway	N/A	N/A	N/A	N/A	N/A	Realignment	San Jose	Santa Clara
Existing	4	Blended, At Grade	SR 85/West Valley Freeway	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Existing	4	Blended, At Grade	Bernal Road	Aerial	No change	Below	N/A	N/A	N/A	San Jose	Santa Clara
Morgan Hill to Gilroy											
Roadway Modification	2	Embankment to Downtown Gilroy	Monterey Highway	N/A	N/A	N/A	N/A	N/A	Realignment from Bernal Way to Fisher Creek	San Jose	Santa Clara
Bike/Ped. Modification	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	N/A	Trail realignment	San Jose	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Blanchard Road	N/A	N/A	N/A	N/A	Yes	Closure of Blanchard Road Intersection with Monterey Highway	San Jose	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	Yes	N/A	N/A	Extension of Blanchard Rd. to the new Emado Ave. extension	San Jose	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	Monterey Highway	N/A	N/A	N/A	N/A	N/A	Realignment from south of Blanchard to Cochrane Rd.	San Jose	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Emado Avenue	N/A	N/A	N/A	N/A	Yes	Closure of Emado Avenue Intersection with Monterey Highway	San Jose	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	N/A	Extension of Emado Rd. to Santa Teresa	San Jose	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Bailey Avenue	Aerial	No change	Below	N/A	N/A	New crash wall	San Jose	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	Charter access road	N/A	N/A	N/A	N/A	N/A	Realigned access road to charter school	San Jose	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Fox Lane	N/A	N/A	N/A	N/A	Yes	Closure of Fox Lane Intersection with Monterey Highway	San Jose	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	Fox Court	N/A	N/A	N/A	N/A	N/A	New Fox Court north of closed Fox Lane, extends from Dougherty Ave.	San Jose	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Palm Avenue	At-grade	Aerial	Below	Y	N/A	Grade Separation	San Jose	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Live Oak Avenue	At-grade	Aerial	Below	Y	N/A	Grade Separation	San Jose	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Tilton Avenue	N/A	N/A	N/A	N/A	Yes	Closure of Tilton Avenue Intersection with Monterey Highway, new cul-de-sac	Morgan Hill	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Madrone Parkway	At-grade	Below grade	Above	Y	N/A	Grade Separation – depressed roadway	Morgan Hill	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	2	Embankment to Downtown Gilroy	Monterey Highway, South of Cochrane Road	At-grade	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	Yes	E. Central Ave. cul-de-sac relocated east	Morgan Hill	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	East Main Avenue	At-grade	Below grade	Above	Y	N/A	Grade Separation – depressed roadway	Morgan Hill	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Depot St.	N/A	N/A	N/A	N/A	Yes	Access from Depot St. to Main Ave. closed due to grade separation	Morgan Hill	Santa Clara
New Bike/Ped. Crossing	2	Embankment to Downtown Gilroy	Morgan Hill Pedestrian Underpass	At-grade	Below grade	Above	N/A	N/A	New pedestrian underpass	Morgan Hill	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	Yes	Diana Ave.cul-de-sac relocated east	Morgan Hill	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	East Dunne Avenue	At-grade	Below grade	Above	Y	N/A	Grade Separation – depressed roadway	Morgan Hill	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	San Pedro Avenue	At-grade	Below grade	Above	Y	N/A	Grade Separation – depressed roadway	Morgan Hill	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	Y	N/A	Grade Separation - Church St. will be put on a bridge over the newly depressed San Pedro Ave.	Morgan Hill	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	Tennant Avenue	N/A	N/A	N/A	Y	N/A	Grade Separation	Morgan Hill	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	N/A	Railroad Ave. roadway modification and realignment between Barrett Ave. and Maple Ave.	Morgan Hill	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	Yes	Caputo Dr. access to Tennant Ave. closed off and converted to cul-de-sac.	Morgan Hill	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Butterfield Boulevard	Embankment	Aerial	Below	N/A	N/A	Butterfield bridge structure extended over HSR.	Morgan Hill	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	East Middle Avenue	At-grade	Aerial	Below	Y	N/A	Grade Separation and realignment over HSR, UPRR, and Monterey Highway.	San Martin	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	Monterey Road	N/A	N/A	N/A	N/A	N/A	Realignment from East Middle Ave. to San Martin Ave. and new bridge over Llagas Creek	San Martin	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Oak Street	N/A	N/A	N/A	N/A	Yes	San Martin Ave realigned on former Oak St.	San Martin	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	East San Martin Avenue	N/A	N/A	N/A	Y	N/A	Grade separation and realignment	San Martin	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	Yes	Colony Ave. realignment to connect with	San Martin	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	Yes	Lincoln Ave. converted to cul-de-sac south of realigned San Martin Ave.	San Martin	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Bike/Ped. Crossing	2	Embankment to Downtown Gilroy	San Martin Ped. Path	At-grade	Below grade	Above	N/A	N/A	New pedestrian path underneath HSR embankment	San Martin	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Church Avenue	At-grade	Embankment/Aerial	Below	Y	N/A	Grade Separation	San Martin	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	Yes	Lena Ave. convert to cul-de-sac	San Martin	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Masten Avenue/Fitzgerald Avenue	At-grade	Below grade	Above	Y	N/A	Grade Separation – depressed roadway and realignment	San Martin	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Rucker Avenue	At-grade	Below grade	Above	Y	N/A	Grade Separation- depressed roadway	Unincorporated	Santa Clara
Roadway Closure	2	Embankment to Downtown Gilroy	Denio Ave.	N/A	N/A	N/A	N/A	N/A	Cul-de-sac	Unincorporated	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Buena Vista Avenue	At-grade	Below grade	Above	Y	N/A	Grade Separation- depressed roadway	Unincorporated	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	Radike Ave.	N/A	N/A	N/A	Y	N/A	Realignment to conform with Buena Vista Ave. grade separation.	Unincorporated	Santa Clara
Roadway Modification	2	Embankment to Downtown Gilroy	Monterey Rd. from north of Denio to Day Rd.	N/A	N/A	N/A	Y	N/A	Depressed roadway to conform with Buena Vista Ave. Grade Separation	Unincorporated	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Cohansey Avenue	At-grade	At-grade	Above	Y	N/A	Grade separation	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Las Animas Ave.	At-grade	At-grade	Above	Y	N/A	Grade separation	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Leavesley Road	At-grade	Below grade	Above	Y	N/A	Grade separation	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Casey Lane	At-grade	Below grade	Above	Y	N/A	Grade separation	Gilroy	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Wheeler Street	N/A	N/A	N/A	N/A	Yes	Shortened and converted to cul-de-sac	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	looF Street	At-grade	Below grade	Above	Y	N/A	Grade separation	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Lewis Street	At-grade	Below grade	Above	N/A	N/A	Shorten and convert to cul-de-sac	Gilroy	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Martin Street	N/A	N/A	N/A	N/A	Yes	Shorten and convert to cul-de-sac	Gilroy	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Railroad Street	N/A	N/A	N/A	N/A	Yes	Closure of Railroad Street from Lewis to 7th St.	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	East 6th Street	At-grade	Below grade	Above	N/A	N/A	N/A	Gilroy	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	2	Embankment to Downtown Gilroy	7th St.	At-grade	Below grade	Above	N/A	N/A	Realignment	Gilroy	Santa Clara
Road Closure	2	Embankment to Downtown Gilroy	Old Gilroy	N/A	N/A	N/A	N/A	Yes	Close Old Gilroy between Alexander and Monterey Rd.	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	East 9th Street	At-grade	Below grade	Above	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	East 10th Street	At-grade	Below grade	Above	N/A	N/A	N/A	Gilroy	Santa Clara
Road Modification	2	Embankment to Downtown Gilroy	Banes Lane	N/A	N/A	N/A	N/A	N/A	Extend for access to new parking and cul-de-sac for access to system site.	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	Luchessa Avenue	At-grade	At-grade	Below	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	2	Embankment to Downtown Gilroy	US 101 Northbound/ Southbound	Aerial/Embankment	Aerial	Below	N/A	N/A	Bridge reconstruction	Gilroy	Santa Clara
Roadway Modification	1, 3	Viaduct to Downtown Gilroy	Monterey Rd	N/A	N/A	N/A	N/A	N/A	Widen roadway south of Bernal Rod.	San Jose	Santa Clara
Road Closure	1, 3	Viaduct to Downtown Gilroy	Monterey Highway and Roding Way	N/A	N/A	N/A	N/A	Yes	Removal of southbound left turn onto Rodling Way	San Jose	Santa Clara
Bike/Ped. Modification	1, 3	Viaduct to Downtown Gilroy	N/A	N/A	N/A	N/A	N/A	N/A	Realign bike path along Coyote Creek Trail	San Jose	Santa Clara
Roadway Modification	1, 3	Viaduct to Downtown Gilroy	Monterey Rd.	N/A	N/A	N/A	N/A	N/A	Widen roadway, new retaining wall, between Metcalf Rd. to Coyote Ranch Rd.	San Jose	Santa Clara
Roadway Modification	1, 3	Viaduct to Downtown Gilroy	Monterey Rd.	N/A	N/A	N/A	Y	N/A	Widen roadway between Coyote Ranch Rd. and Monterey Road Connector Grade Separation	San Jose	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	Bailey Avenue	Aerial	No change	Above	N/A	N/A	N/A	San Jose	Santa Clara
Road Closure	1, 3	Viaduct to Downtown Gilroy	N/A	N/A	N/A	Above	N/A	Yes	Closure of a segment of Ogier due to Monterey Rd. Realignment HSR does not cross Ogier.	Unincorporated	Santa Clara
Roadway Modification	1, 3	Viaduct to Downtown Gilroy	Northbound Monterey Road	At-grade	No change	Above	N/A	N/A	Roadway modification and realignment	Unincorporated	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	Barnhart Avenue	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	Burnett Avenue	Embankment	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	US 101 Southbound Off Ramp tp Cochrane Rd.	At-grade	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	US Loop On-Ramp	At-grade	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	Cochrane Road	At-grade	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	US 101 Southbound On Ramp from Cochrane Rd.	At-grade	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	East Main Avenue	Embankment	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	US 101 Southbound Off Ramp	At-grade	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	East Dunne Avenue	Embankment	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	US 101 Southbound On Ramp from Dunne Ave.	At-grade	No change	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
Road Closure	1, 3	Viaduct to Downtown Gilroy	San Pedro Ave.	N/A	N/A	N/A	N/A	Yes	Relocate cul-de-sac to west of HSR.	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	Barrett Avenue	N/A	N/A	Above	N/A	N/A	Cul-de-sac is closed and road connected to St. John Ct.	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	US 101 Southbound Off Ramp from Tennant Ave.	At-grade	N/A	Above	N/A	N/A	N/A	Morgan Hill	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	Tennant Avenue	Embankment	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	US 101 Southbound On Ramp from Tennant Ave.	At-grade	N/A	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
Roadway Modification	1, 3	Viaduct to Downtown Gilroy	Fisher Avenue	N/A	N/A	N/A	N/A	N/A	Close and relocate cul-de-sac to west of HSR. Change to road closure.	Unincorporated	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	Maple Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	East Middle Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
New Road Crossing	1, 3	Viaduct to Downtown Gilroy	East San Martin Way	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
Road Closure	1, 3	Viaduct to Downtown Gilroy	South Street	N/A	N/A	N/A	N/A	Yes	Shortening of South Street	San Martin	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Church Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Lena Avenue	At-grade	No change	Above	N/A	N/A	2 crossings of Lena Ave.	San Martin	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Masten Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	1	Viaduct to Downtown Gilroy	Rucker Avenue	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Denio Avenue	At-grade	No change	Below	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Buena Vista Avenue	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Cohansey Avenue	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Las Animas Avenue	At-grade	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Leavseley Road	At-grade	No change	Above	N/A	N/A	Widening of Leavesley Road	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Casey Lane	At-grade	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Ioof Avenue	At-grade	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
Road Closure	1	Viaduct to Downtown Gilroy	Railroad St.	N/A	N/A	N/A	N/A	Yes	N/A	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Lewis Street	At-grade	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	Martin Street	At-grade	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	East 6th Street	At-grade	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
Bike/Ped. Modification	1	Viaduct to Downtown Gilroy	East 7th Street/Old Gilroy St.	At-grade	No change	Above	N/A	N/A	New bike lanes	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	East 7th Street/Old Gilroy St.	At-grade	No change	Above	N/A	N/A	Realignment	Gilroy	Santa Clara
Bike/Ped. Modification	1	Viaduct to Downtown Gilroy	Alexander St.	N/A	N/A	N/A	N/A	N/A	New bike lanes	Gilroy	Santa Clara
New	1	Viaduct to Downtown Gilroy	East 10th Street	At-grade	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
Roadway Modification	1	Viaduct to Downtown Gilroy	Banes Lane	N/A	N/A	N/A	N/A	N/A	Extend for access to new parking and cul-de-sac for access to system site.	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	East Luchessa Avenue	At-grade	No change	Below	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	1	Viaduct to Downtown Gilroy	US 101	Embankment	No change	Above	N/A	N/A	N/A	Gilroy	Santa Clara
New Road Crossing	1, 2	Viaduct to Downtown Gilroy	Bloomfield Avenue	At-grade	Embankment/Aerial	Below	Y	N/A	Grade separation, realignment	Unincorporated	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	1, 2	Viaduct to Downtown Gilroy	Bolsa Ave.	N/A	N/A	N/A	N/A	N/A	Realignment	Unincorporated	Santa Clara
Road Closure	1, 2	Viaduct to Downtown Gilroy	Sheldon Avenue	N/A	N/A	N/A	N/A	Yes	South side to cul-de-sac; North side abandoned	Unincorporated	Santa Clara
New Road Crossing	1, 2, 4	Viaduct to Downtown Gilroy	Frazier Lake Road	At-grade	No change	Below	N/A	N/A	N/A	Unincorporated	San Benito
New Road Crossing	1, 2, 4	Viaduct to Downtown Gilroy	Lake Road	At-grade	No change	N/A	N/A	N/A	N/A	Unincorporated	San Benito
New Road Crossing	1,2,4	Viaduct to Downtown Gilroy	Lover's Lane	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	San Benito
New Road Crossing	1, 2, 4	Viaduct to Downtown Gilroy	San Felipe Road	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1, 2, 4	Viaduct to Downtown Gilroy	SR 152/Pacheco Pass Highway	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	1, 2, 4	Viaduct to Downtown Gilroy	SR 152/Pacheco Pass Highway	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Church Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Shean Court	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Lena Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Masten Avenue	At-grade	No change	Above	N/A	N/A	N/A	San Martin	Santa Clara
Roadway Modification	3	Viaduct to East Gilroy	6th St.	N/A	N/A	N/A	N/A	N/A	Realignment	San Martin	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	US 101	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Uno Road	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Denio Avenue	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Buena Vista Avenue	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
Roadway Closure	3	Viaduct to East Gilroy	Cohansey Avenue	N/A	N/A	N/A	N/A	Yes	Road closure of Cohansey Avenue, converted to cul-de-sac on each side of HSR.	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Las Animas Avenue	At-grade	Aerial	Below	Y	N/A	Grade separation	Unincorporated	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	3	Viaduct to East Gilroy	Leavesley Road	At-grade	Aerial	Below	N/A	N/A	Roadway modification and widening to 2 lanes in each direction	Gilroy	Santa Clara
Roadway Modification	3	Viaduct to East Gilroy	New	N/A	N/A	N/A	N/A	N/A	New road north and parallel to Leavesley connecting the station to Marcella Ave.	Gilroy/ Unincorporated	Santa Clara
Roadway Modification	3	Viaduct to East Gilroy	New	N/A	N/A	N/A	N/A	N/A	New road north and parallel to Leavesley to the west of HSR.	Gilroy/ Unincorporated	Santa Clara
Roadway Modification	3	Viaduct to East Gilroy	New	N/A	N/A	N/A	N/A	N/A	New road parallel to Marcella Ave., connecting Leavesley to Las Animas, adjacent to the Gilroy outlets	Gilroy/ Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Gilman Avenue	N/A	N/A	Below	Y	N/A	Grade Separation – and realigned	Unincorporated	Santa Clara
Roadway Closure	3	Viaduct to East Gilroy	Holsclaw Road	N/A	N/A	N/a	N/A	Yes	Road closure of Holsclaw Road, cul-de-sac on both sides of HSR	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	SR 152	N/A	N/A	Below	Y	N/A	Grade separation and realignment	Unincorporated	Santa Clara
Roadway Closure	3	Viaduct to East Gilroy	N/A	N/A	N/A	N/A	N/A	Yes	Road closure	Unincorporated	Santa Clara
Roadway Modification	3	Viaduct to East Gilroy	Frazier Lake Road	N/A	N/A	N/A	Y	N/A	Grade separation and realignment to connect to SR 152 grade separation	Unincorporated	Santa Clara
Roadway Closure	3	Viaduct to East Gilroy	Holsclaw Road	N/A	N/A	N/a	N/A	Yes	Realignment to connect with SR 152 grade separation	Unincorporated	Santa Clara
Roadway Modification	3	Viaduct to East Gilroy	New	N/A	N/A	N/a	N/A	N/a	West of 152, provides property access and access to HSR systems sites	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Bloomfield Avenue	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	Lake Road	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	San Benito
New Road Crossing	3	Viaduct to East Gilroy	Lover's Lane	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	San Benito
New Road Crossing	3	Viaduct to East Gilroy	San Felipe Road	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	SR 152/Pacheco Pass Highway	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
New Road Crossing	3	Viaduct to East Gilroy	SR 156/Pacheco Pass Highway	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Blanchard Road	At-grade	No change	At-grade	N/A	Yes	Quad gates	San Jose	Santa Clara
Roadway Closure	4	Blended, At Grade to Downtown Gilroy	Emado Avenue	N/A	N/A	N/A	N/A	Yes	Closure of Emado Avenue Intersection with Monterey Highway	San Jose	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
Existing	4	Blended, At Grade to Downtown Gilroy	Bailey Avenue	Aerial	No change	Below	N/A	N/A	New crash wall	San Jose	Santa Clara
Roadway Modification	4	Blended, At Grade to Downtown Gilroy	Richmond Ave.	N/A	N/A	N/A	N/A	N/A	New cul-de-sac, widen road by adding shoulders.	Unincorporated	Santa Clara
Roadway Closure	4	Blended, At Grade to Downtown Gilroy	Fox Lane	N/A	N/A	N/A	N/A	Yes	Closure of Fox Lane Intersection with Monterey Highway	Unincorporated	Santa Clara
Roadway Modification	4	Blended, At Grade to Downtown Gilroy	Fox Court	N/A	N/A	N/A	N/A	N/A	New Fox Court north of closed Fox Lane, extends from Dougherty Ave.	Unincorporated	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Palm Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Unincorporated	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Live Oak Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Unincorporated	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Tilton Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Morgan Hill	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Monterey Highway, South of Cochrane Road	At-grade	No change	Above	N/A	N/A	Replace rail bridge over Monterey Rd.	Morgan Hill	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Main Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Morgan Hill	Santa Clara
New Bike/Ped. Crossing	4	Blended, At Grade to Downtown Gilroy	Morgan Hill Pedestrian Underpass	At-grade	Below grade	Above	N/A	N/A	New pedestrian underpass	Morgan Hill	Santa Clara
Roadway Modification	4	Blended, At Grade to Downtown Gilroy	Diana Ave.	N/A	N/A	N/A	N/A	N/A	Diana Ave.cul-de-sac realignment	Morgan Hill	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	East Dunne Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Morgan Hill	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	San Pedro Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Morgan Hill	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Tennant Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Martin	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Butterfield Boulevard	Aerial	No change	Below	N/A	N/A	N/A	Morgan Hill/San Martin	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	East Middle Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Morgan Hill	Santa Clara
New Bike/Ped. Crossing	4	Blended, At Grade to Downtown Gilroy	San Martin Caltrain Station Pedestrian Overpass	N/A	Aerial	Below	N/A	N/A	N/A	San Martin	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	East San Martin Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Martin	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Church Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Martin	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
Existing	4	Blended, At Grade to Downtown Gilroy	Masten Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	San Martin	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Rucker Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Unincorporated	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Buena Vista Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Unincorporated	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Cohansey Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Las Animas Ave.	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Leavesley Road	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Bike/Ped. Modification	4	Blended, At Grade to Downtown Gilroy	Casey Lane	N/A	N/A	N/A	N/A	Yes	Remove pedestrian crossing	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	IooF Street	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Lewis Street	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Martin Street	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	East 6th Street	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Road Modification	4	Blended, At Grade to Downtown Gilroy	7th St.	N/A	N/A	N/A	N/A	Yes	Road closed	Gilroy	Santa Clara
Road Modification	4	Blended, At Grade to Downtown Gilroy	Old Gilroy	N/A	N/A	N/A	N/A	Yes	Road closed	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	East 10th Street	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Road Modification	4	Blended, At Grade to Downtown Gilroy	Banes Lane	N/A	N/A	N/A	N/A	N/A	Extend Banes Lane to AutoMall Parkway/Chestnut St.	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	Luchessa Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates	Gilroy	Santa Clara
Existing	4	Blended, At Grade to Downtown Gilroy	US 101 Northbound/ Southbound	Aerial	Aerial	Below	N/A	N/A	New crash walls	Gilroy	Santa Clara
Road Modification	4	Blended, At Grade to Downtown Gilroy	Carnadero Ave.	N/A	N/A	N/A	N/A	Yes	Road closure	Gilroy	Santa Clara
New Road Crossing	4	Blended, At Grade to Downtown Gilroy	Bloomfield Avenue	At-grade	No change	Aerial	N/A	N/A	MT2 and MT3 on aerial structure	Unincorporated	Santa Clara

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
New Road Crossing	4	Blended, At Grade to Downtown Gilroy	Bloomfield Avenue	At-grade	No change	At-grade	N/A	N/A	Quad gates for UPRR Hollister and HSR MOWF Access tracks crossing of Bloomfield	Unincorporated	Santa Clara
Pacheco Pass											
Road Modification	1, 2, 3, 4	North Pacheco Pass	SR 152/Pacheco Pass Highway	N/A	N/A	N/A	N/A	N/A	Road widening, additional turn out and transition lane on westbound CA-152, additional left turn lane and transition lane on eastbound CA-152. Additional lanes provide cueing space for vehicles going from CA-152 to TPSWS site.	Unincorporated	Santa Clara
Road Modification	1, 2, 3, 4	North Pacheco Pass	SR 152/Pacheco Pass Highway	N/A	N/A	N/A	N/A	N/A	Turn and transition lanes extended. Additional cueing space for vehicles going from CA-152 to the Tunnel 2 west portal access road.	Unincorporated	Santa Clara
New Road Crossing	1, 2, 3, 4	North Pacheco Pass	SR 152/Pacheco Pass Highway	At-grade	No change	Below	N/A	N/A	HSR in tunnel under SR 152 ~3250+00	Unincorporated	Santa Clara
New Road Crossing	1, 2, 3, 4	North Pacheco Pass	SR 152/Pacheco Pass Highway	At-grade	No change	Below	N/A	N/A	HSR in tunnel under SR 152 ~3545+00	Unincorporated	Santa Clara
New Road Crossing	1, 2, 3, 4	North Pacheco Pass	SR 152/Pacheco Pass Highway	At-grade	No change	Below	N/A	N/A	HSR in tunnel under SR 152 ~3660+00	Unincorporated	Santa Clara
New Road Crossing	1, 2, 3, 4	North Pacheco Pass	McCabe Road	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	North Pacheco Pass	Whitworth Road	Aerial	No change	Above	N/A	N/A	N/A	Unincorporated	Merced
Road Modification	1, 2, 3, 4	North Pacheco Pass	Romero Rd N	N/A	N/A	N/A	N/A	N/A	Realignment	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	North Pacheco Pass	I-5	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Merced
San Joaquin Valley											
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Santa Nella Rd/SR 33	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Fahey Road	At-grade	No change	Above	N/A	N/A	Realignment	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Cherokee Road	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Ingomar Grade Road	At-grade	No change	Above	N/A	N/A	N/A	Volta	Merced
Road Closure	1, 2, 3, 4	Henry Miller Road	Volta Rd.	N/A	N/A	N/A	N/A	Yes	Road closure	Volta	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Henry Miller Road	At-grade	Embankment/Aerial	Below	Y	N/A	Grade Separation	Volta	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Badger Flat Road	At-grade	No change	Above	N/A	N/A	N/A	Unincorporated	Merced
Road Modification	1, 2, 3, 4	Henry Miller Road	New	N/A	N/A	N/A	N/A	N/A	New road from Badger Flat Rd. to Nantes Ave.along south of HSR.	Unincorporated	Merced
Road Closure	1, 2, 3, 4	Henry Miller Road	Johnson Road	N/A	N/A	N/A	N/A	Yes	Road closure of Johnson Road	Unincorporated	Merced

Type	Alternative	Design Option	Roadway/Path	Existing Road/Path Grade at Roadway Xing	Proposed Road/Path Profile at HSR	Prop. HSR Grade (Above or Below) at Roadway Xing	Grade Separation	Closure	Modification	City	County
Road Closure	1, 2, 3, 4	Henry Miller Road	Nantes Avenue	N/A	N/A	N/A	N/A	Yes	Road closure of Nantes Avenue	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	SR 165/Mercey Spring Road (proposed)	At-grade	Embankment/Aerial	Below	Y	N/A	Grade Separation	Unincorporated	Merced
Road Closure	1, 2, 3, 4	Henry Miller Road	Santa Fe Grade	N/A	N/A	N/A	N/A	Yes	Road closure of Santa Fe Grade	Unincorporated	Merced
Road Closure	1, 2, 3, 4	Henry Miller Road	Baker Road	N/A	N/A	N/A	N/A	Yes	Road closure of Baker Road	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Delta Road	At-grade	Embankment/Aerial	Below	N/A	N/A	Grade Separation	Unincorporated	Merced
Road Closure	1, 2, 3, 4	Henry Miller Road	Midway Road	N/A	N/A	N/A	N/A	Yes	Cul-de-sac	Unincorporated	Merced
Road Closure	1, 2, 3, 4	Henry Miller Road	Box Car Road	N/A	N/A	N/A	N/A	Yes	Road closure	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Turner Island Road (proposed)	At-grade	Embankment/Aerial	Below	N/A	N/A	Grade Separation	Unincorporated	Merced
Road Closure	1, 2, 3, 4	Henry Miller Road	Hutchins Road	N/A	N/A	N/A	N/A	Yes	Road closure of Hutchins Road	Unincorporated	Merced
New Road Crossing	1, 2, 3, 4	Henry Miller Road	Carlucci Road (proposed)	At-grade	Embankment/Aerial	Below		N/A	Grade Separation	Unincorporated	Merced

Source: Authority 2019a
No. = Number
Xing = crossing
HSR = high-speed rail
Prop. = Proposed
Blvd = Boulevard
I = Interstate
SR = State Route
N/A = Not Applicable

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Table 2 Local Roadway Modifications Required for HSR

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
San Jose to Diridon Station Approach						
Grant St	Other roadway modification	Road shortened		X	X	
De la Cruz Blvd	Grade separation	Changes from overcrossing to undercrossing		X	X	
West Hedding St	Other roadway change	Rebuilds existing overcrossing	X			
West Hedding St	Grade separation	Changes from overcrossing to undercrossing		X	X	
University Ave	Road closure	Converted to a cul-de-sac	X	X	X	
Emory St	Road closure	Converted to a cul-de-sac	X	X	X	
Stockton Ave	Road closure	Converted to a cul-de-sac	X	X	X	
Chestnut St	Alignment change/road closure	Realigned/closed from Ashbury St to W Taylor St	X			
Chestnut St	Alignment change	Realigned		X	X	
W Taylor St	Grade separation	New HSR undercrossing (Caltrain railroad bridge over Taylor is maintained)	X			
W Taylor St	Grade separation	New HSR overcrossing alongside existing Caltrain overcrossing				X
W Taylor St	Alignment change	Realign westbound Taylor St to northbound Chestnut St		X	X	
North Montgomery St	Other roadway change	Extended to maintain property access	X	X	X	
Stover St	Other roadway change	Extend Stover St from S Montgomery St to Autumn St	X	X	X	
Crandall St	Other roadway change	Extend from S Montgomery St to Autumn St	X	X	X	
Cahill St	Other roadway change	Extension to Park Ave and lane conversion to transit only lanes	X	X	X	
SR-87 On-Ramp	Alignment change	Ramp realignment	X	X	X	
Auzerais Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
W Virginia St	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Fuller Ave	Alignment change	Realignment of Fuller Ave dead end				X
Monterey Corridor						
Almaden Expwy	Alignment change	Realign on-ramp to SR 87	X		X	

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Monterey Rd from Southside Dr to between Blossom Hill Rd and Ford Rd	Lane narrowing	Narrowed to four lanes	X		X	
Monterey Rd between Fehren Dr and Blossom Hill Rd	Lane narrowing	Narrowed from six to four lanes		X		
Southbound Monterey Rd	Other roadway change/Alignment change	Road widening for bus turnout, road realignment	X		X	
Monterey Rd between Senter Rd and Skway Dr	Other roadway change	Closure of midblock southbound left turn into shopping center between Senter Rd and Skyway Dr	X	X	X	
Skyway Dr	Grade separation	Skyway Dr depressed and realigned with ramp return to Monterey Rd at grade (Variant A); Monterey Rd depressed (Variant B)		X		
Skyway Dr	4-quadrant gate	4 vehicular arm gates, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, 2 pedestrian barriers				X
Branham Ln	Grade separation	Intersection reconfigured, Monterey Rd depressed, some turn lanes removed		X		
Branham Ln	4-quadrant gate	4 vehicular arm gates, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, 2 pedestrian barriers				X
Rice Way	Road Closure	Access from Rice Wy to Monterey Rd closed		X		
Waterfall Ct	Other roadway change	Extend Waterfall Ct to Broken Lance Ct		X		
Waterfall Ct	Road closure	Close access from Waterfall Ct to Cynoweth		X		
Chynoweth Ave	Grade separation	Roadway reconfigured, some turn lanes removed		X		
Chynoweth Ave	4-quadrant gate	3 vehicular arm gates, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, 1 pedestrian barrier				X
Monterey Rd	Other roadway change	Closure of midblock southbound left turn into shopping center between Chynoweth Ave and Blossom Hill Rd	X	X	X	
Blossom Hill Rd SB Ramp from Monterey Rd to Blossom Hill	Other roadway change	Ramps reconfigured: SB on-ramp moved to other side of Monterey, accessed via SBL pocket		X		
Flintwell Way	Road widening	Widen Monterey Rd at Flintwell Wy	X		X	
Monterey Rd	Other roadway change	Closure of midblock southbound left turn into shopping center at Hicks Ln	X		X	

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Bernal Rd	Road Widening	Widening of on-/off-ramps to Monterey Rd	X		X	
Great Oaks Pkwy	Alignment change	Realignment of Great Oaks Pkwy				X
Morgan Hill and Gilroy						
Monterey Rd	Other roadway change	Removal of southbound midblock left turn into Roding Wy	X		X	
Monterey Rd	Road widening	Widening from Metcalf Rd to Coyote Ranch Rd	X		X	
Blanchard Rd	Road closure	Road closure		X		
Blanchard Rd	Other roadway change	Extension of Blanchard Rd to new Emado Ave extension		X		
Blanchard Rd	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates.				X
Monterey Rd	Alignment change	Realignment from Blanchard Rd to Cochrane Rd		X		
Emado Ave	Road closure	Closure of Emado Ave intersection with Monterey Rd		X		X
Emado Ave	Other roadway change	Extension of Emado Ave to Santa Teresa Blvd		X		
Charter Access Rd	Alignment change	Realigned access road to charter school		X		
Richmond Ave	Road closure	New cul-de-sac, widen road by adding shoulders				X
Fox Ct	Other roadway change	New Fox Ct north of closed Fox Ln, extens from Doughtery Ave		X		X
Fox Ln	Road closure	Road closure		X		X
Palm Ave	Other roadway change	Removal of designated left turn from southbound Monterey Rd	X			
Palm Ave	Grade separation	Palm Ave depressed and realigned to access Monterey Rd from opposite side of roadway		X		
Palm Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates				X
Monterey Rd near Ogier	Alignment change	Realigned with dogleg	X			
Ogier Ave	Road closure	Partial closure due to realignment of Monterey Rd	X		X	
Live Oak Ave	Grade separation	Live Oak Ave realigned to access Monterey Rd from opposite side of roadway		X		

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Live Oak Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, traffic signals where none exist				X
Tilton Ave	Road closure	Road closure		X		
Tilton Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, traffic signals where none exist				X
Madrone Pkwy	Grade separation	Madrone Pkwy realigned to access Monterey Rd from opposite side of roadway; roadway extended to new intersection at Hale Ave		X		
Monterey Rd	Alignment change	Monterey Road realigned		X		
East Central Ave	Road closure	East Central Avenue cul-de-sac relocated east		x		
East Main Ave	Grade separation	Road widening and modifications. No changes to access to Monterey Rd		X		
East Main Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Depot St	Road closure	Access from Depot St to Main Ave closed due to grade separation		X		
Diana Ave	Road closure	Diana Ave cul-de-sac relocated east		X		X
East Dunne Ave	Grade separation	Road widening and modifications. No changes to access to Monterey Rd		X		
East Dunne Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
San Pedro Ave	Grade separation	San Pedro Ave rebuilt. No changes to access on Monterey Rd		X		
San Pedro Ave	Road closure	Relocate cul-de-sac to west of HSR.	X		X	
San Pedro Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Church St	Grade separation	Church Ave realigned to access Monterey Rd from opposite side of roadway		X		

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Railroad Ave	Alignment change	Railroad Ave roadway modification and realignment between Barrett Ave and Maple Ave		X		
Barrett Ave	Alignment change	Access realigned to St. John Ct	X		X	
Tennant Ave	Grade separation	New Underpass along Tennant. Roadway realigned, new frontage road replaces Railroad Ave and provides access to Barrett Ave and Maple Ave		X		
Tennant Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Fisher Ave	Road closure	Close and relocate cul-de-sac to west of HSR.	X		X	
Caputo Dr	Road closure	Caputo Dr. access to Tennant Ave. closed off and converted to cul-de-sac.		X		
East Middle Ave	Grade separation	Realigned grade separation		X		
East Middle Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Monterey Rd	Alignment change	Realignment from East Middle Ave to San Martin Ave and new bridge over Llagas Creek		X		
Colony Ave	Alignment change	Colony Ave to connect with San Martin Ave		X		
Oak St	Other roadway change	San Martin Ave realigned on former Oak St		X		
E San Martin St	Grade separation	New Underpass. Road realigned and rebuilt; access to Monterey Rd converted to T intersection and shifted to west side of roadway; new access onto E San Martin from Colony Ave and Llagas Ave		X		
E San Martin St	4-quadrant gate	4 vehicular arm gates, 50-ft raised median, 4 pedestrian arm gates and exit swing gates				X
Lincoln Ave	Road closure	Lincoln Ave converted to cul-de-sac south of realigned San Martin Ave		X		
South St	Other roadway change	Shortening of South St	X		X	
Church Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, traffic signals where none exist				X
Lena Ave	Road closure	Lena Ave converted to a cul-de-sac		X		

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Masten Ave/Fitzgerald Ave	Grade separation	Monterey Rd depressed. Masten Ave and Fitzgerald Ave realigned to access Monterey Rd.		X		
Masten Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates				X
Rucker Ave	Grade separation	Rucker Ave realigned to access Monterey Rd from opposite side of roadway		X		
Rucker Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, traffic signals where none exist				X
Monterey Hwy	Other roadway change	Depressed roadway to conform with Buena Vista Ave grade separation		X		
Denio Ave	Road closure	Denio Ave converted to cul-de-sac		X		
Buena Vista Ave	Grade separation	New Underpass. Road is realigned and widened. T intersection with realigned Monterey Road on west side of existing road.		X		
Buena Vista Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, traffic signals where none exist				X
Cohansey Ave	Grade Separation	New underpass		X		
Cohansey Ave	Road closure	Road closure			X	
Cohansey Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates, traffic signals where none exist				X
Las Animas Ave	Grade separation	Realigned to merge with Cohansey Ave		X	X	
Las Animas Ave	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates.				X
Marcella Ave	Other roadway change	New road north and parallel to Leavesley connecting the station to Marcella Ave			X	
New road north of Leavesley Road	Other roadway change	New road north and parallel to Leavesley west of HSR			X	
New road parallel to Marcella Ave	Other roadway change	New road parallel to Marcella Ave., connecting Leavesley to Las Animas, adjacent to Gilroy outlets			X	
Leavesley Rd	Grade separation	New underpass		X		

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Leavesley Rd	Road widening	Widening of Leavesley Road	X		X	
Leavesley Rd	4-quadrant gate	2–4 vehicular arm gates, channelizers, 50-ft raised median, 4 pedestrian arm gates and exit swing gates				X
Casey St	Grade separation	New underpass		X		
Casey Ln	Closed	Pedestrian crossing closure				X
Wheeler St	Road closure	Shortened and converted to cul-de-sac		X		
IOOF St	Grade separation	New underpass, demolish existing bridge		X		
IOOF St	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Lewis St	Grade separation	New Underpass		X		
Lewis St	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Martin St	Road closure	Shortened and converted to cul-de-sac		X		
Martin St	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Railroad St	Road closure	Road closure from Lewis St to 7th St	X	X		
E 6th St	Grade separation	New Underpass		X		
E 6th St	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Old Gilroy St	Road closure	Road closure between Alexander St and Monterey Rd	X			X
E 6th St	Alignment change	Realignment		X		
Gilman Rd	Grade separation	Gilman Rd rebuilt over HSR tracks			X	
East 7th St/Old Gilroy St	Alignment change	Realignment	X			
Old Gilroy St	Road closure	Road closed, new pedestrian overcrossing				X
E 7th St	Alignment change	Realigned and extended to Alexander St		X		
E 7th St	Road Closure	Road closed, new pedestrian overcrossing				X
Holsclaw Rd	Road closure	Road closure of Holsclaw Road, cul-de-sac on both sides of HSR			X	

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Holsclaw Rd	Alignment change	Realignment to connect with SR 152 grade separation			X	
E 9th St	Grade separation	New Underpass. Extend road to connect from Alexander street to Monterey Road		X		
E 10th St	Grade separation	New underpass		X		
E 10th St	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Banes Ln	Other roadway change	Extend for access to new parking and cul-de-sac for access to system site	X	X		X
Luchessa Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
Frazier Lake Rd	Alignment change	Grade separation and realignment to connect to SR 152 grade separation			X	
SR 152	Grade separation	New Overpass. Road realigned. On-ramp access from existing Holsclaw Road, Frazier Lake Road			X	
Carnadero Avenue	Road closure	Road closure				X
Bloomfield Ave	4-quadrant gate	2 vehicular arm gates, channelizers, 4 pedestrian arm gates and exit swing gates				X
SR 152/Pachecho Pass Hwy	Road widening	Road widening, additional turn out and transition lane on westbound CA-152, additional left turn lane and transition lane on eastbound CA-152; additional lanes provide queueing space for vehicles going from CA-152 to TPSS site Turn and transition lanes extended; additional quueing space for vehicles going from CA-152 to the Tunnel 2 west portal access road.	X	X	X	X
Pacheco Pass						
N Romero Rd	Alignment change	Realignment	X	X	X	X
San Joaquin Valley						
Fahey Rd	Alignment change	Realignment	X	X	X	X
Volta Rd	Alignment change/road closure	Intersection realigned and roadway closed north of Henry Miller Rd	X	X	X	X
Henry Miller Rd	Grade separation	Road realigned near Volta Rd	X	X	X	X

Roadway	Classification	Description of Change	Alternative			
			1	2	3	4
Henry Miller Rd	Other roadway change	New road from Badger Flat Rd to Nantes Ave.along south of HSR	X	X	X	X
Johnson Rd	Road closure	Road closure	X	X	X	X
Nantes Ave	Road closure	Road closure	X	X	X	X
Mercey Springs Rd	Grade separation	Intersection rebuilt as grade-separated and realigned to access Henry Miller Rd as T intersection	X	X	X	X
Santa Fe Grade	Road closure	Road closure	X	X	X	X
Baker Rd	Road closure	Road closure	X	X	X	X
Delta Rd	Grade separation	Intersection rebuilt as grade-separated and realigned to access Henry Miller Rd as T intersection	X	X	X	X
Midway Rd	Road closure	Road closure	X	X	X	X
Box Car Rd	Road closure	Road closure	X	X	X	X
Turner Island Rd	Grade separation	Intersection rebuilt as grade-separated and realigned to access Henry Miller Rd as T intersection	X	X	X	X
Hutchins Rd	Road closure	Road closure	X	X	X	X
Carlucci Rd	Grade separation	New grade separation; intersection access to Henry Miller Rd reconfigured	X	X	X	X

Source: Authority 2019a

At-Grade Crossings

Depending on the configuration of the existing at-grade crossing, one of eight different four-quadrant gate applications (illustrated on Figure 1 through Figure 4) would be installed at each of the 29 at-grade crossings in the San Jose Diridon Station Approach, Monterey Corridor, and Morgan Hill and Gilroy Subsections under Alternative 4. Table 3 shows the number and locations of four-quadrant gate applications. These applications specify the improvements at each at-grade crossing, including the number of vehicle and pedestrian gates, and the need for channelization or raised medians. Table 3 also shows five existing at-grade crossings that would be closed: three private roads, one public road, and one pedestrian crossing.

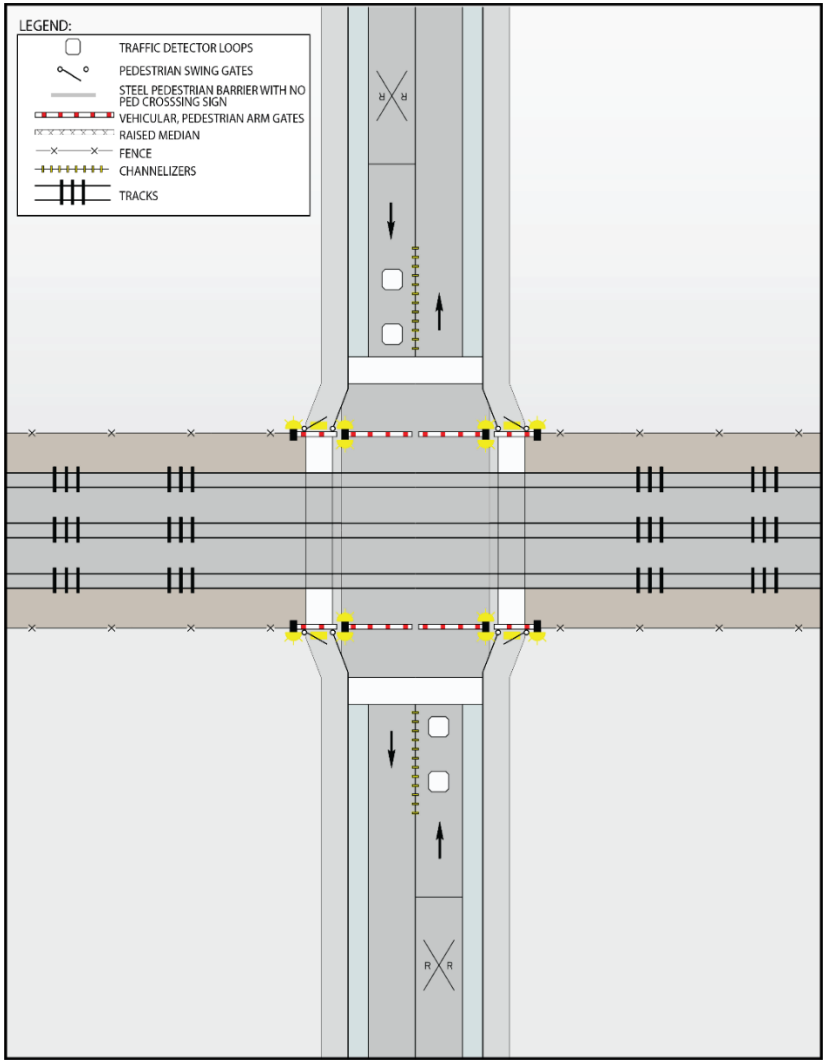
At four crossings (Blanchard Road, Palm and Live Oak Avenues in Coyote Valley, and Bloomfield Road south of Gilroy) within identified wildlife crossing corridors, additional features would be added at the grade crossings to deter wildlife from encroaching into the fenced guideway. These features would be placed across the guideway between the access control fencing and between the tracks as a deterrent to wildlife entering the track bed.

Table 3 Number and Locations of Four-Quadrant Gate Applications

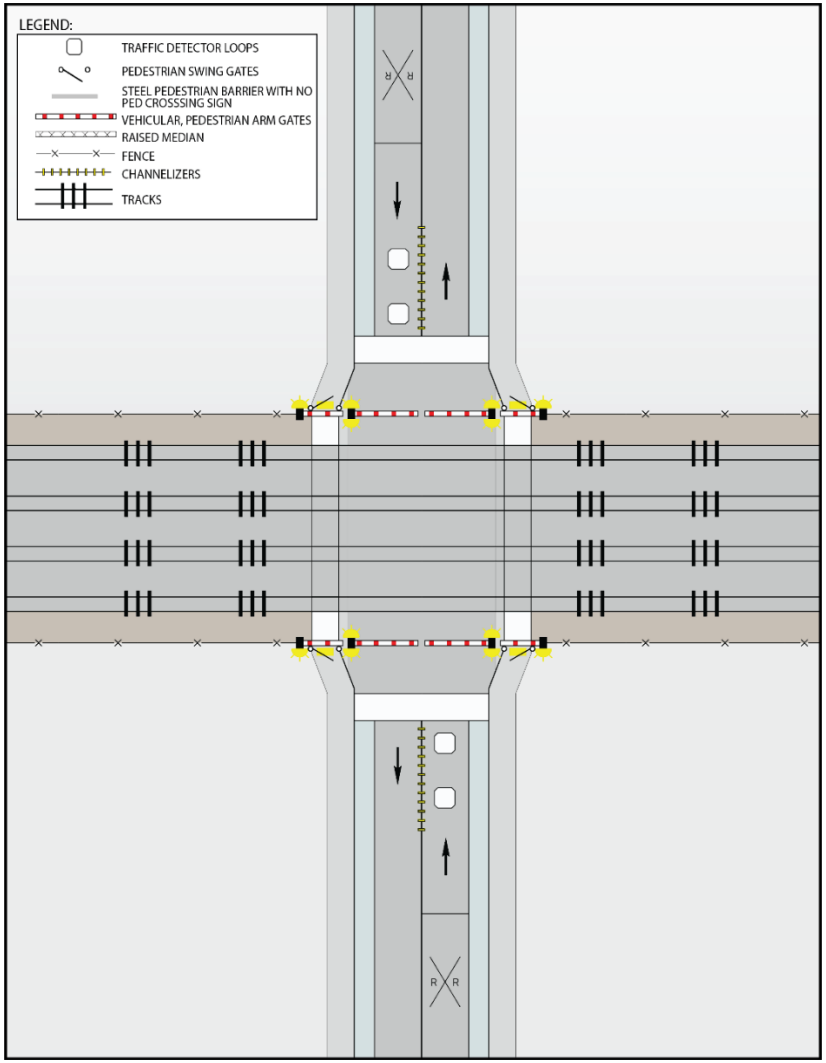
Application	Number of At-Grade Crossings	Location of At-Grade Crossings
A	13	Auzerais Ave (San Jose); W Virginia St (San Jose); Blanchard Rd (San Jose); Main Ave (Morgan Hill); E Dunne Ave (Morgan Hill); San Pedro Ave (Morgan Hill); Tennant Ave (Morgan Hill); E Middle Ave (Morgan Hill); IOOF Ave (Gilroy); Lewis St (Gilroy); Martin St (Gilroy); E 6th St (Gilroy); Bloomfield Ave (Gilroy)
A1	2	E 10th St (Gilroy); Luchessa Ave (Gilroy)
B	1	E San Martin Ave (Santa Clara County)
C	2	Palm Ave (San Jose); Las Animas Ave (Gilroy)
C1	2	Masten Ave (Santa Clara County); Leavesley Rd (Gilroy)
C2	6	Live Oak Ave (San Jose); Tilton Ave (Morgan Hill); Church Ave (Santa Clara County); Rucker Ave (Santa Clara County); Buena Vista Ave (Gilroy); Cohansey Ave (Gilroy)
D	2	Skyway Dr (San Jose); Branham Ln (San Jose)
D1	1	Chynoweth Ave (San Jose)
Closed	5	Emado Avenue (Private) and Fox Lane (Private) in San Jose; No Name driveway (Private), Casey Lane (Pedestrian Crossing) and East 7th Street in Gilroy
Total	**29**	

Source: Authority 2019a

Application A



Application A1

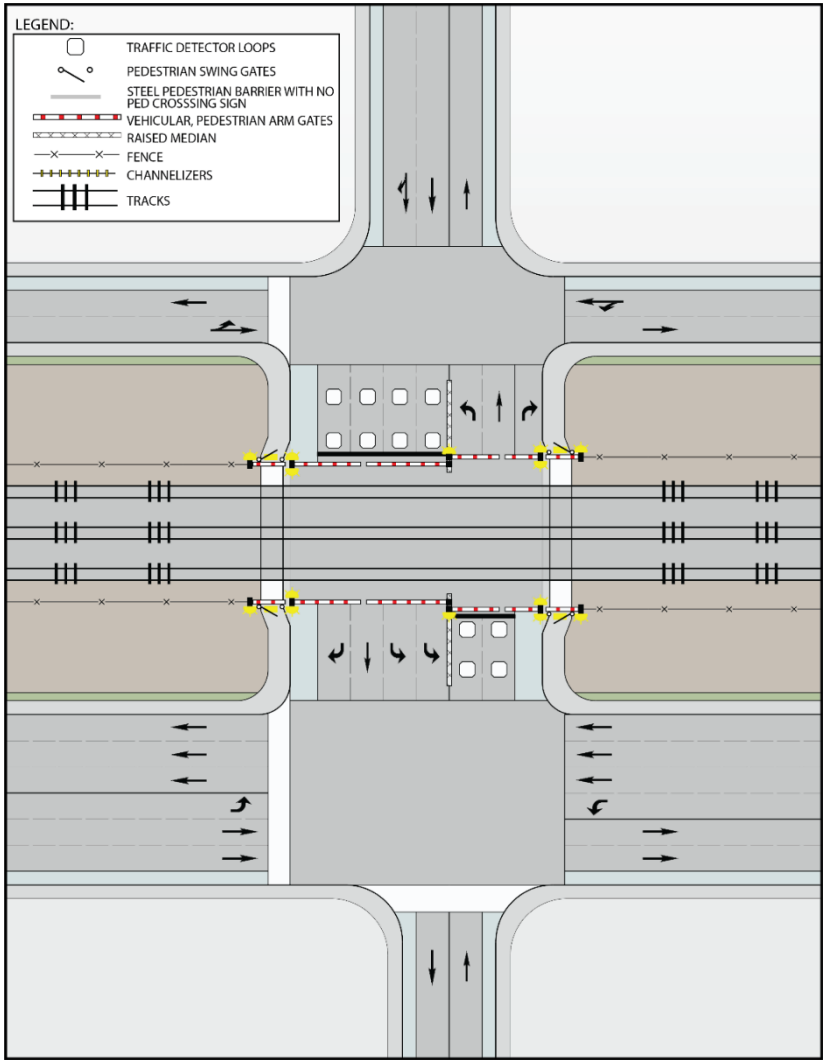


Source: Authority 2019a

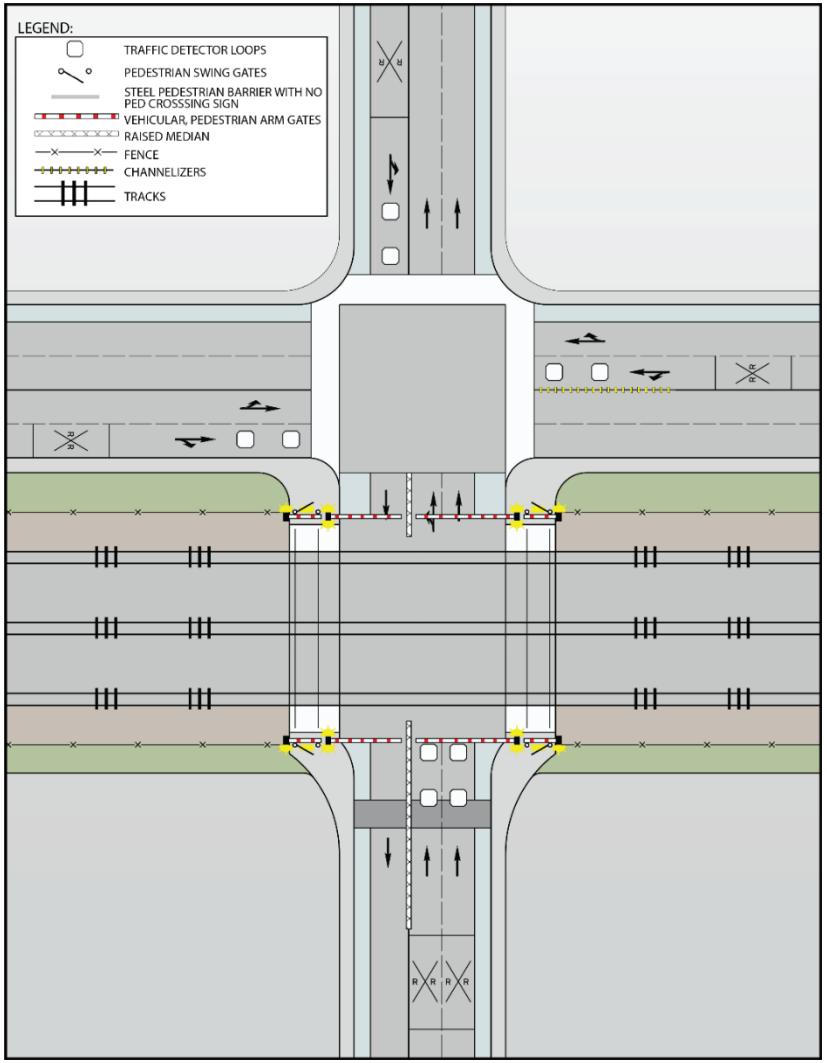
MARCH 2019

Figure 1 Applications of Four-Quadrant Gates (Options A and A1)

Application B



Application C

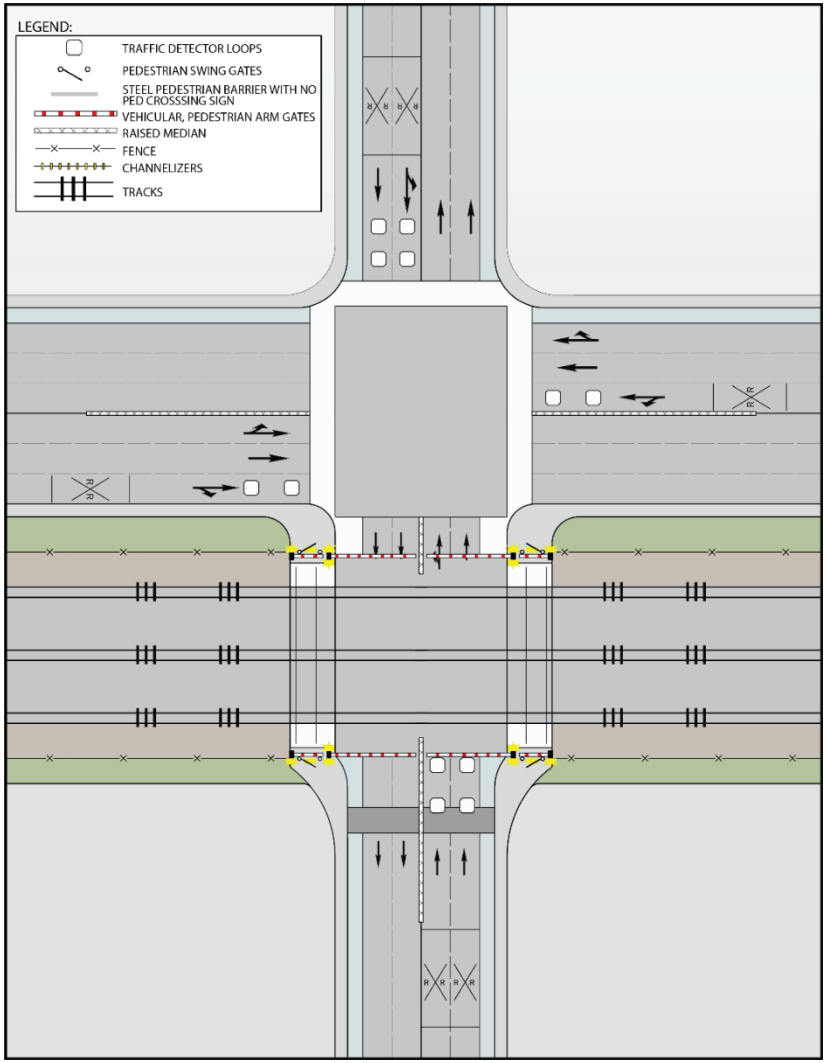


Source: Authority 2019a

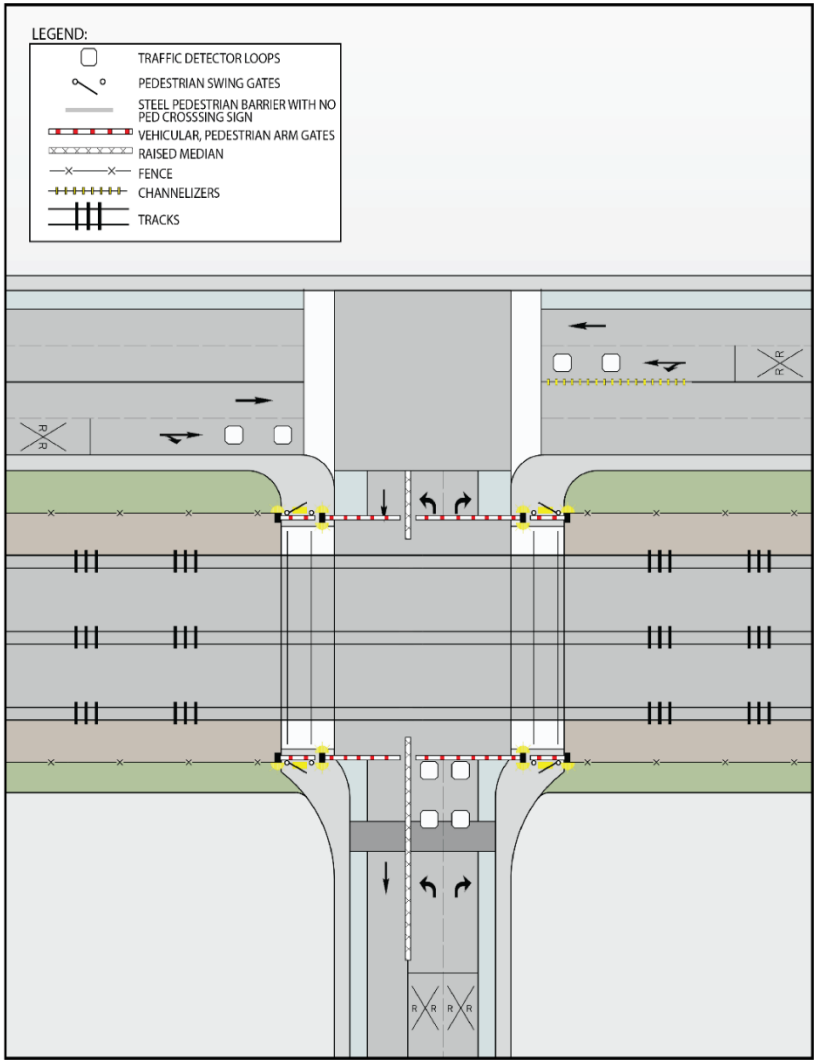
MARCH 2019

Figure 2 Applications of Four-Quadrant Gates (Options B and C)

Application C1



Application C2

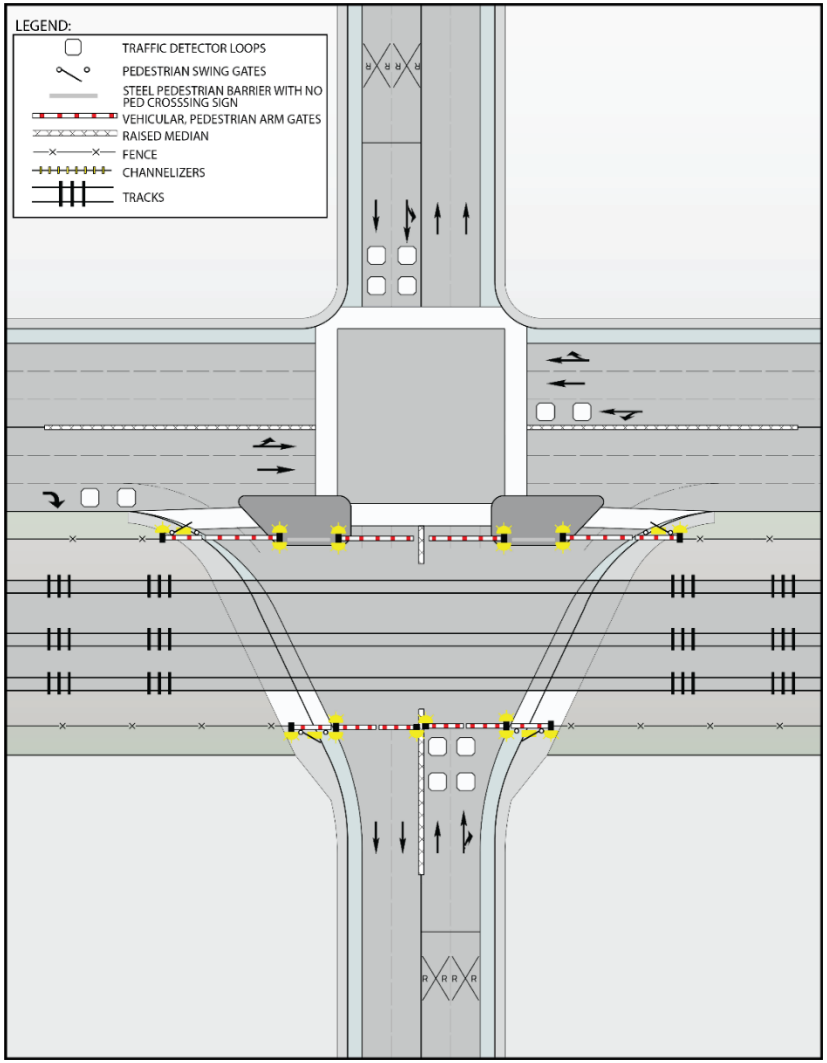


Source: Authority 2019a

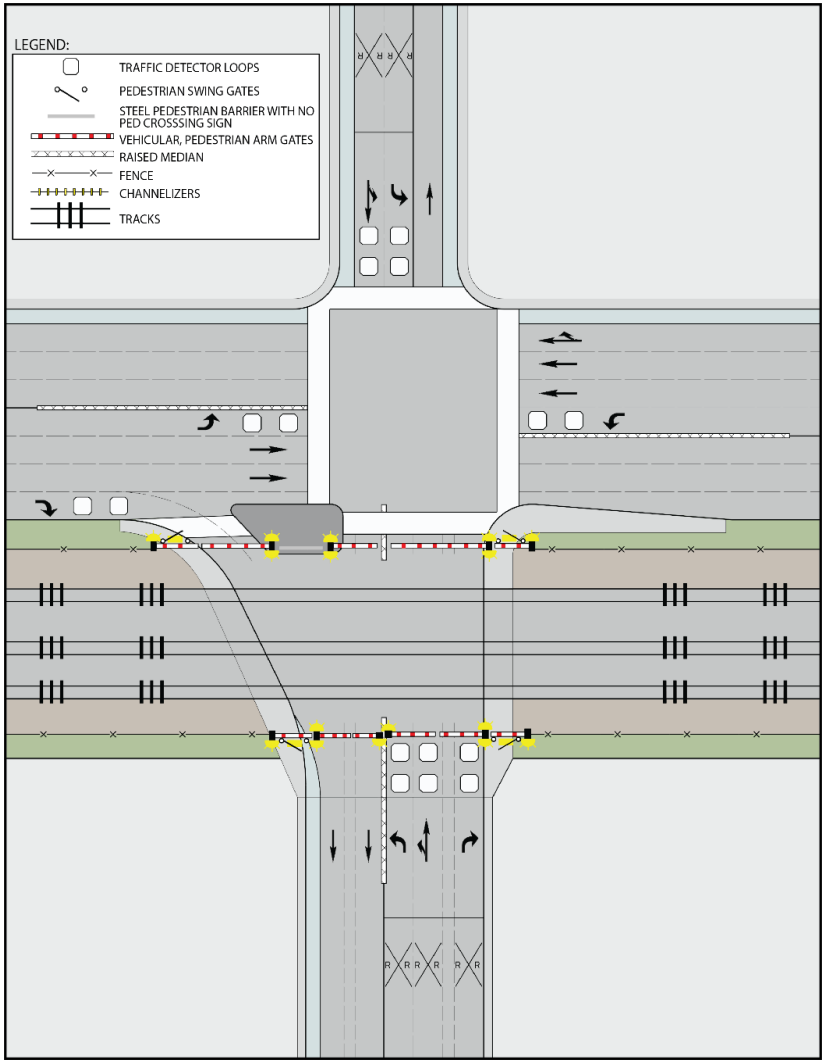
MARCH 2019

Figure 3 Applications of Four-Quadrant Gates (Options C1 and C2)

Application D



Application D1



Source: Authority 2019a

MARCH 2019

Figure 4 Applications of Four-Quadrant Gates (Options D and D1)

APPENDIX 2-B: RAILROAD CROSSINGS

APPENDIX 2-B: RAILROAD CROSSINGS

Crossing No.	Alternative	Design Option	Railroad Xing Location	Railroad	Railroad Grade	HSR Grade	City	County
San Jose Diridon Approach								
1	1	Viaduct to I-880	South of Taylor Street and Coleman Street	Union Pacific Railroad	At-Grade	Aerial	San Jose	Santa Clara
2, 3	1	Viaduct to I-880	Lenzen Wye, near Cinnabar St. and N. Montgomery St.	Union Pacific Railroad	At-Grade	Aerial	San Jose	Santa Clara
4	1	Viaduct to I-880	Approx. 400 ft north of West Santa Clara Street, north of Diridon Station	Caltrain	At-Grade	Aerial	San Jose	Santa Clara
5	1	Viaduct to I-880	Diridon Station	VTA	Tunnel	Aerial	San Jose	Santa Clara
6	1	Viaduct to I-880	Park Avenue, south of Diridon Station	Caltrain	At-Grade	Aerial	San Jose	Santa Clara
7	1	Viaduct to I-880	Guadalupe Freeway	Santa Clara Valley Transportation Authority	At-Grade	Aerial	San Jose	Santa Clara
8	1	Viaduct to I-880	Approx. 750 ft northwest of Willow Street	Caltrain	Embankment	Aerial	San Jose	Santa Clara
1	2, 3	Viaduct to Scott Blvd	Lafayette Street	Caltrain	At-Grade	Embankment	Santa Clara	Santa Clara
2	2, 3	Viaduct to Scott Blvd	Approx. 350 ft southeast of De La Cruz Boulevard	Union Pacific Railroad	At-Grade	Aerial	Santa Clara	Santa Clara
3	2, 3	Viaduct to Scott Blvd	Approx. 1,250 ft southeast of De La Cruz Boulevard	Caltrain/Union Pacific Railroad	At-Grade	Aerial	Santa Clara	Santa Clara
4	2, 3	Viaduct to Scott Blvd	Approx. 3,000 ft southeast of De La Cruz Boulevard	Caltrain/Union Pacific Railroad	At-Grade	Aerial	San Jose	Santa Clara
5, 6	2, 3	Viaduct to Scott Blvd	Lenzen Wye, near Cinnabar St. and N. Montgomery St.	Union Pacific Railroad	At-Grade	Aerial	San Jose	Santa Clara
7	2, 3	Viaduct to Scott Blvd	Approx. 400 ft north of West Santa Clara Street, north of Diridon Station	Caltrain	At-Grade	Aerial	San Jose	Santa Clara

Crossing No.	Alternative	Design Option	Railroad Xing Location	Railroad	Railroad Grade	HSR Grade	City	County
8	2, 3	Viaduct to Scott Blvd	Diridon Station	VTA	Tunnel	Aerial	San Jose	Santa Clara
9	2, 3	Viaduct to Scott Blvd	Park Avenue, south of Diridon Station	Caltrain	At-Grade	Aerial	San Jose	Santa Clara
10	2, 3	Viaduct to Scott Blvd	Guadalupe Freeway	Santa Clara Valley Transportation Authority	At-Grade	Aerial	San Jose	Santa Clara
11	2, 3	Viaduct to Scott Blvd	Approx. 750 ft northwest of Willow Street	Caltrain	Embankment	Aerial	San Jose	Santa Clara
1	4	At-Grade	Diridon Station	VTA	Tunnel	At-Grade	San Jose	Santa Clara
2	4	At-Grade	Guadalupe Freeway	Santa Clara Valley Transportation Authority	At-Grade	Aerial	San Jose	Santa Clara
Monterey Corridor								
9	1	Viaduct	Fehren Drive	Caltrain/UPRR	At-Grade	Aerial	San Jose	Santa Clara
12	2, 3	At-Grade, Viaduct	Fehren Drive	Caltrain/UPRR	At-Grade	Aerial	San Jose	Santa Clara
Morgan Hill and Gilroy								
13	2	Viaduct, Embankment	South of US 101	Union Pacific Railroad	At-Grade	Trench	Gilroy	Santa Clara
10	1	Viaduct	South of US 101	Union Pacific Railroad	At-Grade	Aerial	Gilroy	Santa Clara
3	4	At-Grade	South of US 101	Union Pacific Railroad	At-Grade	Aerial	Gilroy	Santa Clara
San Joaquin Valley								
11, 14, 13	1, 2, 3	Henry Miller Road	Ingomar Grade	Union Pacific Railroad	At-Grade	Aerial	Volta	Merced
4	4	Henry Miller Road	Ingomar Grade	Union Pacific Railroad	At-Grade	Aerial	Volta	Merced

Source: List based on November 2018 engineering plans.
This table identifies HSR crossings of railroad tracks within the project extent.
No. = Number
Xing = crossing
HSR = high-speed rail
Prop. = proposed
I = Interstate
Approx. = approximately
Ft = feet

APPENDIX 2-C: OPERATIONS AND SERVICE PLAN SUMMARY

- Part 1: Operations and Service Plan Summary (February 2017)
- Part 2: San Francisco to Gilroy HSR System Requirements (August 2018)

APPENDIX 2-C PART 1: OPERATIONS AND SERVICE PLAN SUMMARY (FEBRUARY 2017)

California High-Speed Rail Authority

Statewide

Operations and Service Plan

February 2017

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

TABLE OF CONTENTS

1 INTRODUCTION 1-1

2 SERVICE PLAN OVERVIEW 2-1
2.1 Implementation Phasing 2-1

3 SERVICE PLANS 3-1
3.1 Valley to Valley and Valley to Valley Extended (2025) 3-2
3.2 Phase 1 (2029) 3-2

4 PASSENGER STATION OPERATIONS 4-1
4.1 Intermediate Stations and Platform Tracks 4-1
4.2 Terminal Stations 4-2
4.2.1 Passenger Boarding 4-3
4.2.2 Train Cleaning and Servicing 4-4
4.2.3 Train Layover Times at Terminal 4-4

5 ROLLING STOCK STORAGE AND MAINTENANCE 5-1
5.1 Fleet Requirements 5-1
5.2 Train Storage and Maintenance Facilities 5-1
5.3 Rolling Stock Maintenance Program 5-2
5.4 Facility Site Location Criteria 5-3
5.5 Estimated Site Requirements 5-3
5.6 Commissioning of Rolling Stock 5-4

6 TRAIN DISPATCHING AND CONTROL 6-1
6.1 Operations Control Center 6-1
6.2 Communications with HST Stations 6-1

Tables

Table 1-1 Summary of Phased Implementation 1-1
Table 4-1 Time Required for Terminal Layover Activities (HST Planning Assumptions, Revenue Train to Revenue Train) 4-5
Table 5-1 Horizon Year 2040 (Phase 1) Service Plan. Revenue Train Sets Required at Each Terminal to Start Weekday Morning Train Service. 5-1
Table 5-2 Horizon Year 2040 (Phase 1) Train Fleet Requirements 5-1
Table 5-3 Phase 1 Blended Service (2040) Storage/Layup Track Requirements 5-2

Figures

Figure 3-1 Valley to Valley Extended Train Stopping Patterns (2025: Peak Period Service) 3-2
Figure 3-2 Phase 1 Train Stopping Patterns (2029) 3-3
Figure 4-1 Intermediate Station Typical Configuration 4-1
Figure 4-2 Intermediate Station Typical Cross-Section 4-2
Figure 4-3 Terminal Station—4 Track Terminal and 2 Island Platforms 4-2
Figure 4-4 Terminal Station—6 Track Terminal and 3 Island Platforms 4-3
Figure 5-1 Example of Typical Concept Configuration for Overnight Storage Yard with Shop 5-2

ACRONYMS AND ABBREVIATIONS

AB	(California) Assembly Bill
Authority	California High-Speed Rail Authority
BMP	best management practice
C.F.R.	Code of Federal Regulations
Caltrans	California Department of Transportation
EIR	environmental impact report
EIS	environmental impact statement
Fed. Reg.	*Federal Register*
FRA	Federal Railroad Administration
HSR	high-speed rail
PMT	Program Management Team
RC	Regional Consultant
SB	(California) Senate Bill
SR	State Route
U.S.C.	United States Code

1 INTRODUCTION

This summary provides background information on the intended service and operations of the California High-Speed Train (HST) System to provide sufficient detail for the environmental assessment of proposed HST operations. Recognizing that the California system is still at a relatively early stage of the planning process, and that many operational issues remain to be resolved, this section summarizes how the system is envisioned to operate at this point in project planning.

Inspired by successes of high-speed train systems around the world, California has been planning a statewide high-speed rail line that will serve as a backbone and a needed alternative to the state's existing transportation network. The system will interface with and complement other modes of transportation – commercial airports, mass transit, the state's highway network, bike paths and pedestrian traffic. It will be capable of 220 mph revenue operating speed. It will interconnect with other modes of transportation and provide an environmentally friendly alternative to vehicle and air travel.

The updated phasing strategy for the California HST System will initiate revenue service between San Jose in the Silicon Valley and north of Bakersfield in the Central Valley in 2025. In the event that some additional funding can be made available this initial service may be extended to operate between San Francisco 4th and King Station, Merced and Bakersfield.

Phase 1 will be realized in 2029 with the expansion of the system to Los Angeles and Anaheim (See Table 1-1).

Proven train technologies similar to those used in other countries with established high-speed train systems (for example: Japan, France, Germany, Great Britain, Spain, Korea and China) will be used. This technology includes steel-wheel-on-steel-rail, entirely electric power, state-of-theart safety and signaling systems, and automated train control. This technology, although new to North America, was introduced in Japan in 1964, France in 1981, and in many other countries within the past two decades.

The HST will operate primarily on exclusive (dedicated) track with portions of the route shared with other existing passenger rail operations. The route (alignment) will be constructed either atgrade, in an open trench, in a tunnel, or on an elevated guideway, depending on the terrain, physical constraints, environmental impacts and community input along each section. The system will predominately be within, or adjacent to, existing rail or highway right-of-way to reduce potential environmental impacts and minimize land acquisition.

Table 1-1 Summary of Phased Implementation

Section	Length (Approx.)	Endpoints	Service Description	Planning Schedule
Valley to Valley	250 miles	San Jose and north of Bakersfield	▪ One-seat ride from San Jose to north of Bakersfield ▪ Begins with construction of up to 130 miles of high-speed rail track and structures in Central Valley. ▪ Private sector operator. ▪ Ridership and revenues sufficient to attract private capital for expansion. ▪ Connects with enhanced regional/local rail for blended operations with common ticketing.	2025

Section	Length (Approx.)	Endpoints	Service Description	Planning Schedule
Valley to Valley (extended)	300 miles	San Francisco to Bakersfield and Merced	▪ One-seat ride between San Francisco and Bakersfield and Merced ▪ Shared use of electrified/upgraded Caltrain corridor between San Jose and San Francisco 4th and King station.	2025
Phase 1	500 miles	San Francisco to Los Angeles/Anaheim	▪ One-seat ride between San ▪ Francisco and Los ▪ Angeles/Anaheim.[1] ▪ Dedicated high-speed rail infrastructure between San Jose and Burbank Station. ▪ Shared use of electrified/upgraded Caltrain corridor between San Jose and San Francisco Transbay Transit Center, and between Burbank and Anaheim ▪ Upgraded Metrolink corridor from LA to Anaheim, including remodeled Los Angeles Union Station (delivered by the Link US program)	2029

[1] One-seat ride means that passengers do not need to switch trains, even if the train operates over two systems (e.g., moving north on dedicated high-speed rail infrastructure and then moving onto Caltrain tracks at San Jose, assuming electrification of Caltrain corridor by 2019 as proposed by Caltrain)

2 SERVICE PLAN OVERVIEW

2.1 Implementation Phasing

Valley to Valley (V2V) - The implementation of the High-Speed Rail System will be accomplished in phases beginning with an initial section that extends from San Jose in the Silicon Valley to a temporary terminal north of Bakersfield in the Central Valley. Expected to be completed by 2025, this 250-mile section will support the operation of 44 train runs a day.

Valley to Valley extended (V2VE) – this option, which is subject to securing additional funding, will see the system expanded north to San Francisco and south into Bakersfield. This 300-mile system is also expected to operate at a level of 44 train runs per day with additional service between San Jose and Merced.

Phase 1 – The system will expand to 500 miles and include service between San Francisco to Anaheim at a level of 176 revenue service train runs a day.

3 SERVICE PLANS

Concept level rail operations and service plans have been developed to serve several purposes:

- Confirm the level of service assumptions (travel times and service frequencies between station pairs) used to develop the estimates of system ridership and revenue.
- Validate the operational feasibility of the desired level of service at a conceptual level.
- Identify operable patterns of train service, particularly the general requirements for non-stop or limited-stop trains to pass slower trains that need to make a greater number of (local) stops along the route (i.e., the locations and frequencies of occurrence of these "overtakes" at various times of day).
- Provide a basis for an order of magnitude estimate of the number of train sets and overall rolling stock fleet requirements for the full build-out.
- Provide a basis for estimating platform track and storage track capacity to support operations at the end terminal stations.
- Provide a basis for sizing train storage and maintenance facilities throughout the HST System.
- Provide a basis for planning passenger-handling operations at HST stations, which can be used to help size and configure station facilities.

The HST System ridership and revenue estimates are used in developing the operations and service plans so the level of service that would be provided at each station is generally equivalent to the level of service assumed in developing the ridership and revenue estimates for the HST System. Weekday ridership demand is assumed to reach peak levels during a three-hour period in the morning and again in the afternoon. Train service density would be greatest during these periods, reverting to a slightly lower level of service during the remainder of the day.

Currently, the proposed mix of services would offer regular clock-face patterns, with each service type leaving passenger stations at the same time each hour, with relatively limited exceptions. Slightly more service is assumed during the three hour peak periods in the morning and late afternoon than during off-peak hours, consistent with expected ridership peaking.

Trains would run in diverse patterns between various terminals. Three basic service types are envisioned:

- Express trains, which would serve major stations only, providing fast travel times.
- Limited-stop trains, which would stop at selected stops along a route to provide faster service between stations served.
- All-stop trains, which would focus on regional service and connection from/to faster trains.

In early phases of revenue service, the service is generally structured with all-stop trains. As the system expands, limited-stop and express trains are introduced. In Phase 1, the vast majority of trains would provide express services or limited-stop service and offer a relatively fast run time between the largest metropolitan areas while connecting various intermediate stations by all-stop service. Stations with higher ridership demand potential would generally be served by more trains than those with lower estimated ridership demand.

The service plan provides direct train service between most station pairs at least once per hour. Certain routes may not always be served directly, and some passengers would need to transfer from one train to another at an intermediate station, such as Fresno Station and Los Angeles Union Station, to reach their final destination.

These service plans provide a useful initial estimate of the level of service that matches projected long-range demand on the HST System. As the HST System is implemented and both the operating plan and the ridership estimates are refined, it will be possible to make informed benefit

and cost tradeoffs to develop the most appropriate mix of limited, express and all-stop services, which will affect the trip times between stations and the frequency of service offered at each station for each route.

3.1 Valley to Valley and Valley to Valley Extended (2025)

Both of these scenarios for the train service would include trains operating over a subset of the routes listed later for the Phase 1 network. Figure 3-1 provides an illustration of the types of service and the number of trains of each type of stopping patterns that would operate under the V2VE option in the year 2025. If only V2V were adopted, then the service would start at San Jose and terminate at a temporary station just north of Bakersfield. The service level for both would be limited to one train per hour in each direction throughout the day with a second train per hour during the peak periods. A service diagram can be found below for illustrative purposes only.

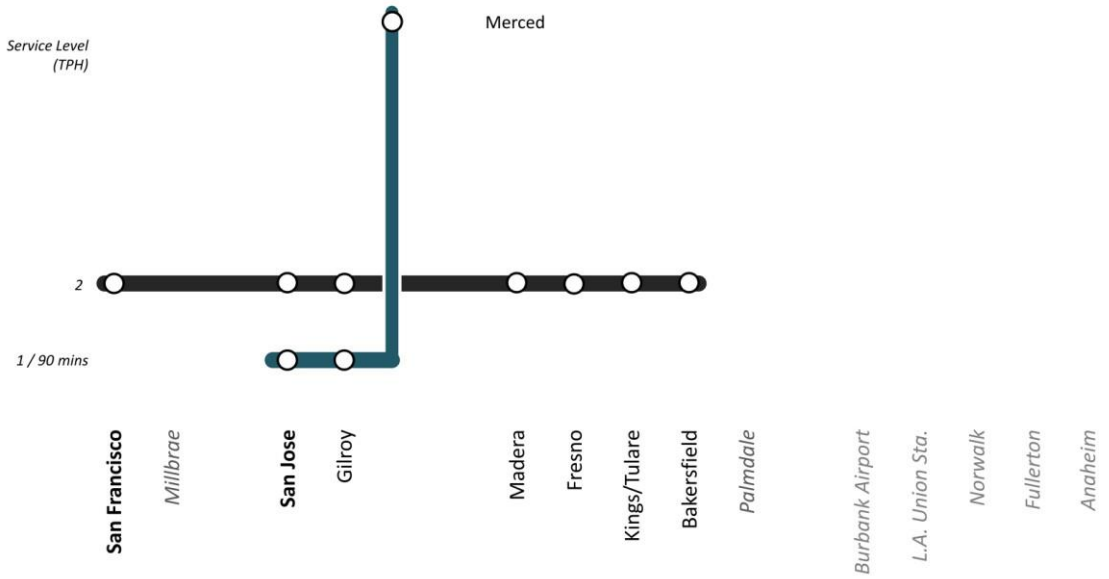


Figure 3-1 Valley to Valley Extended Train Stopping Patterns (2025: Peak Period Service)

3.2 Phase 1 (2029)

The service plan concept for Phase 1 estimates that the main HST line through the Central Valley would have eight trains per hour in each direction during the peaks, and five trains per hour during the off-peaks. Due to capacity constraint coming from the shared-use operations between Caltrain regional rail service and the high-speed rail service, the level of high-speed rail service along the Peninsula Corridor would be limited at four trains per hour in each direction throughout the day.

In the peak periods, the base level of service would include:

- Two trains per hour between San Francisco and Los Angeles
- Two trains per hour between San Francisco and Anaheim
- Two trains per hour between San Jose and Los Angeles
- One train per hour between Merced and Los Angeles
- One train per hour between Merced and Anaheim

Trains between the same terminal stations would have varying end-to-end stopping patterns. For example, one of the San Francisco to Anaheim trains would be all-stop and the other would be limited stop.

During off-peak periods, the base level of service would include three trains per hour between San Francisco and Los Angeles, one train per hour between San Francisco and Anaheim, and one train per hour between Merced and Anaheim in each direction.

Figure 3-2 shows potential stopping patterns for Phase 1, for illustrative purposes only.

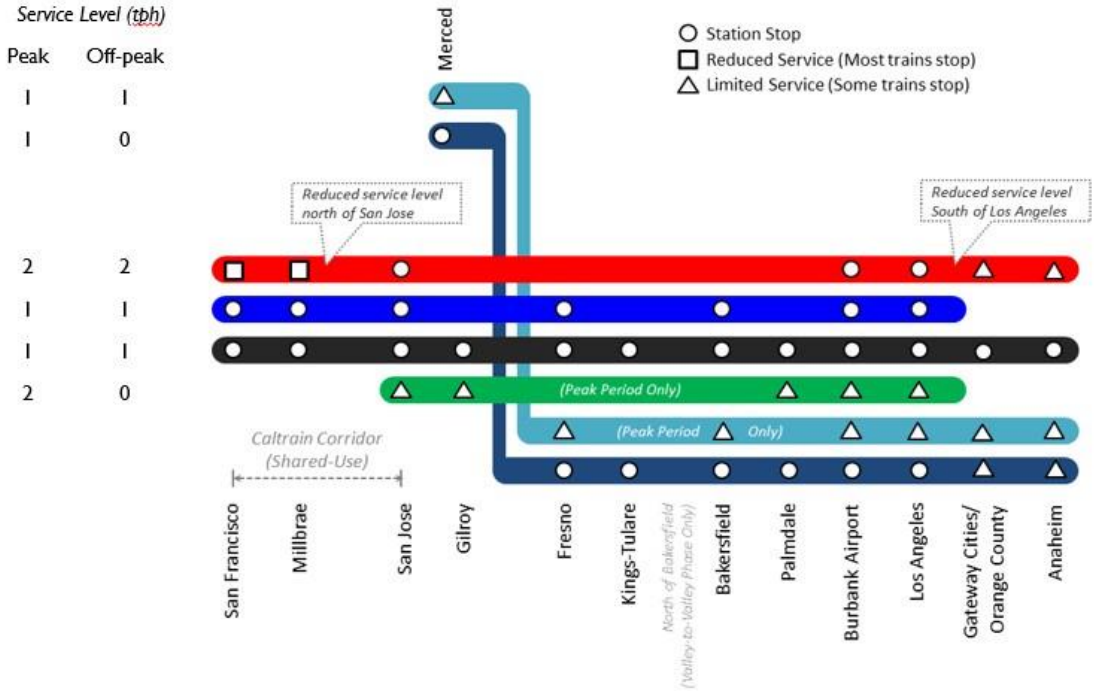


Figure 3-2 Phase 1 Train Stopping Patterns (2029)

4 PASSENGER STATION OPERATIONS

The Phase 1 service plan encompasses 13 passenger stations, including eight intermediate stations and five terminal stations. The V2V service plan (expected to be operational in 2025), envisions three intermediate and two terminal stations. The V2VE service plan, if adopted, envisions five intermediate stations and three terminal stations.

Station platforms are assumed to be 800 feet long. In accordance with Code of Federal Regulations (CFR) regulations that require that platform design meet the Americans with Disabilities Act (ADA) Accessibility Guidelines, the HST platforms will be designed to allow for level boarding.

4.1 Intermediate Stations and Platform Tracks

All the intermediate stations in the exclusive, dedicated sections of the high speed system incorporate platform tracks for stopping trains. Stations are spaced about 50 miles apart in rural areas and approximately 15 miles apart in metropolitan areas, with overall average spacing about 30 miles.

Because the Los Angeles high speed rail station is both a terminal station and intermediate station in Phase 1, and a high-volume station, it has a special layout that incorporates intermediate and terminal station features. Full details of the layout of Los Angeles Union Station are still in development by the Link US program being led by Metro in which HSR is an active partner.

The typical intermediate station will have the configuration shown in Figure 4-1 and Figure 4-2, with platform tracks on the outside flanked by side platforms. The platforms will be high-level, tangent and will cover the full length of an 820 foot train, permitting level boarding through all train doors.

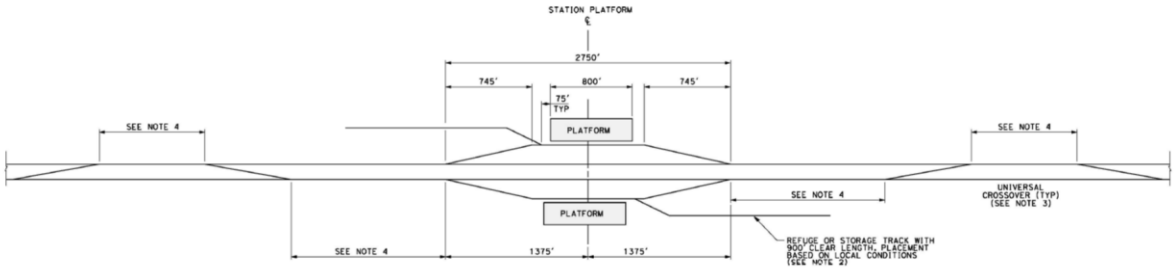


Figure 4-1 Intermediate Station Typical Configuration

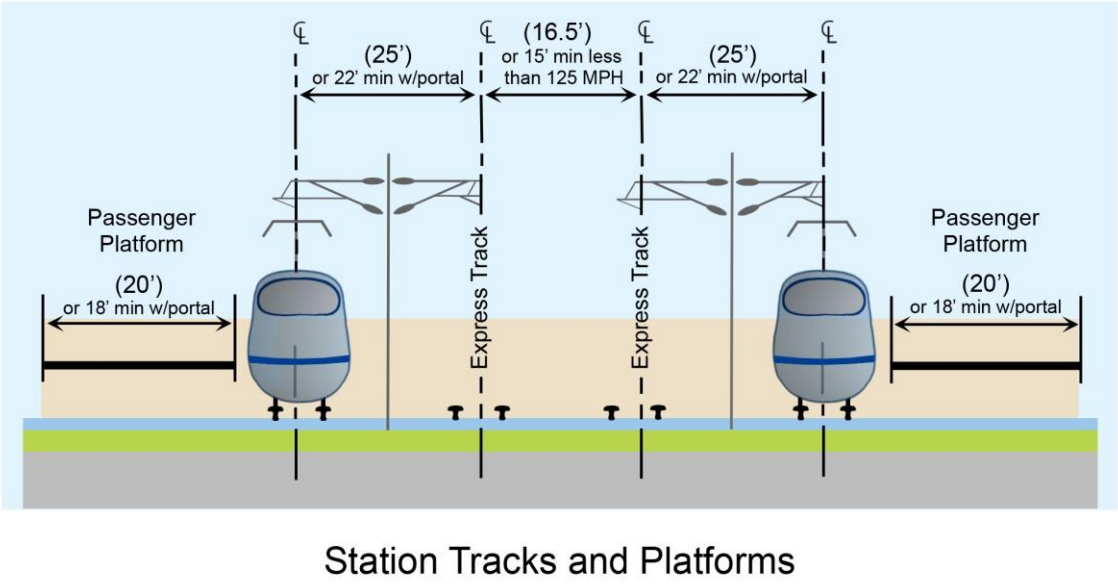


Figure 4-2 Intermediate Station Typical Cross-Section

4.2 Terminal Stations

Terminal stations are envisioned to have island platforms serving tracks on both sides and be able to accommodate train cleaning, restocking with on board food service, mandatory train inspection and as-needed maintenance and repair of trainset components – along with the alighting and boarding of passengers. The track and platform configurations at terminal stations vary based on the level of projected train service, local physical constraints, and requirements for other (non-HST) train services that would be located adjacent to the HST facilities. Figure 4-3 and Figure 4-4 show typical configurations for a four-track and six-track terminal.

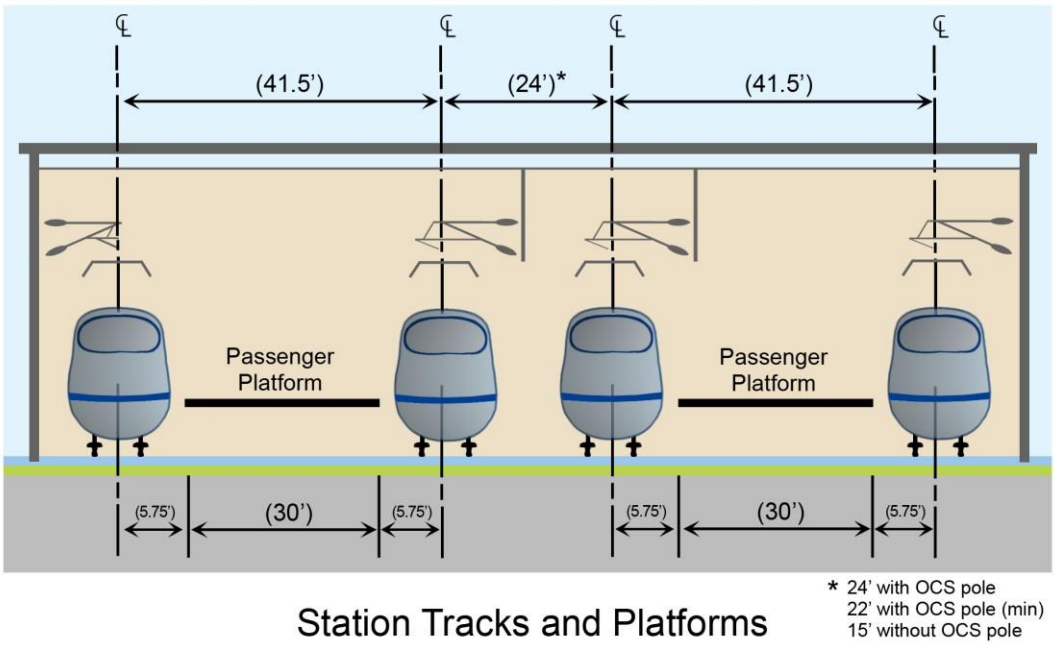


Figure 4-3 Terminal Station—4 Track Terminal and 2 Island Platforms

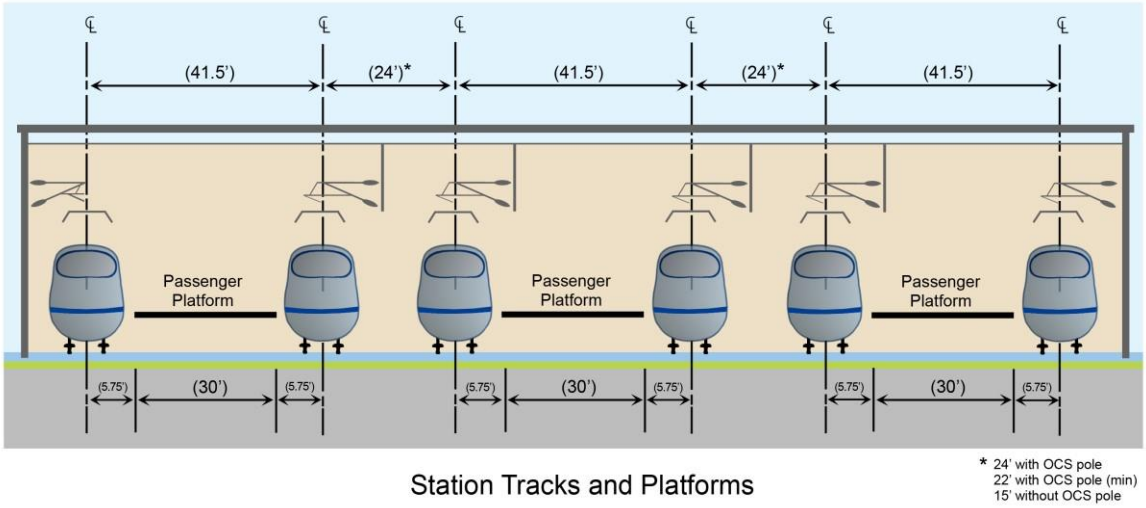


Figure 4-4 Terminal Station—6 Track Terminal and 3 Island Platforms

4.2.1 Passenger Boarding

There are several different ways in which passenger boarding could be managed at HST terminal stations. The HST project has not finalized the preferred methods for passenger-handling system wide, and the HST sponsors and operator likely will want consistent passenger handling practices across the entire system. Passenger-handling requirements affect the design and configuration of the physical facilities used for passenger-processing, waiting, queuing and horizontal and vertical circulation.

Examples of potential variations in passenger-handling procedures and required facilities encompass the following:

Advance staging of boarding passengers

- Retain all boarding passengers at concourse level until cleaning/servicing is substantially complete and the train is ready for boarding
- Permit boarding passengers to descend to platform level as soon as the load of detraining passengers has cleared the platform (passengers and service personnel and equipment would occupy the platform level simultaneously)

Number and location of boarding concourse points

- Board from a single concourse location
- Board from dual locations
- Board from multiple locations spread along a mezzanine or longitudinal concourse situated above or below the platform level, with multiple vertical circulation connections to the platforms

Reserved seat policy

- Open seating, where passengers select the car that they will board

Reserved seating (similar to most European and Asian high-speed rail systems), where passengers are assigned to a seat in a particular car, and where the time required to board the train can be minimized by pre-positioning passengers either on the platform or at concourse level close to where their seat will be located.

These options have differing implications in terms of required facilities, the configuration of concourse and vertical circulation elements, and the station operating costs associated with managing the boarding process.

4.2.2 Train Cleaning and Servicing

At terminal stations, train servicing would be done using the passenger platforms. Because of space constraints at the proposed terminal sites, dedicated service platforms are not envisioned. To maximize passenger safety, servicing operations efficiency, and achieve predictable layover (train parking) times, normal operating procedures would plan for providing temporal separation between the passenger unloading and loading processes and train servicing activities at the terminal platforms.

To attract and keep a dedicated passenger clientele it is important to establish and maintain a cleanliness standard aboard the train consists. This service is accomplished by cleaning techniques implemented at selected times in a service day. Two types of cleaning are envisaged.

- "Normal" (Lay-up) Cleaning – This service is performed at a train storage and maintenance facility, and is generally done when a train is parked for a sufficient time to receive a thorough interior cleaning of the passenger areas to include seats and bathrooms. It is usually scheduled daily and is completed prior to a train entering revenue service in the morning. All trash is removed, seats and floors cleaned, and bathrooms sanitized.
- "Light" (Pick-up) Cleaning – When a train turns around (i.e. the rear end of the train arriving at the station becomes the front end of the train departing) in a terminal station or on a storage track with insufficient opportunity for a full normal cleaning, this service is performed to return the interior to an acceptable condition.

Cleaning toilets (and emptying the "holding" tanks) would occur during the overnight layup period at maintenance facilities and would not occur in the terminals during the turnaround time.

4.2.3 Train Layover Times at Terminal

Because the terminals are stub-ended, all HST trains will change directions (turnaround with rear end of the arriving train becoming the front end of the departing train) at terminal stations. Three types of train turnaround will occur in terminal stations:

- Revenue to Non-Revenue: Revenue trains (with passengers) arrive, with the equipment turning around and going to the maintenance facility for storage or servicing, without passengers.
- Non-Revenue to Revenue: Trains enter the terminal from the maintenance facility (without passengers), departing passengers board (the train), and the train departs as a revenue train (with passengers).
- Revenue to Revenue: Revenue trains (with passengers) arrive and passengers unload, the train would park at the platform while it is inspected, cleaned and restocked with bathroom and food service supplies, departing passengers board the train, and the train departs as a revenue train (with passengers).

Estimating the time required to carry out the various terminal turnaround train servicing and passenger processing functions, and identifying which functions can proceed in parallel with each other and which depend upon the prior completion of other activities, allows definition of a "critical path" of activities that governs the minimum time necessary between an inbound train arrival and the subsequent outbound train departure. The required sequence that must be followed for four basic processes that occur during the turnaround layover period are as follows:

- Passenger alighting and boarding
- Re-stocking of food and beverage service items
- Coach cleaning and re-stocking of bathroom supplies (critical path item)

- Train safety system pre-departure preparation
- In addition, minor equipment repairs that can be accomplished during the layover (parking) period will be addressed.

Facilities would need to be provided at the terminals to support the food service provisioning (commissary), coach cleaning and railroad mechanical department (equipment maintenance and repair). These facilities would need to be located in proximity to the HST platforms, to minimize the time required to access a train when it arrives at the terminal. Direct service elevator access would be required between these facilities and the HST platforms, separate from the elevators and access points used by passengers.

The HST scheduled terminal station turnaround time is composed of four primary "critical path" factors: Passenger alighting, interior cleaning, passenger boarding, and a "Recovery Time Factor." The following table summarizes HST assumptions for the minimum exception and minimum standard scheduled turnaround times (based on an 820 foot train).

Table 4-1 Time Required for Terminal Layover Activities (HST Planning Assumptions, Revenue Train to Revenue Train)[2]

Critical Path Activity	Minimum Exception	Minimum Standard
Passenger Alighting	5 minutes	5 minutes
Cleaning, Restocking, Servicing & Provisioning	5 minutes	10 minutes
Passenger Boarding "Window"	5 minutes	5 minutes
Total Scheduled Turnaround Time Assumption	15 minutes	20 minutes

[2] Train safety system preparations can be accommodated within time windows available for alighting, cleaning and boarding.

5 ROLLING STOCK STORAGE AND MAINTENANCE

5.1 Fleet Requirements

In 2040, 78 train sets will be required to operate the 176 daily revenue service train runs envisioned for the full build revenue service plan. Each train set is approximately 650 feet long and seats approximately 500 passengers in the initial formation. The train could be potentially extended to 820 feet long and seats approximately 650 passengers.

Table 5-1 Horizon Year 2040 (Phase 1) Service Plan. Revenue Train Sets Required at Each Terminal to Start Weekday Morning Train Service.

Terminal	Total Single Sets
San Francisco – Transbay	13
Mid-Peninsula (San Jose and Gilroy)	14
Central Valley (Merced, Fresno, and Bakersfield)	13
Los Angeles Basin (Palmdale, Burbank Airport, Los Angeles Union Station, and Anaheim)	31
Total Sets Required	**71**

The Horizon Year 2040 operations and service plan envisions the need for 71 revenue train sets. Also as indicated in Table 5-2, the estimated number of trainsets along with an allowance for spare train sets for maintenance and repair substitute and hot stand-by trainsets, and extra trainsets to accommodate higher demand on peak demand days, resulting in an overall fleet estimate of 78 total units. The 10% total spare ratio is the mid-range of spare ratios for U.S. and international intercity and high-speed rail fleets. The estimated fleet requirement numbers will be modified as the operating plan, demand projections, and maintenance plans are refined.

Table 5-2 Horizon Year 2040 (Phase 1) Train Fleet Requirements

Trainset Description	Trainsets Required
For Single-set Trains	71
For Double-set Trains	0
Subtotal Revenue Requirement	0
Hot Stand-by	2
Extra Trainsets for Peak Demand Days	2
Spare Equipment (Assume 10%)	3
Total Sets Required	**78**

5.2 Train Storage and Maintenance Facilities

Train storage yard facilities should be located as close as physically possible to the terminal stations.

Generally, the terminal stations are in heavily urbanized areas that do not have land available immediately adjacent to the terminal for new train storage yards. As a result, trains that are entering or leaving service at a terminal station will have to operate as non-revenue or “deadhead” train movements to and from the storage yards.

The overnight layup facilities are the basic facility at each of the terminal locations that provide overnight storage (parking) for the trainsets and daily inspections and cleaning. Layup facilities would be located close to Gilroy Station but be without a heavy maintenance capability. Yards including a periodic inspection facility (shop) would be located in northern California along the Peninsula Corridor at Brisbane near San Francisco and one in southern California, near Los Angeles Union Station. One Heavy Maintenance Facility (HMF) will be located in the center of the statewide system to provide all of the overhauls and component refurbishment capability. An example of a typical concept configuration for an overnight storage facility equipped with a shop to perform periodic inspections is shown in Figure 5-1.

The storage capacity of each facility is based on the number of trains estimated in the Full Build-Out Operations and Service Plan and is summarized in Table 5-3 below.

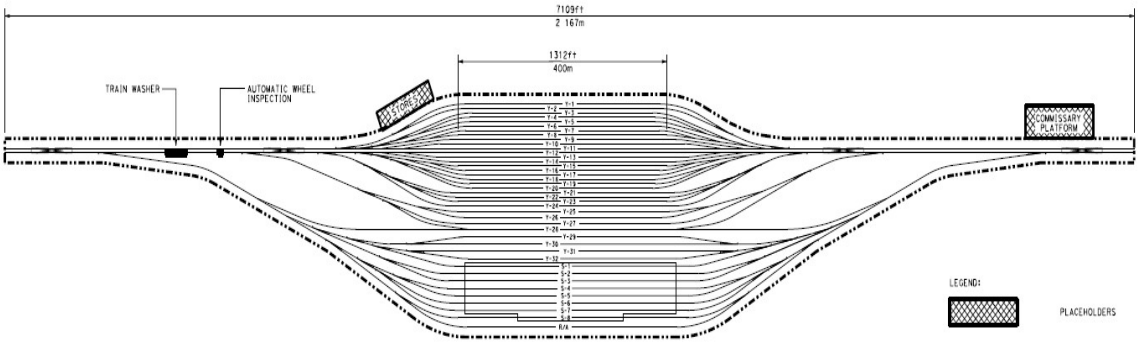


Figure 5-1 Example of Typical Concept Configuration for Overnight Storage Yard with Shop

Table 5-3 Phase 1 Blended Service (2040) Storage/Layup Track Requirements

Location	Total Trains to be laid up at facility	Train capacity at each facility*
Brisbane	14	14-18
Gilroy	13	13-16
HMF	23	23-27
Southern California	28	28-35
Total	**78**	**78-96**

*Excess capacity will allow flexibility to move trains around in order to meet actual level of demand

5.3 Rolling Stock Maintenance Program

Consistent with international methods, the California high-speed train system is planned to provide five different levels of train maintenance activity:

- Level 1 – In-Service Monitoring: daily testing and diagnostics of certain safety sensitive apparatus on the train in addition to automatic on-board and on-ground monitoring devices.
- Level 2 – In-Service Examinations: inspections, tests, verifications and “quick” replacement of certain components on the train. Examples include inspection and maintenance tasks associated with the train’s running gear, bogies, underbody elements and pantographs.
- Level 3 – Periodic Inspections: part of planned preventive maintenance program requiring specialized equipment and facilities. Examples include: a) examination of interior fittings and all parts of the train in the immediate environment of the passengers, b) in depth inspection of axles and underbody components, critical to train safety by identifying and repairing any

condition in the running gear and connecting components, c) wheel condition diagnostics and re-profiling (wheel truing).

- Level 4 – Overhauls (HMF only): part of the planned life cycle maintenance program requiring a specialized heavy maintenance shop with specific heavy duty equipment. Activities include the complete overhaul of train components replaced during Level I, II and III. In addition, a full complement of heavy maintenance is completed on each trainset every 7 to 10 years (30 days per trainset) as well as mid-life overhauls which are performed on each trainset every 15 to 20 years (45 days per trainset).
- Level 5 – Rolling Stock Modifications & Accident Repair (HMF only): Activities to support installation of a major modification to the design of the trainset for purposes of improving safety, reliability and passenger comfort. In addition, this category includes repair to a trainset which has “suffered” significant damage.

The frequency with which these maintenance procedures are performed varies by level. To minimize cost, maximize flexibility and to address all of the levels of maintenance and inspections, these maintenance functions will be undertaken at a relatively small number of facilities spread across the HST network. The locations at which maintenance will occur can be broken into three groups:

- Overnight Layup Facility – Provides Levels 1 and 2 maintenance and inspections
- Periodic Inspection Facility – Provides Levels 1 to 3 maintenance and inspections
- Heavy Maintenance Facility – Provides Levels 1 to 5 maintenance and inspection, including overhauls and component refurbishment.

5.4 Facility Site Location Criteria

It is important that each of these facilities be located immediately adjacent to the HST main line tracks and connected directly to them with a 110 mph turnout (switch) and two connecting tracks

(i.e., “double track”) of approximately 3,696 feet on both ends of each facility. The connecting tracks will transition to become the slow speed (15 mph) lead tracks within each facility.

In addition to proximity and connectivity to the HST System main line tracks, the site of the Light Maintenance facilities should be such that the distance between the light maintenance facility and the Terminal Stations is minimized. The preferred distance is up to 1.5 miles, an acceptable distance is from 1.5 to 3.0 miles and anything further than 3.0 miles would be considered as an exception. Light Maintenance Facilities (LMF) are required for the terminus stations or end points of the system at San Francisco, Los Angeles, Anaheim and Merced for Phase 1, with additional LMFs at San Diego and Sacramento for the Full Build-Out. In addition, consideration is being given to a possible combined LMF for Los Angeles and Anaheim.

The desirable site for the Heavy Maintenance Facility (HMF) is that it be located centrally on the HST System between Merced and Bakersfield. The section between Merced and Bakersfield is in the “central part” of the system, is part of the trunk line (Anaheim-San Francisco), and has the ability to include a high-speed test track. No other part of the system meets these criteria. The required length of this test track is based upon current high-speed train manufacturers’ recommendations for testing and commissioning which includes a protocol for sustained running for ten minutes up to 250 mph. Train operations at these speeds require straight alignment of approximately 80 to 105 miles.

5.5 Estimated Site Requirements

Based on a conceptual rendering of these facilities they would require the following land parcel “footprints” range (depending on the shape of the land parcel), inclusive of buildings, outdoor service areas, storage, roadways and parking:

- Merced to Bakersfield Heavy Maintenance Facility Concept, 169 +/- Acres

- Los Angeles Storage Yard and Maintenance Facility Concept, 100 +/- Acres
- Brisbane Storage Yard and Maintenance Facility Concept, 100 +/- Acres
- San Jose/Gilroy Storage Yard and Maintenance Facility Concept, 42 +/- Acres

5.6 Commissioning of Rolling Stock

In addition to the in-service maintenance regimen, the HMF is assumed to be used during the pre-revenue service period (from 2020) for the assembly, testing, acceptance, and commissioning of the HST System new rolling stock fleet. Implementation of the testing, acceptance and commissioning activity would also require a main line test track between 80 and 105 miles in length connected directly to the HMF. The HMF would also be used for decommissioning or retirement of equipment from the system to make way for the next generation of rolling stock.

6 TRAIN DISPATCHING AND CONTROL

6.1 Operations Control Center

A train operations control center will be located in the Central Valley area. Space for employee parking, pedestrian access/egress and appropriate bathroom and lunchroom facilities has been accounted for. However, the operations control center can be located at any place along the system.

6.2 Communications with HST Stations

HST trains will be dispatched and controlled from a central control facility remote from the individual stations and terminals. A direct communications link will exist between the central control facility and the Terminal Operations Center or HST Passenger Services office at each HST station and terminal, to enable station staff of the HST System Operator (and the Terminal Operator, at facilities where the terminal is managed by a third party) to monitor the status of train operations on the rail network and respond to any unusual conditions that may arise.

APPENDIX 2-C PART 2: SAN FRANCISCO TO GILROY HSR SYSTEM REQUIREMENTS (AUGUST 2018)

California High-Speed Rail Authority

Rail Operations and Delivery Branch

San Francisco to Gilroy HSR System Requirements

PD-ROD-SR-0001 Rev 0.1

Date August 02, 2018

Version 0, Revision 0.1

August 02, 2018

CALIFORNIA High-Speed Rail Authority

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California High-Speed Rail System

Rail Operations and Delivery Branch
San Francisco to Gilroy HSR System Requirements

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0.1	08-02-2018	Updated clarify and to reflect comments received.

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1 TABLE OF CONTENTS

1 TABLE OF CONTENTS 4

2 ABREVIATIONS AND ACRONYM 5

3 INTRODUCTION 6
- 3.1 Objectives 6
- 3.2 Scope and Applicability 6

4 OPERATIONAL REQUIREMENTS 7
- 4.1 2027 Peninsula Service 7
- 4.2 2029 Valley to Valley Service 8
- 4.3 2033 Phase One 9

5 INFRASTRUCTURE REQUIREMENTS – SAN JOSE – GILROY 10
- 5.1 Outline 10
- 5.2 Right-of-Way 10
- 5.3 Track 10
- 5.4 OCS 10
- 5.5 Minimum Vertical Clearance 11
- 5.6 HSR Stations 11
- 5.7 Caltrain Stations 11
- 5.8 Grade Crossings 11
- 5.9 Utilities 12

6 SYSTEM SITE CRITERIA 13
- 6.1 Traction Power 13
- 6.2 Communications / Radio Sites 13
- 6.3 Automatic Train Control (ATC) 14
- 6.4 Positive Train Control 14
- 6.5 Grade Crossings 14

7 APPENDIX 1 16

8 APPENDIX 2 25

2 ABREVIATIONS AND ACRONYM

ACE	Altamont Corridor Express
ATC	Automatic Train Control
Authority	California High-Speed Rail Authority
CEMOF	Central Equipment & Maintenance Facility - Caltrain
CP	Control Point
CPUC	California Public Utilities Commission
FCC	Federal Communications Commission
FJ	San Francisco to CP Lick
FRA	Federal Railroad Authority
HSR	High-Speed Rail
JM	San Jose to Merced
LMF	Light Maintenance Facility
MAS	Maximum Allowable Speed / Operating Speed
MOWF	Maintenance-of-Way Facility
MP	Mile Post
MPH	Miles Per Hour
MTx	Main Track x
NTD	Notice to Designers
OCS	Overhead Catenary System
PS	Paralleling Site
ROW	Right-of-Way
SWS	Switching Site
TAMC	Transportation Agency for Monterey County
TOR	Top-of-Rail
TOWAIR	The FCC communications antenna tool.
TPSS	Traction Power Sub-Station
UPRR	Union Pacific Railroad
VTA	Valley Transit Authority

3 INTRODUCTION

3.1 Objectives

These requirements specify the Rail and Operations Delivery Branch (Rail Group) infrastructure requirements to meet the operational requirements of High-Speed Rail services between San Francisco and Gilroy and beyond as per the Authority 2018 Business Plan.

The requirements within this document are intended to describe a blended operations, overhead line electrified railroad, contained within the existing ROW, between San Francisco and Gilroy with a MAS of 110 mph.

These requirements are intended as guidance to the Northern California regional team and Consultants to facilitate the environmental clearance process.

Any changes or deviations from these requirements shall be documented and agreed with the Rail Group.

3.2 Scope and Applicability

This document and the requirements contained within it form the highest level of Rail Group requirements.

In order of precedence requirements shall be managed as follows;

1. San Francisco to CP Lick;
    a. HSR Design Standards;
    b. Caltrain Design Standards; then
    c. Sub-consultant generated options.
2. CP Lick to South of Gilroy;
    a. UPRR Standards
    b. HSR Design Standards;
    c. Caltrain Design Standards; then
    d. Sub-consulant generated options.

When the development of the project moves through the order of precedent listed above and referenced standards change due to local circumstances, the Rail Group shall be notified and shall agree a course of action prior to the development work progressing.

It is permissible to have multiple variations on the application of applicable standards used as the design moves along the alignment to suit local circumstances providing the proposal is coherent and compliant.

For the tracks between San Francisco and San Jose it is noted that there is prior agreement to amendments to the Caltrain Design Criteria for Track as detailed in the HNTB Submittal Memo from Kim Franchi, Subject ‘San Francisco – San Jose (FJ) Basis of Design (Track)’ dated 04/25/2018.

4 OPERATIONAL REQUIREMENTS

DRAFT – Operational Planning Analysis REVISED– San Francisco to Gilroy as per memo from Paul Hebditch to Frank Vacca dated July 27, 2018 applies. Revisions to this memo are to clarify points made in the original and to provide operational context. See Appendix 1,

4.1 2027 Peninsula Service

1. San Francisco – San Jose
    a. San Francisco 4th & King temporary Station platform lengths in accordance with Rail Systems Directive 2017-03-06-01 Rev 4a dated 1/29/2018;
    b. Grade separated rail access to Brisbane LMF;
    c. All at-grade crossings converted to four quadrant gates with channelization to permit operations up to 110 mph;
    d. No additional grade separations by HSR;
    e. Hold-out rule eliminated at College Park, Broadway and Atherton;
    f. MAS shall be 79 mph;
    g. No changes to CEMOF;
    h. San Jose Diridon Station at-grade (as described in directive);
        i. Two High-Level HSR Platforms with four adjacent tracks;
        ii. 1,400’ between fouling points of switches at both ends;
    i. Track configuration from CP Coast to Diridon;
        i. Two electrified tracks;
        ii. Two non-electrified tracks;
    j. Completely access controlled ROW using fences, trespass guards and quad-gates.
2. San Jose – Gilroy
    a. At-Grade within existing ROW;
    b. One non-electrified track (MT1), two electrified tracks (MT2 and MT3);
    c. San Jose Diridon Station at-grade;
        i. Two High-Level HSR Platforms with four adjacent tracks;
        ii. 1,400’ between fouling points of switches at both ends;
    d. Tamien Station;
        i. No change to station layout or platforms;
        ii. Two electrified sidings located south of Tamien Station (min 700’ long);
    e. Michael Yard;
        i. Stabling for minimum of four 7-Car trainsets (7-car max length = 675’);
        ii. Non-electrified;
        iii. The two long Michael Yard tracks shall be double ended from MT1;
    f. Southbound 50 mph crossovers for connecting MT1 to MT2 - These may be located in a suitable location north of Blossom Hill Station;
    g. Quarry siding;
        i. Access from MT3 from south as per existing access;
        ii. To enable access to the Quarry from MT1, 30 mph crossovers shall be provided between MT1 and MT2 and MT2 and MT3;
    h. Coyote;
        i. One non-electrified siding at Coyote (min 2,500’ long). This may extend up to 4000’ if achievable within the existing ROW.

i. Gilroy at-grade station;
    i. As detailed in 'Rail Systems Directive 2017-03-06-01 Rev 4a dated 1/29/2018', two high-level platforms shall be provided and they shall be the maximum length that can be provided within platform track;
    ii. Two low level platforms minimum length 600' each;
    iii. Three electrified storage tracks (to replicate existing length);
    iv. 'TAMC' track shall tie into MT1 south of the station;
    v. Relocate the storage tracks to the 2033 location per direction from the Rail Group on 6/15/2018. See Appendix 2;
    vi. Northbound 50 mph crossovers for connecting MT2 to MT1;
j. Gilroy MOWF. Two options to be considered;
    i. South of Gilroy (no Gilroy LMF) - for early operations in 2027, HSR trains may use UPRR tracks to gain access to the MOWF from the North; and
    ii. Adjacent to Gilroy Station - use existing land within the Gilroy station area.
k. These options shall allow;
    i. Rail access from UPRR tracks for delivery of construction and maintenance materials;
    ii. Laydown areas for storage of construction and maintenance materials;
    iii. Stabling for railway equipment;
l. All at-grade crossings converted to four-quadrant gates with channelization (or closed) to allow operation to 110 mph;
m. No new HSR grade separations;
n. Reconfigure VTA/Caltrain stations at San Martin, Morgan Hill, Blossom Hill and Capitol to be accessed from MT2 and MT3; and
o. Completely access controlled ROW using fences, trespass guards and quad-gates.

4.2 2029 Valley to Valley Service

1. San Francisco – San Jose
    a. No changes required to infrastructure provided for 2027 operations.
2. San Jose – Gilroy
    a. Reconfiguration of Gilroy station and connecting tracks southward to connect with dedicated HSR alignment and provision of bypass tracks;
    b. 1,400' minimum distance between points of switch of the Gilroy platform tracks;
    c. HSR northern access to MOWF shall not utilize UPRR tracks as a permanent condition but may cross UPRR tracks; and
    d. MOWF shall have direct access to HSR Mainline tracks as well as connection to the existing freight railroad in order to facilitate access for delivery of materials and equipment.

4.3 2033 Phase One

1. San Francisco – San Jose;
    a. Increase MAS to 110 mph;
    b. Upgrade of signaling system (Note; all upgrades to signaling system in FJ segment by Caltrain not HSR); and
    c. Add HSR Millbrae Station.

2. San Jose – Gilroy
    a. No changes 2029 operations.

5 INFRASTRUCTURE REQUIREMENTS – SAN JOSE – GILROY

5.1 Outline

1. All connections to freight branch lines and local industry shall be retained with connection to MT1.
2. 101 Freeway - HSR and UPRR tracks to pass through existing under-bridge.

5.2 Right-of-Way

1. The Regional team are responsible for determining;
   a. ROW boundaries, including for earthworks;
   b. Provision of access roads and gates;
   c. Roadway modifications;
   d. Pedestrian overpasses;
   e. Grade crossings;
   f. System sites;
   g. Utility mitigation; and
   h. Associated environmental clearance.

5.3 Track

1. Two electrified tracks, MAS of 110 mph;
2. One non-electrified track, MAS of 79 mph;
3. Track spacing shall be as follows;
   a. Alignment shall be designed to fit, where possible, within existing ROW, based on;
   b. MT1 to MT2 – 20’ between track centers; and
   c. MT2 to MT3 – 20’ between track centers;
4. Where alignment, ROW or physical features prevent the above requirements from being achieved, the order of preference of track spacings shall be as follows;
   a. Reduce MT2 - MT3 spacing to 15’ minimum;
   b. Reduce MT1 – MT2 spacing to 18’ minimum; then
   c. Additional land take.
5. There shall be 10’ 8” minimum horizontal clearance between track centerline and the perpendicular face of any vertical obstruction.
6. All reductions in track spacing from those described in 5.3-2 a & b above shall be documented and approved by the Rail Group prior to design progressing; then

5.4 OCS

1. Electrification to terminate immediately north of ‘East 10th Street’ Grade Crossing unless the Gilroy storage tracks are relocated south of the crossing.
2. Clearance between the centerline of any track and the face of OCS structures shall be a minimum of 15’; and
3. The preliminary placement of portal structures is to be agreed with the Rail Group on completion of track alignment design.

5.5 Minimum Vertical Clearance

1. The minimum vertical clearances measured from top of rail (TOR) shall be 27'.

5.6 HSR Stations

1. In accordance with Engineering Directive Letter '2017-03-06-01 Rev 4', HSR Platform tracks shall be designed to allow 1,400' clear track from the fouling points of switch along adjacent lines; and
2. High-level platform face shall be as long as possible up to 1,400', but with a minimum length of 800'.

5.7 Caltrain Stations

1. There shall be no requirement for passing tracks to be provided at stations between San Jose and Gilroy;
2. Low level platforms shall be provided between the two electrified tracks for use by Caltrain and shall be provided to meet the 'Caltrain Design Criteria, Chapter 3 – Stations and Facilities';
3. Passenger access and egress shall be provided by pedestrian overpasses or underpasses and ramps to the platforms;
4. Pedestrian grade crossings shall not be allowed at station locations except at existing road / vehicle grade crossing;
5. Caltrain platform lengths shall be environmentally cleared for 700' ; and
6. A three-track gantry with OCS poles located outside the tracks is preferred. If site conditions require the use of OCS poles located in the middle of the platform, this shall be approved by the Rail Group prior to proceeding with design.

5.8 Grade Crossings

1. All at-grade road crossings shall be closed or converted to four-quadrant gates with channelization;
2. Where existing grade crossings have gates across adjacent pedestrian crossings these shall be provided;
3. At-grade pedestrian only crossings shall be closed and/or replaced with grade separated crossings;
4. The Rail Group shall take the lead role in coordinating with FRA/CPUC regarding requirements for at-grade crossings in this corridor;
5. The Regional team shall be responsible for environmental clearance of four-quadrant gates with channelization, or closing of grade crossings as applicable;
6. The Regional team shall be responsible for analysis of roadway impacts and modifications;
7. The Regional team shall be responsible for grade crossing gate downtime analysis;
8. The Regional team shall be responsible for all interfaces with local authorities, and Caltrans, with regards to modified road layouts associated with grade crossing modifications; and
9. The Regional team shall be responsible for environmental clearance of land associated with four-quadrant gate operational equipment located at each grade crossing.

5.9 Utilities

1. The Regional team shall be responsible for the identification and proposed relocation of all existing utilities including any required ROW impacts.
2. Opportunities for shared use of cable ducts shall be referred to the Rail Group on a case by case basis.

6 SYSTEM SITE CRITERIA

6.1 Traction Power

1. Site locations
    a. TPS locations shall be arranged, TPSS – PS(x) – SWS – PS(y) – TPSS, with x & y indicating the number of PS locations based on the distances involved;
    b. Distances between TPSS locations shall be approx. 30miles ±20%;
    c. Distances between TPSS and SWS shall be approx. 15miles ±25%;
    d. Distances between TPSS and PS, SWS and PS, PS and PS shall be approx. 5miles +50% / -10%;
    e. If any greater variance in distances is required, this shall be agreed with the Rail Group;
    f. TPSS locations shall be located adjacent to or near existing PG&E 115kV/230kV transmission lines or switching stations wherever possible;
    g. The Caltrain facilities 'TPSS 2', located at approx. MP46 and 'PS-7', located at approx. MP49, near Michael Yard, shall be assumed to be fixed points;
    h. 'TPSS 5' east of the Pacheco Pass tunnel and west of Interstate 5 shall be assumed to be a fixed point; and
    i. For staging purposes, the site of 'TPSS 4' shall be on the portion of the ROW between San Jose and Gilroy that is assumed to be electrified in the initial stage so power can be supplied to the railroad operating in 2027;
2. Sites are to be sized;
    a. Paralleling Station (PS) 120'x80';
    b. Switching Station (SWS) 160'x90';
    c. Traction Power Sub Station (TPSS) 200'x160'; and
    d. Any variance to these sizes shall to be agreed with the Rail Group prior to progressing;
3. Paved access;
    a. To be provided to facilitate both construction and ongoing emergency and maintenance access; and
    b. Parking at the system sites shall be in addition to the system facility size and as follows:
        i. Two parking spaces shall be provided at each TPSS location; and
        ii. Two parking spaces shall be provided at each PS or SWS location.
4. Phase breaks;
    a. Shall be positioned at TPSS and SWS locations; and
    b. The track gradient at phase break locations shall not exceed 0.6% for 4,000' (centred at the phase break location).

6.2 Communications / Radio Sites

1. System radio sites may be co-located with traction tower facilities;
2. Stand-alone radio sites shall be 40' by 25' (Per NTD 6);
3. System radio sites shall be 20' by 15' (when located as part of the combined system site);
4. System radio sites shall be cleared for the installation of radio masts up to 190' in height from ground level (NTD 6);
5. Suitability of all radio towers shall be investigated via FCC's TOWAIR tool (Per NTD 9); and
6. A single parking space shall be provided at each Stand-alone radio site location.

6.3 Automatic Train Control (ATC)

1. ATC system sites shall be located adjacent to where electrified tracks have interlockings.
2. ATC sites shall be 70'x 35'
3. Environmental clearance for ATC system sites shall be undertaken at;
    a. Tamien Station;
    b. Michael Yard;
    c. Capitol Station;
    d. Morgan Hill Station;
    e. San Martin Station;
    f. Gilroy Station; and
    g. Other locations where required.
4. An access road and one parking space shall be provided at each ATC location.

6.4 Positive Train Control

1. Environmental clearance for PTC system sites shall be undertaken where non-electrified tracks have interlockings at;
    a. Gilroy Station;
    b. Coyote Siding;
    c. Capitol Station;
    d. Michael Yard; and
    e. Other locations where required.
2. PTC system sites shall be 20' x 30'; and
3. One parking space for a single pick-up truck shall be provided at each location.

6.5 Grade Crossings

1. Each grade crossing shall require a 10' by 10' flat level area located at one corner of the grade crossing for the erection of an 8' x 8' x 8' equipment cubicle;
2. The location of the cubicle shall not obscure visibility to either road users, pedestrians or train operators / engineers;
3. One parking space for a single pick-up truck shall be provided at each location;
4. The area shall be safely accessible for maintenance; and
5. Barriers shall be provided across sidewalks to prevent pedestrian access to the ROW when the grade crossing gates are down.

Fig 1 – Typical quad-gate equipment layout.

7 APPENDIX 1

HIGH-SPEED RAIL: *CONNECTING AND TRANSFORMING CALIFORNIA*

Memorandum

DATE: July 27, 2018

TO: Frank Vacca, Director, Rail Group

FROM: Paul Hebditch, Lead Operations Planner, Rail Group

CC: Rebecca Kohlstrand, John Popoff, Simon Whitehorn, Boris Lipkin

SUBJECT: DRAFT – Operational Planning Analysis – San Francisco to Gilroy – REVISED

DRAFT

Purpose

This memo provides information pertaining to the operational planning analysis that has been undertaken to determine a schedule that may be operated once high-speed rail services commence operation between San Francisco and Gilroy as detailed in the California High-Speed Rail Authority (the Authority) 2018 Business Plan.

The memo includes an illustrative schedule[1] showing a two-hour peak period service plan for full Phase 1 operations commencing in 2033. The Authority do not currently anticipate an increase in the level of high-speed train operations between San Francisco and San Jose beyond that shown for full Phase 1.

The memo also describes the key track and system infrastructure parameters required to support the illustrative schedule.

Train service planning

The Authority and Caltrain have been meeting on a regular basis for several years to develop options for blended operations. The most recent work has been developed through joint working led by an independent rail timetabling consultancy.

[1] The schedule is illustrative as there may be variations in stopping patterns and trip times based upon refinements in information in some areas – e.g. market demand, trainsets, signal system, etc.

The working group has agreed upon the assumptions and parameters referred to below and used modern timetabling modelling software to refine its outcomes.

Caltrain and their tenants

Following the Peninsula Corridor Electrification Program, Caltrain will increase their peak train service frequency to 6 trains per hour per direction (tphpd) between San Francisco and San Jose. It is this level of service that has been used in development of the service plans for all phases of high-speed train operation ramp-up. Based upon input from Caltrain, some stopping patterns have been changed to better meet expected market demand.[2]

Caltrain also currently operate three trains from Gilroy to San Jose in the morning peak and three trains from San Jose to Gilroy in the evening peak. All these services stop at all the intermediate stations. Once the Authority have completed the upgrade and electrification of two tracks in the current Union Pacific Rail Road (UPRR) right-of-way between CP Lick and Gilroy, there will be 12 train slots per hour per direction available for electric trains. Eight of these will be utilized by high-speed electric train services running non-stop between San Jose and Gilroy.

The remaining four train slots will be available for electric trainsets to operate to provide services between San Jose and Gilroy. These train slots will reduce journey time between San Jose and Gilroy by 27 minutes over today's service but, will only be able to call at 3 of the 5 intermediate stops. Therefore, to provide the same level of service as today will require 6 skip-stop trains to operate.

Capitol Corridor services operate between CP Coast and San Jose. Provision for up to 2 tphpd have been included in the assessment of platform capacity at San Jose station.

Altamont Corridor Express (ACE) services operate between CP Coast and Michael Yard at Tamien. Provision for up to 4 tphpd has been included in the assessment of platform capacity at San Jose station and of track capacity south of San Jose on the non-electrified tracks.

[2] Full details of market demand and stopping patterns will be in Caltrain's Business Plan due for publication in Q1 2019.

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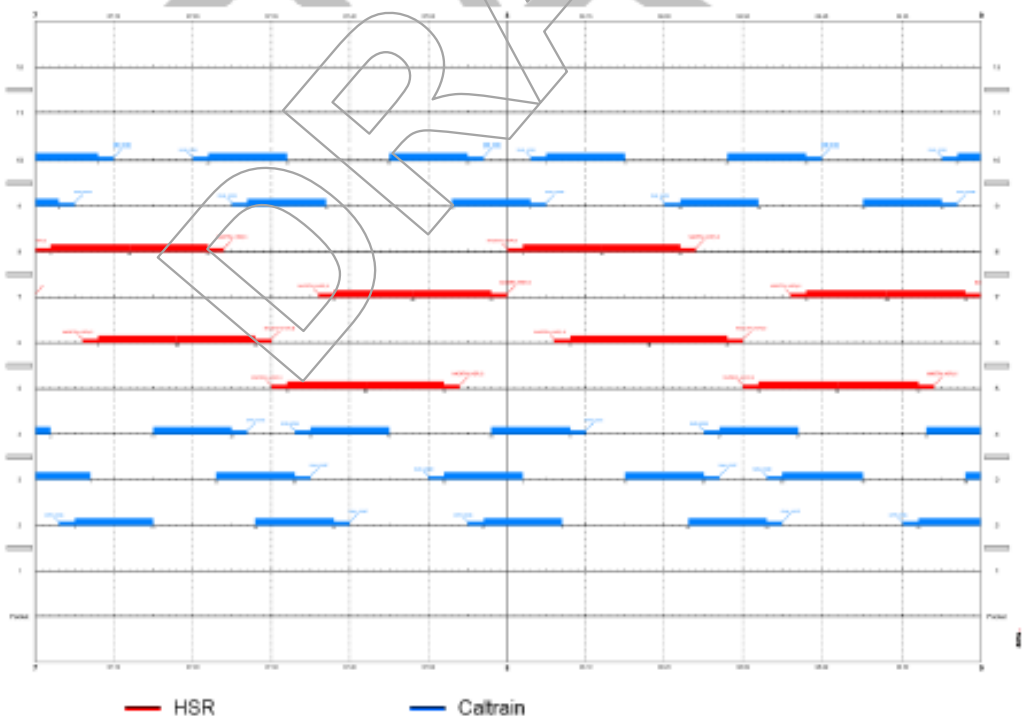
San Francisco – 4th and King Station

The illustrative schedule that has been developed can be accommodated in the existing layout at San Francisco 4th and King station. Proposed platform allocations are:

Platform	Track(s)	Platform height	Service(s)
1	1	Low level	
	2	Low level	Caltrain
2	3	Low level	Caltrain
	4	Low level	Caltrain
3	5	High level	High-speed
	6	High level	High-speed
4	7	High level	High-speed
	8	High level	High-speed
5	9	Low level	Caltrain
	10	Low level	Caltrain
6	11	Low level	
	12	Low level	

The diagram below shows station working in the peak hours 0700-0900:



This proposal maintains Caltrain's ability to undertake their non-revenue activities in the station area.

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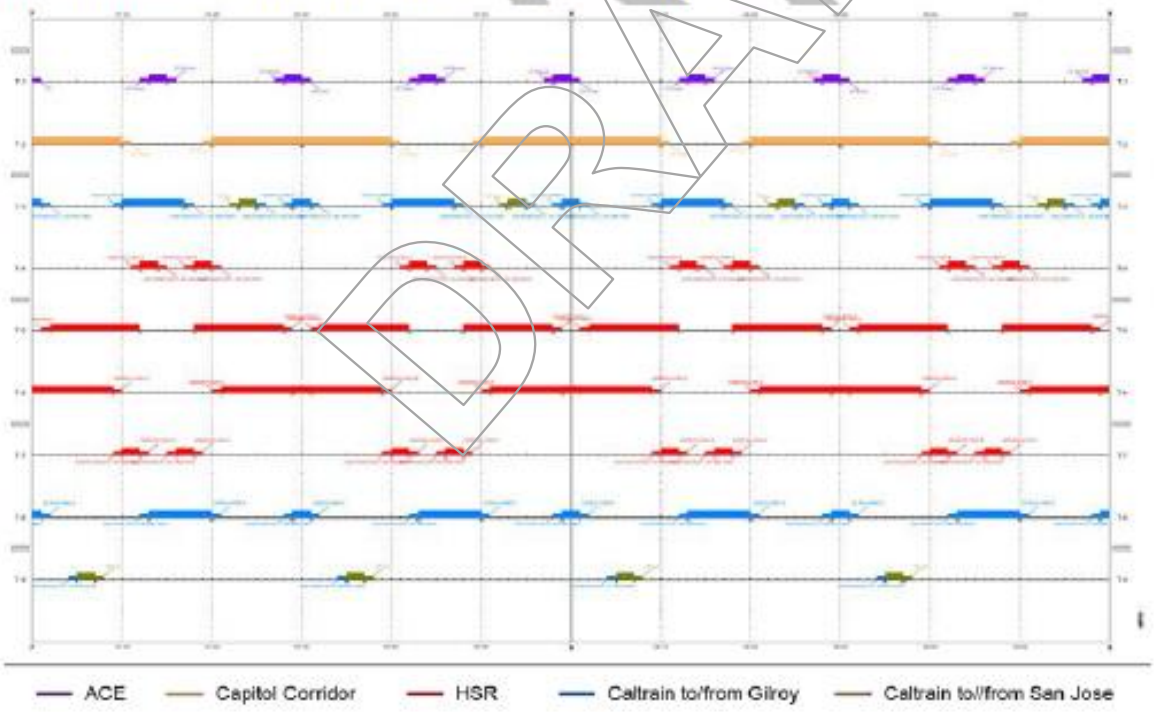
San Jose Diridon Station – platform arrangements

The illustrative schedule that has been developed can be accommodated in the existing layout at San Jose Diridon station together with the needs of Caltrain's tenants. Platform allocations are:

Platform	Track(s)	Platform height	Service(s)
1	1	Low level	ACE and UPRR
2	2	Low level	Capitol Corridor
	3	Low level	Caltrain northbound
3	4	High level	HSR northbound thru
	5	High level	HSR San Jose – LAUS
4	6	High level	HSR San Jose – LAUS
	7	High level	HSR southbound thru
5	8	Low level	Caltrain southbound
	9	Low level	Caltrain southbound

The diagram below shows station working in the peak hours 0700-0900:



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Requirements and service plans, Phase 1, 2033

Operating parameters

Signal headways:	3 mins
Dwell times:	High-speed rail, 2 mins
	Caltrain, 1 min at major stations, 45 secs at minor stations
Train turnaround time:	20 mins for all operators
Trainsets:	High-speed rail, generic high-speed trainset
	Caltrain, Stadler KISS electric multiple units
Recovery time (pad):	10% distributed across the schedule

Infrastructure parameters

Tracks:	Two track railway with maximum available speed (MAS) up to 110mph[3]
Traction power:	Overhead 25kV catenary system
Passing locations (existing):	Bayshore, Lawrence
Passing locations (new):	Millbrae
High-speed stations:	San Francisco 4th and King[4] – 2 platforms, 4 tracks
	Millbrae – 1 platform, 2 tracks
	San Jose – 2 platforms, 4 tracks
	Gilroy - 2 platforms, 2 tracks

Peak[5] (off peak) operations

High-speed rail plans to operate:

- 4 (3) tphpd between San Francisco and southern California
  - all trains will call San Jose
  - 2 (2) tphpd will call at Millbrae
  - 1 (1) tphpd will call at Gilroy
- 3 (0) tphpd between San Jose and southern California
  - 1 (0) tphpd will call at Gilroy
- 1 (1) tphpd between San Jose and Merced, calling at Gilroy

[3] Note that from CP Coast to San Jose Diridon station two non-electrified tracks are required for UPRR, ACE and Capitol Corridor services

[4] Upon completion of the Downtown extension high-speed services will operate to/from the Salesforce Transit Center

[5] Peak hours are 0600-0900 and 1600-1900

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Illustrative Timetable – San Jose to Gilroy – 2033, 2040: Skip-Stop

Train type	SS-1	HSR	SS-2	HSR	SS-3	HSR	HSR	SS-1	HSR	SS-2	HSR	SS-3	HSR	HSR
SAN FRANCISCO / 4th AND KING	6:03		6:08	6:22	6:25	6:28		6:33		6:38	6:52	6:55	6:58	
22nd STREET	6:07		|	|	|	|		6:37		|	|	|	|	
BAYSHORE	|		|	|	6:36	|		|		|	|	7:06	|	
SOUTH SAN FRANCISCO	|		6:18	|	|	|		|		6:48	|	|	|	
SAN BRUNO	6:16		|	|	|	|		6:46		|	|	|	|	
MILLBRAE	6:20		6:23	6:37	6:44	|		6:50		6:53	7:07	7:14	|	
BROADWAY	|		|	|	6:47	|		|		|	|	7:17	|	
BURLINGAME	|		6:27	|	|	|		|		6:57	|	|	|	
SAN MATEO	6:24		6:30	|	|	|		6:54		7:00	|	|	|	
HAYWARD PARK	|		|	|	6:52	|		|		|	|	7:22	|	
HILLSDALE	|		6:33	|	6:54	|		|		7:03	|	7:24	|	
BELMONT	6:30		|	|	|	|		7:00		|	|	|	|	
SAN CARLOS	6:33		|	|	6:58	|		7:03		|	|	7:28	|	
REDWOOD CITY	|		6:39	|	7:02	|		|		7:09	|	7:32	|	
ATHERTON	|		6:42	|	|	|		|		7:12	|	|	|	
MENLO PARK	6:39		6:45	|	|	|		7:09		7:15	|	|	|	
PALO ALTO	6:41		6:48	|	7:07	|		7:11		7:18	|	7:37	|	
STANDFORD STADIUM	|		|	|	|	|		|		|	|	|	|	
CALIFORNIA AVENUE	6:44		|	|	7:10	|		7:14		|	|	7:40	|	
SAN ANTONIO	6:48		|	|	|	|		7:18		|	|	|	|	
MOUNTAIN VIEW	6:51		6:55	|	7:15	|		7:21		7:25	|	7:45	|	
SUNNYVALE	|		|	|	7:19	|		|		|	|	7:49	|	
LAWRENCE	|		7:04	|	|	|		|		7:34	|	|	|	
SANTA CLARA	6:59		|	|	|	|		7:29		|	|	|	|	
COLLEGE PARK	|		|	|	|	|		|		|	|	|	|	
SAN JOSE - ARR	7:05		7:13	7:10	7:29	7:16		7:35		7:43	7:40	7:59	7:46	
SAN JOSE - DEP	7:07	7:09	7:20	7:12	7:31	7:18	7:28	7:37	7:39	7:50	7:42	8:01	7:48	7:58
TAMIEN	|	|	7:24	|	7:35	|	|	|	|	7:54	|	8:05	|	|
CAPITOL (HSR)		|	7:29	|	|	|	|		|	7:59	|	|	|	|
BLOSSOM HILL (HSR)		|	|	|	7:42	|	|		|	|	|	8:12	|	|
MORGAN HILL (HSR)		|	7:40	|	|	|	|		|	8:10	|	|	|	|
SAN MARTIIN (HSR)		|	|	|	7:54	|	|		|	|	|	8:24	|	|
GILROY (HSR)		7:31	7:48	7:35	7:59	7:41	7:50		8:01	8:18	8:05	8:29	8:11	8:20

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Illustrative Timetable – San Jose to Gilroy – 2033, 2040: Skip-Stop

Train Type	SS-1	HSR	SS-2	HSR	SS-3	HSR	HSR	SS-1	HSR	SS-2	HSR	SS-3	HSR	HSR
SAN FRANCISCO / 4th AND KING	7:03		7:08	7:22	7:25	7:28		7:33		7:38	7:52	7:55	7:58	
22nd STREET	7:07		|	|	|	|		7:37		|	|	|	|	
BAYSHORE	|		|	|	7:36	|		|		|	|	8:05	|	
SOUTH SAN FRANCISCO	|		7:18	|	|	|		|		7:48	|	|	|	
SAN BRUNO	7:16		|	|	|	|		7:45		|	|	|	|	
MILLBRAE	7:20		7:23	7:37	7:44	|		7:50		7:53	8:07	8:14	|	
BROADWAY	|		|	|	7:47	|		|		|	|	8:17	|	
BURLINGAME	|		7:27	|	|	|		|		7:57	|	|	|	
SAN MATEO	7:24		7:30	|	|	|		7:54		8:00	|	|	|	
HAYWARD PARK	|		|	|	7:52	|		|		|	|	8:22	|	
HILLSDALE	|		7:33	|	7:54	|		|		8:03	|	8:24	|	
BELMONT	7:30		|	|	|	|		8:00		|	|	|	|	
SAN CARLOS	7:33		|	|	7:58	|		8:03		|	|	8:28	|	
REDWOOD CITY	|		7:39	|	8:02	|		|		8:09	|	8:32	|	
ATHERTON	|		7:42	|	|	|		|		8:12	|	|	|	
MENLO PARK	7:39		7:45	|	|	|		8:09		8:15	|	|	|	
PALO ALTO	7:41		7:48	|	8:07	|		8:11		8:18	|	8:37	|	
STANDFORD STADIUM	|		|	|	|	|		|		|	|	|	|	
CALIFORNIA AVENUE	7:44		|	|	8:10	|		8:14		|	|	8:40	|	
SAN ANTONIO	7:48		|	|	|	|		8:18		|	|	|	|	
MOUNTAIN VIEW	7:51		7:55	|	8:15	|		8:21		8:25	|	8:45	|	
SUNNYVALE	|		|	|	8:19	|		|		|	|	8:49	|	
LAWRENCE	|		8:04	|	|	|		|		8:34	|	|	|	
SANTA CLARA	7:59		|	|	|	|		8:29		|	|	|	|	
COLLEGE PARK	|		|	|	|	|		|		|	|	|	|	
SAN JOSE - ARR	8:05		8:13	8:10	8:29	8:16		8:35		8:43	8:40	8:59	8:46	
SAN JOSE - DEP	8:07	8:09	8:20	8:12	8:31	8:18	8:28	8:37	8:39	8:50	8:42	9:01	8:48	8:58
TAMIEN	|	|	8:24	|	8:35	|	|	|	|	8:54	|	9:05	|	|
CAPITOL (HSR)		|	8:29	|	|	|	|		|	8:59	|	|	|	|
BLOSSOM HILL (HSR)		|	|	|	8:42	|	|		|	|	|	9:12	|	|
MORGAN HILL (HSR)		|	8:40	|	|	|	|		|	9:10	|	|	|	|
SAN MARTIIN (HSR)		|	|	|	8:54	|	|		|	|	|	9:24	|	|
GILROY (HSR)		8:31	8:48	8:36	8:59	8:41	8:50		9:01	9:18	9:05	9:29	9:11	9:20

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Illustrative Timetable – San Jose to Gilroy – 2033, 2040: Skip-Stop

Train type	SS-3	HSR	HSR	SS-2	HSR	HSR	SS-1	SS-3	HSR	HSR	SS-2	HSR	HSR	SS-1
GILROY (HSR)	6:31	6:40	6:48	6:42	6:54	6:59		6:01	6:10	6:18	6:12	6:24	6:29	
SAN MARTIIN (HSR)	6:37	|	|	|	|	|		6:07	|	|	|	|	|	
MORGAN HILL (HSR)	|	|	|	6:51	|	|		|	|	|	6:21	|	|	
BLOSSOM HILL (HSR)	6:49	|	|	|	|	|		6:19	|	|	|	|	|	
CAPITOL (HSR)	|	|	|	6:02	|	|		|	|	|	6:32	|	|	
TAMIEN	6:56	|	|	6:07	|	|	|	6:26	|	|	6:37	|	|	|
SAN JOSE - ARR	6:59	6:02	6:12	6:10	6:18	6:21	6:23	6:29	6:32	6:42	6:40	6:48	6:51	6:53
SAN JOSE - DEP	6:01		6:14	6:17	6:20		6:25	6:31		6:44	6:47	6:50		6:55
COLLEGE PARK	|		|	|	|		|	|		|	|	|		|
SANTA CLARA	|		|	|	|		6:31	|		|	|	|		7:01
LAWRENCE	|		|	6:30	|		|	|		|	7:00	|		|
SUNNYVALE	6:11		|	|	|		|	6:41		|	|	|		|
MOUNTAIN VIEW	6:15		|	6:36	|		6:39	6:45		|	7:06	|		7:09
SAN ANTONIO	|		|	|	|		6:42	|		|	|	|		7:12
CALIFORNIA AVENUE	6:19		|	|	|		6:45	6:49		|	|	|		7:15
STANDFORD STADIUM	|		|	|	|		|	|		|	|	|		|
PALO ALTO	6:23		|	6:42	|		6:49	6:53		|	7:12	|		7:19
MENLO PARK	|		|	6:45	|		6:51	|		|	7:15	|		7:21
ATHERTON	|		|	6:48	|		|	|		|	7:18	|		|
REDWOOD CITY	6:28		|	6:51	|		|	6:58		|	7:21	|		|
SAN CARLOS	6:31		|	|	|		6:57	7:01		|	|	|		7:27
BELMONT	|		|	|	|		7:00	|		|	|	|		7:30
HILLSDALE	6:35		|	6:57	|		|	7:05		|	7:27	|		|
HAYWARD PARK	6:38		|	|	|		|	7:08			|	|		|
SAN MATEO	|		|	7:00	|		7:06	|		|	7:30	|		7:36
BURLINGAME	|		|	7:03	|		|	|		|	7:33	|		|
BROADWAY	6:43		|	|	|		|	7:13		|	|	|		|
MILLBRAE	6:46		|	7:07	6:54		7:10	7:16		|	7:37	7:24		7:40
SAN BRUNO	|		|	|	|		7:14	|		|	|	|		7:44
SOUTH SAN FRANCISCO	|		|	7:12	|		|	|		|	7:42	|		|
BAYSHORE	6:58		|	|	|		|	7:28		|	|	|		|
22nd STREET	|		|	|	|		7:23	|		|	|	|		7:53
SAN FRANCISCO / 4th AND KING	7:05		7:02	7:22	7:08		7:27	7:35		7:32	7:52	7:38		7:57

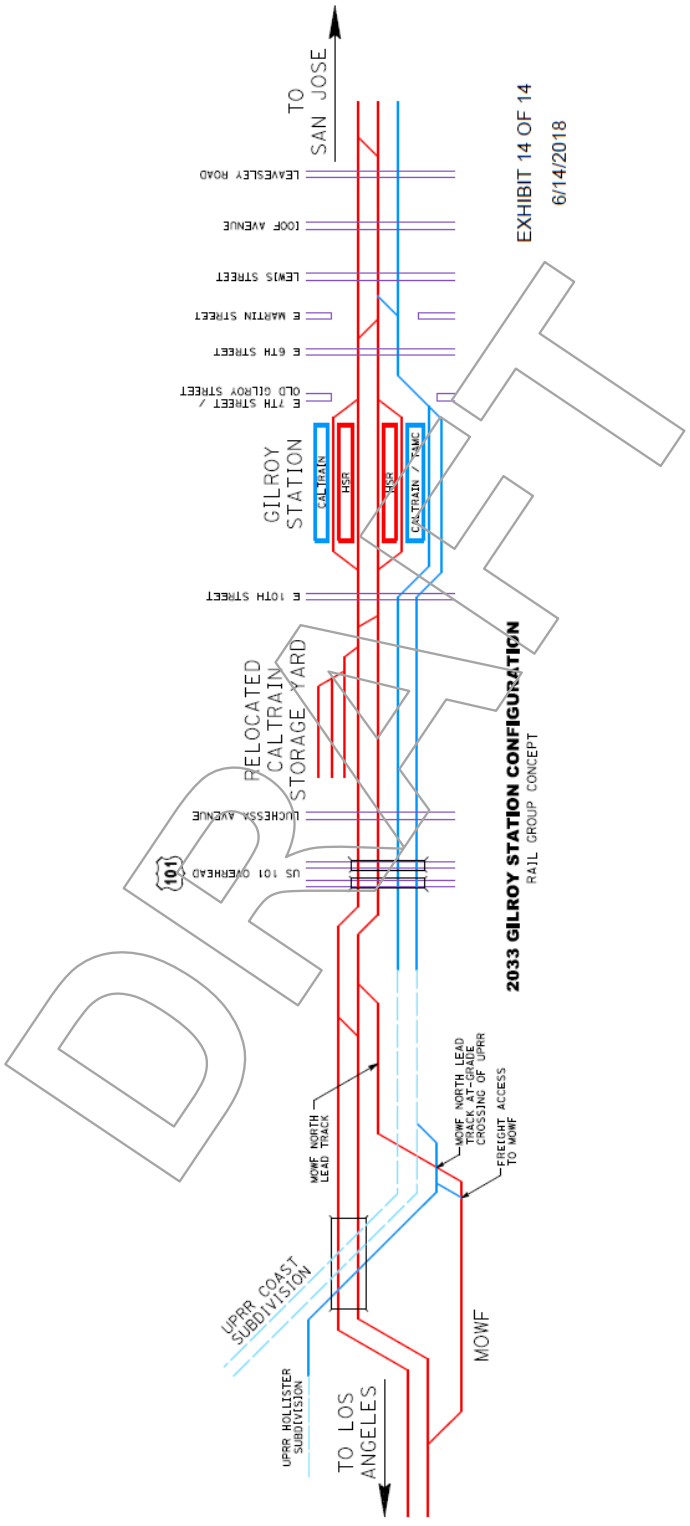
DRAFT

Illustrative Timetable – San Jose to Gilroy – 2033, 2040: Skip-Stop

Train type	SS-3	HSR	HSR	SS-2	HSR	HSR	SS-1	SS-3	HSR	HSR	SS-2	HSR	HSR	SS-1
GILROY (HSR)	6:31	6:40	6:48	6:42	6:54	6:59		7:01	7:10	7:18	7:12	7:24	7:29	
SAN MARTIIN (HSR)	6:37	|	|	|	|	|		7:07	|	|	|	|	|	
MORGAN HILL (HSR)	|	|	|	6:51	|	|		|	|	|	7:21	|	|	
BLOSSOM HILL (HSR)	6:49	|	|	|	|	|		7:19	|	|	|	|	|	
CAPITOL (HSR)	|	|	|	7:02	|	|		|	|	|	7:32	|	|	
TAMIEN	6:56	|	|	7:07	|	|	|	7:26	|	|	7:37	|	|	|
SAN JOSE - ARR	6:59	7:02	7:12	7:10	7:18	7:21	7:23	7:29	7:32	7:42	7:40	7:48	7:51	7:53
SAN JOSE - DEP	7:01		7:14	7:17	7:20		7:25	7:31		7:44	7:47	7:50		7:56
COLLEGE PARK	|		|	|	|		|	|		|	|	|		|
SANTA CLARA	|		|	|	|		7:31	|		|	|	|		8:01
LAWRENCE	|		|	7:30	|		|	|		|	8:00	|		|
SUNNYVALE	7:11		|	|	|		|	7:41		|	|	|		|
MOUNTAIN VIEW	7:15		|	7:36	|		7:39	7:45		|	8:06	|		8:09
SAN ANTONIO	|		|	|	|		7:42	|		|	|	|		8:12
CALIFORNIA AVENUE	7:19		|	|	|		7:45	7:49		|	|	|		8:16
STANDFORD STADIUM	|		|	|	|		|	|		|	|	|		|
PALO ALTO	7:23		|	7:42	|		7:49	7:53		|	8:12	|		8:19
MENLO PARK	|		|	7:45	|		7:51	|		|	8:16	|		8:21
ATHERTON	|		|	7:48	|		|	|		|	8:18	|		|
REDWOOD CITY	7:28		|	7:51	|		|	7:58		|	8:21	|		|
SAN CARLOS	7:31		|	|	|		7:57	8:01		|	|	|		8:27
BELMONT	|		|	|	|		8:00	|		|	|	|		8:30
HILLSDALE	7:35		|	7:57	|		|	8:05		|	8:27	|		|
HAYWARD PARK	7:38		|	|	|		|	8:08		|	|	|		|
SAN MATEO	|		|	8:00	|		8:06	|		|	8:30	|		8:36
BURLINGAME	|		|	8:03	|		|	|		|	8:33	|		|
BROADWAY	7:43		|	|	|		|	8:13		|	|	|		|
MILLBRAE	7:46		|	8:07	7:54		8:10	8:16		|	8:37	8:24		8:40
SAN BRUNO	|		|	|	|		8:14	|		|	|	|		8:44
SOUTH SAN FRANCISCO	|		|	8:12	|		|	|		|	8:42	|		|
BAYSHORE	7:58		|	|	|		|	8:28		|	|	|		|
22nd STREET	|		|	|	|		8:23	|		|	|	|		8:53
SAN FRANCISCO / 4th AND KING	8:05		8:02	8:22	8:08		8:27	8:35		8:32	8:52	8:38		8:57

8 APPENDIX 2

Track schematic showing 2033 Gilroy Station Configuration with ‘RELOCATED CALTRAIN STORAGE YARD’ shown.



APPENDIX 2-D: APPLICABLE DESIGN STANDARDS

California High Speed Rail Authority
San Jose to Merced Section: San Jose to Central Valley Wye

DESIGN CHECKLISTS
Draft PEPD
May 19, 2017

The discipline leads identified below attest that design for the Draft PEPD submittal for the San Jose to Central Valley Wye portion of the CAHSR San Jose to Merced Section has been performed in general compliance with the standards and guidance established in the attached Design Criteria Checklists, to the extent applicable to a 15% level of design.

Locations where compliance with standards has not been deemed feasible are documented in the Design Variance Log.

TRACK	Myat Ohn, PE	5/15/17 Date
ROADWAY	Lillie Lam, PE	5/15/17 Date
STATION	~~Tony Lee~~ Rosanna McGuire	5/16/17 Date
STRUCTURE	Erik Okada, PE, SE	5/15/17 Date
TUNNEL	Jimmy Thompson FOR	5/15/17 Date
HYDROLOGY	John Mountin, PE	5/15/17 Date
UTILITIES	Peter Anastos, PE	15 May 2017 Date
GENERAL	Myat Ohn, PE	5/15/17 Date
SYSTEMS	~~Sandro Pani~~	5/15/17 Date

HNTB

CAHSR JM
HORIZONTAL DESIGN CHECKLIST

<table>
<tr><th>DESIGN ELEMENT</th><th>CAHSR JM DEDICATED HST CRITERIA</th><th>HST REFERENCE</th><th>CALTRAIN (CHP 2)</th><th>UPRR (INDUSTRIAL TRACK CONSTRUCTION SPECS)</th></tr>
<tr><td>MAIN LINE TRACK CENTER</td><td>MINIMUM 16.5'</td><td>HST TM1.1.21_3.2.2 (Table 3.3)</td><td>Main track: 15 feet minimum
Yard track: 20 feet minimum</td><td>Industry track center minimums are as follows:
a) 15 feet preferred on tangent track.
b) 15 feet if spur is adjacent to a lead track or on a curve track.
c) 20 feet if spur is adjacent to a switching lead.
d) 25 feet if spur is adjacent to a main or branch line track.</td></tr>
<tr><td rowspan="3">SPEED</td><td>V (MPH) — Above 125 mph with an initial maximum operating speed of 220 mph. The design shall not unnecessarily preclude operation at higher speeds up to at least 250 mph.</td><td>HST TM 2.1.2_1.0</td><td rowspan="3">TABLE 2-4 DESIGN SPEEDS THROUGH CURVES
<table><tr><th rowspan="2">Track Type & Condition</th><th colspan="2">Curve Design Speed (MPH)</th></tr><tr><th>Preferred</th><th>Minimum</th></tr><tr><td>Main Track</td><td>90</td><td>Exceed MAS</td></tr><tr><td>Control Siding with #20 T.O.</td><td>50</td><td>NA</td></tr><tr><td>Control Siding with #14 T.O.</td><td>35</td><td>NA</td></tr><tr><td>Temporary Main Track</td><td>Existing MAS</td><td>(MAS – 15 MPH)</td></tr><tr><td>Yard Lead</td><td>25</td><td>15</td></tr><tr><td>Yard Track</td><td>15</td><td>10</td></tr></table></td><td rowspan="3">N/A</td></tr>
<tr><td>V (MPH) — For tunnel, maximum operating speed is 200 mph</td><td>HST NTD 10R1</td></tr>
<tr><td>There should be a relationship between horizontal and vertical alignment standards. For example, there is no point in using vertical curves designed for 250 mph which are adjacent to curves or other constraining elements that permanently restrict speeds to a much lower value. However, the speed used in developing vertical curves should never be lower than that possible under “Exceptional” conditions on adjacent horizontal curves.</td><td>HST TM 2.1.2_4.0</td></tr>
<tr><td>CHANGES IN DIRECTION</td><td>Over four changes in direction per mile shall constitute an Exceptional condition.</td><td>HST TM 2.1.2_6.1</td><td>N/A</td><td>N/A</td></tr>
<tr><td>MINIMUM SEGMENT LENGTH</td><td>Attenuation time, based on the most conservative requirements, shall be:
For V < 186 MPH,
o Desirable attenuation time: not less than 2.4 seconds
o Minimum attenuation time: not less than 1.8 seconds
o Exceptional attenuation time: not less than 1.5 seconds.
o An attenuation time of 1.0 seconds on the diverging route in curves adjacent to or between turnouts
For V >= 186 mph
o Desirable attenuation time: not less than 3.1 seconds
o Minimum attenuation time: not less than 2.4 seconds
o Exceptional attenuation time: not less than 1.8 seconds.
Where alignment segments overlap, each change shall be treated as a separate alignment element for the purpose of calculating minimum segment lengths. Minimum segment length is calculated by the formula: Lfeet = Vmph x 44/30 x tsec</td><td>HST TM 2.1.2_6.1.1</td><td>TABLE 2-2 MINIMUM TANGENT LENGTH (MAIN TRACKS)
<table><tr><th rowspan="2">Tangent Location On Mainline Tracks</th><th colspan="2">Minimum Tangent Length (feet)</th></tr><tr><th>Preferred</th><th>Absolute Minimum</th></tr><tr><td>Between reverse curves</td><td>3V</td><td>100</td></tr><tr><td>Between Point of Switches of turnouts (TO's)</td><td>50</td><td>20*</td></tr><tr><td>Between PS and curve</td><td>100</td><td>15*</td></tr><tr><td>Between PS and platform</td><td>100</td><td>60</td></tr><tr><td>Between PS and grade crossing</td><td>100</td><td>50</td></tr><tr><td>Between PS and last long tie of T.O.</td><td>60</td><td>15*</td></tr><tr><td>Between curve and platform</td><td>60</td><td>30</td></tr><tr><td>Between curve and grade crossing</td><td>50</td><td>10</td></tr></table>* Tangent length shall not be less than the length of stock rail projection
V = design speed in the area, MPH
The minimum tangent length for yard and non-revenue tracks shall be established as per Table 2-3:
TABLE 2-3 MINIMUM TANGENT LENGTH (YARD AND NON-REVENUE TRACKS)
<table><tr><th rowspan="2">Tangent Location On Yard and Non-Revenue Tracks</th><th colspan="2">Minimum Tangent Length (feet)</th></tr><tr><th>Preferred</th><th>Absolute Minimum</th></tr><tr><td>Between reverse curves</td><td>60</td><td>N/A</td></tr><tr><td>Between PS of T.O.'s</td><td>40</td><td>15*</td></tr></table>* Tangent length shall not be less than the length of stock rail projection</td><td>The minimum tangent distance between curves greater than 07° 30' shall be at least one car length (60 feet to 100 feet). Use UP Standard Drawing No. 0018 for guidance for minimum distance between facing point turnouts. Use UP Standard Drawing No. 0017 for guidance for minimum distance between reverse curves.</td></tr>
<tr><td>MINIMUM RADII (BASED ON CHORD DEFINITION)</td><td><table><tr><th rowspan="2">Design Speed</th><th colspan="6">Minimum radius, Based on Superelevation Limits</th></tr><tr><th colspan="2">Desirable</th><th colspan="2">Minimum</th><th colspan="2">Exceptional</th></tr><tr><th>miles per hour</th><th>km/h</th><th>feet</th><th>meters (rounded)</th><th>feet</th><th>meters (rounded)</th><th>feet</th><th>meters (rounded)</th></tr><tr><td>250</td><td>400</td><td>45,000</td><td>13,700</td><td>28,000</td><td>8,500</td><td>25,000</td><td>7,600</td></tr><tr><td>220</td><td>355</td><td>35,000</td><td>10,700</td><td>22,000</td><td>6,700</td><td>19,500</td><td>6,000</td></tr><tr><td>200</td><td>320</td><td>30,000</td><td>9,200</td><td>18,000</td><td>5,500</td><td>16,000</td><td>4,900</td></tr><tr><td>186</td><td>300</td><td>25,000</td><td>7,600</td><td>16,600</td><td>4,700</td><td>14,000</td><td>4,250</td></tr><tr><td><186</td><td><300</td><td>25,000</td><td>7,600</td><td>16,600</td><td>4,700</td><td>12,600</td><td>3,850</td></tr><tr><td>175</td><td>280</td><td>22,000</td><td>6,700</td><td>14,000</td><td>4,200</td><td>11,200</td><td>3,400</td></tr><tr><td>150</td><td>240</td><td>16,000</td><td>4,900</td><td>10,000</td><td>3,100</td><td>8,200</td><td>2,500</td></tr><tr><td>125</td><td>200</td><td>10,500</td><td>3,200</td><td>7,000</td><td>2,100</td><td>5,700</td><td>1,750</td></tr></table></td><td>HST TM 2.1.2_6.1.2 (Table 6.1.3)</td><td rowspan="2">Based on 100' Chord Definition:
Radius, R = 50/sin(Dc/2)
Length of curve, Lc = 100 (D/Dc)
Tangent distance, T = R tan(D/2)
where D = central angle
The minimum length of circular curve shall be 100 feet for mainline tracks and 50
feet for yard and industry tracks.</td><td rowspan="2">Horizontal curves are defined using the 100-foot chord definition method. Horizontal curves shall be 10°0'0". Horizontal curves must not begin on the long ties of a turnout.</td></tr>
<tr><td>MINIMUM DEGREE OF CURVATURE</td><td><table><tr><th rowspan="2">Design Speed</th><th colspan="4">Minimum Curve in Degrees, degree, minutes, seconds</th></tr><tr><th>miles per hour</th><th>km/h</th><th>Desirable</th><th>Minimum</th><th>Exceptional</th></tr><tr><td>250</td><td>400</td><td>0d 07m 30s</td><td>0d 12m 15s</td><td>0d 13m 30s</td></tr><tr><td>220</td><td>355</td><td>0d 09m 45s</td><td>0d 15m 30s</td><td>0d 17m 30s</td></tr><tr><td>200</td><td>320</td><td>0d 11m 15s</td><td>0d 19m 00s</td><td>0d 21m 15s</td></tr><tr><td>186</td><td>300</td><td>0d 13m 45s</td><td>0d 21m 30s</td><td>0d 24m 30s</td></tr><tr><td><186</td><td><300</td><td>0d 13m 45s</td><td>0d 21m 30s</td><td>0d 27m 15s</td></tr><tr><td>175</td><td>280</td><td>0d 15m 30s</td><td>0d 24m 30s</td><td>0d 30m 30s</td></tr><tr><td>150</td><td>240</td><td>0d 21m 15s</td><td>0d 34m 15s</td><td>0d 41m 45s</td></tr><tr><td>125</td><td>200</td><td>0d 32m 30s</td><td>0d 49m 00s</td><td>1d 00m 00s</td></tr></table></td><td>HST TM 2.1.2_6.1.2 (Table 6.1.4)</td></tr>
<tr><td>TOTAL SUPERELEVATION</td><td>Balancing superelevation shall be calculated by one of the following formulae, depending upon how the curve is defined:
SE = 0.0007 V2 D (curvature in degrees, speed in mph and SE in inches)
Which when expressed with radius instead of degrees gives:
SE = 4.0 V2 / R (radius in feet, speed in mph and SE in inches)
<table><tr><th>Speed (mph)</th><th><186</th><th>>=186</th></tr><tr><td>Desirable (in)</td><td>6</td><td>6</td></tr><tr><td>Maximum (in)</td><td>9</td><td>9</td></tr><tr><td>Exceptional (in)</td><td>11</td><td>10</td></tr></table></td><td>HST TM 2.1.2_6.1.3 (Table 6.1.5)</td><td rowspan="3">Equilibrium superelevation shall be determined by the following equation:
e = 0.0007 DcV2
where:
e = total superelevation required for equilibrium, in inches.
V = maximum design speed through the curve, in miles per hour (MPH)
Dc = degree of curvature, in degree
The total superelevation e is expressed as follows:
e = Ea + Eu
where:
Ea = actual superelevation that is applied to the curve
Eu = unbalanced superelevation (amount of superelevation not applied to the curve) The actual superelevation shall be rounded to the nearest 1/4 inch by the formulas above. For any curve, a 1/2 inch minimum superelevation shall be specified.</td><td>No superelevation required</td></tr>
<tr><td>APPLIED SUPERELEVATION</td><td><table><tr><th>Speed (mph)</th><th><186</th><th>>=186</th></tr><tr><td>Desirable (in)</td><td>4</td><td>4</td></tr><tr><td>Maximum (in)</td><td>6</td><td>6</td></tr><tr><td>Exceptional (in)</td><td>7</td><td>7</td></tr></table></td><td>HST TM 2.1.2_6.1.3 (Table 6.1.6)</td><td>No superelevation required</td></tr>
<tr><td>UNBALANCED SUPERELEVATION</td><td><table><tr><th>Speed (mph)</th><th><186</th><th>>=186</th></tr><tr><td>Desirable (in)</td><td>2</td><td>2</td></tr><tr><td>Maximum (in)</td><td>3</td><td>3</td></tr><tr><td>Exceptional (in)</td><td>4</td><td>3</td></tr></table></td><td>HST TM 2.1.2_6.1.3 (Table 6.1.6)</td><td>No superelevation required</td></tr>
</table>

CAHSR JM
HORIZONTAL DESIGN CHECKLIST

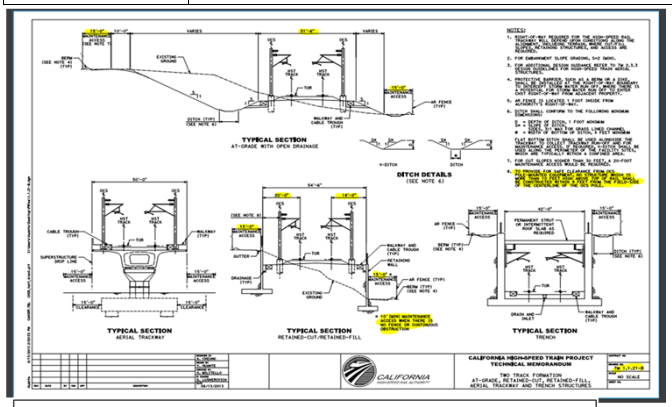
DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA	HST REFERENCE	CALTRAIN (CHP 2)	UPRR (INDUSTRIAL TRACK CONSTRUCTION SPECS)
SPIRAL TYPE	**HALF-SINE SPIRALS** (variable rate transitions) shall be used on all tracks designed for: 1) Ballasted tracks: Curves having design maximum speeds of 80 mph or more 2) Non-ballasted tracks: Curves having design maximum speeds of 60 mph or more 3) Curves associated with turnouts having design maximum speeds of 110 mph or more **CLOTHOID SPIRALS** (constant rate transitions) shall be used on all lower speed tracks. Clothoid spirals may also be used on very large radius curves that require small amounts or no superelevation and have very small unbalanced superelevations	HST TM 2.1.2_6.1.5	The clothoid spiral is commonly used in most CADD design software. Since Caltrain adopted AutoCAD and its associated Civil Design Software in the design of track alignment, the clothoid spiral shall be used. Spirals are not required for curves less than 30 minutes for MAS under 20 MPH or on curve that is part of a turnout, however, a minimum of curve length of 100 feet shall be implemented. Additionally, all curves including such curves shall have a minimum 1/2 inch actual superelevation.	N/A
SPIRAL LENGTH	Spiral Lengths: The length of the spiral shall be the longest length determined by calculating the various length requirements, which are: - Length needed to achieve Attenuation Time - Length determined by allowed rate of change in superelevation - Length determined by allowed rate of change in unbalanced superelevation - Length determined by limitation on twisting over vehicle and truck spacing length **Half-Sine (Variable Change) Spirals *** Spiral Design Factor / Desirable / Minimum / Exceptional Superelevation: 1.63 Ea V / 1.30 Ea V / 1.09 Ea V Unbalance: 2.10 Eu V / 1.57 Eu V / 1.26 Eu V Twist **: 140 Ea / 118 Ea / 98 Ea Minimum Segment: 2.64 V / 2.20 V / 1.47 V **Clothoid (Linear Change) Spirals** Spiral Design Factor / Desirable (0.03 g) / Minimum (0.04 g) / Exceptional (0.05 g) Superelevation: 1.47 Ea V / 1.17 Ea V / 0.98 Ea V Unbalance: 1.63 Eu V / 1.22 Eu V / 0.98 Eu V Twist: 90 Ea / 75 Ea / 62 Ea Minimum Segment: 2.64 V / 2.20 V / 1.47 V The length is given in feet with: - Ea = Actual elevation in inches - Eu = Unbalanced elevation in inches - V = maximum speed of the train in mph * Longer lengths of half-sine spirals are due to the variability in the ramp rate. ** Provides maximum twist rates identical to clothoids. As a practical matter, this limitation never governs due to use of this type spiral only on high-speed tracks.	TM 2.1.2_6.1.5.3 (Table 6.1.7)	The superelevation differential between rail car truck centers should not exceed one (1) inch. The minimum length of spiral between compound curves shall be 62 feet. **Spiral Length Requirements** Based on sections AREMA Chapter 5, Section 3.1, the length of spiral shall be longest as determined from formulas: 1. $L_s = 1.63E_aV$; or $L_s = 1.22E_uV$ * **Desirable** 2. $L_s = 1.2E_aV$ **Minimum (upto 60 mph)** 3. $L_s = 62E_a$ **Absolute Minimum (or Exception) upto 50 mph** * *Use of Spiral length $L_s = 1.22E_uV$ requires the approval of Caltrain Deputy Director of Engineering* where, E_a = actual superelevation that is applied to the curve E_u = unbalanced superelevation (amount of superelevation not applied to the curve) V = design speed, MPH The spiral length shall generally be rounded to the nearest 5 feet.	N/A
SPIRALS ON LARGE RADIUS CURVES	Clothoid spirals may be used instead of half-sine spirals regardless of track type or design speed if the following conditions are met: The required superelevation and unbalanced superelevation are both under 1.0 inches at the maximum design speed; and the "Minimum Segment" length for the spiral is more than twice the length required by any other factor. Spirals may be omitted if the following conditions are met: The required superelevation is zero (balancing superelevation for the maximum speed less than 0.75 inches); and the calculated offset of the curve due to application of the spiral is less than 0.05 feet in ballasted track or less than 0.02 feet in non-ballasted track. (These values are subject to revision.)	HST TM 2.1.2_6.1.5.4	SEE SD-2101 Track Geometry - Curve Marking Details	N/A
REVERSE CURVES	If there is insufficient distance between curves to provide the minimum required length tangent segment, the spirals shall be extended to provide a reversing curve. If beneficial to design and construction, a straight distance between curves that would be run in less than 0.2 seconds at the normal operating speed may be left between spiral ends.	HST TM 2.1.2_6.1.5.4	SEE SD-2102 Track Geometry - Reversing curves Layout and Calculations	N/A
COMPOUND CIRCULAR CURVES	If there is insufficient distance between curves to provide the minimum required length tangent segment, the spirals shall be extended to provide a reversing curve. If beneficial to design and construction, a straight distance between curves that would be run in less than 0.2 seconds at the normal operating speed may be left between spiral ends.	HST TM 2.1.2_6.1.5.4	The minimum length of spiral between compound curves shall be 62 feet	N/A
CLEARANCE	See Typical Section design checlist		See CPUC requirements	See CPUC requirements

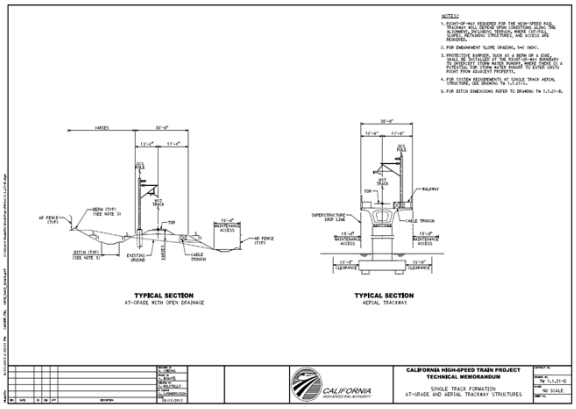
CAHSR JM
VERTICAL DESIGN CHECKLIST

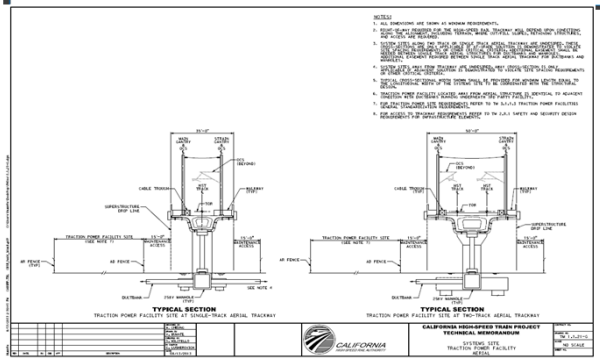
DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA	HST REFERENCE	CALTRAIN (CHP 2)	UPRR (INDUSTRIAL TRACK CONSTRUCTION SPECS)
MINIMUM SEGMENT LENGTH	Attenuation time, based on the most conservative requirements, shall be: For V < 186 MPH, o Desirable attenuation time: not less than 2.4 seconds o Minimum attenuation time: not less than 1.8 seconds o Exceptional attenuation time: not less than 1.5 seconds. o An attenuation time of 1.0 seconds on the diverging route in curves adjacent to or between turnouts For V >= 186 mph o Desirable attenuation time: not less than 3.1 seconds o Minimum attenuation time: not less than 2.4 seconds o Exceptional attenuation time: not less than 1.8 seconds. Where alignment segments overlap, each change shall be treated as a separate alignment element for the purpose of calculating minimum segment lengths. Minimum segment length is calculated by the formula: Lfeet = Vmph x 44/30 x tsec.	HST TM 2.1.2_6.1.1	For mainline track, the desired length of constant profile grade between vertical curves shall be determined by the following formula (but not less than 100 feet): L = 3V where, L = minimum tangent length, feet V = design speed in the area, mph	Minimum length of 100 feet and be designed for the longest curve practical, with a V/L not to exceed 1.2 for Sags and 2.00 for ummits, in which V = (Grade 1) minus (Grade 2) and L = Length of Curve in Stations. Rate of change V/L = Algebraic difference in grades divided by the length of the vertical curve in 100 foot stations
CHANGES IN DIRECTION	Over four changes in direction per mile shall constitute an Exceptional condition.	HST TM 2.1.2_6.1	N/A	The track should be designed to minimize the number of grade changes and use the smallest V/L as practical (See Union Pacific (UP) Standard Drawing No. 0016)
MAXIMUM GRADE LIMITS	Maximum Grade Limits: - Desirable grades: as low as reasonably practical, with a limit of 1.25% - Maximum grades: above 1.25% and shall be as low as practical up to 2.50% - Exceptional grades: above 2.50% and shall be as low as practical up to 3.50% Minimum Grades: Without a separate drainage system, grades in cuts or tunnels (included cut and-cover) shall not be less than 0.25%.	HST TM 2.1.2_6.1.6.1	The maximum continuous main line grade along the Caltrain commuter corridor is one (1)%. The preferred maximum design gradient for long continuous grade shall be one (1)%. Maximum design gradient, with curve compensation at 0.04 percent per degree of curve if applicable, for grades up to two (2)% may be implemented for new construction projects with the approval of the Caltrain Deputy Director of Engineering. The resulting maximum gradient Gc is generally expressed as follows: Gc = G – 0.04D Where G is the Gradient before, and D is the degree of curve, in decimal.	Shall be designed for the least grade practical, but shall not exceed 2.00%. Grades on track at location used for spotting rail cars are not to exceed 0.4%. Vertical curves must not begin on the long ties of a turnout. The grade from the point of switch through the long switch ties must be the same as the existing track that the turnout is coming out of.
LENGTH OF STEEP GRADES	Where terrain permits, long grades steeper than the following shall not be used due to limits of breaking capability of some of the proposed train sets: - The average grade for any 3.7 mi long section of the line shall be under 3.5% - The average grade for any 6.2 mi long section of the line shall be under 2.5%	HST TM 2.1.2_6.1.6.1	N/A	N/A
LIMITATIONS OF SPEED ON GRADES	In European practice, speed on downgrades is constrained by train set braking limitations. The restriction is based on the average grade over any continuous length of 17,100ft along the line. The following speed limits for different grades are as determined in accordance with French standards: - Grade between 3.0% and 3.5%: Vmax = 143 mph - Grade between 2.2% and 3.0%: Vmax = 168 mph - Grade between 1.6% and 2.2%: Vmax = 186 mph - Grade between 0.0% and 1.6%: Vmax = 217 mph	HST TM 2.1.2_6.1.6.1	N/A	N/A
VERTICAL CURVES	The radius of the curve at the crest or sag is determined in accordance with the vertical acceleration permitted for passenger comfort and the maximum speed of the line. The formula in US Customary units would be: Rmin >= (V*44/30)2 / av, where R is in feet, V in mph, Vertical acceleration (av) in feet/sec2 and the 44/30 is necessary for the mph to ft/sec conversion. Vertical Curve Type Shall be Parabolic	HST TM 2.1.2_6.1.6.2	Vertical curves shall be designed per the requirements for high-speed main tracks and shooflies as recommended in AREMA	N/A
VERTICAL CURVES ACCELERATION RATES	The acceleration values to be used for vertical curves shall be: - Desirable: 0.60 ft/sec/sec (1.86 percent of gravity) – AREMA recommended practice for passenger railroads. - Minimum: 0.90 ft/sec/sec (2.80 percent of gravity) - Exceptional: 1.40 ft/sec/sec (4.35 percent of gravity)	HST TM 2.1.2_6.1.6.2	Passenger Train 0.60 (0.02 g) Freight Train 0.10	N/A
VERTICAL CURVE LENGTH	Vertical curve lengths on lines carrying high-speed trains only shall be: - Desirable VC Length: The longer of LVCfeet = 4.55 V (for 3.1 seconds) or LVCfeet = 2.15 V2 (Δ% / 100) / 0.60 ft/sec2, but not less than 400 Δ% - Minimum VC Length: The longer of LVCfeet = 3.52 V (for 2.4 seconds) or LVCfeet = 2.15 V2 (Δ % / 100) / 0.80 ft/ sec2, but not less than 200 Δ% - Exceptional VC Length: The longer of LVCfeet = 2.64 V (for 1.8 seconds) or LVCfeet = 2.15 V2 (Δ % / 100) / 1.20 ft/ sec2, but not less than 100 Δ% - The speed used in the preceding formulae shall be no less than 250 mph, except where other alignment factors such as speed limiting curves exist. In those locations, a lower speed equal to or higher than the maximum anticipated achievable train speed may be used to calculate the required vertical curve lengths. At 250 mph, these formulae give: o Desirable VC Length: LVCfeet = 2250 Δ% o Minimum VC Length: LVCfeet = 1500 Δ% o Exceptional VC Length: LVCfeet = 970 Δ% The 2.15 factor is a constant necessary to unit conversions within the US Customary measuring system.	HST TM 2.1.2_6.1.6.2	L = (D V²K) /A where, A = vertical acceleration, in ft/sec² D = absolute value of the difference in rates of grades expressed in decimal K = 2.15 conversion factor to give L, in feet L = length of vertical curve, in feet V = speed of train, in miles per hour Under no circumstances shall the length of vertical curve be less than 100 feet.	N/A
VERTICAL CURVE AND HORIZONTAL SPIRAL CLEARANCE	Due to potential maintenance difficulties, it is desirable to avoid use of vertical curves in spirals. The desirable distance between end of spiral and beginning of vertical curve or end of vertical curve and beginning of spiral is 160 feet with a minimum limit of 100 feet. Overlap between vertical curves and spirals may be permitted as an Exceptional condition, but only where it can be shown that practical alternatives have been exhausted.	HST TM 2.1.2_6.1.7	N/A	N/A
CLEARANCE	See Typical Section design checklist		N/A	Top of Rail to Existing track - minimum of 200 feet in prior to the proposed point of switch and 200 feet from the last long switch tie. The minimum clearance shall be 23 feet from top of rail to nearest overhead obstruction (See UP Standard Drawing No. 0038 & 0035).

CAHSR JM
TYPICAL SECTION DESIGN CHECKLIST

DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA				CALTRAIN (DWG SD-2151, 2152, 2154)	UPRR (INDUSTRIAL TRACK CONSTRUCTION SPECS)
	AT GRADE (HST TM 1.1.21-B)	PLATFORM (HST TM2.2.4-6.1.3)	MSE WALL (HST TM1.1.21-B)	AERIAL STRUCTURE (HST TM 2.3.3) (HST TM DIRECTIVE DWG 1.1.21-D) (HST TM3.2.1-C) (HST TM DIRECTIVE DWG 1.1.2-G)		
Center of track to Center of OCS Pole	10.67'	n/a	10.67'	10.67'	n/a	n/a
Center of track to Face of OCS Pole	n/a	n/a	n/a	n/a	n/a	n/a
Pole Width	n/a	n/a	n/a	n/a	n/a	n/a
Face of OCS to Structure Clearance	n/a	n/a	n/a	n/a	n/a	n/a
Centerline of OCS to Structure Clearance	9'	n/a	n/a	n/a	n/a	n/a
Face of OCS to Vegetation Clearance	n/a	n/a	n/a	n/a	n/a	n/a
Embankment Slope	2:1	n/a	n/a	n/a	2:1	See UP Standard. Drawing No. 0003 and UP Exhibit 'E' Drawing
Excavation Slope	2:1	n/a	n/a	n/a	2:1	See UP Standard. Drawing No. 0003 and UP Exhibit 'E' Drawing
OCS Pole Foundation Width (TM 1.1.21 3.2.6)	3'	n/a	3'	3'	n/a	n/a
Walkway Width	Desirable 3' Minimum 3' Exceptional 2.5'	n/a	Desirable 3' Minimum 3' Exceptional 2.5'	Desirable 3' Minimum 3' Exceptional 2.5'	2' minimum CPUC	Provide typical cross-sections showing proposed track sections, any side ditches and all areas requiring a walkway (see UP Exhibit 'E' Drawing
Edge of OCS Pole Foundation to Ditch	3'	n/a	n/a	n/a	n/a	n/a
Ditch Width	V-Ditch 6' Ditch 10'	n/a	n/a	n/a	V 2', H 12"	See UP Standard. Drawing No. 0003 and UP Exhibit 'E' Drawing
Fence Foundation Width	n/a	n/a	n/a	n/a	n/a	n/a
Utility Easement	n/a	n/a	n/a	n/a	n/a	n/a
Centerline of Fence to Proposed ROW	1'	n/a	n/a	n/a	n/a	n/a
Proposed ROW to TCE	n/a	n/a	n/a	n/a	n/a	n/a
Center of track to edge of platform	n/a	5.75'	n/a	n/a	5'-4"	n/a
Platform Width	n/a	**Center island platform** Minimum 30' Exceptional 25' **Outboard platform** Minimum 20' Exceptional 18'	n/a	n/a	n/a	n/a
Vertical Circulation (Stairs)	n/a	n/a	n/a	n/a	n/a	n/a
Edge of MSE Wall to Proposed ROW	n/a	n/a	n/a	n/a	n/a	n/a
Centerline of track to face of MSE Wall	n/a	n/a	Wall in Cut 20' Wall in Fill 18'	n/a	n/a	n/a
Edge of Structure to Proposed ROW	n/a	n/a	n/a	n/a	n/a	n/a
Tunnel Cross Section Reduction (NTD 10R1)	a. Reduce operating maximum speed in Tunnels from 220 mph to 200 mph. b. Reduce nominal tunnel diameter from 29.5ft ID to 28ft ID.				n/a	n/a





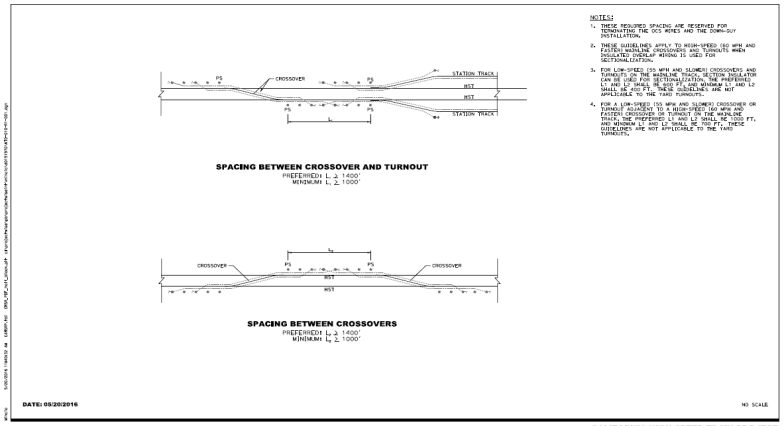


CAHSR JM
TURNOUT AND STATION TRACKS DESIGN CHECKLIST

DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA	HST REFERENCE	CALTRAIN (CHP 2)	UPRR (INDUSTRIAL TRACK CONSTRUCTION SPECS)
GENERAL	Use curved frogs. The high-speed turnouts will normally be built on some form of concrete based track, not on ties and ballast.	HST TM 2.1.3_6.1	a. Lateral turnouts numbers 8 and 9 for yards b. Lateral turnouts number 10, 14, and 20 for main line. Number 20 sha l be used where there are no real estate constraints. c. Number 9 double slip sw tches may be used in terminals. d. Turnouts w th Hollow Steel Ties (HST) per Standard Drawings SD-2000 series shall be used for new constructions. SEE DWG SD-2401-2901	n/a
SUPERELEVATION	Unbalanced Superelevation not to exceed 3 inches Superelevation in curve off of a turnout ≤ 1.25"	HST TM 2.1.3_6.1	N/A	N/A
MINIMUM TIME	Minimum time over any turnout segment or curve connected to a turnout, including spirals on the frog end of turnouts and spirals into a curve on the diverging track that is adjacent to the turnout 1 sec	HST TM 2.1.3_6.1	N/A	N/A
MAXIMUM VIRTUAL TRANSITION RATE AT SWITCH POINT	5.0 inches/second	HST TM 2.1.3_6.1	N/A	N/A
KEEP SPIRALS OUT OF FROGS	Minimum/Exceptional In order to avoid a special design swing nose frog, the frog end spiral shall begin at or beyond the point where track centerline spacing exceeds 5.85 feet, even if this means that the transition length in a crossover will have a run time of less than 1.0 seconds. Desirable Start frog end spiral beyond the point where the track centerline spacing exceeds 7.00 feet, if spiral is to a tangent or followed by a reversing curve. If the spiral is to a compound curve, it shall start beyond the point where the track center ine spacing exceeds 8.00 feet.	HST TM 2.1.3_6.1		
HIGH SPEED TURNOUTS GEOMETRY	See Table 6.1.1	HST TM 2.1.3_6.1.1	N/A	N/A
CROSSOVER BETWEEN MAIN TRACKS	See Table 6.1.2 for 16.50 feet track centers. Use of highspeed crossovers in tracks with centers of under 16.50 feet shall be an Exceptional condition.	HST TM 2.1.3_6.1.2		
STATION CONNECTION TRACKS WITH SPIRAL POINT TURNOUTS	See Table 6.1.3 for 25 feet track centers	HST TM 2.1.3_6.1.3	N/A	N/A
LOW AND MEDIAN SPEED TURNOUTS GEOMETRY	See Table 6.1.4	HST TM 2.1.3_6.1.4	Turnouts and crossovers shall be located on tangent tracks and shall meet the following requirements a. 100 feet minimum from point of switch (PS) to horizontal or vertical curves b. Less than 100 feet from horizontal curves without superelevation with approval from the Ca train Deputy Director of Engineering. c. 100 feet minimum from point of switch to the edge of road crossings (including sidewalks) d. 50 feet minimum from PS to Insulated Joint e. 50 feet minimum from PS to opposing point of switch f. Crossovers sha l be located in parallel tracks only g. Standard crossovers shall be of 15 feet track center SEE SD-2103 TRACK TURNOUTS AND DERAILS - STANDARD TURNOUT AND CROSSOVER DATA	Show a l existing turnouts (within 1500' of the limits of the construction area) and proposed turnouts, including size (No. 11, No. 15, etc). Show the Engineering Station (ES) of each point of switch. **UP Standard Drawing No. 345000 345003** - No. 15 turnouts will be required for all unit train operations and at other locations required by the UP. Installation may or may not require power operation. Main line turnouts are to be made of 136# rail unless specified and/or approved by UP's AVP Engineering – Design/Construction or a designated representative. **UP Standard Drawing 343000 343003**- No. 11 turnouts (minimum) are required out of all main tracks and located not closer than 300 ft. to a main line curve or bridge. Main line turnouts are to be made of 136# rail unless specified and/or approved by UP's AVP Engineering – Design/Construction or a designated representative **UP Standard Drawing 341000 341003** - No. 9 turnouts are recommended for industrial lead and spur track installation other than main track. Turnouts maintained by UP are to be 136# rail unless specified and/or approved by UP's AVP Engineering – Design/Construction or a designated representative. No. 7, No. 8, No. 8-1/2 or No. 10 turnouts will be considered where site conditions warrant in lieu of No. 9 turnouts on privately owned and maintained trackage, they must meet the latest edition of the AREMA Manual. UP w ll not own or maintain turnouts of these sizes.
	a. Reduce size of Turnouts from 110 mph to 60 mph. b. Reducing the speed of the station turnouts is in conjunctic;m w th the recommendation to reduce the speed of the universal crossovers and increase their spacing. c. The station platform track between entry turnout and the exit turnout along the main track shall have a 3,350 foot minimum length centered symmetrically on the midpoint of the station platform.	HST NTD 13		
STORAGE AND REFUGE TRACKS AT HIGH SPEED STATIONS	Turnouts smaller than the number 11 shall not be used. See Table 6.1.5 for 22 feet track offset the turnout - return curve selections.	HST TM 2.1.3_6.1.5	N/A	N/A
	Modify refuge track or storage track length from 1650' to 900' clear length	HST NTD 13	N/A	N/A
Spacing Between Facing Adjacent Points of Switch on Main Tracks	The distance between two facing points of switch of adjacent crossovers and the distance between the point of switch of a turnout facing an adjacent point of switch of a crossover shall adhere to the following spacing requirements • Desirable distance between two high-speed (60 mph or faster) points of switch 1400' • Minimum distance between two high-speed (60 mph or faster) points of switch 1000' • Desirable distance between two low-speed (55 mph or slower) points of switch 600' • Minimum distance between two low-speed (55 mph or slower) points of switch 400' • Desirable distance between high-speed and low-speed points of switch 1000' • Minimum distance between high-speed and low-speed points of switch 700'	HST NTD 10R1	N/A	For the minimum distance between facing point turnouts use UP Standard Drawing No. 0017 for guidance
Crossover Spacing	a. Increase nominal spacing of the interlockings from 20 miles to 40 miles throughout the program. b. Change universal interlocking from 110 mph to 80 mph.	HST NTD 10R1	Maximum authorized speeds (MAS) through turnouts and crossover for passenger and freight trains are as fo lows a. 10/10 MPH for turnouts number 9 for both passenger and freight b. 25/15 (passenger/freight) MPH for turnout number 10 c. 35/25 (passenger/freight) MPH for turnout number 14 d. 50/40 (passenger/freight) MPH for turnout number 20	N/A

CAHSR JM
TURNOUT AND STATION TRACKS DESIGN CHECKLIST

DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA	HST REFERENCE	CALTRAIN (CHP 2)	UPRR (INDUSTRIAL TRACK CONSTRUCTION SPECS)



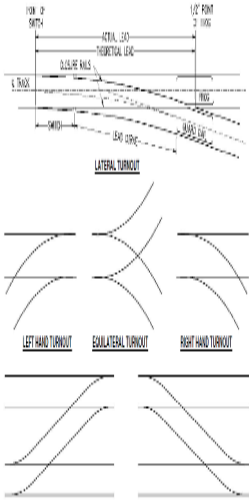
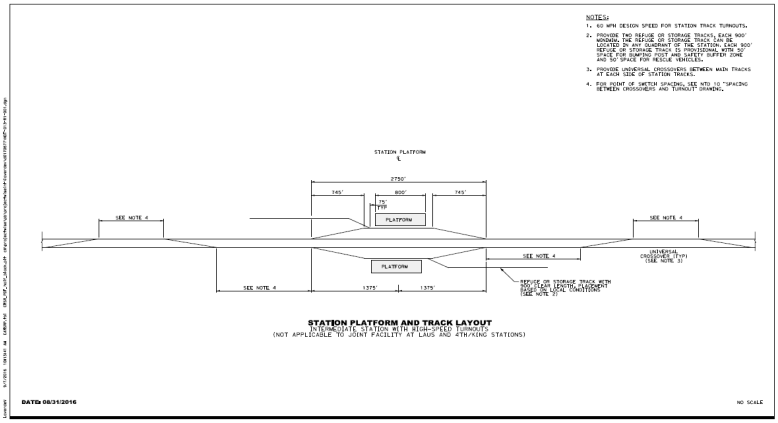
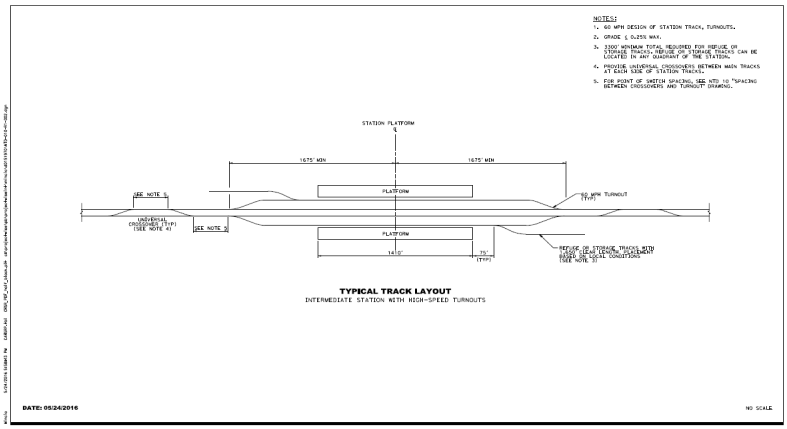


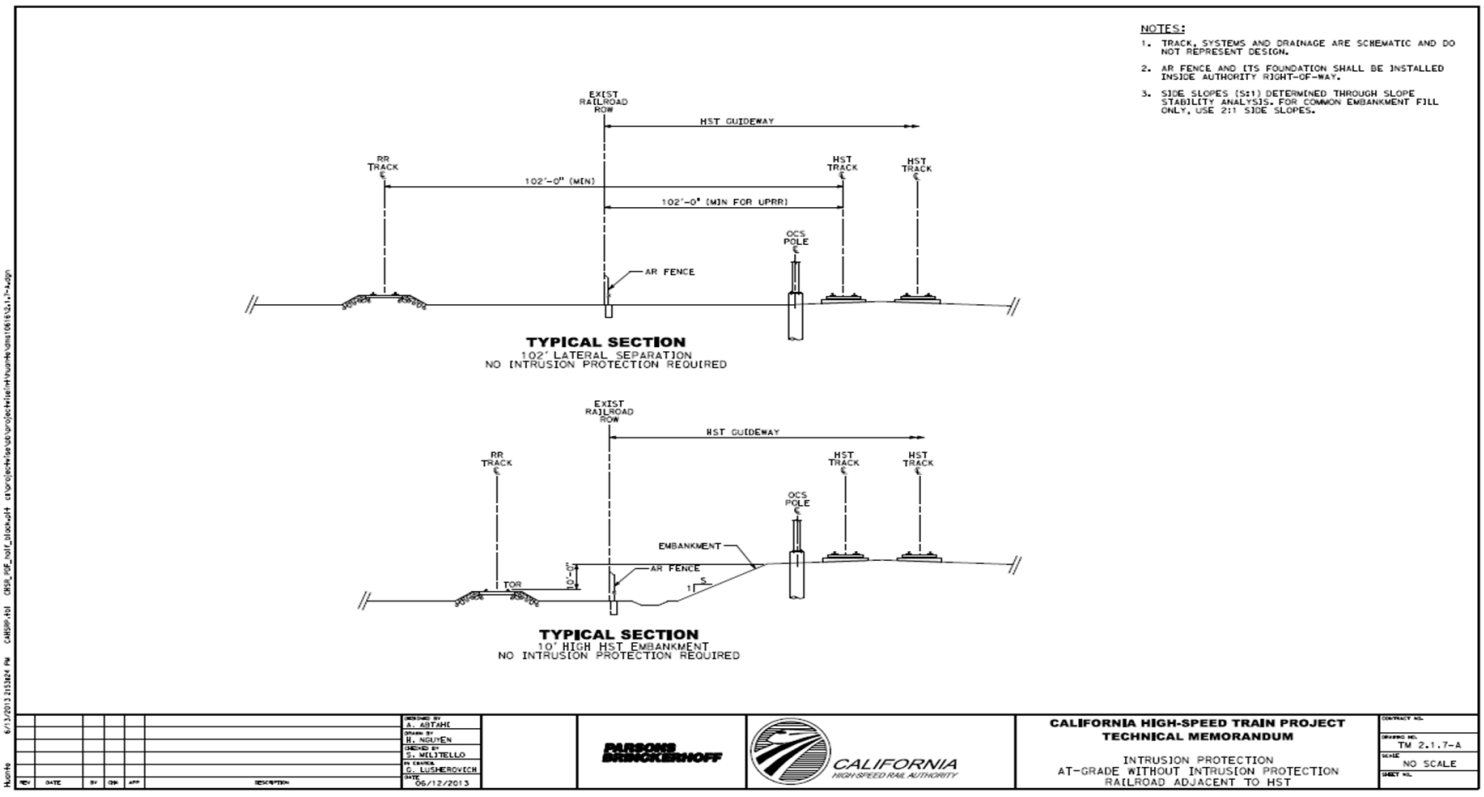
FIGURE 3-4 TURNOUTS AND CROSSOVERS



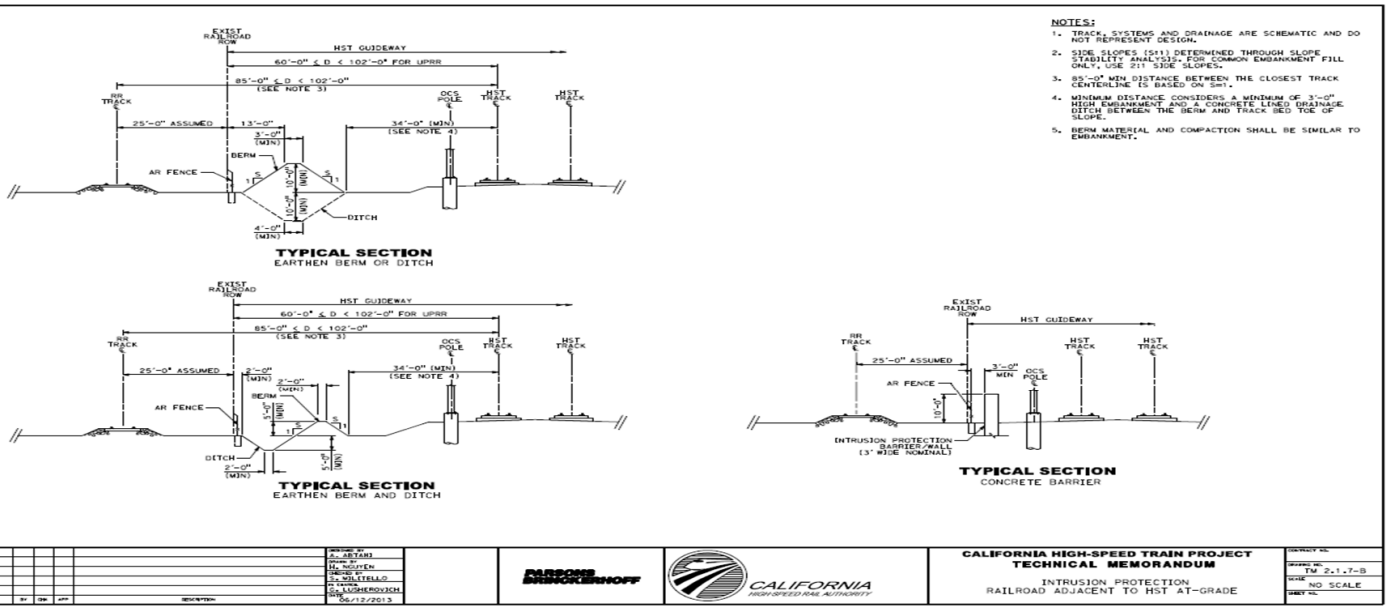


CAHSR JM
ROLLING STOCK AND VEHICLE INTRUSION PROTECTION FROM ADJACENT TRANSPORTATION SYSTEMS DESIGN CHECKLIST

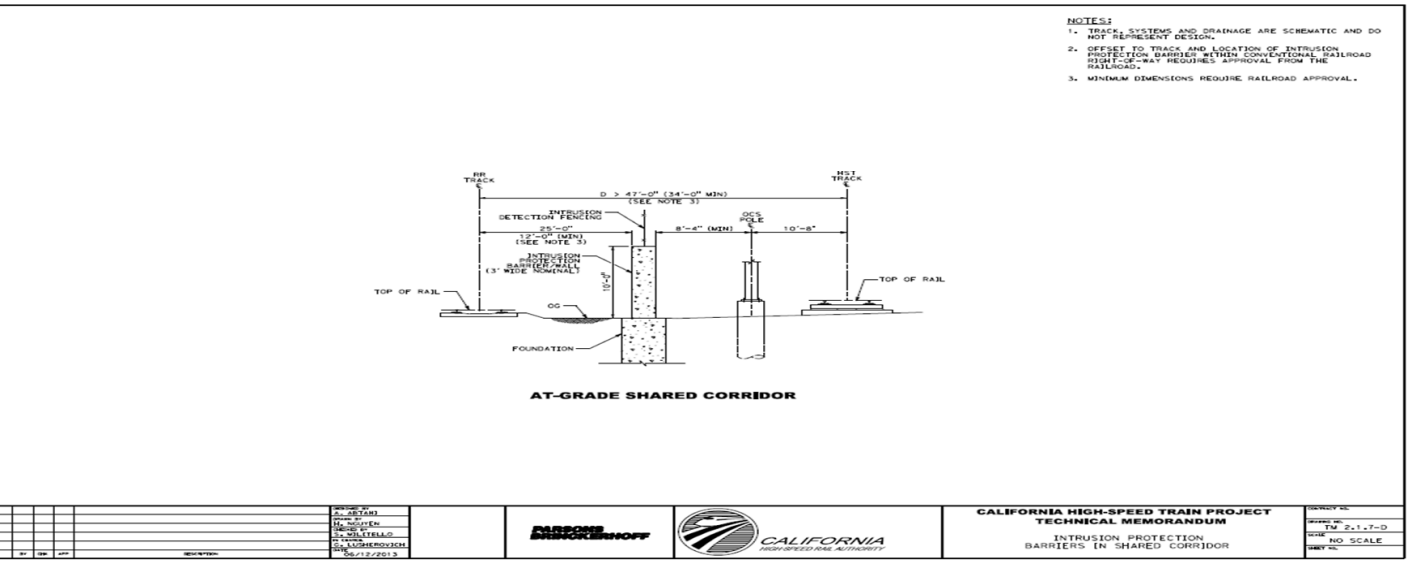
DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA	REFERENCE
SEPARATION DISTANCE FROM ADJACENT RAILROAD SYSTEMS	1. No intrusion protection is required for tracks with centerlines separated horizontally by 102 feet or greater. 2. No intrusion protection is required where the closest HST track elevation is 10 feet or higher than the rail elevation of the closest conventional track. This can be accomplished when the HST is on aerial structure, on an embankment or on a retained fill. However, protective structures may be required for piers, abutments or retaining walls if the side clearance is less than 25 feet. 3. Where intrusion protection is required, the minimum total height shall be 10 feet and may be comprised of a ditch and berm, concrete wall plus screen, or only concrete wall. 4. Use of only berms or ditches as intrusion protection requires centerline separation of 76 feet or more where half of the berm is in the HST right-of-way and the other half in adjacent railroad right-of-way, as shown on drawing TM 2.1.7-A, and 85 feet or greater where the entire berm is in HST right-of-way or 76 feet or more where the entire ditch is within HST right-of-way, as shown on drawing TM 2.1.7- E in Appendix A. 5. A physical intrusion barrier/crash wall is required when the separation between centerlines of the nearest HST and adjacent conventional railroad track is less than 76 feet, as shown on drawing TM 2.1.7-D in Appendix A. The minimum separation between the closest conventional railroad track centerline and HST track centerline is 50 feet (37 feet with railroad approval) for at grade section and 27.5 feet on a common aerial structure as shown on drawing TM 2.1.7-B. These guidelines consider physical separation and do not include right-of-way considerations, which may introduce additional separation requirements. Additionally, separation requirements of other owners and operators must be considered in establishing separation requirements.	HST TM 2.1.7_6.1.4
MINIMUM OFFSET BETWEEN PIER FOR GRADE SEPERATION PROJECTS AND THE CLOSEST TRACK	25 FEET	HST TM 2.1.7_6.1.5



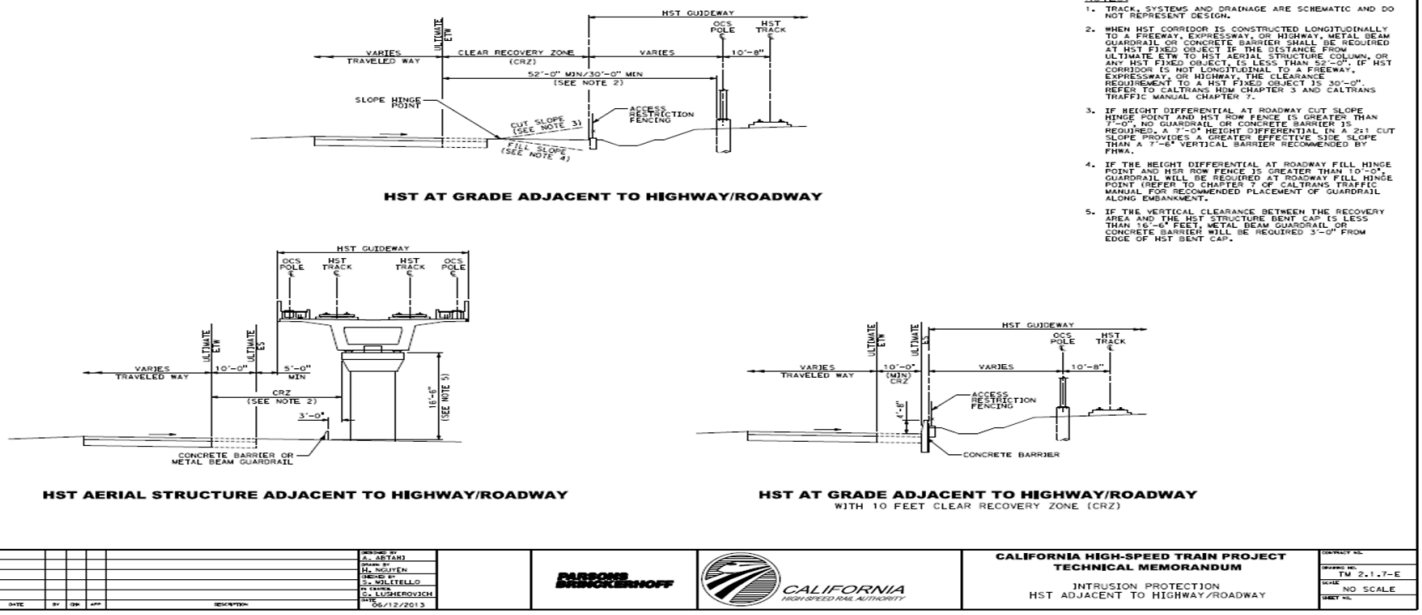
CAHSR JM
ROLLING STOCK AND VEHICLE INTRUSION PROTECTION FROM ADJACENT TRANSPORTATION SYSTEMS DESIGN CHECKLIST



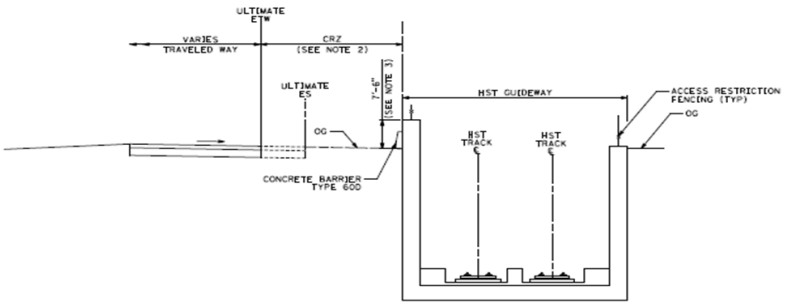
CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM
INTRUSION PROTECTION
RAILROAD ADJACENT TO HST AT-GRADE
TM 2.1.7-B
NO SCALE



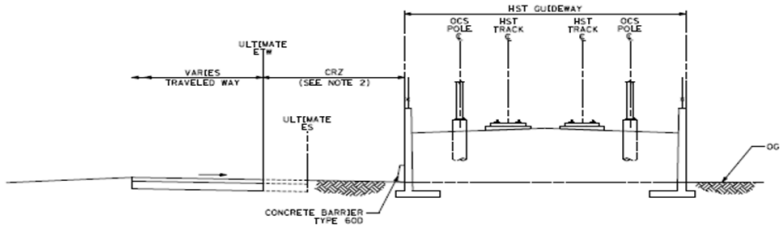
CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM
INTRUSION PROTECTION
BARRIERS IN SHARED CORRIDOR
TM 2.1.7-D
NO SCALE



CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM
INTRUSION PROTECTION
HST ADJACENT TO HIGHWAY/ROADWAY
TM 2.1.7-E
NO SCALE



HIGHWAY/ROADWAY AT GRADE ADJACENT TO HST TRENCH



HIGHWAY/ROADWAY AT GRADE ADJACENT TO HST RETAINED FILL

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. IF THE DISTANCE BETWEEN HST WALL AND THE ULTIMATE ETW IS LESS THAN 52'-0", THE WALL HEIGHT SHALL BE 7'-6" ABOVE THE GROUND SURFACE AND CALTRANS CONCRETE BARRIER TYPE 60D SHALL BE INCLUDED IN CONSTRUCTION OF THE WALL.
3. FHWA RECOMMENDS 7'-6" FEET VERTICAL BARRIER TO CONTAIN HIGH CENTER OF GRAVITY CARGO TRUCKS WITHIN HIGHWAY RIGHT-OF-WAY.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: A. ABTAHI
DRAWN BY: H. NGUYEN
CHECKED BY: S.s WILLITELLO
IN CHARGE: G.s LUGHEROVICH
DATE: 06/12/2013

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM

INTRUSION PROTECTION
HST TRENCH AND RETAINING WALL PROTECTION

CONTRACT NO.
DRAWING NO. TM 2.1.7-F
SCALE NO SCALE
SHEET NO.

CAHSR JM
STRUCTURE GAUGE AND TRACK CENTER DESIGN CHECKLIST

DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA 1.1.10	REFERENCE
MAIN LINE TRACK CENTER	Track Centers – Straight Tracks Where space permits and the cost of doing so is not excessive, the track centers for main tracks shall be set at 20.00 feet. Where placing track at twenty feet track centers is not practical or is excessively costly, the following track center dimensions shall be used. **Speeds above 125 mph:** - Desirable: 16.50 feet - Minimum: 15.75 feet - Exceptional: 15.00 feet – do not use above 175 mph **Speeds of 125 mph and under:** - Desirable: 16.50 feet – Use 15.75 feet where 16.50 feet is not practical - Minimum: 15.00 feet - Exceptional: 14.75 feet – do not use above 90 mph **Yard, Yard Lead and Station and other tracks with speeds under 50 mph:** - Desirable: Yard Lead and Station Tracks: 16.50 feet, Yard Tracks: 15.00 feet - Minimum: 15.00 feet - Exceptional: 14.00 feet **Tracks with Catenary Poles between them:** - Desirable: 25.00 feet - Minimum: 22.00 feet, without walkway - Exceptional: 22.00 feet, without walkway	HST TM 1.1.10_6.2.1
INCREASE IN TRACK CENTERS DUE TO SMALL RADIUS	**Desirable**: Not needed for track centers greater than 16.50 feet. **Minimum**: Adding the value determined by the following formula to 14.25 feet. Track Center Increase (in feet) = 1,100 / R (in feet).	HST TM 1.1.10_6.2.2
EFFECTS OF SUPERELEVATION ON TRACK CENTERS	1) **Desirable** Track Centers: No need. 2) In the case of curves under 3,000 feet radius and the inside track having less superelevation than the outside track, additional space is required between tracks with track centers set to Minimum and Exceptional track center distances. This widening shall be 2.0 times the difference in superelevation.	HST TM 1.1.10_6.2.3
WALKWAY REQUIREMENTS	1) Minimum width: 3 feet. 2) The vertical walkway space shall be no less than 7.50 feet above the walkway surface or top of rail elevation, whichever is higher. 3) The walking surface shall be no less than 6 inches wider than the walkway envelope.	HST TM 1.1.10_6.3.4
WALKWAY ENVELOPE	Figure 6.3.1 Figure 6.3.2	HST TM 1.1.10_6.3.5
STRUCTURE GAUGE OUTLINE REQUIREMENTS	Figure 6.3.3 Figure 6.3.4 **Desirable and Minimum** Widening of Structure Gauge for Effects of Radius of Cuve: EO (in inches) =550 / R (feet)	HST TM 1.1.10_6.3.6-6.3.7.1
ROTATION OF STRUCTURE GAUGE FOR EFFECTS OF SUPERELEVATION	Table 6.3.3, Figure 6.3.7, 6.3.8, 6.3.9, 6.3.10	HST TM 1.1.10__6.3.7.2

Table 3.4.2: Widening for Curvature Effect

	Desirable & Minimum 550 / R(feet)		Exceptional 500 / R (feet)	
Radius (feet(	Widening per side (feet)	Full section max. width (feet)	Widening per side (feet)	Full section max. width (feet)
50,000	0.011	12.94	0.010	12.93
10,000	0.055	13.02	0.050	13.01
5,000	0.110	13.13	0.100	13.11
1,000	0.550	14.01	0.500	13.91
750	0.733	14.38	0.667	14.25
500	1.100	15.11	1.000	14.91

Widening under 0.05 feet may be neglected. The widening applicable to all points on the outline is shown in Table 3.2.3.

Table 3.4.2: Dynamic Envelope – For 500 feet Radius Curve

Desirable/Minimum (feet)		Exceptional (feet)	
X (from centerline)	Y (above top of rail)	X (from centerline)	Y (above top of rail)
0.00	0.21	0.00	0.21
6.43	0.21	6.33	0.21
7.02	2.18	6.92	2.18
7.56	13.35	7.46	13.35
7.28	14.61	7.18	14.61
6.15*	15.42*	6.05*	15.42*
5.01	15.82	4.91	15.82
0.00	15.49	0.00	15.49

- Corner of TSI GC Kinematic Outline

CAHSR JM
ROADWAY WORK (GRADE SEPARATION) DESIGN CHECKLIST

Note: Without knowing exactly which roads will be impacted, all criteria are assumed applicable except for rolling/mountainous rural roadways.

	DESIGN ELEMENTS	REFERENCES							COMMENTS
		CAHSR	AASHTO	Caltrans (HDM)	City of San Jose	City of Morgan Hill	City of Gilroy	City of Los Banos	
1	**VEH CLASSIFICATION**	WB50		WB50	20'/WB50				
	Curb Radius, Arterial				R=65'				
	Curb Radius, Collector				R=65'				
2	**DESIGN SPEED***				(5-10 abv SL)				Design Speed to be confirmed by local jurisdiction
	Design Speed, Arterial (4-6 lanes)				45 mph		1090'		
	Design Speed, Collector (2-4 lanes)				40-45 mph		610'		
	Design Speed, Residential/local (2 lanes)				30 - 40 mph		290' max		
	Design Speed, Level (Access Rd)	30 mph							
	Design Speed, Roll/Mtn (Access Rd)	20 mph							
	*SL = posted Speed Limit								
3	**ROADWAY GRADES, G**								
	Level Terrain, Urban/Local Road, Gmax			6.0%					
	Level Terrain, Rural, Gmax			4.0%					
	Level Terrain, Expw/Fwy, Gmax			3.0%					
	Level Terrain, Urban/Local/Expyw/Fwy, Gmin			0.3%					
	Rolling Terrain, Urban/Local Road, Gmax			7.0%					
	Rolling Terrain, Rural Road, Gmax			5.0%					
	Rolling Terrain, Expwy/Fwy, Gmax			4.0%					
	Rolling Terrain, Urban/Rural/Expwy/Fwy, Gmin			0.3%					
	Mtn Terrain, Urban/Local Road, Gmax			9.0%					
	Mtn Terrain,Rural Road, Gmax			7.0%					
	Mtn Terrain, Expwy/Fwy, Gmax			6.0%					
	Mtn Terrain, Urban/Rural/Expwy/Fwy, Gmin			0.3%					
	Fwy/Expwy Ramp, Gmax			8.0%					
	HST Access Rd, Gmax	6.0%							
	HST Access Rd, Gmin	0.50%							
	HST Access Rd, Reccm G	5% max, 1% min							
4	**ROADWAY X-SLOPES**								
	Road X-slope	2.0%		2.0%				2.50%	
	Road lane same dir X-slope, Algebraic diff, A, max			4%					
	Road lane/shldr same dir X-slope, Algebraic diff, A, max			8%					
5	**GRADE DIFFERENTIAL, A**								
	Crest Vert Curve (local road)							K=20-320	
	Sag Vert Curve (local road)							K=30-155	
	Crest Vert Curve (HST Road/Access Rd)	9.0%							
	Sag Vert Curve (HST Road/Access Rd)	6.5%							

CAHSR JM
ROADWAY WORK (GRADE SEPARATION) DESIGN CHECKLIST

Note: Without knowing exactly which roads will be impacted, all criteria are assumed applicable except for rolling/mountainous rural roadways.

	DESIGN ELEMENTS	REFERENCES							COMMENTS
		CAHSR	AASHTO	Caltrans (HDM)	City of San Jose	City of Morgan Hill	City of Gilroy	City of Los Banos	
6	**ROADWAY WIDTH***								
	Local								roadway widths to be confirmed by local jurisdiction.
	Arterial				106' - 130'	92'-110'	36'	62'-80'	
	Collector				60' - 90'	72'	86'-130'	40'-50'	
	Residential				52' - 56'	48'-52'	48'	32'	
	Rural					52'			
	Non-residential						48'		
	Roadway Width (Access Rd)	22 ft (incl. Shldr)							
	Roadway Width W/FH (Access Rd)	26 ft (incl. Shldr)					20'		
	Overcrossing 2-lane, Min			32' curb-curb					
7	**CUT/FILL SLOPES**								
	Cut slope	2h:1v		4h:1v			2:1		
	Fill slope	2h:1v		4h:1v					
8	**VERTICAL CLEARANCES**								
	Vertical Clr (from HST TOR to New Struct)	27 ft min							
	Vertical Clr (from HST TOR to ex Struct) >125 mph	27 ft min							
	Vertical Clr (from HST TOR to ex Struct) ≤125 mph	24 ft min							
	Vertical Clr (HST Access Rd)	14.5 ft min							
	*up to 25 ft laterally fr CL of outside HST track								
	Vertical Clr (fr Expwy/Fwy FG)			16.5 ft min					
	Vertical Clr (fr local roads FG)			15.0 ft min					
9	**HORIZONTAL CLEARANCES**								
	To Permanent Structure	25 ft fr Trk CL							
	To Fixed Equipment/Object	10 ft fr Trk CL		52' to edge of traveled way					
	Clear Recvry Zone, rd w/posted speed>40 mph			20 ft					
	Clear Recvry Zone, rd w/posted speed≤40 mph&curb			N/A					
	Horiz Clr fr Edge of Shldr, Foc, pole, wall	2.5 ft min							
	Horiz Clr fr edge of traveled way to rail,conc barrier, mbgr			shldr width, or 4 ft min for shldr<4'					
	Ramps - Horiz Clr fr edge of Traveled way to abutwalls, Retwall in cutslope			10' min					
	Local Rds - Horiz Clr fr edge of Traveled way to abutwalls, Retwall in cutslope			shldr width					
	Local Rds w/curbs - Horiz Clr fr edge of Traveled way to abutwalls, Retwall in cutslope			1.5' fr FOC or back of S/W	1.5' fr Foc or back of S/W				
10	**VERTICAL CURVES (L_{min})**								
	Crest Vertical Curve, Arterial				450 ft	200'	200'		
	Crest Vertical Curve, Collector				400 ft	100'	100'		
	Crest Vertical Curve, Residential				350 ft	100'	100'		
	Sag Vertical Curve, Arterial					200'	200'		
	Sag Vertical Curve, Collector					100'	100'		
	Sag Vertical Curve, Residential					100'	100'		
	Crest, HST Roads (A=alg diff in grades)	28 x A (20' min)							
	Sag, HST Roads (A=alg diff in grades)	35 x A (20' min)							
11	**HORIZONTAL CURVES (min R_c)**								
	Arterial (DS 45-55 mph); Caltrans (60-70 mph)			1150'-2100'	900'				

CAHSR JM
ROADWAY WORK (GRADE SEPARATION) DESIGN CHECKLIST

Note: Without knowing exactly which roads will be impacted, all criteria are assumed applicable except for rolling/mountainous rural roadways.

DESIGN ELEMENTS	REFERENCES							COMMENTS
	CAHSR	AASHTO	Caltrans (HDM)	City of San Jose	City of Morgan Hill	City of Gilroy	City of Los Banos	
Collector (DS 30-40 mph); Caltrans (40-50 mph)			550'-850'	300/667/900				
Residential (DS 25-30 mph); Caltrans (20-30 mph)			130'-300'	300'				

CAHSR JM
ROADWAY WORK (GRADE SEPARATION) DESIGN CHECKLIST

Note: Without knowing exactly which roads will be impacted, all criteria are assumed applicable except for rolling/mountainous rural roadways.

	DESIGN ELEMENTS	REFERENCES							COMMENTS
		CAHSR	AASHTO	Caltrans (HDM)	City of San Jose	City of Morgan Hill	City of Gilroy	City of Los Banos	
	Hillside								
	HST Roads (DS 20-30 mph)			130'-300'					
12	**STOPPING SIGHT DISTANCE (VERT)**								
	Highway (DS 65-75 mph)		645' - 820'	660'-840'					
	Arterial (DS 45-55 mph)		360' - 495'	360'-500'	360' - 500'	350'	350'		
	Collector (DS 35-40 mph)		250' - 305'	250'-300'	250' - 300'	200'	200'		
	Residential (DS 25-30 mph)		155' - 200'	150'-200'	150' - 200'	100'	100'		
	HST Roads (20-30 mph)		115' - 200'	120'-200'					
	Cul De Sac					100'	100'		
	*on Sag Curves, increase SSD 20% for g>3% & L>1mile								
13	**K-VALUES**								
	Highway (DS 65-75 mph): CREST/SAG		193-312/157-206						
	Arterial (DS 45-55 mph): CREST/SAG		61-114/79-115					125-220/90-130	
	Collector (DS 35-40 mph) : CREST/SAG		29-44/49-64					50-800/50-70	
	Residential (DS 25-30 mph) : CREST/SAG		12-19/26-37					20-30/30-25	
14	**SUPERELEVATION, e**								
	Urban Rd (<35 mph); e_{max}=0.04; Rc=500 to ovr 5k			0.04 to 0.02					
	Urban Rd (35-45 mph); e_{max}=0.06;Rc=600 to ovr 7k			0.06 to 0.02					
	Expwy/Multi-lane Hwy; e_{max}=0.10; Rc=1100-ovr 20k			0.10 to 0.02					
	Ramp/2-lane Hwy; e_{max}=0.12; Rc=625-ovr 20k			0.12 to 0.02					
15	**LANE WIDTH***								
	Local Rd Lane Width						1- 11' travel lane	2 lanes with parking	
	Arterial Rd Lane Width			12' min	4-6 Lanes 11/12/12/11	4-lanes total (2 in each direction)	13' travel lane	4 lanes with no parking with	
	Collector Rd Lane Width			12' min	2-4 Lanes 11/13/13/11	2 lane in each direction	1- 12' travel lane	parking, 2 lanes with no parking,	
	Residential Rd Lane Width			12' min	17/17	20'-18' (one direction)	1- 12' travel lane		
	Rural Rd Lane Width					14' in each direction			
	HST Roads	22' rd width							
	Sidewalk				9' res/10' coll/12' art	5'	6'	4'-10'	
	Bike Lane			4' min. Speed limit> 40, use 6'	5 ft				
	2-Lane Fwy/Expwy, Paved Shldr, LT/RT			8' min, 10' pref					
	2-lane Rd, Paved Shldr, LT/RT								
	4-lane Rd, Paved Shldr, LT/RT			5'/8' min, 10' pref					
	6-lane Rd, Paved Shldr, LT/RT			8'/8' min, 10' pref					
	Urban Rd, posted speed ≤45 mph & curb median, L/R			2'/8' min, 10' pref					
	Urban Rd, posted speed ≤35 mph & curb med, L/R			0'/8' min, 10' pref					
	Single Ramp, L/R			4'/8'					
17	**CUL DE SAC**								
	Commercial				Curb R=40'				
	Residential				Curb R=30'	Curb = 36'	curb = 36'		
	HST Roads								

CAHSR JM
ROADWAY WORK (GRADE SEPARATION) DESIGN CHECKLIST

Note: Without knowing exactly which roads will be impacted, all criteria are assumed applicable except for rolling/mountainous rural roadways.

	DESIGN ELEMENTS	REFERENCES							COMMENTS
		CAHSR	AASHTO	Caltrans (HDM)	City of San Jose	City of Morgan Hill	City of Gilroy	City of Los Banos	
18	**STREET KNUCKLE**								
	standard					Curb = 20' (min)-30'	Curb = 70'		
18	**STOPPING SIGHT DISTANCE (horizontal)**								
	Highway (DS 65-75 mph)			660'-840'					
	Arterial (DS 45-55 mph)			360'-500'				400'-660'	
	Collector (DS 35-40 mph)			250'-300'				350'-400'	
	Residential (DS 25-30 mph)			150'-200'				250'-300'	
	HST Roads (20-30 mph)			125'-200'					

* requires input from Cities.

CAHSR JM TEMPORARY CONSTRUCTION FACILITIES DESIGN CHECKLIST

The High Speed Rail Authority has no geometric design criteria for temporary construction facilities. Such facilities can be highly variable in extent and location, and are subject to site selection that depends on such factors as expected construction methods, distance to suppliers and material, access and egress to working areas, and many more. Moreover, although these facilities can be described and even acquired by the project owner in anticipation of construction, the means and methods of construction rely largely on the construction contractor's preferences. This being the case, imposition of rigid geometric criteria for temporary facilities would ignore many important factors and hold a contractor to rigid constraints that could adversely affect the efficiency and expense of the work.

Therefore, a design checklist would not be generated.

CAHSR JM
STATION DESIGN CHECKLIST

DESIGN ELEMENT		CAHSR JM DEDICATED HST CRITERIA	REFERENCE	COMMENTS
STATION FUNCTIONAL REQUIREMENTS	Station Design Consideration	HST TM 2.2.2, 6.1	HST TM 2 2.2, 6.1	
	Station Program Requirements	HST TM 2.2.2, 6.2	HST TM 2 2.2, 6.2	
PASSENGER STATION SITE	Station Site Spaces and Factors Influencing Sizing	HST TM 2.2.3, 6.2	HST TM 2 2.3, 6.2	
	Pedestrian Facilities	HST TM 2.2.3, 6.2.1	HST TM 2 2.3, 6.2.1	
	Transit Facilities	HST TM 2.2.3, 6.2.2	HST TM 2 2.3, 6.2 2	
	Bicycle Facilities	HST TM 2.2.3, 6.2.3	HST TM 2 2.3, 6.2 3	
	Pick-Up and Drop-Off Facilities	HST TM 2.2.3, 6.2.4	HST TM 2 2.3, 6.2.4	
	Automobile Parking	Max. distance from parking to station entrance = 1500' or a 5 to 7 minute walk. Provide ADA, carsharing, carpool/vanpool, and staff parking spaces.	HST TM 2 2.3, 6.2 5	
	Roadways and Vehicle Access and Circulation	Single lane driveway: min. 11 5' wide. Min. 10' wide driveway for multiple lanes.	HST TM 2 2.3, 6.2 6	
	Additional Site Layout Considerations	HST TM 2.2.3, 6.3.8	HST TM 2 2.3, 6.3 8	
STATION PLATFORM GEOMETRIC DESIGN	Platform Configuration	HST TM 2.2.4, 6.1.1	HST TM 2 2.4, 6.1.1	
	Usable Platform Length	800'. Not applicable for joint facility stations (e.g. 4th and King or LAUS) where the platform length should be the same as the other rail operators in the facility, but not shorter than 800 ft.	HST NTD 13	
	Platform Width	Center Platform: 30' Min.; 25' Exceptional. Side Platform: 20' Min.; 18' Exceptional	HST TM 2 2.4, 6.1 3	
	Platform Cross Slope	1% Min.; 2.1% Max.	HST TM 2 2.4, 6.1.4	
	Platform Longitudinal Slope	0% Desirable; 0 25% Max.	HST TM 2 2.4, 6.1 5	
	Platform Curvature	Largest radius possible, platform edge be convex, subject to variance process.	HST TM 2 2.4, 6.1 6	
	Platform Height Above Rail	45.47" to 51.18" above top of rail.	HST TM 2 2.4, 6.1.7	
	Track Centerline to Platform Dimension	1/2 width of vehicle + 2.75" (or 5'-9" nominal for preliminary design.)	HST TM 2 2.4, 6.1 8	
	Platform Edge to Train Gap	Horizontal Gap: 3" Max.; Vertical Gap +/- 5/8" Max.	HST TM 2 2.4, 6.1 9	
	Setback of Obstruction from Edge of Platform	6.5' min. setback for small obstruction less than 3.3' in length parallel to platform. 8.25' min. setback for obstruction greater than 3.3' in length parallel to platform	HST TM 2 2.4, 6.1.10	
	Under Platform Refuge Area	30" x 30" min. entire length of platform. Exits from this space shall be provided at platform ends.	HST TM 2 2.4, 6.1.11	
	Platforms Adjacent to Through Tracks	Train speed on tracks adjacent to station platforms not to exceed 125 mph. Through train operating on track adjacent to platform should have one or more following provisions: 1) Passenger access to platform shall only be permitted when train is intended to stop, 2)Provide platform doors/barriers as access control to train, 3) Provide audible and visual warning on platform to provide advance notice of approaching trains.	HST TM 2 2.4, 6.1.12	
	Protection Screen between Station platform & Through Tracks	Provide 25' between track centers to allow for installation of protection screens, if required.	HST TM 2 2.4, 6.1.13	
	OCS Poles on Platforms	To meet National Electrical Safety Code (NESC) requirements. Grounding and Bonding and Protection required per TM 3.2.6.	HST TM 2 2.4, 6.1.14	

CAHSR JM
BRIDGES AND ELEVATED STRUCTURE DESIGN CHECKLIST

DESIGN ELEMENT		HST TM	Caltrain Standards for Design and Maintenance of Structures	BNSF/UPRR Guidelines 1. UPRR - BNSF Railway Guidelines for Railroad Grade Separation Projects (Dated 01/05/2016)	AREMA	CAHSR JM CRITERIA
Superstructure	**General Span/Structure Type**	Proposed basic aerial structure is a prestressed concrete single cell box girder, spanning approximately 100 to 130 feet and supporting two parallel tracks. Simply supported spans. (TM 2.3.3)	Simple span structures are preferred over a continuous span type of superstructure for use along the corridor (2-2). Deck type structures are preferred over hrough type structures. (2-2)	Only simple spans with ballast decks are allowed. Cast-in-place concrete superstructures are unacceptable. (6.1)[1]		Proposed basic aerial structure is a prestressed concrete single cell box girder, spanning approximately 100 to 130 feet and supporting two parallel tracks. Simply supported spans. (TM 2.3.3)
	Structure Type	Prestressed concrete single cell box girder, spanning approximately 100 to 130 feet.	1. Steel rolled beams (4 or more per track) 2. Steel plate girders (4 or more per track) 3. Prestressed concrete box girders or solid slab girders (no voids) 4. Steel rolled beams (2 per track) 5. Prestressed concrete "AASHTO" type girders 6. CIP/RC box girder 7. PT box girder 8. Through type steel structures.	Cast-in-place concrete superstructures are unacceptable. (6.1)[1] 1. Steel rolled beams + steel plate deck (5 or more per track) 2. Steel plate girders + steel plate deck (4 or more per track) 3. Steel rolled beams + concrete deck (5 or more per track) 4. Steel plate girders + concrete deck (4 or more per track) 5. Railroad Standard Prestressed Double Cell Box Beams 6. Prestressed Concrete Box Beams 7. Prestressed Precast Concrete AASHTO Type Beams 8. Through type steel structures. (6.8.1)[1]		Prestressed concrete single cell box girder, spanning approximately 100 to 130 feet.
Substructure	**Type**	10'x6' elliptical single column supports (TM 2.3.3) Substructure to satisfy requirements of TM 2.3.3, Section 6.1 5.	Piers with two columns or solid pier wall are preferred over single column piers. (2.6.1)	Piers with a minimum of two columns shall be provided. A solid pier wall with a minimum of 4'-0" thickness is preferable. Single column piers shall not be considered for Underpass Structures. (6.9.1)[1]		10'x6' elliptical single column supports (TM 2.3.3)
	Skew	---	30 degree maximum, at abutment must be squared off support perpendicular to track (Figure 2-2, page 2-7)	15 degree maximum for concrete structures and 30 degrees max for a steel structure (6.3)[1]	15 degree maximum for precast concrete slabs and box girders, 30 degree maximum for precast concrete I-girder and T-girder, 60 degree maximum for CIP concrete slabs and girders. (8-2.1.6)	
Clearance	**Vertical Permanent Overhead**	27'-0" for new structures (TM 1.1.21) 24'-6" for shared use track (TM 1.1.21)	24'-6" Min. 25'-6" Preferred 23'-6" Absolute Min. (Fig 3.1)	23'-4" minimum within 25'-0" of centerline track (Plan 711100)[1]	23'-0" (Figure 28-1-6)	27'-0" for new structures (TM 1.1.21) 24'-6" for shared use track (TM 1.1.21)
	Vertical Permanent Underpass	16'-6" Freeway / Expressway (TM 1.1.21) Varies / Others (TM 1.1.21)	16'-6" over Freeways and Expressways (2.4 2) 15'-6" over highways and local streets (2.4.2) (Collision protection device required) (Page 2-14)	16'-6" for steel superstructure with 5 or more beams or 4 or more deck plate girders per track 17'-6" for concrete superstructure or steel through plate girders with bolted bottom flanges 20'-0" for steel through plate girders without bolted bottom flanges (6.6.1)[1]		16'-6" Freeway / Expressway (TM 1.1.21) Varies / Others (TM 1.1.21)
	Vertical Temporary	---	21'-6". CPUC approval required for vertical clearance less than 22'-6" (Fig 3.1)	21'-0"		
	Horizontal Permanent Overhead	25' preferred, 12' minimum from CL exterior track to face of column, protection required < 25'-0" (TM 1.1.21)	25' preferred, 15' minimum from CL exterior track to face of column (Fig 3.1)	25'-0" minimum (Plan 711100)[1] Piers within 25'-0" shall be protected. Absolute minimum shall be 18'-0" from centerline track to pier protection wall (5 2.2)[1]	25'-0", less than 25'-0" requires crash walls (Figure 28-1-6) Tangent track, 9'-0" minimum (Figure 28-1-1)	25' preferred, 12' minimum from CL exterior track to face of column, protection required < 25'-0" (TM 1.1.21)
	Horizontal Temporary	---	10'-0" (Note 5, Fig 3.1)	12' for UP (4.4.1)[1]		
Rail	**Ballast Depth**	24" minimum top of tie to deck (Directive Drawing)	8" of ballast over 4" HMAC on structure or 12" HMAC on approach (Fig 2.7)			
Serviceability	**Span to Depth Minimum**	Span Length / 10 (TM 2.3.3)	Span Length / 12.5 (Steel Beam Span, Concrete Box Girder Span, Precast Concrete Beams) (Figure 2.7, 2.8, 2.10, 2.11) Span Length / 10 (Steel Deck Plate Girder Span) (Figure 2.9)			Span Length / 10 (TM 2.3.3)
Loading	**Ballast**	24" minimum top of tie to deck (Directive Drawing)	Min. 12" / Max. 30" (Fig 2.8)	Up to 30" (6.1.1)[1]		
	Live Load	E-50 (TM 2.3.2)	E-80 (2.3.3)	per AREMA (6.1.1)[1]	E-80 (8-2.2 3)	E-80 (2-8)
	Track Placement	Assume that the track locations are fixed transversely.	Tracks can be placed anywhere on deck to maximize load.			Assume that the track locations are fixed transversely.
Construction	**Excavation adjacent to tracks**	N/A	8'-6" minimum from centerline of track unless approved by Chief Engineer (Appendix B)	Excavation not permitted within 12'-0" of track centerline. (Standard Plan 710000)		

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BRIDGES AND ELEVATED STRUCTURE DESIGN CHECKLIST

DESIGN ELEMENT		HST TM	Caltrain Standards for Design and Maintenance of Structures	BNSF/UPRR Guidelines 1. UPRR - BNSF Railway Guidelines for Railroad Grade Separation Projects (Dated 01/05/2016)	AREMA	CAHSR JM CRITERIA
STRUCTURE DESIGN LOADS	6.4 Permanent Loads	**TM 2.3.2** o 6.4.1 Dead Load (DC, DW, EV) o 6.4.2 Downdrag Force (DD) o 6.4.3 Earth Pressure (EV, EHAC, EHAR) o 6.4.4 Earth Surcharge (ES) o 6.4.5 Earth Settlement Effects (SE) o 6.4.6 Creep Effects (CR) o 6.4.7 Shrinkage Effects (SH) o 6.4.8 Secondary Forces from Prestressing (PS) o 6.4.9 Locked-In Construction Forces (EL) o 6.4.10 Water Loads (WA)	**Chap 2.3.3 Design Load for Railroad Bridge Structures** **Dead Loads: Table 2.1**	**AREMA CHAPTER 11**	**AREMA CHAPTER 11** **Dead Loads: Table 2.1**	**TM 2.3.2** Dead Load (DC, DW, EV) Downdrag Force (DD) Earth Pressure (EV, EHAC, EHAR) Earth Surcharge (ES) Earth Settlement Effects (SE) Creep Effects (CR) Shrinkage Effects (SH) Secondary Forces from Prestressing (PS) Locked-In Construction Forces (EL) Water Loads (WA)
	Transient Loads	o 6.5.1 Live Loads (LLP, LLV, LLRR, LLHR, LLH, LLHL, LLHT) o 6.5.2 Vertical Impact Factors (I) o 6.5.3 Centrifugal Force (CF) o 6.5.4 Trac ion and Braking Forces (LF) o 6.5.5 Nosing and Hunting Effects (NE) o 6.5.6 Wind Loads (WS) o 6.5.7 Slipstream Effects (SS) o 6.5.8 Thermal Load o 6.5.9 Frictional Forces (FR) o 6.5.10 Seismic Loads (EQM, EQD, EQL) o 6.5.11 Derailment Load (DR) o 6.5.12 Dynamic Earth Pressures (ED) o 6.5.13 Derailment Loads (DR) o 6.5.14 Collision Loads (CL)	**Chap 2.3.3 Design Load for Railroad Bridge Structures** **Live Load: Cooper E-80** **AREMA CHAPTER 11**	**AREMA CHAPTER 11**	**AREMA CHAPTER 11** **Live Load: Cooper E-80**	Live Loads (LLP, LLV, LLRR, LLHR, LLH, LLHL, LLHT) Vertical Impact Factors (I) Centrifugal Force (CF) Traction and Braking Forces (LF) Nosing and Hunting Effects (NE) Wind Loads (WS) Slipstream Effects (SS) Thermal Load Frictional Forces (FR) Seismic Loads (EQM, EQD, EQL) Derailment Load (DR) Dynamic Earth Pressures (ED) Derailment Loads (DR) Collision Loads (CL)
	Miscellaneous Loads	o 6.6.1 Overhead Contact System (OCS) Loads o 6.6.2 Construction Loads and Temporary Structures o 6.6.3 Rail-Structure Interaction Forces o 6.6.4 Blast Loading	**AREMA CHAPTER 11**	**AREMA CHAPTER 11**	**AREMA CHAPTER 11**	Overhead Contact System (OCS) Loads Construction Loads and Temporary Structures Rail-Structure Interaction Forces Blast Loading
	Load Factors and Load Modifiers	o 6.7.1 Design Load Combinations o 6.7.2 Resistance Factors	**AREMA CHAPTER 11** **Design Load Combinations: GROUP I & GROUP II**		**AREMA CHAPTER 11** **Design Load Combinations: GROUP I & GROUP II**	Design Load Combinations Resistance Factors
DESIGN GUIDELINES FOR HIGH-SPEED TRAIN AERIAL STRUCTURES	Basic High-Speed Train Aerial Structure	**TM 2.3.3** o 6.1.1 Material Type o 6.1.2 Constructability o 6.1.3 Span Length and Span to Depth Ratio o 6.1.4 Span Articula ion o 6.1.5 Substructures	**n/a**	**n/a**	**n/a**	**TM 2.3.3** Material Type Constructability Span Length and Span to Depth Ratio Span Articulation Substructures
TYPICAL CROSS SECTIONS FOR 15% DESIGN		**TM 1.1.21** o 6.1.2 Track Centers o 6.1.3 Overhead Contact System (OCS) Poles o 6.1.4 Walkways o 6.1.5 Drainage Requirement o 6.1.6 Systems Elements Requirement o 6.1.7 Access Control Appendix B: Supplemental Criteria In Shared Rail Corridors	**See Track Alignment Check List**	**See Track Alignment Check List**	**See Track Alignment Check List**	**TM 1.1.21** Track Centers Overhead Contact System (OCS) Poles Walkways Drainage Requirement Systems Elements Requirement Access Control
INTERIM SEISMIC DESIGN CRITERIA		**TM 2.10.4** 6.5 Bridges and Aerial Structures	**CHAPTER 4 Design Guide line for SEISMIC DESIGN**	**AREMA CHAPTER 9 SEISMIC DESIGN**	**AREMA CHAPTER 9 SEISMIC DESIGN**	**TM 2.10.4** Bridges and Aerial Structures
DEPTH OF DECK		**Design Criteria 5.9** T/R to top of deck is 3.0ft for ballasted track (DC 5.10) or 2.5ft for direct fixation track	**n/a**	**n/a**	**n/a**	T/R to top of deck is 3.0ft for ballasted track (DC 5.10) or 2.5ft for direct fixation track
THERMAL LENGTH		**Design Criteria 12.6.5.2** The thermal length kept under the 330ft threshold	**n/a**	**n/a**	**n/a**	The thermal length kept under the 330ft threshold
EMERGENCY ACCESS		**Design Criteria** Emergency Access is provided at a minimum of 2.5 miles via stairs	**n/a**	**n/a**	**n/a**	Emergency Access is provided at a minimum of 2.5 miles via stairs

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TUNNELS DESIGN CHECKLIST

DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA	REFERENCE
Tunnel Plan and Profile		
1	22 feet width for emergency access road is provided on either side of the tracks.	TM 2.8.1
Tunnel Cross Section		
1	Tunnel diameter is shown at 28ft inner diameter.	NTD. 10 R1
2	Cross passages are shown at every 800ft	TM 2.4.2 R1
3	Finished bored tunnel cross sectional area includes the following: - Free tunnel cross sectional area as required - 20 sf for fixed equipment - 6-inch allowance on diameter for construction tolerance - 3-foot depth of invert concrete - An escape walkway at track level (slightly raised above invert level)	TM 2.4.2 R1
Tunnel Portal		
1	The tunnel portal is located where a minimum ground cover of half tunnel diameter can be provided over both tunnels, unless otherwise indicated.	TM 2.4.5 R0
Cut Slopes and Embankments (Pacheco Pass Subsection)		
1	For cut slopes, the slope angle shown in 3H:1V, unless otherwise specified.	TM 2.6.7
2	For embankments, the slope angle is assumed to be 2H:1V, unless otherwise specified.	TM 2.6.7
3	Slope benches are provided at every 30 feet for cut slopes and embankments higher than 30 feet.	DC 10.9.4, TM 2.6.7
4	Slope benches of at least 10 feet wide are provided for cut slopes and embankments higher than 30 feet.	DC 10.9.4, TM 2.6.7
Tunnel Portal Facilities		
1	Space is allocated for the following facilities at each tunnel portal unless otherwise indicated: - Detention pond - TPF site (2 options) - Rescue area (5000 sq. ft) - Train evacuation zone (1400') - Maintenance parking - 22' width maintenance access road - Radio tower site (100' x 100') - Water tanks (100' x 100')	Directive drawing: DD-TN-400 and discussions with RDP
2	Area of approximately 7500 sf is allocated for portal ventilation buildings	TM 2.4.6 R0

CAHSR JM
GRADING DESIGN CHECKLIST

DESIGN ELEMENT	CAHSR JM DEDICATED HST CRITERIA		REFERENCE	COMMENTS
Slope Angles	Normally Adopted	1.5H:1V or 2H:1V	HST TM 2.6.7	
	In case of coarse rock fill, benches, toe walls	1H:1V or 1.25H:1V		
	For slopes supported by compressible soft foundation soils	required slope stability analyses		
	For 15% Design Level: Soil Cuts	2H:1V		
	For 15% Design Level: Rock Cuts	1H:1V		
	Granular Soils	1.5H:1V to 2H:1V according to the height of the cut		
	Cohesive Soils	1.5H:1V to 2H:1V according to the height of the cut, or even flatter, with benches if required		
	Pre-historic landslide areas	required slope stability analyses		
Specific Consideration for Maintenance According to the Structure Height	Cuts with depth greater than 40' or Embankment over 40' height	6 feet wide bench with a 6% gradient toward the toe of the slope/the high-side line	HST TM 2.6.7	
		Place bench every 30 feet in height (allowance from 26 to 32 feet can be considered)		
		The bench shall be connected to the natural ground at each end of the cut/ground for access.		

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HYDROLOGY / HYDRAULICS / DRAINAGE DESIGN CHECKLIST

DESIGN ELEMENT	HST TM 2.6.5	CALTRAIN DESIGN STANDARD (Chapter 8)	CALTRANS HDM	Amtrak Spec No. 63	CAHSR JM DEDICATED HST CRITERIA
Storm Frequency	Drainage Facilities Crossing the HST track (i.e. culverts) Urban 1% (100-yr) Rural 2% (50-yr) Drainage facilities not crossing the HST track (i e. parking lots, station drainage facilities) Urban 2% (50-yr) Rural 10% (10-yr) Ditches/storm drainage systems adjacent to the HST track Urban 2% (50-yr) Rural 4% (25-yr) Drainage systems crossing under bridge structure and on the ROW Urban 1% (100-yr) Rural 2% (50-yr) Critical Facilities (Electrical, vents, communication buildings, etc.) Min 1% (100-yr)	Culverts crossing beneath at-grade track 100-yr Yard & Station runoff collection systems (including those in streets and parking lots) 100-yr Ditches 50-yr Drainage systems crossing under bridge structure and on the ROW 100-yr Strom drain systems adjacent to tracks 100-yr All facilities 100-yr	Refer to Hydraulic Engineering Circular No. 22, 3rd Edition Most highway agencies min. 10-year drain sag points min. 50-year High check storm 100-year	Drainage Facilities 100-yr	Drainage Facilities Crossing the HST track (i.e. culverts) Urban 1% (100-yr) Rural 2% (50-yr) Drainage facilities not crossing the HST track (i e. parking lots, station drainage facilities) Urban 2% (50-yr) Rural 10% (10-yr) Ditches/storm drainage systems adjacent to the HST track Urban 2% (50-yr) Rural 4% (25-yr) Drainage systems crossing under bridge structure and on the ROW Urban 1% (100-yr) Rural 2% (50-yr) Critical Facilities (Electrical, vents, communication buildings, etc.) Min 1% (100-yr)
Basin Characteristics	Refer to Caltrans HDM, Topic 812	Not Defined	Size, Shape, Slope, Land Use, Soil and Geology, Storage, Elevation, and Orientation are the characters described in Topic 812.	Not Defined	Refer to Caltrans HDM, Topic 812
Design Discharge	Refer to Caltrans HDM, Topic 819	Max expected discharge from drainage tributary area shall be computed by using the Rational Method Facilities owned and/or maintained by the Local Agency, the design discharge shall be computed using other applicable procedures as required and approved by the Local Agency Precipitation, intensity, and duration data shall be based on the data either from San Francisco, San Mateo, or Santa Clara counties depending on where the project is located	Refer to Caltrans HDM, Topic 819, Table 819 5A Summary of Methods for Estimating Design Discharge Empirical methods have been used in hydrology, including: Rational methods, Regional Analysis Methods, Flood Frequency Analysis, National Resources Conservation Service (NRCS) Methods, Statistical Methods, Hydrograph Methods	Not Defined	Refer to Caltrans HDM, Topic 819
Floodplain Information	FEMA provides floodplain maps with flood zones identified improvements cannot be higher than the 100-year BFE Refer to Caltrans HDM, Topic 804, Floodplain Encroachments, for FEMA guidelines	Not Defined	23CFR, Section 650.115 Identify flood hazards Water surface elevation for the 100-yr flood Provide floodway data	Not Defined	FEMA provides floodplain maps with flood zones identified improvements cannot be higher than the 100-year BFE Refer to Caltrans HDM, Topic 804, Floodplain Encroachments, for FEMA guidelines Consult with local flood control agency.
Application of Approved Software	Hydrologic/hydraulic - industry accepted design programs are recommended (see Caltrans HDM Topic 808.	Follow Caltrans HDM/Local Agency	Various H&H software including FHWA Hydraulic Toolbox, TR-55, HEC-HMS, HY-8, HEC-RAS, FESWMS, WMS, NOAA Atlas 14, USGS SteamStats, AutoDesk Civil 3D/Hydraflow	Not Defined	Hydrologic/hydraulic - industry accepted design programs are recommended (see Caltrans HDM Topic 808.
Culvert Design	Max allowable headwater of 1.5 times pipe diameter up 0.5 feet below sub-ballast. For 100-year storm event, min freeboard between water surface elevation and the subballast shall be 2 feet 36" Min. Dia RCP (Class V) within ROW Min. 6' below top of rail, and 3' below the flow line of ditch along the track way For pipes not under track use 4' of cover with 45' of the track centerline & 3' min elsewhere	Min. diameter 12" Pipes directly under the track or within 15' from centerline of the tracks: Caltrans Class V RCP required pipe size min. 24" diameter	Caltrans HDM, Topic 825 Min diameter for cross culverts under the roadways 18" Self-cleaning velocity, pipe sizes of 18" or more in diameter should be considered Pipe runs exceed 100' between inlet and outlet, or intermediate cleanout access, the min. diameter of pipe to be used is 24" Larger diameter pipe without the median access is preferred	n/a	Max allowable headwater of 1.5 times pipe diameter up 0.5 feet below sub-ballast. For 100-year storm event, min freeboard between water surface elevation and the subballast shall be 2 feet 36" Min. Dia RCP (Class V) within ROW Min. 6' below top of rail, and 3' below the flow line of ditch along the track way For pipes not under track use 4' of cover with 45' of the track centerline & 3' min elsewhere
Open Channel Design	Avoid critical and supercritical flow in trackside ditches Ditches should be deep enough and sized for handling the design runoff anticipated while allowing the subgrade to drain Required minimum freeboard, minimize erosion, maintain soil stability Refer AREMA Chapter 1, Part 1 for design adjacent to tracks. Also refer to Caltrans HDM Topic 860.	Not Defined	Caltrans HDM, Topic 860 The shape of a channel section is generally determined by considering the intended purposed, terrain, flow velocity and quantity of flow to be conveyed. Rectangular Channel Freeboard Height Subcritical Flow: 0.1He Supercritical Flow: 0 20d Trapezoidal Channel Freeboard Height Subcritical Flow: 0.2He Supercritical Flow: 0 25d	Not Defined	Avoid critical and supercritical flow in trackside ditches Ditches should be deep enough and sized for handling the design runoff anticipated while allowing the subgrade to drain Required minimum freeboard, minimize erosion, maintain soil stability Refer AREMA Chapter 1, Part 1 for design adjacent to tracks. Also refer to Caltrans HDM Topic 860.
Bridge/Aerial Structure Design	Freeboard above the design frequency water surface elevation min. 2' For ballasted bridge deck drains up to 500' Min. 6" pipe For ballasted bridge deck drains over 500' 8" pipe Longitudinal slope on bridge deck min. 0.5% Or generate minimum velocity 2 ft/sec No standing water on bridge HEC-21 Design of Bridge Drainage HDS-01 Hydraulic of Bridge Waterways AREMA Chapter 1, Part 3 HEC-09, Debris Control Structures Evaluations nd Countermeasures	Not Defined	Not Defined	Not Defined	Freeboard above the design frequency water surface elevation min. 2' For ballasted bridges lengths up to 500' Min. 6" pipe For ballasted bridges lengths over 500' 8" pipe Longitudinal slope on bridge deck min. 0.5% Or generate minimum velocity 2 ft/sec No standing water on bridge
Underdrain System	HDS-01 Hydraulics of Bridge Waterways AREMA Chapter 1, Part 3 HEC-09, Debris Control Structures Evaluations and Countermeasures Refer Caltrain Chapter 8.0 & Caltrans HDM	min. 6" in diameter at min. grade of 0.2% Cleanout Every 300' Manhole/inlet spacing 500' max (up to 30" diameter) 600' - 1000' (>30" diameter) Pipe cover below top of rail min. 48"	n/a for track	Not Defined	min 6" in diameter Cleanout installed every 300' pipe cover min. 48" below top of rail for all pipes Refer to Caltrain Chapter 8 0 & Caltrans HDM
Roadway Drainage	Refer Caltrans HDM, Topic 830	Not Defined	Min pipe diameter for storm drain systems Trunk drain 18" Trunk Laterals 15" Inlet Laterals 15"	Not Defined	Refer Caltrans HDM, Topic 830

10/12/2016

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HYDROLOGY / HYDRAULICS / DRAINAGE DESIGN CHECKLIST

DESIGN ELEMENT	HST TM 2.6.5	CALTRAIN DESIGN STANDARD (Chapter 8)	CALTRANS HDM	Amtrak Spec No. 63	CAHSR JM DEDICATED HST CRITERIA
Pump Station	Refer HEC-24 to design pumps & pump stations	Avoid as much as possible Require prior approval of Caltrain Deputy Director of Engineering	District and the Division of Structures responsible for the design	Not Defined	Refer HEC-24 to design pumps & pump stations
Debris Control	Refer FHWA, HEC-9 on Debris Control Structures Evaluation & Countermeasures Refer Caltrans HDM, Topic 822	Not Defined	Refer FHWA Hydraulic Engineering Circular No. 9 to aid the designer in selecting the appropriate type of debris control structures	Not Defined	Refer FHWA, HEC-9 on Debris Control Structures Evaluation & Countermeasures Refer Caltrans HDM, Topic 822
Detention / Retention of Surface Water Runoff	Refer Caltrans Project Planning and Design Guide HEC-22, Urban Drainage Design Manual, FHWA	Not Defined		Not Defined	Refer Caltrans Project Planning and Design Guide HEC-22, Urban Drainage Design Manual, FHWA Consult with local flood control agency.

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UTILITIES DESIGN CHECKLIST

DEDICATED HST CRITERIA | COMMON CRITERIA | DEDICATED CALTRAIN CRITERIA | DEDICATED UPRR CRITERIA

DESIGN ELEMENT	HST TM 2.7.4	CALTRAIN DESIGN STANDARD (CHPATER 8)	CALIFORNIA PUBLIC UTILITIES COMMISSION	UP Wireline/Pipeline Encroachment Planning Guide & Construction Procedures	DEDICATED HST CRITERIA	DEDICATED CALTRAIN CRITERIA	DEDICATED UPRR CRITERIA	COMMENTS
Underground Utilities	Underground facilities located within the right of way must be located in a steel casing pipe (3/8" minimum thickness) with welded joints. Exception: For electrical and communication lines, a duct bank can be used in lieu of steel casing pipe. Where a portion of the line crosses under the tracks or is located within 45 feet of the nearest track centerline, it must meet the requirements of Exhibit A. Underground Utilities High Risk facilities: • Maintain 500 feet minimum horizontal separation from other High Risk facilities • Maintain 5 feet minimum horizontal separation from other Low Risk facilities • Maintain 20 feet minimum horizontal separation from load carrying structural elements Underground Utilities Low Risk facilities: • Maintain 3 feet minimum horizontal separation from other Low Risk facilities • Maintain 5 feet minimum horizontal separation from load carrying structural elements and 3 feet minimum horizontal separation from other structures • Maintain 1 foot minimum vertical separation from drainage conduits	Utilities specifically designed for the Caltrain facilities at stations and right-of-way shall conform to the standards, codes, and requirements of the CPUC and the local jurisdiction within which the utilities are located, as appropriate. Third party utilities owners include private owners, state, and municipal government. Work shall be coordinated with and done in accordance with the standards of the utilities owner.	Clearance and Depth Requirements for Supply and Communication Systems: General Order No. 128 Appendix A. Table 1	If the proposed location of the encroachment crosses existing culverts, the top of the buried encroachment will have to be installed a minimum of 5' below the culvert invert. If the location crosses a ditch beyond the end of the culvert (field side) then the top of the buried encroachment must be installed 5' below the clean bottom elevation of the ditch. Track bores must be a minimum of 60 inches below base of rail. Wet bores are not permitted on Union Pacific property. The ends of steel casing (see Union Pacific Common Standard 1029) will have to be a minimum of 30 feet from centerline of the track when measured at right angle to the track. Also, bore pits must be a minimum of 30 feet from centerline of track when measured at right angle to the track. In addition, no bore pits can be located in the slope of a cut or fill section of the roadbed. The bore pit size must be kept to a minimum. Manholes must be capable of withstanding H-20 highway loading requirements and must be installed so as not to create a stumbling hazard.	Underground facilities located within the right of way must be located in a steel casing pipe (3/8" minimum thickness) with welded joints. Exception: For electrical and communication lines, a duct bank can be used in lieu of steel casing pipe. Where a portion of the line crosses under the tracks or is located within 45 feet of the nearest track centerline, it must meet the requirements of Exhibit A. Underground Utilities High Risk facilities: • Maintain 500 feet minimum horizontal separation from other High Risk facilities • Maintain 5 feet minimum horizontal separation from other Low Risk facilities • Maintain 20 feet minimum horizontal separation from load carrying structural elements Underground Utilities Low Risk facilities: • Maintain 3 feet minimum horizontal separation from other Low Risk facilities • Maintain 5 feet minimum horizontal separation from load carrying structural elements and 3 feet minimum horizontal separation from other structures • Maintain 1 foot minimum vertical separation from drainage conduits Underground Electric Supply and Communication Systems: General Order No. 128	Utilities specifically designed for the Caltrain facilities at stations and right-of-way shall conform to the standards, codes, and requirements of the CPUC and the local jurisdiction within which the utilities are located, as appropriate. Third party utilities owners include private owners, state, and municipal government. Work shall be coordinated with and done in accordance with the standards of the utilities owner. Clearance and Depth Requirements for Supply and Communication Systems: General Order No. 128 Appendix A. Table 1	If the proposed location of the encroachment crosses existing culverts, the top of the buried encroachment will have to be installed a minimum of 5' below the culvert invert. If the location crosses a ditch beyond the end of the culvert (field side) then the top of the buried encroachment must be installed 5' below the clean bottom elevation of the ditch. Track bores must be a minimum of 60 inches below base of rail. Wet bores are not permitted on Union Pacific property. The ends of steel casing (see Union Pacific Common Standard 1029) will have to be a minimum of 30 feet from centerline of the track when measured at right angle to the track. Also, bore pits must be a minimum of 30 feet from centerline of track when measured at right angle to the track. In addition, no bore pits can be located in the slope of a cut or fill section of the roadbed. The bore pit size must be kept to a minimum. Manholes must be capable of withstanding H-20 highway loading requirements and must be installed so as not to create a stumbling hazard.	
Overhead Utilities	Except for electrical and communication lines, overhead utilities shall cross the tracks at local street overpasses encased in a steel casing sleeve. Where electrical and communication lines cannot be accommodated in an overpass structure, their design shall be governed by the requirements of CPUC General Orders.	Minimum Vertical Clearance per CPUC General Order 95: Standard Drawing SD-2005	Minimum Clearances of Wires above Railroads: General Order No. 95 Section III Table 1	N/A	Except for electrical and communication lines, overhead utilities shall cross the tracks at local street overpasses encased in a steel casing sleeve. Where electrical and communication lines cannot be accommodated in an overpass structure, their design shall be governed by the requirements of CPUC General Orders. Minimum Clearances of Wires above Railroads: General Order No. 95 Section III Table 1	Minimum Clearances of Wires above Railroads: General Order No. 95 Section III Table 1 Minimum Vertical Clearance per CPUC General Order 95: Standard Drawing SD-2005	N/A	
Above Ground Utilities	In exclusive Authority right of way, all above ground utilities shall be moved outside of the right of way or conform to the requirements of Sections 6.3.1 and 6.3.2. In shared corridors, where design and location of existing utilities may be governed by existing agreements, and where relocation of the utility will have significant impact with respect to cost, environment or public inconvenience, the designer shall investigate the use of fencing, walls, cages, or other sources of protection in order to separate or isolate the utility from CHSTP features.	N/A	Minimum Clearances of Wires above Railroads: General Order No. 95 Section III Table 1	N/A	In exclusive Authority right of way, all above ground utilities shall be moved outside of the right of way or conform to the requirements of Sections 6.3.1 and 6.3.2. In shared corridors, where design and location of existing utilities may be governed by existing agreements, and where relocation of the utility will have significant impact with respect to cost, environment or public inconvenience, the designer shall investigate the use of fencing, walls, cages, or other sources of protection in order to separate or isolate the utility from CHSTP features. Minimum Clearances of Wires above Railroads: General Order No. 95 Section III Table 1	Minimum Clearances of Wires above Railroads: General Order No. 95 Section III Table 1	N/A	
Exempt Utilities	Exemptions from these requirements will not be permitted. Where the requirements of this technical memorandum 2.7.4 can not be met, the Design Variance process shall be followed.	N/A	N/A	N/A	Exemptions from these requirements will not be permitted. Where the requirements of this technical memorandum 2.7.4 can not be met, the Design Variance process shall be followed.	N/A	N/A	
Location of Proposed Utilities	Proposed utilities that are not related to the operation and maintenance of CHSTP shall be located outside the Authority right of way.	N/A	N/A	The wireline/pipeline (encroachment) must be located at the outer limits of railroad right-of-way within 5 feet of property line and a minimum of 35 feet from centerline of nearest track.	Proposed utilities that are not related to the operation and maintenance of CHSTP shall be located outside the Authority right of way.	N/A	The wireline/pipeline (encroachment) must be located at the outer limits of railroad right-of-way within 5 feet of property line and a minimum of 35 feet from centerline of nearest track.	

10/12/2016

CAHSR JM GEOTECHNICAL DESIGN CHECKLIST

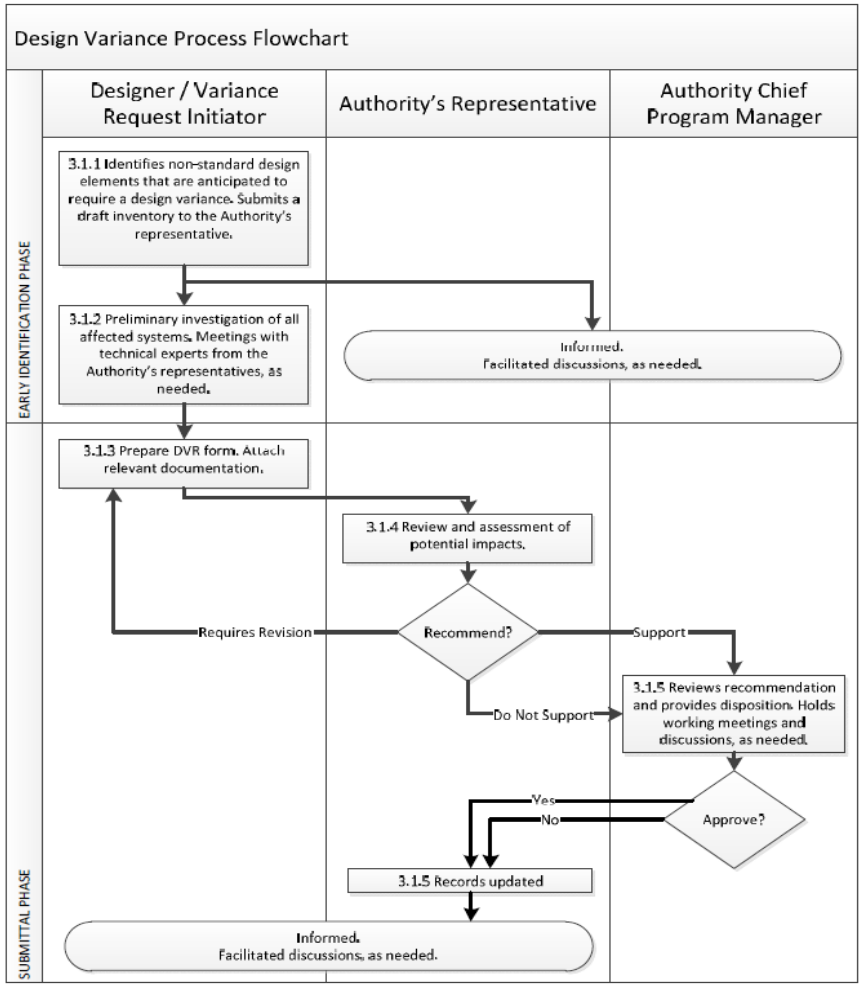
Three Geotechnical Investigation Plans and one Geotechnical Data Report were prepared by ENGEO between March and Sept 2016. These reports do not contain recommendations nor design values. Therefore, a design checklist would not be generated.

CAHSR JM RIGHT OF WAY DESIGN CHECKLIST

The High Speed Rail Authority has not promulgated geometric criteria for Right of Way. Right of way limits, both permanent and temporary construction easements (TCEs), are designed taking a number of factors into account. Many of these are qualitative and have to do with the surroundings of the rail alignment. HSRA design guidance exists for typical cross-sections. The right of way width and TCE limits vary for different standard cross-sections. Right of way and TCE will also vary depending on surrounding topography and land features, development, environmental considerations, and a host of other non-quantifiable conditions. For these reasons, right of way and TCE are generally determined by the judgment of the engineers, which reflects railroad clearance and alignment requirements, but also the many other factors that do not lend themselves to strict quantification.

Therefore, a design checklist would not be generated.

CAHSR FJ
GENERAL DESIGN CHECKLIST

DESIGN ELEMENT	DEDICATED HST CRITERIA (HST TM 1.1.18)	DEDICATED CALTRAIN CRITERIA (CALTRAIN DESIGN STANDARD- Chapter 1)	DEDICATED UPRR CRITERIA
DESIGN VARIANCE PROCESS		Standard ('shall') means required, no exception. Guidance ('should') means recommended, involving engineering judgment. Option ('may') means permission. Support is informational statement. Any deviations from all these criteria shall receive prior aproval by The Caltrain Deputy Director of Engineering. It shall be noted that variances or deviations are not for convenience. They shall be very rare, and only as a last resource and only after exhaustive analysis. Designers or other Project personnel shall not request a variance based on precedence. To request a variance, designers shall prepare written justifications documenting the reasons and justifications. If approved, the variance is only valid for the specific location of the project. This variance can not be used for future variance request. Any design variances shall never be less than the regulatory standards, and shall not introduce unacceptable safety and functionality of the railroad.	N/A
DOCUMENT CONTROL	1) Design Variance Request Form 2) Required Data 3) Supporting Documentation	To request a variance, designers shall prepare written justifications documenting the reasons and justifications.	N/A

CAHSR JM
SYSTEMS DESIGN CHECKLIST

	HIGH-SPEED TRAIN TM			HIGH-SPEED TRAIN DIRECTIVE DRAWING			HIGH-SPEED TRAIN NTD			CAHSR JM DEDICATED HST CRITERIA		COMMENTS
AUTOMATIC TRAIN CONTROL SITE												
TYPE A SITE	SITE SIZE	TM 3.3.2	45'x25'	SITE SIZE	TM-3.3.2-DD	70'x35'	SITE SIZE	NTD 11	70'x35'	SITE SIZE	70'x35'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION	TM 3.3.2	WITHIN INTERLOCKING LIMITS	LOCATION		-	LOCATION	NTD 11	WITHIN INTERLOCKING LIMITS	LOCATION	WITHIN INTERLOCKING LIMITS	
	ALTERNATE LOCATION		N/A	ALTERNATE LOCATION	TM-3.3.2-AA	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	NTD 11	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	
	SITE POSITION	TM 3.3.2	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	TM-3.3.2-CC	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	NTD 11	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	
	SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING	N/A	
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED	NTD 11	ACCESS ROAD AND GATE	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING	NTD 11	REQUIRED FOR EACH SITE	PARKING	REQUIRED FOR EACH SITE	
	STAIRWAY	TM 3.3.2	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY		-	STAIRWAY	NTD 11	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	
TYPE AA SITE	SITE SIZE			SITE SIZE	TM-3.3.2-DD	90'x35'	SITE SIZE	NTD 11	90'x35'	SITE SIZE	90'x35'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION			LOCATION		-	LOCATION	NTD 11	WITHIN INTERLOCKING LIMITS	LOCATION	WITHIN INTERLOCKING LIMITS	
	ALTERNATE LOCATION			ALTERNATE LOCATION		N/A	ALTERNATE LOCATION		N/A	ALTERNATE LOCATION	N/A	
	SITE POSITION			SITE POSITION	TM-3.3.2-CC	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	NTD 11	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	
	SITE SPACING			SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING	N/A	
	ACCESS REQUIRED			ACCESS REQUIRED		-	ACCESS REQUIRED	NTD 11	ACCESS ROAD AND GATE	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING			PARKING		-	PARKING	NTD 11	REQUIRED FOR EACH SITE	PARKING	REQUIRED FOR EACH SITE	
	STAIRWAY			STAIRWAY		-	STAIRWAY	NTD 11	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	
TYPE B SITE	SITE SIZE	TM 3.3.2	30'x25'	SITE SIZE	TM-3.3.2-DD	30'x35'	SITE SIZE	NTD 11	30'x35'	SITE SIZE	30'x35'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION	TM 3.3.2	WITHIN INTERLOCKING LIMITS	LOCATION		-	LOCATION	NTD 11	WITHIN INTERLOCKING LIMITS	LOCATION	WITHIN INTERLOCKING LIMITS	
	ALTERNATE LOCATION		N/A	ALTERNATE LOCATION	TM-3.3.2-AA, TM-3.3.2-BB	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	NTD 11	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	
	SITE POSITION		-	SITE POSITION		-	SITE POSITION		-	SITE POSITION	N/A	
	SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING	N/A	
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED	NTD 11	ACCESS ROAD AND GATE	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING	NTD 11	REQUIRED FOR EACH SITE	PARKING	REQUIRED FOR EACH SITE	
	STAIRWAY	TM 3.3.2	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY		-	STAIRWAY	NTD 11	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	
TYPE C SITE	SITE SIZE	TM 3.3.2	35'x25'	SITE SIZE	TM-3.3.2-DD	35'x35'	SITE SIZE	NTD 11	35'x35'	SITE SIZE	35'x35'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION	TM 3.3.2	WITHIN INTERLOCKING LIMITS	LOCATION		-	LOCATION	NTD 11	WITHIN INTERLOCKING LIMITS	LOCATION	WITHIN INTERLOCKING LIMITS	
	ALTERNATE LOCATION		N/A	ALTERNATE LOCATION	TM-3.3.2-AA	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	NTD 11	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	
	SITE POSITION		-	SITE POSITION		-	SITE POSITION		-	SITE POSITION	N/A	
	SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING	N/A	

CAHSR JM
SYSTEMS DESIGN CHECKLIST

	HIGH-SPEED TRAIN TM			HIGH-SPEED TRAIN DIRECTIVE DRAWING			HIGH-SPEED TRAIN NTD			CAHSR JM DEDICATED HST CRITERIA		COMMENTS
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED	NTD 11	ACCESS ROAD AND GATE	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING	NTD 11	REQUIRED FOR EACH SITE	PARKING	REQUIRED FOR EACH SITE	
	STAIRWAY	TM 3.3.2	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY		-	STAIRWAY	NTD 11	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	
TYPE D SITE	SITE SIZE			SITE SIZE	TM-3.3.2-CC	100'x65'	SITE SIZE	NTD 11	100'x65'	SITE SIZE	100'x65'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION			LOCATION		-	LOCATION	NTD 11	WITHIN INTERLOCKING LIMITS	LOCATION	WITHIN INTERLOCKING LIMITS	
	ALTERNATE LOCATION			ALTERNATE LOCATION		N/A	ALTERNATE LOCATION	NTD 11	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	ALTERNATE LOCATION	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	
	SITE POSITION			SITE POSITION	TM-3.3.2-CC	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	NTD 11	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	
	SITE SPACING			SITE SPACING	TM-3.3.2-CC	NOMINAL 7.5 MI MIN 5.8 MI MAX 8.7 MI	SITE SPACING	NTD 11	NOMINAL 7.5 MI MIN 5.8 MI MAX 8.7 MI	SITE SPACING	NOMINAL 7.5 MI MIN 5.8 MI MAX 8.7 MI	
	ACCESS REQUIRED			ACCESS REQUIRED		-	ACCESS REQUIRED	NTD 11	ACCESS ROAD AND GATE	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING			PARKING		-	PARKING	NTD 11	REQUIRED FOR EACH SITE	PARKING	REQUIRED FOR EACH SITE	
	STAIRWAY			STAIRWAY		-	STAIRWAY	NTD 11	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	
TYPE E SITE	SITE SIZE			SITE SIZE	TM-3.3.2-CC	110'x65'	SITE SIZE	NTD 11	110'x65'	SITE SIZE	110'x65'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION			LOCATION		-	LOCATION	NTD 11	WITHIN INTERLOCKING LIMITS	LOCATION	WITHIN INTERLOCKING LIMITS	
	ALTERNATE LOCATION			ALTERNATE LOCATION	TM-3.3.2-BB	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	NTD 11	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	ALTERNATE LOCATION	PROVIDED ON OPPOSITE SIDE OF TRACK WHERE POSSIBLE	
	SITE POSITION			SITE POSITION	TM-3.3.2-CC	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	NTD 11	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	SITE POSITION	LONGEST SIDE OF ATC SITES PARALLEL TO MAIN TRACKS	
	SITE SPACING			SITE SPACING		N/A	SITE SPACING		N/A	SITE SPACING	N/A	
	ACCESS REQUIRED			ACCESS REQUIRED		-	ACCESS REQUIRED	NTD 11	ACCESS ROAD AND GATE	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING			PARKING		-	PARKING	NTD 11	REQUIRED FOR EACH SITE	PARKING	REQUIRED FOR EACH SITE	
	STAIRWAY			STAIRWAY		-	STAIRWAY	NTD 11	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	STAIRWAY	WITHIN 250' OF ATC SITES FROM PARKING AREATO R/W FOR ELEVATED STRUCTURE OR IN A CUT	
TRACTION POWER SITES												
TP SUBSTATION W/ TWO POWER TRANSFORMERS	SITE SIZE	TM 3.1.1.3	200'x160'	SITE SIZE	TM-3.1.1.3-A	200'x160'	SITE SIZE		-	SITE SIZE	200'x160'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION	TM 3.1.1.3	MAX 100' FROM HSR ALIGNMENT	LOCATION		-	LOCATION		-	LOCATION	MAX 100' FROM HSR ALIGNMENT	
	SITE SPACING	TM 3.1.1.3	APPROXIMATELY 30 MI	SITE SPACING		-	SITE SPACING		-	SITE SPACING	APPROXIMATELY 30 MI	
	ALTERNATE LOCATION	TM 3.1.1.3	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	ALTERNATE LOCATION		-	ALTERNATE LOCATION		-	ALTERNATE LOCATION	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED		-	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING		-	PARKING	REQUIRED FOR EACH SITE	
	EASEMENT	TM 3.1.1.3	40' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	EASEMENT		-	EASEMENT		-	EASEMENT	40' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	

CAHSR JM
SYSTEMS DESIGN CHECKLIST

	HIGH-SPEED TRAIN TM			HIGH-SPEED TRAIN DIRECTIVE DRAWING			HIGH-SPEED TRAIN NTD			CAHSR JM DEDICATED HST CRITERIA		COMMENTS
TP SUBSTATION W/ THREE POWER TRANSFORMERS	SITE SIZE	TM 3.1.1.3	200'x210'	SITE SIZE	TM-3.1.1.3-B	200'x210'	SITE SIZE		-	SITE SIZE	200'x210'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION	TM 3.1.1.3	MAX 100' FROM HSR ALIGNMENT	LOCATION		-	LOCATION		-	LOCATION	MAX 100' FROM HSR ALIGNMENT	
	SITE SPACING	TM 3.1.1.3	APPROXIMATELY 30 MI	SITE SPACING		-	SITE SPACING		-	SITE SPACING	APPROXIMATELY 30 MI	
	ALTERNATE LOCATION	TM 3.1.1.3	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	ALTERNATE LOCATION		-	ALTERNATE LOCATION		-	ALTERNATE LOCATION	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED		-	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING		-	PARKING	REQUIRED FOR EACH SITE	
	EASEMENT	TM 3.1.1.3	40' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	EASEMENT		-	EASEMENT		-	EASEMENT	40' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	
TP SWITCHING STATION (SWS)	SITE SIZE	TM 3.1.1.3	160'x90'	SITE SIZE	TM-3.1.1.3-C	160'x90'	SITE SIZE		-	SITE SIZE	160'x90'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION	TM 3.1.1.3	MAX 100' FROM HSR ALIGNMENT	LOCATION		-	LOCATION		-	LOCATION	MAX 100' FROM HSR ALIGNMENT	
	SITE SPACING	TM 3.1.1.3	APPROXIMATELY MIDWAY BETWEEN TPSS SITES	SITE SPACING		-	SITE SPACING		-	SITE SPACING	APPROXIMATELY MIDWAY BETWEEN TPSS SITES	
	ALTERNATE LOCATION	TM 3.1.1.3	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	ALTERNATE LOCATION		-	ALTERNATE LOCATION		-	ALTERNATE LOCATION	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED		-	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING		-	PARKING	REQUIRED FOR EACH SITE	
	EASEMENT	TM 3.1.1.3	40' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	EASEMENT		-	EASEMENT		-	EASEMENT	40' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	
TP PARALLELING STATION (PS)	SITE SIZE	TM 3.1.1.3	120'x80'	SITE SIZE	TM-3.1.1.3-D	120'x80'	SITE SIZE		-	SITE SIZE	120'x80'	NO REQUIREMENT ON SIZE OF PARKING AREA
	LOCATION	TM 3.1.1.3	MAX 100' FROM HSR ALIGNMENT	LOCATION		-	LOCATION		-	LOCATION	MAX 100' FROM HSR ALIGNMENT	
	SITE SPACING	TM 3.1.1.3	APPROXIMATELY 5 MI INTERVALS BETWEEN SWITCHING AND SUBSTATION	SITE SPACING		-	SITE SPACING		-	SITE SPACING	APPROXIMATELY 5 MI INTERVALS BETWEEN SWITCHING AND SUBSTATION	
	ALTERNATE LOCATION	TM 3.1.1.3	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	ALTERNATE LOCATION		-	ALTERNATE LOCATION		-	ALTERNATE LOCATION	PROVIDE ALTERNATE LOCATION ON DIFFERENT PARCEL	
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED		-	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING		-	PARKING	REQUIRED FOR EACH SITE	
	EASEMENT	TM 3.1.1.3	30' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	EASEMENT		-	EASEMENT		-	EASEMENT	30' WIDE PERMANENT EASEMENT PROVIDED WHEN TP SITE LOCATED AWAY FROM HSR ALIGNMENT FOR DUCTBANK AND MANHOLE	
STAND-ALONE RADIO SITES												
STAND-ALONE RADIO SITES	SITE REQUIREMENT			SITE REQUIREMENT		-	SITE REQUIREMENT	NTD 6	SITE ARE REQUIRED WHEN SPACING BETWEEN TP FACILITIES, SIGNAL EQUIPMENT HOUSES (TYPE A, AA, D, E), AND TUNNEL PORTAL SITES IS GREATER THAN 3 MILES	SITE REQUIREMENT	SITE ARE REQUIRED WHEN SPACING BETWEEN TP FACILITIES, SIGNAL EQUIPMENT HOUSES (TYPE A, AA, D, E), AND TUNNEL PORTAL SITES IS GREATER THAN 3 MILES	NO REQUIREMENT ON SIZE OF PARKING AREA
	SITE SIZE	TM 3.4.2	8'X12'	SITE SIZE	NTD 6 - DRAWING NO. 2	40'x25'	SITE SIZE	NTD 6	40'x25'	SITE SIZE	40'x25'	
	SITE SPACING		N/A	SITE SPACING		-	SITE SPACING	NTD 6	NOMINAL 2.5 MI NO GREATER THAN 3 MI	SITE SPACING	NOMINAL 2.5 MI NO GREATER THAN 3 MI	
	ACCESS REQUIRED	TM 3.3.2 TM 2.8.1	ACCESS ROAD AND GATE	ACCESS REQUIRED		-	ACCESS REQUIRED	NTD 6	ACCESS ROAD AND GATE	ACCESS REQUIRED	ACCESS ROAD AND GATE	
	PARKING	TM 3.3.2 TM 2.8.1	REQUIRED FOR EACH SITE	PARKING		-	PARKING	NTD 6	REQUIRED FOR EACH SITE	PARKING	REQUIRED FOR EACH SITE	
	TCE FOR INSTALLATION		N/A	TCE FOR INSTALLATION	NTD 6 - DRAWING NO. 2	MINIMUM 40'x60'	TCE FOR INSTALLATION	NTD 6	MINIMUM 40'x60'	TCE FOR INSTALLATION	MINIMUM 40'x60'	

APPENDIX 2-E: PROJECT IMPACT AVOIDANCE AND MINIMIZATION FEATURES

APPENDIX 2-E: PROJECT IMPACT AVOIDANCE AND MINIMIZATION FEATURES

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- Where appropriate, the verb "would," when used specifically to describe impact avoidance and minimization features (IAMF) or mitigation measures, as well as their directly related activities, was changed to "will," indicating their integration into project design.
- The IAMF to reduce emissions from on-road construction vehicles (AQ-IAMF#5) was clarified.
- The title of AQ-IAMF#4 was corrected.
- BIO-IAMF#12 was revised to include use of facility designs and architecture that minimizes the potential for bird collisions with buildings, to the extent feasible and consistent with local design requirements, and use of bird-friendly lighting on all stationary light sources (i.e., lighting with shorter wavelengths toward the blue and green spectrum), provided it is consistent with safety and security requirements. The Grasslands Ecological Area was added as a location where additional bird operational actions will be required.

Impact Avoidance and Minimization Features Definitions

The California High-Speed Rail Authority (Authority) and the Federal Railroad Administration (FRA) have pledged to integrate programmatic IAMFs consistent with the (1) *2005 Statewide Program Environmental Impact Report/ Environmental Impact Statement (EIR/EIS)*, (2) *2008 Bay Area to Central Valley Program EIR/EIS*, and (3) *2012 Partially Revised Final Program EIR* into the high-speed rail (HSR) project. The Authority and FRA will implement these features during project design and construction, as relevant to the San Jose to Merced Project Section (Project Section), to avoid or reduce impacts.

IAMFs are incorporated into the Project Section design and construction to avoid or minimize environmental or community impacts. The description of each measure details the means and effectiveness of the measure in avoiding or minimizing impacts, as well as the environmental benefits of implementing the measure. For example, an IAMF can require development and application of measures to reduce impacts on air quality and hydrology based on applicable design standards that will also reduce impacts on biological resources.

Each IAMF is described in the EIR/EIS. The factual basis for their efficacy, feasibility, and implementation is provided. The IAMFs are included in the Mitigation Monitoring and Enforcement Plan to enhance implementation tracking, identify the responsible party, and clarify implementation timing.

Descriptions of Impact Avoidance and Minimization Features

AG-IAMF#1: Restoration of Important Farmland Used for Temporary Staging Areas

Prior to any ground disturbing activities at the site of a temporary construction staging area located on Important Farmland, the Contractor shall prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation and successful achievement of restoration for temporary impacts. Actions shall include removing and stockpiling the top 18 inches of soil for replacement on-site during restoration activities. Before beginning construction use of sites on Important Farmland, the Contractor shall submit the restoration plan to the Authority for review and obtain Authority (and if applicable, the landowner) approval. The restoration plan shall include time-stamped photo documentation of the pre-construction conditions of all temporary staging areas.

All construction access, mobilization, material laydown, and staging areas on Important Farmlands will be returned to a condition equal to the pre-construction staging condition. This requirement is included in the design-build construction contract requirements.

AG-IAMF#2: Permit Assistance

Prior to disturbance causing activities affecting any segment of a confined animal facility, the Authority will assign a representative to act as a single point of contact to assist each confined animal facility owner during the process of obtaining new or amended permits or other regulatory compliance necessary to the continued operation or relocation of the facility. The Authority will consider and may provide compensation when acquisition of a confined animal site will require either relocation of the facility or amendment of its existing regulatory permits. The Authority will create a permit assistance center for landowners and operators whose operations will be out of compliance with permits because of the HSR. This permit center will focus on helping the permit holders modify or obtain any new permits that are required because of the HSR impacts.

AG-IAMF#3: Farmland Consolidation Program

The Authority will establish and administer a farmland consolidation program to sell remnant parcels to neighboring landowners for consolidation with adjacent farmland properties. In addition, the program will assist the owners of remnant parcels in selling those remnants to adjacent landowners, upon request. The goal of the program is to provide for continued agricultural use on the maximum feasible amount of remnant parcels that otherwise may not be economic to farm. The program will focus on severed remainder parcels, including those that were under Williamson Act or Farmland Security Act contract at the time of right-of-way acquisition and have become too small to remain in the local Williamson Act or Farmland Security Act program. The program will assist landowners in obtaining lot line adjustments where appropriate to incorporate remnant parcels into a larger parcel that is consistent with size requirements under the local government regulations.

The program will operate for a minimum of 5 years after construction of the section is completed. The Authority shall document implementation of this measure through issuance of a compliance memorandum- after the minimum operation period of 5 years has elapsed. The document shall be filed with Environmental Mitigation Management and Assessment system (EMMA).

AG-IAMF#4: Notification to Agricultural Property Owners

Prior to the start of any construction activity adjacent to farmland, the Authority shall provide written notification to agricultural property owners or leaseholders immediately adjacent to the disturbance limits for the HSR project section. The notification is to indicate the intent to begin construction, including an estimated date for the start of construction. In order to provide agricultural property owners or leaseholders sufficient lead time to make any changes to their operations due to project section construction, this notification shall be provided at least 3 months, but no more than 12 months, prior to the start of construction activity.

AG-IAMF#5: Temporary Livestock and Equipment Crossings

Prior to the start of any construction activity adjacent to any farmland, the Authority shall coordinate with agricultural property owners or leaseholders to provide temporary livestock and equipment crossings to minimize impacts to livestock movement, as well as routine operations and normal business activities, during project construction.

AG-IAMF#6: Equipment Crossings

During final design, and in coordination with the property owners of land in use for agricultural operations, the Authority shall finalize the realignments of any affected access roads to provide equipment crossings to minimize impediments to routine agricultural operations and normal business activities that may result from long-term project operation.

Air Quality

AQ-IAMF#1: Fugitive Dust Emissions

During construction, the Contractor shall employ the following measures to minimize and control fugitive dust emissions. The Contractor shall prepare a fugitive dust control plan for each distinct

construction segment. At a minimum, the plan shall describe how each measure will be employed and identify an individual responsible for ensuring implementation. At a minimum, the plan shall address the following components unless alternative measures are approved by the applicable air quality management district.

- Cover all vehicle loads transported on public roads to limit visible dust emissions, and maintain at least 6 inches of freeboard space from the top of the container or truck bed.
- Clean all trucks and equipment before exiting the construction site using an appropriate cleaning station that does not allow runoff to leave the site or mud to be carried on tires off the site.
- Water exposed surfaces and unpaved roads at a minimum three times daily with adequate volume to result in wetting the top 1 inch of soil while avoiding overland flow. Rain events may sufficiently wet the top 1 inch of soil to alleviate the need to manually apply water.
- Limit vehicle travel speed on unpaved roads to 15 miles per hour (mph).
- Suspend any dust-generating activities when average wind speed exceeds 25 mph.
- Stabilize all disturbed areas, including storage piles that are not being used on a daily basis for construction purposes, by using water, a chemical stabilizer/suppressant, or hydro mulch or by covering with a tarp or other suitable cover or vegetative ground cover. In areas adjacent to organic farms, the Authority will use nonchemical means of dust suppression.
- Stabilize all on-site unpaved roads and off-site unpaved access roads using water or a chemical stabilizer/suppressant. In areas adjacent to organic farms, the Authority will use nonchemical means of dust suppression.
- Apply water to or presoak all areas where land clearing, grubbing, scraping, excavation, land leveling, grading, cut-and-fill, and demolition activities are carried out.
- For buildings up to six stories tall, wet all exterior surfaces of buildings during demolition.
- Limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at a minimum of once daily, using a vacuum type sweeper.
- After the addition of materials to or the removal of materials from the surface or outdoor storage piles, apply sufficient water or a chemical stabilizer/suppressant.

AQ-IAMF#2: Selection of Coatings

During construction, the contractor will use:

- Low–volatile organic compound (VOC) paint that contains less than 10 percent of VOC contents (VOC, 10%).
- Super-compliant or Clean Air paint that has a lower VOC content than that required by Bay Area Air Quality Management District Regulation 8, Rule 3, Monterey Bay Unified Air Pollution Control District Rule 426, and San Joaquin Valley Unified Air Pollution Control District Rule 4601, when available. If not available, the contractor will document the lack of availability, recommend alternative measure(s) to comply with Regulation 8, Rule 3, Rule 426, and Rule 4601 or disclose absence of measure(s) for full compliance, and obtain concurrence from the Authority.

AQ-IAMF#3: Renewable Diesel

During construction, the Contractor will use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks. Renewable diesel must meet the most recent ASTM D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50% of diesel with the lowest carbon intensity among petroleum fuels sold in California. The Contractor will provide the Authority with monthly and annual reports, through the Environmental Mitigation Management and Application

(EMMA) system, of renewable diesel purchase records and equipment and vehicle fuel consumption. Exemptions to use traditional diesel can be made where renewable diesel is not available from suppliers within 200 miles of the project site. The construction contract must identify the quantity of traditional diesel purchased and fully document the availability and price of renewable diesel to meet project demand.

AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment

Prior to issuance of construction contracts, the Authority will incorporate the following construction equipment exhaust emissions requirements into the contract specifications:

- All heavy-duty off-road construction diesel equipment used during the construction phase will meet Tier 4 engine requirements.
- A copy of each unit's certified tier specification and any required CARB or air pollution control district operating permit will be made available to the Authority at the time of mobilization of each piece of equipment.
- The contractor will keep a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment.
- The contractor will provide the Authority with monthly reports of equipment operating hours (through the Environmental Mitigation Management and Assessment [EMMA] system) and annual reports documenting compliance.

AQ-IAMF#5: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment

Prior to issuance of construction contracts, the Authority will incorporate the following material-hauling truck fleet mix requirements into the contract specifications:

- All diesel on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, shall use a model year 2010 or newer engine.
- The contractor will provide documentation to the Authority of efforts to secure such a fleet mix.
- The contractor will keep a written record of equipment usage during project construction for each piece of equipment and provide the Authority with monthly reports of VMT (through EMMA) and annual reports documenting compliance.

AQ-IAMF#6: Reduce the Potential Impact of Concrete Batch Plants

Prior to construction of any concrete batch plant, the contractor will provide the Authority with a technical memorandum documenting consistency with the Authority's concrete batch plant siting criteria and utilization of typical control measures. Concrete batch plants will be sited at least 1,000 feet from sensitive receptors, including places such as daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant will implement typical control measures to reduce fugitive dust such as water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central dust collection systems, and other suitable technology, to reduce emissions to be equivalent to the USEPA AP-42 controlled emission factors for concrete batch plants. The contractor will provide to the Authority documentation that each batch plant meets this standard during operation.

Aesthetics and Visual Quality

AVQ-IAMF#1: Aesthetic Options

Prior to construction the Contractor shall document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous high-speed rail non-station structures across the state. Examples of aesthetic

options will be provided to local jurisdictions that can be applied to non-standard structures in the high-speed rail system. Refer to Aesthetic Options for Non-Station Structures, 2017.

AVQ-IAMF#2: Aesthetic Review Process

Prior to construction, the contractor will document that the Authority's aesthetic review process has been followed to guide the development of non-station area structures. Documentation will be accomplished through issuance of a technical memorandum to the Authority. The Authority will identify key non-station structures recommended for aesthetic treatment; consult with local jurisdictions on how best to involve the community in the process; solicit input from local jurisdictions on their aesthetic preferences; evaluate aesthetic preferences for potential cost, schedule, and operational impacts and compatibility with project-wide aesthetic goals, include recommended aesthetic approaches in the construction procurement documents; and work with the contractor and local jurisdictions to review and incorporate designs and local aesthetic preferences into final design and construction. *Refer to Aesthetic Options for Non-Station Structures, 2017*.

Biological Resources

BIO-IAMF#1: Project Biologist

At least 15 business days prior to commencement of any ground disturbing activity, including but not limited to geotechnical investigations, utility realignments, creation of staging areas, or initial clearing and grubbing, the Authority will submit the name(s) and qualifications of Project Biologists, Designated Biologists, Species-Specific Biological Monitors, and General Biological Monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures. No ground disturbing activity will begin until the Authority has received written approval from the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), where applicable, and the California Department of Fish and Wildlife (CDFW) that the biologists and monitors have been approved to conduct the specified work. The Project Biologist is responsible for ensuring the timely implementation of the biological avoidance and minimization measures as outlined in the Biological Resources Management Plan (BRMP), and for guiding and directing the work of the Designated Biologists and Biological Monitors. Designated Biologists will be responsible for directly overseeing and reporting the implementation of general and species-specific conservation measures. In some instances, Designated Biologists will only be approved for specific species, in which case they will only be authorized to conduct surveys and implement measures for the species for which they have been approved. Species-Specific Biological Monitors will be responsible for implementation of species-specific measures for the species for which they have been approved, and will report directly to a Designated Biologist. General Biological Monitors will report directly to a Designated Biologist or to the Project Biologist. General Biological Monitors will be responsible for conducting Worker Environmental Awareness Program (WEAP) training, implementing general conservation measures, conducting general compliance monitoring, and reporting on compliance monitoring activities. The term Project Biologist is used in these IAMFs to mean the Project Biologist, Designated Biologists, Species-Specific Biological Monitors, and General Biological Monitors, as appropriate. When the Authority is specified as implementing an IAMF, it is assumed that the Authority, or its contractor or agent, is implementing the IAMF under the supervision of biologists and biological monitors, as appropriate.

BIO-IAMF#2: Agency Access

Throughout the construction period, the Authority will allow access by the USFWS, NMFS, U.S. Army Corps of Engineers (USACE), CDFW, and State Water Resources Control Board (SWRCB) to the project site. Because of safety concerns, all visitors will check in with the Authority's resident engineer prior to entering the project footprint. In the event that agency personnel visit the project footprint, the Project Biologist will prepare a memorandum within 3 business days after the visit documenting the issues raised during the field meeting. The Project Biologist will report any issues regarding regulatory compliance raised by agency personnel to the Authority.

BIO-IAMF#3: Construction Period WEAP Training

Prior to any ground disturbing activity, the Project Biologist will prepare a Worker Environmental Awareness Program (WEAP) for the purpose of training construction crews to recognize and identify sensitive biological resources that may be encountered in the vicinity of the project footprint. The WEAP training materials will be submitted to the Authority for review and approval. A video of the WEAP training prepared and presented by the Project Biologist and approved by the Authority may be used if the Project Biologist is not available to present the training in person.

At a minimum, WEAP training materials will include the following information: key provisions of the federal Endangered Species Act (federal ESA), the California Endangered Species Act (CESA), the Bald and Golden Eagle Protection Act (BGEPA), the Migratory Bird Treaty Act (MBTA), California Fish and Game Code 1600, Porter-Cologne Water Quality Control Act (Porter-Cologne), and the Clean Water Act (CWA); the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of avoidance, minimization, and mitigation measures.

The Project Biologist will present WEAP training to all construction personnel before they work in the project footprint. As part of the WEAP training, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures. Crews will be informed during the WEAP training that, except when necessary as determined in consultation with the Project Biologist, travel within the project footprint is restricted to established roadbeds, which include all pre-existing and project-constructed unimproved and improved roads. A fact sheet conveying this information will be prepared by the Project Biologist for distribution to the construction crews and to others who enter the project footprint. Fact sheet information will be duplicated in a wallet-sized format and will be provided in other languages as necessary to accommodate non-English speaking workers. All construction staff will attend the WEAP training prior to beginning work on-site, and will attend the WEAP training on an annual basis thereafter.

Upon completion of the WEAP training, each member of the construction crew will sign a form stating that they attended the training, understood the information presented, and agreed to comply with the requirements set out in the WEAP training. The Project Biologist will submit the signed WEAP training forms to the Authority on a monthly basis. On an annual basis, the Authority will certify that WEAP training had been provided to all construction personnel. On a monthly basis, the Project Biologist will provide updates relevant to the training to construction personnel during the daily safety ("tailgate") meeting.

BIO-IAMF#4: Operation and Maintenance Period WEAP Training

Prior to initiating operation and maintenance (O&M) activities, O&M personnel will attend a WEAP training session arranged by the Authority.

At a minimum, O&M WEAP training materials will include the following information: key provisions of the ESA, CESA, the BGEPA, the MBTA, Porter-Cologne, and the CWA; the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a dead or injured wildlife species. The training will include an overview of provisions of the biological resources management plan, annual vegetation, and management plan, weed control plan and security fencing and wildlife exclusion fencing maintenance plans pertinent to O&M activities. A fact sheet prepared by the Authority environmental compliance staff will be prepared for distribution to the O&M employees. The training will be provided by the Authority environmental compliance staff. The training sessions will be provided to employees prior to their involvement in any O&M activity and will be repeated

for all O&M employees on an annual basis. Upon completion of the WEAP training, O&M employees will, in writing, verify their attendance at the training sessions and confirm their willingness to comply with the requirements set out in those sessions.

BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan

Prior to any ground disturbing activity, the Project Biologist will prepare the BRMP, which will include a compilation of the biological resources avoidance and minimization measures applicable to the HSR section. All project environmental plans, such as the Restoration and Revegetation Plan (RPP) and Weed Control Plan (WCP), will be included as appendices to the BRMP. The BRMP is intended to serve as a comprehensive document that sets out the range of avoidance and minimization measures to support the appropriate and timely implementation of those measures. The implementation of these measures will be tracked through final design, construction, and operation phases. The BRMP will contain, but not be limited to, the following information:

- A master schedule that shows construction of the project, pre-construction surveys, and establishment of buffers and exclusions zones to protect sensitive biological resources.
- Specific measures for the protection of special-status species.
- Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, along with the locations where habitats are to be restored.
- Identification of agency-approved Project Biologist(s) and Biological Monitor(s), including those responsible for notification and report of injury or death of federally or State-listed species.
- Measures to preserve topsoil and control erosion.
- Design of protective fencing around Environmentally Sensitive Areas (ESAs) and the construction staging areas.
- Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees.
- Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within sensitive habitat areas.
- Specific measures for the protection of vernal pool habitat and riparian areas. These measures may include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements.
- Provisions for biological monitoring during ground disturbing activities to confirm compliance and success of protective measures. The monitoring will: (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s); (4) identify the reporting requirements; and (5) provide an accounting of impacts to special-status species habitat compared to pre-construction impact estimates.

The BRMP will be submitted to the Authority for review and approval prior to any ground disturbing activity.

BIO-IAMF#6: Establish Monofilament Restrictions

Prior to any ground disturbing activity, the Project Biologist will verify that plastic monofilament netting (erosion control matting) or similar material is not being used as part of erosion control activities. The Project Biologist will identify acceptable material for such use, including: geomembranes, coconut coir matting, tackified hydroseeding compounds, and rice straw wattles (e.g., Earthsaver wattles: biodegradable, photodegradable, burlap). Within developed or urban

areas, the Project Biologist may allow exceptions to the restrictions on the type of erosion control material if the Project Biologist determines that the construction area is of sufficient distance from natural areas to ensure the avoidance of potential impacts to wildlife.

BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations

At the end of each work day during construction, the Authority will cover all excavated, steep-sided holes or trenches more than 8 inches deep and that have sidewalls steeper than 1:1 (45 degree) slope with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than 3:1) constructed of earth fill or wooden planks. The Project Biologist will thoroughly inspect holes and trenches for trapped animals at the start and end of each work day.

The Authority will screen, cover, or elevate at least 1 foot above ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored overnight within the project footprint. These pipes, culverts, and similar structures will be inspected by the Project Biologist for wildlife before such material is moved, buried, or capped.

BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes

Prior to any ground disturbing activity, the Authority will establish staging areas for construction equipment in areas that minimize effects to sensitive biological resources, including habitat for special-status species, seasonal wetlands, and wildlife movement corridors. Staging areas (including any temporary material storage areas) will be located in areas that will be occupied by permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. The Authority will flag and mark access routes to ensure that vehicle traffic within the project footprint is restricted to established roads, construction areas and other designated areas.

BIO-IAMF#9: Dispose of Construction Spoils and Waste

During ground disturbing activities, the Authority may temporarily store excavated materials produced by construction activities in areas at or near construction sites within the project footprint. Where practicable, the Authority will return excavated soil to its original location to be used as backfill. Any excavated waste materials unsuitable for treatment and reuse will be disposed at an off-site location, in conformance with applicable State and federal laws.

BIO-IAMF#10: Clean Construction Equipment

Prior to any ground disturbing activity, the Authority will ensure that all equipment entering the Work Area is free of mud and plant materials. The Authority will establish vehicle cleaning locations designed to isolate and contain organic materials and minimize opportunities for weeds and invasive species to move in and out of the project footprint. Cleaning may be done by washing with water, blowing with compressed air, brushing, or other hand cleaning. The cleaning areas will be located so as to avoid impacts to surface waters and appropriate Stormwater Pollution Prevention Plan (SWPPP) best management practices (BMPs) will be implemented so as to further control any potential for the spread of weeds or other invasive species. Cleaning stations will be inspected regularly (at least monthly).

BIO-IAMF#11: Maintain Construction Sites

Prior to any ground disturbing activity, the Authority will prepare a construction site BMP field manual. The manual will contain standard construction site housekeeping practices required to be implemented by construction personnel. The manual will identify BMPs for the following topics; temporary soil stabilization, temporary sediment control, wind erosion control, non-storm water management, waste management and materials control, rodenticide use, and other general construction site cleanliness measures.

All construction personnel will receive training on BMP field manual implementation prior to working within the project footprint. All personnel will acknowledge, in writing, their understanding of the BMP field manual implementation requirements. The BMP field manual will be updated by

January 31st of each year. The Authority will provide, on an annual basis, training updates to all construction personnel.

BIO-IAMF#12: Design the Project to be Bird Safe

Prior to final construction design, the Authority will ensure that the catenary system, masts, and other structures such as fencing, electric lines, communication towers and facilities are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012), and other guidelines related to collisions with buildings available from the American Bird Conservancy (Sheppard and Phillips 2015). Applicable recommendations include, but are not limited to:

- Ensuring sufficient spacing of phase conductors to prevent bird electrocution
- Configuring lines to reduce vertical spread of lines and/or decreasing the span length if such options are feasible
- Marking lines and fences (e.g. Bird Flight Diverter for fencing and lines) to increase the visibility of lines and reduce the potential for collision. Where fencing is necessary, using bird compatible design standards to increase visibility of fences to prevent collision and entanglement.
- Installing perch guards to discourage avian presence on and near project facilities
- Minimizing the use of guywires. Where the use of guywires is unavoidable, demarcating guywires using the best available methods to minimize avian strikes (e.g. line markers).
- Reusing or co-locating new transmission facilities and other ancillary facilities with existing facilities and disturbed areas to minimize habitat impacts and avoid collision risks
- Structures will be monopole or dual-pole design versus lattice tower design to minimize perching and nesting opportunities. Communication towers will conform to Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning (UFWS 2018).
- Use of facility lighting that does not attract birds or their prey to project sites. These include using non-steady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen). Lighting will not be installed under viaduct and bridge structures in riparian habitat areas.
- Use of facility designs and architecture that minimizes the potential for bird collisions with buildings, to the extent feasible and consistent with local design requirements.

Additional bird operational actions will be required for the Grasslands Ecological Area, dry lakes and playas, Audubon Important Bird Areas and documented avian movement corridors. These measures include:

- Avoid, to the extent feasible, siting transmission lines across canyons or on ridgelines to prevent bird and raptor collisions.
- Install bird flight diverters on all facilities spanning or within 1,000 feet of stream and wash channels, canals, ponds, and any other natural or artificial body of water.
- Fencing or other type of flight diverter will be installed on all viaduct structures to encourage birds and raptors to fly over the HSR and avoid flying directly in the path of on-coming trains.

- Use of bird-friendly lighting on all stationary light sources (i.e., lighting with shorter wavelengths toward the blue and green spectrum), provided it is consistent with safety and security requirements.

Cultural Resources

CUL-IAMF#1: Geospatial Data Layer and Archaeological Sensitivity Map

Prior to Construction (any ground disturbing activities) and staging of materials and equipment, the Contractor's archaeologist or geoarchaeologist shall prepare a geospatial data layer identifying the locations of all known archaeological resources and built historic resources that require avoidance or protection, and areas of archaeological sensitivity that require monitoring within the area of potential effect (APE). The Contractor's archaeologist, who meets the Secretary of the Interior's Professional Qualifications Standards provided in 36 Code of Federal Regulations (CFR) Part 61, is to use, as appropriate, a combination of the following: known locations of archaeological sites and built historic properties, tribal consultation, landforms, depositional processes, distance to water, mapping provided in the Archaeological Treatment Plan, or historic mapping. This mapping is to be updated as the design progresses if it results in an expansion of the area of ground disturbance/APE, including temporary construction easements and new laydown and access areas. This mapping will be used to develop an archaeological monitoring plan to be prepared by the Contractor's archaeologist, and upon approval by the Authority, implemented by the Contractor's archaeologist. When design is sufficiently advanced, a geospatial data layer will be produced by the Contractor overlaying the locations of all known archaeological resources and built historic resources within the APE, for which avoidance measures are necessary, and all archaeologically sensitive areas, for which monitoring is required.

CUL-IAMF#2: WEAP Training Session

Prior to Construction (any ground disturbing activity) construction contractor personnel who work on site will attend a WEAP training session provided by the Contractor. The WEAP will include cultural resources awareness training performed by the Contractor's archaeologist who meets the Secretary of the Interior's Professional Qualification Standards provided in 36 CFR Part 61. The Contractor will develop instructional materials and a fact sheet for distribution to the construction crews, and submit the materials, as well as qualifications of the personnel providing the training, to the Authority for approval at least 15 days prior to being permitted on-site access. The training will address measures required to avoid or protect built historic resources, educate crews on artifacts and archaeological features they may encounter and the mandatory procedures to follow should potential cultural resources be exposed during construction. Translation services shall be provided by the Contractor for non-English speaking participants. The training sessions shall be given prior to the initiation of any ground disturbance activities and repeated on an annual basis. Additionally, new construction crewmembers shall attend an initial WEAP training session prior to working on site.

On completion of the WEAP training, construction crews will sign a form stating that they attended the training, understood the information presented, and will comply with the WEAP requirements. The Contractor's archaeologist will submit the signed WEAP training forms to the Mitigation Manager on a monthly basis. On an annual basis, the Contractor will provide the Authority with a letter indicating that regular WEAP training has been implemented and will provide at least one PowerPoint annually of the WEAP training. On a monthly basis, the Contractor's archaeologist will provide updates and synopsis of the training to workers during the daily safety ("tailgate") meeting. Construction crews will be informed during the WEAP training that, to the extent possible, travel within the marked project site will be restricted to established roadbeds.

CUL-IAMF#3: Pre-Construction Cultural Resource Surveys

Prior to Construction (any ground disturbing activities in areas not yet surveyed) and the staging of materials and equipment, the Contractor shall conduct pre-construction cultural resource

surveys. Resulting from lack of legal access, much of the construction footprint may not have been surveyed. Once parcels are accessible the Contractor will have archaeologists or architectural historians, as appropriate, who meet the Secretary of the Interior professional qualification standards survey and complete reporting in appropriate document for archaeology and / or built resources, in accordance with documentation requirements stipulated in the Programmatic Agreement. Identified resources shall be evaluated for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR). The qualified archaeologist or architectural historian, as appropriate, will assess the potential to affect to historic properties (NRHP) by applying the effects criteria in 36 CFR Part 800.5(a)(1), and the potential of significant impacts to historical resources (CRHR) by applying the criteria in California Environmental Quality Act (CEQA) Guidelines 15064.5(b). Should the Authority and FRA determine, in consultation with the State Historic Preservation Office (SHPO), that any newly identified historic properties or historical resources will be adversely affected, the Built Environment Treatment Plan or Archeological Treatment Plan, as appropriate, will be amended, to document mitigation measures agreed upon by the MOA signatories. The schedule of these surveys will be dependent on the timing of obtaining legal access to the properties and may be driven by the need to complete construction-related activities, e.g., geotechnical borings, laydown yards, etc. Prior to beginning surveys, updated records searches may be required by the FRA and Authority, depending on the length of the passage of time, to validate that accurate information was obtained regarding previous inventory and evaluation efforts. The Contractor's archaeologist, in consultation with the Authority, will determine if an updated records search is required. If an updated records search is necessary, the search shall be performed by the Contractor's archaeologist.

CUL-IAMF#4: Relocation of Project Features when Possible

Changing the rail alignment to avoid newly discovered sites is likely infeasible; however, access areas and laydown sites may be relocated should their proposed location be found to be on archaeological sites or have the potential to affect historic built resources in the vicinity. The contractor will delineate all avoidance and protection measures for identified archaeological and built resources on construction drawings.

CUL-IAMF#5: Archaeological Monitoring Plan and Implementation

Prior to construction the Contractor's professionally qualified archaeologist, as defined in the Programmatic Agreement, will prepare a monitoring plan based on the results of geospatial data layer and archaeological sensitivity map. The plan is to be reviewed and approved by the Authority prior to any ground-disturbing activities. During Construction (any ground disturbing activities) or staging of materials or equipment, the Contractor will be responsible for implementing the monitoring plan and providing archaeological and tribal monitoring of ground-disturbing construction activities with a potential to affect archaeological remains in areas identified as archaeologically sensitive in the Archaeological Treatment Plan. The Contractor shall obtain Authority approval of all persons providing archaeological or tribal monitoring.

CUL-IAMF#6: Pre-Construction Conditions Assessment, Plan for Protection of Historic Built Resources, and Repair of Inadvertent Damage

Prior to Construction (any ground disturbing activities that are within 1,000 feet of a historic built property) the Contractor may be required to assess the condition of construction-adjacent historic properties, and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage. The MOA and Built Environment Treatment Plan (BETP) will stipulate for which properties the plan is to be prepared. MOA signatories and consulting parties may comment on the adequacy of the assessments. Protection measures will be developed in consultation with the landowner or land-owning agencies as well as the SHPO and the MOA signatories and consulting parties, as required by the Programmatic Agreement. As the design progresses, additional properties may be identified by the Authority as requiring this plan. The plan shall record existing conditions in order to (1) establish a baseline against which to compare the property's post-project condition, (2) to identify structural deficiencies that make the property

vulnerable to project construction related damage, such as vibration, and (3) to identify stabilization or other measures required to avoid or minimize inadvertent adverse effects. The plan will be further described in the BETP and be prepared by an interdisciplinary team, including (but not limited to) as appropriate, an architectural historian, architect, photographer, structural engineer, and acoustical engineer. Ambient conditions will be used to identify buildings that are sensitive receptors to construction-related vibration and require vibration monitoring during construction activities. Additional protective measures may be required if the property is vacant during construction.

The plan content shall be outlined in the BETP and is to be completed and approved by the Authority, with protective measures implemented before construction begins within 1,000 feet of the subject building. The plan shall describe the protocols for documenting inadvertent damage (should it occur), as well as notification, coordination, and reporting to the SHPO, MOA signatories, and the owner of the historic property. The plan shall direct that inadvertent damage to historic properties shall be repaired in accordance with the Secretary of the Interior's (SOI) Standards for the Treatment of Historic Properties (U.S. Department of the Interior, 1995). The plan shall be developed in coordination with the Authority and FRA, and shall be submitted to the SHPO for review and approval. Protective plans will be required for buildings that will be moved as part of the project mitigation, including stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation.

CUL-IAMF#7: Built Environment Monitoring Plan

Prior to Construction (any ground disturbing activities within 1,000 feet of a historic property or resource) the Contractor shall prepare a Built Environment Monitoring Plan (BEMP). Draft and final BEMP's will be prepared describing the properties that will require monitoring, the type of activities or resources that will require full-time monitoring or spot checks, the required number of monitors for each construction activity, and the parameters that will influence the level of effort for monitoring. Maximum vibration level thresholds may be established in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage the monitoring of which will be included in this monitoring plan. The BETP will outline the process for corrective action should the protection measures prove ineffective. Consultation procedures will also be defined in the BETP. The Contractor shall develop both the draft and final plans in coordination with the Authority and FRA, and shall be submitted to the SHPO for review and approval. The plan will be implemented prior to any ground-disturbing activities within 1,000 feet of properties identified as requiring monitoring, as specified in the BETP.

CUL-IAMF#8: Implement Protection and/or Stabilization Measures

Implement the plan described in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage and in the Built Environment Treatment Plan. Such protection measures will include, but will not be limited to, vibration monitoring of construction in the vicinity of historic properties; cordoning off of resources from construction activities (e.g., traffic, equipment storage, personnel); shielding of resources from dust or debris; and stabilization of buildings adjacent to construction. Temporary stabilization and protection measures will be removed after construction is complete, and the historic properties will be restored to their pre-construction condition. For buildings that will be moved, treatment will include stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation.

EMI/EMF Standards

EMI/EMF-IAMF#1: Preventing Interference with Adjacent Railroads

TM 3.00.10. Implementation Stage Electromagnetic Compatibility Program Plan (ISEP) requires coordination with adjacent railroads. During Project Design the Contractor will work with the engineering departments of railroads that operate parallel the HSR to apply standard design practices to prevent interference with the electronic equipment operated by these railroads. Prior to Operation and Maintenance of each operating segment, the Contractor shall certify through

issuance of a technical memorandum to the Authority that design provisions to prevent interference have been established and have been determined to be effective prior to the activation of potentially interfering systems of the HSR.

The contractor will work with the railroad engineering departments where these railways parallel the HSR to apply the standard design practices to prevent interference with the electronic equipment operated by these railroads. Design provisions to prevent interference will be put in place and determined to be adequately effective by a qualified electrical engineering professional prior to the HSR activation of potentially interfering systems. The HSR Design Criteria Manual (DCM) Chapter 26 summarizes the applicable electromagnetic interference/electromagnetic field (EMI/EMF) design standards that the Authority will use for the project.

EMI/EMF-IAMF#2: Controlling Electromagnetic Fields/Electromagnetic Interference

Prior to Construction, the Contractor will prepare an electromagnetic field/electromagnetic interference technical memorandum for review and approval by the Authority. The HSR project shall adhere to international guidelines and comply with applicable federal and state laws and regulations. The HSR project design will follow TM 300.10, ISEP, the CHSR DCM Chapter 26, which provides detailed EMC design criteria for the HSR systems and equipment, and the HSR DCM Chapter 22, which addresses grounding requirements for third-party metallic structures, including fences and pipelines, which are parallel and adjacent to the CHSTS right of way. These documents describe the design practices to avoid EMI and to provide for HSR operational safety. Some measures of the ISEP include:

- During the planning stage through system design, the Authority will perform electromagnetic compatibility (EMC)/EMI safety analyses, which will include identification of existing nearby radio systems, design of systems to prevent EMI with identified neighboring uses, and incorporation of these design requirements into bid specifications used to procure radio systems.
- Pipelines and other linear metallic objects that are not sufficiently grounded through the direct contact with earth will be separately grounded in coordination with the affected owner or utility to avoid possible shock hazards. For cases where metallic fences are purposely electrified to inhibit livestock or wildlife from traversing the barrier, specific insulation design measures will be implemented.
- HSR standard corrosion protection measures will be implemented to eliminate risk of substantial corrosion of nearby metal objects.

Geologic Resources

GEO-IAMF#1: Geologic Hazards

Prior to Construction, the Contractor shall prepare a Construction Management Plan (CMP) addressing how the Contractor will address geologic constraints and minimize or avoid impacts to geologic hazards during construction. The plan will be submitted to the Authority for review and approval. At a minimum, the plan will address the following geological and geotechnical constraints/resources:

a. Groundwater Withdrawal. Controlling the amount of groundwater withdrawal from the project, by re-inject groundwater at specific locations if necessary, or use alternate foundation designs to offset the potential for settlement. This control is important for locations with retained cuts in areas where high groundwater exists, and where existing buildings are located near the depressed track section.

b. Unstable Soils. Employing various methods to mitigate for the risk of ground failure from unstable soils. If soft or loose soils are encountered at shallow depths, they can be excavated and replaced with competent soils. To limit the excavation depth, replacement materials can also be strengthened using geosynthetics. Where unsuitable soils are deeper, ground

improvement methods, such as stone columns, cement deep-soil-mixing (CDSM), or jet-grouting, can be used. Alternatively, if sufficient construction time is available, preloading—in combination with prefabricated vertical drains (wicks) and staged construction—can be used to gradually improve the strength of the soil without causing bearing-capacity failures.

c. Subsidence. The Authority addresses subsidence in its design and construction processes. For the initial design, survey monuments were installed to establish a datum and set an initial track profile. In the construction phase, the design-build (DB) contractors for track bed preparation will conduct topographic surveys for preparation of final design. Because subsidence could have occurred since the original benchmarks (survey monuments) were established, the DB contractor's topographic surveys will be used to help determine whether subsidence has occurred. The updated topographic surveys will also be used to establish the top of rail elevations for final design where the HSR system is outside established floodplain areas and above water surface elevations. Where the HSR system is in floodplain areas susceptible to flooding, consideration is being given to overbuild the height of the rail bed in anticipation of future subsidence.

d. Water and Wind Erosion. The Contractor will implement erosion control methods as appropriate from the various erosion control methods documented in the Construction Storm Water Pollution Prevention Plan (SWPPP) (See HYD-IAMF#3), the Caltrans Construction Manuals, and the construction technical memorandum (see GEO-IAMF#6), and in coordination with other erosion, sediment, stormwater management and fugitive dust control efforts. Water and wind erosion control methods may include, but are not limited to, use of revegetation, stabilizers, mulches, and biodegradable geotextiles.

e. Soils with Shrink-Swell Potential. In locations where shrink-swell potential is marginally unacceptable, soil additives will be mixed with existing soil to reduce the shrink-swell potential. Construction specifications will be based upon the decision whether to remove or treat the soil. This decision is based on the soils, specific shrink-swell characteristics, the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil.

f. Soils with Corrosive Potential. In locations where soils have a potential to be corrosive to steel and concrete, the soils will be removed and buried structures will be designed for corrosive conditions, and corrosion-protected materials will be used in infrastructure.

GEO-IAMF#2: Slope Monitoring

During Operation and Maintenance, the Authority shall incorporate slope monitoring by a Registered Engineering Geologist into the Operation and Maintenance procedures. The procedures shall be implemented at sites identified in the CMP where a potential for long-term instability exists from gravity or seismic loading including but not limited to at-grade sections where slope failure could result in loss of track support, or where slope failure could result in additional earth loading to foundations supporting elevated structures.

GEO-IAMF#3: Gas Monitoring

Prior to Construction, the Contractor shall prepare a Construction Management Plan (CMP) addressing how gas monitoring will be incorporated into construction best management practices. The CMP will be submitted to the Authority for review and approval. Hazards related to potential migration of hazardous gases due to the presence of known oil and gas fields, areas of active or historic landfills, or other subsurface sources can be reduced or eliminated by following strict federal and state Occupational Safety & Health Administration (OSHA/Cal-OSHA) regulatory requirements for excavations, and by consulting with other agencies as appropriate, such as the Department of Conservation (Division of Oil and Gas) and the California Environmental Protection Agency, Department of Toxic Substances Control, regarding known areas of concern.

Practices will include using safe and explosion-proof equipment during construction, and testing for gases regularly. Installation of passive or active gas venting systems, gas collection systems, as well as active monitoring systems and alarms will be required in underground construction

areas and facilities where subsurface gases are present. Installing gas-detection systems can monitor the effectiveness of these systems.

GEO-IAMF#4: Historic or Abandoned Mines

Prior to Construction, the Contractor shall prepare a Construction Management Plan (CMP) addressing how historic and abandoned mines will be incorporated into construction best management practices. The CMP will be submitted to the Authority for review and approval. Depending on the properties of an individual mine, mitigations to address historic or abandoned mines could include:

a. CERCLA Cleanup. Environmental cleanups at sites that are releasing or threatening to release hazardous substances such as heavy metals from acid mine drainage.

b. Non-CERCLA Cleanup. Cleanups of non-hazardous substance-related surface disturbance such as revegetation of disturbed areas, stabilization of mine tailings, reconstruction of stream channels and floodplains.

c. Safety Mitigation. Mitigation of physical safety hazards such as closure of adits and shafts and removal of dangerous structures.

GEO-IAMF#5: Hazardous Minerals

Prior to Construction, the Contractor shall prepare a Construction Management Plan (CMP) addressing how the contractor will minimize or avoid impacts related to hazardous minerals (i.e., radon, mercury, and naturally occurring asbestos (NOA)) during construction. The CMP will be submitted to the Authority for review and approval. The CMP shall include appropriate provisions for handling hazardous minerals including but limited to dust control, control of soil erosion and water runoff, and testing and proper disposal of excavated material.

GEO-IAMF#6: Ground Rupture Early Warning Systems

Prior to Construction, the Contractor shall document how the project design incorporates installation of early warning systems, triggered by strong ground motion association with ground rupture. Known nearly active fault will be monitored. Linear monitoring systems such as time domain reflectometers or similar technology shall be installed along rail lines in the zone of potential ground rupture. These devices emit electronic information that is processed in a centralized location and will be used to temporarily control trains, thus reducing accidents due to fault creep. Damage to infrastructure from fault creep can be mitigated with routine maintenance including minor realignment.

GEO-IAMF#7: Evaluate and Design for Large Seismic Ground Shaking

Prior to Construction, the Contractor shall document through preparation of a technical memorandum how all HSR components were evaluated and designed for large seismic ground shaking. Prior to final design, the Contractor will conduct additional seismic studies to establish up-to-date estimation of levels of ground motion. The most current Caltrans seismic design criteria at the time of design will be used in the design of any structures supported in or on the ground. These design procedures and features reduce to the greatest practical extent for potential movements, shear forces, and displacements that result from inertial response of the structure. In critical locations, pendulum base isolators may be used to reduce the levels of inertial forces. New composite materials may also be used to enhance seismic performance.

GEO-IAMF#8: Suspension of Operations During an Earthquake

Prior to Operation and Maintenance activities, the Contractor shall document in a technical memorandum how suspension of operations during or after an earthquake was addressed in project design. Motion-sensing instruments to provide ground motion data and a control system to shut down HSR operations temporarily during or after a potentially damaging earthquake will be incorporated into final design. Monitoring equipment will be installed at select locations where high ground motions could occur. The system will then be inspected for damage due to ground motion and/or ground deformation, and then returned to service when appropriate.

GEO-IAMF#9: Subsidence Monitoring

Prior to Operation and Maintenance, the Authority shall develop a stringent track monitoring program. Once tracks are operational, a remote monitoring program will be implemented to monitor the effects of ongoing subsidence. Track inspection systems will provide early warning of reduced track integrity. HSR train sets will be equipped with autonomous equipment for daily track surveys. This specification will be added to HSR train bid packages. If monitoring indicates that track tolerances are not met, trains will operate at reduced speed until track tolerances are restored. In addition, the contractor responsible for wayside maintenance will be required to implement a stringent program for track maintenance.

GEO-IAMF#10: Geology and Soils

Prior to Construction, the Contractor shall document through issuance of a technical memorandum how the following guidelines and standards have been incorporated into facility design and construction:

- 2015 American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Bridge Design Specifications and the 2015 AASHTO Guide Specifications for Load and Resistance Factor Seismic Bridge Design, or their most recent versions. These documents provide guidance for characterization of soils, as well as methods to be used in the design of bridge foundations and structures, retaining walls, and buried structures. These design specifications will provide minimum specifications for evaluating the seismic response of the soil and structures.
- Federal Highway Administration (FHWA) Circulars and Reference Manuals: These documents provide detailed guidance on the characterization of geotechnical conditions at sites, methods for performing foundation design, and recommendations on foundation construction. These guidance documents include methods for designing retaining walls used for retained cuts and retained fills, foundations for elevated structures, and at-grade segments. Some of the documents include guidance on methods of mitigating geologic hazards that are encountered during design.
- American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual: These guidelines deal with rail systems. Although they cover many of the same general topics as AASHTO, they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways.
- California Building Code: The code is based on 2015 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance.
- IBC and American Society of Civil Engineers (ASCE)-7: These codes and standards provide minimum design loads for buildings and other structures. They will be used for the design of the maintenance facilities and stations. Sections in IBC and ASCE-7 provide minimum requirements for geotechnical investigations, levels of earthquake ground shaking, minimum standards for structural design, and inspection and testing requirements.
- Caltrans Design Standards: Caltrans has specific minimum design and construction standards for all aspects of transportation system design, ranging from geotechnical explorations to construction practices. These amendments provide specific guidance for the design of deep foundations that are used to support elevated structures, for design of mechanically stabilized earth (MSE) walls used for retained fills, and for design of various types of cantilever (e.g., soldier pile, secant pile, and tangent pile) and tie-back walls used for retained cuts.
- Caltrans Construction Manuals: Caltrans has a number of manuals including Field Guide to Construction Dewatering, Caltrans Construction Site BMPs Manual and Construction Site BMP Field Manual and Troubleshooting Guide. These provide guidance and best

management practices for dewatering options and management, erosion control and soil stabilization, non-storm water management, and waste management at construction sites.

- American Society for Testing and Materials (ASTM): ASTM has developed standards and guidelines for all types of material testing- from soil compaction testing to concrete-strength testing. The ASTM standards also include minimum performance requirements for materials.

GEO-IAMF#11: Engage a Qualified Paleontological Resources Specialist

Prior to the 90% design milestone for each construction package[1] (CP) within the Project Section, the Contractor will retain a paleontological resources specialist (PRS) responsible for

- reviewing the final design for the CP, and
- developing a detailed Paleontological Resources Monitoring and Mitigation Plan (PRMMP) for the CP. The PRS will be responsible for implementing the PRMMP, including delivery of WEAP Training, and evaluation and treatment of finds, if any, per the PRMMP and for each CP. A Supervising Paleontologist, who is also a PRS, will be retained and act as Lead Paleontologist for the CP if there are multiple PRS' retained for a single CP.

Retention of PRS staff will occur in a timely manner, in advance of the 90% design milestone for each CP, such that the PRS is on board and can review the 90% design submittal without delay when it becomes available. If feasible, the same PRS will be responsible for all CPs within the Project Section. However, if efficiency dictates, separate qualified PRSs may be retained for the various Project Section CPs. Should a CP retain more than one PRS, a supervising paleontologist will be identified.

All PRS staff will meet or exceed the qualifications for a Principal Paleontologist as defined in the California Department of Transportation's (Caltrans') current *Standard Environmental Reference*, Chapter 8 (Caltrans 2014). Appointment of PRS staff will be subject to review and approval by the Authority.

GEO-IAMF #12: Perform Final Design Review and Triggers Evaluation

For each CP within the Project Section, the responsible PRS will evaluate the 90% design submittal to identify the portions of the CP that will involve work in paleontologically sensitive geologic units (either on the surface or in the subsurface), in consideration of the final Paleontological Resources Technical Report prepared for the Project Section. Evaluation will consider the location, areal extent, anticipated depth of disturbance, the construction techniques that are planned/proposed, and the geology of the CP and vicinity. The evaluation and resulting recommendations will be consistent with guidance in the Society of Vertebrate Paleontology (SVP) *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (SVP Impact Mitigation Guidelines Revision Committee 2010), the *SVP Conditions of Receivership for Paleontologic Salvage Collections* (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current Caltrans *Standard Environmental Reference* (Caltrans 2014).

The purpose of the Final Design Review and Triggers Evaluation will be to develop specific language detailing the paleontological monitoring and other requirements applicable to each CP within the Project Section. Paleontological protection requirements identified through the Final Design Review and Triggers evaluation will be recorded in a concise technical memorandum ("Final Design Review Requirements for Paleontological Resources Protection") and will then be incorporated in full detail into the PRMMP for each CP. Portions of the CP requiring paleontological monitoring will also be clearly delineated in the project construction documents for each CP.

[1] Because of their length and complexity, most HSR Project Sections are expected to be designed and constructed in segments, with separate construction documents (plans and specifications) developed for each segment. *Construction package* refers to a portion (segment) of a Project Section for which a discrete, stand-alone construction document set will be developed.

GEO-IAMF#13: Prepare and Implement Paleontological Resources Monitoring and Mitigation Plan (PRMMP)

Following the Final Design Review and Triggers Evaluation for each CP, the PRS will develop a CP-specific PRMMP. For greater efficiency, PRMMPs may be combined such that they cover more than one CP, as long as the specific requirements of this IAMF are satisfied explicitly and in detail for each CP included.

The PRMMP for each CP will incorporate the findings of the Design Review and Triggers Evaluation for that CP and will be consistent with the Society of Vertebrate Paleontology (SVP) *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (SVP Impact Mitigation Guidelines Revision Committee 2010), the SVP *Conditions of Receivership for Paleontologic Salvage Collections* (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current Caltrans *Standard Environmental Reference* (Caltrans 2014). As such, the PRMMP will provide for at least the following:

- Implementation by qualified personnel, as follows:
  - The PRS will be required to meet or exceed Principal Paleontologist Qualifications per Chapter 8 of the current *Caltrans Standard Environmental Reference* (Caltrans 2014). The Supervising Paleontologist may, but not necessarily, be the PRS who prepares the PRMMP.
  - Paleontological Monitors will be required to meet or exceed Paleontological Monitor qualifications per Chapter 8 of the current Caltrans *Standard Environmental Reference* (Caltrans 2014).
- Pre-construction survey by qualified personnel, with salvage or protection in place, as appropriate, in areas where the CP will result in surface disturbance of geologic units identified as highly sensitive for paleontological resources (“highly sensitive units”).
- Pre-construction and construction-period coordination procedures and communications protocols.
- Paleontological monitoring by qualified staff for all ground-disturbing activities known to involve, or potentially involve, highly sensitive units and for activities involving other geologic units in any areas where the PRS considers it warranted based on the results of the TR or field surveys. In all areas subject to monitoring, monitoring will initially be conducted full-time during all grading and excavation activities, but the PRMMP may provide for monitoring frequency in any given location to be reduced once 50% of the ground-disturbing activity in that location has been completed, if the reduction is appropriate based on the implementing PRS’s professional judgment in consideration of actual site conditions.
- If the PRS considers it warranted, monitoring will also be stipulated for construction drilling operations. In general, small diameter (i.e., <18 inches) drilling activities or drilling activities using bucket augers tend to pulverize impacted sediments and contained fossils and not typically monitored. The portion of the PRMMP monitoring program for drilling operations will be developed in conjunction with the CP design and geotechnical teams, in consideration of the nature, depth, and location of drilling needed, and the anticipated equipment and staging configurations.
- Provisions for the content and delivery of paleontological resources WEAP training.
- In-progress documentation of monitoring (and, if applicable, salvage/recovery operations) via “construction dailies” or a similar means.
- Provisions for a “stop work, evaluate, and treat appropriately” response in the event of a known or potential paleontological discovery, including finds in highly sensitive units as well as finds, if any, in units identified as less sensitive, or non-sensitive, for paleontological resources.

- Sampling and recovery procedures consistent with SVP *Standard Procedures* (SVP Impact Mitigation Guidelines Revision Committee 2010) and the SVP *Conditions of Receivership* (SVP Conformable Impact Mitigation Guidelines Committee 1996). Recovery procedures will provide for recovery of both macrofossils and microfossils.
- A repository agreement providing for appropriate curation of recovered materials, consistent with the SVP *Conditions of Receivership* (SVP Conformable Impact Mitigation Guidelines Committee 1996). If more than one repository institution is designated, separate repository agreements must be provided.
- Final report preparation procedures consistent with Caltrans *Standard Environmental Reference* Chapter 8 provisions for the Paleontological Monitoring Report and Paleontological Stewardship Summary (Caltrans 2014).
- Procedures for the preparation, identification, and analysis of fossil specimens and data recovered, consistent with the SVP *Conditions of Receivership* (SVP Conformable Impact Mitigation Guidelines Committee 1996) and any specific requirements of the designated repository institution(s).

GEO-IAMF #14: Provide WEAP Training for Paleontological Resources

Prior to groundbreaking for each CP within the Project Section, the Contractor will provide paleontological resources WEAP training delivered by the Supervising Paleontologist. All management and supervisory personnel and construction workers involved with ground-disturbing activities will be required to take this training before beginning work on the project. Refresher training will also be made available to management and supervisory personnel and workers as needed, based on the judgment of the PRS.

At a minimum, paleontological resources WEAP training will include information on:

- coordination between construction staff and paleontological staff
- construction and paleontological staff roles and responsibilities in implementing the PRMMP
- the possibility of encountering fossils during construction
- the types of fossils that may be seen and how to recognize them
- proper procedures in the event fossils are encountered, including the requirement to halt work in the vicinity of the find and procedures for notifying responsible parties in the event of a find.

Training materials and formats may include, but are not necessarily limited to, in-person training, prerecorded videos, posters, and informational brochures that provide contacts and summarize procedures in the event paleontological resources are encountered. WEAP training contents will be subject to review and approval by the Authority. Paleontological resources WEAP training may be provided concurrently with cultural resources WEAP training.

Upon completion of any WEAP training, the Contractor will require workers to sign a form stating that they attended the training and understand and will comply with the information presented. Verification of paleontological resources WEAP training will be provided to the Authority by the Contractor.

GEO-IAMF#15: Halt Construction, Evaluate, and Treat if Paleontological Resources Are Found

If known or potential fossil materials are discovered during construction, regardless of the individual making a paleontological discovery, all activity in the immediate vicinity of the discovery will halt and the find will be protected from further disturbance. If the discovery is made by someone other than the PRS or qualified paleontological monitor, the person who made the discovery will immediately notify construction supervisory personnel, who will notify the PRS. Notification to the PRS will take place promptly (prior to the close of work the same day as the

find), and the PRS will evaluate the find and prescribe appropriate treatment as soon as feasible. Work may continue on other parts of the site while evaluation (and, if needed, treatment) takes place, as long as the find can be adequately protected in the judgment of the PRS.

If the PRS determines that treatment is warranted, such treatment, and any required reporting, will proceed consistent with the PRMMP. The Contractor will be responsible for ensuring prompt and accurate implementation, subject to verification by the Authority.

The stop work requirement does not apply to drilling since drilling typically cannot be suspended in mid-course. However, if finds are made during drilling, the same notification and other follow-up requirements will apply. The PRS will coordinate with construction supervisory and drilling staff regarding the handling of recovered materials.

The requirements of this IAMF will be detailed in the PRMMP and presented as part of the paleontological resources WEAP training.

Hazardous Materials and Waste

HMW-IAMF#1: Property Acquisition Phase 1 and Phase 2 Environmental Site Assessments

During the right-of-way acquisition phase, Phase 1 environmental site assessments (ESA) shall be conducted in accordance with standard ASTM methodologies to characterize each parcel. The determination of parcels that require a Phase 2 ESA (e.g., soil, groundwater, soil vapor subsurface investigations) will be informed by a Phase 1 ESA and may require coordination with state and local agency officials. If the Phase 2 ESA concludes that the site is impacted, remediation or corrective action (e.g., removal of contamination, in-situ treatment, or soil capping) will be conducted with state and local agency officials (as necessary) and in full compliance with applicable state and federal laws and regulations.

HMW-IAMF#2: Landfill

Prior to Construction (any ground disturbing activities), the Contractor shall verify to the Authority through preparation of a technical memorandum that methane protection measures will be implemented for all work within 1,000 feet of a landfill, including gas detection systems and personnel training. This will be undertaken pursuant to State of California Title 27, Environmental Protection – Division 2, Solid Waste, and the hazardous materials best management practices plan.

HMW-IAMF#3: Work Barriers

Prior to Construction (any ground disturbing activities), the Contractor shall verify to the Authority through preparation of a technical memorandum the use of work barriers. Nominal design variances, such as the addition of a plastic barrier beneath the ballast material to limit the potential release of volatile subsurface contaminants, may be implemented in conjunction with site investigation and remediation.

HMW-IAMF#4: Undocumented Contamination

Prior to Construction, the Contractor shall prepare a CMP addressing provisions for the disturbance of undocumented contamination. The plan will be submitted to the Authority for review and approval. Undocumented contamination could be encountered during construction activities and the Contractor will work closely with local agencies to resolve any such encounters and address necessary clean-up or disposal. Copies of all required hazardous material documentation shall be provided within 30 days to the Authority.

HMW-IAMF#5: Demolition Plans

Prior to Construction that involves demolition, the Contractor shall prepare demolition plans for the safe dismantling and removal of building components and debris. The demolition plans will include a plan for lead and asbestos abatement. The plans shall be submitted to the Project Construction Manager (PCM) on behalf of the Authority for verification that appropriate demolition

practices have been followed consistent with federal and state regulations regarding asbestos and lead paint abatement.

HMW-IAMF#6: Spill Prevention

Prior to Construction (any ground disturbing activities), the Contractor shall prepare a Construction Management Plan addressing spill prevention. A Spill Prevention, Control, and Countermeasure (SPCC) plan (or Soil Prevention and Response Plan if the total above-ground oil storage capacity is less than 1,320 gallons in storage containers greater than or equal to 55-gallons) shall prescribe BMPs to follow to prevent hazardous material releases and clean-up of any hazardous material releases that may occur. The plans will be prepared and submitted to the PCM on behalf of the Authority and shall be implemented during Construction.

HMW-IAMF#7: Transport of Materials

During Construction, the Contractor will comply with applicable state and federal regulations, such as the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Hazardous Materials Release Response Plans and Inventory Law, and the Hazardous Waste Control Act. Prior to Construction the Contractor will provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials transport.

HMW-IAMF#8: Permit Conditions

During Construction the Contractor will comply with the State Water Resources Control Board Construction Clean Water Act Section 402 General Permit conditions and requirements for transport, labeling, containment, cover, and other BMPs for storage of hazardous materials during construction. Prior to Construction, the Contractor shall provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials transport, containment, and storage BMPs that will be implemented during Construction.

HMW-IAMF#9: Environmental Management System

To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous substances in the material selection process for construction, operation, and maintenance of the HSR System. The Authority will use an Environmental Management System to describe the process that will be used to evaluate the full inventory of hazardous materials as defined by federal and state law employed on an annual basis and will replace hazardous substances with nonhazardous materials. The Contractor shall implement the material substitution recommendation contained in the annual inventory.

HMW-IAMF#10 Hazardous Materials Plans

Prior to Operations and Maintenance activities, the Authority shall prepare hazardous materials monitoring plans. These will use as a basis source, such as a hazardous materials business plan as defined in Title 19 California Code of Regulations and a SPCC plan.

Hydrology and Water Resources

HYD-IAMF#1: Storm Water Management

Prior to Construction, the Contractor shall prepare a storm water management and treatment plan for review and approval by the Authority. During the detailed design phase, each receiving stormwater system's capacity to accommodate project runoff will be evaluated. As necessary, on-site stormwater management measures, such as detention or selected upgrades to the receiving system, will be designed to provide adequate capacity and to comply with the design standards in the latest version of Authority Technical Memorandum *2.6.5 Hydraulics and Hydrology Guidelines*. On-site stormwater management facilities will be designed and constructed to capture runoff and provide treatment prior to discharge of pollutant-generating surfaces, including station parking areas, access roads, new road over- and underpasses, reconstructed interchanges, and

new or relocated roads and highways. Low-impact development techniques will be used to detain runoff on site and to reduce off site runoff such as constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips, will be used where appropriate.

HYD-IAMF#2: Flood Protection

Prior to Construction, the Contractor shall prepare a flood protection plan for Authority review and approval. The project will be designed both to remain operational during flood events and to minimize increases in 100-year or 200-year flood elevations, as applicable to locale. Design standards will include the following:

- Establish track elevation to prevent saturation and infiltration of stormwater into the sub-ballast.
- Minimize development within the floodplain, to such an extent that water surface elevation in the floodplain will not increase by more than 1 foot, or as required by state or local agencies, during the 100-year or 200-year flood flow [as applicable to locale]. Avoid placement of facilities in the floodplain or raise the ground with fill above the base-flood elevation.
- Design the floodplain crossings to maintain a 100-year floodwater surface elevation of no greater than 1 foot above current levels, or as required by state or local agencies, and project features within the floodway itself will not increase existing 100-year floodwater surface elevations in Federal Emergency Management Agency-designated floodways, or as otherwise agreed upon with the county floodplains manager.

The following design standards will minimize the effects of pier placement on floodplains and floodways:

- Design site crossings to be as nearly perpendicular to the channel as feasible to minimize bridge length.
- Orient piers to be parallel to the expected high-water flow direction to minimize flow disturbance.
- Elevate bridge crossings at least 3 feet above the high-water surface elevation to provide adequate clearance for floating debris, or as required by local agencies.
- Conduct engineering analyses of channel scour depths at each crossing to evaluate the depth for burying the bridge piers and abutments. Implement scour-control measures to reduce erosion potential.
- Use quarry stone, cobblestone, or their equivalent for erosion control along rivers and streams, complimented with native riparian plantings or other natural stabilization alternatives that will restore and maintain a natural riparian corridor.
- Place bedding materials under the stone protection at locations where the underlying soils require stabilization as a result of stream-flow velocity.

HYD-IAMF#3: Prepare and Implement a Construction Stormwater Pollution Prevention Plan

Prior to Construction (any ground disturbing activities), the Contractor shall comply with the State Water Resources Control Board (SWRCB) Construction General Permit requiring preparation and implementation of a SWPPP. The Construction SWPPP will propose BMPs to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs will include measures to incorporate permeable surfaces into facility design plans where feasible, and how treated stormwater will be retained or detained on site. Other BMPs shall include strategies to manage the amount and quality of overall stormwater runoff. The Construction SWPPP will include measures to address, but will not be limited to, the following:

- Hydromodification management to verify maintenance of pre-project hydrology by emphasizing on site retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation (supplemented by detention where required). Additional flow control measures will be implemented where local regulations or drainage requirements dictate.
- Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater.
- Limiting fueling and other activities using hazardous materials to areas distant from surface water, providing drip pans under equipment, and daily checks for vehicle condition.
- Implementing practices to reduce erosion of exposed soil, including soil stabilization, regular watering for dust control, perimeter siltation fences, and sediment catchment basins.
- Implementing practices to maintain current water quality, including: siltation fencing, wattle barriers, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, storage tanks and sediment traps to arrest and settle sediment.
- Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.
- Using diversion ditches to intercept surface runoff from off site.
- Where feasible, limiting construction to dry periods when flows in water bodies are low or absent.
- Implementing practices to capture and provide proper off-site disposal of concrete wash water, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatments (e.g., dry ice).
- Developing and implementing a spill prevention and emergency response plan to handle potential fuel and/or hazardous material spills.

Implementation of a SWPPP will be performed by the construction contractor as directed by the contractor's Qualified SWPPP Practitioner or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before, during and after storm events. Records of these inspections and monitoring results are submitted to the local regional water quality control board (RWQCB) as part of the annual report required by the Statewide Construction General Permit. The reports are available to the public online. The SWRCB and RWQCB will have the opportunity to review these documents.

HYD-IAMF#4: Prepare and Implement an Industrial Stormwater Pollution Prevention Plan

Prior to Construction of any facility classified as an industrial facility, the Contractor shall comply with existing water quality regulations. The stormwater general permit requires preparation of a SWPPP and a monitoring plan for industrial facilities that discharge stormwater from the site, including vehicle maintenance facilities associated with transportation operations. The permit includes performance standards for pollution control.

HYD-IAMF-#5: Tunnel Design Features and Construction Methods

The Contractor shall implement the following tunnel design features and construction methods to avoid and/or minimize the potential for groundwater depletion during tunnel construction and operation, and consequential potential for hydrologic changes that may affect groundwater and/or surface water resources in areas overlying the tunnel alignment. Two types of potential effects must be considered, (1) temporary effects that occur due to construction; and (2) permanent effects that could occur over the lifetime of the project.

Hydraulic conductivity of the subsurface strata is expected to be low along many parts of the Pacheco Pass tunnel alignments based on evaluation of the construction of previous tunnels

nearby and of the geological strata along the proposed tunnel alignment (Authority 2017b). However, certain sections of the tunneled alignments (e.g. fault zones, zones of highly fractured or sheared rock, or other pervious deposits) could exhibit higher hydraulic conductivity, higher rates of groundwater inflow into excavated opening(s) and higher water pressure(s) on tunnel's permanent structure (final liner). Subsurface conditions for the Pacheco tunnels could include groundwater pressures up to 435 psi (Authority 2017b).[2]

The amount of groundwater depletion will depend upon the geotechnical and hydrogeological conditions along the tunnel alignment, the tunnel construction methods utilized, and design features that will minimize such inflows. Temporary inflows into the tunnel and groundwater flow around the outside of the tunnel (annular flow) during construction are likely unavoidable Thus, temporary effects to surface and groundwater conditions are possible even with implementation of this IAMF. Methods implemented to control potential effects will depend on the consequences and nature of the anticipated effects.

The tunnels at Pacheco Pass could be constructed using tunnel boring machine (TBM) tunneling methods or conventional mined tunnel methods such as the sequential excavation method (SEM). Cross passages will most likely be constructed using a conventional mining approach. The table below summarizes the potential for temporary and permanent groundwater effects for the two primary tunneling methods. It should be recognized that potential for groundwater effects also depends on geologic and groundwater conditions as well.

Tunneling Method	Potential for Temporary Groundwater Depletion	Potential for Permanent Groundwater Depletion	Comments
TBM Methods	Low, as inflows typically occur at or close to the tunnel face and are controlled via TBM design that allows watertight construction and may include special measures applied from the TBM or from the surface to lower potential for groundwater inflows into the tunnel	Very low especially with the provision of a watertight lining. Also, grouting around precast segmental liner will lower potential for directional groundwater depletion due to annular flows along the tunnel alignment	Generally, TBM tunnels will have a one-pass precast concrete segmental lining designed to be watertight
Conventional Mining or SEM Methods	Can be higher; inflows along the entire tunnel alignment can be controlled by special measures until final lining is installed	Very low since a watertight lining is usually provided	Initial lining installed using this approach is usually not a watertight lining. Special measures (grouting) can control higher inflows during sequential excavation and initial liner construction. Drainage system may be provided to reduce hydrostatic pressures on final lining; however, such system is usually not practical in long tunnels due to requirement for continuous maintenance measures of the drainage system components (cleanouts, piping).

Tunnel Design to Avoid Permanent Groundwater Depletion

[2] California High Speed Rail Authority. 2017b. Conceptual Tunnel Design and Constructability Considerations for Pacheco Pass – Draft PEPD. Project Section: San Jose to Central Valley Wye. May.

Tunnels shall be designed to be watertight, smooth, durable, and low maintenance to generally maintain existing groundwater levels over the tunnel structures throughout the tunnel design service life. Tunnel lining shall consist of one- or two-pass lining systems to meet HSR design criteria requirements.

TBM Methods - One-pass tunnel lining construction entails the installation of a precast concrete segmental lining with gaskets at each segment joint to construct an essentially watertight tunnel lining. The segmental lining is installed from within the shield at the rear of a TBM. A dual system of gaskets can be utilized to increase safety factors for resisting water pressures and arrest groundwater intrusion into the final tunnel structure. The feasibility for watertight linings are generally limited to magnitudes of water pressure less than 40 bars (580 psi)[3].

A two-pass tunnel lining system involves two stages of construction and will be used in tunnels where groundwater pressures exceed the capacity of state-of-the-art one-pass linings available at the time of project construction. During the first stage of construction, an initial ground support system (e.g. precast segmental lining for a TBM tunnel) will be erected during the excavation cycle to maintain stability of the excavated opening, minimize water inflows and protect workers. During the second stage, a watertight membrane together with a cast-in-place concrete liner will be installed as the final component and permanent support of a two-pass lining system. This two-pass lining approach has been used in long, high-speed rail tunnel projects with high ground water pressures, such as in tunnels in the Lyon-Turin line, the Gotthard Base Tunnel (Switzerland), and the Vienna-St. Pölten Railway Line (Austria).

Conventional Tunneling Methods – Conventional tunneling methods using drill and blast or mechanical excavation will also be designed to be undrained and watertight to arrest or minimize potential groundwater depletion effects. The initial concrete linings used for temporary excavation support will likely consist of sprayed shotcrete, reinforced or unreinforced, and may be preceded by implementation of grouting measures that may control groundwater inflows during excavation. Following application of initial shotcrete support and prior to installation of permanent (final) lining, a waterproofing membrane will be installed. Often ‘compartmentalization’ of waterproofing membrane is implemented, including grouting hoses, to allow local repairs to be made later in case groundwater leakage is identified in course of the liner service life. The shape and size of the tunnel cross section of a conventionally mined tunnel will be designed and adjusted to accommodate ground conditions, including potentially high groundwater pressures.

The specific tunnel lining type will be determined during final design, informed by Phase 2 geotechnical investigations proximate to the tunnel alignment. The Contractor shall utilize state-of-the-art technology available to ensure that potential groundwater depletion is avoided or minimized to the greatest degree practicable.

Construction Methods to Minimize Temporary Groundwater Depletion

The following construction methods shall be employed to avoid and minimize temporary groundwater depletion due to tunnel construction.

TBM Methods - TBM requirements shall include:

- Capability to control potential water inflows by using a closed-face, shielded TBM including special shield provisions (multiple brush system with inflatable seals) to maintain waterproofed excavation on a temporary basis prior to segmental liner installation;
- Capability of systematic probe drilling, monitoring of water inflows, and pre-excavation grouting and backfilling with two-component grout. Grouting requirements include providing adequate backfill grouting, monitoring grout volumes, and using appropriate grout mixes to prevent grout washout; these measures will improve watertight performance of tunnel linings; and

[3] See discussion of Hallandsas Tunnel and Arrowhead Tunnels in Authority (2017a).

- Check-grouting through dedicated sockets in precast segmental liner to completely fill the annular opening due to TBM over-excavation, between the segments and the ground.

Pre-excavation grouting can be performed from the TBM, provided the TBM is delivered with built-in capability, including grout ports through the TBM cutter-head and through the shield, and set-up for concurrent drilling and grouting of multiple holes. For predominantly non-cohesive soils, or cohesive soils, Slurry TBMs or Earth Pressure Balance (EPB) TBMs, respectively, as well as variable density TBMs, use pressurized tunnel face and pressurized tunnel perimeter around the tunnel shield to counterbalance external earth and groundwater pressures to minimize groundwater inflow during tunnel construction and work in concert with special layered shield brush-system with inflatable seals, to assure shield water-tightness during the tunnel excavation.[4]

Conventional Tunneling Methods – Conventional tunneling methods require access to the open face of the tunnel are limited to ground which can remain stable during excavation. In very hard rock, drill and shoot methods are required. In medium to soft rock, a road header can be employed and in stiff clay and soil an excavator can be used. Conventional tunneling is a very flexible method and can adapt to varying ground conditions and changing geometry. Support type and excavation methods can be adapted to meet the ground conditions including the ability to vary the support types, size of opening, ring closure time and the excavation technique as well as other factors. Tunneling can be done full face or in several drifts and benches. Typically, the cyclic steps of excavation included loosening and removing material in short sets of 3 feet to 10 feet before placing support measures. The freshly exposed ground must remain stable long enough to allow workers time to put initial support measures such as dowels, mesh, shotcrete, and lattice girders in place. The face and sides of the tunnel are exposed during the time between excavation and placement of support. For this reason, conventional tunneling methods are limited to stiff soil or rock. Construction below the water table in fractured rock or highly permeable ground such as sand, requires ground modification measures such as grouting or ground freezing in advance of excavation. Such measures are usually employed for short stretches of tunnel or adits but generally are cost prohibitive for long tunnels where use of a TBM is much more economical.

In conventional mined tunnel segments and cross passages, the Contractor shall use pre-excavating grouting techniques as the preliminary primary method of groundwater control to lower ground permeability and minimize or arrest ground water inflow into the excavated openings, prior to excavation of cross passages and other underground structures. Pre-excavation grouting will be adjusted as necessary to control ground water inflows. Pre-excavation grouting for conventionally mined tunnels will be carried out within the tunnel by face grouting or radial grouting. Ground improvement measures such as jet grouting and ground freezing, as applicable to specific ground conditions, are other methods which may be used to stabilize the excavation and seal off water during construction. As tunnel inflows may become mixed with construction materials such as concrete and grout that could otherwise affect water quality, tunnel inflows will be collected and pre-treated prior to any discharge into surface water or groundwater as necessary to maintain baseline water quality.

Monitoring and Remedial Action

Hydrogeologic information from pre-construction subsurface investigations will be used to model existing hydrogeologic features and evaluate potential effects of tunneling on the local groundwater regime. Based on assessment of existing conditions and anticipated effects of construction to groundwater regime, the contractor will identify the specific methods (based on the methods described above) to minimize construction effects to the existing groundwater regime and suggest refined tunnel excavation methods and/or design to minimize or eliminate the risk and likelihood of impacts to groundwater.

[4] State-of-the-art of slurry and EPB technology limits maximum pressure to approximately 17 bars/247 psi (570 feet of hydrostatic pressure). These TBM's can be utilized where feasible.

In order to check that these approaches are performing as anticipated, a groundwater instrumentation and monitoring program will be implemented. Prior to any disturbance of the groundwater regime by construction or pre-construction activities, baseline groundwater and surface water conditions will be established by systematic monitoring for a period of at least three years. Baseline monitoring shall include measurements of groundwater levels and groundwater quality as well as measurements of flow rates and hydroperiod of surface water features including creeks and ponds and precipitation.

During tunnel construction and operation, monitoring of groundwater conditions shall consist of systematic observation, measurement, and reporting of changes in 1) water levels in monitoring wells and existing water supply wells; 2) conditions at local springs and surface water bodies; 3) groundwater and surface water chemistry; and 4) quantity and quality of groundwater inflows to the tunnel.

Should unanticipated groundwater inflows be such that excavation by conventional tunneling methods is only possible with dewatering, design of dewatering measures shall specify horizontal and vertical limits on lowering of the groundwater table. Controlled dewatering, if necessary, could be accomplished by vertical or horizontal wells or vacuum drains and could be done from the ground surface or from within the tunnel. If monitoring and modeling indicate that water levels outside of the immediate vicinity of the tunnel could be affected, a simultaneous pumping and recharge system could be used to maintain existing water levels away from the immediate vicinity of the tunnel.

Following initial construction of the tunnel, if groundwater inflow and/or annular flow around the completed tunnel indicates substantial ongoing groundwater depletion, then remedial action, primarily consisting of additional grouting into void spaces around the tunnel exterior and/or other appropriate actions shall be employed.

Land Use, Development, and Station Planning

LU-IAMF#1: HSR Station Area Development: General Principles and Guidelines

Prior to Operation and Maintenance, the Authority shall prepare a memorandum for each station describing how the Authority's station area development principles and guidelines are applied to achieve the anticipated benefits of station area development. Refer to HSR Station Area Development General Principles and Guidelines, February 3, 2011.

LU-IAMF#2: Station Area Planning and Local Agency Coordination

Prior to Operation and Maintenance, the Authority shall prepare a memorandum for each station describing the local agency coordination and station area planning conducted to prepare the station area for HSR operations. Refer to HSR Station Area Development: General Principles and Guidelines, February 3, 2011.

LU-IAMF#3: Restoration of Land Used Temporarily During Construction

Prior to any ground disturbing activities at the site of land to be used temporarily during construction, the Contractor shall prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation and successful achievement of restoration for temporary impacts. Before beginning construction use of land, the Contractor shall submit the restoration plan to the Authority for review and obtain Authority approval. The restoration plan shall include time-stamped photo documentation of the pre-construction conditions of all temporary staging areas. All construction access, mobilization, material laydown, and staging areas will be returned to a condition equal to the pre-construction staging condition. This requirement is included in the design-build construction contract requirements.

Noise and Vibration

NV-IAMF#1: Noise and Vibration

Prior to Construction, the Contractor shall prepare and submit to the Authority a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts will be employed when work is being conducted within 1,000 feet of sensitive receptors. Typical construction practices contained in the FTA and FRA guidelines for minimizing construction noise and vibration impacts include the following:

- Construct noise barriers, such as temporary walls or piles on excavated material, between noisy activities and noise sensitive resources.
- Route truck traffic away from residential streets, when possible.
- Construct walled enclosures around especially noisy activities or around clusters or noise equipment.
- Combine noisy operations so that they occur in the same period.
- Phase demolition, earthmoving, and ground impacting operations so as not to occur in the same time period.
- Avoid impact pile driving where possible in vibration sensitive areas.

Parks, Recreation, and Open Space

PK-IAMF#1: Parks, Recreation, and Open Space

Prior to Construction, the Contractor shall prepare and submit to the Authority a technical memorandum that identifies project design features to be implemented to minimize impacts on parks, recreation and open space. Typical design measures to avoid or minimize impacts to parks and recreation may include:

- Provide safe and attractive access for present travel modes (e.g., motorists, bicyclists, pedestrians—as applicable) to existing park and recreation facilities.
- Design guideway, system, and station features in such a way as to enhance the surrounding local communities. Provide easy crossings of the guideway which allows for community use under the guideway or at station areas.

Public Utilities and Energy

PUE-IAMF#1: Design Measures

The HSR project design incorporates utilities and design elements that minimize electricity consumption (e.g., using regenerative braking, energy-saving equipment on rolling stock and at station facilities, implementing energy saving measures during construction, and automatic train operations to maximize energy efficiency during operations). Thus, the project will not overburden utility services. The design elements are included in the design build contract. Additionally, the Authority has adopted a sustainability policy that establishes project design and construction requirements that avoid and minimize impacts.

PUE-IAMF#2: Irrigation Facility Relocation

Where relocating an irrigation facility is necessary, the Contractor will verify the new facility is operational prior to disconnecting the original facility, where feasible. Irrigation facility relocation preferences are included in the design-build contract and reduce unnecessary impacts to continued operation of irrigation facilities. The Contractor shall document all relocations in a memorandum for Authority review and approval.

PUE-IAMF#3: Public Notifications

Prior to Construction in areas where utility service interruptions are unavoidable, the Contractor will notify the public through a combination of communication media (e.g., by phone, email, mail, newspaper notices, or other means) within that jurisdiction and the affected service providers of the planned outage. The notification will specify the estimated duration of the planned outage and will be published no less than 7 days prior to the outage. Construction will be coordinated to avoid interruptions of utility service to hospitals and other critical users. The Contractor will submit the public communication plan to the Authority 60 days in advance of the work for verification that appropriate messaging and notification are to be provided.

PUE-IAMF#4: Utilities and Energy

Prior to Construction, the Contractor shall prepare a technical memorandum documenting how construction activities will be coordinated with service providers to minimize or avoid interruptions. It will include upgrades of existing power lines to connect the HSR System to existing utility substations. The technical memorandum shall be provided to the Authority for review and approval.

Safety and Security

SS-IAMF#1: Construction Safety Transportation Management Plan

Prior to Construction (any ground disturbing activity), the Contractor shall prepare for submittal to the Authority a construction safety transportation management plan. The plan will describe the contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access. The plan will also specify the Contractors procedures for implementing temporary road closures including: access to residences and businesses during construction, lane closures, signage and flag persons, temporary detour provisions, alternative bus and delivery routes, emergency vehicle access, and alternative access locations. The Contractor shall prepare and submit monthly reports to the Authority documenting construction transportation plan implementation activities for compliance monitoring.

SS-IAMF#2: Safety and Security Management Plan

Sixty days after receiving from the Authority a construction notice-to-proceed, the Contractor shall provide the Authority with a technical memorandum documenting how the following requirements, plan, programs and guidelines were considered in design, construction and eventual operation to protect the safety and security of construction workers and users of the HSR. The Contractor shall be responsible for implementing all construction-related safety and security plans and the Authority shall be responsible for implementing all safety and security plans related to HSR operation.

- Workplace worker safety is generally governed by the Occupational Health and Safety Act of 1970, which established the OSHA. OSHA establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, OSHA enforcement of workplace requirements is performed by California Occupational Safety and Health Administration (Cal OSHA). Under Cal OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program.
- The Authority has adopted a Safety and Security Management Plan to guide the safety and security activities, processes, and responsibilities during design, construction and implementation phases of the project to protect the safety and security of construction workers and the public. A Systems Safety Program Plan (SSPP) and a System Security Plan will be implemented prior to the start of revenue service to guide the safety and security of the operation of the high-speed rail system.

- Prior to Construction, the Contractor shall provide the Authority with a Safety and Security Management Plan documenting how they will implement the Authority's safety and security requirements within their project scope.
- Implement site-specific health and safety plans and site-specific security plans to establish minimum safety and security guidelines for contractors of, and visitors to, construction projects. Contractors will be required to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites.
- Preparation of a Valley Fever action plan that includes: A) information on causes, preventative measures, symptoms, and treatments for Valley Fever to individuals who could potentially be exposed through construction activities (i.e., construction workers, monitors, managers, and support personnel); B) continued outreach and coordination with California Department of Public Health; C) coordination with county departments of public health to ensure that the above referenced information concerning Valley Fever is readily available to nearby residents, schools, and businesses and to obtain area information about Valley Fever outbreaks and hotspots; and D) provide a qualified person dedicated to overseeing implementation of the Valley Fever prevention measures to encourage a culture of safety of the contractors and subcontractors. The Valley Fever Health and Safety (VFHS) designee shall coordinate with the county Public Health Officer and oversee and manage the implementation of Valley Fever control measures. The VFHS designee is responsible for ensuring the implementation of measures in coordination with the county Public Health Officer. Medical information will be maintained following applicable and appropriate confidentiality protections. The VFHS in coordination with the county Public Health Officer will determine what measures will be added to the requirements for the Safety and Security Management Plan regarding preventive measures to avoid Valley Fever exposure. Measures shall include, but are not limited to the following: A) train workers and supervisors on how to recognize symptoms of illness and ways to minimize exposure, such as washing hands at the end of shifts; B) provide washing facilities nearby for washing at the end of shifts; C) provide vehicles with enclosed, air conditioned cabs and make sure workers keep the windows closed; D) equip heavy equipment cabs with high efficiency particulate air (HEPA) filters; and E) make NIOSH approved respiratory protection with particulate filters as recommended by the CDPH available to workers who request them.
- System safety program plans incorporate FRA requirements and are implemented upon FRA approval. FRA's SSPPs requirements will be determined in FRA's new System Safety Regulation (49 CFR 270).
- Rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules and practices, passenger safety, emergency response, and passenger equipment safety standards found in 49 CFR Parts 200-299.
- The HSR *Urban Design Guidelines* (Authority 2011) require implementing the principles of crime prevention through environmental design. The contractor shall consider four basic principles of crime prevention through environmental design during station design and site planning: territoriality (design physical elements that express ownership of the station or site); natural surveillance (arrange physical features to maximize visibility); improved sightlines (provide clear views of surrounding areas); and access control (provide physical guidance for people coming and going from a space). The HSR design includes emergency access to the rail right-of-way, and elevated HSR structure design includes emergency egress points.
- Implement fire/life safety and security programs that promote fire and life safety and security in system design, construction, and implementation. The fire and life safety program is coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes. The Authority will establish fire/life safety and security committees throughout the HSR section.

- Implement system security plans that address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. A dedicated police force will ensure that the security needs of the HSR system are met.
- The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections and the provision of appropriate space as defined by fire and safety codes along at-grade sections of the alignment to allow for emergency response access.
- Implement standard operating procedures and emergency operating procedures, such as the FRA-mandated Roadway Worker Protection Program to address the day-to-day operation and emergency situations that will maintain the safety of employees, passengers, and the public.

SS-IAMF#3: Hazard Analyses

The Authority's hazard management program includes the identification of hazards, assessment of associated risk, and application of control measures (mitigation), to reduce the risk to an acceptable level. Hazard assessment includes a preliminary hazard analysis (PHA) and threat and vulnerability assessment (TVA).

- The Authority's programmatic PHAs are developed in conformance with the FRA's *Collison Hazard Analysis Guide: Commuter and Intercity Passenger Service* (FRA 2007) and the U.S. Department of Defense's System Safety Program Plan (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed by—and either eliminated or minimized—the design.
- TVAs establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations. Provisions include right-of-way fencing, intrusion detection, security lighting, security procedures and training, and closed-circuit televisions. Intrusion-detection technology could also alert to the presence of inert objects, such as toppled tall structures or derailed freight trains, and stop HSR operations to avoid collisions.
- During design and construction, the Contractor will conduct site-specific PHA and TVA assessments to apply the programmatic work to their specific project designs.

The Authority's safety and security committees will be responsible for implementing the recommendations contained in the hazard analysis during HSR operation.

SS-IAMF#4: Oil and Gas Wells

Prior to ground disturbing activities, the Contractor shall identify and inspect all active and abandoned oil and gas wells within 200 feet of the HSR tracks. Any active wells will be abandoned and relocated by the Contractor in accordance with the California Department of Conservation, Division of Oil, and Gas and Geothermal Resources (DOGGR) standards in coordination with the well owners. In the event that relocated wells do not attain the current production rates of the now-abandoned active wells, the Authority will be responsible for compensating the well owner for lost production. All abandoned wells within 200 feet of the HS tracks will be inspected and re-abandoned, as necessary, in accordance with DOGGR standards and in coordination with the well owner. The Contractor will provide the Authority with documentation that the identification and inspection of the wells has occurred prior to construction.

Socioeconomics and Communities

SOCIO-IAMF#1: Construction Management Plan

Prior to Construction, the Contractor shall prepare a CMP providing measures that minimize impacts on low-income households and minority populations. The plan shall be submitted to the Authority for review and approval. The plan will include actions pertaining to communications, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize

impacts on low-income households and minority populations. The plan will verify that property access is maintained for local businesses, residences, and emergency services. This plan will include maintaining customer and vendor access to local businesses throughout construction by using signs to instruct customers about access to businesses during construction. In addition, the plan will include efforts to consult with local transit providers to minimize impacts on local and regional bus routes in affected communities.

SOCIO-IAMF#2: Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act.

The Authority must comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended (Uniform Act). The provisions of the Uniform Act, a federally mandated program, will apply to all acquisitions of real property or displacements of persons resulting from this federally assisted project. It was created to provide for fair and equitable treatment of all affected persons. Additionally, the Fifth Amendment of the U.S. Constitution provides that private property may not be taken for a public use without payment of "just compensation."

The Uniform Act requires that the owning agency provide notification to all affected property owners of the agency's intent to acquire an interest in their property. This notification includes a written offer letter of just compensation. A right-of-way specialist is assigned to each property owner to assist him or her through the acquisition process. The Uniform Act also provides benefits to displaced individuals to assist them financially and with advisory services related to relocating their residence or business operation. Benefits are available to both owner occupants and tenants of either residential or business properties.

The Uniform Act requires provision of relocation benefits to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits to which eligible owners or tenants may be entitled are determined on an individual basis and explained in detail by an assigned right-of-way specialist.

The California Relocation Assistance Act essentially mirrors the Uniform Act and also provides for consistent and fair treatment of property owners. However, because the project will receive federal funding, the Uniform Act takes precedence. Owners of private property have federal and state constitutional guarantees that their property will not be acquired or damaged for public use unless owners first receive just compensation. Just compensation is measured by the "fair market value," where the property value is considered to be the highest price negotiated on the date of valuation. The value must be agreed upon by a seller who is willing, not obliged to sell, but under no particular or urgent necessity and by a buyer who is ready, willing, and able to buy but under no particular necessity. Both the owner and the buyer must deal with the other with the full knowledge of all the uses and purposes for which the property is reasonably adaptable and available (Code of Civil Procedure Section 1263.320a).

More detailed information about how the Authority plans to comply with the Uniform Act and the California Relocation Assistance Act is provided in the following three detailed relocation assistance documents modeled after Caltrans versions:

- *Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Residential)*
- *Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Mobile Home)*
- *Your Rights and Benefits as a Displaced Business, Farm, or Nonprofit Organization under the Uniform Relocation Assistance Program*

SOCIO-IAMF#3: Relocation Mitigation Plan

Before any acquisitions occur, the Authority will develop a relocation mitigation plan, in consultation with affected cities and counties and property owners. In addition to establishing a program to minimize the economic disruption related to relocation, the relocation mitigation plan will be written in a style that also enables it to be used as a public-information document.

The relocation mitigation plan will be designed to meet the following objectives:

- Provide affected property and business owners and tenants a high level of individualized assistance in situations when acquisition is necessary and the property owner desires to relocate the existing land use.
- Coordinate relocation activities with other agencies acquiring property resulting in displacements in the study area to provide for all displaced persons and businesses to receive fair and consistent relocation benefits.
- Make a best effort to minimize the permanent closure of businesses and non-profit agencies as a result of property acquisition.
- Within the limits established by law and regulation, minimize the economic disruption caused to property owners by relocation.
- In individual situations, where warranted, consider the cost of obtaining the entitlement permits necessary to relocate to a suitable location and take those costs into account when establishing the fair market value of the property.
- Provide those business owners who require complex permitting with regulatory compliance assistance.

The relocation mitigation plan will include the following components:

- A description of the appraisal, acquisition, and relocation process as well as a description of the activities of the appraisal and relocation specialists.
- A means of assigning appraisal and relocation staff to affected property owners, tenants, or other residents on an individual basis.
- Individualized assistance to affected property owners, tenants, or other residents in applying for funding, including research to summarize loans, grants, and federal aid available, and research areas for relocation.
- Creation of an ombudsman's position to act as a single point of contact for property owners, residents, and tenants with questions about the relocation process. The ombudsman will also act to address concerns about the relocation process as it applies to the individual situations of property owners, tenants, and other residents.

Transportation

TR-IAMF#1: Protection of Public Roadways during Construction

Prior to Construction, the Contractor shall provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the proposed project site. The photographic survey shall be submitted for approval to the agency responsible for road maintenance and the Authority. The Contractor shall be responsible for the repair of any structural damage to public roadways caused by HSR construction or construction access, returning any damaged sections to the equivalent of their original pre HSR construction structural condition or better. The Contractor shall survey the condition of the public roadways along truck routes providing access to the proposed project site after construction is complete. The Contractor shall complete a before- and after-survey report and submit it to the Authority for review, indicating the location and extent of any damage.

TR-IAMF#2: Construction Transportation Plan

The design-build contractor shall prepare a detailed Construction Transportation Plan (CTP) for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways in close consultation with the local jurisdiction having authority over the site. The Authority must review and approve the CTP before the Contractor commences any construction activities. This plan will address, in detail, the activities to be carried out in each

construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The CTP will provide traffic controls pursuant to the *California Manual on Uniform Traffic Control Devices* sections on temporary traffic controls (Caltrans 2012) and will include a traffic control plan that includes, at a minimum, the following elements:

- Temporary signage to alert drivers and pedestrians to the construction zone.
- Flag persons or other methods of traffic control.
- Traffic speed limitations in the construction zone.
- Temporary road closures and provisions for alternative access during the closure.
- Detour provisions for temporary road closures—alternating one-way traffic will be considered as an alternative to temporary closures where practicable and where it will result in better traffic flow than a detour.
- Identified routes for construction traffic.
- Provisions for safe pedestrian and bicycle passage or convenient detour.
- Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practicable—where road closures are required during construction, limit to the hours that are least disruptive to access for the adjacent land uses.
- Provisions for farm equipment access.
- Provisions for 24-hour access by emergency vehicles.
- Safe vehicular and pedestrian access to local businesses and residences during construction. The plan will provide for scheduled transit access where construction will otherwise impede such access. Where an existing bus stop is within the work zone, the design-builder will provide a temporary bus stop at a safe and convenient location away from where construction is occurring in close coordination with the transit operator. Adequate measures will be taken to separate students and parents walking to and from the temporary bus stop from the construction zone.
- Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to provide for the safety of schoolchildren. Review existing or planned Safe Routes to Schools with school districts and emergency responders to incorporate roadway modifications that maintain existing traffic patterns and fulfill response route and access needs during project construction and HSR operations.
- Identification and assessment of the potential safety risks of project construction to children, especially in areas where the project is located near homes, schools, day care centers, and parks.
- Promotion of child safety within and near the project area. For example, crossing guards could be provided in areas where construction activities are located near schools, day care centers, and parks.

CTPs will consider and account for the potential for overlapping construction projects.

TR-IAMF#3: Off-Street Parking for Construction-Related Vehicles

The Contractor shall identify adequate off-street parking for all construction-related vehicles throughout the construction period to minimize impacts to public on-street parking areas. If adequate parking cannot be provided on the construction sites, the Contractor shall designate a remote parking area and arrange for the use a shuttle bus to transfer construction workers to/from the job site. This measure shall be addressed in the CTP.

TR-IAMF#4: Maintenance of Pedestrian Access

The Contractor shall prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Actions that limit pedestrian access will include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, provide covered walkways and fencing. The plan objective shall be to maintain pedestrian access where feasible (i.e., meeting design, safety, Americans with Disabilities Act (ADA) requirements). This measure shall be addressed in the CTP.

TR-IAMF#5: Maintenance of Bicycle Access

The Contractor shall prepare specific construction management plans to address maintenance of bicycle access during the construction period. Actions that limit bicycle access will include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period. Maintain bicycle access where feasible (i.e., meeting design, safety, ADA requirements). This measure shall be addressed in the CTP.

TR–IAMF#6: Restriction on Construction Hours

The Contractor shall limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to minimize impacts to traffic on roadways. The contractor shall limit the number of construction employees arriving or departing the site between the hours of 7 a.m. and 8:30 a.m. and 4:30 p.m. and 6 p.m. Areas where these restrictions will be implemented will be determined as part of the CTP. Based on Authority review of the CTP the restricted hours maybe altered due to local travel patterns.

TR-IAMF#7: Construction Truck Routes

The Contractor shall deliver all construction-related equipment and materials on the appropriate truck routes and shall prohibit heavy-construction vehicles from using alternative routes to get to the site. Truck routes will be established away from schools, day care centers, and residences, or along routes with the least impact if the Authority determines those areas are unavoidable. This measure shall be addressed in the CTP.

TR-IAMF#8: Construction during Special Events

The Contractor shall provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that substantially (10 percent or more) increase traffic on roadways affect by project construction. Mechanisms include the presence of police officers directing traffic, special-event parking, use of within-the-curb parking, or shoulder lanes for through-traffic and traffic cones. This measure shall be addressed in the CTP.

TR-IAMF#9: Protection of Freight and Passenger Rail during Construction.

The Contractor shall repair any structural damage to freight or public railways that may occur during the construction period, and return any damaged sections to their original structural condition. If necessary, during construction, a “shoofly” track will be constructed to allow existing train lines to bypass any areas closed for construction activities. Upon completion, tracks will be opened and repaired; or new mainline track will be constructed, and the “shoofly” will be removed. Contractor repair responsibility will be included in the design/build contract.

TR-IAMF#10: Off Peak Hour Employee Work Shift Changes at HMF *[as applicable to HMF-related sections or the HMF project]*

The Authority will time work shifts for the heavy maintenance facility (HMF) facilities so the shifts do not coincide with local peak hour travel period. When the HMF employees arrive and depart,

they will do so during a non-peak period for local traffic. As a result, the total volumes on the roads during shift changes will be less than the volumes that occur during the local peak periods.

TR-IAMF#11: Maintenance of Transit Access.

The Contractor shall prepare specific construction management plans to address maintenance of transit access during the construction period. Actions that limit transit access will include, but not be limited to, roadway lane closures or narrowing, closure or narrowing of streets that are designated transit routes, bus stop closures, bridge closures, placement of construction-related materials within designated transit lanes, bus stop or layover zones or along transit routes, and other actions that may affect the mobility or safety of bus transit during the construction period. Maintain transit access where feasible (i.e., meeting design, safety, ADA requirements). This measure shall be addressed in the CTP.

TR-IAMF#12: Pedestrian and Bicycle Safety

Prior to construction, the Contractor shall provide a technical memorandum describing how pedestrian and bicycle accessibility will be provided and supported across the HSR corridor, to and from stations and on station property. Priority of safety for pedestrians and bicycles and vulnerable populations over motor vehicle access will be done in a way so as to encourage maximum potential access from non-motorized modes. Local access programs, such as Safe Routes to Schools, shall be maintained or enhanced. Access to community facilities for vulnerable populations shall be maintained or enhanced.

APPENDIX 2-F: PG&E NETWORK UPGRADES

APPENDIX 2-F: PG&E NETWORK UPGRADES

Introduction

Connecting the HSR system to the statewide electrical grid would require upgrades to existing Pacific Gas and Electric Company (PG&E) network facilities to serve the increased electrical load during operation.

Network Upgrades

The reconductoring of the existing single-circuit 9.8 mile Metcalf to Morgan Hill and the 10.8 mile Morgan Hill to Llagas 115 kV Power Lines (carried on the same set of self-supporting lattice steel towers) (Figure 1-1) would entail replacing the existing single-circuit lines comprising three conductors (i.e., 0.73- and 0.974-inch-diameter specular 715-15 and 715.5-37 AAC conductor, respectively) with larger sized conductor having a summer emergency rating higher than 940 Amps.

The existing single circuit line from Metcalf to Morgan Hill line is supported by 74 structures: 62 lattice steel towers (ie. four concrete footings with no guy wires/rods), 10 wood poles to be replaced, 1 tubular steel pole, and 1 new pole, The Morgan Hill to Llagas existing single-circuit lines are supported by 66 structures:62 lattice steel towers, three lattice steel poles (i.e., one footing and four guy wires/rods), and one tubular steel poles (TSP), all ranging from 82 to 102 feet tall, with an average height of approximately 95 feet. The lattice steel towers and poles could be raised or replaced with new lattice steel towers and poles with non-reflective finishes; replacement structures would be approximately 25 feet taller than the existing ones. It is assumed that the existing towers and poles would be replaced, only where necessary. The cross-arms of the TSPs would be reframed to support the new conductor.

Construction

Power Line Reconductoring

Power line reconductoring would require the following:

- Staging areas/helicopter landing zones/pull and tension sites
- Access roads
- Tower removal/modifications
- New tower installation
- Vegetation clearance and removal
- Erosion and sediment control and pollution prevention
- Best management practices (BMP)
- Site cleanup and waste disposal

Power lines would be designed to be bird- and raptor-safe in accordance with the applicable recommendations presented in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (APLIC 2012).

Staging Areas/Work Areas/Helicopter Landing Zones/Pull Sites

Site preparation is not expected to be necessary for most of the staging areas, work areas, helicopter landing zones, and pull sites; however, some limited surface blading, grading, and filling to create a stable and level staging area would take place as needed. Some vegetation/crop removal, tree trimming, and matting or plating of drainage crossings may be required for vehicle access.

Construction materials would be delivered by line trucks using existing paved, dirt, and gravel roads and overland travel routes. For remote or environmentally sensitive areas, helicopter access may be required.

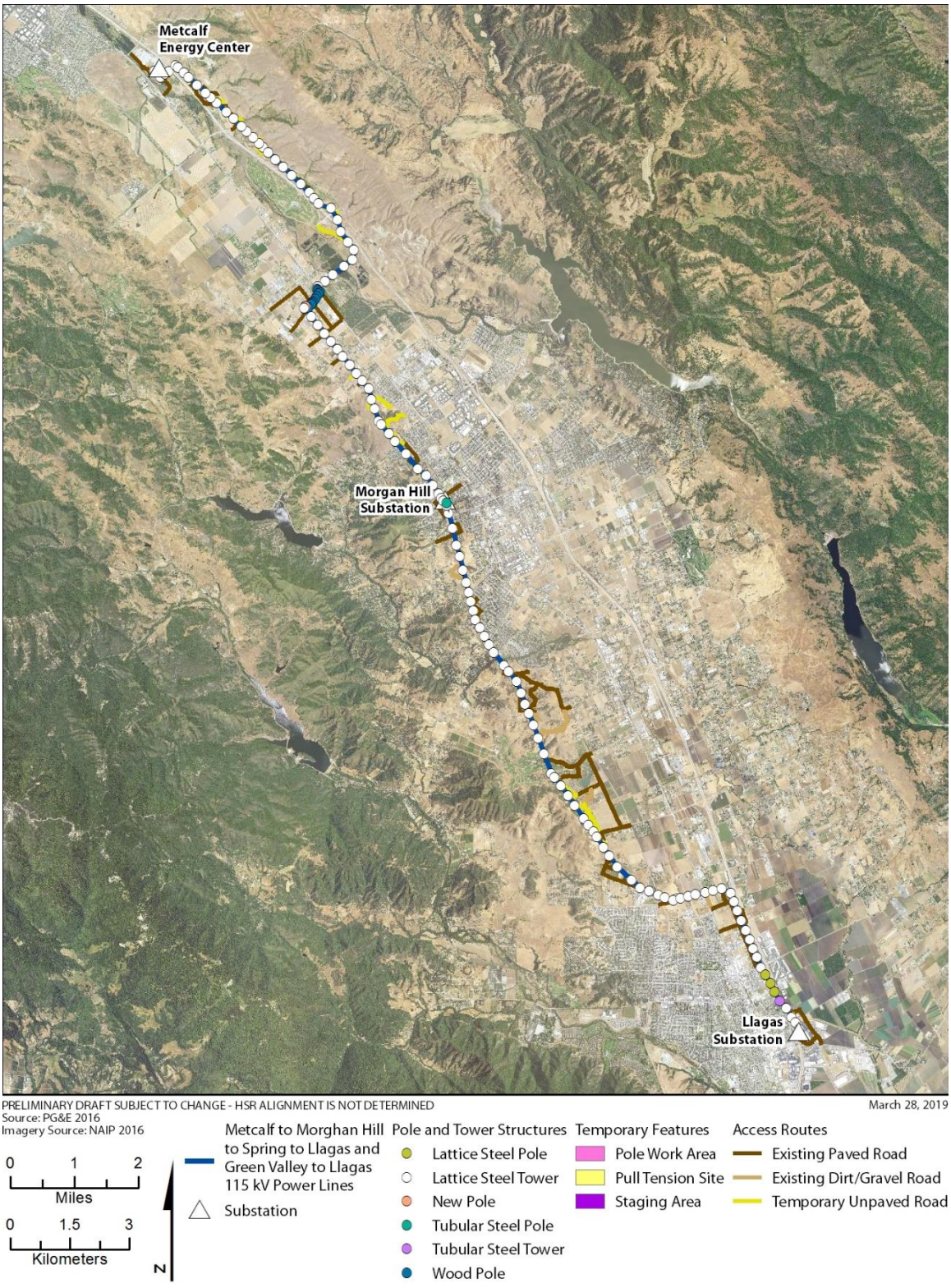


Figure 1-1 Morgan Hill to Llagas 115 kV Power Lines

Staging Areas

Construction of the project would require temporary staging and storage areas to store materials and equipment during the construction process. Materials and equipment typically staged at these areas would include construction materials; construction vehicles and facilities; crew vehicles; material removed from the existing power lines awaiting salvage, recycling, or disposal; and portable stations for concrete cleanup.

Work Areas

Modifications to lattice steel towers and poles, removal of existing lattice steel towers and poles, and assembly and installation of lattice steel towers and poles would require a maximum 0.30-acre work area at each structure site.

Pull Sites

Pull sites would be used during construction to stage conductor-pulling trucks and conductor reel trucks to install the new conductors onto the lattice steel towers and poles. To haul the conductor to the site, reel trailers with reel stands would be mounted on a line truck. On the line truck, pullers would be mounted to install the conductor. The old conductor would be removed from the sites on a line truck.

Access

The project would be accessed using existing paved, dirt, and gravel roads and temporary unpaved access roads that would be constructed for the project. Temporary unpaved access roads will be used if no existing roads can be feasibly used. No new permanent access roads would be constructed for reconductoring. Upgrades would performed within the existing access road corridor and would include vegetation removal, grading, filling, and repair and maintenance activities. Portions of some unpaved access roads may need to be reestablished and maintained through tree trimming, vegetation clearing, the addition of substrate, and some minor grading or blading. PG&E coordinates with landowners and compensates them for the temporary loss of revenue and reestablishment of any crop required to be removed to accommodate an access road.

Temporary Lane Closure

Temporary lane closures along streets as required for construction activities would be coordinated with local jurisdictions. PG&E is a member of the California Joint Utility Traffic Control Committee, which in 2014 published the *Work Area Protection and Traffic Control Manual*. The traffic control plans and associated text in this manual conform to the guidelines established by the federal and state departments of transportation. PG&E would follow the recommendations in this manual regarding basic standards for the safe movement of traffic on highways and streets in accordance with Section 21400 of the California Vehicle Code. These recommendations include provisions for safe access of police, fire, and other rescue vehicles. Any road closures that must be implemented on private and county roads would not typically last more than a few minutes and would be coordinated with the county or landowner.

Lattice Steel Tower and Pole Removal

Prior to removing the existing lattice steel towers and poles along the Metcalf to Morgan Hill and Morgan Hill to Llagas 115 kV Power Lines, PG&E would install temporary utility shooflies (a line of wood poles) as necessary to temporarily support the lines, allowing them to remain in service during construction. The conductors would be transferred to the shoofly wood poles, allowing workers to unbolt the tower/pole sections and remove them to be lifted by a crane and placed on an adjacent work area for dismantling. The concrete foundations would be removed using a backhoe or air compressor–powered hand tools to about 6 feet below ground with the balance abandoned in place. The remaining hole would be backfilled to grade with the excavated material, supplemented as necessary.

Structure Installation

Temporary Structures

To facilitate safe conductor installation, temporary guard structures (installed alongside roadways [one crossing of U.S. Highway 101 and one crossing of State Route 52] or at utility crossings), snub poles (single wood poles for pulling operations), and line poles (three-pole wood structures to support the temporary lines) could be installed prior to reconductoring.

Installalation of temporary wood poles begins with excavating a pole hole using an auger. Depending on the pole size, the hole dimensions would be 3–4 feet in diameter and 7–16 feet deep. Following excavation, the poles, insulators, and hardware would be delivered to the pole work area and assembled. The poles would be placed in the hole using line trucks or cranes, the remaining void would be backfilled, and the surrounding area would be compacted. Poles would be direct buried (i.e., no foundation or footing) and may be guyed for stability. Once the pole is embedded and the surrounding area is compacted, additional hardware would be installed using a bucket truck.

Permanent Structures

Typical dimensions for power line structures are provided in Table 1-1.

Table 1-1 Summary of Typical Structure Dimensions

Structure Feature	Structure Type	Approximate Metrics
Pole diameter	Temporary wood pole	1–2 feet
	Lattice steel tower	4 feet per footing
	Lattice steel pole	4–7 feet
Auger hole depth	Temporary wood pole	6.5–16 feet
	Lattice steel tower	6–12 feet
	Lattice steel pole	10–24 feet
Footprint	Temporary wood pole	1–3 square feet (temporary)
	Lattice steel tower	600–800 square feet (permanent)
	Lattice steel pole	38.5 square feet (permanent)

Source: Author's compilation 2017

Replacement of lattice steel towers and poles may be required along the Metcalf to Morgan HIll and Morgan Hill to Llagas 115 kV Power Lines. Each lattice steel tower would require four foundations, one for each structure leg, and each lattice steel pole would require one foundation. Workers would place reinforcing steel in each hole along with stub angles, which become part of the lattice steel tower/pole leg itself. Concrete forms that reach up to 2 or 3 feet above natural ground level would be placed over each hole, and concrete would be placed around the reinforcing steel and stub angles up to the top of the form.

Lattice steel tower and pole components, packaged in bundles by structure type, would be dispatched to the staging areas or to the site itself. Individual towers and poles that are assembled immediately adjacent to the foundations would be raised into place using a large crane.

Individual lattice steel towers and poles that are assembled at staging areas would be transported to their locations by helicopter. A typical tower would require two to three "lifts" or trips by helicopter to each tower location. The first lift would transport the lower portion of the tower and subsequent lifts would transport the upper portion(s) of the tower. After the structure is set on the

foundation, crews would tighten all bolts, attach insulators to the cross arms, and prepare the towers for the conductor stringing operation.

Reconductoring

During reconductoring activities, when existing conductor is replaced with new conductor, the existing power line and any distribution lines that cross or are collocated on the line could be taken out of service (known as “taking a clearance”). To avoid potential safety concerns, a road closure or a rolling stop would be arranged for any locations where lines cross over roads before conductor installation begins. Alternatively, guard structures may be installed at road crossings, as mentioned above, in lieu of road closures.

To replace conductor, the existing conductor would first be detached from its support structure and temporarily lifted. Rollers would then be installed at the conductor’s attachment point, and the conductor would be placed onto the rollers. The rollers would allow the conductor to be pulled through each structure. Installing rollers and detaching the existing conductor typically require one bucket truck. Crews would access each staging area by pickup truck or bucket truck, using existing access roads when possible.

Once the rollers are in place for an entire section of conductor, the existing conductor would be pulled out of place. A cable would be attached between the old conductor and new conductor, which would be on a reel attached to a line truck at a pull site. A line truck with a drum puller and empty conductor reel would pull the old conductor onto the reel, where it would be collected for salvage. Reel stands mounted on a line truck at the pull site would feed new conductor along the rollers that were previously installed at each structure, while also maintaining tension in the line so that it does not sag to the ground. After the conductor is pulled into place, conductor sags would be adjusted to required tensions. The conductor would then be clamped to the end of each insulator as the rollers are removed. The final step in the conductor installation process would be to install vibration dampers and other accessories as necessary. Old conductor would be removed from sites on a line truck.

For each line proposed to be reconductored, one dump truck would be required to remove materials. It is not anticipated that reconductoring work would require closure of U.S. Highway 101 or use of a helicopter at any of the crossing locations.

Packing crates, spare bolts, and construction debris would be picked up and hauled away for recycling or disposal during construction. PG&E would conduct a final inspection to confirm that cleanup activities have been successfully completed.

Helicopter Use

Construction activities associated with the Metcalf to Morgan Hill and Morgan Hillto Llagas 115 kV Power Lines may require use of up to two helicopters at one time to facilitate access to work areas. To accommodate use of helicopters, helicopter landing zones would be colocated with staging areas.

The helicopter flight path from the designated day-use landing zones would generally follow the existing alignment and would avoid flying over residences when transporting material and crews. The helicopter would generally be stationed overnight at a public or private use airport within approximately 5 miles of the proposed work area.

The helicopter type would depend on availability at the time of construction; however, the actual helicopter to be used would not be larger than a Bell L3 (long ranger) with a load capacity of approximately 1,200 pounds. The total hours of operation for each helicopter would be an estimated 32 hours (8 days of operation, 4 hours of operation per day, and two landings/take-offs per day), with a maximum of up to 42 hours (7 days of operation, 6 hours of operation per day, and four landings/take-offs per day). It is not anticipated that residents would be required to temporarily vacate their homes; however, in the unlikely event that final construction plans require otherwise, all Federal Aviation Administration (FAA) requirements would be met and PG&E would coordinate with potentially affected residents (providing a minimum of 30 days advance notice) to minimize the necessary work duration and any resultant inconvenience.

Water Usage

Water usage would generally be limited to dust suppression associated with construction activities. Construction associated with the Metcalf to Morgan Hill and Morgan Hill to Llagas 115 kV Power Lines would require up to 2,516,904 gallons of water over the entire construction period, or an average of 2,689 gallons of water per day. PG&E would obtain water from existing municipal supplies. Potable water for construction personnel would be transported to the construction site by construction vehicles. Wastewater services would be provided to the construction workers by portable toilets.

Land Disturbance

The project is anticipated to require temporary land disturbance throughout the entire project area. No net permanent impact would result. No land would be acquired to support construction. Table 1-2 shows anticipated temporary land disturbance in acres. Restoration activities would be conducted as needed and in coordination with landowners.

Approximately 22 cubic yards of material would be excavated at each lattice steel tower location and 34 cubic yards at each lattice steel pole location, for a total of approximately 2,830 cubic yards. Waste and construction materials including concrete footings and soil would be disposed of at appropriately licensed off-site facilities or would be used to backfill the holes from the structures proposed to be replaced.

Table 1-2 Anticipated Land Disturbance

Component	Temporary Land Disturbance (acres)					
	Temporary Access Road	Staging Area	Pull and Tension Site	Work Areas	Helicopter Landing Zone	Total
Metcalf to Morgan HIII	14.7	7.1	4.2	1.1	0.3	27.4
Morgan Hill to Llagas	6.3	13.1	8.5	28.5	0	56.4

Source: Author's compilation 2017

Construction Workforce and Equipment

On a typical work day, 15–20 construction workers would be at any one work area; however, because of the variety of work activities that may be completed concurrently, up to 45 workers may be distributed throughout the project area at any time. During line work, crews typically would be working at adjacent towers/poles. Construction activities would generally be scheduled during daylight hours (7:00 a.m. to 6:00 p.m.) Monday through Saturday. Nighttime construction could occur depending on clearance constraints. Tables 1-3 and 1-4 show details on workers and equipment.

Table 1-3 Typical Construction Workers and Equipment

Activity	Number of Construction Workers	Equipment Quantity and Type
Site preparation	5	1 backhoe, 1 small bulldozer, 1 truck with trailer, 1 500-gallon water truck, 1 light-duty pickup truck
Auger holes	3	1 500-gallon water truck, 1 pickup truck, 1 line truck with auger attachment
Haul material	3	1 line truck with trailer

Activity	Number of Construction Workers	Equipment Quantity and Type
Tower installation	6	1,200-ton crane, up to 2 helicopters
Conductor installation	6 per crew	1 line or semi-truck with conductor reel, 2 pickup trucks, 1 line truck with bucket/crane, 1 line truck with conductor puller, 1 line truck with conductor tensioner, up to 2 helicopters

Source: Author's compilation 2017

Table 1-4 Other Anticipated Construction Equipment

Equipment	Use
Cement and mortar mixer	Lattice steel tower/pole foundations
Dump truck	Trash removal
Excavator/fork lifts	Install mats
Gas crew truck (26,000 lbs.) with trailer	Transport equipment and materials
Generator set	Generate power for operation of tools
Hand-digging equipment	Use for air or hydrologic-operated tooling
Mechanics service trucks	Service and repair vehicles
Motor grader	Grade work areas and access roads
Pickup truck (1 ton)	Transport equipment and materials
Plate compactor	Grading
Pump	Dewater and/or water for dirt suppression, if necessary
Rough terrain forklift	Activities associated with transport of poles
Sweeper/scrubber	Clean roads, if necessary
Vacuum trailer	Clean up potential concrete washout during foundation installation

Source: Author's compilation 2017

Construction Schedule

Construction would begin in 2027 and be completed within approximately 24 months. Due to line outage restrictions, reconductoring of the two lines (Metcalf to Morgan Hill 115 kV Power Line [12 months] and Morgan Hill to Llagas 115 kV Power Line [12 months]) would not take place concurrently.

Operations and Maintenance Activities

Operation and maintenance activities would remain unchanged from current conditions.

APPENDIX 2-G: SUMMARY OF REQUIREMENTS FOR OPERATIONS AND MAINTENANCE FACILITIES

Summary of Requirements for Maintenance Facilities

Prepared by:	Joseph Metzler, Operations	March 14, 2016 Date
Checked by:	Paul Hebditch, Operations	March 14, 2016 Date
	Jonathan Scott, Maintenance	March 14, 2016 Date
Approved by:	Simon Whitehorn, Deputy Director, Operations & Maintenance	March 14, 2016 Date
Released by:	Gary Griggs, Program Director	March 14, 2016 Date

Revision	Date	Description
0	25 Aug 2009	Initial Release as TM 5.3
1	21 Mar 2013	Update for Blended Service Plan, remove from TM format, incorporate Authority comments
2	16 Mar 2016	Full revision confirming maintenance facility locations to support 2016 Business Plan

DRAFT

CONTENTS

1.0 INTRODUCTION 1
1.1 PURPOSE 1
1.2 SOURCE DOCUMENTS 1
1.3 ASSUMPTIONS 2
1.3.1 Rolling stock 2
1.3.2 Heavy and light maintenance facilities for rolling stock 2
1.3.3 General assumptions 2
2.0 FACILITIES SITE LOCATION CRITERIA 4
2.1 RECOMMENDED LOCATIONS 4
2.2 RATIONALE FOR THE LOCATION AND FUNCTION 6
2.2.1 Overview: Rolling Stock Maintenance Facilities 6
2.2.2 Overview: MOI Facilities 6
2.3 LOCATION ANALYSIS 7
2.3.1 Rolling Stock Maintenance Facilities 7
2.3.1.1 Northern California, Phase 1 7
2.3.1.2 HMF in the Central Valley 7
2.3.1.3 LMFs in Southern California for Phase 1 7
2.3.2 Maintenance Of Infrastructure Facilities 9
3.0 FACILITIES DESCRIPTIONS 14
3.1 HEAVY MAINTENANCE FACILITY 14
3.2 LIGHT MAINTENANCE FACILITY 17
3.3 MAINTENANCE OF INFRASTRUCTURE FACILITIES 19
3.4 MAINTENANCE OF INFRASTRUCTURE SIDINGS 20
4.0 OTHER FACTORS 21
4.1 ROADWAY ACCESS AND PARKING 21
4.2 ENVIRONMENTAL CONSIDERATIONS 21
4.3 COMMERCIAL CONSIDERATIONS 22
4.4 CONNECTIVITY ISSUES 22
5.0 APPENDICES 24
5.1 HMF CONCEPT PLAN 24
5.2 HMF CONCEPT PLAN 25
5.3 APPENDIX C: MOIF CONCEPT PLAN 26
5.4 APPENDIX D: MOIS CONCEPT PLAN 27
5.5 APPENDIX E: LOCATION ANALYSIS SUMMARY 28

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to define the Rail Delivery Partner's (RDP) analysis of the optimal siting of facilities for Heavy and Light Maintenance Facilities for rolling stock, and for Maintenance of Infrastructure (MOI) locations across the high speed rail network. The report also provides an updated comprehensive listing of requirements for those facilities throughout the phased implementation of the California High-Speed Rail (HSR) Program.

The type of maintenance facilities required to support the Phase 1 service are as follows:-

- Heavy Maintenance Facility (HMF) for rolling stock
- Light Maintenance Facility (LMF) for rolling stock
- Maintenance of Infrastructure Facility (MOIF)
- Maintenance of Infrastructure Siding (MOIS)

The focus of this report is to update the locations and number of tracks required at each facility to be consistent with the 2016 business plan, taking into account current procurement philosophy, and recent and ongoing developments with respect to environmental clearance and right-of-way acquisition. As such, earlier guidance on such things as track geometry, functional requirements, etc. provided by previously issued technical memoranda and other documents remains in effect except as specifically described in this report.

The overall goal is to better inform at the preliminary design phase the decisions associated with engineering and environmental clearance.

1.2 SOURCE DOCUMENTS

Source documents used to develop this memorandum include:

- Technical Memorandum 5.1, *Terminal and Heavy Maintenance Facility Guidelines,* 8/25/09
- Technical Memorandum 5.3, *Summary Description of Guidelines for: Heavy Maintenance Facility (HMF), Terminal Layup/Storage & Maintenance Facilities & Right-of-Way Maintenance Facilities,* 8/25/09
- Memorandum, Summary of Requirements for O&M Facilities, 3/21/13
- Directive Drawing TM 5.1-A *Heavy Maintenance Facility (HMF) Concept Plan,* 5/29/09
- Directive Drawing TM 5.1-H *MOI Yard*, 8/30/11
- Directive Drawing TM 5.1-I *MOI Siding*, 8/30/11
- *Concept of Operations,* Draft, Rev 5, 12/11/15
- *Maintenance of Infrastructure – Concept and Requirements*, Draft, Rev 3, 6/30/15
- *Rolling Stock Maintenance Plan – Preliminary Draft*, Rev 4, 6/26/12
- *California High Speed Rail Program –Maintenance Facility Location Analysis Dec.8, 2015 ver.02*

The information derived from these source documents has been updated, where appropriate, to reflect the phased-implementation strategy being developed for the California High-Speed Rail Authority's 2016 Business Plan.

1.3 ASSUMPTIONS

1.3.1 Rolling stock

- will be operated and maintained in configurations of 660-foot trainsets, potentially operated in double trainsets of 1,320-foot total length.
- fleet size is expected to grow from a small initial procurement for the early stage service offering, increasing to 90 trainsets for the full Phase 1 service plan.
- maintenance will follow a 5-level hierarchy of functions:
    - Level I – Daily inspections, pre-departure cleaning and testing
    - Level II – Monthly inspections
    - Level III – Quarterly inspections, including wheel-truing
    - Level IV – Annual inspections, including underside/bogie inspection
    - Level V – Overhaul, component change out, commissioning and decommissioning
- The rolling stock life cycle is 25-30 years, including a "heavy" overhaul. Bogie overhaul will occur at 600,000 mile intervals, equating to approximately 3-year cycles and in advance of the heavy overhaul. Heavy overhaul cycles (Level 5) occur at 3-5 year intervals in the rolling stock life cycle, staggered to work through the fleet in stages.
- fleet size includes a nominal 20% margin for trainsets identified as a "spare ratio" and positioned for maintenance/inspection backup, hot standby for breakdowns, and seasonal or other service demand fluctuations. It is assumed that 10% of the fleet will be out of revenue service awaiting or undergoing maintenance. Storage space for accommodating reserve equipment is accounted for in each facility.

1.3.2 Heavy and light maintenance facilities for rolling stock

- sized to handle projected system growth to the year 2040.
- designed to accommodate two 660-foot trainsets each. Capacity for trainsets is estimated to be at 80% of total possible space in the yard, in order to provide room to maneuver the equipment to and from the shop areas and the main tracks and to allow some room for growth.
- tracks are designed to serve as storage for trainsets that are to be used for revenue service. The majority of these tracks are to be used for middle of the day or overnight layup of trainsets. The trainsets will need to make non-revenue trips between the MOE facility and the origin or destination at the beginning or end of revenue service, respectively.
- include spare tracks designed to serve as storage for trainsets that are waiting to undergo maintenance. The number of these tracks varies based on the type of MOE facility as the shop tracks for higher maintenance levels could be occupied for longer periods of time.
- shop tracks are for trainsets that are currently undergoing maintenance. The number of these tracks varies based on the type of MOE facility as there will be a greater number of specialized maintenance activities performed at higher maintenance levels.
- shop tracks are designed to accommodate a minimum of one trainset each. Shop capacity for holding/storing trainsets is set at 50% of total possible space in the shop area, in order to accommodate various shop track functionalities and to provide room to maneuver equipment.
- Additional tracks in each HMF and LMF has been set aside for MOI equipment storage. Work trains, track and tie installation trains and rail trains may be among the types of equipment stored on these tracks.

1.3.3 General assumptions

- All the sites for HMF, LMF and MOI facilities are identified to best support the full Phase 1 system (from San Francisco and Merced to Anaheim) and to avoid the need to build temporary facilities during the phased construction of the system.
- Phase 1 Service requirements identified in this document were developed to support the ridership forecasts and service plan of the 2016 Business Plan, and include the service to/from Anaheim.

- Impacts to environmental resources will be avoided and/or minimized to the extent feasible in the locating of facilities.
- The optimal locations have been identified taking into account the limitations of geography at specific site locations based on available site footprints and using the best and newest information available.
- Maintenance staff will be able to start their assignment at the site of work or nearest MOIF/S each night regardless of their residence and their base MOIF.
- Maximum achievable speed of MOI equipment in mobilization and de-mobilization will be 60 MPH.

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2.0 FACILITIES SITE LOCATION CRITERIA

2.1 RECOMMENDED LOCATIONS

Based on a service design driven by the ridership demand forecast, an operating plan was developed to define train schedules and estimate the number of trainsets required. In order to support the commissioning activities, layup/storage and maintenance program requirements (Levels I, II, III, IV, V - and ultimate de-commissioning of the fleet, concepts were developed to provide the requisite tracks and shop buildings. The following rolling stock facilities are recommended:

- Brisbane LMF
- Gilroy LMF
- Central Valley HMF
- Antelope Valley LMF
- Los Angeles, West Yard LMF
- Los Angeles, Montebello Yard LMF
- Anaheim LMF

In addition, right-of-way maintenance requirements were examined, and a description of a “typical” MOIF and MOIS configuration has been developed. Assuming Caltrain will be responsible for maintenance between San Francisco and San Jose, recommendations for approximate locations along the high-speed train system alignment were identified. These are namely

- Gilroy MOIF
- Los Banos MOIS
- Madera MOIF
- Corcoran MOIS
- Shafter MOIF
- Edison MOIS
- Tehachapi MOIS
- Lancaster MOIF
- Glendale MOIF
- Fullerton MOIS

Preliminary guidelines and criteria applicable to the design of the HMF, LMF, MOIF, and MOIS have been prepared. The size and configuration of these facilities were estimated based on defining the capabilities and functional requirements necessary to support the activities critical to efficiently maintaining and safely operating the rolling stock fleet and physical plant.

Regional consultant teams used these preliminary guidelines and criteria to identify suitable site alternatives at which to locate the various facilities. The feasibility of each of these site alternatives was then evaluated from an operational, engineering, and environmental standpoint. Viable sites were carried forward for additional review. Non-viable sites were eliminated from future consideration. Using information gathered during this process, revised service plans were prepared to adjust to local conditions to validate design assumptions and to update the preliminary guidelines and criteria which are presented in this memorandum.

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Figure 1 is a schematic diagram showing the relative locations of all the facilities at full build-out of the California HSR System. The approximate location of each facility through the progression of phased development through Phase 1 is shown in Figure 1.

Figure 1 – Schematic of O&M Facilities

2.2 RATIONALE FOR THE LOCATION AND FUNCTION

2.2.1 Overview: Rolling Stock Maintenance Facilities

- It is desirable that the HMF is located centrally between Merced and Bakersfield such that only one such facility is required for full HSR operation. The facility should:
    - provide direct connection to the main track enabling quick access
    - be activated prior to delivery of new train-sets for purposes of (potential) assembly and to have the functional requirements of the facility available during the required testing, acceptance and commissioning of the fleet
- The location of each LMF facility needs to be selected based upon limiting the amount of deadhead miles required to move trainsets for the revenue-service trip
- Minimizing deadhead miles needs to be traded against the aim to keep the number of facilities to a minimum. For instance, Level 1 facilities for storing equipment, light cleaning and as on-board crew bases, will help in reducing deadhead miles at strategic locations within the system
- Facilities should be located to support the startup and close down of service
- The sensitivities of placing a HMF/LMF in an urban environment also need to be considered
- The location of facilities is designed to facilitate the provision of desirable arrival and departure times for business travelers to the primary markets at each end of the HSR phase 1 network from intermediate stations
- All facilities have potential access to Class 1 Railroads to enable transshipment of material and equipment from outside sources.

2.2.2 Overview: MOI Facilities

- MOIF should be located to support the efficient use of the maintenance access times available between the first and the last trains of the day operating on each section of the network.
- Five MOIF locations, two in the north half and three in the south half of the system should be sufficient to cater for the “heavy” maintenance activities associated with track, overhead contact system (OCS) and signal and communication systems
- These are then supplemented by MOIS, which should ideally be evenly spaced along the network between MOIFs to provide sufficient storage for on-track equipment required to be placed strategically prior to the beginning of the overnight maintenance access
- MOIS should have capacity to temporarily store maintenance equipment and supplies of the on-track MOI equipment temporarily located there to minimize the need for transit moves to/from one of the MOIFs
- There should be additional space provided to enable staff to park their vehicles at each MOIS to allow for them to report or dismiss at those locations
- Each of the MOIF and MOIS should be also able to support the on- and off-tracking of high-rail and other road-rail convertible equipment
- The use of the refuge sidings at intermediate stations will also allow for on-track equipment to be stored at each of these locations to further improve upon access times available for work

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2.3 LOCATION ANALYSIS

2.3.1 Rolling Stock Maintenance Facilities

2.3.1.1 Northern California, Phase 1

It is envisioned that there will be only one location in the northern section of the route that will handle the activities associated with a Level III facility. The two potential locations identified in this report at Brisbane and Gilroy are however envisioned to work together. Whichever location is finally determined to be the best to handle the Level III activity then it is still a requirement for the other one be developed such that is equipped to handle lower level activity. As such at this stage it is recommended both locations be cleared as Level III capable LMF locations from an environmental perspective.

Several LMF site alternatives have been identified in the vicinity of Gilroy, with a likely alternative in the vicinity of Morgan Hill, approximately 10 miles north of Gilroy station and approximately 20 miles south of San Jose Diridon station. A LMF site alternative has been identified in Brisbane, approximately 10 miles south of San Francisco Transbay Station. For the purposes of the service planning done for this report the locations for the two northern LMFs have been assumed. These locations are consistent with the service planning done for the 2016 Business Plan.

2.3.1.2 HMF in the Central Valley

Several site alternatives for the HMF in the Central Valley are currently being considered from Fresno in the north to Shafter in the south. For the purposes of the service planning done for this report the HMF has been assumed to be located in Fresno, approximately 10 miles south of Fresno Station. Again this location is consistent with the service planning done for the 2016 Business Plan.

2.3.1.3 LMFs in Southern California for Phase 1

The southern LMFs are also envisioned to work in concert with each other. Preliminary guidance given in the memorandum, Summary of Requirements for O&M Facilities, 3/21/13, called for two LMFs with the larger facility being located in Los Angeles, either in the San Fernando Valley or the Los Angeles Basin, that would handle up to Level III maintenance and the smaller facility in the Antelope Valley near Palmdale that would handle up to Level I maintenance.

As it was determined for Northern California, although only one level III facility will be needed finally, it is recommended that two level III facilities will have to be cleared environmentally to ensure that the region will have adequate maintenance capability.

Five potential sites have been identified in Southern California as potential LMF locations: Antelope Valley, East Bank LA, West Bank LA, Montebello Yard and Anaheim.

The Antelope Valley site located in Lancaster provides the necessary acreage for activities up to Level III, but is more remote from Los Angeles than desirable thereby creating more deadhead miles than sites closer to Los Angeles. This site is therefore preferred as a Level I facility unless the Montebello site cannot be secured and developed.

The site at Montebello is also potentially a suitable Level III facility adjacent to the proposed mainline alignment 10 miles south of LAUS. This site would be ideally located and can provide sufficient space for storage and shop activities to serve both LAUS and Anaheim for the beginning and end of operational service. This is the preferred Level III site in Southern California.

The sites at East and West Bank identified as part of the Southern California Regional Interconnection Project (SCRIP) whilst closer to LAUS both present less than ideal solutions. The East bank alternative in particular is problematic owing to its inability to provide storage for Anaheim based trains and the fact that it is elevated. For these reasons the East Bank site is not recommended for progression.

The West bank site is much better located and can serve as level I storage to support morning operations from LAUS station as a run-through facility. If the Montebello site is not possible and the Antelope Valley site becomes the Southern California Level III LMF then the West Bank site must be built to support operations at LAUS.

To accommodate a service of up to 4 TPH to Anaheim, an additional, small two track LMFs has been proposed in Anaheim, mainly for trainset layup purposes. Maintenance at the Anaheim LMF will be limited to Level I activities due to limited available land in the area.

Before a final decision on the location of the Southern California LMFs can be made further comparative studies, design and review activities must be undertaken.

Table 1 – Summary of HMF/LMFs

Facility Location	Facility Type	Number of Tracks	Maximum Maintenance Level (Rolling Stock Facilities Only)	Year 2025 (Projected Fleet Size of 19 Trainsets)		Year 2034 (Projected Fleet Size of 90 Trainsets)		Year 2059 (Projected Fleet Size of 110 Trainsets)	
				Trainsets at Each Facility [1]	Morning Train Starts from Each Facility [2]	Trainsets at Each Facility [1]	Morning Train Starts from Each Facility [2]	Trainsets at Each Facility [1]	Morning Train Starts from Each Facility [2]
Brisbane	LMF	13 yard 2 or 8 shop	III (or I) [3]	8 to 10	6 to 8	14 to 17	10 to 13	16 to 21	12 to 17
Gilroy	LMF	10 yard 8 or 2 shop	I (or III) [3]	8 to 10 (See Note)	6 to 8 (See Note)	13 to 15	12 to 14	13 to 17	12 to 16
Central Valley	HMF	14 yard 10 shop	V	9 to 12	6 to 8	20 to 22	11 to 13	22 to 24	13 to 15
Antelope Valley	LMF	21 yard 8 shop	I (or III) [4]	N/A	N/A	9 to 29	8 to 25	13 to 37	12 to 32
Los Angeles (West Bank)[5]	LMF	7 yard	I or II	N/A	N/A	9 to 14	8 to 13	13 to 19	12 to 18
Montebello	LMF	21 yard 8 shop	III (or I) [4]	N/A	N/A	9 to 29	8 to 25	13 to 37	12 to 32
Anaheim	LMF	2 yard	I	N/A	N/A	1 to 3	1 to 3	2 to 5	2 to 5

[1] Number of trainsets (as single consists) at each facility is given as a range to allow for unknown availability of station tracks for overnight layup and for storage of consists that have been outfitted with autonomous inspection and measurement equipment.

[2] Number of morning starts (as single consists) from each facility differs from the number of trainsets stored at each facility due to allowances for hot standby trainsets, high-demand spares, and maintenance downtime.

[3] Maximum maintenance level at Brisbane could be lowered to Level I if the facility in Gilroy is built with the Level III capability,

[4] Maximum maintenance level at Antelope Valley facility could be potentially lowered to Level I if the facility at Montebello is built with the Level III capability.

[5] If the facility in Montebello is not built, West Bank facility would be necessary to support operations at LA Union Station.

2.3.2 Maintenance Of Infrastructure Facilities

It is anticipated that the maintenance of infrastructure on the Caltrain corridor will be undertaken by the Caltrain. As such this report makes no recommendation to site an MOI between San Francisco and San Jose. If one is required in future consideration could be given to co-locating this with an MOE at Brisbane.

A site has been environmentally cleared for a MOIF in Fresno. This same site is currently being considered as an HMF site alternative. Ideally it would be good to collocate both facilities at this location. Should this not be possible, the Fresno MOIF could move to a site in Madera, approximately 25 miles to the north. At this stage it would be prudent to environmentally clear this site.

Preliminary guidance given in the memorandum, Summary of Requirements for O&M Facilities, 3/21/13, called for an MOIS in Hanford. As the HSR track alignment was designed to traverse Hanford on viaduct, an alternative at-grade location for the MOIS was sought to the south so as to keep the distances to the Fresno and Shafter MOIF sites roughly equal. A site was identified and environmentally cleared for an MOIS in Corcoran, approximately 20 miles south of Hanford.

Preliminary guidance given in the memorandum, Summary of Requirements for O&M Facilities, 3/21/13, called for MOIFs in Shafter and Palmdale with two MOISs in between, at Tehachapi and Rosamond, to support infrastructure maintenance in the Tehachapi mountain range area. A suitable MOIF site has been identified in northern Lancaster, approximately 20 miles north of Palmdale, and the Shafter MOIF site has also shifted approximately 5 miles farther north as a result of preliminary design refinement. The MOIS locations between these two MOIF sites have also been shifted slightly to the north to maintain roughly even spacing between all of the facilities

The recommended locations for MOISs are now Edison and Tehachapi instead of Tehachapi and Rosamond. The proximate MOIS to the south has also been moved north for the same reason. The recommended location for this MOIS is now Santa Clarita instead of Sylmar. Note that the Santa Clarita location would only be appropriate if HSR follows the SR14 alignment.

In addition to providing MOI capabilities, the locations at Edison and Tehachapi should also be equipped to support access for the emergency services to the nearby tunnel sections and to act as rally points for passengers in the event that a tunnel evacuation is necessary. Further, these locations should also have one track with OCS and facilities to aid detraining of passengers in an emergency.

Although, to date, no agreements have been reached with other railroads in Southern California to identify infrastructure maintenance responsibilities, it is envisioned that the Authority will be required to make provision to maintain those rights of way that are dedicated for their use and assets provided solely for high speed train operation, e.g. the traction electrification system.

Preliminary guidance given in the memorandum, Summary of Requirements for O&M Facilities, 3/21/13, called for no MOIF south of the San Gabriel Mountains, but this was based on LAUS serving as the southern terminal station.

With the Phase 1 running to Anaheim, an MOIF south of the San Gabriel Mountains is necessary. Additionally, with long tunnels currently under consideration between Palmdale and Burbank, an MOIF south of the San Gabriel Mountains would reduce the amount of maintenance trips through the tunnels and would provide access to the tunnels from the south.

Earlier drafts of the MOI Concept and Requirements had envisioned an MOIF near Anaheim, but this was only appropriate while an extension of HSR south to Irvine was being contemplated. With the southern terminal station in Anaheim, a centrally located MOIF in Glendale is now recommended, supported by an MOIS to the south in Fullerton. It may be acceptable for the Glendale MOIF to be smaller than the other MOIFs as its maintenance functions may be limited, but this would be dependent on specific conditions outlined in agreements with other railroads.

Table 2 – HMF, LMF and MOI locations

Proposed Facility	Miles (from SF Transbay)	Approximate location name	Comment
LMF	5.00	Brisbane	▪ Level III facility to support train servicing and start up and close down of service at San Francisco. ▪ Corresponds to location of previously proposed LMF. ▪ This site could also function as a level I site on a smaller footprint to support service for the San Francisco terminals
LMF	60.00	Coyote (between San Jose and Morgan Hill)	▪ Level I facility to support train servicing and start up and close down of service at San Jose, Gilroy and Merced. Will need to clear a level III facility at this location based on the availability of the Brisbane site or the phasing requirements of the project. ▪ Corresponds to the most likely of several alternative sites already being considered for a LMF. ▪ Co-location of this facility with the nearby MOIF is possible.
MOIF	80.00	Just South of Gilroy station	▪ Corresponds to location of previously proposed MOIF. ▪ Co-location of this facility with the nearby LMF is possible.
MOIS	120.00	(west of) Los Banos	▪ Corresponds to location of previously proposed MOIS.
MOIF	180.00	Madera (just south of Madera Acres, about 15 miles north of Fresno Station)	▪ Corresponds roughly to the locations currently being considered for two MOIF alternative sites. ▪ These two Madera/Parksdale locations appear to be ideally situated from a geometric standpoint (ample tangents at-grade)
HMF	230.00	Between Fresno and Kings-Tulare	▪ There are a number of potential locations in the Central Valley that would be appropriate for the HMF. Provided the site meets the criteria outlined elsewhere in this report any of the current proposals would be acceptable. ▪ This location is shown for indicative purposes only.

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Proposed Facility	Miles (from SF Transbay)	Approximate location name	Comment
MOIS	240.00	Corcoran	▪ Corresponds roughly to location of previously proposed (and environmentally cleared) MOIS in Corcoran. Recommend keeping Corcoran as MOIS location.
MOIF	300.00	Shafter	▪ The originally proposed location, in Bakersfield by 7th Standard Road, was ultimately rejected for an MOIF next to a Halliburton facility in northern Bakersfield ▪ The site was rejected for a number of reasons, including that the main tracks would be on a high viaduct through this area, and a MOIF here would have not complemented planned land uses for the area ▪ Preliminary design of an MOIF in Shafter - approximately 10 miles to the north and just south of the FCS – is currently being progressed
MOIS	320.00	Edison	▪ For the staging of work trains and equipment. ▪ Can serve as an area of safe refuge for passengers or crews in the event of a tunnel emergency incident.
MOIS	330.00	Tehachapi	▪ For the staging of work trains and equipment. ▪ Can serve as an area of safe refuge for passengers or crews in the event of a tunnel emergency incident.

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Proposed Facility	Miles (from SF Transbay)	Approximate location name	Comment
MOIF	360.00	Lancaster	▪ This proposed location is in the northern Antelope Valley, just south of the town of Tehachapi ▪ This location is unsuitable for an MOIF due to the (relatively, for a railroad) steep terrain, the proximity of a large wind farm in the area, and the proximity of a quarry that routinely engages in blasting activities ▪ A more suitable location would be farther south in the Antelope Valley (areas to the north are mountainous until you reach the Central Valley at approximately Edison on the outskirts of Bakersfield, although there is a bit of a plateau at the town of Tehachapi) ▪ The identified site in north Lancaster, approximately 30 miles farther south, is more suitable for an MOIF ▪ The Tehachapi Mountain Range (and also the San Gabriel Mountains to a lesser degree) is prone to seasonal weather extremes, including snow, landslides, and wildfires that occasionally require shutdown of main transportation routes ▪ For this reason, the previous proposal has two proposed MOISs, in Edison and Tehachapi, between the Central Valley and the Antelope Valley
LMF	390.00	Antelope Valley	▪ Level I facility to support train servicing and start up and close down of service to the north of Los Angeles ▪ At this stage, should be cleared as a level III facility as contingency if Montebello site is not feasible. ▪ Located at the previously proposed location, but reduced in size on the assumption that a sufficiently large facility can be found near to LA Union station ▪ The communities in the Antelope Valley have historically been willing to work with the Authority and have been somewhat (relatively) receptive to HSR facilities in their communities.

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Proposed Facility	Miles (from SF Transbay)	Approximate location name	Comment
MOIF	450.00	Glendale	▪ An MOIF in the vicinity of Glendale is recommended to serve the LA metropolitan area. Note that the Santa Clarita Valley and Antelope Valley were temporarily cut off from Los Angeles immediately after the Northridge earthquake as there are limited road connections between these areas, making it risky to only serve the LA metropolitan area from points north of the San Gabriel Mountains. ▪ If the East Corridor alternatives through the San Gabriel Mountains get advanced, this facility would also provide a means to perform maintenance activities from the south. ▪ Additional capabilities to stage work trains and equipment in proximity to portals of long tunnels should be evaluated when those designs have been sufficiently advanced.
LMF	455.00	Los Angeles: West Bank Yard Option	▪ Level I facility for storage of trains adjacent to LAUS.
LMF	460.00	Los Angeles: Montebello Yard Option	▪ Level III facility to support train servicing and start up and close down of service at Los Angeles and Anaheim ▪ Use of two or three separate packages of land could be a solution; however careful, detailed consideration would need to be given to the layout of each site and the consequential deadhead moves required between locations to enable full maintenance of rolling stock
MOIS	470.00	Fullerton	▪ For the staging of work trains and equipment.
LMF	475.00	Anaheim	▪ Small Level I facility located north of the station to store trainsets preparatory to morning service

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3.0 FACILITIES DESCRIPTIONS

3.1 HEAVY MAINTENANCE FACILITY

The Heavy Maintenance Facility (HMF) is a key element of the California High-Speed Train system. Locating the HMF in the central part of the system is critical to the efficient implementation of operating and equipment maintenance plans. Functional requirements of the HMF site include: receipt, setup and commissioning of equipment; heavy maintenance and repairs; and decommissioning of equipment at end-of-service-life milestones. These activities require yard tracks, each capable of holding two complete trainsets, plus two runaround/transfer tracks to move from one end of the facility to the other.

The HMF will support Level I through Level V maintenance activities, the only such facility in the California HSR System, although Level V maintenance activities do not begin until 3-5 years into the equipment life cycle. Level I-III maintenance activities will require 4 inspection/service tracks, 1 wheel-truing track with drop table, and 1 track equipped with lift equipment to accommodate an entire trainset intact. All servicing tracks for Level I-III maintenance will be accessible from the outside on both ends, allowing for pass-through movement of the equipment.

Level IV-V maintenance activities include the lifting of equipment for underside inspection, heavy repairs, major component change-out, and modifications or upgrades of equipment. To support these activities, the HMF shop facilities will include 4 heavy maintenance tracks, all with interior access capable of enclosing an entire trainset. The end result is a total of 10 tracks inside the shop building. The shop facilities will be segregated into individual functional areas including run-though servicing and inspection, running repairs, truck/bogie shop, component cleaning, brake shop, electronics shop, HVAC unit repair, pantograph repair, battery storage and repair, a paint shop, and a wheel shop that includes wheel truing capability.

Setup of equipment includes space to accommodate the receipt, assembly, testing, acceptance and commissioning of up to 35 trainsets prior to the start of revenue service. The shop facility requirements for setup and commissioning will be based upon the trainset manufacturer's recommendations. The HMF must be adjacent to the main track alignment in order to facilitate efficient, effective testing of equipment: must be near to repair facilities in case of malfunction, technicians must have ready access to equipment and facilities, and distance traveled for deadhead moves should be minimized in order to maximize the effective use of the testing windows.

Speed through the train wash will be limited, so one dedicated train wash track should be added so as to not create a bottleneck at the facility. The location of this track can vary based on the configuration of the facility, but it should be placed where the majority of trainsets will enter the facility from the main tracks and must be long enough for trainsets to stop in advance of the train wash without fouling the main tracks. If this train-wash track is combined with one of the lead tracks entering the facility, special track-work must be added to allow trainsets to bypass the train wash track when occupied. Wheel defect detection equipment should be placed on the incoming lead track(s) to ensure that all vehicles are inspected. This equipment should be placed before the train wash.

Development of HMF functions during stage works

The functions of the HMF evolve as the California HSR System matures. Initially, during the Testing/Commissioning phase prior to the startup phase, the HMF supports all setup, final assembly and integration of systems, testing/commissioning and maintenance of the rolling stock for the system with the potential to layup the entire fleet if necessary. Two shop tracks will be dedicated to setup of new equipment. These tracks will evolve into functioning service tracks as the revenue service levels mature, requiring the addition of two new setup tracks within the shop building.

The HMF will then support operations service levels for approximately half of the system. Supporting the revenue service includes cleaning and servicing activities between runs, pre-departure inspections and testing, and train wash and wheel defect detection.

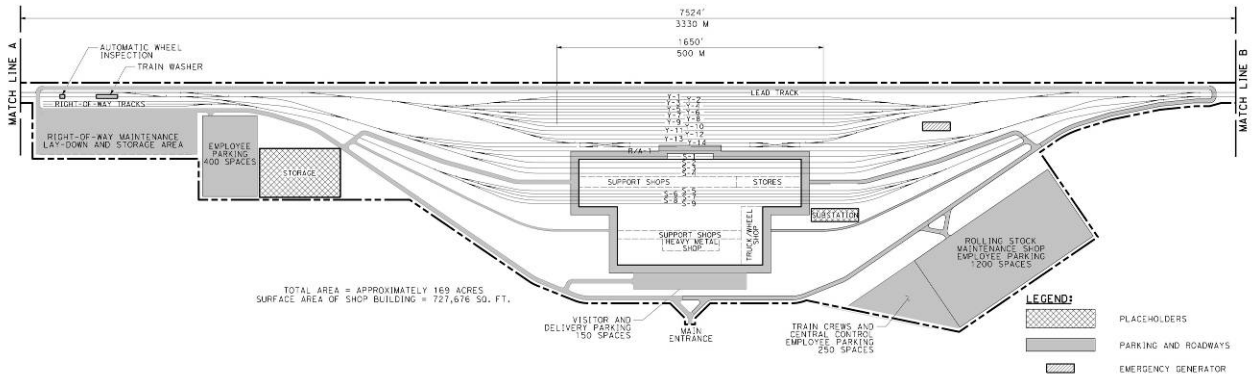
During later phases of operation the HMF transitions to a more traditional maintenance role of centralized maintenance and repair. Minimal daily service is dispatched from the HMF during these phases due to the greater distances to the outer terminals. Phase 1 also includes storage capacity to satisfy the need to accept and commission additional equipment to support Phase 2 Full Build service levels, plus acceptance and commissioning of new equipment while at the same time decommissioning older equipment at end-of-service-life milestones.

Layout and size of the HMF

The layout of the HMF in relation to the main tracks will have a significant effect on HMF functionality and the flow of trains on the main tracks. The recommended HMF configuration that maximizes main track capacity and minimizes the effects on the revenue service plan includes direct main track access achieved though double-ended yard leads to facilitate movements both north and south without changing direction, grade-separated flyovers to access the main track opposite the HMF without affecting main track traffic, 60 MPH interlockings with universal crossovers at the main tracks (on both ends, immediately adjacent to the main track turnouts), and 1,700-foot transition tracks to reduce/increase speed to/from stop and to transition the automatic train control system.

The result is a total estimated length of about 7,500 feet (not including transition tracks), an estimated width of about 1,200 feet (at the widest point), and an overall estimated minimum footprint of about 170 acres. Figure 3 shows a conceptual layout for the HMF (See Appendix B for the plan in larger size). Note that this conceptual layout depicts a facility with the maintenance shop tracks arranged parallel to and alongside the storage tracks, but that in-line facilities with the maintenance shop tracks arranged parallel to and in series with the storage tracks may also be acceptable, and in some cases even preferred, and may be considered on a case-by-case basis to accommodate site constraints.

Figure 2 – Heavy Maintenance Facility Concept Plan



Less optimal configurations might include at-grade or "flat" interlockings, single 60 MPH crossovers at the main tracks (on both ends, immediately adjacent or within up to 3 miles of the main track turnouts), turnout speeds in interlockings of less than 60 MPH, shorter transition tracks, and single-ended facilities. Note that a single-ended HMF could be considered on a case-by-case basis depending on the proposed location of a site relative to the nearest station and on the operational details of the service plan. Work-arounds to these conditions could include additional deadhead miles or time in order to avoid delays to revenue trains by deadhead movements, additional operating crews in order to expedite reverse movements in the facility and/or on the main track, and alterations to maintenance scheduling to accommodate the arrival of deadhead trains at non-peak hours of operation. The operational and cost impacts of these less optimal configurations must be analyzed further in order to evaluate the trade-off of the additional yearly operating costs versus the increased capital construction costs and the potential increase in environmental impacts.

Other facilities that could be co-located with the HMF include the Operations Control Center and a Maintenance of Infrastructure Facility. Locating these facilities as an integral part of, or adjacent to, the HMF may allow for better coordination and utilization of operations systems and assets, while also potentially reducing the overall footprint required for the facilities. Locating these facilities away from the

HMF will not necessarily introduce negative impacts. The individual requirements for these facilities will be discussed in further detail in separate sections of this report.

Commissioning

- The HMF must be sited adjacent to the main track.
- Maintenance buildings, dispatch sites and training facilities should be located in the HMF at this juncture to support the testing and commissioning of the HSR system. Post this phase this facilities would transition to provide on-going support to the HSR system.
- Personnel for Train Control, Communication, SCADA and other systems must be trained and those systems tested prior to Trainset commissioning.
- Tactical discussion and debriefing will be necessary as the systems are placed on line. Central location will be important for the successful integration of multiple cross functional systems
- Vendors will better be able to supervise and staff systems integration effort for warranty and operations testing

Initial Operations

- Central location will make for better strategic response in the event of a service disruption by making the discipline leaders available for face to face coordination.
- Training and on the job experience will be easier and cheaper to accomplish by the existence of a co-located facility. Split facilities will result in additional training costs to the operating entity.

It should be noted that locating these facilities separate from the HMF will not necessarily introduce negative impacts that could not be effectively managed/mitigated.

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3.2 LIGHT MAINTENANCE FACILITY

Terminal station locations will be supported by a Light Maintenance Facility (LMF) for the purpose of supplying freshly-inspected and serviced trainsets at the start of revenue service. The LMFs will be sized accordingly.

LMF locations will additionally be sized to support either Level I, Level II or Level III maintenance activities. These activities include cleaning and servicing activities between runs, pre-departure inspections and testing, and monthly inspection and maintenance activities. Level III functionality includes train wash and wheel defect detection facilities. For Level II and Level III facilities, daily servicing, and monthly and quarterly inspections and maintenance will be made utilizing inside shop tracks with interior access and inspection pits for underside and bogie inspections.

Table 3 summarizes shop track requirements at each facility based on the maintenance level. It should be noted however, number of shop tracks actually required at each facility could potentially changes from the numbers in Table 3 and needs to be determined based on the actual train operating plans and associated fleet manipulation plans.

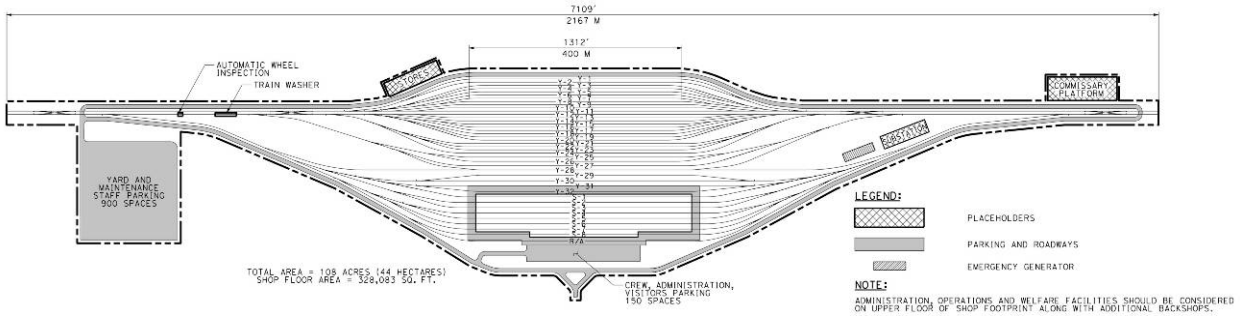
Table 3 – Summary of Shop Tracks at Each Maintenance Level

Facility Type	Maintenance Level	Number of Maintenance Shop Tracks
LMF	Up to I	0
	Up to II	2
	Up to III	8
HMF	Up to V	10

The LMFs will require yard tracks, each capable of holding two complete trainsets, plus two runaround/transfer tracks to move from one end of the facility to the other. In the case of Level III LMFs, speed through the train wash will be limited, so one dedicated train wash track should be added so as to not create a bottleneck at the facility. The location of this track can vary based on the configuration of the facility, but it should be placed where the majority of trainsets will enter the facility from the main tracks and must be long enough for trainsets to stop in advance of the train wash without fouling the main tracks. If this train-wash track is combined with one of the lead tracks entering the facility, special track work must be added to allow trainsets to bypass the train wash track when occupied. Wheel defect detection equipment should be placed on the incoming lead track(s) to ensure that all vehicles are inspected. This equipment should be placed before the train wash.

The layout of the LMF in relation to the main tracks will have a significant effect on LMF functionality and the flow of trains on the main tracks. The recommended LMF configuration includes direct main track access achieved through double-ended yard leads to facilitate movements both north and south without changing direction, grade separated flyovers to access the main track opposite the LMF without affecting main track traffic, 60 MPH interlockings with universal crossovers at the main tracks (on both ends, immediately adjacent to the main track turnouts), and 1,700-foot transition tracks to reduce/increase speed to/from stop and to transition the automatic train control system. The result is a total estimated length of about 7,500 feet (not including transition tracks) with a width dependent on the number of tracks required at each facility, and an overall estimated minimum footprint of ranging from about 40 to about 110 acres. Figure 4 shows a conceptual layout for the LMF (See Appendix C for the plan in larger size). It should be noted that this conceptual layout depicts a facility with the maintenance shop tracks arranged parallel to and alongside the storage tracks, but that in-line facilities with the maintenance shop tracks arranged parallel to and in series with the storage tracks may also be acceptable, and in some cases even preferred, and may be considered on a case-by-case basis to accommodate site constraints.

Figure 3 – LMF Concept Plan



Less optimal configurations might include at-grade or “flat” interlockings, single 60 MPH crossovers at the main tracks (on both ends, immediately adjacent or within up to 3 miles of the main track turnouts), turnout speeds in interlockings of less than 60 MPH, shorter transition tracks, and single-ended facilities. Note that a single-ended LMF could be considered on a case-by-case basis depending on the proposed location of a site relative to the nearest station and on the operational details of the service plan. Work-arounds to these conditions could include additional deadhead miles or time in order to avoid delays to revenue trains by deadhead movements, additional operating crews in order to expedite reverse movements in the facility and/or on the main track, and alterations to maintenance scheduling to accommodate the arrival of deadhead trains at non-peak hours of operation. The operational and cost impacts of these less optimal configurations must be analyzed further in order to evaluate the trade-off of the additional yearly operating costs versus the increased capital construction costs and the potential increase in environmental impacts.

Other facilities that could be co-located with an LMF include an MOIF. Locating these facilities as an integral part of, or adjacent to, the LMF could facilitate better coordination and utilization of operations systems and assets, while also potentially reducing the overall footprint required for the facilities. Locating these facilities away from the LMF will not necessarily introduce negative impacts that could not be effectively managed/mitigated.

DRAFT

3.3 MAINTENANCE OF INFRASTRUCTURE FACILITIES

The infrastructure will be maintained from regional MOIFs located at approximately 100- to 150-mile intervals. The MOIF will be sized and outfitted to support the maintenance of infrastructure requirements for approximately 50 to 75 miles in either direction, supported by a Maintenance of Infrastructure Siding (discussed later) within each 50- to 75-mile segment. The 100- to 150-mile territory covered by each MOIF accommodates the time for equipment traveling at 60 mph to reach locations along the alignment during the five-hour non-revenue maintenance period. Resources will be assigned according to the specific needs of the adjacent territory (for example, the Palmdale MOIF will support maintenance activities for tunnels and high-viaducts that will not be the responsibility of the Fresno MOIF).

The MOIFs will be the locations of regional maintenance machinery servicing storage, materials storage, personnel, and maintenance and administration.

Functional requirements of the MOIF sites include:

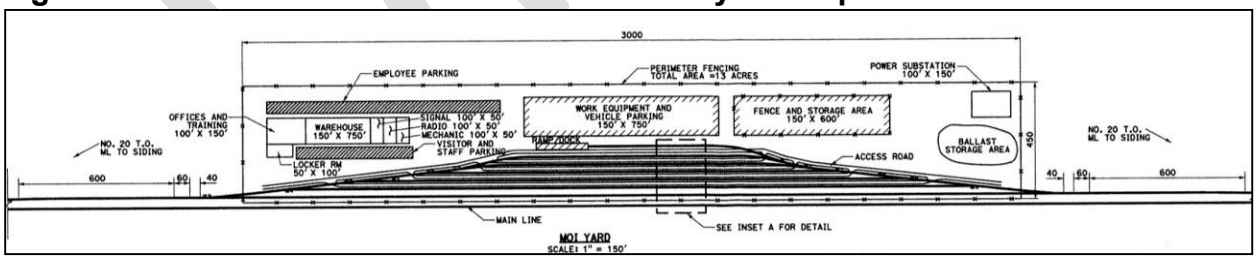
- 6 yard tracks plus one siding track (1,600 feet).
- Approximately 8,150 feet of yard track capacity.
- Shop facilities for the following activities: MOI inventory, infrastructure and equipment maintenance/repair.
- Stockpile areas for ballast and other bulk materials.
- Secured stockpile areas for non-bulk materials.
- Rail side unloading dock and continuously welded rail (CWR) train storage (1600').
- Rail-borne equipment and locomotive storage tracks.
- Road-rail vehicle access locations.

Main track access is accomplished through 50 MPH (#20) turnouts with 60 MPH single crossovers immediately beyond (or within up to 1 mile of) the turnouts at both ends to facilitate efficient movement to either main track from either end of the facility. Location of the MOIF near main track universal crossover locations may remove the need for one or both of these 60 MPH single crossovers.

Co-location of an MOIF with the nearest HMF or LMF may be considered to consolidate HSR resources and minimize community impacts.

Also required is effective connectivity to the highway road network and access to utilities including water, gas, electricity, sewer and communications. MOIF facilities are estimated to be approximately 30 acres in size, inclusive of roadways and parking. Figure 5 shows a conceptual layout and sizing for the MOIF (See Appendix D for the plan in larger size).

Figure 4 – Maintenance of Infrastructure Facility Concept Plan



3.4 MAINTENANCE OF INFRASTRUCTURE SIDINGS

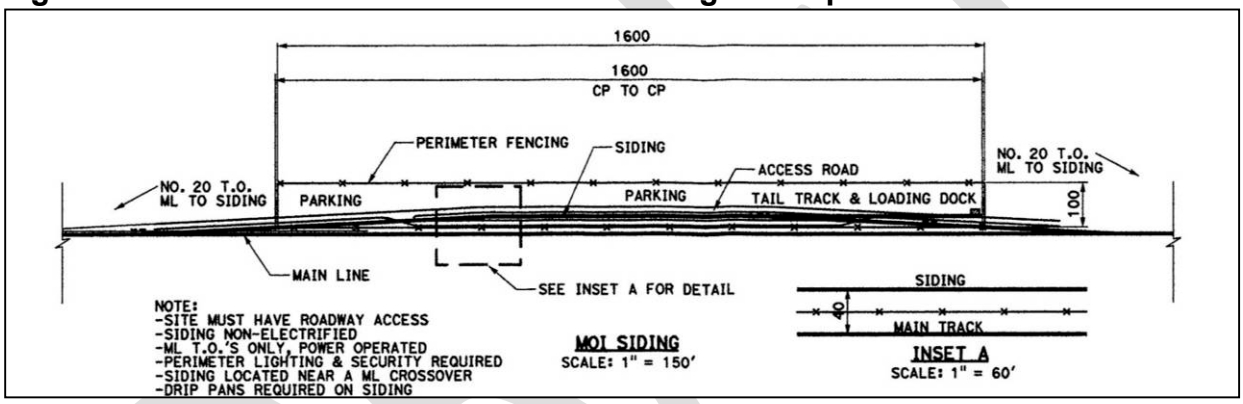
Maintenance of Infrastructure Sidings (MOIS) will be centrally located within the 50- to 75-mile maintenance sections on either side of each MOIF. The purpose of the MOIS facilities is to support the MOIF activities by providing a location for layover of maintenance of infrastructure equipment and temporary storage of materials and other resources needed in the adjacent section. The goal is to reduce travel time required to arrive at the maintenance location, thereby enhancing the efficiency and productivity of the maintenance activities.

Functional requirements of the MOIS sites include:

- One siding track (1,600 feet)
- One tail track (200 feet).
- Stockpile areas for ballast and other bulk materials.
- Secured stockpile areas for non-bulk materials.
- Road-rail vehicle access locations.

MOIS facilities are estimated to be approximately 5 acres in size. Figure 6 shows the conceptual layout and sizing for the MOIS (See Appendix E for the plan in larger size).

Figure 5 – Maintenance of Infrastructure Siding Concept Plan



Main track access is accomplished through 50 MPH (#20) turnouts with 60 MPH single crossovers immediately beyond (or within up to 1 mile of) the turnouts at both ends to facilitate efficient movement to either main track from either end. Location of the MOIF near main track universal crossover locations may remove the need for one or both of these 60 MPH single crossovers. More than one location may be required in some MOI territories as a result of difficult terrain such as in the Tehachapi Mountains.

4.0 OTHER FACTORS

4.1 ROADWAY ACCESS AND PARKING

The conceptual layout of the roadways and parking areas needed to support the O&M facilities has been developed based on the following assumptions:

Access and Circulation

- Access/egress primarily controlled at a single gated entry point. A perimeter security fence would be installed around the entire facility, connecting to the HSR access-restriction fencing along the corridor. A safety fence would be installed to separate the facility from the main tracks to prevent accidental entry.
- A two-way circulation road, 24 feet wide, would follow the interior perimeter of each facility
- Roadways to provide access to specific locations in the building(s) and yard(s) would be considered, as shown on the conceptual schematics
- For the HMF and LMFs, a 50-foot wide asphalt "apron" would surround the main shop building to provide access for emergency vehicles to any point around the structure
- For the HMF, a pedestrian "bridge" over the train yard tracks would be used to connect the employees' parking lot on one side of the yard tracks and the main shop building on the other side should the design result in the need to cross active tracks

Parking:

- At the HMF, approximately 330 employees are estimated to be accommodated during "peak shifts," including consideration of overlapping departure and arrivals of personnel in various operations, dispatching, and maintenance duties. It is assumed that approximately twenty percent of employees would commute by modes other than single-occupied automobile, such as walking, bicycle, public transportation, and/or ridesharing, resulting in an eighty percent automobile mode share for employee work trips. The public transportation share would be employees commuting via bus or a possible employee train stop off the CHST system
- It is estimated that the parking demand for HMF rolling stock shop maintenance employees would require space for approximately 310 vehicles based on the estimate of eighty percent automobile mode share and 85% typical utilization of the parking spaces (320 x 80% / 85% = 310.6).

4.2 ENVIRONMENTAL CONSIDERATIONS

Impacts to the natural, physical and human environment must be addressed in the development of criteria for locating of facilities. A fatal-flaw level of analysis should include, but not be limited to, the identification of impacts from the siting of facilities to:

- Potential relocation of residences and businesses
- Relocations or displacements of key economic generators
- State and Federal waters
- Historic, archeological and cultural resources (such as those protected un Section 4(f) and Section 106)
- Areas of known biological habitats or other sensitive protected lands
- Compatibility with adjacent land uses

In addition, to ensure a satisfactory range of alternatives under State and Federal law, multiple site alternatives for the HMF and LMF sites should be developed and fully analyzed in project-level EIR/EIS documents. MOIF and MOIS sites should be located appropriately and analyzed as part of each corridor alternative.

4.3 COMMERCIAL CONSIDERATIONS

The facilities will have specific commercial and personnel requirements. The areas where these facilities will be located will need to be able to provide the labor forces to staff the facilities and the programs to train them and/or the services to attract skilled employees from other areas to move to these locations. The following are approximate personnel needs for each of the facilities:

Table 4 – Approximate Facility Personnel Needs

Facility Type	Approximate Personnel Needs (at Each Facility)
HMF	~ 330
LMF	100 – 150
MOIF	~230

These employees would need to have the requisite training to perform their functions in addition to the pre-requisite common basic knowledge and skills to perform professional work, such as basic computer use skill. For some positions, there are already qualified personnel in California and in the Central Valley but for other functions, such as maintenance of signaling systems and OCS, new training programs will have to be developed and skilled employees from other parts of the country will need to be attracted to the area.

For the higher skilled positions, training programs will need to be developed and can potentially be housed at some of the many Central Valley colleges and universities such as California State University (CSU) Bakersfield, CSU Fresno, CSU Stanislaus, University of California (UC) Merced, the community colleges in the area, and other public and private colleges. Other positions may require apprenticeship and qualification programs through the various craft unions. As operation of these facilities approaches, the exact needs of the system will become clearer and the training and hiring programs can be customized for the system and be housed at appropriate locations.

4.4 CONNECTIVITY ISSUES

In addition to the items that are described above and depicted on the concept schematics, there are other requirements that will have to be provided to support the operation of these facilities:

- Connectivity provision for the facilities roadways (as shown on the schematics) to the local road and highway network providing access/egress for (examples):
    - Employees commuting by automobile
    - Convenient access to public transportation
    - Deliveries of materials and supplies (using heavy trucks)
    - Emergency response personnel such as the fire department and medical teams
- Connectivity provision to the electric power grid to power the buildings, shops and trains. These facilities are currently described at a concept level and the requirements will be clarified as design progresses.

- For the HMF and LMFs, substations will need to be constructed at the site that would support power needs for:
    - Train storage
    - Train movements
    - Shop operations
    - All other buildings and facilities
- For the HMF and LMFs, it is expected that this approach would require a new utility service from the nearest utility distribution line. In this case, it is estimated that ~13.8kV lines would not be sufficient and that a ~34.5kV service into a split step down facility is preferred. The overhead contact system (OCS) would be (isolated from the main line) supplied by a standard 1x25kV transformer, and the HMF would be fed from standard transformers which could distribute 480v 3ph throughout the facility
- Connectivity to the water system, and both storm and sanitary sewer systems for personnel and industrial purposes. These facilities will provide train washing and toilet servicing for the revenue equipment fleet. Water supply would also be required for employee locker room/bathroom facilities, interior building maintenance activities, and commercial food service needs. Local wastewater treatment may be required for the train wash facility.
- Consideration for refuse removal services

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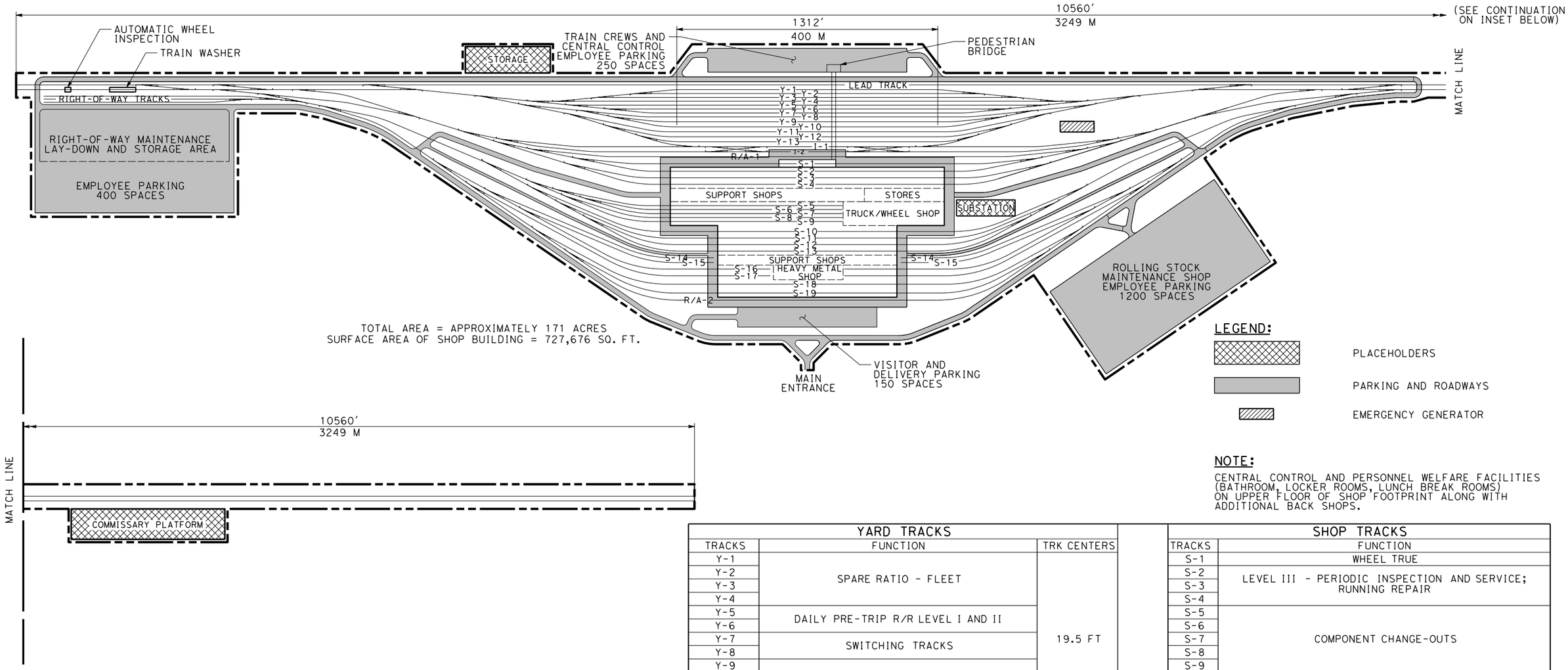
Appendix 5.1 - Heavy Maintenance Facility Concept Plan



NOTE:

CENTRAL CONTROL AND PERSONNEL WELFARE FACILITIES (BATHROOM, LOCKER ROOMS, LUNCH BREAK ROOMS) ON UPPER FLOOR OF SHOP FOOTPRINT ALONG WITH ADDITIONAL BACK SHOPS.

YARD TRACKS		
TRACKS	FUNCTION	TRK CENTERS
Y-1	SPARE RATIO - FLEET	19.5 FT
Y-2		
Y-3		
Y-4		
Y-5	DAILY PRE-TRIP R/R LEVEL I AND II	
Y-6		
Y-7	SWITCHING TRACKS	
Y-8		
Y-9	MANIPULATION - LAYUP - DAILY	
Y-10		
Y-11		
Y-12	EXTRAORDINARY INTERIOR CLEANING ON PLATFORM	
Y-13		
I-1	INTERCHANGE	25 FT
I-2		
R/A-1	RUNAROUND	
R/A-2	RUNAROUND	

SHOP TRACKS	
TRACKS	FUNCTION
S-1	WHEEL TRUE
S-2	LEVEL III - PERIODIC INSPECTION AND SERVICE; RUNNING REPAIR
S-3	
S-4	
S-5	COMPONENT CHANGE-OUTS
S-6	
S-7	
S-8	
S-9	
S-10	LEVEL IV - OVERHAUL
S-11	
S-12	
S-13	
S-14	HEAVY REPAIR STORAGE
S-15	
S-16	LEVEL V - HEAVY REPAIR
S-17	
S-18	PAINT
S-19	

REV	DATE	BY	CHK	APP	DESCRIPTION
2	07/11/11	BJ	JTS	PM	ADDED SUBSTATION
1	06/26/09	BJ	JTS	PM	ADD: MOW SPACE, PARKING, ROADWAY, SUPPORT BLDGS

DESIGNED BY J. SHEEHAN
DRAWN BY T. DOUNG
CHECKED BY P. MOSIER
IN CHARGE J. METZLER
DATE 05/29/09

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM

HEAVY MAINTENANCE FACILITY (HMF) CONCEPT PLAN

CONTRACT NO. 13259
DRAWING NO. TM 5.1-A
SCALE NO SCALE
SHEET NO.

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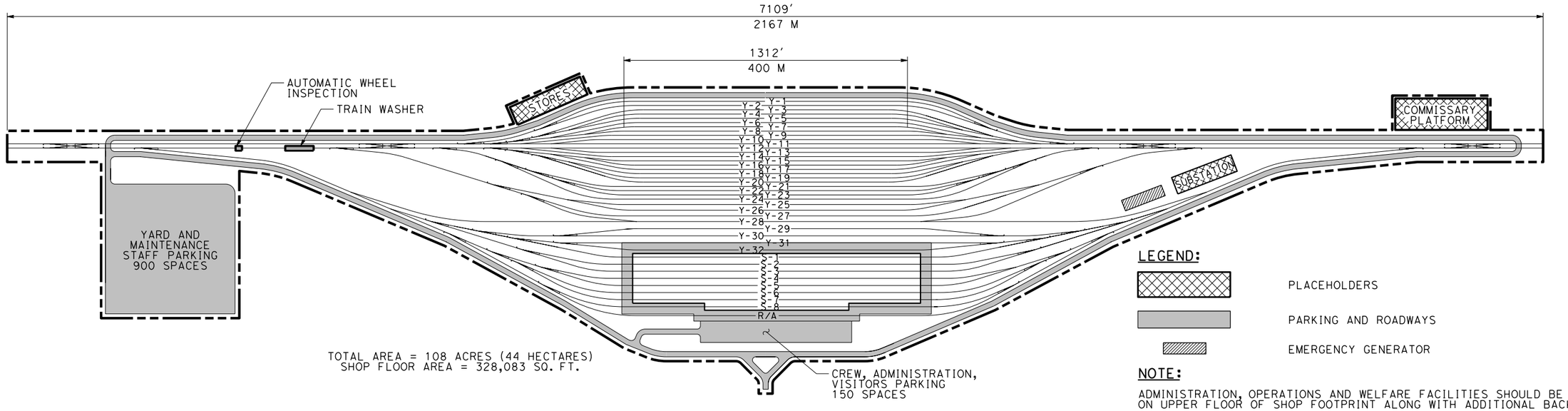
Appendix 5.2 - Light Maintenance Facility Concept Plan



NOTE:

ADMINISTRATION, OPERATIONS AND WELFARE FACILITIES SHOULD BE CONSIDERED ON UPPER FLOOR OF SHOP FOOTPRINT ALONG WITH ADDITIONAL BACKSHOPS.

YARD TRACKS			
TRACKS	FUNCTION		TRK CENTERS
Y-1	DAILY PRE-TRIP RUNNING REPAIR LEVEL I AND II MANIPULATION LAYUP	STORAGE INSPECTION DAILY CLEANING TOILET SERVICING	19.5 FT
Y-2			
Y-3			
Y-4			
Y-5			
Y-6			
Y-7			
Y-8			
Y-9			
Y-10			
Y-11			
Y-12			
Y-13			
Y-14			
Y-15			
Y-16			
Y-17			
Y-18			
Y-19			
Y-20			
Y-21			
Y-22			
Y-23			
Y-24			
Y-25			
Y-26			
Y-27			
Y-28	SWITCHING TRACKS	FOR YARD SWITCHING	25 FT
Y-29			
Y-30	EXTRAORDINARY INTERIOR CLEANING	SPECIAL CLEANING PLATFORM	
Y-31			
Y-32	INTERCHANGE	EQUIPMENT DELIVERY AND RELEASE	

SHOP TRACKS	
TRACKS	FUNCTION
S-1	PIT TRACKS - LEVEL III PERIODIC INSPECTIONS
S-2	
S-3	
S-4	
S-5	
S-6	FLAT TRACK - LIFT & TRUCK/BOGEY CHANGE OUT / MEDIUM REPAIR
S-7	
S-8	WHEEL TRUE
R/A	RUNAROUND TRACK

REV	DATE	BY	CHK	APP	DESCRIPTION
2	07/11/11	BJ	JTS	PM	ADDED SUBSTATION
1	07/22/09	BJ	JTS	PM	ADD: MOW SPACE, PARKING, ROADWAY, SUPPORT BLDGS

DESIGNED BY J. SHEEHAN
DRAWN BY T. DOUNG
CHECKED BY P. MOSIER
IN CHARGE J. METZLER
DATE 05/29/09

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM

SAN FRANCISCO
STORAGE YARD AND MAINTENANCE FACILITY
CONCEPT PLAN

CONTRACT NO. 13259
DRAWING NO. TM 5.1-C
SCALE NO SCALE
SHEET NO.

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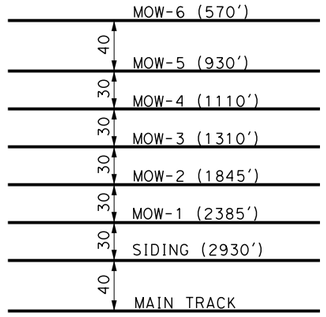
Appendix 5.3 - Maintenance of Infrastructure Facility Concept Plan



INSET A
SCALE: 1" = 60'

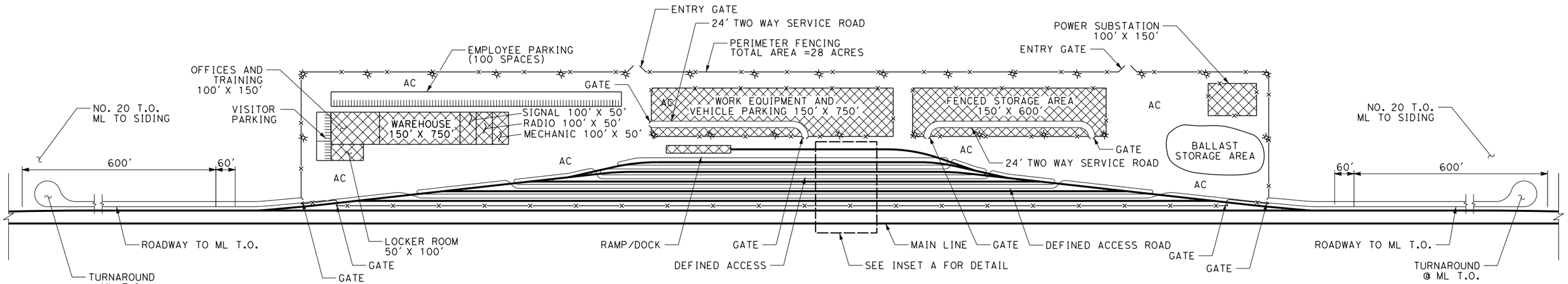
NOTES:

1. SIDING TRACK ELECTRIFIED.
2. YARD TRACKS NON-ELECTRIFIED
3. DRIP PANS REQUIRED ON YARD TRACKS ALL INTERIOR SURFACES PAVED EXCEPT FOR STORAGE TRACK (SEE DEFINED ACCESS)
4. ROADWAY ACCESS REQUIRED (LOCATION DETERMINED BY SITE) TWO CONNECTED ACCESS GATES VIA ROADWAY AS POSSIBLE.
5. ADDITIONAL LIGHTING AT ROADWAY ACCESS POINT
6. PERIMETER FENCING AREA = 28± ACRES

LEGEND:

PLACEHOLDERS

LIGHTING



MOI YARD
SCALE: 1" = 150'

REV	DATE	BY	CHK	APP	DESCRIPTION
					INTERNAL DRAFT

DESIGNED BY J. SHEEHAN
DRAWN BY V. HUANTE
CHECKED BY R.WALKER
IN CHARGE J. METLZER
DATE 08/30/11

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM

MOI YARD

CONTRACT NO. 13259
DRAWING NO. TM 5.1-H
SCALE AS SHOWN
SHEET NO.

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Appendix 5.4 - Maintenance of Infrastructure Siding - Concept Plan

NOTES:

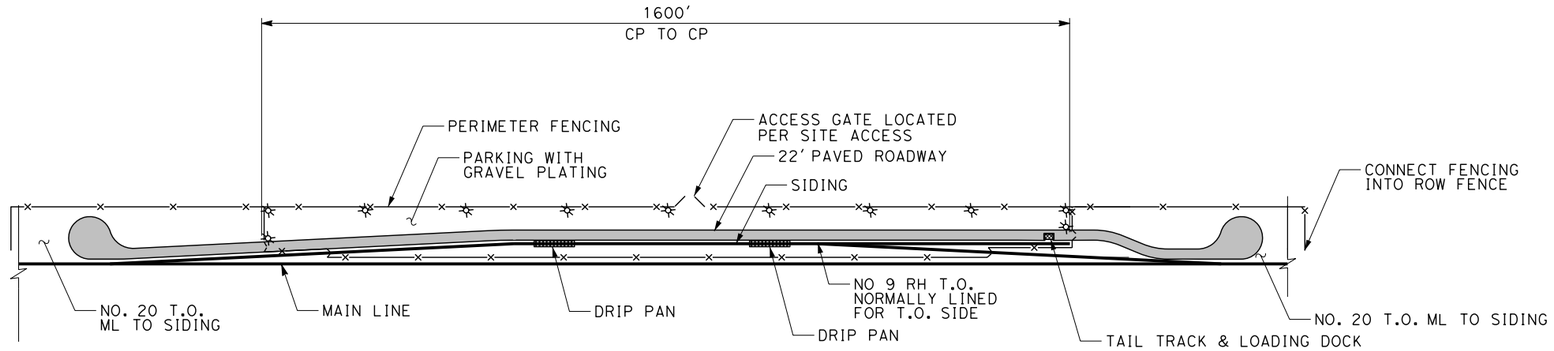
1. SITE MUST HAVE ROADWAY ACCESS
2. SIDING NON-ELECTRIFIED
3. ML T.O.'S ONLY, POWER OPERATED
4. PERIMETER LIGHTING & SECURITY REQUIRED
5. SIDING LOCATED NEAR A ML CROSSOVER
6. DRIP PANS REQUIRED ON SIDING
7. PERIMETER AREA = 4± ACRES

LEGEND:

PLACEHOLDERS

ROADWAYS

LIGHTING



MOI SIDING
SCALE: 1" = 150'

REV	DATE	BY	CHK	APP	DESCRIPTION
					INTERNAL DRAFT

DESIGNED BY J. SHEEHAN
DRAWN BY V. HUANTE
CHECKED BY R. WALKER
IN CHARGE J. METZLER
DATE 08/30/11

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM

MOI SIDING

CONTRACT NO. 13259
DRAWING NO. TM 5.1-I
SCALE AS SHOWN
SHEET NO.

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Appendix 5.5 - Location Analysis Summary

Starting Point for Maintenance Facility Location Analysis

Note: all times are approximate and for high level assessment purposes only

		Mileage
SF Transbay	Station	0.00
SF 4th and King	Station	1.20
Brisbane	TSMF	10.00
	MOIS	
Millbrae	Station	14.30
Mid-peninsula	Station	
San Jose Diridon	Station	47.90
Gilroy (Morgan Hill)	TSMF	
Gilroy	Station	78.10
Gilroy	MOIF	
Los Banos	MOIS	
Merced	*Station*	
Fresno	Station	193.40
Fresno	MOIF	
Fresno	HMF	
Hanford	*Station*	
Hanford	*HMF*	
Corcoran	MOIS	
Wasco	*HMF*	
Shafter	MOIF	
Bakersfield	Station	306.70
Edison	MOIS	
Tehachapi	MOIS	
North Lancaster	MOIF	
Palmdale	TSMF	
Palmdale	Station	390.60
Santa Clarita	MOIS	
Burbank	Station	439.85
Glendale	MOIS	
LA Union	Station	448.70
Downtown LA	TSMF	
Fullerton	MOIS	
Anaheim	MOIF	
ARTIC	Station	476.87

Spacing analysis (miles)

MOIF	MOIF/S	Layup	Region
80	70	70	50
		10	
		20	
		10	75
	50		
130	80	10	120
100	50		
	50		105
100	35		
	25		
	40		
110	35	5	110
	35	65	
	35		
	35	2	45
	5	30	

Southbound		Northbound		Engineering access times		
First train	Last train	First train	Last train	Southbound	Northbound	Both lines
0500	2100	0800	0000	2120-0500	0000-0740	0000-0500
0520	2120	0740	2340	2200-0520	2340-0700	2340-0520
0600	2200	0700	2300	2250-0650	2300-0610	2300-0610
0650	2250	0610	2210	2315-0650	2210-0610	2315-0610
0715	2315	0545	2145	2330-0715	2145-0545	2330-0545
0730	2330	0530	2130	2345-0730	2130-0515	2345-0515
0745	2345	0515	2115	0000-0745	2115-0500	0000-0500
0800	0000	0500	2100			

Note: first and last Caltrains times not considered

Note: first and last Metrolink times not considered

Shared infrastructure

Conclusions Reached in Maintenance Facility Location Analysis Paper v1.0

		Mileage
SF Transbay	Station	0.00
SF 4th and King	Station	1.00
Brisbane	LMF (III)	5.00
Millbrae	Station	14.00
Mid-peninsula	Station	
San Jose Diridon	Station	48.00
Gilroy (Coyote)	LMF (I)	60.00
Gilroy	Station	78.00
Gilroy	MOIF	80.00
Los Banos	MOIS	120.00
Madera	MOIF	180.00
Fresno	Station	193.00
Central Valley	HMF	230.00
Kings Tulare	Station	
Hanford (alternative)	*HMF*	
Corcoran	MOIS	240.00
Wasco (alternative)	*HMF*	
Shafter	MOIF	300.00
Bakersfield	Station	307.00
Edison	MOIS	320.00
Tehachapi	MOIS	330.00
Lancaster	MOIF	360.00
Antelope Valley	LMF (I)	390.00
Palmdale	Station	391.00
Burbank	Station	438.00
Glendale	MOIF	450.00
LA Union	Station	454.00
Los Angeles - West Bank Yard	LMF (I)	455.00
Los Angeles - Montebello Yard	LMF (III)	460.00
Fullerton	MOIS	470.00
Anaheim	LMF (I)	476.00
ARTIC	Station	477.00

MOIF	MOIF/S	Layup	Region
Caltrain		5	Caltrain
		73	
	32	12	72
		18	
		?	
100	40		
	60		120
120			
	60	37	
			80
60	20		
	10		
	30		
			118
80	80	1	
		1	
	20	6	39
27			
	7	17	
		1	

Southbound		Northbound		Engineering access times		
First train	Last train	First train	Last train	Southbound	Northbound	Both lines
0600	2230	0723	2353	2300-0545 6h45m	0000-0700 7h00m	0000-0545 5h45m
0601	2246	0709	2352	2330-0545 6h15m	0000-0630 6h30m	
0600	2321	0634	2355	2345-0545 6h00m	0000-0615 6h15m	
0615	2336	0616	2339	0000-0600 6h00m	2345-0615 6h30m	0000-0600 6h00m
0630	2345	0637	2329	2315-0615 7h00m	2330-0615 6h45m	2330-0615 6h45m
0645	2311	0628	2313	2345-0600 6h15m	2330-0600 6h30m	2345-0600 6h15m
0615	2340	0610	2329	0000-0600 6h00m	2330-0545 6h15m	0000-0545 5h45m
0631	2355	0600	2312	0000-0615 6h15m	2315-0545 6h30m	
0642	2358	0600	2300	0000-0630 6h30m	2315-0545 6h30m	0000-0545 5h45m
0722	2347	0602	2239			

APPENDIX 2-H: EMERGENCY AND SAFETY PLANS

CALIFORNIA HIGH-SPEED RAIL PROGRAM

SAFETY AND SECURITY MANAGEMENT PLAN

Revision 2

Prepared by:	John Cockle, RDP System Safety Manager	06/30/2016 Date
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Released by:	Jeff Morales, Chief Executive Officer	8/22/16 Date

Document	Sections/Pages Affected	Date of Document
Rev 0	Initial Draft	02/14/2013
Rev 1	Revised to reflect new hazard management principles and processes, new Authority organizational structure, and new construction requirements for safety and security	03/04/2014
Rev 2	Revised section on handling of D/B Contractor Certification Package submittals, and Safety/Security Roles and Responsibilities for the RDP	06/30/2016

TABLE OF CONTENTS

1.0 Management Commitment And Philosophy 1
1.1 Safety and Security Policy Statement 1
1.2 Background 1
1.3 Purpose of the SSMP 2
1.4 Applicability and Scope of SSMP 2
1.4.1 Project Description 2
1.4.2 Phased Implementation 3
1.4.3 SSMP Scope 3
1.5 SSMP Goals and Objectives 4
1.5.1 Goals 4
1.5.2 Objectives 4
1.6 SSMP Review and Updates 5
1.7 SSMP Applicability to Third Parties 5
1.8 System Safety Program Plan and System Security Plan 5
2.0 Integration of Safety and Security into The CHSRP Development Process 6
2.1 Safety and Security Activities 6
2.2 Procedures and Resources 7
2.2.1 Procedures 7
2.2.2 Resources 8
2.3 Interfacing with Management 8
3.0 Safety and Security Responsibilities 9
3.1 Roles and Responsibilities 9
3.2 Authority Organization 10
3.2.1 Authority Chief Executive Officer 10
3.2.2 Authority Director of Risk Management 11
3.2.3 Authority Safety and Security Manager 11
3.3 Rail Delivery Partner Organization 11
3.3.1 RDP System Safety Manager 11
3.3.2 RDP System Security Manager 12
3.3.3 RDP Construction Safety Officer 12
3.3.4 Other RDP Managers 13
3.4 Contract/Procurement Safety and Security 13
3.5 Committee Structure 13
3.5.1 Safety and Security Executive Committee 13
3.5.2 Safety and Security Program Committee 14
3.5.3 Safety and Security Working Group (SSWG) 15
3.5.4 Fire and Life Safety and Security Committees (FLSSC) 15
3.5.5 Change Control 16
3.5.6 Rail Activation Committee (RAC) 16
3.5.7 System Integration Testing Committee (SITC) 16
3.6 Safety and Security Responsibilities Matrix 16
4.0 Hazard Management 18
4.1 Overview 18

4.2	Risk-Based Safety Hazard Management	18
4.2.1	Application of Risk-Based Hazard Management – Common Safety Method	19
4.2.2	System Definition	21
4.2.3	Hazard Identification and Classification	22
4.2.4	Risk Analysis	23
4.2.4.1	Application of Codes of Practice	25
4.2.4.2	Use of a Reference System	25
4.2.4.3	Explicit Risk Estimation	26
4.2.5	Risk Estimation Process and Risk Acceptance Criteria	27
4.2.6	As Low as Reasonably Practicable (ALARP Principle)	32
4.2.7	Hazard Analysis Processes and Documentation, Verification and Validation	32
4.3	Security Risk Assessment Process	34
4.3.1	Assets	36
4.3.1.1	Identification	36
4.3.1.2	Criticality Determination	36
4.3.2	Identification of Threats	36
4.3.3	Scenario Analysis	38
4.3.4	Identification of Vulnerabilities	39
4.3.5	Determining Likelihood	40
4.3.6	Determining the Consequence	41
4.3.7	Security Risk Criticality Matrix	42
4.3.8	Countermeasure Development	43
4.3.9	Residual Risk	44
4.3.10	Reporting	44
4.4	Verification and Validation Documentation	45
5.0	Development Of Safety And Security Design Criteria	46
5.1	Prevention through Design	46
5.2	Design Criteria	47
5.3	Design Reviews	48
5.4	Deviations and Changes	48
6.0	OPERATIONS AND MAINTENANCE	50
6.1	Operations and Maintenance Requirements	50
6.2	Operational Plans, Rules and Procedures	51
6.3	Training Program	51
6.4	Emergency Preparedness	52
7.0	Safety And Security Certification Program	53
7.1	Overview	53
7.2	Program Goals and Objectives	54
7.3	Responsibilities	54
7.4	Safety and Security Certification Process	54
7.4.1	Certifiable Elements	55
7.4.2	Certifiable Items Lists	56
7.4.3	Tracking of Hazards and Vulnerabilities	57
7.4.4	Certification of Final Design and Construction	58

7.4.5 Testing Phase Certification 59
7.4.6 Startup Phase Certification 59
7.4.7 Open Items List 60
7.4.8 Conditional Certification 60
8.0 Construction Safety And Security 61
8.1 Overview 61
8.2 Program Elements 61
8.2.1 Safety and Security Management Plan 61
8.2.2 Site-Specific Plans 62
8.2.3 Construction Safety and Security Management 62
8.2.4 Stop Work Order 62
8.3 Construction Risk Management 62
9.0 State Safety Oversight Regulations 64
9.1 Applicability 64
10.0 Coordination With Federal Railroad Administration 65
10.1 Activities 65
10.2 Implementation 66
10.3 Coordination Process 66
11.0 Department Of Homeland Security Coordination 67

FIGURES

FIGURE 3-1 CHSRP ORGANIZATION FOR SAFETY AND SECURITY ACTIVITIES 10
FIGURE 4-1 THE COMMON SAFETY METHOD PROCESS 20
FIGURE 4-2 SECURITY RISK ASSESSMENT PROCESS 35
FIGURE 4-3 SECURITY RISK WORKSHEET EXAMPLE 45
FIGURE 7-1 CEHL (SAMPLE) 57
FIGURE 7-2 CERTIFICATE OF CONFORMANCE (SAMPLE) 59

TABLES

TABLE 2-1 PROJECT SAFETY AND SECURITY ACTIVITIES MATRIX 7
TABLE 3-1 SAFETY AND SECURITY RESPONSIBILITIES MATRIX 16
TABLE 4-1 HAZARD SEVERITY CATEGORIES 29
TABLE 4-2 HAZARD FREQUENCY CATEGORIES 30
TABLE 4-3 RISK ASSESSMENT MATRIX 31
TABLE 4-4 RISK ACCEPTANCE MATRIX 31
TABLE 4-6 THREAT CATEGORY EXAMPLES 37
TABLE 4-7 GENERAL CRIME CATEGORIES AND EXAMPLES 37
TABLE 4-8 THREAT OR ATTACK TYPES EXAMPLES 37
TABLE 4-9 THREAT RATING MATRIX (INTENT X CAPABILITY) 38
TABLE 4-10 THREAT RATING AND DEFINITIONS 38
TABLE 4-11 VULNERABILITY LEVELS AND DESCRIPTION 40
TABLE 4-12 LIKELIHOOD DETERMINATION MATRIX (THREAT X VULNERABILITY) 41
TABLE 4-13 LIKELIHOOD RATING AND DEFINITIONS 41
TABLE 4-14 CONSEQUENCE RATINGS AND ASSESSMENT CRITERIA 42
TABLE 4-15 SECURITY RISK CRITICALITY MATRIX (LIKELIHOOD X CONSEQUENCE) 43
TABLE 4-16 SECURITY RISK INDEX 43

APPENDICES

APPENDIX A – CALIFORNIA HIGH-SPEED RAIL AUTHORITY ORGANIZATIONAL CHART
APPENDIX B – CHSRP CONSTRUCTION SAFETY PROGRAM REQUIREMENTS
APPENDIX C - TECHNICAL MEMORANDUM 500.01 *SAFETY AND SECURITY POLICY STATEMENT*
APPENDIX D - TECHNICAL MEMORANDUM 500.02 *SAFETY AND SECURITY EXECUTIVE COMMITTEE CHARTER*
APPENDIX E - TECHNICAL MEMORANDUM 500.03 *SAFETY AND SECURITY PROGRAM COMMITTEE CHARTER*
APPENDIX F - TECHNICAL MEMORANDUM 500.04 *FIRE AND LIFE-SAFETY AND SECURITY PROGRAM*
APPENDIX G - HAZARD ANALYSIS DESCRIPTIONS

ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definition
ARHRAM	Adjacent Railroad Hazard Risk Assessment Model
Authority	California High-Speed Rail Authority
CFR	Code of Federal Regulations
CHSR	California High-Speed Rail
CHSRP	California High-Speed Rail Program
CIL	Certifiable Items List
CPUC	California Public Utilities Commission
DHS	Department of Homeland Security
DOORS	Dynamic Object Oriented Requirements Management System (V & V database)
EMT	Engineering Management Team
FD	Final Design Phase
FLSSC	Fire/Life Safety and Security Committee
FMEA	Failure Mode Effects Analysis
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTAn	Fault Tree Analysis
ICS	Initial Construction Segment
OHA	Operating Hazard Analysis
PCM	Project Construction Management
PE	Preliminary Engineering Phase
PHA	Preliminary Hazard Analysis
PMO	Program Management Oversight
PMP	Project Management Plan
PTEPP	Passenger Train Emergency Preparedness Plan
QC	Quality Control
RAC	Rail Activation Committee
RAP	Rail Activation Plan
RC	Regional Consultant
RDP	Rail Delivery Partner

SITC	System Integration Testing Committee
SONO	Statement of No Objection
SSCP	Safety and Security Certification Plan
SSEC	Safety and Security Executive Committee
SPP	Security Program Plan
SSPP	System Safety Program Plan
SHEA	Software Hazard Effects Analysis
SiSHA	Site-Specific Hazard Analysis
SiSTVA	Site-Specific Threat and Vulnerability Assessment
SSHASP	Site-Specific Health and Safety Plan
SSI	Sensitive Security Information
SSMP	Safety and Security Management Plan
SSPC	Safety and Security Program Committee
SSSP	Site-Specific Security Plan
SSWG	Safety and Security Working Group
TSA	Transportation Security Administration
TVA	Threat and Vulnerability Assessment
V&V	Verification and Validation

REFERENCE DOCUMENTS

The following documents are referenced in this SSMP:

- 49 CFR Parts 200-299, Federal Railroad Administration regulations
- 49 CFR Part 633, Federal Transit Administration *Project Management Oversight*
- 49 CFR Part 659, Federal Transit Administration *State Safety Oversight*
- ANZI Z590.3-2011 *Prevention through Design*, 01/23/2012
- California Code of Regulations Title 8 Construction Safety Orders
- Department of Defense Military Standard 882E *Standard Practice for System Safety*. 5/11/2012
- European Railway Agency *Common Safety Method on Risk Evaluation and Assessment*, Official Journal of the European Union, 29.4.2009, Regulation 352/2009/EC
- European Railway Agency *Guide for the Application of the CSM Regulation*, ERA/GUI/01-2008/SAF, Version 1.1, page 26
- FRA *Collision Hazard Analysis Guide: Commuter and Intercity Passenger Rail Service*, October 2007
- FTA *Handbook for Transit Safety and Security Certification*, 11/2002
- FTA document *Hazard Analysis Guidelines for Transit Projects*, 01/2000.
- FTA document *Public Transportation System Security and Emergency Preparedness Planning Guide*, 01/2003.
- FTA Circular 5800.1 *Safety and Security Management Guidance for Major Capital Projects*, dated 8/1/07
- Federal Transit Administration manual *Transit Safety Management and Performance Measurement*, FTA Office of Safety and Security, 2011
- ISO 31000 Risk Management Standard

1.0 MANAGEMENT COMMITMENT AND PHILOSOPHY

1.1 Safety and Security Policy Statement

Safety and Security Policy Statement

It is the policy of the California High-Speed Rail Authority (Authority) to perform work on the California High-Speed Train System (CHSTS) in a manner that ensures the safety and security of passengers, employees, contractors, emergency responders, and the public. The application of system safety and security comprises a fundamental hazard and vulnerability management process that incorporates the characteristics of planning, design, construction, testing, operational readiness, and subsequent operation of the high-speed rail system. Safety and security are priority considerations in the planning and execution of all work activities on the CHSTS.

All trains, facilities, systems and operational processes must be designed, constructed, and implemented in a manner that promotes the safety and security of persons and property. The design, construction testing, and start-up of the CHSTS will comply with applicable safety and security laws, regulations, requirements and railroad industry practices. The Authority will maintain or improve upon the public transit and railroad industry standards for safety and security. Through the Reliability, Availability, Maintainability, and Safety (RAMS) Program a standard of safety will be established that is as safe as or safer than conventional U.S. railroad operations and in conformance with the best practices and standards for safety in the international high-speed rail industry. The design, construction, testing, and start-up of the CHSTS will be accomplished in compliance with this standard.

The Authority is committed to providing a safe and secure travel and work environment. Therefore, safety, accident prevention, and security breach prevention must be incorporated into the performance of every employee task. All Authority, Program Management Team, and contractor personnel, subcontractors and employees are charged with the responsibility for ensuring the safety and security of passengers, employees, contractors, emergency responders, and the public who come in contact with the CHSTS. Each individual and organization is responsible for hazard and vulnerability management, for applying the processes that are designed to ensure safety and security, and for maintaining established safety and security standards, consistent with their position and organizational function. Through a cooperative team effort and the systemic application of safety and security principles, the CHSTS will be designed, constructed, tested, and placed into service in a safe and secure manner.

Jeff Morales — 12-5-12

Jeffrey Morales, CEO
California High-Speed Rail Authority

Date

1.2 Background

The Federal Railroad Administration (FRA) requires that the California High-Speed Rail Authority (Authority) implement safety and security principles and processes throughout the development and operation of the California High-Speed Rail Program (CHSRP). Absent federal regulations that govern the completion of major capital projects, FRA looks to the Federal Transit Administration (FTA) regulations for guidance. Federal Transit Administration (FTA) regulations found at 49 CFR Part 633 requires the development of a *Project Management Plan* (PMP) for every major capital transit project. As described in FTA Circular 5800.1 Safety *and Security Management Guidance for Major Capital Projects,* (dated 8/1/07) a Safety *and Security Management Plan* (SSMP) is the element of the PMP that manages project safety and security activities, responsibilities, and verification processes throughout the project life cycle. This document fulfills the FRA requirement for managing safety and security in the development and operation of the CHSRP.

The SSMP does not carry over into revenue operations, but will lead to development of a System Safety Program Plan (SSPP),Security Program Plan (SPP) and Emergency Preparedness Plan (EMP) to govern safety and security for the operating system prior to the start of revenue service. The FRA is in the process of promulgating regulations that require the application of a System Safety Program Plan to inter-city passenger railroad operations.

1.3 Purpose of the SSMP

The SSMP formalizes the management principles and strategies for determining safety and security risk acceptance throughout the CHSRP life cycle, from the design phase through the start of revenue service, and is applied to each segment undertaken in turn. The SSMP defines the process for identifying, evaluating, and resolving safety hazards and security vulnerabilities associated with future railroad operations of the System prior to the start of revenue service. This process helps to ensure the achievement of the highest practical level of operational safety and security for the riding public, the employees, and anyone coming into contact with the CHSRP.

The purpose of the SSMP is to define the safety and security activities of the CHSRP and methods for identifying, evaluating, and resolving potential safety hazards and security vulnerabilities. It establishes responsibility and accountability for safety and security during the preliminary engineering, final design, construction, testing, and start-up phases of CHSRP development. Specifically, the SSMP does the following:

- Establishes the Authority's commitment and philosophy to achieve the highest practical level of safety and security for the Authority's staff, Rail Delivery Partner (RDP) staff, contractors, emergency responders, and members of the public that come into contact with the CHSRP
- Establishes processes for managing safety and security activities intended to minimize risk of injury and property damage, and to maximize the safety and security for the CHSRP passengers, employees, and the public
- Integrates the safety and security functions and activities throughout the CHSRP and its organizational structure
- Defines the safety and security responsibilities between the Authority and CHSRP design, construction, and start-up teams
- Defines the process for the documentation and certification of safety and security activities
- Evaluates project phases and activities to ensure continued development and advancement of safety and security principles
- Establishes the framework for construction safety and security

1.4 Applicability and Scope of SSMP

The SSMP is applicable to all phases of CHSRP development, from preliminary engineering through final design, construction, testing and the start of revenue service. The SSMP encompasses all equipment, infrastructure, operating and maintenance plans and procedures associated with the CHSRP.

1.4.1 Project Description

The CHSRP will construct a state-of-the-art, statewide, high-speed performance passenger railroad based on operating practices and designs of existing high-speed rail networks in Europe and Asia which have had extraordinary performance and safety records. The CHSRP will require certification by federal and other regulatory agencies which have indicated they are open to approaches which provide equivalent or better safety than existing rail regulations in the United States. The Authority's eventual goal is to develop a system of more than 800 route miles that provides high-speed rail service between the major metropolitan centers of the San Francisco Bay Area and Sacramento in the north, through the Central Valley, to Los Angeles, Anaheim, Irvine and San Diego in the south.

The CHSRP trains will operate at speeds up to 220 mph within its dedicated or shared-use corridors where the CHSRP has sole use of a track, and up to 110 mph in shared-use conditions where there is joint use of tracks with other rail carriers. No hazardous materials will be transported or permitted to be transported on Authority trains or by others on Authority dedicated tracks.

The service will use high-speed steel-wheel on steel-rail technology which has been service-proven in Asia and Europe and provides a high level of service in terms of safety, comfort, and reliability. The system will operate on a mostly dedicated, fully grade-separated standard gage track with electric trains powered through the use of an overhead contact system (OCS). The right-of-way will make use of tunneling and elevated structures to achieve an ideal alignment and profile. Automotive, animal, other railroad and non-railroad equipment crossings will be accomplished by means of an underpass or overpass.

The system will include an Automatic Train Control (ATC) system based on designs for similar high-speed environments in Europe and Asia, modified only where necessary to meet regulatory requirements and functional and performance needs specific to the CHSRP. The ATC system will cover all functions of a train control system including both safety critical and non-safety critical operations and will incorporate Positive Train Control in compliance with 49 CFR Part 236. A hazard detection system will be applied throughout the CHSRP where supported by hazard analysis to alert the operating control center of natural events such as seismic activity, excessive wind speeds, high water levels, and excessive ambient temperature levels that trigger a system response; and other events such as vehicle or rail car intrusion, and trespassers.

1.4.2 Phased Implementation

Although Preliminary Engineering Phase activities will occur simultaneously for the entire system, the Final Design and Construction Phase activities will be developed in phases according to geographic segments, due to the size of the eventual system. The Initial Construction Segment (ICS) has been designated as a point north of Madera to a point north of Bakersfield. Subsequent segments will extend north and south from the ICS.

The Initial Operating Segment (IOS) will encompass several construction segments, with high-speed operations planned between San Jose in the north and a point north of Bakersfield in the south. The SSMP has been developed with processes that will ensure conformance to system safety goals and requirements throughout the life-cycle of the CHSRP and while various segments are under different development phases simultaneously.

1.4.3 SSMP Scope

This SSMP encompasses the following equipment, facilities, plans, and procedures as they relate to the System.

- System-Wide Elements – includes the passenger vehicles, train control and signaling, voice and data communications, closed-circuit television cameras and recorders, overhead contact system, traction power substations, track, and auxiliary vehicles and equipment
- Fixed Facilities – includes rail stations; pedestrian overpasses and underpasses; highway overpasses and underpasses; aerial and other elevated structures; below-grade structures and tunnels; operations and maintenance facilities including storage yards, shops, and sidings; administrative facilities; and the Central Control Facility
- Safety and Security Plans and Procedures – includes items such as Safety and Security Certification Plan (SSCP), safety and security related Design Criteria, Passenger Train Emergency Preparedness Plan (PTEPP), SSPP, SPP and EMP.
- Procedures and Instructions – includes items such as: hazard management, operations and maintenance plans procedures, rulebooks and manuals; and training programs for operating, maintenance and management employees, employee qualifications, contractor training, and emergency responder training.

1.5 SSMP Goals and Objectives

1.5.1 Goals

The goals of the SSMP are as follows:

- Ensure that the system initiated into revenue service is safe and secure for passengers, employees, emergency response personnel, and the general public through a formal program of safety and security certification
- Ensure that the design, acquisition, construction, fabrication, installation, and testing of critical elements of CHSRP development will be verified for conformance with the established safety and security requirements and validated for achieving an effective level of safety and security
- Ensure that a mechanism is in place for the resolution of any restriction to full safety and security certification
- Establish a Construction Safety and Security Program that provides appropriate safeguards against injuries to employees and the public, damage to property and the environment, as well as minimizes security breaches, during all CHSRP work activities
- Achieve a level of risk that is acceptable to the Authority through a systematic approach to hazard and threat/vulnerabilities management

1.5.2 Objectives

The SSMP goals will be achieved by meeting the following objectives:

- Identifying, evaluating, resolving, and documenting safety hazards and security vulnerabilities at the earliest possible phase of CHSRP development, applying the *Prevention through Design* principle where possible
- Establishing specific safety and security requirements for the CHSRP based on applicable safety and security regulations, codes, standards, guidelines, and recognized best practices both domestically and internationally where applicable
- Certifying that all CHSRP facilities, systems, and equipment have been designed, built, procured, installed, inspected, and tested in accordance with the safety and security requirements found in design criteria and specifications
- Implementing CHSRP construction safety and security programs in conformance with established construction safety and security requirements and complying with the California Occupational Safety and Health Administrative safety regulations for construction projects
- Establishing a program for the completion of training of personnel who will respond to emergencies, including CHSRP personnel and emergency responders, on the CHSRP emergency procedures, equipment, and operations
- Establishing and documenting the qualifications and training programs for all personnel who will operate and maintain the CHSRP in revenue service
- Conducting and documenting emergency exercises and drills prior to the start of revenue service
- Documenting safety, security, and emergency rules and procedures for CHSRP employees, staff, and contractors in the form of rulebooks, standard operating procedures, emergency operating procedures, and other documents
- Maintaining a process to manage and track open safety and security issues resulting from design deviations, change orders, and non-conformances from inception through closure and acceptance

- Documenting final Safety and Security Certification for the CHSRP segment under consideration by means of a Final Safety and Security Certification Report to the FRA prior to placing that segment into revenue service
- Ensuring coordination with the Federal Railroad Administration, California Public Utilities Commission, the Transportation Security Administration, the Office of the State Fire Marshal, and other external agencies as applicable

1.6 SSMP Review and Updates

The SSMP will be reviewed at least annually, whenever the Program Management Plan or other reference documents are modified, and following any SSMP audit to ensure the safety and security management program remains current and applicable. If revised, the SSMP will be re-issued to all SSMP recipients. The SSMP will be updated to reflect changes in the CHSRP, the Authority's organizational makeup, or the safety and security management program requirements. The review and update process will be the responsibility of the Authority with the oversight and coordination of the Authority's System Safety Manager.

The Federal Railroad Administration is developing regulations for inter-city passenger rail system safety programs, to be codified under 49 CFR, Part 270. This SSMP is written to be in conformance with proposed regulations for 49 CFR, Part 270 and will support the project management requirements of a System Safety Program Plan.

1.7 SSMP Applicability to Third Parties

The safety and security requirements for third party assets (adjacent infrastructure or operations, shared-use corridors, utility interfaces, etc.) will be developed following the safety and security management program of the applicable third party but in conformance to the processes and requirements of this SSMP. Safety and security certification of third party elements shall conform to the Safety and Security Certification Program requirements of the third party and Section 7 of this SSMP.

1.8 System Safety Program Plan and System Security Plan

A System Safety Program Plan (SSPP) will be developed prior to the start of revenue operations. The SSPP will comply with all FRA and other applicable regulatory requirements, and will be appropriate in scope and content to manage the transition the CHSRP safety program from a project to an operating system.

A System Security Program Plan (SPP) will also be developed prior to the start of revenue operations. The SPP will comply with all Department of Homeland Security (DHS) and other applicable regulatory requirements, and will be appropriate in scope and content to manage the transition the CHSRP security program from a project to an operating system

2.0 INTEGRATION OF SAFETY AND SECURITY INTO THE CHSRP DEVELOPMENT PROCESS

2.1 Safety and Security Activities

This section describes the safety and security activities that have been or will be performed during the major phases of the project. A list of the basic activities and the desired milestone goals are presented in Table 2-1. The California High-Speed Rail Program has four phases:

- Preliminary Engineering
- Final Design
- Construction
- Testing and Startup of Revenue Operations

Although Preliminary Engineering Phase activities will occur simultaneously for the entire system, the Final Design and Construction Phase activities will be developed in phases according to geographic segments, due to the size of the eventual system. The SSMP has been developed with processes that will ensure conformance to system safety goals and requirements throughout the life-cycle of the CHSRP and while various segments are under different development phases simultaneously.

Within each phase of the CHSRP, activities are identified to determine the safety and security-related certification activities expected to be accomplished at each project milestone. The California High-Speed Rail Authority will apply a detailed and thorough safety and security certification program. The safety and security certification program, as described in Section 7.4 of this SSMP, will ensure that the project achieves all safety and security requirements in design criteria and specifications and that the safety and security contents of the plans, procedures, and training materials are systematically reviewed and revised as required.

Leading up to and through the Preliminary Engineering phase of the project, the safety and security activities encompass the following:

- Develop the SSMP, including a process for achieving safety and security certification, to meet all FRA requirements for a safety and security management plan in a major capital project, in conformance with the FTA's Circular 5800.1 *Safety and Security Management guidance for Major Capital Projects*.
- Develop a list of safety-critical and security-critical elements and items for the CHSRP Preliminary Hazard Analyses (PHA) and Threat and Vulnerability Assessment (TVA).
- Specify safety and security certification requirements, in conformance with the process identified in the *CHSRP Verification and Validation Management Plan*, in contract documents. Safety and security certification requirements will be part of the scope of work for the design/build contractors during the Final Design and Construction phases of the project.
- Implement a hazard and certification tracking system.
- Perform a PHA and a TVA to identify certifiable elements and hazards/vulnerabilities requiring mitigation. Identify hazard/vulnerability mitigation from the PHA and TVA to be incorporated into preliminary and final designs. Perform additional analysis as required.
- Develop design criteria conformance checklists, known as Critical Items Lists (CIL). The tracking system will be an integrated subset of the Verification and Validation program applied throughout the CHSRP.

Table 2-1 Project Safety and Security Activities Matrix

Task No.	Safety and Security Task	Project Phase			
		Prelim. Engr.	Final Design	Construction	Testing and Startup
1	Develop and update the Safety and Security Management Plan (SSMP)	√	⇒	⇒	⇒
2	Identify Certifiable Elements and Items	√	⇒	⇒	⇒
3	Specify Safety and Security Certification Requirements into Contract Documents	√	⇒	⇒	⇒
4	Implement Certification Tracking System	√	⇒	⇒	⇒
5	Conduct Preliminary Hazard Analysis (PHA) and Threat and Vulnerability Assessment (TVA) and Resolve Unacceptable Hazards and Vulnerabilities	√	⇒	⇒	⇒
6	Develop Design Criteria Conformance Checklists	√	⇒		
7	Conduct Independent Safety and Security Audits		√	⇒	⇒
8	Verify Design Criteria Conformance Checklists and Issue Certificates		√	⇒	
9	Develop Construction Specification Conformance Checklists		√	⇒	
10	Develop Safety-Related Testing Conformance Checklists			√	⇒
11	Verify Specification Conformance Checklists			√	⇒
12	Verify Safety-Related Testing Conformance Checklists				√
13	Verify Operations and Maintenance Manuals Conformance			√	⇒
14	Complete Contractor Training			√	⇒
15	Complete Rules and Procedures and Issue Certificates			√	⇒
16	Complete Operations Training and Issue Certificates				√
17	Complete Emergency Services Training				√
18	Complete Emergency Response Exercises				√
19	Issue Phase Safety/Security Certificate of Conformance				√
20	Issue Final Safety/Security Certification Report				√

Note: √ = Task activity initiated
⇒ = Task activity updated

2.2 Procedures and Resources

2.2.1 Procedures

A *CHSRP Project Management Plan* (PMP) for the system has been prepared. The PMP establishes the framework for managing and administering all activities related to implementation of the system and provides guidance for the coordination of activities. The PMP identifies that the RDP is responsible for

developing the basic design requirements of the high-speed rail system, ensuring that common approaches for the environmental and outreach work are used through the entire alignment, preparing and helping execute bid and procurement processes for design, construction, maintenance, and operations, and managing the work of or coordinating with a variety of other consultants to the Authority, notably the Regional Consultants (RC).

A major component of the PMP is this *Safety and Security Management Plan*, describing processes for identifying and managing hazards and vulnerabilities associated with the CHSRP. It is the responsibility of the Authority to ensure that the management of identified safety hazards and security threats and vulnerabilities is effective and integrated throughout the design, construction, testing, and startup phases of the CHSRP.

The verification and validation process will be applied throughout the CHSRP for the purpose of tracking and verifying that critical elements are incorporated into all project phases. Critical elements include safety-critical and security-critical elements as identified though the hazard management processes identified in this SSMP.

2.2.2 Resources

The Chief Executive Officer authorizes the SSMP, ensuring that it is applied throughout the CHSRP. The Risk Manager administers and oversees the implementation of the SSMP. The Authority will provide additional safety and security management resources for executing the system safety and security activities during the Preliminary Engineering phase. Further resources and responsibilities will be identified as the system progresses into later phases, culminating in startup and commissioning.

The budget and schedule for implementation of the SSMP is revised each year and is held with the Risk Manager. This assures that the requirements of the SSMP are executed by the Authority, supported by the RDP, during the Preliminary Engineering phase and in subsequent phases of the project. This includes, but is not limited to, the performance of safety analyses and security assessments at the appropriate phases of the project; implementation of a Safety and Security Certification Program beginning at Preliminary Engineering and continuing through each subsequent phase of the project; a process to ensure that safety issues and security concerns are addressed and tracked to resolution; and construction safety oversight activities as appropriate to the Construction phases and contracts under way at the time.

2.3 Interfacing with Management

The California High-Speed Rail Authority Chief Executive Officer, through the Authority Director of Risk Management, has the ultimate decision-making authority for safety and security issues and is responsible for communication of safety and security issues to the Authority Board of Directors. The Authority Director of Risk Management will oversee the overall implementation of the safety and security program and will report the progress and challenges in its implementation to the Safety and Security Program Committee. The Safety and Security Program Committee will communicate the safety and security issues to the Authority executive management through reports to the Safety and Security Executive Committee.

Successful implementation of the SSMP will also require significant interaction between various members of the Authority, the Rail Delivery Partner, Contractors, Regional Consultants, Engineering/Construction Managers, and Emergency Response Agencies. These interactions will occur during regularly scheduled meetings of the Safety and Security Program Committee (SSPC) and Safety and Security Executive Committee (SSEC) that focus on the safety and security aspects of the system.

3.0 SAFETY AND SECURITY RESPONSIBILITIES

3.1 Roles and Responsibilities

The California High-Speed Rail Authority (Authority) is responsible for developing a high-speed train system in California in a safe and secure manner, ensuring that all trains, facilities, systems and operational processes are designed, constructed, and implemented in a manner that promotes the safety and security of persons and property. The Authority has the ultimate authority and responsibility for the implementation of the *Safety and Security Management Plan* (SSMP) for this system. The Authority is tasked to prepare a plan and design for the system, conduct environmental studies and obtain necessary permits, and undertake the construction and operation of a high-speed train passenger network in California.

The Authority Safety and Security Manager, under the direction of the Authority Director of Risk Management, administers and oversees the implementation and activities of the Safety and Security Program. See Risk, Safety and Security Organizational Chart in Appendix A. The Authority's primary vehicle for oversight of the safety and security activities is a tiered organization of safety and security committees (explained in detail in Section 3.3).

The Federal Railroad Administration (FRA) is the lead agency for the Federal Environmental Impact Statement. The FRA is also the primary regulatory agency responsible for approving and certifying the system safety and security aspects of the CHSRP. At the state level, the California Office of the State Fire Marshal has regulatory authority over the fire and life safety aspects of the occupied structures, including right-of-way access/egress facilities

The Authority has contracted with WSP | Parsons Brinckerhoff (PB) as the Rail Delivery Partner (RDP), and five Regional Consultant (RC) teams to conduct the preliminary engineering on specific segments of the line and provide overall Program Management for the CHSRP.

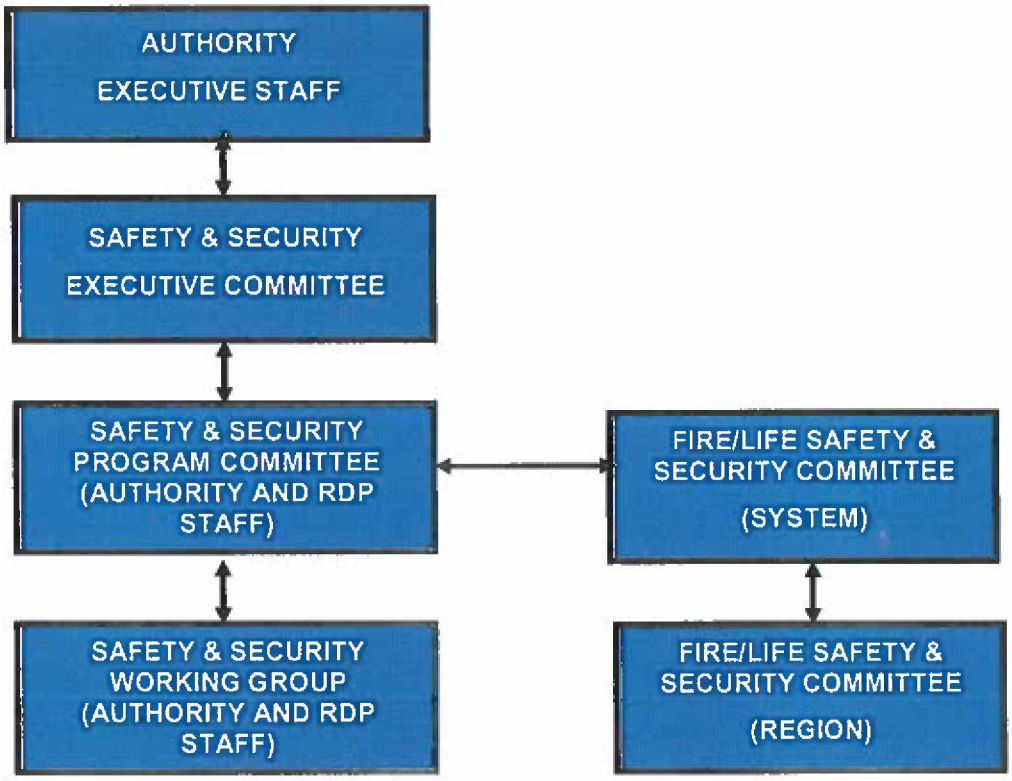
The RDP is responsible for the management of the preliminary design of the high-speed train system, including ensuring that system safety and security is applied consistently and effectively for the entire CHSRP alignment and across all phases of the project.

The RDP Safety and Security Managers will support the Authority Safety and Security Manager in the application of safety and security in all aspects and phases of the project coordinating with the Program Deputy Directors, Discipline Managers, and Regional Managers. This support will ensure that other individual project staff members perform in accordance with the SSMP in establishing and overseeing the safety and security management tasks. The RDP's primary vehicle for input to and support of the safety and security activities is the Safety and Security Program Committee (explained in detail in Section 3.3.2).

Staff members assigned to the CHSRP by the Authority, RDP, contractors, consultants, emergency response agencies, FRA and CPUC are responsible for ensuring that the design, construction, installation, and testing of all safety-critical and security-critical system elements of the system are evaluated for conformance with the safety and security requirements and verified for operational readiness before completing each phase of the project.

Refer to Figure 3-1 for the CHSRP organizational chart for safety and security activities. This SSMP shall be updated to reflect any significant changes in the organizational structure or definition of responsibilities with respect to safety and security in the CHSRP.

Figure 3-1 CHSRP Organization for Safety and Security Activities



3.2 Authority Organization

The Authority has a nine-member policy board and a core staff, supported by contract with private consulting firms (the RDP, Regional Consultants and other specialty firms) to carry out the project's system safety and security programs, environmental studies, project planning and engineering work under the supervision and guidance of Authority staff. The Authority's Director of Risk Management is responsible for safety and security activities, reporting directly to the Chief Executive Officer.

The project organization will remain in place throughout the CHSRP development process; however, the composition of the project organization may be revised to respond appropriately to the changing project needs as the project proceeds through from the preliminary engineering phase through to the start of revenue service. The Authority project organization during the initial project phases comprises the Authority and RDP staff supplemented by Regional Consultant staff. In each phase, the Authority will use the assistance of the RDP to manage project-related activities, as well as further assistance from professional engineering and other project management consulting firms.

The current California High-Speed Rail Authority organization is shown in Appendix A.

3.2.1 Authority Chief Executive Officer

The Authority Chief Executive Officer oversees and directs the management of all Authority staff and the Rail Delivery Partner. The day-to-day management of the development activities for the California High-Speed Rail Program is the functional responsibility of the Authority Program Director under the direction of the Authority Chief Executive Officer. The Authority Chief Executive Officer ensures that Authority

resources are allocated to meet the SSMP goals and objectives, and is ultimately responsible for execution of the *Safety and Security Management Plan* through the Authority Director of Risk Management and the Authority Safety and Security Manager. The Authority Chief Executive Officer chairs the SSEC and reports to the Authority Board of Directors.

3.2.2 Authority Director of Risk Management

The Authority Director of Risk Management reports directly to the Authority Chief Executive Officer and is responsible for identifying, managing and tracking risks and risk mitigation/contingencies, and all responsibilities related to safety and security management on the project, His duties also include maintaining the risk management tool and documentation information, leading risk identification sessions for the project, monitoring prime contractor risk management efforts, and participating in risk management activities for risks that cross project boundaries or are beyond the project's control. He chairs the SSPC and directs active management of all safety and security efforts for the project and reports activities from the SSPC to the SSEC.

3.2.3 Authority Safety and Security Manager

The Authority Safety and Security Manager is responsible for the management of all safety and security activities associated with the development and implementation of the CHSRP. The Authority Safety and Security Manager is a member of the SSPC, SSEC and SSWG, and advises the Authority on policy decisions with regard to safety and security. The Authority Safety and Security Manager reports directly to the Authority Director of Risk Management and coordinates safety activities with the RDP Safety and Security Managers.

The Authority Safety and Security Manager has the authority and responsibility for, but is not limited to the following:

- Ensuring that the SSMP requirements and processes are being implemented and that SSMP goals and objectives are being achieved
- Oversight of the RDP safety and security activities
- Developing corrective action plans (CAPs) that result from accident/incident investigations, hazard analyses, certification of Certifiable Items List (CIL), and safety and security reviews and audits; and tracking corrective actions through closeout to ensure that all identified deficiencies are adequately mitigated or controlled
- Providing oversight for the Contractors' job site safety and programs
- Reviewing and supporting Authority decision for Contractor's safety submittals
- Investigating accidents and incidents on behalf of the Authority
- Reporting unacceptable hazardous conditions to executive management as soon as possible
- Fulfill the role of Chair for the Fire and Life-Safety and Security Statewide Committees

3.3 Rail Delivery Partner Organization

The Authority has engaged a Rail Delivery Partner (RDP) to assist with the management of the delivery of the California High-Speed Rail System. As an integrated member of the Authority's staff the RDP provides technical expertise, advice and support to the Authority with regards to safety and security.

3.3.1 RDP System Safety Manager

The RDP System Safety Manager will support the Authority Safety and Security Manager in the implementation and completion of all safety activities associated with the development of the CHSRP. The RDP System Safety Manager will coordinate safety activities within the RDP and sits on the SSWG, SSPC, SSEC, and Fire and Life-Safety and Security Committees as requested. The RDP System Safety Manager's role on the Committees is to ensure that safety is not compromised by other priorities of the design and construction teams.

The RDP System Safety Manager has the responsibility for, but is not limited to, the following:

- Performing hazard management of CHSRP elements and design criteria to determine any potential hazards that may be created by system development, expansion or modification, and supporting the development of mitigating and controlling factors to address such hazards
- Participating in the project design reviews, including overseeing and administering formal safety and security certification programs
- Working with RDP engineering, operations and maintenance staff to ensure that the system is being designed to safety and security criteria
- Fulfilling the role of Coordinator for the SSPC, the SSWG the Fire and Life-Safety and Security Statewide and Regional Committees
- Supporting Authority outreach efforts to local, regional and State emergency response agencies
- Performing other safety-related activities as requested by the Authority

3.3.2 RDP System Security Manager

The RDP System Security Manager will support the Authority Safety and Security Manager in the implementation and completion of all security activities associated with the development of the CHSRP. The RDP System Security Manager will coordinate security activities within the RDP and sit on the SSPC, SSWG, SSEC, and Fire and Life-Safety and Security Committees as requested. The RDP Security Manager's role on the Committees is to ensure that security requirements are not compromised by other priorities of the design and construction teams.

The RDP System Security Manager has the responsibility for, but is not limited to, the following:

- Performing threat and vulnerability assessments of CHSRP operating environments and design criteria to determine any potential vulnerabilities that may be created by system development, expansion or modification, and supporting the development of mitigating and controlling factors to address such vulnerabilities
- Participating in the project design reviews, including overseeing and administering formal safety and security certification programs
- Working with RDP engineering, operations and maintenance staff to ensure that the system is being designed to safety and security criteria
- Fulfilling the role of Coordinator for the SSEC
- Supporting Authority outreach efforts to local, regional and State emergency response agencies and law enforcement agencies
- Performing other security-related activities as requested by the Authority

3.3.3 RDP Construction Safety Officer

The RDP Construction Safety Officer will support the Authority Construction Manager and Safety and Security Manager in the implementation and completion of all safety activities associated with the construction of the CHSRP.

The RDP Construction Safety Officer has the responsibility for, but is not limited to, the following:

- Oversight of the Project Construction Management (PCM) teams for safety and security activities
- Field audits and inspections of construction activities on behalf of the Authority
- Accident investigation and follow-up
- Development of field safety rules and procedures for Authority and RDP staff

- Training to support Authority and RDP field safety rules and procedures
- Safety Management System data collection, analysis, and documentation

3.3.4 Other RDP Managers

The managers of the following disciplines will be responsible for implementing the SSMP requirements and process in their respective areas, participating in the SSPC and for supporting the Authority Safety and Security Manager as required:

- Engineering, including Infrastructure and Systems
- Operation and Maintenance
- Rolling Stock
- Integration and Regulatory Approvals
- Project Risk
- Contracts and Procurement
- Verification and Validation

3.4 Contract/Procurement Safety and Security

The complexity of the CHSRP necessitates varied approaches to design and constructions for Project elements such as infrastructure, rolling stock, track, and systems. All procurements for project elements, regardless of the procurement type, will contain safety and security requirements that support the safety and security program of the HSR. All contractors will be required to manage their programs consistent with the hazard management approach and certification contained within the Authority's SSMP and other safety and security requirements, such as the Design Criteria Manual Chapter 32.

3.5 Committee Structure

Chapter 2 of the PMP describes the function of various project committees. In addition, safety and security committees listed below will be established to facilitate review of issues and to provide a forum for discussion and resolution.

3.5.1 Safety and Security Executive Committee

The Safety and Security Executive Committee (SSEC) and its members will ensure that the CHSRP is designed, built, and implemented in a safe and secure manner. The SSEC will address safety and security issues that are Authority policy considerations, require Authority approval, require Authority direction for resolution of a dispute, or constitute final acceptance of safety and security certification.

The duties and responsibilities of the SSEC are as follows:

- Provide guidance to and approval of policy decisions with respect to safety and security
- Provide a forum for safety and security discussions among Authority Executive Management, discipline leads, and RDP Management
- Authorize the establishment of the SSPC
- Review and approve regular reports of safety and security activities from the SSPC
- Resolve safety and security issues that cannot be resolved at the SSPC level
- Review and accept a final Safety and Security Certification Report prior to the startup of revenue operations

The SSEC comprises the following persons:

- Chief Executive Officer (Chair)
- Director of Risk Management and Project Controls (Vice-Chair)

- Regional Directors (Northern California, Central Valley, Southern California)
- Chief Program Manager, Rail Operations and Maintenance
- Chief Counsel
- Chief Engineer
- Program Director, Program Delivery
- Chief Administrative Officer
- Safety & Security Risk Manager (advisory role)
- System Safety Manager (advisory role)
- System Security Manager (Committee Coordinator - advisory role)
- Construction Safety and Security Manager (advisory role)

The Chairperson of the SSEC is the Chief Executive Officer or a designated Authority executive management representative. If a designated member of the SSEC is unable to attend a SSEC meeting, they must assign an appropriate representative.

The SSEC Charter, Technical Memorandum 500.02, can be found in Appendix C of this SSMP.

3.5.2 Safety and Security Program Committee

Working at the project delivery level, the Safety and Security Program Committee (SSPC) will ensure that the CHSRP is designed, built, and implemented in a safe and secure manner. The SSPC will achieve this goal by providing oversight of the application of the SSMP through all phases of the CHSRP development and to act as a conduit to informing and assuring Authority executive management (through the SSEC) of safety and security issues affecting the project.

The SSPC will address safety and security issues which are directed to it by the SSEC, require project delivery level resolution, require elevation to the SSEC for Authority direction for resolution, or constitute preliminary review and SONO of Safety and Security Certification.

The duties and responsibilities of the SSPC are as follows:

- Approve the initial version of the SSMP and subsequent updates
- Oversee the application of the SSMP through all CHSRP development phases
- Tracking of identified hazards or vulnerabilities listed on the programmatic Certified Items List
- Provide regular reports of safety and security activities to the SSEC
- Forward to the SSEC for resolution any safety and security issues that cannot be resolved at the SSPC level
- Review Safety and Security Certification Packages and a Final Certification Verification Report for each project phase
- Forward a final Safety and Security Certification Report to SSEC for Authority acceptance at the completion of significant project milestones or phases and prior to the startup of revenue service
- Provide a forum for safety and security discussions among Authority/RDP staff members and a conduit for safety and security issues requiring policy decisions to the Authority's Executive management through the SSEC

The SSPC is made up of the following persons:

- Director of Risk Management and Project Controls (Chair)
- Safety and Security Risk Manager (Vice-Chair)

- System Safety Manager (Committee Coordinator)
- System Security Manager
- Construction Safety and Security Manager
- Director of Operations and Maintenance
- Deputy Director Operations & Maintenance
- Director of Engineering
- Director of Construction Support
- Director of Network Integration
- Rail Systems Manager
- Rolling Stock Manager
- Deputy Regional Directors (Northern California, Central Valley, Southern California)
- Director of Environmental Services
- Director of Real Property

If a designated member of the SSPC is unable to attend a SSPC meeting, they must assign an appropriate representative.

The SSPC Charter, Technical Memorandum 500.03, can be found in Appendix D of this SSMP.

3.5.3 Safety and Security Working Group (SSWG)

The Safety and Security Working Group (SSWG) is the technical group created to assist in application of hazard assessment methodology, evaluation of safety and security design criteria and other technical safety and security requirements. The group consists of safety and security, operations and project delivery staff. Technical safety and security issues are evaluated within the group prior to being forwarded to the SSPC and SSEC.

3.5.4 Fire and Life Safety and Security Committees (FLSSC)

The Fire and Life Safety and Security Committees (FLSSC) will be composed of representatives from fire, police and local building code agencies assigned to two levels of standing committees: a Statewide FLSSC and several regional FLSSC working on a local level. The CHSRP formed the FLSSC during the Preliminary Engineering phase of the project. The purpose of the FLSSC is to provide outreach to local and regional emergency response agencies for issues that are critical to fire and life safety and security, to acquire input and concurrence from the state and local authorities having jurisdiction over the proposed designs to meet code requirements, and to ensure compliance with state and local fire code standards or fire/life safety hazard mitigation measures during the design phase. As the project moves into the Testing and Startup Phase the FLSSC will review operating plans and procedures, results of after-action reviews following major emergency response incidents or exercises, and training programs for content appropriateness and effectiveness.

The Statewide FLSSC will focus on systemic, high-level, fire/life safety and security issues, including federal and state codes or requirements impacting the regional efforts. A goal of the Statewide FLSSC is to obtain concurrence from Federal and State authorities with respect to fire and life safety and security concerns. The Statewide FLSSC will include a representative from each regional FLSSC as well as representatives from Federal and State agencies such as the California Office of the State Fire Marshal, California Highway Patrol, California Office of Emergency Services, CPUC, FRA, and DHS. The Statewide FLSSC will be chaired by the System Safety Manager. Meetings will be held regularly in Sacramento with agendas, minutes, and other support materials supplied by the committee chair. Minutes and action items from the meetings will be conveyed to the regional FLSSCs and to the Safety and Security Program Committee for their consideration

Regional FLSSCs will focus on the CHSRP characteristics specific to their corridor segments (type/length of underground and elevated structures, access methods, terminals, etc.) to provide input with respect to local building codes or requirements that are in line with the emergency response characteristics and capabilities of the local agencies. A goal of the regional FLSSC is to obtain concurrence from local authorities with respect to the proposed designs and the code requirements of the State and Federal authorities having jurisdiction. The regional FLSSC will be composed of appropriate representatives (e.g., Fire Marshal, Police Chief) from local emergency response agencies (fire, police, EMT) and will be chaired by the System Safety and Security Managers or designees. Meetings will be held regularly at a location local to the regional corridor, with agendas, minutes, and other support materials supplied by the committee co-chairs. Minutes and action items from the meetings will be conveyed to the system FLSSC and to the Safety and Security Program Committee for their consideration. One representative from each regional FLSSC will be asked to participate in the system FLSSC. Consistent membership is critical to success. Each regional representative must be the same representative attending to System FLSSC matters and reporting results to their specific Regional Committee.

The FLSSC Charter, Technical Memorandum 500.04, can be found in Appendix E of this SSMP.

3.5.5 Change Control

There are two committees devoted to change control at CHSRA. The first committee, the Change Control Committee (CCC) manages scope, costs and schedule. Another committee or process is being developed to ensure technical changes are tracked and managed.

3.5.6 Rail Activation Committee (RAC)

During construction, a multi-disciplinary rail activation committee will be formed to ensure all elements for rail activation are being managed, including meeting FRA regulatory requirements, safety and security certification and other program requirements. This committee will coordinate planning and process development efforts for the operational testing of the system and eventual startup of revenue service.

3.5.7 System Integration Testing Committee (SITC)

Typically a System Integration Testing Committee (SITC) will coordinate the development of an integrated testing program as a sub-committee to the RAC. If required, the SITC will plan for the effective and efficient testing of subsystems, and then the overall system, including ensuring that as testing progresses mitigations are taken to ensure the safety of the tests. The maturity of the various subsystems will be taken into account prior to full development and assurance that the systems are proven safe. The SITC will be multi-disciplinary in scope and will be established during the latter stages of the Construction Phase.

3.6 Safety and Security Responsibilities Matrix

The requirements, authority, and activities for safety and security will be integrated into the overall project management. At each stage of project advancement, there will be a process in place to ensure that the appropriate parties are aware of their safety and security responsibility associated with the project activity. The Safety and Security Responsibility Matrix (Table 3-1) lists the activities to be performed and assigns the responsibilities from the Preliminary Engineering phase through system Start-up phase.

Table 3-1 Safety and Security Responsibilities Matrix

Key Safety and Security Program Elements	Preliminary Engineering					Final Design					Construction					Testing and Startup				
	SS	PC	EC	CM	CN	SS	PC	EC	CM	CN	SS	PC	EC	CM	CN	SS	PC	EC	CM	CN
System Requirements	P	O	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Programmatic Hazard Analysis	P	O	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Site-Specific Hazard Analysis	P	O	A	-	-	S	-	-	O	P	S	-	-	O	P	S	-	-	O	P
Design Variance Requests / Analysis	-	-	-	-	-	S	-	-	O	P	S	-	-	O	P	S	-	-	O	P
Risk Acceptance	P	O	A	-	-	P	O	A	-	-	P	O	A	-	-	P	O	A	-	-

Design Criteria	P	O	-	-	-	P	O	-	-	-	P	O	-	-	-	P	O	-	-	-
Certifiable Items Lists (CIL)	P	-	-	-	-	S	-	-	O	P	S	-	-	O	P	S	-	-	O	P
Safety and Security Certification Reports including. CIL	-	-	-	-	-	-	-	-	O	P	-	-	-	O	P	-	-	-	O	P
SONO of Safety and Security Certification Reports	-	-	-	-	-	O	P	-	S	S	O	P	-	S	S	O	P	-	S	S
Certification of Safety and Security of Project Phase	-	-	-	-	-	P	S	A	-	-	P	S	A	-	-	P	S	A	-	-

P = Primary S = Supporting A = Approval O = Oversight/Audit

4.0 HAZARD MANAGEMENT

4.1 Overview

A hazard is an intentional or unintentional condition or circumstance that has the potential to cause injury, illness, death, damage or loss of equipment or property, or severe environmental damage. Safety hazards (unintentional) or security hazards (intentional) both require management to identify and reduce the risk to the Authority

A risk assessment process for the management of safety and security hazards will be used for the CHSRP. The purpose of the process is as follows:

- Identify and evaluate the effects of hazardous conditions on passengers, CHSRP personnel, CHSRP infrastructure and equipment in order to apply mitigation measures that allow the Authority to achieve an acceptable level of risk.
- Define and evaluate mitigation measures to eliminate or control the identified safety and security hazards.
- Document the development and incorporation of safety and security measures on a Certifiable Items List (CIL) during System development and implementation, demonstrating how an acceptable level of safety and security is to be achieved.

The development of the safety hazard analyses and security risk assessments will be coordinated with the appropriate engineering disciplines for the identification of applicable hazards and recommended control measures. Supporting documentation will be submitted to the SSPC for review. The SSPC will elevate the reports to the Authority, through the SSEC, as appropriate to the processes described in Section 3.4.

Hazard management processes will be applied to the development of the System throughout the entire System life cycle. As the System enters Final Design, the design/build contractors will review and update the CIL for the geographic section under consideration, and work with the Authority to perform or support other analyses as warranted by local or site-specific conditions or designs. Any deviations to the Design Criteria will follow the procedures outlined in section 5.4. Other hazards may be identified during the normal course of work on the development of the CHSRP, including such activities as design reviews, construction inspection and testing, and start-up and integrated testing. Additional hazards or vulnerabilities identified during these activities will also require a hazard analysis or vulnerability assessment to be performed.

The SSPC will be responsible for reviewing and approving all hazard analyses and vulnerability assessments to ensure that significant safety hazards and security threats and vulnerabilities are identified and that the proposed countermeasures adequately resolve the issues. The SSPC will monitor the status of the identified hazards and vulnerabilities from initial identification through final resolution and closure. Sensitive security issues will be tracked on a separate log per the CHSRP SSI Program.

4.2 Risk-Based Safety Hazard Management

Risk-based safety hazard management addresses hazards to the system based upon the amount of risk, both the severity and frequency, posed by the hazard. Hazards that represent higher levels of risk will receive higher levels of resources and analysis.

The risk-based hazard management process is the overall iterative process that comprises:

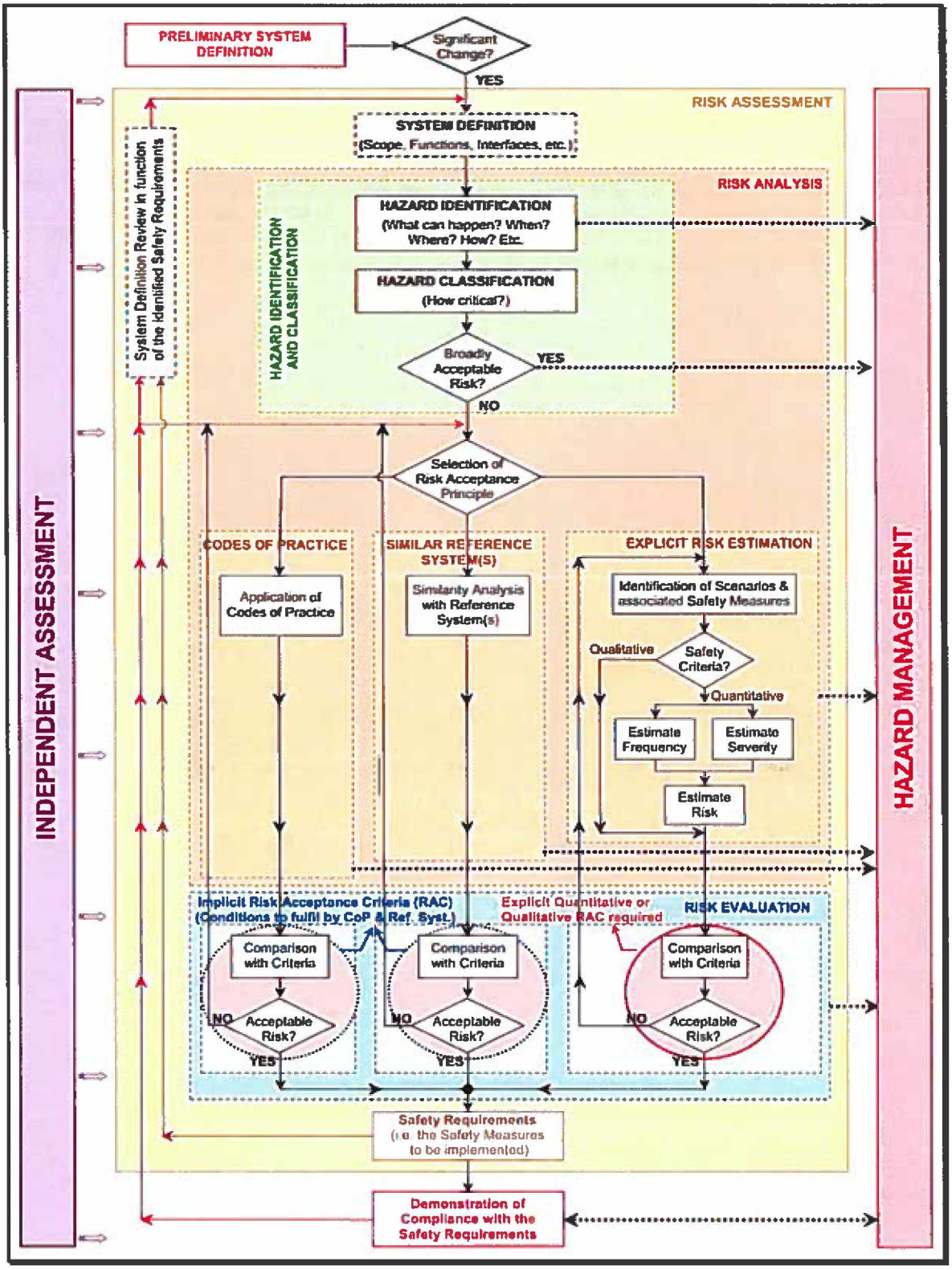
- System definition
- Hazard identification
- Risk analysis
- Accepting residual risk after the application of measures of mitigation
- Verification and validation of implemented hazard management elements

Risk-based hazard management shall be the responsibility of the Authority or its designated representative, but subject to review by an Independent Safety Assessment body (ISA). Risk-based hazard management will begin at the system level and flow-down to sub-system or site-specific levels as appropriate to capture relevant information and sufficient detail to provide appropriate input to the hazard analysis process.

4.2.1 Application of Risk-Based Hazard Management – Common Safety Method

Risk-based hazard management shall be applied to a new system or sub-system and to significant safety-related technical, operational, or organizational changes to the CHSRP using a process called Common Safety Method (CSM). The CSM applied to the CHSRP is based upon the process identified in the European Commission Regulation No. 352/2009 and described in the UK Office of Rail Regulation's (ORR) *Guidance on the Application of the Common Safety Method (CSM) on Risk Evaluation and Assessment*, December 2012. The main phases of the CSM process are illustrated in Figure 4-1. Note that the significant change referenced in Figure 4-1 also implies application to new systems or sub-systems.

Figure 4-1 The Common Safety Method Process



To determine the significance of a new system, sub-system, or change, the following six criteria should be examined:

- Failure consequence: most reasonable credible mishap scenario in the event of failure of the system under assessment, taking into account the existence of safety barriers outside the system
- Novelty used in implementing the change: this concerns both what is innovative in the railway sector, and what is new just for the organization implementing the change
- Complexity of the change
- Monitoring: the inability to monitor the implemented change throughout the system life-cycle and take appropriate interventions
- Reversibility: the inability to revert to the system before the change
- Additionally: assessment of the significance of the change taking into account all recent safety-related modifications to the system under assessment and which were not judged as significant

Guidance on determining significance can be found in SSMP Appendix G *ORR Guidance on the Application of the CSM, Annex 1, December 2012.*

Technical changes are changes to structural and functional railway sub-systems. Technical changes should also be reviewed to determine whether they introduce changes to the operation of the railway sub-system under consideration.

Examples of operational changes include the following:

- Changes to the operation of the CHSRP as a whole
- Changes to the operation of a structural CHSRP sub-system
- Changes to the operating rules of the CHSRP

Changes to the operation of a CHSRP sub-system may be caused by technical changes to that sub-system. In this case, the technical change and its effect on the operation of the CHSRP sub-system, and any changes to the operation or operating rules of the CHSRP, should be assessed together. For example, a change in the wayside signaling may result in increased line capacity. The technical change (new wayside signals) should be assessed together with the operational change (added trains to the line). However, changes to the operation or operating rules of the CHSRP can be introduced without a related technical change. The CSM should be used to assess whether these safety-related changes are significant or not. If they are significant, the CSM should be applied to these changes.

Technical changes to a sub-system can also introduce changes to the operating rules of the railway system. Changes to the operating rules of the CHSRP should be considered together with the technical change, the change to the operation of the affected CHSRP sub-system, and any change to the operation of the CHSRP as a whole.

Organizational changes are changes to the organization of an actor or entity within the CHSRP which could impact on the safety of the CHSRP. The "actor" could be any organization (Authority, contractor, sub-contractor, etc.) that directly affects the safety of the CHSRP. Guidance on organizational changes can be found in SSMP Appendix G *ORR Guidance on the Application of the CSM, Annex 4, December 2012.*

4.2.2 System Definition

The CSM process starts with the system definition. This provides the key details of the new system or the system that is being changed - its purpose, functions, interfaces and the existing safety measures that apply to it. In most cases, the hazards which need to be analyzed will exist at the boundary of the system with its environment. The definition is not static and during iterations of the risk management process, it should be reviewed and updated with the additional safety requirements that are identified by the risk analysis. It,

therefore, describes the condition (or expected condition) of the system before the change, during the change, and after the change.

The system definition shall address at least the following issues:

- System objective, (e.g., intended purpose)
- System functions and elements, where relevant (e.g., human, technical and operational elements)
- System boundary including other interacting systems
- Physical (i.e., interacting systems) and functional (i.e., functional input and output) interfaces
- System environment (e.g., energy and thermal flow, shocks, vibrations, electromagnetic interference, operational use)
- Existing mitigation measures and definition of the safety requirements identified by the hazard risk assessment process
- Assumptions that shall determine the limits for the hazard risk assessment

The system definition needs to cover not only normal mode of operations but also degraded or emergency mode.

Consideration of interfaces should not be restricted to physical parameters, such as interfaces between wheel and rail. It should include human interfaces, for example the user-machine interface between the locomotive engineer and displays in the cabs of rail vehicles. It should also include interfaces with non-railway installations and organizations, for example, the interface with underground utilities.

Operational procedures and rules, and staff competence should be considered as part of the system environment in addition to the more usual issues such as weather, electromagnetic interference, local conditions such as lighting levels, etc. The system definition is complete and sufficient if it describes the system elements, boundaries and interfaces, as well as what the system does.

The description can effectively serve as a model of the system and should cover structural issues (how the system is constructed or made up) and operational issues (what it does, and how it behaves normally and in failure modes). The existing safety measures, which may change as the risk assessment process progresses, can be added after the structural and operational parts of the model are complete.

The Hazard Assessor may not know all the environmental or operational conditions in which the altered or new system will operate. In these circumstances, they should make assumptions on the basis of the intended or most likely environment. These assumptions will determine the initial limits of use of the system and should be recorded. When the system is put into use, the Hazard Assessor (who may be different to the original proposer) should review the assumptions and analyze any differences with the intended environmental and operational conditions.

4.2.3 Hazard Identification and Classification

The Authority shall systematically identify, using wide-ranging expertise from a competent team, all reasonably foreseeable hazards for the whole system under assessment, its functions where appropriate, and its interfaces. Scope of hazards shall be limited to those hazards that directly or indirectly affect the safety of passengers, employees, rolling stock, and facilities of the CHSRP. All identified hazards shall be registered in the CIL.

The purpose of the hazard identification is to identify all reasonably foreseeable hazards which are then analyzed further in the next steps.

The hazard identification should be systematic and structured, which means taking into account factors such as the following:

- The boundary of the system and its interactions with the environment

- The system's modes of operation (i.e., normal/degraded/emergency)
- The system life cycle including maintenance
- The circumstances of operation (e.g., proximity to freight-only line, tunnel, bridge, etc.)
- Human factors
- Environmental conditions
- Relevant and foreseeable system failure modes

Relevant tools for hazard identification include structured brainstorming, checklists, task analysis, operations analysis, preliminary hazard analysis, and failure modes and effects analysis. Whichever technique is used, it is important to have the right mixture of experience and competence while maintaining impartiality and objectivity. Correct hazard identification will underpin the whole risk assessment process and give assurance that the risks will be managed in the project.

Preliminary Hazard Analysis (PHA) shall be performed in order to identify an initial risk index for hazard classification and to form a basis for risk acceptance. Development of the PHA involves identifying the severity of consequence and frequency of occurrence before the application of mitigation measures, using the risk estimation process and risk acceptance criteria identified in Section 4.2.5.

Development of the PHA will allow classification of the hazard as broadly acceptable or not. Based on expert judgment, hazards associated with a broadly acceptable risk need not be analyzed further but shall be registered in the CIL. In this context, 'broadly acceptable' applies to those hazards where the risk is essentially insignificant or negligible. Their acceptable classification shall be justified in order to allow acceptance by the Authority.

The level of detail of the hazard identification depends on the system that is being assessed and needs to be sufficient to ensure that relevant safety measures can be identified. If it can be successfully demonstrated that a hazard can be controlled by application of one of the three risk assessment principles identified in the CSM, following high-level hazard identification, then no further hazard identification is necessary. If it is not possible to have sufficient confidence at this stage, then further analysis of the causes of these high level hazards is undertaken to identify relevant measures to control the risks arising. The risk assessment process continues until it can be shown that the overall system risk is controlled by one or more of the risk assessment principles.

Hazard identification is still necessary for those systems/sub-systems/changes where the hazards are controlled by the application of codes of practice or by comparison to reference systems. Hazard identification in these cases will serve to check that all the identified hazards are being controlled by relevant codes of practice or by adopting the safety measures for an appropriate in-use system. This will also support mutual recognition and transparency. The hazard identification can then be limited to verification of the relevance of the codes of practice or reference systems, if these completely control the hazards, and identification of any deviations from them. If there are no deviations, the hazard identification may be considered complete.

During the hazard identification, mitigation measures may be identified as well. Potential mitigation measures shall be registered in the CIL.

The hazard identification only needs to be carried out at a level of detail necessary to identify frequency and severity of the hazard, plus potential mitigations. Development of sub-system analysis may be necessary until a sufficient level of detail is reached for the identification of hazards.

4.2.4 Risk Analysis

The risk acceptability of the system under analysis shall be established by following this hierarchy of CSM Risk Acceptance Principles:

1. The application of codes of practice (Section 4.2.4.1)
2. A comparison with reference systems (Section 4.2.4.2)

3. Explicit risk estimation (Section 4.2.4.3)

More than one of these risk acceptance principles may be applied in concert. The Hazard Assessor shall demonstrate in the risk evaluation that the selected risk acceptance principle is adequately applied. The Hazard Assessor shall also ensure that the selected risk acceptance principles are used consistently. The Authority is ultimately responsible for approving the risk evaluation efforts of the Hazard Assessor and accepting the residual risk associated with the identified hazard or vulnerability.

Whenever a code of practice or a reference system is used to control the risk, the hazard identification must also include the following:

- The verification of the relevance of the code of practices or of the reference system
- The identification of the deviations from the code of practices or from the reference system

The application of CSM Risk Acceptance Principles shall identify possible mitigation measures that make the risk(s) of the system under assessment acceptable. Among these mitigation measures, the ones selected to control the risk(s) shall become the safety requirements to be fulfilled by the system. Compliance with these safety requirements shall be demonstrated in accordance with the Verification and Validation and Safety and Security Certification Program requirements identified in Chapter 7 of this SSMP.

Mitigation measures shall be applied in accordance with the *Prevention through Design* principle as detailed in Section 5.1. The *Prevention through Design* principle includes the following elements in order of precedence:

1. Avoidance
2. Elimination
3. Substitution
4. Engineering Controls
5. Warnings
6. Administrative Controls such as Operations and Maintenance Procedures
7. Personal Protective Equipment and Guards

Unacceptable risk will be reduced to an acceptable level before design acceptance. Undesirable risk must be reduced where reasonably practicable, and an Authority decision is required to accept the residual risk of the hazard or dispose of the system. The hazards will be reviewed by the SSPC, with recommendation made to the SSEC for decision. Acceptance of the level of risk or disposal of the system will be provided by the Authority through the SSEC. Tolerable risk can be tolerated and accepted with adequate controls, although risk-reducing mitigations must be applied where reasonably practicable. The iterative risk assessment process can be considered as completed when it is demonstrated that all safety requirements are fulfilled and no additional reasonably foreseeable hazards have to be considered.

As a criterion, risks resulting from hazards may be classified as acceptable when the risk is so small that it is not reasonable to implement any additional safety measure. The expert judgment shall take into account that the contribution of all the broadly acceptable risks does not exceed a defined proportion of the overall risk.

Individual hazards can be closed out by the application of one of the three principles, but it is likely that for most major projects a combination of the three principles will be used. Any risk assessment conducted under the CSM should always be proportionate to the extent of the risk being assessed. The CSM has been introduced to ensure that levels of safety are maintained or improved when and where necessary and reasonably practicable. Applying one or more of the three risk acceptance principles correctly for all identified hazards means that the risk has been reduced to an acceptable level. No further evidence is required to show that the residual risk is acceptable.

4.2.4.1 Application of Codes of Practice

The Authority shall analyze whether one or several hazards are appropriately covered by the application of relevant codes of practice.

The codes of practice shall satisfy at least the following requirements:

- Be widely acknowledged in the passenger rail industry. If this is not the case, the codes of practice will have to be justified and be acceptable to the Authority.
- Be relevant for the control of the considered hazards in the system under assessment.
- Be publicly available.

If one or more hazards are controlled by codes of practice fulfilling the requirements of points above, then the risks associated with these hazards shall be considered as acceptable. This means that these risks need not be analyzed further, however the use of the codes of practice shall be registered in the CIL as safety requirements for the relevant hazards.

The PHA form developed during the hazard identification phase shall be completed with the term "acceptable" in the Resolution column. It will not be necessary to identify a final risk index.

Standards and rules that are widely accepted in the passenger rail sector include the following:

- Federal Railroad Administration regulations found in 49 CFR, Parts 200-299
- Federal Transit Administration regulations
- AREMA Standards for track
- California Public Utilities Commission General Orders
- TSIs or other mandatory European standards and norms
- Standards issued by the American National Standards Institute (ANSI)

This list is not exhaustive. It is also possible to use standards or codes of practice from other sectors (for example aviation, maritime, etc.) but these have to be justified and be acceptable to the ISA.

Deviations from codes of practice are possible where the Hazard Assessor can demonstrate that at least the same level of safety will be achieved. Mandatory standards such as FRA regulations often include a process for deviating from them. Most non-mandatory standards do not have a process for deviating from them. If one or more conditions of the code of practice are not fulfilled, the Hazard Assessor may have to conduct explicit risk estimation on those hazards where the code of practice is not relevant for the control of the hazards in the system under assessment. Alternatively, other codes of practice or reference systems could be used. Where an alternative approach is not fully compliant with a code of practice, the Hazard Assessor shall demonstrate that the alternative approach taken leads to at least the same level of safety.

If the risk for a particular hazard cannot be made acceptable by the application of codes of practice, additional mitigation measures shall be identified applying one of the two other risk acceptance principles.

When all hazards are controlled by codes of practice, the hazard management process may be limited to the following:

- The hazard identification and classification in accordance with Section 4.2.3
- The registration of the use of the codes of practice in the CIL
- The documentation of the hazard management process in accordance with Section 4.2.7

4.2.4.2 Use of a Reference System

The Authority, with the support of other involved actors, shall analyze whether one or more hazards are covered by a similar system that could be taken as a reference system. Reference systems can be used to derive the safety requirements for the new or changed system.

A reference system shall satisfy at least the following requirements:

- It has already been proven in-use to have an acceptable safety level and would still qualify for approval by the regulatory body having jurisdiction.
- It is accepted by the body having regulatory authority over its application to CHSRP (e.g., FRA, CPUC, Office of State Fire Marshal, etc.).
- It is used under similar functional, operational, and environmental conditions and has similar interfaces as the system under consideration for CHSRP.

For technical changes, it is unlikely that evidence of in-service history alone can prove that a high integrity system has an acceptable safety level, given the low failure rates required of such systems. Evidence that sufficient safety engineering principles have been applied in the development of the reference system will need to be confirmed for each application of it.

If a reference system fulfills the requirements listed above, then for the system under assessment the risks associated with the hazards covered by the reference system shall be considered as acceptable.

If the system under assessment deviates from the reference system, the risk evaluation shall demonstrate that the system under assessment reaches at least the same safety level as the reference system. The risks associated with the hazards covered by the reference system shall, in that case, be considered as acceptable.

If the same safety level as the reference system cannot be demonstrated, additional mitigation measures shall be identified for the deviations, applying one of the two other risk acceptance principles.

The safety requirements for the hazards covered by the reference system may be derived from the safety analyses or from an evaluation of safety records of the reference system. These safety requirements shall be registered in the CIL as safety requirements for the relevant hazards.

The PHA form developed during the hazard identification phase shall be completed with the term "acceptable" in the Resolution column. It will not be necessary to identify a final risk index.

When hazards are accepted by use of a reference system, the hazard management process may be limited to the following:

- The hazard identification and classification in accordance with section 4.2.3
- The registration of the use of the reference system in the CIL
- The documentation of the hazard management process in accordance with Section 4.2.7

4.2.4.3 Explicit Risk Estimation

Explicit risk estimation is an assessment of the risks associated with hazard(s), where risk is defined as a combination of the likelihood (or frequency of occurrence) and the consequence (or severity) of a hazard. Explicit risk estimation can be used where:

- The Authority is unable to address the hazards identified in the hazard identification stage of the CSM via a code of practice or comparison with a reference system;
- Deviations are necessary from codes of practice or reference systems; or
- The Authority needs to analyze the hazards and evaluate design principles or safety measures.

The estimation can be qualitative, semi-quantitative, or quantitative. The choice will be determined by factors such as availability of, and confidence in, quantitative data; the depth of analyses should be proportionate to the potential risks. Any risk assessment should follow a systematic and structured process. Qualitative hazard assessment shall be performed by technical experts with sufficient experience and qualifications relevant to the hazard under consideration.

The acceptability of the estimated risks shall be evaluated using the risk acceptance criteria identified in Section 4.2.5. The acceptability of the risk may be evaluated either individually for each associated hazard or globally for the combination of all hazards considered in the explicit risk estimation.

If the estimated risk is not acceptable, additional mitigation measures shall be identified and implemented in order to reduce the residual risk to an acceptable level. The ALARP Principle (As Low as Reasonably Practicable) shall be applied to compare the cost and feasibility of applying additional mitigation measures against the benefit gained from reduced residual risk.

When hazards are accepted by use of explicit risk estimation, the hazard management process may be limited to the following:

- The hazard identification and classification in accordance with section 4.2.3
- Completion of the PHA process by registering the risk index in the Residual Risk Index (Projected) column of the PHA form
- The registration of the use of the explicit risk estimation and the mitigation measures in the CIL; and
- The documentation of the hazard management process in accordance with Section 4.2.7.

When the risk associated with one or a combination of several hazards is considered as acceptable, the identified mitigation measures shall be registered in the CIL.

Where hazards arise from failures of technical systems not covered by codes of practice or the use of a reference system, the following risk acceptance criterion shall apply for the design of the technical system:

- For technical systems where a functional failure has credible direct potential for a catastrophic consequence, the associated risk does not have to be reduced further if the failure rate of that system is less than or equal to 10^{-9} failures per operating hour.

The explicit risk estimation and evaluation shall satisfy at least the following requirements:

- The methods used for explicit risk estimation shall reflect correctly the system under assessment and its parameters (including all operational modes).
- The results shall be sufficiently accurate to serve as robust decision support, i.e., minor changes in input assumptions or prerequisites shall not result in significantly different requirements.

4.2.5 Risk Estimation Process and Risk Acceptance Criteria

The risk assessment process for significant hazards is as follows:

1. Identify the hazardous event(s) that have the potential to cause injury or death to passengers, employees, or members of the public who are directly or indirectly exposed to the technical, operational, or organizational change being considered.
2. Identify the precursors (i.e., the component, sub-system or system failures, physical effects, human error failures or operational conditions) that can result in the occurrence of each hazardous event.
3. Identify the control measures that are in place to control or limit the occurrence of each precursor that cannot be eliminated.
4. Estimate the frequency at which each hazardous event can occur.
5. Estimate the consequences (most reasonable credible mishap) in terms of injuries and fatalities, environmental impact, monetary loss, or reputational damage that could occur for the different outcomes that may follow the occurrence of a hazardous event.
6. Estimate the overall risk associated with the hazardous event.

7. Identify additional mitigations or control measures that, if applied, would ensure that residual risk is reduced so far as is reasonably practicable.
8. Provide clear and comprehensive documentary evidence of the methodologies, assumptions, data, judgments, and interpretations used in the development of the risk assessment and the analysis of its results. Particularly where the assessment is quantitative and where different safety measures need to be assessed, the results may also need to be accompanied by sensitivity and uncertainty analysis.

The severity category and frequency of occurrence of the potential mishap(s) for each hazard across all system modes are estimated using the definitions in Table 4-1 and Table 4-2 respectively.

Table 4-1 Hazard Severity Categories

Hazard Category	Definition

1
Catastrophic
	Could result in one or more of the following:
	• Multiple fatalities or equivalent fatalities
	• Irreversible significant environmental impact
	• Monetary loss equal to or exceeding $10M
	  ○ Severe damage or total loss of rolling stock
	  ○ Severe damage to infrastructure or other severe system loss causing all or a significant portion of the system to be unavailable for normal service for more than 72 hours
	• Reputational damage of national impact

2
Critical
	Could result in one or more of the following:
	• A single fatality or multiple major injuries or occupational illnesses
	• Reversible significant environmental impact
	• Monetary loss equal to or exceeding $1M but less than $10M
	  ○ Major but repairable damage to rolling stock
	  ○ Major damage to infrastructure or other major system loss, repairable within 72 hours to allow normal service
	• Reputational damage of statewide impact

3
Marginal
	Could result in one or more of the following:
	• A major injury or occupational illness, or multiple minor injuries
	• Reversible moderate environmental impact
	• Monetary loss equal to or exceeding $100K but less than $1M
	  ○ Minor repairable damage to railcars
	  ○ Minor damage to infrastructure or other minor system loss, repairable within 24 hours to allow normal service
	• Reputational damage of local area impact

4 **Negligible**	Could result in one or more of the following: • A minor injury or occupational illness • Minimal environmental impact • Monetary loss less than $100K ○ Minimal infrastructure damage or system loss affecting normal service for less than 12 hours • Reputational damage of limited or little impact

To determine the appropriate severity category as defined in Table 4-1 for a given hazard at a given point in time, identify the potential for death or injury, environmental impact, monetary loss, or reputational damage in a most reasonable credible mishap scenario. A given hazard may have the potential to affect one or all of these areas. An equivalent fatality may be expressed as 10 major injuries (those requiring hospitalization) or 100 minor injuries (those not requiring hospitalization).

Hazard frequency is defined as the likelihood that a specific hazard will occur during the planned life-cycle of the system element, subsystem, or component, recognizing that these life-cycles will vary depending upon the item under consideration. Hazard frequency can be described subjectively in potential occurrences per unit of time (Mean Time to Hazardous Event – MTTHE), events, population, items, or activity, and shall be ranked as shown in Table 4-2.

Table 4-2 Hazard Frequency Categories

Description	Level	Qualitative Definition	Qualitative Description for the System	Quantitative Context (Probability of Occurrence)
Frequent	A	Likely to occur frequently in an individual item or the System; may be continuously experienced in fleet/inventory.	MTTHE < 2 months	$p > 10^{-1}$
Probable	B	Likely to occur several times in the life of an individual item or the System; will occur frequently in fleet/inventory.	2 months < MTTHE < 1 year	$10^{-1} > p > 10^{-2}$
Occasional	C	Likely to occur sometime in the life of an individual item or the System; will occur several times in fleet/inventory.	1 year < MTTHE < 10 years	$10^{-2} > p > 10^{-3}$
Remote	D	Unlikely but possible to occur in the life of an individual item or the System; unlikely but can be expected to occur in fleet/inventory.	10 years < MTTHE < 100 years	$10^{-3} > p > 10^{-6}$
Highly Unlikely	E	So unlikely that it can be assumed occurrence may not be experienced in the life of an individual item or the System; unlikely but possible to occur in fleet/inventory.	MTTHE > 100 years	$10^{-6} > p$
Eliminated	F	Incapable of occurrence. This level is used when potential hazards are identified and later eliminated.	n/a	$p = 0$

Note - Frequency level F is used to document cases where the hazard is no longer present. No amount of doctrine, training, warning, caution, or Personal Protective Equipment (PPE) can move a mishap frequency to level F.

The frequency of the hazard can be determined qualitatively based on the relative frequency of expected occurrence, or quantitatively (using failure rates or accident/incident statistical data). Quantitative determination is generally preferable, but in the absence of applicable quantitative data the use of qualitative estimation is necessary and appropriate. Table 4-2 identifies both a qualitative definition and a qualitative description of the system using MTTHE, based upon a railway operation 20 hours per day, 7 days per week.

Hazard severity categories (1 through 4) and hazard frequency categories (A through E) are combined in the Risk Assessment Matrix (Table 4-3) to produce a risk index for each identified hazard. The Risk Acceptance Matrix (Table 4-4) identifies required actions to reduce risk based on the risk rating. The Authority will accept the residual risk through the Safety and Security Executive Committee process (where appropriate) through direct approval of individual risk acceptance decisions for hazard risks categorized as

Undesirable. Hazard risks categorized as *Acceptable* do not require direct SSEC approval, however review of the risk assessment process will fulfill the Authority's responsibility to accept the residual risk.

Table 4-3 Risk Assessment Matrix

Frequency \ Severity	1 Catastrophic	2 Critical	3 Marginal	4 Negligible
(A) Frequent	1A	2A	3A	4A
(B) Probable	1B	2B	3B	4B
(C) Occasional	1C	2C	3C	4C
(D) Remote	1D	2D	3D	4D
(E) Highly unlikely	1E	2E	3E	4E
(F) Eliminated				

Table 4-4 Risk Acceptance Matrix

Hazard Risk Index	Risk Rating	Action Required
1A, 1B, 1C, 2A, 2B, 3A	Unacceptable	Risk must be reduced and managed
1D, 2C, 2D, 3B, 4A	Undesirable	Risk is acceptable only where further risk reduction is impracticable. Authority decision at the SSEC level is required to accept residual risk.
1E, 2E, 3C, 3D, 4B	Tolerable	Apply mitigations where reasonably practicable. Risk can be tolerated and accepted with adequate controls. Authority review at the SSPC level is required to accept residual risk.
3E, 4C, 4D, 4E	Acceptable	No further risk reduction required
	Eliminated	None

4.2.6 As Low as Reasonably Practicable (ALARP Principle)

The ALARP Principle shall be applied as necessary to assess the cost/benefit of applying additional measures of mitigation in order to achieve residual risk that is as low as reasonably practicable. ALARP calculations can be qualitative, semi-quantitative, or quantitative depending on the level of risk and the amount of data available to the assessor. Qualitative analysis is entirely appropriate for assessment of risks that are found in standard industry practice or common experiences. Hazards deemed appropriate for more quantitative analysis will require development of more comprehensive analysis to provide the required level of data. Criteria for applying a detailed, quantitative cost/benefit analysis includes high risks that must be mitigated and accepted, highly-controversial risks, risks with a potentially high impact to the System or project under consideration.

The ALARP principle considers the fact that infinite time, effort and money could be spent on the attempt of reducing a risk to zero, but doing so is usually not practical. The principle is not simply a quantitative measure of benefit against detriment; it is more accurately a best common practice of judgment of the balance of risk and societal benefit. ALARP does not represent zero risk.

For a risk to be ALARP it must be possible to demonstrate that the cost involved in reducing the risk further would be grossly disproportionate to the benefit gained; that is the greater the risk, the more resources that should be spent in reducing it, and the greater the bias on the side of safety. The costs could marginally outweigh the benefits and yet the measure could still be reasonably practicable to introduce in order to reduce risk.

The disproportion factors (DF) in Table 4-5 shall be applied to the ALARP process according to the amount of risk. DFs that may be considered gross vary from upwards of 1 depending on a number of factors including the magnitude of the consequences and the frequency of realizing those consequences, i.e., the greater the risk, the greater the DF.

Table 4-5 Disproportion Factors for Risk

Risk Rating	DF
Unacceptable	10
Undesirable	8
Tolerable	5
Acceptable	1

When using a cost/benefit analysis, convert both the additional mitigation(s) and the risk (so far as it is being reduced) to a common set of units (dollars) for the purpose of making a comparison. A hazard is considered ALARP using a cost/benefit analysis when cost divided by the benefit is greater than the DF.

Other issues to consider when performing a cost/benefit analysis include the sensitivity of key inputs (frequency/severity of the hazardous event), animalization (average costs and average benefits), and discounting the value of future benefits.

4.2.7 Hazard Analysis Processes and Documentation, Verification and Validation

A variety of hazard analysis processes are available for proper risk estimation and mitigation development, based upon the characteristics of the system or subsystem under consideration. The types of analyses that may be required for the development of the CHSRP are described below.

- Preliminary Hazard Analysis (PHA) is typically the initial hazard analysis technique used during the system or subsystem design phase. PHA is used to identify safety critical areas within the system and roughly evaluate hazards. PHA establishes the basis for the safety criteria in design, equipment, and performance specifications.
- Site-Specific Hazard Analysis (SiSHA) is an expansion of the PHA, conducted as the general design criteria and system requirements are applied to specific system and subsystem elements. An example would be a SiSHA for an elevated structure spanning the SR-99 highway in Fresno, applying the safety-critical criteria found in the

Design Criteria to the specific characteristics and site conditions of this structure. SiSHA is generally performed during the Final Design, Construction, and Testing/Startup Phases. The primary output of the SiSHA is the identification and evaluation of hazards and mitigations that are specific to the system element under consideration.

- Failure Modes and Effects Analysis (FMEA) is an inductive analysis used to identify equipment failures. It evaluates a system or subsystem to identify possible failures of each individual component in the system. The results or effects of the subsystem and component failures are then classified according to severity.
- Fault Tree Analysis (FTAn) is representative of the deductive process. The purpose of the Fault Tree Analysis is to provide a concise and orderly description of the various combinations of possible occurrences within the system that can result in an undesired event. This is the most rigorous of the hazard identification processes and analyses and is typically performed for the most complex systems.
- Interface Hazard Analysis (IHA) is performed to identify design hazards in components and subsystems of a major system as they relate to other components or subsystems. IHA determines the functional relationships between the systems, subsystems, processes, components and equipment based solely on safety considerations and also identifies all elements in which a functional failure could result in a hazardous condition or accidental loss.
- Operating Hazard Analysis (OHA) is performed to determine all applicable operational safety requirements for personnel, procedures, and equipment throughout all phases of the system life cycle. Engineering data, procedures, and instructions developed from other safety analyses, the engineering design, and initial test programs are used to support this analysis.
- Software Hazard Analysis (SHA) will be used to evaluate software design, related software, and hardware documentation for safety-critical software-controlled functions. The analysis will review software and hardware failures that could cause the system to operate in a hazardous manner.
- Adjacent Railroad Hazard Risk Assessment Model (ARHRAM) will be used to assess the hazards associated with freight railroad right-of-ways directly adjacent to the CHSRP right-of-way This is a semi-quantitative assessment process that relies on input from technical experts to assess site-specific characteristics of the adjacent railway.
- Adjacent Roadway Vehicle Hazard Risk Assessment Model will be used to assess hazards associated with roadway vehicles traveling directly adjacent to the CHSRP right-of-way. This is a semi-quantitative assessment process that relies on input from technical experts to assess site-specific characteristics of the adjacent roadway.

The detailed process for completing each of these analysis types, including the appropriate forms, is identified in SSMP Appendix G. Appropriate support documentation used in the development of risk assessment will be identified or referenced in detail as part of each analysis process, including, but not limited to, the following:

- System description including modes of operation and tasks
- Schematics, drawing, block diagrams, lists of assemblies, parts and components addressed within each subsystem and system
- Documented reliability and safety data including failure rate data obtained from service use in identical or manifestly similar equipment in similar environment
- Documented reliability and safety data obtained from formal test results, conducted in similar applications

- Documented reliability and safety data obtained from formal analyses, conducted for equipment in similar applications
- Hazard management requires monitoring and documentation throughout the project life cycle. Verification and validation activities shall fulfill the requirements of the Safety and Security Certification Program, as described in Section 7 of this SSMP.

4.3 Security Risk Assessment Process

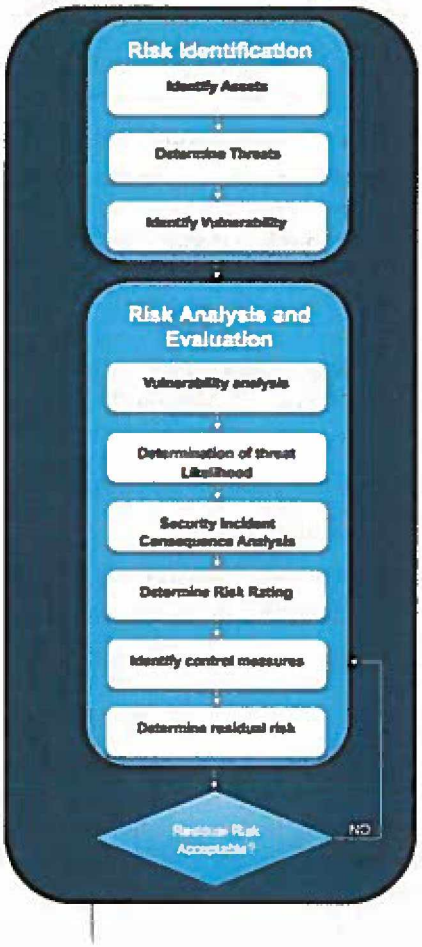
Planning in advance of day-to-day passenger rail crimes, terrorist acts, or other security incidents is essential to providing CHST passengers and employees with a safe and secure environment. A breach in security may result in serious injuries or death, destruction of property and facilities, and/or the inability to continue CHSRP operations to the region.

Adopting a methodology that involves periodic assessment is consistent with the requirement of the system security lifecycle and ISO 31000 Risk Management standard.

In order to ensure that the Authority has considered security risks, such as crime or acts of terrorism, it is crucial to apply a methodological approach and process to security risk management. The risk assessment process that will be used (and as illustrated in Figure 4-2) includes the following:

- Identify the key assets
- Identify the threats
- Identify the vulnerabilities
- Identify the likelihood
- Identify the consequence/impact
- Assign the initial risk index as the basis for future risk decision criteria
- Identify potential mitigation measures/countermeasures
- Determine residual risk after implementation of countermeasures

Figure 4-2 Security Risk Assessment Process



To evaluate the susceptibility to potential threats and to design corrective actions that can reduce or mitigate the risk of serious consequences from a security incident, a Threat and Vulnerability Assessment (TVA) will be initiated during the preliminary phases of the CHSRP. The assessment will be reviewed and updated at each subsequent phase.

The TVA process will identify the likelihood of specific threats that may endanger railroad assets (people, property, and information); the potential vulnerabilities associated with the design of the CHSRP; and mitigation efforts that can be designed into the CHSRP to reduce the risk and to minimize the consequences of identified potential criminal and terrorism activities. It will also identify future security training needs of transit personnel and the necessity for security procedures. The Security Risk Assessment will be protected under Sensitive Security Information (SSI) and shared *only* with those persons with a need to know.

4.3.1 Assets

4.3.1.1 Identification

Assets are defined as people and property. System assets include the following:

- People – passengers, employees, visitors, contractors, vendors, surrounding communities, and others who come into contact with the transit system
- Property – fixed infrastructure, rolling stock, software
- Information – plans, procedures, network information, passwords and access codes

Assets associated with the CHSRP will be identified during the TVA process and included as a listing in the Threat and Vulnerability Assessment Report.

4.3.1.2 Criticality Determination

Assets will be prioritized in terms of criticality. Most weight will be given to those assets that present the greatest threat to life safety or service disruption. In making this determination, consideration will be given to the following:

- Impact on CHSRP passengers, employees, and first responders
- Impact on CHSRP operations
- Economic value of the asset, including current and replacement value
- Intrinsic value of the asset to a potential adversary
- Asset location relative to other critical assets

4.3.2 Identification of Threats

Threats are defined as deliberate actions intended to cause injury or death to people or damage or loss of critical assets. The threats (or attack types) to the CHSRP will generally be the same as those faced by other public transportation networks. Threat is the combination of both intent and capability of a threat actor or threat source to realize a threat or attack against an asset. It is possible to separately analyze the intent and the capability but this type of analysis requires specific information and intelligence about specific threat actors.

As part of the security risk management system it is important to understand target attractiveness. Target attractiveness varies depending upon threat actor motivations and goals, but in general the following criteria are useful in determining the potential for target selection:

- Potential for public impact, damaging the society and ecosystem as a whole
- Lack of target protection and does the target follow predictable patterns
- Potential for mass casualties
- Potential for global significance or visibility to either the threat actor or the target
- Target permanently or frequently available
- Potential for major political or economic impact
- Potential for economic gain
- Ease of accessibility
- Perceived "iconic" status

Determination of security threat is always evolving and requires analysis to be based on the past performance of threat actors, both successful and attempted. Historical data (from reliable open source information) of manifested threat events across national and international transit systems provides accurate data to enable security threats to the CHSRP assets and systems to be established.

A series of tables illustrate examples of threat categories (Table 4-6), crime categories (Table 4-7), and threat types (Table 4-8).

Table 4-6 Threat Category Examples

Threat Category	Sources
Criminal	Petty crime Organized crime Current/former staff
Terrorism	Domestic extremist groups Transnational extremist groups Single-issue groups
Hostile State	Military State-sponsored hostile actors

Table 4-7 General Crime Categories and Examples

Threat Category	Crime Types within Category
Crimes against Persons	Assault, homicide, robbery, theft
Crimes against Property	Arson, cargo theft, vandalism, burglary
Other Crimes committed on Transit Property	Organized crime presence – infiltrating rail system, using rail system to move contraband, drugs, prostitution, fare evasion, trespass

Table 4-8 Threat or Attack Types Examples

Threat Type	Types within Category
Explosives	Military explosive, improvised explosive device (IED), vehicle-borne improvised explosive device (VBIED), personnel-borne improvised explosive device (PBIED)
Chemical	Toxic industrial chemicals, and poisons
Arson	Incendiary Devices
Small Arms Attack	Use of standard firearms and other weapons
Standoff Attack	Weapons with high-energy explosives that are designed to hit and penetrate heavily protected objects from a distance.
Cyber Attack	Viruses, Worms and Trojan Horses
Hoax Call or Device	Intentional false alarm or threat

As stated previously, threat is based upon the combination of intent and capability. Table 4-9 provides the threat rating matrix and Table 4-10 provides the threat ratings and their descriptions.

Table 4-9 Threat Rating Matrix (Intent x Capability)

INTENT	CAPABILITY				
	Similar exploit has been used	Operational capability confirmed by credible evidence	Some evidence that operational capability exists; not confirmed	No evidence of operational capability but feasibility confirmed	No evidence and even feasibility unconfirmed
Tactic has been used in the past and a similar attack may be planned	Very High	Very High	High	Medium	Low
Tactic has been used before and it is credible that it is being considered for further use	Very High	High	High	Medium	Low
Tactic has not been used before but is under consideration	High	High	Medium	Medium	Low
Tactic has not been used before but it may be under consideration	Medium	Medium	Medium	Low	Very Low
Tactic has not been used before and is not known to be under consideration	Low	Low	Low	Very Low	Very Low

Table 4-10 Threat Rating and Definitions

Threat Rating	Threat Rating Definition
VERY HIGH	Significant and proven threat present based upon demonstrated intent and demonstrated capability
HIGH	Threat present based upon stated/demonstrated intent with demonstrated capability.
MEDIUM	Medium level threat exists based upon either strong intent or some degree of stated/demonstrated capability.
LOW	General threat exists and should be monitored – no proven intent or demonstrated capability
VERY LOW	General threat may exist with intent and capability feasibility unconfirmed

For purposes of the CHST System, threat of terrorist activity will be based on information provided by DHS/TSA and other credible sources. For other threats, including crime and quality of life incidental threats, the Security Risk Assessment will review crime data provided by law enforcement in the adjacent areas, and open source data of criminal threats for other rail systems.

4.3.3 Scenario Analysis

Scenarios are the outcome of pairing specific assets with specific threats. An explosive device at a rail station provides a scenario that can be evaluated to identify the vulnerabilities that may make the rail station, an identified asset, susceptible to an attack. Scenario development also identifies impacts of threats on

critical assets and promotes mitigation strategies and capability needs. The scenarios are intended to represent credible, real-world events and, as such, will be derived primarily from other operating systems' experiences, FTA and TSA resource documents, and local crime report information.

4.3.4 Identification of Vulnerabilities

Vulnerability is defined as any weakness, flaw or condition that allows and/or can be exploited, for the successful realization of a potential threat against the CHSRP. In general, vulnerability conditions allow access to an asset in order to be attacked. As the threat environment is ever changing, vulnerabilities to different threats and attack methods may also change, which requires updated review of the threats, vulnerabilities and the consequences. However, by addressing known vulnerabilities and therefore limiting the associated consequences of a potential threat, the likelihood of having to make significant changes is reduced for future updates.

Vulnerability conditions can be classified into two different types, physical, and procedural. A physical vulnerability condition is an actual physical deficiency, flaw, or absence of physical measures designed to deter, detect, delay, and/or respond against a breach or unauthorized access to an asset. A procedural vulnerability condition relates to the existence, implementation, legality, and oversight of policies and procedures, which are designed to deter, detect, delay, or respond against a breach or unauthorized access to an asset.

Successful execution of an attack type is dependent upon the presence of either a physical vulnerability, or a procedural vulnerability, or both. By identifying the physical and procedural conditions that contribute to a certain threat type and attack method, it is possible to start developing general mitigation strategies to address the vulnerability and therefore reduce the likelihood and/or consequences of a successful attack.

In a new project, the assumption is that the system is completely without mitigations measures, but takes into account typical operating features and assets. Any countermeasures that might impact a perceived vulnerability will be recommended for implementation into the design and construction. Assessments performed on existing systems look for the weaknesses in an existing design or system.

Table 4-11 details the vulnerability levels used as part of the vulnerability determination.

Table 4-11 Vulnerability Levels and Description

Vulnerability Level	Assessment Criteria
Very High	• Non-existent advanced physical and procedural mitigation measures • Inadequate existing mitigation measures; and will likely fail to deter, detect, delay, or respond to a security risk • No security awareness culture present • No business or operations contingencies to manage security events and recover. Severe disruptions are likely
High	• Some physical and procedural mitigation measures, but ineffective at deterring, detecting, delaying, or responding to advanced security risks • More than 50% of existing mitigation measures are likely to fail to deter, detect, delay, or respond to a basic security risk • No security exercises performed or planned • Few contingencies/plans are in place for business and operations recovery. Significant disruptions likely
Moderate	• 50% of advanced physical and procedural mitigation measures are effective with remaining measures likely to fail to deter, detect, delay, or respond to a security risk • Existing mitigation measures are capable of deterring, detecting, delaying, and responding to basic security risks • Exercise program exists and exercises are performed for select areas • Basic security awareness culture • Contingencies/plans are in place across most but not all key areas of business and operations, but require improvement. Some disruptions are likely
Low	• 50% - 80% of advanced physical and procedural mitigation measures are effective but some improvements are required • Existing mitigation measures are capable of deterring, detecting, delaying, and responding to basic security risks • Procedures and evidence (records) of audit and review of existing security measures • Exercise program exists and exercises are performed for select areas • Cultivation of security awareness culture is a primary objective of management • Business and operations contingencies plans are in place for all key areas to manage security events and recover
Very Low	• 80% or higher effectiveness of advanced physical and procedural mitigation measures to deter, detect, delay, and respond to security risks and are sustainable • Procedures and evidence (records) of audit and review of existing controls • Exercise program exists and exercises are performed for select areas • Security awareness culture is integrated into all business activities • Comprehensive contingency plans in place across entire business and operations to manage most identified disruptions

4.3.5 Determining Likelihood

Likelihood is the combination of threat and vulnerability. Table 4-12 describes the combination of the threat and vulnerability to create the likelihood rating and index.

Table 4-12 Likelihood Determination Matrix (Threat x Vulnerability)

Threat	Vulnerability				
	Very High	High	Moderate	Low	Very Low
Very High	Almost Certain	Almost Certain	Highly Likely	Likely	Likely
High	Almost Certain	Highly Likely	Highly Likely	Likely	Possible
Medium	Highly Likely	Likely	Likely	Possible	Possible
Low	Likely	Likely	Possible	Possible	Remote
Very Low	Possible	Possible	Possible	Remote	Remote

The likelihood is based upon the definitions in Table 4-13.

Table 4-13 Likelihood Rating and Definitions

Likelihood Rating	Likelihood Characteristics
Almost Certain A	Vulnerability exists and threat is proven and demonstrated. Threat realization can be expected to occur during the system's operational phases
Highly Likely B	Vulnerability exists and threat is proven although may not be demonstrated. Threat realization may be expected during system's operational phases
Likely C	Some vulnerability exists and threat has some resource, experience, and skill, though may not be demonstrated. Threat realization may occur during the system's operational phases
Possible D	Limited vulnerability exists and threat may be under resourced and may lack experience and skill, should not occur during the system's operational phases
Remote E	Limited vulnerability exists or threat has not been proven or demonstrated, not expected during the system's operational phases

4.3.6 Determining the Consequence

Consequence is the assessed impact and severity of a successful threat against an asset, the system, or network. Consequence is measured by the level of impact on primary areas of people, equipment or service and finances. Reputational impacts can also be assessed. Examples of consequences include injuries to the public or to CHSRP personnel, loss of equipment causing financial losses, and disruption to CHSRP operations. Reputational damage occurs when the system is considered unsafe or dangerous, impacting ridership, and funding. Severity categories are defined to provide a qualitative measure of the result of a security breach and are summarized in Table 4-14.

Table 4-14 Consequence Ratings and Assessment Criteria

Severity Rating	CHARACTERISTICS			
	People	Equipment or Services	Financial	Reputational
Catastrophic 1	Several deaths and/or numerous severe injuries	Total loss of equipment or system interruption requiring months to repair	Estimated loss in excess of $5 million	Ongoing international, national media coverage, severe reputational damage, government intervention, Weeks - Months
Critical 2	Low number of deaths (less than 3) and/or severe injuries	Significant loss of equipment or system interruption, requiring weeks to repair	Estimated loss from the incident expected to range from $500,000 to $5 million	Prolonged national and local media, serious reputational damage, sustained government involvement, Days-Weeks
Moderate 3	Possible severe injury or several minor injuries	Loss of equipment or system interruption, requiring seven or less days to repair	Estimated loss from the incident expected to range from $50,000 to $499,999	Adverse national and local media coverage, reputational damage, government involvement
Minor 4	Possible minor injuries or illness	Minor loss of equipment, no system interruption, less than 24 hours to repair	Estimated loss from the incident expected to be minor, $1000 to $49,999	Local media coverage and some reputational damage
Negligible 5	No injuries or illness	Minor damage to equipment, no system interruption, no immediate repair necessary	Estimated loss less than $1000	No adverse media coverage or reputational damage

4.3.7 Security Risk Criticality Matrix

The consequence, or severity, of a threat and the likelihood of occurrence will be combined into a risk level criticality matrix. The consequences will be assessed both in terms of severity of impact and probability of occurrence for a given threat. The criticality matrix organizes the resulting consequences into categories of high, serious, and low. The matrix will help to prioritize risk to focus available resources on the most serious threats requiring resolution while effectively managing the available resources. The Security Criticality Matrix is shown in Table 4-15.

Table 4-15 Security Risk Criticality Matrix (Likelihood X Consequence)

Consequence Severity	Likelihood				
	Almost Certain A	Highly Likely B	Likely C	Possible D	Remote E
Catastrophic – 1	Very High 1A	Very High 1B	High 1C	High 1D	Moderate 1E
Critical – 2	Very High 2A	High 2B	High 2C	Moderate 2D	Moderate 2E
Moderate – 3	High 3A	High 3B	Moderate 3C	Moderate 3D	Low 3E
Minor – 4	Moderate 4A	Moderate 4B	Moderate 4C	Low 4D	Very Low 4E
Negligible – 5	Low 5A	Low 5B	Low 5C	Very Low 5D	Very Low 5E

Source: Adapted from FTA's Public Transportation System Security and Emergency Preparedness Planning Guide

Once the risk rating is determined for each security risk to each identified asset, then the risk index at Table 4-16 can be used to determine and prioritize the resources and financial justification for risk treatment.

Table 4-16 Security Risk Index

Risk index	Risk Rating	Action Required
1A, 1B, 2A	VERY HIGH	Risk must be immediately mitigated and constantly monitored
1C, 1D, 2B, 2C, 3A, 3B	HIGH	Risk must be treated and monitored, Authority decision at the SSEC level is required to accept risk.
1E, 2D, 2E, 3C, 3D, 4A, 4B, 4C	MODERATE	Risk should be managed and reduction strategies implemented. Authority decision at the SSPC level is required
3E, 4D, 5A, 5B, 5C	LOW	Risk may be accepted after a risk review by the SSWG
4E, 5D, 5E	VERY LOW	Risk would normally not be treated

Source: Adapted from FTA's Public Transportation System Security and Emergency Preparedness Planning Guide

4.3.8 Countermeasure Development

After determination of the risk, countermeasures or corrective actions are developed that can mitigate or eliminate the risk. Effective countermeasures can either be design or procedural or a combination. Examples of design or engineered countermeasures include the following:

- Installing physical barriers designed to reduce the asset's vulnerability to unauthorized access, explosive, or other incendiary attacks
- Installing integrated intrusion detection and alarm systems throughout key facilities
- Installing chemical, biological, radiological and/or nuclear detection devices at facility and station locations

Procedural or Administrative countermeasures include the following:

- Increasing the frequency of security patrols at key asset locations
- Increasing security-related training to improve the abilities of employees to identify suspicious packages or activities
- Conducting emergency exercises and drills involving security-related scenarios
- Developing working groups and information exchange committees with local law enforcement and emergency response agencies.

During the development of countermeasures, consideration will be given not only to the initial costs of procurement and implementation, but also to the associated maintenance costs and expected level of effectiveness at eliminating or controlling the threat and/or vulnerability. Cases where conditions may be exacerbated, such as special events, will be taken into account. During these conditions, ridership is likely to be greater than normal and may impact the effectiveness of the countermeasure.

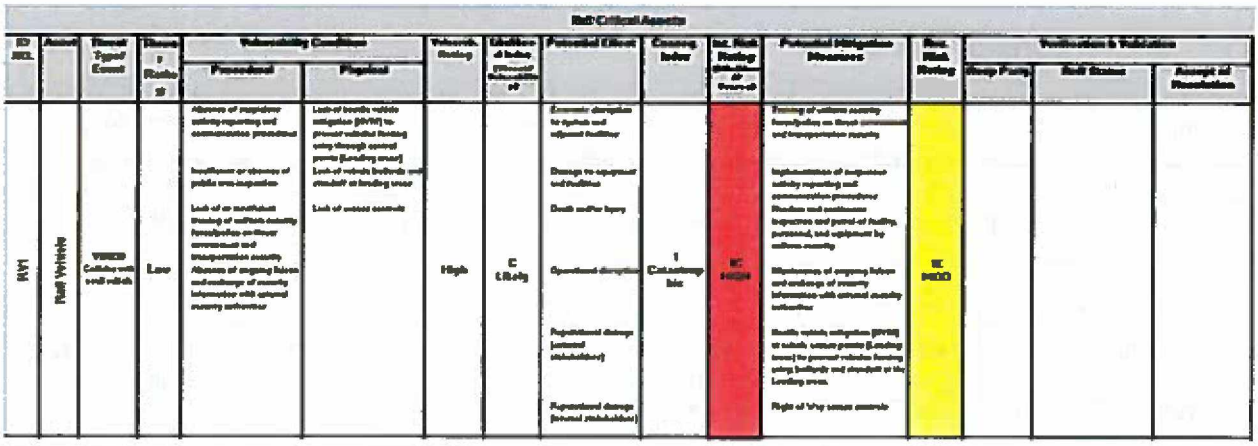
4.3.9 Residual Risk

Residual risk refers to the risk remaining after application of the countermeasures. If the residual risk has not been reduced to an acceptable level, additional countermeasures or mitigation strategies must be considered.

4.3.10 Reporting

The assessment details are captured in worksheets or tables which define the major elements of specific scenarios. An example of a TVA worksheet is depicted in Figure 4-3.

Figure 4-3 Security Risk Worksheet Example



4.4 Verification and Validation Documentation

Each identified safety hazard and security risk will be managed to resolution through the hazard management methodology and documented in the Dynamic Object Oriented Requirements Management System (DOORS) database system adopted by the CHSRP. The V&V methodology and documentation requirements are described in the CHSRP Verification and Validation Management Plan.

5.0 DEVELOPMENT OF SAFETY AND SECURITY DESIGN CRITERIA

5.1 Prevention through Design

Hazards can be resolved by deciding to either assume the risk associated with the hazard or to eliminate or control the hazard. The Prevention through Design principle, as identified in ANZI Z590.3-2011 *Prevention through Design*, incorporates safety and security considerations into the early design of a system element so as to avoid, eliminate, or mitigate hazard risk to a level as low as reasonably practicable. The following order of precedence shall be applied when incorporating safety considerations into design:

1. Avoidance. Develop concepts of operations, basis of design, or general system requirements to avoid the introduction of hazards to the system.
2. Elimination. Design, redesign or retrofit to eliminate (i.e., design out) the hazards through design selection. This strategy generally applies to acquisition of new equipment or expansion of existing systems; however, it can also be applied to any change in equipment or individual subsystems.
3. Substitution for Minimum Risk. If an identified hazard cannot be eliminated, reduce the associated risk to an acceptable level. This may be accomplished, for example, through the use of fail-safe devices and principles in design, the incorporation of high-reliability systems and components and use of redundancy in hardware and software design.
4. Engineering Controls. Hazards that cannot be eliminated or controlled through design selection will be controlled to an acceptable level through the use of fixed, automatic or other protective safety design features or devices. This could result in the hazards being reduced to an acceptable risk level. Safety devices may be part of the system, subsystem or equipment. Examples of safety devices include interlock switches, protective enclosures and safety pins. Care must be taken to ascertain that the operation of the safety device reduces the loss or risk and does not introduce an additional hazard. Safety devices will also permit the system to continue to operate in a limited manner. Provisions will be made for periodic functional checks of safety devices.
5. Provide Warning Devices. When neither design nor safety devices can effectively eliminate nor will control an identified hazard, devices shall be used to detect the hazardous condition and generate an adequate warning signal to provide for personnel remedial action. Warning signals and their application will be designed to minimize the probability of incorrect personnel reaction to the signals and will be standardized within like types of systems. Warning signals and their application should also be designed to minimize the likelihood of false alarms that could lead to creation of secondary hazardous conditions.
6. Administrative Controls. Where it is not possible to eliminate or adequately control a hazard through design selection or use of safety and warning devices, procedures and training will be used to control the hazard. Special equipment operating procedures can be implemented to reduce the probability of a hazardous event and a training program can be conducted. The level of training required will be based on the complexity of the task and minimum trainee qualifications contained in training requirements specified for the subject system element and subsystem. Precautionary notations in manuals will be standardized. Safety critical tasks, duties and activities related to the system element and subsystem will require certification of personnel proficiency. However, without specific written approval, no warning, caution or other form of written advisory will be used as the only risk reduction method for unacceptable and undesirable hazards.
7. Personal Protective Equipment and Guards: Where no other higher-level alternative mitigations are possible, the use of personal protective equipment or the installation of guards will be used to mitigate the hazard. Personal protective equipment and guards may be used to supplement other higher-level mitigations, but when they are the only mitigation applied they are to be used only when no other alternatives exist.

5.2 Design Criteria

Design criteria are developed from the engineering experience of the design team obtained from numerous other rail projects, as well as the following sources:

- Formal hazard analyses, including Preliminary Hazard Analysis
- Threat and Vulnerability Assessments
- Federal Railroad Administration regulations found in Code of Federal Regulations Title 49, Parts 200-299
- California Public Utilities Commission (CPUC) General Orders
- California Building Code
- California State Fire Marshal's Office direction and recommendations
- Local building codes and Fire Marshal recommendations
- National Fire Protection Association (NFPA)
- American Public Transportation Association (APTA)
- American Railway Engineering and Maintenance-of-Way Association (AREMA)
- Underwriters Laboratories (UL)
- Safety and security recommendations of the Department of Homeland Security (DHS), Transportation Security Administration (TSA), and the Federal Transit Administration (FTA)
- Other industry or technical standards

CHSRP will conduct PHAs and TVAs during the Preliminary Engineering phase to aid in defining safety and security design criteria.

Design criteria are developed to address system safety and security requirements applicable to the entire system. System safety and security requirements for each specific design element will be incorporated into a Design Manual chapter entitled *CHSRP Design Criteria* with reference to corresponding design criteria for specific engineering elements (e.g., clearances, structures, seismic criteria, etc.).

The processes described in the *CHSRP Verification and Validation Management Plan* (VVMP) will ensure that the design criteria and the basis of design report will incorporate safety and security requirements into the system design.

The following documents have been prepared by the RDP in order to achieve the system's design criteria's objectives:

- Basis of Design Report
- Risk Management Plan and Hazard Log
- System Requirements
- Infrastructure Maintenance Plan
- Technical Memoranda
- Design Criteria
- Standard Drawings
- Standard Specifications

A consistent approach will be utilized within all the engineering efforts and will assist the CHSRP Regional Consultant teams in preparation of their designs.

The *Basis of Design Report* defines the key CHSRP performance requirements. This document serves as the guiding force in establishing the design criteria and development of design standards. The key audience for the Basis of Design Report is the Authority, the Program Manager, the Regional Project Managers, and the Section Designers. The purpose of the report is to guide the Engineering Management Team during the development of engineering criteria and provide the required performance levels for the CHSRP.

A *Risk Management Plan and Hazard Log* will be developed outlining methodologies to ensure that a consistent approach to risk assessment and cost are applied throughout the CHSRP. The plan will address both system safety risk and project delivery risk, and include a Program level risk register that will be regularly updated and maintained.

The *CHSRP System Requirements* provides a common platform for which similar Code of Federal Regulations, CPUC General Orders, and European Union Technical Specifications for Interoperability, as well as other industry best practice and standards, can be collectively presented and assessed at a detailed technical level. In addition to guiding and supporting specific technical guidance at the subsystem level, the CHSRP System Requirements structure is used to demonstrate how the performance objectives of the CHSRP are to be achieved.

Technical Memoranda have been prepared to describe detailed analysis of specific technical topics, and to provide guidance to the Regional Consultants in the development of Preliminary Engineering to support feasibility, environmental, and procurement efforts. Technical Memoranda are provided as information to Final Design teams, but are not considered mandatory requirements.

The *Infrastructure Maintenance Plan* is a base document outlining how the CHSRP will be maintained. This document sets forth the requirements for maintenance facilities for rolling stock and the railway infrastructure, as well as the approximate location and size of supporting facilities.

Design Criteria have been prepared that is intended to serve as the design requirements for a possible Design/Build consortium. The Design Criteria identifies and specifies required elements and considerations to ensure a safe and reliable operating railway for the CHSRP. The Design Criteria will be supported by *Standard Drawings* and *Standard Specifications* as required.

5.3 Design Reviews

CHSRP drawings and specifications will be reviewed informally during development and formally during preliminary and final design. The purpose of these reviews will be to verify conformance with all of the projects design criteria. These reviews are performed by the corresponding RDP discipline design personnel, their design supervisors, applicable oversight agencies, representatives from the Regional Consultants, and the RDP System Safety and Security staff.

Design reviews will be scheduled and coordinated so as to permit ample opportunity for comments. After satisfactory resolution of comments, the specifications are "sealed" by professional engineers from the design team and issued for use.

5.4 Deviations and Changes

For any instances that arise requiring a possible deviation from the safety-critical or security critical design criteria (i.e., physical constraints identified within the system's corridor conflicting with baseline requirements), the RDP and the associated segment Regional Consultant during Preliminary Engineering (and RDP and Design/Build Contractor during Final Design) will be required to explore all reasonable alternatives to provide a design that conforms to the requirements of the existing criteria. If a reasonable alternative cannot be developed, the requesting party will submit a Design Variance Request (DVR) to the RDP, whose members include safety and security personnel and representatives of the required engineering disciplines. The requesting party will be responsible for identifying and resolving any hazards or vulnerabilities related to any deviations.

Any deviations to the Design Criteria developed by the RDP or design/build contractors will require a site-specific assessment for each deviation to ensure that the same level of safety and security is achieved as would have occurred had the Design Criteria been followed. A formal PHA or TVA may be required to

support the safety and security assessment of Design Criteria deviations. If the change request is approved, the findings and recommendations will be incorporated into the Final Design engineering and construction plans and the Final Design Certifiable Items Lists and Safety and Security Certification Package will be updated to reflect the change.

During the life cycle of the project, the SSPC may also confront design issues that require additional hazard analysis or vulnerabilities assessment, the outcome of which may result in requests for design changes. Such requests will be processed through the Design Variance Request process.

The RDP is responsible for monitoring all requests for design variances from compliance with the Design Criteria or Design Standards documents, including statutory and regulatory requirements and requirements specified in any contract. The Design Variance Request process is described in more detail in Design Variance Guidelines R2.

6.0 OPERATIONS AND MAINTENANCE

6.1 Operations and Maintenance Requirements

The Authority's Operations and Maintenance Team, supported by the Safety and Security Team, will be responsible for developing system operations and maintenance requirements that support the safe and efficient operation of the California High-Speed Rail Program. Principal activities during the development of the CHSRP include the following:

- Provide ongoing operations input to the Engineering Management Team and Regional Engineering teams in the development of system design elements
- Review and comment on engineering design elements to ensure responsiveness to operations' functional requirements
- Coordinate with FRA on development of CHSRP rules and procedures and their relationship to current regulations and new regulations that will emerge from the CHSRP. Key categories include:
    - Code of Federal Regulations (CFR) regulatory issues
    - Rail System Operating Rules and Procedures
    - Employee Safety Rules and Procedures
    - Standard Operating Procedures
    - Emergency Action Operations Plans and Procedures
    - Infrastructure /Systems maintenance and inspection procedures
    - Rolling Stock maintenance and inspection procedures
- Coordinate with railroads, operating agencies/rail service providers and stakeholders as required

Personnel staffing requirements for the operation and maintenance of the in-service CHSRP will be established and described in the *CHSRP Training and Personnel Qualification Plan*, to be developed prior to the startup of revenue operations.

Development of the *CHSRP Operations and Maintenance Plan* for any system or subsystem component will begin during Construction Phase. Position titles, responsibilities, qualifications, and training requirements will be identified consistent with other high-speed rail operating systems using similar technologies and operating characteristics. The magnitude of the in-service CHSRP (trains operated, vehicles in service, track and OCS systems to maintain) will determine staffing levels for operators, maintainers, and supervisors.

Additionally, the *CHSRP Infrastructure Maintenance Requirements Plan* (IMRP) establishes and describes how infrastructure maintenance will be planned and implemented including methods utilized and resources required. The IMRP specifies the CHSRP requirements necessary to meet passenger and public safety levels that meet or exceed FRA Class 6 Regulatory Safety Standards, consistent with FRA's High-Speed Passenger Rail Safety Strategy. IMRP requirements will be incorporated into the system Design Criteria during the Preliminary Engineering phase of the CHSRP.

6.2 Operational Plans, Rules and Procedures

The following documents will be developed or revised for the CHSRP during the Project Construction Phase, in preparation for Testing and Startup:

- Concept of Operations
- Code of Operating Rules
- Rolling Stock Maintenance Plan
- Infrastructure Maintenance Requirements Plan
- Training and Personnel Qualification Plan
- Service/Operating Plan
- Command and Control Facilities Plan
- On-Board Operating Plan
- Passenger Station Operating Plan
- Passenger Train Emergency Preparedness Plan
- Air Brake Operating Instructions
- Electrical Operating Instructions
- Emergency Operating Procedures
- Timetable Special Instructions
- On-Track Safety Rules
- System Safety Program Plan (SSPP)
- System Security Program Plan (SPP)
- Emergency Preparedness Plan

6.3 Training Program

The Authority intends to hire one or more concessionaires to provide rail operations and maintenance services. The Authority will be responsible for ensuring that the concessionaire(s) assign qualified O&M personnel to the CHSRP who are trained to perform pre-revenue and revenue operations. Instruction in safe methods of operation, safety requirements, security awareness and emergency response procedures will be included in manuals, handbooks, and other documentation developed for the training and certification of operations and maintenance personnel. Training plans, which include in-house classroom training and on-the-job training and testing, will be developed based on the individual characteristics of the equipment or CHSRP locations.

The future CHSRP Operators, Instructors and Field Supervisors will undergo familiarization training on all operational equipment, rules, plans and procedures. The future Central Control Operations Staff (including Superintendents, Supervisors, and Train Dispatchers) will require extensive training and qualification on the train control system, in addition to operating rules and procedures, and safety and security procedures.

Positions which will require detailed job descriptions and training programs prior to entering the Testing Phase of the CHSRP include, but are not limited to the following:

- Superintendents
- Operations Supervisors
- Train and Engine Service Employees
- Control Center Supervisors
- Control Center Train Dispatchers
- Equipment Maintenance Employees
- Signal and Communications Employees
- Maintenance of Way Employees
- Power and OCS Employees

Contractors and suppliers providing equipment and facilities for the CHSRP will be responsible for developing training plans, training manuals, and conducting training courses for applicable CHSRP

Operations and Maintenance staff. Contractors will be required to develop and implement programs to train appropriate CHSRP personnel in the operation and maintenance of each piece of equipment or systems provided in conformance with the *CHSRP Training and Personnel Qualification Plan*.

6.4 Emergency Preparedness

A *Passenger Train Emergency Preparedness Plan* (PTEPP) will be developed prior to the start of the Testing Phase of the CHSRP to prepare for emergency incidents that may occur during testing. The PTEPP will be further developed and carried over into the start of revenue service. The PTEPP will contain emergency preparedness requirements and procedures for the Operations and Equipment Maintenance disciplines, in compliance with 49 CFR, Part 239. The PTEPP will identify requirements for a program of training (including instructional programs, emergency preparedness drills and tabletop exercises) of railroad operating and maintenance personnel and emergency responders. The goal of the PTEPP is to verify and validate the following:

- Adequacy of emergency plans and procedures
- Readiness of railroad operating and maintenance personnel to perform under emergency conditions
- Effective coordination between railroad operations and emergency response agencies: police, fire, and emergency medical services
- Familiarization of fire, police, and emergency medical services personnel with the physical and operating characteristics of CHSRP operations and inherent hazards

After-action reviews will be conducted following any major emergency response event or exercise prior to the start of revenue operations. A report of the findings will be provided to the SSPC and SSEC. Action items will be tracked by the SSPC to completion.. Outcomes may include recommendations for revisions to the PTEPP, operating rules or procedures, equipment or infrastructure changes, or emergency responder procedures, and changes to training plans and training programs pertaining to emergency response and personnel.

Fire/Life Safety and Security Committees will be active at both a regional and State level as described in Section 3.5.3 of this SSMP to provide a vehicle for clear, consistent communication with emergency responders.

7.0 SAFETY AND SECURITY CERTIFICATION PROGRAM

7.1 Overview

The California High-Speed Rail Authority is ultimately responsible for ensuring that all safety-critical and security-critical elements of the CHSRP are designed, constructed, tested, and made operationally ready in a safe and secure manner. The Safety and Security Certification Program (SSCP) describes the responsibilities and processes required to demonstrate that the CHSRP is safe and secure, in conformance to the FTA *Handbook for Transit Safety and Security Certification* and other FRA Regulations as applicable. The Safety and Security Certification Program applies to all phases of the development of the CHSRP, from preliminary engineering to the start of revenue operations, for each segment designed and built for the system. FRA approval to operate will be achieved through final safety and security certification prior to the start of revenue service.

The SSCP scope encompasses safety and security certification of the facilities, systems and equipment, safety-related procedures, training programs, and hazard and vulnerability resolution activities and operational readiness for the project. Specifically, safety and security certification focuses on conformance to the requirements found in the following areas:

- Hazard and Vulnerability Resolution
- Design Criteria
- Construction Specification
- Safety-Related Testing
- Operations and Maintenance Manuals
- Rules and Procedures

Certification will be performed in phases, both geographically and chronically, by contract package once the Project moves beyond the Preliminary Engineering Phase. Certification of latter-phase contract packages may consist of one or more certifiable elements defined in Section 7.4.1. The exceptions to this are the system wide activities such as procedures, training, emergency drills and integration testing and start-up which will be certified for the complete system.

Certification occurs at the beginning of each project phase, and is required for advancing system elements into the next phase. For example, the Final Design of a bridge structure must be certified to meet all safety and security design criteria prior to construction, and then must be certified to have been built in conformance to those safety and security design criteria before being placed into operation. This process assures the Authority that CHSRP elements are safe and secure as they move through each successive phase of the System development.

Certification Items that are not completed prior to moving to the next phase are placed on an Open Items List and tracked to completion. The Open Items List process is described in Section 7.4.7.

A Certificate of Conformance is issued after completion of a Project phase for each certifiable element. The Certificate of Conformance required for the various elements necessitates the performance of a variety of safety and security assessment activities. The activities may be performed either independently, or integrated with other tasks such as acceptance testing or quality control measures. Regardless of whether the activities are performed independently or integrated with others, adequate system safety, security, and fire/life safety activity records must be developed and maintained as evidentiary support for the Certificate of Conformance.

The verification and validation (V&V) database program will be used to manage the demonstration of objective evidence that satisfies the safety and security requirements during Final Design and Construction or Implementation. The process to develop the Safety and Security Certificate of Conformance will be supported by the requirements management database program used by the larger V&V process but requires distinctly different output documents.

7.2 Program Goals and Objectives

The goals of the Safety and Security Certification Program are to verify that identified safety and security requirements have been met in the preliminary engineering, final design, and construction phases and to provide evidence that the CHSRP is safe and secure for revenue service.

The objectives of the Safety and Security Certification Program are to document the following:

- Safety and security design criteria are reflected in contract documents
- Facilities and equipment have been designed, constructed, manufactured, inspected, installed, and tested in accordance with safety and security requirements
- Operations and maintenance procedures and rules have been developed and implemented to ensure safe operations
- Training documents have been developed for the training of operating and emergency response personnel
- Transportation and maintenance personnel have been trained and qualified
- Emergency response agency personnel have been prepared to respond to emergency situations in or along the CHSRP corridor
- Safety and security systems integration tests have been conducted
- All safety and security related issues have been addressed, resolved and documented

7.3 Responsibilities

The Authority Safety and Security Manager, with the assistance of the RDP System Safety Manager and RDP System Security Manager, will have overall responsibility for the administration of the Safety and Security Certification Program through the oversight of the SSPC and SSEC.

The SSPC will be responsible for tracking the progress of safety and security certification through regular review and update of the Program-level CIL and PHA/TVA maintained by the RDP Safety Manager and RDP Security Manager.

FRA approval to operate will be achieved through final safety and security certification prior to the start of revenue service.

7.4 Safety and Security Certification Process

The CHSRP safety and security certification process will be divided in the following distinct stages and steps.

- Stage 1: Environmental Review / Preliminary Engineering
- Stage 2: Design / Build Contracts
  - Step 1: Final Design
  - Step 2: Construction
  - Step 3: Testing / Acceptance
- Stage 3: Final Integration, Testing and Certification

During the preliminary engineering phase Preliminary Hazard Analysis (PHA) or Site-specific Hazard Analysis (SiSHA) will be performed by the RDP System Safety Manager. Hazards are identified by various means such as historical data, generic hazard checklists, conceptual design, already developed design criteria, scenario development and the subjective judgment of a hazard management team during formal brainstorming workshop sessions. The hazard analysis is then performed on the identified hazards. The principal means of identifying security-related design criteria are Threat and Vulnerability Assessments (TVA) conducted by the RDP System Security Manager in collaboration with the other RDP discipline technical experts. Other analyses, including site-specific threat and vulnerability assessments (SiSTVA)

are conducted as necessary. The adopted mitigation measures from the PHA and TVA provide input to design criteria or other project requirements. The mitigation measures identified in SiSHA and SiSTVA are contract specific and are tracked for resolution in the specific Design/Build (D/B) contract. Chapter 4 of this SSMP describes the Authority's Hazard Management Program.

Once all design/build contracts have been successfully completed and certified, the CHSRP as a whole system will be integrated, tested and certified under supervision of the Authority.

7.4.1 Certifiable Elements

The Project has defined CHSRP Certifiable Elements for safety and security certification. Samples of sub-elements are listed under the Certifiable Elements.

- Trainway
  - Track
  - Trench Structures
  - Tunnel/Underground
  - Aerial Structures
  - Retaining Structures
  - Alignment
  - Access/egress facilities
  - Barriers and Warnings
  - Utilities
  - Adjacent Hazardous Facilities/Conditions
- Rolling Stock
  - Carbody
  - Couplers
  - Doors, door controls
  - Trucks and suspension
  - Braking
  - Operator Cab and Controls
  - Communications Equipment
  - Lighting
  - HVAC
  - Fire/Flammability/Smoke Emissions
- Station(s)
  - Elevators/Escalators
  - Station structure
  - Stand-by generators
  - Platforms
  - Concourse
  - Lighting
  - Access/egress facilities
- Support Facilities
  - Storage/setup Yards
  - Vehicle Maintenance Facilities
  - Track maintenance facilities
  - Operations Control Center

- Traction Power
  - Traction Power Substations
  - Switching Stations
  - Overhead Catenary System
- Ventilation
  - Emergency Ventilation System
  - Ventilation Structure
- Communications
  - Radio
  - Closed Circuit TV
  - Emergency Telephone
  - Emergency Trip Station
  - Fire Telephone
  - Public Address System
- Signals and Train Control
  - Mainline Controls and Indications
  - Grade Crossing Warning Devices
  - Track Signals
  - Signal Indications
  - Train Protection
  - Interlocking Circuits/Equipment
- Test Plans
  - Acceptance Test
  - Integrated Tests
  - Pre-revenue Tests
- Training and Certification
- Plans and Procedures
  - Safety and Security Plans
  - Operation and Maintenance Plans (SOPs and EOPs)
  - Manuals and Rulebooks
  - Emergency Response and Management
    - Drills and Exercises

PHATVA are completed by the Authority for hazards associated with the Certifiable Elements, assessing the extent of the hazards and threats/vulnerabilities and identifying potential mitigations to reduce the residual risk to an acceptable level. The sub-element listing will be modified and expanded as project develop, as additional hazard analyses are performed, and as new or modified hazards are identified. Hazard identification can be performed by the Authority, the RDP, or Design/Build Contractors but all hazards must be tracked through the one central CHSRP tracking system.

7.4.2 Certifiable Items Lists

The Authority has developed a Certifiable Items List (CIL) which includes mitigations derived from the Program-level PHA and TVA. The CIL is managed through the V&V DOORS database management system by the Authority and Contractors through all Project phases to ensure that the safety and security hazards identified are mitigated consistently throughout the project life cycle. The Final Design and

Construction Contractors shall update and revise the CIL according to their project scope, as new or revised hazards as are determined through site-specific PHA or TVA associated with their design activities.

The additional CILs identified during each project phase or contract package will carry over into subsequent project phases or contract packages.

CILs that are specific to safety and security requirements will be distinctly identified as such and tracked and submitted independently.

7.4.3 Tracking of Hazards and Vulnerabilities

The program-level and project-specific CILs will be managed using the DOORS database, allowing for consistency and completeness across all Project phases. The CIL identifies the major elements of the CHSRP that are to be proven to be safe and secure prior to the startup of revenue service and acts as a guide for the certification process throughout project life cycle. The safety and security related portions of the CIL will be developed by the RDP System Safety and Security Managers in collaboration with the other discipline technical experts and presented to the SSPC for review. The CIL will be updated and expanded following the completion of analyses during the various phases of the development of the CHSRP. A sample CIL is depicted in Figure 7-1. Regular updates of the CIL will be presented to the SSPC and included in the quarterly reports to the SSEC.

Figure 7-1 CIL (Sample)

California High-Speed Rail Program
Certifiable Elements and Hazards Log
Monday, December 09, 2013

Absolute Number	Date Identified	Hazards & Mitigations/Critical Items	Certified for Preliminary Engineering	Date Certified for Preliminary Engineering	Certified for Final Design CP01	Date Certified for Final Design CP01	Certified for Construction CP01	Date Certified for Construction CP01
		locations.						
10	—	**1.1.1.7 High Winds** High winds						
154	8/30/2011	*1.1.1.7.1 Mitigation #1* [1] SYS/O&M: Perform wind analysis for effects on vehicles and operations.						
155	8/30/2011	*1.1.1.7.2 Mitigation #2* [2] SYS: Install weather stations at regular intervals to monitor wind conditions.						
156	8/30/2011	*1.1.1.7.3 Mitigation #3* [3] O&M: Develop operational responses to extreme wind conditions.						
157	8/30/2011	*1.1.1.7.4 Mitigation #4* [4] INF: Install wind barriers at high-risk locations where need is supported by wind analysis.	DCM [STR] 12.3 Types of Structures DCM [STR] 12.5.1.1 Dead Load (DC, DW) DCM [STR] 12.5.2.6 Wind Loads (WS, WL) DCM [STR] 12.8.6.17 Walkways, Parapets, and Sound Walls DD-ST-001 AERIAL STRUCTURE, TWO TRACK NON-BALLASTED, TYPICAL CONFIGURATION ON TOP OF DECK DD-ST-002 AERIAL STRUCTURE, ONE TRACK NON-BALLASTED, TYPICAL CONFIGURATION ON TOP OF DECK DD-ST-020 AERIAL STRUCTURE, SOUND WALL CONFIGURATION DD-ST-021 EMBANKMENT, SOUND WALL CONFIGURATION					
12	—	**1.1.2 Collision**						
31	—	**1.1.2.1 Collision between HSR trains**						
161	8/30/2011	*1.1.2.1.1 Mitigation #1* [1] INF: Track center spacing exceeds the combined dynamic envelopes of the trains.	DCM [CLR] 3.5 Track Center Spacing	5/9/13				
162	8/30/2011	*1.1.2.1.2 Mitigation #2* [2] SYS:						

Page 22 of 95 Created by: IBM Rational DOORS 9.3

Note – Figure 7-1 is a sample representation only. Refer to current CIL for identified hazards and required mitigations.

7.4.4 Certification of Final Design and Construction

The Contractors are responsible for completing and updating the CILs applicable to their specific project scope during both the Final Design and Construction Phases. The Contractors shall identify in the resolution section of the CILs objective evidence that demonstrates compliance with the required safety-critical or security-critical requirements. Objective evidence may consist of any output from the design or construction processes that allows for clear and unequivocal verification that the requirements of the design criteria are satisfied. Examples include item-specific references on signed/approved drawings, reports, design variance requests, or other official documents signed/certified by the Contractor. Emails, directive letters, or meeting minutes are examples of documents that are not to be considered as objective evidence.

Requests for variance from the requirements identified in the CILs shall be handled through the process identified in Section 5.4 and shall include a site-specific assessment for each deviation to ensure that the same level of safety and security is achieved as would have occurred had the Design Criteria been followed. Certification Items that are not completed prior to moving to the next phase shall be managed according to the Open Items process outlined in section 7.4.6.

Completed CILs for a particular element or infrastructure component, along with associated supporting material, shall be compiled in a Certificate of Conformance Package by the Contractors and submitted to the Authority for review and SONO, prior to moving to the next project phase, at Final Design and Construction. Certificate of Conformance Packages shall consist of a Certificate of Conformance specific to the project element, all completed CILs, and all supporting documentation such as design element descriptions, hazard analysis, drawings, specification, design variances, field reports and photographs.

Completed Certificate of Conformance Packages (Final Design or Construction) for a substantial grouping of contract elements shall be submitted to the Authority through the SSEC for certification that all safety and security requirements have been successfully completed and that the System is ready for revenue service.

A sample Certificate of Conformance is depicted on Figure 7-2.

Figure 7-2 Certificate of Conformance (Sample)

CHSTS Verification, Validation and Safety/Security Certification
Certifiable Elements and Hazards Log (CEHL) - Certification Sheet

CEHL Item 0183
Certification Signoff Sheet Page 1 of 3

R-O-W, Generally/Collision 1.1.2.10: Trespasser – Mitigation 1: Intrusion prevention barriers

Phase: PE – Preliminary Engineering

To all signatories: Please review the included information and sign and date in the appropriate spaces. By signing this form, you are certifying that the critical item described has been coordinated between the Specifier and all Verifiers, and that the Certifiable Item has been verified for safety and security certification in conformance with the CHSTS safety-critical and security-critical requirements. Please do not amend any of the information in the form. If you have comments on the contents, please return the form unsigned.

To Specifier: After reviewing the contents, please sign the front page and initial the individual entries in the attached table. By signing this form, you hereby certify that:

1. the documentation referenced by you accurately specifies the requirements of the critical item, and
2. the documentation referenced by the Verifier fully satisfies the requirements of the critical item.

Specifier Signature

Safety:

John Cockle 3/15/2013 Date

To Verifiers: After reviewing the contents, please sign the front page and initial the individual entries in the table. By signing this form, you hereby certify that:

1. you understand the documentation referenced by the Specifier,
2. the documentation referenced by you accurately and completely verifies that the requirements of the critical item have been addressed, and
3. entries marked "(Not applicable)" accurately reflect that the requirement for that discipline does not apply.

Verifier Signatures

Civil	Verifier Company
Silvia Militello 3/12/13 Date	PB

Independent 3rd Party Auditor Signatures (if applicable)

Printed Name: Date	Independent 3rd Party Auditor Company

SAMPLE

7.4.5 Testing Phase Certification

The safety-critical and security-critical items for systems identified during the Final Design and Construction Phases shall be carried over into the Testing Phase. The CILs shall be expanded to include a Testing section upon completion of the Final Design phase of a particular CHSRP element In addition, the relationships between systems and subsystems shall be analyzed for systems integration requirements as identified in a Systems Integration Test Plan, and CILs for integrated testing shall be developed to prove the integration of associated systems. Safety and security certification of the Testing phase shall be completed in conformance with the process described in Section 7.4.3.

The Systems Contractor(s) shall be responsible for any additional analyses that are required (PHA, TVA, FMEA, IHA, SHEA, FTAn and OHA as appropriate), as the safety-critical or security-critical testing criteria are developed and applied to specific CHSRP system or subsystem elements. The Systems Contractor(s) shall be responsible for developing and completing the CILs that apply to their scope of work during the Testing Phase. The system(s) contractor must identify in the resolution section of the CILs objective evidence that demonstrates compliance with testing requirements that are identified as safety-critical or security-critical. Requests for variance from the requirements identified in the CILs shall be handled through the process identified in Section 5.4.

7.4.6 Startup Phase Certification

The safety-critical and security-critical items for operational readiness of the CHSRP identified during the Final Design, Construction and Testing Phases shall be carried over into the Startup phase. The CILs shall be expanded to include a Startup section as the CHSRP is prepared for the start of revenue operations.

Certifiable startup items include but are not limited to operation plans, emergency preparedness plans, training programs, timetables and rulebooks. Safety and security certification of the Startup phase shall be completed in conformance with the process described in Section 7.4.3.

The O&M contractor(s) shall be responsible for completing the CILs that apply to their scope of work prior to the start of revenue service. The O&M contractor(s) must identify in the resolution section of the CILs objective evidence that demonstrates compliance with requirements for the start of revenue operations that are identified as safety-critical or security-critical. The O&M contractor(s) shall be responsible for any additional analyses that are required (PHA, TVA, FMEA, IHA, SHEA, FTAn and OHA as appropriate), as the safety-critical or security-critical criteria for startup are applied to specific CHSRP, subsystem or operational elements. Requests for variance from the requirements identified in the Certifiable Items Lists shall be handled through the process identified in Section 5.4.

7.4.7 Open Items List

Certifiable Items that cannot be closed prior to the start of the next project phase shall be placed on an Open Items List for tracking purposes. The Open Items List shall describe the Certifiable Item that cannot be certified at that time, the reason the item cannot be certified, the responsible party for the Open Item, the status of the item (open or closed), the date of opening or closure, and the person verifying that the requirements of the Certifiable Item have been satisfied and that the Open Item has been closed.

The Open Items Lists for Final Design and Construction elements are managed by the D/B Contractors and shall be included in Safety and Security Certification Package submittals to the Authority. Once these Safety and Security Certification Packages are accepted by the Authority the D/B Contractor's Open Items Lists shall be added to the larger programmatic Open Items List and managed by the Authority. The programmatic Open Items List shall be maintained by the Authority Safety and Security Manager and periodically reviewed by the SSPC for progress and completeness.

7.4.8 Conditional Certification

A Contractor desiring to advance their work to the next Project phase may request Conditional Certification Permit from the Authority for certifiable items placed on the Open Items List. The Authority's approval of Conditional Certification may include temporary restrictions or conditions that must be followed until the Certifiable Item is fully certified and removed from the Open Items List. The restrictions or conditions will be documented on the CIL and Open Items List. The request for Conditional Certification will include additional hazard analysis applied by the Contractor as appropriate. The request for Conditional Certification shall be presented to the SSPC for review and SONO. The request for Conditional Certification shall describe all conditions or restrictions associated with the conditional use of the Certifiable Item, including an expiration date. Revisions to the Conditional Certification, including extension of the expiration date, shall require further review and SONO by the SSPC.

8.0 CONSTRUCTION SAFETY AND SECURITY

8.1 Overview

The purpose of the construction safety and security program is to define the minimum health, safety and security requirements to which all participating CHSRP staff, Contractors and subcontractors shall adhere to in fulfilling the Authority's commitment to ensuring a safe and secure construction project. This commitment includes the prevention of job-related injuries and illnesses for the workers engaged in project construction activities, as well as providing safe and secure conditions during construction of the project for the members of the public, who live, work or travel near to the project work areas.

All applicable codes and regulations must be followed by employees engaged in construction activities, including but not limited to the following:

- California Code of Regulations Title 8 Construction Safety Orders
- Federal Railroad Administration regulations as found at 49 CFR 214, 219, 225, 228, 236
- CPUC General Orders
- Other applicable federal and state OSHA regulations

Contractors shall be required to develop a program-level Safety and Security Management Plan (SSMP) specific to their scope of work, as well as Site-Specific Health and Safety Plans (SSHASP) and a Site-Specific Security Plans (SSSP) that identify the local conditions and requirements peculiar to the site and work to be performed, in compliance with the above regulations.

Contractors are responsible for ensuring the compliance of their employees and subcontractor's with their SSMP, SSHASP and SSSP.

8.2 Program Elements

The Contractor shall be responsible for all aspects of safety and security at the project work site, as required through the standard contract provisions. The *CHSRP Construction Safety and Security Program* (Appendix B) describes the basic programmatic requirements for construction safety and security, compliance to which is required through the CHSRP construction contract documents.

8.2.1 Safety and Security Management Plan

The Contractor's SSMP will identify:

- Roles, responsibilities, qualifications and organizational structure of their safety and security team
- Processes to manage the SSHASP and SSPP
- Safety and security hazard management consistent with the Authority's hazard management plan,
- A program for ensuring compliance to the Contractor's SSMP,
- training,
- Safety and security communications plans and processes,
- Processes for coordination with adjacent third-party requirements (including adjacent railroads and roadways),
- Emergency response plans and procedures,
- Hazardous materials handling and communications,
- Public safety requirements, and other safety and security elements as identified in the Contractor's corporate safety and security program.

The SSMP will be submitted to the Authority for review and Statement of No Objection (SONO).

8.2.2 Site-Specific Plans

The Contractor will be required to develop and implement SSHASPs and SSSPs specific to its contract scope of work on the CHSRP, in conformance with the *CHSRP Construction Safety and Security Program* contract requirements. A site-specific Job Hazard Assessment (JHA) and TVA will be performed by the Contractor to determine the safety or security processes, equipment utilized, and personnel assignments to be provided by the Contractor at each project work site.

8.2.3 Construction Safety and Security Management

The RDP Construction Safety Manager and Project Construction Management team will be responsible for the management oversight of the entire construction safety and security program. The RDP Construction Safety Manager and Project Construction Management team will verify contractor compliance with the safety and security requirements of the approved SSMP, SSHASPs, SSSPs, and other safety/security related contract provisions and applicable regulations throughout the construction, testing and start-up phases of the CHSRP. The RDP Construction Safety Manager and Project Construction Management team will audit Contractor activities and results will be reported to the Authority's Safety and Security Manager.

8.2.4 Stop Work Order

The CHSRP construction management plan will establish procedures regarding control of nonconforming work and stop work orders. In the event that a failure to meet safety and/or security requirements results in imminent danger to workers or the general public or property, a Stop Work Order will be issued by the CHSRP Construction Manager.

The CHSRP stop-work procedure shall apply to all construction activities. The stop-work procedure will be used only where imminent danger situations exist. An "imminent danger" is any condition or practice that could reasonably be expected to cause death or serious physical harm immediately or before the danger can be eliminated by normal means.

Stop-work orders will be in effect until the issuing authority determines that the problem(s) is resolved and the work area(s) is brought to satisfactory conformance with health, safety and security requirements.

8.3 Construction Risk Management

The CHSRP is committed to identifying and managing construction safety hazards and security vulnerabilities as subdivisions within the general issue of project risk. Risk in this context includes those events that, if they do occur, could impact safety, security, the environment, CHSP System's interests or the interests of third parties, including property owners and municipalities.

Risk Management is utilized by the CHSRP as a decision support tool, specifically identifying areas of high risks, which are reviewed to ensure that all reasonable practicable measures are taken to mitigate them. Risk Control measures shall be identified for all risks to the System. These include financial and schedule risks as well as property, safety and security risks.

For the construction phase, prior to finalization of the contract documents, surveys to identify any unique hazards, threats, or vulnerabilities that may exist for the particular construction elements will be conducted and actions to mitigate these hazards or vulnerabilities will be included in the Special Provisions of the specific contract package.

During construction, each contractor shall cooperate with CHSRP staff and other interested parties in providing information needed in connection with risk management of its contract works. The contractor will prepare and submit to the RDP Risk Manager a Risk Management Plan for review and acceptance. The Risk Management Plan shall be based upon the CHSRP *Program Risk Management Plan* and shall include a means of monitoring progress in the reduction of the overall number and impact of risks through the use of a Risk Register which shall be in a format acceptable to the RDP Risk Manager. Safety hazards and

security vulnerabilities shall be identified as risks, and will be included as special categories in the Risk Register.

During the contract each contractor's Risk Register shall be updated monthly and submitted to the RDP in hard copy and electronic formats. The risks identified by the contractor shall be integrated into the CHSRP Risk Register.

The Contractor's Risk Management process shall ensure that as far as is reasonably practicable:

- All risks are identified;
- Judgments are made as to risk importance;
- Risk exposure is reduced to acceptable levels;
- Risk control measures are assessed against cost benefit as appropriate; and
- Control measures are reviewed and managed until close out.

For the top "critical" risks from the Risk Register each contractor shall provide a narrative for each Critical risk identified in this category section and the mitigation plan proposed. Safety hazards and security vulnerabilities will be treated as separate categories of risk, and will be classified as Critical depending on specific site conditions.

9.0 STATE SAFETY OVERSIGHT REGULATIONS

9.1 Applicability

The California High-Speed Rail Program does not fall under the Federal Transit Administration applicability regulations for State Safety Oversight, described in 49 CFR 659. As such, this section does not apply. The Federal Railroad Administration has authority for oversight of safety regulations.

10.0 COORDINATION WITH FEDERAL RAILROAD ADMINISTRATION

10.1 Activities

The California High-Speed Rail Program will design and construct a railroad system that is regulated by the Federal Railroad Administration. FRA regulation is by directive under the United States Department of Transportation.

Effective on the date the railroad begins revenue operations, the following generally applicable federal railroad safety regulations from Title 49, Code of Federal Regulations, and any amendments thereto are made applicable to the CHSRP, except where the CHSRP is granted relief through an FRA waiver.

- Part 207, Railroad Police Officers
- Part 209, Railroad Safety Enforcement Procedures
- Part 210, Railroad Noise Emission Compliance Regulations
- Part 211, Rules of Practice
- Part 212, State Safety Participation Regulations
- Part 213, Track Safety Standards
- Part 214, Railroad Workplace Safety
- Part 215, Freight Car Safety Standards
- Part 216, Special Notice and Emergency Order Procedures
- Part 217, Railroad Operating Rules
- Part 218, Railroad Operating Practices
- Part 219, Control of Alcohol and Drug Use
- Part 220, Railroad Communications
- Part 221, Rear End Marking Device
- Part 222, Use of Locomotive Horns at Public highway-Rail Grade Crossings
- Part 225, Railroad Accidents / Incidents: Reports, Classification and Investigations
- Part 227, Occupational Noise Exposure
- Part 228, Hours of Service of Railroad Employees
- Part 229, Railroad Locomotive Safety Standards
- Part 231, Railroad Safety Appliance Standards
- Part 232, Brake System Safety Standards
- Part 233, Signal Systems Reporting Requirements
- Part 235, Instructions Governing Applications for Approval of a Discontinuance
- Part 236 Signal and Train Control Systems, Devices, and Appliances
- Part 237, Bridge Safety Standards
- Part 238, Passenger Equipment Safety Standards
- Part 239, Passenger Train Emergency Preparedness
- Part 240, Qualification and Certification of Locomotive Engineers
- Part 242, Passenger Train System Safety Plans
- Part 270, System Safety Program (under development)

The CHSRP will submit to the FRA any plans, programs, and procedures that affect the safe operation of the system, or which are required to demonstrate compliance with the applicable regulations.

Throughout Preliminary Engineering and Final Design phases the CHSRP will communicate with the FRA to ensure that the FRA is current on the status of operations and engineering design requirements as they are developed. CHSRP will maintain regular contact with FRA during development of operating rules, training of maintenance and operating personnel and development of operating practices prior to the start of revenue service.

As detailed in Section 7 of this SSMP, the CHSRP will manage a safety and security certification program to record and demonstrate that all safety and security requirements for the project are identified and integrated into the final system.

10.2 Implementation

The CHSRP, through the Rail Delivery Partner, will maintain communications with the FRA representatives throughout the Planning, Preliminary Engineering, Final Design, Construction, and Testing and Start-up phases.

10.3 Coordination Process

Interface and coordination with FRA will be conducted through the RDP. The RDP will designate those persons authorized to interface with agents of the FRA to ensure that information and decisions communicated between CHSRP and FRA are consistent, correct and authorized.

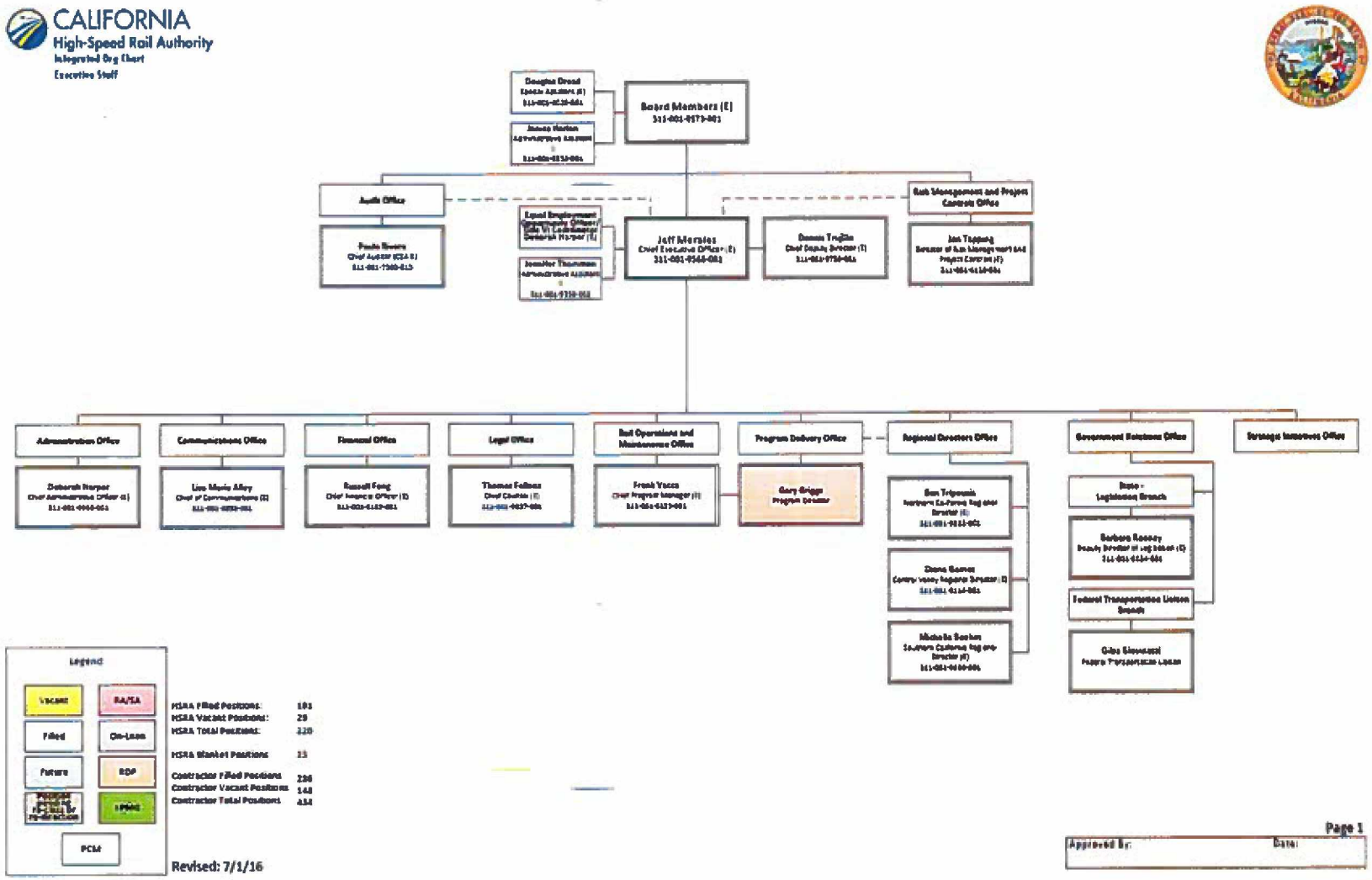
The FRA will provide guidance to the RDP with regard to applicable regulations, documents that will require formal submission and approval, and how any variances may be processed.

11.0 DEPARTMENT OF HOMELAND SECURITY COORDINATION

The Transportation Security Administration has authority over all transportation modes and requires that security risk be assessed and managed. During design and construction the Authority will coordinate with TSA and other federal, state and local law enforcement and security jurisdictions to ensure security is considered in design and construction. The Authority will develop a Security Program Plan (SPP) prior to revenue operation. The SPP will fulfill DHS/TSA requirements for an operating railroad, which include development of an SPP, and designating a primary and alternate Security Coordinator and providing TSA with names and contact information for 24 hour/7 days per week availability. The Security Coordinator will have a direct reporting relationship to the Authority Chief Executive Officer regarding matters of security.

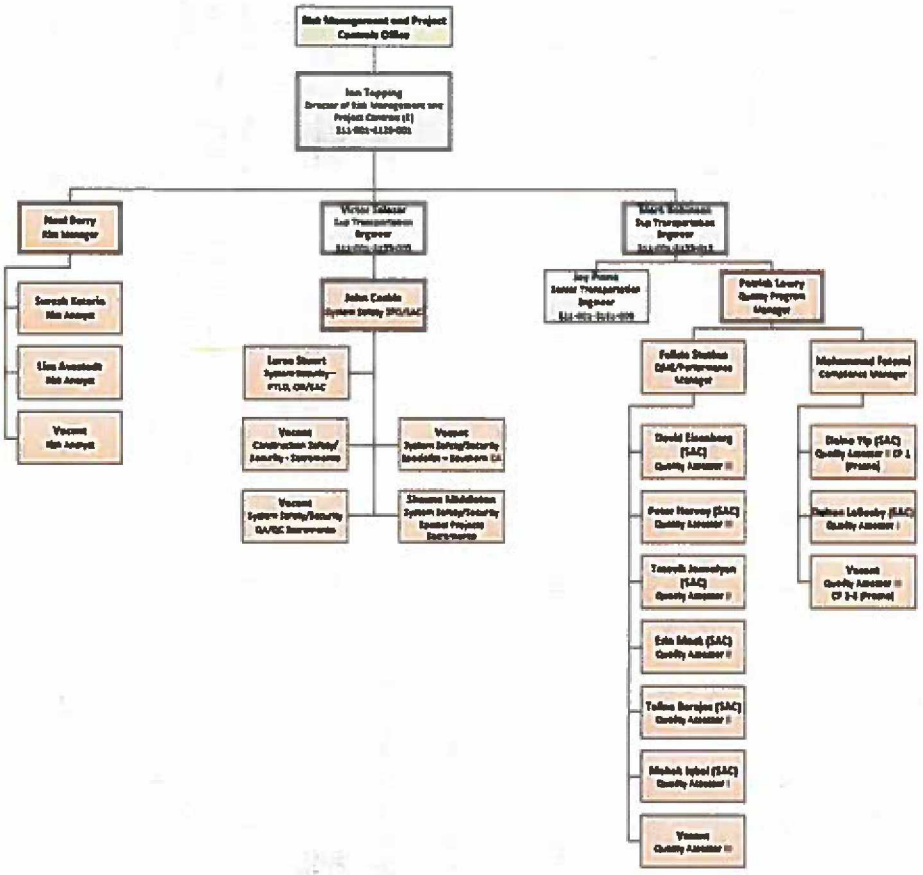
The Authority has established liaison with the TSA Mass Transit and Rail Department through the RDP System Security Manager who reports directly to the project operations manager. This liaison has been established to ensure all DHS/TSA requirements will be met once the project is complete, and to stay current with all security concerns, threats, best practices and developing security regulations that affect rail security.

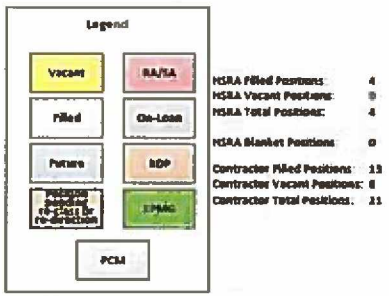
APPENDIX A – CALIFORNIA HIGH-SPEED RAIL AUTHORITY ORGANIZATIONAL CHART



CALIFORNIA HIGH SPEED RAIL AUTHORITY RISK, SAFETY AND SECURITY OFFICE

CALIFORNIA
High-Speed Rail Authority
Risk Management and Project Controls Office





HSRA Filled Positions:	4
HSRA Vacant Positions:	0
HSRA Total Positions:	4
HSRA Blanket Positions	0
Contractor Filled Positions:	13
Contractor Vacant Positions:	8
Contractor Total Positions:	21

Page 22

Approved By:	Date:

APPENDIX B – CHSRP CONSTRUCTION SAFETY PROGRAM REQUIREMENTS

1.0 CHSRP CONSTRUCTION SAFETY AND SECURITY PROGRAM

1.1 Safety and Security Program Objectives

The Safety and Security Program objectives are as follows:

a. Prevent personal injuries and property damage or loss;

b. Provide safe and secure work environment for employees, contractors, passengers, emergency responders, third parties, and the public at large;

c. To convey the CHSRP Safety and Security Policy Statement to all contractors and subcontractors;

d. To ensure compliance with the stated objectives and requirements contained in the CHSRP Safety and Security Policy Statement, the Contractor's SSHASP, the Contractor's SSSP, Contract provisions, applicable Laws, and industry consensus standards;

e. To identify general requirements for the Contractors' workplace safety and security programs; and

f. To identify a process for the Authority approval or acceptance of the of the safety and security submittals as appropriate.

1.2 Construction Safety and Security

1.2.1 Contractor Responsibilities

The Contractor is responsible for ensuring safety and security at all of its work sites, including the activities of Subcontractors. Safety and security management and enforcement for each contract shall be administered by employees (direct hire) of the Contractor. This responsibility shall not be delegated nor contracted out to Subcontractors, suppliers, consultant service/company, or any other persons/agency without written approval from the Authority. The effectiveness of the Contractor's safety and security efforts depends upon active participation, cooperation, and compliance by the Contractor's and Subcontractors' project managers, superintendents, supervisors, and other employees.

The Contractor shall:

a. Plan and execute all Work to prevent personal injury and property damage or loss, and ensure public safety, security of all people and assets;

b. Comply with Laws, applicable industry consensus standards; and the Authority and Contractor policies, procedures, and requirements;

c. Define, implement, and maintain a program for prompt identification and correction of hazards and unhealthy practices and conditions;

d. Define, implement, and maintain a program for prompt notification and investigation of all incidents of injury, damage, or near-miss incidents to determine causes and take necessary corrective action to prevent re-occurrence;

e. Define, implement and maintain a system of prompt identification, notification, investigation, and correction of security breaches and incidents;

f. Develop, establish, and conduct a safety and security training program for all employees assigned to the Project;

g. Ensure proper tools, equipment, and processes are available for use as required for the work at hand, and are used according to the manufacturer's guidelines;

h. Maintain an accurate record of data utilizing the Authority's integrated Safety Management System for all identified hazards, near-misses, and accidents and incidents resulting in death, personal injury, occupational disease, or damage or loss to property, materials, supplies, or equipment;

i. Plan and execute all Work in compliance with the stated objectives and requirements contained in the CHSRP Safety and Security Policy Statement (contained in the CHSRP SSMP in Book IV, Part D.5); the Contractor's SSHASP and SSSP; Contract provisions; applicable federal, State, and local laws and regulations; and industry consensus standards;

j. Ensure all Subcontractors, suppliers, etc. are provided with a copy of the CHSRP Safety and Security Policy Statement, and the Contractor's SSHASP and SSSP, and are properly informed of their obligations with regards to compliance;

k. Complete safety and security certification requirements as identified in Section 1.2.1:

l. Obtain permits required by the California Division of Occupational Safety. Permits shall be kept on file at the Site;

m. Designate a Safety and Security Manager responsible to ensure the proper implementation of the SSHASP and SSSP and a team of Field Safety Representatives appropriate to the scope of the Project and work to be performed. The Contractor shall demonstrate that their representatives have sufficient knowledge and experience to perform the required duties;

   i. Minimum qualifications for the Safety and Security Manager include:

      - Ten years of heavy civil construction safety experience;
      - Certification as a Construction Health and Safety Technician, Certified Safety Professional, or Certified Safety/Security Director - Rail;
      - OSHA 30-hour Construction Training card; and
      - One year of FRA Roadway Worker Protection qualification per 49 CFR Part 213;
      - The Contractor may propose combinations of the above qualifications that demonstrate sufficient competency for the Safety and Security Manager position;

   ii. Minimum qualifications for the Field Safety Representatives include:

      - Three years of heavy civil construction safety experience;
      - OSHA 30-hour Construction Training card; and
      - First Aid/CPR;

n. Define, implement, and maintain a SSMP for the administration of the SSHASP(s), SSSP(s), and the Safety and Security Team including roles/responsibilities, reporting, and work plan approach; and

o. Contractor shall develop a plan for the use of heavy equipment that, when used, might encroach or otherwise intrude into third party operating space (public or adjacent railway). The plan must address how third party approval for potential encroachment will be achieved and how any safety requirements by third party will be communicated to the operators and responsible parties of the heavy equipment. Third party approvals shall be made available to the Authority for review upon request.

1.2.2 Contractor Deliverables

The Contractor shall submit the following:

a. A SSMP in accordance with the "Safety and Security Management Plan" clause (Section 1.2.3);

b. A SSHASP(s) in accordance with the "Construction Site-Specific Health and Safety Plan Elements" clause (Section 1.2.4);

c. SSSP(s) in accordance with the "Site-Specific Security Plan Elements" clause (Section 1.2.5);

d. A Safety and Security Certification Plan in accordance with Section 7 Safety and Security Certification Program;

e. Site-Specific Hazard Analysis (SiSHA) Reports and Site-Specific Threat/Vulnerability Assessment (SiSTVA) Reports, and an updated Certifiable Elements and Hazards Log, in support of the Contractor's Safety and Security Certification Plan. A SONO of new or revised SiSHAs and SiSTVAs is required prior to commencement of Construction phase activities;

f. A monthly report utilizing the Authority's Integrated Safety Management System of safety performance including a narrative summary of safety activities, hazard identification and mitigation, incidents of injury or property damage incurred, injury rates, incident investigation results, corrective action plans, reports of near-miss incidents, a summary of communication and training efforts, a summary of field audits/observations for safety, a summary of Job Hazard Analyses completed, and other activities as identified by the Contractor; and

g. A monthly report of security performance, including incidents of trespass or security breach, incident investigation results, corrective action plans, a narrative summary of security activities, and other items as identified by the Contractor. The report shall be submitted to the Authority by close of the 5th business day of the following month.

1.2.3 Safety and Security Management Plan

The Contractor shall submit a SSMP to the Authority for review and SONO within 60 days following NTP. The SSMP will identify the qualification and organizational structure of the Safety and Security Team, and the processes that the Team will employ to manage the SSHASP(s) and SSSP(s). The SSMP shall:

a. Describe a process for managing hazards or incident of injury or damage through identification, reporting, and correction or abatement or mitigation, including descriptions for processes and applicability of Job Hazard Analyses (JHA) for each job assignment within the scope of the contract for which a person may be exposed to incidents of injury or illness. JHAs previously performed by the Contractor will be acceptable for use in determining preventive measures if the scope and functionality of the jobs under review are justifiably the same. The previously-performed JHAs, however, must address the specific characteristics of each site and tasks performed within the Project scope. JHAs shall be kept on the Site and made available to the Authority upon request;

b. Describe procedures for work site safety audits and inspections, including assignment of responsibility, frequency, documentation method, and actions following various audit results;

c. Describe the program for Safety and Security Program training employees of the Contractor, Sub-contractors, the Authority, and other applicable third parties. The training program description shall include safety and security program training requirements and documentation including training curriculum, frequencies of and method of delivery for training, training records, a method for identifying and certifying qualified employees, and lists of qualified/competent persons for specific tasks;

d. Describe an employee communication program that identifies individual responsibilities for all employees, schedules for specific communication techniques, and a process for recording and tracking communication program performance. The employee communication program shall include job briefing procedures/requirements, HazComm, employee safety and security committees, Project safety and security committees, and notification process for employees and the Authority of incidents or hazards when identified;

e. Describe a process for identifying applicable health and safety rules and regulations applicable to the tasks to be performed on the Project, including all local, State, and federal occupational safety and health regulations, including but not limited to California Code of Regulations Title 8 Construction Safety Orders, FRA regulations 49 C.F.R. Parts 200-299, California MUTCD, the Contractor's corporate safety plan, and the CHSRP Safety and Security Policy Statement. Rules and procedures shall address Site-specific work activities and conditions including:

   i. Safeguards for the protection of all workers, pedestrians, and the public from excavations, construction equipment, obstructions, and other dangers. Safeguards may include fencing, adequate railings, guard rails, temporary walks, barricades, warning signs, directional signs, overhead protection, planking, decking, danger lights, and other suitable safeguards;
   ii. Personal protective equipment requirements for all work site hazards and conditions, including equipment issuance/availability procedures;
   iii. Mobile equipment operation procedures and training program, including qualification process and requirements, and performance observation/evaluation requirements;
   iv. Fall protection and scaffolding procedures, including minimum fall protection equipment requirements, a process for training workers, and performance observation/evaluation requirements;

v. Motor vehicle operation program, including rules and procedures for specific equipment to be used at the work site (including industrial lift trucks), operator screening and qualification process and requirements, and performance observation/evaluation requirements;
vi. Roadway worker protection (on-track safety) for the Authority ROW in compliance with FRA regulations contained in 49 C.F.R. Part 214;
vii. Hazardous Materials handling and storage plan specific to each work site, including a plan for cataloguing Material Safety Data Sheets and submitting same to the Authority, and for communicating Material Safety Data Sheet information to employees;
viii. Lockout/tagout programs for all applicable energy sources, including electrical, hydraulic, and kinetic; and
ix. Fire prevention and suppression, including procedures for identification of hazards that could lead to fire, procedures for local fire suppression and notification to authorities, inspection processes, and a detailed training and exercise program;

f. Identify, develop, and implement a program for coordinating roadway worker protection activities and compliance with adjacent railroads. All contractors working in the shared corridor will meet frequently with the responsible representatives of the operating railway and coordinate activities to minimize risks and hazards to Contractor personnel, and to avoid hazards or disruptions to the operation of the railway;

g. Describe a process for managing security of Authority properties within the Contractor's Scope of Work. Security program elements shall include at a minimum:

i. Identification of threats and vulnerabilities, reporting, and controls or mitigation. Include process description and applicability of Threat and Vulnerabilities Assessments (TVAs) for each job location within the scope of the contract. Process should include how the processes would adapt in the face of imminent threat or change of security conditions;
ii. Description of how the planned deployment of security measures such as fencing, guards, lighting will be evaluated for initial effectiveness;
iii. Description of an audit and inspection plan to review security measures and ensure that controls are being managed effectively; and
iv. Description of the internal and external (Authority and local law enforcement) reporting structure and process for security incidents, including thresholds for reporting including at a minimum:

- Description of a program for reporting Security incidents. Incident reports for graffiti, vandalism, and trespass to be submitted to the Authority within 48 hours. Incident reports for any significant damage or conditions observed, and any injuries to employees, subcontractors or others will be submitted to the Authority immediately. Security reports submitted weekly to include:, daily security logs noting deployment of security personnel, any significant weather conditions, site locations covered, incident notifications or threats, any noted security equipment conditions (cut fence, broken lights). Copies of an reports from local agencies who respond to incidents on the Authority's property under Contractor control;
- Description of how the background check process will appropriately screen for internal threats to the security of the project Include a description of any code of conduct and expectations for employee behavior, and procedures for internal and external notification when personnel security is violated;
- Description of how the access control to project sites will be applied to ensure the security and control of all project sites including procedures for authorizing new employees or visitors, and procedures for monitoring access control performance;
- Description of the security awareness employee training program, content and schedule including record keeping of training completion;
- Description of the process for ensuring all subcontractors on site adhere to the Contractor's SSMP requirements; and
- A process for recommending enhancements to the Authority's security elements;

h. Identify, develop, and implement an Emergency Response Plan for management of emergency situations associated with, but not limited to, the following: injury to an employee or member of the public; fire; flood; earthquake; property damage and damage to various utilities (such as, electrical, gas, sewage, water, telephone, or public roadways); public demonstrations; sabotage or threats of sabotage; other security incidents or threats, Hazardous Materials encountered; toxic spills; explosions; vehicular accidents; and confined space rescues. The Emergency Response Plan shall include the following items, at minimum:

   i. Identification of the person responsible for handling an emergency;
   ii. Establishment of teams for handling each type of emergency;
   iii. Identification of the person responsible for making emergency call (preferably the ranking Supervisor present);
   iv. The requirement to conspicuously post a list of emergency phone numbers, along with information to be transmitted. Include with the emergency phone numbers, the number of the Authority's representative to be contacted (request telephone number and name of the Authority contact person or persons);
   v. Site identification and signage for emergency responders;
   vi. Trench and confined space rescue plan or tunnel evacuation plan, as applicable;
   vii. The procedure for contacting the Authority Representative when an incident requiring emergency response occurs; and
   viii. Scene management for the emergency response including procedures for ensuring the safety of employees and emergency responders, safeguarding the scene from unwanted entry, and handling on-scene media;

i. Identify, develop, and implement a HAZWOPER Plan for the control of hazardous substances in compliance with California Code of Regulations, Title 8, Section 5192;

j. Identify, develop, and implement a program for ensuring public safety at work sites and avoiding damage to public property. The public shall be considered as any persons and property not employed or owned by the Contractor or its Subcontractors. The program shall address site-specific work activities and conditions including:

   i. Identification of potential hazards to the public;
   ii. Erection and proper upkeep at all times of all necessary safeguards for the protection of the public, including pedestrian and vehicle traffic, and the assignment of trained and competent flaggers whose sole duties shall consist of directing the movement of public traffic through or around the Work site;
   iii. Posting of signs warning against the hazards created by construction or warranty service activities;
   iv. Elimination of unnecessary noise, obstructions, and other annoyances to nearby residents and businesses;
   v. Procedures and competency training for employees assigned to public safety and public property protection; and
   vi. Designated work zones – Work outside of the designated work zones shall be performed only when specifically stated in writing from the Authority Representative;

k. Identify, develop, and implement a program for Temporary Traffic Control. Temporary Traffic Control Plans will be developed in compliance with the requirements of the current California MUTCD. The Contractor shall apply to the jurisdictional authority for approval of the plan and for a permit or permits to work in the public ROW. In cases where there is more than one jurisdictional authority, a separate Temporary Traffic Control Plan will be developed for each jurisdictional authority, as required. The Temporary Traffic Control Plan shall include:

i. Drawings showing proposed traffic control devices including temporary signage and temporary pavement markings and striping;
ii. Different traffic diversion patterns and methods of control. Include for each phase detailed schedules for performance of work and include proposed traffic control devices;
iii. Requirements for flagger training and qualifications, assignment, and supervision;
iv. Notification plans for vehicular, bicycle, and pedestrian traffic detours including notifications of business owners, residents, and property owners in the vicinity of traffic and parking disruptions;
v. Any other requirement of the authority having jurisdiction; and

l. Other safety and security elements as identified in the Contractor's corporate safety and security program.

1.2.4 Construction Site-Specific Health and Safety Plan Elements

The safety processes, equipment utilized, and personnel assignments to be provided by the Contractor at each individual work site may differ based upon a site-specific JHA performed by the Contractor. A SSHASP shall be developed for each distinct and unique work site. The SSHASP will be appropriate to the Project development, phasing, and tasks at hand. It may be submitted incrementally as work is designed and plans are approved for construction and will be revised as the Project evolves. A SONO of new or revised SSHASPs is required prior to the commencement of new work activities. Each SSHASP shall:

a. Be specific to the relevant work site conditions and Project phases for the Work;

b. Be kept on site and made available to all employees, authorized visitors, and the Authority upon request;

c. Include the Contractor's safety and security policy statement;

d. Conform to applicable workplace safety regulations including California Code of Regulations Title 8 Construction Safety Orders, FRA regulations as found at 49 C.F.R. Parts 214, 219, 225, 228, and 236; California Public Utilities Commission General Orders; Federal and State OSHA regulations;

e. Identify roles and responsibilities of all employees for the Contractor and Subcontractors with respect to safety;

f. Identify the reporting and inter-action processes of the Contractor's Safety team with the rest of the Project work force (including Subcontractors and the Authority), and with third parties such as emergency responders, utilities, and adjacent railroad operators;

g. Include a detailed description of site-specific hazards and mitigations. A daily JHA shall be conducted and a plan developed to alter mitigations as daily conditions change;

h. Include a detailed description of site-specific workplace health and safety rules and procedures that conform to all regulatory requirements described in the SSMP;

i. Include a detailed HAZWOPER Plan to be kept on site, available to all employees, authorized visitors, and the Authority upon request;

j. Roadway worker protection for adjacent railroad ROWs – Employees of any CRE working in these locations shall be trained by the Contractor to ensure they become fully familiar with railway operations, procedures, rules, and safety requirements;

k. Include a detailed plan for work site first-aid resources and a training program for employees;

l. Include a detailed Emergency Response Plan. The Emergency Response Plan shall be updated when conditions or procedures change. The Emergency Response Plan will be kept on site;

m. Include a detailed program for ensuring public safety at work sites and avoiding damage to public property, specific to each phase of the work;

n. Include a detailed Temporary Traffic Control Plan for each phase of the work; and

o. Include other elements that conform to the Contractor's corporate health and safety plan.

1.2.5 Site-Specific Security Plan Elements

Security at construction sites is to ensure all personnel working at the site, the Authority's assets and property, and the surrounding communities, are protected from trespassers, vandalism, theft, encroachment and other intentional criminal activity. In compliance with these provisions, the Contractor shall develop a SSSP which shall address crime and security- related conditions specific to the conditions and configuration of the individual work sites. This includes protection of property, materials, tools, equipment, and personal property of workers at specific sites. The SSSP will be appropriate to the Project development, phasing, and tasks at hand. The SSSP may be submitted incrementally as work is designed and plans are approved for construction, and will be revised as the Project evolves. A SONO of new or revised SSSPs is required prior to commencement of new work activities. The types of security to be provided by the Contractor at each site may differ based upon a site-specific security assessment performed by the Contractor.

The SSSP shall include:

a. Safety and security policy statement;

b. Threat and vulnerability assessment process, including how the process will be informed of threat conditions and how specific mitigations or controls will be applied to those potential threats of the construction areas;

c. Identification of the makeup, reporting structure, and inter-action processes of the Contractor's Project Management Team, including the Contractor's Security Management Team, with the rest of the Project work force (including Subcontractors and the Authority) and with third parties such as local law enforcement agencies;

d. Identification of security roles and responsibilities of all employees for the Contractor and Subcontractors;

e. Protection plan of public and property, materials, equipment, and tools based on the outcome of the security assessment through appropriate security applications such as fencing, access control, locks, alarms, intrusion detection, lighting, security guards, and any other security requirements that may be applicable;

f. A description of how access to individual worksites will control who and how employees access the specific sites, how other authorized persons are identified for each work site, and procedures for monitoring site specific access control performance;

g. Coordination program with local law enforcement for incident reporting, and other security-related conditions or events;

h. Procedures for providing site specific security information for inclusion into the Contractor's required project reporting requirements; and

i. Other elements that conform to the Contractor's corporate security plan or the SSMP.

1.2.6 Non-Compliance

The Contractor shall take all necessary corrective actions to avoid the issuance of a stop work order on identification of a safety or security noncompliance. If the Contractor fails or refuses to take corrective action promptly, the Authority may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances. The Contractor shall be responsible for its Subcontractors' compliance with this clause.

Appendix C

Safety & Security Policy Statement

TM 500.01

California High-Speed Train System

TECHNICAL MEMORANDUM

Safety and Security Policy Statement
TM 500.01

Prepared by:	John Cockle System Safety	26 October 12 Date
Checked by:	Jack/Sheehan, Safety & Security Manager	01 November 12 Date
Approved by:	Joseph Metzler, Operations Manager	07 November 12 Date
Released by:	Brent FelkerPE, Program Director	11-28-12 Date
Reviewed by:	Michael D Lewis, PE. Project Management Oversight	07 NOV 12 Date
Reviewed by:	Jon Tapping, Risk Manager. Authority	11-16-12 Date 11-16-12
Accepted by:	Jeffrey Morales, CEO, Authority	12-7-12 Date

Revision	Date	Description
0	26 Oct 12	Initial Release

Note: Signatures apply for the latest technical memorandum revision as noted above.

Prepared by PARSONS BRINCKERHOFF

for the California High-Speed Rail Authority

This document has been prepared by ***Parsons Brinckerhoff*** for the California High-Speed Rail Authority and for application to the California High-Speed Train System. Any use of this document for purposes other than this System, or the specific portion of the System stated in the document, shall be at the sole risk of the user, and without liability to PB for any losses or injuries arising from such use.

TABLE OF CONTENTS

TABLE OF CONTENTS I

ABSTRACT 1

1.0 INTRODUCTION 2

1.1 PURPOSE OF TECHNICAL MEMORANDUM 2

1.2 GENERAL INFORMATION 2

2.0 DEFINITION OF TECHNICAL TOPIC 2

2.1 SAFETY AND SECURITY POLICY STATEMENT 2

3.0 SUMMARY AND RECOMMENDATIONS 3

3.1 RECOMMENDATIONS 3

APPENDIX A 4

ABSTRACT

This memorandum is intended to establish the Safety and Security Policy for the California High-Speed Train System (CHSTS) that will be used as a confirmation of the California High-Speed Rail Authority's (Authority) commitment to plan, design, construct, test and prepare for operating a high-speed train system that operates with a primary focus on safety and security.

1.0 INTRODUCTION

The California High-Speed Rail Authority (Authority) is responsible for certifying the planning, design, construction, testing, and placement into revenue service a safe and secure high-speed train system. The Safety and Security Policy Statement is a high-level confirmation of the Authority's commitment to safety and security.

1.1 PURPOSE OF TECHNICAL MEMORANDUM

The purpose of this technical memorandum is to provide a vehicle for the authorization of the Safety and Security Policy Statement by the Authority.

1.2 GENERAL INFORMATION

Absent federal regulations that govern the completion of major capital projects, the Federal Railroad Administration looks to the Federal Transit Administration (FTA) regulations for guidance. FTA regulations found at 49 CFR 633 requires the development of a *Project Management Plan* (PMP) for every major capital transit project. As described in FTA Circular 5800.1 *Safety and Security Management Guidance for Major Capital Projects*, (dated 8/1/07) a *Safety and Security Management Plan* (SSMP) is the element of the PMP that manages project safety and security activities, responsibilities, and verification processes throughout the project life cycle.

A critical (and required) element of the SSMP, as described in FTA Circular 5800.1, is the Safety and Security Policy Statement.

2.0 DEFINITION OF TECHNICAL TOPIC

2.1 SAFETY AND SECURITY POLICY STATEMENT

It is the policy of the Authority to perform work on the California High-Speed Train System (CHSTS) in a manner that ensures the safety and security of passengers, employees, contractors, emergency responders, and the public. The application of system safety and security comprises a fundamental hazard and vulnerability management process that incorporates the characteristics of planning, design, construction, testing, operational readiness, and subsequent operation of the high-speed rail system. Safety and security are priority considerations in the planning and execution of all work activities on the CHSTS.

All trains, facilities, systems and operational processes must be designed, constructed, and implemented in a manner that promotes the safety and security of persons and property. The design, construction, testing, and start-up of the CHSTS will comply with applicable safety and security laws, regulations, requirements and railroad industry practices. The Authority will maintain or improve upon the public transit and railroad industry standards for safety and security. Through the Reliability, Availability, Maintainability, and Safety (RAMS) Program a standard of safety will be established that is as safe as or safer than conventional U.S. railroad operations and in conformance with the best practices and standards for safety in the international high-speed rail industry. The design, construction, testing, and start-up of the CHSTS will be accomplished in compliance with this standard.

The Authority is committed to providing a safe and secure travel and work environment. Therefore, safety, accident prevention, and security breach prevention must be incorporated into the performance of every employee task. All Authority, Program Management Team, and contractor personnel, subcontractors and employees are charged with the responsibility for ensuring the safety and security of passengers, employees, contractors, emergency responders, and the public who come in contact with the CHSTS. Each individual and organization is responsible for hazard and vulnerability management, for applying the processes that are designed to ensure safety and security, and for maintaining established safety and security standards, consistent with their position and organizational function. Through a cooperative team

effort and the systemic application of safety and security principles, the CHSTS will be designed, constructed, tested, and placed into service in a safe and secure manner.

3.0 SUMMARY AND RECOMMENDATIONS

3.1 RECOMMENDATIONS

It is recommended that the Authority approve and authorize this Safety and Security Policy Statement.

It is recommended that the Program Management Team implements this Safety and Security Policy Statement across all facets of the CHSTS, initially including it in the *Safety and Security Management Plan*, and subsequently in the *System Safety Program Plan* and the *Security and Emergency Preparedness Plan*.

It is recommended that the Safety and Security Policy Statement be included in all construction safety and security contract requirements.

It is recommended that the Authority's CEO signature be affixed to all versions of the Safety and Security Policy statement when published in other documents. See Appendix A.

APPENDIX A

Safety and Security Policy Statement

It is the policy of the California High-Speed Rail Authority (Authority) to perform work on the California High-Speed Train System (CHSTS) in a manner that ensures the safety and security of passengers, employees, contractors, emergency responders, and the public. The application of system safety and security comprises a fundamental hazard and vulnerability management process that incorporates the characteristics of planning, design, construction, testing, operational readiness, and subsequent operation of the high-speed rail system. Safety and security are priority considerations in the planning and execution of all work activities on the CHSTS.

All trains, facilities, systems and operational processes must be designed, constructed, and implemented in a manner that promotes the safety and security of persons and property. The design, construction, testing, and start-up of the CHSTS will comply with applicable safety and security laws, regulations, requirements and railroad industry practices. The Authority will maintain or improve upon the public transit and railroad industry standards for safety and security. Through the Reliability, Availability, Maintainability, and Safety (RAMS) Program a standard of safety will be established that is as safe as or safer than conventional U.S. railroad operations and in conformance with the best practices and standards for safety in the international high-speed rail industry. The design, construction, testing, and start-up of the CHSTS will be accomplished in compliance with this standard.

The Authority is committed to providing a safe and secure travel and work environment. Therefore, safety, accident prevention, and security breach prevention must be incorporated into the performance of every employee task. All Authority, Program Management Team, and contractor personnel, subcontractors and employees are charged with the responsibility for ensuring the safety and security of passengers, employees, contractors, emergency responders, and the public who come in contact with the CHSTS. Each individual and organization is responsible for hazard and vulnerability management, for applying the processes that are designed to ensure safety and security, and for maintaining established safety and security standards, consistent with their position and organizational function. Through a cooperative team effort and the systemic application of safety and security principles, the CHSTS will be designed, constructed, tested, and placed into service in a safe and secure manner

Jeff Morales

12-5-12

Jeffrey Morales, CEO
California High-Speed Rail Authority

Date

Appendix D

Safety & Security Executive Committee Charter

TM 500.02

California High-Speed Rail System

TECHNICAL MEMORANDUM

Safety and Security Executive Committee Charter
TM 500.02

Prepared by:	Lurae Stuart, System Security	06 APR 2016 Date
Checked by:	John Cookie, System Security	06 APR 2016 Date
Approved by:	Victor Salazar, Safety and Security Risk Manager	28/4/16 Date
Released by:	Jon Tapping, Director of Risk Management	4/28/16 Date
Accepted by:	Jeffrey Morales, CEO, Authority	5·3·16 Date

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TABLE OF CONTENTS

TABLE OF CONTENTS I

ABSTRACT 1

1.0 INTRODUCTION 2

1.1 PURPOSE OF TECHNICAL MEMORANDUM 2

1.2 GENERAL INFORMATION 2

2.0 DEFINITION OF TECHNICAL TOPIC 2

2.1 SSEC GOAL AND PURPOSE 2

2.2 AUTHORITY 2

2.3 SCOPE 2

2.4 DUTIES AND RESPONSIBILITIES 2

2.5 MEMBERSHIP 3

2.6 MEETINGS 3

ABSTRACT

The California High-Speed Rail Authority (Authority) is responsible for planning, designing, constructing, testing and preparing for revenue operations a high-speed rail system that is safe and secure. This responsibility is confirmed in the *Safety and Security Policy Statement*.

The Safety and Security Executive Committee (SSEC) allows the Authority to participate in the application of safety and security principles and processes to the California High-Speed Rail System.

This memo is intended to establish the SSEC for the California High-Speed Rail System (CHSRS) in support of the *Safety and Security Management Plan*.

1.0 INTRODUCTION

The California High-Speed Rail Authority (Authority) is responsible for planning, designing, constructing, testing and preparing for revenue operations a high-speed rail system that is safe and secure. The Safety and Security Executive Committee (SSEC) allows the Authority to participate in the application of safety and security principles and processes to the California High-Speed Rail System (CHSRS).

1.1 PURPOSE OF TECHNICAL MEMORANDUM

The purpose of this technical memorandum is to define the scope, duties and responsibilities of the SSEC, identify committee membership and the members' respective responsibilities, and the process by which safety and security-related issues are addressed through the SSEC.

1.2 GENERAL INFORMATION

Absent federal regulations of its own that govern the completion of major capital projects, the Federal Railroad Administration (FRA) looks to the Federal Transit Administration (FTA) regulations for guidance. FTA regulations as stipulated at 49 CFR 633 require the development of a *Project Management Plan* (PMP) for every major capital transit project. As described in *FTA Circular 5800.1 Safety and Security Management Guidance for Major Capital Projects*, a *Safety and Security Management Plan* (SSMP) is the element of the PMP that details the processes for managing project safety and security activities, responsibilities, and verification processes throughout the project life-cycle.

A required element of the SSMP, as also described in FTA Circular 5800.1, is a description of committees identified to support the SSMP. The Committees may carry over to revenue operations through inclusion in the *System Safety Program Plan* and *Security and Emergency Preparedness Plan*. This SSEC Charter is designed to satisfy the requirement with respect to the SSEC.

2.0 DEFINITION OF TECHNICAL TOPIC

2.1 SSEC GOAL AND PURPOSE

The SSEC and its members will ensure that the CHSRS is designed, built, and implemented in a safe and secure manner. The SSEC will achieve this goal by providing oversight of the application of the SSMP through all phases of the CHSRS development and to act as a conduit to informing and assuring Authority executive management of safety and security issues affecting the CHSRS.

2.2 AUTHORITY

The authority for the SSEC is established in the SSMP. The SSEC Charter will be modified as necessary as the development of the CHSRS progresses.

2.3 SCOPE

The SSEC will address safety and security issues which:

- Are Authority policy considerations;
- Require Authority approval;
- Require Authority direction for resolution of a dispute; or,
- Constitute final acceptance of Safety and Security Certification.

2.4 DUTIES AND RESPONSIBILITIES

The duties and responsibilities of the SSEC are as follows:

- Approve revisions/updates to the SSMP

- Oversee the application of the SSMP through all CHSRS development phases
- Authorize the establishment of the Safety and Security Program Committee (SSPC), comprised of representatives from the Authority and the Rail Delivery Partner (RDP)
- Review and approve regular reports of safety and security activities from the SSPC
- Review and discussion of field safety and security activities, incidents, trends, and future developments
- Resolve safety and security issues that cannot be resolved at the SSPC level
- Review Safety and Security Certification (SSC) Certificates of Conformance and accept final Certification Verification Report to certify that the System is safe and secure for revenue operation
- Provide a forum for safety and security discussions among Authority and RDP Executive Management

2.5 MEMBERSHIP

Voting members of the SSEC include the following persons:

- Chief Executive Officer (Chair)
- Director of Risk Management and Project Controls (Vice-Chair)
- Regional Directors (Northern California, Central Valley, Southern California)
- Chief Program Manager, Rail Operations and Maintenance
- Chief Counsel
- Program Director, Program Delivery
- Chief Administrative Officer
- Chief Engineer

Advisory members include:

- Safety & Security Risk Manager
- System Safety Manager
- System Security Manager (Committee Coordinator)
- Construction Safety and Security Manager

The Chairperson of the SSEC is the Authority Executive Director or a designated Authority executive management representative. If a designated member of the SSEC is unable to attend a SSEC meeting, they must assign an appropriate representative.

2.6 MEETINGS

The SSEC will meet at least quarterly at a regular time and location determined at the previous meeting. The Chairperson (or designee) will conduct the meeting according to the published agenda. The meeting may be postponed or rescheduled by the Chairperson due to the availability of the membership.

The RDP System Security Manager will act as Coordinator and will be responsible to notify all SSEC members of the time, date, location, and agenda in advance of the meeting. The Coordinator will also distribute any support material pertinent to the meeting.

To validate meetings and the business conducted therein, a quorum of members must be present at the meeting. Decisions will also be decided by a quorum of the members. Regular committee members may designate alternate representatives. A quorum is a simple majority of the membership.

Special meetings may be called on an exceptional basis at the direction of the Chair or designee to discuss matters of urgency. In these cases, the Coordinator will notify all members in writing of the date, time, place and purpose of the meeting at least 48 hours in advance if possible.

The Coordinator will ensure a record is kept of all proceedings of the Committee and maintain an action items matrix showing resolutions and pending items. The Chairperson will designate a person responsible for follow up of the action items as required.

The Coordinator will post meeting minutes, action items matrix, and supporting material accessible to all SSEC members within two weeks following each meeting. Meeting minutes, an action items matrix, and supporting forms shall be retained by the SSEC Coordinator in accordance with the Authority's Record Retention Policy.

Appendix E

Safety & Security Program Committee Charter

TM 500.03

California High-Speed Rail System

TECHNICAL MEMORANDUM

Safety and Security Program Committee Charter
TM 500.03

Prepared by:	**John Cockle, System Safety**	**06 APR 2016** **Date**
Checked by:	**Lurae Stuart, Security Manager**	**06 APR 2016** **Date**
Approved by:	**Victor Salazar, Safety and Security Manager**	**06/04/16** **Date**
Released by:	**Jon Tapping, Director of Risk Management**	**4/20/16 Date** Date

Revision	Date	Description
0	26 OCT 2012	Initial Release
1	26 JUL 2013	Update for SSPC Membership
2	12 OCT 2015	Update for CHSRA and RDP Organization Changes
3	06 APR 2016	Update for Intearated Authority/RDP Organization

Note: Signatures apply for the latest technical memorandum revision as noted above.

TABLE OF CONTENTS

TABLE OF CONTENTS I

ABSTRACT 1

1.0 INTRODUCTION 2

1.1 PURPOSE OF TECHNICAL MEMORANDUM 2

1.2 GENERAL INFORMATION 2

2.0 DEFINITION OF TECHNICAL TOPIC 2

2.1 SSPC GOAL AND PURPOSE 2

2.2 AUTHORITY 2

2.3 SCOPE 2

2.4 DUTIES AND RESPONSIBILITIES 2

2.5 MEMBERSHIP 3

2.6 MEETINGS 3

ABSTRACT

The California High-Speed Rail Authority is responsible for planning, designing, constructing, testing and preparing for operating a high-speed train system that is safe and secure. This responsibility is confirmed in the *Safety and Security Policy Statement*.

The Safety and Security Executive Committee allows the Authority to participate in the application of safety and security principles and processes to the development of the California High-Speed Rail System through the Safety and Security Program Committee, which operates at the project level.

This memo is intended to establish the Safety and Security Program Committee for the CHSRS in support of the *Safety and Security Management Plan*.

1.0 INTRODUCTION

The California High-Speed Rail Authority (Authority) is responsible for planning, designing, constructing, testing and preparing for revenue operations of a high-speed train system that is safe and secure. Under the direction of the Authority, the Rail Delivery Partner (RDP) is responsible for working with the Authority to develop, implement, and manage the safety and security initiatives that are described in the *Safety and Security Management Plan* (SSMP).

The Safety and Security Program Committee (SSPC) allows the CHSRA/RDP to implement the SSMP throughout the California High-Speed Rail System (CHSRS).

1.1 PURPOSE OF TECHNICAL MEMORANDUM

The purpose of this technical memorandum is to define the scope, duties and responsibilities of the SSPC, identify committee membership and the members' respective responsibilities, and the process by which safety and security-related issues are addressed through the SSPC.

1.2 GENERAL INFORMATION

Absent federal regulations that govern the completion of major capital projects, the Federal Railroad Administration looks to the Federal Transit Administration (FTA) regulations for guidance. FTA regulations as stipulated at 49 CFR 633 require the development of a *Project Management Plan* (PMP) for every major capital transit project. As described in *FTA Circular 5800.1 Safety and Security Management Guidance for Major Capital Projects*, a *Safety and Security Management Plan* (SSMP) is the element of the PMP that details the processes for managing project safety and security activities, responsibilities, and verification processes throughout the project life-cycle.

A required element of the SSMP, as also described in FTA Circular 5800.1, is a description of committees identified to support the SSMP. The Committees may carry over to revenue operations through inclusion in the *System Safety Program Plan* and *Security and Emergency Preparedness Plan*. This SSPC Charter is designed to satisfy the requirement with respect to the Safety and Security Program Committee.

2.0 DEFINITION OF TECHNICAL TOPIC

2.1 SSPC GOAL AND PURPOSE

The SSPC and its members will ensure that the CHSRS is designed, built, and implemented in a safe and secure manner at the project level. The SSPC will achieve this goal by providing oversight of the application of the SSMP through all phases of CHSRS development and to act as a conduit to informing and assuring Authority executive management (through the SSEC) of safety and security issues affecting the CHSRS.

2.2 AUTHORITY

The authority for the Safety and Security Program Committee is established in the *Safety and Security Management Plan* (SSMP). The SSPC Charter will be modified as necessary as CHSRS development progresses.

2.3 SCOPE

The SSPC will address safety and security issues which:

- Are directed it by the SSEC;
- Are appropriate for or require resolution at the Program level;
- Require elevation to the SSEC for Authority direction for resolution; or,
- Constitute preliminary review and acceptance of Safety and Security Certification.

2.4 DUTIES AND RESPONSIBILITIES

The duties and responsibilities of the SSPC are as follows:

- Recommend to the SSEC the initial version of the SSMP and subsequent updates

- Oversee the application of the SSMP through all CHSRS development phases
- Review and forwarding to the SSEC with recommendation for approval of Preliminary Hazard Analyses and Threat/Vulnerability Assessments as they are developed or updated
- Tracking of identified hazards or vulnerabilities through the hazard/vulnerability tracking database
- Review and discussion of field safety and security activities, incidents, trends, and future developments
- Provide regular reports of safety and security activities or issues to the SSEC
- Forward to the SSEC for resolution any safety and security issues that cannot be resolved at the SSPC level
- Review of Safety and Security Certification (SSC) Certificates of Conformance and a Final Certification Verification Report
- Forward SSC Certificates of Conformance and a final Certification Verification Report with recommendation to the SSEC for Authority acceptance
- Provide a forum for safety and security discussions among CHSRA/RDP staff members and a conduit for safety and security issues to the Authority through the SSEC

2.5 MEMBERSHIP

The SSPC comprises the following persons:

- Director of Risk Management and Project Controls (Chair)
- Safety and Security Risk Manager (Vice-Chair)
- System Safety Manager (Committee Coordinator)
- System Security Manager
- Construction Safety and Security Manager
- Director of Operations and Maintenance
- Deputy Director Operations & Maintenance
- Director of Engineering
- Director of Construction Support
- Director of Network Integration
- Rail Engineering Manager
- Trainset Project Manager
- Regional Directors of Projects (Northern, Central, Southern)
- Director of Environmental Services
- Director of Real Property
- Legal Services

Designated members of the SSPC are responsible for assigning an appropriate representative if they are unable to attend a SSPC meeting.

2.6 MEETINGS

The SSPC will meet at least monthly at a regular time and location. The Chairperson (or designee) will conduct the meeting according to the published agenda. The meeting may be postponed or rescheduled by the Chairperson due to the availability of the membership.

The Coordinator will be responsible for notifying all SSPC members of the time, date, location, and agenda in advance of the meeting. The Coordinator will also distribute any support material pertinent to the meeting.

To validate meetings and the business conducted therein, a quorum of members must be present at the meeting. Decisions will also be decided by a quorum of the members. Regular committee

members may designate alternate representatives. A quorum is a simple majority of the membership.

Special meetings may be called on an exceptional basis at the direction of the Chairperson or his/her designated representative to discuss matters of urgency. In these cases, the Coordinator will notify all members in writing of the date, time, place and purpose of the meeting at least 48 hours in advance if possible.

The Coordinator will record all proceedings of the Committee and maintain an action items matrix showing resolutions and pending items. The Chairperson will designate a person responsible for follow up of the action items as required.

The Coordinator will distribute meeting minutes, an action items matrix, and supporting forms to all SSPC members via e-mail within one week following each meeting. Members have one week to advise the Coordinator of any inaccuracies. A copy of meeting minutes, an action items matrix, and supporting forms shall be retained by the Coordinator in accordance with the Authority's Record Retention Policy.

Appendix F

Fire & Life Safety and Security Program

TM 500.04

California High-Speed Train System

TECHNICAL MEMORANDUM

Fire and Life Safety and Security Program
TM 500.04

Prepared by:	**John Cockle, System Safety**	**26 October 12** Date
Checked by:	**Jack Sheehan, Safety Security Manager**	**01 November 12** Date
Approved by:	**Joseph Metzler, Operations Manager**	**07 November 12** Date
Released by:	**Brent Felker, PE, Program Director**	**11-28-12** Date
Reviewed by:	**Michael D. Lewis, PE, Project Management Oversight**	07 Nov 12 Date
Reviewed by:	**Jon Tapping, Risk Manager, Authority**	11-16-12 Date
Accepted by:	**Jeffrey Morales, CEO, Authority**	**12-5-12** Date

Revision	Date	Description
0	26 Oct 2012	Initial Release, R0

Note: Signatures apply for the latest technical memorandum revision as noted above.

Prepared by PARSONS BRINCKERHOFF

for the California High-Speed Rail Authority

This document has been prepared by ***Parsons Brinckerhoff*** for the California High-Speed Rail Authority and for application to the California High-Speed Train System. Any use of this document for purposes other than this System, or the specific portion of the System stated in the document, shall be at the sole risk of the user, and without liability to PB for any losses or injuries arising from such use.

TABLE OF CONTENTS

ABSTRACT 1

1.0 PURPOSE 2

2.0 BACKGROUND 2

3.0 FIRE AND LIFE SAFETY AND SECURITY PROGRAM 2

3.1 PURPOSE 2

3.2 SCOPE 3
3.2.1 STATEWIDE FLSSC 3
3.2.2 REGIONAL FLSSC 3

3.3 FIRE AND LIFE SAFETY AND SECURITY REPORT 4

4.0 POLICY RECOMMENDATION 4

ABSTRACT

This Technical Memorandum (TM) establishes the Fire and Life Safety and Security Program, including the establishment of Regional and System Fire and Life Safety and Security Committees.

1.0 PURPOSE

The purpose of this Technical Memorandum (TM) is to establish the approach the California High-Speed Rail Authority (Authority) will take with respect to fire and life safety and security issues in the development and implementation of the California High-Speed Train System (CHSTS), and to provide a medium for the authorization of the Fire and Life Safety and Security Committees.

2.0 BACKGROUND

The identification of design criteria that specifically addresses fire and life safety issues is a critical component of the development and operation of passenger rail transit systems. Involving emergency response agencies (both systemically and locally) in the development of fire and life safety design criteria and operating practices assures the Authority and the passenger railroad operator that emergency response infrastructure, equipment and procedures are designed, constructed/installed, and implemented to an acceptable level of safety.

Security has been added to the traditional fire and life safety scope in order to bring together all local emergency response agencies into one forum. This strategy allows the Authority to capitalize on commonalities among emergency response agencies as a force multiplier, increasing lines of communication while maximizing CHSTS resources.

Absent federal regulations that govern the completion of major capital projects for railroad systems, the Federal Railroad Administration looks to the Federal Transit Administration (FTA) regulations for guidance. FTA regulations as stipulated at 49 CFR 633 require the development of a *Project Management Plan* (PMP) for every major capital transit project. As described in *FTA Circular 5800.1 Safety and Security Management Guidance for Major Capital Projects*, a *Safety and Security Management Plan* (SSMP) is the element of the PMP that details the processes for managing project safety and security activities, responsibilities, and verification processes throughout the project life-cycle.

A required element of the SSMP, as also described in FTA Circular 5800.1, is a description of committees identified to support the SSMP. The Committees may carry over to revenue operations through inclusion in the *System Safety Program Plan* and *Security and Emergency Preparedness Plan*. This Fire and Life Safety and Security Program is designed to satisfy the requirement with respect to the Fire and Life Safety and Security Committees.

3.0 FIRE AND LIFE SAFETY AND SECURITY PROGRAM

3.1 Purpose

The purpose of the Fire and Life Safety and Security (FLSS) Program is to assure that fire and life safety and security considerations are integrated into the CHSTS design criteria, programs, procedures, and communications to the maximum extent possible.

Fire and Life Safety and Security Committees (FLSSC) will be established for the purpose of engaging emergency response agencies, at both state and regional levels, to acquire their input with regard to CHSTS designs that mitigate identified hazards. The FLSSC are essential to fostering a professional, friendly, collaborative relationship with the local emergency response agencies, helping to facilitate final permit approval and issuance of Certificates of Occupancy for successful implementation of revenue service. The goal of these committees is to provide a forum for emergency response agencies to provide input and feedback to the Authority concerning fire and life safety and security issues in a formal and consistent manner.

3.2 Scope

The scope of the FLSSC during the Planning, Preliminary Engineering and Final Design project phases will focus on infrastructure and systems design requirements. For the CHSTS, security is added to the traditional fire and life safety scope in order to bring together all local emergency response agencies to one forum. Operational procedures, emergency response procedures, and training requirements and exercises will be considered by the FLSSC during the Construction and Testing/Startup project phases.

Security will remain an integral part of the FLSS Program during the Planning, Preliminary Engineering and Final Design project phases. Separate Security Committees may be established when considered appropriate by the Authority.

Two approaches are executed for the Fire and Life Safety and Security Committees: Regional Committees and a Statewide Committee to address state-level issues.

The Authority's safety and security managers will have primary responsibility for administering the FLSS Program including interactions with local, regional, and statewide emergency response agencies, and holding chairperson positions within the various FLSS committees.

3.2.1 Statewide FLSSC

The one Statewide FLSSC will focus on systemic, high-level, fire and life safety and security issues including Federal and State codes or requirements impacting the regional efforts. A goal of the Statewide FLSSC is to obtain concurrence from federal and state authorities with respect to fire and life safety and security concerns.

The Statewide FLSSC will include representatives from state and federal agencies such as the Office of the State Fire Marshal, California Highway Patrol, Office of Emergency Services, the California Emergency Management Agency, CPUC, FRA, and DHS as well as a representative from each Regional FLSSC. The Statewide FLSSC will be chaired by the Authority's Safety and Security Manager(s). Meetings will be held regularly in Sacramento with agendas, minutes, and other support materials supplied by the committee Chair. Minutes and action items from the meetings will be conveyed to the Regional FLSSC's and to the Safety and Security Program Committee for their consideration. It is anticipated that these Statewide FLSSC meetings will be held quarterly.

3.2.2 Regional FLSSC

Each Regional FLSSC will focus on the CHSTS characteristics specific to their corridor segments (type/length of underground and elevated structures, access methods, terminals, etc.) to provide input with respect to local building codes or requirements that are in line with the emergency response characteristics and capabilities of the local agencies. A goal of the Regional FLSSC is to obtain concurrence from local emergency response agencies with respect to the proposed designs and the code requirements of the state and federal authorities having jurisdiction.

The Regional FLSSC will be comprised of appropriate representatives (e.g., Fire Marshal) from local emergency response agencies (fire, police, emergency medical response) and will be chaired by the Authority's Safety and Security Manager(s), and include the Authority's Regional Director for the region. Meetings will be held regularly at a location local to the regional corridor, with agendas, minutes, and other support materials supplied by the committee Chair. Minutes and action items from the meetings will be conveyed to the Statewide FLSSC and to the Safety and Security Program Committee for their consideration. It is anticipated that these Regional FLSSC meetings will be held bi-monthly, alternating with the Statewide FLSSC.

One representative from each Regional FLSSC will be asked to participate in the Statewide FLSSC. Consistent representation is critical to success. Each Regional representative must be the same representative attending to Statewide FLSSC matters and reporting results to their specific Regional Committee.

3.3 Fire and Life Safety and Security Report

The input gathered through the FLSSC will support the development of Preliminary Hazard Analysis, Threat and Vulnerabilities Assessments, and other analyses as required and in conformance with the CHSTS Safety and Security Management Plan. The results of these analyses will be used to develop safety and security design criteria and operational procedures, all of which will be assured through the Verification & Validation process. A Fire and Life Safety and Security Report will be developed to describe the system-level strategies, mitigations, and processes implemented to achieve an acceptable level of fire and life safety. The Fire and Life Safety and Security Report will be updated as conditions change or as new information is acquired through the FLSSC.

4.0 POLICY RECOMMENDATION

It is recommended that Authority implement a Fire and Life Safety and Security Program for the CHSTS by appending this Technical Memorandum to the CHSTS Safety and Security Management Plan (SSMP). It is also recommended that this Technical Memorandum is appended to both the System Safety Program Plan (SSPP) and Security and Emergency Preparedness Plan (SEPP) when they are developed prior to the initiation of revenue service.

It is recommended that Regional FLSSCs be established in the Initial Construction Segment between Fresno and Bakersfield. It is also recommended that the Statewide FLSSC be established in Sacramento, California. All committees should be established as soon as possible in order to integrate FLSS input to the development of design criteria.

This Policy will be modified as design and construction progresses to fit the specific needs of the immediate phase of the project segments.

Appendix G

Hazard Analysis Descriptions

Preliminary Hazard Analysis (PHA)

The primary output of the PHA is the early identification and evaluation of hazards and mitigations on a high-level systems requirement basis. The following instructions are used in the development of the Preliminary Hazard Analysis:

PURPOSE	**The purpose of the PHA is to provide an early assessment of the hazards associated with a design or concept.**
PROCEDURE	**The PHA identifies critical areas, hazards and criteria being used and considers: hazardous events, components, interfaces, environmental constraints, and operating, maintenance and emergency procedures.** **When possible, the corrective action should identify the approach(s) to be taken: design change, procedures, and special training and personnel qualifications.**
RESULTS	**The PHA will provide for verification that corrective or preventive measures or procedures are taken in safety reviews, modification of specifications, and generation of methods and procedures to eliminate, minimize or control hazards and provide inputs to the interface hazard analysis, operating hazard analysis and failure mode and effects analysis.**
DOCUMENTATION	**Document the analysis to show compliance with the specified safety and operational requirements, and provide for the tracking of actions and verifying effectiveness. A PHA Report will be developed where appropriate to document the analysis process for specific subsystem hazards.**

Sample PHA

System: Infrastructure				**California High-Speed Train Project**				**Prepared by:** John Cockle **Date** 5-Feb-14		
Subsystem: R-O-W, Generally				**Preliminary Hazard Analysis (PHA)**				**Reviewed by:** Gulzar Ahmed **Date** 5-Feb-14		
PHA No. 1.1.1 **Rev No.** 0								**Approved by:** **Date**		
General Description Derailment				**Hazard Cause / Effect**		**Hazard Risk Index**		**Corrective Action**		
No.	**Sys Mode**	**Site Speci-fic**	**Hazard Description**	**Potential Cause**	**Effect on Subsystem / System**	**Initial**	**Residual (Projected)**	**Potential Controlling Measures**	**Resolution**	**Remarks**
4	Normal	Yes	Washout	Flooding, scouring	Derailment w/mass casualties, property damage, service interruption	[redacted]	I-E Acceptable w/Review	1) Perform hydraulics analysis and incorporate results into sub-grade design, slope protection and setting of profile. 2) Install scour protection (revetment or other structure) to protect sub-grade from water course. 3) Install culvert or bridge structure where crossing water course. 4) Identification and monitoring by O&M of potential hazardous locations.	1) Perform hydraulics analysis and incorporate results into sub-grade design, slope protection and setting of profile. 2) Install scour protection (revetment or other structure) to protect sub-grade from water course. 3) Install culvert or bridge structure where crossing water course. 4) Identification and monitoring by O&M of potential hazardous locations.	Identified 8/30/11. Improvement in frequency to *Highly Unlikely*, but not eliminated. No effect on severity of a derailment if it does occur. 12/2013: Mitigation and Resolution # 4 added during the Verification and Validation process

Note – This is a sample representation only. Refer to current PHA for identified hazards and controlling measures.

INSTRUCTIONS FOR COMPLETING THE PHA FORM:

- **In System, enter the nomenclature of the applicable system element (e.g. Infrastructure, Train Control, Communications, Rolling Stock, etc).**

- In Subsystem, enter the nomenclature of the subsystem as broken out from the system and which includes the item or hazard undergoing PHA.
- In PHA No., enter the PHA number for the subsystem element. This coding will be sequentially numbered by each Contractor for each subsystem and will be utilized for all related analysis.
- In Rev. No., enter the revision number of the PHA to indicate the latest status.
- In Prepared by _ Date _, the preparer will sign and enter the date of issue or revision of the analysis.
- In Reviewed by _ Date _, the reviewer will enter the date of review.
- In Approved by _ Date _, enter the date of approval by the SSPC or SSEC as appropriate.
- In No., enter the reference number which uniquely identifies the high-speed rail system element and any identifiable element subsystem and item being analyzed.
- In System Mode, enter state of the system when the failure mode or hazardous condition occurs.
- In HAZARD DESCRIPTION, describe an immediate condition which could lead to an accident involving potential injury, death or equipment damage.
- In POTENTIAL CAUSE, enter the most likely primary and secondary causes that can potentially contribute to the presence of the hazard.
- In EFFECT ON SUBSYSTEM / SYSTEM, describe the effect that the hazardous condition may have on the system element or its element subsystem in terms of safety (e.g. delay, inconvenience, injury, damage, fatality, etc.)
- In HAZARD RISK INDEX, enter a combination of the qualitative measure of the worst potential consequence resulting from the hazard, and its probability of occurrence (e.g., IA, IIB, etc.), under the following conditions:
    - In INITIAL, enter the designation for hazard risk index estimated prior to implementation of the controlling measures, considering the condition of the subsystem element if no measures of mitigation were applied.
    - In RESIDUAL (PROJECTED), enter the designation for hazard risk index estimated following the adoption/implementation of the proposed controlling measures. This may result in reduction of either the probability of occurrence or the severity of the hazard, or both.
- In POTENTIAL CONTROLLING MEASURES AND REMARKS, describe the proposed measures of mitigation that can be applied to prevent or reduce the severity and probability of the hazard under analysis.
- In RESOLUTION / RESOLUTION, describe changes made or steps taken relative to design and/or procedures, training, etc., to eliminate or control the hazard. The identified reference should be as specific as possible for verification purposes.
- In REMARKS, identify the date that the hazard was initially analyzed, any subsequent analysis, and other items that support or describe the analysis process.

Site-Specific Hazard Analysis (SiSHA)

The SiSHA is conducted as the general design criteria and system requirements are applied to specific system and subsystem elements within a defined geographic area. The standard SiSHA segment will be one mile in length, but can be shorter if specialized conditions require. SiSHA is systemic in that it includes ALL hazards and mitigations that are found within the segment under consideration, analyzing the relationship between the various hazards and mitigations. SiSHA is performed when the final alignment is identified during the Preliminary Engineering Phase and in advance of the Final Design, Construction, and Testing/Startup Phases. The primary output of the SiSHA is a validation of the PHA mitigations in relation to the segment under consideration, and the identification and evaluation of hazards and mitigations that are specific to the segment under consideration.

The instructions and format for completing the SiSHA form are the same as for the PHA form.

Failure Mode and Effects Analysis (FMEA)

PURPOSE

The purpose of the FMEA is to determine the results or effects of item failures on a system operation and to classify each potential failure according to its risk index (severity and frequency of occurrence). The goal is to provide an early identification of failures with unacceptable and undesirable risks so that they can be eliminated or minimized through appropriate actions at the earliest possible time.

PROCEDURE

Variations in design complexity and available data will generally dictate the analysis approach to be used. There are two primary approaches for accomplishing an FMEA, the hardware approach and the functional approach.

The hardware approach is normally used when hardware items can be uniquely identified from schematics, drawings, and other engineering and design data. The hardware approach is normally utilized in a parts-level up fashion (bottom-up approach), by listing individual hardware items and analyzing the effect of their possible failure modes on the entire system and its subsystems.

The functional approach is normally used when hardware items cannot be uniquely identified or when system complexity requires analysis from the initial indenture level downward through succeeding indenture levels (top-down approach). The functional approach recognizes that every item is designed to perform a number of functions that can be classified as outputs. The outputs are listed and their failure modes analyzed.

The FMEA may be performed as a hardware analysis, a functional analysis, or a combination analysis depending on the design detail available.

The FMEA will examine the system element by element, to evaluate the system for safety hazards and ultimately to assess risk. Each identified failure mode will be assigned a severity classification. A probability of occurrence will also be assigned in accordance with MIL-STD-882E The resulting risk index will be utilized during design to establish priorities for corrective actions. The FMEA will be reviewed on a continuous basis to verify that design modifications do not add hazards to the system.

To perform a FMEA, the following process should be implemented:

- Identify all major system components, functions, and processes
- Determine consequences of interest
- Determine the potential failure modes of interest
- Specify effects of failures of system
- Identify safety provisions to control hazards and failures
- Identify detection methods for failures
- Establish overall significance of each failure

RESULTS	The FMEA will provide information to evaluate identified hazards, identify safety critical areas and provide inputs to safety design criteria and procedures with provisions and alternatives to eliminate or control all unacceptable and undesirable hazards based on their combination of severity and probability of occurrence, and to identify critical items.
DOCUMENTATION	Document the analysis to show compliance with specified system safety requirements and to track the corrective action.

Fault Tree Analysis (FTAn)

PURPOSE

The Fault Tree Analysis (FTAn) is a deductive procedure used to determine the various combinations of hardware and software failures and human errors that could cause undesired events (referred to as top events) at the system level. The FTAn has much use because of its ability to distinguish between those events that must occur (represented by an AND gate) and those that simply can occur (represented by an OR gate) in order for the top event to occur. The analysis thus helps to identify potential causes of system failures before the failures actually occur. The deductive analysis begins with a general conclusion, then attempts to determine the specific causes of the conclusion by constructing a logic diagram called a fault tree. After completing an FTAn, efforts can be directed to improve system safety.

PROCEDURE

The FTAn will be conducted on unresolved, undesirable, or unacceptable hazards identified in other safety analyses. Following procedure will be used to do a comprehensive FTAn:

1. Define the undesirable/unacceptable hazard, and write down the top level event.
2. Using technical information and professional judgments, determine the possible reasons for the top level event to occur. These are level two elements because they fall just below the top level event in the tree.
3. Continue to break down each element with additional gates to lower levels. Consider the relationships between elements to help decide proper selection of the logic gate.
4. .Finalize and review the complete diagram. The chain can only be terminated in a basic fault: human, hardware software.
5. If possible, evaluate the probability of occurrence for each of the lowest level elements and calculate the statistical probabilities from the bottom up.

RESULTS

The information charted on a fault tree provides a qualitative analysis by demonstrating how specific events will affect an outcome. If probability data is known for these events, then the FTAn can also provide quantitative information to further evaluate the likelihood of achieving the top event. Once developed, the fault areas that are responsible for yielding an undesired event can be further evaluated.

DOCUMENTATION

Document the analysis to show compliance with specified system safety requirements and to track the corrective action.

Interface Hazard Analysis (IHA)

PURPOSE	The IHA identifies and assesses existing or potential hazards between subsystems and systems and their effect on overall System safety and operations. The emphasis is on interfaces. Through the early identification of existing or potential hazards, corrective action(s) can be taken to eliminate or control unacceptable and undesirable hazards, based on the combination of their hazard severity and probability of occurrence.
PROCEDURE	The IHA is conducted on the critical interrelationships of each subsystem and system to determine the cause and effect of possible independent, dependent and simultaneous failures that could present a hazardous condition, including failures of safety devices. When the IHA indicates a potential problem, it is made known to the responsible engineer in order to initiate a design review. The IHA will be reviewed on a continuous basis to verify that design modifications do not add hazards to the system.
RESULTS	The IHA provides for the identification and correction of possible hazards associated with subsystem and system failures. The IHA provides inputs to design reviews, maintainability, reliability and system safety and system operations.
DOCUMENTATION	Document the analysis to show compliance with specified system safety requirements and to track the corrective action.

Operating Hazard Analysis (OHA)

PURPOSE	The purpose of the OHA is to identify and analyze hazards associated with personnel and procedures during production, installation, testing, training, operations, maintenance and emergencies.
PROCEDURE	The OHA will be conducted on all tasks and human actions, including acts of omission and commission, by persons interacting with the system, subsystems and assemblies at any level. When the OHA indicates a potential safety hazard, it will be made known to the responsible engineer, in order to initiate a design review or a system safety working group action item. The OHA will be reviewed on a continuous basis to provide for design modifications, procedures, testing, etc., that do not create hazardous conditions.
RESULTS	The OHA will provide for corrective or preventive measures to be taken to minimize the possibility that any human error or procedure will result in injury or system damage. The OHA will provide inputs for recommendations for changes or improvements in design or procedures to improve efficiency and safety, development of warning and caution notes to be included in manuals and procedures, and the requirement of special training of personnel who will carry out the operation and maintenance of the system.
DOCUMENTATION	Document the analysis to show compliance with specified system safety and operational requirements.

Software Hazard Effects Analysis (SHEA)

PURPOSE

The Software Hazard Effects Analysis (SHEA) is a software design evaluation and validation tool used to identify errors generated from incorrect or inadequate specifications of software functions. A software fault causing a resultant harmful system function is a software hazard.

Software faults can be described in three forms:

- Error generated through coding the software
- Faults due to incorrect software specifications implemented by the function developer
- Faults due to hardware failures that affect changes in coding software

A software hazard can be any of four types:

- An undesired signal causing an unwanted event
- An undesired signal causing an out-of-sequence event in the response
- An undesired signal preventing the occurrence of a necessary action or response
- An undesired signal causing an event to be out of tolerance

The SHEA concentrates on potential safety problem areas in the software. The purpose of the SHEA is to provide an early study of the software design for possible hazards and to initiate appropriate actions to eliminate/ control hazards.

PROCEDURE

The initial step in the analysis is to identify the safety critical areas of the system and their functional paths. These paths may contain hardware as well as software elements. Focus the analysis on the software functions within each system functional flow path. Whether the coded instructions are stored in software or firmware, analysis of the system in question for hazardous occurrences should include an analysis of the stored coded instructions.

The SHEA will be conducted on identified software fault conditions, and will proceed from a qualitative to a quantitative analysis as the design develops. When the SHEA indicates a potential problem, it will be made known to the responsible engineer in order to initiate proper action. The SHEA will be reviewed on a continuous basis to verify that software design modifications do not add hazards to the system.

The SHEA should be developed in conjunction with FMEA.

RESULTS

The SHEA will provide information to evaluate identified software related hazards, identify safety critical areas in software design and provide inputs to safety design criteria and procedures. The latter will include provisions and alternatives to eliminate or control all unacceptable and undesirable software related hazards based on their combination of severity and probability of occurrence, and to identify critical items.

DOCUMENTATION

Document the analysis to show compliance with the specified system safety requirements and to track the corrective action.

APPENDIX 2-I: ALTERNATIVES CONSIDERED DURING ALTERNATIVES SCREENING PROCESS

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The project-level environmental review process for the San Jose to Merced Project Section commenced in 2009 with a notice of intent (NOI), a notice of preparation (NOP), and an agency and public scoping process.

The alternative development and consideration process was iterative from 2009 to 2017 as illustrated on Figure 1. The California High-Speed Rail Authority (Authority) solicited public and agency comments on the range of alternatives that should be studied in the environmental impact report/environmental impact study (EIR/EIS) multiple times, including the National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) scoping period, during alternative analysis document preparation in 2010 through 2013, and when the project analysis shifted focus to the San Jose to Central Valley Wye Project Extent in 2016 and 2017. Interagency coordination also informed the development of alternatives for consideration. After analysts identified the initial group of potential alternatives, they developed plans, concepts, and cross sections as necessary to support early consideration. Initial alternatives were developed and screened in coordination with the NEPA/404/408 Integration process.

NEPA/404/408 Integration Process

The MOU between the FRA, the Authority, USACE, and USEPA establishes a three-part "checkpoint" process for integrating NEPA and the requirements of Clean Water Act Section 404 and Rivers and Harbors Act Section 408:

- **Checkpoint A**—The USACE and USEPA review the FRA and Authority's identification of the project's purpose and need, and concur that it is fully described.
- **Checkpoint B**—The USACE and USEPA review the FRA and Authority's identification of alternatives for full evaluation in the EIR/EIS and concur that the range of alternatives is reasonable prior to release of the Draft EIR/EIS.
- **Checkpoint C**—The USACE and USEPA review the FRA and Authority's preferred alternative and provide concurrence that it represents the preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) and may be preliminarily recommended for Section 408 approval.

NEPA/404/408 Integration is a formal process by which the Federal Railroad Administration (FRA), Authority, U.S. Army Corps of Engineers (USACE), and U.S. Environmental Protection Agency (USEPA) coordinate on the identification, preliminary technical evaluation, and validation of detailed evaluation of alternatives in a NEPA document to ascertain that the requirements of Clean Water Act (CWA) Section 404 (concerning waters/wetlands) and Rivers and Harbors Act Section 408 (concerning federally authorized flood control projects) are fully and concurrently considered. The FRA, Authority, USACE, and USEPA signed a memorandum of understanding (MOU) that established a three-step "checkpoint" process to govern interagency coordination for the integration process (see sidebar).

The following summarizes the San Jose to Merced alternatives development and analysis process and results.

HSR Project-Level Alternatives Requirements

An EIR/EIS is required to analyze the potential effects of a range of reasonable alternatives (14 California Code of Regulations [Cal. Code Regs.] 15126.6; 40 Code of Federal Regulations (C.F.R.) Part 1502.14(a)). Under CEQA, the alternatives are to include a No Project Alternative and a range of potentially feasible alternatives that could (1) meet most of the project's basic objectives and (2) avoid or substantially lessen one or more of the project's significant adverse effects (14 Cal Code Regs. § 15126.6(c)). The lead agency must describe its reasons for excluding other potential alternatives when considering alternatives for evaluation in the environmental document. Under the "rule of reason," an EIR is required to study a sufficient range of alternatives in order to permit a reasoned choice (Cal. Code Regs. 14 § 15126.6(f)). CEQA does not require that all possible alternatives be studied.

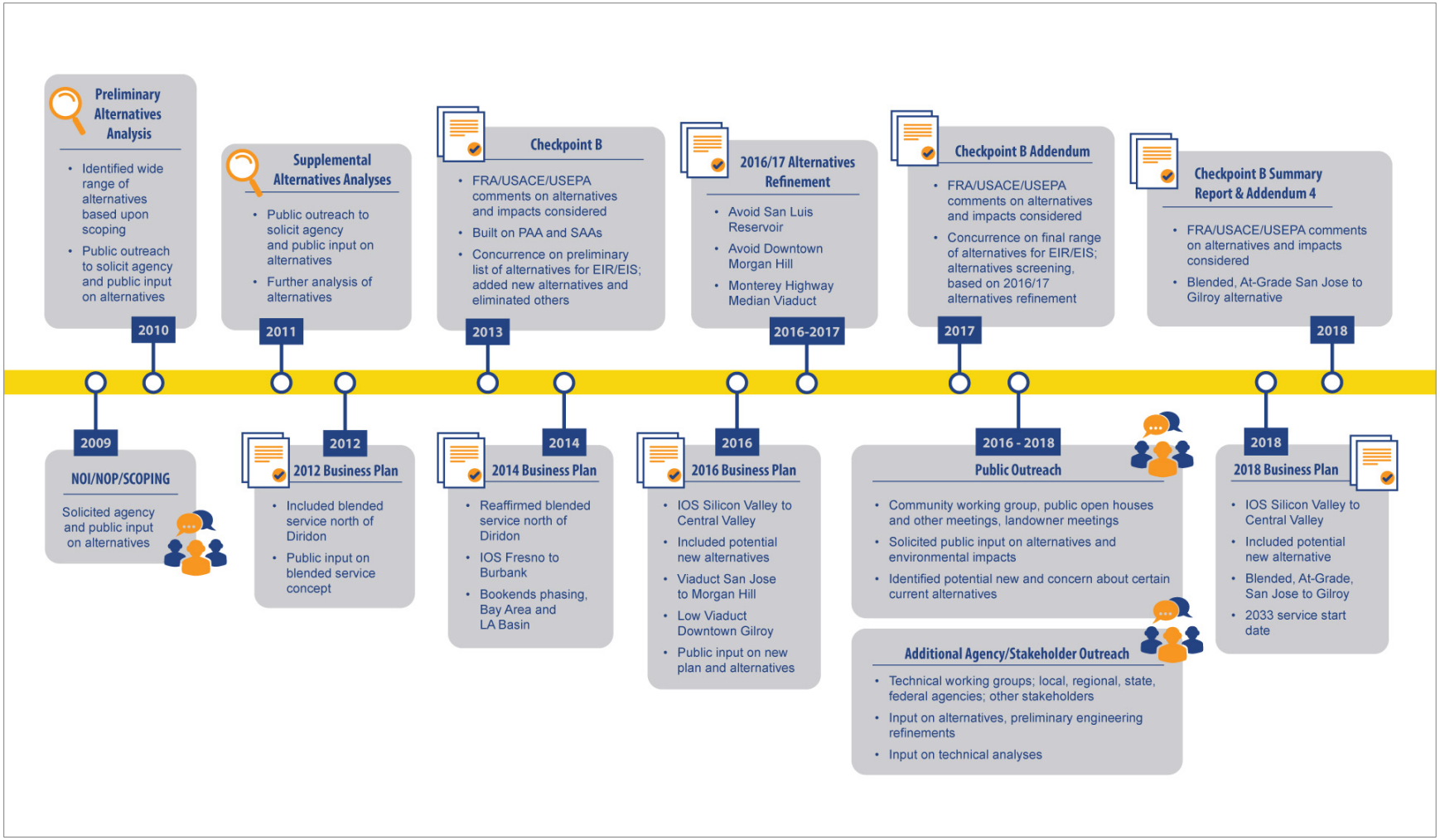

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Figure 1 Project Alternatives Development and Screening Process

Under NEPA, the alternatives analysis is "the heart of the environmental impact statement" (40 C.F.R. Part 1502.14). Under Council on Environmental Quality (CEQ) regulations, an EIS is required to examine "all reasonable alternatives" to the proposed action, as well as the no-action alternative. The CEQ guidance also allows, when the number of potentially reasonable alternatives is very large, the lead agency to examine "a reasonable number of examples, covering the full spectrum of alternatives" (CEQ, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations [1981]). Pursuant to Section 10(b) of the FRA's *Procedures for Considering Environmental Impacts*, "It is entirely proper that the number of alternatives being considered should decrease as the environmental consideration process proceeds and as analysis reveals that certain alternatives would in fact be unreasonable" (64 Fed. Reg. 28546, 28550). The Authority and FRA considered the input of the public and interested resource agencies when developing the reasonable range of alternatives. Pursuant to CEQA and NEPA, the Authority and FRA held scoping meetings to invite public participation in defining the scope of the analysis, including the range of reasonable alternatives.

Alternatives Consideration Process and Chronology

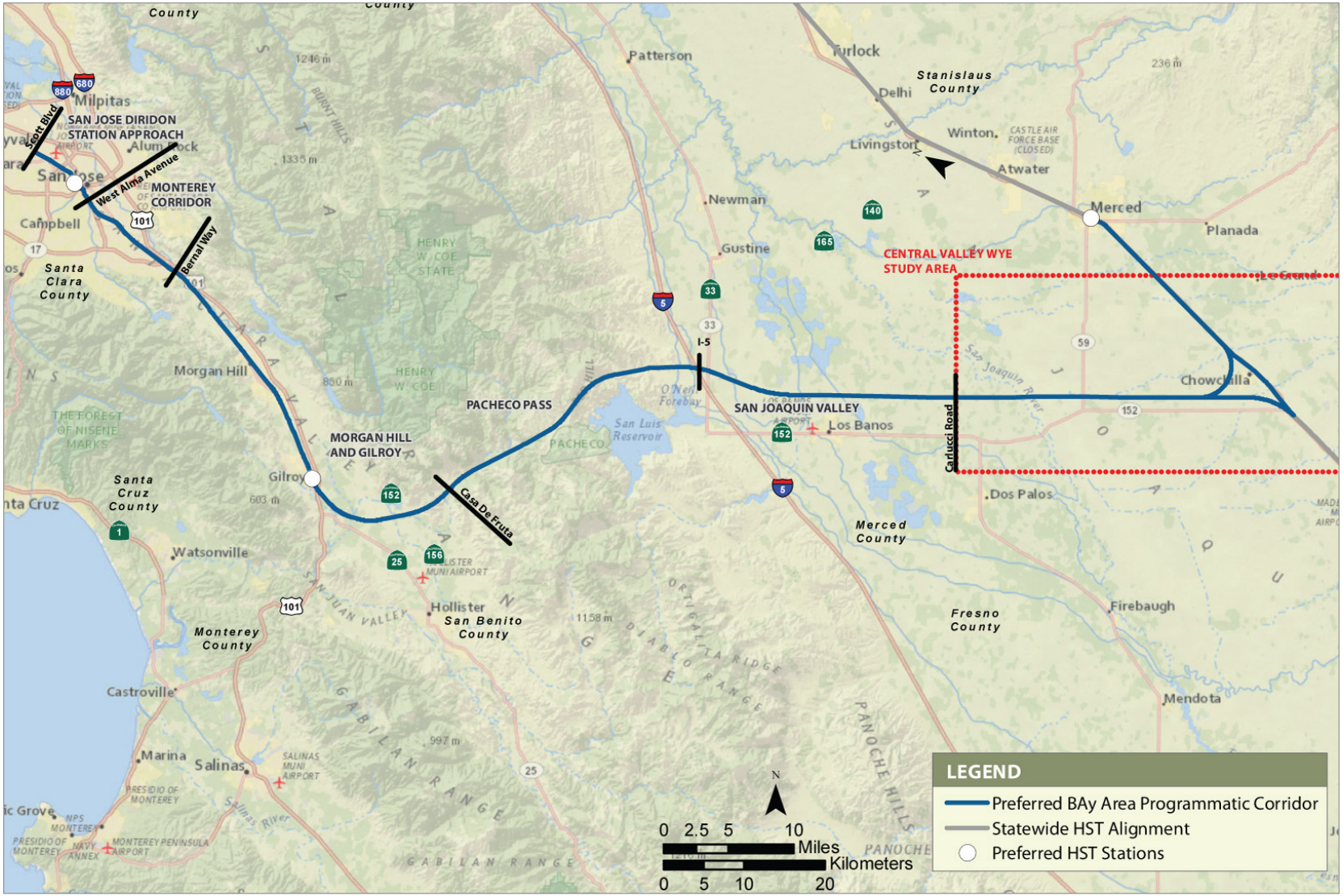
The following summarizes the milestones in alternatives development and consideration during this period.

NEPA/CEQA Scoping (2009)

On February 23, 2009, the Authority distributed an NOP announcing preparation of an EIR for the entire San Jose to Merced Project Section. The FRA published an NOI in the Federal Register on March 16, 2009, announcing the preparation of an EIS for the Project Section. Figure 2 from the Final Scoping Report illustrates the preferred corridor identified in the Statewide Program EIR/EIS (Authority and FRA 2009). The Authority held scoping meetings in Merced (March 18, 2009), San Jose (March 25, 2009), and Gilroy (March 26, 2009). More than 300 residents, property and business owners, agency representatives, elected officials, the media, and other interested parties participated in these meetings. The Authority and FRA solicited input concerning potential project-level alternatives and environmental effects.

Major issues raised during scoping included alignment options and alternatives for routes, stations, and maintenance facilities, design options for grade crossing and separations, considerations for alternative elevated, trenched or tunneled alignments, parking locations, and other facilities. Additional alignment alternatives suggested and shown on Figure 3 included:

- In San Jose, to avoid potential impacts on the greater Gardner neighborhood, several options for an underground tunnel or at-grade and alignment design options along State Route (SR) 87, south of I-280, between the Diridon and Tamien Caltrain stations
- In the south part of San Jose between the Tamien station to Coyote Valley, an option to follow SR 87 and SR 85, replacing the (Santa Clara) Valley Transportation Authority (VTA) light rail that runs along that corridor with high speed rail, and relocating the VTA light trail to Monterey Road.
- South of San Jose, an option to follow U.S. Highway (US) 101 to reach Gilroy, bypassing downtown Morgan Hill
- East of Gilroy on the west side of Pacheco Pass, an option to explore alignment options that would avoid bisecting the Frazier Lake Airpark
- On the east side of Pacheco Pass, options to avoid the Grassland Ecological Area and cross the San Joaquin Valley from Santa Nella to SR 99
- From Los Banos east, several options to follow SR 152 to reduce potential impacts on agricultural lands and Chowchilla
- Options south of SR 152 to reduce potential impacts on Chowchilla and make a connection to the Merced to Bakersfield Project Section



Source: Authority and FRA 2009

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Figure 2 Tier 1 Decision as Foundation for Range of Alternatives in Tier 2 EIR/EIS

This input helped to shape the initial alternative alignments that were considered for this section of the HSR system.

Preliminary and Supplemental Alternatives Analysis (2010–2011)

The development of initial project-level alternatives in 2009 followed the process described in *Alternatives Analysis Methods for Project EIR/EIS, Version 2* (Authority 2009). Figure 3 illustrates the initial range of alternatives identified through the scoping process. The assessment of potential alternatives involved both qualitative and quantitative analyses to address applicable policy and technical considerations. These methods included field inspections of corridors; project team input and review considering local issues that could affect alignments; qualitative assessment of constructability, accessibility, operations, maintenance, right-of-way, public infrastructure, railway infrastructure, and environmental effects; engineering assessment of project length, travel time, and configuration of key features of the alignment (such as the presence of existing infrastructure); and geographic information system (GIS) analysis of effects on farmland, water resources, wetlands, threatened and endangered species, cultural resources, current urban development, and infrastructure. Stakeholder input, concerns, and preferences were considered to provide local context.

Key Environmental Factors in the PAA and SAA Analysis

The PAA/SAA review considered all of the following factors:

- System factors: journey time, rail length, intermodal connections, costs
- Constructability: feasibility, disruption to existing railroads and utilities
- Endangered and Threatened Species: Effects on habitat for state- and federally listed plant and wildlife species
- Farmland: Effects on designated Important Farmland
- Flood Control: Effects on floodplains
- Cultural resources: Effects on archaeological sites and historic buildings and structures
- Geological constraints
- Land Use: Consistency with local planning
- Noise-sensitive receptors near alignment
- Parks and Open Space: Effects on publicly owned parks, recreational areas, and wildlife areas per Section 4(f) of the 1966 Department of Transportation Act
- Residential/Commercial: Potential displacement of residences and businesses
- Schools in close proximity
- Traffic effects and road closures
- Visual/scenic resources
- Waters/Wetlands: Effects on state and federal waters

Next, the Authority evaluated the narrowed range of alternatives against HSR system performance criteria. Figure 4 illustrates the alignment alternatives that were carried forward into detailed alternatives analysis. The screening process entailed use of environmental criteria to measure the potential effects of the proposed alternatives on the natural and human environment. For example, the land use criteria measured the extent to which a station alternative would support transit use; be consistent with existing adopted local, regional, and state plans; and be supported by existing and future growth areas. Constructability measured the feasibility of construction and the extent to which right-of-way would be constrained. Community effects measured the extent of disruption to neighborhoods and communities, such as the potential to minimize (1) right-of-way acquisitions, (2) the extent of division of an established community, and (3) conflicts with community resources. The analysis of biological resources and water quality evaluated the extent to which an alternative would minimize effects on natural resources. As a result of this screening process, some alignment alternatives were selected to proceed into the Draft EIR/EIS, as illustrated on Figure 5.

The *San Jose to Merced Preliminary Alternatives Analysis Report* (PAA) (Authority and FRA 2010) and the two San Jose to Merced Supplemental Alternatives Analysis reports (SAA) (Authority and FRA 2011a, 2011b) present the alternatives analysis. The PAA and SAAs considered the entire Project Section from the San Jose HSR Station through the Central Valley Wye (the planned junction with the Merced to Fresno Project Section) and north to Merced. The alternatives analyses provide the reader with an understanding of how alternatives were developed, taking into account alignment and station development considerations. While the

alternatives analysis process considered multiple criteria (see sidebar), it emphasized the project objective to maximize the use of existing transportation corridors and available rights-of-way to the extent feasible as determined by the Authority" (California Streets and Highways Code, Division 4, Chapter 20, Section 2704 et seq.). Those alternatives that were not carried forward by the Authority and FRA had greater direct and indirect environmental effects, were impracticable, or failed to meet the project purpose. Figure 6 illustrates the alignment and station alternatives that resulted from this further development and screening process.

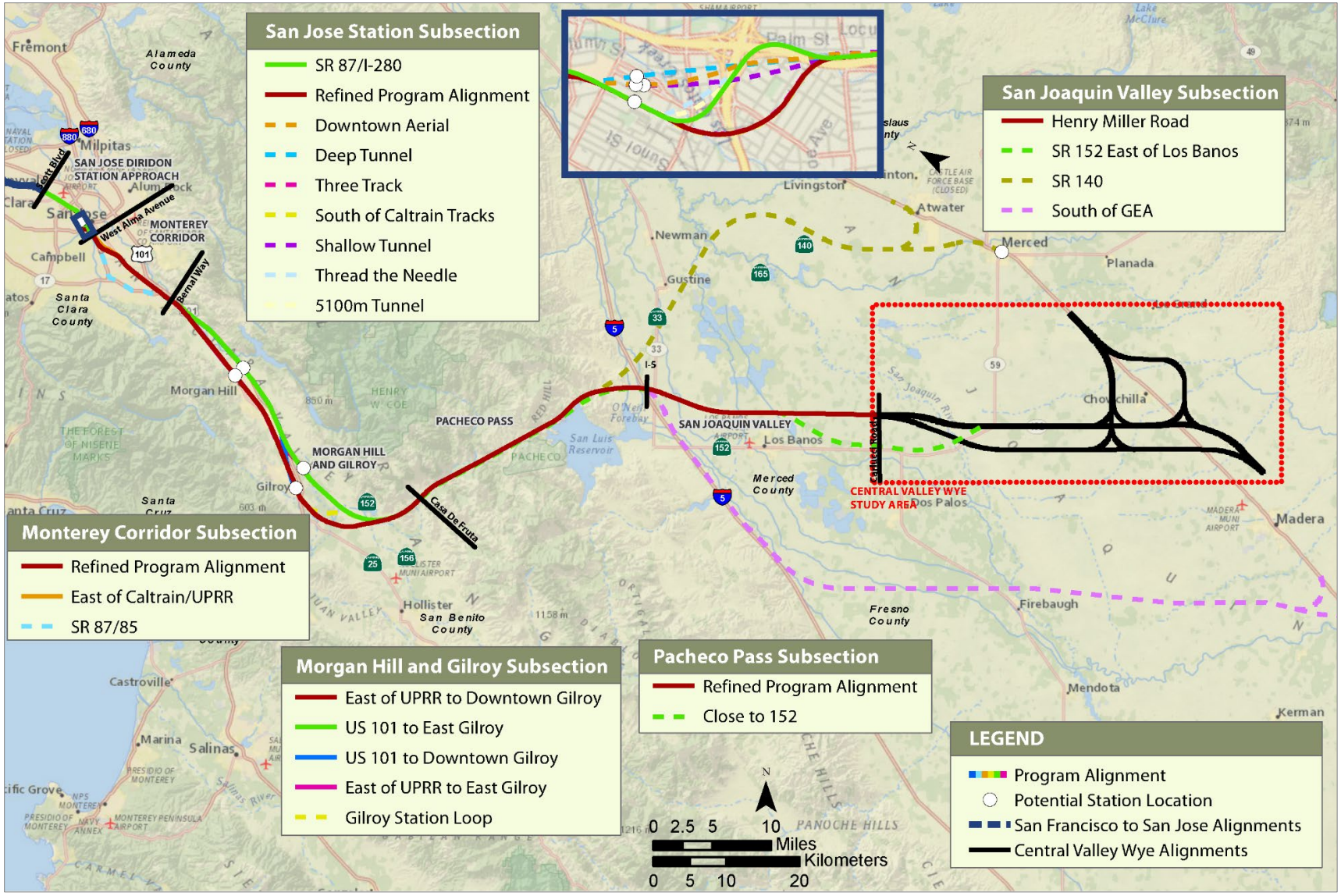
The three alternatives analysis reports referenced above (Authority and FRA 2010, 2011a, 2011b) evaluated alignment alternatives. These documents describe the procedure and rationale for selecting and rejecting alignment alternatives.

Public and agency comments were solicited by the Authority during preparation of the alternatives analysis reports. The PAA and SAAs describe the recommended alternatives to be carried forward for further analysis and alternatives to be withdrawn from further consideration.

2012 Business Plan (2012) and SB 1029

The 2012 Business Plan (Authority 2012) introduced the blended system concept for the San Francisco to San Jose Project Section of the HSR system. Under the blended system, Caltrain and HSR would share the Caltrain corridor and tracks in a mostly at-grade system from San Jose to San Francisco. Senate Bill (SB) 1029 made the blended system a legislative mandate. The San Jose to Merced Project Section includes the area north of the San Jose Diridon Station to Scott Boulevard. As further discussed in the description of Alternative 1, Caltrain and HSR would operate in a blended service from north of I-880 to Scott Boulevard.[1]

[1] Alternatives 2 and 3 would transition to at-grade operations at Scott Boulevard and therefore would not include a blended service component.



Source: Authority and FRA 2010

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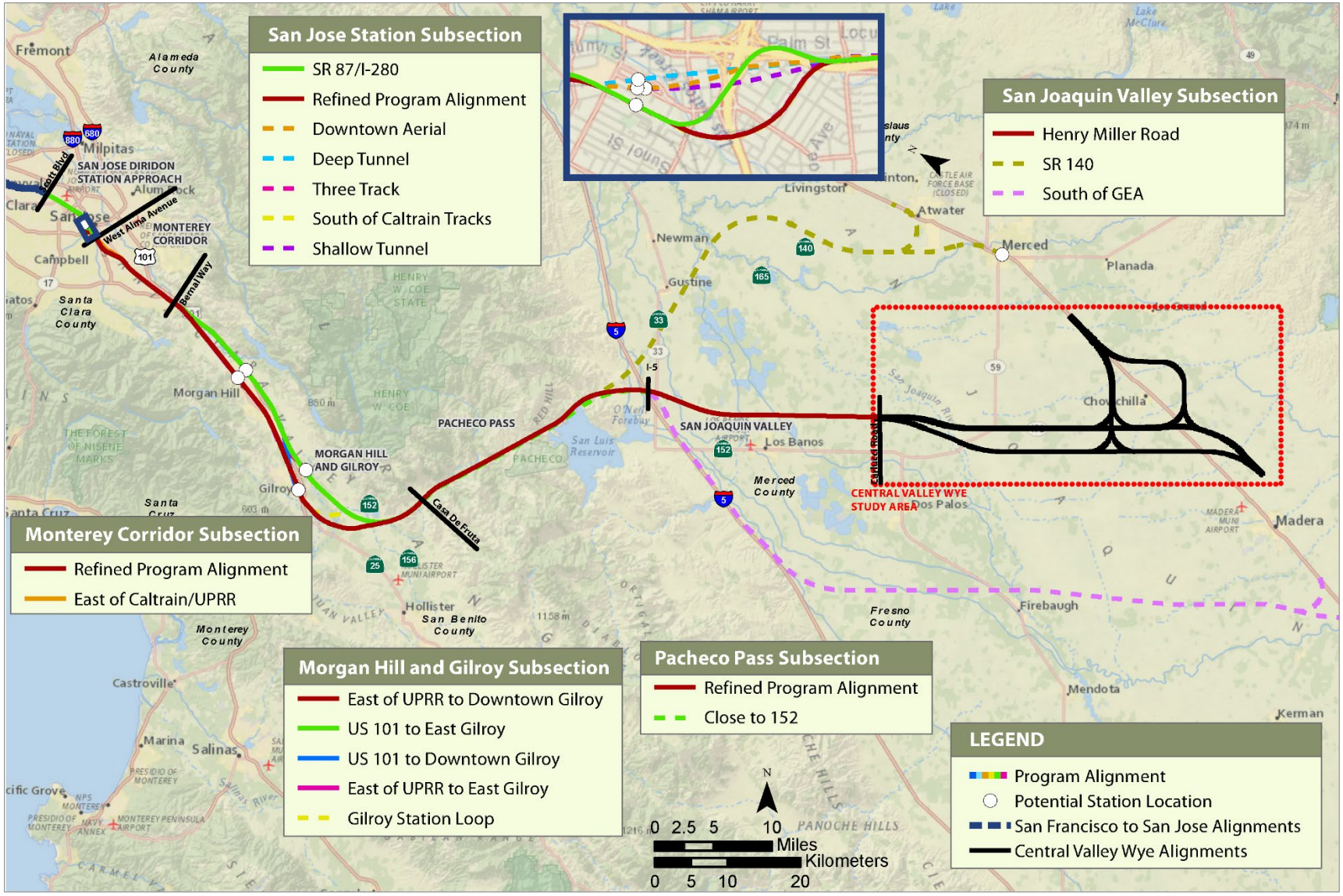
Figure 3 Alternatives Considered in the 2010 Preliminary Alternative Analysis Report as a Result of 2009 Scoping



Source: Authority and FRA 2010

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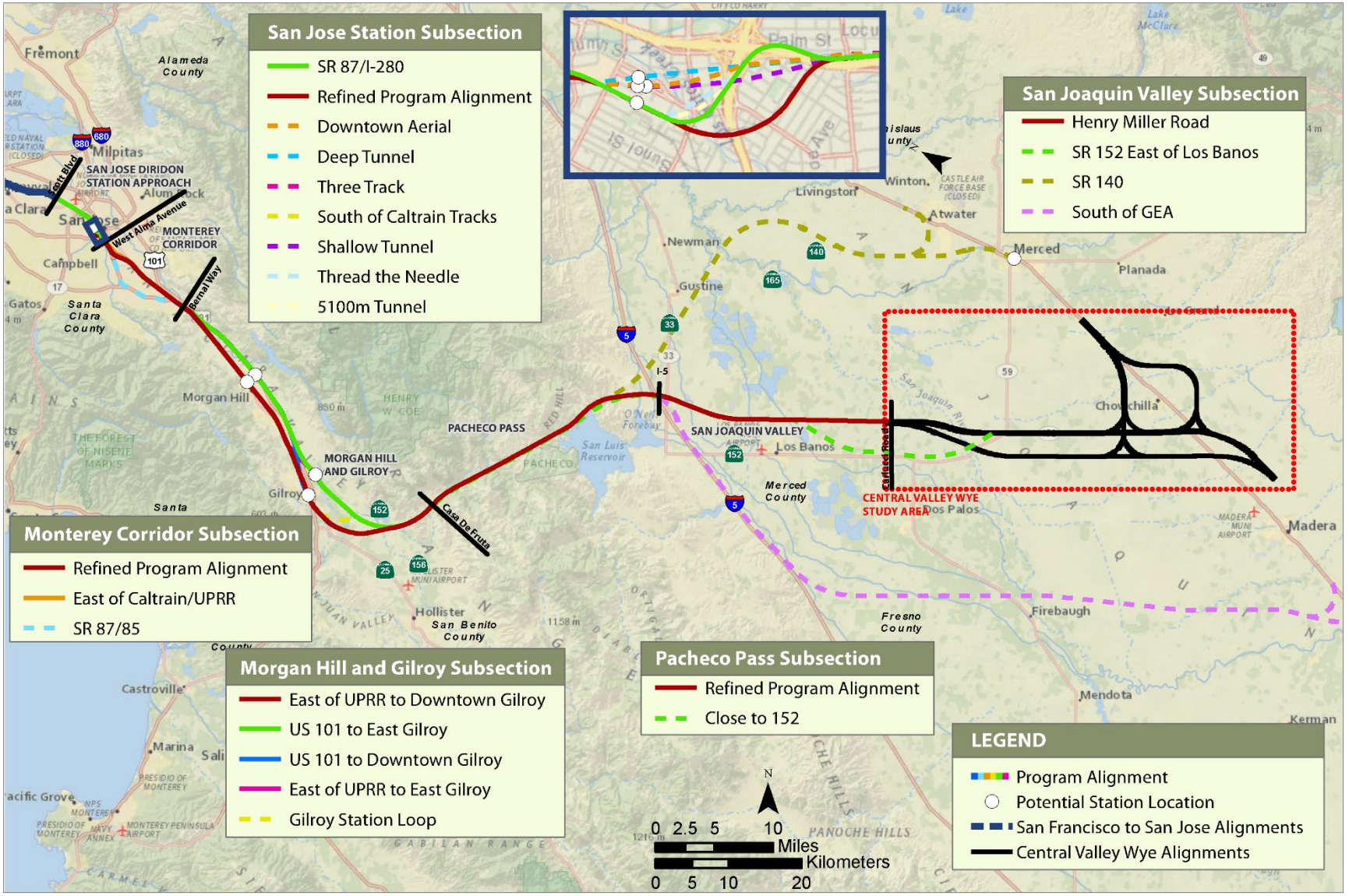
Figure 4 Alignment Alternatives Carried Forward into Detailed Alternatives Analysis in the 2010 Preliminary Alternatives Analysis Report



Source: Authority and FRA 2010

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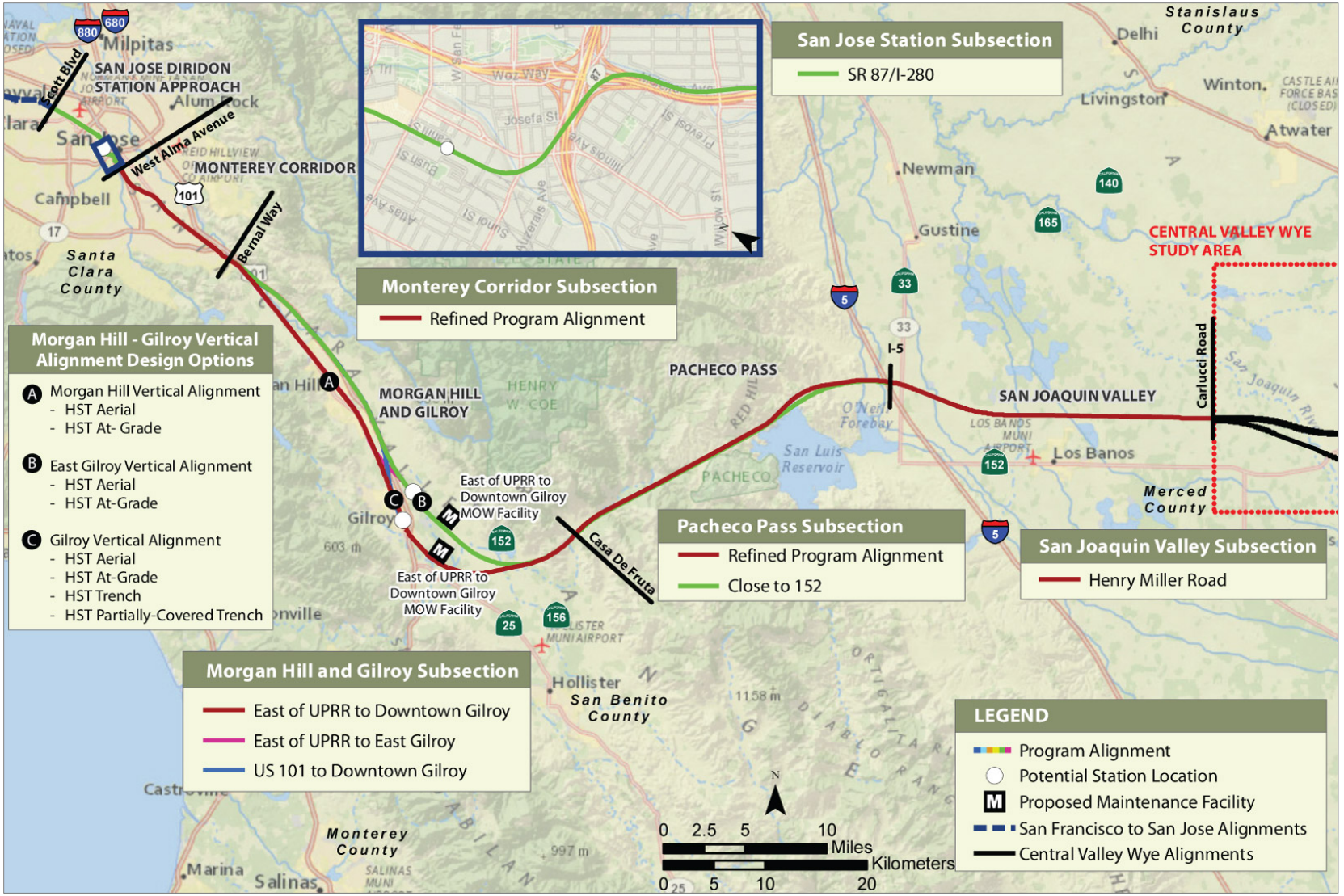
Figure 5 Alignment Alternatives Carried Forward into EIR/EIS as Identified in the Preliminary Alternatives Analysis Report



Source: Authority and FRA 2011

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Figure 6 Alignment and Station Alternatives to Be Carried Forward into the EIR/EIS as Identified in the 2011 Supplemental Alternatives Analysis Report

Checkpoint B Summary Report (2013)

Pursuant to the NEPA/404/408 Integration MOU, the FRA and the Authority are required to get concurrence from the USACE and USEPA regarding the range of alternatives to be analyzed in the Draft EIR/EIS. The integration process makes certain that the evaluation considers potential alternatives that can be feasibly permitted by the USACE under the requirements of CWA Section 404 and Rivers and Harbors Act Section 408.

In 2013, the Authority and FRA developed a *Checkpoint B Summary Report*, largely drawn from the work completed for the PAA and SAAs between June 2010 and July 2011, for review by the USACE and USEPA. The USACE and USEPA concurred in August and September 2014, respectively, with the alternatives recommended for inclusion in the Draft EIR/EIS.

Following the completion of the Checkpoint B analysis in 2013, work on the San Jose to Merced Project Section as a whole was suspended, and the Authority initiated a more limited study focused on the Central Valley Wye. The Central Valley Wye study was advanced as a supplemental EIR/EIS for the Merced to Fresno Project Section. The *Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR/EIS* (Authority 2019) was published May 2, 2019.

Key Environmental Factors in the Checkpoint B Analysis

The Checkpoint B alternatives review considered all the following factors:

- Waters/Wetlands: Effects on waters of the U.S. (including wetlands) per CWA Section 404 as well as state-regulated wetlands and riparian areas
- Flood Control: Effects on federally authorized flood control projects under Rivers and Harbors Act Section 408 and on floodplains
- Cultural Resources: Effects on archaeological sites and historic buildings and structures
- Endangered and Threatened Species: Effects on habitat for state- and federally listed plant and wildlife species
- Environmental Justice: Extent of low-income populations and minority populations near the alignment
- Farmland: Effects on designated Important Farmland
- Parks and Open Space: Effects on publicly owned parks, recreational areas, and wildlife areas per Section 4(f) of the 1966 Department of Transportation Act
- Residential and Commercial: Potential displacement of residences and businesses

In late 2015, the Authority reinitiated work on the San Jose to Central Valley Wye Project Extent – that is, the portion of the San Jose to Merced Project Section that is located to the west of the Central Valley Wye. The additional analysis of the Project Extent began with, and built upon, the range of alternatives that had been documented in the *2014 Checkpoint B Summary Report* for the San Jose to Merced Project Section.

2016 Business Plan (2016)

The 2016 Business Plan (Authority 2016) described the Authority's decision to shift its early focus from the project sections in Southern California to those in Northern California with a goal of initiating Central Valley to Silicon Valley (Valley-to-Valley) service in 2025. In light of updated ridership forecasts and operational planning undertaken since the 2012 Business Plan, the Authority identified certain new alternatives (such as a viaduct alternative between San Jose and Gilroy and blended operation north of Diridon Station) and also reconsidered the formerly dismissed at-grade alignment for the San Jose Diridon Station Approach Subsection as part of the 2016 Business Plan.

Further Outreach, Consultation, and Alternatives Refinement (2016–2017)

After reinitiating work on the San Jose to Central Valley Wye Project Extent in 2015 and after adoption of the Business Plan in 2016, the Authority and FRA conducted additional community outreach and engineering along the corridor. With project reinitiation, the Authority and FRA reached out to the public, stakeholders, and agencies to solicit their input and concerns about project alternatives and to consider refinements of the prior alternatives or the addition of new alternatives responsive to those concerns. The reconsideration of alternatives in 2016 and 2017 used a two-phase screening process to evaluate the direct and relative performance of conceptual alternatives. The initial phase considered financial feasibility, constructability, and operations. If the alternative met these initial criteria, then it was also reviewed for community and environmental impacts (Table 1).

Table 1 Evaluation Criteria, 2016–2017 Alternatives Refinement for San Jose to Central Valley Wye Project Extent

Evaluation Criteria	Considerations
First Phase	
Financial feasibility	▪ Be financially feasible within the Authority's capital expenditure program
Constructability	▪ Provide constructible, 100-year lifecycle infrastructure ▪ Be reasonably constructed within the project schedule timeframe without unacceptable risks
Operations/Maintenance	▪ Support safe, reliable, and resilient operations ▪ Train speed meets the Prop 1A service travel time ▪ Peak hour average representative travel time ▪ Blended operations north of Diridon Station and dedicated operations south of Diridon Station ▪ Station configuration to accommodate passing trains ▪ Adhere to federal and state laws governing transportation projects
Second Phase	
Community impact	▪ Would the alternative result in unacceptable community impacts?
Environmental impact	▪ Would the alternative avoid or minimize impacts on aquatic resources protected under Section 404 of the CWA such that it could be considered the least environmentally damaging practicable alternative (LEDPA)? ▪ Would the alternative avoid or minimize impacts on public recreational facilities, wildlife refuges, and listed historic resources protected under Section 4(f) of the U.S. Department of Transportation Act of 1966? ▪ Would the alternative comply with other federal and state regulations protecting environmental resources including the National Historic Preservation Act, the Civil Rights Act, and federal and state Endangered Species Acts?

Source: Compiled by Authority and ICF 2019

During 2016 and 2017, the Authority refined and modified the range of alternatives to be considered in the Draft EIR/EIS in response to changed community conditions, a more detailed understanding of environmental and community concerns, and cost and constructability issues. This section summarizes the outreach processes used in 2016 and 2017 and the input provided by various parties. The actual consideration and fate of 2016 and 2017 alternatives considered are presented in Section 2.4.3, Range of Potential Design Options Considered and Findings by Subsections.

The Authority and FRA conducted public outreach meetings, consulted with environmental regulatory agencies; consulted with cities and counties; met with federal, state, and private landowners; and met with other stakeholders during this process. The Authority presented the alternatives under consideration for the Draft EIR/EIS in a wide-ranging series of public, agency, and stakeholder meetings and received input regarding concerns about alternatives and suggestions for additional alternatives. This additional outreach led to the development of new design options in the Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections and reconsideration of some alternatives previously dismissed in earlier alternative evaluations. Figure 7 illustrates the alignments and design options that were presented in April 2016 community and technical working group meetings. Table 2 shows the key outreach venues, concerns expressed, and alternatives considered as a result of this outreach. Summaries of individual public and agency meetings are shown in Table 9-1 in Chapter 9, Public and Agency Involvement, of the Final EIR/EIS.

Table 2 Summary of Key Outreach Venues and Alternatives Concerns, 2016–2017

Type	Dates	Concerns Expressed
Open House/Community meetings (Los Banos, Gilroy, Morgan Hill, San Jose, neighborhood groups)	2016: May, June, September, November, December 2017: February, March, April, May, July	▪ San Joaquin Valley: Community expressed concerns about impacts on farmlands, dairies, wildlife, and Henry Miller Road. Requests to reconsider options south and north of Henry Miller Road dismissed in prior PAA/SAA/Checkpoint B processes. ▪ Pacheco Pass: Community expressed concerns about impact on individual properties and the Romero Ranch Conservation Easement. ▪ Gilroy: Citizens expressed concerns about community disruption, aesthetics, right-of-way acquisition, agricultural impacts, and cultural resources for both downtown and east Gilroy options. Alternatives considered include East Gilroy, Downtown Gilroy, and US 101 options. ▪ San Martin: Residents advocated for reconsideration of US 101 alignments to avoid impacts on downtown San Martin. ▪ Morgan Hill: Community expressed concerns about impact of alignments through downtown and bypassing downtown due to displacement. Environmental group concerns about the impact on wildlife movement in the Coyote Valley. ▪ Monterey Corridor: Residents expressed concerns about traffic, noise, and aesthetic impacts on Monterey Corridor. Requests for reconsideration of US 101 alignments and for tunnel option. ▪ Downtown San Jose: Some parties expressed continued interest in tunnel and at-grade options due to concern about aesthetics and business displacements of downtown aerial option. Other parties expressed concern about impact of at-grade options on communities and other rail operators (e.g., Caltrain). ▪ North of downtown San Jose: Community expressed concerns about aesthetic impact of viaduct to Scott Blvd. option and favor shorter viaduct (to I-880).
CWGs (Los Banos, Gilroy-Morgan Hill, San Jose)	2016: April, August 2017: January, May, July, August, September, October	
TWGs (Los Banos–Gilroy, Gilroy, San Jose to Morgan Hill, San Jose)	2016: March, April, June, July, August, September 2017: January, June, July	

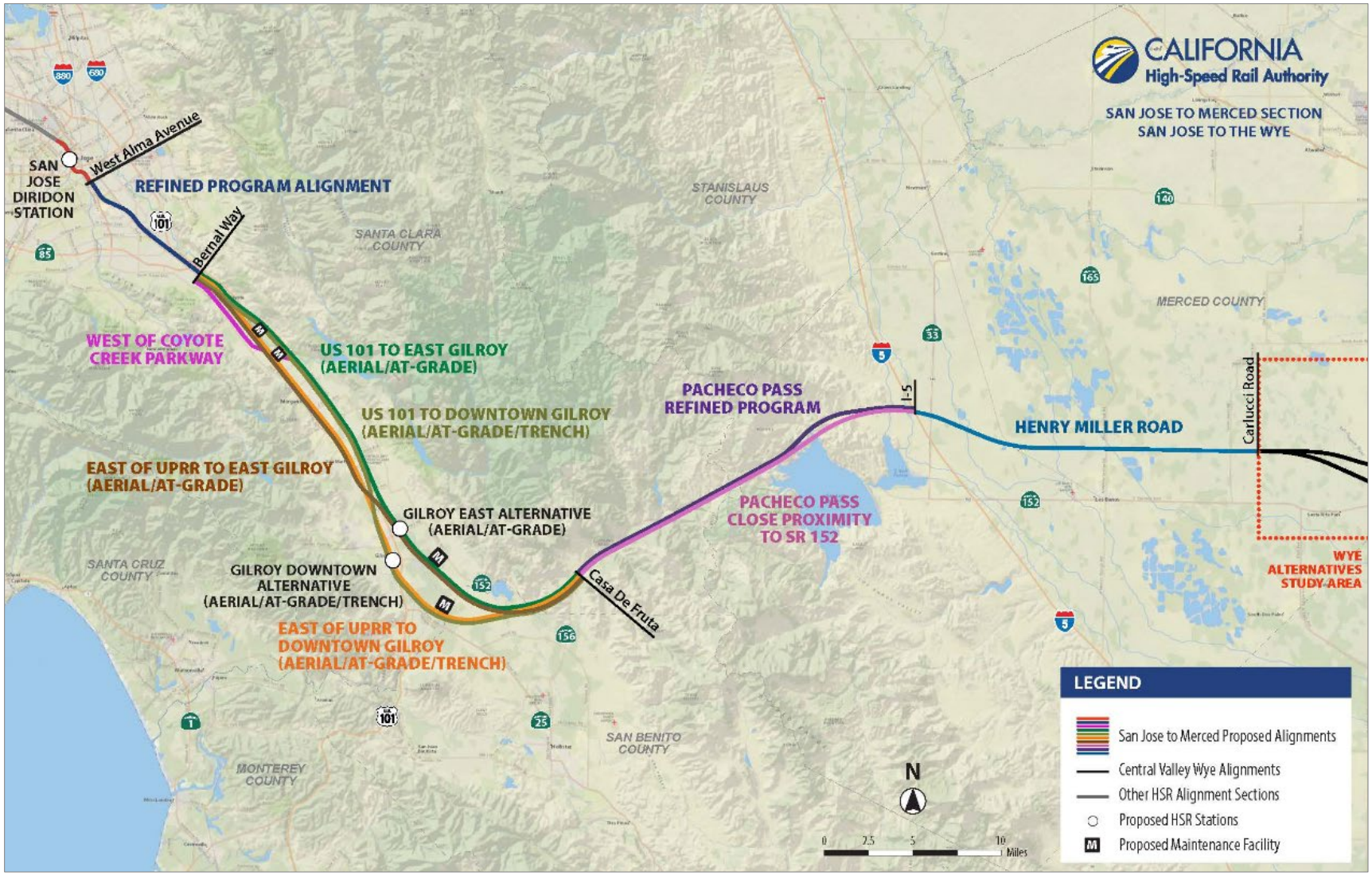
Type	Dates	Concerns Expressed
City/County Meetings Gilroy, Morgan Hill, San Jose, Santa Clara County, Merced County	2016: May, June, July, August, September, October, November, December 2017: January, February, March, April, May, June, July, August	▪ Consultation with Gilroy resulted in selection of two vertical options for downtown Gilroy including low viaduct and embankment (eliminating trench and high viaduct options) and consideration of a US 101 alignment within Gilroy. ▪ Consultation with Morgan Hill resulted in creation of a Morgan Hill bypass option to reduce impacts on downtown Morgan Hill. ▪ Consultation with City of San Jose resulted in development of a median viaduct option as well as consideration of a tunnel option for Monterey Corridor. The city also requested a reconsideration of a prior tunnel and at-grade options for downtown San Jose and conducted independent analyses of these options.
Agency meetings Federal: GSA, Reclamation, USFWS, NMFS State: CDFW, CALTRANS, RWQCB Local: SCVWD, VTA, Water Authorities, Reclamation Districts, Irrigation Districts, Caltrain, BART, School Districts. Pajaro River Watershed Flood Prevention Authority	2016: March, June, July, August, October, November, December 2017: January, February, March, April, May, June, July, August	▪ Reclamation concerns regarding encroachment into San Luis Reservoir resulted in a shift of the Pacheco Pass option to the North Pacheco Pass tunnel option to avoid the reservoir. ▪ Resource agencies' registered concerns over impacts on sensitive species and habitat, aquatic resources, and wildlife movement corridors. Detailed analysis, in cooperation with agencies, through the checkpoint process led to design modifications of increase wildlife permeability. ▪ Water infrastructure agency concerns addressed through project design modifications and mitigation. ▪ Soap Lake designs were coordinated with flood districts and resource agencies to address floodplain capacity and wildlife movement concerns with more permeable structures. ▪ Coordination with interagency working group on Diridon Station options to consider City of San Jose, Caltrain, BART, SCVWD, and other agency concerns.

Source: Compiled by ICF 2017
CWG = community working group
TWG = technical working group
PAA = preliminary alternatives analysis
SAA = supplemental alternatives analysis
US = U.S. Highway
I- = Interstate
GSA = General Services Administration
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
USFWS = U.S. Fish and Wildlife Service
CDFW = California Department of Fish and Wildlife
CALTRANS = California Department of Transportation
RWQCB = Regional Water Quality Control Board
SCVWD = Santa Clara Valley Water District
VTA = (Santa Clara) Valley Transportation Authority
BART = Bay Area Rapid Transit

Checkpoint B Summary Report Addendum 3 (2017)

The Authority and FRA reviewed prior design options and new design options developed during 2016 and 2017. The results of the evaluation of new design options and reconsideration of prior design options are presented in Section 2.4.3, Range of Potential Design Options Considered and Findings by Subsection.

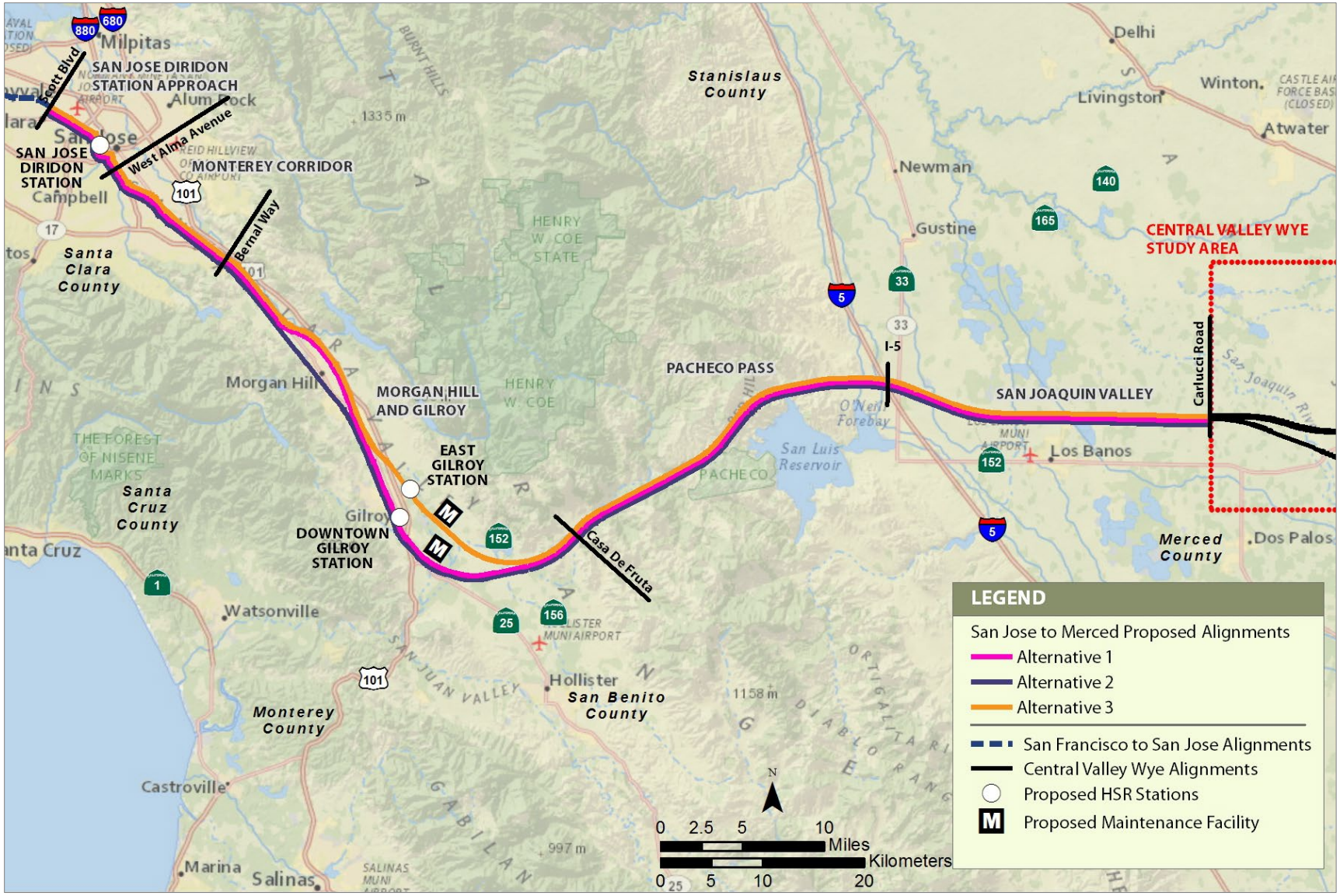
The Authority and FRA developed a Checkpoint B Summary Report Addendum 3 to narrow the range of alternatives to three of the end-to-end alternatives evaluated in the Draft EIR/EIS. Figure 8 illustrates the alignments and design options that were recommended to carry forward in the Draft EIR/EIS as a result of the evaluation. The USACE and USEPA concurred with the range of alternatives in the Checkpoint B Summary Report Addendum 3 (Authority and FRA 2017) on October 20, 2017.



Source: Authority and FRA 2017

DECEMBER 2017

Figure 7 Alternatives Refinements Resulting from April 2016 Community Working Group and Technical Working Group Meetings



Source: Authority and FRA 2017

DECEMBER 2017

Figure 8 Alternatives Refinements Resulting from Outreach during 2017 Checkpoint B Addendum Development

2018 Business Plan (2018)

The 2018 Business Plan (Authority 2018) confirmed the Authority's decision to focus on the project sections in Northern California with a goal of initiating Central Valley to Silicon Valley (Valley-to-Valley) service in 2033. In light of operational planning undertaken since the 2016 Business Plan, the Authority reconsidered the formerly dismissed at-grade alignment for the San Jose Diridon Station Approach Subsection and extending blended service proposed for the San Francisco to San Jose Project Section from San Jose to Gilroy as part of the 2018 Business Plan. The blended infrastructure and service between San Jose Diridon Station and Downtown Gilroy Station would occur largely at grade and predominantly within the existing Caltrain and UPRR rights-of-way. The concept of extending blended electrified passenger rail infrastructure and operations from San Jose to Gilroy is currently under discussion between the California State Transportation Agency, the Authority, and UPRR. The parties have advanced the concept sufficiently that the Authority has determined that this alternative merits study as at least potentially feasible at this time. Figure 9 illustrates the phasing plan from the 2018 Business Plan.

Checkpoint B Summary Report Addendum 4 (2018)

The Authority and FRA reviewed a Blended, At-Grade design option developed during 2017 and 2018 that would implement the 2018 Business Plan concept. The blended alternative would represent a least-cost option for initiating early service between San Jose and downtown Gilroy and could reduce certain impacts relative to the other alternatives previously advanced for study.

The Authority and FRA developed a *Checkpoint B Summary Report Addendum 4* to review the preliminary effects of this alternative and assess whether to evaluate a new alternative in the Draft EIR/EIS. The USACE and USEPA concurred with the range of alternatives in the *Checkpoint B Summary Report Addendum 4* (Authority and FRA 2018) on January 22 and February 1, 2019 (respectively).

Range of Potential Design Options Considered and Findings by Subsection

This section discusses the range of potential route design options and corresponding locations of stations and maintenance facilities that were considered by the Authority and FRA during the alternatives development process (the PAA, the two SAAs, the 2013 Checkpoint B Report, the 2017 Checkpoint B Summary Report Addendum 3, and the 2018 Checkpoint B Summary Report Addendum 4). The following analysis discusses design options by subsection. After the Authority and the FRA screened design options for each subsection to determine which would be advanced to EIR/EIS evaluation, the Authority linked the design options to define three end-to-end project alternatives; a fourth alternative was identified to provide blended, at-grade service from San Jose to Gilroy.

The new design options developed during 2016 and 2017 and some of the prior design options previously reviewed were reviewed by the Authority and FRA using the five-step process previously described. The results of the evaluation of new design options and reconsideration of prior design options are presented in Section 2.4.3, Range of Potential Design Options Considered and Findings by Subsection.

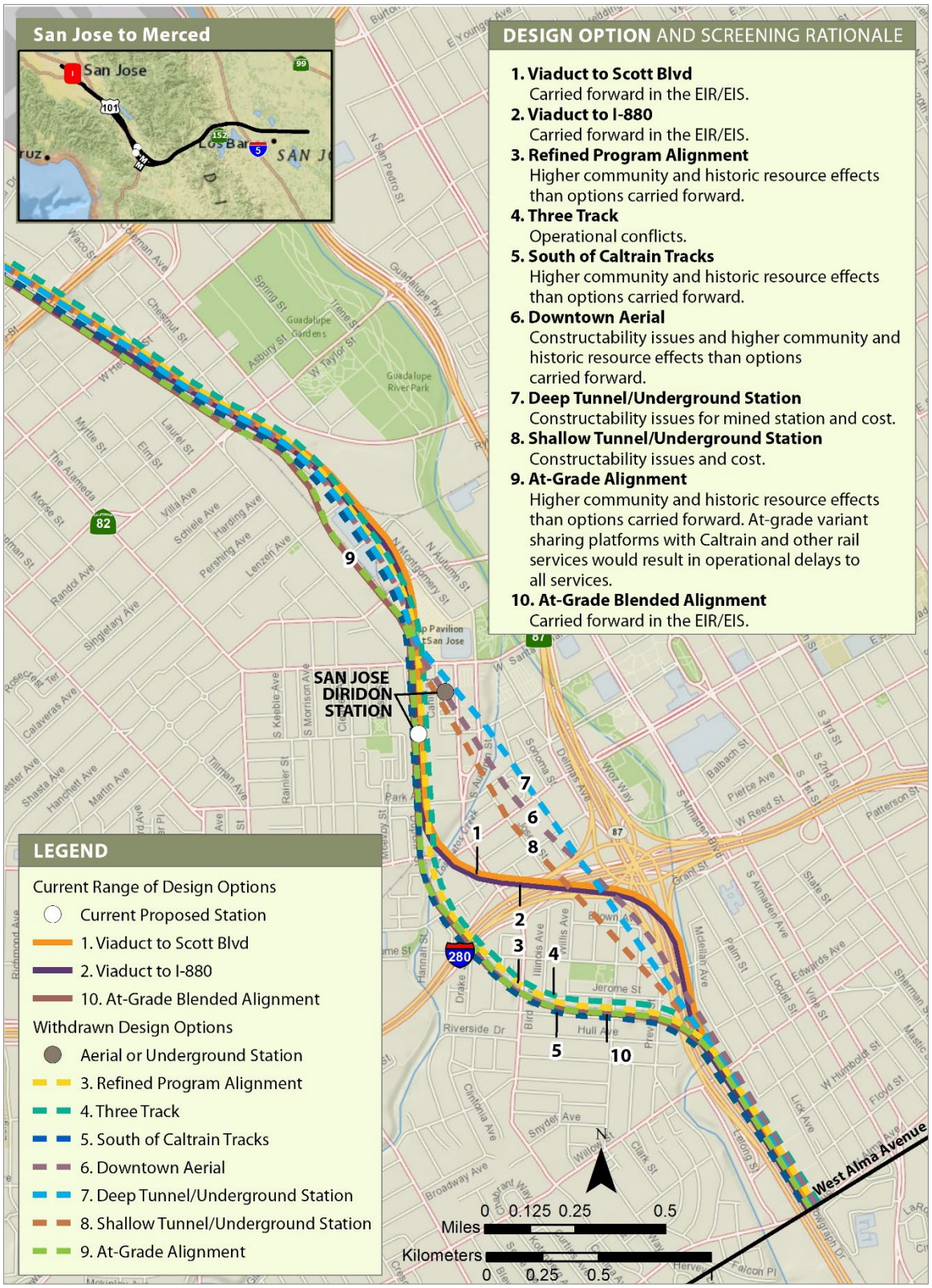
San Jose Diridon Approach Subsection Design Options Considered

The Authority and FRA considered a range of horizontal and vertical alignments to connect the HSR system to downtown San Jose for the San Jose Diridon Approach Subsection, as illustrated on Figure 10.

Note: Implementation phasing is described in Appendix 2-L
Source: Authority 2018

JANUARY 2019

Figure 9 Phasing Plan from the 2018 Business Plan



Source: Authority and FRA 2013, Authority 2016

MARCH 2019

Figure 10 Design Options Considered in the San Jose Diridon Approach Subsection

Two broad themes characterize design options in this subsection: (1) whether HSR will remain within the Caltrain Corridor and (2) whether the HSR vertical profile will be at grade, aerial, or tunnel. Several design options generally follow the Caltrain Corridor alignment: Refined Program Alignment (RPA), Three Track, South of Caltrain Tracks, and At-Grade Alignment options, but they also include areas outside (and parallel to) Caltrain. The Blended, At-Grade option is entirely within the Caltrain and UPRR right-of-way. Other design options do not follow the Caltrain Corridor south of Diridon Station (such as the SR 87/I-280 aerial, Downtown Aerial, and Downtown Tunnel options). The second theme is vertical profile. Many of the design options along the Caltrain Corridor use extensive at-grade profile rather than aerial and tunnel options. Three design options considered by the Authority and FRA (Viaduct to Scott Boulevard, Viaduct to I-880, and Downtown Aerial) entail aerial structures through downtown. The Blended, At-Grade option is entirely at grade through downtown. The Authority and FRA considered and evaluated several tunnel design options.

The Authority and FRA evaluated design options for this subsection in the PAA, SAAs, the 2013 Checkpoint B Summary Report, the 2017 Checkpoint B Summary Report Addendum 3, and the 2018 Checkpoint B Summary Report Addendum 4. Additional modified tunnel options were evaluated leading into the Checkpoint B Summary Report Addendum 3 process per community interest. An additional Blended, At-Grade option was evaluated in the 2018 Checkpoint B Summary Report Addendum 4.

In the 2013 Checkpoint B Summary Report, all the design options, except the SR 87/I-280 aerial option, were withdrawn from further consideration by the Authority and FRA due to a variety of practicability, feasibility, and environmental effect reasons. Table 3 shows the rationale, and greater detail is provided in the PAA, SAAs, 2013 Checkpoint B Summary Report, 2017 Checkpoint B Summary Report Addendum 3, and 2018 Checkpoint B Summary Report Addendum 4. The downtown tunnel options considered in the Checkpoint B process (Deep Tunnel and Shallow Tunnel) were withdrawn due to constructability constraints of a mined underground station and the substantially higher cost than an aerial option.

Three modified tunnel options considered subsequent to the Checkpoint B process were withdrawn, primarily for constructability constraints. The “Thread the Needle” tunnel option would have increased travel time compared to the Deep Tunnel and would face constructability issues because of limited portal space in the SR 87/I-280 interchange. The “5100m Tunnel” option would face constructability issues associated with building a station beneath active rail lines and stations, as well as increased travel time compared to the Deep Tunnel. The “Modified Tunnel” option—a medium-depth tunnel—was withdrawn due to constructability issues associated with a mined station, concerns about interaction with the future Bay Area Rapid Transit (BART) station, and constraints on future development.

An at-grade, dedicated alignment and HSR operations for the San Jose Diridon Approach Subsection were reconsidered after the Authority Board of Directors adopted the 2016 Business Plan. Staff evaluated combined use of the existing Diridon Station platforms and tracks for stopping and through-station operations with other passenger railroads. Staff determined that combined use would result in substantial delays to all passenger rail services (and conflict with freight rail operations) because of insufficient capacity at Diridon Station and approaching track. Resolving capacity constraints would require relocation of the Caltrain Centralized Equipment Maintenance and Operations Facility (CEMOF) to allow the combination of dedicated HSR and continued and planned passenger rail services (Authority 2016). The Authority and FRA also reaffirmed that an at-grade, dedicated alignment would have substantial community effects on the North Gardner neighborhood, as originally identified in the PAA, SAAs, and 2013 Checkpoint B Summary Report.

in 2016 and 2017, public input continued to advocate for consideration of HSR within the existing railroad rights-of-way to minimize impacts on existing communities and planned development along the alignment between San Jose and Gilroy. During this period, the concept of extending blended electrified passenger rail infrastructure and operations from San Jose to Gilroy was discussed by the California State Transportation Agency, the Authority, and UPRR. The parties

had advanced the concept sufficiently that the Authority determined that the approach was potentially feasible and merited further evaluation. A blended, at-grade alternative was added after the Authority Board of Directors adopted the 2018 Business Plan. The new alternative was evaluated in the Checkpoint B Summary Report Addendum 4 after development and consideration in 2017 and 2018.

Variations of the at-grade alignment, with exclusive HSR platforms east or west of the existing Diridon Station and platforms, were evaluated by the Authority in response to public concerns raised in 2016 and 2017 about the aesthetic and land displacement effects of an aerial design option on downtown San Jose. An HSR station east of the existing station tracks would require moving the existing historic Diridon station, using extensive portions of City parking lots around the SAP Center for tracks, and necessitating other displacements in downtown, in addition to the aforementioned community effects on the North Gardner neighborhood. An HSR station west of the existing station tracks would eliminate access to CEMOF, require relocation of the VTA light rail station, necessitate the demolition of multistory residential units west of the existing station, and lead to the aforementioned impacts on the North Gardner neighborhood. In consideration of these factors, the Authority and FRA dismissed all permutations of an at-grade design option for this subsection, confirming the prior 2013 Checkpoint B Summary Report determination.

In 2016 and 2017, local community residents expressed concern about visual and noise effects of an aerial section north of I-880 next to the College Park neighborhood. In response to these comments, the Authority developed a variant of the aerial design option that would entail an at-grade profile near I-880 instead of continuing on aerial structure all the way to Scott Boulevard. In response to the Authority's 2018 Business Plan and input received from the public about developing an at-grade station at San Jose Diridon and staying within the existing railroad right-of way, the Authority developed and considered a Blended, At-Grade option that would use a blended alignment from the San Jose Diridon Station to Downtown Gilroy Station. This option was subsequently evaluated in the Checkpoint B Summary Report Addendum 4.

Table 3 shows the design options considered for this subsection and the rationale for inclusion or withdrawal from further consideration in this Final EIR/EIS. With elimination of the other design options, three design options for the San Jose Diridon Approach Subsection are evaluated in this Final EIR/EIS: Viaduct to Scott Boulevard, Viaduct to I-880 as demonstrated here, and Blended, At-Grade as a result of the 2018 Business Plan. These design options are described in greater detail in Section 2.5.

Monterey Corridor Subsection Design Options Considered

The Authority and FRA considered a range of horizontal and vertical alignments for the Monterey Corridor Subsection (Figure 11). The themes defining the design options considered in this subsection are choice of transportation corridor (i.e., UPRR, Monterey Road, US 101, or SR 87/SR 85) and vertical profile (i.e., at grade, aerial, or tunnel).

The Bay Area to Central Valley Program EIR/EIS originally considered shared use of the UPRR corridor (as distinct from the UPRR right-of-way) for an at-grade alignment between San Jose and Gilroy. When UPRR subsequently decided not to provide HSR with use of the UPRR corridor, the Authority and FRA withdrew shared use and longitudinal encroachments within the UPRR right-of-way as design options. The Tier 1 EIR/EIS proposed an HSR at-grade alignment adjacent to the UPRR right-of-way, using surplus right-of-way resulting from the reduction of lanes on Monterey Road as proposed in the San Jose general plan. Subsequently, an addendum to Checkpoint B proposed the addition of a fourth alternative (Alternative 4) to the San Jose to Central Valley Wye project, augmenting the three alternatives that were defined in the 2017 Checkpoint B Summary Report Addendum 3. Alternative 4 would implement blended electrified passenger rail infrastructure and operations between San Jose and Gilroy. Under Alternative 4, blended infrastructure and service would extend past the current endpoint for blended operations at San Jose Diridon Station to the Downtown Gilroy Station. This service would occur largely at grade and within the existing Caltrain and UPRR rights-of-way, as described in the 2018 Business Plan (Authority 2018).

The concept of extending blended electrified passenger rail infrastructure and operations from San Jose to Gilroy is currently under discussion between the California State Transportation Agency, the Authority, and UPRR. The parties have advanced the concept sufficiently that the Authority has determined that this alternative merits study as at least potentially feasible at this time and would reduce certain impacts relative to the other alternatives previously advanced for study.

The Bay Area to Central Valley Program EIR/EIS identified the Monterey Road corridor as the preferred program route on the basis of feasibility and community effect issues associated with the US 101 and SR 87/SR 85 corridors. The SR 87/SR 85 design option was further reviewed prior to completion of the PAA and was withdrawn because of cost and logistical impracticability, including the need to relocate the VTA's light rail line from SR 87 to the Monterey Road corridor, overhead clearance issues, and community effects. The Authority and FRA considered three US 101 design options: US 101/I-280, US101 to Monterey Road via SR 85, and US 101 to Monterey Road via Blossom Hill Road, in response to public outreach comments in 2016 and 2017. The Authority determined that the freeway and roadways curves are too sharp to accommodate HSR design requirements (nominally 125–130 mph) for this subsection. Where the HSR alignment would depart from the roadway right-of-way, comparatively more residential and commercial displacements would be required than those associated with the Monterey Road design options carried forward. A US 101 alignment from South San Jose to Gilroy would also result in substantially greater effects on Section 4(f) public recreational resources and sensitive biological resources compared to the Monterey Road design options carried forward.

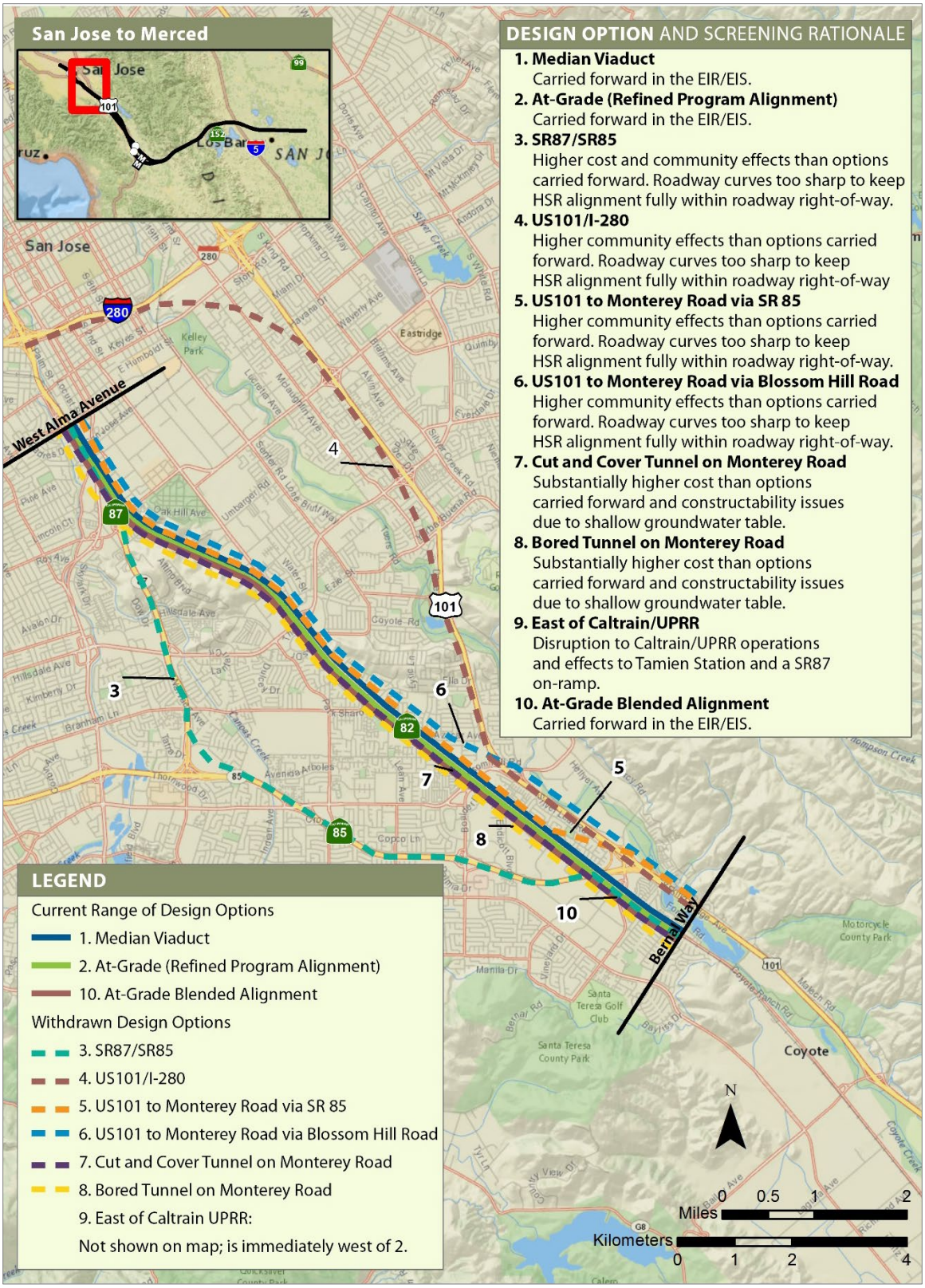
Analogous to consideration of horizontal alignment options within the vicinity of the Tier 1 corridor, the Authority and FRA have evaluated vertical at-grade, aerial, trench, and tunnel profile design options as part of the Tier 2 project analysis. An at-grade alignment along Monterey Road (previously referred to as the RPA) was the initial proposal. During design development, the cost and feasibility of providing an at-grade alignment within the UPRR corridor was considered. A viaduct option (the 2016 Business Plan based the program capital cost estimate on a viaduct alongside Monterey Road) was introduced to address the preference for use of existing transportation corridors, while also acknowledging that a viaduct could offer enhanced separation from UPRR and to consider cost differential. When the aerial viaduct alongside Monterey Road was explored, it became clear that the ground impacts and visual intrusion of running the line along one side of Monterey Road would present substantial effects that could be addressed by moving the aerial viaduct into the median of Monterey Road. The original viaduct alignment adjacent to the UPRR right-of-way on the west side of Monterey Road was shifted to the roadway median after consultation with City of San Jose staff to allow more room for the roadway. The At-Grade (RPA) and the Median Viaduct along Monterey Road were both determined to be practicable and are included as part of the alternatives evaluated in detail in this Final EIR/EIS.

Table 3 San Jose Diridon Station Approach Subsection: Design Options Considered

Design Option	Description	Determination	Rationale
Design options to be evaluated in detail in the Final EIR/EIS			
Viaduct to Scott Blvd.	Viaduct from south of Tamien Station to SR 87/I-280, Diridon Station arrival and departure, and then north to Scott Blvd	To be evaluated in detail in EIR/EIS	This option is potentially practicable and is carried forward for further analysis because it meets the project's purpose and need; minimizes effects by staying predominantly within existing transportation corridor rights-of-way; and does not have the logistical, feasibility, and cost issues associated with the alignment options being withdrawn.
Viaduct to I-880	Viaduct from south of Tamien Station to SR 87/I-280, Diridon Station arrival and departure, and then north to I-880 and at-grade to Scott Blvd	To be evaluated in detail in EIR/EIS	This option is potentially practicable and is carried forward for further analysis because it meets the project's purpose and need; minimizes effects by staying predominantly within existing transportation corridor rights-of-way; and does not have the logistical, feasibility, and cost issues associated with the alignment options being withdrawn. This option would entail a shorter viaduct than the Viaduct to Scott Blvd option, which would reduce visual effects but would require other changes in construction.
Blended, At-Grade	Blended, at-grade from south of Tamien Station to Scott Blvd	To be evaluated in detail in EIR/EIS	This option is potentially practicable and is carried forward for further analysis because it meets the project's purpose and need; minimizes effects by staying predominantly within existing railroad rights-of-way; and does not have the logistical, feasibility, and cost issues associated with the alignment options being withdrawn. This option would entail blended at-grade operation, which would be a least-cost option.
Design options withdrawn from further consideration			
Refined Program Alignment (RPA)	Aerial structure from Diridon Station to south of West Virginia St, then at-grade alignment along Caltrain Corridor with two additional tracks for HSR, then to an elevated structure crossing SR 87, continuing south within the SR 87 and Caltrain ROW	Withdrawn in the PAA and the 2013 Checkpoint B document.	Withdrawn from further analysis because of greater effects on historic properties than the design options being carried forward, and could also affect additional residential properties. In addition, comparatively greater significant community effects could result from substantial noise, visual, vibration, traffic congestion and circulation, property value, and construction disruption impacts.

Design Option	Description	Determination	Rationale
Three Track	Same as the RPA option with the exception that Caltrain and UPRR would share one track through the Greater Gardner neighborhood south of Diridon Station	Withdrawn in the PAA and the 2013 Checkpoint B document	Withdrawn from further analysis because it would be impracticable due to operational conflicts with existing rail and transit and would not meet the project's purpose and need.
South of Caltrain Tracks	Same as the RPA except the HSR tracks would be south of the existing Caltrain/UPRR tracks through the Greater Gardner neighborhood	Withdrawn in the PAA and the 2013 Checkpoint B document	Withdrawn from further analysis because of substantial effects on aesthetic/visual resources, residential displacements, and more severe effects on historic properties than the options being carried forward.
Downtown Aerial	Aerial through downtown San Jose bypassing Diridon Station	Withdrawn in the PAA and the 2013 Checkpoint B document	Withdrawn from further analysis because it was found to be impracticable due to major constructability issues, the comparatively high number of residential displacements, potential inconsistency with existing plans and policies, aesthetic/visual effects, and more severe effects on historic properties than the options being carried forward.
Deep Tunnel/ Underground Station	Tunnel through downtown San Jose and underground San Jose HSR station	Withdrawn in the PAA and the 2013 Checkpoint B document	Withdrawn from further analysis because it was found to be impracticable as a result of geologic conditions (constructability and operational challenges of a mined underground station in an area of high groundwater); this design option would also have a capital cost approximately four times that of the option being carried forward.
Shallow Tunnel/ Underground Station	Tunnel through downtown	Withdrawn in the PAA and the 2013 Checkpoint B document	Withdrawn from further analysis because it was determined to be impracticable due to constructability logistics and a capital cost nearly three times that of the alignment option being carried forward; further, the shallow tunnel design could result in additional cost effects and disruption to both existing and future heavy and commuter rail service caused by possible settlement from tunnel construction where tunnels would cross under those facilities. This design option would result in substantial biological effects resulting from cut-and-cover activities under Los Gatos Creek.
At-Grade Alignment	Follows Caltrain corridor with additional dedicated tracks for HSR with three station variants: shared platforms with Caltrain and other services, HSR station west of Diridon platforms, HSR station east of Diridon platforms	Evaluated in 2017 and withdrawn	Withdrawn from further analysis due to substantial community disruption to neighborhoods south of downtown from at-grade alignment through North Gardner neighborhood. Sharing of platform option with Caltrain and other rail services would create substantial operational delays to all services. An HSR station east of the existing station tracks would require moving the existing historic Diridon Station structure, using extensive portions of City parking lots around the SAP Center for tracks, and require other displacements in downtown. An HSR station west of the existing station tracks would eliminate access to Caltrain's CEMOF, require relocation of the VTA station, and require the demolition of multistory residential units west of the existing rail station.

Source: Compiled by ICF 2019



Source: Authority and FRA 2013, Authority 2016

MARCH 2019

Figure 11 Design Options Considered in the Monterey Corridor Subsection

The Authority also considered a trench option, but eliminated it from further consideration due to substantially higher construction costs than the at-grade or aerial options. Pursuant to comments from outreach in 2016 and 2017 concerning the effects of the at-grade alignment and the median viaduct on Monterey Road, the Authority evaluated two tunnel design options along Monterey Road: a cut-and-cover tunnel and a bored tunnel. Both tunnel options would extend from the Communications Hill area to south of Bailey Road (approximately 10 miles), because there is not adequate space area along Monterey Road in San Jose to accommodate a short tunnel portal. The Authority dismissed these tunnel designs from further consideration because of prohibitive cost compared to other design options, as well as concern about the effects of lengthy tunnels in an area constrained by the hydraulics of shallow groundwater. The cut-and-cover tunnel would be approximately 2 times and the bored tunnel approximately 2.5 times more costly than the median viaduct.

The Authority previously considered a variation on the at-grade option—East of Caltrain/UPRR—located in the Caltrain right-of-way from Tamien to Curtner Avenue then transitioning to east of UPRR by CP Lick and to a similar alignment as the At-Grade option (RPA). This option was withdrawn from further consideration due to conflicts with Caltrain and UPRR operations and effects on the Tamien Station and a SR 87 northbound on-ramp. The Blended, At-Grade option was identified in response to the Authority's 2018 Business Plan and input received from the public about staying within the existing railroad right-of-way. The option provides an alternative that would travel within the UPRR railroad right-of-way from San Jose Diridon Station to downtown Gilroy.

Table 4 shows the design options considered for this subsection and the rationale for inclusion or withdrawal from further consideration in this Final EIR/EIS. Three designs for the Monterey Corridor Subsection are included in the alternatives being considered in this Final EIR/EIS: (1) Median Viaduct, (2) At-Grade within the Caltrain corridor, and (3) Blended, At-Grade sharing the Caltrain/UPRR right-of-way. These design options are described in greater detail in Section 2.5.

Table 4 Monterey Corridor Subsection: Design Options Considered

Design Option	Description	Determination	Rationale
Design options to be evaluated in detail in the Final EIR/EIS			
1. Median Viaduct	Viaduct along median of Monterey Rd	To be evaluated in detail in EIR/EIS	This option was added because it reduces environmental and community effects relative to the East of UPRR option in this subsection (also known as the At-Grade option); also reduces interaction with UPRR facilities, which reduces the need for intrusion barriers; reduces effects on Swainson's hawk and tricolored blackbird habitat and on grazing land. The reduced footprint of the viaduct also displaces fewer residential units, both in number and square footage, than the At-Grade option.
2. At Grade (RPA)	East of UPRR on west side of Monterey Rd (outside UPRR ROW)	To be evaluated in detail in EIR/EIS	The option is potentially practicable and is carried forward for further analysis because it meets the project's purpose and need; while there are engineering challenges, it would allow for more efficient operation than would the East of Caltrain/UPRR option.
3. Blended, At-Grade	Within the UPRR ROW	To be evaluated in detail in EIR/EIS	This option was added because it reduces the disturbance area and thereby environmental and community effects relative to the other options in this subsection by remaining predominantly within the Caltrain/UPRR railroad right-of-way.
Design options withdrawn from further consideration			
4. SR 87/SR 85	Follows SR 87 and SR 85 from downtown San Jose to south San Jose; relocates VTA light rail along Monterey Rd and South First St	Withdrawn prior to the 2011 PAA	Determined impracticable due to cost and logistics; it would not meet HSR criteria for curve radii; would require construction of an aerial alignment over the freeways, through a residential neighborhood, and across from a high school; and would require relocation of VTA's operating LRT line. The clearance beneath existing overpasses along SR 87 and SR 85 is too low to meet HSR design standards. Relocation of the VTA's LRT would require unidentified funding and study, as it would eliminate light rail service from an existing 10-mile corridor and replace it along a new corridor at considerable cost and impact. This option would also cause more rail and displacement effects than the options carried forward.
5. US 101/I-280	Follows US 101 and I-280 from downtown San Jose to south San Jose	Considered due to public interest; withdrawn in 2017	Determined impracticable due to cost and logistics; it would not meet HSR criteria for curve radii for design speeds. Because the curves required for HSR would have to be located outside the road right-of-way, this option would result in more commercial and residential displacements along the route, compared to options carried forward.
6. US 101 to Monterey Rd via SR 85	Uses SR 85 to connect from Monterey Rd to a US 101 alignment south	Considered due to public interest; withdrawn in 2017	The SR 85 highway corridor curve between US 101 and Monterey Rd is too sharp for proposed HSR design speeds; constructing a 125–130 mph curve would require substantially more displacement of residential/commercial and open space than options carried forward.
7. US 101 to Monterey Rd via Blossom Hill Rd	Uses Blossom Hill Rd to connect from Monterey Rd to a US 101 alignment south	Considered due to public interest; withdrawn in 2017	The Blossom Hill corridor curve between US 101 and Monterey Rd is too sharp for proposed HSR design speeds; constructing a 125–130 mph curve would require substantially more displacement of residential/commercial and open space than options carried forward.

Design Option	Description	Determination	Rationale
8. Cut and Cover Tunnel on Monterey Rd	Cut and cover tunnel on Monterey Rd from Communication Hill to south of Bailey Rd (~10 miles)	Considered due to public interest; withdrawn in 2017	Withdrawn due to prohibitive cost of $2.7 billion, which far exceeds costs for At-Grade or Viaduct options (Viaduct cost for 10 miles is approx. $1.3 billion assuming comprehensive unit cost of $125 million/mile). Tunnel could have substantial effects on groundwater hydrology and supply due to shallow water table. Construction would require closing half of Monterey Rd, resulting in disruption of the transportation corridor.
9. Bored Tunnel on Monterey Rd	Bored tunnel from Communications Hill to south of Bailey Rd (~10 miles).	Considered due to public interest; withdrawn in 2017	Withdrawn due to prohibitive cost of $3.2 billion, which far exceeds costs for At-Grade or Viaduct options (Viaduct cost for 10 miles is approx. $1.3 billion assuming comprehensive unit cost of $125 million/mile). Tunnel could have substantial effects on groundwater hydrology and supply due to shallow water table.
10. East of Caltrain/ UPRR	Within Caltrain ROW from Tamien Station to Curtner Ave, then transitioning to east of UPRR on west side of Monterey Rd (outside UPRR ROW)	Withdrawn in the PAA and 2013 Checkpoint B	Withdrawn from further analysis due to constructability and implementation issues. This option would disrupt Caltrain and UPRR operations and affect the Caltrain Tamien Station and the SR 87 northbound on-ramp.

Morgan Hill and Gilroy Subsection Design Options Considered

In the Morgan Hill and Gilroy Subsection, the Authority and FRA considered a range of horizontal and vertical alignments, as illustrated on Figure 12 through Figure 14.

The defining themes of design options in this subsection are transportation corridor selection (i.e., Monterey Road, US 101, UPRR, or neither); Gilroy station location; vertical profile (i.e., at grade, embankment, aerial, trench, and tunnel); and horizontal alignment. Various maintenance facility locations were also considered.

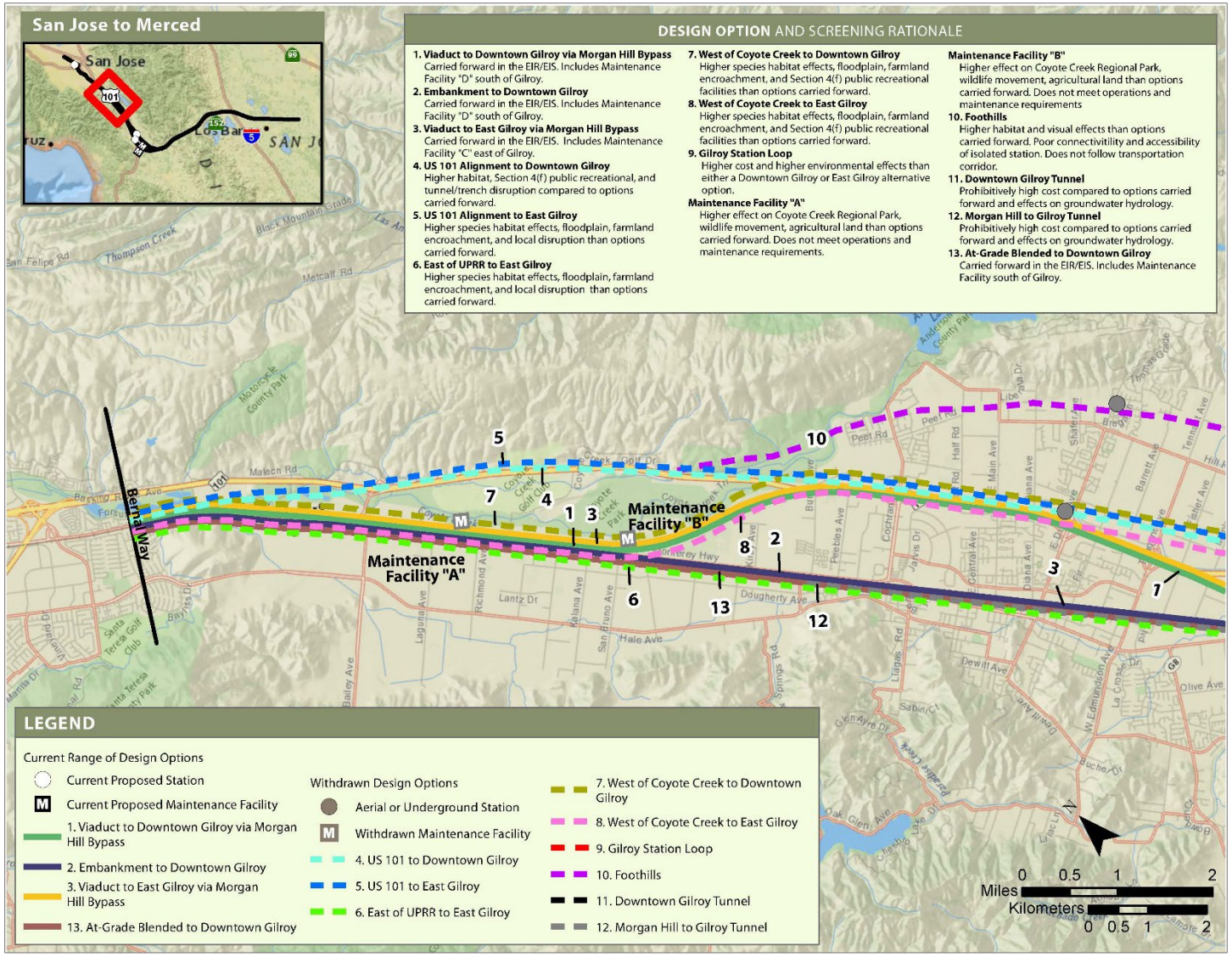
In the Statewide Program EIR/EIS, the Authority considered several alignments outside existing transportation corridors. The Foothills alignment along the base of the Diablo Range foothills on the east side of Santa Clara Valley included a station east of Morgan Hill. The East of 101 alignment crossed open space, farmland, and rural residential land east of US 101. The Authority withdrew both options from further consideration because they did not follow existing transportation corridors and would have poor station connectivity and accessibility. The Foothills alignment would also have had substantially greater effects on sensitive biological resources than design options carried forward. As discussed below, several options using alignments partially east of US 101 were considered during the project-level alternatives analysis.

The Bay Area to Central Valley Program EIR/EIS (and the Revised Program EIR/EIS and Partially Revised EIR/EIS) focused on the Monterey Road corridor. The Authority subsequently developed additional alignments along the Monterey Road and US 101 corridors for further evaluation, evaluating a total of seven alignment options and four maintenance facility options in the PAA, SAAs, and 2013 Checkpoint B report. All the initial alignment options (except the Gilroy Station Loop) and the four maintenance facility options were originally recommended for inclusion in the Draft EIR/EIS.

The Gilroy Station Loop, which included a mainline track through east Gilroy and a spur track to a two-track Downtown Gilroy Station, was withdrawn from further consideration due to the combined cost and effects, particularly aesthetic and visual quality effects, of building both an east Gilroy and a downtown Gilroy alignment.

The 2016 Business Plan also introduced a viaduct to downtown Gilroy, and the Authority conducted further outreach, agency consultation, and evaluations of potential design options in 2016 and 2017. Based on this input, the Authority identified new designs for consideration and reconsidered the inclusion of prior alignment and maintenance facility options in the Draft EIR/EIS. The 2018 Business Plan introduced a Blended, At-Grade option with an associated maintenance facility location that was subsequently evaluated in the 2018 Checkpoint B Summary Report Addendum 4. Table 5 shows the evaluation process.

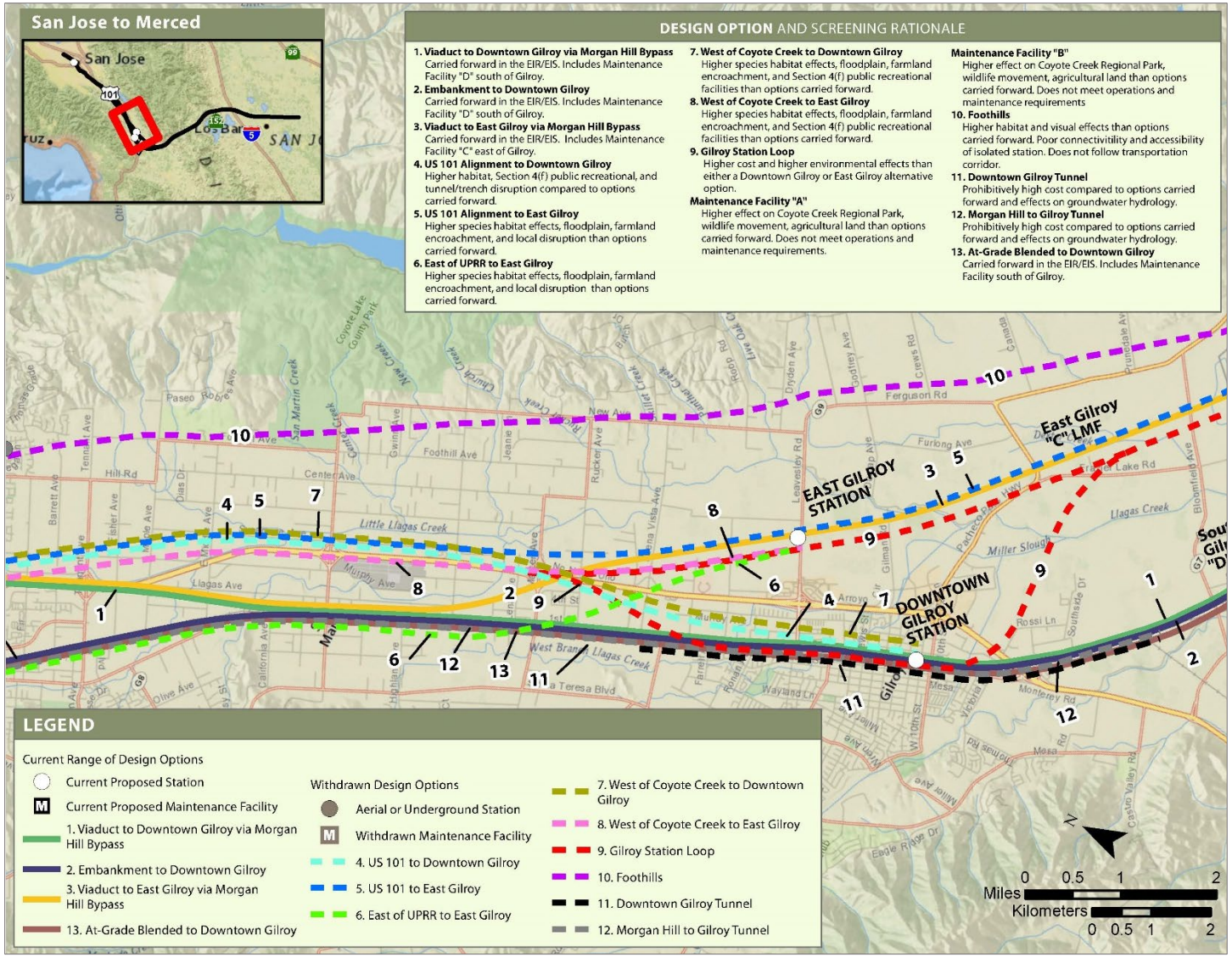
Four design options were carried forward for evaluation in this Final EIR/EIS. Two new designs (Viaduct to Downtown Gilroy via Morgan Hill Bypass and Viaduct to East Gilroy via Morgan Hill Bypass) were determined to be practicable and to have fewer effects on Section 4(f) public recreational and sensitive biological resources than other design options. The Embankment to Downtown Gilroy option (formerly the East of UPRR to Downtown Gilroy option) considered in the PAA, SAAs, 2013 Checkpoint B Summary Report, and 2017 Checkpoint B Summary Report Addendum 3 was also determined to be practicable and to result in performance and effects contrasting with those of the two viaduct design options as a consequence of a different route through Morgan Hill and a different vertical profile through Gilroy. The Blended, At-Grade option was determined to be practicable and to minimize disruption and noise impacts on existing local communities, benefit rail operations, and avoid the visual and spatial disruption associated with constructing a dedicated guideway on embankment or viaduct, as determined in the 2018 Checkpoint B Summary Report Addendum 4.



Source: Authority and FRA 2013, Authority 2016

MARCH 2019

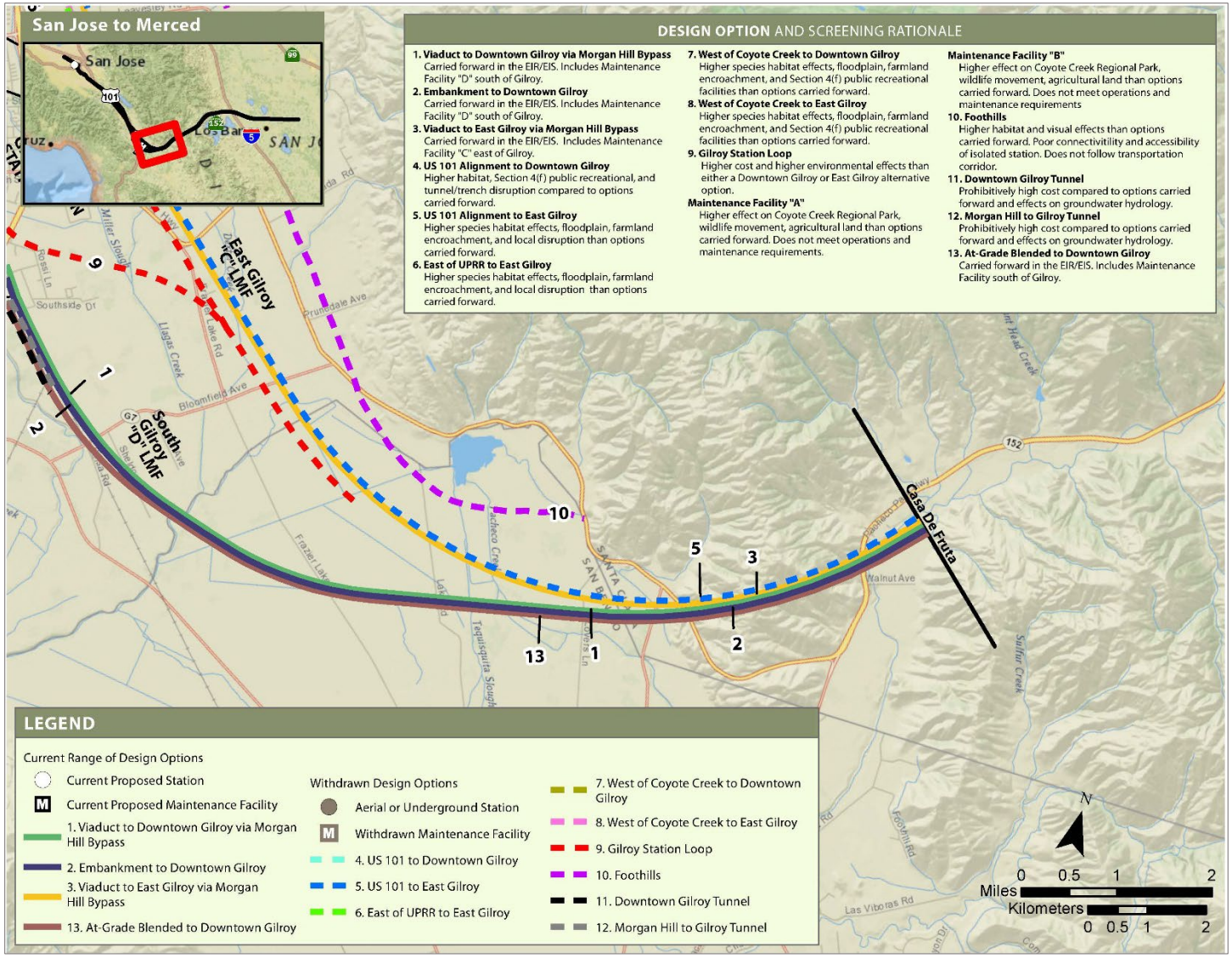
Figure 12 Design Options Considered in the Morgan Hill and Gilroy Subsection



Source: Authority and FRA 2013, Authority 2016

MARCH 2019

Figure 13 Design Options Considered in the Morgan Hill and Gilroy Subsection



Source: Authority and FRA 2013, Authority 2016

MARCH 2019

Figure 14 Design Options Considered in the Morgan Hill and Gilroy Subsection

The Authority determined the US 101 design options (i.e., US 101 Alignment to Downtown Gilroy, US 101 Alignment to East Gilroy) and the West of Coyote design options (i.e., West of Coyote Creek to Downtown Gilroy, West of Coyote Creek Parkway to East Gilroy), although avoiding the Coyote Creek Parkway, would result in substantially greater effects on Section 4(f) recreational resources, aquatic resources, special-status species habitat, and Important Farmland than other design options carried forward. All except the US 101 to East Gilroy design would also disturb a larger area of floodplains than design options carried forward. The trench and tunnel portions of the alignments near the San Martin Airport would result in greater disruption during construction and increased cost.

The Authority determined that the East of UPRR to East Gilroy design option would have greater effects on special-status species habitat, built historic resources, floodplains, Important Farmland, and residences than design options carried forward. The crossover from east of the UPRR right-of-way to east of US 101 north of Gilroy would also disrupt local infrastructure and land uses to a greater degree than design options carried forward.

Three vertical profile options were considered for the downtown Gilroy alignment: a trench, a high viaduct, and a low viaduct. The trench option would require changing the grade of the existing UPRR tracks and trenching the new grade for the HSR tracks, entailing extensive grade-separation work throughout downtown Gilroy. A high viaduct (nominally 60 feet above ground level) would result in greater visual effects in downtown than the low viaduct option (nominally 30–40 feet high) specified in the Viaduct to Downtown Gilroy option. Because of the greater disruption and visual effects than the options being carried forward, the trench and high viaduct options were withdrawn from further consideration.

Two additional tunnel design options were considered pursuant to outreach conducted in Gilroy and Morgan Hill during 2016 and 2017. A Downtown Gilroy Tunnel design was considered to avoid some of the community effects of the downtown embankment and low viaduct options. Using the tunnel cost estimates developed for the Monterey Corridor Subsection, a 4-mile tunnel was estimated to cost $1.1–1.3 billion compared to a rough cost of $500 million for viaduct of a similar length (excluding the cost of a Gilroy station).[2] A Morgan Hill to Gilroy Tunnel design was considered to avoid effects of an embankment or viaduct design through Morgan Hill, San Martin, and Gilroy. Using the same general unit cost factors, a 15-mile tunnel was estimated to cost $4.0–4.7 billion compared to an estimated cost of $2.0 billion for a viaduct of similar length (excluding the cost of a Gilroy station). Because the substantially higher costs associated with these options, the Authority withdrew them from further consideration.

In 2017, the City of Gilroy requested the Authority consider an alignment along US 101 through Gilroy. The Authority evaluated three Gilroy US 101 Alignment variants along US 101, all of which would transition from Monterey Road north of Buena Vista Avenue to US 101 and then split into either an east of US 101, US 101 median, or west of US 101 alignment. South of downtown Gilroy, the alignments would cross over US 101 and then cross the Soap Lake floodplain to Tunnel 1. The Authority evaluated these alignment variants against the downtown and east Gilroy alignment options using the following criteria: intermodal connectivity, pedestrian and vehicular accessibility, TOD implementation, economic benefit, construction impacts, and parking requirements (Richard 2017).[3] Relative to the downtown alignments, the US 101 alignment and its variants were ranked lower for intermodal connectivity, pedestrian activity, TOD implementation, economic benefit, construction impacts, and parking requirements. Vehicular accessibility was similar. Accordingly, the Authority concluded that a US 101 alignment through Gilroy did not provide any substantial benefit over the downtown alignments included for evaluation in the Final EIR/EIS and thus did not warrant further consideration.

The Authority initially developed and evaluated four maintenance facility options in the PAA, SAAs, and 2013 Checkpoint B report. The maintenance requirements of HSR operations and

[2] The cost estimates for the Monterey Corridor Subsection were developed for cut-and-cover and bored tunnel sections.

[3] The criteria used in evaluating the Gilroy US 101 Alignment variants were refined from the initial list of screening criteria reflecting specific concerns in this corridor.

blended service envisioned in the 2016 Business Plan included the need for equipment and infrastructure maintenance facilities located near Gilroy. The Authority also determined that Maintenance Facility Option “A” (Coyote Creek) and Maintenance Facility “B” (Coyote Creek) would have greater effects on Coyote Creek Regional Park, Important Farmland, and wildlife movement in Coyote Valley than the design options carried forward. Due to operational requirements and greater environmental effects, these design options were withdrawn from further consideration. Maintenance Facility Option “C” (east Gilroy) and Maintenance Facility Option “D” (south of Gilroy) were determined practicable and compatible with the alignments carried forward into the Final EIR/EIS and were accordingly identified to carry forward into the Final EIR/EIS as the East Gilroy LMF/MOIF and South Gilroy LMF/MOIF, respectively. Subsequently, the 2018 Business Plan identified Brisbane as the LMF for San Francisco to San Jose Project Section and changing the East Gilroy and South Gilroy facilities to an MOWF. In addition, the consideration and evaluation of a Blended, At-Grade design between San Jose Diridon Station and Downtown Gilroy Station identified a second south of Gilroy MOWF site. The East Gilroy MOWF, South Gilroy MOWF, and South Gilroy MOWF for Alternative 4 were thus carried forward into the Final EIR/EIS.

Table 5 shows the design options considered for this subsection and the rationale for inclusion or withdrawal from further consideration in this Final EIR/EIS. With elimination of the other design options, four designs for the Morgan Hill and Gilroy Subsection were included in the alternatives being considered in this Final EIR/EIS: (1) Viaduct to Downtown Gilroy via Morgan Hill Bypass (including the South Gilroy MOWF); (2) Embankment to Downtown Gilroy (including the South Gilroy MOWF); (3) Viaduct to East Gilroy via Morgan Hill Bypass (including the East Gilroy MOWF); and (4) Blended, At-Grade to Downtown Gilroy (including the South Gilroy MOWF. These design options are described in greater detail in Section 2.5).

Table 5 Morgan Hill and Gilroy Subsection: Design Options Considered

Design Option	Description	Determination	Rationale
Design options to be evaluated in detail in the Final EIR/EIS			
1. Viaduct to Downtown Gilroy via Morgan Hill Bypass	Viaduct along Monterey Rd median from San Jose, then crossing Coyote Valley east to west side of US 101 around Morgan Hill, then west to Monterey Rd through San Martin, then low viaduct through downtown Gilroy. Includes Maintenance Facility Site D, south of Gilroy	To be evaluated in detail in EIR/EIS	This option was added in response to input from Morgan Hill and Gilroy and to reduce environmental effects in the vicinity of Coyote Creek Regional Park. A viaduct rather than an at-grade embankment would increase permeability for wildlife movement in the Coyote Valley, an important area for migration of various species including elk. The viaduct alignment west of US 101 would avoid residential and commercial displacements in downtown Morgan Hill and displacement of the Morgan Hill Aquatic Center and adjacent soccer fields, and would reduce the structural complexity and expense of crossing over US 101. This option would avoid effects on undeveloped land by siting the HSR station in downtown Gilroy, rather than using an East Gilroy Station option. This option would include a maintenance facility that meets operations and maintenance requirements, and avoids impacts upon parkland, wildlife movement, and agricultural land in Coyote Valley. This option would also reduce environmental effects for most resources, relative to the options that are withdrawn.
2. Embankment to Downtown Gilroy	Embankment east of UPRR along Monterey Rd and through Downtown Gilroy. Includes Maintenance Facility Site D, south of Gilroy	To be evaluated in detail in EIR/EIS	This option is potentially practicable and is carried forward for further analysis because it meets the project's purpose and need; it does not have the logistical, feasibility, and high cost issues of some of the withdrawn options; and it would avoid or minimize effects on Section 4(f) recreational resources including Coyote Creek Regional Park. This option would avoid the visual effects of an aerial option, but would have greater construction effects and disruption than an aerial option. This option would include a maintenance facility that meets operations and maintenance requirements, and avoids impacts upon parkland, wildlife movement, and agricultural land in Coyote Valley.
3. Viaduct to East Gilroy via Morgan Hill Bypass	Viaduct along Monterey Rd median from San Jose, then crossing Coyote Valley eastward to west side of US 101 around Morgan Hill, then westward to Monterey Rd through San Martin, then eastward across US 101 to east Gilroy station site. Includes Maintenance Facility Site C, east of Gilroy	To be evaluated in detail in EIR/EIS	This option was added in response to input from Morgan Hill and to reduce environmental effects in the vicinity of Coyote Creek Regional Park. A viaduct rather than an at-grade embankment would increase permeability for wildlife movement in the Coyote Valley, an important area for migration of various species including elk. The viaduct alignment west of US 101 would avoid residential and commercial displacements in downtown Morgan Hill and displacement of the Morgan Hill Aquatic Center and adjacent soccer fields, and would reduce the structural complexity and expense of crossing over US 101. This option would reduce conversion of raw land relative to options that follow a longer stretch of US 101. This option would avoid the land displacements of a guideway and station in downtown Gilroy and avoid acquisition of land owned by the UPRR for a downtown station site; it would reduce environmental effects on many resources relative to the options that are withdrawn. This option would include a maintenance facility that meets operations and maintenance requirements, and avoids impacts upon parkland, wildlife movement, and agricultural land in Coyote Valley.

Design Option	Description	Determination	Rationale
4. Blended, At-Grade to Downtown Gilroy	Blended, At-Grade within the UPRR railroad right-of-way and through downtown Gilroy. Includes Maintenance Facility south of Gilroy	To be evaluated in detail in EIR/EIS	This option is potentially practicable and is carried forward for further analysis because it meets the project's purpose and need; it does not have the logistical, feasibility, and high cost issues of some of the withdrawn options; and it would avoid or minimize disruption and noise impacts on existing local communities, benefit rail operations, and avoid the visual and spatial disruption associated with constructing a dedicated guideway on embankment or viaduct. This option would include a maintenance facility that meets operational and maintenance requirements and would avoids impact on parkland, wildlife movement, and agricultural land in Coyote Valley.
Design options withdrawn from further consideration			
5. US 101 Alignment to Downtown Gilroy	Follows US 101 to south of San Martin Airport, crosses over to Monterey Rd to a station in downtown Gilroy and maintenance facility south of Gilroy	Dismissed from further evaluation	Withdrawn because this alignment has greater environmental effects than options carried forward on the following resources: aquatic features, California red-legged frog, California tiger salamander, least Bell's vireo, tricolored blackbird, steelhead, San Joaquin kit fox, Bay checkerspot butterfly, and Metcalf Canyon jewelflower. It would require conversion of a greater extent of 100-year floodplains, parks, and agricultural land than the options carried forward. It would displace portions of the Morgan Hill Aquatic Center and associated soccer fields in Morgan Hill and would require a tunnel and trench to cross US 101 with associated disruption of local land use and infrastructure.
6. US 101 Alignment to East Gilroy	Follows US 101 to a station and maintenance facility in East Gilroy	Withdrawn in Checkpoint B Addendum 2017	Withdrawn because this alignment has greater environmental effects than the options carried forward on the following resources: aquatic features, California red-legged frog, California tiger salamander, least Bell's vireo, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf Canyon jewelflower, and Santa Clara Valley dudleya. The US 101 to East Gilroy option would also convert a greater extent of important agricultural land than the options carried forward and would displace portions of the Morgan Hill Aquatics Center and associated soccer fields and portions of Coyote Creek Regional Park.
7. East of UPRR to East Gilroy	Embankment east of UPRR along Monterey Rd to San Martin, then east across US 101 to East Gilroy	Withdrawn in Checkpoint B Addendum 2017	Withdrawn because this alignment has greater environmental effects than the options carried forward on the following resources: California red-legged frog, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf Canyon jewelflower, Santa Clara Valley dudleya, and built environment resources. The footprint for this option would require more conversion of 100-year floodplain, important agricultural land, and residential housing than the options carried forward. The East of UPRR to East Gilroy option would also affect a greater extent of land in conservation easements. These effects are associated with a relatively larger at-grade footprint. This option would also create substantial disruption to local infrastructure use and land uses as it crosses over from east of the UPRR right-of-way to east of US 101 north of Gilroy.

Design Option	Description	Determination	Rationale
8. West of Coyote Creek to Downtown Gilroy	From Monterey Rd, transitions to a US 101 alignment south of Coyote Creek Pkwy, then transitions back to Monterey Rd south of San Martin Airport	Withdrawn in Checkpoint B Addendum 2017	Withdrawn because this alignment has greater environmental effects than the options carried forward on the following resources: aquatic features, California red-legged frog, California tiger salamander, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf Canyon jewelflower, Santa Clara Valley dudleya, and built environment cultural resources. This option would convert a greater amount of 100-year floodplain and important agricultural land than the options carried forward. This option would require demolition of more residences (in number and square footage) than the options carried forward. This option would also displace portions of the Morgan Hill Aquatics Center and associated soccer fields and portions of Coyote Creek Regional Park. It would require a combination of tunnel and trench to cross under US 101, with substantial disruption to local land uses and cost.
9. West of Coyote Creek to East Gilroy	From Monterey Rd, transitions to a US 101 alignment south of Coyote Creek Pkwy then to east Gilroy station	Withdrawn in Checkpoint B Addendum 2017	Withdrawn because this alignment has greater environmental effects than the options carried forward on the following resources: aquatic features, California red-legged frog, least Bell's vireo, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf Canyon jewelflower, and Santa Clara Valley dudleya. The at-grade and embankment crossover between the Monterey corridor and US 101 would obstruct wildlife movement in the Coyote Valley. This option would also convert more important agricultural land, 100-year floodplain, conservation easements, and parks (both number and acreage) than the options carried forward, and would displace portions of the Morgan Hill Aquatics Center and associated soccer fields
10. Gilroy Station Loop	Mainline track along east Gilroy alignment with spur track to downtown Gilroy; two-track downtown Gilroy station and grade-separated flyovers where mainline and spur meet north and south of Gilroy	Withdrawn in the PAA and Checkpoint B 2013	Withdrawn from further analysis due to prohibitive cost and visual effects, this option would result in the combined cost and effects of building both an east Gilroy alignment and a downtown Gilroy alignment. This alignment option would have the greatest aesthetic/visual effects of all alignment options in this subsection due to the double alignment.
11. Foothills	Alignment along the east side of Santa Clara Valley in the Morgan Hill and Gilroy area	Withdrawn in 2005 Statewide Program EIR/EIS	Withdrawn from further investigation in the 2005 Statewide Program EIR/EIS because it would have potentially substantial effects on sensitive habitat through the foothills and would have high visual effects. The Morgan Hill (Foothills) and the Morgan Hill (east of US 101) station sites were eliminated from further investigation in the 2005 Statewide Program EIR/EIS because they would have poor connectivity and accessibility and would not meet the basic program objectives. No new information has been identified by the Authority subsequent to the Program EIR/EIS that would change the prior conclusion.

Design Option	Description	Determination	Rationale
12. Downtown Gilroy Tunnel	Tunnel in downtown Gilroy (~4 miles)	Originally considered in 2013; reconsidered due to public outreach in 2017; withdrawn	Withdrawn from further analysis due to prohibitive cost; assuming cut-and-cover cost of $270 million per mile and bored tunnel cost of $310 million per mile, cost could be $1.1–1.3 billion, not including cost of underground Gilroy station. Costs for tunnel options far exceed embankment and viaduct options carried forward (estimated cost of viaduct for 4 miles would be $500 million assuming $125 million per mile). Tunnel could have substantial effects on groundwater hydrology and supply due to shallow water table, as well as substantial disruption to downtown Gilroy during construction of cut-and-cover tunnel.
13. Morgan Hill to Gilroy Tunnel	Tunnel from north of Morgan Hill to south of Gilroy (15 miles)	Considered due to public outreach in 2017; withdrawn	Withdrawn from further analysis due to prohibitive cost; assuming cut-and-cover cost of $270 million per mile and bored tunnel cost of $310 million per mile, cost could be $4.0–4.7 billion, not including cost of underground Gilroy station. Costs for tunnel options far exceed embankment and viaduct options carried forward (estimated cost for viaduct for 16 miles, including Morgan Hill Bypass, would be $2.0 billion, excluding Gilroy station, assuming $125 million per mile). Tunnel could have substantial effects on groundwater hydrology and supply due to shallow water table, as well as substantial disruption to downtown Gilroy during construction of cut-and-cover tunnel.
14. Gilroy US 101 Alignment	From Buena Vista Avenue, transition to US 101, then along the east side, median, or west side of US 101 to south of downtown	Considered due to public outreach in 2017; withdrawn	A US 101 alignment through Gilroy does not meet the Authority's and CPUC's station area policy on TOD. Only the two existing downtown Gilroy alignments meet TOD requirements. Through a qualitative analysis, potential variant alignments along US 101 do not offer any benefits over the existing downtown alignments. Although the downtown Gilroy alignments may be disruptive during construction, the long-term economic, pedestrian, vehicular, and intermodal connectivity benefits are quite substantial. Among the US 101 variants, the west of US 101 alignment has the least amount of impacts. However, it is still a still highly disruptive alignment that involves many straddle-bent structures, disruption to a PG&E high-voltage power line, impacts on several residential and industrial properties, and impacts on a public park. In light of these infrastructure impacts, the US 101 Gilroy alignment would not be consistent with the City's desire to minimize impacts on residences and businesses. Additionally, the Authority does not consider any of the US 101 Gilroy alignment variants analyzed as likely to be considered the Least Environmentally Damaging Practicable Alternative.
▪ Maintenance Facility "A"	Adjacent to Monterey Rd on the east side between Morgan Hill and San Jose; would work with west of Coyote Creek alignments only	Withdrawn in Checkpoint B Addendum 2017	Withdrawn because the location does not meet operations and maintenance requirements, would encroach on Coyote Creek Regional Park land and agricultural land, and would obstruct wildlife movement in the constrained corridor of Coyote Valley.
▪ Maintenance Facility "B"	Adjacent to Monterey Rd on the east side between Morgan Hill and San Jose; would work with Monterey Rd alignments only	Withdrawn in Checkpoint B Addendum 2017	Withdrawn because the location does not meet operations and maintenance requirements, would encroach on Coyote Creek Regional Park land and agricultural land, and would obstruct wildlife movement in the constrained corridor of Coyote Valley.

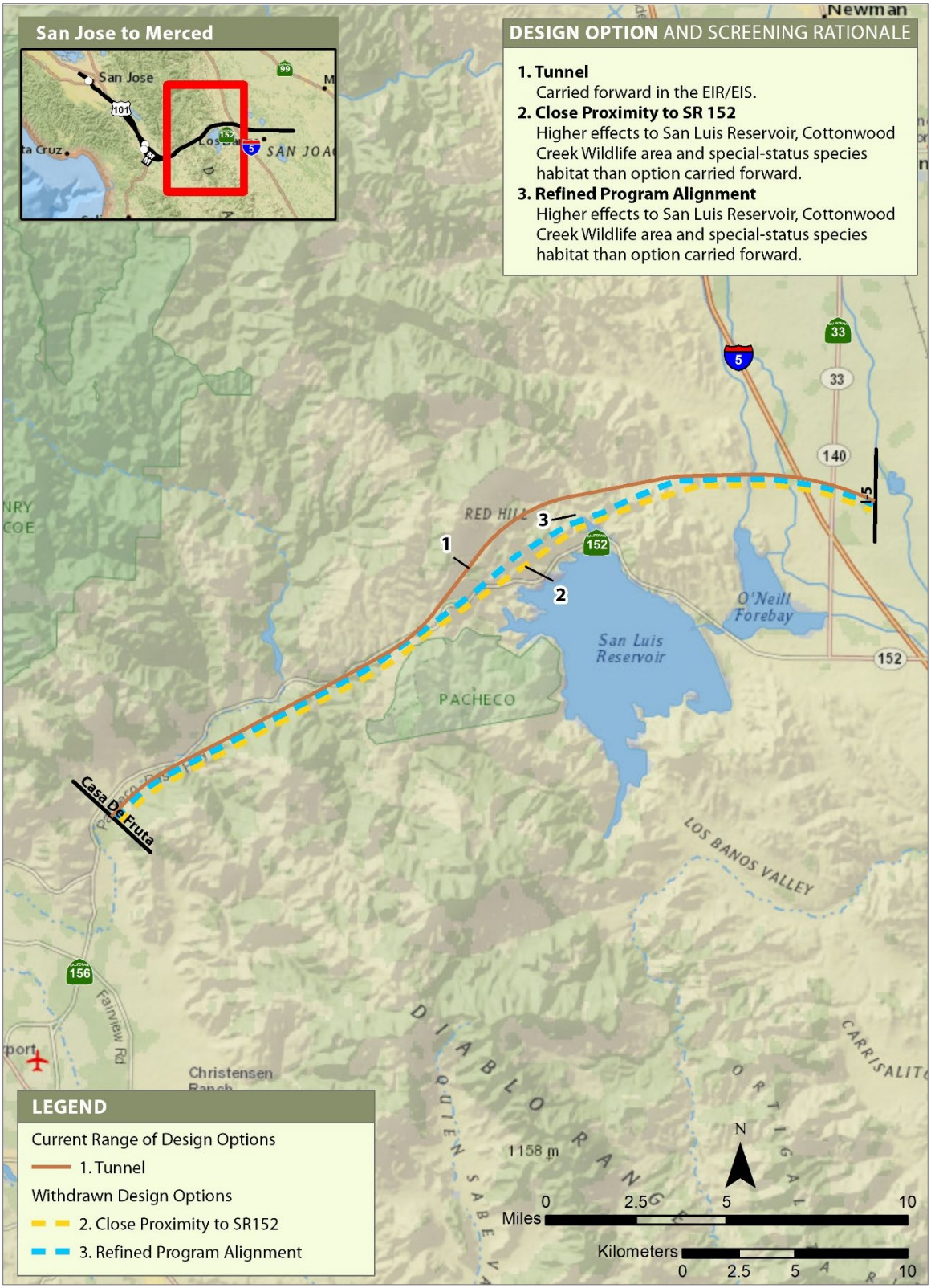
Pacheco Pass Subsection Design Options Considered

The Authority and FRA considered three design options for the Pacheco Pass Subsection, as illustrated on Figure 15.

The Bay Area to Central Valley EIR/EIS (and the Revised EIR and Partially Revised EIR) identified the SR 152 corridor over Pacheco Pass as the preferred route for connecting the Bay Area and Central Valley portions of the HSR system. In the PAA, SAAs, and 2013 Checkpoint B Summary Report, the Authority identified two potential design options for the route. The Close Proximity to SR 152 design would entail a combination of embankment, viaduct, and tunnels along SR 152. The RPA is the same as the Close Proximity to SR 152 option where it crosses over SR 152, but diverges to the north at San Luis Reservoir to cross at the narrower part of the Cottonwood Creek arm of the reservoir. Both design options were recommended to be carried forward in the 2013 Checkpoint B Summary Report.

After reinitiating design and environmental work on the Project Section in late 2015, the Authority continued to consult with the U.S. Department of the Interior, Bureau of Reclamation, which (along with the California Department of Water Resources) urged complete avoidance of the San Luis Reservoir, and the California Department of Fish and Wildlife, which urged minimization of any surficial encroachment within the Cottonwood Creek Wildlife Area. The Authority subsequently developed a new option, the Tunnel, which would include a 13.5-mile tunnel and avoid any encroachment into the San Luis Reservoir or surficial encroachment into the Cottonwood Creek Wildlife Area. Once the Tunnel design was determined to be practicable, the other two designs were withdrawn from further consideration because they would have substantially greater effects on aquatic resources, special-status species habitat, and 4(f) resources than the new tunnel option. The analysis of the two withdrawn options and the new tunnel option are documented in the 2017 Checkpoint B Summary Report Addendum 3 (Authority 2017). In 2017, the Authority continued to consult with stakeholders and refine the design to reduce impacts on known resources including Romero Creek and the operations of Romero Ranch. The alignment included three crossings of Romero Creek and a traversal of Romero Ranch. The Authority subsequently adjusted the alignment northward (half in tunnel and half at the eastern end of the subsection) to provide one crossing of Romero Creek and to reduce encroachments on highly sensitive Romero Creek species and sensitive habitat as well as on ranch calving pastures and headquarters. Once the Romero Ranch realignment was determined to be practicable, the other alignment was withdrawn from further consideration because it would have substantially greater effects on creek species and sensitive habitat than the new alignment.

Table 6 shows the design options considered for this subsection and the rationale for inclusion or withdrawal from further consideration in this Final EIR/EIS. With elimination of the other design options, one design for the Pacheco Pass Subsection is included in the alternatives being considered in this Final EIR/EIS: Tunnel. This design option is described in greater detail in Section 2.5.



Source: Authority and FRA 2013, 2017c.

MARCH 2019

Figure 15 Design Options Considered in the Pacheco Pass Subsection

Table 6 Pacheco Pass Subsection: Design Options Considered

Design Option	Description	Determination	Rationale
Design option to be evaluated in detail in the Final EIR/EIS			
1. Tunnel	Predominantly a 13.5-mile tunnel north of SR 152	To be evaluated in detail in EIR/EIS	This option was added because it would avoid crossing the San Luis Reservoir and associated potential effects on water storage capacity and recreational uses, and would avoid surficial use of the Cottonwood Creek Wildlife Area (a Section 4(f) property). Subsequent refinements reduced the crossing of Romero Creek from three to one and provided for the continued operation of Romero Ranch and the movement of wildlife. The two options the Authority proposes to withdraw would affect the reservoir, requiring major steps to maintain the ongoing safety of the reservoir and to avoid decreases in water storage capacity, and would alter the ground surface within the Cottonwood Creek Wildlife Area, a use that would affect recreation and wildlife resource values. The Tunnel option would use more tunneling compared to at-grade or viaduct guideway, with an associated reduction of effects on the surface landscape.
Design options withdrawn from further consideration			
2. Close proximity to SR 152	Combination of embankment, viaduct, and tunnels along SR 152	Withdrawn in 2017 Checkpoint B Addendum	Withdrawn because it would encroach upon the San Luis Reservoir with associated effects on water storage capacity. This option has greater environmental effects than the Tunnel option on aquatic resources, California red-legged frog, California tiger salamander, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, San Joaquin kit fox, blunt-nosed leopard lizard, and giant garter snake. The option would have more extensive effects on 100-year floodplains, important agricultural land, lands under conservation easement, parks (both in number and acreage), the Cottonwood Creek Wildlife Area, and the San Luis Reservoir State Recreation Area.
3. Refined Program Alignment (RPA)	Combination of embankment, viaduct, and tunnels farther from SR 152.	Withdrawn in 2017 Checkpoint B Addendum	Withdrawn because it would encroach upon the San Luis Reservoir with associated effects on water storage capacity and recreational uses. The RPA has greater effects on aquatic resources, California red-legged frog, California tiger salamander, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, San Joaquin kit fox, and blunt-nosed leopard lizard. This option would convert more 100-year floodplain and important agricultural land and would affect more parks (number and acreage) and more acreage of the Cottonwood Creek Wildlife Area and the San Luis Reservoir State Recreation Area (which is avoided by the Tunnel option).

San Joaquin Valley Subsection Design Options Considered

The Authority and FRA considered three horizontal design options for the San Joaquin Valley Subsection, as illustrated on Figure 16.

In the PAA, SAAs, and 2013 Checkpoint B Summary Report, the Authority and FRA analyzed design options for the complete San Jose to Merced Project Section. Subsequently, the Authority and FRA decided to analyze the Central Valley Wye alternatives separately in a Supplemental EIR/EIS to the Merced to Fresno EIR/EIS and to focus on the alignments west of the Central Valley Wye in this Final EIR/EIS.

During the PAA, SAA, and 2013 Checkpoint B Summary Report analyses, three primary routes were considered east of the Pacheco Pass subsection: a central route predominantly along Henry Miller Road to Carlucci Road and then various Central Valley Wye options; a northern route using SR 140; and a southern route through Firebaugh.

The northern route, GEA North/Merced, would proceed northeast from near I-5 across SR 33 and then along SR 140 east toward Merced. The Authority determined that this option would result in substantially greater effects on aquatic resources than the alignment along Henry Miller Road; would be the only option to affect the North Grasslands Wildlife Area; would have high visual intrusiveness associated with a river crossing within a state park; and would add 4 minutes of travel time between San Francisco and Los Angeles, likely making it inconsistent with the travel time objective under Proposition 1A of 2 hours 40 minutes between the Transbay Terminal in San Francisco and Los Angeles Union Station.

The southern route, South of GEA, would proceed south along I-5 to past SR 165, then east through Firebaugh to meet the north-south route between Madera and Fresno. The Authority determined that this option would have the greatest effect on aquatic resources of all options considered in this subsection and would have high cost and logistical issues due to its extensive environmental effects and additional miles of alignment compared to other options considered.

Public meetings, Community Working Group meetings, Technical Working Group meetings, and stakeholder and agency meetings were conducted in 2016 and 2017, during which the public expressed concern about the potential environmental effects of the Henry Miller Road to Carlucci Road option. Impacts on farmlands, properties, dairies, wetlands, wildlife, and water infrastructure were of particular concern. As part of the Program EIR/EIS Tier 1 environmental process, the Authority committed to 3 miles of an elevated profile adjacent to the GEA and to the purchase of 10,000 acres of conservation easements to avoid and reduce impacts to wildlife species. The Authority also consulted in 2016 and 2017 with irrigation districts, the San Luis and Delta-Mendota Water Authority and U.S. Department of the Interior, Bureau of Reclamation on design refinements to be included in the project to minimize infrastructure conflicts and land use displacement/disruptions. Although the Henry Miller alignment would affect farmlands and dairies, as noted above, the alternatives that avoided Henry Miller Road would have had substantially higher impacts on aquatic resources, which would make them difficult, if not impossible to permit by the U.S. Army Corps of Engineers.

Several vertical design options were also considered by the Authority for the San Joaquin Valley Subsection during preliminary engineering, including the following:

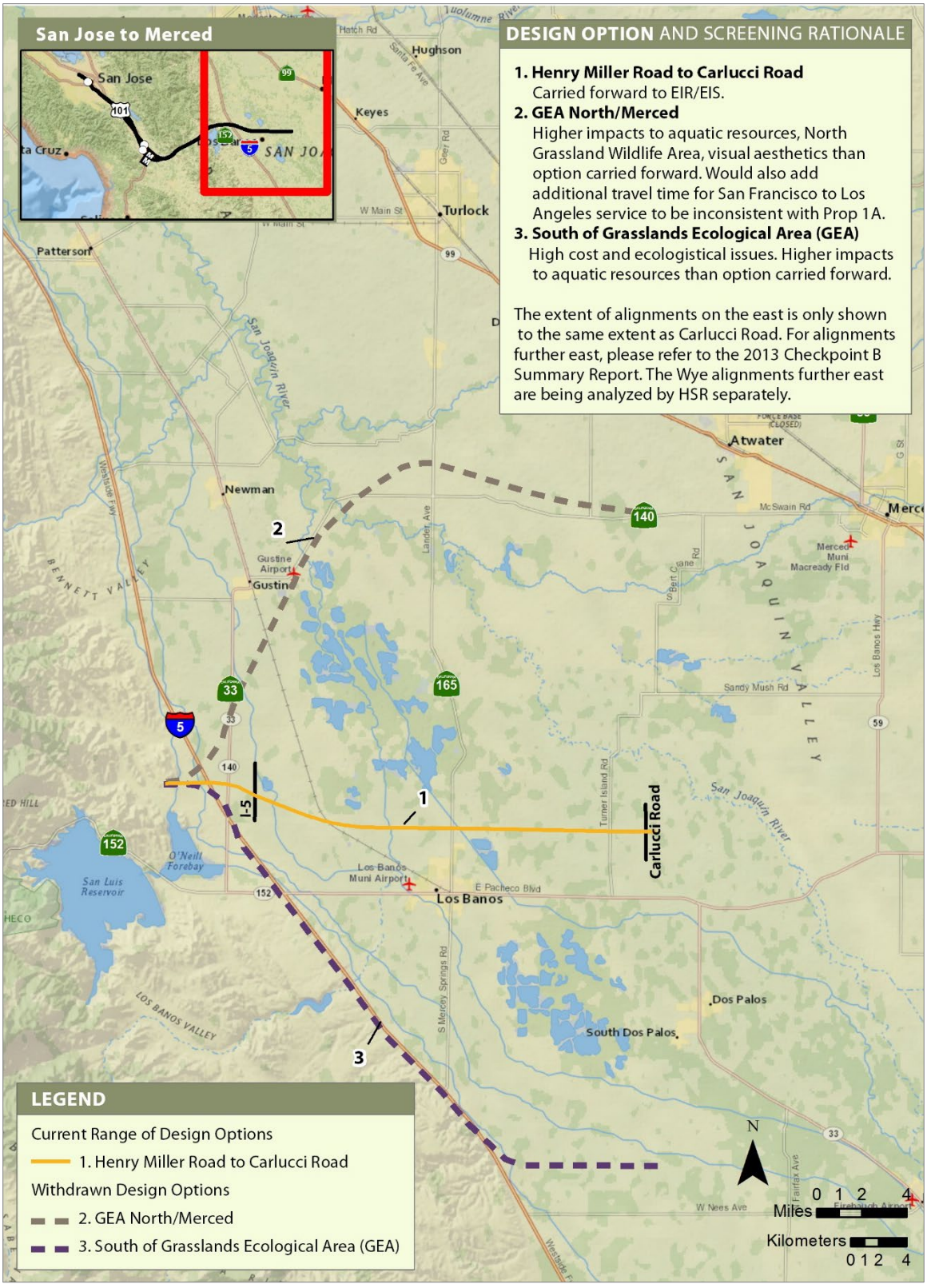
- *Addressing Bird/Wildlife Issues with Barriers/Enclosures or Tunnel*: Due to concerns about potential effects of elevated vertical alignments (embankment or viaduct) along Henry Miller Road on birds and other wildlife due to visual effects, noise effects, and bird strike effects within the GEA, the Authority explored three different approaches to addressing these impacts. The first approach, which has been incorporated into the project through Mitigation Measure BIO-MM#80, is to build additional structures in the San Joaquin Valley Subsection in sensitive wildlife areas to address these impacts. Structures would be designed with the goal of reducing or eliminating the visual presence of the moving train and reducing noise. Opaque noise barriers would be built in the GEA Important Bird Area (IBA) near Volta, between Stations B4550+00 and B4630+00. The second approach would be occur for approximately 3.4 miles in the GEA IBA, centered approximately at Mud Slough between

Stations B4914+00 and B5095+00, where the rail design would be modified to enclose the train's operating envelope and overhead contact system. The Authority also considered a third approach that would use an underground tunnel in sensitive wildlife areas in the GEA. Tunneling is a cost-prohibitive approach because it is substantially more expensive than aboveground embankment or viaduct approaches, even when including aboveground mitigation in the form of noise barriers or enclosures. As discussed in Volume 2, Appendix 2-I for tunnel options for the Monterey Corridor, cut-and-cover tunnel options can be approximately 2 times and bored tunnel options can be approximately 2.5 times more costly than a viaduct option. As a result, the Authority determined a tunnel alternative for portions of the San Joaquin Valley Subsection would be not feasible for reasons of cost.

- *Additional Viaduct Sections:* The Authority also considered a potential viaduct crossing of the existing Whitworth Road overcrossing (near the I-5 California Highway Patrol [CHP] Inspection/Weigh Station) and a viaduct section instead of embankment west of I-5. A horizontal alignment closer to the CHP Inspection/Weigh Station that allowed a lower HSR profile would require reconstruction and realignment of the Whitworth Road interchange, resulting in additional impacts on prime farmland compared to the horizontal and vertical alignment in the Draft EIR/EIS. The viaduct alignment to the west of I-5 had impacts similar to the horizontal and vertical alignment in the Draft EIR/EIS, so it did not provide any environmental advantages. Thus, this additional viaduct alignment option was dismissed from further consideration because it did not reduce any environmental impacts associated with the proposed alignment.

The Authority concluded that the issues raised by public concerns were previously considered in the 2013 Checkpoint B Summary Report, prior Tier 1 commitments and additional design refinements were responsive to concerns raised earlier and in 2016 and 2017 and that the prior conclusions regarding the design options to be carried forward or withdrawn from further consideration remained valid.

Table 7 shows the design options considered in this subsection and the rationale for inclusion or withdrawal from further consideration in this Final EIR/EIS. The central route (Henry Miller Road to Carlucci Road) was determined to be practicable and to result in less effects on aquatic resources than the other two options and was carried forward for analysis in this EIR/EIS. This design option is described in greater detail in Section 2.5.



Source: Authority and FRA 2013, Authority 2016

MARCH 2019

Figure 16 Horizontal Design Options Considered in the San Joaquin Valley Subsection

Table 7 San Joaquin Valley Subsection: Design Options Considered

Design Option	Description	Determination	Rationale
Design option to be evaluated in detail in Final EIR/EIS			
1. Predominantly Henry Miller Rd to Carlucci Rd	Mostly at-grade alignment with some viaduct or embankment	To be evaluated in detail in EIR/EIS	Lesser effects on wetlands than northern and southern alignments.
Design options withdrawn from further consideration			
2. Grasslands Ecological Area (GEA) North/ Merced	Across SR 33 to SR 140 to Merced	Withdrawn in the PAA and 2013 Checkpoint B Report	Withdrawn from further analysis because the potential effects on aquatic resources would be substantially greater than those of the alignment along Henry Miller Rd, and it would be the only option to affect the North GEA. This option would result in high visual intrusiveness by adding an HSR river crossing within a state park. Further, this option would add 4 minutes of travel time between San Francisco and Los Angeles, likely making it inconsistent with the travel time objective of Proposition 1A (2 hours 40 minutes between Los Angeles Union Station and San Francisco). Because it is inconsistent with Proposition 1A, this option does not meet the project's purpose and need.
3. South of GEA	South along I-5 past SR 165, then east through Firebaugh to SR 99 corridor between Madera and Fresno	Not included in program-level corridors, but analyzed and withdrawn in the PAA and 2013 Checkpoint B Report	The South of GEA option was not included in one of the program-level corridors. This option was withdrawn from further analysis because it would have the greatest effect on aquatic resources of options considered and would have high cost and logistical issues due to its extensive environmental effects and additional miles of alignment compared to the design option carried forward.
4. GEA Tunnel	Tunnel along Henry Miller Road for areas adjacent to sensitive wildlife areas in the GEA	Considered and eliminated as part of preliminary engineering	Tunneling is a cost-prohibitive approach because it is substantially more expensive than aboveground embankment or viaduct approaches, even when including aboveground mitigation in the form of noise barriers or enclosures. As a result, the Authority determined a tunnel alternative for portions of the San Joaquin Valley Subsection would be not feasible for reasons of cost.

Design Option	Description	Determination	Rationale
5. Viaduct Crossing of the Whitworth Road overcrossing of I-5/Viaduct west of I-5	Viaduct crossing and viaduct west of I-5 instead of embankment	Considered and eliminated as part of preliminary engineering/environmental evaluation	A horizontal alignment closer to the CHP Inspection/Weigh Station that allowed a lower HSR profile would require reconstruction and realignment of the Whitworth Road interchange, resulting in additional impacts on prime farmland compared to the horizontal and vertical alignment in the Draft EIR/EIS. The viaduct alignment to the west of I-5 had impacts similar to the horizontal and vertical alignment in the Draft EIR/EIS, so it did not provide any environmental advantages. Thus, this additional viaduct alignment option was dismissed from further consideration because it did not reduce any environmental impacts associated with the proposed alignment.

References

California High-Speed Rail Authority (Authority). 2009. *Alternatives Analysis Methods for Project EIR/EIS*. Version 2. September 2009.

———. 2012. *California High-Speed Rail Program Revised 2012 Business Plan.* April 2012.

———. 2016. *California High-Speed Rail 2016 Business Plan*.

———. 2017. *Checkpoint B Summary Report Addendum 3.* Sacramento, CA and Washington, DC.

———. 2018. *California High-Speed Rail 2018 Business Plan*. June 1, 2018.

———. 2019. *Merced to Fresno Section: Central Valley Wye Draft Supplemental Environmental Impact Report/Environmental Impact Statement.* Volume 1. Sacramento, CA. May 2019.

California High-Speed Rail Authority (Authority) and Federal Railroad Administration (FRA). 2009. *Final Scoping Report for the San Jose to Merced High-Speed Train Project EIR/EIS.* www.hsr.ca.gov/docs/programs/statewide_rail/proj_sections/SanJose_Merced/San_Jose_to_Merced_Final_Scoping_Report_9_1_09.pdf. Accessed: February 6, 2019.

———. 2010. *San Jose to Merced Preliminary Alternatives Analysis Report*. Sacramento, CA and Washington, DC.

———. 2011a. *San Jose to Merced Supplemental Preliminary Alternatives Analysis Report*. Sacramento, CA and Washington, DC. May 2011.

———. 2011b. *San Jose to Merced Supplemental Preliminary Alternatives Analysis Report*. Sacramento, CA and Washington, DC. July 2011.

———. 2013. *Checkpoint B Summary Report.* Sacramento, CA and Washington, DC. December 2013.

———. 2017. *San Jose to Merced Project Section Draft Checkpoint B Summary Report Addendum*. (Addendum 3). Sacramento, CA and Washington, DC. August 2017.

———. 2018. *San Jose to Merced Project Section Draft Checkpoint B Summary Report Addendum 4*. Sacramento, CA and Washington, DC. December 2018.

Council on Environmental Quality (CEQ). 1981. *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*. Memorandum to agencies. 46 Fed. Reg. 18026 (March 23, 1981) as amended. Washington, DC. www.energy.gov/sites/prod/files/G-CEQ-40Questions.pdf (accessed June 27, 2019).

Richard, Dan. Chair, California High-Speed Rail Authority. 2017. *Gilroy—Highway 101 Alternatives Evaluation*. Letter and memorandum to Mayor Roland Velasco, City of Gilroy, November 7, 2017.

APPENDIX 2-J: REGIONAL AND LOCAL PLANS AND POLICIES

APPENDIX 2-J: REGIONAL AND LOCAL PLANS AND POLICIES

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- This appendix was updated to include *Envision: San José 2040 General Plan* (City of San Jose 2011) policies ES-3.1 and ES 3.24 in Table 11 and the *Santa Clara Valley Agricultural Plan* (County of Santa Clara and Santa Clara Valley Open Space Authority 2018), *Santa Clara Valley GreenPrint* (Santa Clara Valley Open Space Authority 2014), and *Pajaro River Watershed Integrated Regional Water Management Plan* (Pajaro River Watershed Integrated Regional Water Management 2014) in Table 14.
- Table 6 was updated to note that the Santa Clara County General Plan also addresses biological resources under the Resource Conservation chapter and land uses relevant to biological resources under the Land Use chapter of Part 3 of the General Plan in Book B, which addresses Rural Unincorporated Area Issues & Policies. Additional summary detail was added to the description of Santa Clara County Code of Ordinances, Title C—Construction, Development and Land Use, Division C16, Tree Preservation and Removal.

The San Jose to Central Valley Wye project extent travels through Santa Clara, San Benito, and Merced counties and the cities of Santa Clara, San Jose, Morgan Hill, Gilroy, and Los Banos. This appendix provides a list of relevant regional and local plans and policies considered in the preparation of this analysis by resource area. The plans, goals, and policies are presented geographically following the proposed alignment from San Jose to Carlucci Road. All plans and policies have been adopted unless otherwise noted.

Transportation

Table 1 Regional and Local Plans and Policies Relevant to Transportation

Plan and Policies	Summary
Regional	
Plan Bay Area 2040 (2017)	The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) adopted *Plan Bay Area 2040* on July 26, 2017 as the Bay Area's long-term regional transportation plan and sustainable communities strategy. The plan includes the following goals and targets relevant to transportation: Goal: Transportation System Effectiveness ▪ Target 11: Increase non-auto mode share ▪ Target 12: Reduce vehicle operating and maintenance costs due to pavement conditions ▪ Target 13: Reduce per-rider transit delay due to aged infrastructure
Merced County Regional Transportation Plan (2016)	The Merced County Association of Governments (MCAG) adopted *Regional Transportation Plan 2014-2040* on September 25, 2014; and an amended version on May 19, 2016 as the County's long-term regional transportation plan and sustainable communities strategy. The plan includes the following goals and targets relevant to transportation: Goal: A rail system that provides safe and reliable service for passengers. ▪ 3.1. Maintain adequate passenger service on Amtrak San Joaquin route. 3.1.1. Monitor the activities of Amtrak to assure passenger rail services in Merced County. ▪ 3.2. Establish a High Speed Rail system connecting Merced and Los Banos to Sacramento and the Bay Area. 3.2.1. Support the High Speed Rail planning process and actively provide comments and input.

Plan and Policies	Summary
	Goal: Provide a transportation system that enables safe movement of goods in and through Merced County. ▪ 4.1. Provide an adequate regional road system for goods movement. 4.1.1. Support and participate in the Valley-wide Goods Movement Study. 4.1.2. Work with the Freight Advisory Committee to enhance and maintain a viable transportation system for freight and goods movement. Goal: A regional transportation system for bicyclists and pedestrians. ▪ 6.1. Develop and construct bike and walkway facilities in urban areas and other communities where non-motorized systems do not currently exist. 6.1.1. Construct class I, II and III bike routes as designated in the local and regional plans. 6.1.2. Actively pursue bicycle and pedestrian related funding sources to implement local and regional plans. ▪ 6.2. Prepare and/or update a regional active transportation / non-motorized plan every five years. 6.2.1. Create an Advisory Committee or use existing groups for bike planning and project implementation recommendations. 6.2.2. Implement the projects and programs in the plan. ▪ 6.3. Develop and construct walkway facilities in urban areas and other communities where pedestrian systems do not currently exist. 6.3.1. Actively pursue pedestrian related funding sources to implement local and regional plans. Goal: Develop and support financing strategies that provide for a continuous implementation of the Regional Transportation Plan projects and strategies. ▪ 10.1. Develop and adopt policies that will provide adequate funding resources for all transportation modes and strategies. 10.1.1. Seek voter approval of ballot measure for a 1 percent or ½ percent per dollar increase in the sales tax, for transportation system maintenance and improvements. 10.1.2. Implement and manage a regional transportation development fee program for priority road and transit improvement projects. 10.1.3. Provide technical assistance to local jurisdictions in the development of transportation financing mechanisms. 10.1.4. Consider cost efficiency in project evaluation criteria. Goal: Reduce per capita greenhouse gas emissions through compact growth and alternative transportation strategies. ▪ 12.2 Prioritize funding for complete street projects on existing corridors. Prioritize investment in active travel, including investments in necessary infrastructure (sidewalks, streetlights, curb and gutter, bike lanes, and other pedestrian safety measures) to promote increased walking and biking. Establish and implement a complete streets policy as aggressively as possible that requires its member jurisdictions to accommodate all transportation users through the incorporation of sidewalks, streetlights, curb and gutter and bicycle infrastructure in all projects, prioritizing existing streets and roads. ▪ 12.6 Prioritize vanpools and ridesharing. Prioritize funding for vanpool and ridesharing programs to expand them and encourage their use. Investigate creative transit options for rural communities such as informal ridesharing and subsidized ridesharing to supplement paratransit. Increase efforts to encourage employers to give or increase

Plan and Policies	Summary
	incentives for employees to rideshare. Investigate the feasibility of dedicating high-occupancy vehicle (HOV) lanes on highways and multi-lane roadways. ▪ 12.9 Transit. Improve access to public transit in rural and urban areas. Re-Evaluate and update the definitions of "unmet transit needs" and "reasonable to meet" to broaden and expand service to rural areas. While continuing to invest in existing urban service, identify new funding sources for improvements to service in rural areas.
Moving Forward 2035 Monterey Bay (2017)	The Association of Monterey Bay Area Governments (AMBAG) adopted *Moving Forward 2035 Monterey Bay* on January 11, 2017 as Monterey Bay's long-term regional transportation plan and sustainable communities strategy. The plan includes the following goals and targets relevant to transportation: Goal: Access and Mobility ▪ Provide convenient, accessible, and reliable travel options while maximizing productivity for all people and goods in the region. Goal: Economic Vitality ▪ Raise the region's standard of living by enhancing the performance of the transportation system. Goal: Healthy Communities ▪ Protect the health of our residents; foster efficient development patterns that optimize travel, housing, and employment choices and encourage active transportation. Goal: Social Equity ▪ Provide an equitable level of transportation services to all segments of the population. Goal: System Preservation and Safety ▪ Preserve and ensure a sustainable and safe regional transportation system.
Caltrain Strategic Plan (2014)	The *Caltrain Strategic Plan* was adopted on September 4, 2014 and establishes a roadmap for the next 10 years to reinforce Caltrain's existing commitments and service as a comprehensive policy framework from 2015 to 2024. The plan is organized into focus areas with goals and objectives. Focus Area 5: Transportation & Land Use, includes the following goals and objectives applicable to transportation: Goal A. Improve connectivity to local and regional transportation systems. 1. Explore mutually beneficial ways to plan and coordinate services with local transit providers. 2. Prioritize partnerships and efforts related to key intermodal stations including the Transbay Transit Center, Millbrae, and San Jose Diridon. 3. Improve physical, electronic and web-based intermodal way finding and transfer information. 4. Participate in and influence regional initiatives related to the integration of fares and payment, information systems and marketing. Goal B. Improve multimodal station access. 1. Develop a station access plan based on the Caltrain Access Policy Statement. 2. Reduce the incidence of "bike bumps" by complementing the bikes onboard program with improved capacity. 3. Pursue strategies that enhance first- and last-mile connections to stations. Goal C. Encourage transit supportive development at and around stations. 1. Adopt a transit-oriented development policy. 2. Participate in and influence local station area planning efforts along the corridor. 3. Develop Peninsula Corridor Joint Powers Board (PCJPB) real estate assets in a way that supports the system financially and operationally with local land use goals.

Plan and Policies	Summary
	Goal D. Integrate with California's statewide rail network. 1. Support implementation of the Caltrain/HSR blended system in the Peninsula Corridor with consideration of local community interests and concerns. 2. Continue to accommodate freight and passenger tenants whose operations are compatible with Caltrain and blended system service, and support compatibility between passenger and freight service to the extent possible. 3. Partner with [California High-Speed Rail Authority], [Transbay Joint Powers Authority], and the region, define roles and responsibilities, and implement the blended system.
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted on December 20, 1994. It establishes the overall policy framework for countywide land use and urban development, including transportation. The plan includes the following policies relevant to the transportation: Transportation and Energy Conservation (TR) ▪ C-TR 1: Santa Clara County should develop and maintain an adequate, balanced, and integrated transportation system that is affordable and convenient to use and that is capable of meeting projected future demand. ▪ C-TR 2: An adequate transportation system for Santa Clara County should be considered essential for improving overall quality of life, including: a. Continued economic development and increased living standards; b. Enhanced environmental quality; and c. Improved livability of urbanized areas. ▪ C-TR 3: In order to safeguard future mobility and achieve other transportation-related goals and objectives stated in the Vision of General Plan, the following set of coordinated strategies should guide decision-making and implementation efforts on a sub-regional basis: a. Develop urban land use patterns that support travel alternatives; b. Manage travel demand, system operation, and congestion levels; c. Expand system capacity and improve system integration; and d. Support new transportation technologies. ▪ C-TR 4: Overall transportation planning for Santa Clara County should be integral and consistent with the goals and objectives of comprehensive, countywide planning regarding urban growth management, compact and mixed use development patterns, environmental quality, and social and economic well-being. ▪ C-TR 5: The transportation plans and the land use plans, specific plans, and redevelopment plans of local jurisdictions should be consistent and mutually reinforcing in order to enhance transportation infrastructure investment. ▪ C-TR 8: Urban design concepts and site development standards which facilitate use of transit and other travel alternatives should be adopted and implemented by local jurisdictions, to provide adequate: a. Accessibility to transit and transit facilities; b. Pedestrian and bicycle pathways and facilities, both on and between individual sites; and c. Building design, orientation, on-site services and amenities which support the use of travel alternatives. ▪ C-TR 10: Transportation System Management measures should be employed to ensure maximum operating efficiency of the existing system of roads and highways, including but not limited to the following:

Plan and Policies	Summary
	a. Signal synchronization, signal pre-emptions for transit vehicles; b. Ramp metering; and c. Traffic surveillance and traffic advisory signals. ▪ C-TR 12: It is the goal of this plan to achieve a level-of-service (LOS) no lower than D at peak travel periods on city streets, county roads, expressways and state highways. However, in certain instances, a lower level of service may be acceptable when LOS D cannot practically be achieved. ▪ C-TR 15: Increase the overall physical capacity of the transportation system to meet projected demand, primarily through the following means: a. Increased transit system capacity and service levels for light rail, passenger rail, and bus transit; b. Increased paratransit, bike and pedestrian facilities and service; and c. Roadway capacity improvements to improve interchanges and complete the commuter lane network. ▪ C-TR 16: Provide a balanced and integrated transportation system, which will allow for alternative means of travel and opportunities for transfer between alternative means. ▪ C-TR 17: Development of the local transportation system should be coordinated with the regional and inter-regional transportation systems to ensure they are fully integrated with each other. ▪ C-TR 18: The entire transportation system should be fully accessible to and be planned and designed to be responsive to the special needs of seniors, school children, low-income, the physically challenged and transit disabled in accordance with the Americans with Disabilities Act of 1990. ▪ C-TR 20: An integrated system of local, regional and inter-regional rail service should be developed. ▪ C-TR 21: Local transit systems should be integrated with the local and regional transit systems of adjacent counties. ▪ C-TR 22: The use of existing railroad rights-of-way for transit and alternative transportation (i.e., bicyclists and pedestrians) should be encouraged. ▪ C-TR 24: Support the use of the rail transit system by establishing a feeder system that would enable travelers to access rail stations without the use of their private vehicle. ▪ C-TR 25: Priority should be given to sustaining a base level of service on major grid bus lines. ▪ C-TR 29: Improve transit accessibility to schools. ▪ C-TR 35: A bicycle transit system should be provided that is safe and convenient for the user and which will provide for the travel needs of bicyclists. ▪ C-TR 36: Facilities should be provided to make bicycle and pedestrian travel more safe, direct, convenient and pleasant for commuting and other trips to activity centers and to support the use of other commute alternatives. ▪ C-TR 42: Development and application of advanced transportation-related technologies should be supported to meet current and future travel demand, minimize economic productivity losses due to roadway congestion, and increase travel safety.
Santa Clara Countywide Bicycle Plan (2008)	The Santa Clara Valley Transportation Authority (VTA) first established a Countywide Bicycle Plan in 2000, with the most recent updates made in 2008. The primary purpose of the plan is the create easier and safer bicycle travel between cities in Santa Clara County by establishing a network of bikeway corridors and identifying locations where new and improved bike connections are needed. The plan includes the following goals and policies relevant to transportation:

Plan and Policies	Summary
	Goal A. Transportation Planning and Programming ▪ Policy 1: Plan and implement a seamless bicycle and pedestrian travel network that is continuous across city boundaries and county boundaries with a goal of a 10 percent bicycle mode share for commute trips by 2035. ▪ Policy 2: Include bicycle and pedestrian facilities in applicable transportation plans, programs, and studies. ▪ Policy 3: Coordinate with other federal, state, regional, county and local agencies to fund and implement bicycle projects in Santa Clara County. ▪ Policy 4: Fully integrate bicycle access to and within the transit system. ▪ Policy 5: Utilize multi-modal transportation demand models that are based on person-trips and that can forecast bicycle trips, pedestrian trips and transit trips in addition to motor vehicle trips. Goal B. Land Use Planning ▪ Encourage existing developments to provide bicycle/pedestrian connections to link neighborhoods and residential areas with schools, commercial services, employment centers, recreational areas and transit centers. ▪ Policy 2: Encourage new developments to include bicycle and pedestrian such as trails and bicycle lanes. ▪ Policy 3: Encourage new developments to provide mobility for pedestrians and bicyclists by providing non-motorized connections and access ways such as cul-de-sac connections, pathways and other short-cuts to schools, transit centers and other adjacent destinations. ▪ Policy 4: Ensure that existing bicycle facilities and access are maintained and preserved. Goal D. Design and Construction – Infrastructure ▪ Policy 1. Ensure that Member Agency construction or rehabilitation projects incorporate best practices for bicycle and pedestrian facilities when and where appropriate. ▪ Policy 2: Implement proactive strategies to identify and remove obstacles and hazards to bicycle travel. ▪ Policy 3: Consider roadway designs to enhance traffic safety. ▪ Policy 4: Establish guidelines for and encourage the use of bicycle-safe and friendly roadway and bike path design and operation.
City of Santa Clara	
City of Santa Clara 2010–2035 General Plan (2010)	The Santa Clara City Council adopted the *City of Santa Clara 2010–2035 General Plan* on November 16, 2010. The plan represents a long-range vision supported by strategies and policies for managing changing priorities and development pressures. The plan includes the following goals and policies relevant to transportation: 5.1.1 Prerequisite Goals and Policies ▪ 5.1.1-G4: Development of a multimodal transportation system that reduces the reliance on owning and driving single-occupant vehicles. 5.3.1 General Land Use Goals and Policies ▪ 5.3.1-G1: Reduced dependence on the single-occupant automobile. ▪ 5.3.1-G3: Development that minimizes vehicle miles traveled, capitalizes on public investment in transit and infrastructure, and is compatible with surrounding uses. ▪ 5.3.1-P9: Require that new development provide adequate public services and facilities, infrastructure, and amenities to serve the new employment and residential growth.

Plan and Policies	Summary
	▪ 5.3.1-P12: Encourage convenient pedestrian connections within new and existing developments. ▪ 5.3.1-P15: Require new developments and major infrastructure projects to include adequate rights-of-way to accommodate all modes of transportation. ▪ 5.3.1-P29: Encourage design of new development to be compatible with, and sensitive to, nearby existing and planned development, consistent with other applicable General Plan policies. 5.3.4 Mixed Land Use Goals and Policies ▪ 5.3.4-P15: Maximize opportunities to connect streets, bicycle facilities and pedestrian pathways to improve accessibility between mixed-use development and surrounding neighborhoods, parks, open spaces, transit and public amenities. Provide clear signage, high visibility, adequate lighting and special paving to enhance pedestrian and bicycle facilities. 5.3.5 Office and Industrial Land Use Goals and Policies ▪ 5.3.5-P11: Construct sidewalks in industrial areas, with priority along streets served by existing and planned transit services. 5.4.2 Downtown Focus Area Goals and Policies ▪ 5.4.2-G4: Pedestrian and transit priority for mobility in the Downtown Focus Area ▪ 5.4.2-P10: Integrate established and new uses through pedestrian connections, streetscape, and complementary architecture and site design. 5.4.3 Santa Clara Station Focus Area Goals and Policies ▪ 5.4.3-G3: A link between the Santa Clara Station and a variety of transit options that offer viable transportation alternatives throughout the City and the region. ▪ 5.4.3-G4: Pedestrian and bicycle priority within the Santa Clara Station Focus Area with transit and vehicular priority to access the station. ▪ 5.4.3-P13: Provide new street, bicycle, and pedestrian networks that encourage visibility, accommodate multiple modes of travel and maximize connections, particularly through large sites and to the Downtown and Santa Clara University. ▪ 5.4.3-P14: Encourage alternative modes of travel to and from the Station, including biking, walking and shuttles. 5.8.1 General Mobility and Transportation Goals and Policies ▪ 5.8.1-G2: Transportation networks that provide a safe, efficient, convenient and integrated system to move people and goods. ▪ 5.8.1-G3: Transportation networks that promote a reduction in the use of personal vehicles and vehicle miles traveled. ▪ 5.8.1-P1: Create accessible transportation network systems to meet the needs of all segments of the population, including youth, seniors, persons with disabilities and low-income households. ▪ 5.8.1-P2: Link all City transportation networks, including pedestrian and bicycle circulation, to existing and planned regional networks. ▪ 5.8.1-P3: Identify opportunities to connect people to supportive services, public amenities and transportation. ▪ 5.8.1-P4: Expand transportation options and improve alternate modes that reduce greenhouse gas emissions. 5.8.2 Roadway Network Goals and Policies ▪ 5.8.2-G3: A roadway network designed to accommodate alternate transportation models in addition to vehicles.

Plan and Policies	Summary
	▪ 5.8.2-G4: Technological advances applied to the roadway infrastructure to maximize the use of the existing roadway and support efficient traffic flow. ▪ 5.8.2-P1: Require that new and retrofitted roadways implement "Full-Service Streets" standards, including minimal vehicular travel lane widths, pedestrian amenities, adequate sidewalks, street trees, bicycle facilities, transit facilities, lighting and signage, where feasible. ▪ 5.8.2-P8: Minimize disruption of traffic flow resulting from truck traffic and deliveries, particularly during commute hours. ▪ 5.8.2-P9: Require all new development to provide streets and sidewalks that meet City goals and standards, including new development in employment areas. ▪ 5.8.2-P11: Implement street standards that remove barriers and increase accessibility. ▪ 5.8.2-P12: Coordinate transportation planning with emergency service providers to ensure continued emergency service operations and services. 5.8.2 Transit Network Goals and Policies ▪ 5.8.2-G1: Transit services that are accessible to all segments of the City's population. ▪ 5.8.3-G2: A transit network that supports a reduction in automobile dependence for residents, employees and visitors. ▪ 5.8.3-G3: Transit options that are available to provide commuter services throughout the City. ▪ 5.8.3-P1: Support a coordinated regional transit system that circles the South Bay and the Peninsula including existing and planned Bay Area Rapid Transit (BART), Altamont Commuter Express (ACE), Caltrain, VTA and HSR facilities. ▪ 5.8.3-P2: Support continued and upgraded Caltrain, VTA, ACE, and Capitol Corridor transit facilities and services. ▪ 5.8.3-P5: Facilitate implementation of the transit system defined in the transit network classifications and illustrated on the Transit Network Diagram in Figure 5.7-2. ▪ 5.8.3-P6: Encourage additional multimodal transit centers and stops in order to provide convenient access to commuter rail, buses, shuttle and taxi services. ▪ 5.8.3-P7: Provide transit stops at safe, efficient and convenient locations to maximize ridership, including near employment centers, higher-density residential developments and Downtown. ▪ 5.8.3-P8: Require new development to include transit stop amenities, such as pedestrian pathways to stops, benches, travel information and shelters. ▪ 5.8.3-P12: Improve the existing public transit system and support expanded services to increase ridership. 5.8.4 Bicycle and Pedestrian Network Goals and Policies ▪ 5.8.4-P2 Provide a system of pedestrian and bicycle friendly facilities that supports the use of alternative travel modes and connects to activity centers as well as residential, office and mixed-use developments. ▪ 5.8.4-P5 Design streets to include detached sidewalks with planting strips or wider, attached sidewalks with tree-wells to encourage pedestrian use and safety, as well as to remove barriers and increase accessibility. ▪ 5.8.4-P6 Require new development to connect individual sites with existing and planned bicycle and pedestrian facilities, as well as with on-site and neighborhood amenities/services, to promote alternate modes of transportation. ▪ 5.8.4-P8 Require new development and public facilities to provide improvements, such as sidewalks, landscaping and bicycling facilities, to promote pedestrian and bicycle use.

Plan and Policies	Summary
	▪ 5.8.4-P9 Encourage pedestrian- and bicycle-oriented amenities, such as bicycle racks, benches, signalized mid-block crosswalks, and bus benches or enclosures. ▪ 5.8.4-P11 Provide pedestrian crossings that are well-marked using measures, such as audio/visual warnings, bulb-outs and median refuges, to improve safety. ▪ 5.8.4-P12 Include pedestrian and bicycle facilities when making improvements or modifications to railroad crossings, grade separations, interchanges and freeways. ▪ 5.8.4-P13 Promote pedestrian and bicycle safety through "best practices" or design guidelines for sidewalks, bicycle facilities, landscape strips and other buffers, as well as crosswalk design and placement. ▪ 5.8.4-P15 Work with school districts to implement a "Safe Routes to Schools" program to encourage children to walk to school. 5.8.5 Transportation Demand Management Goals and Policies ▪ 5.8.5-G1 Transportation demand management programs for all new development in order to decrease vehicle miles traveled and single occupant vehicle use. ▪ 5.8.5-P1 Require new development and City employees to implement transportation demand management programs that can include site-design measures, including preferred carpool and vanpool parking, enhanced pedestrian access, bicycle storage and recreational facilities. ▪ 5.8.5-P3 Encourage all new development to provide on-site bicycle facilities and pedestrian circulation. Air Quality Goals and Policies ▪ 5.10.2-P1 Support alternative transportation modes and efficient parking mechanisms to improve air quality. ▪ 5.10.2-P2 Encourage development patterns that reduce vehicle miles traveled and air pollution.
City of San Jose	
Envision: San José 2040 General Plan (2011)	The *Envision: San José 2040 General Plan* was adopted in November 2011. The plan includes strategies to achieve desired growth, while taking on a growing environmental and economic leadership role. The plan includes the following goals, policies, and actions are relevant to transportation: Goal LU-1 – General Land Use: Establish a land use pattern that fosters a more fiscally and environmentally sustainable, safe, and livable city. ▪ Policy LU-1.2: Encourage Walking. Create safe, attractive, and accessible pedestrian connections between developments and to public streets to minimize vehicular miles travels. ▪ Policy LU-1.3: Create safe, attractive, and accessible pedestrian connections between developments and to adjacent public streets to minimize vehicular miles traveled. Goal LU-3 – Downtown: Strengthen Downtown as a regional job, entertainment, and cultural destination and as the symbolic heart of San Jose. ▪ Policy LU-3.5: Balance the need for parking to support a thriving Downtown with the need to minimize the impacts of parking upon a vibrant pedestrian and transit oriented urban environment. Provide for the needs of bicyclists and pedestrians including adequate bicycle parking areas and design measures to promote bicyclist and pedestrian safety. Goal LU-9 – High-Quality Living Environments: Provide high quality living environments for San Jose's residents. ▪ Policy LU-9.1: Create a pedestrian-friendly environment by connecting new residential development with safe, convenient, accessible, and pleasant pedestrian facilities.

Plan and Policies	Summary
	Provide such connections between new development, its adjoining neighborhood, transit access points, schools, parks, and nearby commercial areas. Consistent with Transportation Policy TR-2.11, prohibit the development of new cul-de-sacs, unless it is the only feasible means of providing access to a property or properties, or gated communities, that do not provide through- and publicly-accessible bicycle and pedestrian connections. Goal TR-1 – Balanced Transportation System: Complete and maintain a multimodal transportation system that gives priority to the mobility needs of bicyclists, pedestrians, and public transit users while also providing for the safe and efficient movement of automobiles, buses, and trucks. ▪ Policy TR-1.1: Accommodate and encourage use of non-automobile transportation models to achieve San Jose's mobility goals and reduce vehicle trip generation and vehicle miles traveled (VMT). ▪ Policy TR-1.2: Consider impacts on overall mobility and all travel modes when evaluating transportation impacts of new developments or infrastructure projects. ▪ Policy TR-1.3 Increase substantially the proportion of commute travel using modes other than the single-occupant vehicle. […] ▪ Policy TR-1.5: Design, construct, operate, and maintain public streets to enable safe, comfortable, and attractive access and travel for motorists and for pedestrians, bicyclists, and transit users of all ages, abilities, and preferences. ▪ Policy TR-1.6: Require that public street improvements provide safe access for motorists and pedestrians along development frontages per current City design standards. ▪ Policy TR-1.7: Require that private streets be designed, constructed and maintained to provide safe, comfortable, and attractive access and travel for motorists and for pedestrians, bicyclists, and transit users of all ages, abilities, and preferences. ▪ Policy TR-1.8: Actively coordinate with regional transportation, land use planning, and transit agencies to develop a transportation network with complementary land uses that encourage travel by bicycling, walking and transit, and ensure that regional greenhouse gas emission standards are met. ▪ Policy TR-1.10: Require needed public street right-of-way dedication and improvements as development occurs. The ultimate right-of-way shall be no less than the dimensions as shown on the Functional Classification Diagram except when a lesser right-of-way will avoid significant social, neighborhood or environmental impacts and perform the same traffic movement function. Additional public street right-of-way, beyond that designated on the Functional Classification Diagram, may be required in specific locations to facilitate left-turn lanes, bus pullouts, and right-turn lanes in order to provide additional capacity at some intersections. ▪ Action TR-1.13: Reduce vehicle capacity on streets with projected excess capacity by reducing either the number of travel lanes or the roadway width, and use remaining public right-of-way to provide wider sidewalks, bicycle lanes, transit amenities, and/or landscaping. Establish criteria to identify roadways for capacity reduction (i.e., road diets) and conduct engineering studies and environmental review to determine implementation feasibility and develop implementation strategies. Goal TR-2 – Walking and Bicycling: Improve walking and bicycling facilities to be more convenient, comfortable, and safe, so that they become primary transportation modes in San Jose. ▪ Policy TR-2.2: Provide a continuous pedestrian and bicycle system to enhance connectivity throughout the City by completing missing segments. Eliminate or minimize physical obstacles and barriers that impede pedestrian and bicycle movement on City streets. Include consideration of grade-separated crossings at railroad tracks and

Plan and Policies	Summary
	freeways. Provide safe bicycle and pedestrian connections to all facilities regularly accessed by the public, including the Mineta San José International Airport. ▪ Policy TR-2.3: Construct crosswalks and sidewalks that are universally accessible and designed for use by people of all abilities. ▪ Policy TR-2.6: Require that all new traffic signal installations, existing traffic signal modifications, and projects included in San José's Capital Improvement Plan include installation of bicycle detection devices where appropriate and feasible. ▪ Policy TR-2.7: Give priority to pedestrian improvement projects that: improve pedestrian safety; improve pedestrian access to and within the Urban Villages and other growth areas; and that improve access to parks, schools, and transit facilities. ▪ Policy TR-2.8: Require new development where feasible to provide on-site facilities such as bicycle storage and showers, provide connections to existing and planned facilities, dedicate land to expand existing facilities or provide new facilities such as sidewalks and/or bicycle lanes/paths, or share in the cost of improvements. ▪ Policy TR-2.9: Coordinate and collaborate with the VTA, PCJPB, Amtrak, ACE, and local shuttle operators to permit bicyclists to transport bicycles and provide appropriate amenities on-board all commuter trains, buses, and shuttles. Coordinate with local transit operators to provide secure bicycle parking facilities at all park-and-ride lots, train stations, and major bus stops. ▪ Policy TR-2.10: Coordinate and collaborate with local School Districts to provide enhanced, safer bicycle and pedestrian connections to school facilities throughout San José. ▪ Policy TR-2.11: Prohibit the development of new cul-de-sacs, unless it is the only feasible means of providing access to a property or properties, or gated communities that do not provide through and publicly accessible bicycle and pedestrian connections. Pursue the development of new through bicycle and pedestrian connections in existing cul-de-sac areas where feasible. ▪ Policy TR-2.12: Consider alternative public right of way materials for roadway, sidewalks, park strips, crosswalks, and trails etc. to enhance the pedestrian and bicyclist experience as well as provide other benefits such as storm water management and hydro-modification control. ▪ Action TR-2.18: Provide bicycle storage facilities as identified in the San José Bicycle Master Plan. ▪ Action TR-2.20: Continue to participate in and support the recommendations of the Safe Routes to School program. As part of the on-going Safe Routes to School program, work with School Districts to increase the proportion of students who walk or bike to school by improving the safety of routes to school, by educating students and parents about the health and environmental benefits of walking and bicycling, and by creating incentives to encourage students to walk and bike. ▪ Action TR-2.21: Identify locations where traffic signal phases can be modified or added or where alternative intersection control can be utilized to enhance efficiency and safety for pedestrian service. Goal TR-3 – Maximize Use of Public Transit: Maximize use of existing and future public transportation services to increase ridership and decrease the use of private automobiles. ▪ Policy TR-3.1: Pursue development of Bus Rapid Transit (BRT), bus, shuttle, and fixed guideway (i.e., rail) services on designated streets and connections to major destinations. ▪ Policy TR-3.2: Ensure that roadways designated as Grand Boulevards adequately accommodate transit vehicle circulation and transit stops. Prioritize bus mobility along Stevens Creek Boulevard, The Alameda, and other heavily traveled transit corridors.

Plan and Policies	Summary
	▪ Policy TR-3.3: As part of the development review process, require that new development along existing and planned transit facilities consist of land use and development types and intensities that contribute toward transit ridership. In addition, require that new development is designed to accommodate and to provide direct access to transit facilities. ▪ Policy TR-3.4: Maintain and improve access to transit stops and stations for mobility challenged population groups such as youth, the disabled, and seniors. ▪ Action TR-3.6: Collaborate with Caltrans and VTA to prioritize transit mobility along the Grand Boulevards identified on the Growth Areas Diagram. Improvements could include installing transit signal priority, queue jump lanes at congested intersections, and/or exclusive bus lanes. ▪ Action TR-3.7: Regularly collaborate with BART to coordinate planning efforts for the proposed BART extension to San José/Santa Clara with appropriate land use designations and transportation connections. ▪ Action TR-3.8: Collaborate with transit providers to site transit stops at safe, efficient, and convenient locations, and to develop and provide transit stop amenities such as pedestrian pathways approaching stops, benches and shelters, nighttime lighting, traveler information systems, and bike storage to facilitate access to and from transit stops. ▪ Action TR-3.9: Ensure that all street improvements allow for easier and more efficient bus operations and improved passenger access and safety, while maintaining overall pedestrian and bicycle safety and convenience. Goal TR-4 – Passenger Rail Service: Provide maximum opportunities for upgrading passenger rail service for faster and more frequent trains, while making this improved service a positive asset to San Jose that is attractive, accessible, and safe. ▪ Policy TR-4.2: Work collaboratively with the California High-Speed Rail Authority to bring high speed rail to San José in a timely manner. ▪ Policy TR-4.4: Work cooperatively with the California High-Speed Rail Authority to ensure that rail corridors within the city are planned and constructed in a manner that enhances the character of the surrounding neighborhoods. ▪ Action TR-4.5: As appropriate, regularly coordinate with rail operators in San José on the following matters: o Maintenance of rail lines, landscaping, and easements. o Vehicle and pedestrian safety near at-grade rail crossings. o Rail electrification to increase the frequency of train service and reduce environmental impacts. o Grade separations (either above-ground or underground) to improve street connectivity and pedestrian and bicycle mobility at ground level. o The establishment of timed transfers with other transit providers in the area. o Analysis and mitigation of the potential negative impacts resulting from increased train service, corridor expansion, and the eventual upgrading of a rail line. Goal TR-5 – Vehicular Circulation: Maintain the City's street network to promote the safe and efficient movement of automobile and truck traffic while also providing for the safe and efficient movement of bicyclists, pedestrian, and transit vehicles. ▪ Policy TR-5.3: The minimum overall roadway performance during peak travel periods should be level of service "D" except for designated areas. How this policy is applied and exceptions to this policy are listed in the following bullets: o Vehicular Traffic Mitigation Measures. Review development proposals for their impacts on the level of service and require appropriate mitigation measures if development of the project has the potential to reduce the level of service to "E" or

Plan and Policies	Summary
	worse. These mitigation measures typically involve street improvements. Mitigation measures for vehicular traffic should not compromise or minimize community livability by removing mature street trees, significantly reducing front or side yards, or creating other adverse neighborhood impacts. ○ Downtown. In recognition of the unique position of the Downtown as the transit hub of Santa Clara County, and as the center for financial, business, institutional and cultural activities, development within the Downtown is exempted from traffic mitigation requirements. Intersections within and on the boundary of this area are also exempted from the level of service "D" performance criteria. ○ Special Strategy Areas. In recognition of the unique characteristics and particular goals of Special Strategy Areas, intersections identified as Protected Intersections within these areas, may be exempt from traffic mitigation requirements. Special Strategy Areas are identified in the City's adopted General Plan and include Urban Villages, Transit Station Areas, and Specific Plan Areas. ▪ Policy TR-5.5: Require that new development, which includes new public or private streets, connect these streets with the existing public street network and prohibit the gating of private streets with the intention of restricting public access. Furthermore, where possible, require that the street network within a given project consists of integrated short blocks to facilitate bicycle and pedestrian travel and access. Goal TR-6 – Goods Movement: Provide for safe and efficient movement of goods to support commerce and industry. ▪ Policy TR-6.1: Minimize potential conflicts between trucks and pedestrian, bicycle, transit, and vehicle access and circulation on streets with truck travel. ▪ Policy TR-6.2: Maintain primary freight routes that provide for direct access for goods movement to industrial and employment areas. ▪ Policy TR-6.6: Support the efficient and safe movement of goods by rail where appropriate and promote the continued operation of freight rail lines that serve industrial properties. Goal TR-9 – Tier I Reduction of VMT: Reduce VMT by 10 percent, from 2009 levels, as an interim goal. ▪ Policy TR-9.1: Enhance, expand and maintain facilities for walking and bicycling, particularly to connect with and ensure access to transit and to provide a safe and complete alternative transportation network that facilitates non-automobile trips. ▪ Action TR-1.13: Reduce vehicle capacity on streets with projected excess capacity by reducing either the number of travel lanes or the roadway width, and use remaining public right-of-way to provide wider sidewalks, bicycle lanes, transit amenities and/or landscaping. Establish criteria to identify roadways for capacity reduction (i.e. road diets) and conduct engineering studies to determine implementation feasibility and develop implementation strategies. ▪ Action: TR-3.5: Work with the VTA and other public transit providers to increase transit frequency and service along major corridors and to major destinations like Downtown and North San José. Goal TR-12 – Intelligent Transportation System (ITS): Develop a sustainable ITS system to effectively manage, operate, and maintain the current and future transportation network for all models of travel. A robust and efficient ITS system will provide added opportunities for reducing congestion and greenhouse gas emissions, and increasing safety and the quality of life for all users. ▪ Policy TR-12.2: Enhance the safety and effectiveness of transit service, bicycle, and pedestrian travel as alternative modes using advanced ITS systems. ▪ Action TR-12.4: Provide enhanced management of new, efficient streetlights for energy savings, sustainability, and safety along corridors and at intersections.

Plan and Policies	Summary
	▪ Action TR-12.8: Implement technology on select roadways (primary bikeways) to support bicycling as the preferred mode of transportation, such as advanced detection, signal priority timing, and public information kiosks. ▪ Action TR-12.9: Implement technology to aid pedestrians walking across intersections. Consider devices such as countdown timers and accessible pedestrian signals, which include audible and vibrating push buttons for disabled users.
Diridon Station Area Final Plan (2014)	The *Diridon Station Area Plan* was adopted in 2014. The Diridon Station Area Plan, 2014–2040 analyzes the expansion of the existing Diridon Station and the development of land uses within the 250-acre project boundary surrounding the station. The following goals and policies are relevant to the project: Connectivity Objective: ▪ Establish and strengthen connections to surrounding districts and within the planning area for pedestrians, bicyclists, and motorists, with emphasis on east-west connectivity across SR 87 and the rail corridor. Transportation Objective: ▪ Prioritize pedestrian circulation and transit. Improve pedestrian and bicycle connection to Guadalupe River from the area. Station Area Transportation Strategies: ▪ Facilitate pedestrian access and safety through pedestrian enhancements, including the provision of crosswalks at all intersections, wider sidewalks, and high quality pedestrian amenities along transit corridors ▪ Promote easy walking access from the station to commercial developments ▪ Encourage improved bicycle and trail connectivity and provide enhanced bicycle parking opportunities within the Station Area ▪ Ensure increased transit connectivity within and to/from the Station Area and provide for transit amenities at stops that improve the comfort and convenience for transit riders ▪ Promote the development of the Station Area's street and intersection network that supports the proposed intensification of land uses, while providing mobility for all travel modes and users Proposed Station Area Transportation Strategies: ▪ Walking o Promote walking connections from surrounding neighborhoods and employment centers to the Plan area by providing a continuous network of sidewalks, paseos, and pathways. o Facilitate pedestrian access and safety through pedestrian enhancements, including the installation of wider sidewalks along key pedestrian corridors. o Provide enhanced crosswalks at signalized intersections and key pedestrian crossings through the use of pedestrian bulb-outs, median refuge islands, and/or special paving treatments o Consider mid-block crosswalks and/or pedestrian signals at high-use uncontrolled crossings, as appropriate o Consider a pedestrian "scramble" signal phasing locations with high pedestrian volumes. o Enhance pedestrian underpass connections through installation of ramps, pedestrian-scale lighting, wider sidewalks, and public art. ▪ Bicycling o Provide a network of bicycle priority streets that provide linkages through the Plan area.

Plan and Policies	Summary
	○ Provide bicycle lanes (also known as Class II facilities) on streets with available right-of-way and higher traffic volumes. ○ Enhance the safety and comfort of the bicycle network through the use of colored bike lanes, "sharrow" markings, separated bike lands, signage, and/or other specialized treatments. ○ Develop trail connections along the Los Gatos Creek and Guadalupe River. ○ Where appropriate, provide grade-separated crossings along the Los Gatos Creek and Guadalupe River Trails to enhance connectivity and safety of the trail network. ○ Provide sufficient bicycle parking facilities for short-term and long-term purposes. ○ With the Station Area as its focus, promote usage of the existing bike share station and overall expansion of the program to encourage cycling as a primary mode and facilitate use of transit without having to transport a bicycle. ○ Support the expansion of Diridon Station's bicycle parking supply with the aim of creating a major bicycle parking facility, such as the 4th and King Bike Station in San Francisco. ▪ Transit ○ Enhance bus stops with appropriate amenities (shelters, benches, lighting, real-time passenger information) to improve the overall comfort and safety for transit riders. ○ Support rail transit operators (including VTA, Caltrain, ACE, Amtrak, and BART) to improve service and amenities that increase daily ridership and reduce potential negative effects on the community. ○ Consider implementing an additional shuttle route connecting Diridon Station and Mineta San Jose International Airport. ▪ Complete Streets ○ Improve the street grid system by creating new street connections and shorter blocks to promote additional travel options and reduce walking distances to destinations. ○ Provide adequate width for all sidewalk uses, including loading and unloading from on-street parking, walking traffic, window shopping traffic, bicycle parking, and street furniture. ○ Provide street trees to separate the pedestrian walkway from the bicycle and/or vehicle travel way, and to add identity and enhance the aesthetics of an area. ○ Provide pedestrian-scale lighting on key streets, crosswalks, and mid-block crossings. ○ Provide amenities such as pedestrian kiosks, benches, newspaper racks, trash cans, bus shelters, cafe tables, hanging flower baskets, and chairs to increase the number of opportunities for people to socialize and spend leisure time outdoors along public streets. ○ Incorporate "green street" features such as pervious surfaces, open channels, and vegetated drainage swales at appropriate locations. ○ Remove existing pork-chop islands to enhance public safety. ○ Provide continuous sidewalk improvements along major arterial streets. Close gaps between pedestrian connections. ▪ Parking Objective: ○ Disperse parking in different locations in the planning area and beyond to ensure easy walking access to destinations
San Jose Bike Plan 2020 (2009)	The City of San Jose prepared the San Jose Bike Plan 2020 in 2009. The Plan defines a network of bikeways that includes both on-street and off-street bikeways, and recommends policies, projects, and programs that encourage and facilitate bicycling within San Jose.

Plan and Policies	Summary
	This includes providing guidance for projects on the bikeway network, a regular maintenance program for bicycle facilities, recommendations on City policies regarding bicycle parking and supportive facilities (such as showers), and general policy guidance on facilitating bicycling.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The *Morgan Hill 2035 General Plan* was adopted in July 2016 and establishes the overall policy framework for countywide land use and urban development. The following goals and policies are relevant to the project: **Circulation System and Complete Streets** Goal TR-1: A balanced, safe and efficient circulation system for all segments of the community, meeting local needs and accommodating projected regional and sub-regional traffic while protecting neighborhoods. ▪ Policy TR 1.1 System Efficiency: Plan, construct and maintain a coordinated and efficient system of local streets and highways throughout the community, meeting local needs and accommodating projected regional and subregional traffic while protecting neighborhoods from cut-through traffic. ▪ Policy TR 1.2 Highway 101 Widening: Plan for roadway system right-of-way based on the assumption that Highway 101 will be 8-lanes wide through the city by 2030. ▪ Policy TR 1.3 Transportation Safety: Implement strategies to ensure safe and appropriate operation of all components of the transportation system, such as programs to lower crash rates and reduce the number of transportation-related injuries in the city through education, enforcement, engineering strategies, physical improvements, and operational systems. Prioritize strategies that improve safety for students, pedestrians and bicyclists. Goal TR-2: A system designed for a healthy, active community based on complete streets, smart growth, and Sustainable Communities strategies; reflecting a balanced, safe, multi-modal transportation system for all users, especially in Downtown where pedestrian, bicycle, and transit facilities will be emphasized along with vehicular facilities. ▪ Policy TR 2.1 Multi-Model System for All Users: A balanced multi-modal system offers viable choices for residents, employees, customers, visitors, and recreational users. Use smart growth and Sustainable Communities principles throughout the city to provide a balanced transportation system which assures access to all, and which integrates all appropriate modes of transportation into an effectively functioning system, including such modes as auto, ride sharing, public rail and bus transit, bicycling and walking. ▪ Policy TR 2.2 Integrated Land Use/Transportation Planning: Integrate planning for land use and transportation development by ensuring that the timing, amount, and location of urban development is consistent with the development of the transportation system capacity. Promote environmental objectives that support smart growth and Sustainable Communities principles, such as safe and uncongested neighborhoods, a pedestrian-friendly vibrant downtown that emphasizes non-auto transportation modes, energy conservation, reduction of air and noise pollution, and the integrity of scenic and/or hillside areas. **Local Roadways and Level of Service** Goal TR-3: A coordinated, continuous network of streets and roads. ▪ Policy TR-3.4. As the LOS Policy and design criteria for roadway improvements, use a Tiered LOS Standard as follows: o LOS F in the Downtown at Main/Monterey, along Monterey Road between Main and Fifth Street, and along Depot Street at First through Fifth Streets [...]

Plan and Policies	Summary
	○ LOS D for intersections and segments elsewhere; except [for] LOS E for identified freeway ramps/zones, road segments and intersections that (1) provide a transition to and are located on the periphery of downtown; (2) are freeway zone intersections; and/or (3) where achieving LOS D could result in interim intersection improvements which would be "over-built" once the city's circulation network has been completed, and/or would involve unacceptable impacts on existing buildings or existing or planned transportation facilities including roads, sidewalks, bicycle and transit facilities; and/or would involve extraordinary costs to acquire land and existing buildings and build the improvement in relation to benefits achieved; and/or the facility would be widened beyond requirements to serve local traffic, in that the facility accommodates a significant component of peak hour sub-regional and regional through traffic. ○ In order to reduce the incentive for regional travel to be drawn off the freeway and onto local neighborhood streets, protect neighborhoods, avoid overbuilding intersections, and to create an incentive for using alternate modes of travel, LOS E during peak hours of travel is acceptable for the following identified freeway ramps, road segments and intersections: – Main Avenue and Del Monte Avenue – Main Avenue and Depot Street – Dunne Avenue and Del Monte Avenue – Dunne Avenue and Monterey Avenue – Dunne Avenue and Church Street; also until closed: Dunne Avenue and Depot Street – Cochrane Road and Monterey Road – Tennant Avenue and Monterey Road – Tennant Avenue and Butterfield Boulevard – Cochrane Road Freeway Zone: from Madrone Parkway/Cochrane Plaza to Cochrane/DePaul Drive – Dunne Avenue Freeway Zone: from Walnut Grove/East Dunne to Condit/East Dunne – Tennant Avenue Freeway Zone: from Butterfield/Tennant to Condit/Tennant – Freeway Ramps ▪ Policy TR3.5 Mitigation and Environmental Review Requirements: For roadway transportation facilities, when future traffic studies determine that an intersection, roadway segment, or freeway ramp/zone level of service will fall below its adopted standard, then the transportation studies will identify appropriate mitigation measures to ensure that the applicable level of service standard is attained. If a proposed traffic mitigation measure requires improvements for vehicular transportation that are beyond the jurisdiction of the City of Morgan Hill; and/or lead to an over-built intersection; and/or would have unacceptable impacts on existing buildings, or existing or planned transportation facilities and/or alternate modes of transportation, including roads, sidewalks, bicycle and transit facilities, the City may (but would not be required to) impose alternative mitigation measures that do not create the unacceptable impacts. [...] ▪ Policy TR-3.6 Unacceptable Impacts from Mitigation Measures: Measures. The types of impacts from identified vehicular traffic mitigation measures that may be determined by the City to be unacceptable include, but are not limited to the following: ○ Those that would encourage substantial neighborhood or community cut-through traffic;

Plan and Policies	Summary
	○ Those that would eliminate or reduce the width of a sidewalk below minimum City standard, where there is not sufficient planned public right-of-way to relocate the sidewalk; ○ Those that would eliminate a bicycle lane or reduce its width below City standard, where there is not sufficient planned public right-of-way to relocate the bicycle lane; ○ Those that would create unsafe pedestrian, bicycle, or vehicular operating conditions; ○ Those that would eliminate a bus stop or a parking lane that accommodates a bus stop, which cannot be relocated; ○ Those that would require acquisition of substantial existing buildings, and/or extraordinarily high cost of land acquisition, or an extraordinarily high project cost in relation to benefits achieved. ▪ Policy TR-3.7: Alternate Mitigation Measures and Conditions of Approval: Alternate mitigation measures and/or conditions of approval may include, but not be limited to making improvements to other facilities that assist with maintaining or improving projected levels of service, payment of an in-lieu fee to the City to be used to improve other components of the City's transportation system, developer installation of transportation improvements, and/or incorporation of physical features and operational programs into a project that support Trip Reduction/Travel Demand Management goals. ▪ Policy TR-3.8 Monitoring for Safety and Congestion: Improvements. While mitigation measures may not be required because level of service would not fall below an applicable LOS E or F standard, the City, developers, property owners, and others are not precluded from identifying and implementing improvements and strategies to improve level of service and reduce congestion. ▪ Policy TR-3.11 Arterial Roadways: Require the following streets to be built to arterial standards in the locations and at the number of lanes shown on the Circulation Element Map, and encourage the County to improve county arterial roadways to appropriate arterial standards in unincorporated areas. As described by the "Planned Transportation System (2030)" description of the major planned roads in this Circulation Element, the nature of the arterials will range from a 2-lane minor arterial, 2-lane major arterial, 2-lane multi-modal arterial, 4-lane or 6-lane major arterial, and 4-lane multi-modal arterial. North/South Arterial Roadways ○ Butterfield Boulevard (Cochrane Road to Monterey Road) ○ Hill/Peet Road Corridor (Cochrane Road to Tennant Avenue) ○ Monterey Road (the current 4-lane arterial may be narrowed to a 2-lane arterial) ○ Murphy Avenue/Mission View Drive Corridor (Cochrane Road to Maple Avenue) ○ Santa Teresa/Hale Corridor East/West Arterial Roadways ○ Cochrane Road (Monterey Road to Peet Road) ○ Dunne Avenue (Santa Teresa Corridor to Gallop Drive) ○ Edmundson Avenue (Santa Teresa Corridor to Monterey Road) ○ Main Avenue (Hale Avenue to Hill Road Corridor) ○ Madrone Parkway (west and east of Monterey Road) ○ Llagas Road Connection (Hale/Santa Teresa Corridor to Monterey/Old Monterey) ○ East Middle (Monterey Road to Murphy Avenue – outside City of Morgan Hill Sphere of Influence) ○ Tennant Avenue (Monterey Road to Hill Road) ○ Watsonville Road (connected to Butterfield Corridor)

Plan and Policies	Summary
	▪ Policy TR-3.12 Collector Roadways: Require the following streets to be built to collector standards in the locations designated on the Circulation Element Map, and encourage the County to improve these roadways to collector standards in unincorporated areas: o North/South Collector Roadways – Church Street (Dunne Avenue to Tennant Avenue) – Condit Road – Del Monte Street (Llagas Road to Wright Avenue, Dunne Avenue to Cosmo Avenue) – Depot Street – DeWitt Avenue (Dunne Avenue to Spring Avenue) – Foothill Avenue – La Alameda Drive – Murphy Avenue/Mission View Drive – Corridor (north of Cochrane Road) – Old Monterey Road (Llagas Road to Monterey Road) – Olive Avenue – Olympic Drive – Peak Avenue – Saddleback Drive – Serene Drive - East Lane – Sutter Boulevard – Trail Drive – Vista de Lomas Avenue – Walnut Grove Drive / Juan Hernandez (Tennant Avenue to Diana Avenue) o East/West Collector Roadways – Barrett Avenue (Juan Hernandez Drive to Butterfield Boulevard and Church Street to Monterey Road) – Burnett Avenue (Monterey Road to Vista de Lomas Avenue) – Central Avenue (Butterfield Boulevard to East Lane) – Cochrane Road (Peet Road to Malaguerra Drive) – Cosmo Avenue – Diana Avenue (Butterfield Boulevard to Laurel Road, Condit Road to Hill Road Corridor) – East Dunne Avenue (Gallop Drive to Jackson Oaks Drive) – West Dunne Avenue (Santa Teresa Corridor to DeWitt Avenue) – Fountain Oaks Drive – Half Road (Condit Road to Hill Road Corridor) – Hill Road (Tennant Avenue to Maple Avenue) – La Crosse Drive – Llagas Road (Old Monterey Road to Woodland Acres) – Main Avenue (Hale Avenue to Peak Avenue) – Native Dancer Drive – San Pedro Avenue (Spring Avenue Connector to Laurel Road, Condit Road to Hill Road)

Plan and Policies	Summary
	– Spring Avenue (Santa Teresa Corridor to San Pedro Avenue Connector) – Tennant Avenue (Hill Road to Foothill Avenue) – Vineyard Boulevard (La Crosse Drive to Tennant Avenue) – Wright Avenue (Monterey Road to Peak Avenue) ▪ Policy TR-3.18 Grade-Separated Railroad Crossings: Plan for the construction of grade-separated crossings of the Union Pacific railroad to improve emergency vehicle response times, and minimize conflicts between railroad trains and on-road vehicles. California Public Utilities Commission approval is required to modify an existing highway rail crossing or to construct a new crossing. Grade-separated crossings should be encouraged at Dunne Avenue (Depot Street to be re-routed through the existing Community and Cultural Center parking lot to create an intersection with Church Street either prior to or in conjunction with the grade separation project). ▪ Policy TR-3.19 Monterey Road Functionality: Give special consideration to the design of Monterey Road, balancing its functions as an arterial street, a "main street" accommodating downtown activities, and as an access road to the downtown and the major commercial areas of the city. Goal TR-4: Emphasis on transportation improvements in the Butterfield, Hale/Santa Teresa, and Monterey corridors. ▪ Policy TR-4.1 Right-of-Way for Butterfield Boulevard: Establish, maintain, and implement an adequate right-of-way for a major multi-modal arterial along Butterfield Boulevard, with four lanes extending from Cochrane Road to its connection with Watsonville Road at Monterey Road in the south end of town; and with two lanes extending north of Cochrane Road to connect with Madrone Parkway. ▪ Policy TR-4.2 Monterey Road Extension. Connect Monterey: Road to Butterfield Boulevard to the north end of town - generally in the vicinity of Cochrane Road at the north. Goal TR-5 Adequate off-street parking ▪ Policy TR-5.1 Adequate Parking Supply: Ensure that all developments provide adequate and convenient parking. In the Downtown, implement the Parking Resources Supply and Management Strategy in order to monitor and ensure provision of a public parking supply adequate to serve non-residential uses, with no on-site requirement for non-residential development. Continue to identify and implement policies and pricing strategies that encourage alternatives to single-occupant vehicle use. ▪ Policy TR-5.4 Long-Term On-Street Parking Prohibition: Prohibit long-term on-street parking in the industrial and commercial areas of the city. **Transit** Goal TR-6: A safe and efficient transit system that reduces congestion by providing viable non-automotive modes of transportation. ▪ Policy TR-6.4: Make existing and future commuter bus service convenient and accessible: Coordinate with the Monterey Road streetscape planning process to plan for and implement optimal locations for bus stops, shelters and turnouts in and near the Downtown area. ▪ Policy TR-6.7: Advanced Technologies. Use advanced technologies to enhance and improve transit safety and mobility. ▪ Policy TR-6.8: Transit for Changing Needs. Expand public transit as needed to meet the changing needs of the area for local and regional access, including methods such as bus, dial-a-ride, paratransit, and rail, where appropriate, for all users. Goal TR-7: Well-planned high-speed rail service that minimizes negative local impacts. ▪ Policy TR-7.3: Rail Crossings. The City recognizes that rail crossings are essential to provide connections from neighborhoods to destinations such as schools, parks, and

Plan and Policies	Summary
	services. The convenience of rail crossings should be balanced with the need to minimize safety and circulation impacts. ▪ Policy TR-7.4: Preferred Alignment. The City supports the alignment of high-speed rail along Highway 101 within the City of Morgan Hill, Placement of the high-speed rail alignment through downtown would be contrary to the City's vision and goals for its Downtown as expressed in the General Plan and Downtown Specific Plan. **Bikeways** Goal TR-8: A useable and comprehensive bikeway system that safety connects neighborhoods with workplaces and community destinations. ▪ Policy TR-8.8 Priorities for Bikeways Implementation: Where feasible, implement the bikeways system concurrent with adjacent development. Establish priorities for bikeways implementation based on improving safety and enhancing both commute and recreational cycling. These priorities shall be considered in directing resources and efforts to obtain funding for implementation. Priorities shall be regularly reviewed and updated as implementation proceeds. Current priorities for implementation of the bikeways plan include the following: o Live Oak High School Access o Little Llagas Creek Trail o Santa Teresa and Monterey Highway Corridor Improvements o East West Connection to Coyote Creek Trail **Pedestrian Network** Goal TR-9: Expanded pedestrian opportunities ▪ Policy TR-9.1: Private Development Connections. Ensure adequate pedestrian access in all developments, with special emphasis on pedestrian connections in the downtown area, in shopping areas, and major work centers, including sidewalks in industrial areas in accordance with the Trails and Natural Resources Master Plan. **Transportation Demand Management** Goal TR-10: A transportation system that incorporates strategies and technologies to manage traffic efficiently and reduce automotive vehicle trips.
City of Gilroy	
City of Gilroy 2002–2020 General Plan (2002)	The *City of Gilroy 2002-2020 General Plan* was adopted in June 2002. The following goals and policies are relevant to the project: **Traffic Circulation and Parking** GOAL: (a) A functional and balanced transportation system that provides access for all, is compatible with existing and proposed land uses, and minimizes emissions of air pollutants; (b) A coordinated multi-modal system that accommodates private motor vehicles, pedestrians, bicycles and mass transit. ▪ Policy 12.02 System Function and Neighborhood Protection. Ensure that the existing and proposed highways, streets, bikeways and pedestrian paths serve the functions they are intended to serve, while protecting the character of residential neighborhoods. ▪ Policy 12.08 Standard LOS. Maintain traffic conditions at LOS C or better at Gilroy intersections and roadways, allowing some commercial and industrial areas (as specified on the 'Level of Service D Areas' Map, page 6-11) to operate at LOS D or better. Exceptions to this standard will be allowed only where the City Council determines that the improvements needed to maintain the City's standard level of service at specific locations are infeasible. ▪ Policy 12.10 Land Use and Congestion. Promote land use planning that helps to reduce auto-mobile trips, thereby reducing congestion and helping to achieve air quality goals. In particular, strive for a balance of jobs and housing in future development to provide

Plan and Policies	Summary
	Gilroy residents the opportunity to work within Gilroy, and reduce long distance commuting both to and from Gilroy. [...] **Transit** GOAL: Local and regional public transit systems that are responsive to the changing needs of Gilroy area residents. ▪ Policy 13.03 Transit-Oriented Development: Encourage higher density residential and mixed use developments in close proximity to transit services, especially in the vicinity of the Downtown Caltrain station and multi-modal transit center. ▪ Policy 13.04 Regional Transit Services. Support regional transit operations that serve the Gilroy area through coordination of planning efforts and development policies that promote transit use. **Bicycle and Pedestrian Circulation** GOAL: Bicycling and walking as significant transportation modes, promoting personal health and recreational enjoyment while minimizing energy consumption and environmental degradation. ▪ Policy 14.02 Land Use Planning to Promote Walking and Biking: Promote compact, mixed use development patterns that encourage pedestrian and bicycle travel and transit use. For example, providing commercial services such as day care centers, restaurants, banks and stores near employment centers can reduce auto trips by promoting pedestrian travel. Providing neighborhood commercial and park uses within residential developments can reduce short auto trips by making pedestrian and bicycle trips feasible. Support implementation of the Neighborhood Districts, infill development, and mixed use development in the Downtown for their potential air quality benefits, as well as their other community benefits. ▪ Policy 14.03 Bicycle and Pedestrian Paths and Facilities. Correct deficiencies, expand existing facilities, and provide for the design of safer, convenient and attractive bicycle and pedestrian facilities whenever possible. Proposed roadways will be planned to accommodate bicycle traffic in accordance with the bikeway designations set forth in the City's Bicycle Transportation Plan. Similarly, greenbelts, linear parks, public easements and drainages reserved in public open space will be planned to accommodate bike and pedestrian traffic if they are so designated in the Bicycle Transportation Plan. ▪ Policy 14.04 Crossings. Design street crossings to provide for the safety needs of bicyclists and pedestrians. River and other crossings by bridges will be designed to accommodate bike lanes or paths in accordance with the designations set forth in the Bicycle Transportation Plan. Bridges for the exclusive use of pedestrians and bicycles should be considered whenever barriers exist which impede convenient and safe access. ▪ Action 14.A Trail and Pathway Implementation. Work with the County in implementing trails and bike paths planned locally as part of the County-wide network in the County Trails and Pathways Master Plan. New development along designated trail or bikeway corridors should be required to dedicate land and construct the designated facility. ▪ Action 14.I Bike Paths for Emergency Access. Design bike paths to be wide enough for emergency vehicles where other emergency routes do not exist, located and designed to enhance the personal safety of bicyclists. Use removable bollards or other devices to prevent vehicles other than emergency and maintenance vehicles from using the bike paths. ▪ Action 14.J Bikeway Planning and Design Criteria. Follow the criteria for bikeways outlined in the California Department of Transportation's publication Planning and Design Criteria for Bikeways in California.
City of Gilroy Bicycle/Pedestrian	The City of Gilroy published the Gilroy Bicycle/Pedestrian Transportation Plan in February 2002. The plan aims to facilitate programs that encourage bicycle ridership and pedestrian

Plan and Policies	Summary
Transportation Plan (2002)	activity, coordinate planning for bikeways and bicycle facilities with other modes of transportation, encourage multi-modal and multi-agency coordination, and provide a framework for incremental improvements to the bicycle and pedestrian networks in Gilroy. The plan includes the following policies relevant to transportation: Goal 5: Improve and promote bicycle access to public transportation facilities with bikeways and storage facilities. Objective: Reduce the conflict between bicycles and other modes of travel, and thereby decrease the number of collisions involving bicycles. Policies: System Continuity ▪ Plan a bikeway network to integrate with other City and regional bicycle routes and other modes of transportation (Park and Ride lots, transit facilities, train stations etc.) in order to encourage and support the use of bicycling and reduce the use of motor vehicles. ▪ Pan bicycle paths or lanes as part of new development and new roadway construction, consistent with provisions of this Plan and based on the bikeways map.
San Benito County	
San Benito County 2035 General Plan (2015)	San Benito County published the San Benito County 2035 General Plan in July 2015. The plan includes the following policies relevant to transportation: Section 6: Circulation Element Goal C-1: To provide an adequate road system that is safe, efficient, reliable, and within the County's ability to finance and maintain. ▪ C-1.1 Intermodal Connectivity: The County shall ensure that, whenever possible, roadway, highway, public transit systems, and pedestrian and bicycle trails are interconnected with other modes of transportation. Goal C-2: To provide a safe, continuous, and accessible system of facilities for bicycle and pedestrian travel in appropriate areas of the county. Goal C-3: To promote a safe and efficient public transit system that provides a viable travel alternative to automobiles, maximizes mobility, and reduces roadway congestion and greenhouse gas emissions. ▪ C-3.1 Transit-Supportive Land Use: The County shall encourage transit lines, stops, and facilities in locations where land uses and density would support transit use. ▪ C-3.2 Future Connections to High-Speed Rail: The County shall pursue potential opportunities to connect transit to future high-speed rail if a high-speed rail station is built in Gilroy and ensure that proposed connection alignments are carefully planned to maximize accessibility and minimize related environmental impacts associated with visual obstructions and noise, as appropriate. ▪ C-3.3 Connections to Gilroy Transit Center: The County shall encourage the use of shuttles/transit services at the Gilroy Transit Center to connect to appropriate and carefully planned locations that maximize use and minimize impacts to existing communities. The County shall also encourage the expansion of passenger rail between the Gilroy Caltrain Station and Hollister. ▪ C-3.9 Consistency with RTP: The County shall require all new development proposals to be consistent with and implement the San Benito County Regional Transportation Plan transit policies.
San Benito Regional Transportation Plan (2014)	The Council of San Benito County Government prepared a countywide regional transportation plan in June 2014. The plan includes the following policies relevant to transportation: Goal: Access and Mobility

Plan and Policies	Summary
	▪ Policy Objective: Provide convenient, accessible, and reliable travel options while maximizing productivity for all people and goods in the region. Goal: Economic Vitality ▪ Policy Objective: Raise the region's standard of living by enhancing the performance of the transportation system. Goal: Healthy Communities ▪ Policy Objective: Protect the health of our residents; foster efficient development patterns that optimize travel, housing, and employment choices and encourage active transportation. Goal: Social Equity ▪ Policy Objective: Provide an equitable level of transportation services to all segments of the population Goal: System Preservation and Safety ▪ Policy Objective: Preserve and ensure a sustainable and safe regional transportation system
Merced County	
2030 Merced County General Plan (2013)	Merced County adopted the 2030 Merced County General Plan in December 2013. The plan establishes the overall policy framework for countywide land use and urban development. In addition to the land use policies, the Merced County General Plan addresses transportation, housing, resource conversation, open space, health and safety, and noise. The plan includes the following policies relevant to transportation: ▪ Policy AG-2.16: High Speed Rail Line Location. Coordinate with the California High Speed Rail Authority to locate the high speed rail lines along existing major transportation corridors, such as SR 99 or 152, to minimize the conversion of productive agricultural land to non-agricultural uses. Transportation and Circulation Element Goal CIR-1: Maintain an efficient roadway system for the movement of people and goods that enhances the physical, economic, and social environment while being safe, efficient, and cost-effective. ▪ Policy CIR-1.3: Transportation Efficiency. Encourage transportation programs that result in more efficient energy use, reduce greenhouse gas emissions and noise levels, and improve air quality. ▪ Policy CIR-1.5: County Level of Service Standards. Implement a Countywide roadway system that achieves the following LOS standards during peak traffic periods: a) For roadways located within rural areas: LOS "C" or better. b) For roadways located outside Urban Communities that serve as connectors between Urban Communities: LOS of "D" or better. c) For roadways located within Urban Communities: LOS of "D" or better. ▪ Policy CIR-1.6: Level of Service "E" Exception. Allow a level of service "E" or worse only on a minor component of the circulation system (such as a left turn movement from a local roadway) if the major component of the circulation system (such as a through movement on a collector or arterial roadway) would be significantly compromised in the process of improving the level of service of the minor component. ▪ Policy CIR-1.21: Agricultural Operations. Require adequate right-of-way to accommodate increases in vehicular traffic on rural roads that serve agricultural tourism, value-added agriculture, and/or other unique agriculture-related land uses and pursue improvements as funding and resources allow.

Plan and Policies	Summary
	▪ Policy CIR-1.23: At-Grade Railroad Crossing Guidelines. Work with California Public Utilities Commission and the affected railroads to monitor the effects of development, and implement necessary and applicable design improvements at railroad crossings. Goal CIR-3: Maintain a public transit system that provides an alternative to automobile travel, supports ridesharing, and meets the needs of the entire community. ▪ Policy CIR-3.1: Multi-Modal Transportation. Encourage multi-modal transportation opportunities within Urban Communities. ▪ Policy CIR-3.2: Transit Improvements. Continue to support transit efforts by the Merced County Association of Governments, Dial-A-Ride, UC Merced Transit, other public entities, private social service providers, and other various private charter services to improve and expand public transit throughout the County. ▪ Policy CIR-3.8: New Transit Hubs. Identify and develop new regional transit hubs at major commercial centers, employers, or institutions. Goal CIR-4: Maintain and expand a safe, continuous, and easily accessible bicycle and pedestrian circulation system. Goal CIR-5: Maintain and expand a rail transportation system that provides safe, efficient, and reliable movement of freight and passengers within and through Merced County. ▪ Policy CIR-5.1: Freight and Passenger Rail Services. Support the continued operation and improvements to existing freight and passenger rail lines and terminals. ▪ Policy CIR-5.3: Rail Service Coordination. Encourage coordination of passenger rail services with other public transportation. ▪ Policy CIR-5.4: At-Grade Rail Crossing. Encourage alternatives to at-grade rail crossings at existing and future roads. ▪ Policy CIR-5.5: Railroad Corridor Preservation. Work with other agencies to plan railroad corridors that facilitate the preservation of important rail line right-of-way for future rail expansion or other appropriate transportation facilities. ▪ Policy CIR-5.7: High Speed Rail. Coordinate with the California High Speed Rail Authority, the cities, and other local agencies in efforts to properly locate the High Speed Rail corridors throughout Merced County, including at least one station and a heavy maintenance facility.
City of Los Banos 2030 General Plan Update (2009)	The *City of Los Banos 2030 General Plan Update* was adopted in 2009 and establishes the overall policy framework for citywide land use and urban development. The following goals and policies are relevant to the project: ▪ C-G-1 Promote safe and efficient vehicular circulation. ▪ C-G-6 Maintain acceptable levels of service (LOS) D and ensure that future development and the circulation system are in balance. ▪ C-G-14 Participate in the planning process for the California High-Speed Train.

Sources: ABAG and MTC 2017; AMBAG 2017; Caltrain 2014; Caltrans 2016; City of Gilroy 2002a, 2002b; City of Los Banos 2009; City of Morgan Hill 2016a; City of San Jose 2009, 2011, 2014; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2014, 2015a; County of Santa Clara 1994; MCAG 2016; VTA 2008.
ABAG = Association of Bay Area Governments
AMBAG = Association of Monterey Bay Area Governments
MTC = Metropolitan Transportation Commission
PCJPB = Peninsula Corridor Joint Powers Board
HSR = high-speed rail
LOS = level-of-service
TSM = Transportation System Management
VTA = Santa Clara Valley Transportation Authority
BART = Bay Area Rapid Transit
ACE = Altamont Commuter Express
VMT = vehicle miles traveled
RTP = regional transportation plan

Air Quality and Greenhouse Gases

Table 2 Regional and Local Plans and Policies Relevant to Air Quality and Greenhouse Gases

Plan and Policies	Summary
Regional	
Plan Bay Area 2040	The Association of Bay Area Governments and the Metropolitan Transportation Commission adopted Plan Bay Area 2040 as the Bay Area's long-term regional transportation and land use blueprint in 2017. The following goals and objectives are relevant to the project: ▪ Target #1: Reduce per-capita CO2 emissions from cars and light-duty trucks by **15%**. ▪ Target #3: Reduce adverse health impacts associated with air quality, road safety, and physical inactivity by 10%.
San Joaquin Valley Blueprint Planning Process Summary Report (2010)	The *San Joaquin Valley Blueprint Planning Process Summary Report* was prepared in 2010. The following goals and policies are relevant to the project: ▪ Principle 12: Support actions that encourage environmental resource management.
Moving Forward 2035 Monterey Bay (2017)	The Association of Monterey Bay Area Governments adopted *Moving Forward 2035 Monterey Bay* as the region's long-term regional transportation in 2014 and amended it in 2017. The following goals and objectives are relevant to the project: ▪ Policy 3: Environment – Promote environmental sustainability and protect the natural environment.
2014-2020 Regional Transportation Plan and Sustainable Communities Strategy for Merced County (2016)	The Merced County Association of Governments adopted *2014-2020 Regional Transportation Plan and Sustainable Communities Strategy for Merced County* as the County's long-term regional transportation in 2014 and amended it in 2016. The following goals and objectives are relevant to the project: ▪ 8.1. Coordinate transportation planning with air quality planning at the technical and policy level.
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994. The following goals and policies are relevant to the project: ▪ Policy C-TR 11 Santa Clara County shall participate in updating and implementing the Congestion Management Plan, the provisions of which as set forth by law: a. establish priority for air quality goals and objectives and development of alternatives to automobile travel; and b. allow additional road capacity to be created only when all feasible automobile travel demand measures have been implemented. ▪ Policy C-RC 80 Sub-regional/countywide planning for Santa Clara County should place major emphasis on the inter-related goals, strategies and policies for improving energy efficiency in transportation, air quality, and reducing traffic congestion.

Plan and Policies	Summary
City of Santa Clara	
City of Santa Clara 2010–2035 General Plan (2010)	The *City of Santa Clara 2010–2035 General Plan* was adopted in November 2010. The following goals and policies are relevant to the project: ▪ 5.10.2-P1 Support alternative transportation modes and efficient parking mechanisms to improve air quality. ▪ 5.10.2-P2 Encourage development patterns that reduce vehicle miles traveled and air pollution. ▪ 5.10.2-P3 Encourage implementation of technological advances that minimize public health hazards and reduce the generation of air pollutants. ▪ 5.10.2-P4 Encourage measures to reduce greenhouse gas emissions to reach 30 percent below 1990 levels by 2020. ▪ 5.10.2-P6 Require "Best Management Practices" for construction dust abatement. ▪ 5.8.1-P4 Expand transportation options and improve alternate modes that reduce greenhouse gas emissions. ▪ 5.10.3-P15 Explore opportunities for alternative energy "fueling stations" and promote participation in shuttle services that use new technology vehicles to reduce greenhouse gas emissions.
City of San Jose	
Envision: San José 2040 General Plan (2011)	The *Envision: San José 2040 General Plan* was adopted in 2011. The following goals and policies are relevant to the project: ▪ MS-1.7 Encourage retrofits for existing buildings throughout San José to use green building principles in order to mitigate the environmental, economic, and social impact of those buildings, to achieve greenhouse gas reductions, and to improve air and water quality. ▪ MS-4.1 Promote the use of building materials that maintain healthful indoor air quality in an effort to reduce irritation and exposure to toxins and allergens for building occupants. ▪ MS-4.2 Encourage construction and pre-occupancy practices to improve indoor air quality upon occupancy of the structure. ▪ MS-10.1 Assess projected air emissions from new development in conformance with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines and relative to state and federal standards. Identify and implement feasible air emission reduction measures. ▪ MS-10.2 Consider the cumulative air quality impacts from proposed developments for proposed land use designation changes and new development, consistent with the region's Clean Air Plan and State law. ▪ MS-10.3 Promote the expansion and improvement of public transportation services and facilities, where appropriate, to both encourage energy conservation and reduce air pollution. ▪ MS-10.4 Encourage effective regulation of mobile and stationary sources of air pollution, both inside and outside of San José. In particular, support Federal and State regulations to improve automobile emission controls. ▪ MS-10.7 Encourage regional and statewide air pollutant emission reduction through energy conservation to improve air quality.

Plan and Policies	Summary
	▪ MS-10.8 Minimize vegetation removal required for fire prevention. Require alternatives to discing, such as mowing, to the extent feasible. Where vegetation removal is required for property maintenance purposes, encourage alternatives that limit the exposure of bare soil. ▪ MS-10.9 Foster educational programs about air pollution problems and solutions. ▪ MS-11.2 For projects that emit toxic air contaminants, require project proponents to prepare health risk assessments in accordance with BAAQMD-recommended procedures as part of environmental review and employ effective mitigation to reduce possible health risks to a less than significant level. Alternatively, require new projects (such as, but not limited to, industrial, manufacturing, and processing facilities) that are sources of TACs to be located an adequate distance from residential areas and other sensitive receptors. ▪ MS-11.3 Review projects generating significant heavy duty truck traffic to designate truck routes that minimize exposure of sensitive receptors to TACs and particulate matter. ▪ MS-11.4 Encourage the installation of appropriate air filtration at existing schools, residences, and other sensitive receptor uses adversely affected by pollution sources. ▪ MS-11.5 Encourage the use of pollution absorbing trees and vegetation in buffer areas between substantial sources of TACs and sensitive land uses. ▪ MS-13.1 Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At minimum, conditions shall conform to construction mitigation measures recommended in the current BAAQMD CEQA Guidelines for the relevant project size and type. ▪ MS-13.2 Construction and/or demolition projects that have the potential to disturb asbestos (from soil or building material) shall comply with all the requirements of the California Air Resources Board's air toxics control measures (ATCMs) for Construction, Grading, Quarrying, and Surface Mining Operations. ▪ MS-13.3 Require subdivision designs and site planning to minimize grading and use landform grading in hillside areas. ▪ EC-7.7 Determine for any development or redevelopment site that is within 1,000 feet of a known, suspected, or likely geographic ultramafic rock unit (as identified in maps developed by the Department of Conservation – Division of Mines and Geology) or any other known or suspected locations of serpentine or naturally occurring asbestos, if naturally occurring asbestos exists and, if so, comply with the Bay Area Air Quality Management District's Asbestos Air Toxic Control Measure requirements. ▪ TR-1.8 Actively coordinate with regional transportation, land use planning, and transit agencies to develop a transportation network with complementary land uses that encourage travel by bicycling, walking and transit, and ensure that regional greenhouse gas emission standards are met.
Midtown Specific Plan (1992)	The *Midtown Specific Plan* was adopted in 1992. The following goals and policies are relevant to the project: ▪ Policy 4.3: Future development should incorporate energy-conserving devices to promote conservation.

Plan and Policies	Summary
Diridon Station Area Plan (2014)	The *Diridon Station Area Plan* was adopted in 2014. No goals and policies are directly relevant to the air quality or greenhouse gas analysis of the project.
Communications Hill Specific Plan (1992)	The *Communications Hill Specific Plan* was adopted in1992. The following goals and policies are relevant to the project: ▪ Minimize the potential adverse impacts of the Communications Hill area development on the immediate surrounding neighborhood.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The *Morgan Hill 2035 General Plan* was adopted in 2016. The following goals and policies are relevant to the project: ▪ Policy NRE-10.1 Regional and Subregional Cooperation. Cooperate with regional agencies in developing and implementing air quality management plans. Support subregional coordination with other cities, counties, and agencies in the Santa Clara Valley and adjacent areas to address land use, jobs/housing balance, and transportation planning issues as a means of improving air quality. ▪ Policy NRE-10.2 State and Federal Regulation. Encourage effective regulation of mobile and stationary sources of air pollution and support State and federal regulations to improve automobile emission controls. ▪ Policy NRE-10.3 Automobile Emissions. Encourage the use of and infrastructure for alternative fuel, hybrid, and electric vehicles. Encourage new and existing public and private development to include electric vehicle charging stations. ▪ Policy NRE-10.4 Reduced Automobile Use. To reduce air pollution the frequency and length of automobile trips and the amount of traffic congestion by controlling sprawl, promoting infill development, and encouraging mixed uses and higher density development near transit. Support the expansion and improvement of alternative modes of transportation. Encourage development project designs that protect and improve air quality and minimize direct and indirect air pollutant emissions by including components that reduce vehicle trips. ▪ Policy NRE-11.2 TACs and Existing Sensitive Uses. Encourage the installation of appropriate air filtration mechanisms at existing schools, residences, and other sensitive receptors adversely affected by existing or proposed pollution sources. ▪ Policy NRE-11.3 Health Risk Assessments. For proposed development that emits toxic air contaminants, require project proponents to prepare health risk assessments in accordance with Bay Area Air Quality Management District procedures as part of environmental review and implement effective mitigation measures to reduce potential health risks to less-than-significant levels. Alternatively, require these projects to be located an adequate distance from residences and other sensitive receptors to avoid health risks. Consult with the Bay Area Air Quality Management District to identify stationary and mobile toxic air contaminant sources and determine the need for and requirements of a health risk assessment for proposed developments. ▪ Policy NRE-11.4 Truck Routes. For development projects generating significant heavy duty truck traffic, designate truck routes that minimize exposure of sensitive receptors to toxic air contaminants and particulate matter. ▪ Policy NRE-11.5 Truck Idling. For development projects generating significant truck traffic, require signage to remind drivers that the State truck idling law limits truck idling to five (5) minutes.

Plan and Policies	Summary
	▪ Policy NRE-11.5 Truck Idling. For development projects generating significant truck traffic, require signage to remind drivers that the State truck idling law limits truck idling to five (5) minutes. ▪ Policy NRE-11.6 Vegetation Buffers. Encourage the use of pollution-absorbing trees and vegetation in buffer areas between substantial sources of toxic air contaminants and sensitive receptors. ▪ Policy NRE-12.1 Best Practices. Requirement that development projects implement best management practices to reduce air pollutant emissions associated with construction and operation of the project. ▪ Policy NRE-12.2 Conditions of Approvals. Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At a minimum, conditions shall conform to construction mitigation measures recommended in the current Bay Area Air Quality Management District CEQA Guidelines. ▪ Policy NRE-12.3 Control Measures. Require construction and demolition projects that have the potential to disturb asbestos (from soil or building material) to comply with all the requirements of the California Air Resource Board's air toxics control measures (ATCMs) for Construction, Grading, Quarrying, and Surface Mining Operations. ▪ Policy NRE-12.4 Grading. Require subdivision designs and site planning to minimize grading and use landform grading in hillside areas. ▪ Policy NRE-15.1 Greenhouse Gas Emission Reduction Targets. Maintain a greenhouse gas reduction trajectory that is consistent with the greenhouse gas reduction targets of Executive Orders B-30-15 (40 percent below 1990 levels by 2030) and S-03-05 (80 percent below 1990 levels by 2050) to ensure the City is consistent with statewide efforts to reduce greenhouse gas emissions. ▪ Policy NRE-15.2 Linking Land Use and Transportation. Encourage land use and transportation patterns that reduce dependence on automobiles. ▪ Policy NRE-15.3 Climate Action Plan. Utilize policies in this General Plan denoted with the green leaf symbol as the City's greenhouse gas emissions reduction strategy. ▪ Policy NRE-15.4 Sustainable Land Use. Promote land use patterns that reduce the number and length of motor vehicle trips. ▪ Policy NRE-15.10 VMT Reduction. Continue to work with the Santa Clara Valley Transportation Authority on regional transportation solutions that will reduce vehicle miles traveled and greenhouse gas emissions.
City of Gilroy	
City of Gilroy 2002–2020 General Plan (2002)	The *City of Gilroy 2002–2020 General Plan* was adopted in 2002. The following goals and policies are relevant to the project: ▪ Policy 21.01 "Sensitive Receptors." Use land use planning and project siting to separate air pollution sources (such as freeways, arterials, industrial sites, etc.) from residential areas and other "sensitive receptors" (such as schools, hospital, and nursing homes) that would be adversely affected by close proximity to air pollutants. ▪ Policy 21.02 Landscaping to Reduce Pollutants. Promote the use of trees and plants in landscaping to reduce air pollutant levels. ▪ Policy 21.04 Regional Collaboration. Cooperate with the Bay Area Air Quality Management District and other agencies that deal with issues related to air quality (e.g., the Metropolitan Transportation Commission and the Association

Plan and Policies	Summary
	of Bay Area Governments) to develop and implement regional air quality strategies. Also, support subregional coordination with other cities, counties and agencies in Santa Clara Valley and adjacent areas to address land use, jobs/housing balance, and transportation planning issues as a means of improving air quality. ▪ Policy 21.05 Air Quality Impacts from Construction Activity. Reduce the air quality impacts associated with construction activity by reducing the exhaust emissions through appropriate mitigation actions. ▪ Policy 21.06 Traffic Control Measures. Implement the Transportation Control Measures recommended by the Bay Area Air Quality Management District in the 2000 Clean Air Plan to reduce pollutant emissions. ▪ Policy 12.09 LOS and Air Quality. Maintain the City's Standard Level of Service whenever feasible to minimize traffic congestion and thereby minimize exposure to carbon monoxide, since vehicles generate less air pollutant emissions at higher speed. ▪ Policy 14.01 Non-Auto Modes of Travel. Emphasize non-auto travel modes of transportation as a key strategy for achieving air quality goals. For example, encourage bicycle riding to school from an early age by providing safer bikeways between residential areas and schools and encourage the schools to provide secured bike racks and/or lockers.
Downtown Gilroy Specific Plan (2005)	The *Downtown Gilroy Specific Plan* was adopted in 2005. No goals and policies are directly relevant to the air quality or greenhouse gas analysis of the project.
San Benito County	
San Benito County 2035 General Plan (2015)	The *San Benito County 2035 General Plan* was adopted in 2015. The following goals and policies are relevant to the project: ▪ HS-5.1 New Development. The County shall use the CEQA process to ensure development projects incorporate feasible mitigation measures to reduce construction and operational air quality emissions, and consult with the Monterey Bay Unified Air Pollution Control District early in the development review process. ▪ HS-5.2 Sensitive Land Use Locations. The County shall ensure adequate distances between sensitive land uses and facilities or operations that may produce toxic or hazardous air pollutants or substantial odors. ▪ HS-5.3 Early Coordination with the Air Quality Control District. The County shall notify and coordinate with the Monterey Bay Unified Air Pollution Control District when industrial developments are proposed within the county to ensure applicants comply with applicable air quality regulations and incorporate design features and technologies to reduce air emissions. ▪ HS-5.4 PM10 Emissions from Construction. The County shall require developers to reduce particulate matter emissions from construction (e.g., grading, excavation, and demolition) consistent with standards established by the Monterey Bay Unified Air Pollution Control District. ▪ HS-5.6 New Construction Mitigation. The County shall work in coordination with the Monterey Bay Unified Air Pollution Control District to minimize air emissions from construction activities associated with proposed development. ▪ HS-5.7 Greenhouse Gas Emission Reductions. The County shall promote greenhouse gas emission reductions by supporting carbon efficient farming methods (e.g., methane capture systems, no-till farming, crop rotation, cover cropping); supporting the installation of renewable energy technologies; and

Plan and Policies	Summary
	protecting grasslands, open space, oak woodlands, riparian forest and farmlands from conversion to urban uses. ▪ HS-5.8 GHG Reduction Targets. The County acknowledges that the state endeavors to achieve 1990 greenhouse gas (GHG) emission levels, and establish a long-term goal to reduce GHG emissions by 80 percent below 1990 levels by 2050. The County will encourage projects that support these goals, recognizing that these goals can be met only if the state succeeds in decarbonizing its fuel supply. ▪ AD-2.5 Air Quality Management Coordination. The County shall continue to coordinate with the Monterey Bay Unified Air Pollution Control District (MBUAPCD) and affected agencies and neighboring jurisdictions in the North Central Coast Air Basin to ensure regional cooperation on cross-jurisdictional and regional transportation and air quality issues, and to establish parallel air quality programs and implementation measures. ▪ PFS-2.1 Efficient Operations. The County shall maintain facilities and service standards and conduct operations in a manner that meets community needs in an efficient manner, conserves resources, and reduces the County's contribution to greenhouse gas emissions.
Merced County	
2030 Merced County General Plan (2013)	The *2030 Merced County General Plan* was adopted in 2013. The following goals and policies are relevant to the project: ▪ Policy ED-1.7: Improving Merced County's Quality of Life (SO/PI). Economic development efforts shall include consideration of improving air quality, developing an educated workforce, promoting safe/crime-free communities, protecting water quality, and increasing recreational opportunities as a means to improve the quality of life for residents and workers and to attract new industries to the County. ▪ Policy LU-10.9: Air Quality Management Coordination (IGC). Coordinate with the San Joaquin Valley Air Pollution Control District and affected agencies and neighboring jurisdictions in the San Joaquin Valley Air Basin to ensure regional cooperation on cross-jurisdictional and regional transportation and air quality issues, and to establish parallel air quality programs and implementation measures, such as trip reduction ordinances and indirect source programs. ▪ Policy LU-10.10: San Joaquin Valley Air Pollution Control District Consultation (IGC). Consult with the San Joaquin Valley Air Pollution Control District during CEQA review for discretionary projects that have the potential for causing adverse air quality impacts. Ensure that development projects are submitted to the District for CEQA comments and review of air quality analysis. ▪ Policy CIR-1.3: Transportation Efficiency (RDR) Encourage transportation programs that result in more efficient energy use, reduce greenhouse gas emissions and noise levels, and improve air quality. ▪ Policy AQ-1.1: Energy Consumption Reduction (RDR) Encourage new residential, commercial, and industrial development to reduce air quality impacts from energy consumption. ▪ Policy AQ-1.6: Air Quality Improvement (SO) Support and implement programs to improve air quality throughout the County by reducing emissions related to vehicular travel and agricultural practices. ▪ Policy AQ-2.1: Air Quality Plan Compliance (RDR) Require all development projects to comply with applicable regional air quality plans and policies. ▪ Policy AQ-2.3: Cumulative Impacts (RDR). Encourage the reduction of cumulative air quality impacts produced by projects that are not significant by

Plan and Policies	Summary
	themselves, but result in cumulatively significant impacts in combination with other development. ▪ Policy AQ-2.4: Mitigation (RDR). Require that local and regional air quality impacts identified during CEQA review for projects reviewed and approved by the County are consistently and fairly mitigated. ▪ Policy AQ-2.5: Innovative Mitigation Measures (RDR, IGC, JP). Encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the San Joaquin Valley Air Pollution Control District, project applicants, and other interested parties. ▪ Air Quality Element Goal AQ-3. Improve air quality through improved public facilities and operations and to serve as a model for the private sector. ▪ Policy AQ-4.6: Non-Motorized Transportation (RDR). Encourage non-motorized transportation corridors within and between communities. ▪ Policy AQ-4.7: Planning Integration (RDR). Require land use, transportation, and air quality planning to be integrated for the most efficient use of resources and a healthier environment. ▪ Policy AQ-5.1: Residential Buffers (RDR). Require effective buffers between residential and other sensitive land uses, and nonresidential land uses that generate hazardous air emissions such as highways (e.g., I-5 and SR-99), trucking centers, gasoline dispensing facilities, and dry cleaners. Effective buffers shall be determined by requiring consultation with the SJVAPCD for any project that may have a health risk impact, including those projects that would otherwise appear to be exempt from CEQA requirements.

Sources: ABAG and MTC 2017; AMBAG 2017; City of Gilroy 2002a, 2005; City of Morgan Hill 2016a; City of San Jose 1992a, 1992b, 2011, 2014; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994; MCAG 2016; San Joaquin Valley Regional Planning Agencies 2010.

Noise and Vibration

Table 3 Regional and Local Plans and Polices Relevant to Noise and Vibration

Plan/Policy Document	Summary
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994 with amendments published in 2016. The general plan includes the following strategies, policies, and implementation recommendations relevant to noise and vibration: **Strategy 1: Prevent or Minimize Noise Conflicts** ▪ Policy C-HS 24: Environments for all residents of Santa Clara County free from noises that jeopardize their health and well-being should be provided through measures which promote noise and land use compatibility. ▪ Policy C-HS 25: Noise impacts from public and private projects should be mitigated. o Implementation C-HS(i) 24: Where necessary, construct sound walls or other noise mitigations. o Implementation C-HS(i) 25: Prohibit construction in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented.
Santa Clara County Ordinance Code (2016)	The Santa Clara Ordinance Code was originally adopted in 1972. The Code establishes the following sections of Division B11, Chapter VIII, Control of Noise and Vibration, relevant to noise and vibration:

Plan/Policy Document	Summary
	Section B11-152. – Exterior noise limits Maximum permissible sound levels by receiving land use: ▪ The noise standards for the various receiving land use categories as presented in [the following bullets, derived from Table B11-152] will apply to all property within any zoning district: o One and Two-Family Residential – 45 dBA between 10 pm to 7 am, and 55 dBA between 7 am to 10 pm; o Multiple Family Dwelling – 50 dBA between 10 pm and 7 am; o Residential Public Space – 55 dBA between 7 am to 10 pm; o Commercial – 60 dBA between 10 pm and 7 am, and 65 dBA between 7 am to 10 pm; o Light Industrial -- 70 dBA at all times; and o Heavy Industrial – 75 dBA at all times. ▪ No person may operate or cause to be operated any source of sound at any location within the unincorporated territory of the County or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by the person, which causes the noise level when measured on any other property either incorporated or unincorporated, to exceed: a) The noise standard for that land use as specified [above] for a cumulative period of more than 30 minutes in any hour; or b) The noise standard plus five dB for a cumulative period of more than 15 minutes in any hour; or c) The noise standard plus ten dB for a cumulative period of more than five minutes in any hour; or d) The noise standard plus 15 dB for a cumulative period of more than one minute in any hour; or e) The noise standard plus 20 dB or the maximum measured ambient, for any period of time. **Sec. B11-153. - Interior noise standards** Maximum permissible dwelling interior sound levels: ▪ The interior noise standards for multifamily residential dwellings as presented in [the following bullet, derived from Table B11-153] will apply, unless otherwise specifically indicated, within all dwellings: o Multi-Family Dwelling – 35 dBA allowable interior noise level between 10 pm and 7 pm, and 45 dBA between 7 am and 10 pm. ▪ No person will operate or cause to be operated within a dwelling unit any source of sound or allow creation of any noise which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed: a) The noise standard as specified [above] for a cumulative period of more than five minutes in any hour; or b) The noise standard plus five dB for a cumulative period of more than one minute in any hour; or c) The noise standard plus ten dB or the maximum measured ambient, for any period of time. ▪ If the measured ambient level exceeds that permissible within any of the noise limit categories above, the allowable noise exposure standard will be increased in five-dB increments in each category as appropriate to reflect the ambient noise level.

Plan/Policy Document	Summary
	Section B11-154. – Prohibited acts ▪ Construction/demolition a) Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekdays and Saturday hours of 7 p.m. and 7 a.m., or at any time on Sundays or holidays, that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance. b) Where technically and economically feasible, construction activities will be conducted in a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule: i. Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment: [See full ordinance for table of maximum noise levels] ii. Stationary equipment. Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of ten days or more) of stationary equipment are as follows: [See full ordinance for table of maximum noise levels] ▪ Vibration a) Operating or permitting the operation of any device that creates a vibrating or quivering effect that: i. Endangers or injures the safety or health of human beings or animals; or ii. Annoys or disturbs a person of normal sensitivities; or iii. Endangers or injures personal or real properties.
City of Santa Clara	
City of Santa Clara 2010-2035 General Plan (2010)	The City of Santa Clara adopted the 2010-2035 General Plan on November 16, 2010. Updates were published in 2013 and 2014. The general plan includes the following environmental quality goals and policies which are applicable to noise and vibration: Goals ▪ 5.10.6-G1 Noise sources restricted to minimize impacts in the community. ▪ 5.10.6-G2 Sensitive uses protected from noise intrusion. Policies ▪ 5.10.6-P2 Incorporate noise attenuation measures for all projects that have noise exposure levels greater than General Plan “normally acceptable” levels. ▪ 5.10.6-P6 Discourage noise sensitive uses, such as residences, hospitals, schools, libraries and rest homes, from areas with high noise levels, and discourage high noise generating uses from areas adjacent to sensitive uses. ▪ 5.10.6-P10 Encourage transit agencies to develop and apply noise reduction technologies for their vehicles to reduce the noise and vibration impacts of Caltrain, Bay Area Rapid Transit, future High Speed Rail, light rail and bus traffic.
Santa Clara City Code (2017)	The Santa Clara City Code is current through Ordinance 1969, passed in 2017. Chapter 9.10, Regulation of Noise and Vibration, is relevant to noise and vibration: **9.10.040 Noise or sound regulation:** [. . .] The maximum noise or sound levels are set forth, as follows: ▪ Category 1: Single Family and Duplex Residential – 55 dBA between 7 am to 10 pm, and 50 dBA between 10 pm to 7 am;

Plan/Policy Document	Summary
	▪ Category 2: Multiple Family Residential – 55 dBA between 7 am to 10 pm; 50 dBA between 10 pm and 7 am; ▪ Category 3: Commercial, Office – 65 dBA between 7 am and 10 pm, and 60 dBA between 10 pm and 7 am; ▪ Light Industrial -- 70 dBA at all times; and ▪ Heavy Industrial – 75 dBA at all times. **9.10.050 Vibration regulation:** [. . .] Vibration [should not exceed] the vibration perception threshold of an individual at the closest property line point to the vibration source on the real property affected by the vibration.
City of San Jose	
Envision San Jose 2040 General Plan (2011)	The *Envision*: *San Jose 2040 General Plan* was adopted in 2011. The Plan establishes the following goals and policies relevant to noise and vibration: **Goal EC-1 – Community Noise Levels and Land Use Compatibility.** Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies. ▪ **Policy EC-1.1:** Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state and City noise standards and guidelines as a part of new development review. **Interior Noise Levels** ▪ The City's standard for interior noise levels in residences, hotels, motels, residential care facilities, and hospitals is 45 dBA DNL. […] **Exterior Noise Levels** ▪ The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses. The acceptable exterior noise level objective is established for the City, except in the environs of the San José International Airport and the Downtown, as described below: ▪ For new multi-family residential projects, the residential component of mixed-use development, [and single family residential uses] use a standard of 60 dBA DNL in usable outdoor activity areas [. . .] ▪ **Policy EC-1.2:** Minimize the noise impacts of new development on land uses sensitive to increased noise levels (Categories 1, 2, 3 and 6) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would: ○ Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable"; or ○ Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level. ▪ **Policy EC-1.7:** Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would: ○ Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months. For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance

Plan/Policy Document	Summary
	coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses. ▪ **Policy EC-1.9:** Require noise studies for land use proposals where known or suspected loud intermittent noise sources occur which may impact adjacent existing or planned land uses. For new residential development affected by noise from heavy rail, light rail, BART or other single-event noise sources, implement mitigation so that recurring maximum instantaneous noise levels do not exceed 50 dBA Lmax in bedrooms and 55 dBA Lmax in other rooms. **Goal EC-2 – Vibration. Minimize vibration impacts on people, residences, and business operations.** ▪ **Policy EC-2.1:** Near light and heavy rail lines or other sources of ground-borne vibration, minimize vibration impacts on people, residences, and businesses through the use of setbacks and/or structural design features that reduce vibration to levels at or below the guidelines of the Federal Transit Administration. Require new development within 100 feet of rail lines to demonstrate prior to project approval that vibration experienced by residents and vibration sensitive uses would not exceed these guidelines. ▪ **Policy EC-2.2:** Require new sources of ground-borne vibration, such as transit along fixed rail systems or the operation of impulsive equipment, to minimize vibration impacts on existing sensitive land uses to levels at or below the guidelines of the Federal Transit Administration. ▪ **Policy EC-2.3:** Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.
San Jose Municipal Code (2017)	The San Jose Municipal Code, codified through Ordinance No. 29912, was last adopted in May 2017. The Code includes the following titles and chapters relevant to noise and vibration: **Chapter 20.100: Administration and Permits** The City of San José does not establish quantitative noise limits for demolition or construction activities occurring in the City. According to San José Municipal Code, the legal hours of construction within 500 feet of a residential unit are limited to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday. The City's Municipal Code also contains a Zoning Ordinance that limits noise levels generated by stand-by/backup and emergency generators. The noise level emitted by these generators shall not exceed 55 decibels at the property line of residential properties. The standards and criteria for stand-by/ backup generators are set as follows: ▪ Maximum noise levels, based upon a noise analysis by an acoustical engineer, will not exceed the applicable noise standards set forth in Title 20.80.2030. ▪ Testing of generators is limited to 7 a.m. to 7 p.m., Monday through Friday.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The Morgan Hill 2035 General Plan was adopted in 2016. The Plan includes the following goals and policies relevant to noise and vibration: **Goal SSI-8. Prevention of noise from interfering with human activities or causing health problems Policies**

Plan/Policy Document	Summary
	▪ **Policy SSI-8.1: Exterior Noise Level Standards.** Require new development projects to be designed and constructed to meet acceptable exterior noise level standards, as follows: ○ Apply a maximum exterior noise level of 60 dBA Ldn in residential areas where outdoor use is a major consideration (e.g., backyards in single-family housing developments and recreation areas in multi-family housing projects). Where the City determines that providing an Ldn of 60 dBA or lower cannot be achieved after the application of reasonable and feasible mitigation, an Ldn of 65 dBA may be permitted. ○ Indoor noise levels should not exceed an Ldn of 45 dBA in new residential housing units. ○ Noise levels in new residential development exposed to an exterior Ldn 60 dBA or greater should be limited to a maximum instantaneous noise level (e.g., trucks on busy streets, train warning whistles) in bedrooms of 50 dBA. Maximum instantaneous noise levels in all other habitable rooms should not exceed 55 dBA. The maximum outdoor noise level for new residences near the railroad shall be 70 dBA Ldn, recognizing that train noise is characterized by relatively few loud events. ▪ **Policy SSI-8.3: Commercial and Industrial Noise Level Standards**. Evaluate interior noise levels in commercial and industrial structures on a case-by-case basis based on the use of the space. ▪ **Policy SSI-8.4: Office Noise Level Standards.** Interior noise levels in office buildings should be maintained at 45 dBA Leq (hourly average) or less, rather than 45 dBA Ldn (daily average). ▪ **Policy SSI-8.5: Traffic Noise Level Standards.** Consider noise level increases resulting from traffic associated with new projects significant if: a) the noise level increase is 5 dBA Ldn or greater, with a future noise level of less than 60 dBA Ldn, or b) the noise level increase is 3 dBA Ldn or greater, with a future noise level of 60 dBA Ldn or greater. ▪ **Policy SSI-8.6: Stationary Noise Level Standards.** Consider noise levels produced by stationary noise sources associated with new projects significant if they substantially exceed existing ambient noise levels. ▪ **Policy SSI-9.3: Sound Wall Design.** The maximum height of sound walls shall be eight feet [. . .]
Morgan Hill Municipal Code (2017)	The Morgan Hill Municipal Code was originally published in 1987. The current code is updated through Ordinance Number 2256 N.S., enacted June 28, 2017. The following sections from Chapter 8.28, Noise, of Title 8, Health and Safety, of the municipal code are applicable to noise and vibration: **8.28.040 - Enumeration of unlawful noises.** Unlawful noises include: **D.1. Construction activities as limited below**. "Construction activities" are defined as including but not limited to excavation, grading, paving, demolition, construction, alteration or repair of any building, site, street or highway, delivery or removal of construction material to a site, or movement of construction materials on a site. Construction activities are prohibited other than between the hours of seven a.m. and eight p.m., Monday through Friday and between the hours of nine a.m. to six p.m. on Saturday. Construction activities may not occur on Sundays or federal holidays. […] **I. Noises Adjacent to Schools, Courts, Churches and Hospitals**. The creation of any excessive noise on any street adjacent to any school, institution of learning, church or court while the same is in use or adjacent to any hospital, which noise

Plan/Policy Document	Summary
	unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital; provided, conspicuous signs are displayed in such streets indicating that the street is adjacent to a school, hospital or court; **J. Pile Drivers, Hammers and Similar Equipment.** The operation, between the hours of eight p.m. and seven a.m. of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist or other appliance, the use of which is attended by loud or unusual noise.
City of Gilroy	
The City of Gilroy 2002-2020 General Plan (2002)	The City of Gilroy 2002-2020 General Plan was adopted in 2002. The Plan includes the following goals and policies relevant to noise and vibration from Chapter 8, Community Resources and Potential Hazards. **GOAL:** Protection of Gilroy residents from exposure to excessive noise and its effects through appropriate mitigation measures and responsive land use planning, especially in regard to noise-sensitive land uses such as schools, hospitals, and housing for seniors. ▪ **Policy 26.02: Maximum Permissible Noise Levels.** Ensure that outdoor and indoor noise levels are within the maximum permitted levels (see Figure A- 27). ▪ **Policy 26.04: Acoustical Design.** Consider the acoustical design of projects in the development review process to reduce noise to an acceptable level. Ensure that noise mitigation features are designed and implemented in an aesthetically pleasing and consistent manner. ▪ **Policy 26.05: Earth Berms.** Require landscaped earth berms as an alternative to soundwalls where feasible to buffer noise along major thoroughfares adjacent to residential areas. Where an earth berm is not feasible, a masonry wall screened with drought tolerant, low maintenance landscaping should be required.
Gilroy Municipal Code (2017)	The Gilroy Municipal Code is current through Ordinance 2017-03, passed in 2017. The Code includes the following chapters relevant to noise and vibration. **Chapter 16, Offences—Miscellaneous** **Section 16.38 Hours of construction** of the Gilroy Municipal Code states the following regarding construction noise: (a) Unless otherwise provided for in a validly issued permit or approval, construction activities shall be limited to the hours of 7 a.m. and 7 p.m., Monday through Friday and 9 a.m. to 7 p.m. on Saturday. Construction activities shall not occur on Sundays or city holidays, which include: New Years Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas. "Construction activities" are defined as including but not limited to, excavation, grading, paving, demolitions, construction, alteration or repair of any building, site, street or highway, delivery or removal of construction material to a site, or movement of construction materials on a site. […] **Chapter 30, Zoning Ordinance** **30.41.31 Specific provisions—Noise.** It shall be unlawful to generate noise within the city limits that exceeds the limits established in this section. (b) Maximum Outdoor Noise Levels. (2) Commercial and Industrial Noise Impacting Residentially Zoned Properties. Noise emanating from properties that are zoned for uses other than residential is limited to a maximum of 70 dBA (L10) measured at the

Plan/Policy Document	Summary
	residential property line. Such noise is limited to the hours of 7 a.m. to 10 p.m., and prohibited between the hours of 10 p.m. and 7 a.m.
San Benito County	
San Benito County 2035 General Plan (2015)	The San Benito County 2035 General Plan was adopted in 2015. The Plan includes the following goals and policies relevant to noise and vibration: **Health and Safety** **Goal HS-8:** To protect the health, safety, and welfare of county residents through the elimination of annoying or harmful noise levels. ▪ **Policy HS-8.1 Project Design.** The County shall require new development to comply with the noise standards shown in the tables in Figure A-29 through proper site and building design, such as building orientation, setbacks, barriers (e.g., earthen berms), and building construction practices. The County shall only consider the use of soundwalls after all design-related noise mitigation measures have been evaluated or integrated into the project or found infeasible. ▪ **Policy HS-8.2 Acoustical Analysis.** The County shall require an acoustical analysis to be performed prior to development approval where proposed land uses may produce or be exposed to noise levels exceeding the "normally acceptable" criteria (e.g. "conditionally acceptable", "normally unacceptable") shown in Table 9-2. Land uses should be prohibited from locating, or required to mitigate, in areas with a noise environment within the "unacceptable" range. ▪ **Policy HS-8.3 Construction Noise.** The County shall control the operation of construction equipment at specific sound intensities and frequencies during day time hours between 7 a.m. and 6 p.m. on weekdays and 8 a.m. and 5 p.m. on Saturdays. No construction shall be allowed on Sundays or federal holidays. ▪ **Policy HS-8.7 Acceptable Vibration Levels.** The County shall require construction projects anticipated to generate a significant amount of vibration to ensure acceptable interior vibration levels at nearby noise-sensitive uses based FTA criteria. ▪ **Policy HS-8.10 Reduction in Noise Levels at Existing Land Uses**. Reduce traffic noise levels where expected to significantly impact sensitive receptors through the installation of noise control measures such as quiet pavement surfaces, noise barriers, traffic calming measures, and interior sound insulation treatments. ▪ **Policy HS-8.12 Construction Noise Control Plans.** Require all construction projects to be constructed within 500 feet of sensitive receptors to develop and implement construction noise control plans that consider the following available controls in order to reduce construction noise levels as low as practical: ○ Utilize 'quiet' models of air compressors and other stationary noise sources where technology exists; ○ Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment; ○ Locate all stationary noise-generating equipment, such as air compressors and portable power generators, as far away as possible from adjacent land uses; ○ Locate staging areas and construction material areas as far away as possible from adjacent land uses; ○ Prohibit all unnecessary idling of internal combustion engines; ○ Notify all abutting land uses of the construction schedule in writing; and ○ Designate a "disturbance coordinator" (e.g. contractor foreman or authorized representative) who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of

Plan/Policy Document	Summary
	the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.
San Benito County Ordinance Code (2016)	The San Benito County Ordinance Code, codified through Ordinance 937, was most recently adopted in 2015. The Code includes Chapter 19.39, Noise Control Regulations, of Title 19, Land Use and Environmental Regulations, relevant to noise and vibration: **Article IV. Sound Level Restrictions** **19.39.030 MAXIMUM PERMISSIBLE SOUND PRESSURE LEVELS.** No person shall operate, or permit to be operated, on private property any source of sound in such a manner as to create: (A) A sound pressure level which exceeds the limits set forth for the receiving land use category in Table 1 [summarized in the following bullets] which may be measured at or within the real property boundary of the receiving land use, or its vertical extension: ▪ Rangeland, Productive Rural Lands, and Rural Transitional -- 45 dBA day and 35 dBA night ▪ Single Family Residential, Residential Multiple, and Planned Unit Development – 50 dBA day, 40 dBA night ▪ Commercial – 65 dBA day and 55 dBA night ▪ Controlled Manufacturing, Light Industrial, and Heavy Industrial – 70 dBA day and 60 dBA night (B) A sound pressure level which exceeds the limits set forth for the receiving land use category in Table A- 5 for more than 15 minutes in 60 minutes which may be measured at or within the real property boundary of the receiving land use, or its vertical extension; or (C) An equivalent A-weighted sound level that exceeds the limits set forth for the receiving land use category in Table A- 5 which may be measured at or within the real property boundary of the receiving land use or its vertical extension. (D) A sound level that exceeds the ambient sound level by 5 dB which may be measured at or within the real property boundary of the receiving land use or its vertical extension.
Frazier Lake Airpark Comprehensive Land Use Plan (2001)	The Frazier Lake Airpark Comprehensive Land Use Plan was adopted by the San Benito County Airport Land Use Commission in 2001. The following compatibility guidelines are relevant to noise and vibration: **4.3.1 Noise Compatibility:** The objective of noise compatibility criteria is to minimize the number of people exposed to frequent and/or high levels of aircraft noise. ▪ The maximum CNEL considered clearly acceptable for residential uses in the vicinity of the Airport is 55 dB CNEL. ▪ Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Table 4-1 presents acceptable noise levels for other land uses in the vicinity of the Airport. ▪ Single-event noise levels should be considered when evaluating the compatibility of highly noise sensitive land uses such as schools, libraries, and outdoor theaters. Single-event noise levels are especially important in the areas regularly overflown by aircraft, but which do not produce significant CNEL contours.

Plan/Policy Document	Summary
Merced County	
2030 Merced County General Plan (2013)	The 2030 Merced County General Plan was adopted in 2013. The Plan includes the following goals and policies relevant to noise and vibration: **Public Facilities and Services** ▪ **Policy PFS-8.7: Incompatible Land Uses near Schools.** Coordinate with school districts to reduce the effects of incompatible land uses and noise adjacent to school facilities. **Health and Safety** **Goal HS-7:** Protect residents, employees, and visitors from the harmful and annoying effects of exposure to excessive noise. ▪ **Policy HS-7.4: New Noise or Groundborne Vibration Generating Uses.** Require new commercial and industrial uses to minimize encroachment on incompatible noise or groundborne vibration sensitive land uses. Also consider the potential for encroachment by residential and other noise or groundborne vibration sensitive land uses on adjacent lands that could significantly impact the viability of the commercial or industrial areas. ▪ **Policy HS-7.5: Noise Generating Activities.** Limit noise generating activities, such as construction, to hours of normal business operation. ▪ **Policy HS-7.9: Transportation Project Construction/Improvements.** Require transportation project proponents to prepare all acoustical analysis for all roadway and railway construction projects in accordance with Policy HS-7.2; additionally, rail projects shall require the preparation of a groundborne vibration analysis in accordance with Policy HS-7.2. Consider noise mitigation measures to reduce traffic and/or rail noise levels to comply with Table HS-1 standards if pre-project noise levels already exceed the noise standards of Table HS-1 and the increase is significant. The County defines a significant increase as follows: ○ Pre-Project Noise Environment of Less than 60 dB – 5+ dB would result in a significant increase ○ Pre-Project Noise Environment of between 60 - 65 dB – 3+ dB would result in a significant increase ○ Pre-Project Noise Environment greater than 65 dB – 1.5+ dB would result in a significant increase ▪ **Policy HS-7.11: Train Whistle Noise.** Support improvements to at-grade crossings in urban areas in order to eliminate the need for train whistle blasts near or within communities.
Merced County Ordinance Code (2016)	The Merced County Ordinance Code is current through Ordinance 1951, passed in 2017. The Code includes Chapter 10.60, Noise Control, of Title 10, Public Health and Safety, relevant to noise and vibration: **10.60.030 Sound level limitations.** A. No person shall cause, suffer, allow, or permit the operation of any sound source on private property in such a manner as to create a sound level that results in any of the following, when measured at or within the real property line of the receiving property: 1. Exceeds the background sound level by at least 10 dBA during daytime hours (7 a.m. to 10 p.m.) and by at least 5 dBA during nighttime hours (10 p.m. to 7 a.m.). The background sound level for purposes of this section shall be determined as set forth in Section 10.60.060; or

Plan/Policy Document	Summary
	2. Exceeds 65 dBA Ldn on residential real property or 70 dBA Ldn on nonresidential real property; or 3. Exceeds 75 dBA Lmax on residential real property or 80 dBA Lmax on nonresidential real property. B. The following are exempt from the sound level limits of Section 10.60.030(A): 5. Noise from construction activity, provided that all construction in or adjacent to urban areas shall be limited to the daytime hours between 7a.m. and 6 p.m., and all construction equipment shall be properly muffled and maintained.

Sources: City of Gilroy 2002a; City of Morgan Hill 2016a; City of San Jose 2011; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994, 2016a; San Benito County Airport Land Use Commission 2001.
Note: Acronyms that are part of policy titles are not defined. They are considered part of the proper noun.
dBA = A-weighted decibel
dB = decibel
SCCC = Santa Clara County Code
DNL = day/night sound level
BART = Bay Area Rapid Transit
Lmax = maximum sound level
PPV = peak particle velocity
SENL = single-event noise level
Ldn = day-night sound level
Leq = sound level equivalent
FTA = Federal Transit Administration
CNEL = community noise equivalent level

Electromagnetic Fields and Electromagnetic Interference

Table 4 Regional and Local Plans and Policies Relevant to Electromagnetic Fields and Electromagnetic Interference

Plans and Policies	Summary
City of Santa Clara	
Santa Clara City Code, Title 12 Chapter 40 Sec 450	▪ This section of the Santa Clara City Code provides the following exception regarding underground utilities for facilities transmitting electric energy in excess of specified voltages and for mass transit conveyances: ▪ Poles, overhead wires, and associated overhead facilities used for the transmission of electric energy with potential difference of more than fifty thousand (50,000) volts or any overhead circuit with a current carrying capacity of four hundred (400) amperes or more at twelve thousand (12,000) volts line to line or direct current facilities used for mass transit conveyances shall be exempt from the provisions of this article.
City of Gilroy	
Gilroy City Code Chapter 30 Article XXXV Subsection 30.35.16.i 2016	▪ The Gilroy City Code includes a number of sections concerning RF EMF and EMI that relate to the HSR project: ▪ A plan for safety/security considerations, consistent with section 30.35.19 (Non-ionizing Electromagnetic Radiation or NIER exposure). A detailed description of the proposed measures to ensure that the public would be kept at a safe distance from any NIER transmission source associated with the proposed wireless communication facility, consistent with the NIER standards of the FCC or any potential future superseding standards, must be submitted as part of the application. The submitted plans must also show that the outer perimeter of the facility site (or NIER hazard zone in the case of rooftop antennas) will be posted with bilingual NIER hazard warning signage that also indicates the facility operator and an emergency contact. The emergency contact shall be someone available on a twenty-four (24) hour a day

Plans and Policies	Summary
	basis who is authorized by the applicant to act on behalf of the applicant regarding an emergency situation. For the protection of emergency response personnel, each wireless communication facility shall have an on-site emergency shut-off switch to de-energize all RF-related circuitry/componentry at the base station site (including a single shut-off switch for all facilities at a co-location site), or some other type of emergency shut-off by emergency personnel acceptable to the local fire chief, unless the applicant can prove that the FCC public exposure limits cannot be exceeded in the vicinity of the proposed facility, even if firefighters or other personnel work in close proximity to the antenna(s) or other RF radiation emitting devices/components
Subsection 30.36.17.f	▪ Compliance with FCC Rules. All telecommunication facilities shall comply at all times with all FCC rules, regulations, and standards
Subsection 30.35.19.a	▪ No telecommunication facility shall be located or operated in such a manner that it poses, either by itself or in combination with other such facilities, a potential threat to public health. To that end, no telecommunication facility or combination of facilities shall produce at any time power densities that exceed the FCC-adopted standard for human exposure, as amended, or any more restrictive standard subsequently adopted or promulgated by the city, county, the State of California, or the federal government
Subsection 30.35.19.b	▪ Initial compliance with this requirement shall be demonstrated for any facility through submission, at the time of application for the necessary permit or entitlement, of NIER (nonionizing electromagnetic radiation calculations) specifying NIER levels where the levels produced are projected to be highest. If these calculated NIER levels exceed eighty percent (80%) of the NIER standard established by this article, the applicant shall hire a qualified electrical engineer licensed by the State of California to measure NIER levels at said location after the facility is in operation. A report of these measurements and the findings with respect to compliance with the established NIER standard shall be submitted to the planning manager. NIER monitoring shall to be conducted utilizing the monitoring protocol described in section 30.35.11. Said facility shall not commence normal operations until it complies with this standard. Proof of said compliance shall be a certification provided by the engineer who prepared the original report. In order to assure the objectivity of the analysis, the city may require, at the applicant's expense, independent verification of the results of the analysis. Because of their intermittent nature, facilities solely for personal use, such as citizens band radio antenna or antenna operated by a federally licensed amateur radio operator as part of the amateur radio service, or for the incidental use of a co-located commercial activity, shall be required to comply with applicable FCC rules for NIER emissions, but they shall be routinely exempt from the submission requirements in this article
Subsection 30.35.19.c	▪ Within ninety (90) days of operation, every telecommunication facility and all broadcast radio and television facilities shall demonstrate continued compliance with the NIER standard established by this article. Every two (2) years a report listing each transmitter and antenna present at the facility and the effective radiated power radiated shall be submitted to the planning manager. If either the equipment or effective radiated power has changed, calculations specifying NIER levels where said levels are projected to be highest shall be prepared. NIER calculations shall also be prepared every time the adopted NIER standard changes. If calculated levels in either of these cases exceed eighty percent (80%) of the standard established by this article, the operator of the facility shall hire a qualified electrical engineer licensed by the State of California to measure the actual NIER levels produced. A report of these calculations, required measurements, if any, and the author's/engineer's findings with respect to compliance with the current NIER standard shall be submitted to the planning manager within ninety (90) days of facility approval and every two (2) years

Plans and Policies	Summary
	thereafter. In the case of a change in the standard, the required report shall be submitted within ninety (90) days of the date said change becomes effective
San Benito County	
San Benito County Code of Ordinances 7.11	▪ The San Benito County Code of Ordinances, passed in 2013, includes the following relevant electromagnetic policies: o 7.11.001: To provide a uniform and comprehensive set of standards for the orderly development, operation and maintenance of wireless telecommunications facilities consistent with applicable federal standards. The standards contained in this chapter are designed to promote public health, safety and welfare and the aesthetic quality of the county as forth in the policies of the general plan. It is also the intent of the county to provide the community with the benefits of this technology without unduly restricting service providers. o 7.11.012: Wireless communications facilities operating alone and in conjunction with other telecommunications facilities shall not generate electromagnetic frequency (EMF) radiation in excess of the guidelines for permissible human exposure to EMF as adopted by the Federal Communications Commission (FCC).
Merced County	
2030 Merced County General Plan (2013)	Merced County adopted the *2030 Merced County General Plan* on December 10, 2013. The general plan includes the following policies: ▪ Policy PFS-5.4: Require mitigation of electrical interference to adjacent land uses in the placement of electrical and other transmission facilities. ▪ Policy PFS-5.7: Coordinate with local gas and electric utility companies in the design and location, and appropriate expansion, of gas and electric systems, while minimizing impacts to agriculture and minimizing noise, electromagnetic, visual, and other impacts on residents.
City of Los Banos	
Los Banos Municipal Code, Title 9, Chapter 3, Article 21	The Los Banos Municipal Code includes the following relevant electromagnetic policy: ▪ Any device which radiates radio frequency energy shall be so operated as not to cause interference with any activity carried on beyond the boundary line of the property upon which the device is located. No radiation of any kind shall be emitted which is dangerous to human beings. (§ 5.25, Ord. 342, as amended by § 182, Ord. 1095, eff. November 20, 2010)

Sources: Merced County 2013a.
ANSI = American National Standards Institute
CPUC = California Public Utilities Commission
EMF = electromagnetic field
EMI = electromagnetic interference
FAA = Federal Aviation Administration
FCC = Federal Communications Commission
HSR = high-speed rail
MPE = Maximum Permissible Exposure
RF = radio frequency
WCF = wireless communication facilities
WTS = wireless telecommunications services

Public Utilities and Energy

Table 5 Regional and Local Plans and Policies Relevant to Public Utilities and Energy

Plan/Policy Document	Summary
Regional	
Plan Bay Area (2017)	▪ The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) adopted Plan Bay Area 2040 on July 26, 2017 as the Bay Area's long-term regional transportation plan and sustainable communities strategy. The document includes the following goals relevant to public utilities and energy: ▪ Target #9a: Increase non-auto mode share by 10 percentage points (to 26 percent of trips). ▪ Climate Initiatives Program. Invest in strategies that reduce transportation-related emissions and vehicle miles traveled and encourage the use of cleaner fuels.
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994. The general plan includes the following goals relevant to public utilities and energy: ▪ Strategy #1: Reduce Transportation Energy Demand and Oil-Dependency o C-RC 79: Energy use and fossil fuel dependency in the transportation sector should be reduced by the following general means: a) Growth management policies and implementation to minimize increases in the extent of the urbanized area and to promote balanced, compact urban development; b) Land use and development standards which support alternative transportation modes; c) Travel demand management and transportation system operational efficiency; expanded transit service; d) Increased availability and use of alternative fuels. o C-RC 80: Sub-regional/countywide planning for Santa Clara County should place major emphasis on the inter-related goals, strategies and policies for improving energy efficiency in transportation, air quality, and reducing traffic congestion. ▪ Strategy #2: Conserve Energy in Residential and Other Sectors o C-RC 81: Energy conservation in existing buildings and homes, particularly those pre-dating adoption of energy-efficiency building code standards, should be improved and encouraged. o C-RC 82: Alternatives to non-renewable energy sources should be encouraged and implemented in the design of new buildings and incorporated in the redesign and reconstruction of older buildings. o C-RC 83: Industrial and agricultural processes should be modified wherever feasible to take advantage of energy savings, to reduce operational costs, and to enhance competitiveness. ▪ Strategy #3: Increase Consumer and General Public Awareness Through Education o C-RC 84: Countywide efforts to promote energy efficiency and conservation awareness should be continued and coordinated through public utilities, community organizations, the educational system, industries, and government. Direction and assistance of local gas and electric utilities should be sought in the development of education programs.

Plan/Policy Document	Summary
Santa Clara Valley Water District 2015 Urban Water Management Plan (2016)	The State of California set a goal of reducing urban water use by 20 percent with adoption of the Water Conservation Act of 2009 (SB X7-7). Retail urban water suppliers are required to determine baseline water use during their baseline period and also target water use for the years 2015 and 2020 in order to help achieve the statewide 20 percent reduction. The *Santa Clara Valley Water District 2015 Urban Water Management Plan* established the following policies to support the state goal: ▪ Policy E-2.1.5: "Maximize water use efficiency, water conservation and demand management opportunities" including BMPs or DMMs. ▪ Water Supply Objective 2.1.1 "…maintain and develop groundwater to optimize reliability…" and in consideration of water shortage management objectives established in the Plan.
Santa Clara County Countywide Integrated Waste Management Plan (1995)	The *Santa Clara County Countywide Integrated Waste Management Plan* was adopted in November 1995. The following goals, objectives, and policies are relevant to public utilities and energy: ▪ Goal #1: The highest priority shall be given to the prevention of waste, and secondary priority to the recycling, composting, and transformation of waste materials. Materials which cannot be recycled or composted shall be landfilled in an environmentally safe and effective manner. New technologies in integrated waste management techniques shall be evaluated and the use of effective methods and technologies shall be encouraged. ▪ Goal #5: Efforts shall be made to reduce the amount and hazard of special wastes generated to maximize recycling, reuse, and composting of special waste generated in the County, and to ensure environmentally safe disposal of the special waste generated which cannot be reused, recycled, or composted. ▪ Objective #1: The Cities and the County will implement an integrated waste management system designated to divert a percentage of the waste stream from landfill disposal. Specifically, the combined jurisdictions of the county will divert at least 25 percent of the 1990 base year materials by 1995, and 50 percent by the year 2000.
City of Santa Clara	
City of Santa Clara General Plan (2014)	The City of Santa Clara adopted the *City of Santa Clara General Plan Housing Element and Land Use Policies* in December 2014. The following policies are relevant to public utilities and energy: ▪ Prerequisite Goal 5.1.1-G 3: Adequate planning and implementation of infrastructure, services, amenities and public facilities for new neighborhoods and intensified development. ▪ Prerequisite Goal 5.1.1-G 4: Development of a multimodal transportation system that reduces the reliance on owning and driving single-occupant vehicles. ▪ Prerequisite Goal 5.1.1-G 5: A balanced community in terms of jobs, housing, supporting infrastructure and public services. ▪ Policy 5.1.1-P 18: Prior to 2023, evaluate the potential effects of climate change trends and identify any available mechanisms to address sea level rise, if any. ▪ Conservation Goal 5.10.1-G 3: Adequate solid waste disposal capacity through effective programs for recycling and composting. ▪ Conservation Goal 5.10.1-G 4: Adequate wastewater treatment and conveyance capacities. ▪ Energy Goal 5.10.3-G 3: Adequate energy service to residents, businesses, and municipal operations.

Plan/Policy Document	Summary
	▪ Water Goal 5.10.4-G 1: A reliable, safe supply of potable water adequate to meet present and future needs.
City of Santa Clara Climate Action Plan (2013)	The City of Santa Clara adopted the *City of Santa Clara Climate Action Plan* in 2013. The Climate Action Plan supports the statewide goal of reducing GHG emissions to 1990 levels by 2020. The Climate Action Plan establishes the following goals and policies relevant to public utilities and energy: ▪ Goal: Maximize the efficient use of energy throughout the community. ▪ Goal: Reduce GHG-intensive water use practices. ▪ Goal: Establish land uses and transportation options that minimize single-occupant vehicle use.

City of Santa Clara Municipal Code (2003, 2017)	The Santa Clara Municipal Code was adopted in 2003, with the most recent update made in 2017. The code includes the following policies relevant to public utilities and energy:
	▪ Title 5, Business Licenses and Regulation, Chapter 5.20.180 Removal or relocation of facilities: Utilities shall remove or relocate without expense to the City any facilities installed, used, or maintained under the franchise when made necessary by any lawful change of grade, alignment, or width of any public street, way, alley, or place, including the construction for or by the City of any subway or viaduct or any other lawful public work of governmental character.
	▪ Title 12, Streets, Sidewalks, and Public Places, Chapter 12.25 Excavation and Use of City Rights-of-Way: An encroachment permit shall be required of any person seeking to use or make cuts, openings or excavations in or under the surface of any public right-of-way or City easement for the repair, installation, removal, or construction of any pipe, conduit, duct, tunnel, vault, wire, cable, utility structure, utility cabinet, or for any other purpose.
	▪ Title 13, Public Services, Chapter 13.05 Operation of an Electric Utility: Under the City Charter the City of Santa Clara owns and operates an electric utility which has the objectives of:
	  ○ Acquire and/or generate electric power;
	  ○ Arrange for the transmission and distribution of such power;
	  ○ Operate and maintain equipment and facilities necessary to provide electric services.

City of San Jose	
Envision San Jose 2040 General Plan (2011)	The City of San Jose adopted the *Envision San Jose 2040 General Plan* in 2011. The following goals are relevant to public utilities and energy: ▪ Goal MS-2: Energy Conservation and Renewable Energy Use—Maximize the use of green building practices in new and existing development to maximize energy efficiency and conservation and to maximize the use of renewable energy sources. ▪ Goal IN-1.10: Require undergrounding of all new publicly owned utility lines. Encourage undergrounding of all privately owned utility lines in new developments. Work with electricity and telecommunications providers to underground existing overhead lines. ▪ Goal CD-1.27: When approving new construction, require the undergrounding of distribution utility lines serving the development. Encourage programs for undergrounding existing overhead distribution lines. Overhead lines providing electrical power to light rail transit vehicles and high tension electrical transmission lines are exempt from this policy.

Plan/Policy Document	Summary
2015 Urban Water Management Plan, San Jose Municipal Water System (2016)	The San Jose Municipal Water System adopted the Urban Water Management Plan in 2016. The plan includes the following Groundwater Basin Management Objectives relevant to public utilities and energy: ▪ Manage groundwater in conjunction with surface water through direct and in-lieu recharge programs to sustain groundwater supplies and to minimize saltwater intrusion and land subsidence. ▪ Implement programs to protect or promote groundwater quality to support beneficial uses. ▪ Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.
San Jose Municipal Code, Title 15, Public Utilities (2018)	The City of San Jose Municipal Code was adopted in 2010 with the most recent update made in 2018. The code establishes the following policies relevant to public utilities and energy: Chapter 15.08 - Municipal Water System ▪ The city will endeavor to supply water dependably and safely in adequate quantities to meet the reasonable needs and requirements of customers. It cannot, however, guarantee complete freedom from interruption. Chapter 15.10 - Water Waste Prevention and Water Shortage Measures ▪ 15.10.200 - Water waste prevention: (A) The regulations in this part are intended to be permanent water conservation measures and to apply to the use of water from all sources on an on-going basis; (B) No person shall waste water from any source nor shall any person allow such water wastage; (C) No person shall use any water from any source, or continue the use of any water from any source, in any way prohibited. ▪ 15.10.260 – Building and construction: No person shall use, permit, or allow the use of potable water for building or construction purposes, such as consolidation of backfill or dust control, without a prior approved written exception from the city.
City of Morgan Hill	
Morgan Hill General Plan (2016)	The City of Morgan Hill adopted the *Morgan Hill General Plan* in 2016. The plan includes the following goals and policies relevant to public utilities and energy: ▪ GOAL NRE -16 Conservation of energy resources. ▪ Policy NRE -15.3 Climate Action Plan. Utilize policies in this General Plan as the City's GHG emissions reduction strategy.
City of Morgan Hill Municipal Code Title 13 (2018)	The City of Morgan Hill Municipal Code was adopted in 2010, with the most recent update made in 2018. The code includes the following policies relevant to public utilities and energy: ▪ Title 13, Public Services ○ Chapter 13.30 - Urban Storm Water Quality Management and Discharge Control includes Chapter 13.30.100 - Prohibition of discharges from industrial or commercial activity. ○ Illegal discharges from industrial/commercial sources into the storm drain system is prohibited unless permitted under a separate NPDES permit or as allowed by BMPs approved by the city public works department. Such discharges include water, cleansers, or solvents from the cleaning of vehicles, machinery or equipment, and other such commercial and industrial operations.

Plan/Policy Document	Summary
City of Morgan Hill Urban Water Management Plan 2015 (2016)	The City of Morgan Hill adopted the Urban Water Management Plan in 2016. The plan includes the following Groundwater Basin Management Objectives relevant to public utilities and energy: ▪ Water suppliers must submit an Urban Water Management Plan to the Department of Water Resources in accordance with California Water Code requirements. The purpose of the Urban Water Management Plan is to implement and maintain the reliability of urban water supplies, ensure that future beneficial use can be complemented by sufficient water supply, continue to promote policies and programs that benefit water conservation, and provide a means for response during water supply shortages and drought conditions. ▪ BMO 1: Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence. ▪ BMO 2: Groundwater is protected from existing and potential contamination, including salt water intrusion.
City of Gilroy	
City of Gilroy General Plan (2002)	The City of Gilroy adopted the General Plan in 2002. The plan includes the following goals and policies relevant to public utilities and energy: ▪ Policy 19.09 - Storm Drain System. Provide and maintain a system of storm drains to protect areas of development from localized flooding. ▪ Policy 19.11 - Undergrounding. Encourage the undergrounding of utilities in older areas, especially when an area is undergoing extensive redevelopment or significant construction. Continue to require the undergrounding of utilities in areas of new development. ▪ Policy 19.01 - Resource Limits. Work with the Santa Clara Valley Water District to ensure that water demand created by new development does not exceed the groundwater supply that can be economically and legally withdrawn from the aquifer on a sustained basis. Restrict groundwater pumping to rates that will not impair groundwater quality or create other environmental damage, such as subsidence. ▪ Policy 19.03 - Sewer, Treatment, and Disposal Capacities. Provide and maintain adequate sewers, wastewater treatment, and treated water disposal capacities to meet the needs of future growth (residential, industrial, and other). ▪ Policy 19.06 - Sewer Connections. Require that new development connect to the City's principal wastewater treatment plant. Require pre-treatment of wastes if necessary, and continue to discourage the development of package treatment plants.
Gilroy Economic Development Strategic Plan (2014)	The City of Gilroy adopted the *Gilroy Economic Development Strategic Plan* on February 19, 2014. The plan includes the following goal relevant to public utilities and energy: ▪ Goal 6: Utilize Key Infrastructure To Support Economic Development Opportunities. The City is incorporating planning for the proposed high-speed rail facility in the New General Plan. High Speed Rail and other projects also provide the potential to add new conduit and fiber through the planning and construction of new infrastructure.

Plan/Policy Document	Summary
Gilroy Strategic Plan 2015→2020→2030 (2015)	The City of Gilroy adopted the *Gilroy Strategic Plan* in March 2015. The plan includes the following goals relevant to public utilities and energy: ▪ Principle 7 - Green City – Environmentally Friendly ○ Item 4. Conserving water resources ○ Item 5. Expanded recycled water system in the City ○ Item 6. Reduced City government and community carbon footprint
City of Gilroy Municipal Code (2018)	The City of Gilroy Municipal Code was adopted in 1969 with the most recent update in 2018. The code includes the following policies relevant to public utilities and energy: ▪ Chapter 19, Sewers and Sewage Disposal § 19.9 Plans, design standards and inspection of sewerage construction ○ Plans for sewerage construction shall meet all design requirements of the Standard Details, Public Works Department Manual and shall also meet the design requirements as established from time to time by the director of public works. ▪ Chapter 26A, Underground Utility Districts § 26A.8 Responsibility of utility companies ○ If underground construction is necessary to provide utility service within a district created by any resolution adopted pursuant to section 26A.3 hereof, the supplying utility shall furnish that portion of the conduits, conductors and associated equipment required to be furnished by it under its applicable rules, regulations and tariffs on file with the commission (Ord. No. 831, § 1, 10-21-68). ▪ Chapter 27A, Water Resources Protection—Guidelines and Standards § 27A.3 Applicability. ○ Regulations for stream protection apply to all properties within a streamside review area. Streamside development is subject to review for applicability of the "Guidelines and Standards for Land Use Near Streams" ratified by the Water Resource Protection Collaborative (2007-11, § 4-16-07). ▪ Chapter 27C, Municipal Storm Water Quality Protection and Discharge Control § 27C.8 Prohibition of discharges from industrial or commercial activity. ○ Illegal discharges from industrial/commercial sources into the storm drain system is prohibited unless permitted under a separate NPDES permit or as allowed by BMPs approved by the city public works department. Such discharges include water, cleansers, or solvents from the cleaning of vehicles, machinery or equipment, and other such commercial and industrial operations.
City of Gilroy Urban Water Management Plan (2016)	The Final Draft of the Urban Water Management Plan for the City of Gilroy was published in May 2016. The purpose of this plan is to implement and maintain the reliability of urban water supplies, ensure that future beneficial use can be complemented by sufficient water supply, continue to promote policies and programs that benefit water conservation, and provide a means for response during water supply shortages and drought conditions. The plan establishes water use targets including a 2020 Urban Water Use Target to reduce water use by 20 percent from the 5-year average per capita water use.

Plan/Policy Document	Summary
San Benito County	
San Benito County 2035 General Plan (2015)	San Benito County adopted the *San Benito County 2035 General Plan* on July 21, 2015. The plan includes the following goals and policies relevant to public utilities and energy: ▪ GOAL PFS -8: To ensure that all areas of the County are provided with gas and electric service and residents and businesses can connect renewable energy facilities to the electric grid. ▪ GOAL NCR -6: To increase energy independence and reduce greenhouse gas emissions through the use of renewable energy sources and improved energy conservation and efficiency.
San Benito County Code of Ordinances (2018)	The San Benito County Code of Ordinances was adopted in 1969 with the most recent update made in 2018. The code includes the following policies relevant to public utilities and energy: ▪ Chapter 15.03. UNDERGROUND UTILITY DISTRICTS § 15.03.026 Responsibility Of Utility Companies o If underground construction is necessary to provide utility service within a district created by any resolution adopted pursuant to § 15.03.021 of this chapter, the supplying utility shall furnish that portion of the conduits, conductors and associated equipment required to be furnished by it under its applicable rules, regulations and tariffs on file with the Commission. ▪ Chapter 15.05. WATER § 15.05.004 Permit Required For Extraction Of Groundwater For Use Off-Parcel o In the unincorporated areas of the county, it is unlawful to extract groundwater of any nature or description, or for a property owner to allow the extraction for the purpose of using the water or selling the water for any use on other than a parcel of land within the sub-basin as described in the San Benito County Water District Annual Groundwater Report upon which the extraction occurs, provided such use does not exceed the safe yield of the sub-basin, without first obtaining a permit. ▪ Chapter 15.05. § 15.05.005 Permit Required For Injection Of Imported Water Into Groundwater Basins Or Aquifers o It is unlawful to inject native surface water or imported water of any nature or description or for a property owner to allow the injection, into a groundwater aquifer without first obtaining a permit.
2015 Hollister Urban Area Urban Water Management Plan (2016)	The Hollister Urban Area covered by the 2015 Urban Water Management Plan is an approximately 20 square mile area comprising all of the incorporated, and some unincorporated county lands, surrounding the City of Hollister. The plan includes the following Groundwater Basin Management Objective relevant to public utilities and energy: ▪ Implement Water Shortage Contingency Plan to reduce water demand by more than 25 percent to meet the state mandated water use reduction, including Demand Management Measures.

Plan/Policy Document	Summary
Merced County	
2030 Merced County General Plan (2013)	Merced County adopted the *2030 Merced County General Plan* on December 10, 2013. The plan includes the following goals and policies relevant to public utilities and energy: ▪ Goal PFS-1: Ensure adequate funding for new, expanded, and upgraded public facilities and services. ▪ Policy PFS-1.1: Determine the acceptable minimum level for the efficient delivery and funding of essential County services. ▪ Goal W-2: Ensure the adequate wastewater collection, treatment, and disposal within the County. ▪ Goal PFS-3: Ensure the management of stormwater in a safe and environmentally sensitive manner through the provisions of adequate storm drainage facilities that protect people, property, and the environment. ▪ Goal PFS-4: Ensure the safe and efficient disposal and recycling of solid and hazardous waste generated in the County. ▪ Goal PFS-5: Ensure the provision of adequate utilities to the residents of Merced County. ▪ Policy PFS-5.1: Encourage the provision of adequate gas and electric, communications, and telecommunications service and facilities to serve the needs of existing and future residents and businesses. ▪ Policy PFS-5.3: Encourage new transmission and distribution lines to be sited within existing utility easements and right-of-ways or utilize joint-use of easements among different utilities to avoid impacting existing communities. ▪ Policy PFS-5.4: Require mitigation of electrical interference to adjacent land uses in the placement of electrical and other transmission facilities. ▪ Policy PFS-5.6: Require power transmission and distribution facilities to be located underground within urban communities and residential centers. ▪ Policy PFS-5.7: Coordinate with local gas and electric utility companies in the design and location, and appropriate expansion of gas and electric systems, while minimizing impacts to agriculture and minimizing noise, electromagnetic, visual, and other impacts on residents. ▪ Goal NR-2: Provide adequate and efficient energy supplies by increasing renewable energy production and energy conservation. ▪ Policy NR-2.1: Promote the development and use of renewable energy resources to reduce dependency on petroleum-based energy sources. ▪ Policy NR-2.2: Encourage new electricity providers to use only clean alternative energy sources (e.g., solar, thermal, wind).
Merced Integrated Regional Water Management Plan (2013)	Merced County adopted the *Merced Integrated Regional Water Management Plan* in November 2013. The plan includes the following objectives relevant to public utilities and energy: ▪ Objective B: Meet demands for all uses, including agriculture, urban, and environmental resource needs. ▪ Objective E: Maximize water use efficiency.

Plan/Policy Document	Summary
Merced County Storm Water Management Program (2007)	Merced County adopted the *Merced County Storm Water Management Program* in April 2007. The program includes the following objectives relevant to public utilities and energy: ▪ Objective: Detect and eliminate illicit discharges to the storm sewer system. ▪ Objective: Reduce pollutants in storm water runoff from construction sites. ▪ Objective: Reduce pollutants in post-construction storm water runoff from new and redevelopment.
City of Los Banos	
City of Los Banos 2030 General Plan Update (2009)	The City of Los Banos adopted the *Los Banos 2030 General Plan Update* in 2009. The plan includes the following policy relevant to public utilities and energy: ▪ POSR-I-42 Support federal and State efforts to reduce greenhouse gasses and emissions through local action that will reduce motor vehicle use, support alternative forms of transportation, require energy conservation in new construction, and energy management in public buildings.

Sources: ABAG and MTC 2017; City of Gilroy 2002a, 2014a, 2015, 2016; City of Los Banos 2009; City of Morgan Hill 2016a, 2016b, 2018; City of San Jose 2011; City of Santa Clara 2013, 2014; County of Merced 2007, 2013a, 2013b; County of San Benito 2015a; County of Santa Clara 1994, 1995a; San Benito County Water District et al. 2016; San Jose Municipal Water Systems 2016; Santa Clara Valley Water District 2016a.
VMT = vehicle miles traveled
SB = Senate Bill
BMP = best management practices
DMMs = Demand Management Measures
GHG = greenhouse gas
NPDES = National Pollutant Discharge Elimination System

Biological and Aquatic Resources

Table 6 Regional and Local Plans and Policies Relevant to Biological and Aquatic Resources

Policy Title	Summary
Santa Clara County	
Santa Clara County General Plan, 1995-2010 and *General Plan Updates* (County of Santa Clara 1994, 2015)	The Santa Clara County General Plan addresses biological resources under the Habitat & Biodiversity section of the Resource Conservation Chapter. The general plan policies are framed under four organizing strategies. Each strategy and the policies relevant to the project extent are as follows: ▪ Strategy 1: Improve Current Knowledge and Awareness of Habitats and Natural Areas *[No applicable policies]* ▪ Strategy 2: Protect the Biological Integrity of Critical Habitat Areas ▪ Policy C-RC 30: Habitat and other resource areas not suitable or intended for urbanization should be excluded from urbanization, and non-urban development which occurs within resource conservation areas should minimize impacts upon habitat and biodiversity. ▪ Policy C-RC 32: Land uses permitted in resource conservation areas should not be allowed to degrade the integrity of natural habitat. ▪ Policy C-RC 33: Linkages and corridors between habitat areas should be provided to allow for migration and otherwise compensate for the effects of habitat fragmentation.

Policy Title	Summary
	▪ Strategy 3: Encourage Habitat Restoration Areas *[No applicable policies]* ▪ Strategy 4: Evaluate Effectiveness of Environmental Mitigations ▪ Policy C-RC 36: Specific project mitigations for the purpose of preserving habitat should be monitored for a period of time to assure the likelihood of their effectiveness. The Santa Clara County General Plan addresses historical and specimen trees (protected trees) under the Heritage Resources section of the Resource Conservation Chapter. The general plan policies are framed under three basic strategies, but only one strategy and one policy apply to biological resources (protected trees). The strategy and policy relevant to protected trees in the project extent are as follows: ▪ Strategy 2: Prevent or Minimize Adverse Impacts on Heritage Resources ▪ Policy C-RC 52: Prevention of unnecessary losses to heritage resources should be ensured as much as possible through adequate ordinances, regulations, and standard review procedures. Mitigation efforts, such as relocation of the resource, should be employed where feasible when projects will have significant adverse impact upon heritage resources. The Santa Clara County General Plan also addresses biological resources under the Resource Conservation chapter of Part 3 of the General Plan in Book B, which addresses Rural Unincorporated Area Issues & Policies. ▪ Policy R-RC 43: Large scale grading and clearing of land should not be allowed if it will significantly degrade valuable habitat or impair surface water quality. ▪ Policy R-RC 47: Impacts from new development on woodland habitats should be minimized by encouraging: a. clustering of development to avoid critical habitat areas, where clustering is permitted; b. inclusion of important habitat within open space areas for project requiring open space dedication; c. siting and design of roads, utility corridors and other infrastructure to avoid fragmentation of habitat; and d. acquisition or avoidance of critical habitat areas. ▪ Policy R-RC 51: Preservation of habitat linkages and migration corridors should be encouraged where needed to allow for species migration, prevent species isolation, and otherwise compensate for the effects of habitat fragmentation. ▪ Policy R-RC 52: For rural area development proposals subject to open space dedication requirements and adjacent to other open space lands, the County shall encourage project design which maximizes the contiguity of undeveloped, open space areas, reducing fragmentation of habitat. ▪ Implementation R-RC(i) 17: Utilize updated mapping and information on natural areas and habitats to identify and assess the potential need for maintaining migration corridors and habitat linkages. The Santa Clara County General Plan also addresses land uses relevant to biological resources under the Land Use chapter of Part 3 of the General Plan in Book B, which addresses Rural Unincorporated Area Issues & Policies.

Policy Title	Summary
	▪ Policy R-LU 28: For all uses allowed in Hillsides areas other than agricultural and single-family residential land uses, open space preservation by means of easement dedication may be required in order to: a. protect the public health, safety and general welfare; b. prevent or mitigate potentially significant adverse environmental impacts; and/or c. to create perimeter areas that adequately buffer neighboring properties from adverse off-site impacts of the proposed land use. ▪ Policy R-LU 79: New public transportation facilities shall be compatible with the land uses in the areas in which they are located and consistent with the County's General Plan.
Santa Clara County Code of Ordinances, Title C—Construction, Development and Land Use, Division C16, Tree Preservation and Removal (Santa Clara County Code & Municipal Code Corporation, 1998–2006)	This code of ordinance for tree preservation and removal states that the county preservation of all trees in private and public property is necessary to provide habitat to a variety of wildlife species. The Santa Clara County Municipal Code regulates the protection, maintenance, removal and planting of trees, including heritage trees. **Definitions** A protected tree shall consist of any of the following: (a) Any tree having a main trunk or stem measuring 37.7 inches or greater in circumference (12 inches or more in diameter) at a height of 4.5 feet above ground level, or in the case of multi-trunk trees a total of 75.4 inches in circumference (24 inches or more of the diameter) of all trunks in the following areas of the County: (1) Parcels zoned "Hillsides" (three acres or less); (2) Parcels within a "-d" (Design Review) combining zoning district; (3) Parcels within the Los Gatos Hillside Specific Plan Area. (b) Any tree within the "-h1" Historic Preservation zoning district for New Almaden having a main trunk or stem measuring six inches or more in diameter (18.8 inches or greater in circumference) at a height of 4.5 feet above ground level, or in the case of multi-trunk trees, a total of 12 inches in diameter (37.7 inches in circumference) of all trunks at 4.5 feet above ground. For parcels having a base zoning district of "HS, Hillside" within the "-h1" combining zoning district, this provision supersedes C16-3(a)(1). (c) Any heritage tree. (d) Any tree required to be planted as a replacement for an unlawfully removed tree. (e) Any tree that was required to be planted or retained by the conditions of approval for any use permit, building site approval, grading permit, architectural and site approval, design review, special permit or subdivision. (f) On any property owned or leased by the County, any tree which measures over 37.7 inches in circumference (12 inches or more in diameter) measured 4.5 feet above the ground, or which exceeds 20 feet in height. (g) Any tree, regardless of size, within road rights-of-way and easements of the County, whether within or without the unincorporated territory of the County. *Heritage Tree*: "any tree which, because of its history, girth, height, species, or other unique quality, has been recommended for inclusion on

Policy Title	Summary
	the heritage resource inventory by the Historical Heritage Commission and found by the Board of Supervisors to have special significance to the community, and which has therefore been included in the heritage resource inventory adopted by resolution of the Board of Supervisors." *Prune*: "to trim or cut away any limbs or branches of a tree which will not adversely impair the health of the tree." *Remove*: "Remove and removal shall include cutting down, burning, poisoning, or otherwise diminishing the vigor of or destroying a tree, as well as adversely pruning or topping a tree." **Permits** Except as otherwise provided below in Section C16-4 (Exceptions), it shall be unlawful for any person to remove any protected tree on any private or public property in designated areas of the County without having first obtained an administrative permit from the County Planning Office or an encroachment permit from the Department of Roads and Airports. Where the tree in question has been designated as a heritage tree, all applications for a tree removal permit shall be forwarded to the County Historical Heritage Commission (HHC) by the Planning Office. A site visit may be conducted by representatives of the HHC and a written opinion from an arborist, forester, or other expert may be required to evaluate the status of the tree. … Permit Applications (Sec. C16-7). Any person desiring to remove any tree regulated herein shall file an application with the County Planning Office for an administrative permit not less than ten days prior to the date of such planned removal. In the case of heritage trees, such application must be made not less than 90 days prior to the date of the planned removal, following the hearing procedures set forth in Section C16-12 and Section C16-13 below. Any application for a special permit or use permit for tree cutting shall be filed in accordance with procedures set forth in Chapters 5.60 and 5.65 of the County Zoning Ordinance. Removal of any tree, regardless of size, located within a County road right-of-way shall require an encroachment permit from the Department of Roads and Airports not less than 60 days prior to planned removal... In addition to standard information required as part of all applications for administrative permits, special permits, use permits or encroachment permits, the following information shall be included in such applications for tree removal: (a)A brief statement of the reasons for removal of the tree. (b)A photograph of the tree(s) proposed for removal. (c)A description of the method to be used in the removal of the tree(s). Applicant should demonstrate that good harvesting practices will be used. (d)A tree survey (map) with the accurate location, number, species, size (diameter measured 4.5 feet above ground, approximate height, and approximate canopy diameter), general health, and approximate age, if known, of the tree or trees in question. (e)A replanting and/or re-vegetation plan for all trees to be removed. Replacement trees shall be of a like kind and species of tree removed, if native and feasible, or of a kind and species to be determined by the Planning Department. The location of the replacement tree(s) need not be in the same location of the tree removed. Replacement tree planting shall

Policy Title	Summary
	utilize at least five-gallon size stock. The ratio of trees removed to trees planted shall be determined by the Planning Department. An erosion control plan may also be required where deemed appropriate by County staff. … (Ord. No. NS-1203.107, § 1, 2-11-97; Ord. No. NS-1200.318, § 30, 3-28-06) … Criteria for Permit Approval (Sec. C16-11). The Planning Office or any other person or body charged with determining whether to grant, conditionally grant or deny an administrative permit, special permit, use permit, or encroachment permit for tree removal shall take into account the following factors in determining what action to take upon the permit application: … (b)The potential impact the removed tree or trees may have upon adjacent trees (i.e. increased windthrow). Where appropriate, removal may necessitate an assessment of potential impacts upon adjacent trees by a certified arborist or forester, along with the development of mitigations to lessen such impacts. … (d)The topography of the land and the effect of the proposed tree removal upon erosion, soil retention, and the diversion or increased flow of sediment. (e)The number, species, size, and location of existing trees in the area, and the effect the proposed removal would have upon shade, privacy impact, scenic beauty, and property values of the area. … (Ord. No. NS-1203.107, § 1, 2-11-97)
City of Santa Clara	
City of Santa Clara 2010-2035 General Plan (City of Santa Clara 2010)	The City of Santa Clara General Plan policies applicable to biological resources are described in the Conservation Goals and Policies Section in the Goals and Policies Chapter. Applicable goals and policies are as follows: ▪ Goal 5.10.1-G1: The protection of fish, wildlife and their habitats, including rare and endangered species. ▪ Goals 5.10.1-G2: Conservation and restoration of riparian vegetation and habitat. ▪ Policy 5.10.1-P1: Require environmental review prior to approval of any development with the potential to degrade the habitat of any threatened or endangered species. ▪ Policy 5.10.1-P2: Work with Santa Clara Valley Water District and require that new development follow the “Guidelines and Standards for Lands Near Streams” to protect streams and riparian habitats. ▪ Policy 5.10.1-P3: Require preservation of all City-designated heritage trees listed in the Heritage Tree Appendix 8.10 of the General Plan. ▪ Policy 5.10.1-P4: Protect all healthy cedars, redwoods, oaks, olives, bay laurel and pepper trees of any size, and all other trees over 36

Policy Title	Summary
	inches in circumference measured from 48 inches above-grade on private and public property as well as in the public right-of-way. ▪ Policy 5.10.1-P5: Encourage enhancement of land adjacent to creeks in order to foster the reinstatement of natural riparian corridors where possible.
Santa Clara Tree and Shrub Removal Ordinance (City of Santa Clara 2017)	Chapter 12.35 of the City of Santa Clara Municipal Code prohibits the removal or alteration of trees, plants, or shrubs within a street or public place without a written permit from the superintendent of streets and establishes penalties for noncompliance. Additionally, the City's Design Guidelines require that mature trees that are proposed to be removed be replaced on-site to the extent feasible at a 1:1 ratio with a 24-inch or 36-inch box specimen tree.
City of San Jose	
City of San Jose 2040 General Plan (City of San Jose 2011)	The City of San Jose General Plan policies applicable to biological resources are described under Natural Resources with the overarching goal that "The City should balance resource conservation and urban development to maximize achievement of environmental, economic and social objectives." Applicable policies are subdivided by habitat and species as follows: ▪ Woodlands, Grasslands, Chaparral, and Scrub Goal: Protect the biological diversity and scenic characteristics of grasslands, woodlands, chaparral, and scrub in hillside areas. ▪ Policy 3: The City should cooperate with other agencies in the preservation of hillside vegetation. ▪ Policy 4: Grading should be designed to minimize the removal of significant vegetation. ▪ Policy 8: Serpentine grasslands, particularly those supporting sensitive serpentine bunchgrass communities of plant and animal species of concern, should be preserved and protected to the greatest extent feasible. When disturbance cannot be avoided, appropriate measures should be required to restore, or compensate for loss of serpentine bunchgrass communities or habitat of species of concern. ▪ Wetlands Goal: Preserve, protect, and restore riparian corridors and upland wetlands within the City of San Jose's Sphere of Influence. ▪ Policy 1: Creeks and natural riparian corridors and upland wetlands should be preserved whenever possible. ▪ Policy 2: New public and private development adjacent to riparian corridors should be consistent with the provisions of the Riparian Corridor Policy Study. ▪ Policy 3: New development within the Urban Service Area should be set back from the outside edge of riparian habitat (or top of bank, whichever is greater) a distance sufficient to buffer the impacts of adjacent human activities and provide avenues for wildlife dispersal. ▪ Policy 4: New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise and toxic substances into the riparian zone. ▪ Policy 5: When disturbances to riparian corridors and upland wetlands cannot be avoided, appropriate measures should be required to restore, or compensate for damage to the creeks or riparian corridors.

Policy Title	Summary
	▪ Policy 8: Natural riparian corridors outside the Urban Service Area should be protected from disturbance associated with development (such as structures, roadways, sewage disposal facilities and overhead utility lines, except those required for flood control or bridging) by a minimum 150-foot setback from the top bank line, wherever feasible. ▪ Species of Concern Goal: Preserve habitat suitable for Species of Concern, including threatened and endangered species. ▪ Policy 2: Habitat areas that support Species of Concern should be retained to the greatest extent feasible. ▪ Policy 3: Recreational uses in wildlife refuges, nature preserves, and wilderness areas in parks should be limited to those activities which have minimal impact on sensitive habitats. ▪ Policy 4: New development on undeveloped properties throughout the City contributes to the regional loss of Burrowing Owl habitat. To offset this loss of habitat, the City should require either habitat preservation on- or off-site or other appropriate measures for habitat acquisition, habitat enhancement, and maintenance of local habitat bank.
City of San Jose Planning, Building & Code Enforcement – Tree Removal (City of San Jose 2017)	A permit is needed if the tree is: ▪ a street tree; ▪ a heritage tree; ▪ an ordinance-size tree, live or dead; or ▪ any tree located on multifamily, commercial, industrial, or mixed use property or in a common area. **Street Trees** Street trees are those located in the public right-of-way between the curb and sidewalk; in some locations, the public right-of-way may be up to 12 feet from the curb. The City's Department of Transportation (DOT) provides no-cost permits for pruning street trees and oversees their removal. It is illegal to prune or remove a street tree without a permit; fines up to $15,000 per tree may apply. **Heritage Trees** The City's Heritage Tree List identifies over 100 trees with special significance to the community because of their size, history, unusual species, or unique quality. This list is updated from time to time to add or delete certain trees. Pursuant to Chapter 13.28 of the San Jose Municipal Code, it is illegal to prune or remove a heritage tree without first consulting the City Arborist and obtaining a permit; fines up to $30,000 per tree may apply. **Ordinance-Size Trees** An ordinance-size tree on private property is either: Single Trunk - 56 inches or more in circumference at 2 feet above ground; or Multi-trunk - The combined measurements of each trunk circumference (at 2 feet above ground) add up to 56 inches or more. For multifamily residences, commercial properties, and industrial properties, a permit is required for the removal of trees of any size. For trees on these properties, a Tree Removal Permit is required if the tree is ordinance sized, or a Permit Adjustment is required if the tree is smaller than ordinance sized.

Policy Title	Summary
City of Morgan Hill	
Morgan Hill General Plan (City of Morgan Hill 2016)	The City of Morgan Hill General Plan policies applicable to biological resources are described under the general plan's Open Space and Conservation element. Applicable policies under that element are sole within the goal for "Plants and Wildlife" as follows: ▪ Policy 6a: Preserve all fish and wildlife habitats in their natural state whenever possible. Consider development impacts upon wildlife and utilize actions to mitigate those environmental impacts. ▪ Policy 6b: Minimize impacts upon wildlife when considering extending annexations, urban service areas, and other governmental actions that permit urban development of previously undeveloped property. ▪ Policy 6c: Preserve outstanding natural features, such as the skyline of a prominent hill, rock outcroppings, and native or historically significant trees. ▪ Policy 6d: Development will be designed to conserve soil and avoid erosion. ▪ Policy 6e: Identify and protect wildlife, rare and endangered plants and animals, and heritage resources from loss and destruction. ▪ Policy 6f: Access to creeks should be of sufficient width to accommodate trails, flood control access, and protection of riparian habitat. ▪ Policy 6g: Encourage use of native plants, especially drought-resistant species, in landscaping to the extent possible.
City of Morgan Hill Tree Removal Policy (City of Morgan Hill 2017)	**Tree Removal** Some trees in the city are protected as significant trees by the municipal code. It is unlawful for any person to cut down, remove, poison, or otherwise kill or destroy, or cause to be removed any significant tree or community of trees on any city or private property without a permit. Significant trees on residential properties include all indigenous species having a circumference of 18 inches or more measured at 4.5 feet vertically above the ground or immediately below the lowest branch, whichever is lower. All street trees, regardless of the type of tree are considered to be significant trees. An approved tree removal permit is required to remove any significant tree.
City of Gilroy	
City of Gilroy 2020 General Plan (City of Gilroy 2002)	The City of Gilroy's General Plan policies applicable to biological resources are described under the general plan's Open Space and Habitat Areas Goal. The goal states "[p]reservation, protection, and maintenance of Gilroy's natural open space resources (including creeks, meadows, hills, woodlands, and vistas) for their watershed protection, habitat preservation, recreation, and aesthetic value, ensuring that they retain their natural qualities and beauty in perpetuity." Applicable policies to achieve that goal are as follows: ▪ Policy 20.02-Creek Protection: Protect the ecological, aesthetic and recreation value of the creeks that flow through the Gilroy Planning Area from urban encroachment and degradation. Ensure that new development preserves the function of natural drainages, including small canyons and seasonal creeks. The easements and setbacks

Policy Title	Summary
	adjacent to these creeks will be maintained in open space. Access to creeks should be of sufficient width to accommodate trails, flood control access, and protection of riparian habitat. ▪ Policy 20.03-Plant and Wildlife Habitats: Preserve important plant and wildlife habitats, including riparian communities, heavily vegetated hillside areas, unique hillside ecosystems (e.g., serpentine barrens), creeks, and sensitive nesting sites. Loss of these habitats should fully offset through creation of habitat of equal value, with the compensation rate for habitat creation determines by a qualified biologist. ▪ Policy 20.04-Rare and Endangered Species: Limit development in areas that support the California Tiger Salamander and other rare or endangered species. If development of these areas must occur, any loss of habitat should be fully compensated on-site. Off-site mitigation, if necessary, should occur within the Gilroy Planning Area whenever possible, and must be accompanied by plans and a monitoring program prepared by a qualified biologist. ▪ Policy 20.09-Preservation in Perpetuity: When open space easements, dedications or other land preservation measures are required as a condition of project approval, ensure that dedicated lands are preserved in perpetuity.
San Benito County	
San Benito County 2035 General Plan (San Benito County 2015)	The Natural and Cultural Resources Element addresses management and conservation of biological resources in San Benito County. The following goals relate to the proposed project: ▪ NCR-1.1 - Maintenance of Open Space: The County shall support and encourage maintenance of open space lands that support natural resources, agricultural resources, recreation, tribal resources, wildlife habitat, water management, scenic quality, and other beneficial uses. ▪ NCR-1.2 - Conservation Easements: The County shall support and encourage the use of conservation easements to protect open space that contains valuable natural resources. ▪ NCR-2.4 - Maintain Corridors for Habitat: The County shall protect and enhance wildlife migration and movement corridors to ensure the health and long-term survival of local animal and plant populations, in particular contiguous habitat areas, in order to increase habitat value and lower land management costs. As part of this effort, the County shall require road and development sites in rural areas to: (a.) Be designed to maintain habitat connectivity with a system of corridors for wildlife or plant species and avoiding fragmentation of open space areas; and (b.) Incorporate measures to maintain the long-term health of the plant and animal communities in the area, such as buffers, consolidation of/or rerouting access, transitional landscaping, linking nearby open space areas, and habitat corridors. ▪ NCR-2.5 - Mitigation for Wetland Disturbance or Removal: The County shall encourage the protection of the habitat value and biological functions of oak woodlands, native grasslands, riparian and aquatic resources, and vernal pools and wetlands. The County shall require that development avoid encroachment and require buffers around these habitats to the extent practicable. The County shall further require mitigation for any development proposals that have the potential to reduce these habitats. Recreational trails and other features established

Policy Title	Summary
	within natural wetlands and aquatic and riparian buffer areas shall be, as long as such areas are not required to meet the Americans with Disabilities Act, located along the outside of the sensitive habitat whenever possible to minimize intrusions and maintain the integrity of the habitat. In all cases where intrusions into these buffers are made, only the minimum amount of vegetation necessary to construct the feature shall be removed. ▪ NCR-2.7 - Mitigation of Oak Woodlands: The County shall encourage development near oak woodlands to be clustered to avoid, where technically or economically practical, the loss of heritage oak trees. The County shall require transitional buffers to help maintain viable ecosystems where appropriate. Where removal of trees cannot be avoided, the County shall require project applicants to prepare a mitigation plan that identifies on- or off-site tree replacement. ▪ NCR-2.8 - Pre-Development Biological Resource Assessment: The County shall require the preparation of biological resource assessments for new development proposals as appropriate. The assessment shall include the following: a biological resource inventory based on a reconnaissance-level site survey, and an analysis of anticipated project impacts to: potentially occurring special-status species (which may require focused special-status plant and/or animal surveys); an analysis of sensitive natural communities; wildlife movement corridors and nursery sites on or adjacent to the project site; potentially jurisdictional wetlands/waterways; and locally protected biological resources such as trees. The assessment shall contain suggested avoidance, minimization, and/or mitigation measures for significant impacts to biological resources. ▪ NCR-2.9 - Mitigation Funding and Site Protection: The County shall require that project applicants demonstrate that adequate funding can be provided to implement all required biological mitigation and monitoring activities. Habitat preserved as part of any mitigation and monitoring plan shall be preserved through a conservation easement, deed restriction, or other method to ensure that the habitat remains protected. ▪ NCR- 2.10 - Invasive Species: The County shall require that new developments avoids the introduction or spread of invasive plant species during construction by minimizing surface disturbance, seeding and mulching disturbed areas with certified weed-free native mixes, and using native or noninvasive species in erosion control plantings.
Merced County	
Merced County 2030 General Plan, Natural Resources Element (County of Merced 2013)	The Natural Resources Element addresses protection, preservation, and enhancement of biological resources in Merced County. The following policies relate to the proposed project: ▪ Policy NR-1.1: Habitat Protection: Identify areas that have significant long-term habitat and wetland values, including riparian corridors, wetlands, grasslands, rivers and waterways, oak woodlands, vernal pools, and wildlife movement and migration corridors, and provide information to landowners. ▪ Policy NR-1.2: Protected Natural Lands: Identify and support methods to increase the acreage of protected natural lands and special habitats, including wetlands, grasslands, vernal pools, and wildlife movement

Policy Title	Summary
	and migration corridors, potentially through the use of conservation easements. ▪ Policy NR-1.4 Important Vegetative Resource Protection: Minimize the removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion, and sedimentation. ▪ Policy NR-1.5 Wetland and Riparian Habitat Buffer: Identify wetlands and riparian habitat areas and designate a buffer zone around each area sufficient to protect them from degradation, encroachment, or loss. ▪ Policy NR-1.6: Terrestrial Wildlife Mobility: Encourage property owners within or adjacent or designated habitat connectivity corridors that have been mapped or otherwise identified by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service to manage their lands in accordance with such mapping programs. ▪ Policy NR-1.8: Use of Native Plant Species for Landscaping: Encourage the use of native plant species in landscaping, and, where the County has discretion, require the use of native plant species for landscaping. ▪ Policy NR-1.10: Aquatic and Waterfowl Habitat Protection: Cooperate with local, state, and federal water agencies in their efforts to protect significant aquatic and waterfowl habitats against excessive water withdrawals or other activities that would endanger or interrupt normal migratory patterns or aquatic habitats. ▪ Policy NR-1.11: On-Going Habitat Protection and Monitoring: Cooperate with local, state, and federal agencies to ensure that adequate on-going protection and monitoring occurs adjacent to rare and endangered species habitats or within identified significant wetlands. ▪ Policy NR-1.12: Wetland Avoidance: Avoid or minimize loss of existing wetland resources by careful placement and construction of any necessary new public utilities and facilities, including roads, railroads, high-speed rail, sewage disposal ponds, gas lines, electrical lines, and water/wastewater systems. ▪ Policy NR-1.13: Wetland Setbacks: Require an appropriate setback, to be determined during the development process, for developed and agricultural uses from the delineated edges of wetlands. ▪ Policy NR-1.17: Agency Coordination: Consult with private, local, state, and federal agencies to assist in the protection of biological resources and prevention of degradation, encroachment, or loss of resources managed by these agencies. ▪ Policy NR-1.20: Conservation Easements: Encourage property owners to work with land trusts and state and federal agencies to pursue voluntary conservation easements. ▪ Policy NR-1.21: Special-Status Species Surveys and Mitigation: Incorporate the survey standards and mitigation requirements of state and federal resource management agencies for use in the County's review processes for both private and public projects.

Sources: City of Gilroy 2002a; City of Morgan Hill 2016a, 2017; City of San Jose 2011, 2017; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994, 2015.

Hydrology and Water Resources

Table 7 Regional and Local Plans and Policies Relevant to Hydrology and Water Resources

Plan/Policy Document	Summary
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994. The general plan includes the following goals and policies relevant to hydrology and water resources: Resource Conservation ▪ C-RC 2: The County shall provide leadership in efforts to protect or restore valuable natural resources, such as wetlands, riparian areas, and woodlands, and others: a. for County-owned lands; and b. through multi-jurisdictional endeavors. ▪ C-RC 18: Water quality countywide should be maintained and improved where necessary to ensure the safety of water supply resources for the population and the preservation of important water environments and habitat areas. ▪ C-RC 19: The strategies for maintaining and improving water quality on a countywide basis, in addition to ongoing point source regulation, should include: a. effective non-point source pollution control; b. restoration of wetlands, riparian areas, and other habitats which serve to improve Bay water quality; and c. comprehensive Watershed Management Plans and "best management practices" (BMPs). ▪ C-RC 20: Adequate safeguards for water resources and habitats should be developed and enforced to avoid or minimize water pollution of various kinds, including: a. erosion and sedimentation; b. organic matter and wastes; c. pesticides and herbicides; d. effluent from inadequately functioning septic systems; e. effluent from municipal wastewater treatment plants; f. chemicals used in industrial and commercial activities and processes; g. industrial wastewater discharges; h. hazardous wastes; and i. non-point source pollution. ▪ C-RC 22: Countywide, compliance should be achieved with the requirements of the National Pollution Discharge Elimination System (NPDES) permit for discharges into S.F. Bay, and to that end, the Countywide Nonpoint Source Pollution Control Program should receive the full support and participation of each member jurisdiction. ▪ C-RC 34: Restoration of habitats should be encouraged and utilized where feasible, especially in cases where habitat preservation and flood control, water quality, or other objectives can be successfully combined. Safety and Noise ▪ C-HS 28: Countywide strategies for reducing the threat of natural hazards to life and property should include: a. Inventory hazards and monitor changing conditions. b. Minimize the resident population within high hazard areas. c. Design, locate and regulate development to avoid or withstand hazards. d. Reduce the magnitude of the hazard, if feasible. e. Provide public information regarding natural hazards. ▪ C-HS 33: Development in areas of natural hazards should be designed, located, and otherwise regulated to reduce associated risks, by regulating the type, density, and placement of development where it will not: a. be directly jeopardized by hazards; b. increase hazard potential; and c. increase risks to neighboring properties. ▪ C-HS 34: Flood control measures should be considered part of an overall community improvement program and advance the following goals, in addition to

Plan/Policy Document	Summary
	flood control: a. resource conservation; b. preservation of riparian vegetation and habitat; c. recreation; and d. scenic preservation of the county's streams and creeks ▪ C-HS 42: The long-term viability and safety of underground aquifers and groundwater systems countywide shall be protected to highest degree feasible. ▪ C-HS 44: All new on-site wastewater treatment systems should be located only in areas where: a. there is reasonable assurance that they will function well over a long period; b. they can be designed to have a minimum negative impact on the environment; and c. they will not contaminate wells, groundwater or surface water. ▪ C-HS 45: On-site wastewater treatment systems should not be allowed in areas where soil characteristics impede their operation (e.g., areas of high groundwater conditions, areas with saturated soils, areas with limited depth to bedrock, etc.). ▪ C-HS 47: Groundwater quality should be monitored to ensure the long-term integrity of countywide water resources. Growth and Development ▪ R-GD 28: Due to the prevalence of steeply sloping land, geologic, seismic, and other natural hazards, soil characteristics, and other development issues, including the need for adequate access and onsite wastewater treatment, the County shall thoroughly evaluate development proposals on slopes exceeding 30% to secure the public health, safety, and welfare. Resource Conservation ▪ R-RC 11: Areas with prime percolation capabilities shall be protected to the maximum extent possible, and placement of significant pollution sources within such areas shall be avoided. ▪ R-RC 13: Sedimentation and erosion shall be minimized through controls over development, including grading, quarrying, vegetation removal, road and bridge construction, and other uses which pose such a threat to water quality. ▪ R-RC 15: Commercial and industrial uses such automobile dismantlers, waste transfer disposal facilities, light industries, uses requiring septic systems, and other uses that have the greatest potential for pollution shall not be located within the vicinity of streams, reservoirs, or percolation facilities where contaminants could easily come in contact with flood waters, high groundwater, flowing streams, or reservoirs. Such uses shall be required to reduce any threat of contamination to an insignificant level as a condition of approval. ▪ R-RC 31: Natural streams, riparian areas, and freshwater marshes shall be left in their natural state providing for percolation and water quality, fisheries, wildlife habitat, aesthetic relief, and educational or recreational uses that are environmentally compatible. Streams which may still provide spawning areas for anadromous fish species should be protected from pollution and development impacts which would degrade the quality of the stream environment. ▪ R-RC 32: Riparian and freshwater habitats shall be protected through the following general means: o setback of development from the top of the bank; o regulation of tree and vegetation removal; o reducing or eliminating use of herbicides, pesticides, and fertilizers by public agencies; o control and design of grading, road construction, and bridges to minimize environmental impacts and avoid alteration of the streambed and stream banks (free span bridges and arch culverts, for example); and

Plan/Policy Document	Summary
	○ protection of endemic, native vegetation. ▪ R-RC 33: Public projects shall be designed to avoid damage to freshwater and stream environments. ▪ R-RC 34: In floodplains that are not already developed, land uses shall be restricted to avoid the need for major flood control projects which would alter stream flows and vegetation. ▪ R-RC-35: Flood control modifications to be made in streams that have substantial existing natural areas should employ flood control designs which enhance riparian resources and avoid to the maximum extent possible significant alteration of the stream, its hydrology, and its environs. ▪ R-RC-37: Lands near creeks, streams, and freshwater marshes shall be considered to be in a protected buffer area, consisting of the following: ○ 150 feet from the top bank on both sides where the creek or stream is predominantly in its natural state; ○ 100 feet from the top bank on both sides of the waterway where the creek or stream has had major alterations; and ○ In the case that neither (1) nor (2) are applicable, an area sufficient to protect the stream environment from adverse impacts of adjacent development, including impacts upon habitat, from sedimentation, biochemical, thermal and aesthetic impacts. ▪ R-RC-38: Within the aforementioned buffer areas, the following restrictions and requirements shall apply to public projects, residential subdivisions, and other private non-residential development: ○ No building, structure or parking lots are allowed, exceptions being those minor structures required as part of flood control projects. ○ No despoiling or polluting actions shall be allowed, including grubbing, clearing, unrestricted grazing, tree cutting, grading, or debris or organic waste disposal, except for actions such as those necessary for fire suppression, maintenance of flood control channels, or removal of dead or diseased vegetation, so long as it will not adversely impact habitat value. ○ Endangered plant and animal species shall be protected within the area. ▪ R-RC-39: Within areas immediately adjacent to the stream buffer area, new development should minimize environmental impacts on the protected buffer area, and screening of obtrusive or unsightly aspects of a project should be considered as a means of preserving the scenic value of riparian areas. ▪ R-RC-40: Where new roads, clustered residential development, or subdivisions are proposed in proximity of streams and riparian areas, they should be designed so that: ○ riparian vegetation is retained; ○ creeks and streams remain open and unfenced; and ○ there is adequate separation of new roads and building sites from the stream environment.
Santa Clara County Ordinance Code (2016a-c)	The Santa Clara Ordinance Code was originally adopted in 1972. The Code includes the following sections relevant to hydrology and water resources: Title B: Regulations ▪ Division B11.5 Nonpoint Source Pollution: requires compliance with the MRP within the Phase I MS4 areas in Santa Clara County, including riparian setbacks for San Martin

Plan/Policy Document	Summary
	▪ Division B33 Water Conservation in Landscaping: provides design standards for landscape areas that minimize runoff and water consumption Title C: Construction, Development, and Land Use ▪ Division C12 Chapter III Grading and Drainage Article 8 – Design Standards: requires grading to be performed to minimize runoff, erosion, and sedimentation, and regulates grading through a permitting framework ▪ Division C12 Chapter VII Floodplain Management: designates the floodplain manager for floodplains with County jurisdiction, provides design standards for development and construction in floodplains, and requires the City's review of proposed developments in floodplains prior to approval.
Santa Clara Valley Water District Ordinance 90-1 Wells (1990)	The SCVWD Ordinance 90-1 Wells requires a permit for any digging, boring, drilling, deepening, refurbishing, or destroying a water well, cathodic protection well, observation well, monitoring well, exploratory boring (45 feet or deeper), or other deep excavation that intersects the groundwater aquifers of Santa Clara County.
Santa Clara Valley Water District Ordinance 06-1 Water Resources Protection (2010)	The Water Resources Protection Ordinance requires that project sponsors obtain and Encroachment Permit for modifications on SCVWD facilities or easements. SCVWD relies on the Water Resources Protection Manual to administer the requirements of the ordinance, including specific erosion control, groundwater assessment, and design requirements.
Santa Clara Valley Water District Groundwater Management Plan (2016)	The Santa Clara Valley Water District Groundwater Management Plan was published in 2016. The Plan includes the following policies relevant to hydrology and water resources: ▪ Strategy 1: Manage groundwater in conjunction with surface water. ▪ Strategy 2: Implement programs to protect and promote groundwater quality. ▪ Strategy 3: Maintain and develop adequate groundwater models and monitoring networks. Strategy 4: Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.
The Santa Clara Valley Greenprint (Santa Clara Valley Open Space Authority 2014)	The Santa Clara Valley Greenprint was published in 2014. The guide for protecting open space and livable communities includes the following strategies relevant to hydrology and water resources: ▪ Strategy 1a: Initiate and participate in joint projects with the Santa Clara Valley Water District, the San Francisco Public Utilities Commission, and others to protect water resources, particularly in upper watersheds, groundwater recharge areas, urban areas, and undeveloped floodplains. ▪ Strategy 1b: Advocate policies and use land protection measures that prevent urban development in groundwater recharge areas, particularly the Coyote Valley. ▪ Strategy 1c: Encourage cities and public agencies to integrate protection of wetlands, floodplains, and riparian areas into land use and capital planning and mitigation projects to increase resilience to climate change impacts. ▪ Strategy 1d: Expand the Authority's Urban Open Space Program guidelines to promote restoration of urban streams and riparian habitats, groundwater recharge areas, and floodplains. ▪ Strategy 1e: Implement restoration projects in urban areas to reduce impervious surfaces and urban runoff, slowing water and increasing opportunities for infiltration into groundwater basins.

Plan/Policy Document	Summary
	▪ Strategy 1f: Explore pilot projects to increase local water supplies through construction of small-scale managed aquifer recharge projects such as the RCD's Bokariza project in the lower Pajaro River watershed. ▪ Strategy 1g: Develop programs with the Natural Resources Conservation Service, Resource Conservation Districts, and other partners to implement watershed protection, stewardship, and restoration programs on working farms and ranches through conservation easements, water-related ecosystem service payments, or performance-based management agreements. ▪ Strategy 1h: Develop fuels management plans and initiatives to reduce potential for erosion, landslides, and sedimentation following a catastrophic fire. ▪ Strategy 2a: Participate in the Bay Area and Pajaro Integrated Regional Water Management planning efforts to identify opportunities for protecting water resources. Seek partnerships with the SCVWD, Pajaro River Flood Prevention Authority, the Association of Bay Area Governments, the San Francisco Estuary Institute, the San Francisco Estuary Partnership, the San Francisco Bay Bird Observatory, Trout Unlimited, The Nature Conservancy, and other organizations to fund and implement priority projects. ▪ Strategy 2b: Participate in Santa Clara Valley Water District's water resources watershed master planning efforts to identify and prioritize land conservation and stewardship projects and investments, including opportunities for watershed restoration on Authority preserves. ▪ Strategy 2c: Engage in watershed-based conservation partnerships including the Upper Alameda Watershed Partnership and the Upper Pajaro Conservation Collaboration. These partnerships aim to identify non-regulatory tools, strategies, and financial incentives to promote watershed conservation and stewardship in these agricultural landscapes. ▪ Strategy 2d: Promote coordination between regulatory agencies and watershed stakeholders to facilitate priority watershed restoration projects, including larger riparian buffers or setbacks in both urban and rural settings. Explore feasibility of expanding the Integrated Watershed Restoration Program for San Mateo and Santa Cruz Counties to include Santa Clara County to streamline permitting and use of grant funds for watershed restoration projects. ▪ Strategy 2e: Support efforts of the NRCS and RCDs to fund local watershed coordinator position(s) and secure grant funds for restoration. ▪ Strategy 2f: Advocate for county and city land use planning and policies that protect water resources through protective zoning and strong riparian protection ordinances. ▪ Strategy 3a: Complete and build on efforts such as the Healthy Lands & Healthy Economies initiative (Batker et al. 2014) to quantify the economic value of open spaces and working lands to protect local groundwater supplies, reduce water treatment costs, and provide flood control. ▪ Strategy 3b: Develop specific case studies by watershed (for example, the Coyote watershed and Santa Clara Valley aquifer) that identify multi-benefit water resource conservation projects and potential new funding sources. ▪ Strategy 3c: Seek funding from the NRCS Conservation Innovation Grant program and other sources to evaluate emerging markets for water quality improvements, wetland restoration, habitat conservation, and carbon sequestration. ▪ Strategy 3d: Explore use of market-based incentives for protecting strategic water resources in the Santa Clara Valley though development of a pilot ecosystem services credit trading and banking project.

Plan/Policy Document	Summary
	▪ Strategy 4a: Ensure that leases and management agreements for the Authority's agricultural tenants are written to protect water resources from depletion, pollution, development, and fire, including promotion of organic operations to limit the use of pesticides and fertilizers. ▪ Strategy 4b: Ensure that management plans for Authority lands identify opportunities to improve water quality and aquatic habitat (for example, by decommissioning unnecessary roads, upgrading culverts, or restoring ponds and riparian areas). ▪ Strategy 4c: Demonstrate and interpret watershed restoration programs and projects on Open Space Authority preserves. Work with the NRCS, RCDs, and the SCVWD to develop public workshops and training about watershed protection techniques and funding sources. ▪ Strategy 4d: Seek funding and partnerships for pilot projects on Open Space Authority preserves to demonstrate effectiveness of new tools and techniques for water capture and recharge, such as off-stream ponds and managed recharge basins. Small-scale projects located throughout upper and middle watersheds can increase water supplies and reduce the need for downstream flood protection. ▪ Strategy 5a: Seek funding and partnerships with the NRCS, RCDs, and SCVWD to develop interpretive materials and watershed education programs for use by Authority staff and volunteers on Authority properties. ▪ Strategy 5b: Encourage local schools and watershed educators to utilize Authority lands in their programs, and seek funding and partnerships with the NRCS, RCDs, and SCVWD to support those programs. ▪ Strategy 5c: Promote research and citizen science on Authority lands to collect information about watershed health. ▪ Strategy 5d: Feature water conservation and watershed restoration projects funded through US Department of Agriculture Natural Resources Conservation Service programs such as the Wildlife Habitat Incentive Program, Environmental Quality Incentives Program, and other grants to encourage local use of those funding sources.
City of Santa Clara	
City of Santa Clara General Plan (2010)	The City of Santa Clara adopted the 2010-2035 General Plan on November 16, 2010. The general plan includes the following environmental quality goals and policies applicable to hydrology and water resources: Conservation ▪ 5.10.1-P2: Work with Santa Clara Valley Water District and require that new development follow the "Guidelines and Standards for Lands Near Streams" to protect streams and riparian habitats. ▪ 5.10.1-P6: Require adequate wastewater treatment and sewer conveyance capacity for all new development. ▪ Water ▪ 5.10.4-P4: Require and adequate water supply and water quality for all new development. ▪ 5.10.4-P5: Prohibit new development that would reduce water quality below acceptable state and local standards. ▪ 5.10.4-P10: Work with Santa Clara Valley Water District to minimize undesirable compaction of aquifers and subsidence of soils.

Plan/Policy Document	Summary
	▪ 5.10.4-P12: Encourage diversion of runoff from downspouts, and replacement of hardscapes to landscaped areas and permeable surfaces ▪ Safety ▪ 5.10.5-P5: Regulate development, including remodeling or structural rehabilitation, to ensure adequate mitigation of safety hazards, including flooding, seismic, erosion, liquefaction and subsidence dangers. ▪ 5.10.5-P10: Support efforts by the Santa Clara Valley Water District to reduce subsidence. ▪ 5.10.5-P11: Require that new development meet stormwater and water management requirements in conformance with state and regional regulations. ▪ 5.10.5-P13: Require that development complies with the Flood Damage Protection Code ▪ 5.10.5-P15: Require new development to minimize paved and impervious surfaces and promote on-site best management practices for infiltration and retention, including grassy swales, pervious pavement, covered retention areas, bioswales, and cisterns, to reduce urban water run-off. ▪ 5.10.5-P16: Require new development to implement erosion and sedimentation control measures to maintain an operational drainage system, preserve drainage capacity and protect water quality. ▪ 5.10.5-P17: Require that grading and other construction activities comply with the Association of Bay Area Governments' Manual of Standards for Erosion and Sediment Control Measures and with the California Stormwater Quality Association, Stormwater Best Management Practice Handbook for Construction ▪ 5.10.5-P18: Implement the Santa Clara Valley Nonpoint Source Pollution Control Program, Santa Clara Valley Urban Runoff Pollution Prevention Program and the Urban Runoff Management Plan. ▪ 5.10.5-P19: Limit development activities within riparian corridors to those necessary for improvement or maintenance of stream flow. ▪ 5.10.5-P20: Maintain, upgrade, and replace storm drains throughout the City to reduce potential flooding. ▪ 5.10.5-P21: Require that storm drain infrastructure is adequate to serve all new development and is in place prior to occupancy. ▪ 5.10.5-P22: Regulate development on sites with known or suspected contamination of soil and/or groundwater to ensure that construction workers, the public, future occupants and the environment are adequately protected from hazards associated with contamination, in accordance with applicable regulations. ▪ 5.10.5-P23: Require appropriate clean-up and remediation of contaminated sites.
Santa Clara City Code (2017, 2018)	The Santa Clara City Code is current through Ordinance 1966, passed in 2017. The Code includes the following titles and chapters relevant to hydrology and water resources: Title 13: Public Services ▪ Chapter 13.10 Sewers: regulates discharges to the sewer system, such as construction dewatering, through a permitting framework ▪ Chapter 13.20 Storm Drains and Discharges: this ordinance requires compliance with the MRP Title 15: Buildings and Construction

Plan/Policy Document	Summary
	▪ Chapter 15.05 Administrative Code: requires grading to be performed to minimize runoff, erosion, and sedimentation, and regulates grading through a permitting framework ▪ Chapter 15.45 Prevention of Flood Damage Code: designates the floodplain manager for floodplains with City jurisdiction, provides design standards for development and construction in floodplains, and requires the City's review of proposed developments in floodplains prior to approval Title 18: Zoning ▪ Chapter 18.88 Landscape Permit Provisions: provides design standards for landscape areas that minimize runoff and water consumption
City of San Jose	
Envision San Jose 2040 General Plan (2011)	The *Envision: San Jose 2040 General Plan* was adopted in 2011. The Plan establishes the following goals and policies relevant to hydrology and water resources: City Design ▪ CD-2.5: Integrate Green Building Goals and Policies of this Plan into site design to create healthful environments. Consider factors such as shaded parking areas, pedestrian connections, minimization of impervious surfaces, incorporation of stormwater treatment measures, appropriate building orientations, etc. Environmental Considerations ▪ EC-4.1: Design and build all new or remodeled habitable structures in accordance with the most recent California Building Code and municipal code requirements as amended and adopted by the City of San José, including provisions for expansive soil, and grading and storm water controls. ▪ EC-4.5: Ensure that any development activity that requires grading does not impact adjacent properties, local creeks and storm drainage systems by designing and building the site to drain properly and minimize erosion. An Erosion Control Plan is required for all private development projects that have a soil disturbance of one acre or more, are adjacent to a creek/river, and/or are located in hillside areas. Erosion Control Plans are also required for any grading occurring between October 15 and April 15. ▪ EC-4.12: Require review and approval of grading plans and erosion control plans (if applicable) prior to issuance of a grading permit by the Director of Public Works. ▪ EC-5.1: The City shall require evaluation of flood hazards prior to approval of development projects within a Federal Emergency Management Agency (FEMA) designated floodplain. Review new development and substantial improvements to existing structures to ensure it is designed to provide protection from flooding with a one percent annual chance of occurrence, commonly referred to as the “100-year” flood or whatever designated benchmark FEMA may adopt in the future. New development should also provide protection for less frequent flood events when required by the State. ▪ EC-5.2: Allow development only when adequate mitigation measures are incorporated into the project design to prevent or minimize siltation of streams, flood protection ponds, and reservoirs ▪ EC-5.3: Preserve designated floodway areas for non-urban uses. ▪ EC-5.7: Allow new urban development only when mitigation measures are incorporated into the project design to ensure that new urban runoff does not increase flood risks elsewhere.

Plan/Policy Document	Summary
	▪ EC-5.9: Work with local, regional, state and federal agencies to ensure new and existing levees provide adequate flood protection and actively partner with the Santa Clara Valley Water District and other levee owners with respect to National Flood Insurance Program (NFIP) levee recertification. ▪ EC-5.10: Encourage the preservation and restoration of urban creeks and rivers to maintain existing floodplain storage. When in-channel work is proposed, engineering techniques which include the use of plant materials (bioengineering) are encouraged. ▪ EC-5.11: Where possible, reduce the amount of impervious surfaces as a part of redevelopment and roadway improvements through the selection of materials, site planning, and street design. ▪ EC-5.12: Locate critical or public facilities (such as the Water Pollution Control Plant, local hospitals, police and fire service facilities, and schools) above the 500-year floodplain or protect such facilities up to the magnitude 500-year flood. Construction standards based on FEMA guidelines may include freeboard, elevation above the 500-year floodplain, and elevated access ramps. ▪ EC-5.13: As a part of the City's policies for addressing the effects of climate change and projected water level rise in San Francisco Bay, require evaluation of projected inundation for development projects near San Francisco Bay or at flooding risk from local waterways which discharge to San Francisco Bay. ▪ EC-5.14: Implement the requirements of FEMA relating to construction in Special Flood Hazards Areas as illustrated on Flood Insurance Rate Maps. Periodically update the City's Flood Hazard Regulations to implement FEMA requirements. ▪ EC-5.15: San José will participate in the National Flood Insurance Program (NFIP) Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed minimum NFIP requirements. Flood insurance premium rates for property owners within the city may be discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the CRS, which are to reduce flood damage to insurable property; strengthen and support the insurance aspects of the NFIP; and encourage a comprehensive approach to floodplain management. ▪ EC-5.16: Implement the Post-Construction Urban Runoff Management requirements of the City's Municipal NPDES Permit to reduce urban runoff from project sites. ▪ EC-5.17: Implement the Hydromodification Management requirements of the City's Municipal NPDES Permit to manage runoff flow and volume from project sites. ▪ EC-7.5: On development and redevelopment sites, require all sources of imported fill to have adequate documentation that it is clean and free of contamination and/ or acceptable for the proposed land use considering appropriate environmental screening levels for contaminants. Disposal of groundwater from excavations on construction sites shall comply with local, regional, and state requirements. ▪ EC-7.8: Where an environmental review process identifies the presence of hazardous materials on a proposed development site, the City will ensure that feasible mitigation measures that will satisfactorily reduce impacts to human health and safety and to the environment are required of or incorporated into the projects. This applies to hazardous materials found in the soil, groundwater, soil vapor, or in existing structures. ▪ EC-7.9: Ensure coordination with the County of Santa Clara Department of Environmental Health, Regional Water Quality Control Board, Department of

Plan/Policy Document	Summary
	Toxic Substances Control or other applicable regulatory agencies, as appropriate, on projects with contaminated soil and/or groundwater or where historical or active regulatory oversight exists. ▪ EC-7.10: Require review and approval of grading, erosion control and dust control plans prior to issuance of a grading permit by the Director of Public Works on sites with known soil contamination. Construction operations shall be conducted to limit the creation and dispersion of dust and sediment runoff. Environmental Resources ▪ ER-2.2: Ensure that a 100-foot setback from riparian habitat is the standard to be achieved in all but a limited number of instances, only where no significant environmental impacts would occur. ▪ ER-8.1: Manage stormwater runoff in compliance with the City's Post-Construction Urban Runoff (6-29) and Hydromodification Management (8-14) Policies. ▪ ER-8.2: Coordinate with regional and local agencies and private landowners to plan, finance, construct, and maintain regional stormwater management facilities. ▪ ER-8.4: Assess the potential for surface water and groundwater contamination and require appropriate preventative measures when new development is proposed in areas where storm runoff will be directed into creeks upstream from groundwater recharge facilities. ▪ ER-8.5: Ensure that all development projects in San José maximize opportunities to filter, infiltrate, store and reuse or evaporate stormwater runoff onsite. ▪ ER-8.7: Encourage stormwater reuse for beneficial uses in existing infrastructure and future development through the installation of rain barrels, cisterns, or other water storage and reuse facilities. ▪ ER-8.8: Consider the characteristics and condition of the local watershed and identify opportunities for water quality improvement when developing new or updating existing development plans or policies including, but not limited to, specific or area land use plans. ▪ ER-9.1: In consultation with the Santa Clara Valley Water District, other public agencies and the SCVWDs Water Resources Protection Guidelines and Standards (2006 or as amended), restrict or carefully regulate public and private development in streamside areas so as to protect and preserve the health, function and stability of streams and stream corridors. ▪ ER-9.2: In consultation with the SCVWD restrict or carefully regulate public and private development in upland areas to prevent uncontrolled runoff that could impact the health and stability of streams. ▪ ER-9.3: Utilize water resources in a manner that does not deplete the supply of surface or groundwater or cause over drafting of the underground water basin. ▪ ER-9.5: Protect groundwater recharge areas, particularly creeks and riparian corridors. ▪ ER-9.6: Require the proper construction and monitoring of facilities that store hazardous materials in order to prevent contamination of the surface water, groundwater and underlying aquifers. In furtherance of this policy, design standards for such facilities should consider high groundwater tables and/or the potential for freshwater or tidal flooding. Infrastructure ▪ IN-3.3: Meet the water supply, sanitary sewer and storm drainage level of service objectives through an orderly process of ensuring that, before development

Plan/Policy Document	Summary
	occurs, there is adequate capacity. Coordinate with water and sewer providers to prioritize service needs for approved affordable housing projects. ▪ IN-3.7: Design new projects to minimize potential damage due to storm waters and flooding to the site and other properties. ▪ IN-3.8: In designing improvements to creeks and rivers, protect adjacent properties from flooding consistent with the best available information and standards from the Federal Emergency Management Agency (FEMA) and the California Department of Water Resources (DWR). Incorporate restoration of natural habitat into improvements where feasible. ▪ IN-3.10: Incorporate appropriate stormwater treatment measures in development projects to achieve stormwater quality and quantity standards and objectives in compliance with the City's National Pollutant Discharge Elimination System (NPDES) permit. ▪ IN-3.11: The "modified floodplain design" is the preferred design for future flood protection facilities. Use the "widen-one-bank" and "trapezoidal channel" designs only when funding or right-of-way limitations make the use of the modified flood plain design impractical. For future development, consider factors such as flooding risks, proximity to waterways, and the potential for implementing flood protection measures. Measureable Sustainability ▪ MS-3.4: Promote the use of green roofs (i.e., roofs with vegetated cover), landscape based treatment measures, pervious materials for hardscape, and other stormwater management practices to reduce water pollution. ▪ MS-3.5: Minimize areas dedicated to surface parking to reduce rainwater that comes into contact with pollutants. ▪ MS-13.3: Require subdivision designs and site planning to minimize grading and use landform grading in hillside areas. ▪ MS-13.6: Revise the grading ordinance and condition grading permits to require that graded areas be stabilized from the completion of grading to commencement of construction. ▪ MS-18.4: Retrofit existing development to improve water conservation. ▪ MS-18.12: Encourage stormwater capture and encourage, when feasible and cost effective, on-site rainwater catchment for new and existing development. ▪ MS-18.13: Encourage graywater use whenever appropriate and in areas that do not impact groundwater quality as determined through coordination with local agencies. ▪ MS-18.14: Participate in regional efforts to develop codes and standards for stormwater capture and graywater reuse, whenever feasible and cost-effective, and in areas that do not impact groundwater quality as determined through coordination with local agencies. ▪ MS-19.5: Improve the treatment of recycled water so that it can be used to help augment streams and recharge groundwater aquifers that provide a portion of the City's potable water supply. ▪ MS-20.1: Lead through advocacy with local, regional and state agencies to ensure the protection and enhancement of the quality of San José's water sources. ▪ MS-20.3: Protect groundwater as a water supply source through flood protection measures and the use of stormwater infiltration practices that protect groundwater quality. In the event percolation facilities are modified for infrastructure projects, replacement percolation capacity will be provided.

Plan/Policy Document	Summary
	▪ MS-20.4: Work with local, regional and state agencies to protect and enhance the watershed, including the protection of surface water and ground water supplies from pollution and degradation. Transportation ▪ TR-2.12: Consider alternative public right of way materials for roadway, sidewalks, park strips, crosswalks, and trails etc. to enhance the pedestrian and bicyclist experience as well as provide other benefits such as stormwater management and hydromodification control.
Tamien Station Area Specific Plan (1995)	Livable Community ▪ Goal 8: Protect people and property in the Tamien Station area from potential environmental hazards such as noise, flooding, and the impacts associated with increased traffic Land Use and Design Policies ▪ Policy 4 Riparian Corridor Development Guidelines: All new development adjacent to the Guadalupe River or its bypass channel should be consistent with the provisions of the Riparian Corridor Development Guidelines contained in the City of San Jose's Riparian Corridor Policy Study. ▪ Policy 16 Habitat Protection: The riparian habitat of the Guadalupe River and adjacent areas west of Lelong Avenue should be preserved as open space resources consistent with the Riparian Corridor Policy Study. ▪ Policy 17 Bypass Channel Design: An open channel design for the flood control bypass channel adjacent to the Elks Club site is the preferred design solution and should be implemented if the site is redeveloped. The culvert design solution should be avoided, if feasible, even if the site is not redeveloped in the near future. (The current plan proposed by the Santa Clara Valley Water District is a bypass concrete box culvert.) Implementation ▪ Policy 12 Flooding Mitigation: If new development in the Specific Plan area proceeds in advance of the implementation of the Guadalupe River Flood Control Project, the new structures within the 100-year floodplain should be constructed at elevations above the 100-year flood level. Property owners proposing new developments in the flood control improvement area may be required to dedicate land or grant easements to the Santa Clara Valley Water District for future flood control facilities. ▪ Policy 20 Storm Drainage Facilities Mitigation: New development should upgrade storm drains in Almaden Road and at the Elks Club site to current City standards. A segment of the 15-inch line between the northerly terminus of Almaden Road and Almaden Avenue/Alma Avenue intersection should be upgraded to at least a 24-inch line.
Communications Hill Specific Plan (1992)	▪ Minimize grading or re-contouring of Communications Hill to preserve the topography of the land, wherever possible, and to avoid the creation of visible cut and fill slopes or obviously engineered or flat-surfaced slopes.
San Jose Municipal Code (2017, 2018)	The San Jose Municipal Code, codified through Ordinance No. 29912, was last adopted in May 2017. The Code includes the following titles and chapters relevant to hydrology and water resources: Title 15: Public Utilities ▪ Chapter 15.11 Water Efficient Landscape Standards for New and Rehabilitated Landscaping: provides design standards for landscape areas that minimize runoff and water consumption

Plan/Policy Document	Summary
	▪ Chapter 15.14 Sewer Use Regulations: regulates discharges to the sewer system, such as construction dewatering, through a permitting framework Title 17: Buildings and Construction ▪ Chapter 17.04 Part 6 Excavation and Grading: requires grading to be performed to minimize runoff, erosion, and sedimentation, and regulates grading through a permitting framework ▪ Chapter 17.08 Special Flood Hazard Area Regulations: designates the floodplain manager for floodplains with City jurisdiction, provides design standards for development and construction in floodplains, and requires the City's review of proposed developments in floodplains prior to approval Title 20: Zoning ▪ Chapter 20.95 Storm Water Management: this ordinance requires compliance with the MRP
San Jose Council Policy 6-29 Post-construction Urban Runoff Management (2016)	The San Jose Council Policy 6-29 was approved in 1998. The policy requires specific source control BMPs for projects with the following components: a) Car Washing and Detailing Facilities b) Construction/Corporation Yards c) Automobile Dismantling and Parts Recovery d) Material Recycling Facilities (processing, transfer and large collection facilities) e) Gas Stations or Equipment Fueling f) Uncovered Parking Lots g) Loading Docks
San Jose Council Policy 8-14 Post-Construction Hydromodification Management (2016)	The San Jose Council Policy 8-14 was approved in 2010. The policy implements the requirements of the MRP for hydromodification management
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The *Morgan Hill 2035 General Plan* was adopted in 2016. The Plan includes the following goals and policies relevant to hydrology and water resources: Safety, Services, and Infrastructure ▪ SSI-2.6: Protect hillsides and carefully control development on steep slopes. When hillside land is developed, it should be done with minimum disruption of topography and vegetative cover. ▪ SSI-2.8: Prohibit development in areas where increased runoff from the addition of impervious surfaces and drainage would increase the probability of downslope land sliding, or where additional projects would add to the cumulative effect of increased runoff, unless a downslope drainage improvement plan has been approved ▪ SSI-5.1: Prohibit development in floodways and regulate development in floodplains to minimize flood damage and be consistent with the federal flood insurance program. ▪ SSI-5.3: Prior to the start of construction, a Flood Clearance shall be obtained from the Floodplain Administrator for the City of Morgan Hill that provides plans drawn to scale showing the nature, location, dimensions, and elevation of the area; existing or proposed structures, fill, storage of material, and drainage facilities, and floodproofing provisions. Specifically, the following information shall be required: o Proposed elevation in relation to mean sea level of the lowest floor (including basement) of all structures o Proposed elevation in relation to mean sea level to which any structure will be floodproofed. o Appropriate elevation and floodproofing certifications.

Plan/Policy Document	Summary
	○ Description of the extent to which any water course will be altered or relocated as a result of the proposed development. New residential buildings in the 100-year floodplain shall have their lowest floor elevation (excluding garage) floodproofed or raised a minimum of 1 foot above the base flood elevation (BFE). Substantially improved structures within the 100-year floodplain shall meet the same floodplain construction requirements as new buildings. ▪ SSI-5.4: Require that new developments within flood hazard areas are done in a manner that will not cause floodwaters to be diverted onto adjacent property or increase flood hazards to properties located elsewhere unless secured through a flood easement or fee title buyout. ▪ SSI-5.5: Require all local development to provide appropriate mitigation of off-site flooding impacts, including limiting runoff to predevelopment levels and/or complete solutions to flooding and local drainage problems in the vicinity of the development, using such methods as detention or retention. ▪ SSI-5.6: Consider risk of flood hazards and damage in new development proposals within flood hazard areas. Ensure that new construction is consistent with federal flood protection regulations. ▪ SSI-5.9: Restore and maintain the natural functions of riparian corridors, creeks, and channels to reduce flooding, convey stormwater flows, and improve water quality. ▪ SSI-6.3: Areas which are developed or planned for development should be protected by the construction of flood control facilities. ▪ SSI-6.6: Encourage flood management designs that respect the natural topography and vegetation of waterways while retaining dynamic flow and functional integrity. ▪ SSI-6.7: Preserve the existing floodplain capacity of urban creeks and channels. ▪ SSI-6.8: Encourage increased stormwater and flood management infrastructure capacity in order to accommodate changes in climate, precipitation, and extreme weather events. ▪ SSI-16.2: Ensure that the level of detention or retention provided on the site of any new development is compatible with the capacity of the regional storm drainage system. ▪ SSI-16.3: Require a storm water management plan for each proposed development, to be presented early in the development process and describe the design, implementation, and maintenance of the local drainage facilities. ▪ SSI-16.4: Coordinate with the Santa Clara Valley Water District to ensure compatibility of the local and regional storm drainage systems. Natural Resources and Environment ▪ NRE-5.3: Retain natural streamside and riparian areas in their natural state in order to preserve their value as percolation and recharge areas, natural habitat, scenic resources, and recreation corridors, and to stabilize banks. ▪ NRE-5.5: Where flood control projects are needed to protect existing development, minimize disruption of streams and riparian systems, maintaining slow flow and stable banks through design and other appropriate mitigation measures. ▪ NRE-5.6: Protect existing stream channels and riparian vegetation by requiring buffering or landscaped setbacks and storm runoff interception as specified in Table NRE-1.

Plan/Policy Document	Summary
	▪ NRE-6.5: Require development to be designed to conserve soil and avoid erosion. ▪ NRE-8.1: Protect water quality from contamination, and monitor it to assure that present policies and regulations are adequate. Prohibit such uses as waste facilities, septic systems, and industries using toxic chemicals where polluting substances may come in contact with groundwater, floodwaters, and creeks or reservoir waters. ▪ NRE-8.2: Continue land use policies that limit the number of individual septic systems in areas vulnerable to groundwater contamination, because of the potential for cumulative degradation of water quality. ▪ NRE-8.3: Continue to monitor groundwater and surface water quality conditions to determine if changes in regulations regarding septic systems and land use are needed. ▪ NRE-8.4: In areas where future development is expected to be served by sewers, continue large lot policies which allow minimal development and limited numbers of septic systems. (This approach increases the feasibility of designing future urban density subdivisions with smaller lots, which are more efficient for sewers in terms of service and cost.) ▪ NRE-8.6: Protect properties located in areas that have soils with rapid water percolation from future development in order to ensure existing water quality. Permit development (including commercial and industrial uses) in such areas only under strict safety limitations according to the City's Hazardous Materials Storage Ordinance section specifically related to high percolation rates. ▪ NRE-8.7: In order to provide greater protection of the aquifers which supply drinking water to the South County, give special consideration to the management of contaminants (e.g., hazardous materials, sanitary effluents) in groundwater recharge areas where no protective aquitard layer exists. ▪ NRE-8.8: Implement Best Management Practices to improve water quality, in conformance with the South Santa Clara County and City of Morgan Hill Total Maximum Daily Load (TMDL) Monitoring Plan for the Pajaro River Watershed (2015) and findings in subsequent annual status updates, as required for compliance with community standards and applicable State and federal provisions. ▪ NRE-12.4: Require subdivision designs and site planning to minimize grading and use landform grading in hillside areas.
Morgan Hill Downtown Specific Plan (2009)	▪ Storm Drainage System Projections and Improvements – The City's Storm Drain Master Plan does not call for any improvements to the existing storm drain system in Downtown, except for the Upper Llagas Creek Flood Protection Project (also known as PL566). PL566 is intended to provide flood protection for the Cities of Gilroy and Morgan Hill and the unincorporated portion of Santa Clara County known as San Martin. The project will consist of a series of channels, box culverts, and bridges designed to protect the floodplain from a one-percent flood. ▪ Floodplain Regulations – Development within the floodplain is required to comply with the Flood Damage Prevention ordinance (Chapter 18.42), which provides various standards for construction, subdivisions, utilities, and other issues. Standards for new developments include, but are not limited to: anchoring building structures; using appropriate materials; flood-proofing commercial buildings; providing drainage paths; elevating residential structures; and designing utilities to minimize infiltration of floodways.

Plan/Policy Document	Summary
Morgan Hill Station Area Master Plan (2018)	Streetscape and Placemaking ▪ Toolkit for Buffer Areas Strategy A – Planted Bulb-outs at Intersections: As part of its Placemaking Strategy, the City has installed bulb-outs at Monterey Road intersections. As further improvements to Monterey Road are considered, the City could contemplate further extending bulb-outs at intersections all the way to the edge of the travel lane. Doing so would further enhance the bulb-out's contribution to traffic calming and increase the reduction in pedestrian crossing distances. The City could also consider installing green infrastructure elements, such as bioretention planters, in retrofitted existing planted bulb-outs or potential new bulb-outs.
Morgan Hill Municipal Code (2016, 2018)	The Morgan Hill Municipal Code was published in 1987. The Code includes the following titles and chapters relevant to hydrology and water resources: Title 13: Public Services ▪ Chapter 13.30 – Urban Storm Water Quality Management and Discharge Control: this ordinance requires compliance with the SWRCB NPDES Permit Title 15: Buildings and Construction ▪ Chapter 15.08 – Building Code: requires grading to be performed to minimize runoff, erosion, and sedimentation, and regulates grading through a permitting framework Title 17: Subdivisions ▪ Chapter 17.32 – Improvements and Improvement Agreements: this ordinance requires stormwater runoff to be collected and conveyed by an approved storm drain system Title 18: Zoning ▪ Chapter 18.42 – Flood Damage Prevention: this ordinance requires flood damage prevention/protection measures for development/redevelopment within flood hazard areas ▪ Chapter 18.71 – Post Construction Stormwater Pollution Prevention: this ordinance requires compliance with stormwater BMPs listed in the CASQA handbook and manuals from the City of Morgan Hill ▪ Chapter 18.73 – Water Conservation in Landscaping: provides design standards for landscape areas that minimize runoff and water consumption
City of Gilroy	
City of Gilroy 2002–2020 General Plan (2002)	The *City of Gilroy 2002-2020 General Plan* was adopted in 2002. The Plan includes the following goals and policies relevant to hydrology and water resources: ▪ 1.16: Minimize the amount of grading and topographical alteration needed in hillside development to create developments that appear to be in a natural setting, sited in the least obtrusive fashion as a compatible rather than as an imposed scheme. Clustered development in hillside areas should be encouraged. Also, design roadways that pass through hillside areas to preserve the ecological and scenic character of the hillsides. ▪ 19.01: Work with the Santa Clara Valley Water District to ensure that water demand created by new development does not exceed the groundwater supply that can be economically and legally withdrawn from the aquifer on a sustained basis. Restrict groundwater pumping to rates that will not impair groundwater quality or create other environmental damage, such as subsidence. ▪ 19.09: Provide and maintain a system of storm drains to protect areas of development from localized flooding.

Plan/Policy Document	Summary
	▪ 20.02: Protect the ecological, aesthetic and recreational value of the creeks that flow through the Gilroy Planning Area from urban encroachment and degradation. Ensure that new development preserves the function of natural drainages, including small canyons and seasonal creeks. The easements and setbacks adjacent to these creeks shall be maintained in open space. Access to creeks should be of sufficient width to accommodate trails, flood control access, and protection of riparian habitat. ▪ 22.03: Prohibit development of waste facilities, septic systems, and industries using toxic chemicals in areas where polluting substances may come in contact with groundwater, floodwaters, creeks, or reservoir waters. Within the Gilroy Planning Area, identify land uses that may contribute to the degradation of groundwater quality and ensure adequate monitoring, controls and enforcement to protect groundwater quality. ▪ 22.09: Restrict development on properties that have soils with "rapid water percolation" to protect water quality. Commercial and industrial developments in such areas shall only be permitted under the strict safety limitations required by the City's and/or County's Hazardous Materials Specialists. ▪ 22.10: To provide greater protection of the aquifers that supply drinking water to South County, give special consideration to the management of contaminants (e.g., hazardous materials, sanitary effluents) in groundwater recharge areas where no protective aquitard layer exists. ▪ 25.01: Permit development only in those areas where potential danger to the health, safety, and welfare of residents can be adequately mitigated to an "acceptable level of risk" (see Policy 25.04). This applies to development in areas subject to flood damage or geological hazard due to their location and/or design. Development should be prohibited in areas where emergency services, including fire protection, cannot be provided. ▪ 25.04: Enact development controls to ensure "an acceptable level of risk" in those areas where life and property are subject to seismic, geologic, and flooding hazards. "Acceptable risk" in this instance describes the level of risk that the majority of citizens will accept without expecting governmental action to provide protection. This definition considers acceptable risk only from the point of view of the public agency; individual concepts of acceptable risk may vary widely. Levels of acceptable risk and damage related to kind of facility and occupancy are presented in Figure 8-1. ▪ 25.17: Work closely with the Santa Clara Valley Water District to alleviate flooding and drainage problems in the Planning Area, ensuring that new flood control measures are designed and implemented in accordance "Best Management Practices (BMPs) and in keeping with the goals and policies of the General Plan. ▪ 25.18: Restrict urban development and expansion in areas prone to flooding (as indicated on the Flood Hazards Map) or on properties where drainage problems or saturated soil conditions create flood hazards. Allow development in such areas only if measures are enacted to reduce these hazards to an acceptable level of risk. ▪ 25.19: Discourage the construction of expensive flood prevention facilities by leaving high-risk floodways in agricultural and recreational uses. ▪ 25.20: Minimize the long-term public costs of flood control improvements and mitigate potential adverse environmental impacts. Also, ensure that measures to reduce flood damage to individual properties do not increase erosion and/or flood hazards on other properties.

Plan/Policy Document	Summary
	▪ 25.21: Design flood control measures and drainage channel improvements as part of an overall community improvement program with provision for multiple use, including recreational open space, trails, bikeways, groundwater recharge, protection and restoration of riparian vegetation and wildlife habitats, and enhancement of scenic qualities. ▪ 25.22: Design new drainage channels with gently sloping and curving banks to maximize safety, ease of maintenance, and natural appearance. To the greatest extent feasible, use riparian vegetation to stabilize the banks and to landscape the channels in a manner that is natural in character and easy to maintain, creating a scenic asset for the enjoyment of City residents. ▪ 25.23: Require new development to include green areas for reducing runoff and increasing runoff absorption capacities. Similarly, encourage the removal of pavement that is not directly serve traffic parking needs; maintain unpaved parkways between sidewalks and streets; encourage the use of permeable paving materials; and require the use of landscaped strips and islands to break-up large paved areas. ▪ 25.24: Require new developments in hillside areas to retain and protect areas of native vegetation to help reduce erosion and slow the speed of rainfall runoff, thereby retaining the hillside areas' natural flood control characteristics. Ensure that retention and protection of vegetated areas is also in keeping with fire hazard management goals.
Downtown Specific Plan (2005)	IV Design Guidelines, C Project Landscape and Hardscape ▪ Existing trees in good health and appearance should be preserved if possible. ▪ Urban runoff can be greatly reduced by diverting stormwater from impervious areas such as roofs and paths to landscaped areas and infiltration basins where water can seep into the ground. VI Streetscape Beautification and Public Improvements, Sidewalks ▪ Extensions of the sidewalk into the roadway at crosswalks are called "bulbouts" or "curb extensions." Designed to give pedestrians greater visibility as they approach the crossing, bulbouts decrease the distance users must cross as well as slow traffic. Sidewalk bulb-outs shall be used where feasible considering the requirements of traffic volumes and specific storm drainage conditions.
Gilroy Municipal Code (2016, 2018)	The Gilroy Municipal Code is current through Ordinance 2017-03, passed in 2017. The Code includes the following chapters relevant to hydrology and water resources: Chapter 6: Buildings ▪ Requires grading to be performed to minimize runoff, erosion, and sedimentation, and regulates grading through a permitting framework Chapter 27: Water ▪ Chapter 27a Water Resources Protection: setbacks for stream channels is 50 feet from the top of the bank or edge of the riparian corridor, whichever is greater ▪ Chapter 27c Municipal Storm Water Quality Protection and Discharge Control: this ordinance requires compliance from the SWRCB NPDES Permit ▪ Chapter 27d Post Construction Storm Water Pollution Prevention: this ordinance requires compliance with stormwater BMPs listed in the CASQA handbook and manuals from the City of Gilroy ▪ Chapter 27e Floodplain Management: requires flood damage prevention/protection measures for development/redevelopment within flood hazard areas.

Plan/Policy Document	Summary
	Chapter 30: Zoning Ordinance ▪ Chapter 30 Article XXXVIII Landscaping: provides design standards for landscape areas that minimize runoff and water consumption
San Benito County	
San Benito County 2035 General Plan (2015)	The *San Benito County 2035 General Plan* was adopted in 2015. The Plan includes the following goals and policies relevant to hydrology and water resources: Land Use ▪ LU-1.8: The County shall require all submitted site plans, tentative maps, and parcel maps to depict all environmentally sensitive and hazardous areas, including: 100-year floodplains, fault zones, 30 percent or greater slopes, severe erosion hazards, fire hazards, wetlands, and riparian habitats. ▪ LU-1.10: The County shall encourage specific development sites to avoid natural and manmade hazards, including, but not limited to, active seismic faults, landslides, slopes greater than 30 percent, and floodplains. Development sites shall also be on soil suitable for building and maintaining well and septic systems (i.e., avoid impervious soils, high percolation or high groundwater areas, and provide setbacks from creeks). The County shall require adequate mitigation for any development located on environmentally sensitive lands (e.g., wetlands, erodible soil, archaeological resources, important plant and animal communities). Circulation ▪ C-1.19: The County shall ensure that road development is minimized in hazardous areas (e.g. faults, flood plains, landslide areas, fire hazard areas) and that, if a hazard is present within a planned road alignment, the planned alignment is modified to the extent feasible to avoid the hazard. Public Facilities and Services ▪ PFS-3.5: The County shall support plans to develop new reliable future sources of supply, including, but not limited to, the expansion of surface water storage and conjunctive use of surface water and groundwater, while promoting water conservation and water recycling/reuse. ▪ PFS-3.8: The County shall support and participate in the integrated management of surface water and groundwater resources, wastewater, stormwater treatment and use, and the use of reclaimed water. ▪ PFS-6.1: The County shall require that stormwater drainage facilities are properly designed, sited, constructed, and maintained to efficiently capture and dispose of runoff and minimize impacts to water quality. ▪ PFS-6.2: The County shall require best management practices in the development, upgrading, and maintenance of stormwater facilities and services to reduce pollutants from entering natural water bodies while allowing stormwater reuse and groundwater recharge. ▪ PFS-6.3: The County shall encourage the use of natural stormwater drainage systems (e.g., swales, streams) to preserve and enhance the environment and facilitate groundwater recharge. ▪ PFS-6.4: The County shall require project designs that minimize stormwater drainage concentrations and impervious surfaces, complement groundwater recharge, avoid floodplain areas, and use natural watercourses in ways that maintain natural watershed functions and provide wildlife habitat. ▪ PFS-6.5: Where necessary, the County shall require on-site detention/retention facilities and/or velocity reducers to maintain pre-development runoff flows and velocities in natural drainage systems.

Plan/Policy Document	Summary
	▪ PFS-6.6: The County shall require stormwater detention basins be designed to ensure public safety, be visually unobtrusive, provide temporary or permanent wildlife habitat, and where feasible, provide recreation opportunities. ▪ PFS-6.7: The County shall require all drainage systems in new development and redevelopment to comply with applicable State and Federal non-point source pollutant discharge requirements. ▪ PFS-6.8: The County shall ensure that drainage systems are designed and maintained to minimize soil erosion and sedimentation and maintain natural watershed functions. Natural and Cultural Resources ▪ NCR-2.5: The County shall encourage the protection of the habitat value and biological functions of oak woodlands, native grasslands, riparian and aquatic resources, and vernal pools and wetlands. The County shall require that development avoid encroachment and require buffers around these habitats to the extent practicable. The County shall further require mitigation for any development proposals that have the potential to reduce these habitats. Recreational trails and other features established within natural wetlands and aquatic and riparian buffer areas shall be, as long as such areas are not required to meet the Americans with Disabilities Act, located along the outside of the sensitive habitat whenever possible to minimize intrusions and maintain the integrity of the habitat. Exceptions to this action include irrigation pumps, roads and bridges, levees, docks, public boat ramps, and similar uses. In all cases where intrusions into these buffers are made, only the minimum amount of vegetation necessary to construct the feature shall be removed. ▪ NCR-4.1: The County shall consider implementing Regional Water Quality Control Board Basin Plan policies to improve areas of low water quality, maintain water quality on all drainage, and protect and enhance habitat for fish and other wildlife on major tributaries to the Pajaro River (San Benito River, Pacheco Creek) and the Silver Creek watershed. ▪ NCR-4.5: The County shall encourage new development to preserve, where feasible, areas that provide important groundwater recharge and stormwater management benefits such as undeveloped open spaces, natural habitat, riparian corridors, wetlands, and natural drainage areas. ▪ NCR-4.6: To ensure an adequate water supply, large-scale development projects that meet the criteria in California Water Code section 10912 shall prepare an analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project in accordance with SB 610. ▪ NCR-4.7: The County shall encourage new development to avoid significant water quality impacts and protect the quality of water resources and natural drainage systems through site design, source controls, runoff reduction measures, and best management practices (BMPs). Health and Safety ▪ HS-1.14: The County shall discourage development in areas that may be more severely impacted by climate change, including areas at high risk of wildfire or flooding, unless proper design mitigation is included in the project. ▪ HS-2.1: The County shall require a minimum 100-year flood protection for all new development in accordance with local, State, and Federal requirements to avoid or minimize the risk of flood damage.

Plan/Policy Document	Summary
	▪ HS-2.2: The County shall encourage, to the extent feasible, new development located in dam inundation areas to consider and mitigate the risks from dam failure. ▪ HS-2.3: The County shall require new flood control projects or developments within areas subject to 100 year floods to be constructed in a manner that will not cause floodwaters to be diverted onto adjacent property or increase flood hazards to property downstream. ▪ HS-2.4: The County shall coordinate with local, regional, State, and Federal agencies to define existing and potential flood problem areas associated with expected impacts from climate change and develop and implement strategies to improve and maintain flood control facilities accordingly. ▪ HS-2.5: The County shall ensure that the upgrade, expansion, or construction of any flood control facilities will not adversely divert flood water or increase flooding. ▪ HS-2.6: The County shall encourage multi-purpose flood control facilities that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the county's streams, creeks, rivers, and lakes. ▪ HS-2.7: The County shall prohibit further channeling, straightening, or lining of waterways until alternative multi-purpose modes of flood control, such as wider berms and landscaped levees, in combination with recreation amenities, are studied. ▪ HS-2.8: The County shall encourage flood control facility designs that retail natural contours and vegetation of waterways, while retaining dynamic flow and functional integrity. ▪ HS-2.9: The County shall ensure that flood control facilities are designed and maintained to minimize soil erosion and sedimentation and maintain natural watershed functions.
San Benito County Ordinance Code (2016, 2018)	The San Benito County Ordinance Code, codified through Ordinance 937, was most recently adopted in 2015. The Code includes the following titles and chapters relevant to hydrology and water resources: Title 15: Public Works ▪ Chapter 15.05: Water: require groundwater aquifer protection from groundwater extraction and permits for excavations that may intersect groundwater basins Title 19: Land Use and Environmental Regulations ▪ Chapter 19.15: Flood Damage Protection: requires flood damage prevention/protection measures for development/redevelopment within flood hazard areas ▪ Chapter 19.17: Grading, Drainage and Erosion Control: grading must be done at least 50 from the top of the bank of a stream creek, river or from a wetland or body of water and grading to be performed to minimize runoff, erosion, and sedimentation, and regulates grading through a permitting framework Title 23: Subdivisions ▪ Chapter 23.17: Improvements: this ordinance requires stormwater runoff to be collected and conveyed by an approved storm drain system ▪ Chapter 23.31: Improvement Designs Article III Storm Drainage Design Standards: design requirements for storm new/improved storm drainage systems
Merced County	
2030 Merced County General Plan (2013)	The *2030 Merced County General Plan* was adopted in 2013. The Plan includes the following goals and policies relevant to hydrology and water resources:

Plan/Policy Document	Summary
	Public Facilities and Services ▪ PFS-2.5: Prohibit wastewater disposal facilities, including private residential facilities, that are determined to have the potential to contaminate the groundwater or surface water, on either a site-specific or cumulative basis. ▪ PFS-3.2: Require that new development in unincorporated communities includes adequate stormwater drainage systems. This includes adequate capture, transport, and detention/retention of stormwater. ▪ PFS-3.3: Encourage development of community drainage systems rather than individual project level systems, in order to use land more efficiently and project people, property and the environment in a more comprehensive manner. ▪ PFS-3.4: Coordinate with the U.S. Army Corps of Engineers and other appropriate agencies to develop stormwater detention/retention facilities and recharge facilities that enhance flood protection and improve groundwater recharge. ▪ PFS-3.5: Require on-site detention/retention facilities and velocity reducers when necessary to maintain pre-development storm flows and velocities in natural drainage systems. ▪ PFS-3.6: Encourage stormwater detention/retention project designs that minimize drainage concentrations and impervious coverage, avoid floodplain areas, are visually unobtrusive and, where feasible, provide a natural watercourse appearance and a secondary use, such as recreation. Natural Resources ▪ NR-1.4: Minimize the removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion, and sedimentation. ▪ NR-1.13: Require an appropriate setback, to be determined during the development review process, for developed and agricultural uses from the delineated edges of wetlands. ▪ NR-3.1: Protect soil resources from erosion, contamination, and other effects that substantially reduce their value or lead to the creation of hazards. ▪ NR-3.2: Require minimal disturbance of vegetation during construction to improve soil stability, reduce erosion, and improve stormwater quality. ▪ NR-3.3: Encourage landowners to participate in programs that reduce soil erosion and increase soil productivity. This shall include promoting and coordinating the efforts of University of California Cooperative Extension, various Resource Conservation Districts, and other similar agencies and organizations. ▪ NR-3.15: Within all areas designated for urban land uses by the 2030 General Plan, all structures, paving, or grading shall be set back from rivers, creeks, channels or other major waterways at least twenty feet from the top of bank or twenty feet plus twice the channel depth measured from the toe of the near embankment, whichever is greater, unless a greater setback is required by state or federal regulation Health and Safety ▪ HS-1.7: Discourage construction and grading on slopes in excess of 30 percent. ▪ HS-2.1: Prepare and adopt a floodplain management program in flood hazard areas that gives priority to regulation of land uses over development of structural controls as a method of reducing flood damage. ▪ HS-2.6: Prohibit new development in existing undeveloped areas (i.e., area devoted to agriculture or open space that is not designated for development) protected by a State flood control project without appropriately considering significant known flooding risks and taking reasonable and feasible action to

Plan/Policy Document	Summary
	mitigate the potential property damage to the new development resulting from a flood. ▪ HS-2.7: The County shall not enter into a development agreement, approve any building permit or entitlement, or approve a tentative or parcel map unless it finds one of the following: a) The flood control facilities provides 200-year level of protection in urban and non-urban areas consistent with the current Central Valley Flood Protection Plan; b) Conditions imposed on the development will protect the property at a 200-year level of protection in urban and non-urban areas consistent with the current Central Valley Flood Protection Plan; or c) The local flood management agency has made "adequate progress" on the construction of a flood protection system which will result in protection equal or greater than the 200-year flood event in urban and non-urban areas consistent with the current Central Valley Flood Protection Plan. ▪ HS-2.8: Require new flood control projects or developments within areas subject to 100- and 200-year frequency floods are done in a manner that will not cause floodwaters to be diverted onto adjacent property or increase flood hazards to property located elsewhere. ▪ HS-2.9: Encourage all agencies that operate public facilities, such as roads, structures, wastewater treatment plants, gas, electrical, and water systems within areas subject to 100- and 200-year frequency floods to locate and construct facilities to minimize or eliminate potential flood damage. ▪ HS-2.10: Prohibit the construction of essential facilities (including hospitals, healthcare facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities) in the 100- and 200-year floodplain, unless it can be demonstrated that the structural and operational integrity of the facility can be maintained during flood events. ▪ HS-2.14: Encourage multi-purpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the County's streams, creeks, and lakes. ▪ HS-2.15: Encourage flood control designs that respect the natural topography and vegetation of waterways while retaining dynamic flow and functional integrity. ▪ HS-2.16: Encourage increased stormwater and flood protection infrastructure capacity in order to accommodate changes in precipitation and extreme weather events. ▪ HS-2.17: Permit the construction of County flood control facilities in existing developments located within flood hazard areas to proceed only after a complete review of the environmental effects and project costs and benefits. ▪ HS-6.1: Development Restrictions in High Risk Areas (RDR) • Prohibit development in areas that may be more severely impacted by climate change, including areas at high risk of wildfire or flooding, unless proper design mitigation is included in the project. Water ▪ W-1.4: Support implementation of groundwater recharge projects consistent with adopted Integrated Regional Water Management Plans to minimize overdraft of groundwater and ensure the long-term availability of groundwater. ▪ W-2.1: Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these water resources. ▪ W-2.2: Prepare updated development regulations, such as best management practices, that prevent adverse effects on water resources from construction and development activities.

Plan/Policy Document	Summary
	▪ W-2.3: Encourage the use of natural channels for drainage and flood control to benefit water quality and other natural resource values. ▪ W-2.4: Encourage agriculture and urban practices to comply with the requirements of the Regional Water Quality Control Board for irrigated lands and confined animal facilities, which mandate agricultural practices that minimize erosion and the generation of contaminated runoff to ground or surface waters by providing assistance and incentives. ▪ W-2.5: Enforce septic tank and onsite system regulations of the Regional Water Quality Control Board to protect the water quality of surface water bodies and groundwater quality. ▪ W-2.7: Monitor and enforce provisions of the U.S. Environmental Protection Agency National Pollution Discharge Elimination System (NPDES) program to control non-point source water pollution. ▪ W-2.8: Coordinate with the State Water Resources Control Board, Regional Water Quality Control Board, and other responsible agencies to ensure that sources of water contamination (including boron, salt, selenium and other trace element concentrations) do not enter agricultural or domestic water supplies, and will be reduced where water quality is already affected. ▪ W-4.1: Protect watersheds, aquifer recharge areas, and areas susceptible to ground and surface water contamination by identifying such areas, and implementing requirements for their protection such as: o Implement zoning and development regulations to protect water resources, including aquifer recharge areas and areas susceptible to ground and surface water contamination; o For new development, and when adopting new Community Plans, require community drainage systems that incorporate on-site infiltration and contaminant control measures that are compatible with the County SWMP and NPDES regulations for post-construction runoff conditions; and o Cooperate with other agencies and entities with responsibilities for water quality and watershed protection.
Merced County Code (2016, 2018)	The Merced County Ordinance Code, codified through Ordinance No. 2472, was most recently passed in February 2017. The Code includes the following chapters relevant to hydrology and water resources: Title 9: Public Peace, Morals, and Welfare ▪ Chapter 9.53 Regulation of Stormwater: this ordinance requires compliance from the SWRCB NPDES Permit and the CASQA handbooks ▪ Title 16: Building and Construction ▪ Chapter 16.18.010 California Residential Building Code Adopted: requires grading to be performed to minimize runoff, erosion, and sedimentation and regulates grading through a permitting framework. Title 18: Subdivisions ▪ Chapter 18.34 Special Flood Hazard Areas: requires flood damage prevention/protection measures for development/redevelopment within flood hazard areas ▪ Chapter 18.38 Landscape Standards: provides design standards for landscape areas that minimize runoff and water consumption

Sources: City of Gilroy 2002a, 2005; City of Morgan Hill 2009, 2010; City of San Jose 1992b, 1995, 2011, 2016a, 2016b; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara County 1994; Santa Clara Valley Open Space Authority 2014; Santa Clara Valley Water District 2016b.

Geology, Soils, and Seismicity

Table 8 Regional and Local Plans and Policies Relevant to Geology, Soils, and Seismicity

Plans and Policies	Summary
County of Santa Clara	
Santa Clara County Geologic Ordinance (2002)	Chapter IV Geologic Provisions, adopted in March 2002, establishes requirements for geologic evaluation of projects based on proposed land use and adopted official County Geologic Hazard Maps. The ordinance establishes requirements, rules, and regulations for the development of land that is on or adjacent to known potentially hazardous areas. The geologic investigation would be reviewed and approved by the county geologist prior to any project approval.
Santa Clara County Grading and Drainage Ordinance (2013)	Chapter III Grading and Drainage, effective in May 2013, establishes minimum standards for grading projects in order to control erosion and the production of sediment, as well as to control other related environmental damage such as destabilization and/or scarring of hillsides.
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994. The following polices from the Safety and Noise section are relevant to the project: ▪ Policy C-HS 28: Countywide strategies for reducing the threat of natural hazards to life and property should include: (a) Inventory hazards and monitor changing conditions; (b) Minimize the resident population within high hazard areas; (c) Design, locate, and regulate development within high hazard areas; (d) Reduce the magnitude of the hazard, if feasible; (e) Provide public information regarding natural hazards. ▪ Policy C-HS 29: Inventories and mapping of natural hazards shall be adequately maintained for use in planning and decision-making. ▪ Policy C-HS 33: Development in areas of natural hazards should be designed, located, and otherwise regulated to reduce associated risks, by regulating the type, density, and placement of development where it will not: (a) be directly jeopardized by hazards; (b) increase hazard potential; and (c) increase risks to neighboring properties.

Plans and Policies	Summary
City of Santa Clara	
City of Santa Clara 2010-2035 General Plan (2010)	The *City of Santa Clara 2010-2035 General Plan* was adopted in November 2010. The following goals and policies are relevant to the project: ▪ 5.10.5-G1 Protection of life, the environment and property from natural catastrophes and man-made hazards. ▪ 5.10.5-P5 Regulate development, including remodeling or structural rehabilitation, to ensure adequate mitigation of safety hazards, including flooding, seismic, erosion, liquefaction and subsidence dangers. ▪ 5.10.5-P6 Require that new development is designed to meet current safety standards and implement appropriate building codes to reduce risks associated with geologic conditions. ▪ 5.10.5-P7 Implement all recommendations and design solutions identified in project soils reports to reduce potential adverse effects associated with unstable soils or seismic hazards. ▪ 5.10.5-P16 Require new development to implement erosion and sedimentation control measures to maintain an operational drainage system, preserve drainage capacity and protect water quality. ▪ 5.10.5-P17 Require that grading and other construction activities comply with the Association of Bay Area Governments' Manual of Standards for Erosion and Sediment Control Measures and with the CASQA, Stormwater Best Management Practice Handbook for Construction.
City of San Jose	
San Jose 2040 General Plan (2011)	The *San Jose 2040 General Plan* was adopted in 2011. The following goals and policies are relevant to the project: ▪ Goal EC-3: Seismic Hazards: Minimize the risk of injury, loss of life, property damage, and community disruption from seismic shaking, fault rupture, ground failure (liquefaction and lateral spreading), earthquake-induced landslides, and other earthquake-induced ground deformation. ▪ Policy EC-3.5: Locate, design, and construct vital public utilities, communication infrastructure, and transportation facilities in a manner that maximizes risk reduction and functionality during and after an earthquake. ▪ Goal: EC-4: Geologic and Soil Hazards: Minimize the risk of injury, loss of life, and property damage from soil and slope instability including landslides, differential settlement, and accelerated erosion. ▪ Policy EC-4.5: Ensure that any development activity that requires grading does not impact adjacent properties, local creeks and storm drainage systems by designing and building the site to drain properly and minimize erosion. An Erosion Control Plan is required for all private development projects that have a soil disturbance of one acre or more, are adjacent to a creek/river, and/or are located in hillside areas. Erosion Control Plans are also required for any grading occurring between October 15 and April 15. ▪ Policy EC-4.6: Evaluate development proposed in areas with soils containing naturally occurring asbestos (i.e., serpentinite) that would require ground disturbance and/or development of new residential or other sensitive uses, for risks to people from airborne asbestos particles during construction and post-construction periods. Hazards shall be assessed, at minimum, using guidelines and regulations of the Bay Area Air Quality Management District and the California Air Resources Board.

Plans and Policies	Summary
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The *Morgan Hill 2035 General Plan* was adopted in 2016. The following goals and policies are relevant to the project: ▪ Goal SSI-2: Reduction of potential harm to persons or property from geologic/seismic hazards. ▪ Policy SSI-2.1: Hillside Development. Protect hillsides and carefully control development on steep slopes. When hillside land is developed, it should be done with minimum disruption of topography and vegetative cover. ▪ Policy SSI-2.7: Landslides. Prohibit development on known active landslides and limit development in areas where such development might initiate sliding or be affected by sliding on adjacent parcels. ▪ Policy SSI-2.8: Runoff and Slope Stability. Prohibit development on known active landslides and limit development in areas where such development might initiate sliding or be affected by sliding on adjacent parcels. ▪ Policy SSI-2.10: Slope Stability. Enforce and maintain strict grading and building regulations to minimize instability of sloping areas and reduce public costs associated with maintaining roads and utilities on unstable slopes. ▪ Policy SSI-2.11: Geotechnical Investigations. Require geotechnical investigations on all projects in unstable areas, including areas of expansive soils, prior to construction to ensure that the potential hazards are identified and can be properly mitigated.
City of Gilroy	
City of Gilroy 2002-2020 General Plan (2002)	▪ Natural Hazards Goals: (a) Minimal potential for loss of life, injury, damage to property, economic and social dislocation, and unusual public expense due to natural hazards; (b) Development and use controls to protect the public from the risk of flood damage and to minimize hazards posed by fire, seismic activity, geologic instability, soil erosion, weak and expansive soils, and potentially hazardous soils materials. ▪ Policy 25.01: Location of Future Development. Permit development only in those areas where potential danger to the health, safety, and welfare of residents can be adequately mitigated to an “acceptable level of risk”. This applies to development in areas subject to flood damage or geological hazard due to their location and/or design. Development should be prohibited in areas where emergency services, including fire protection, cannot be provided. ▪ Policy 25.08: Structural Standards. Assure that structures for human occupancy are designed and constructed to retain their structural integrity when subjected to seismic activity in accordance with the Uniform Building Code of the State of California. ▪ Policy 25.09: Site Investigation and Mitigation. Ensure proper site investigations and appropriate mitigation for development proposals in areas of unconsolidated fill, in former streambeds, and in areas subject to seasonal high groundwater tables. Site and building design and engineering must minimize potential damage to an “acceptable level of risk” from hazards posed by liquefaction, differential settlement, and severe ground shaking. ▪ Policy 25.11: Slope Restrictions. Restrict development on steep slopes and on slopes susceptible to landslides and soil creep. Slopes of 10 to 30 percent may be suitable for low intensity, low density development, subject to site-specific review and approval. Slopes greater than 30 percent, areas of high landslide risk, and areas with highly expansive soils on slopes greater than 10 percent are not suitable for development and will remain open space.

Plans and Policies	Summary
City of Gilroy General Guidelines (2014)	The City requires that complete grading plans be prepared that illustrate all proposed cuts-and-fills (Ord. No. 85-15, 2, 8-19-85) and a geotechnical report that examines the property of all phases prior to development.
San Benito County	
San Benito County 2035 General Plan (2015)	The *San Benito County 2035 General Plan* was adopted in 2015. The following goals and policies are relevant to the project: ▪ Goal HS-3: To protect lives and property from seismic and geologic hazards. ▪ Policy HS-3.2: Subsidence or Liquefaction. The County shall require that all proposed structures, utilities, or public facilities with recognized near-surface subsidence or liquefaction areas be located and constructed in a manner that minimizes or eliminates potential damage. It is County policy to minimize erosion resulting from grading, cutting, and filling. The County requires a geotechnical report and grading plans prior to development.
Merced County	
2030 Merced County General Plan (2013)	Merced County adopted the *2030 Merced County General Plan* on December 10, 2013. The general plan includes the following goals and policies: ▪ Health and Safety Element Goal HS-1: Minimize the loss of life, injury, and property damage of County residents due to seismic and geologic hazards. ▪ Policy HS-1.1: Require that all new habitable structures be located and designed in compliance with the Alquist-Priolo Special Studies Zone Act and related State earthquake legislation. ▪ Policies HS-1.6, HS-1.7, HS-1.8, and HS-1.9 related to construction on unstable soils address unstable soils, slope instability, and landslides. ▪ Natural Resources Element Goal NR-3: Facilitate orderly development and extraction of mineral resources while preserving open space, natural resources, and soil resources and avoiding or mitigating significant adverse impacts. ▪ Policy NR-3.1: Protect soil resources from erosion, contamination, and other effects that substantially reduce their value or lead to the creation of hazards. ▪ Policy NR-3.2 addresses soil erosion and soil stability.
Merced County Code (2017)	The Merced County Code is current through Ordinance No. and the June 2017 code supplement. ▪ 16.16.010 International Building Code: The International Building Code, 2012 Edition, the Standards referenced in Chapter 35 and all Appendix Chapters, as adopted by the International Code Council, and California State Amendments to the code, are hereby adopted by reference and, except as herein otherwise provided, are applicable to and shall cover all construction within the unincorporated area of the county of Merced. ▪ 18.41 Performance Standards: The Merced County Code, Chapter 18.41, establishes performance standards to make sure there is compatibility between land uses by setting limits. It includes provisions for clearing, grading, earth moving, and other site preparation activities during construction.

Sources: City of Gilroy 2002a, 2014b; City of Morgan Hill 2016a; City of San Jose 2011; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994.

Paleontological Resources

Table 9 Regional and Local Plans and Policies Relevant to Paleontological Resources

Plans and Policies	Summary
County of Santa Clara	
County of Santa Clara General Plan (1994)	The County of Santa Clara General Plan recognizes paleontological sites as having scientific value and the potential to increase our knowledge of the natural world, and has a goal (Goal 5.1) to protect and preserve paleontological resources. ▪ Policies C-RC 49 and R-RC 81 state that heritage resources, which includes paleontological resources, within Santa Clara County and within rural unincorporated areas should be preserved. ▪ Policies C-RC 50 and R-RC 82 provide a countywide general approach to heritage resource protection, which involves: (1) inventory and evaluation of heritage resources, (2) prevention or minimization of adverse impacts on heritage, and (3) restoration, enhancement, and commemoration of resources as appropriate. ▪ Additional policies and recommendations set the guidance by which the general approach is to be implemented (Policies C-RC 51 through C-RC 56 and R-RC 83 through R-RC 94; Implementation Recommendations C-RC(i) 24 through C-RC(i) 29 and R-RC(i) 32 through R-RC(i) 34).
City of Santa Clara	
City of Santa Clara General Plan (2010)	The City of Santa Clara General Plan has two goals and four policies to protect paleontological resources. ▪ Goal 5.6.3-G1: Protection and preservation of cultural resources, as well as archaeological and paleontological sites. ▪ Goal 5.6.3-G2: Appropriate mitigation in the event that human remains, archaeological resources, or paleontological resources are discovered during construction activities. ▪ Policy 5.6.3-P1: Require that new development avoid or reduce potential impacts to archaeological, paleontological and cultural sites. ▪ Policy 5.6.3-P2: Encourage salvage and preservation of scientifically valuable paleontological or archaeological materials. ▪ Policy 5.6.3-P4: Require that a paleontologist/archaeologist monitor all grading and/or excavation if there is a potential to affect archaeological or paleontological resources. ▪ Policy 5.6.3-P5: In the event that archaeological/paleontological resources are discovered, require that work be suspended until the significance of the find and recommended actions are determined by a qualified archaeologist/paleontologist.

Plans and Policies	Summary
City of San Jose	
City of San José 2040 *General Plan* (2011)	The City of San José General Plan has two policies and one action in place to protect paleontological resources: ▪ Policy ER-10.1: Proposed development sites that have been identified as archaeologically or paleontologically sensitive, require investigation during the planning process in order to determine whether potentially significant archaeological or paleontological information may be affected by the project and then require, if needed, that appropriate mitigation measures be incorporated into the project design. ▪ Policy ER-10.3: Ensure that City, State, and Federal historic preservation laws, regulations, and codes are enforced, including laws related to archaeological and paleontological resources, to ensure the adequate protection of historic and pre-historic resources. ▪ Action ER-10.4: The City will maintain a file of archaeological and paleontological survey reports by location to make such information retrievable for research purposes over time.
City of Morgan Hill	
City of Morgan Hill General Plan (2016)	The City of Morgan Hill's General Plan requires preservation of the City's historic identity and cultural resources for future generations. To support this, two policies are in place regarding paleontological resources. ▪ Policy HC-8.1: This policy requires the City to identify and protect heritage resources from loss and destruction. ▪ Policy HC-8.5: This policy requires that if cultural resources, including tribal, archaeological, or paleontological resources, are uncovered during grading or other on-site excavation activities, construction shall stop until appropriate mitigation is implemented.
County of San Benito	
County of San Benito General Plan (2015)	The San Benito County General Plan contains one goal, two policies, and one implementation program relating to the stewardship and protection of paleontological resources in the County. ▪ Goal NCR-1 is to preserve and enhance valuable open space lands that provide wildlife habitat and conserve natural, historical, archaeological, paleontological, tribal, and visual resources of San Benito County ▪ Policy NCR-7.10 requires that the County educate the public regarding laws, codes, and ordinances that forbid collecting items associated with tribal, archeological, historical, and paleontological sites, and unique geological formations, particularly artifacts or other objects found in association with human remains. ▪ Policy NCR-7.11 states that the County shall prohibit unauthorized grading, collection, or degradation of Native American, tribal, archaeological, or paleontological resources, or unique geological formations. ▪ Implementation Program NCR-G is to prepare and distribute, as necessary, information related to inventories of historic resources in the county, including educational materials regarding the laws, codes, and ordinances that forbid collecting of items associated with archeological, historical, and paleontological sites, particularly artifacts or other objects found in association with human remains.

Plans and Policies	Summary
County of Merced	
2030 Merced County General Plan (2013), Recreation and Cultural Resources (RCR) Element	The Merced County General Plan states that archaeological, historical, architectural, paleontological, and Native American cultural resources and values must be considered in all phases of planning and subsequent development projects, including design, permitting, construction, and long-term maintenance. It is essential that the public and project proponents be aware of cultural resources, as well as all county, state, and federal environmental laws and regulations that protect them. ▪ Policy RCR-2.9 states that the County must establish and adopt mandatory guidelines for use during the environmental review processes for private and public projects to identify and protect historical, cultural, archaeological, and paleontological resources, and unique geological features. ▪ Program RCR-B requires the County to prepare and formally adopt guidelines and standards for the preparation of assessments of historical, cultural, archaeological, and paleontological resources, and unique geological features prepared pursuant to Policy RCR-2.9. At a minimum, the guidelines will include resource survey guidelines covering personnel qualifications, research and field techniques, investigation and documentation, data collection and recordation, and resource preservation, avoidance, minimization, and mitigation strategies.
City of Los Banos	
City of Los Banos General Plan (2009)	The City of Los Banos General Plan contains references to protecting paleontological resources but does not lay out any specific protections. ▪ Guiding Policy POSR-G-12 requires the City to identify and preserve the archaeological and historic resources that are found within the Los Banos Planning Area. ▪ Implementing Action POSR-I-37 requires that new development analyze and avoid any potential impacts on archaeological, paleontological, and designated historic resources by studying the potential effects of development and construction (as required by CEQA). No further guidance is provided on the protection or mitigation of paleontological resources within the City.

Sources: City of Los Banos 2009; City of Morgan Hill 2016a; City of San Jose 2011; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994.
BLM = Bureau of Land Management
CEQA = California Environmental Quality Act
RCR = recreation and cultural resources

Hazardous Materials and Wastes

Table 10 Regional and Local Plans and Policies Relevant to Hazardous Materials and Wastes

Plans and Policies	Summary
Santa Clara County	
Santa Clara County Ordinance Code, Division B11 (2016)	The Santa Clara County Department of Environmental Health Hazardous Materials Compliance Division regulates the storage and handling of hazardous materials through hazardous materials building permits and storage permits. The Ordinance Code includes a Hazardous Materials Storage Ordinance, which defines hazardous materials and requires hazardous materials business plans. The goal is to protect health, life, resources and property through prevention and control of unauthorized discharges and hazardous materials.

Plans and Policies	Summary
Santa Clara County General Plan (1994)	The Hazardous Materials subsection of the Santa Clara County General Plan includes a multipronged strategy for reducing risk from hazardous wastes. Two overarching strategies are listed: ▪ Strategy 1: Manage hazardous materials safely and effectively. ▪ Strategy 2: Ensure the adequacy of local hazardous waste treatment facilities.
City of San Jose	
City of San Jose General Plan (2011)	The General Plan of the City of San Jose stipulates where new hazardous waste facilities may be located and how hazardous materials will be regulated. ▪ Policy ES-1.4 encourages new schools to avoid locations near hazardous materials storage areas. ▪ Policy ES-3.16 calls for a comprehensive program to control and mitigate harmful effects from the storage, use, and transport of hazardous materials.
City of San Jose Municipal Code (2018)	The City of San Jose regulates hazardous materials storage, requiring monitoring plans and permits. ▪ Section 17.68.010: The purpose is the protection of health, life, resources, and property through prevention and control of unauthorized discharges of hazardous materials. ▪ Section 17.68.300: Each facility must have a hazardous materials management plan in place and, if it handles hazardous materials above certain usage thresholds, must submit an annual inventory. ▪ Section 17.68.600: Any entity that stores hazardous materials must keep a current storage permit.
City of Morgan Hill	
City of Morgan Hill Municipal Code, Chapter 8.40 (2018)	Morgan Hill regulates new and existing hazardous materials storage facilities by requiring permits and hazardous materials management plans. The Municipal Code establishes containment standards for hazardous materials facilities.
City of Morgan Hill General Plan 2035 (2016)	The City of Morgan Hill General Plan establishes policies to reduce the risks from hazardous materials by monitoring their use and treatment before disposal, and requiring hazardous materials handling plans. ▪ Policy SSI-4-3: Use and handling requirements, including inspections and monitoring to ensure compliance with hazardous materials regulations. ▪ Policy SSI-4-5: Storage and usage, including regular inspections. ▪ Policy SSI-4-6: Short-term storage, including regular inspections, for facilities that store materials for less than 90 days. ▪ Policy SSI-4-7: Handling, including requiring the submittal of a hazardous materials handling plan. ▪ Policy SSI-4-11: Transportation monitoring, including notification of County jurisdictions in the case of a leak or spill. ▪ Policy SS-4-12: Annual records of hazardous materials inventories submitted to the County. ▪ Policy SS-4-16: Contaminated site mitigation required for projects in areas contaminated from previous discharges. ▪ Action SSI-4-B: Transportation routes for hazardous materials to be specified by the City.

Plans and Policies	Summary
City of Gilroy	
Gilroy City Code (2016)	The City of Gilroy has adopted the California Fire Code with amendments. The Gilroy amendments customize the fire code to agree with Santa Clara County regulations for the definition of and management of hazardous wastes.
Gilroy Hazardous Materials Ordinance (1998)	The Building, Life and Environmental Safety Division of the City of Gilroy administers the Hazardous Materials Ordinance, which mandates hazardous materials business plans, inspections, and permits. ▪ Obligation II.03.A. Mandates possession of a Hazardous Materials Storage Permit. ▪ Obligation II.03.B. Mandates proper containment of hazardous materials. ▪ Obligation II.03.C. Storage shall be in conformance with a Hazardous Materials Business Plan. ▪ Obligation II.03.D. Requires a permit for storage of hazardous materials in an underground storage tank.
Gilroy General Plan 2020 (2002)	Policies 27.01 through 27.05 address hazardous materials education, permitting and monitoring, and transport within the City of Gilroy to minimize danger to public health.
San Benito County	
San Benito County 2035 General Plan (2015)	The County of San Benito General Plan identifies the following plans goals and policies relevant to hazardous materials and wastes: ▪ Goal HS-6: To safeguard and protect the health and safety of people, the environment, and personal property from the potential dangers associated with a hazardous materials release. ▪ HS-6.1: Requires proper storage and disposal of hazardous wastes. ▪ HS-6.2: Requires the County to implement a Hazardous Waste Management Plan. ▪ HS-6.5: The County shall restrict transport of hazardous materials to designated routes.
San Benito County Code of Ordinances (2018)	The San Benito County Code of Ordinances mandates a Hazardous Waste Management Plan.
Merced County	
Merced County Year 2030 General Plan (2013)	The Merced County General Plan outlines policies for hazardous materials waste, transport, and storage, and land development on potentially contaminated parcels. ▪ Goal HS-5: Protect Merced County residents, visitors, and property through the safe use, storage, transport, and disposal of hazardous materials and wastes. ▪ Policy HS-5.1: Requires safe use, storage, transport, and disposal of hazardous materials. ▪ Policy HS-5.2: Coordinate with California Highway Patrol for hazardous materials transport. ▪ Policy HS-5.4: Requires new developments to protect soils, surface water, and groundwater from hazardous materials contamination.

Plans and Policies	Summary
City of Los Banos	
City of Los Banos 2030 General Plan Update (2009)	The City of Los Banos General Plan outlines the City's policy toward hazardous waste, including the adoption of the Merced County Hazardous Waste Management Plan. In addition, the general plan lists hazardous sites within city limits. ▪ Guiding Policy S-G-4: Protect Los Banos' ecology and residents from harm resulting from the improper production, use, storage, disposal, or transportation of hazardous materials. ▪ Action S-I-20: Discourage placement of hazardous materials-producing industries within 0.25 mile of hospitals, schools, and residential neighborhoods. ▪ Action S-I-21: Require Phase I and Phase II studies for new developments on land potentially contaminated with hazardous materials. ▪ Action S-I-22: Require remediation of contaminated sites.
City of Los Banos Municipal Code (2016)	The City of Los Banos has adopted the California Fire Code with city-specific amendments.

Sources: City of Gilroy 1998, 2002a; City of Los Banos 2009; City of Morgan Hill 2016a, ; City of San Jose 2011; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994.
USEPA = United States Environmental Protection Agency
ID = identification number

Safety and Security

Table 11 Regional and Local Plans and Policies Relevant to Safety and Security

Plan/Policy Document	Summary
Regional	
Taming Natural Disasters (2010)	The *Association of Bay Area Governments Executive Board will adopt the Taming Natural Disasters* pending FEMA approval. The 2010 update of the 2005 plan includes the following goals applicable to safety and security: ▪ Infrastructure 2-(a-4): Retrofit or replace critical lifeline infrastructure facilities and/or their backup facilities that are shown to be vulnerable to damage in natural disasters. ▪ Transportation 3-(a-15): Ensure that transit operators, private ambulance companies, cities, and/or counties have mechanisms in place for medical transport during and after disasters that take into consideration the potential for reduced capabilities of roads following these same disasters. ▪ Hazards and Public Education 5-(g-5): Facilitate and/or coordinate the distribution of emergency preparedness or mitigation materials that are prepared by others, such as by making the use of the internet or other electronic means, or placing materials on community access channels or in city or utility newsletters, as appropriate. ▪ Hospitals and Other Critical Health Care Facilities 3-(a-3): Ensure health care facilities are adequately prepared to care for victims with respiratory problems related to smoke and/or particulate matter inhalation. ▪ Critical Facilities Owned by Government 1-(Strategy GOVT a-1): Assess the vulnerability of critical facilities (such as city halls, fire stations, operations and communications headquarters, community service centers, seaports, and airports) to damage in natural disasters and make recommendations for appropriate mitigation. ▪ Coordination Among Local Governments 2-(d-2): Recognize that emergency services is more than the coordination of police and fire response; it also includes

Plan/Policy Document	Summary
	planning activities with providers of water, food, energy, transportation, financial, information, and public health services.
Santa Clara County	
Santa Clara County General Plan (2016)	Santa Clara County adopted the *Santa Clara County General Plan* on December 20, 1994 (amendments published November 2, 2016) The general plan includes the following goals and policies applicable to safety and security: Transportation (TR) ▪ Policy C-TR 42: Development and application of advanced transportation-related technologies should be supported to meet current and future travel demand, minimize economic productivity losses due to roadway congestion, and increase travel safety. Hazards and Safety (HS) ▪ Policy C-HS 17: Local governments should comply with all federal and state regulations regarding emergency planning and preparedness. ▪ Policy C-HS 36: General strategies for airport safety in Santa Clara County include the following: o Limit population densities and land uses within designated safety zones. o Regulate structures and objects, which could be hazardous or distracting to air navigation. ▪ Policy C-HS 37: Land use plans and development proposals within the "influence boundaries" of affected jurisdictions should be consistent with ALUC land use plans for airport safety.
Santa Clara County Operational Area Emergency Operations Plan (2008)	Santa Clara County adopted the *Santa Clara County Operational Area Emergency Operations Plan* on March 25, 2008. The Plan establishes a county emergency management organization, which will coordinate and support on-scene responses including maintenance of situational awareness, facilitation of effective communication between emergency centers at various levels of government, and interaction with public information sources. The plan also establishes the overall operational concepts associated with the management of emergencies at the County and Operational Area levels and provides a flexible platform for planning and response to all hazards and emergencies believed to be important to Santa Clara County. It is applicable to a wide variety of anticipated emergencies including earthquake, wildland/urban interface fires, floods, terrorism, and public health emergencies. The plan includes the following goals related to emergency management and response and applicable to safety and security: ▪ Provide effective life safety measures and reduce property loss and damage to the environment. ▪ Provide for the rapid resumption of impacted businesses, community, and government services. ▪ Provide accurate documentation usable for cost recovery efforts, and after-action improvements in our procedures.
County Of Santa Clara Emergency Operations Plan (2017)	The County of Santa Clara Emergency Operations Plan (EOP) is an all-hazards document describing Santa Clara County's incident management organization, compliance with relevant legal statutes, other relevant guidelines, whole community engagement, continuity of government focus, and critical components of the incident management structure. The plan includes the following goals related to emergency management and response and applicable to safety and security: ▪ Maximize the safety of the public, minimize property and environmental damage, and ensure the continuity of government.

Plan/Policy Document	Summary
	▪ Contribute to the National Preparedness Goal of the Federal Emergency Management Agency (FEMA). ▪ Maintain a robust incident management organization with strong collaborative ties among governments, community-based organizations, volunteers, public service agencies, and the private sector.
Annex to 2010 Association of Bay Area Local Hazard Mitigation Plan Taming Natural Disasters (2011)	Santa Clara County adopted the Association of Bay Area Government's *Annex to 2010 Association of Bay Area Local Hazard Mitigation Plan Taming Natural Disasters* in December of 2011. The plan is intended to serve many purposes and includes the following goals and policies related to safety and security, including: ▪ Helping residents of the County better understand the hazards that threaten public health, safety, and welfare; economic vitality; and the operational capability of important institutions. ▪ Insuring Santa Clara County and its incorporated cities can take full advantage of state and federal grant programs, policies, and regulations that encourage or mandate that local governments develop comprehensive hazard mitigation plans. ▪ Providing the policy basis for mitigation actions that should be promulgated by participating jurisdictions to create a more disaster-resistant future. ▪ To qualify for certain forms of federal aid for pre- and post-disaster funding, local jurisdictions must comply with the federal Disaster Mitigation Act (DMA) 2000 and it's implementing regulations (44 CFR Section 201.6). DMA 2000 intends for hazard mitigation plans to remain relevant and current.
Comprehensive Land Use Plan Santa Clara County: South County Airport (San Martin Airport) (2016)	The Santa Clara County Airport Land Use Commission adopted the *Comprehensive Land Use Plan Santa Clara County: South County Airport* on November 19, 2008. The plan was amended in 2016. The plan includes the following goals and policies applicable to safety and security: ▪ Safety Policy S-6: The principal means of reducing risks to people on the ground is to restrict land uses so as to limit the number of people who might gather in areas most susceptible to aircraft accidents. ▪ Reconstruction Policy R-1: Reconstruction projects that are not subject to a previous avigation easement shall not be required to provide an avigation easement as a condition for approval.
Comprehensive Land Use Plan Santa Clara County: Moffett Federal Airfield (2016)	The Santa Clara County Airport Land Use Commission adopted the *Comprehensive Land Use Plan Santa Clara County: Moffett Federal Airfield* on November 2, 2012. The plan was amended in 2016. The plan includes the following goals and policies applicable to safety and security: ▪ Safety Policy S-6: The principal means of reducing risks to people on the ground is to restrict land uses so as to limit the number of people who might gather in areas most susceptible to aircraft accidents. ▪ Reconstruction Policy R-1: Reconstruction projects that are not subject to a previous avigation easement shall not be required to provide an avigation easement as a condition for approval.
Santa Clara County: Norman Y. Mineta San Jose International Airport Comprehensive Land Use Plan (2016)	The Santa Clara County Airport Land Use Commission adopted the *Santa Clara County Norman Y. Mineta San Jose International Airport Comprehensive Land Use Plan* on May 25, 2011. The plan was amended in 2016. The plan includes the following goals and policies applicable to safety and security: ▪ Safety Policy S-6: The principal means of reducing risks to people on the ground is to restrict land uses so as to limit the number of people who might gather in areas most susceptible to aircraft accidents.

Plan/Policy Document	Summary
	▪ Reconstruction Policy R-1: Reconstruction projects that are not subject to a previous avigation easement shall not be required to provide an avigation easement as a condition for approval.
City of Santa Clara	
City of Santa Clara 2010-2035 General Plan (2010)	The City of Santa Clara adopted the *City of Santa Clara 2010-2035 General Plan* on November 16, 2010. The general plan includes the following goals and policies applicable to safety and security: ▪ Goal 5.8.1-G2: Transportation networks that provide a safe, efficient, convenient and integrated system to move people and goods. ▪ Policy 5.8.3-P7: Provide transit stops at safe, efficient and convenient locations to maximize ridership, including near employment centers, higher-density residential developments and Downtown. ▪ Goal 5.8.7-G2: Neighborhoods protected from negative effects associated with rail and freight services. ▪ Goal 5.10.5-G1: Protection of life, the environment and property from natural catastrophes and man-made hazards. ▪ Goal 5.10.5-G2: Adequate emergency preparedness plans. ▪ Goal 5.10.5-G3: Availability of emergency services in the event of a disaster. ▪ Policy 5.10.5-P4: Identify appropriate evacuation routes so people can be efficiently evacuated in the event of a natural disaster.
City of San Jose	
Envision San Jose 2040 General Plan (2011)	The City of San Jose adopted the *Envision San Jose 2040 General Plan* on November 1, 2011. The general plan includes the following goals and policies which are applicable to safety and security: ▪ Goal EC-3: Minimize the risk of injury, loss of life, property damage, and community disruption from seismic shaking, fault rupture, ground failure (liquefaction and lateral spreading), earthquake-induced landslides, and other earthquake-induced ground deformation. ▪ Policy EC-3.5: Locate, design and construct vital public utilities, communication infrastructure and transportation facilities in a manner that maximizes risk reduction and functionality during and after an earthquake. ▪ Policy EC-4.3: Locate new public improvements and utilities outside of areas with identified soils and/or geologic hazards (e.g., deep seated landslides in the Special Geologic Hazard Study Area and former landfills) to avoid extraordinary maintenance and operating expenses. Where the location of public improvements and utilities in such areas cannot be avoided, effective mitigation measures will be implemented. ▪ Goal EC-5: Protect the community from flooding and inundation and preserve the natural attributes of local floodplains and floodways. ▪ Goal EC-8: Protect lives and property from risks associated with fire-related emergencies at the urban/wildland interface. ▪ Policy ES-3.1: Provide rapid and timely level of service response time to all emergencies: 1. For police protection, use as a goal a response time of six minutes or less for 60 percent of all Priority 1 calls, and of 11 minutes or less for 60 percent of all Priority 2 calls.

Plan/Policy Document	Summary
	2. For fire protection, use as a goal a total response time (reflex) of eight minutes and a total travel time of four minutes for 80 percent of emergency incidents. ▪ Policy ES-3.24: Analyze service demands and deploy dynamic response techniques to reduce response time and maximize use of available resources. ▪ Policy TR-14.3 For development in the Airport Influence Area overlays, ensure that land uses and development are consistent with the height, safety and noise policies identified in the Santa Clara County Airport Land Use Commission (ALUC) comprehensive land use plans for Mineta San José International and ReidHillview airports, or find, by a two-thirds vote of the governing body, that the proposed action is consistent with the purposes of Article 3.5 of Chapter 4 of the State Aeronautics Act, Public Utilities Code Section 21670 et seq. ▪ Policy TR-14.4 Require avigation and "no build" easement dedications, setting forth maximum elevation limits as well as for acceptance of noise or other aircraft related effects, as needed, as a condition of approval of development in the vicinity of airports.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The City of Morgan Hill adopted the *Morgan Hill 2035 General Plan* on July 27, 2016. The general plan includes the following goals and policies applicable to safety and security: Transportation (TR) ▪ Goal TR-1: A balanced, safe, and efficient circulation system for all segments of the community, meeting local needs and accommodating projected regional and sub-regional traffic while protecting neighborhoods. ▪ Policy TR-1.3: Implement strategies to ensure safe and appropriate operation of all components of the transportation system for all users, such as programs to lower crash rates and reduce the number of transportation-related injuries in the city through education, enforcement, engineering strategies, physical improvements, and operational systems. Prioritize strategies that improve safety for students, pedestrians, and bicyclists. ▪ Goal TR-6: A safe and efficient transit system that reduces congestion by providing viable non-automotive modes of transportation. ▪ Goal TR-7: Well-planned High-Speed Rail service that minimizes negative local impacts. Safety, Service, and Infrastructure (SSI) ▪ Goal SSI-2: Reduction of potential harm to persons or property from geologic/seismic hazards. ▪ Goal SSI-3: Minimize threat to persons, property, and the environment from fire hazards. ▪ Policy SSI-3-2: Avoid actions which increase fire risk, such as increasing public access roads in fire hazard areas, because of the great environmental damage and economic loss associated with a large wildfire. ▪ Policy SSI-3.5: Work cooperatively with CAL FIRE and other public agencies with responsibility for fire protection to reduce fire risks in Morgan Hill. ▪ Goal SSI-4: Avoidance of exposure to hazardous substances. ▪ Goal SSI-5: The least possible damage to persons and property from flooding. ▪ Goal SSI-6: Adequate, safe, and environmentally responsible drainage and flood control

Plan/Policy Document	Summary
	▪ Goal SSI-7: To protect the public's health and safety, ensure compatible land uses with South County Airport operations. ▪ Goal SSI-11: Efficient police, fire, and emergency medical response and services, and access to local medical facilities. ▪ Goal SSI-12: Reduce risk to life and property associated with emergencies and natural and manmade disasters.
City of Morgan Hill Office of Emergency Service Emergency Operations Plan Revision 2.0 (2018)	The City of Morgan Hill adopted the Revised *City of Morgan Hill Office of Emergency Service Emergency Operations Plan* on January 18, 2018. The plan defines the actions required before, during, and after an emergency and to guide the City's response to major emergencies/disasters. ▪ Mitigation: Actions taken to reduce exposure to, probability of, or potential loss from hazardous events ▪ Preparedness: Establishing of authorities and responsibilities for emergency actions and the garnering of resources to support them. ▪ Response: Time-sensitive actions taken to save lives and protect property, including actions to stabilize the situation. Response actions include notifying and activating the City's emergency management organization. ▪ Recovery: Efforts to restore the infrastructure, social, and economic life of the City.
City of Gilroy	
Gilroy General Plan (2002)	The City of Gilroy adopted the *City of Gilroy General Plan* and *City of Gilroy General Plan Environmental Impact Report* on June 13, 2002. The general plan includes the following goals and policies applicable to safety and security: ▪ Goal 18: Public health and safety through (1) the provision of high quality police, fire, and emergency response services that respond to community needs and issues; (2) education programs that raise community awareness about public safety issues; and (3) preventive programs that involve residents in deterring crime, reducing fire hazards, and addressing other threats to public health and safety. ▪ Policy 18.01: Continue to provide and maintain police and fire services that are adequate in manpower, equipment, and resources to respond to localized emergencies and calls for service within the City. The departments' current levels of service should be maintained or improved as the City continues to grow, with average emergency response times for police services of approximately 4.5 minutes and average emergency response times for fire services of less than 5.0 minutes. ▪ Policy 18.03: Ensure that facilities designated as local command control centers for emergency/disaster services are designed to withstand a "maximum probable seismic event" and remain operational. Secondary facilities should be identified and equipped as back up. ▪ Policy 18.05: Continue to provide essential emergency public services during natural catastrophes. Promote emergency preparedness through staff training and planning in cooperation with other public agencies and appropriate public interest organizations. ▪ Policy 18.07: Ensure adequate access for emergency vehicles and equipment, providing a second means of ingress and egress in all development. ▪ Goal 25: (a) Minimal potential for loss of life, injury, damage to property, economic and social dislocation, and unusual public expense due to natural hazards. (b) Development and use controls to protect the public from the risk of flood damage and to minimize hazards posed by fire, seismic activity, geologic

Plan/Policy Document	Summary
	instability, soil erosion, weak and expansive soils, and potentially hazardous soils materials.
San Benito County	
San Benito County 2035 General Plan (2015)	San Benito County adopted the *San Benito County 2035 General Plan* on July 21, 2015. The general plan includes the following goals and policies applicable to safety and security: Circulation (C) ▪ Goal C-3: To promote a safe and efficient public transit system that provides a viable travel alternative to automobiles, maximizes mobility, and reduces roadway congestion and greenhouse gas emissions. ▪ Goal C-6: To promote the safe and efficient use of aviation facilities. Public Facilities and Services (PFS) ▪ Policy PFS-1.5: The County shall site public facilities to minimize the potential vulnerability of the facilities to natural and human-made hazards and threats. ▪ Goal PFS-12: To provide adequate law enforcement facilities and services to prevent crime, ensure the safety of residents and visitors, and protect private and public property. ▪ Policy PFS-12.2: The County shall strive to achieve and maintain appropriate Sheriff Department response times for all call priority levels to provide adequate law enforcement services for all County residents. ▪ Goal PFS-13: To coordinate with fire protection and emergency service providers to ensure adequate fire facilities, equipment, and services are available to protect county residents and property from fire. ▪ Policy PFS-13.1: The County shall strive to maintain fire department staffing levels and response times consistent with National Fire Protection Association standards. ▪ Policy PFS-13.2: The County shall maintain mutual aid agreements between fire districts and emergency service providers to ensure residents and property are adequately served and to facilitate the efficient use of available resources. Health and Safety (HS) ▪ Goal HS-1: To maintain the necessary level of fire, EMS, law enforcement, and disaster preparedness for the protection of the health, safety, and welfare of people living, working, and residing in San Benito County. ▪ Policy HS-1.1: Provide adequate fire and EMS protection based on current state and national standards to promote a safe and vibrant community with limited fire loss and loss of life. ▪ Policy HS-1.2: Work with the Cities and fire protection agencies in the region to provide County residents with adequate fire and life safety protection to promote the general welfare and economy of the community and its citizens. ▪ Policy HS-1.4: The County shall maintain local law enforcement, fire, and health services in a state of readiness to insure adequate protection during a disaster for the citizens of San Benito County. ▪ Policy HS-1.7: The County shall develop, maintain, and implement a Multi-Hazard Mitigation Plan to address disasters such as earthquakes, flooding, dam or levee failure, hazardous material spills, epidemics, fires, extreme weather, major transportation accidents, and terrorism. ▪ Policy HS-1.9: The County shall continue to maintain the Emergency Operations Center (EOC) as the single point for centralized management and coordination of emergency response and recovery operations during a disaster or emergency.

Plan/Policy Document	Summary
	▪ Goal HS-2: To minimize the loss of life, injury, or damage to property as a result of floods in the county. ▪ Goal HS-3: To protect lives and property from seismic and geologic hazards. ▪ Goal HS-4: To minimize the risk of wildland and urban fire hazards. ▪ Goal HS-6: To safeguard and protect the health and safety of people, the environment, and personal property from the potential dangers associated with a hazardous materials release. ▪ Goal HS-7: To promote the safe operation of public and private airports and protect the safety of county residents.
San Benito County Operational Area Emergency Operations Plan (2015)	San Benito County adopted the *San Benito County Operational Area Emergency Operations Plan* on August 25, 2015. The plan provides the needed foundation for the management of emergencies and disasters and addresses the integration and coordination with other governmental levels when required. Operational Goals include the following: ▪ Mitigate hazards ▪ Meet basic human needs ▪ Address needs of people with disabilities and older adults ▪ Restore essential services ▪ Support community and economic recovery
Frazier Lake Airpark Comprehensive Land Use Plan (2001)	The San Benito County Airport Land Use Commission adopted the *Frazier Lake Airpark Comprehensive Land Use Plan* on November 15, 2001. The plan includes the following policies applicable to safety and security: ▪ Height Compatibility Policy: Any project that may exceed a FAR Part 77 surface must notify the Federal Aviation Administration (FAA) as required by FAR Part 77, Subpart B on FAA Form 7460-1, Notice of Proposed Construction or Alteration. (Notification to the FAA under FAR Part 77, Subpart B, is required even for certain proposed construction that does not exceed the height limits allowed by Subpart C of the FARs). ▪ Safety Compatibility Criteria: The principal means of reducing risks to people on the ground is to restrict land uses so as to limit the number of people who might gather in areas most susceptible to aircraft accidents.
Hollister Municipal Airport Land Use Compatibility Plan (2012)	The San Benito County Airport Land Use Commission adopted the *Hollister Municipal Airport Land Use Compatibility Plan* on June 21, 2012. The plan includes the following policies applicable to safety and security: ▪ Safety Policy Objective 3.3.1: The intent of land use safety compatibility criteria is to minimize the risks associated with an off-airport aircraft accident or emergency landing. The policies focus on reducing the potential consequences of such events when they occur. Risks both to people and property in the vicinity of an airport and to people on board the aircraft shall be considered. ▪ Airspace Protection Policy 3.4.7: The project proponent must submit notification of a proposal to the FAA where required by the provisions of FAR Part 77, Subpart B, and by the California Public Utilities Code, Sections 21658 and 21659. FAA notification requirements apply to all objects including structures, antennas, trees, mobile objects, and temporary objects such as construction cranes. The FAA will conduct an "aeronautical study" of the object(s) and determine whether the object(s) CHAPTER 2 POLICIES 2–30 Hollister Municipal Airport Land Use Compatibility Plan would be of a height that would constitute a hazard to air navigation. See Appendix C for a copy of FAR Part 77

Plan/Policy Document	Summary
	and online procedures for filing Form 7460-1. The following requirements reflect ALUC policy: (a) Local agencies shall inform project proponents of the requirements for notification to the FAA. FAA notification is required under the following circumstances: (1) The project contains proposed structures or other objects that exceed the height standards defined in FAR Part 77, Subpart B, as applied to the Hollister Municipal Airport (see Policies 3.4.4(a)(1) and 3.4.4(a)(3)), unless the object is shielded by nearby taller objects as is exempted in accordance with FAR Part 77, Paragraph 77.15. Note that notification to the FAA under FAR Part 77, Subpart B, is required even for certain proposed construction that does not exceed the height limits allowed by Subpart C of the regulations. (2) Any proposal for construction or alteration of a structure, including antennas, taller than 200 feet above the ground level at the site regardless of proximity to any airport. (b) Any proposed development project that includes construction of a structure or other object and that is required to be submitted to the ALUC for a consistency review in accordance with Policies 1.5.3 or 1.5.5 shall include a copy of the completed FAR Part 77 notification form (Form 7460-1) submitted to the FAA, if applicable, and of the resulting FAA findings from its aeronautical study (i.e., notice of determination letter). (c) ALUC Review: The requirement for notification to the FAA shall not by itself trigger an airport compatibility review of an individual project by the ALUC. If the general plan of the local agency in which the project is to be located has been determined by the ALUC to be consistent with this Compatibility Plan, then no ALUC review is required. If the general plan has not been made consistent, then the proposed project must be submitted to the ALUC for review (see Policies 1.5.3 and 1.5.5).
Merced County	
2030 Merced County General Plan (2013)	Merced County adopted the *2030 Merced County General Plan* on December 10, 2013. The general plan includes the following goals and policies applicable to safety and security: ▪ Policy CIR-4.1: Encourage a complete, safe, and interconnected bicycle and pedestrian circulation system that serves both commuter and recreational travel, and provides access to major destinations within and between urban communities and cities. ▪ Goal CIR-5: Maintain and expand a rail transportation system that provides safe, efficient, and reliable movement of freight and passengers within and through Merced County. ▪ Policy CIR-5.4: Encourage alternatives to at-grade rail crossings at existing and future roads. ▪ Policy CIR-5.7: Coordinate with the California High Speed Rail Authority, the cities, and other local agencies in efforts to properly locate the High Speed Rail corridors throughout Merced County, including at least one station and a heavy maintenance facility

Plan/Policy Document	Summary
	▪ Goal CIR-6: Ensure that air transportation systems provide safe, efficient, and reliable movement of passengers and freight. ▪ Goal HS-1: Minimize the loss of life, injury, and property damage of County residents due to seismic and geologic hazards. ▪ Goal HS-2: Minimize the possibility of loss of life, injury, or damage to property as a result of flood hazards. ▪ Goal HS-3: Minimize the exposure of county residents and public and private property to the effects of urban and wildland fires. ▪ Goal HS-4: Promote the safe operation of airports and the safety of Merced County residents by requiring that any new development within the airport area of influence be consistent with the requirements of the Merced County Airport Land Use Commission's compatibility plan and compliant with Federal Aviation Administration regulations. ▪ Policy PFS-5.5: Require utility and pipeline companies and districts maintain contingency plans for responding to potentially hazardous situations such as pipeline breaks and fallen power lines. ▪ Goal PFS-6: Ensure the provision of timely and adequate law enforcement through proper management and staffing of the Sheriff Department in Merced County. ▪ Goal PFS-7: Provide adequate fire and emergency medical facilities and services to protect County residents from injury and loss of life, and to protect property from fire. ▪ Policy PFS-7.6: Strive to achieve and maintain optimum staffing levels and appropriate response times to provide adequate emergency medical services for all county residents.
County of Merced Emergency Operations Plan (2013)	Merced County adopted the *County of Merced Emergency Operations Plan* in December, 2013. The plan includes the following goals applicable to safety and security: ▪ Mitigate hazards ▪ Meet basic human needs ▪ Address needs of people with disabilities and older adults ▪ Restore essential services ▪ Support community and economic recovery
County of Merced Department of Public Health Medical / Health Emergency Operations Plan (2017)	The Medical / Health Emergency Operations Plan, adopted December 2017, provides Departmental Operations Center (DOC) responders with procedures and position checklists, and provides detailed information in supplemental requirements such as Public Information, Hazard Mitigation, and Recovery Operations for disaster response. The goal of the Plan is to promote community health, prevent disease, injury, and disability, and minimize the morbidity and mortality that occur as a result of a disaster.
Merced County Airport Land Use Compatibility Plan (2012)	Merced County adopted the *Merced County Airport Land Use Compatibility Plan* on June 21, 2012. The plan includes Los Banos Municipal Airport, and includes the following policy is applicable to safety and security: ▪ Safety Criteria Policy Objective 5.2.1: The intent of land use safety compatibility criteria is to minimize the risks associated with an off-airport aircraft accident or emergency landing. The policies focus on reducing the potential consequences of such events when they occur. Risks both to people and property in the vicinity of an airport and to people on board the aircraft shall be considered. (Note that land

Plan/Policy Document	Summary
	use features that can be the *cause* of an aircraft accident are addressed under Airspace Protection, Section 5.2.11.) ▪ Airspace Protection Criteria Policy 5.3.4: The criteria for determining the acceptability of a project with respect to height shall be based upon the standards set forth in Federal Aviation Regulations (FAR) Part 77, Subpart C, Objects Affecting Navigable Airspace, and applicable airport design standards published by the FAA. Additionally, where an FAA aeronautical study of a proposed object has been required as described in Policy 5.3.6, the results of that study shall be taken into account by the ALUC and the local agency.
City of Los Banos	
City of Los Banos 2030 General Plan Update (2009)	The City of Los Banos adopted the *Los Banos General Plan Update* in 2009. The General Plan includes the following. Safety (S) ▪ Policy S-G-3 Protect Los Banos' residents and businesses from potential wildfire and structural fire hazards. ▪ Policy S-G-5 Maintain and enhance the City's capacity for law enforcement and fire-fighting. ▪ Policy S-G-8 Minimize the risk of personal injury, property damage, and environmental damage from both natural and manmade disasters.

Sources: ABAG 2010; City of Gilroy 2002a; City of Los Banos 2009; City of Morgan Hill 2016a, 2018; City of San Jose 2011; City of Santa Clara 2010; County of Merced 2012, 2013a, 2013c, 2017; County of San Benito 2012, 2015a, 2015b; County of Santa Clara 2008, 2016a, 2016b, 2016c, 2016d, 2017; ; San Benito County Airport Land Use Commission 2001.

Socioeconomics and Communities

Table 12 Regional and Local Plans and Policies Related to Socioeconomics and Communities

Policy Document	Goal, Policy, or Objective
Regional	
Plan Bay Area (2013)	*Plan Bay Area* was adopted by the Association of Bay Area Governments in 2013. The following goals and policies from the plan are relevant to the project extent. ▪ Target #2: House 100 percent of the region's projected population growth by income level (very-low, low, moderate, above-moderate) without displacing current low-income residents. ▪ Target #7: Decrease by 10 percentage points (to 56 percent, from 66 percent) the share of low-income and lower-middle income residents' household income consumed by transportation and housing.
Metropolitan Transportation Commission (2015)	The Metropolitan Transportation Commission adopted the following relevant policy statement in February 2015. "Below 200 percent of poverty" includes all those described as 'in poverty' under the official U.S. Census Bureau definition, plus some people who have incomes above poverty but less than two times their poverty threshold." Due to high income levels in this region, the percent of population below 200 percent of poverty is used for the San Jose to Gilroy subsections.

Policy Document	Goal, Policy, or Objective
Santa Clara County	
Santa Clara County General Plan (1994, 2014)	The *Santa Clara County General Plan* was adopted in 1994 and updated in 2014. The following goals and policies from the plan are relevant to the project extent: Growth and Development (C-GD) ▪ C-GD 37 Within the urban areas of Santa Clara County, a balance should be achieved and maintained between employment levels, housing supply, infrastructure capacity, and environmental quality. ▪ C-GD 40 Improved balance between employment and housing opportunities should include the need for: a. increased overall supply and more varied types of housing; b. housing costs commensurate with household income distribution; and c. increased proximity of housing to employment centers. Economic Well-Being (C-EC) ▪ C-EC 3 Diversification in the mix of local industry should be encouraged in Santa Clara County to achieve a broader base of industrial and commercial activities in order to insulate the local economy from possible future economic downturns and to provide more lower skilled jobs. ▪ C-EC 5 Barriers such as inadequate housing, transportation and childcare facilities which prevent individuals from obtaining employment should be reduced or eliminated. ▪ C-EC 7 The potential impacts on businesses of all sizes should be considered in developing local government plans, policies, regulations, approval processes, and fees. ▪ C-EC 8 Local governments, as part of an overall economic development program, should work to maintain and improve the overall quality of life in Santa Clara County by: a. increasing the supply of affordable housing; b. improving our transportation network and facilitating alternative transportation modes; ▪ C-EC 11 Local governments should adequately plan for infrastructure improvements needed to accommodate planned growth. Housing (HG) ▪ HG 1 The planning for the supply and diversity of housing in each part of the urbanized areas county shall provide for existing and expected employment and household needs and a diversity of affordability that matches the diversity of household incomes, while respecting the capacity of constructed or planned public systems and services. ▪ HG 4 The County and the cities should work cooperatively to ensure that there is a balanced housing supply sufficient to achieve countywide economic, social, and environmental objectives. Further opportunities for interagency, intergovernmental, interregional, and public/private cooperation should be sought out and encouraged. ▪ HG 5 Intergovernmental and public and private cooperation shall be encouraged to achieve an adequate supply of affordable housing that meets changing demographic needs in Santa Clara County. ▪ HG 10 The County of Santa Clara shall work to enforce laws against discrimination against people of protected status under federal and state law. ▪ HG 13 The provision of affordable housing which is suitable for a variety of special needs households shall be given high priority in housing assistance programs. ▪ HG 21 The conservation and rehabilitation of the existing housing supply shall be encouraged and facilitated.

Policy Document	Goal, Policy, or Objective
City of Santa Clara	
City of Santa Clara 2010–2035 General Plan (2010, 2014)	On November 16, 2010, the City Council adopted the *2010–2035 General Plan*. The following goals and policies from the plan are relevant to the project extent: General Land Use ▪ 5.3.1-P1 Preserve the unique character and identity of neighborhoods through community-initiated neighborhood planning and design elements incorporated in new development. ▪ 5.3.1-P5 Implement a range of development densities and intensities within General Plan land use classification requirements to provide diversity, use land efficiently and meet population and employment growth. Residential Land Use ▪ 5.3.2-G1 Equitable housing opportunities within the community for persons of all economic levels, regardless of religion, gender, sexual orientation, marital status, national origin, ancestry, familial status, race, color, age, source of income or mental or physical disability. ▪ 5.3.2-G2 A variety of housing types, sizes, location and tenure in order to maintain social and economic diversity in the City. ▪ 5.3.2-G3 Affordable housing units dispersed throughout the City to avoid a concentration in any one neighborhood. ▪ 5.3.2-G4 Respect for the existing character and quality of adjacent neighborhoods from new residential development and redevelopment. ▪ 5.3.2-G5 Compliance with all State and federal regulations related to housing opportunities and the prevention of discrimination. Commercial Land Use ▪ 5.3.3-G1 A variety of retail, commercial and neighborhood office uses throughout the City, consistent with the intensities defined in the commercial land use classifications. ▪ 5.3.5-P1 Work with existing Santa Clara businesses to retain and expand employment opportunities and strengthen the existing tax base. ▪ 5.3.5-P2 Encourage existing businesses that may be displaced by new development to relocate within Santa Clara. Housing Element ▪ Policy A-1: Maintain and improve the quality of residential neighborhoods, eliminate housing deficiencies and prevent future blight through the encouragement of ongoing maintenance, rehabilitation and conservation of existing housing stock. ▪ Goal C: Provide housing within the community for persons of all economic levels, regardless of religion, gender, sexual orientation, marital status, national origin, ancestry, familial status, source of income, or mental or physical disability. ▪ Goal D: Provide an adequate variety of individual choices of housing tenure, type and location, including higher density where possible, especially for low and moderate income and special needs households
City of San Jose	
Envision: San Jose 2040 General Plan (2011) *and 2014–23 Housing Element* (2015)	The City of San Jose adopted *Envision: San Jose 2040 General Plan* in 2011. The following goals and policies from the plan are relevant to the project extent: Land Use and Employment ▪ IE-1.5 Promote the intensification of employment activities on sites in close proximity to transit facilities and other existing infrastructure.

Policy Document	Goal, Policy, or Objective
	▪ IE-1.6 Plan land uses, infrastructure development, and other initiatives to maximize utilization of the Mineta San Jose International Airport, existing and planned transit systems including fixed rail (e.g., High-Speed Rail, BART and Caltrain), Light-Rail and Bus Rapid Transit facilities, and the roadway network. Consistent with other General Plan policies, promote development potential proximate to these transit system investments compatible with their full utilization. Encourage public transit providers to serve employment areas. ▪ IE-1.9 Invest in strategic infrastructure improvements, as appropriate, in order to encourage private investment, reduce new construction costs, increase business efficiency, and in order to support business retention and growth, stimulate economic activity, and employ people. ▪ IE-1.13 Achieve goals related to Quality Neighborhoods, including diverse housing options, a walkable/bikable public street and trail network and compact, mixed-use development where infrastructure exists to distinguish San Jose as a livable and attractive city, to promote interaction among community members, and to attract talented workers to the City. Broad Economic Prosperity ▪ IE-6.2 Attract and retain a diverse mix of businesses and industries that can provide jobs for the residents of all skill and education levels to support a thriving community. ▪ IE-6.3 Attract job opportunities accessible to all of San Jose's residents, particularly residents in low-income neighborhoods. City Operations ▪ FS-4.1 Preserve and enhance employment land acreage and building floor area capacity for various employment activities because they provide revenue, near-term jobs, contribute to our City's long-term achievement of economic development and 2 job growth goals, and provide opportunities for the development of retail to serve individual neighborhoods, larger community areas, and the Bay Area. Housing (H) ▪ H-1.1 Through the development of new housing and the rehabilitation of existing housing, facilitate the creation of economically, culturally, and demographically diverse and integrated communities. ▪ H-1.2 Facilitate the provision of housing sites and structures across location, type, price and status as rental or ownership that respond to the needs of all economic and demographic segments of the community including seniors, families, the homeless and individuals with special needs. ▪ H-1.3 Create housing opportunities and accessible living environments that allow seniors to age in place, either in the same home, assisted living facilities, continuing care facilities, or other housing types within the same community. ▪ H-1.4 Encourage the location of housing designed for senior citizens in neighborhoods where health and community facilities and services are within a reasonable walking distance and are accessible by public transportation. ▪ H-1.5 Facilitate the development of multi-generational housing in compact form that meets the needs of families living together. ▪ H-1.7 Comply with State and Federal laws prohibiting discrimination in housing and that support fair and equal access to housing. ▪ H-2.1 Facilitate the production of extremely low-, very low-, low-, and moderate-income housing by maximizing use of appropriate policies and financial resources at the federal, state, and local levels; and various other programs.

Policy Document	Goal, Policy, or Objective
	▪ H-2.2 Integrate affordable housing in identified growth locations and where other housing opportunities may exist, consistent with the Envision General Plan. ▪ H-2.3 Conserve viable housing stock through a balanced combination of housing code enforcement and complementary programs such as rehabilitation loans and grants to help maintain the supply of low-priced housing. ▪ H-2.4 Allow affordable residential development at densities beyond the maximum density allowed under an existing Land Use/Transportation Diagram designation, consistent with the minimum requirements of the State Density Bonus Law (Government Code Section 65915) and local ordinances. ▪ H-2.5 Facilitate second units on single-family residential lots, in conformance with our City's Secondary Unit Ordinance, to take advantage of a potential source of affordable housing and to assist our City in meeting its needs as identified in its Consolidated Plan. ▪ H-2.6 Evaluate and incorporate, if feasible, an affordable housing component in the preparation of specific plans, master plans, or strategy plans that include plans for housing. ▪ H-2.7 Support strategies in collaboration with other jurisdictions and agencies to end homelessness by creating permanent housing solutions combined with services such as medical, education, and job placement. ▪ H-2.8 Facilitate the production of affordable and safe housing for workers who provide goods and services to San Jose residents and businesses. ▪ H-2.11 Update the City's dispersion policy: 1) to align the location of future affordable housing developments with planned future Growth Areas identified in the Envision General Plan; 2) to be consistent with the City's inclusionary housing ordinance; 3) to maximize the access of transit, retail, services, and amenities to affordable housing developments; and 4) to reemphasize the support for integration and complete communities. ▪ H-2.13 Maintain our City's Inclusionary Housing Policy and Ordinance, and provide technical assistance to the development community to ensure that residential projects conform to it. ▪ H-2.14 Support State and federal regulations that preserve "at-risk" subsidized rental units subject to potential conversion to market rate rents and that will encourage equitable and fair policies that protect tenant and owner rights. ▪ H-3.4 Promote the conservation and rehabilitation of existing viable housing stock. ▪ H-3.5 Prioritize housing resources to assist those groups most in need, or to those geographic locations in the City that most require investment in order to improve neighborhood blight conditions. ▪ H-3.6 Regulate conversions of rental apartments to condominium or community apartment projects to meet public health and safety standards and to assist displaced renters. Residential rentals undergoing conversion should meet or exceed the minimum residential density in this Plan. General Land Use (LU) ▪ LU-1.1 Foster development patterns that will achieve a complete community in San Jose, particularly with respect to increasing jobs and economic development and increasing the City's jobs-to-employed resident ratio while recognizing the importance of housing and a resident workforce. ▪ LU-1.6 Locate employee-intensive commercial and industrial uses within walking distance of transit stops. Encourage public transit providers to provide or increase services to areas with high concentrations of residents, workers, or visitors.

Policy Document	Goal, Policy, or Objective
	▪ LU-2.1 Provide significant job and housing growth capacity within strategically identified "Growth Areas" in order to maximize use of existing or planned infrastructure (including fixed transit facilities), minimize the environmental impacts of new development, provide for more efficient delivery of City services, and foster the development of more vibrant, walkable urban settings. ▪ LU-2.2 Include within the Envision General Plan Land Use / Transportation Diagram significant job and housing growth capacity within the following identified Growth Areas: o Downtown – The City's Downtown Strategy plans for ambitious job and housing growth capacity in the Downtown area to reinforce its role as San Jose's civic, cultural and symbolic center and to support key infrastructure investments, including the planned BART and High-Speed Rail systems. o Urban Villages: BART/Caltrain Station Areas – To maximize utilization of the Caltrain and BART systems, support regional commuting and foster the City's growth as a regional job center, significant new job growth capacity is planned for the each of the BART / Caltrain Urban Villages. Significant job and housing growth capacity is planned for the Berryessa BART station area in order to support intensification of the station area as a regional employment destination and to achieve a level of density consistent with that planned for other BART and Light Rail station areas. o Urban Villages: Transit / Commercial Corridors – A large and balanced amount of job and housing growth capacity is planned for the Transit / Commercial Corridor Urban Villages with the goal to maximize the opportunity for creating new mixed-use Urban Villages in these areas. While the BART area job capacity is planned primarily for mid-rise and high-rise offices, the Light Rail Urban Villages provide more opportunity for retail and service jobs that benefit from close proximity to residential use. Although the BART system serves as a regional transit line that brings workers from throughout the region to employment centers within San Jose, the light rail system is more appropriate for shorter commute trips and is also less likely to generate land use compatibility concerns. Accordingly, it is appropriate to include more residential and retail growth capacity along the light rail system. The Oakridge Mall Light Rail station area is particularly of interest because of its size and high level of unrealized potential to support a walkable, mixed-use community owing to the amount and diversity of established commercial uses and other services already located within the area. ▪ LU-9.3 Integrate housing development with our City's transportation system, including transit, roads, and bicycle and pedestrian facilities. ▪ LU-9.10 Discourage substantial expansion of existing nonresidential uses (e.g., major structural improvements or expansions) that are incompatible with residential uses on properties designated for residential use. ▪ LU-9.13 Equitably distribute residential social service programs (e.g., board and care facilities) throughout the City, especially in areas with access to transit, rather than concentrating them in a few areas. Encourage the County and other social service licensing agencies to recognize and implement this policy. ▪ LU-9.14 Allow small residential care and service facilities, supportive housing, and transitional housing for up to six persons, in residential neighborhoods of any density. Encourage facilities for more than six persons to locate in areas with access to transit, retail, services, and other amenities. ▪ LU-10.3 Develop residentially- and mixed-use-designated lands adjacent to major transit facilities at high densities to reduce motor vehicle travel by encouraging the use of public transit.

Policy Document	Goal, Policy, or Objective
	▪ LU-10.5 Facilitate the development of housing close to jobs to provide residents with the opportunity to live and work in the same community. ▪ LU-11.5 Integrate new and existing neighborhoods and facilitate movement throughout the City by connecting streets and particularly by providing pedestrian and bicycle cross-access connections. Integrate new infill development into the existing neighborhood pattern, continuing, and where applicable extending or completing, the existing street network. Transportation (TR) ▪ TR-1.1 Accommodate and encourage use of non-automobile transportation modes to achieve San Jose's mobility goals and reduce vehicle trip generation and vehicle miles traveled (VMT). ▪ TR-1.3 Increase substantially the proportion of commute travel using modes other than the single-occupant vehicle. ▪ TR-3.3 As part of the development review process, require that new development along existing and planned transit facilities consist of land use and development types and intensities that contribute toward transit ridership. In addition, require that new development is designed to accommodate and to provide direct access to transit facilities. ▪ TR-3.4 Maintain and improve access to transit stops and stations for mobility-challenged population groups such as youth, the disabled, and seniors. ▪ TR-4.1 Support the development of amenities and land use and development types and intensities that increase daily ridership on the VTA, BART, Caltrain, ACE and Amtrak California systems and provide positive fiscal, economic, and environmental benefits to the community. ▪ TR-4.3 Support the development of amenities and land use and development types and intensities that contribute to increased ridership on the potential high-speed rail system, and also provide positive benefits to the community. ▪ TR-4.4 Work cooperatively with the California High-Speed Rail Authority to ensure that rail corridors within the city are planned and constructed in a manner that enhances the character of the surrounding neighborhoods.
Midtown Specific Plan (1992)	The *Midtown Specific Plan* was adopted by the City of San Jose in 1992. The following goals and policies from the plan are relevant to the project extent: ▪ Policy 1.1 A wide diversity of multi-family and alternative housing types, as well as a mixture of rental and ownership housing, should be encouraged. ▪ Policy 1.4 Existing industrial uses should be encouraged to remain and intensify between Park Avenue and West San Carlos Street. ▪ Policy 1.11 Appropriate setbacks and treatments should be established between future residential development and the mainline railroad tracks along the eastern edge of the Cahill West neighborhood. ▪ Objective 5 Preserve and intensify existing industrial and commercial-service uses along the Lincoln and Auzerais Avenue corridors. ▪ Policy 3.3 Any new industrial/commercial development should provide adequate mitigation for nearby existing or planned residential uses. ▪ Policy 3.4 To retain the important economic contribution of the properties designated Combined Industrial/Commercial (e.g., the Del Monte plant on Auzerais Avenue), new uses in close proximity to the Combined Industrial/Commercial areas should provide an adequate buffer for noise, vibration, and other potential conflicts.

Policy Document	Goal, Policy, or Objective
Diridon Station Area Plan (2014)	The *Diridon Station Area Plan* was adopted by the City of San Jose in 2014. The following goals and policies from the plan are relevant to the project extent: ▪ Establish a land use plan and policy framework that will guide future development and redevelopment toward land uses that support transit ridership and economic development and create a world-class cultural destination. ▪ Improve pedestrian, bicycle, motorized and transit connectivity between the station site and existing adjacent commercial and residential areas. ▪ Develop and implement urban design standards that promote walkable, livable, and business supportive environments within the Diridon Station Area. ▪ Provide a variety of commercial and mixed-use development opportunities, ranging from large-scale corporate or institutional sites to smaller infill development sites. ▪ Create a highly active and lively pedestrian and bicycle friendly environment with excellent connectivity to downtown destinations and regional transit. ▪ Enhance the existing neighborhoods and add high-density residential-commercial mixed-use development within the study area and to act as a catalyst for similar developments in surrounding areas.
Tamien Station Area Specific Plan (1995)	The *Tamien Station Area Specific Plan* was adopted by the City of San Jose in 1994. The following goals and policies from the plan are relevant to the project extent: Transit and Pedestrian Goals and Objectives ▪ Create a combination of land uses that effectively support transit use, reduce dependency on the automobile, and attract pedestrian activity. Livable Community Goals and Objectives ▪ Protect people and property in the Tamien Station area from potential environmental hazards such as noise, flooding, and the impacts associated with increased traffic. Neighborhood Compatibility Goals and Objectives ▪ Maintain the positive qualities and characteristics of existing neighborhoods by ensuring that new development is compatible with existing neighborhoods. ▪ Create a positive environment for the new neighborhoods developed in the Tamien Station area by preserving and enhancing the character of existing neighborhoods.
Communications Hill Specific Plan (1992)	The *Communications Hill Specific Plan* was adopted by the City of San Jose in 1992. The following goals and policies from the plan are relevant to the project extent: ▪ Adopt site planning and architectural guidelines and noise attenuation techniques to protect Communications Hill residents and workers from excessive noise from arterials, freeways, the fairground activities, adjacent industrial activities and trains and planes traveling nearby.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016) *and 2015–2023 Housing Element Update* (2015)	The *Morgan Hill 2035 General Plan* was adopted by the City of Morgan Hill in 2015. The *2015-2023 Housing Element Update* was adopted in 2015. The following goals and policies from the plan are relevant to the project extent: City and Neighborhood Form (CNF) ▪ Policy CNF-2.2 A Balanced Community. Plan for the needs of all socioeconomic segments of the community, encouraging a balance and match in jobs and housing within the City. ▪ Policy CNF-2.3 Quality of life. Maintain Morgan Hill's high quality of life for existing and future residents.

Policy Document	Goal, Policy, or Objective
	▪ Policy CNF-2.4 Changing Demographics. When considering future urban development, look at least five to ten years into the future to take into account changing local and regional demographics. ▪ Policy CNF-3.10 Multi-Family Housing. Maintain an adequate supply of allotments available for multi-family and affordable housing consistent with the City's adopted Housing Element. ▪ Policy CNF-8.19 Incompatible Uses. Use setbacks, natural and man-made barriers such as streams, park land, and drainage ways, and other mitigation to separate incompatible uses whenever possible. ▪ Policy CNF-10.5 Affordable Single-Family Housing. To the maximum extent possible, emphasize single-family units in affordable housing allocations, rental and ownership housing assistance projects, and rehabilitation programs to improve the existing housing stock. ▪ Policy CNF-11.1 Preservation of Single-Family Neighborhoods. Encourage preservation and rehabilitation of single-family neighborhoods within the City. ▪ Policy CNF-15.2 Successful Commercial Uses. Ensure the viability of Downtown and other recognized shopping areas, and discourage isolated and sprawling commercial activities along major roads. ▪ Policy CNF-15.6 Preservation of Homes Along Monterey Road. Encourage preservation of older homes along Monterey Road north of Central Avenue for commercial and office use. ▪ Policy CNF-17.1 Industrial Land Conversion. Discourage the conversion of property designated for industrial to non-industrial uses. ▪ Policy CNF-17.2 Industrial Land Use Conflicts. Ensure proposed new uses adjacent to industrial uses do not introduce land use conflicts that would adversely impact industrial activities. ▪ Policy CNF-17.4 Property between Monterey Road and UPRR Tracks. Allow a mix of uses on the property located on the east side of Monterey Road south of the Union Pacific train trestle. Require designs for new development to recognize the significance of this portion of Monterey Road as the northerly entrance to downtown and the necessary limitations on use due to its single point of access. Economic Development (ED) ▪ Policy ED-2.3 Economic Diversity. Promote a diversified economic industry base with a variety of job types and skills to insulate the local economy from possible economic downturns. Encourage agriculture as an appropriate part of the economic mix. (South County Joint Area Plan 2.02) ▪ Policy ED-3.1 Business Retention, Expansion, and Attraction Efforts. Encourage retention and expansion of existing businesses, and attract new businesses. ▪ Policy ED-3.2 Employment Land Supply. Preserve the City's supply of industrial and commercial lands to support the City's goals and policies related to economic development and jobs-housing balance. ▪ Policy ED-3.4 Business Attraction and Retention Strategy. Develop a biennial strategy that details the City's proactive approach to business attraction and retention that identifies the specific industries toward which efforts will be targeted, and focus the City's available economic development resources on assisting the targeted industries. ▪ Policy ED-3.5 Diverse Housing Stock. To help Morgan Hill businesses recruit and retain the necessary workforce, provide a diverse housing stock that meets the needs of employees at different income levels and with diverse household characteristics and housing preferences.

Policy Document	Goal, Policy, or Objective
	▪ Policy ED-7.5 Incentives to Revitalize and Reuse Shopping Centers. Consider and, if appropriate, offer a range of financial and non-financial incentives and assistance to encourage revitalization and reuse of obsolete shopping centers. ▪ Policy ED-7.8 Tenant Assistance. Proactively assist tenants who will be dislocated by revitalization or reuse projects to find replacement business locations within the City. ▪ Policy ED-9.3 Robust Transportation Options. Work with local and regional transportation agencies to ensure that local employees and residents have a robust set of transportation options to respond to changing workforce demographics and preferences, reduce roadway congestion, and improve local quality of life. Healthy Community (HC) ▪ Policy HC-3.1 Universal Recreation. Provide recreational facilities and programs that meet the needs of all Morgan Hill residents, including seniors, youth, low-income residents, and citizens with disabilities. Transportation (TR) ▪ Policy TR-2.1 Multi-Modal System for All Users. A balanced multi-modal system offers viable choices for residents, employees, customers, visitors, and recreational users. Use smart growth and Sustainable Communities principles throughout the city to provide a balanced transportation system which assures access to all, and which integrates all appropriate modes of transportation into an effectively functioning system, including modes such as auto, ride sharing, public rail and bus transit, paratransit, bicycling, and walking. (South County Joint Area Plan 11.00 & 11.01). ▪ Policy TR-3.18 Grade-Separated Railroad Crossings. Plan for the construction of grade-separated crossings of the Union Pacific railroad to improve emergency vehicle response times and minimize conflicts between railroad trains and on-road vehicles. California Public Utilities Commission approval is required to modify an existing highway rail crossing or to construct a new crossing. Grade-separated crossings should be encouraged at Dunne Avenue (Depot Street to be re-routed through the existing Community and Cultural Center parking lot to create an intersection with Church Street either prior to or in conjunction with the grade separation project). ▪ Policy TR-6.8 Transit for Changing Needs. Expand public transit as needed to meet the changing needs of the area for local and regional access, including methods such as bus, dial-a-ride, paratransit, and rail, where appropriate, for all users. (South County Joint Area Plan 11.04). ▪ Policy TR-7.2 Neighborhood Impacts. When examining potential impacts of High Speed Rail alternatives and proposals, attention shall be given to all Morgan Hill neighborhoods and mitigation measures shall be proportionate to identified impacts. Natural Resources and Environment (NRE) ▪ Policy NRE-4.1 Agriculture Retention and Transition to Urban Uses. Support programs and techniques, including conservation easements and purchase of development rights to encourage the retention of agricultural activities and to minimize conflicts in the transition from agriculture to urban uses. ▪ Policy NRE-4.2 Support for Agricultural Activity. Support agricultural activity by encouraging agriculture-related industry, commercial uses, and community events within the urban area, and expanding opportunities for small-scale agriculture. ▪ Policy NRE-4.7 Long-Term Maintenance of Agriculture. Continue to support the long-term maintenance of agricultural land uses and agriculture, including vineyards and wineries, as an economic enterprise in South County. (South County Joint Area Plan 14.00).

Policy Document	Goal, Policy, or Objective
	▪ Policy NRE-4.9 Urban Encroachment. Require new urban development adjacent to an existing agricultural operation to create an appropriate buffer area, on land within the proposed development, between urban uses and agricultural activities. ▪ Policy NRE-4.10 Land Use to Support Agricultural Viability. Maintain the economic viability of agriculture using a variety of methods. ▪ Policy NRE-4.13 Urban Growth. Wherever existing development patterns and existing and planned roads and other public facilities permit, concentrate urban development adjacent to existing developed areas in order to minimize the impact of development on agricultural land. Plan for further urban growth to occur in areas which will avoid encroachment into those agricultural lands with the greatest long-term potential to remain economically viable. (South County Joint Area Plan 14.07). ▪ Policy NRE-11.2 TACs and Existing Sensitive Uses. Encourage the installation of appropriate air filtration mechanisms at existing schools, residences, and other sensitive receptors adversely affected by existing or proposed pollution sources. ▪ Policy NRE-12.1 Best Practices. Requirement that development projects implement best management practices to reduce air pollutant emissions associated with construction and operation of the project. ▪ Policy NRE-12.3 Control Measures. Require construction and demolition projects that have the potential to disturb asbestos (from soil or building material) to comply with all the requirements of the California Air Resource Board's air toxics control measures (ATCMs) for Construction, Grading, Quarrying, and Surface Mining Operations. Safety, Services and Infrastructure (SSI) ▪ Policy SSI-8.1 Exterior Noise Level Standards. Require new development projects to be designed and constructed to meet acceptable exterior noise level standards.
Downtown Morgan Hill Specific Plan (2009)	The *Downtown Morgan Hill Specific Plan* was adopted by the City of Morgan Hill in 2009. The following goals and policies from the plan are relevant to the project extent: ▪ Promote Transit-Oriented Development along Third and Depot Streets, as well as on Block 16, to strengthen the relationship between the train station and residential uses. While Block 16 is designated for Mixed Use-CBD, desired development is for high-density residential use, Caltrain/VTA parking, with perhaps some office uses. Any commercial service use should be minor or ancillary, and retail uses are prohibited under this Specific Plan, as the goal is that retail uses be concentrated in the Downtown Core. ▪ Encourage the preservation of the small-scale residential neighborhoods west of Monterey Road and north of Fourth Street.
San Martin Planning Area	
Santa Clara County General Plan (1994, 2014)	The *Santa Clara County General Plan* was adopted in 1994 and updated in 2014. The following goals and policies from the plan are relevant to the project extent: Land Use (R-LU) ▪ R-LU 114 San Martin is a rural unincorporated community governed by the County Board of Supervisors. Furthermore, San Martin should be viewed as a distinct geographic entity, unique within the rural unincorporated areas of Santa Clara County and having a unique rural identity and character within the South County area. Care should be taken to prevent premature commitment of land for uses which would restrict future options for the community. In order to best preserve future options for the San Martin community and environs, San Martin shall remain a rural community, predominantly nonurban and residential in nature. ▪ R-LU 114.1 Policies, permit decision-making, and other matters subject to the discretion of the County and Board of Supervisors shall also take into consideration

Policy Document	Goal, Policy, or Objective
	the desire and intent of the community to preserve and enhance the character, identity, and importance of the village core area of San Martin, being that area most central to the distinct identity of San Martin. ▪ R-LU 136 Residential land use and development patterns shall remain the preferred and predominant use pattern in the San Martin Planning Area. Establishment of allowed non-residential uses in areas of existing or planned rural residential land use should be allowed only with the utmost consideration for the potential adverse impact of such uses upon the residential character and quality of life of the community. ▪ R-LU 141 Agricultural uses should be encouraged to continue.
City of Gilroy	
Gilroy 2020 General Plan (2002) *and 2015–23 Housing Element* (2014)	The *Gilroy 2020 General Plan* was adopted by the City of Gilroy in 2002; the *2015–23 Housing Element* was adopted in 2014. The following goals and policies from the plan are relevant to the project extent: Community Design ▪ Policy 1.02 Mix of Uses. Create a diverse mix of land uses to achieve a balance between jobs and housing and to ensure the community's long-term viability. Through the Land Use Plan Map, the City shall encourage a range of housing types, a diversity of businesses and industries, and adequate services and leisure activities to meet residents' social and economic needs. ▪ Policy 1.05 Existing Neighborhoods. Maintain and enhance the quality of existing residential neighborhoods, ensuring adequate public facilities such as parks, schools, streets, water supply, and drainage. Protect residential neighborhoods from excessive noise and traffic impacts; provide pedestrian and bicycle circulation facilities to encourage walking and biking; and work with the Santa Clara Valley Transportation Authority (VTA) to provide adequate levels of transit service to meet resident needs. Encourage infill developments that enhance neighborhood quality, supporting community input and participation in the planning and design of large infill projects or projects that propose non-residential, neighborhood-serving uses (such as neighborhood commercial uses). Infill development in existing residential neighborhoods should follow similar design guidelines as those outlined for new neighborhoods in the Neighborhood Districts text on pages 3-8 through 3-14. Economic Development ▪ Policy 3.01 Jobs and Revenues. Attract industrial, high-tech, and commercial office employers to provide a diversity of well-paid job opportunities for local residents and to broaden the City's revenue base, ensuring adequate resources over time to support the provision of quality city services. Also, support the development, retention, and expansion of small and medium size businesses, agricultural businesses, and tourism-related businesses, recognizing their vital importance to the City's economic future. See also SCJAP 2.01 and 2.02. ▪ Policy 3.02 Economic Development Activities. Actively promote Gilroy as a place for business and industry, capitalizing on the City's location and numerous amenities, to encourage new businesses to locate here and to retain existing businesses. ▪ Policy 3.26 Business Development in the Downtown. Provide amenities that will make Downtown attractive to office users and retail businesses (e.g., convenient parking, an attractive and safe environment, access to regional transit services, high quality infrastructure, reliable services, etc.) and encourage new office and retail businesses and expansions of existing businesses in Gilroy to locate there. Agriculture

Policy Document	Goal, Policy, or Objective
	▪ Policy 4.01 Economic Viability of Agriculture. Support the long-term economic viability of agriculture and agri-tourism, thereby encouraging landowners to keep their land in cultivation. ▪ Policy 4.02 Agricultural Land Preservation. Work with the County, LAFCo, and other relevant agencies as well as private landowners to protect agricultural and grazing lands from encroachment by urban uses, and to encourage the use of such lands for active cultivation. Specifically, implement the strategies and actions recommended by the South County Agricultural Study (Strategies to Balance Planned Growth and Agricultural Viability in the Areas South and East of Gilroy, October 1996). Housing Element (H) ▪ Policy H-1.2 The City shall encourage the provision of a variety of housing options for Gilroy residents. ▪ Policy H-1.C. Variety of Housing in Neighborhood Districts The City shall review and revise, as appropriate, the Neighborhood District Policy to ensure that it encourages the development of housing that is affordable to a variety of income groups by comparing its features with the Residential Development Ordinance and making any changes to ensure the two policies are compatible and designed to reach the same goals. ▪ Policy H-2.1 The City shall encourage the provision of new affordable housing. ▪ Policy H-2.2 The City shall provide incentives for affordable housing, including but not limited to the density bonus ordinance, expedited project review, and Affordable Housing Exemption in the Residential Development Ordinance. ▪ Policy H-2.3 The City shall support homeownership opportunities for low- and moderate-income households. ▪ Policy H-2.4 The City shall encourage partnerships between non-profit and for-profit housing developers to encourage affordable housing production. ▪ Policy H-2.5 The City shall continue to require 15 percent of new housing in the Neighborhood District to be affordable to very low-, low-, and moderate-income households. ▪ Policy H-2.6 The City shall consider the development of single-room occupancy units, studio apartments, and other similar unit types that are affordable to extremely low-income residents in higher-density areas of the city. ▪ Policy H-2.7 The City shall continue to participate in programs that assist lower- and moderate-income households to secure affordable housing, such as the County's Mortgage Credit Certificate program, Section 8 rental voucher programs, and the Housing Trust Fund of Santa Clara County. ▪ Policy H-3.2 The City shall strive to preserve the affordability of existing below market rate housing units. ▪ Policy H-3.E. Rent and Income Restrictions on Rental Below-Market Rate Units The City shall continue to implement rent and income restrictions on rental Below Market Rate (BMR) units to ensure that affordable units provided through public assistance or public action are retained for 30 years or more as affordable housing stock. ▪ Policy H-4.1 The City shall encourage housing opportunities for special needs groups, including: seniors; persons with disabilities, including developmental disabilities; the homeless; large households; single female-headed households; and farmworkers. ▪ Policy H-4.2 The City shall encourage the development, rehabilitation, and preservation of affordable and market-rate housing for seniors, particularly in

Policy Document	Goal, Policy, or Objective
	neighborhoods that are accessible to public transit, commercial services, and health and community facilities. ▪ Policy H-4.3 The City shall support efforts to provide emergency shelter, transitional housing, and permanent supportive housing for homeless persons and those at risk of homelessness. ▪ Policy H-4.4 The City shall support the development of permanent and seasonal farmworker housing in appropriate areas of the city. ▪ Policy H-4.5 The City shall encourage affordable housing developments to include units that can accommodate large households of five or more. ▪ Policy H-4.6 The City shall encourage the development and maintenance of housing accessible to people with disabilities, including developmental disabilities. ▪ Policy H-4.7 The City shall continue to provide individuals with disabilities reasonable accommodation through flexibility in the application of land use or zoning, when necessary to eliminate barriers to housing opportunities. ▪ Policy H-5.1 The City shall promote fair housing standards.
Gilroy Economic Development Strategic Plan (2015)	The *Gilroy Economic Development Strategic Plan* was adopted by the City of Gilroy in 2015. The following goals and policies from the plan are relevant to the project extent: ▪ Transit Hub Station at 7th Street/Old Gilroy Street with Transit oriented Development in the area. ▪ No community divide – sense of one Gilroy community. ▪ Expand the city tax base through economic growth. ▪ Increase the numbers of businesses in Downtown. ▪ Expand public transportation services to Silicon Valley for events.
San Benito County	
San Benito County 2035 General Plan (2015)	The *San Benito County 2035 General Plan* was adopted by San Benito County in 2015. The following goals and policies from the plan are relevant to the project extent: Land Use (LU) ▪ GOAL LU-1 To maintain San Benito County's rural character and natural beauty while providing areas for needed future growth. ▪ LU-1.3 Future Development Timing: The County shall ensure that future development does not outpace the ability of either the County or other public/private service providers to provide adequate services and infrastructure. The County shall review future development proposals for their potential to reduce the level of services provided to existing communities or place economic hardships on existing communities, and the County may deny proposals that are projected to have these effects. (RDR/MPSP) ▪ GOAL LU-3: To ensure the long-term preservation of the agricultural industry, agricultural support services, and rangeland resources by protecting these areas from incompatible urban uses and allowing farmers to manage their land and operations in an efficient, economically viable manner. ▪ GOAL LU-6: To promote the development of new industrial and employment uses in the unincorporated parts of the county that are compatible with surrounding land uses and meet the present and future needs of county residents. Administration (AD) ▪ GOAL AD-2: To cooperate and coordinate with applicable local, regional, State, and Federal jurisdictions and agencies in order to achieve mutually beneficial development, environmental, and economic goals.

Policy Document	Goal, Policy, or Objective
Merced County	
2030 Merced County General Plan (2013)	The *2030 Merced County General Plan* was adopted by Merced County in 2013. The following goals and policies from the plan are relevant to the project extent: Economic Development (ED) ▪ Policy ED-1.8: Jobs/Housing Balance (RDR) Encourage all communities, and require new or expanded Community Plans, to include sufficient employment-based land uses to maintain a 1:1 jobs/housing balance. ▪ Policy ED-3.1: Business Retention (SO) Support local and regional business retention and expansion programs to ensure that County services are applicable and accessible to local businesses. ▪ Policy ED-3.2: Small Business Promotion (JP) Promote entrepreneurial development and small business expansion and recognize the job creation potential of locally-owned small businesses. ▪ Policy ED-5.2: Regional Cooperation (IGC) Cooperate with regional economic development organizations and agencies to expand and improve the economic base of the County. Land Use and Community Character (LU) ▪ Policy LU-1.7: Compact Development (RDR) Promote compact development in urban communities that supports pedestrian activity and transit ridership. ▪ Policy LU-5.A.6: Jobs/Housing Balance (RDR) Promote a jobs/housing balance by encouraging residential development near employment centers when preparing new or updating existing Community Plans and providing adequate land for employment generating land use. Agriculture (AG) ▪ Policy AG-2.2: Agricultural Land Mitigation (RDR) Protect productive agricultural areas from conversion to non-agricultural residential uses by establishing and implementing an agricultural mitigation program that matches acres converted with farmland acres of similar quality to those converted preserved at a 1:1 ratio. Coordinate with the six cities in Merced County and the Merced Local Agency Formation Commission (LAFCo), consistent with LAFCo's statutory mission to preserve agricultural land and open space, to establish consistent standards and mitigation for the loss of farmland. In addition, the Land Evaluation and Site Assessment Model (LESA model) may be used to determine whether the conservation land is of equal or greater value than the land being converted. ▪ Policy AG-2.8: Conservation Easements (RDR/MPSP) Support the efforts of public, private, and non-profit organizations to preserve agricultural areas in the County through dedicated conservation easements, and range land held as environmental mitigation. ▪ Policy AG-2.11: Preservation Collaboration (IGC/JP) Collaborate with landowners, cities, State and Federal agencies, colleges, universities, stakeholders, and community-based organizations to continue and expand agricultural preservation in the County. ▪ Policy AG-2.16: High Speed Rail Line Location (IGC) Coordinate with the California High Speed Rail Authority to locate the high speed rail lines along existing major transportation corridors, such as State Routes 99 or 152, to minimize the conversion of productive agricultural land to non-agricultural uses. Transportation and Circulation (CIR)

Policy Document	Goal, Policy, or Objective
	▪ Policy CIR-1.3: Transportation Efficiency (RDR) Encourage transportation programs that result in more efficient energy use, reduce greenhouse gas emissions and noise levels, and improve air quality. ▪ Policy CIR-3.1: Multi-Modal Transportation (RDR) Encourage multi-modal transportation opportunities within Urban Communities. ▪ Policy CIR-3.2: Transit Improvements (RDR) Continue to support transit efforts by the Merced County Association of Governments, Dial-A-Ride, UC Merced Transit, other public entities, private social service providers, and other various private charter services to improve and expand public transit throughout the County. ▪ Policy CIR-5.1: Freight and Passenger Rail Services (RDR) Support the continued operation and improvements to existing freight and passenger rail lines and terminals. ▪ Policy CIR-5.7: High Speed Rail (RDR/IGC) Coordinate with the California High Speed Rail Authority, the cities, and other local agencies in efforts to properly locate the High Speed Rail corridors throughout Merced County, including at least one station and a heavy maintenance facility. Housing Element ▪ Policy 1.1 The County shall continue to adopt programs, ordinances, incentives, land use plans and other regulatory mechanisms that provide opportunities for the private sector to address the housing needs of citizens in all economic levels. ▪ Policy 1.15 Wherever feasible, the County shall encourage affordable housing to be located in transit-oriented development projects. ▪ Policy 2.8 The County shall continue to provide rental assistance to very low- and low-income households through programs offered by the Housing Authority and other agencies. ▪ Policy 2.14 The County shall support the development of housing plans and programs, including new government subsidized housing, that maximize housing choice for minorities and lower-income households. ▪ Policy 4.1 The County shall strive to address the unique housing needs of seniors, large families, single-parent households, and the homeless, persons with disabilities, extremely low-income households, farmworkers, and students. Health and Safety (HS) ▪ Policy HS-7.4: New Noise or Groundborne Vibration Generating Uses (RDR) Require new commercial and industrial uses to minimize encroachment on incompatible noise or groundborne vibration sensitive land uses. Also consider the potential for encroachment by residential and other noise or groundborne vibration sensitive land uses on adjacent lands that could significantly impact the viability of the commercial or industrial areas. ▪ Policy HS-7.11: Train Whistle Noise (IGC) Support improvements to at-grade crossings in urban areas in order to eliminate the need for train whistle blasts near or within communities. Air Quality (AQ) ▪ Policy AQ-2.1: Air Quality Plan Compliance (RDR) Require all development projects to comply with applicable regional air quality plans and policies. ▪ Policy AQ-4.6: Non-Motorized Transportation (RDR) Encourage non-motorized transportation corridors within and between communities.
Merced County Regional Transportation Plan 2014–2040 (2014)	The Merced County Association of Governments' *Merced County Regional Transportation Plan and Sustainable Communities Strategy 2014–2040* was adopted

Policy Document	Goal, Policy, or Objective
	by Merced County in 2014. The following goals and policies from the plan are relevant to the project extent: ▪ Goal 1: A safe and efficient regional road system that accommodates the demand for movement of people and goods. ▪ Goal 2: Provide an efficient, effective, coordinated regional transit system that increases mobility for urban and rural populations, including transportation disadvantaged persons. ▪ Goal 3: A rail system that provides safe and reliable service for passengers. ▪ Policy 3.2: Establish a High-Speed Rail system connecting Merced and Los Banos to Sacramento and the Bay Area. ▪ Goal 7: Reduce usage of nonrenewable energy resources for transportation purposes. ▪ Goal 8: Achieve air quality standards set by the U.S. Environmental Protection Agency, and the State Air Resources Board. ▪ Goal 9: Provide economical, long-term solutions to transportation problems by encouraging community designs which encourage walking, transit, and bicycling.
City of Los Banos	
City of Los Banos 2030 General Plan Update (2009) *and 2014–2023 Housing Element* (2016)	The *City of Los Banos 2030 General Plan Update* was adopted by the City of Los Banos in 2009; the *2014–2023 Housing Element* was adopted in 2016. The following goals and policies from the plan are relevant to the project extent: Circulation (C-G) ▪ C-G-14 Participate in the planning process for the California High-Speed Train. Housing Element ▪ Objective 3 Encourage the maintenance, improvement and rehabilitation of the City's existing housing stock and encourage the maintenance and upkeep of existing affordable housing. ▪ Objective 5 Ensure that all residents have access to housing. ▪ Objective 7 Maintain an adequate percentage of affordable rental units within the City to accommodate all income groups and family types. ▪ Objective 8 Encourage redevelopment and new development projects for special need groups.

Sources: ABAG and MTC 2013; City of Gilroy 2002a, 2005, 2014c, 2015; City of Los Banos 2009, 2016; City of Morgan Hill 2009, 2015, 2016a; City of San Jose 1992a, 1992b, 1995, 2011, 2014, 2015; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994; Merced County Association of Governments 2016.

Station Planning, Land Use, and Development

Table 13 Regional and Local Plans and Policies Relevant to Station Planning, Land Use, and Development

Plan and Policies	Summary
Regional	
Plan Bay Area (2013)	The Association of Bay Area Governments and the Metropolitan Transportation Commission adopted *Plan Bay Area* as the Bay Area's long-term regional transportation and land use blueprint in 2013. The following goals and objectives are relevant to the project: ▪ Target #1: Reduce per-capita CO2 emissions from cars and light-duty trucks by 15 percent (Statutory requirement is for year 2035, per SB 375).

Plan and Policies	Summary
	▪ Target #6: Direct all nonagricultural development within the urban footprint (existing urban development and urban growth boundaries). ▪ Target #9: Increase non-auto mode share by 10 percentage points (to 26 percent of trips); decrease automobile vehicle miles traveled per capita by 10 percent.
San Joaquin Valley Blueprint Planning Process Summary Report (2010)	The *San Joaquin Valley Blueprint Planning Process Summary Report* was prepared in 2010. The following goals and policies are relevant to the project: ▪ Principle 7: Preserve open space, farmland, natural beauty, and critical environmental areas. ▪ Principle 8: Provide a variety of transportation choices. ▪ Principle 11: Enhance the economic vitality of the region. ▪ Principle 12: Support actions that encourage environmental resource management.
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994. The following goals and policies are relevant to the project: ▪ Policy C-GD 14: Future urban development in Coyote Valley should be planned to realize the potential it holds for improving the City of San Jose's existing jobs-housing imbalance and for the benefit to the county as a whole, including: ▪ Policy C-GD 15: Land uses along public transit corridors in Coyote Valley should be of sufficient density and adequate design to encourage use of public transit and provide affordable housing. ▪ Policy C-GD 29: Land use and development patterns that enhance the cost effectiveness of transportation and other urban infrastructure investments should be encouraged. ▪ Policy C-GD 32: Mixed land use and compact development should be encouraged which clusters employment, residential, and the types of land uses, goods, and services customarily needed on a daily basis around transit stations, along transit corridors, and in other appropriate urban locations. ▪ Policy C-GD 33: Cities' land use plans should be coordinated and consistent with long range master plans for light rail and other transit services. ▪ Policy C-GD 35: Employment area densities should be increased wherever practical to support efficient public transit service. ▪ Policy C-TR 3: In order to safeguard future mobility and achieve other transportation-related goals and objectives stated in the Vision of the General Plan, the following set of coordinated strategies should guide decision-making and implementation efforts on a sub-regional basis: a. develop urban land use patterns that support travel alternatives; b. manage travel demand, system operation, and congestion levels; c. expand system capacity and improve system integration; and d. support new transportation technologies. ▪ Policy R-GD 1: Strategies and policies for managing land use and development in the rural unincorporated areas include the following: 1. Preserve the resources and rural character of lands outside Urban Service Areas. 2. Develop special area plans for areas that require or would benefit from more detailed planning and policies.

Plan and Policies	Summary
	▪ Policy R-LU 1: The term "Resource Conservation Areas" refers to a general category of land uses that consists of the following specific land use designations or classifications: a. Baylands; b. Agriculture; c. Hillsides; d. Ranchlands, Agricultural; e. Open Space Reserve; f. Regional Parks, Existing; and g. Other Public Open Space Lands. ▪ Policy R-LU 2: Rural unincorporated lands outside cities' Urban Service Areas that are not designated 'Rural Residential' or other specialized land uses shall be designated as a type of 'Resource Conservation Area.' These lands consist primarily of the mountains and foothills, Bay wetlands and lowlands, and valley agricultural lands. ▪ Policy R-LU 3: The general intent of each 'Resource Conservation Area' designation is to encourage land uses and densities appropriate to the rural unincorporated areas that also: a. help preserve rural character; b. conserve natural, scenic, and cultural resources; c. protect public health and safety from natural and man-made hazards; d. preserve agriculture and prime agricultural soils; e. protect watersheds and water quality; f. enhance air quality; and g. minimize the demand for and cost of public services and facilities. ▪ Policy R-LU-11: Allowable land uses shall be limited to: a. agriculture and ancillary uses; b. uses necessary to directly support local agriculture; and c. other uses compatible with agriculture which clearly enhance the long term viability of local agriculture and agricultural lands.
City of Santa Clara	
City of Santa Clara 2010-2035 General Plan (2010)	The *City of Santa Clara 2010-2035 General Plan* was adopted in November 2010. The following goals and policies are relevant to the project: ▪ 5.3.1-P5: Implement a range of development densities and intensities within General Plan land use classification requirements to provide diversity, use land efficiently and meet population and employment growth. ▪ 5.3.1-P13: Support high density and intensity development within a quarter-mile of transit hubs and stations and along transit corridors. ▪ 5.3.1-P15: Require new developments and major public infrastructure projects to include adequate rights- of-way to accommodate all modes of transportation. ▪ 5.3.2-P2: Encourage higher-density residential development in transit and mixed-use areas and in other locations throughout the City where appropriate. ▪ 5.3.4-G3: Mixed-use development that maximizes accessibility to alternate transportation modes and integrates pedestrian, bicycle, transit, open space and outdoor uses to encourage active centers.

Plan and Policies	Summary
City of San Jose	
Envision: San Jose 2040 General Plan (2011)	The *Envision: San Jose 2040 General Plan* was adopted in 2011. The following goals and policies are relevant to the project: ▪ Goal LU-1, General Land Use: Establish a land use pattern that fosters a more fiscally and environmentally sustainable, safe, and livable city. ▪ LU-1.6: Locate employee-intensive commercial and industrial uses within walking distance of transit stops. Encourage public transit providers to provide or increase services to areas with high concentrations of residents, workers, or visitors. ▪ Goal LU-2 – Growth Areas: Focus new growth into identified Growth Areas to protect the quality of existing neighborhoods, while establishing new mixed use neighborhoods with a compact and dense form that is attractive to the City's projected demographics i.e., a young and senior population, and that supports walking, provides opportunities to incorporate retail and other services in a mixed-use format, and facilitates transit use. ▪ Policy LU-2.1: Provide significant job and housing growth capacity within strategically identified "Growth Areas" in order to maximize use of existing or planned infrastructure (including fixed transit facilities), minimize the environmental impacts of new development, provide for more efficient delivery of City services, and foster the development of more vibrant, walkable urban settings. ▪ Policy LU-2.2: Include within the Envision General Plan Land Use / Transportation Diagram significant job and housing growth capacity within the following identified Growth Areas: o Downtown – The City's Downtown Strategy plans for ambitious job and housing growth capacity in the Downtown area to reinforce its role as San Jose's civic, cultural and symbolic center and to support key infrastructure investments, including the planned BART and High-Speed Rail systems. o Employment Lands – The Plan supports significant intensification of employment activity within each of the City's major employment districts (North San José, Monterey Corridor, Edenvale, Berryessa/International Business Park, Mabury, East Gish and Senter Road and North Coyote Valley). Within the North San José, Berryessa / International Business Park and Old Edenvale areas, a centralized sub-area with strong transit access has been designated as an Employment Center to support mid-rise or high-rise employment development. ▪ Policy LU-4.1: Retain existing commercial lands to provide jobs, goods, services, entertainment, and other amenities for San José's workers, residents, and visitors. ▪ Policy LU-10.3: Develop residentially- and mixed-use-designated lands adjacent to major transit facilities at high densities to reduce motor vehicle travel by encouraging the use of public transit. ▪ Policy LU-17.1: Allow development in hillside and rural residential areas consistent with or below existing or planned densities in these areas to maximize resource conservation. Support development only when it is compatible with the character and pattern of the surrounding area, even if below the maximum potential residential density as designated on the Land Use/Transportation Diagram. ▪ Policy TR-1.8. Actively coordinate with regional transportation, land use planning, and transit agencies to develop a transportation network with

Plan and Policies	Summary
	complementary land uses that encourage travel by bicycling, walking and transit, and ensure that regional greenhouse gas emission standards are met. ▪ Policy TR-4.1. Support the development of amenities and land use and development types and intensities that increase daily ridership on the VTA, BART, Caltrain, ACE and Amtrak California systems and provide positive fiscal, economic, and environmental benefits to the community. ▪ Policy TR-4.2. Work collaboratively with the California High-Speed Rail Authority to bring high speed rail to San José in a timely manner. ▪ Policy TR-4.3. Support the development of amenities and land use and development types and intensities that contribute to increased ridership on the potential high-speed rail system, and also provide positive benefits to the community. ▪ Policy TR-4.4. Work cooperatively with the California High-Speed Rail Authority to ensure that rail corridors within the city are planned and constructed in a manner that enhances the character of the surrounding neighborhoods.
Midtown Specific Plan (1992)	The City of San Jose's *Midtown Specific Plan* was adopted in 1992. The following goals and policies are relevant to the project: ▪ Configure land uses in Midtown (i.e., type, mix, density) in a manner that reinforces and maximizes transit ridership. ▪ Create a pattern of land uses, open space and transportation facilities that strengthens pedestrian access within Midtown and provides linkages to downtown and surrounding neighborhoods. ▪ Preserve viable industrial and commercial-service uses within Midtown. ▪ Introduce land uses that complement the existing character of adjacent single-family neighborhoods; ensure that new development immediately adjacent to these neighborhoods has a similar height, scale and orientation as the historic fabric of single-family homes. ▪ Ensure the efficient operation of existing and planned transit improvements within Midtown to reduce auto-dependency. ▪ Create a pattern of roadways that serves future land uses within the district and avoids vehicular impacts (particularly north-south through-movement) within the adjacent neighborhoods. Design roadways in a manner that reflects objectives for reduced auto-dependency and a strong pedestrian orientation. ▪ Aggressively pursue public funding of major infrastructure elements that will be of benefit to the larger community (e.g., Los Gatos Creek, transit, arterial roadways, etc.). <u>Cahill West Subarea</u> ▪ Objective 1: Create a high-density mixed-use neighborhood that complements and extends the pattern of residential uses in the adjacent St. Leo's neighborhood, and that reinforces existing commercial uses along The Alameda, Park Avenue, and West San Carlos Street. ▪ Policy 1.4: Existing industrial uses should be encouraged to remain and intensity between Park Avenue and West San Carlos Street. ▪ Policy 1.7: A pattern of development that reinforces and extends the block structure and pedestrian character of adjacent areas of San Jose should be established within Midtown. <u>Cahill East Subarea</u>

Plan and Policies	Summary
	▪ Objective 3: Intensity development surrounding Cahill Station in a manner to promote the area as a mixed-use transit district, with appropriate height and intensity transitions to Los Gatos Creek. ▪ Policy 3.2: To the extent feasible, single-purpose transportation and parking facilities should be concentrated west of Cahill Street, adjacent to the railroad right-of-way. <u>Vasona Subarea</u> ▪ Objective 4: Create a high-density mixed-use activity center surrounding the future West San Carlos Station of the Vasona LRT corridor. ▪ Policy 4.3: The major focus of this area should be the planned LRT station and an active pedestrian plaza connecting it with West San Carlos Street.
Diridon Station Area Plan (2014)	The *Diridon Station Area Plan* was adopted in 2014. The following goals and policies are relevant to the project: ▪ *Urban Form and Structure*. Create an urban district in the Station Area with buildings that maximize height potential. The Station Area should accommodate a mix of uses including commercial, office, and entertainment development. ▪ *Connectivity*. Establish and strengthen connections to surrounding districts and within the planning area for pedestrians, bicyclists, and motorists, with emphasis on east-west connectivity across SR 87 and the rail corridor. ▪ *Transportation*. Prioritize pedestrian circulation and transit. Improve pedestrian and bicycle connection to Guadalupe River from the area. ▪ *Compatibility with surrounding neighborhoods*. Ensure sensitive transitions in scale and design to surrounding residential neighborhoods. ▪ *Land Use*. Provide a range of commercial and residential uses. Commercial uses would include neighborhood services for surrounding residential areas, and a synergistic mix of entertainment, hotels, shopping, restaurants, and offices.
Tamien Station Area Specific Plan (1995)	The *Tamien Station Area Specific Plan* was adopted on March 21, 1995. The following goals and policies are relevant to the project: Transit and Pedestrian Goals and Objectives: 1. Create a combination of land uses that effectively support transit use, reduce dependency on the automobile, and attract pedestrian activity. 2. Locate the most intense uses and highest residential densities on sites in close proximity to transit facilities. 6. Replace existing land uses near transit facilities with more intensive land uses as market forces dictate or opportunities arise. Neighborhood Compatibility Goal and Objective: 1. Maintain the positive qualities and characteristics of existing neighborhoods by ensuring that new development is compatible with existing neighborhoods.
Communications Hill Specific Plan (1992)	The *Communications Hill Specific Plan* was adopted in1992. The following goals and policies are relevant to the project: ▪ Adopt site planning and architectural guidelines and noise attenuation techniques to protect Communications Hill residents and workers from excessive noise from arterials, freeways, the fairground activities, adjacent industrial activities and trains and planes traveling nearby.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The *Morgan Hill 2035 General Plan* was adopted in 2016. The following goals and policies are relevant to the project:

Plan and Policies	Summary
	▪ Policy CNF-1.3 Regional Coordination. Work with other governmental agencies to reach a coordinated approach to future community development tasks (also see Regional Coordination Element). ▪ Policy CNF-8.19 Incompatible Uses. Use setbacks, natural and man-made barriers such as streams, park land, and drainage ways, and other mitigation to separate incompatible uses whenever possible. ▪ Policy CNF-17.2 Industrial Land Use Conflicts. Ensure proposed new uses adjacent to industrial uses do not introduce land use conflicts that would adversely impact industrial activities. ▪ Policy CNF-17.3. Buffer between Industrial and Incompatible Uses. Ensure that all industrial uses are well sited and buffered from incompatible uses; buffers may include offices adjacent to sensitive uses, landscaping, berms, etc. ▪ Policy CNF-22.1. County Land Use Policies. Support the continuation of adopted County land use policies for the unincorporated areas in order to: a) promote a productive, primarily agricultural rural area; and b) balance the needs of rural residents and landowners and the needs for effective natural resource management, enhanced rural scenic quality, and lands for planned urban growth, rural activities, and long-term open space. ▪ Policy TR-2.2. Integrated Land Use/Transportation Planning. Integrate planning for land use and transportation development by ensuring that the timing, amount, and location of urban development is consistent with the development of the transportation system capacity. Promote environmental objectives that supports smart growth and Sustainable Communities principles, such as safe and uncongested neighborhoods, a pedestrian-friendly vibrant downtown that emphasizes non-auto transportation modes, energy conservation, reduction of air and noise pollution, and the integrity of scenic and/or hillside areas. ▪ Policy TR-7.1. Planning for High-Speed Rail. Remain actively engaged in planning efforts for High-Speed Rail service to minimize local impacts and ensure that design is consistent with local plans and policies. ▪ Policy TR-7.2. Neighborhood Impacts. When examining potential impacts of High Speed Rail alternatives and proposals, attention shall be given to all Morgan Hill neighborhoods and mitigation measures shall be proportionate to identified impacts. ▪ Policy NRE-1.4. South County Open Space. Preserve and maintain the wide variety of open spaces in the South County; including greenbelt areas, parks, and agricultural uses. ▪ Policy NRE-4.9. Require new urban development adjacent to an existing agricultural operation to create an appropriate buffer area, on land within the proposed development, between urban uses and agricultural activities.

Plan and Policies	Summary
City of Gilroy	
City of Gilroy 2002–2020 General Plan (2002)	The *City of Gilroy 2002-2020 General Plan* was adopted in 2002. The following goals and policies are relevant to the project: ▪ Community Design and Development Policy 1.01. Pattern of Development. Ensure an orderly, contiguous pattern of development that prioritizes infill development, phases new development, encourages compactness and efficiency, preserves surrounding open space and agricultural resources, and avoids land use incompatibilities. ▪ Community Design and Development Policy 1.03. Uses East of Highway 101. Restrict lands east of Highway 101 to industrial and agricultural use except for (1) commercial developments that draw a clear majority of customers from outside of Gilroy, in accordance with criteria established by the City of Gilroy; and (2) public and quasi-public facilities identified on the Land Use Plan Map. The City will encourage the maintenance of agricultural uses in all undeveloped industrially designated areas. Residential care facilities will only be allowed in the area east of Highway 101 if they meet the criteria set forth in Policy 14.05, Residential Care Facilities for Seniors. ▪ Community Design and Development Policy 1.05. Existing Neighborhoods. Maintain and enhance the quality of existing residential neighborhoods, ensuring adequate public facilities such as parks, schools, streets, water supply, and drainage. Protect residential neighborhoods from excessive noise and traffic impacts; provide pedestrian and bicycle circulation facilities to encourage walking and biking; and work with VTA to provide adequate levels of transit service to meet resident needs. Encourage infill developments that enhance neighborhood quality, supporting community input and participation in the planning and design of large infill projects or projects that propose non-residential, neighborhood-serving uses (such as neighborhood commercial uses). Infill development in existing residential neighborhoods should follow similar design guidelines as those outlined for new neighborhoods in the Neighborhood Districts text on pages 3-8through 3-14. ▪ Community Design and Development Policy 3.25. Mix of Uses Downtown. Encourage a wide mix of uses in close proximity to each other in the Downtown area, including governmental services and facilities, cultural and recreational activities, a broad range of retail activities, financial and professional services, entertainment, transit services, and housing for residents. Encourage mixed use developments that integrate housing and commercial uses.
Measure H – Gilroy Urban Growth Boundary Initiative (2016)	Measure H was passed by the voters of the City of Gilroy in November 2016 to designate an Urban Growth Boundary on the General Plan Land Use Map. Land outside the UGB is designated as Open Space and land uses cannot be changed without voter approval.
Downtown Gilroy Specific Plan (2005)	The *Downtown Gilroy Specific Plan* was adopted in 2005 and contains the following goals and policies relevant to land use: ▪ Encourage higher density projects if the projects are consistent with the existing character and feel of Downtown Gilroy. ▪ Locate the highest density projects at focal points within Downtown Gilroy or on adjacent parcels where connectivity, scale, and texture make these projects appropriate. ▪ Encourage the creation of pedestrian connections within, as well as to and from, the Downtown area.

Plan and Policies	Summary
	▪ Capitalize on the proximity of the Caltrain commuter population and promote linkages to the Downtown through use of signs, etc.
San Benito County	
San Benito County 2035 General Plan (2015)	The *San Benito County 2035 General Plan* was adopted in 2015. The following goals and policies are relevant to the project: ▪ Policy C-3.2 Future Connections to High Speed Rail. The County shall pursue potential opportunities to connect transit to future high-speed rail if a high speed rail station is built in Gilroy and ensure that proposed connection alignments are carefully planned to maximize accessibility and minimize related environmental impacts associated with visual obstructions and noise, as appropriate. ▪ Policy NCR-1.1 Maintenance of Open Space. The County shall support and encourage maintenance of open space lands that support natural resources, agricultural resources, recreation, tribal resources, wildlife habitat, water management, scenic quality, and other beneficial uses.
Merced County	
2030 Merced County General Plan (2013)	The *2030 Merced County General Plan* was adopted in 2013. The following goals and policies are relevant to the project: ▪ LU-2.3. Land Use Activity Limitations (RDR) -- Limit allowed land use within Agricultural and Foothill Pasture areas to agricultural crop production, farm support operations, and grazing and open space uses. ▪ Policy CIR-5.5: Work with other agencies to plan railroad corridors that facilitate the preservation of important rail line right-of-way for further rail expansion or other appropriate transportation facilities. ▪ Policy CIR-5.7: High Speed Rail. Coordinate with the California High Speed Rail Authority, the cities, and other local agencies in efforts to properly locate the High Speed Rail corridors throughout Merced County, including at least one station and a heavy maintenance facility.
2014–2020 Regional Transportation Plan and Sustainable Communities Strategy for Merced County (2016)	The *2014-2020 Regional Transportation Plan and Sustainable Communities Strategy for Merced County* was adopted in 2014. The following goals and policies are relevant to the project: ▪ Policy 3.2. Establish a High Speed Rail system connecting Merced and Los Banos to Sacramento and the Bay Area. ▪ Policy 3.2.1. Support the High Speed Rail planning process and actively provide comments and input.
Merced County Code, Title 18 Zoning, Chapter 18.02 Agricultural Zones	Chapter 18.02 designates agricultural zones and permitted uses allowed therein. These expressly include the following transportation and communication uses: ▪ Airport/airstrip (public or private) ▪ Communication equipment, electrical distribution/transmission substation ▪ Television, radio, cellular communication, microwave towers (excluding studios) ▪ Transportation, equipment yard ▪ Truck parking

Sources: ABAG and MTC 2013; City of Gilroy 2002a; 2005, 2016b; City of Morgan Hill 2016a; City of San Jose 1992a, 1992b, 1995, 2011, 2014; City of Santa Clara 2010; County of San Benito 2015a; County of Santa Clara 1994; County of Merced 2013a, 2017; MCAG 2016; San Joaquin Valley Regional Planning Agencies 2010.
ACE = Altamont Corridor Express
BART = Bay Area Rapid Transit
CO2 = carbon dioxide
LRT = Light Rail
SB = Senate Bill

SR = state route
VTA = Santa Clara Valley Transportation Authority

Agricultural Farmland

Table 14 Regional and Local Plans and Policies Relevant to Agricultural Farmland

Plans and Policies	Summary
San Francisco Bay Area	
Plan Bay Area 2040 (2017)	The Association of Bay Area Governments and the Metropolitan Transportation Commission adopted *Plan Bay Area 2040* on July 16, 2017. It is a regional housing and transportation plan for the nine-county San Francisco Bay Area. The plan includes the following goal and target relevant to agricultural resources: **Goal**: Open Space and Agricultural Preservation. ▪ Target: Direct development within urban footprint. Only 10 percent of the plan's investments are directed toward expanding capacity-constrained freeways and transit lines. This stems from a "fix it first" emphasis, with an intent to shift travel mode [from car-centric transportation] and achieve the plan's open space and agricultural preservation target.
Moving Forward 2035 Monterey Bay (2017)	The Association of Monterey Bay Area Governments adopted the 2035 Metropolitan Transportation Plan/Sustainable Communities Strategy, also known as *Moving Forward 2034 Monterey Bay*, in June 2014, and was amended in January 2017.It is a regional transportation plan for Monterey County, San Benito County, and Santa Cruz County. The plan includes the following goals and policies that are relevant to agricultural resources: ▪ Environment- Promote environmental sustainability and protect the natural environment ▪ Healthy Communities- Protect the health of our residents; foster efficient development patterns that optimize travel, housing, and employment choices and encourage active transportation.
Santa Clara County	
Santa Clara County General Plan, 1995–2010 (1994)[a]	The *Santa Clara County General Plan, 1995–2010* was adopted on December 20, 1994. The plan contains the following strategies and policies relevant to agricultural resources: **Role of Agriculture** Strategy #1: Inventory, Map and Monitor the Status of Agricultural lands Strategy #2: Maintain Stable Long Range Land Use Patterns Strategy #3: Enhance the Long Term Economic Viability of Agriculture ▪ **Policy C-RC 37**: Agriculture should be encouraged and agricultural lands retained for their vital contributions to the overall economy, quality of life, and for their functional importance to Santa Clara County, in particular: a. local food production capability; b. productive use land not intended for urban development; and c. protection of public health and safety. ▪ **Policy C-RC 40**. Long term land use stability and dependability to preserve agriculture shall be maintained and enhanced by the following general means: b. regulating non-agricultural uses in agricultural areas, and their intensity and impacts on adjacent lands;

Plans and Policies	Summary
	c. maintaining agriculturally-viable parcel sizes; and d. minimizing conflicts between adjacent agricultural and non-agricultural land uses, through such means as right-to-farm legislation and mediation of nuisance claims. **Growth and Development** Strategy #1: Preserve the Resources and Character of Rural Lands ▪ ***R-GD 1.*** Strategies and policies for managing land use and development in the rural unincorporated areas include the following: 1. Preserve the resources and rural character of lands outside Urban Service Areas (USAs). 2. Develop special area plans for areas that require or would benefit from more detailed planning and policies. ▪ ***R-GD 3.*** Land uses and development permitted under County jurisdiction shall be consistent with the following major County policies: e. preservation of agriculture **Resource Conservation** Agriculture & Agricultural Resources ▪ ***R-RC 57.*** Agriculture shall be encouraged and prime agricultural lands retained for their value to the overall economy and quality of life of Santa Clara County, including: a. local food production capability; b. productive use of lands not intended or suitable for urban development; and, c. preservation of a diminishing natural resource, prime agricultural soils. Strategy #2: Maintain Stable, Long Range Land Use Patterns ▪ **R-RC 40.** Long term land use stability and dependability to preserve agriculture shall be maintained and enhanced by the following general means: a. limiting the loss of valuable farmland from unnecessary and/or premature urban expansion and development; b. regulating non-agricultural uses in agricultural areas, and their intensity and impacts on adjacent lands; c. maintaining agriculturally-viable parcel sizes; and d. minimizing conflicts between adjacent agricultural and non-agricultural land uses, through such means as right-to-farm legislation and mediation of nuisance claims. ▪ ***R-RC 59.*** Sizeable remaining areas of agricultural lands shall be preserved in large parcels in order to: a. stabilize long term land use patterns; b. allow for long term agricultural investment; c. facilitate entry of individuals into agricultural livelihoods; and d. avoid introduction of incompatible residential or other development in agriculture areas. ▪ ***R-RC 60.*** Recombining of parcels in agricultural areas should be encouraged. ▪ ***R-RC 61.*** Allowable land uses in exclusive agricultural areas shall be limited to

Plans and Policies	Summary
	a. agriculture and ancillary uses, b. uses necessary to directly support local agriculture, and c. other uses compatible with agriculture which clearly enhance the long term viability of local agriculture and agricultural lands. ▪ ***R-RC 64.*** As the means and resources become available, agricultural areas of greatest long term viability should be designated for long term or possibly permanent preservation from urban development. Areas such as the lands south and east of Gilroy should be considered for designation and preservation. Strategy #3: Enhance the Long Term Economic Viability of Agriculture ▪ ***R-RC 65.*** The long term economic viability of agricultural activities shall be maintained and enhanced by promoting: a. improved markets for locally-grown products; b. Williamson Act provisions for property tax relief; c. use of innovative, more cost-efficient growing techniques; d. review of the economic impacts of regulation and other means of enhancing competitiveness; and e. adequate agricultural worker housing. ▪ ***R-RC-66.*** Williamson Act contracts for the preservation of agriculture and agricultural lands should be promoted and maintained. Requests for immediate contract cancellation should be denied except in cases of unusual circumstances or hardship. **Land Use** Description and Intent ▪ ***R-LU 3.*** The general intent of each 'Resource Conservation Area' designation is to encourage land uses and densities appropriate to the rural unincorporated areas that also: d. preserve agriculture and prime agricultural soils ▪ **Policy R-LU 8**. Santa Clara County is enriched by a special combination of the very finest soils, a very favorable, dependable growing climate, and generally adequate water supplies. Lands in agricultural uses contribute to the economy and quality of life enjoyed by county residents. This combination of factors makes it highly desirable that certain lands be preserved for their intrinsic value as agricultural land and for productive agricultural land uses. ▪ ***R-LU 9.*** For those areas of greatest long term viability for agriculture and highest quality soils, permanent preservation as agricultural land is the ultimate goal. Other areas are designated 'Agriculture' in order to: a. encourage productive use of lands not currently planned for city development, or b. preserve lands in agricultural uses where physical limitations, such as frequent flooding or high ground water conditions, make them unsuitable for other uses. Allowable Uses ▪ ***R-LU 11.*** Allowable land uses shall be limited to: a. agriculture and ancillary uses; b. uses necessary to directly support local agriculture; and

Plans and Policies	Summary
	c. other uses compatible with agriculture which clearly enhance the long term viability of local agriculture and agricultural lands. Allowable Densities ▪ ***R-LU 14.*** For areas designated 'Agriculture-Large Scale,' minimum parcel sizes shall be no less than 40 acres. ▪ ***R-LU 15.*** For areas designated 'Agriculture-Medium Scale,' minimum parcel sizes shall be no less than 20 acres. **South County Area Joint Plan** ▪ ***SC 0.3.*** The South County Joint Area Plan shall apply to the incorporated and unincorporated areas south of the Morgan Hill - San Jose boundary agreement line approved by LAFCO. The Joint Area Plan also includes policies relating to the Coyote Valley, since it is within the Morgan Hill Unified School District and has an impact upon the South County due to its strategic location. Agriculture ▪ ***SC 14.2.*** Agricultural lands should be protected from encroachment by incompatible land uses. ▪ ***SC 14.4.*** Some prime agricultural lands in South County (particularly within the prime agricultural areas east and south of Gilroy) should be preserved for agricultural use.
Santa Clara County Code of Ordinances (2018)	Title 18 Zoning, Chapter 18.08 Regulations for A- Agricultural Zoning Districts. Chapter 18.08 designates agricultural zones and permitted uses allowed therein.
Santa Clara Valley Agricultural Plan (2018)	The County of Santa Clara and the Santa Clara Valley Open Space Authority, along with multiple partner agencies and individuals, created the *Santa Clara Valley Agricultural Plan 2018*. The plan includes the following objectives, strategies, and actions relevant to agricultural resources. **Focus Area: Land Use Policy** ▪ **Objective 1:** Recognize Viable Agricultural Lands and Sub-Areas Within the County General Plan and Zoning Ordinance. Strategies / Actions a. Extend Agricultural zoning to encompass all viable agricultural lands. b. Consider designation of agricultural zoning regions specific to sub-areas in the Agricultural Resource Area (ARA) that share a common identity, for focused application of agricultural protection tools. c. Coordinate with neighboring Santa Clara Valley cities to create consistency in the designation of agricultural areas between the County and Cities' General Plans. ▪ **Objective 2:** Prevent the Conversion of Agricultural Lands to Non-Agricultural Uses Within the Rural Areas. Strategies / Actions a. Prevent the establishment of incompatible uses within the ARA which increase land speculation and impair ongoing agricultural production. b. Prevent conversion of agricultural lands into rural ranchettes that increase land speculation and reduce viability of ongoing neighboring farm operations.

Plans and Policies	Summary
	c. Enact a County-wide agricultural mitigation fee that requires a mitigation fee for development that converts viable agricultural land to other uses. ▪ **Objective 4:** Reduce Conflict Between Incompatible Uses and Agriculture Within Agricultural Areas. Strategies / Actions a. Require setbacks/buffers for new non-agricultural development within or adjacent to agricultural lands to reduce interface between incompatible land uses and farming. b. Strengthen right-to-farm requirements. **Focus Area: Regional Agricultural Conservation Easement Program and Other Voluntary Financial Incentives** ▪ **Objective 5:** Establish a Regional Agricultural Conservation Easement Purchasing Program for the Santa Clara Valley. Strategies / Actions a. Establish a Regional ACE Purchasing Program. ▪ **Objective 6:** Encourage Landowners to Take Advantage of Property Tax Incentives to Keep Land in Agriculture. Strategies / Actions a. Increase participation in the County's Williamson Act Program and Establish a Farmland Security Zone Program. ▪ **Objective 7:** Identify Opportunities and Create Programs that Provide Financial Compensation to Farmers for Providing Ecosystem Benefits (GHG Reduction, Groundwater and Floodplain Protection) Through Farming. Strategies / Actions a. One of the most important means to protect the local agricultural land base is to help ensure that farmers and ranchers can stay profitable over the long-term, reducing the pressure to sell land for development. **Focus Area: Agricultural Economic Development Strategy** ▪ **Objective 8:** Support the viability of the agricultural economy. Strategies / Actions a. Support farmers in obtaining permits and regulatory compliance associated with actions and activities that support long term agricultural investment and growth of the agricultural economy. ▪ **Objective 9:** Improve the Climate for the Growth of a Diverse, Vibrant, and Innovative Agriculture Economy. Strategies / Actions a. Create an Agricultural Enterprise Program for specific sub-areas of the ARA. b. Coordinate and support the small farms initiative effort under way by the SCC Food Systems Alliance. c. Support expansion of ag tourism. d. Address the need for additional distribution and processing space for agricultural products; include assessment of "hubs" for co-located businesses.

Plans and Policies	Summary
	▪ **Objective 10:** Support the Growth of New Farms and Creation of New Farmers to Provide Diversity and Long-Term Resiliency in the Local Agricultural Economy. Strategies / Actions a. Address the needs of beginning and immigrant farmers, currently in the Country or interested in starting farming operations in the County, for land access, technical assistance and financial assistance. b. Develop an action plan for implementation of a Farm Incubator or AgPark, with related programs.
Santa Clara Valley GreenPrint (2014)	The Santa Clara Valley Open Space Authority developed the *Santa Clara Valley Green Print*, a 30-year roadmap for the Authority which identifies goals, priorities, and strategies for land conservation. **Goal: Conserve farms, ranches, and other working landscapes to sustain the economic viability of local agriculture.** **Strategies for Protecting Farms, Ranches, and Other Working Lands** 1. Protect farms and ranches through fee purchase, conservation easements, and other incentives. a. Partner with local and regional conservation organizations to secure funding for regionally significant farm and ranch protection projects with a focus on (1) farms and ranches that demonstrate long-term economic viability and operational adaptability, and that provide multiple environmental benefits and (2) urban-edge farmlands threatened by conversion to non-agricultural uses. b. Increase the Authority's funding and staffing capacity to manage conservation easements by developing program guidelines and mitigation policies. c. Explore the use of new conservation tools to help make farming economically viable, such as affirmative easements, right to purchase at farm value, and payment for ecosystem service programs. d. As new funding becomes available, develop a matching grant program to fund local Resource Conservation Districts, UC Cooperative Extension, land trusts, or other nonprofit conservation partners that assist farmers and ranchers with agricultural and natural resource protection projects. f. Work with conservation partners to conduct outreach to agricultural landowners to raise awareness about the Authority's conservation programs. 2. Manage Open Space Authority lands for natural resource protection and viable agricultural operations, and to model effective public-private partnerships. a. Engage experts to develop comprehensive management plans for Authority properties and easements that integrate agricultural and natural resources. b. Work with the Natural Resources Conservation Service, Resource Conservation Districts, and other partners to share best practices for land management and secure funding to implement farm and rangeland conservation projects on Authority preserves and nearby private lands that enhance water quality, habitat protection, carbon sequestration, and other ecosystem services.

Plans and Policies	Summary
	c. Demonstrate and interpret successful conservation practices on Authority lands, such as hedgerows, sediment basins, irrigation efficiency projects, or other climate-smart projects. d. Explore opportunities for beginning farmers to lease Authority agricultural lands, for example, through California FarmLink. Offer competitive leases and long-term land security in exchange for tenants' commitment to implementing on-farm conservation and stewardship projects. 4. Engage in local, regional, and state land use planning and policy projects to promote farm and rangeland protection and the economic viability of regional agriculture. a. Work with the Santa Clara County Local Agency Formation Commission (LAFCO), the County, and cities to maintain and strengthen agricultural zoning, maintain effective urban growth boundaries, and develop and implement effective agricultural mitigation policies and projects. b. Work with state legislators to restore funding for the Williamson Act (including a focus on urban-edge farms, which are grossly underrepresented in Williamson Act contracts) and engage County leadership to secure funding and provide incentives, such as transportation project mitigation, and urban agriculture incentive zones to increase agricultural viability and protect open space. c. Advocate for agricultural tax credits such as California's Natural Heritage Tax Credit program. e. Initiate multi-benefit agricultural conservation projects that contribute to groundwater recharge and water supplies, water quality, and flood risk reduction. g. Advocate for a portion of AB 32 cap-and-trade revenues to be directed to farmland conservation. h. Strengthen SB 375 to integrate agricultural protection into the local Sustainable Communities Strategy (Plan Bay Area) and to promote agricultural protection within Association of Bay Area Government (ABAG) Priority Conservation Areas. i. Support adoption of minimum statewide standards for mitigating the loss of farmland when a project results in the conversion of farmland to non-agricultural uses. j. Engage with transportation projects needing agricultural mitigation, such as the High Speed Rail and highway widening projects. k. Support implementation of a local agricultural enterprise zone to use tax benefits to incentivize farmland protection and value-added farm enterprises
Pajaro River Watershed Integrated Regional Water Management Plan (2014)	The Pajaro Valley Water Management Agency, San Benito County Water District, and Santa Clara Valley Water District collaborated to create the *Pajaro River Watershed Integrated Regional Water Management Plan* which identifies regional and multi-beneficial projects for the Pajaro River Watershed. The plan includes the following goals and objectives and strategies relevant to agricultural resources: **Flood Protection Goal:** Ensure flood management strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to maximize opportunities for comprehensive management of water resources.

Plans and Policies	Summary
	Objectives: 2. Reach consensus on the Pajaro River Risk Reduction Project necessary to protect existing urban areas and infrastructure from flooding and erosion from the 100-year event and to maximize opportunities to protect agricultural land uses. 5. Provide community benefits beyond flood protection such as public access, open space, recreation, agriculture preservation and economic development
City of Santa Clara	
City of Santa Clara 2010–2035 General Plan (2010)	The *City of Santa Clara 2010–2035 General Plan* was adopted November 16, 2010, and Land Use policies were updated December 9, 2014. The plan does not include goals or policies relevant to agricultural resources.
City of San Jose	
Envision San José 2040 (2011)	*Envision San José 2040* was adopted November 1, 2011. The Land Use and Transportation chapter includes the following goals, policies, and actions relevant to agricultural resources: **Goal LU-12**—Urban Agriculture. Expand the cultivation and sale of locally grown agriculture as an environmentally sustainable means of food production and as a source of healthy food for San José residents. ▪ ***LU-12.3.*** Protect and preserve the remaining farmlands within San José's sphere of influence that are not planned for urbanization in the timeframe of the Envision General Plan, such as mid- and south Coyote Valley, through the following means: o Limit residential uses in agricultural areas to those which are incidental to agriculture. o Restrict and discourage subdivision of agricultural lands. o Encourage contractual protection for agricultural lands, such as Williamson Act contracts, agricultural conservation easements, transfers of development rights, or other property tax relief measures as incentives for preservation of these lands. o Restrict land uses within and adjacent to agricultural lands, such as Williamson Act contracts, agricultural conservation easements, and transfers of development rights. o Prohibit land uses within or adjacent to agricultural lands that would compromise the viability of these lands for agricultural uses. o Strictly maintain the Urban Growth Boundary in accordance with other goals and policies in this Plan. ▪ ***LU-12.4.*** Preserve agricultural lands and prime soils in non-urban areas in order to retain the aquifer recharge capacity of these lands. **Goal LU-20** – Rural Agriculture. Provide and protect sufficient agricultural land to facilitate local food production, to provide broad community access to healthful foods, to add to a distinct community image, and to promote environmental, fiscal, and economic benefits of rural agricultural lands. ▪ ***LU-20.1.*** Protect and preserve the remaining farmlands within San Jose's sphere of influence that are not planned for urbanization in the timeframe of the Envision General Plan, such as mid- and south Coyote Valley, through the following means:

Plans and Policies	Summary
	1. Strongly discourage conversion of agricultural lands outside the Urban Growth Boundary to non-agricultural uses. 2. Limit residential uses in agricultural areas to those which are incidental to agriculture. 3. Prohibit subdivision of agricultural lands, unless it can be established that the subdivision would not reduce the overall agricultural productivity of the land and that viable agricultural operations would be sustained. 4. Encourage contractual protection for agricultural lands, such as Williamson Act contracts, agricultural conservation easements, transfers of development rights, or other property tax relief measures as incentives for preservation of these lands. 5. Restrict land uses within and adjacent to agricultural lands that would compromise the agricultural viability of these lands. Require new adjacent land uses to mitigate any impacts on the use of agricultural lands. 6. Require ancillary non-agricultural land uses on agricultural lands to be ancillary to and compatible with agricultural land uses, agricultural production, and the rural character of the area, and to enhance the economic viability of agricultural operations. ▪ ***LU-20.2.*** Preserve agricultural lands and prime soils in non-urban areas in order to provide local and regional fresh food supplies, reduce dependence on foreign products, conserve energy, and retain the aquifer recharge capacity of these lands. ▪ ***LU-20.9.*** Explore use of agricultural easements, transfer/purchase of development rights, or other options to keep Mid-Coyote Valley as permanent agriculture.
Communications Hill Specific Plan (1992)	The City of San Jose adopted the *Communications Hill Specific Plan* in 1992. It is a specific plan incorporated into the City's General Plan. The following objectives are relevant to agricultural resources: ▪ To provide a comprehensive planning framework for development of an urban high-density, pedestrian-oriented, community with a mix of uses. ▪ To make the most of the natural amenities within the area including the panoramic views available from the hill.
San Jose Municipal Code (2018)	Title 20 Zoning, Chapter 20.20 Open Space & Agricultural Zoning Districts. Chapter 20.20 designates agricultural zones and permitted uses allowed therein.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The *Morgan Hill 2035 General Plan* was adopted on July 27, 2016. The plan includes the following goals and policies relevant to agricultural resources: **Goal CNF-20**. Sustainable growth in the East of 101 Area Plan Overlay District ▪ ***CNF-20.4.*** **East of 101 Area Integrated Agriculture.** Strongly encourage new development to preserve existing agricultural uses as feasible and integrate agricultural features into new development to reflect the history of this area. **Goal CNF-21**. Effective, stable growth of the South County ▪ ***CNF-21.1.*** County Land Use Policies. Support the continuation of adopted County land use policies for the unincorporated areas in order to:

Plans and Policies	Summary
	a) promote a productive, primarily agricultural rural area; and b) balance the needs of rural residents and landowners and the needs for effective natural resource management, enhanced rural scenic quality, and lands for planned urban growth, rural activities, and long-term open space. **Goal NRE-1**. Preservation of open space areas and natural features ▪ ***NRE-1.2.*** Large Open Space Areas. Work with the County, the Open Space Authority, appropriate conservancy organizations and land trusts, and property owners to preserve large open space areas, such as agricultural lands and outdoor recreation areas, to conserve natural resources and retain the City's unique identity. ▪ ***NRE-1.4.*** South County Open Space. Preserve and maintain the wide variety of open spaces in the South County; including greenbelt areas, parks, and agricultural uses. **Goal NRE-4**. A viable agricultural industry ▪ ***NRE-4.3.*** Agriculture in the Sphere of Influence**.** Support significant agricultural activity within the Sphere of Influence by providing a market for agricultural products (e.g., farmers' markets) and decreasing the costs associated with agriculture by allowing such uses to occur in the Sphere of Influence. ▪ ***NRE-4.7.*** Long-Term Maintenance of Agriculture. Continue to support the long-term maintenance of agricultural land uses and agriculture, including vineyards and wineries, as an economic enterprise in South County. ▪ ***NRE-4.8.*** Policy Support for Agriculture. Take positive action to encourage agriculture by supporting local, county, and State policies favorable to agriculture. ▪ ***NRE-4.9.*** Require new urban development adjacent to an existing agricultural operation to create an appropriate buffer area, on land within the proposed development, between urban uses and agricultural activities. ▪ ***NRE-4.10.*** Land Use to Support Agricultural Viability. Maintain the economic viability of agriculture using a variety of methods, such as: o Designating land outside urban areas as agricultural; o Requiring minimum lot sizes in agricultural areas; o Requiring land uses that support agricultural activities; o Marketing the benefits of agricultural uses to the public. ▪ ***NRE-4.11.*** Agricultural Mitigation. Enforce the agricultural mitigation requirement of requiring the preservation of a minimum of 1 acre of agricultural land for each acre of agricultural land changed to a non-agricultural use. ▪ ***NRE-4.13.*** Urban Growth. Wherever existing development patterns and existing and planned roads and other public facilities permit, concentrate urban development adjacent to existing developed areas in order to minimize the impact of development on agricultural land. Plan for further urban growth to occur in areas which will avoid encroachment into those agricultural lands with the greatest long-term potential to remain economically viable. ▪ ***NRE-4.17***. Williamson Act Contracts. Support the preservation of land under Williamson Act contracts within the Morgan Hill Sphere of Influence.

Plans and Policies	Summary
Morgan Hill Agricultural Lands Preservation Program (2014)	The *Morgan Hills Agricultural Lands Preservation Program* was adopted on November 5, 2014. The program is intended to promote continued agricultural activities in and around Morgan Hill through land use policies and implementation activities. The plan includes the following goals and policies relevant to agricultural resources: **Goals** 1. Preserve open space agricultural lands and agricultural activity within the Morgan Hill Sphere of Influence. 5. Focus land preservation in the City's Southeast Quadrant area, but also encourage preservation efforts throughout the City's Sphere of Influence. **Policies** 4. Mitigation Ratio. A minimum of one (1) acre of Agricultural Land (1:1 mitigation ratio) shall be preserved for each acre of Agricultural Land changed to a non-agricultural use.
Morgan Hill Municipal Code (2018)	Title 18 Zoning, Chapter 18.85 Agricultural Mitigation. Chapter 18.85 designates agricultural zones and permitted uses allowed therein.
Morgan Hill ZA-14-11 Agricultural Mitigation Ordinance (2015)	The City of Morgan Hill's Ordinance ZA-14-11 was adopted into law on August 5, 2015 (Chapter 18.85.010—Agricultural lands preservation program). It codifies the goals and policies of the Agricultural Lands Preservation Program of 2014. The policies of the program and thus of the ordinance accomplish the following goals relevant to agricultural resources: 1. Preserve open space agricultural lands and agricultural activity within the Morgan Hill sphere of influence. 5. Focus land preservation in the city's southeast quadrant.
City of Gilroy	
Gilroy 2020 General Plan (2002)	The *Gilroy 2020 General Plan* was adopted on Jun 13, 2002. The plan contains the following goal and policies relevant to agricultural resources: **Community Design and Development** **Goal**: Continued viability of agriculture and agri-tourism in the Gilroy area through (a) recognition of agriculture's significant contribution to the local economy; (b) protection of agricultural lands from urban encroachment; (c) preservation of agricultural lands as a natural buffer between Gilroy and surrounding communities; and (d) appreciation for the role of agricultural lands in enhancing Gilroy's semi-rural, smalltown character. ▪ ***4.02.*** Agricultural Land Preservation. Work with the County, LAFCo, and other relevant agencies as well as private landowners to protect agricultural and grazing lands from encroachment by urban uses, and to encourage the use of such lands for active cultivation. Specifically, implement the strategies and actions recommended by the South County Agricultural Study (*Strategies to Balance Planned Growth and Agricultural Viability in the Areas South and East of Gilroy*, October 1996). ▪ ***4.05.*** Agricultural Uses within the Planning Area. Recognize and encourage agriculture as a compatible use in undeveloped portions of the Planning Area. Community gardens, food production, seed production and other intensive agricultural operations will be allowed as long term uses when compatible with adjacent existing or planned land use.
Gilroy City Code (2018)	Chapter 30 Zoning, Section 30.4 Agricultural and Rural Residential District. Chapter 30.4 designates agricultural zones and permitted uses allowed therein. Additionally, Chapter 3A, Agricultural Disclosure and Dispute

Plans and Policies	Summary
	Resolution, provides clarification on disputes between rural residential and agricultural land operations that are adjacent.
San Benito County	
2035 San Benito County General Plan (2015)	The *2035 San Benito County General Plan* was adopted on July 21, 2015. The plan contains the following goals and policies relevant to agricultural resources: **Land Use** **Goal LU-3**. To ensure the long-term preservation of the agricultural industry, agricultural support services, and rangeland resources by protecting these areas from incompatible urban uses and allowing farmers to manage their land and operations in an efficient, economically viable manner. ▪ **Policy *LU-3.1.*** Agricultural Diversification. The County shall support existing farms, vineyards, and other agricultural operations and encourage the agricultural industry to continue diversification that includes organic, value-added, small-scale, sustainable, and community-supported agricultural practices throughout the county. ▪ **Policy *LU-3.2.*** Agricultural Integrity and Flexibility. The County shall protect the integrity of existing agricultural resources, and provide for flexibility and economic viability of farming and ranching operations. ▪ **Policy LU-3.9**. Right to Farm and Ranch. The County shall protect the rights of operators of productive agricultural properties (as defined in the Glossary) and ranching properties to commence and continue their agricultural and ranching practices (a "right to farm and ranch") even though established urban uses in the general area may foster complaints against those agricultural and ranching practices. The "right to farm and ranch" shall encompass the processing of agricultural and ranching products and other activities inherent in the definition of productive agriculture and in ranching activities. The County shall require all parcel maps approved for locations in or adjacent to productive agricultural areas and ranching areas to indicate the "right to farm and ranch" policy. The County shall require the program to be disclosed to buyers of property in San Benito County. ▪ **Policy *LU-3.10.*** Agricultural Land Mitigation. If new development permanently converts Prime Farmland that is Class 1 soil to non-agricultural uses, the County shall encourage project applicants to preserve up to an equal number of Prime Farmland acres (i.e. up to a 1:1 ratio) either on- or off-site. An applicant may pay an in lieu mitigation fee(s) for some or all of the converted Prime Farmland that is designated Class 1 soils to nonagricultural uses as agreed in a development agreement. ▪ **Policy LU-3.12**. Agricultural Viability of Small Parcel Sizes. The County shall require project applicants seeking to subdivide agriculturally-zoned parcels to demonstrate the continued viability of lots less than 40 acres for commercial agriculture operations. ▪ **Policy *LU-3.14.*** Land Trusts and Financial Incentives. The County shall consider land trusts and financial incentives to preserve agricultural soil resources and to protect the integrity of important agricultural areas for future use. ▪ **Policy *LU-3.15.*** Williamson Act Minimum Parcel Size. For parcels not operating as part of a larger farming operation, the County shall encourage larger parcel size minimums (40 or more acres) and/or evidence of commercial agricultural use for entering new Williamson Act contracts.

Plans and Policies	Summary
	Natural and Cultural Resources Element **Goal NCR-1**. To preserve and enhance valuable open space lands that provide wildlife habitat and conserve natural, historical, archaeological, paleontological, tribal, and visual resources of San Benito County. ▪ **Policy *NCR-1.1.*** Maintenance of Open Space. The County shall support and encourage maintenance of open space lands that support natural resources, agricultural resources, recreation, tribal resources, wildlife habitat, water management, scenic quality, and other beneficial uses.
San Benito County Code of Ordinances (2018)	Title 25 Zoning, Section 25.07 Agricultural Districts. Chapter 25.07 designates agricultural zones and permitted uses allowed therein. Additionally, Title 19 Land Use and Environmental Regulations, Chapter 19.01 Agricultural Provisions, provides details on agricultural community disclosure and agricultural preserves.
Merced County	
2030 Merced County General Plan (2013)	The *2030 Merced County General Plan* was adopted on December 10, 2013, updating the previous version of the general plan that was included in Section 3.14, Agricultural Lands (page 3.14-4) of the Merced to Fresno Final EIR/EIS (Authority and FRA 2012). The plan includes the following goals and policies relevant to agricultural resources: **Goal AG-2**. Ensure the long-term preservation and conservation of land used for productive agriculture, potentially-productive agricultural land, and agricultural-support facilities. ▪ Policy AG-2.1: Protect agriculturally-designated areas and direct urban growth away from productive agricultural lands into cities, urban communities, and new towns. ▪ Policy AG-2.2: Protect productive agricultural areas from conversion to nonagricultural and urban uses by establishing and implementing an agricultural mitigation program that matches acres converted with farmland acres of similar quality to those converted preserved at a 1:1 ratio. Coordinate with the six cities in Merced County and the Merced LAFCo, consistent with LAFCo's statutory mission to preserve agricultural land and open space, to establish consistent standards and mitigation for the loss of farmland. In addition, the LESA model may be used to determine whether the conservation land is of equal or greater value than the land being converted. ▪ Policy AG-2.4: Encourage property owner participation in programs that preserve farmland, including the Williamson Act, conservation easements, and USDA-funded conservation practices. ▪ Policy AG-2.9: Oppose the extension of urban services, such as sewer lines, water lines, or other urban infrastructure, into areas designated for agricultural use, unless necessary to protect public health, safety, and welfare. ▪ Policy AG-2.13: Require a 20 acre minimum permitted parcel size in areas designated Agricultural to discourage land divisions for rural residential purposes and maintain parcels large enough for efficient commercial agriculture production. Require 160 acre minimum permitted parcel size in areas designated Foothill Pasture and in grassland areas. ▪ Policy AG-2.14: Require applicants seeking to divide agriculturally-zoned parcels to demonstrate the continued viability of lots less than 40 acres for commercial agriculture, using specific standards (i.e., access to agricultural

Plans and Policies	Summary
	water, joint farm management, access for aerial spraying, size viability for specific commodities) and farm management plans. ▪ Policy AG-2.16: Coordinate with the California High-Speed Rail Authority to locate the high-speed rail lines along existing major transportation corridors, such as SRs 99 or 152, to minimize the conversion of productive agricultural land to nonagricultural uses. ▪ Policy LU-2.3: Limit allowed land use within Agricultural and Foothill Pasture areas to agricultural crop production, farm support operations, and grazing and open space uses.
Merced County Municipal Code (2018)	Title 18 Zoning, Chapter 18.02 Agricultural Zones. Chapter 18.02 designates agricultural zones and permitted uses allowed therein.
2018 Regional Transportation Plan and Sustainable Communities Strategy for Merced County (2018)	The Merced County Association of Governments adopted the *2018 Regional Transportation Plan and Sustainable Communities Strategy for Merced County* on August 16, 2018. The plan includes the following goals and objectives that are relevant to agricultural resources: ▪ Goal 9 Land Use Development Patterns and Strategies: Provide economical, long-term solutions to transportation problems by encouraging community designs that encourage walking, transit, and bicycling. ▪ Objective 9.1: Innovative land use and transportation planning. ▪ Objective 9.2: Plan future roads to accommodate land uses at a regional level. ▪ Objective 9.4: Preserve productive farmland and land that provides habitat for rare, endangered, or threatened species. ▪ Goal 12 Sustainable Communities: Reduce per capita greenhouse gas emissions through compact growth and alternative transportation strategies. Protect and enhance the natural environment. Support vehicle electrification and the provision of electrification infrastructure in public and private parking facilities and structures.
Santa Nella Community Specific Plan (2000)	The County of Merced adopted the *Santa Nella Community Plan* on May 5, 2000. The plan includes the following goals and objectives that are relevant to agricultural resources: Land Use ▪ Goal 1: Land Use patterns should enhance the integrity of both urban and rural areas. ▪ Goal 3: Plan for a mixture of land uses that meet the residential, commercial, industrial, recreational, cultural, and public service needs of Santa Nella residents. Open Space, Conservation, and Recreation ▪ Goal 2: Soil, water, air, mineral, energy, and historical resources are properly managed. Agriculture ▪ Goal 1: Improve the agricultural sector's financial viability. ▪ Policy 1: Seek the introduction of new agricultural processors in the Santa Nella Industrial Area through consideration of suitable financial mechanisms such as Industrial Revenue Bonds. ▪ Goal 2: Productive agricultural lands are conserved. ▪ Policy 1: Utilize the County General Plan Land Use and Agriculture chapter policies for evaluating proposals to expand the Santa Nella SUDP.

Plans and Policies	Summary
	▪ Goal 3: Assure that potentially disruptive land uses to the agricultural economy are properly located and operated. ▪ Policy 1: Provide land use transitions and buffers between urban and agricultural areas which reduce interference and protect agricultural land from conversion to nonagricultural uses. ▪ Policy 2: Upwind dairies on the fringe or in the path of development should be phased out. ▪ Policy 3: Continue to enforce the County's Right-To-Farm Ordinance on new residents within the fringes of the Santa Nella SUDP as a disclosure of the effects of adjacent farming practices. ▪ Goal 4: Work with local water districts on exchange agreements to use agricultural water for urban use. ▪ Policy 1: Investigate the use of groundwater and intermediate treated wastewater to irrigate adjacent agricultural lands in exchange for fresh surface water supplies for the community.
City of Los Banos	
City of Los Banos 2030 General Plan Update (2009)	The City of Los Banos adopted the *2030 General Plan Update* on July 15, 2009. The plan includes the following goals and implementing policies that are relevant to agricultural resources: Land Use ▪ LU-G-1: Promote a sustainable, balanced land use pattern that satisfies existing needs and safeguards future needs of the City. ▪ LU-I-58: Require residential development adjacent to the Central California Irrigation District Canal/HG Fawcett Parkway to comply with buffer requirements and provide direct public access where feasible. ▪ LU-I-59: Required development to transition in density, with lot sizes increasing to the south as a buffer for the adjoining rural and agricultural districts. Parks, Open Space, and Conservation ▪ POSR-G-8: Promote preservation of agriculture within the Planning Area. ▪ POSR-I-17: Establish priorities for open space preservation and acquisition based on the evaluation of: o Significant natural areas that are historically, ecologically, or scientifically unique or are outstanding, important or threatened; o Wildlife habitats and fragile ecosystems in need of protection; o Watersheds or significant water recharge areas; o Open space for safety and public health; o Lands suitable for recreation such as biking, photography, or nature study; and o Land suitable for agricultural production. ▪ POS-I-25: Establish and maintain a Grasslands Resources Overlay Zone (GROZ) for the inter-canal area between the San Luis Canal and the Santa Fe Canal north of SR-152 where lands within the GROZ (allowing or the bypass) shall remain in agricultural and open space uses. ▪ POSR-I-28: Work with the County and with the Grasslands Water District to preserve agricultural uses outside the Urban Growth Boundary. ▪ POSR-I-30: Require property developers adjacent to sites where agricultural uses are being conducted to inform subsequent buyers of

Plans and Policies	Summary
	potential continued agricultural production and the lawful use of agricultural chemicals, including pesticides and fertilizers. ▪ POSR-1-31: Require anti-vandalism designs (appropriate fencing or other landscape features) to ensure that new development has conditions that minimize increased vandalism of adjacent agricultural activities outside the Urban Growth Boundary.

Sources: ABAG and MTC 2017; Association of Monterey Bay Area Governments 2017; Authority and FRA 2012; City of Gilroy 2002a; City of Los Banos 2009; City of Morgan Hill 2014, 2016a; City of San Jose 1992b, 2011; City of Santa Clara 2010; County of Merced 2013a; County of Merced, Santa Nella Citizen's Advisory Committee, and Santa Nella Development Association 2000; County of San Benito 2015a; County of Santa Clara 1994; Merced County Association of Governments 2018.

Parks, Recreation, and Open Space

Table 15 Regional and Local Plans and Policies Relevant to Parks, Recreation, and Open Space

Policy Document	Summary
Santa Clara County	
Santa Clara County General Plan (1994)	The Santa Clara County General Plan was adopted in 1994. The following policies from Part 2, Parks and Recreation Chapter, are relevant to the project extent: ▪ C-PR 2: Sufficient land should be acquired and held in the public domain to satisfy the recreation needs of current and future residents and to implement the trailside concept along our scenic roads. ▪ C-PR 4: The public open space lands system should: (a.) preserve visually and environmentally significant open space resources; and (b.) provide for recreation activities compatible with the enjoyment and preservation of each site's natural resources, with trail linkages to adjacent and nearby regional park lands. ▪ C-PR 7: Opportunities for access to regional parks and public open space lands via public transit, hiking, bicycling, and equestrian trails should be provided. Until public transit service is available, additional parking should be provided where needed. ▪ C-PR-14: Parks and recreation system planning, acquisition, development, and operation should be coordinated among cities, the County, State and Federal governments, school districts and special districts, and should take advantage of opportunities for linkages between adjacent publicly owned parks and open space lands. ▪ C-PR 20.1: Trail access should be provided for a range of user capabilities and needs (including persons with physical limitations) in a manner consistent with State and Federal regulations.
County of Santa Clara Ordinance Code, Division B14, Parks and Recreation (2017)	The Municipal Code consists of local laws and ordinances for parks and recreation enacted and enforced by the local municipality. However, these local laws and ordinances predominantly pertain to rules and regulations for daily use of parks, recreation, and open space. As a result, no local laws and ordinances are applicable to the project extent.
Santa Clara County Countywide Trails Master Plan (1995)	The Santa Clara County Countywide Trails Master Plan was adopted on November 14, 1995. The following policy is relevant to the project extent: ▪ PR-TS 1.2: Trail access should be provided for a range of user capabilities and needs (including persons with physical limitations) in a manner consistent with State and Federal regulations.

Policy Document	Summary
Santa Clara Valley Open Space Authority	
Santa Clara Valley Greenprint (2014)	The Santa Clara Valley Greenprint was adopted on March 27, 2014. The following goals and strategies is relevant to the project extent: ▪ Protect and manage an interconnected system of wildlands and natural areas to support native habitats and species and to ensure resilience to a changing environment. ▪ Protect and manage a network of open space lands that provide opportunities for nature-based recreation and education for all residents. ▪ Protect and maintain connections between large open space parcels to provide large habitat blocks, ensure critical linkages, and provide climate resilience.
City of Santa Clara	
City of Santa Clara 2010–2035 General Plan (2010)	The City of Santa Clara 2010–2035 General Plan was adopted on November 16, 2010. The following goals and policies from Chapter 5.9, Public Facilities and Services, are relevant to the project extent: ▪ 5.9.1-G1: Ample facilities for physical activities that promote community health. ▪ 5.9.1-G4: Park, trail, and open space facilities that are accessible and provide connections to destination points and activity centers within the City. ▪ 5.9.1-P4: Provide connections between private and public open space through publicly accessible trails and pathways and by orienting open spaces to public streets. ▪ 5.9.1-P12: Promote the preservation of open space and recreational areas on existing and closed school sites. ▪ 5.9.1-P20: Promote the continuation of a parks per population ratio of 2.4 per 1,000 residents and explore the potential to increase the ratio to 3.0, based on the Parks and Recreation Needs Assessment (Parks Master Plan), referenced in Plan Prerequisite 5.1.1-P24.
City of San Jose	
Envision: San José 2040 General Plan (2011)	The City of San Jose Envision: San José 2040 General Plan was adopted on November 1, 2011. The following goals and policies from Part 4, Parks, Open Space, and Recreation are relevant to the project extent: ▪ PR-1.1: Provide 3.5 acres per 1,000 population of neighborhood/community serving parkland through a combination of 1.5 acres of public park and 2.0 acres of recreational school grounds open to the public per 1,000 San José residents. ▪ PR-1.2: Provide 7.5 acres per 1,000 population of citywide/regional park and open space lands through a combination of facilities provided by the City of San José and other public land agencies. ▪ Goal PR-3: Create a balanced park system that provides all residents access to parks, trails, open space, community centers, dog parks, skate parks, aquatics facilities, sports fields, community gardens, and other amenities. ▪ PR-3.1: Provide equitable access to parks, trails, open space, community centers, dog parks, skate parks, aquatics facilities, sports fields, community gardens, and other amenities to the greatest extent feasible in order to provide a high quality of life for our residents. ▪ Goal PR-5: Develop and promote a series of grand parks to act as focal points for the City, its residents, and its visitors. ▪ PR-5.1: Develop the Guadalupe River Park & Gardens as one of the City's grand parks, and as part of an integrated park system. . .

Policy Document	Summary
	▪ PR-5.5: Connect the Guadalupe River Park & Gardens to other assets in the City via a network of trails and bike paths to encourage connectivity and community and to maximize the park's use and accessibility.
Diridon Station Area Plan Final Plan Report (2014)	The Diridon Station Area Plan was adopted June 2014. The following goal and constraints and assumptions is relevant to the project extent: ▪ Open Space. Enhance and expand recreational opportunities in the Station area, and establish an open space system integrated with Los Gatos Creek and Guadalupe River Park. ▪ Completion of the Los Gatos Creek Master Plan: Making the final connection between the northern and southern sections of the creekside park and trails by completing the section between Santa Clara Street and Park Avenue is a high priority for the City and the community. The DSAP – Final Plan Report show this final piece in place as part of the approach to distribution and connection of public open spaces. ▪ New community park at existing Fire Department training yard: The existing facility, bounded by Park Avenue, South Montgomery Street, West San Carlos Street and the railroad tracks has been identified by The City as an opportunity site for a new public park if the fire training station chooses to relocate elsewhere within San Jose. This area is shown as a large new public park with the Los Gatos creek running through it in the DSAP – Final Plan Report.
San Jose Municipal Code, Title 13, Chapter 13.44, Parks (2017)	The Municipal Code consists of local laws and ordinances on parks enacted and enforced by the local municipality. However, these local laws and ordinances predominantly pertain to rules and regulations for daily use of parks, recreation, and open space. As a result, no local laws and ordinances are applicable to the project extent.
City of Morgan Hill	
City of Morgan Hill 2035 General Plan (2016)	The City of Morgan Hill 2035 General Plan was adopted on July 27, 2016. The following goals and policies from Community Development, Open Space and Conservation are relevant to the project extent: City and Neighborhood Form ▪ Goal CNF-5: Efficient development of County land within the UGB consistent with the City's long-term development strategy. ▪ Goal CNF-7: Preservation of viable agricultural lands and publicly-accessible open space uses on unincorporated lands outside the UGB. Healthy Community ▪ Goal HC-3: Usable, complete, well-maintained, safe, and high-quality activities and amenities, including active and passive parks and recreational facilities, community gardens, and trails that are accessible to all ages, functional abilities, and socio-economic groups. Natural Resources and Environment ▪ Goal NRE-1: Preservation of open space areas and natural features. ▪ Goal NRE-5: Preservation and reclamation of streams and riparian areas as open space.
Morgan Hill Municipal Code, Chapter 12.20, City Parks and Recreation Buildings (2016)	The Municipal Code consists of local laws and ordinances on parks enacted and enforced by the local municipality. However, these local laws and ordinances predominantly pertain to rules and regulations for daily use of parks, recreation, and open space. As a result, no local laws and ordinances are applicable to the project extent.

Policy Document	Summary
City of Gilroy	
Gilroy 2020 General Plan (2002)	The City of Gilroy 2020 General Plan was adopted on June 13, 2002. The following goals and policies from the Public Facilities and Services Chapter are relevant to the project extent: ▪ Goal: A comprehensive and coordinated system of convenient, efficient, and high quality park and recreation facilities and programs to meet the current and future needs of Gilroy residents, integrating important natural features and contributing to the City's identity and livability ▪ Policy 16.01: Maintain the City's established standard of 5 acres of developed park land per thousand population. a) This standard includes mini-parks, neighborhood/school parks, community and community/school parks, sports parks, trails/linear parkways, and special use facilities. b) Park preserves and limited active recreation use areas are valued at 5 percent of their total acreage toward meeting this standard. c) Golf courses non-accessible open spaces, and private recreational facilities are not included in this standard. School lands are not included unless there is a long-term lease agreement for their use as City recreational facilities. ▪ Policy 16.09: Ensure that all facilities and parks comply with State and Federal accessibility codes and standards, such as those established by the Americans with Disabilities Act (ADA), and California Building Standards Code (Title 24, California Code of Regulations) ▪ Policy 16.14: In addition to updates and completion of existing parks and facilities, initiate the following new facilities by the year 2020: – Aquatics facility – Indoor recreation and sports facility – Performing and visual arts facility – Expanded trails system – New community and neighborhood parks in areas not currently served by parks – Downtown park, plaza, or town square that is integral to the functions of Downtown – Expansion of Uvas Creek Park Preserve, extending from Burchell Road in the Hecker Pass area downstream to Highway 101 and Gavilan College, via the Gilroy Sports Park Some of these facilities may be developed in partnership with other agencies and organizations.
Gilroy City Code, Chapter 18, Public Parks (2016)	The Municipal Code consists of local laws and ordinances on parks enacted and enforced by the local municipality. However, these local laws and ordinances predominantly pertain to rules and regulations for daily use of parks, recreation, and open space. As a result, no local laws and ordinances are applicable to the project extent.

Policy Document	Summary
San Benito County	
San Benito County 2035 General Plan (2015)	The San Benito County 2035 General Plan was adopted on July 21, 2015. The following goals and policies from the Natural and Cultural Resources Element are relevant to the project extent: ▪ Goal NCR-1: To preserve and enhance valuable open space lands that provide wildlife habitat and conserve natural, historical, archaeological, paleontological, tribal, and visual resources of San Benito County. Goal NCR-3: To develop and maintain a comprehensive system of parklands and protected public recreational areas that meet both the active and passive recreation needs of all age groups.
San Benito County Code of Ordinances, Title 19, Chapter 19.23, Parks (2016)	The Municipal Code consists of local laws and ordinances on parks enacted and enforced by the local municipality. However, these local laws and ordinances predominantly pertain to rules and regulations for daily use of parks, recreation, and open space. As a result, no local laws and ordinances are applicable to the project extent.
Merced County	
2030 Merced County General Plan (2013)	The Merced County General Plan was adopted on December 10, 2013. The following policies from the Natural Resources Element and the Recreation and Cultural Resources Element are relevant to the project extent: Natural Resources Element ▪ Policy NR-1.2: Identify and support methods to increase the acreage of protected natural lands and special habitats, including but not limited to, wetlands, grasslands, vernal pools, and wildlife movement and migration corridors, potentially through the use of conservation easements Recreation and Cultural Resources Element ▪ Goal RCR-1: Preserve, enhance, expand, and manage Merced County's diverse system of regional parks, trails, recreation areas, and natural resources for the enjoyment of present and future residents and park visitors. ▪ Policy RCR-1.1: Encourage the continuation and expansion of existing public recreation land uses, including, but not limited to, public beaches, parks, recreation areas, wild areas, and trails. ▪ Policy RCR-1.3: Encourage a minimum of three acres of neighborhood, community, or regional parkland per each 1,000 persons in the County by: a) Working with other agencies and private interests to provide for adequate neighborhood, community, and regional parkland and facilities; b) Actively participating in the planning of projects that have regional recreation benefits; c) Encouraging and supporting local agency efforts to achieve their objectives for providing local parkland. All local providers should seek to provide at least three acres of parkland for each 1,000 persons. d) Actively seeking available regional, State, and Federal grant funds for acquiring, developing, and maintaining regional parks; and e) Encouraging and supporting other public agencies and private groups in the development of recreation facilities that are consistent with the 2030 Merced County General Plan. ▪ Policy RCR-1.6: Require buffering between non-recreational land uses and sensitive public recreation lands through site design and other techniques when the non-recreational land use may significantly impact recreational lands.

Policy Document	Summary
	▪ Policy RCR-1.11: Encourage the use of regional parks and open-space areas as a mechanism to preserve the county's natural scenic beauty and protect land for public purposes.

Sources: City of San Jose 2011, 2014; City of Santa Clara 2010; City of Morgan Hill 2016a,; City of Gilroy 2002a, 2016c; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994, 1995b; Santa Clara Valley Open Space Authority 2014.
Urban Growth Boundary - UGB

Aesthetics and Visual Quality

Table 16 Regional and Local Plans and Policies Relevant to Aesthetics and Visual Quality

Plan and Policies	Summary
Santa Clara County	
Santa Clara County General Plan (1994)	Growth and Development ▪ C-GD 17: Provide protection of a scenic corridor in Coyote Valley adjacent to US 101. Transportation ▪ C-TR(i) 29: Build attractive transit facilities, including passenger waiting shelters and major transfer facilities. Parks and Recreation ▪ C-PR 4: Public lands should preserve visually significant open space. ▪ C-PR 34: Designate and protect eligible roadways as local or state scenic highways. ▪ C-PR 35: Designate a system of scenic roads linking the urban area with the rural and open space areas. ▪ C-PR(i) 20: Designate all Santa Clara County roads shown in the "California Master Plan of Scenic Highways Eligible for Official Scenic Highway Designation" as scenic highways. ▪ C-PR(i) 21: Add the following highways (US 101 south of SR 85, SR 152 west of Gilroy, SR 17 south of I-280, I-680 and I-280 south of I-880) to the State Master Plan for Scenic Highways and designate them as official state scenic highways. ▪ C-PR(i) 22: Designate as scenic highways roads warranting scenic highway status in the County's General Plan. ▪ C-PR(i) 23: Seek city scenic highway designations for those freeways and expressways designated in the County's General Plan as scenic highways. ▪ C-PR 37: The natural scenery along many of Santa Clara County's highways should be protected from land uses and other activities which would diminish its aesthetic beauty. ▪ C-PR 38: Land use should be controlled along scenic roads so as to relate to the location and functions of these roads and should be subject to design review and conditions to assure the scenic quality of the corridor. ▪ C-PR 39: Protect the visual integrity of the scenic gateways to the South County (Pacheco Pass, Hecker Pass, Route 101 south of Gilroy, and a Coyote greenbelt area north of Morgan Hill). ▪ C-PR 43: Locate new structures where they will not have a negative impact on the scenic quality of the area. In rural areas they should generally be set back at least 100 feet from scenic roads and highways to minimize their visual impact.

Plan and Policies	Summary
	▪ C-PR 45: Screen from view activities along scenic highways that are of a substantially unsightly nature, such as equipment storage or maintenance, fuel tanks, refuse storage or processing and service yards. Resource Conservation ▪ C-RC 1: Natural and heritage resources shall be protected and conserved for their ecological, functional, economic, aesthetic, and recreational values. ▪ C-RC 27: Habitat types and biodiversity within Santa Clara County and the region should be maintained and enhanced for their ecological, functional, aesthetic, and recreational importance. ▪ C-RC 57: The scenic and aesthetic qualities of both the natural and built environments should be preserved and enhanced for their importance to the overall quality of life for Santa Clara County. ▪ C-RC 58: The general approach to scenic resource preservation on a countywide basis should include: conserving scenic natural resources through long range, inter-jurisdictional growth management and open space planning; minimizing development impacts on highly significant scenic resources; and maintaining and enhancing scenic urban settings, such as parks and open space, civic places, and major public common areas. ▪ C-RC 60: Hillsides, ridgelines, scenic transportation corridors, major county entryways, and other areas designated as being of special scenic significance should receive additional consideration and protections due to their prominence, visibility, or symbolic value. ▪ C-RC 61: Public and private development and infrastructure located in areas of special scenic significance should not create major, lasting adverse visual impacts. ▪ C-RC 62: Urban parks and open spaces, civic places, and public commons areas should be designed, developed and maintained such that the aesthetic qualities of urban settings are preserved and urban livability is enhanced. Natural resource features and functions within the urban environmental should also be enhanced. Health and Safety ▪ C-HS(i) 28: Incorporate acoustic site planning into the design of new development through measures such as: separation of noise sensitive buildings from noise generating sources; use of topography and intervening structures to shield noise sensitive land uses; and adequate sound proofing within receiving structures. Rural Growth and Development ▪ R-GD 3: Land uses and development permitted under County jurisdiction shall be consistent with the following major County policies: a. conservation of natural resources; b. avoidance of natural hazards and the prevention of pollution which could pose a threat to public health, safety, and welfare; c. minimizing demand for public services and costs to the general public of providing and maintaining services; d. preservation of rural character, rural lifestyle opportunities, and scenic resources; e. preservation of agriculture; and f. preventing unwanted or premature development that would preclude efficient conversion to urban uses and densities in areas suitable and intended for future annexation. ▪ R-GD 9: Special area plans should be developed and employed for rural unincorporated areas that require or would benefit from more detailed planning, policies, and implementation measures, such as: a. areas subject to critical development constraints, deficiencies, or other special circumstances which render individual development proposals difficult or infeasible to process and

Plan and Policies	Summary
	approve; b. joint planning for areas of mutual interest or concern to multiple jurisdictions, such as joint hillside development plans or interurban/ greenbelt areas; c. designated areas of "critical environmental concern" as described under CEQA law, or areas likely to be adversely affected by cumulative development impacts; d. areas formally designated as historic or agricultural preserves; and e. areas designated for natural resource conservation, such as significant natural habitat areas, water supply watersheds, or scenic preservation areas. ▪ R-GD 20: Grading and terrain alteration should conserve the natural landscape and resources, minimize erosion impacts, protect scenic resources, habitat, and water resources. ▪ R-GD 25: Grading associated with roads, bridges, retaining walls, or similar improvements related to access requirements should not create a significant visual scar or impact to the environment. They should generally follow natural terrain and contours to the maximum extent feasible. ▪ R-GD 27: Grading and excavation to situate a structure within a hillside to reduce visual impacts is encouraged. Rural Transportation ▪ Strategy #5: Preserve and Enhance Scenic Qualities adjacent to Scenic Rural Roads. Rural Parks and Recreation ▪ Strategy #2: Protect scenic highway corridors. ▪ R-PR 36: Local and state roads and highways traversing Santa Clara County's scenic rural and urban areas should be designated and protected as local or state scenic highways. ▪ R-PR(i) 21: Designate as official scenic highways all Santa Clara County roads shown in the "California Master Plan of Scenic Highways Eligible for Official Scenic Highway Designation. "R-PR(i) 22: Add the following highways to the State Master Plan for Scenic Highways and designate them as official state scenic highways: US 101 (South Valley Freeway); SR 152 (Hecker Pass Highway); SR 17 (Los Gatos to Campbell); I-680; I-280 (between 17/880 and US 101). ▪ R-PR(i) 23: Designate as scenic highways in the County's General Plan those roads warranting scenic highway status. ▪ R-PR(i) 24: Seek city scenic highway designations for those freeways and expressways designated in the County's General Plan as scenic highways. ▪ R-PR 41: Protect the visual integrity of the scenic gateways to the South County—Pacheco Pass, Hecker Pass, Route 101 south of Gilroy, and a Coyote greenbelt area north of Morgan Hill. ▪ R-PR 45: New structures should be located where they will not have a negative impact on the scenic quality of the area. In rural areas they should generally be set back at least 100 feet from scenic roads to minimize their visual impact. ▪ R-PR 47: Activities along scenic highways that are of a substantially unsightly nature, such as equipment storage or maintenance, fuel tanks, refuse storage or processing and service yards, should be screened from view. Rural Resource Conservation ▪ R-RC 39: Screening of obtrusive or unsightly aspects of a project should be considered as a means of preserving the scenic value of riparian areas.

Plan and Policies	Summary
	▪ R-RC 86: Projects in areas found to have heritage resources shall be conditioned and designed to avoid loss or degradation of the resources. If conflict is unavoidable, mitigation measures may be imposed. ▪ R-RC 95: The scenic and aesthetic qualities of both the natural and built environments should be preserved and enhanced for their importance to the overall quality of life. ▪ R-RC 96: The general approach to scenic resource preservation for the rural unincorporated areas consists of minimizing scenic impacts in rural areas through control of development densities and limiting development impacts on highly significant scenic resources, such as ridgelines, prominent hillsides, streams, transportation corridors, and county entranceways. ▪ R-RC 98: Hillsides, ridgelines, scenic transportation corridors, major county entryways, stream environments, and other areas designated as being of special scenic significance should receive utmost consideration and protection due to their prominence, visibility, and overall contribution to the quality of life in Santa Clara County. ▪ R-RC 101: Roads, building sites, structures, and public facilities shall not be allowed to create major or lasting visible scars on the landscape. ▪ R-RC(i) 36: Protect the scenic value of the following major County thoroughfares and entranceways through state scenic highway designation, including SR 152 east of Gilroy (Pacheco Pass), SR 152 west of Gilroy (Hecker Pass), and US 101 south of the San Jose city limits. Rural Health and Safety ▪ R-HS(i) 6: Incorporate acoustic site planning into the design of new development. Possible methods include: separating noise sensitive buildings from noise generating sources; using topography and intervening structure to shield noise sensitive land uses; and adequate sound reduction within the receiving structure. Rural Land Use Policies ▪ R-LU 1: “Resource Conservation Areas” refers to following: Baylands; Agriculture; Hillsides; Ranchlands, Agricultural; Open Space Reserve; Regional Parks, Existing; and other Public Open Space Lands. ▪ R-LU 74: Major electric transmission lines should avoid ridgelines and follow the natural flow and rhythm of land forms as much as possible. Routes should not cross scenic roads at points where lines will be visible for long distances. Minimum height structures should be used where the additional structures which result are not objectionable. Design and paint selection should reduce visual impact. Vegetation should be used for screening and need not always be removed in order to provide adequate service access where it will not interfere with a facility’s safe operation. ▪ R-LU 75: Electric substations and gas control and metering stations shall be located, designed, and landscaped to fit as inconspicuously and harmoniously as possible into the area in which they are required. Locations along scenic roads and heavily traveled highways should be avoided. ▪ R-LU 79: New public transportation facilities shall be compatible with the land uses in the areas in which they are located and consistent with the County’s General Plan. ▪ R-LU 113: The San Martin Planning Area boundary encompasses the area between Maple Avenue on the North; Masten Avenue on the South; the East Foothills and West Foothills (excluding those areas annexed to Morgan Hill). It excludes that part of the current study area which lies west of Monterey Road

Plan and Policies	Summary
	and between the hill crest north and paralleling California Avenue and West Middle Avenue. ▪ R-LU 148: The portion of Highway 101 (South Valley Freeway) in San Martin should be considered a scenic highway. South County Joint Area Plan ▪ SC 0.3: The South County Joint Area Plan shall apply to the incorporated and unincorporated areas south of the Morgan Hill–San Jose boundary agreement line. The Joint Area Plan also includes policies relating to the Coyote Valley. ▪ SC 16.6: The visual integrity of the scenic gateways to the South County (Pacheco Pass, Hecker Pass, Route 101 south of Gilroy, and a Coyote greenbelt area north of Morgan Hill) should be protected.
City of Santa Clara	
City of Santa Clara 2010-2035 General Plan (2010)	General Land Use Policies ▪ 5.3.1-P1: Preserve the unique character and identity of neighborhoods through community-initiated neighborhood planning and design elements incorporated in new development. ▪ 5.3.1-P3: Support high quality design consistent with adopted design guidelines and the City's architectural review process. ▪ 5.3.1-P10: Provide opportunities for increased landscaping and trees in the community, including requirements for new development to provide street trees and a minimum 2:1 on- or off site replacement for trees removed as part of the proposal to help increase the urban forest and minimize the heat island effect. ▪ 5.3.1-P24: Coordinate sign programs for commercial uses to promote continuity, improve streetscape design, and reduce visual clutter. ▪ 5.3.1-P27: Encourage screening of above-ground utility equipment to minimize visual impacts. ▪ 5.3.1-P28: Encourage undergrounding of new utility lines and utility equipment throughout the City. El Camino Real Focus Area Goals and Policies ▪ 5.4.1-P14: Encourage public art, special signage, banners, and landscaping throughout the Focus Area, including features that would connect the corridor with Downtown. Santa Clara Station Focus Area Goals and Policies ▪ 5.4.3-P9: Encourage streetscape design with street trees, wider sidewalks, pedestrian-oriented lighting, curb bulb-outs and special paving and striping within the Focus Area to emphasize accessibility. ▪ Historic Preservation Goals and Policies ▪ 5.6.1-G1: Preservation of historic resources and neighborhoods. ▪ 5.6.1-P3: Protect historic resources from demolition, inappropriate alterations, and incompatible development. Rail and Freight Goals and Policies ▪ 5.8.7-G2: Neighborhoods protected from negative effects associated with rail and freight services. Conservation Goals and Policies ▪ 5.10.1-G2: Conservation and restoration of riparian vegetation and habitat. ▪ 5.10.1-P4: Protect all healthy cedars, redwoods, oaks, olives, bay laurel, and pepper trees of any size, and all other trees over 36 inches in circumference

Plan and Policies	Summary
	measured from 48 inches above-grade on private and public property as well as in the public right-of-way. ▪ 5.10.1-P5: Encourage enhancement of land adjacent to creeks in order to foster the reinstatement of natural riparian corridors where possible. ▪ 5.10.1-P12: Encourage property owners and landscapers to use native plants and wildlife-compatible non-native plants when feasible. ▪ 5.10.4-P7: Require installation of native and low-water-consumption plant species when landscaping new development and public spaces to reduce water usage. ▪ 5.10.4-P8: Require all new development within a reasonable distance of existing or proposed recycled water distribution systems to connect to the system for landscape irrigation.
City of San Jose	
Envision: San José 2040 General Plan (2011)	Arts and Culture ▪ AC-2.1: High Impact Public Art. Site public art in key locations. Prioritize innovative public art in three regional destination areas: Downtown, North San José, and the Mineta San José International Airport. Place public art at transportation hubs: pedestrian, bike, and transit improvements in pedestrian priority areas; encourage the inclusion of public art at VTA and BART stations, including Diridon Station; and integrate a broad range of art projects into the trail network to connect neighborhoods and bring people closer to nature. Integrate public art into bond-funded park, library, community facility, and public safety projects. Cultivate community-based art projects that support neighborhood revitalization goals. Fiscal Sustainability ▪ FS-5.10: Maintain the rural and agricultural character of Central Coyote Valley and do not expand the Urban Service Area to include it. Measurable Environmental Sustainability ▪ MS-21.5: As part of the development review process, preserve protected trees (as defined by the Municipal Code), and other significant trees. Avoid any adverse effects on the health and longevity of protected or other significant trees through appropriate design measures and construction practices. Special priority should be given to the preservation of native oaks and native sycamores. When tree preservation is not feasible, include appropriate tree replacement, both in number and spread of canopy. ▪ MS-21.6: As a condition of new development, require the planting and maintenance of both street trees and trees on private property to achieve a level of tree coverage in compliance with and that implements City laws, policies, or guidelines. ▪ MS-21.7: Manage infrastructure to ensure that the placement and maintenance of street trees, streetlights, signs, and other infrastructure assets are integrated. Give priority to tree placement in designing or modifying streets. ▪ MS-21.8: For Capital Improvement Plan or other public development projects, or through the entitlement process for private development projects, require landscaping including the selection and planting of new trees to achieve the following goals: avoid conflicts with nearby power lines; avoid potential conflicts between tree roots and developed areas; avoid use of invasive, non-native trees; remove existing invasive, non-native trees; incorporate native trees into urban plantings in order to provide food and cover for native wildlife species; and

Plan and Policies	Summary
	plant native oak trees and native sycamores on sites which have adequately sized landscape areas and which historically supported these species. ▪ MS-21.9: Where urban development occurs adjacent to natural plant communities (e.g., oak woodland, riparian forest), landscape plantings shall incorporate tree species native to the area and propagated from local sources (generally from within 5–10 miles and preferably from within the same watershed). Environmental Resources ▪ ER-2.2: Ensure that a 100-foot setback from riparian habitat is the standard to be achieved in all but a limited number of instances, only where no significant environmental impacts would occur. ▪ ER-2.3: Design new development to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise, and toxic substances into the riparian zone. ▪ ER-6.3: Employ low-glare lighting in areas developed adjacent to natural areas, including riparian woodlands. Any high-intensity lighting used near natural areas will be placed as close to the ground as possible and directed downward or away from natural areas. ▪ ER-6.4: Site public facilities such as ballparks and fields that require high-intensity night lighting at least 0.5 mile from sensitive habitats to minimize light pollution, unless it can be demonstrated that lighting systems will not substantially increase lighting within natural areas (e.g., due to screening topography or vegetation). Environmental Considerations/Hazards ▪ EC-1.5: Encourage the State Department of Transportation and County transportation agencies to provide visually pleasing sound attenuation devices on all new and existing freeways and expressways. Infrastructure ▪ IN-1.9: Design new public and private utility facilities to be safe, aesthetically pleasing, compatible with adjacent uses, and consistent with the Envision General Plan goals and policies for fiscal sustainability, environmental leadership, an innovative economy, and quality neighborhoods. ▪ IN-1.10: Require undergrounding of all new publicly owned utility lines. Encourage undergrounding of all privately owned utility lines in new developments. Work with electricity and telecommunications providers to underground existing overhead lines. ▪ IN-1.11: Locate and design utilities to avoid or minimize impacts to environmentally sensitive areas and habitats. Vibrant Neighborhoods ▪ VN-1.9: Cluster parking, make use of shared parking facilities, and minimize the visual impact of surface parking lots to the degree possible to promote pedestrian and bicycle activity and to improve the City's aesthetic environment. Community Design ▪ CD-1.13: Use design review to encourage creative, high-quality, innovative, and distinctive architecture that helps to create unique, vibrant places that are both desirable urban places to live, work, and play and that lead to competitive advantages over other regions. ▪ CD-1.14: Use the Urban Village Planning process to establish standards for their architecture, height, and massing.

Plan and Policies	Summary
	▪ CD-1.17: Minimize the footprint and visibility of parking areas. Where parking areas are necessary, provide aesthetically pleasing and visually interesting parking garages with clearly identified pedestrian entrances and walkways. Encourage designs that encapsulate parking facilities behind active building space or screen parked vehicles from view from the public realm. Ensure that garage lighting does not impact adjacent uses, and to the extent feasible, avoid impacts of headlights on adjacent land uses. ▪ CD-1.19: Encourage the location of new and relocation of existing utility structures into underground vaults or within structures to minimize their visibility and reduce their potential to detract from pedestrian activity. When above-ground or outside placement is necessary, screen utilities with art or landscaping. ▪ CD-1.23: Further the Community Forest Goals and Policies in this Plan by requiring new development to plant and maintain trees at appropriate locations on private property and along public street frontages. Use trees to help soften the appearance of the built environment, help provide transitions between land uses, and shade pedestrian and bicycle areas. ▪ CD-1.24: Within new development projects, include preservation of ordinance-sized and other significant trees, particularly natives. Avoid any adverse effect on the health and longevity of such trees through design measures, construction, and best maintenance practices. When tree preservation is not feasible, include replacements or alternative mitigation measures in the project to maintain and enhance our Community Forest. ▪ CD-1.26: Apply the Historic Preservation Goals and Policies of this Plan to proposals that modify historic resources or include development near historic resources. ▪ CD-4.6: Support cohesive and architecturally distinctive urban development along Grand Boulevards, and include such design elements as enhanced landscaping; attractive lighting; wide, comfortable sidewalks; area identification banners; and harmonious building scale features. ▪ CD-4.11: Accomplish sound attenuation for development along City streets through the use of setbacks and building design rather than sound attenuation walls. When sound attenuation walls are located adjacent to expressways, freeways, or railroad lines, landscaping, public art, or an aesthetically pleasing and visually interesting design should be used to minimize visual impacts. ▪ CD-5.5: Include design elements during the development review process that address security, aesthetics, and safety. Safety issues include, but are not limited to, minimum clearances around buildings, fire protection measures such as peak load water requirements, construction techniques, and minimum standards for vehicular and pedestrian facilities and other standards set forth in local, state, and federal regulations. ▪ CD-5.6: Design lighting locations and levels to enhance the public realm, promote safety and comfort, and create engaging public spaces. Seek to balance minimum energy use of outdoor lighting with goal of providing safe and pleasing well-lit spaces. Consider the City's outdoor lighting policies in development review processes. ▪ CD-6.5: Promote iconic architecture and encourage and incorporate innovative, varied, and dynamic design features (e.g., appearance, function, sustainability aspects) into sites, buildings, art, streetscapes, landscapes, and signage to make Downtown visually exciting and to attract residents and visitors. ▪ CD-6.8: Recognize Downtown as the hub of the County's transportation system and design buildings and public spaces to connect and maximize use of all

Plan and Policies	Summary
	types of transit. Design Downtown pedestrian and transit facilities to the highest quality standards to enhance the aesthetic environment and to promote walking, bicycling, and transit use. Design buildings to enhance the pedestrian environment by creating visual interest, fostering active uses, and avoiding prominence of vehicular parking at the street level. ▪ CD-6.12: Promote creative and experimental urban forms, activities and land uses that further the economic, fiscal, environmental, and social goals of this plan and reflect San José's culture of innovation. ▪ CD-9.1: Ensure that development within the designated Rural Scenic Corridors is designed to preserve and enhance attractive natural and built vistas. ▪ CD-9.3: Ensure that development along designated Rural Scenic Corridors preserves significant views of the Valley and mountains, especially in, or adjacent to, Coyote Valley, the Diablo Range, the Silver Creek Hills, the Santa Teresa Ridge, and the Santa Cruz Mountains. ▪ CD-10.1: Recognize the importance of Gateways in shaping perceptions of San José. ▪ CD-10.3: Require that development visible from freeways (including U.S.101, I-880, I-680, I-280, SR17, SR85, SR237, and SR87) be designed to preserve and enhance attractive natural and built vistas. ▪ CD-10.6: Develop Gateway plans for Gateway locations identified in the Envision General Plan. Plans should include overall streetscape and private design guidelines, needed capital improvements, and long-term solutions for their maintenance. Land Use Policies ▪ LU-14.3: Design new development, alterations, and rehabilitation/remodels in Conservation Areas to be compatible with the character of the Conservation Area. In particular, projects should respect character-defining elements of the area that give the area its identity. These defining characteristics could vary from area to area and could include density, scale, architectural consistency, architectural variety, landscape, etc. ▪ LU-14.7: Ensure City public works projects (street lights, street tree planting, sidewalk design, etc.) promote, preserve, or enhance the historic character of Conservation Areas. ▪ LU-14.8: Perform modifications to the exterior of any building or structure located in a Conservation Area in a manner consistent with any and all design guidelines approved or accepted by the City Council for the preservation of historic buildings or structures. Transportation Policies ▪ TR-4.3: Support the development of amenities and land use and development types and intensities that contribute to increased ridership on the potential high-speed rail system, and also provide positive benefits to the community. ▪ TR-4.4: Work cooperatively with the California High-Speed Rail Authority to ensure that rail corridors within the city are planned and constructed in a manner that enhances the character of the surrounding neighborhoods. ▪ TR-4.5: As appropriate, regularly coordinate with rail operators in San José on the following matters: maintenance of rail lines, landscaping, and easements; vehicle and pedestrian safety near at-grade rail crossings; electrification to increase the frequency of train service and reduce environmental impacts; separations (either above-ground or underground) to improve street connectivity and pedestrian and bicycle mobility at ground level; establishment of timed transfers with other transit providers in the area; and analysis and mitigation of

Plan and Policies	Summary
	the potential negative impacts resulting from increased train service, corridor expansion, and the eventual upgrading of a rail line. Implementation ▪ IP-16.1: Other public agencies and utility companies should consider the Envision General Plan goals and policies and Land Use/Transportation Diagram in planning the delivery of services to San José residents and businesses. ▪ IP-16.2: Where determination of consistency, compatibility, or conformance of any proposal with the Envision General Plan depends on an exercise of discretion, such discretion is solely within the purview of the City of San José. Any agency proposing to apply the provisions of the Envision General Plan to a proposal can seek a determination of such consistency, compatibility, or conformance by filing a written request with the Director of Planning of the City of San José.
Diridon Station Area Plan (2014)	▪ None
City of San Jose Tamien Station Area Specific Plan (1995)	▪ None
City of San Jose Communications Hill Plan (1992)	▪ None
City of San Jose Coyote Valley Plan (2008)	Fixed Environmental Elements ▪ 11: The alignment and improvements of Monterey Road necessitated by CVP shall maintain a landscape buffer between the road and the railroad of at least – feet and incorporate existing Keesling's Shade Trees. The landscaped buffer shall be installed in conjunction with adjacent Monterey Road improvements and shall include an analysis of the health of the existing trees, remedial maintenance of existing trees, and replacement of dead or dying trees with trees of the same species. Community Facilities and Services ▪ 125: Provide a continuous sidewalk on the east side of Monterey Road that is separated by a landscape strip from the roadway. ▪ 126: Preserve the westerly curb line of Monterey Road to protect the Keesling's Shade Trees. Add massing of shrubs within the area between the curb line and the railroad right-of-way, which screens views to the railroad. ▪ 127: Provide a 20-foot minimum buffer planted with redwood trees on the west side of the railroad right of way. ▪ 128: Encourage a landscape buffer, sound walls and shrubs on the west side of the railroad right-of-way. Within this 20-foot buffer zone, shrubs should be planted on both sides of the wall, and vines that attach without support should be planted on the west side of the wall. ▪ 129: A continuous planted "orchard" style grid of trees should be used to recall the agricultural history of Coyote Valley and create an attractive edge on the eastern side of Monterey Road, between the road and the development. Species include orchard varieties such as cherries, apricot, peach, and plums. ▪ 130: Plant the median of Monterey Road with large-scale canopy trees, with one species used for the entire length of the road through Coyote Valley.

Plan and Policies	Summary
Coyote Creek Parkway County Park Master Plan (2006)	Guideline, Goals, and Objectives ▪ PR-5: Maintain opportunities for the Parkway user to experience a sense of remoteness within the context of a rural riparian habitat corridor.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	City and Neighborhood Form ▪ Policy CNF-8.1: High Quality Design. Require all development to feature high quality design that enhances the visual character of Morgan Hill. ▪ Policy CNF-8.10: Public Landscaping. Landscape medians and public areas along major streets using drought- tolerant plant materials, and encourage CALTRANS to use drought-tolerant plants along Highway 101. ▪ Policy CNF-8.14: Sound Walls. Minimize the use of sound walls to situations where they are required to meet noise standards and other forms of mitigation are not available. Use techniques less visually disturbing than sound walls, including but not limited to earth berms and intervening placement of non-sensitive buildings when requiring noise impact mitigation of new and/or expanded development. ▪ Policy CNF-8.20: Nighttime Lighting. Require nighttime lighting to be designed to minimize light spillage to adjacent properties.* ▪ Policy CNF-19.2: Visual Integrity of Gateways. Enhance the visual integrity of the gateways to the City such as the Madrone area north of Cochrane Road, the Cochrane Road/Monterey Road intersection, Monterey Road south of Watsonville Road, the Cochrane, Dunne, and Tennant freeway interchanges, and the Caltrain station. Transportation ▪ Policy TR-3.18: Grade-Separated Railroad Crossings. Plan for the construction of grade-separated crossings of the Union Pacific railroad to improve emergency vehicle response times and minimize conflicts between railroad trains and on-road vehicles. California Public Utilities Commission approval is required to modify an existing highway rail crossing or to construct a new crossing. Grade-separated crossings should be encouraged at Dunne Avenue (Depot Street to be re-routed through the existing Community and Cultural Center parking lot to create an intersection with Church Street either prior to or in conjunction with the grade separation project). ▪ Policy TR-3.20: Arterial Design and Landscaping. Require development adjacent to arterial streets to minimize the use of fences and walls wherever possible. Strive to accommodate all modes of travel on arterial streets, and improve the Butterfield Corridor, Monterey Road Corridor, and Hale/Santa Teresa Corridor to the extent feasible as well-landscaped multi-modal boulevards. Continue to implement the program for planting street trees and landscaping arterial streets and major intersections. ▪ Natural Resources and Environment ▪ Policy NRE-2.1: Hillside and Ridgeline Views. Protect views of hillsides, ridgelines, and prominent natural features surrounding the City. These features help define the City's historic rural character, sense of place, image and identity. ▪ Policy NRE-6.4: Tree Preservation and Protection. Preserve and protect mature, healthy trees whenever feasible, particularly native trees, historically significant trees, and other trees which are of significant size or of significant aesthetic value to the immediate vicinity or to the community as a whole. ▪ Safety, Services, and Infrastructure

Plan and Policies	Summary
	▪ Policy SSI-9.7: Sound Barrier Design. Require non-earthen sound barriers to be landscaped, vegetated, or otherwise designed and/or obscured to improve aesthetics and discourage graffiti and other vandalism.
City of Gilroy	
City of Gilroy 2002-2020 General Plan (2002)	Community Design and Development ▪ 1.09: Gateways. Create entry points to the City that are identified by well-designed, landscaped entrances with landscaped medians, indicating civic pride and a concern for civic beauty. Principal gateways to Gilroy are located on north and south Monterey Street; Highway 152/Hecker Pass; Highway 152/Pacheco Pass; north and south Santa Teresa Boulevard; and at the Highway 101 interchanges at Masten, Buena Vista, Leavesley, and Tenth Street. ▪ 6.01: Scenic Highways. Support the designation of Hecker Pass Highway, Santa Teresa Boulevard, and Pacheco Pass Highway as official State Scenic Highways, and establish appropriate development controls to ensure long-term protection of their scenic qualities. Controls should establish appropriate setbacks, sign controls, and other development regulations in keeping with State guidelines for the protection of scenic highway corridors. ▪ 6.03: Highway 101 Landscaping and View Protection. Work with CALTRANS and the County to provide additional landscaping along the Highway 101 right-of-way to enhance its attractiveness, recognizing that it is the primary "visitor-serving" traffic artery in the Planning Area. Also, encourage new developments facing Highway 101 to provide landscape screening and to protect and enhance existing views of farmland and surrounding hills. Community Resources and Potential Hazards ▪ 26.03: Buffering Standards. Enforce stringent buffering standards to protect residents from freeway, expressway, highway, and industrial noise. Use open land as a buffer between residential areas and highways or industrial areas wherever possible. ▪ 26.04: Acoustical Design. Consider the acoustical design of projects in the development review process to reduce noise to an acceptable level. Ensure that noise mitigation features are designed and implemented in an aesthetically pleasing and consistent manner. ▪ 26.05: Earth Berms. Require landscaped earth berms as an alternative to noise barriers where feasible to buffer noise along major thoroughfares adjacent to residential areas. Where an earth berm is not feasible, a masonry wall screened with drought tolerant, low maintenance landscaping should be required.
Downtown Specific Plan (2005)	Vision ▪ Continue to embrace the historic and eclectic design pattern of Downtown Gilroy by not requiring new development to adhere to a particular design theme. ▪ Protect the character, scale and design of adjacent single-family residential development beyond Eigleberry Street and Railroad Street. ▪ Encourage enhanced landscaping, including mature street trees, shrubs, and groundcover that provide interest, color, style and flowering characteristics in Downtown Gilroy. ▪ Provide a stronger and more cohesive sense of identity to the Downtown by adhering to a common design for public infrastructure such as signs, lighting and other elements. ▪ Parking should be located behind structures in all districts.

Plan and Policies	Summary
	▪ Planting should be used to screen or separate less desirable areas from public view, such as trash enclosures, parking areas, storage areas, loading areas, and public utilities. ▪ Existing historic or older structures with architectural details or ornamentation should be retained, restored, or replicated whenever possible. Land Use ▪ Properties between Lewis Street and Seventh Street on the west side of the railroad corridor must provide a setback to accommodate on-site parking, access drive, and a landscaped buffer. Articulation should be provided on building facades to promote a pleasing view of Downtown. ▪ A "standard" fencing design and a five-foot minimum landscape planter area adjacent to the railroad corridor. ▪ A pedestrian pathway along the east side of the railroad corridor between Tenth Street and Leavesley Road. ▪ Streetscape Beautification and Public Improvements ▪ The former industrial/railroad area will transform into a contemporary urban streetscape. ▪ Sidewalks will be widened and street trees added. Streetscape and lighting improvements will complement the urbanized environment. Railroad Corridor ▪ This corridor will be beautified to the greatest extent possible. Fencing will provide security as well as aesthetic enhancement. Landscaping, including trees and other plants, will improve the look of the corridor and help screen undesirable views to adjoining properties. ▪ Improved pedestrian crossings at Tenth Street, Old Gilroy Street, Sixth Street, Martin Street, and Lewis Street will also enhance the area. Parking Structures ▪ All proposed parking structures in the Downtown will be public parking structures and should adhere to specific standards in order to minimize the structure's impact upon the streetscape. ▪ All public parking structures should adhere to the following guidelines: Design openings to look like window openings; substantial massing should occur at the corner of the structures to anchor the building; height should be added to the parapet at key areas on the building structure to accent entries and reduce the long horizontal façade that is typical of parking structures; consider adding awnings or trellis structures at vehicular and pedestrian entrances to create a pedestrian scale; horizontal openings should be broken up with vertical columns to create a rhythm of openings; retail spaces should front the pedestrian spaces at the ground floor-where retail is not provided on the ground floor, the structure should be located so that the structure does not directly abut paved areas, and; consider providing landscaping and vines on façades to help reduce the visual impact of the structure.
Gilroy High-Speed Train Station Visioning Project Vision Report (2012)	▪ None
San Benito County	
San Benito County 2035 General Plan (2015)	Public Facilities and Services Element ▪ PFS-9.4: The County shall require that the siting of telecommunications facilities minimizes their visibility, prevents visual clutter, reduces conflicts with

Plan and Policies	Summary
	surrounding land uses, and avoids views of scenic highways, public parks and recreation facilities, or other scenic view areas. ▪ PFS-9.5: The County shall require that the design of telecommunications facilities (e.g., cabinets, buildings, antennas, security fencing) integrate into existing adjacent conditions and minimize visibility through the use of: appropriate colors, existing buildings and structures, screening, disguising, landscaping, and compatibility with surrounding structures and natural environments. Natural and Cultural Resources Element ▪ NCR-1.3: The County shall continue to protect and preserve the rural landscape and implement open space policies for: public health, safety, and welfare; continued agricultural uses; scenic viewscape preservation, including scenic highway corridors; park and recreation uses; conservation of significant natural resources; the containment and definition of limits to urbanization; and the preservation of the natural habitat for threatened or endangered plant and animal species. ▪ NCR-8.1: The County shall endeavor to protect the visual characteristics of certain transportation corridors that are officially designated as having unique or outstanding scenic qualities. ▪ NCR-8.3: The County shall review all projects involving grading within Scenic Corridors to protect valuable soil resources, preserve the natural environment, and avoid significant adverse impacts within scenic areas. ▪ NCR-8.8: The County shall require all new electric and communication distribution facilities proposed within the Scenic Corridor to be placed underground, whenever feasible. Where overhead utility lines are unavoidable, every effort should be made to reduce the visual impact through elements of design. ▪ NCR-8.11: The County shall ensure that new development and structures, within areas that are not regulated by a Specific Plan, are screened and/or developed in a manner to appear similar to existing agricultural, rural, or low intensity uses in the vicinity. ▪ NCR-9.1: The County shall continue to enforce the development lighting ordinance (SBC Code Chapter 19.13) and restrict outdoor lighting and glare from development projects in order to ensure good lighting practices, minimize nighttime light impacts, and preserve quality views of the night sky. The ordinance shall continue to recognize lighting zones and contain standards to avoid light trespass, particularly from developed uses, to sensitive uses, such as the areas surrounding Fremont Peak State Park and Pinnacles National Park.
Merced County	
2030 Merced County General Plan (2013)	▪ Policy NR-4.1: Promote the preservation of agricultural land, ranch land, and other open space areas as a means of protecting the County's scenic resources. ▪ Policy NR-4.2: Coordinate with CALTRANS, during the review of proposed structures and activities located adjacent to state designated scenic highways, to ensure that scenic vistas and local scenic values are not significantly degraded. ▪ Policy NR-4.4: Consider the surrounding landscape, topography, and existing scenic values when determining the location and construction of new roads. ▪ Policy NR-4.5: Develop and implement a lighting ordinance to require good lighting practices, such as the use of specific light fixtures that reduce light pollution, minimize light impacts, and preserve views of the night sky. The

Plan and Policies	Summary
	ordinance shall contain standards to avoid light trespass, particularly from developed uses, to sensitive wildlife corridors and refuges. ▪ Policy P FS-5.7: Coordinate with local gas and electric utility companies in the design, location, and appropriate expansion of gas and electric systems, while minimizing impacts to agriculture and minimizing noise, electromagnetic, visual, and other impacts on residents.
San Luis Reservoir	
San Luis Reservoir State Recreation Area Resource Management Plan / Preliminary General Plan (2012)	Resource Management ▪ RES-S1: Preserve scenic vistas that overlook open land and water through the identification and definition of significant vista points and viewsheds. Before development of new facilities, consider the visual effect of new structures and carefully site features within an identified viewshed. Where feasible, avoid placement of new structures or other obstructions at or near identified significant vista points and along uninterrupted shorelines and landscapes. ▪ RES-S2: Maintain large expanses of open space free of visual and physical interruptions. Minimize, shield, or use new architectural controls in the development of new structures and reduce existing structures and other features that visually and physically fragment open space. ▪ RES-S3: Make new structures architecturally compatible with their use as recreation facilities and distinguishable from the water operations structures but in keeping with overall site character. Identify the architectural components (style) and other contributing elements that define the recreation use areas and site character, and use this information to assess consistency of new structures. Where feasible, ensure that the mass and scale of new structures are compatible with the setting and do not dominate the surrounding landscape. ▪ RES-S4: Identify a common and unified set of site-related details and materials (signage, gates, surface materials, fences, etc.) so that new facilities and infrastructure are compatible with the character of the site and are distinctive for recreation facilities. Avoid the introduction of materials not in keeping with the local and onsite character. Design new details to be compatible with existing materials and finishes while creating a unified image for the Plan Area recreation facilities. Develop a signage and wayfinding system that incorporates guidelines and standards for signage as well as the location, distribution, and frequency of signs. ▪ RES-S5: Prevent aesthetic and environmental damage from duration and intensity of lighting and fixtures. Design and place light fixtures only as needed and in keeping with use and character. Minimize intensity by considering techniques such as low-voltage fixtures and downlighting. Design lighting systems and facilities that avoid light pollution onsite and offsite spills to neighboring areas.
Santa Nella	
Santa Nella Community Specific Plan (2000)	Circulation ▪ 9: Establish landscape programs for I-5 and the arterial street system within appropriate rights-of-way. Create an urban forest along I-5. Noise ▪ 3: Use a combination of noise barriers of a maximum 6'-8" block wall and/or landscape berms, or larger setbacks as required by noise study, to reduce the noise level in residential exterior yards to 65 dBAs.

Sources: City of Gilroy 2002a, 2005, 2012; City of Morgan Hill 2016a; City of Santa Clara 2010; City of San Jose 1992b, 1995, 2008, 2011, 2014; County of Merced 2000, 2013a; County of San Benito 2015a; County of Santa Clara 1994; Santa Clara County Parks 2006; Reclamation/DPR 2012.

I- = interstate
CALTRANS = California Department of Transportation
CEQA = California Environmental Quality Act
VTA = Valley Transportation Authority
BART = Bay Area Rapid Transit
SR = State Route
dBA = A-weighted decibels

Cultural Resources

Table 17 Regional and Local Plans and Policies Relevant to Cultural Resources

Plan and Policies	Summary
Santa Clara County	
Santa Clara County General Plan (1994)	Santa Clara County adopted the *Santa Clara County General Plan* in 1994. The plan includes the following goals, policies, and recommendations related to cultural resources: Vision of the General Plan: Goals for Responsible Resource Conservation ▪ Goal 5. Heritage Resources Protected ▪ Goal 5.1 Protection and preservation of heritage resources both natural (e.g. heritage trees; and paleontological resources) and cultural (e.g. historic sites and structures, and archeological sites). Cultural heritage resources reflecting the contributions to society of all cultures acknowledged, preserved and commemorated. Parks and Recreation Element ▪ Policy C-PR 10: Recreation facilities and activities within regional parks and public open space lands should be located and designed to be compatible with the long term sustainability of each site's natural and cultural resources, with particular attention to the preservation of unique, rare, or endangered resources (including historic and archeological sites, plant and animal species, special geologic formations, etc.). ▪ Policy C-PR 50: Scenic routes which are historic routes into or through the county should be so designated and historic sites and features along them identified and enhanced where appropriate. Resource Conservation Element: General Cultural Heritage Resources Policies ▪ Policy C-RC 49: Cultural heritage resources within Santa Clara County should be preserved, restored wherever possible, and commemorated as appropriate for their scientific, cultural, historic and place values. ▪ Policy C-RC 50: Countywide, the general approach to heritage resource protection should include the following strategies: 1. Inventory and evaluate heritage resources; 2. Prevent or minimize adverse impacts on heritage resources; 3. Restore, enhance, and commemorate resources as appropriate. Strategy #1: Inventory and Evaluate Heritage Resources ▪ Policy C-RC 51: Inventories of heritage resources should be maintained as the basis for local decision making regarding such resources. ▪ Implementation Recommendation C-RC(i)24: Update inventories and evaluations of heritage resources. Survey resources as necessary to augment existing inventories. Strategy #2: Prevent or Minimize Adverse Impacts on Heritage Resources ▪ Policy C-RC 52: Prevention of unnecessary losses to heritage resources should be ensured as much as possible through adequate ordinances, regulations, and standard review procedures. Mitigation efforts, such as relocation of the resource, should be employed where feasible when projects will have significant adverse impact upon heritage resources. ▪ Policy C-RC 53: Cities should balance plans for urban redevelopment with the objectives of heritage resource preservation in such cases where potential conflicting interest may

Plan and Policies	Summary
	arise. Care should be taken to integrate heritage resources with new development wherever possible. ▪ Implementation Recommendation C-RC(i)25: Review administrative procedures and enforcement for effectiveness. ▪ Implementation Recommendation C-RC(i)26: Explore designation of historic districts to preserve character of areas rich in heritage resources. Strategy #3: Restore, Enhance and Commemorate Resources ▪ Policy C-RC 54: Heritage resources should be restored, enhanced, and commemorated as appropriate to the value and significance of the resource. ▪ Policy C-RC 55: Public awareness and appreciation of existing heritage resources and their significance should be enhanced through community organizations, neighborhood associations, the educational system, and governmental programs. ▪ Policy C-RC 56: Heritage resource acquisition, preservation, restoration, and interpretation projects eligible for funding with County Parks Charter Funds are identified in the "Santa Clara County Heritage Resources Inventory" adopted by the Board of Supervisors. ▪ Implementation Recommendation C-RC(i)27: Publicize financial resources from ISTEA and federal income tax credits for restoration of designated resources. ▪ Implementation Recommendation C-RC(i)28: Publish inventories of heritage resources. ▪ Implementation Recommendation C-RC(i)29: Organize community organizations and constituencies for heritage resource preservation. Rural Unincorporated Area Issues and Policies: General Policies ▪ Policy R-RC81: Heritage resources within the rural unincorporated areas of Santa Clara County shall be preserved, restored wherever possible, and commemorated as appropriate for their scientific, cultural, historic and place values. ▪ Policy R-RC82: The following strategies should provide overall direction to efforts to preserve heritage resources: o Inventory and evaluate heritage resources. o Prevent, or minimize, adverse impacts on heritage resources. o Restore, enhance, and commemorate resources as appropriate. Strategy #1: Inventory and Evaluate Heritage Resources ▪ Policy R-RC83: The County's Heritage Resources data base shall be maintained and used to review private development projects and guide the design of public projects. ▪ Policy R-RC84: Heritage resource acquisition, preservation, restoration, and interpretation projects eligible for funding with County Parks Charter Funds are identified in the "Santa Clara County Heritage Resources Inventory" adopted by the Board of Supervisors. ▪ Implementation Recommendation R-RC(i) 32: Update the listings of heritage trees in the Heritage Resources Inventory. Strategy #2: Prevent or Minimize Adverse Impacts on Heritage Resources ▪ Policy R-RC85: No heritage resource shall knowingly be allowed to be destroyed or lost through a discretionary action (zoning, subdivision site approval, grading permit, building permit, etc.) of the County of Santa Clara unless: the site or resource has been reviewed by experts and the County Historic Heritage Commission and has been found to be of insignificant value; or there is an overriding public benefit from the project and compensating mitigation to offset the loss is made part of the project. ▪ Policy R-RC86: Projects in areas found to have heritage resources shall be conditioned and designed to avoid loss or degradation of the resources. Where conflict with the resource is unavoidable, mitigation measures that offset the impact may be imposed.

Plan and Policies	Summary
	▪ Policy R-RC87: Land divisions in areas with heritage resources shall be encouraged to cluster building sites in locations which will minimize the impacts to heritage resources. ▪ Policy R-RC88: For projects receiving environmental assessment, expert opinions and field reconnaissance may be required if needed at the applicant's expense to determine the presence, extent, and condition of suspected heritage resources and the likely impact of the project upon the resources. ▪ Policy R-RC89: Demolition permits proposed for designated heritage resources shall be referred to the Historic Heritage Commission for review and recommendation to the Board of Supervisors. ▪ Policy R-RC90: Heritage and old growth trees, particularly redwoods, should not be cut, except in instances where public safety is jeopardized. ▪ Policy R-RC91: The application of historic district zoning to areas containing historic structures shall be encouraged. ▪ Policy R-RC92: The participation of concerned citizens and professionals dealing with heritage resources in the identification of sites and the review and conditioning of projects by its boards and commissions shall be encouraged by the County. Strategy #3: Restore, Enhance, and Commemorate Resources ▪ Policy R-RC93: Heritage resources should be restored, enhanced, and commemorated as appropriate to the value and significance of the resource. All historic rehabilitation activities should comply with the Secretary of Interior's Standards for Rehabilitation ▪ Policy R-RC94: Public awareness and appreciation of existing heritage resources and their significance should be enhanced through community organizations, neighborhood associations, the educational system, and governmental programs. ▪ Implementation Recommendation R-RC(i) 33: Utilize all financial resources available, including those from federal !STEA and income tax credits for rehabilitation of designated heritage resources. ▪ Implementation Recommendation R-RC(i) 34: Encourage and support efforts by local historians, educational institutions and others interested in recording oral histories and documenting the lives of the people of Santa Clara County who also make up an important but often overlooked part of the County's heritage.
City of Santa Clara 2010–2035 General Plan (2010)	
City of Santa Clara 2010–2035 General Plan (2010, updated 2018)	The City of Santa Clara adopted the *City of Santa Clara 2010–2035 General Plan* in November 2010. The plan includes the following goals and policies related to cultural resources: **Goals and Policies** ***Prerequisites*** ▪ Policy 5.1.1-P22: Prior to 2023, comprehensively update the City's list of Architecturally or Historically Significant Properties (Appendix 8.9), including evaluation of historic significance and statement of historic context for historic resources. ***General Land Use Policies*** ▪ Policy 5.3.1-P4: Encourage new development that meets the minimum intensities and densities specified in the land use classifications or as defined through applicable Focus Area, Neighborhood Compatibility or Historic Preservation policies of the General Plan. ▪ Policy 5.3.1-P20: Encourage uses and development on City-owned and leased land that is consistent with the General Plan land use classification or applicable Focus Area, Neighborhood Compatibility or Historic Preservation Policies. ***El Camino Real Focus Area Goals***

Plan and Policies	Summary
	▪ Goal 5.4.1-G2: High quality design that respects the scale and character of adjacent residential neighborhoods and historic resources and creates a walkable environment. ▪ Goal 5.4.2-P7: Apply the General Plan Transition and Historic Preservation policies for new development at the edges of Downtown in order to respect the scale and character of the adjacent historic Old Quad neighborhood. ▪ Goal 5.4.2-P17: Promote pedestrian-friendly streetscapes with trees, benches, outdoor seating, kiosks, amenities, banners and signature signage, and landscaping that reflect the historic neighborhood character. ***Discretionary Use Goals and Policies*** ▪ Goal 5.5.1-G2: Flexibility in permitted land uses, densities and intensities to support General Plan Major Strategies and goals and policies for Focus Areas, Historic Preservation, Mobility and Transportation, and Environmental Quality. ▪ Policy 5.5.1-P12: For City historically or architecturally significant properties, listed in Appendix 8.9, allow alternate uses from those on the General Plan Land Use Diagram in order to encourage preservation of the resource, provided that the alternate use is compatible with planned uses on neighboring properties and consistent with other applicable General Plan policies. ***Historic Preservation Goals and Policies*** Historic Preservation Goals and policies are applicable to the City's historic resources in order to provide the basis for their protection, reuse and identification in the City. These resources include historic structures, like the Berryessa Adobe, the Harris-Lass Historic Preserve and the Santa Clara Railroad Depot, as well as some of the City's historic homes in areas like the Old Quad. Appendix 8.9 includes the City's list of Architecturally or Historically Significant Properties. ▪ Goal 5.6.1-G1: Preservation of historic resources and neighborhoods. ▪ Goal 5.6.1-G2: Public awareness of the City's historic preservation programs. ▪ Goal 5.6.1-G3: Changes and maintenance of historic resources that retain the integrity of the property and its historic value. ▪ Policy 5.6.1-P1: Discourage the demolition or inappropriate alterations of historic buildings and ensure the protection of historic resources through the continued enforcement of codes and design guidelines. ▪ Policy 5.6.1-P2: Protect the historic integrity of designated historic properties and encourage adaptive reuse when necessary to promote preservation. ▪ Policy 5.6.1-P3: Protect historic resources from demolition, inappropriate alterations and incompatible development. ▪ Policy 5.6.1-P4: Use the City's Criteria for Local Significance as the basis for designating historic resources and review proposed changes to these resources for consistency with the Secretary of Interior Standards and California Historic Building Code. ▪ Policy 5.6.1-P5: Promote the use of the preservation standards outlined in the current Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, for properties listed, or eligible for listing, on the City's list of Architecturally or Historically Significant Properties. ▪ Policy 5.6.1-P6: Promote an active program to identify, interpret and designate the City's historic properties, including the evaluation of resources over 50 years old to determine eligibility for the City's list of Architecturally or Historically Significant Properties. ▪ Policy 5.6.1-P7: Encourage programs that provide incentives and leverage public and private resources, to promote historic preservation, maintenance and adaptive reuse by property owners, such as Mills Act Contracts for tax benefits, tax credits and zero or low-interest loans for income-qualified residents.

Plan and Policies	Summary
	▪ Policy 5.6.1-P8: Coordinate historic preservation efforts with other agencies and organizations, including the Chamber of Commerce, Santa Clara County Historical and Genealogical Society, and other historical organizations. ▪ Policy 5.6.1-P9: Facilitate public outreach, education and information regarding historic preservation through the City's Historical and Landmarks Commission. ▪ Policy 5.6.1-P10: Update and maintain the City's list of Architecturally or Historically Significant Properties, and associated State Department of Parks and Recreation forms, as an Appendix to the General Plan. ***Areas of Historic Sensitivity Goals and Policies*** The area immediately surrounding historic resources contributes to the setting for the resource. It is important to review any changes in these areas with that in mind. The following goals and policies provide direction for all properties within a radius of 100 feet to City, State, or federally listed historic resources in the City. Relevant policies regarding transitions between uses may be found in Section 5.4: Neighborhood Compatibility. Appendix 8.9 includes an illustration of the Areas of Sensitivity for Agnew Village and the Old Quad (Figure 8.9-2). ▪ Goal 5.6.2-G1: New development that is compatible with nearby historic resources. ▪ Goal 5.6.2-G2: Preservation of the neighborhood context for historic resources. ▪ Policy 5.6.2-P1: Evaluate any proposed changes to properties within 100 feet of historic resources on the City's list of Architecturally or Historically Significant Properties for potential negative effects on the historic integrity of the resource or its historic context. ▪ Policy 5.6.2-P2: Require that changes to properties that contribute to the context of a historic resource are compatible in scale, materials, design, height, mass and use with the historic resource or its context. ▪ Policy 5.6.2-P3: Strengthen the character and historic context of the Old Quad historic neighborhood through streetscape design, amenities and street tree planting. ▪ Policy 5.6.2-P4: Work with Santa Clara University to improve compatibility between University-owned properties and nearby historic resources. ▪ Policy 5.6.2-P5: Work with off-campus housing providers to ensure that maintenance and operational provisions that protect nearby historic resources are implemented. ▪ Policy 5.6.2-P6: Provide notification and information to owners and developers of properties near historic resources in order to increase awareness of potential constraints on new development and/or uses. ***Archaeological and Cultural Resources Goals and Policies*** The City of Santa Clara is rich with archaeological and paleontological resources. These resources include the Santa Clara Mission, Native American burial grounds, the Berryessa Adobe and many others. The following Goals and Policies ensure that these resources are protected, now and into the future, and that appropriate mitigation measures to unforeseen impacts are enforced. ▪ Goal 5.6.3-G1: Protection and preservation of cultural resources, as well as archaeological and paleontological sites. ▪ Goal 5.6.3-G2: Appropriate mitigation in the event that human remains, archaeological resources or paleontological resources are discovered during construction activities. ▪ Policy 5.6.3-P1: Require that new development avoid or reduce potential impacts to archaeological, paleontological and cultural resources. ▪ Policy 5.6.3-P2: Encourage salvage and preservation of scientifically valuable paleontological or archaeological materials. ▪ Policy 5.6.3-P3: Consult with California Native American tribes prior to considering amendments to the City's General Plan.

Plan and Policies	Summary
	▪ Policy 5.6.3-P4: Require that a qualified paleontologist/archaeologist monitor all grading and/or excavation if there is a potential to affect archeological or paleontological resources, including sites within 500 feet of natural water courses and in the Old Quad neighborhood. ▪ Policy 5.6.3-P5: In the event that archaeological/paleontological resources are discovered, require that work be suspended until the significance of the find and recommended actions are determined by a qualified archaeologist/paleontologist. ▪ Policy 5.6.3-P6: In the event that human remains are discovered, work with the appropriate Native American representative and follow the procedures set forth in State law. **Appendix 8.9 - Historic Preservation And Resource Inventory** Table 8.9-1 and Figure 8.9-1 identify the names and locations of the historic properties in the City of Santa Clara. In addition, this Appendix includes a depiction of the Areas of Historic Sensitivity, defined as 100 feet from the property line of an identified historically significant property. Figure 8.9-2 shows this 100-foot area around historic properties in the Old Quad and Agnew neighborhoods where a number of the City's resources are located. **Appendix 8.10 - Heritage Tree Inventory** ▪ Heritage Tree Inventory as adopted by the City.
City of San Jose	
Envision: San José 2040 General Plan (2011)	The City of San Jose adopted the *Envision: San José 2040 General Plan* in 2011. The plan includes the following goals, policies, and actions related to cultural resources: General Goals ▪ Goal ER-10 Archaeology and Paleontology: Preserve and conserve archaeologically significant structures, sites, districts and artifacts in order to promote a greater sense of historic awareness and community identity. ▪ Policy ER-10.1 For proposed development sites that have been identified as archaeologically or paleontologically sensitive, require investigation during the planning process in order to determine whether potentially significant archeological or paleontological information may be affected by the project and then require, if needed, that appropriate mitigation measures be incorporated into the project design. ▪ Policy ER-10.2 Recognizing that Native American human remains may be encountered at unexpected locations, impose a requirement on all development permits and tentative subdivision maps that upon their discovery during construction, development activity will cease until professional archaeological examination confirms whether the burial is human. If the remains are determined to be Native American, applicable state laws shall be enforced. ▪ Policy ER-10.3 Ensure that City, State, and Federal historic preservation Laws, regulations, and codes are enforced, including laws related to archaeological and paleontological resources, to ensure the adequate protection of historic and pre-historic resources. ▪ Action ER-10.4 The City will maintain a file of archaeological and paleontological survey reports by location to make such information retrievable for research purposes over time. Historic Preservation ▪ Goal LU-13 Landmarks and Districts: Preserve and enhance historic landmarks and districts in order to promote a greater sense of historic awareness and community identity and contribute toward a sense of place. ▪ Policy LU-13.1: Preserve the integrity and fabric of candidate or designated Historic Districts.

Plan and Policies	Summary
	▪ Policy LU-13.2: Preserve candidate or designated Landmark buildings, structures and historic objects, with first priority given to preserving and rehabilitating them for their historic use, second to preserving and rehabilitating them for a new use, or third to rehabilitation and relocation on-site. If the City concurs that no other option is feasible, candidate or designated landmark structures should be rehabilitated and relocated to a new site in an appropriate setting. ▪ Policy LU-13.3: For landmark structures located within new development areas, incorporate the landmark structures within the new development as a means to create a sense of place, contribute to a vibrant economy, provide a connection to the past, and make more attractive employment, shopping, and residential areas. ▪ Policy LU-13.4: Require public and private development projects to conform to the adopted City Council Policy on the Preservation of Historic Landmarks. ▪ Policy LU-13.5: Evaluate areas with a concentration of historically and/or architecturally significant buildings, structures, or sites and, if qualified, preserve them through the creation of Historic Districts. ▪ Policy LU-13.6: Ensure modifications to candidate or designated landmark buildings or structures conform to the Secretary of the Interior's Standards for Treatment of Historic Properties and/or appropriate State of California requirements regarding historic buildings and/or structures, including the California Historical Building Code. ▪ Policy LU-13.7: Design new development, alterations, and rehabilitation/remodels within a designated or candidate Historic District to be compatible with the character of the Historic District and conform to the Secretary of the Interior's Standards for the Treatment of Historic Properties, appropriate State of California requirements regarding historic buildings and/or structures (including the California Historic Building Code) and to applicable historic design guidelines adopted by the City Council. ▪ Policy LU-13.8: Require that new development, alterations, and rehabilitation/remodels adjacent to a designated or candidate landmark or Historic District be designed to be sensitive to its character. ▪ Policy LU-13.9: Promote the preservation, conservation, rehabilitation, restoration, reuse, and/ or reconstruction, as appropriate, of contextual elements [e.g., structures, landscapes, street lamps, street trees, sidewalk design, signs) related to candidate and/or landmark buildings, structures, districts, or areas. ▪ Policy LU-13.10: Ensure City public works projects (street lights, street tree plantings, sidewalk design, etc.) promote, preserve, or enhance the historic character of Historic Districts. ▪ Policy LU-13.11: Maintain and update an Historic Resources Inventory in order to promote awareness of these community resources and as a tool to further their preservation. Give priority to identifying and establishing Historic Districts. ▪ Policy LU-13.12: Develop and encourage public/public and public/private partnerships as a means to support, expand, and promote historic preservation. ▪ Policy LU-13.13: Foster the rehabilitation of buildings, structures, areas, places, and districts of historic significance. Utilize incentives permitting flexibility as to their uses: transfer of development rights: tax relief for designated landmarks and districts; easements; alternative building code provisions for the reuse of historic structures; and financial incentives. ▪ Policy LU-13.14: Advocate for the continuation and appropriate expansion of Federal and State tax and/or other incentives for the rehabilitation and/or restoration of historically or architecturally significant buildings, structures, areas, and/or places. ▪ Policy LU-13.15: Implement City, State, and Federal historic preservation laws, regulations, and preservation goals and policies and their implications early in the development process.

Plan and Policies	Summary
	▪ Policy LU-13.16: Alert property owners, land developers, and the building industry to historic preservation goals and policies and their implications early in the development process. ▪ Action LU-13.17: Amend the City's Historic Preservation Ordinance to specify that a Contributing Structure to a City Historic District is eligible for consideration of a Mills Act contract and to require Historic Preservation Permits and/or Adjustments for modifications to buildings, structures, and/or sites in a National Register Historic District. ▪ Action LU-13.18: Explore establishing a grant program for historic preservation, potentially partnering with Preservation Action Council San Jose, History San Jose, or other organizations. ▪ Action LU-13.19: Continue to identify landmarks, landmark districts and Conservation Areas on the Land Use/Transportation Diagram as Areas of Historic Sensitivity. ▪ Action LU-13.20: Explore funding options and techniques to proactively conduct additional historic surveys and to maintain and update the City's Historic Resources Inventory. As funding allows, undertake comprehensive area-wide surveys of the City to identify potential Historic Districts. Cultural Landscapes at the City's edge, and significant buildings and/or structures, including Traditional Cultural Properties. ▪ Action LU-13.21: Implement strategic General Plan and zoning changes as indicated by federal, state or municipal "Historic" or "Conservation Area" designations, in order to maintain neighborhood vitality and character and to preserve the integrity of historic structures located within those neighborhoods. To preserve predominantly single-family historic neighborhoods, rezone residential structures located in these areas to a single-family zoning designation. ▪ Action LU-13.22: Require the submittal of historic reports and surveys prepared as part of the environmental review process. Materials shall be provided to the City in electronic form once they are considered complete and acceptable. ▪ Action LU-13.23: Maintain a file of historic survey reports by location by the City of San Jose to make the information retrievable for research purposes. ▪ Action LU-13.24: For vacant lands at the edge of the Urban Growth Boundary in the Almaden, Alviso, and Coyote Planning Areas, require investigation during the development review process to determine whether significant Cultural Landscapes or Traditional Cultural Properties eligible for the National Register of Historic Places may be affected by the project and then require, if needed, that appropriate mitigation measures be incorporated into the project design. ▪ Goal LU-14 Historic Structures of Lesser Significance: Preserve and enhance historic structures of lesser significance (i.e., Structures of Merit, Identified Structures, and particularly Historic Conservation Areas) as appropriate, so that they remain as a representation of San Jose's past and contribute to a positive identity for the City's future. ▪ Policy LU-14.1: Preserve the integrity and enhance the fabric of areas or neighborhoods with a cohesive historic character as a means to maintain a connection between the various structures in the area. ▪ Policy LU-14.2: Give high priority to the preservation of historic structures that contribute to an informal cluster or a Conservation Area; have a special value in the community; are a good fit for preservation within a new project; have a compelling design and/or an important designer: etc. ▪ Policy LU-14.3: Design new development, alterations, and rehabilitation/remodels in Conservation Areas to be compatible with the character of the Conservation Area. In particular, projects should respect character defining elements of the area that give the area its identity. These defining characteristics could vary from area to area and could include density, scale, architectural consistency, architectural variety, landscape, etc.

Plan and Policies	Summary
	▪ Policy LU-14.4: Discourage demolition of any building or structure listed on or eligible for the Historic Resources Inventory as a Structure of Merit by pursuing the alternatives of rehabilitation re-use on the subject site, and/or relocation of the resource. ▪ Policy LU-14.5: Continue and strengthen enforcement programs, such as those addressing vacant buildings, to promote the maintenance and survival of all classes of the city's historic and cultural resources. ▪ Policy LU-14.6: Consider preservation of Structures of Merit and Contributing Structures in Conservation Areas as a key consideration in the development review process. As development proposals are submitted, evaluate the significance of structures, complete non-Historic American Building Survey level of documentation, list qualifying structures on the Historic Resources Inventory, and consider the feasibility of incorporating structures into the development proposal, particularly those structures that contribute to the fabric of Conservation Areas. ▪ Policy LU-14.7: Ensure City public works projects [street lights, street tree planting, sidewalk design, etc.) promote, preserve, or enhance the historic character of Conservation Areas. ▪ Policy LU-14.8: Perform modifications to the exterior of any building or structure located in a Conservation Area in a manner consistent with any and all design guidelines approved or accepted by the City Council for the preservation of historic buildings or structures. ▪ Action LU-14.9: Amend applicable design guidelines and City policies to add flexibility in the development review process (for example, with regulations related to parking, independently accessible private open spaces, requirement for units to be attached, etc.) to encourage the preservation, conservation, rehabilitation, reuse, or relocation of historic resources consistent with the character and needs of the surrounding properties and uses. ▪ Goal LU·15 - Public Awareness: Increase public awareness and understanding of the history of San Jose, historic preservation, and its importance to the economic and cultural vitality of the City. ▪ Policy LU-15.1: Encourage widespread public participation in the identification and designation of historically or culturally significant buildings, structures, sites, areas. and/or places to update and maintain the City's Historic Resources Inventory. ▪ Policy LU-15.2: Foster a community sense of stewardship and personal responsibility for all historic and cultural resources. ▪ Policy LU-15.3: Encourage public accessibility and/or use of City Landmark, California Register, and National Register buildings, structures, areas, places, and sites, even if only for temporary or special events. ▪ Policy LU-15.4: Educate/inform the public of the importance of San Jose's strong historic connections to past industry. To serve as a link between San Jose's present and past, preserve historical resources from agriculture to high-tech whenever possible, feasible, and appropriate. ▪ Action LU-15.5: Work with neighborhood groups and historic preservation advocacy groups on events, materials. and efforts to educate the public on the positive benefits of historic preservation generally and in specific neighborhoods. ▪ Action LU-15.6: Expand resources such as historic maps, historic markers, or self-guided walking tours as a means to promote and celebrate historic preservation in San Jose. ▪ Goal LU-16 Sustainable Practices: Preserve, conserve, and/or rehabilitate historic structures as a means to achieve the City of San Jose's environmental, economic, and fiscal sustainability goals. ▪ Policy LU-16.1: Integrate historic preservation practices into development decisions based upon fiscal, economic, and environmental sustainability.

Plan and Policies	Summary
	▪ Policy LU-16.2: Evaluate the materials and energy resource consumption implications of new construction to encourage preservation of historic resources. ▪ Policy LU-16.3: Encourage sustainable energy, water. and material choices that are historically compatible as part of the preservation, conservation, rehabilitation, and/or reuse of historical resources. ▪ Policy LU-16.4: Require development approvals that include demolition of a structure eligible for or listed on the Historic Resources Inventory to salvage the resource's building materials and architectural elements to allow re-use of those elements and materials and avoid the energy costs of producing new and disposing of old building materials. ▪ Policy LU-16.5: Utilize the aesthetic and cultural qualities of historic resources of all types as means of promoting San Jose as a place to live, work and visit consistent with the City's economic development goals. ▪ Action LU-16.6: Explore the revision of the Construction and Demolition Diversion Deposit (CDDD) program to eliminate the deposit requirement for projects proposing rehabilitation of a historic landmark, a property in a Historic District, or the conservation of more than 75% of a Structure of Merit or structure in a Conservation Area. ▪ Action LU-16.7: Work with agencies, organizations, property owners, and business interests to develop and promote heritage tourism opportunities as an economic development tool.
Midtown Specific Plan (1992)	The City of San Jose adopted the *Midtown Specific Plan* in 1992. The plan includes the following objectives and policies related to cultural resources: **Task Force Objectives** ▪ Land Use: (4) Introduce land uses that complement the existing character of adjacent single-family neighborhoods; ensure that new development immediately adjacent to these neighborhoods has a similar height, scale and orientation as the historic fabric of single-family homes; (7) Retain historic elements and features that convey the unique history and role of Midtown, and incorporate them within new development in a meaningful and viable manner. **Land Use and Urban Design** ▪ Cahill East Subarea Policy 3.6: Cahill Station should be enhanced as a major historic and visual landmark within the Cahill East subarea. ▪ Public/Quasi-Public (PQP) Designated Land Compatibility with Cahill Station: Special consideration should be given to ensure that all development located adjacent to Cahill Station employs architectural treatments and materials that are compatible and complementary with the historic Cahill Station. ▪ Public Parking Facilities: Public parking structures built along Cahill Street should be designed in a manner compatible with the historic station structure, utilizing an architectural treatment on the building facade that screens views to automobiles and creates a complementary building rhythm. ▪ Lincoln-Auzerais Subarea Policy 5.5: The Del Monte water tower should be preserved as a major visual landmark within the area. **Implementation** ▪ Objective 4: The preservation of historic resources should be encouraged wherever practicable. ▪ Policy 4.1: The Midtown Specific Plan provides flexibility in use and density/intensity of uses to facilitate the preservation of historic resources, as set forth in Discretionary Alternate Use Policy #3 in the Horizon 2000 General Plan. ▪ Policy 4.2: Businesses located in historic structures, whether designated a landmark or not, are encouraged to continue their operations

Plan and Policies	Summary
Tamien Station Area Specific Plan (1995)	The City of San Jose adopted the *Tamien Station Area Specific Plan* on March 21, 1995. The plan includes the following objectives and policies related to cultural resources: **Task Force Objectives** ▪ Land Use Constraints: (2) Archaeological and cultural resources may limit the location and extent of new development to preserve or avoid damaging these resources. **Implementation** ▪ Archaeological Resources Mitigation: New development on larger parcels should be required to conduct mechanical archaeological testing and, if necessary, more detailed in-field hand excavation and archaeological monitoring if resources are discovered. ▪ Historic Preservation Mitigation: The Italian Gardens complex should be added to the City's Historic Resources Inventory. In addition, the Historic Landmarks Commission should consider designating this site as an Historic Landmark. ▪ Italian Gardens – Historic Preservation: Any modification or removal of Italian Gardens complex buildings should be allowed only after the preparation of a more detailed Historic Resources Report which will expand on the initial analysis prepared for the specific plan EIR.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The City of Morgan Hill adopted the *Morgan Hill 2035 General Plan* on July 27, 2016. The plan includes the following goals, policies, and actions related to cultural resources: **Healthy Community Element** ▪ Goal HC-8: Historic identity and cultural resources that are preserved for future generations. ▪ Policy HC-8.1: Identify and Protect Resources. Identify and protect heritage resources from loss and destruction (South County Joint Area Plan 15.09). ▪ Policy HC-8.2: Historic Structures. Encourage the preservation and rehabilitation of the City's historic structures. ▪ Policy HC-8.3: Demolition. Prior to approving demolition or alteration of historically significant buildings, evaluate alternatives, including structural preservation, relocation, or other mitigation, and demonstrate that financing has been secured for replacement use. ▪ Policy HC-8.4: Tribal Consultation. Consult with Native American tribes that have ancestral ties to Morgan Hill regarding proposed new development projects and land use policy changes. ▪ Policy HC-8.5: Mitigation. Require that if cultural resources, including tribal, archaeological, or paleontological resources, are uncovered during grading or other on-site excavation activities, construction shall stop until appropriate mitigation is implemented. ▪ Action HC-8.A: Update Inventory. Review and update the inventory of historic resources. ▪ Action HC-8.B: Technical Assistance. Provide clear and easily accessible information to property owners and developers about design guidelines, financing options, assistance programs, and other technical issues involved in preserving and restoring historic buildings.
Morgan Hill Downtown Specific Plan (2009)	The City of Morgan Hill adopted the *Morgan Hill Downtown Specific Plan* on November 4, 2009. The plan includes the following guidelines and policies related to cultural resources: **Design Guidelines** ▪ Design Principle #2: Buildings along Monterey Road and Third Street should be designed in an architectural style compatible with traditional Main Street buildings. ▪ Policy DG-A17: Follow the Secretary of the Interior's standards when renovating or modifying historic buildings.

Plan and Policies	Summary
	▪ Policy DG-C3: Reflect the architecture of Morgan Hill in new buildings. **Implementation and Plan for Investment** ▪ Historic Preservation: Provide loans/grants to preserve historic resources in Downtown, such as the Morgan Hill United Methodist Church property.
Code of Ordinances (City of Morgan Hill)	Chapter 18.75 of the City of Morgan Hill's Code of Ordinances focuses on Historical Resources. The purpose of this chapter is to promote the public health, safety and general welfare by providing for the identification, protection, enhancement, perpetuation and use of historical resources, including buildings, structures, signs, objects, features, sites, historic and prehistoric archaeological sites, places, districts, designed landscapes, cultural landscapes and areas within the city that reflect special elements of the city's architectural, artistic, cultural, engineering, aesthetic, historical, political, social and other heritage.
City of Gilroy	
City of Gilroy 2002–2020 General Plan (2002)	The City of Gilroy adopted the *City of Gilroy 2002–2020 General Plan* in 2002. The plan includes the following directions, goals, policies, and actions related to cultural resources: Strategic Direction The Strategic Direction section of the General Plan recommends that the Downtown Commercial district be subdivided into three sub-districts with differing uses, design character and planning requirements. One of the three proposed sub-designations for Downtown is a Downtown Historic District. Primary goals in this area are: restoration and adaptive reuse of historic buildings, compatibility of architectural styles, and enhancement of the area's overall visual character. The Strategic Direction section identifies historic preservation as an economic development opportunity, noting that historic preservation "is an important concern in the Downtown core, with the area's historic character providing a valuable asset for economic development. ▪ Policy 3.30: Historic Preservation, Restoration, and Re-Use in the Downtown Area Community Design and Development Element ▪ Goal 5: Historic Preservation - A strong sense of connection to Gilroy's past through historical, archaeological, and paleontological resources that are preserved, protected, enhanced, and commemorated for the benefit of current and future generations. ▪ Policy 5.01: Encourage public and private efforts for the preservation of historic and architecturally significant buildings, archaeological sites, and other landmarks that give residents a tie with the past. ▪ Policy 5.02: Seek state and federal funding for the preservation of buildings of historical merit and consider public/private partnerships for capital and program improvements. ▪ Policy 5.03: Encourage preservation of older homes, other structures, and neighborhood districts to maintain and enhance the historic character of the city. In particular, encourage the retention and rehabilitation of older homes in and near the historic city center (roughly bound by First Street on the north, Princeville on the west, Tenth Street on the south, and Chestnut/Murray on the east) and ensure that rehabilitation activities are sensitive to the historic character of the building and/or site. ▪ Policy 5.04: Designate a Downtown Historic District and promote the preservation of historic buildings within the district area to reinforce Downtown's historic character and scale. Provide incentives for the retention and rehabilitation of buildings with historic merit. ▪ Policy 5.05: Promote adaptive reuse of buildings, especially in the Downtown Historic District, to preserve the buildings' historic character while encouraging development of an economically vital Downtown. ▪ Policy 5.06: Allow non-conforming uses in designated Historic Structures. In some situations, a historic building can be retained only if it can be used for an activity that

Plan and Policies	Summary
	would not normally be permitted under the zoning classification. The City may consider conditional use permits where the proposed use will not have a detrimental effect on the neighborhood and will be in keeping with the historic nature of the building, taking into consideration parking needs and compatibility of the use to neighboring uses. ▪ Policy 5.07: Archaeological Resources. If archaeological resources or human remains are discovered during construction, work shall be halted within 50 meters (150 feet) of the find until it can be evaluated by a qualified professional archaeologist. If the find is determined to be significant, appropriate mitigation measures shall be formulated and implemented. ▪ Implementing Action 5.A: Historic Preservation Designations - Continue to designate buildings, sites, features and districts based upon their historic value, and work towards their preservation. Two types of designations apply: 1. Historic Buildings and Sites, these are individual structures, sites, or features of historic value, whether or not they are located in a historic preservation district; 2. Historic Preservation Districts, these are areas that contain a significant number of structures, sites, or features worthy of preservation. Although each and every structure in such an area may not be historically significant, the structures collectively, together with other features such as mature trees, flower gardens, etc., constitute an area worthy of preservation. A Historic Preservation District may include a block or part of a block or may consist of an entire neighborhood. ▪ Implementing Action 5.B: Review of Structural Modifications and Use Changes - For designated Historic Structures and of structures within a Historic Preservation District, submit proposed structural modifications that change the exterior appearance and proposed use changes to the Historic Heritage Committee and the Planning Commission for review and approval. ▪ Implementing Action 5.C: Environmental Impact Reports for Historic Structures - Require an Environmental Impact Report (EIR) for any proposed demolition of a designated Historic Structure, with consultation of the Historic Heritage Committee in preparation of the EIR. For demolition of a structure within a Historic Preservation District, determination will be made by the Planning Division Manager on whether a negative declaration or EIR is appropriate. Following the Public Hearing of the EIR, the Planning Commission would pass the EIR and the request for demolition permit, along with its comments and recommendations, to the City Council for action. The Council would have the power to postpone, without undue delay, approval of a demolition permit for any structure in a Historic Preservation District or any designated Historic Structure to provide interested parties an opportunity to preserve the structure. In the case of historic structures heavily damaged by fire, earthquake, or other natural disaster, the EIR requirement for demolition may be waived. ▪ Implementing Action 5.D: Design Review in Historic Preservation Districts - Evaluate projects in Historic Preservation Districts for compatibility with the surrounding neighborhood. Review and approval authority shall be with the Historic Heritage Committee. ▪ Implementing Action 5.E: Survey of Historic Structures - Periodically update the City's Survey of Historic Structures. ▪ Implementing Action 5.F: Public Information Program on Historic Preservation - Continue to provide public information to increase awareness of historic preservation. ▪ Implementing Action 5.G: Mills Act Agreements - Support the development of Mills Act Agreements for historic properties to provide reductions in property taxes, in keeping with the City's adopted Mills Act Agreement Policy. ▪ Implementing Action 5.H: Historic Preservation Ordinance - Adopt a Historic Preservation Ordinance and submit it for certification by the Secretary of the Interior so that owners of designated historic buildings can apply for tax relief. ▪ Implementing Action 5.I: Archeological Assessments - Require an archeological assessment for all CEQA projects (i.e., projects requiring an environmental assessment)

Plan and Policies	Summary
	in potentially sensitive archeological areas (as indicated on the City's Historic and Cultural Re¬ sources Map). The assessment shall consist of a preliminary survey and, if evidence of sites is found, a test-level investigation.
City of Gilroy Historic Sites Inventory (1986)	The City of Gilroy created an inventory of historic sites in 1986. Any buildings on the inventory that are assigned a rating of 3, 4, or 5 are considered to be significant. Major project proposals related to significant historic sites must be approved by the Historic Heritage Committee and Planning Commission through the architectural and site review processes.
Downtown Gilroy Specific Plan (2005)	The City of Gilroy adopted the *Downtown Gilroy Specific Plan* on November 21, 2005. The plan includes guidance related to cultural resources, including design guidelines for the Downtown Historic District zoning area; a recommendation to restore historic buildings Downtown to add to the area's unique character; and suggestions for historic preservation as incentive/public benefit.
San Benito County	
San Benito County 2035 General Plan (2015)	San Benito County adopted the *San Benito County 2035 General Plan* in 2015. The plan includes the following goals and policies related to cultural resources: ▪ Goal LU-1: To maintain San Benito County's rural character and natural beauty while providing areas for needed future growth. ▪ Policy LU-1.10: Development Site Suitability - The County shall encourage specific development sites to avoid natural and manmade hazards, including, but not limited to, active seismic faults, landslides, slopes greater than 30 percent, and floodplains. Development sites shall also be on soil suitable for building and maintaining well and septic systems (i.e., avoid impervious soils, high percolation or high groundwater areas, and provide setbacks from creeks). The County shall require adequate mitigation for any development located on environmentally sensitive lands (e.g., wetlands, erodible soil, archaeological resources, important plant and animal communities). ▪ Goal LU-7: To preserve San Benito County's historic identity and rural community character. ▪ Policy LU-7.1: Historic Communities and Structures - The County shall protect historic communities and structures by requiring new or remodeled development to respect their architectural and historical significance. ▪ Policy LU-7.2: Historic Preservation - The County shall coordinate with property owners, neighborhood associations, and preservation groups to improve building facades and exteriors consistent with each community's unique history and visual character. ▪ Policy LU 7.3: Adaptive Reuse - The County shall encourage the adaptive reuse of historic structures in order to preserve the historic resources, so long as the reuse of the structure is consistent with the individual history of each community. ▪ Policy LU 7.4: New Development in Historical Areas - The County shall require new development in historical areas to be compatible with existing historic structures. ▪ Policy LU-7.8: Signage Program - The County should develop, adopt, and maintain a unified signage and way-finding program that identifies historic communities and structures and directs residents and visitors to points of interest. Economic Development Element ▪ Goal ED-5: To expand tourism opportunities in order to make the county a premier destination. ▪ Policy ED 5.2: Heritage Tourism Promotion - The County shall coordinate with agencies, organizations, property owners, and business interests to develop and promote heritage tourism opportunities in the county. Heritage tourism refers to experiencing the places,

Plan and Policies	Summary
	artifacts, and activities that authentically represent the stories and people of the past and present. This can include cultural, historic, and natural resources. Natural and Cultural Resources Element ▪ Goal NCR-1: To preserve and enhance valuable open space lands that provide wildlife habitat and conserve natural, historical, archaeological, paleontological, tribal, and visual resources of San Benito County. ▪ Policy NCR-1.1: Maintenance of Open Space - The County shall support and encourage maintenance of open space lands that support natural resources, agricultural resources, recreation, tribal resources, wildlife habitat, water management, scenic quality, and other beneficial uses. ▪ Policy NCR-1.3: Open Space Overlay District - The County shall continue to protect and preserve the rural landscape and implement open space policies for: public health, safety, and welfare; continued agricultural uses; scenic viewscape preservation, including scenic highway corridors; park and recreation uses; conservation of significant natural resources; the containment and definition of limits to urbanization; and the preservation of the natural habitat for threatened and/or endangered plant and animal species. ▪ Goal NCR-7: To protect, preserve, and enhance the unique cultural and historic resources in the county. ▪ Policy NCR-7.1: Historic Districts - The County shall establish historic districts for the communities of Tres Pinos and New Idria to preserve the character of these historic communities. ▪ Policy NCR-7.2: Commercial Recreational Uses - The County shall promote commercial recreational uses in underutilized historic structures. ▪ Policy NCR-7.3: Assemble Information - The County shall cooperate with the Historical Society and other organizations to assemble information on historic areas of the county that should be preserved. ▪ Policy NCR-7.4: Integrate Architectural Styles - The County shall protect existing historic structures by requiring nearby new development to use architectural styles that complement the historic structures and by striving to ensure roadway improvements enhance and do not detract from nearby historic resources. ▪ Policy NCR-7.5: Preservation of Structures - The County shall require development proposals that would remove structures 100 years or older to demonstrate why preservation of the structures and integration of the structures into the development proposal is inappropriate or infeasible. ▪ Policy NCR-7.6: Historic Consultant - The County shall retain an historic consultant at the developer's expense to evaluate the historic merits of existing structures, make recommendations for the new development, and, if necessary, to review building elevations for new development. ▪ Policy NCR-7.7: Resource Identification and Preservation - The County shall maintain a register of historic properties that will be used during the design review process to protect the character of historic communities in the county. ▪ Policy NCR-7.8: Adaptive Reuse of Historic Structures - The County shall encourage the adaptive reuse (e.g., converting a historic building to residential use) of historic resources when the original use of the resource is no longer feasible and when the new use is allowed by the underlying land use designation and zoning district. ▪ Policy NCR-7.9: Tribal Consultation - The County shall consult with Native American tribes regarding proposed development projects and land use policy changes consistent with the State's Local and Tribal Intergovernmental Consultation requirements. ▪ Policy NCR-7.10: Cultural Resources Education - The County shall educate the public regarding laws, codes, and ordinances that forbid collecting items associated with tribal,

Plan and Policies	Summary
	archeological, historical, and paleontological sites, and unique geological formations, particularly artifacts or other objects found in association with human remains. ▪ Policy NCR-7.11: Prohibit Unauthorized Grading - The County shall prohibit unauthorized grading, collection, or degradation of Native American, tribal, archaeological, or paleontological resources, or unique geological formations. ▪ Policy NCR-7.12: Archaeological Artifacts - The County shall require an archaeological report prior to the issuance of any project permit or approval in areas determined to contain significant historic or prehistoric archaeological artifacts and when the development of the project may result in the disturbance of the site. The report shall be written by a qualified cultural resource specialist and shall include information as set forth in the county's archaeological report guidelines available at the County Planning Department. ▪ Goal NCR-8: To enhance and preserve the attractive visual qualities of scenic vistas and corridors in the county. ▪ Policy NCR-8.1: Protect Scenic Corridors - The County shall endeavor to protect the visual characteristics of certain transportation corridors that are officially designated as having unique or outstanding scenic qualities. ▪ Policy NCR-8.2: Sign Regulations within Scenic Corridors - The County shall require the elimination of signs within Scenic Corridors other than those identified in the permitted use section of the Zoning Ordinance. ▪ Policy NCR-8.3: Grading within Scenic Corridors - The County shall review all projects involving grading within Scenic Corridors to protect valuable soil resources, preserve the natural environment, and avoid significant adverse impacts within scenic areas. ▪ Policy NCR-8.4: Review Architectural Massing - The County shall review development proposals to ensure that the obstruction of views is minimized through architectural building massing and location that is compatible with scenic areas. ▪ Policy NCR-8.5: Review Site Planning - The County shall review development proposals to ensure a reasonable and attractive appearance from the highway concurrent with a harmonious relationship with the existing landscape and shall require development that determined not to be in harmonious relationship with the existing landscape to be screened from view through planting or other forms of visual buffers. ▪ Policy NCR-8.6: Regulate Building Height and Setback - The County shall regulate building height and setbacks to protect the field of vision within an officially designated Scenic Corridor. The County shall not approve building heights that exceed, nor setback requirements that are less, than those of the basic zoning district unless such variance has had the appropriate review and public comment. ▪ Policy NCR-8.9: Hillside and Ridgeline Protection - The County shall use design review for development on hillsides and within Scenic Corridors to protect the hillsides and ridgelines that are a unique scenic resource in the County. The County shall prohibit development within 100 vertical feet of any ridgeline unless there are no site development alternatives. ▪ Policy NCR-8.10: Sign Ordinance - The County shall maintain and implement the Sign Ordinance to control the locations and types of signs throughout the county in an effort to protect the county's scenic character. ▪ Implementation Program NCR-G: Historic and Archeological Resources Information - The County shall prepare and distribute, as necessary, information related to inventories of historic resources in the county. This should include educational materials regarding the laws, codes, and ordinances that forbid collecting of items associated with archeological, historical, and paleontological sites, particularly artifacts or other objects found in association with human remains. Health and Safety Element

Plan and Policies	Summary
	▪ Goal HS-3: To protect lives and property from seismic and geologic hazards. ▪ Policy HS-3.5: Historic Structures - The County shall consider historic community resources in the abatement of unsafe structures and shall strive to preserve the essential qualities of historic buildings while improving structural safety.
Merced County	
2030 Merced County General Plan (2013)	Merced County adopted the *2030 Merced County General Plan* in 2013. The plan includes the following goals and policies related to cultural resources: Land Use Element ▪ Goal LU-5.B: Preserve and enhance the design, heritage, historic character, and quality of life of Urban Communities in Merced County. ▪ Policy LU-5.B.9: Adaptive Reuse - Encourage and promote the presentation and adaptive reuse of locally, State, or Federally listed historic resources and structures in order to preserve Merced County's historic heritage. Natural Resources Element ▪ Program NR-F: Ongoing Inventory of Open Space Resources. The County shall maintain an open space and conservation inventory to delineate those areas that have significant open space or conservation value. Those areas include agricultural lands, native pasture lands, parks and recreation areas, historic resources, scenic highways, wetland, wildlife and vegetation habitat resources, mineral and energy resource areas, fire hazard areas, geologic and flood hazard areas, noise impacted areas and other resource and hazard areas. Recreation and Cultural Resources Element ▪ Goal RCR-2. Protect and preserve the cultural, archaeological, and historic resources of the County in order to maintain its unique character. ▪ Policy RCR-2.1: Archaeological Site and Artifact Protection. Require development projects that affect archaeological sites to avoid disturbance or damage to these sites. ▪ Policy RCR-2.2: Historical Area Preservation. Support the preservation of historical structures and areas, particularly those listed on the National Register of Historic Places and the California Register of Historical Resources. ▪ Policy RCR-2.3: Architectural Character Preservation. Require that the original architectural character of significant State- and Federally-listed historic structures be maintained in compliance with preservation standards and regulations. ▪ Policy RCR-2.4: Park and Open Space Historic Resource Preservation. Require the preservation of historic resources located in parks and publically-owned open space areas. ▪ Policy RCR-2.5: Human Remains Discovery. Require that, in the event of the discovery of human remains on any project construction site, all work in the vicinity of the find will cease and the County Coroner and Native American Heritage Commission will be notified. ▪ Policy RCR-2.6: Historic Buildings and Areas. Identify and preserve buildings and areas with special and recognized historic, architectural, or aesthetic value during the Community Plan update process. New development should response architecturally and historically significant buildings and areas. ▪ Policy RCR-2.7: Historic Preservation. Support the efforts of local preservation groups and community property owners to preserve or improve building facades and exteriors consistent with the historic and visual character of the specific building or area. ▪ Policy RCR-2.8: Historical Preservation Area/Site Designations. Allow sites of historical and archaeological significance to be designated as historical preservation areas or sites during the Community Planning process or on individual sites in rural areas.

Plan and Policies	Summary
	▪ Policy RCR-2.9: Historical and Cultural Resources Investigation, Assessment, and Mitigation Guidelines. Establish and adopt mandatory guidelines for use during the environmental review processes for private and public projects to identify and protect historical, cultural, archaeological, and paleontological resources, and unique geological features. ▪ Policy RCR-2.10: Tribal Consultation - Consult with Native American tribes regarding proposed development projects and land use policy changes consistent with Planning and Zoning Law at Government Code Section 65351, and the OPR Tribal Consultation Guidelines (2005). ▪ Program RCR-B: Historic and Cultural Resources Investigation, Assessment and Mitigation Guidelines. Prepare and formally adopt guidelines and standards for the preparation of assessments of historical, cultural, archaeological, and paleontological resources, and unique geological features prepared pursuant to Policy RCR-2.9. At a minimum, the guidelines shall include resource survey guidelines covering personnel qualifications, research and field techniques, investigation and documentation, data collection and recordation, and resource preservation, avoidance, minimization, and mitigation strategies. The guidelines shall specify broad categories of acceptable mitigation consistent with Public Resources Code Section 21083.2 and State CEQA Guidelines Section 15126.4(b), as they may be amended for any identified adverse effects to historic and cultural resources, paleontological resources, or unique geological features.

Sources: City of Gilroy 1986, 2002a, 2005; City of Morgan Hill 2009, 2016a; City of San Jose 1992a, 1995, 2011; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994.
HSR = high-speed rail
Authority = California High-Speed Rail Authority
FRA = Federal Railroad Administration

Regional Growth

Table 18 Regional and Local Plans and Policies Relevant to Regional Growth

Policy Title	Summary
Regional	
Plan Bay Area (ABAG and MTC 2017)	The Association of Bay Area Governments and the Metropolitan Transportation Commission adopted Plan Bay Area as the Bay Area's long-term regional transportation and land use blueprint in 2013. The following goals and objectives are relevant to the project: ▪ Target #2: House 100 percent of the region's projected growth (from a 2010 baseline year) by income level (very-low, low, moderate, above-moderate) without displacing current low-income residents (Statutory requirement, per SB 375). ▪ Target #6: Direct all nonagricultural development within the year 2010 urban footprint (existing urban development and urban growth boundaries). ▪ Target #8: 8 Increase gross regional product by 110 percent — an average annual growth rate of approximately 2 percent (in current dollars). Plan Bay Area 2040 is an update to Plan Bay Area 2013. The Preferred Scenario for Plan Bay Area 2040 was adopted in December 2016, and the Final Plan Bay Area 2040 and Environmental Impact Report was adopted on July 27, 2017.
2035 Metropolitan Transportation Plan/ Sustainable Communities Strategy (AMBAG 2014)	The Association of Monterey Bay Area Governments adopted the *2035 Metropolitan Transportation Plan/Sustainable Communities Strategy*, which includes San Benito County, in 2014. The following themes and policies are relevant to the project:

Policy Title	Summary
	▪ Economic vitality—Raise the region's standard of living by enhancing the performance of the transportation system. ▪ System preservation and safety—Preserve and ensure a sustainable and safe regional transportation system. AMBAG is developing a technical update to the current *2035 Metropolitan Transportation Plan/ Sustainable Communities Strategy*. The *2040 Metropolitan Transportation Plan/ Sustainable Communities Strategy* is scheduled for adoption in June 2018.
San Joaquin Valley Blueprint Planning Process Summary Report (San Joaquin Valley Regional Planning Agencies 2010)	The San Joaquin Valley Regional Planning Agencies published the *San Joaquin Valley Blueprint Planning Process Summary Report* (2010). The report is a plan for the future of the San Joaquin Valley. The following principles are relevant to the project: ▪ Create a range of housing opportunities and choices ▪ Make development decisions predictable, fair, and cost-effective ▪ Mix land uses ▪ Take advantage of compact building design ▪ Enhance the economic vitality of the region
2014–2020 Regional Transportation Plan and Sustainable Communities Strategy for Merced County (MCAG 2014)	The Merced County Association of Governments adopted the *2014–2020 Regional Transportation Plan and Sustainable Communities Strategy for Merced County* in 2014 and amended it in 2016. The following themes and policies are relevant to the project: ▪ Support full-time employment with livable wages; i.e., support job creation & economic vitality. ▪ Support orderly and planned growth that enhances the integration and connectivity of various modes of transportation. ▪ Policy 9.2: Plan future roads to accommodate land uses at a regional level. ▪ Policy 12.1: Prioritize infill and growth in existing communities. Direct growth through infill strategies that promote increased investment in existing communities—prioritizing disadvantaged neighborhoods and communities - that provide a range of housing choices (affordable small, medium, large lot single family and multifamily housing) for existing and new residents. Direct housing and employment growth to existing cities and unincorporated communities rather than directing growth to new town development and sprawl.
County of Santa Clara	
Santa Clara County General Plan (County of Santa Clara 1994)	Santa Clara County adopted the *Santa Clara County General Plan* in 1994. The following goals and policies are relevant to the project: ▪ Strategy #1: Promote Compact Urban Development Patterns ▪ C-GD 1: Most of the future urban growth of Santa Clara County should be accommodated within the existing urban areas, through infill development, rather than through expansion of the urbanized area into hillsides and resource areas. ▪ C-GD(i) 3: Continue support for city's efforts to promote appropriate infill of existing vacant lands and redevelopment through their general plans, development regulations, specific plans, as well as other implementing mechanisms. ▪ C-GD 30: Cities should make maximum use of vacant or underutilized lands within the existing urban area for application of compact and mixed use development principles. Wherever possible, expansion of the urbanized area should also incorporate such principles.

Policy Title	Summary
	▪ C-GD 31: Mixed land use and compact developments should be encouraged in urban areas wherever appropriate and compatible with city plans and existing development for the purposes of enhancing community identity, creating more affordable housing, reduced auto dependency, trip reduction, and improved environmental quality. ▪ C-GD 32: Mixed land use and compact development should be encouraged which clusters employment, residential, and the types of land uses, goods, and services customarily needed on a daily basis around transit stations, along transit corridors, and in other appropriate urban locations. ▪ C-GD 38: Increases in employment should be consistent with the following: a. the rate of housing supply increase; b. the ability of cities and districts to provide needed urban services and infrastructure without lessening levels of service to existing neighborhoods; and c. the attainment of environmental quality standards. ▪ C-GD 40: Improved balance between employment and housing opportunities should include the need for: a. increased overall supply and more varied types of housing; b. housing costs commensurate with household income distribution; and c. increased proximity of housing to employment centers. ▪ C-EC(i) 9: Continue to monitor the impact of job growth in reducing unemployment and underemployment in the county. ▪ C-EC 3: Diversification in the mix of local industry should be encouraged in Santa Clara County to achieve a broader base of industrial and commercial activities in order to insulate the local economy from possible future economic downturns and to provide more lower skilled jobs
City of Santa Clara	
City of Santa Clara 2010–2035 General Plan (City of Santa Clara 2010)	The City of Santa Clara adopted the *City of Santa Clara 2010–2035 General Plan* in November 2010. The following goals and policies are relevant to the project: ▪ 5.3.1-P5 Implement a range of development densities and intensities within General Plan land use classification requirements to provide diversity, use land efficiently and meet population and employment growth. ▪ 5.3.1-P13 Support high density and intensity development within a quarter-mile of transit hubs and stations and along transit corridors. ▪ 5.3.2-P1 Encourage the annual construction of the housing units necessary to meet the City's regional housing needs assessment by reducing constraints to housing finance and development. Commercial Land Use Policies ▪ 5.3.3-P1 Provide a mix of retail and commercial uses to meet the needs of local customers and draw patrons from the greater region. ▪ 5.3.5-P1 Work with existing Santa Clara businesses to retain and expand employment opportunities and strengthen the existing tax base. ▪ 5.3.5-P2 Encourage existing businesses that may be displaced by new development to relocate within Santa Clara.
City of San Jose	
Envision San Jose 2040 General Plan (City of San Jose 2011)	The City of San Jose adopted the *Envision San Jose 2040 General Plan* in 2011. The following goals and policies are relevant to the project: ▪ IE-1.2: Plan for the retention and expansion of a strategic mix of employment activities at appropriate locations throughout the City to support a balanced economic base, including industrial suppliers and services, commercial/retail

Policy Title	Summary
	support services, clean technologies, life sciences, as well as high technology manufacturers and other related industries. ▪ IE-1.4: Manage land uses to enhance employment lands to improve the balance between jobs and workers residing in San José. Strive to achieve a minimum ratio of 1.3 jobs/employed resident to attain fiscal sustainability for the City. ▪ IE-1.5: Promote the intensification of employment activities on sites in close proximity to transit facilities and other existing infrastructure, in particular within the Downtown, North San José, the Berryessa International Business Park and Edenvale. ▪ Goal IE-2: Business Growth and Retention: Promote San José as an employment center. Nurture existing and attract new companies of all sizes (large anchor companies, emerging growth companies, small businesses) in industries that will drive the job and revenue growth for our City and regional economy. ▪ IE-2.5: Provide business assistance and support to facilitate job creation, develop new businesses, spur private investment, and promote industry growth. ▪ Goal IE-6: Broad Economic Prosperity: Provide widespread access to diverse employment and training opportunities in San José and strive to increase job growth, particularly jobs that provide self-sufficient wages and health care benefits, to allow the community to broadly share in the region's prosperity. ▪ FS-3.3: Promote land use policy and implementation actions that increase the ratio of Jobs to Employed Residents to improve our City's fiscal condition, consistent with economic development and land use goals and policies. Maintain or enhance the City's net total employment capacity collectively through amendments made to this General Plan in each Annual Review process. ▪ FS-3.13: Encourage other cities within the region to take on a greater share of the region's housing needs to promote an improved regional jobs-housing balance. ▪ LU-1.1: Foster development patterns that will achieve a complete community in San José, particularly with respect to increasing jobs and economic development and increasing the City's jobs-to-employed resident ratio while recognizing the importance of housing and a resident workforce. ▪ LU-2.1: Provide significant job and housing growth capacity within strategically identified "Growth Areas" in order to maximize use of existing or planned infrastructure (including fixed transit facilities), minimize the environmental impacts of new development, provide for more efficient delivery of City services, and foster the development of more vibrant, walkable urban settings. ▪ LU-2.2: Include within the Envision General Plan Land Use / Transportation Diagram significant job and housing growth capacity within the following identified Growth Areas: Downtown, Specific Plan Areas, North San José, Employment Lands, Urban Villages: BART/Caltrain Station Areas, Urban Villages: Transit / Commercial Corridors, Urban Villages: Commercial Centers, and Urban Villages: Neighborhood Urban Villages ▪ LU-2.3: To support the intensification of identified Growth Areas, and to achieve the various goals related to their development throughout the City, restrict new development on properties in non-Growth Areas.
City of Morgan Hill	
2035 General Plan (City of Morgan Hill 2016)	The City of Morgan Hill adopted the *2035 General Plan* in July 2016. The following goals and policies are relevant to the project: ▪ Policy CNF-2.1: Orderly Development. Promote the orderly development of the City, with concentric growth and infill of existing developed areas.

Policy Title	Summary
	▪ Policy CNF-2.2: A Balanced Community. Plan for the needs of all socioeconomic segments of the community, encouraging a balance and match in jobs and housing within the City. ▪ Policy CNF-2.4: Changing Demographics. When considering future urban development, look at least five to ten years into the future to take into account changing local and regional demographics. ▪ GOAL CNF-3: A growth management system that maintains a population cap, a metered pace of development, and high level of community amenities, and that is clear, fair, flexible, and streamlined. ▪ Policy CNF-3.5: Rate of Growth. Maintain steady and predictable annual growth consistent with the population limit. ▪ Policy CNF-3.7: Jobs/Housing Balance. Plan for residential growth that supports a healthy balance between residents and jobs located within Morgan Hill. ▪ Policy CNF-4.1: Future Growth Areas. Use the current Urban Service Area and Urban Growth Boundary to identify future urban development areas based on adequacy and availability of municipal services. ▪ Policy CNF-4.9: Orderly Growth. Urban growth should occur in an orderly and contiguous pattern, within the designated Urban Service Area, encouraging infill of vacant urban land. ▪ Policy CNF-10.1: Range of Residential Densities. Continue to provide for a full range of residential land use densities and building types, within the General Plan and Zoning Ordinance. ▪ GOAL CNF-21: Effective, stable growth of the South County. ▪ GOAL ED-1: High quality jobs for residents that support household incomes in line with local housing costs and higher-education institutions that enhance skills and increase access to high-quality education. ▪ Policy ED-1.2: Jobs/Housing Balance. Balance jobs and housing supplies to minimize traffic congestion, and commute times, and to optimize economic diversity and capacity to provide services. ▪ Policy HE-1a: Adequate Land for New Development. Ensure that an adequate amount of land is available for new residential development, zoned for a range of residential densities. ▪ Policy HE-1d: Variety of Housing. Encourage a variety of housing types and densities within the community.
City of Gilroy	
Gilroy 2020 General Plan (City of Gilroy 2002)	The City of Gilroy adopted the *Gilroy 2020 General Plan* in June 2002. The following goals and policies are relevant to the project: ▪ Policy 2.01: Location of Growth. Maximize existing infrastructure and service investments— and avoid premature investment for facility and service extensions—by directing new growth to vacant and under-utilized lands within the Urban Service Area. As a second-tier priority, direct new development to areas that border on existing urban development or are immediately adjacent to the Urban Service Area, prohibiting costly “leap frog” development and ensuring a compact development pattern. ▪ Policy 2.02: Rate and Timing of Growth. Ensure that the rate of growth is controlled such that resource and system capacity constraints are not exceeded (e.g., water supply and sewage treatment) and necessary urban services (such as sewer, water supply, police, and schools) are funded, implemented and completed prior to occupation of new buildings.

Policy Title	Summary
	▪ Policy 2.07: Urban Service Area. Establish and maintain an Urban Service Area that indicates the area of land that could potentially be developed in the next 5 years and to which the City is committed to providing basic infrastructure and services. ▪ Policy 2.08: 20-Year Boundary. Establish a "20-Year Boundary" and display it on the Land Use Plan Map, indicating the area of land that could potentially be developed in the next 20 years. ▪ Policy 3.01: Jobs and Revenues. Attract industrial, high-tech, and commercial office employers to provide a diversity of well-paid job opportunities for local residents and to broaden the City's revenue base, ensuring adequate resources over time to support the provision of quality city services. Also, support the development, retention, and expansion of small and medium size businesses, agricultural businesses, and tourism-related businesses, recognizing their vital importance to the City's economic future. ▪ Policy 3.02: Economic Development Activities. Actively promote Gilroy as a place for business and industry, capitalizing on the City's location and numerous amenities, to encourage new businesses to locate here and to retain existing businesses. ▪ Policy 3.04: Industrial Growth. Encourage new industrial uses to locate in Gilroy that can provide jobs for Gilroy residents. Discourage industrial uses that create noxious or nuisance conditions, as well as industries that would substantially fuel housing and population growth and place excessive burdens on public services, facilities, and schools. Phase new industrial development according to the availability of local housing, public facility capacities, and provision of urban services. ▪ Policy 3.25: Mix of Uses Downtown. Encourage a wide mix of uses in close proximity to each other in the Downtown area, including governmental services and facilities, cultural and recreational activities, a broad range of retail activities, financial and professional services, entertainment, transit services, and housing for residents. Encourage mixed use developments that integrate housing and commercial uses. ▪ Policy 3.26: Business Development in the Downtown. Provide amenities that will make Downtown attractive to office users and retail businesses (e.g., convenient parking, an attractive and safe environment, access to regional transit services, high quality infrastructure, reliable services, etc.) and encourage new office and retail businesses and expansions of existing businesses in Gilroy to locate there. ▪ Policy H-1.1: The City shall strive to ensure adequate land is available at a range of densities to meet Gilroy's existing and projected housing needs.
San Benito County	
San Benito County 2035 General Plan (County of San Benito 2015)	San Benito County adopted the *San Benito County 2035 General Plan* in July 2015. The following goals and policies are relevant to the project: ▪ LU-1.2: Sustainable Development Patterns. The County shall promote compact, clustered development patterns that use land efficiently; reduce pollution and the expenditure of energy and other resources; and facilitate walking, bicycling, and transit use; and encourage employment centers and shopping areas to be proximate to residential areas to reduce vehicle trips. Such patterns would apply to infill development, unincorporated communities, and the New Community Study Areas. The County recognizes that the New Community Study Areas comprise locations that can promote such sustainable development. ▪ GOAL LU-5: To promote the development of regional, thoroughfare, and locally serving commercial uses at key opportunities sites in the unincorporated county.

Policy Title	Summary
	▪ GOAL LU-6: To promote the development of new industrial and employment uses in the unincorporated parts of the county that are compatible with surrounding land uses and meet the present and future needs of county residents. ▪ GOAL LU-8: To provide the option for New Communities to be considered as a way of accommodating planned growth in the unincorporated parts of San Benito County. ▪ GOAL ED-1: To sustain the long-term economic wellbeing of the county by promoting economic sustainability and diversification. ▪ ED-1.2: Jobs/Housing Balance. The County shall strive to improve the housing balance countywide by providing sufficient employment-based land uses. ▪ ED-2.1: Business Expansion. The County shall encourage local and regional businesses to expand their operations, increase their employment opportunities, and increase their competitiveness in the regional market. ▪ GOAL ED-4: To expand the county's wine and hospitality industries in order to ensure San Benito County becomes a regional leader in the wine industry and a premier tourist destination. ▪ HOU-2A: The County shall encourage and assist the construction of a variety of housing types with varying densities and prices, for both sales and rental that are affordable to all income groups, particularly very low income and special needs groups
Merced County	
2030 Merced County General Plan (County of Merced 2013)	Merced County adopted the *2030 Merced County General Plan* in December 2013. The following goals and policies are relevant to the project: ▪ Goal ED-1 Support and promote growth and diversification of the County's economy. ▪ Policy ED-1.8: Jobs/Housing Balance. Encourage all communities, and require new or expanded Community Plans, to include sufficient employment-based land uses to maintain a 1:1 jobs/housing balance. ▪ Goal ED-3: Support and promote the retention and expansion of existing businesses. ▪ Goal ED-4: Support and promote new business development and employment growth, including local-serving, high-technology, and sustainable businesses. ▪ Goal LU-1: Create a countywide land use pattern that enhances the integrity of both urban and rural areas by focusing urban growth towards existing or suitably located new communities. ▪ Policy LU-1.2: Rural Centers. Limit the amount of new growth within existing Rural Centers by allowing only agriculture-supporting residential and commercial uses. ▪ Policy LU-1.10: Orderly Community Growth. Require the orderly, well planned, and balanced growth of the unincorporated communities consistent with the limits imposed by local infrastructure, services, public facilities, and their ability to assimilate growth. ▪ Policy LU-5.A.3: Growth Limitations. Limit growth in existing Urban Communities that lack public sewer and water systems to only include land use designations and densities which can be accommodated by individual septic systems and/or wells. ▪ Policy LU-5.A.5: Smart Growth. Promote the principles of smart growth in Community Plans for each Urban Community, including: a) creating safe, walkable neighborhoods; b) providing a mix of residential densities; c) creating a strong sense of place; d) mixing land uses; e) directing growth toward existing communities; f) building compactly; g) discouraging sprawl; h) encouraging infill; i)

Policy Title	Summary
	preserving open space; and j) creating a range of housing opportunities and choices. ▪ Policy LU-5.A.6: Jobs/Housing Balance. Promote a jobs/housing balance by encouraging residential development near employment centers when preparing new or updating existing Community Plans and providing adequate land for employment generating land use. ▪ Goal HE-1: To provide for a broad range of housing types and densities to meet the needs of all residents of the unincorporated area.

Sources: ABAG and MTC 2017; AMBAG 2014; MCAG 2014; City of Gilroy 2002a; City of Morgan Hill 2016a; City of San Jose 2011; City of Santa Clara 2010; County of Merced 2013a; County of San Benito 2015a; County of Santa Clara 1994; San Joaquin Valley Regional Planning Agencies 2010.
ABAG = Association of Bay Area Governments
MTC = Metropolitan Transportation Commission
SB = Senate Bill
AMGAG = Association of Monterey Bay Area Governments
MCAG = Merced County Association of Governments
BART = Bay Area Rapid Transit

References

Association of Bay Area Governments (ABAG). 2010. *Santa Clara County, CA Annex to 2010 Association of Bay Area Local Hazard Mitigation Plan: Taming Natural Disasters*. Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area -2010 Update of 2005 Plan. Page viii; Page 1-18; Page 1-21. http://resilience.abag.ca.gov/wp-content/documents/ThePlan-Chapters-Intro.pdf (accessed January 25, 2017).

Association of Bay Area Governments (ABAG) and Metropolitan Transit Commission (MTC). 2013. *Plan Bay Area*. http://files.mtc.ca.gov/pdf/Plan_Bay_Area_FINAL/Plan_Bay_Area.pdf (accessed March 6, 2017).

———. 2017. *Plan Bay Area 2040*. Final. http://2040.planbayarea.org/cdn/farfuture/DNwQeazEwHFfJg-HZ-_GMZSVQxPV0mKk0nTUkVaDSes/1506467747/sites/default/files/2017-09/Plan_Bay_Area_2040-09262017-links.pdf (accessed October 3, 2017).

Association of Monterey Bay Area Governments (AMBAG). 2014. *2035 Metropolitan Transportation Plan/Sustainable Communities Strategy*. June. http://ambag.org/programs/met_transp_plann/documents/Final_2035_MTP_SCS/MovingForwardMontereyBayFinal.pdf (accessed November 23, 2016).

———. 2017. *Moving Forward 2035 Monterey Bay*. Adopted June 11, 2014 and amended January 11, 2017. www.ambag.org/programs-services/planning/metro-transport-plan/Moving-Forward-2035-Monterey-Bay (accessed April 18, 2017).

California Department of Transportation (Caltrans). 2016. *California Transportation Plan 2040. Integrating California's Transportation Future*. www.dot.ca.gov/hq/tpp/californiatransportationplan2040/Final%20CTP/FINALCTP2040-Report-WebReady.pdf (accessed on October 3, 2017).

California High-Speed Rail Authority (Authority) and U.S. Department of Transportation Federal Railroad Administration (FRA). 2012. *California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement, Merced to Fresno Section*. Final. April. http://www.hsr.ca.gov/Programs/Environmental_Planning/final_merced_fresno.html (accessed April 22, 2019).

Caltrain. 2014. *Strategic Plan: FY2015-2024*. www.caltrain.com/Assets/Caltrain+Modernization+Program/Documents/Strategic+Plan+Final+Doc.pdf (accessed on October 3, 2017).

City of Gilroy. 1986. *City of Gilroy Historic Sites Inventory.* https://yourvoice.cityofgilroy.org/citywide-historic-resource-inventory-update (accessed April 22, 2019).

———. 1998. *City of Gilroy Hazardous Materials Storage Permit Ordinance.* www.ci.gilroy.ca.us/DocumentCenter/View/604 (accessed April 22, 2019).

———. 2002a. *2020 General Plan.* June. http://www.cityofgilroy.org/274/2020-General-Plan (accessed March 2017).

———. 2002b. *City of Gilroy Bicycle/Pedestrian Transportation Plan.* http://www.cityofgilroy.org/DocumentCenter/Home/View/2330 (accessed October 3, 2017).

———. 2005. *Downtown Gilroy Specific Plan*. November 21. http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/1271 (accessed March 7, 2017).

———. 2012. *High-Speed Train Station Visioning Project Vision Report*. February. http://www.gilroyhighspeedtrain.org/wp-content/uploads/2015/08/Vision_Report_Final_web.pdf (accessed April 22, 2019).

———. 2014a. *Economic Development Strategic Plan.* February 19. http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5976 (accessed June 2, 2017).

———. 2014b. *City of Gilroy General Guidelines (Ord 85-15, 2, 8-19-85).*

———. 2014c. *Gilroy General Plan 2040: 2015-2023 Housing Element Policy Document and Background Report*. http://www.gilroy2040.com/wp-content/uploads/2015/03/GilHE_Adopted_HE_Compiled_web.pdf (accessed April 22, 2019).

———. 2015. *Strategic Plan 2015 -> 2020 -> 2030*. March. http://www.cityofgilroy.org/DocumentCenter/Home/View/5277 (accessed June 20, 2017).

———. 2016a. *City of Gilroy Urban Water Management Plan*. 2016. www.cityofgilroy.org/DocumentCenter/View/5908 (accessed September 8, 2017).

———. 2016b. *Measure H – Gilroy Urban Growth Boundary Initiative.* http://www.cityofgilroy.org/DocumentCenter/View/6254 (accessed March 6, 2017).

———. 2016c. *Gilroy City Code, Chapter 18, Public Parks*. Updated through Ordinance 2016-18, passed December 19, 2016.

City of Los Banos. 2009. *2030 General Plan Update*. Approved July 15. http://losbanos.org/wp-content/uploads/2013/09/plan_gp_entire.pdf (accessed April 14, 2017).

———. 2016. *City of Los Banos Housing Element*. Draft 2014-2023. July. http://www.hcd.ca.gov/community-development/housing-element/docs/los_banos-5th-adopted081116.pdf (accessed April 22, 2019).

City of Morgan Hill. 2009. *Morgan Hill Downtown Specific Plan.* http://www.morgan-hill.ca.gov/DocumentCenter/View/3195 (accessed October 12, 2017).

———. 2010. *Morgan Hill General Plan*. http://www.morgan-hill.ca.gov/DocumentCenter/View/22839/MH2035-General-Plan---December-2017?bidId= (accessed April 22, 2019).

———. 2014. *Agricultural Lands Preservation Program*. www.morgan-hill.ca.gov/1468/Agricultural-Lands-Preservation (accessed October 6, 2017).

———. 2015. *City of Morgan Hill Housing Element*. Adopted February 18. www.morgan-hill.ca.gov/DocumentCenter/View/15642/Adopted_MH_HousingElement?bidId= (accessed April 22, 2019).

———. 2016a. *2035 General Plan.* morganhill2035.org/wp-content/uploads/2016/08/MorganHill2035_GeneralPlan_Adopted1.pdf (accessed March 7, 2017).

———. 2016b. *City of Morgan Hill Urban Water Management Plan 2015.* August. http://www.morgan-hill.ca.gov/DocumentCenter/View/17947 (accessed June 20, 2017).

———. 2017. *Tree Removal*. http://www.morgan-hill.ca.gov/86/Tree-Removal (accessed September 28, 2017).

———. 2018. *City of Morgan Hill Emergency Operations Plan*. Revision 2.0. January 11, 2018. http://www.morgan-hill.ca.gov/DocumentCenter/View/22986/Morgan-HIll-Emergency-Operations-Plan---08jfeb018-rev-21 (accessed January 15, 2019).

City of San Jose. 1992a *Midtown Specific Plan*. http://www.sanjoseca.gov/DocumentCenter/Home/View/461 (accessed March 6, 2017).

———. 1992b. *Communications Hill Specific Plan.* http://www.sanjoseca.gov/DocumentCenter/Home/View/456 (accessed March 6, 2017).

———. 1995. *Tamien Station Area Specific Plan*. City of San Jose Department of City Planning and Building. Adopted March 21. http://www.sanjoseca.gov/DocumentCenter/Home/View/464 (accessed: June 9, 2016).

———. 2008. *Coyote Valley Plan: A Vision for Sustainable Development*. April 2008. http://coyotevalley.sanjoseca.gov/coyotevalley/CVP_text/cvp-coverintro.pdf (accessed: June 9, 2016).

———. 2009. *Bike Plan*. www3.sanjoseca.gov/clerk/Agenda/20091117/20091117_0602att.pdf (accessed April 22, 2019).

———. 2011. *Envision San Jose 2040 General Plan: Building a City of Great Places*. Adopted November 1. http://www.sanjoseca.gov/DocumentCenter/Home/View/474 (accessed: June 9, 2016).

———. 2014. *Diridon Station Area Plan.* http://www.sanjoseca.gov/DocumentCenter/View/33057 (accessed on March 6, 2017).

———. 2015. *City of San Jose 2014-2023 Housing Element*. Adopted January 27. http://www.sanjoseca.gov/DocumentCenter/View/43711 (accessed April 22, 2019).

———. 2016a. *San Jose Council Policy Manual*. Policy 6-29 Post Construction Urban Runoff Management.

———. 2016b. *San Jose Council Policy Manual*. Policy 8-14 Post-Construction Hydromodification Management.

———. 2017. *Planning, Building, and Code Enforcement – Tree Removal.* http://www.sanjoseca.gov/index.aspx?NID=3655 (accessed September 28, 2017).

City of Santa Clara. 2010. *2010–2035 General Plan*. Adopted November 16. http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan (accessed October 12, 2017).

———. 2013. Santa Clara Climate Action Plan. December 3. http://santaclaraca.gov/home/showdocument?id=10170 (accessed April 22, 2019).

———. 2014. *2010–2035 General Plan Update to the Housing Element*. December 9. http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan (accessed April 22, 2019).

County of Merced. 2007. *Storm Water Management Program*. April 2007. Prepared by Merced Storm Water Group. http://www.waterboards.ca.gov/water_issues/programs/stormwater/swmp/merced_swmp.pdf (accessed June 20, 2017).

———. 2012. *Merced County Airport Land Use Compatibility Plan Containing the individual compatibility plans for: Castle Airport, Gustine Municipal Airport, Los Banos Municipal Airport, Merced Regional Airport, and Turlock Municipal Airport*. Prepared for Merced County Airport Land Use Commission. Adopted June 21, 2012 Page 2-24. http://www.co.merced.ca.us/pdfs/planning/aluc/alucp_july2012/2012_mer_alucp_entire_document.pdf (accessed February 2, 2017).

———. 2013a. *Merced County Year 2030 General Plan*. Prepared by Merced County in consultation with Mintier Harnish, Planning Partners, KD Anderson, Nolte, Economic and Planning Systems, Dunn Environmental, Bollard Acoustical Consultants. Adopted December 10. http://www.co.merced.ca.us/DocumentCenter/Home/View/6766 (accessed: June 9, 2016).

———. 2013b. *Merced Integrated Regional Water Management Plan*. Prepared by RMC Water and Environment. August. http://mercedirwmp.org/documents.html (accessed June 20, 2017).

———. 2013c. *County of Merced Emergency Operations Plan*. Adopted December 2013. Page 1; Page 11. http://www.co.merced.ca.us/BoardAgenda/2013/MG189171/AS189204/AS189214/AI189266/DO188949/all_pages.pdf (accessed February 2, 2017).

———. 2017. *County of Merced Department of Health: Medical/Health Emergency Operations Plan*. http://www.co.merced.ca.us/DocumentCenter/View/17468/Merced-County-Medical-Health-Emergency-Operations-Plan?bidId= (accessed January 15, 2019).

County of Merced, Santa Nella Citizen's Advisory Committee, and Santa Nella Development Association. 2000. *Santa Nella Community Specific Plan*. May 5. http://web2.co.merced.ca.us/pdfs/planning/cplan/completed/santanella/Santa%20Nella%20CSP%2005052000.pdf (accessed June 9, 2016).

County of San Benito. 2012. *Hollister Municipal Airport Land Use Compatibility Plan, San Benito County Airport Land Use Commission*. June 21. Page 2-19. http://www.sanbenitocog.org/pdf/ADOPTED%20%20ALUCP%20-June%202012.pdf (accessed February 2, 2017).

———. 2014. *San Benito County Regional Transportation Plan.* http://sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf (accessed October 3, 2017).

———. 2015a. *San Benito County 2035 General Plan.* Adopted July 21. http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf (accessed March 7, 2017).

———. 2015b. *San Benito County Operational Area Emergency Operations Plan*. Adopted August 2015. Page i. http://www.cosb.us/wp-content/uploads/SBC-EOP-2015.pdf (accessed February 2, 2017).

County of Santa Clara. 1993. *County of Santa Clara Hazardous Waste Program*.

———. 1994 (revised 2006). *Santa Clara County General Plan, 1995–2010.* December 20. www.sccgov.org/sites/dpd/PlansOrdinances/GP/Pages/GP.aspx (accessed March 8, 2017).

———. 1995a. *Integrated Waste Management Plan, Summary Plan and Siting Element*. http://www.sccgov.org/sites/rwr/Documents/CoIWMP/Summary-plan-and-siting-element.pdf (accessed September 8, 2017).

———. 1995b. *Santa Clara County Countywide Trails Master Plan*. November 14. http://www.sccgov.org/sites/parks/PlansProjects/Documents/TrailsMasterPlan/Entire_Countywide_Trails_Master_Plan_Searchable.pdf (accessed July 19, 2017).

———. 2008. *Santa Clara County Operational Area Emergency Operations Plan*. San Jose, CA. Adopted March 18, 2008. Page 4 of 67; Page 6 of 67. http://www.sanjoseca.gov/DocumentCenter/View/47601 (accessed January 25, 2017).

———. 2013. *Santa Clara Climate Action Plan*. Adopted December 2, 2013. http://santaclaraca.gov/home/showdocument?id=10170 (accessed June 20, 2017).

———. *2014. General Plan.* http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan (accessed June 21, 2017).

———. 2015. *Santa Clara County General Plan Updates.* November. http://www.sccgov.org/sites/dpd/DocsForms/Documents/GP_BookB_LocalServing_ReplacementPages.pdf (accessed September 27, 2017).

———. 2016a. *Santa Clara County General Plan*, adopted 1994, updated November 2, 2016. San Jose, California, Safety and Noise Countywide Issues and Policies, Page I-33; Transportation Countywide Issues and Policies, Page F-27. http://www.sccgov.org/sites/dpd/PlansOrdinances/GP/Pages/GP.aspx (accessed January 25, 2017).

———. 2016b. *Comprehensive Land Use Plan Santa Clara County: South County Airport (San Martin Airport) Santa Clara County Airport Land Use Commission, San Jose, California, September 10, 2008*. Amended November 16, 2016. Pages 4-5; 4-9; 4-10. http://www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_E16_CLUP.pdf (accessed January 25, 2017).

———. 2016c. *Comprehensive Land Use Plan Santa Clara County: Moffett Federal Airfield Santa Clara County Airport Land Use Commission, San Jose, California, November 2, 2012*. Amended November 16, 2016. Pages 4-5; 4-9; 4-10. http://www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_NUQ_CLUP.pdf (accessed January 25, 2017).

———. 2016d. *Comprehensive Land Use Plan Santa Clara County: Norman Y. Mineta-San Jose International Airport Santa Clara County Airport Land Use Commission, San Jose, California, May 25, 2011*. Amended November 16, 2016. Pages 4-5; 4-9; 4-10. http://www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_SJC_CLUP.pdf (accessed January 25, 2017).

———. 2017. *County of Santa Clara Emergency Operations Plan.* Approved January 10, 2017. http://www.sccgov.org/sites/oes/partners/Documents/emergency-operations-plan-jan-2017.pdf (accessed January 15, 2019).

County of Santa Clara and Santa Clara Valley Open Space Authority. 2018. *Santa Clara Valley Agricultural Plan: Investing in our Working Lands for Regional Resilience*. January 2018. www.openspaceauthority.org/system/user_files/Documents/Grids/current_projects/SCV_ActionPlan_010318.pdf (accessed September 2, 2020).

Merced County Airport Land Use Commission. 2012. *Merced County Airport Land Use Compatibility Plan.* http://web2.co.merced.ca.us/pdfs/planning/aluc/alucp_july2012/2012_mer_alucp_entire_document.pdf (accessed April 22, 2019).

Merced County Association of Governments (MCAG). 2014. *2014–2020 Regional Transportation Plan and Sustainable Communities Strategy for Merced County*. September. **Error! Hyperlink reference not valid.** (accessed November 21, 2016).

———. 2016. *Merced County Regional Transportation Plan 2014–2040*. Adopted September 2014 and amended May 2016. www.mcagov.org/DocumentCenter/View/789 (accessed March 7, 2017).

———. 2018. *Merced County Regional Transportation Plan and Sustainable Communities Strategy for Merced County*. Adopted August 16. http://www.mcagov.org/DocumentCenter/View/1731/MCAG-2018-RTP-finaldraft-2018-08-06?bidId= (accessed April 22, 2019).

Metropolitan Transportation Commission (MTC). 2013. *Plan Bay Area: Regional Transportation Plan and Sustainable Communities Strategy for the San Francisco Bay Area* 2013–2040. http://mtc.ca.gov/our-work/plans-projects/plan-bay-area-2040/plan-bay-area (accessed September 8, 2017).

Pajaro River Watershed Integrated Regional Water Management. 2014. *Pajaro River Watershed Integrated Regional Water Management Plan*. August 2014. https://static1.squarespace.com/static/5c0806f83917ee62c5270383/t/5c2e935b88251bade4ab9497/1546556265202/Pajaro+IRWM+Plan+Update+2014+Final.pdf.

San Benito County Airport Land Use Commission. 2001. *Comprehensive Land Use Plan Frazier Lake Airpark.* Page 3-1, Page 3-11. http://www.frazierlake.com/public_docs/CLUP-Text.pdf (accessed February 2, 2017).

———. 2019. *Vital Signs*. Adopted February 2015. Updated March 2019. https://www.vitalsigns.mtc.ca.gov/poverty (accessed May 3, 2019).

San Benito County Water District, Sunnyslope County Water District, and City of Hollister. 2016. *2015 Hollister Urban Area (HUA) Urban Water Management Plan*. July 2016. http://hollister.ca.gov/wp-content/uploads/2016/07/PUBLIC-DRAFT-HUA-UWMP-FINAL-071516.pdf (accessed June 20, 2017).

San Joaquin Valley Regional Planning Agencies. 2010. *San Joaquin Valley Blueprint Planning Process Summary Report.* www.valleyblueprint.org/files/SJVBR_Summary_Final_2010-09-22.pdf (accessed March 7, 2017).

San Jose Municipal Water System (SJMWS). 2016. 2015 *Urban Water Management Plan San Jose Municipal Water System.* June. http://www.sanjoseca.gov/DocumentCenter/View/57483 (accessed April 22, 2019).

Santa Clara County Parks. 2006. *Coyote Creek Parkway County Park: Integrated Natural Resources Management Plan and Master Plan Draft*. Prepared by 2M Associates, Jones and Stokes Associates, Balance Hydrologics, Inc., and Harison and Associates. Available online: http://www.sccgov.org/sites/parks/PlansProjects/Documents/Coyote-Creek-Parkway/Draft-Integrated-Plan-Report.pdf (accessed: June 9, 2016).

Santa Clara Valley Open Space Authority. 2014. *Santa Clara Valley Greenprint*. March 27. http://www.openspaceauthority.org/about/pdf/SCVOSA.Greenprint.FINAL.March2014_RevisedWithCovers28May2014_LoRes.pdf (accessed April 22, 2019).

Santa Clara Valley Transportation Authority (VTA). 2008. Santa Clara Countywide Bicycle Plan. http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001FZYt (accessed on October 3, 2017).

Santa Clara Valley Water District (SCVWD). *2016a. Santa Clara Valley Water District 2015 Urban Water Management Plan*. http://www.valleywater.org/EkContent.aspx?id=3433&terms=urban+water+management+plan (accessed June 21, 2017).

———. 2016b. *2016 Groundwater Management Plan*. https://s3.us-west-2.amazonaws.com/assets.valleywater.org/2016%20Groundwater%20Management%20Plan.pdf (accessed April 22, 2019).

U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and Department of Parks and Recreation (DPR). 2012. *San Luis Reservoir State Recreation Area Draft Resource Management Plan/ General Plan and Draft Environmental Impact Statement/Revised Draft Environmental Impact Report*. www.parks.ca.gov/pages/21299/files/sanluisrmp-gp_deis-rdeir_complete.pdf (accessed January 13, 2019).

APPENDIX 2-K: POLICY CONSISTENCY ANALYSES

APPENDIX 2-K: POLICY CONSISTENCY ANALYSES

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- This appendix was updated to provide additional consistency analysis with the Morgan Hill General Plan Transportation Element concerning several features of Alternative 2 in Table 1, Policy Inconsistency, Reconciliation, and Rationale for Transportation.
- This appendix was updated to include *Communications Hill Specific Plan Area Development Policy* (City of San Jose 2014) in Table 5, *Santa Clara Valley Agricultural Plan* (County of Santa Clara and Santa Clara Valley Open Space Authority 2018) in Table 7, and *Envision: San José 2040 General Plan* (City of San Jose 2011) in Table 9.
- SO-MM#1 and SO-MM#2 were removed from Table 5.

The California High-Speed Rail Authority (Authority) is a state agency and therefore is not required to comply with local land use and zoning regulations, however it has endeavored to design and construct the San Francisco to San Jose Project Section (Project Section) so that it is as compatible as possible with land use and zoning regulations. The Council on Environmental Quality (CEQ) and Federal Railroad Administration (FRA) regulations require the discussion of any inconsistency or conflict of a proposed action with regional or local plans and laws. Where inconsistencies or conflicts exist, the CEQ and FRA require a description of the extent of reconciliation and the reason for proceeding if full reconciliation is not feasible (40 C.F.R. § 1506.2(d) and 64 Fed. Reg. 28545, 14(n)(15)). California Environmental Quality Act (CEQA) Guidelines also require that an environmental impact report discuss the inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans (CEQA Guidelines § 15125(d)).

Although the *San Jose to Merced Project Section Environmental Impact Report (EIR)/Environmental Impact Statement (EIS)* (EIR/EIS) describes the Project Section's inconsistency with local plans in order to provide a context for the project, inconsistency with such plans is not considered an environmental impact.

This appendix provides the following for each resource with identified policy inconsistencies:

- A statement for each policy that the Project Section is inconsistent with, and an explanation of any inconsistencies.
- A discussion of reconciliation approaches the Authority has committed to take to reconcile any inconsistency. These consist of impact avoidance and minimization features and mitigation measures (described in Volume 2, Appendix 2-E, Project Impact Avoidance and Minimization Features) and activities described in Appendix 2-D, Applicable Design Standards.
- The rationale for carrying forth the Project Section if it remains inconsistent with the policy despite these approaches.

Transportation

Table 1 Policy Inconsistency, Reconciliation, and Rationale for Transportation

Policy	Description of Inconsistency	Reconciliation	Rationale
Santa Clara County General Plan (1994)			
Policy C-TR 12: It is the goal of this plan to achieve a LOS no lower than D at peak travel periods on city streets, county roads, expressways and state highways. However, in certain instances, a lower level of service may be acceptable when LOS D cannot practically be achieved.	Inconsistent. The project would cause some intersections under County jurisdiction to operate at worse than LOS of D or better, resulting in an inconsistency with the County's LOS policy.	While the project includes features to implement level of service mitigations, the project will remain inconsistent. Not reconciled.	While the project would degrade intersection LOS at some locations, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize level of service degradation.
City of San Jose General Plan (2011)			
Policy TR-5.3: The minimum overall roadway performance during peak travel periods should be level of service "D" except for designated areas.	Inconsistent. The project would cause some intersections under City jurisdiction to operate at worse than the target LOS of D or better, resulting in an inconsistency with the City's LOS policy.	While the project includes features to implement level of service mitigations, the project will remain inconsistent. Not reconciled.	While the project would degrade intersection LOS at some locations, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize level of service degradation.

Policy	Description of Inconsistency	Reconciliation	Rationale
City of Morgan Hill General Plan (2016)			
Policy TR-3.4. As the LOS Policy and design criteria for roadway improvements, use a Tiered LOS Standard as follows: ○ LOS F in the Downtown at Main/Monterey, along Monterey Road between Main and Fifth Street, and along Depot Street at First through Fifth Streets [...] ○ LOS D for intersections and segments elsewhere; except [for] LOS E for identified freeway ramps/zones, road segments and intersections that (1) provide a transition to and are located on the periphery of downtown; (2) are freeway zone intersections; and/or (3) where achieving LOS D could result in interim intersection improvements which would be "over-built" once the city's circulation network has been completed, and/or would involve unacceptable impacts [. . .]	Inconsistent. The project would cause some intersections under City jurisdiction to operate at worse than the target LOS of D or better, resulting in an inconsistency with the City's LOS policy.	While the project includes features to implement level of service mitigations, the project will remain inconsistent. Not reconciled.	While the project would degrade intersection LOS at some locations, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize level of service degradation.
The Transportation Element shows the future circulation system for the City, including planned 2035 improvements. The Transportation Element shows an extension of Madrone Parkway across the railroad, Monterey Road, to Hale Avenue. The Transportation Element also shows maintaining a connection of Tilton Ave. to Monterey Road. The Transportation Element also states the following: "While not analyzed or included in the Circulation Plan for 2030, future consideration should be given to extending Butterfield north of Madrone to connect to Burnett Avenue, perhaps then curving northwest to connect to Tilton Avenue."	Partially Inconsistent. According to the City, they are planning to amend the General Plan in the future to show a grade separation and connections of Burnett Avenue and Tilton Avenue and eliminate the grade separation and extension of Madrone Parkway through to Hale Avenue, but, as of October 2020, that amendment had not yet been realized. Consequently, Alternative 2 is not inconsistent with the currently adopted General Plan Transportation Element in regard to Madrone Parkway but is inconsistent in regard to Tilton Avenue, which is designed in Alternative 2 to be a cul-de-sac.	Due to the realignment of Monterey Road with Alternative 2, there is insufficient space to connect Monterey Road and Tilton Avenue.	No resolution due to space limitations.
City of Gilroy General Plan (2002)			

Policy	Description of Inconsistency	Reconciliation	Rationale
Policy 12.08 Standard LOS. Maintain traffic conditions at LOS C or better at Gilroy intersections and roadways, allowing some commercial and industrial areas to operate at LOS D or better. Exceptions to this standard will be allowed only where the City Council determines that the improvements needed to maintain the City's standard level of service at specific locations are infeasible.	Inconsistent. The project would cause some intersections under City jurisdiction to operate at worse than the target LOS of D or better, resulting in an inconsistency with the City's LOS policy.	While the project includes features to implement level of service mitigations, the project will remain inconsistent. Not reconciled.	While the project would degrade intersection LOS at some locations, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize level of service degradation.

Sources: City of Gilroy 2002; City of Morgan Hill 2016; City of San Jose 2011; County of Santa Clara 1994.
LOS = level-of-service
HSR = high-speed rail
Authority = California High-Speed Rail Authority

Air Quality and Greenhouse Gases

Table 2 Policy Consistency or Inconsistency, Reconciliation, and Rationale

Policy	Consistent or Inconsistent	Reconciliation	Rationale
Plan Bay Area 2040 (2017)			
Target#3: Reduce adverse health impacts associated with air quality, road safety, and physical inactivity by 10%.	Inconsistent During construction, the project would result in temporary emissions of criteria pollutants that could increase temporary health risks in the vicinity of existing communities.	AQ-IAMF#1 and AQ-IAMF#2 would minimize emissions of fugitive dust and off-gassing emissions of VOCs from paints and other coatings. AQ-IAMF#3 through AQ-IAMF#6 would reduce and minimize impacts by requiring the use of renewable diesel and the cleanest reasonably available equipment and control measures to limit criteria pollutant emissions from construction equipment, vehicles, and concrete batch plants. Despite these onsite controls, all project alternatives would result in temporary violations of the NAAQS and CAAQS, which have been established to protect public health. Therefore, the project would remain inconsistent.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The Authority has incorporated IAMFs into the project to minimize impacts on air quality and public health.

Sources: ABAG and MTC 2017.
NAAQS = national ambient air quality standards
CAAQS = California ambient air quality standards
Authority = California High-Speed Rail Authority
IAMF = impact avoidance and minimization feature

Noise and Vibration

Table 3 Policy Inconsistency, Reconciliation, and Rationale for Noise and Vibration

Policy	Description of Inconsistency	Reconciliation	Rationale
Santa Clara County General Plan (1994)			
Noise Compatibility for Land Use in Santa Clara County, page P-5	Project implementation would result in noise environments that exceed 70 L_{dn} which is *Critical* for all noise-sensitive land use	This is applicable to all similar inconsistencies with Land Use Compatibility. The project would incorporate NV-MM#3 to minimize operations noise impacts, and it would consider the following: construct noise barriers, support City implementation of Quiet Zones where cities decide to implement them, install sound insulation, or acquire easements on properties severely affected by noise. These determinations would be based on criteria in the Authority's Noise and Vibration Mitigation Guidelines (Volume 2, Appendix 3.4-B). These measures would reduce or compensate for severe noise impacts from operations. NV-MM#4 requires HSR vehicles to meet federal regulations for noise (40 C.F.R. Part 201.12) at the time of procurement. NV-MM#5 requires the contractor to document how they minimized or eliminated rail gaps related to special trackwork, which can be a major source of noise during operations. NV-MM#6, requires final design noise measures. These mitigation measures would all be effective at reducing the number of severe noise impacts in the RSA; however, they would not mitigate all noise impacts. NV-MM#4 would help to avoid or reduce train horn noise impacts near at-grade crossings with regional implementation of grade separations, but funding is not assured for this mitigation and thus its implementation is uncertain. Thus, there are locations where it is not technically feasible to meet the noise limits.	This is applicable to all similar inconsistencies with Land Use Compatibility. Although mitigation measures would be able to reduce project noise levels, they would not reduce all levels to the standards for residential, commercial, and institutional land uses due to the limitations in noise barrier cost effectiveness, implementation (HSR cannot implement quiet zones; only local jurisdictions can), and funding (in regard to grade separations).

Policy	Description of Inconsistency	Reconciliation	Rationale
Santa Clara County Ordinance Code (2016)			
Construction hours No construction 7 pm to 7 am, weekdays. None allowed on Sundays and holidays	Project construction would occur at night and on weekends outside the hours in the code.	This is applicable to all similar inconsistencies with construction hours. The project would incorporate NV-IAMF#1 to minimize noise impacts by requiring compliance with FRA guidelines for minimizing construction noise and vibration impacts when work is conducted within 1,000 feet of sensitive receptors. The Authority would implement NV-MM#1 which would require the contractor to prepare a noise-monitoring program and noise control plan prior to construction to comply with the FRA construction noise limits wherever feasible. The monitoring program would describe the actions the contractor would use to reduce noise, such as installing temporary noise barriers, avoiding nighttime construction near residential areas, and using low-noise emission equipment.	This is applicable to all similar inconsistencies with construction hours. Construction would occur in a constrained operating rail corridor. Track work and some other work would need to be done at night to avoid disruption to Caltrain commuter rail operations and/or roadway operations. Thus, there are locations where it is not technically feasible to meet the noise limits.
City of Santa Clara 2010-2035 General Plan (2010)			
General Plan Noise Standards, Table 8.14-1	Project implementation would result in noise environments that exceed 70 L_{dn} which Requires Design and insulation for residential land use/FRA Category 2 and schools and churches, etc./FRA Category 3) or 73 L_{dn} which is *Incompatible* for residential land use/FRA Category 2 and schools and churches, etc./FRA Category 3. At institutional and commercial land use/FRA Category 3, project implementation would result in noise environments that exceed 75 L_{dn}/CNEL which requires design and insulation.	This reconciliation is the same as already noted above for Land Use Compatibility.	This rationale is the same as already noted above for Land Use Compatibility

Policy	Description of Inconsistency	Reconciliation	Rationale
Envision San Jose 2040 General Plan (2011)			
Land Use Compatibility Guidelines for Community Noise in San Jose, Table 4	Project implementation would result in noise environments that exceed 70 L_{dn} which requires acoustical analysis for residential land use/FRA Category 2 and schools and churches, etc./FRA Category 3. At institutional and commercial land use/FRA Category 3, project implementation would result in noise environments that exceed 77 L_{dn} which requires acoustical analysis.	This reconciliation is the same as already noted above for Land Use Compatibility.	This reconciliation is the same as already noted above for Land Use Compatibility
Morgan Hill 2035 General Plan (2016)			
State of California Land Use Compatibility Guidelines for Community Noise Environments, Table SSI-1	Project implementation would result in noise environments that exceed 70 CNEL which is *Normally Unacceptable* for residential land use/FRA Category 2 and schools and churches, etc./FRA Category 3, or 75 CNEL which is *Clearly Unacceptable* for residential land use/FRA Category 2 and schools and churches, etc./FRA Category 3. At office and commercial land use/FRA Category 3, project implementation would result in noise environments that exceed 75 CNEL which is *Normally Unacceptable.*	This reconciliation is the same as already noted above for Land Use Compatibility.	This rationale is the same as already noted above for Land Use Compatibility
Morgan Hill Municipal Code (2017)			
Section 8.28.040 Construction hours limited to 7 am – 8 pm M-F and 9 am – 6 pm Saturday Not allowed Sundays and holidays	Project construction would occur at night and on weekends outside the hours in the code.	This reconciliation is the same as already noted above for construction hours.	This rationale is the same as already noted above for construction hours.

Policy	Description of Inconsistency	Reconciliation	Rationale
The City of Gilroy 2002-2020 General Plan (2002)			
Permissible (sic) Maximum Outdoor and indoor Noise Levels, Figure 8-3	Project implementation would result in noise environments that exceed the City's 70 L_{dn} maximum for residential land use with sound attenuation measures in place. At commercial land use/FRA Category 3, project implementation would result in noise environments that exceed the City's maximum 65 L_{dn}.	This reconciliation is the same as already noted above for Land Use Compatibility.	This rationale is the same as already noted above for Land Use Compatibility
Gilroy Municipal Code (2017)			
Chapter 16 offences, 16.38 construction allowed 7 am – 7 pm M-F and 9 am – 7 pm Sat None allowed Sundays and holidays	Project construction would occur at night and on weekends outside the hours in the code.	This reconciliation is the same as already noted above for construction hours.	This rationale is the same as already noted above for construction hours.
San Benito County 2035 General Plan (2015)			
HS-8.3 construction Allowed 7 am -6 pm M-F and 8 am – 5 pm Saturday. Not allowed Sunday and holidays	Project construction would occur at night and on weekends outside the hours in the code.	This reconciliation is the same as already noted above for construction hours.	This rationale is the same as already noted above for construction hours.
2030 Merced County General Plan (2013)			
HS-7.9 Transportation Project, Policy HS-7.9 Significance thresholds are based on increase over existing: for existing <60 L_{dn} an increase over 5 dB would be significant; for existing >65 L_{dn}, an increase of more than 1.5 dB would be significant; for existing 60-65 L_{dn}, an	Project implementation would result in noise increases that would be up to 23 dBA where the existing noise level is less than 60 L_{dn}, 12.5 dBA where the existing noise level is 60 to 65 L_{dn} and 8.1 dBA where the existing noise level is greater than 65 L_{dn}. These increases would be significant per Merced County General Plan.	The project would incorporate NV-MM#3 to minimize operations noise impacts, and it would consider the following: construct noise barriers, support City implementation of Quiet Zones where cities decide to implement them, install sound insulation, or acquire easements on properties severely affected by noise. These determinations would be based on criteria in the Authority's Noise and Vibration Mitigation Guidelines (Volume 2, Appendix 3.4-B). These measures would reduce or compensate for severe noise impacts from operations. NV-MM#4 requires HSR vehicles to meet federal regulations for noise (40 C.F.R. Part 201.12) at	Although mitigation measures would be able to reduce project noise levels, they would not reduce all levels to the standards for residential, commercial, and institutional land uses due to the limitations in noise barrier cost effectiveness, implementation (HSR cannot implement quiet zones; only local jurisdictions can), and funding (in regard to grade separations).

Policy	Description of Inconsistency	Reconciliation	Rationale
increase more than 3 dB would be significant.		the time of procurement. NV-MM#5 requires the contractor to document how they minimized or eliminated rail gaps related to special trackwork, which can be a major source of noise during operations. NV-MM#6, requires final design noise measures. These mitigation measures would all be effective at reducing the number of severe noise impacts in the RSA; however, they would not mitigate all noise impacts. TR-MM#2 would help to avoid or reduce train horn noise impacts near at-grade crossings with regional implementation of grade separations, but funding is not assured for this mitigation and thus its implementation is uncertain. Thus, there are locations where it is not technically feasible to meet the noise limits.	
Land Use Compatibility, Figure 10.1	Project implementation would result in noise environments that exceed 70 Ldn which is *Normally Unacceptable* for residential land use/FRA Category 2 and schools and churches, etc./FRA Category 3, or 75 Ldn which is *Clearly Unacceptable* for residential land use.	This reconciliation is the same as already noted above for Land Use Compatibility.	This rationale is the same as already noted above for Land Use Compatibility.
Merced County Ordinance Code (2016)			
10.60.030 sound level limit Construction hours allowed 7 am to 6 pm	Project construction would occur at night and on weekends outside the hours in the code.	This reconciliation is the same as already noted above for construction hours.	This rationale is the same as already noted above for construction hours.

Sources: City of Gilroy 2002; City of Morgan Hill 2016; City of San Jose 2011; City of Santa Clara 2010; County of Merced 2013; County of San Benito 2015; County of Santa Clara 1994.

Hydrology and Water Resources

Table 4 Policy Inconsistency, Reconciliation, and Rationale for Hydrology and Water Resources

Policy	Description of Inconsistency	Reconciliation	Rationale
City of Morgan Hill General Plan (2016)			
Policy NRE-8.6: Protect properties located in areas that have soils with rapid water percolation from future development in order to ensure existing water quality. Permit development (including commercial and industrial uses) in such areas only under strict safety limitations according to the City's Hazardous Materials Storage Ordinance section specifically related to high percolation rates.	Inconsistent. The project extent is located within groundwater recharge areas and other areas with rapid percolation along the foothills of the Coast Ranges and Diablo Range; such areas are susceptible to contamination from hazardous waste.	A spill prevention, control, and countermeasure plan would control and minimize potential groundwater contamination during construction (HMW-IAMF#6). An Environmental Management System would be developed to identify and promote the use nonhazardous materials (HMW-IAMF#9), which reduce the potential effects of a leak or spill. A hazardous materials and waste plan would be prepared that describes responsible parties and procedures for hazardous waste and the transport of hazardous materials on public roadways (HMW-IAMF#7). Stations and maintenance facilities would be designed to minimize the exposure of pollutants to runoff in accordance with the Phase II MS4 permit. Stations and maintenance facilities would operate under a SWPPP in compliance with the IGP to further minimize potential groundwater quality impacts (HYD-IAMF#4).	While the project extent would develop portions of groundwater recharge areas in the Coyote Valley, which are susceptible to groundwater contamination, project features would minimize potential impacts on groundwater quality.
City of Gilroy General Plan (2002)			
Policy 25.18: Restrict urban development and expansion in areas prone to flooding (as indicated on the Flood Hazards Map) or on properties where drainage problems or saturated soil conditions create flood hazards. Allow development in such areas only if measures are enacted to reduce these hazards to an acceptable level of risk.	Inconsistent. The project extent would include development within areas susceptible to flood hazards within Gilroy, including the construction of viaducts and a maintenance of way facility in the Soap Lake floodplain.	Although the project extent would include development in floodplains, a Flood Protection Plan would be prepared to establish procedures and design features so that the project extent remains operational during the 100-year flood. In addition, the Flood Protection Plan would minimize impacts on the 100-year profiles, footprints, and peak flows of floodplains and floodways, including the Soap Lake floodplain (HYD-IAMF#2).	The project extent would include development within floodplains in Gilroy, because the proposed alignment crosses numerous low-lying areas susceptible to flooding. Project features would minimize potential effects of development in floodplains with a Flood Protection Plan.

Policy	Description of Inconsistency	Reconciliation	Rationale
The Santa Clara Valley Greenprint (2014)			
Strategy 1b: Advocate policies and use land protection measures that prevent urban development in groundwater recharge areas, particularly the Coyote Valley.	Inconsistent. The project extent includes development in groundwater recharge areas in the Coyote Valley.	Although the project extent would include development in groundwater recharge areas, the proposed development would be a small percentage of the overall recharge area. A Stormwater Management and Treatment Plan would include BMPs, such as infiltration BMPs, that would facilitate the percolation of runoff from impervious surfaces (HYD-IAMF#1).	While the project extent would entail development in portions of groundwater recharge areas in the Coyote Valley, project features have been incorporated to minimize impacts on groundwater recharge, including compliance with the Phase II MS4 permit, which requires infiltration BMPs within the southern portion of the Coyote Valley.
Strategy 4a: Ensure that leases and management agreements for the Santa Clara Valley Open Space Authority's agricultural tenants are written to protect water resources from depletion, pollution, development, and fire, including promotion of organic operations to limit the use of pesticides and fertilizers.	Inconsistent. Constructing the project extent would require the relocation or modification of existing irrigation and drainage features in agricultural lands, potentially resulting in the degradation of water resources.	Modifying and realigning jurisdictional features would be conducted in compliance with conditions in permits issued by regulatory agencies. During construction, a SWPPP would be implemented under the county general plan to avoid or minimize the discharge of sediment and pollutants to water resources, such as irrigation facilities and drainage features (HYD-IAMF#3). An Annual Vegetation Management Plan would be prepared to avoid or minimize discharges of pesticides during operations.	While construction of the project extent would require the modification and realignment of waterbodies, numerous IAMFs have been incorporated into the project to prevent the degradation and pollution of water resources in the Santa Clara Valley.

Sources: City of Gilroy 2002; City of Morgan Hill 2016; Santa Clara Valley Open Space Authority 2014.

Socioeconomics and Communities

Table 5 Policy Inconsistency, Reconciliation, and Rationale for Socioeconomics and Communities

Policy	Description of Inconsistency	Reconciliation	Rationale
Santa Clara County General Plan (1994, 2014)			
Policy HG 21. The conservation and rehabilitation of the existing housing supply shall be encouraged and facilitated.	Inconsistent The project extent would require the acquisition of land within the project footprint, result in the demolition of some existing residences that could widen existing community divisions, affect social relationships, and alter the existing character and integrity of the communities through which it passes. Project features and compliance with the Uniform Act would minimize the impacts on existing housing stock by providing relocation assistance for displaced residents. Mitigation measures would partially reduce these impacts; however, some existing housing and businesses would be permanently removed.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities, including housing. The Authority must comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended (Uniform Act), as identified in SOCIO-IAMF#2. ^ Despite implementation of ^ design features, the project would remain inconsistent. Not reconciled.	While the project extent would convert residential land uses to transportation and industrial uses, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize division of communities and reduction of housing stock.
Envision: San Jose 2040 General Plan (2011) and 2014–23 Housing Element (2015)			
Policy H-2.3. Conserve viable housing stock through a balanced combination of housing code enforcement and complementary programs such as rehabilitation loans and grants to help maintain the supply of low-priced housing. Policy H-3.4. Promote the conservation and rehabilitation of existing viable housing stock.	Inconsistent The project extent would require the acquisition of land within the project footprint, result in the demolition of some existing residences that could widen existing community divisions, affect social relationships, and alter the existing character and integrity of the communities through which it passes. Project features would minimize the impacts on existing housing stock by providing replacement housing.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities, including housing. The Authority must comply with the Uniform Act, as amended, as identified in SOCIO-IAMF#2. ^ Despite implementation of ^ design features, the project would remain inconsistent. Not reconciled.	While the project extent would convert residential land uses to transportation and industrial uses, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize division of communities and reduction of housing stock.

Policy	Description of Inconsistency	Reconciliation	Rationale
	Mitigation measures would partially reduce these impacts; however, some existing housing and businesses would be permanently removed.		
Communications Hill Specific Plan (1992)			
Adopt site planning and architectural guidelines and noise attenuation techniques to protect Communications Hill residents and workers from excessive noise from arterials, freeways, the fairground activities, adjacent industrial activities and trains and planes traveling nearby.	Inconsistent The project extent would introduce new sources of noise and vibration and could widen existing community divisions and affect social relationships. Project features would minimize the effects of noise and vibration through specific design features such as noise barriers and enclosed viaduct. Mitigation measures would partially reduce these impacts; however, some increased noise would be unavoidable.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities. The project includes NV-IAMF#1, Noise and Vibration, which requires that FTA and FRA guidelines for minimizing noise and vibration effects at sensitive receptors would be followed during construction and would minimize the effects of construction noise and vibration on communities. While the project includes this feature to implement urban design guidelines, the project would remain inconsistent. Not reconciled.	While the project extent would result in increased noise and vibration to sensitive receptors, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize increased noise and vibration.
Communications Hill Specific Plan Area Development Policy (2014)			
ADP Improvement 8: Capitol Caltrain Station Pedestrian/Bicycle Connection along Monterey Highway. Access from the Communications Hill 2 project site to the Capitol Caltrain Station on the east side of the railroad tracks adjacent to Monterey Road can be acquired by way of three options. These options were developed because property would need to be obtained from private property owners. Option #1 assumes the crossing would located north of the existing Capitol Caltrain Station. The overcrossing location for	Project Alternatives would introduce new tracks, permanent structures, and temporary construction staging where the policy proposes trail and crossing options. Option #1 would be consistent with Alternatives 1 through 4. The proposed trail would pass under the viaducts in Alternatives 1-3. For all alternatives, the crossing would pass over or under the Caltrain and blended corridor.	Conversion of the overcrossing in Option #2 and #3 to an undercrossing would make Option #2 and #3 consistent with Alternatives 1 through 3.	None of the project Alternatives would preclude construction of a pedestrian and bicycle overcrossing at Capitol Caltrain Station. All options proposed in ADP Improvement 8 remain feasible.

Policy	Description of Inconsistency	Reconciliation	Rationale
Options #2 and #3 would be approximately the same; adjacent to or very near the existing Station. The design of the crossing itself would be the same regardless of the access location. These options are generally described below and shown on Figure 2. Option #1 Alignment • Construct approximately 400 linear feet of sidewalk or pathway from the project site to the western landing of the future overcrossing to be located north of the existing Capitol Caltrain Station. • Construct a pedestrian/bicycle overcrossing between the end of the sidewalk/pathway and the existing sidewalk on the east side of the railroad tracks. The sidewalk on the east side of the railroad tracks along Monterey Road would be utilized to access the Station. • Requires right-of-way (easement) from at least one private property owner. • Requires coordination/permit from the Joint Powers Board Option #2 Alignment • Construct approximately 1,200 linear feet of pathway or trail from the project site to the western landing of the overcrossing to the Caltrain Station. A portion of this trail would run along the east side of the railroad tracks.	Option #2 would be consistent with Alternative 4 and inconsistent with Alternatives 1 through 3 as an over crossing would require a substantial increase in crossing height with the construction of the viaduct. Option #3 would be inconsistent with Alternatives 1 through 3 as an over crossing would require a substantial increase in crossing height with the construction of the viaduct. Option #3 would be consistent with Alternative 4 as the Option #3 overcrossing could connect to the overcrossing included in the Alternative 4 Capitol Caltrain Station design.		

Policy	Description of Inconsistency	Reconciliation	Rationale
• Construct a pedestrian/bicycle overcrossing between the end of the pathway/trail and the Station. • Requires easement from at least two private property owners. • Requires coordination/permit from the Joint Powers Board. Option #3 Alignment Utilize existing public streets and sidewalks south of the project site to the extent possible to access the future overcrossing. This would require the construction of approximately 2,200 linear feet of new sidewalks from the project site along Hillcap and Hillsdale Avenues and Granite Rock Way. At the terminus of Granite Rock Way, an approximately 400-foot long pathway/trail would be constructed to the western landing of the overcrossing. Construct a pedestrian/bicycle overcrossing between the end of the pathway/trail and the Station.			
Morgan Hill 2035 General Plan (2016) and 2015–2023 Housing Element Update (2015)			
Policy CNF-2.3. Quality of life. Maintain Morgan Hill's high quality of life for existing and future residents. Policy CNF-11.1. Preservation of Single-Family Neighborhoods. Encourage preservation and rehabilitation of single-family neighborhoods within the City. Policy CNF-15.6. Preservation of Homes Along Monterey Road. Encourage preservation of older homes along	Inconsistent The project extent would require the acquisition of land within the project footprint and result in the demolition of some existing residences and commercial and industrial properties that could widen existing community divisions, affect social relationships, reduce the quality of life for residents, and alter the existing character and integrity of the communities through which it passes. Some agricultural land	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities: Numerous project features and mitigation measures have been incorporated to reduce effects on communities from emissions, noise and vibration, risks to community security and safety, degradation of visual quality, and disruption of circulation and access on communities. The Authority will comply	While the project extent would convert residential, commercial and public facilities to transportation and industrial uses, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize division of communities, reduction of housing stock, and increased noise and vibration.

Policy	Description of Inconsistency	Reconciliation	Rationale
Monterey Road north of Central Avenue for commercial and office use. Policy CNF-17.1. Industrial Land Conversion. Discourage the conversion of property designated for industrial to non-industrial uses. Policy CNF-17.4. Property between Monterey Road and UPRR Tracks. Allow a mix of uses on the property located on the east side of Monterey Road south of the Union Pacific train trestle. Require designs for new development to recognize the significance of this portion of Monterey Road as the northerly entrance to downtown and the necessary limitations on use due to its single point of access. Policy ED-3.1. Business Retention, Expansion, and Attraction Efforts. Encourage retention and expansion of existing businesses, and attract new businesses. Policy ED-3.2. Employment Land Supply. Preserve the City's supply of industrial and commercial lands to support the City's goals and policies related to economic development and jobs-housing balance. Policy NRE-4.1. Agriculture Retention and Transition to Urban Uses. Support programs and techniques, including conservation easements and purchase of development rights to encourage the retention of agricultural activities and to minimize conflicts in the transition from agriculture to urban uses	would be displaced that could result in reduced agricultural production revenues. Project features and compliance with the Uniform Act would minimize the impacts on existing housing stock, commercial and industrial properties, agricultural facilities, and community and public facilities by maintaining access during project extent construction and operation, and offering relocation assistance. Mitigation measures would partially reconcile these impacts; however, some existing housing, commercial and industrial properties, and agricultural land would be permanently removed.	with the Uniform Act to provide relocation assistance for residents, businesses, agricultural properties, and community and public facilities. Despite implementation of project features and mitigation measures, the project would remain inconsistent. Not reconciled.	

Policy	Description of Inconsistency	Reconciliation	Rationale
Policy NRE-4.9. Urban Encroachment. Require new urban development adjacent to an existing agricultural operation to create an appropriate buffer area, on land within the proposed development, between urban uses and agricultural activities. Policy NRE-4.10. Land Use to Support Agricultural Viability. Maintain the economic viability of agriculture using a variety of methods.			
Policy SSI-8.1. Exterior Noise Level Standards. Require new development projects to be designed and constructed to meet acceptable exterior noise level standards.	Inconsistent The project extent would introduce new sources of noise and vibration that could widen existing community divisions, affect social relationships, reduce the quality of life for residents, and alter the existing character and integrity of the communities through which it passes. Project features would minimize the impacts from noise and vibration. Mitigation measures would partially reduce these impacts; however, some severe noise effects would remain.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities. The project includes features to minimize noise (NV-IAMF#1) to the maximum extent feasible. While the project includes this feature to implement urban design guidelines, the project would remain inconsistent. Not reconciled.	While the project extent would result in increased noise and vibration to sensitive receptors, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize increased noise and vibration.
Downtown Morgan Hill Specific Plan (2009)			
Encourage the preservation of the small-scale residential neighborhoods west of Monterey Road and north of Fourth Street.	Inconsistent The East of UPRR design option under Alternative 2 would travel through these neighborhoods and would require the acquisition of land within the project footprint, introduce new sources of noise and vibration, and result in the demolition of some existing residences that could widen existing community divisions, affect social relationships, reduce the quality of life for residents, and alter the	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities. Numerous project features have been incorporated to minimize effects on communities, including housing. While the project includes these features, the project would remain inconsistent. Not reconciled.	While the project extent would convert residential land uses to transportation and industrial uses, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize division of communities and reduction of housing stock.

Policy	Description of Inconsistency	Reconciliation	Rationale
	existing character and integrity of the communities through which it passes. Project features and compliance with the Uniform Act would minimize the impacts on existing housing stock by providing by providing relocation assistance for displaced residents and would minimize the impacts from noise and vibration and changes in visual character. Mitigation measures would partially reduce these impacts; however, some existing housing and businesses would be permanently removed, some increased noise would be unavoidable, and there would be a change in the existing visual environment.		
City of Gilroy 2020 General Plan (2002) and 2015-23 Housing Element (2014)			
Policy 4.01. Economic Viability of Agriculture. Support the long-term economic viability of agriculture and agri-tourism, thereby encouraging landowners to keep their land in cultivation. Policy 4.02, Agricultural Land Preservation. Work with the County, LAFCo, and other relevant agencies as well as private landowners to protect agricultural and grazing lands from encroachment by urban uses, and to encourage the use of such lands for active cultivation. Specifically, implement the strategies and actions recommended by the South County Agricultural Study (Strategies to Balance Planned Growth and Agricultural Viability in the Areas South and East of Gilroy, October 1996).	Inconsistent The project extent would require the acquisition of agricultural land within the project footprint that could result in reduced agricultural production revenues. Project features would minimize the impacts on existing housing stock and agricultural facilities by maintaining access for agricultural operations during construction and operation, and offering relocation assistance. Mitigation measures would partially reduce these impacts; however, some existing agricultural land would be permanently removed.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities: Numerous project features have been incorporated to minimize effects on communities, including agricultural properties. While the project includes these features, the project would remain inconsistent. Not reconciled.	While the project extent would convert farmland to transportation and industrial uses, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize effects on agricultural properties.

Policy	Description of Inconsistency	Reconciliation	Rationale
Santa Benito County 2035 General Plan (2015)			
Policy LU-3.2 Agricultural Integrity and Flexibility. The County shall protect the integrity of existing agricultural resources, and provide for flexibility and economic viability of farming and ranching operations. Policy NCR-1.1 Maintenance of Open Space. The County shall support and encourage maintenance of open space lands that support natural resources, agricultural resources, recreation, tribal resources, wildlife habitat, water management, scenic quality, and other beneficial uses.	Inconsistent The project extent would reduce the amount of land available for agricultural production. The project extent would introduce a large visual element into the existing rural landscape that would alter the rural character and natural beauty of the area. The project extent would also result in displacements of farm residences, acquisition of agricultural parcels, and splitting of some agricultural parcels along the alignment, resulting in the conversion of agricultural land, conflicts with the overall aim of the general plan policies, and short-term economic impacts. Project features and mitigation measures would reduce economic impacts, and compensation would be distributed on a case-by-case basis for split parcels. The project extent would result in overall economic benefits and facilitate regional economic expansion.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities. Numerous project features have been incorporated to minimize effects on communities, including agricultural properties and open space. While the project includes these features, the project would remain inconsistent. Not reconciled.	While the project extent would convert farmland and open space to transportation and industrial uses, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize effects on agricultural properties and open space.
2030 Merced County General Plan (2013)			
Policy AG-2.2. Agricultural Land Mitigation (RDR) Protect productive agricultural areas from conversion to non-agricultural residential uses by establishing and implementing an agricultural mitigation program that matches acres converted with farmland acres of similar quality to those converted preserved at a 1:1 ratio. Coordinate with the six cities in Merced County and the Merced Local Agency Formation Commission (LAFCo), consistent with	Inconsistent The project extent would reduce the amount of land available for agricultural production. The project extent would also result in displacements of farm residences, acquisition of agricultural parcels, and splitting of some agricultural parcels along the alignment, resulting in the conversion of agricultural land, conflicts with the overall aim of the general plan policies, and short-term	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities. Numerous project features have been incorporated to minimize effects on communities, including agricultural properties. While the project includes these features, the project would remain inconsistent. Not reconciled.	While the project extent would convert farmland to transportation and industrial uses, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize effects on agricultural properties.

Policy	Description of Inconsistency	Reconciliation	Rationale
LAFCo's statutory mission to preserve agricultural land and open space, to establish consistent standards and mitigation for the loss of farmland. In addition, the Land Evaluation and Site Assessment Model (LESA model) may be used to determine whether the conservation land is of equal or greater value than the land being converted. Policy AG-2.8. Conservation Easements (RDR/MPSP) Support the efforts of public, private, and non-profit organizations to preserve agricultural areas in the County through dedicated conservation easements, and range land held as environmental mitigation.	economic impacts. Project features and mitigation measures would reduce economic impacts, and compensation would be distributed on a case-by-case basis for split parcels. The project extent would result in overall economic benefits and facilitate regional economic expansion.		
Policy HS-7.4. New Noise or Groundborne Vibration Generating Uses (RDR) Require new commercial and industrial uses to minimize encroachment on incompatible noise or groundborne vibration sensitive land uses. Also consider the potential for encroachment by residential and other noise or groundborne vibration sensitive land uses on adjacent lands that could significantly impact the viability of the commercial or industrial areas.	Inconsistent The project extent would introduce new sources of noise and vibration that could widen existing community divisions, affect social relationships, reduce the quality of life for residents, and alter the existing character and integrity of the communities through which it passes. Project features would minimize the impacts from noise and vibration. Mitigation measures would partially reduce these impacts; however, some severe noise effects would remain.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities. The project includes features to minimize noise (NV-IAMF#1) to the maximum extent feasible. While the project includes this feature to implement urban design guidelines, the project would remain inconsistent. Not reconciled.	While the project extent would result in increased noise and vibration to sensitive receptors, the Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures to minimize increased noise and vibration.

Sources: City of Gilroy 2002, 2014; City of Morgan Hill 2009, 2015, 2016; City of San Jose 1992, 2011, 2015; County of Merced 2013; County of San Benito 2015; County of Santa Clara 1994, 2014.
The Project Section's consistency with regional and local plans and policies is assessed for adopted plans only.

Station Planning, Land Use, and Development

Table 6 Policy Inconsistency, Reconciliation, and Rationale for Station Planning, Land Use, and Development

Policy	Description of Inconsistency	Reconciliation	Rationale
2030 Merced County General Plan (2013)			
Policy LU-2.3: Land Use Activity Limitations (RDR) -- Limit allowed land use within Agricultural and Foothill Pasture areas to agricultural crop production, farm support operations, and grazing and open space uses.	All project alternatives, as one component of the overall statewide HSR system, would introduce a non-allowable land use within Agricultural and Foothill Pasture areas. Alternative 3 would result in the greatest inconsistency with this policy because it would affect the greatest amount of agricultural and pasture land.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities, including housing and job opportunities (LU-IAMF#1: HSR Station Area Development: General Principles and Guidelines, and LU-IAMF#2: Station Area Planning and Local Agency Coordination). While the project includes features to implement urban design guidelines to maximize compatible design, the project would introduce a non-allowable use into agricultural and pasture zones and would remain inconsistent. Not reconciled.	While the project extent would introduce non-permitted transportation and industrial uses into agricultural zones, the Authority is mandated to construct and operate the HSR system. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize conflicts with existing land uses (including agricultural land) and land use plans.
Santa Clara County General Plan (1994)			
Policy R-LU 2: Rural unincorporated lands outside cities' Urban Service Areas that are not designated 'Rural Residential' or other specialized land uses shall be designated as a type of 'Resource Conservation Area.' These lands consist primarily of the mountains and foothills, Bay wetlands and lowlands, and valley agricultural lands. Policy R-LU 3: The general intent of each 'Resource Conservation Area' designation is to encourage land uses and densities appropriate to the rural unincorporated areas that also: a. help preserve rural character; b. conserve natural, scenic, and cultural resources;	All project for alternatives would result in introduction of transportation and industrial uses into Resource Conservation Areas and non-permitted land uses into designated agricultural areas. Alternative 3 would result in the greatest inconsistency with this policy because it would affect the greatest amount of agricultural and pasture land.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities, including housing and job opportunities (LU-IAMF#1: HSR Station Area Development: General Principles and Guidelines, and LU-IAMF#2: Station Area Planning and Local Agency Coordination). While the project includes features to implement urban design guidelines to maximize compatible design, the project would introduce a non-permitted use into agricultural zones and would remain inconsistent. Not reconciled.	While the project extent would introduce non-permitted transportation and industrial uses into agricultural zones, the Authority is mandated to construct and operate the HSR system. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize conflicts with existing land uses (including agricultural land) and land use plans.

Policy	Description of Inconsistency	Reconciliation	Rationale
c. protect public health and safety from natural and man-made hazards; d. preserve agriculture and prime agricultural soils; e. protect watersheds and water quality; f. enhance air quality; and g. minimize the demand for and cost of public services and facilities. Policy R-LU-11: Allowable land uses shall be limited to: a. agriculture and ancillary uses; b. uses necessary to directly support local agriculture; and c. other uses compatible with agriculture which clearly enhance the long term viability of local agriculture and agricultural lands.			
Morgan Hill 2035 General Plan (2016)			
Policy NRE-1.4. South County Open Space. Preserve and maintain the wide variety of open spaces in the South County; including greenbelt areas, parks, and agricultural uses.	All project alternatives would result in loss of existing open space areas. Alternative 3 would result in the greatest inconsistency with this policy because it would affect the greatest amount of open space area.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities, including housing and job opportunities (LU-IAMF#1: HSR Station Area Development: General Principles and Guidelines, and LU-IAMF#2: Station Area Planning and Local Agency Coordination). The project would also incorporate features to minimize impacts on open space, including PK-IAMF#1: Parks, Recreation, and Open Space. While the project includes features to implement urban design guidelines to maximize compatible design and features to minimize effects on open space, the project would remove areas of open space and would remain inconsistent. Not reconciled.	While the project extent would remove some open space, the Authority is mandated to construct and operate the HSR system. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize conflicts with existing land uses (including agricultural land) and land use plans.

Policy	Description of Inconsistency	Reconciliation	Rationale
San Benito County 2035 General Plan (2015)			
Policy NCR-1.1 Maintenance of Open Space. The County shall support and encourage maintenance of open space lands that support natural resources, agricultural resources, recreation, tribal resources, wildlife habitat, water management, scenic quality, and other beneficial uses.	All project alternatives would result in loss of existing open space areas. Alternative 3 would result in the greatest inconsistency with this policy because it would affect the greatest amount of open space area.	The Authority and FRA would work with local governments to enhance the public benefits of HSR development so that they help meet the needs of the local communities, including housing and job opportunities (LU-IAMF#1: HSR Station Area Development: General Principles and Guidelines, and LU-IAMF#2: Station Area Planning and Local Agency Coordination). The project would also incorporate features to minimize impacts on open space, including PK-IAMF#1: Parks, Recreation, and Open Space. While the project includes features to implement urban design guidelines to maximize compatible design and features to minimize effects on open space, the project would remove areas of open space and would remain inconsistent. Not reconciled.	While the project extent would remove some open space, the Authority is mandated to construct and operate the HSR system. This is a state-level project that would have benefits across multiple resource areas. The project design includes features to minimize conflicts with existing land uses (including agricultural land) and land use plans.

Sources: City of Morgan Hill 2016; County of Merced 2013; County of San Benito 2015; County of Santa Clara 1994.
The project extent's consistency with regional and local plans and policies is assessed for adopted plans only.
HSR = high-speed rail
Authority = California High-Speed Rail Authority
FRA = Federal Railroad Administration
IAMF = impact avoidance and minimization feature

Agricultural Farmland

Table 7 Policy Inconsistency, Reconciliation, and Rationale for Agricultural Farmland

Policy	Description of Inconsistency	Reconciliation	Rationale
Plan Bay Area 2040 (2017)			
Goal: Open Space and Agricultural Preservation. Direct development within urban footprint … [The goal's] intent [is] to shift travel mode [from car-centric transportation] and achieve the plan's open space and agricultural preservation target.	Inconsistent Implementation of any of the alternatives would permanently convert substantial Important Farmland for operational infrastructure.	Through AG-MM#1, Conserve Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland), the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the project extent. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
Santa Clara County General Plan, 1995–2010 (1994)			
C-RC 37: Agriculture should be encouraged and agricultural lands retained for their vital contributions to the overall economy, quality of life, and for their functional importance to Santa Clara County. C-RC 40. Long term land use stability and dependability to preserve agriculture shall be maintained and enhanced by the following general means:	Inconsistent Implementation of any of the alternatives would permanently convert substantial Important Farmland for operational infrastructure.	Through AG-MM#1, Conserve Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland), the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the project extent. In addition, the Authority would fund the	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

Policy	Description of Inconsistency	Reconciliation	Rationale
b. regulating non-agricultural uses in agricultural areas, and their intensity and impacts on adjacent lands c. maintaining agriculturally-viable parcel sizes R-GD 1.1 1. Preserve the resources and rural character of lands outside Urban Service Areas (USAs). R-GD 3e. Land uses and development permitted under County jurisdiction shall be consistent with the following major County policies: e. preservation of agriculture. R-RC 40b. Long term land use stability and dependability to preserve agriculture shall be maintained and enhanced by the following general means: b. regulating non-agricultural uses in agricultural areas, and their intensity and impacts on adjacent lands R-RC 57 c. Agriculture shall be encouraged and prime agricultural lands retained for their value to the overall economy and quality of life of Santa Clara County, including: c. preservation of a diminishing natural resource, prime agricultural soils. R-LU-8. Santa Clara County is enriched by a special combination of the very finest soils, a very favorable, dependable growing climate, and generally adequate water supplies…. This combination of factors makes it highly desirable that certain lands be preserved for their intrinsic value as		purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	

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agricultural land and for productive agricultural land uses. SC 14.4. Some prime agricultural lands in South County (particularly within the prime agricultural areas east and south of Gilroy) should be preserved for agricultural use.			
R-RC 61 a, b, c. Allowable land uses in exclusive agricultural areas shall be limited to a. agriculture and ancillary uses, b. uses necessary to directly support local agriculture, and c. other uses compatible with agriculture which clearly enhance the long term viability of local agriculture and agricultural lands. R-LU 11 a, b, c. Allowable land uses shall be limited to: a. agriculture and ancillary uses; b. uses necessary to directly support local agriculture; and c. other uses compatible with agriculture which clearly enhance the long term viability of local agriculture and agricultural lands.	Inconsistent Implementation of any of the alternatives would not serve as an agricultural use and would not provide direct or indirect support to agricultural farmland.	While the project extent alternatives would not provide direct or indirect support to agricultural land, under AG-IAMF#6, Equipment Crossings, the Authority in coordination with the property owners of land in use for agricultural operations would finalize the realignments of any affected access roads to provide equipment crossings to minimize impediments to routine agricultural operations and normal business activities that may result from long-term operation of the project extent. In this way, the project extent would remain as compatible as possible with livestock and equipment movement. While the project extent includes this feature to minimize inconsistency with agricultural farmland, the project extent does not directly support local agriculture nor would it enhance the long term viability of local agriculture and agricultural lands. As a result, the project extent would remain inconsistent. Not reconciled.	HSR has a restricted right-of-way and a limited number of stations. This combination of factors limits the potential for HSR to have an effect outside the immediate corridor.
R-LU-3 d. The general intent of each 'Resource Conservation Area' designation is to encourage land uses and densities appropriate to the rural unincorporated areas that also: d. preserve agriculture and prime agricultural soils.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmlands within an Agricultural Conservation Easement.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

Policy	Description of Inconsistency	Reconciliation	Rationale
		Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	
Santa Clara County Code of Ordinances (2018)			
Title 18 Zoning, Chapter 18.08 Regulations for A- Agricultural Zoning Districts. Chapter 18.08 designates agricultural zones and permitted uses allowed therein.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
Santa Clara Valley Agricultural Plan (2018)			
Focus Area: Land Use Policy ▪ **Objective 1:** Recognize Viable Agricultural Lands and Sub-Areas Within the County General Plan and Zoning Ordinance. Strategies / Actions	Inconsistent Implementation of any of the alternatives would not serve as an agricultural use and would not extend zoning or agricultural designations.	While the project extent alternatives would not provide direct or indirect support to agricultural land, under AG-IAMF#6, Equipment Crossings, the Authority in coordination with the property owners of land in use for agricultural operations would finalize the realignments of any affected access roads to provide equipment crossings to minimize impediments to routine agricultural operations and normal business activities that may result from long-term operation of the project extent.	HSR has a restricted right-of-way and a limited number of stations. This combination of factors limits the potential for HSR to have an effect outside the immediate corridor.

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a. Extend Agricultural zoning to encompass all viable agricultural lands. b. Consider designation of agricultural zoning regions specific to sub-areas in the Agricultural Resource Area (ARA) that share a common identity, for focused application of agricultural protection tools. c. Coordinate with neighboring Santa Clara Valley cities to create consistency in the designation of agricultural areas between the County and Cities' General Plans.		In this way, the project extent would remain as compatible as possible with livestock and equipment movement. While the project extent includes this feature to minimize inconsistency with agricultural farmland, the project extent does not directly support local agriculture nor would it enhance the long term viability of local agriculture and agricultural lands. As a result, the project extent would remain inconsistent. Not reconciled.	
▪ **Objective 2:** Prevent the Conversion of Agricultural Lands to Non-Agricultural Uses Within the Rural Areas. Strategies / Actions a. Prevent the establishment of incompatible uses within the ARA which increase land speculation and impair ongoing agricultural production. b. Prevent conversion of agricultural lands into rural ranchettes that increase land speculation and reduce viability of ongoing neighboring farm operations. c. Enact a County-wide agricultural mitigation fee that requires a mitigation fee for development that converts viable agricultural land to other uses.	Inconsistent Implementation of any of the alternatives would permanently convert substantial Important Farmland for operational infrastructure.	Through AG-MM#1, Conserve Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland), the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural conservation easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the project extent. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

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▪ **Objective 4:** Reduce Conflict Between Incompatible Uses and Agriculture Within Agricultural Areas. Strategies / Actions a. Require setbacks/buffers for new non-agricultural development within or adjacent to agricultural lands to reduce interface between incompatible land uses and farming. b. Strengthen right-to-farm requirements.	Inconsistent Implementation of any of the alternatives would not serve as an agricultural use and would not provide direct or indirect support to agricultural farmland.	While the project extent alternatives would not provide direct or indirect support to agricultural land, under AG-IAMF#6, Equipment Crossings, the Authority in coordination with the property owners of land in use for agricultural operations would finalize the realignments of any affected access roads to provide equipment crossings to minimize impediments to routine agricultural operations and normal business activities that may result from long-term operation of the project extent. In this way, the project extent would remain as compatible as possible with livestock and equipment movement. While the project extent includes this feature to minimize inconsistency with agricultural farmland, the project extent does not directly support local agriculture nor would it enhance the long term viability of local agriculture and agricultural lands. As a result, the project extent would remain inconsistent. Not reconciled.	HSR has a restricted right-of-way and a limited number of stations. This combination of factors limits the potential for HSR to have an effect outside the immediate corridor.
Focus Area: Regional Agricultural Conservation Easement Program and Other Voluntary Financial Incentives ▪ **Objective 5:** Establish a Regional Agricultural Conservation Easement Purchasing Program for the Santa Clara Valley. Strategies / Actions a. Establish a Regional ACE Purchasing Program.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmlands within an Agricultural Conservation Easement.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural conservation easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

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▪ **Objective 6:** Encourage Landowners to Take Advantage of Property Tax Incentives to Keep Land in Agriculture. Strategies / Actions a. Increase participation in the County's Williamson Act Program and Establish a Farmland Security Zone Program.	Inconsistent. Implementation of any of the alternatives would permanently convert Important Farmland, potentially creating remainder parcels that would not meet county criteria for inclusion in Williamson Act and Farmland Security Zone programs and convert Important Farmlands within an Agricultural Conservation Easement	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural conservation easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
▪ **Objective 7:** Identify Opportunities and Create Programs that Provide Financial Compensation to Farmers for Providing Ecosystem Benefits (GHG Reduction, Groundwater and Floodplain Protection) Through Farming. Strategies / Actions a. One of the most important means to protect the local agricultural land base is to help ensure that farmers and ranchers can stay profitable over the long-term, reducing the pressure to sell land for development.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmlands for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural conservation easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

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Focus Area: Agricultural Economic Development Strategy ▪ **Objective 8:** Support the viability of the agricultural economy. Strategies / Actions a. Support farmers in obtaining permits and regulatory compliance associated with actions and activities that support long term agricultural investment and growth of the agricultural economy.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmlands for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural conservation easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
▪ **Objective 9:** Improve the Climate for the Growth of a Diverse, Vibrant, and Innovative Agriculture Economy. Strategies / Actions a. Create an Agricultural Enterprise Program for specific sub-areas of the ARA. b. Coordinate and support the small farms initiative effort under way by the SCC Food Systems Alliance. c. Support expansion of ag tourism. d. Address the need for additional distribution and processing space for agricultural products; include assessment of "hubs" for co-located businesses.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmlands. for operational infrastructure	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural conservation easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

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▪ **Objective 10:** Support the Growth of New Farms and Creation of New Farmers to Provide Diversity and Long-Term Resiliency in the Local Agricultural Economy. Strategies / Actions a. Address the needs of beginning and immigrant farmers, currently in the Country or interested in starting farming operations in the County, for land access, technical assistance and financial assistance. b. Develop an action plan for implementation of a Farm Incubator or AgPark, with related programs.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmlands for operational infrastructure	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural conservation easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
Santa Clara Valley GreenPrint (2014))			
Goal: Conserve farms, ranches, and other working landscapes to sustain the economic viability of local agriculture. **Strategies for Protecting Farms, Ranches, and Other Working Lands** 1. Protect farms and ranches through fee purchase, conservation easements, and other incentives. a. Partner with local and regional conservation organizations to secure funding for regionally significant farm and ranch protection projects with a focus on (1) farms and ranches that demonstrate long-term economic viability and operational adaptability,	Inconsistent Implementation of any of the alternatives would permanently convert substantial Important Farmland for operational infrastructure.	Through AG-MM#1, Conserve Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland), the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the project extent. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

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and that provide multiple environmental benefits and (2) urban-edge farmlands threatened by conversion to non-agricultural uses. b. Increase the Authority's funding and staffing capacity to manage conservation easements by developing program guidelines and mitigation policies. c. Explore the use of new conservation tools to help make farming economically viable, such as affirmative easements, right to purchase at farm value, and payment for ecosystem service programs. d. As new funding becomes available, develop a matching grant program to fund local Resource Conservation Districts, UC Cooperative Extension, land trusts, or other nonprofit conservation partners that assist farmers and ranchers with agricultural and natural resource protection projects. f. Work with conservation partners to conduct outreach to agricultural landowners to raise awareness about the Authority's conservation programs.		to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	
2. Manage Open Space Authority lands for natural resource protection and viable agricultural operations, and to model effective public-private partnerships. a. Engage experts to develop comprehensive management plans	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource

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for Authority properties and easements that integrate agricultural and natural resources. b. Work with the Natural Resources Conservation Service, Resource Conservation Districts, and other partners to share best practices for land management and secure funding to implement farm and rangeland conservation projects on Authority preserves and nearby private lands that enhance water quality, habitat protection, carbon sequestration, and other ecosystem services. c. Demonstrate and interpret successful conservation practices on Authority lands, such as hedgerows, sediment basins, irrigation efficiency projects, or other climate-smart projects. d. Explore opportunities for beginning farmers to lease Authority agricultural lands, for example, through California FarmLink. Offer competitive leases and long-term land security in exchange for tenants' commitment to implementing on-farm conservation and stewardship projects.		replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	areas. The project extent design includes measures to minimize conversion of agricultural lands.
4. Engage in local, regional, and state land use planning and policy projects to promote farm and rangeland protection and the economic viability of regional agriculture. a. Work with the Santa Clara County Local Agency Formation	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource

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Commission (LAFCO), the County, and cities to maintain and strengthen agricultural zoning, maintain effective urban growth boundaries, and develop and implement effective agricultural mitigation policies and projects. b. Work with state legislators to restore funding for the Williamson Act (including a focus on urban-edge farms, which are grossly underrepresented in Williamson Act contracts) and engage County leadership to secure funding and provide incentives, such as transportation project mitigation, and urban agriculture incentive zones to increase agricultural viability and protect open space. c. Advocate for agricultural tax credits such as California's Natural Heritage Tax Credit program. e. Initiate multi-benefit agricultural conservation projects that contribute to groundwater recharge and water supplies, water quality, and flood risk reduction. g. Advocate for a portion of AB 32 cap-and-trade revenues to be directed to farmland conservation. h. Strengthen SB 375 to integrate agricultural protection into the local Sustainable Communities Strategy (Plan Bay Area) and to promote agricultural protection within Association of Bay Area		replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	areas. The project extent design includes measures to minimize conversion of agricultural lands.

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Government (ABAG) Priority Conservation Areas. i. Support adoption of minimum statewide standards for mitigating the loss of farmland when a project results in the conversion of farmland to non-agricultural uses. j. Engage with transportation projects needing agricultural mitigation, such as the High Speed Rail and highway widening projects. k. Support implementation of a local agricultural enterprise zone to use tax benefits to incentivize farmland protection and value-added farm enterprises			
Paj^ a^ ro River Watershed Integrated Regional Water Management Plan (2014)			
Flood Protection Goal: Ensure flood management strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to maximize opportunities for comprehensive management of water resources. **Objectives:** 2. Reach consensus on the Pajaro River Risk Reduction Project necessary to protect existing urban areas and infrastructure from flooding and erosion from the 100-year event and to maximize opportunities to protect agricultural land uses. 5. Provide community benefits beyond flood protection such as public access, open space, recreation, agriculture preservation and economic development	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

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Envision San José 2040 (2011)			
LU-20.1 1. Protect and preserve the remaining farmlands within San José's sphere of influence that are not planned for urbanization in the timeframe of the Envision General Plan, such as mid- and south Coyote Valley, through the following means: 1. Strongly discourage conversion of agricultural lands outside the Urban Growth Boundary to non-agricultural uses. LU-20.9. Explore use of agricultural easements, transfer/purchase of development rights, or other options to keep Mid-Coyote Valley as permanent agriculture.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
Morgan Hill 2035 General Plan (2016)			
NRE-1.4. South County Open Space. Preserve and maintain the wide variety of open spaces in the South County; including greenbelt areas, parks, and agricultural uses.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

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		to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	
Morgan Hill ZA-14-11 Agricultural Mitigation Ordinance (2015)			
1. Preserve open space agricultural lands and agricultural activity within the Morgan Hill sphere of influence.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
Gilroy 2020 General Plan (2002)			
4.02. Agricultural Land Preservation. Work with the County, LAFCo, and other relevant agencies as well as private landowners to protect agricultural and grazing lands from encroachment by urban uses, and to encourage the use of such lands for active cultivation. Specifically, implement the strategies and actions recommended by the South County Agricultural Study (Strategies to Balance Planned Growth and Agricultural Viability in the Areas South and East of Gilroy, October 1996).	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

Policy	Description of Inconsistency	Reconciliation	Rationale
		Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	
2035 San Benito County General Plan (2015)			
LU-3.2. Agricultural Integrity and Flexibility. The County shall protect the integrity of existing agricultural resources, and provide for flexibility and economic viability of farming and ranching operations. LU-3.12. Agricultural Viability of Small Parcel Sizes. The County shall require project applicants seeking to subdivide agriculturally-zoned parcels to demonstrate the continued viability of lots less than 40 acres for commercial agriculture operations.LU-3.14. Land Trusts and Financial Incentives. The County shall consider land trusts and financial incentives to preserve agricultural soil resources and to protect the integrity of important agricultural areas for future use. NCR-1.1. Maintenance of Open Space. The County shall support and encourage maintenance of open space lands that support agricultural resources.	Inconsistent Implementation of any of the alternatives would permanently convert Important Farmland for operational infrastructure.	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
2030 Merced County General Plan (2013)			
AG-2.16: Coordinate with the California High-Speed Rail Authority to locate the high-speed rail lines along existing major transportation corridors, such as SRs 99 or 152, to minimize the conversion of	Inconsistent Implementation of any of the alternatives would not create high-speed rail lines that fully follow an existing major	Through AG-MM#1, the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits

Policy	Description of Inconsistency	Reconciliation	Rationale
productive agricultural land to nonagricultural uses.	transportation corridor along portions of its length within Merced County.	the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the Central Valley Wye. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.
City of Los Banos 2030 General Plan Update (2009)			
Policy POSR-G-8: Promote preservation of agriculture within the Planning Area. Policy POSR-I-28: Work with the County and with the Grasslands Water District to preserve agricultural uses outside the Urban Growth Boundary.	Inconsistent Implementation of any of the alternatives would permanently convert substantial Important Farmland for operational infrastructure.	Through AG-MM#1, Conserve Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland), the Authority would fund the DOC California Farmland Conservancy Program's purchase of agricultural easements from willing sellers. This program would preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur. The replacement ratio would be 1:1 for lands that are permanently, directly converted to nonagricultural use by the project extent. In addition, the Authority would fund the purchase of an additional increment of acreage for agricultural conservation easements at a ratio of not less than 0.5:1 for Important Farmland within a 25-foot wide area adjacent to HSR permanently fenced infrastructure. While the project extent includes this mitigation to preserve agricultural farmland, Important Farmland would be converted to nonagricultural uses. As a result, the project extent would remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project extent design includes measures to minimize conversion of agricultural lands.

Sources: ABAG and MTC 2018; City of Gilroy 2002; City of Los Banos 2009; City of Morgan Hill 2016; City of San Jose 2011; County of Merced 2013; County of San Benito 2015; County of Santa Clara 1994.
DOC = California Department of Conservation
HSR = high-speed rail

Authority = California High-Speed Rail Authority
LAFCo = Local Agency Formation Commission

Aesthetics and Visual Quality

Table 8 Policy Inconsistency, Reconciliation, and Rationale for Aesthetics and Visual Quality

Policy	Description of Inconsistency	Reconciliation	Rationale
Santa Clara County General Plan (1994)			
Policy C-GD 17: Provide protection of a scenic corridor in Coyote Valley adjacent to US 101.	Inconsistent C-GD 17. Implementation of the East Gilroy LMF/MOWF under Alternative 3 or South Gilroy LMF/MOWF under Alternatives 1 and 2 would place a large industrial facility in a rural agricultural setting east of the city of Gilroy that would degrade the visual environment.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, it will remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.
Policy C-PR 39: Protect the visual integrity of the scenic gateways to the South County (Pacheco Pass, Hecker Pass, Route 101 south of Gilroy, and a Coyote greenbelt area north of Morgan Hill). Policy R-PR 41: Protect the visual integrity of the scenic gateways to the South County—Pacheco Pass, Hecker Pass, Route 101 south of Gilroy, and a Coyote greenbelt area north of Morgan Hill.	Inconsistent Implementation of any alternative would degrade the visual environment along SR 152 in the Pacheco Creek Valley by regrading and removing the existing topography and land cover to provide a tunnel portal. Alternatives 1 and 3 would implement HSR aerial structure parallel to US 101 in the Coyote Valley that would block views and overwhelm the existing topography with its scale.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.

Policy	Description of Inconsistency	Reconciliation	Rationale
		that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, it will remain inconsistent. Not reconciled.	
Policy C-RC 61: Public and private development and infrastructure located in areas of special scenic significance should not create major, lasting adverse visual impacts	Inconsistent Implementation of any alternative would degrade the visual environment along SR 152 in the Pacheco Creek Valley by regrading and removing the existing topography and land cover to provide a tunnel portal. All alternatives would implement HSR aerial structure parallel to SR 152 in the Pacheco Creek Valley that would block views and overwhelm the existing topography with its scale.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, it will remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.
Policy R-GD 20: Grading and terrain alteration should conserve the natural landscape and resources, minimize erosion impacts, protect scenic resources, habitat, and water resources. Policy R-GD 25: Grading associated with roads, bridges, retaining walls, or similar improvements related to access requirements should not create a significant visual scar or impact to the environment. They should generally	Inconsistent Implementation of any alternative would degrade the visual environment along SR 152 in the Pacheco Creek Valley by regrading and removing the existing topography and land cover to provide a tunnel portal.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2).	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.

Policy	Description of Inconsistency	Reconciliation	Rationale
follow natural terrain and contours to the maximum extent feasible. Policy R-RC 101: Roads, building sites, structures, and public facilities shall not be allowed to create major or lasting visible scars on the landscape. Policy R-RC(i) 36: Protect the scenic value of the following major County thoroughfares and entranceways through state scenic highway designation, including SR 152 east of Gilroy (Pacheco Pass), SR 152 west of Gilroy (Hecker Pass), and US 101 south of the San Jose city limits. Policy SC 16.6: The visual integrity of the scenic gateways to the South County (Pacheco Pass, Hecker Pass, Route 101 south of Gilroy, and a Coyote greenbelt area north of Morgan Hill) should be protected.		While the proposed project includes these features to minimize visual impacts, it will remain inconsistent. Not reconciled.	
Policy R-LU 79: New public transportation facilities shall be compatible with the land uses in the areas in which they are located and consistent with the County's General Plan.	Inconsistent Implementation of the East Gilroy LMF/MOWF under Alternative 3 or South Gilroy LMF/MOWF under Alternatives 1 and 2 would place a large industrial facility in a rural location that would degrade the visual environment.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, it will remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.

Policy	Description of Inconsistency	Reconciliation	Rationale
2030 Merced County General Plan (2013)			
Policy NR-4.1: Promote the preservation of agricultural land, ranch land, and other open space areas as a means of protecting the County's scenic resources.	Inconsistent Implementation of any alternative would cross through agricultural and open-space lands. Views to and from these lands would be blocked by HSR infrastructure.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the project includes these features to minimize visual impacts, views would not be restored and the project will remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.
Envision: San José 2040 General Plan (2011)			
Policy IN-1.9: Design new public and private utility facilities to be safe, aesthetically pleasing, compatible with adjacent uses, and consistent with the Envision General Plan goals and policies for fiscal sustainability, environmental leadership, an innovative economy, and quality neighborhoods. Policy CD-9.1: Ensure that development within the designated Rural Scenic Corridors is designed to preserve and enhance attractive natural and built vistas. Policy CD-9.3: Ensure that development along designated Rural	Inconsistent Alternatives 1 or 3 would place an aerial structure along Monterey Highway in the Coyote Valley that would block views and overwhelm the existing topography with its scale.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, views would not be restored and the project will remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.

Policy	Description of Inconsistency	Reconciliation	Rationale
Scenic Corridors preserves significant views of the Valley and mountains, especially in, or adjacent to, Coyote Valley, the Diablo Range, the Silver Creek Hills, the Santa Teresa Ridge, and the Santa Cruz Mountains. Policy CD-10.1: Recognize the importance of Gateways in shaping perceptions of San José.			
Morgan Hill 2035 General Plan (2016)			
Policy NRE-2.1: Hillside and Ridgeline Views. Protect views of hillsides, ridgelines, and prominent natural features surrounding the City. These features help define the City's historic rural character, sense of place, image and identity.	Inconsistent Implementation of any alternative would include aerial structures or embankments that would block distant views to prominent natural features surrounding Morgan Hill for viewers adjacent to HSR. Alternatives 1 and 3 would place an aerial structure along US 101 that would block views. Alternative 2 would grade-separate roadways over HSR and UPRR where overcrossings and embankments would block distant views to prominent natural features surrounding Morgan Hill for viewers adjacent to HSR.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, views would not be restored and the project will remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.
Policy NRE-6.4: Tree Preservation and Protection. Preserve and protect mature, healthy trees whenever feasible, particularly native trees, historically significant trees, and other trees which are of significant size or of significant aesthetic value to the	Inconsistent Implementation of Alternative 2 would remove all Keesling's Shade Trees along Monterey Highway from the northern city limit of Morgan Hill to Cochrane Road.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize

Policy	Description of Inconsistency	Reconciliation	Rationale
immediate vicinity or to the community as a whole.		provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, the historic trees will be removed and the project will remain inconsistent. Not reconciled.	visual impacts on sensitive viewers.
Coyote Creek Parkway County Park Master Plan (2006)			
Policy PR-5: Maintain opportunities for the Parkway user to experience a sense of remoteness within the context of a rural riparian habitat corridor.	Inconsistent Alternatives 1 and 3 would place an aerial structure adjacent to the Coyote Creek Parkway that would block views and overwhelm the existing topography with its scale.	Prior to construction the contractor will document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options that can be applied to non-standard structures in the HSR system will be provided to local jurisdictions (AVR-IAMF#1). The Authority will also require its contractors to document that the Authority's *Aesthetic Design Review Process* has been followed (AVR-IAMF#2). While the proposed project includes these features to minimize visual impacts, views would not be restored and the project will remain inconsistent. Not reconciled.	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resource areas. The project design includes measures that will soften the appearance of HSR infrastructure to minimize visual impacts on sensitive viewers.

Sources: City of Morgan Hill 2016; City of San Jose 2011; County of Merced 2013; County of Santa Clara 1994; Santa Clara County Parks 2006.
Authority = California High-Speed Rail Authority
HSR = high-speed rail
LMF = light maintenance facility
MOWF = maintenance of way facility
SR = State Route
US = U.S. Highway

Cultural Resources

Table 9 Policy Inconsistency, Reconciliation, and Rationale for Cultural Resources

Policy	Description of Inconsistency	Reconciliation	Rationale
Envision San José 2040 General Plan (2011)			
Goal ER-10: Preserve and conserve archaeologically significant structures, sites, districts and artifacts in order to promote a greater sense of historic awareness and community identity. Goal LU-13: Preserve and enhance historic landmarks and districts in order to promote a greater sense of historic awareness and community identity and contribute toward a sense of place.	Inconsistent. Significant adverse impacts would occur to known historical resources, including human remains. Additionally, there is a potential for construction activities to encounter unknown archaeological resources or human remains.	Through implementation of CUL-MM#1, the Authority would complete Phased Identification inventory for archaeological resources and utilize or further develop treatment plans for any identified resources that would be impaired by the project. Implementation of CUL-MM#2 would insure that construction crews are trained to identify archaeological resources during construction activities, provide for construction monitoring by qualified professionals in areas of archaeological sensitivity, and establish procedures to stop work in the event of a discovery. Also in accordance with CUL-MM#2, if human remains are encountered, the appropriate state and federal laws would be followed to determine whether the remains are affiliated with a Native American tribe; if so, such remains would be treated appropriately. In accordance with CUL-MM#3, in the event that an unknown archaeological resource is encountered and cannot be avoided, mitigation measures would be applied as stipulated by the MOA and ATP. CUL-MM#4 would require a relocation plan to be prepared and implemented for resources that the alternative would demolish. CUL-MM#4 would be applied to resources where it appears that the resource could feasibly be relocated without degradation of its integrity of setting, design, materials, workmanship, feeling, and association. CUL-MM#6 would be applied to require that properties experiencing a significant impact be fully documented prior to construction to record the character-defining features, and CUL-MM#7 would be applied to provide for the creation of interpretive materials using documentation prepared under CUL-MM#6. CUL-MM#10 would require that new station facilities be designed in a manner consistent with the SOI's Standards for Rehabilitation. CUL-MM#11 would relocate an ATC site away from the location of a historical	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resources areas. Through project features and implementation of mitigation measures, the Authority would reconcile potential inconsistencies and avoid, minimize, or mitigate impacts on cultural resources.

Policy	Description of Inconsistency	Reconciliation	Rationale
		resource, 415 Illinois Avenue, and would prevent the resource's demolition. With the implementation of CUL-MM#1, CUL-MM#2, CUL-MM#3, CUL-MM#4, CUL-MM#6, CUL-MM#7, CUL-MM#10, and CUL-MM#11, the inconsistency would be reconciled and the project would be consistent with these goals and policies.	
Santa Clara County General Plan (1994, revised 2006)			
Goal 5.1: Heritage Resource Protection. Protection and preservation of heritage resources both natural (e.g. heritage trees; and paleontological resources) and cultural (e.g. historic sites and structures, and archeological sites). Cultural heritage resources reflecting the contributions to society of all cultures acknowledged, preserved and commemorated. Policy C-RC-52: Heritage Resources Preservation. Prevention of unnecessary losses to heritage resources should be ensured as much as possible through adequate ordinances, regulations, and standard review procedures. Mitigation efforts, such as relocation of the resource, should be employed where feasible when projects will have significant adverse impact upon heritage resources.	Inconsistent. Significant adverse impacts would occur to known historical resources, including human remains. Additionally, there is a potential for construction activities to encounter unknown archaeological resources or human remains.	Through implementation of CUL-MM#1, the Authority would complete Phased Identification inventory for archaeological resources and utilize or further develop treatment plans for any identified resources that would be impaired by the project. Implementation of CUL-MM#2 would insure that construction crews are trained to identify archaeological resources during construction activities, provide for construction monitoring by qualified professionals in areas of archaeological sensitivity, and establish procedures to stop work in the event of a discovery. Also in accordance with CUL-MM#2, if human remains are encountered, the appropriate state and federal laws would be followed to determine whether the remains are affiliated with a Native American tribe; if so, such remains would be treated appropriately. In accordance with CUL-MM#3, in the event that an unknown archaeological resource is encountered and cannot be avoided, mitigation measures would be applied as stipulated by the MOA and ATP. CUL-MM#4 would require a relocation plan to be prepared and implemented for resources that the alternative would demolish. CUL-MM#4 would be applied to resources where it appears that the resource could feasibly be relocated without degradation of its integrity of setting, design, materials, workmanship, feeling, and association. CUL-MM#6 would be applied to require that properties experiencing a significant impact be fully documented prior to construction to record the character-defining features, and CUL-MM#7 would be applied to provide for the creation of interpretive materials using documentation prepared	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resources areas. Through project features and implementation of mitigation measures, the Authority would reconcile potential inconsistencies and avoid, minimize, or mitigate impacts on cultural resources.

Policy	Description of Inconsistency	Reconciliation	Rationale
		under CUL-MM#6. CUL-MM#10 would require that new station facilities be designed in a manner consistent with the SOI's Standards for Rehabilitation. CUL-MM#11 would relocate an ATC site away from the location of a historical resource, 415 Illinois Avenue, and would prevent the resource's demolition. With the implementation of CUL-MM#1, CUL-MM#2, CUL-MM#3, CUL-MM#4, CUL-MM#6, CUL-MM#7, CUL-MM#10, and CUL-MM#11, the inconsistency would be reconciled and the project would be consistent with these goals and policies.	
City of Santa Clara General Plan (2010)			
Policy 5.6.2-P1: Areas of Historic Sensitivity. Evaluate any proposed changes to properties within 100 feet of historic resources on the City's list of Architecturally or Historically Significant Properties for potential negative effects on the historic integrity of the resource or its historic context. Goal 5.6.3-G1: Archaeological and Cultural Resources. Protection and preservation of cultural resources, as well as archaeological and paleontological sites.	Inconsistent. Significant adverse impacts would occur to known historical resources located within the area of potential effects. Additionally, there is a potential for construction activities to encounter unknown archaeological resources or human remains. Furthermore, there is a potential for construction activities to affect the 100-foot setting of historical resources located outside of the area of potential effects.	Through implementation of CUL-MM#1, the Authority would complete Phased Identification inventory for archaeological resources and utilize or further develop treatment plans for any identified resources that would be impaired by the project. Implementation of CUL-MM#2 would insure that construction crews are trained to identify archaeological resources during construction activities, provide for construction monitoring by qualified professionals in areas of archaeological sensitivity, and establish procedures to stop work in the event of a discovery. Also in accordance with CUL-MM#2, if human remains are encountered, the appropriate state and federal laws would be followed to determine whether the remains are affiliated with a Native American tribe; if so, such remains would be treated appropriately. In accordance with CUL-MM#3, in the event that an unknown archaeological resource is encountered and cannot be avoided, mitigation measures would be applied as stipulated by the MOA and ATP. CUL-MM#4 would require a relocation plan to be prepared and implemented for resources that the alternative would demolish. CUL-MM#4 would be applied to resources where it appears that the resource could feasibly be relocated without degradation of its integrity of setting, design, materials, workmanship, feeling, and association. CUL-MM#6 would be applied to require that properties experiencing a significant impact be fully documented prior	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resources areas. Through project features and implementation of mitigation measures, the Authority would reconcile potential inconsistencies and avoid, minimize, or mitigate impacts on cultural resources.

Policy	Description of Inconsistency	Reconciliation	Rationale
		to construction to record the character-defining features, and CUL-MM#7 would be applied to provide for the creation of interpretive materials using documentation prepared under CUL-MM#6. CUL-MM#10 would require that new station facilities be designed in a manner consistent with the SOI's Standards for Rehabilitation. CUL-MM#11 would relocate an ATC site away from the location of a historical resource, 415 Illinois Avenue, and would prevent the resource's demolition. However, mitigation measures would apply only to historical resources within the area of potential effects. With the implementation of CUL-MM#1, CUL-MM#2, CUL-MM#3, CUL-MM#4, CUL-MM#6, CUL-MM#7, CUL-MM#10, and CUL-MM#11, one inconsistency would be reconciled and the project would be consistent with Goal 5.6.3-G1. The project would remain inconsistent with Policy 5.6.2-P1.	
City of Morgan Hill 2035 General Plan (2016)			
Policy HC-8.1: Identify and protect historic resources. Identify and protect heritage resources from loss and destruction.	Inconsistent. Significant adverse impacts would occur to known historical resources. Additionally, there is a potential for construction activities to encounter unknown archaeological resources or human remains.	Through implementation of CUL-MM#1, the Authority would complete Phased Identification inventory for archaeological resources and utilize or further develop treatment plans for any identified resources that would be impaired by the project. Implementation of CUL-MM#2 would insure that construction crews are trained to identify archaeological resources during construction activities, provide for construction monitoring by qualified professionals in areas of archaeological sensitivity, and establish procedures to stop work in the event of a discovery. Also in accordance with CUL-MM#2, if human remains are encountered, the appropriate state and federal laws would be followed to determine whether the remains are affiliated with a Native American tribe; if so, such remains would be treated appropriately. In accordance with CUL-MM#3, in the event that an unknown archaeological resource is encountered and cannot be avoided, mitigation measures would be applied as stipulated by the MOA and ATP. CUL-MM#4 would require a relocation plan to be prepared and implemented for resources that the alternative would	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resources areas. Through project features and implementation of mitigation measures, the Authority would reconcile potential inconsistencies and avoid, minimize, or mitigate impacts on cultural resources.

Policy	Description of Inconsistency	Reconciliation	Rationale
		demolish. CUL-MM#4 would be applied to resources where it appears that the resource could feasibly be relocated without degradation of its integrity of setting, design, materials, workmanship, feeling, and association. CUL-MM#6 would be applied to require that properties experiencing a significant impact be fully documented prior to construction to record the character-defining features, and CUL-MM#7 would be applied to provide for the creation of interpretive materials using documentation prepared under CUL-MM#6. CUL-MM#10 would require that new station facilities be designed in a manner consistent with the SOI's Standards for Rehabilitation. CUL-MM#11 would relocate an ATC site away from the location of a historical resource, 415 Illinois Avenue, and would prevent the resource's demolition. With the implementation of CUL-MM#1, CUL-MM#2, CUL-MM#3, CUL-MM#4, CUL-MM#6, CUL-MM#7, CUL-MM#10, and CUL-MM#11, the inconsistency would be reconciled and the project would be consistent with these goals and policies.	
San Benito County 2035 General Plan (2015)			
Goal NCR-7: To protect, preserve, and enhance the unique cultural and historic resources in the county.	Inconsistent. Significant adverse impacts would occur to known historical resources. Additionally, there is a potential for construction activities to encounter unknown archaeological resources or human remains.	Through implementation of CUL-MM#1, the Authority would complete Phased Identification inventory for archaeological resources and utilize or further develop treatment plans for any identified resources that would be impaired by the project. Implementation of CUL-MM#2 would insure that construction crews are trained to identify archaeological resources during construction activities, provide for construction monitoring by qualified professionals in areas of archaeological sensitivity, and establish procedures to stop work in the event of a discovery. Also in accordance with CUL-MM#2, if human remains are encountered, the appropriate state and federal laws would be followed to determine whether the remains are affiliated with a Native American tribe; if so, such remains would be treated appropriately. In accordance with CUL-MM#3, in the event that an unknown archaeological resource is encountered and cannot be avoided, mitigation measures would be	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resources areas. Through project features and implementation of mitigation measures, the Authority would reconcile potential inconsistencies and avoid, minimize, or mitigate impacts on cultural resources.

Policy	Description of Inconsistency	Reconciliation	Rationale
		applied as stipulated by the MOA and ATP. CUL-MM#4 would require a relocation plan to be prepared and implemented for resources that the alternative would demolish. CUL-MM#4 would be applied to resources where it appears that the resource could feasibly be relocated without degradation of its integrity of setting, design, materials, workmanship, feeling, and association. CUL-MM#6 would be applied to require that properties experiencing a significant impact be fully documented prior to construction to record the character-defining features, and CUL-MM#7 would be applied to provide for the creation of interpretive materials using documentation prepared under CUL-MM#6. CUL-MM#10 would require that new station facilities be designed in a manner consistent with the SOI's Standards for Rehabilitation. CUL-MM#11 would relocate an ATC site away from the location of a historical resource, 415 Illinois Avenue, and would prevent the resource's demolition. With the implementation of CUL-MM#1, CUL-MM#2, CUL-MM#3, CUL-MM#4, CUL-MM#6, CUL-MM#7, CUL-MM#10, and CUL-MM#11, the inconsistency would be reconciled and the project would be consistent with these goals and policies.	
2030 Merced County General Plan (2013)			
Goal RCR-2: Protect and preserve the cultural, archaeological, and historic resources of the County in order to maintain its unique character. Policy RCR-2.1: Archaeological Site and Artifact Protection. Require development projects that affect archaeological sites and artifacts to avoid disturbance or damage to these sites. Policy RCR-2.5: Human Remains Discovery. Requires that, in the event of	Inconsistent Significant adverse impacts would occur to known historical resources. Additionally, there is a potential for construction activities to encounter unknown archaeological resources or human remains.	Through implementation of CUL-MM#1, the Authority would complete Phased Identification inventory for archaeological resources and utilize or further develop treatment plans for any identified resources that would be impaired by the project. Implementation of CUL-MM#2 would insure that construction crews are trained to identify archaeological resources during construction activities, provide for construction monitoring by qualified professionals in areas of archaeological sensitivity, and establish procedures to stop work in the event of a discovery. Also in accordance with CUL-MM#2, if human remains are encountered, the appropriate state and federal laws would be followed to determine whether the remains are affiliated with a Native	The Authority is mandated to construct and operate the HSR project. This is a state-level project that would have benefits across multiple resources areas. Through project features and implementation of mitigation measures, the Authority would reconcile potential inconsistencies and avoid, minimize, or mitigate impacts on cultural resources.

Policy	Description of Inconsistency	Reconciliation	Rationale
discovery of human remains on any project construction site, all work in the vicinity of the find will cease and the County coroner and Native American Heritage Commission will be notified.		American tribe; if so, such remains would be treated appropriately. In accordance with CUL-MM#3, in the event that an unknown archaeological resource is encountered and cannot be avoided, mitigation measures would be applied as stipulated by the MOA and ATP. CUL-MM#4 would require a relocation plan to be prepared and implemented for resources that the alternative would demolish. CUL-MM#4 would be applied to resources where it appears that the resource could feasibly be relocated without degradation of its integrity of setting, design, materials, workmanship, feeling, and association. CUL-MM#6 would be applied to require that properties experiencing a significant impact be fully documented prior to construction to record the character-defining features, and CUL-MM#7 would be applied to provide for the creation of interpretive materials using documentation prepared under CUL-MM#6. CUL-MM#10 would require that new station facilities be designed in a manner consistent with the SOI's Standards for Rehabilitation. CUL-MM#11 would relocate an ATC site away from the location of a historical resource, 415 Illinois Avenue, and would prevent the resource's demolition. With the implementation of CUL-MM#1, CUL-MM#2, CUL-MM#3, CUL-MM#4, CUL-MM#6, CUL-MM#7, CUL-MM#10, and CUL-MM#11, the inconsistency would be reconciled and the project would be consistent with these goals and policies.	

Sources: City of Gilroy 2002; City of Morgan Hill 2016; City of Santa Clara 2010; County of Merced 2013; County of San Benito 2015; County of Santa Clara 1994.
The project extent's consistency with regional and local plans and policies is assessed for adopted plans only.
ATP = Archaeological Treatment Program
Authority = California High-Speed Rail Authority
CUL-MM = Cultural Resources Mitigation Measure
HSR = high-speed rail
MOA = Memorandum of Agreement

References

Association of Bay Area Governments (ABAG) and Metropolitan Transit Commission (MTC). 2017. *Plan Bay Area 2040*. http://2040.planbayarea.org/cdn/farfuture/DNwQeazEwHFfJg-HZ-_GMZSVQxPV0mKk0nTUkVaDSes/1506467747/sites/default/files/2017-09/Plan_Bay_Area_2040-09262017-links.pdf (accessed October 16, 2017).

California High-Speed Rail Authority and Federal Railroad Administration (Authority and FRA). 2005. *Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System*. Sacramento, CA and Washington, DC. August 2005.

City of Gilroy. 2002. *2020 General Plan*. www.ci.gilroy.ca.us/274/2020-General-Plan (accessed March 7, 2017).

———. 2014. *2015-23 Housing Element.* www.cityofgilroy.org/DocumentCenter/View/5272 (accessed March 7, 2017).

City of Los Banos. 2009. *2030 General Plan Update*. Approved July 15. http://losbanos.org/wp-content/uploads/2013/09/plan_gp_entire.pdf (accessed April 14, 2017).

City of Morgan Hill. 2009. *Downtown Morgan Hill Specific Plan.* www.morgan-hill.ca.gov/DocumentCenter/View/3195 (accessed March 8, 2017).

———. 2015. *2015-2023 Housing Element Update.* www.morgan-hill.ca.gov/DocumentCenter/View/15642 (accessed March 8, 2017).

———. 2016. *2035 General Plan.* http://morganhill2035.org/wp-content/uploads/2016/08/MorganHill2035_GeneralPlan_Adopted1.pdf. (accessed March 7, 2017).

City of San Jose. 1992. *Communications Hill Specific Plan.* Available at: www.sanjoseca.gov/DocumentCenter/Home/View/345. (accessed October 12, 2017).

———. 2011. *Envision San Jose 2040 General Plan: Building a City of Great Places*. Adopted November 1, 2011. Available online: https://www.sanjoseca.gov/DocumentCenter/Home/View/474. (accessed June 9, 2016).

———. 2014. *Communications Hill Specific Plan Area Development Policy*. June 2, 2014. https://www.sanjoseca.gov/home/showdocument?id=24679 (accessed November 11, 2020).

———. 2015. *2014-23 Housing Element.* www.sanjoseca.gov/DocumentCenter/View/43711 (accessed March 6, 2017).

City of Santa Clara. 2010. *City of Santa Clara 2010–2035 General Plan*. November. http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan (accessed March 7, 2017).

County of Merced. 2013. *2030 Merced County General Plan.* www.co.merced.ca.us/DocumentCenter/Home/View/6766 (accessed March 8, 2017).

County of San Benito. 2015. *2035 General Plan.* http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf (accessed March 8, 2017).

County of Santa Clara.1994 (revised 2006). *Santa Clara County General Plan, 1995–2010*. December 20. www.sccgov.org/sites/dpd/PlansOrdinances/GP/Pages/GP.aspx (accessed March 8, 2017).

———. 2014. *County of Santa Clara Housing Element Update 2015-2022.* June. http://www.sccgov.org/sites/dpd/DocsForms/Documents/HealthElement_2015_Adopted_Final.pdf (accessed March 8, 2017).

County of Santa Clara and Santa Clara Valley Open Space Authority. 2018. *Santa Clara Valley Agricultural Plan: Investing in our Working Lands for Regional Resilience*. January 2018.

www.openspaceauthority.org/system/user_files/Documents/Grids/current_projects/SCV_ActionPlan_010318.pdf (accessed September 2, 2020).

Santa Clara County Parks. 2006. *Coyote Creek Parkway County Park: Integrated Natural Resources Management Plan and Master Plan Draft*. Prepared by 2M Associates, Jones and Stokes Associates, Balance Hydrologics, Inc., and Harison and Associates. Available online: www.sccgov.org/sites/parks/PlansProjects/Documents/Coyote-Creek-Parkway/Draft-Integrated-Plan-Report.pdf (accessed June 9, 2016).

Santa Clara Valley Open Space Authority. 2014. Santa Clara Valley Greenprint. Available at: www.openspaceauthority.org/about/pdf/SCVOSA.Greenprint.FINAL.March2014_RevisedWithCovers28May2014_LoRes.pdf (accessed on July 12, 2017).

APPENDIX 2-L: CONSTRUCTABILITY ASSESSMENT REPORT - RECORD PEPD

California High-Speed Rail Authority

San Jose to Merced Project Section: San Jose to Central Valley Wye

Constructability Assessment Report – Record PEPD

March 2019

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY 1-1
1.1 Scope and Approach 1-1
1.2 Conclusions and Recommendations 1-1

2 INTRODUCTION 2-3
2.1 Purpose 2-3
2.2 Project Overview 2-3
2.3 Project Description 2-4
2.4 Alignment Alternatives ..... **Error! Bookmark not defined.**
2.5 Infrastructure Improvements and Phasing 2-9

3 SEGMENT CONSTRUCTION PACKAGING 3-1
3.1 Risks 3-2
3.2 Recommendations 3-2

4 GENERAL CONSTRUCTION METHODS 4-1
4.1 Clearing and Grubbing 4-1
4.2 Demolition 4-1
4.3 Earthwork 4-1
4.4 Roadway 4-3
4.5 Drainage 4-4
4.6 Structures 4-5
4.6.1 Aerial Structures 4-5
4.6.2 Open-Trench Excavation 4-14
4.6.3 Cut-and-Cover Tunnel 4-15
4.6.4 Bored Tunnels 4-15
4.6.5 Retaining Walls 4-15
4.7 Track 4-15
4.8 Utility Relocations/Adjustments/Construction 4-19

5 SUBSECTION CONSTRUCTION 5-1
5.1 San Jose Diridon Station Approach 5-1
5.1.1 Alternative 1 5-1
5.1.2 Alternative 2 5-2
5.1.3 Alternative 4 5-2
5.2 Monterey Corridor 5-3
5.2.1 Monterey Corridor At-Grade/Embankment (Alternative 2) 5-3
5.2.2 Monterey Corridor Viaduct (Alternative 1) 5-4
5.2.3 Monterey Corridor Blended At-Grade (Alternative 4) 5-5
5.3 Morgan Hill and Gilroy 5-6
5.3.1 Viaduct to Downtown Gilroy (Alternative 1) 5-6
5.3.2 Embankment to Downtown Gilroy (Alternative 2) 5-7
5.3.3 Viaduct to East Gilroy (Alternative 3) 5-9
5.3.4 Blended At-Grade to Downtown Gilroy (Alternative 4) 5-9
5.4 Gilroy and Pacheco Pass Tunnels (Alternatives 1-4) 5-10
5.5 San Joaquin Valley (Alternatives 1-4) 5-11

6 CONSTRUCTION STAGING AREAS 6-1
6.1 Monterey Viaduct Alignment Using Full Span Construction 6-1
6.1.1 Location 6-1
6.1.2 Description of Site 6-3

6.1.3 Criteria Compliance 6-3
6.1.4 General Size, Shape, Location 6-3
6.1.5 Site Summary 6-4
6.2 Blended At-Grade Alignment Construction 6-4
6.2.1 Location 6-4
6.2.2 Description of Site 6-5
6.2.3 Criteria Compliance 6-5
6.2.4 General Size, Shape, Location 6-5
6.2.5 Site Summary 6-5

7 PRECASTING OPERATIONS AND YARD REQUIREMENTS 7-1

8 CONSTRUCTION SEQUENCING 8-1
8.1 Construction Timing Constraints 8-1
8.2 Enabling Works 8-1
8.3 Typical Construction Sequencing and Durations 8-1

9 TRAFFIC CONTROL AND DETOURS 9-1
9.1 At-Grade Crossing Replacement 9-1
9.2 Monterey Corridor Grade Separations 9-1
9.3 Caltrain Station Access 9-2

10 CONSTRUCTION POLLUTION CONTROL 10-1
10.1 Air Quality 10-1
10.2 Noise and Vibration 10-1
10.2.1 Water Quality 10-1

11 CONSTRUCTION PERMITS 11-1

12 THIRD PARTY COORDINATION AND AGREEMENTS 12-1
12.1 Caltrans 12-1
12.2 Utilities 12-1
12.3 Railroads 12-2
12.3.1 Caltrain 12-2
12.3.2 Union Pacific Railroad 12-3
12.4 Local Jurisdictions 12-3
12.4.1 Discussion 12-3
12.5 Coordinating Betterments and Adjoining Third Party Work 12-4
12.5.1 Discussion 12-4

13 POTENTIAL EXCAVATION HAZARDS 13-1
13.1 Surface Soils 13-1
13.2 Deep Excavations 13-1

14 RIGHT-OF-WAY ACQUISITION 14-1

15 CONSTRUCTION POLLUTION CONTROL 15-1

16 CONCLUSIONS 16-1

17 REFERENCES 17-1

Tables

Table 2-1 San Jose to Central Valley Wye Design Options by Subsection 2-7
Table 5-1 San Jose to Merced HSR Project Subsections 5-10
Table 11-1 Construction Permits 11-1

Figures

Figure 2-1 High-Speed Rail System in California 2-4
Figure 2-2 San Jose to Central Valley Wye Project Map and Subsections 2-5
Figure 4-1 Expected Haul Distances from Various Types of Equipment 4-2
Figure 4-2 Precast Full Span Construction Schematic 4-5
Figure 4-3 Taiwan High Speed Rail *(Courtesy of Uwe Baier)* 4-6
Figure 4-4 Precast Full Span Sequence and Production Rate 4-7
Figure 4-5 Precast Segmental Construction Schematic 4-8
Figure 4-6 Precast Segmental Construction 4-9
Figure 4-7 Precast Segmental Sequence and Production Rate 4-10
Figure 4-8 Balanced Cantilever Construction Components 4-11
Figure 4-9 Form Travelers and Temporary Supports in Balanced Cantilever Construction 4-11
Figure 4-10 Balanced Cantilever Sequence and Production Rate 4-12
Figure 4-11 Traveling Formwork System from HSR Tech Memo TM 2.3.3 4-13
Figure 4-12 CIP Concrete Construction Sequence and Production Rate 4-14
Figure 4-13 Ballast Track - Schotteroberbau 4-16
Figure 4-14 Ballast Track with Mats - Japan 4-16
Figure 4-15 Ballast Track Turnouts 4-16
Figure 4-16 Slab Track - China HSR 4-17
Figure 4-17 Track Turnouts - China HSR 4-17
Figure 5-1 Typical Section in Subsection San Jose Diridon Station Alternative 1 5-1
Figure 5-2 Typical Section in Subsection San Jose Diridon Station Alternative 2 5-2
Figure 5-3 Typical Sections in Subsection Pacheco Pass (Tunnel) 5-11
Figure 6-1 Far North End Staging Area, Alternatives 1 and 3 (Sta 310+00 near Capitol Caltrain) 6-1
Figure 6-2 Central Staging Area, Alternatives 1 and 3 (Sta 920+00 near Morgan Hill) 6-2
Figure 6-3 South End Staging Area, Alternative 1 (Sta 1575+00 in Gilroy) 6-2
Figure 6-44South End Staging Area, Alternative 3 (Sta 1605+00 in Gilroy) 6-3
Figure 7-1 Precast Yard Layout 7-1

Appendices

Appendix A: Monterey Highway Viaduct, Typical Section Installation – Full Span Precast
Appendix B: Monterey Highway Viaduct, Balanced Cantilever Installation
Appendix C: Monterey Highway Viaduct, Precast Box Girder Yard Dimensions
Appendix D: San Jose Station Approach Constructability Analysis
Appendix E: Potential Contract Packages and Schedule
Appendix F: Potential Construction Sequence at I-280
Appendix G: Potential Construction Sequence at Monterey Highway
Appendix H: Track Shift Works

ACRONYMS AND ABBREVIATIONS

AB	(California) Assembly Bill
ATC	Automatic Train Control
Authority	California High-Speed Rail Authority
BC	Balanced Cantilever
BMP	best management practice
C&M	Construction & Maintenance
CalMod	Caltrain Modernization
Caltrans	California Department of Transportation
CAMUTCD	California Manual on Uniform Traffic Control Devices
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
CHSR	California High-Speed Rail
CIDH	cast-in-drilled hole
CIP	cast-in place
CVY	Central Valley Wye
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HSR	high-speed rail
JM	San Jose to Merced Project Section
MOU	Memorandum of Understanding
MOWF	Maintenance of Way Facility
MOWS	Maintenance of Way Siding
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
OCS	Overhead Contact System
PCEP	Caltrain Peninsula Corridor Electrification Project,
PCJPB	Peninsula Corridor Joint Powers Board
PEPD	Preliminary Engineering for Project Definition
RC	Regional Consultant
ROW	right-of-way
RWQCB	Regional Water Quality Control Board

SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
UPRR	Union Pacific Railroad
VdB	vibration decibels
VTA	Santa Clara Valley Transportation Authority

1 EXECUTIVE SUMMARY

1.1 Scope and Approach

HNTB studied constructability of the San Jose to Merced (JM) Section of the California High-Speed Rail (CHSR) project. Information used included preliminary designs with plans, profiles and cross-sections at the Draft Project Engineering for Project Definition (PEPD) submittal stage.

We approached the study with a mission to understand the project and provide feedback on concerns that a construction contractor or manager might have. We identified numerous factors that could challenge designers, contractors, and agency construction managers. We have provided discussion, a set of risks, and recommendations for action or further study.

1.2 Conclusions and Recommendations

We have concluded that each of the four alternatives, as currently presented, can be built, but they present varying degrees of complexity, cost, duration, and impact on the environment and the public. Physical and other constraints of each alternative will vary the expense, duration, and impact of each one.

“Big ticket” concerns that should be addressed in detail before the project is built include:

- Property acquisition will be long and complex. The California High-Speed Rail Authority (Authority) should carry out property acquisitions itself and not delegate this to the design-build contractors.
- Construction work on route segments should not be started before all property acquisitions are made for the segment.
- Responsibility, processes, and payment mechanisms for dealing with unforeseen environmental contamination should be established in construction contract documents.
- Construction and maintenance (C&M) agreements with stakeholders, including local jurisdictions, California Department of Transportation (Caltrans), and utilities should be comprehensive, detailed, and executed before beginning construction.
- Reflect stakeholder agreements in the construction contract documents, and bind contractors to perform in accordance with the stakeholder agreements.
- Accommodation of Caltrain and Union Pacific Railroad (UPRR) train operations will constrain construction operations and increase the construction cost and duration.
- At-grade and viaduct cross-sections are the most buildable cross-sections.
- Trench and embankment cross-sections present the most difficult staging challenges, mostly due to constrained right-of-way (ROW) width, earthmoving operations, and difficulties stemming from maintaining Caltrain and UPRR operations without modification.

2 INTRODUCTION

2.1 Purpose

The purpose of this Constructability Assessment Report is to provide a general overview of the different types of construction elements involved in this section of the project, identify potential construction concerns, and provide insight into the activities and general sequencing necessary to complete the construction.

This report is divided into various sections that each discuss a separate topic:

- Section 3: Provides a general overview of the project
- Section 4: Provides options and recommendations for a series of construction contract packages.
- Section 5: Discusses general construction elements with probable production rate estimates.
- Section 6: Provides additional insight into individual subsection construction elements, challenges, and general sequencing of construction
- Section 7: Identifies staging areas.
- Section 8: Provides a casting yard layout.
- Section 9: Describes construction sequencing.
- Section 10: Provides a general discussion on traffic control and detours for the project.
- Section 11: Describes pollution control.
- Section 12: Provides a list of probable construction permits that may be required.
- Section 13: Discusses Third Party Coordination and Agreements.
- Section 14: Describes potential excavation hazards.
- Section 15: Discusses ROW acquisition.
- Section 16: Discusses construction pollution control.
- Section 17: Provides summary conclusions.
- Section 18: References.

2.2 Project Overview

The California High-Speed Rail Authority (Authority) proposes to construct, operate, and maintain an electric-powered HSR system in California. When completed, the nearly 800-mile train system would provide new passenger rail service to more than 90 percent of the state's population. More than 200 weekday trains would serve the statewide intercity travel market. The HSR will be capable of operating speeds of up to 220 miles per hour (mph), with state-of-the-art safety, signaling, and automated train control (ATC) systems. The system will connect and serve the state's major metropolitan areas, extending from San Francisco to Los Angeles and Anaheim in Phase 1, with extensions to Sacramento and San Diego in Phase 2. The HSR system will be designed to be capable of a nonstop operational service time between San Francisco and Los Angeles of 2 hours and 40 minutes.

The statewide California HSR Project has been divided into a number of geographic sections for the planning, environmental approval, design, and implementation of the project. This memorandum supports the section of the HSR System between San Jose and Merced, and specifically covers the San Jose to Central Valley Wye project extent from Scott Boulevard in Santa Clara to Carlucci Road in Merced County). See Figure 2-1 Proposed San Jose to Merced Project Section.

Figure 2-1 Proposed San Jose to Merced Project Section

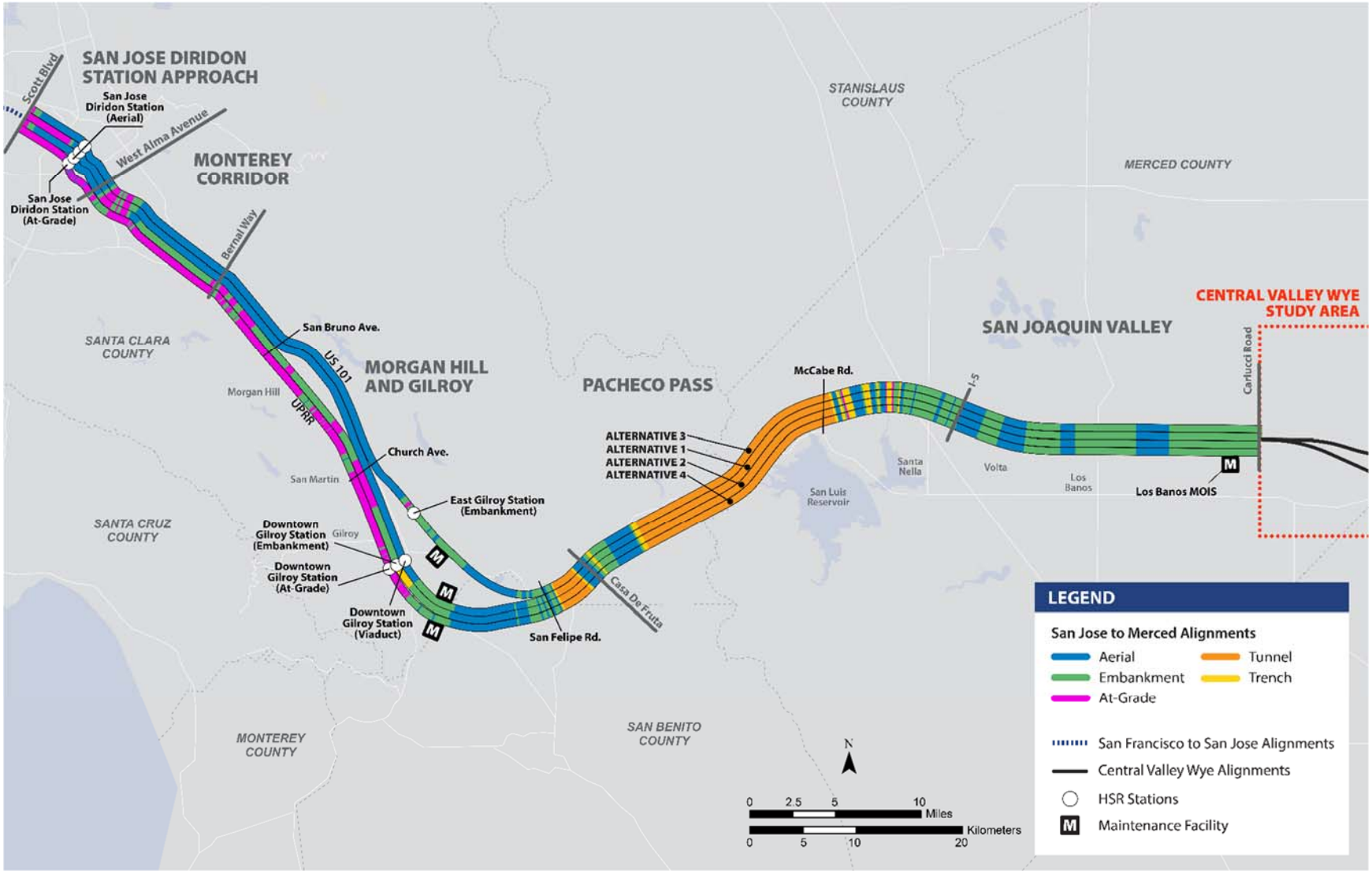
2.3 Project Description

The San Jose to Central Valley Wye segment of the HSR corridor extends approximately 90 miles and includes portions of blended and dedicated track and systems; HSR stations located at San Jose, Diridon, and Gilroy; a maintenance of way facility (MOWF) in the Gilroy area; and a maintenance of way siding (MOWS) west of Turner Island Road in the Central Valley. The project continues south from San Jose to Gilroy, then east through the Pacheco Pass to the Central Valley and ends at Carlucci Road the western boundary of the Central Valley Wye.

The infrastructure and systems of the HSR system consist of HSR trains, tracks, stations, automatic train control (ATC) and communication sites, overhead contact system (OCS) and traction power distribution systems, and infrastructure and vehicle maintenance facilities. The design of dedicated system portions of each HSR alternative includes a double-track rail system to accommodate planned project operational needs for high-capacity rail movement. The HSR safety criteria requires avoidance of at-grade intersections on dedicated HSR alignments where operating speeds will exceed 125 mph; accordingly, the system will require grade-separated overcrossings or undercrossings for roadways that intersect the planned right-of-way. In areas where operating speeds will be less than 125 mph, at-grade intersections may be used. The HSR system will be on an access-controlled guideway with mainline tracks, maintenance, and storage facilities including intrusion detection and monitoring systems designed to prevent access by unauthorized vehicles, persons, animals, and objects. The ends of the HSR trainsets would include a collision response management system to minimize the effects of a collision.

The project comprises the following five subsections shown in Figure 2-2:

- **San Jose Diridon Station Approach**—Extends approximately 6 miles from north of San Jose Diridon Station at Scott Boulevard in Santa Clara to West Alma Avenue in San Jose. This subsection includes the San Jose Diridon Station and overlaps the southern portion of the San Francisco to San Jose Project Section.
- **Monterey Corridor**—Extends approximately 9 miles from West Alma Avenue to Bernal Way in the community of South San Jose. This subsection is entirely within the city of San Jose.



Source: Authority 2018c, 2018d

Figure 2-2 San Jose to Central Valley Wye Project Map and Subsections

- **Morgan Hill and Gilroy**—Extends approximately 30–32 miles from Bernal Way in the community of South San Jose to Casa de Fruta Parkway/State Route (SR) 152 in the community of Casa de Fruta in Santa Clara County.
- **Pacheco Pass**—Extends approximately 25 miles from Casa de Fruta Parkway/SR 152 to Interstate 5 (I-5) in Merced County.
- **San Joaquin Valley**—Extends approximately 18 miles from I-5 to Carlucci Road in unincorporated Merced County.

2.4 Alignment Alternatives

The Authority and the Federal Railroad Administration (FRA) have developed four end-to-end alternatives for the project. Table 2-1 shows the distinguishing features of each alternative by subsection.

Table 2-1 San Jose to Central Valley Wye Design Options by Subsection

Subsection/Design Options	Alternative 1	Alternative 2	Alternative 3	Alternative 4
San Jose Diridon Station Approach				
Viaduct to Scott Boulevard		X	X	
Viaduct to I-880	X			
Blended, At-Grade				X
Monterey Corridor				
Viaduct	X		X	
At-Grade/Embankment		X		
Blended, At-Grade				X
Morgan Hill and Gilroy				
Embankment to downtown Gilroy		X		
Viaduct to downtown Gilroy	X			
Viaduct to east Gilroy			X	
Blended, At-Grade to downtown Gilroy				X
Pacheco Pass				
Tunnel	X	X	X	X
San Joaquin Valley				
Henry Miller Road	X	X	X	X

Source: Authority 2018c, 2018d

For Alternatives 1, 2, and 3, HSR transitions from the blended system between San Francisco and Santa Clara to a fully dedicated double-track system north of the San Jose Diridon Station at either Scott Boulevard or near I-880. Within the dedicated system, track will either be elevated or grade separated from surface roadways so there will be no grade crossings between the high-speed train and vehicular traffic.

Alternative 4 would extend the blended system through San Jose to Gilroy and would be substantially within the existing Caltrain and UPRR rights-of-way before transitioning to a fully dedicated system. Within the blended service portions, train speed would be limited to 110 mph,

and at-grade roadway crossings would be permitted with additional safety improvements. Two tracks would be provided for blended passenger service with an additional track for dedicated freight use by UPRR. Alternative 4 would utilize existing and in-progress infrastructure improvements developed by Caltrain for its Caltrain Modernization Program, including electrification of the Caltrain corridor between San Francisco and Tamien under the Caltrain Peninsula Corridor Electrification Project (PCEP), and the installation of an advanced signal system under the Communications Based Overlay Signal System (CBOSS) Positive Train Control Project south to Control Point Lick. It would also require modifications and safety and security improvements at existing Caltrain stations to accommodate HSR trains.

Alternative 1 (Morgan Hill to Downtown Gilroy Viaduct Alternative) would comprise the following alternative subsection alignments and elements (from north to south):

1. San Jose Diridon Station Approach Subsection – from Scott Boulevard to I-880, HSR travels at-grade in the blended Caltrain corridor and transitions to a dedicated aerial viaduct structure south of I-880 that connects to the San Jose Diridon Station;
2. Monterey Corridor Subsection – from West Alma south, the alignment continues on an aerial viaduct structure;
3. Morgan Hill and Gilroy Subsection – south of Kittery Court, HSR travels primarily on an aerial viaduct through the Downtown Gilroy Station, the South Gilroy MOWF, and Tunnel 1;
4. Pacheco Pass Subsection – the HSR alignment travels through a 13.5-mile-long tunnel; and
5. San Joaquin Valley Subsection - HSR transitions to an embankment at Henry Miller Road, travels through the Los Banos MOWS and connects to the Central Valley Wye HSR Section at Carlucci Road.

Alternative 2 (East UPRR/Downtown Gilroy Embankment) would include the following alternative alignments and elements:

1. San Jose Diridon Station Approach Subsection - starting at Scott Boulevard, the alignment transitions from blended service with Caltrain to a dedicated aerial viaduct that connects to San Jose Diridon Station;
2. Monterey Corridor Subsection - from West Alma south to Bernal/Kittery Court, the HSR alignment travels primarily on embankment;
3. Morgan Hill and Gilroy Subsection – south of Kittery Court, HSR travels on an embankment through the Downtown Gilroy Station and the South Gilroy MOWF through Tunnel 1 to the Pacheco Pass;
4. Pacheco Pass Subsection – is consistent with Alternative 1; and
5. San Joaquin Valley Subsection – is consistent with Alternative 1.

Alternative 3 (Morgan Hill/East Gilroy) would include the following alternative alignments and elements:

1. San Jose Diridon Station Approach Subsection – is consistent with Alternative 2, starting at Scott Boulevard, the alignment transitions from blended service with Caltrain to a dedicated aerial viaduct that connects to the San Jose Diridon Station;
2. Monterey Corridor Subsection – is consistent with Alternative 1;
3. Morgan Hill and Gilroy Subsection – south of Kittery Court, HSR continues primarily on a viaduct through East Gilroy (including East Gilroy Station and East Gilroy MOWF) and Tunnel 1 to Pacheco Pass;
4. Pacheco Pass Subsection – is consistent with Alternative 1; and
5. San Joaquin Valley Subsection – is consistent with Alternative 1.

Alternative 4 (Blended At-grade) would include the following alternative alignments and elements:

1. San Jose Diridon Station Approach Subsection – starting at Scott Boulevard, the alignment remains as blended service with Caltrain to an at-grade San Jose Diridon Station and continuing along the existing Caltrain ROW to West Alma Avenue (south of the Caltrain Tamien Station);
2. Monterey Corridor Subsection – from West Alma Avenue south to Bernal/Kittery Court, the HSR alignment travels at-grade in the existing Caltrain ROW to CP Lick, then in UPRR ROW to south of Kittery Court;
3. Morgan Hill and Gilroy Subsection – south of Kittery Court, HSR travels at-grade in the existing UPRR ROW to the Downtown Gilroy Station, at which point the blended service transitions to a dedicated HSR ROW and a South Gilroy MOWF to the west of the mainline. South of the MOWF, the alignment is consistent with Alternative 1;
4. Pacheco Pass Subsection – is consistent with Alternative 1; and
5. San Joaquin Valley Subsection – is consistent with Alternative 1.

2.5 Infrastructure Improvements and Phasing

HSR blended service from Santa Clara to Gilroy will be phased per the Authority's 2018 Business Plan. This stipulates that improvements will be phased to meet 2027 and 2033 operating requirements, as follows:

2027 Peninsula Service – San Jose to Gilroy

- Convert all at-grade crossings to four quadrant gates with channelization to permit operations up to 110 mph;
- Maintain current maximum allowable speed (MAS) of 79 mph;
- Raise and extend two at-grade platforms at the San Jose Diridon Station for HSR use;
- Between CP Coast and Diridon, provide for two electrified tracks for blended service, and two non-electrified tracks for UPRR use;
- South of Diridon to Gilroy, provide for one non-electrified track (MT1), two electrified tracks (MT2 and MT3);
- Reconfigure VTA/Caltrain stations at San Martin, Morgan Hill, Blossom Hill and Capitol to be accessed from MT2 and MT3; and
- Reconfigure Gilroy Station with two high level platforms for HSR use and provision for HSR bypass tracks, and two low level platforms for Caltrain/TAMC
- Construct the South Gilroy MOWF with access from UPRR.
- Provide completely access controlled ROW using fences, trespass guards and quad-gates.

2029 Valley to Valley Service

- Provide connecting tracks south from Gilroy Station to connect with dedicated HSR alignment;

2033 Phase One

- Increase MAS to 110 mph between Santa Clara and Gilroy.

3 SEGMENT CONSTRUCTION PACKAGING

HSR construction segmentation can be done geographically (by physical area); by trade (per the type of construction to be done); or by end use (to achieve interim operational goals upon completion). The Authority must also decide whether it wants to perform the work in smaller or larger segments.

The decision on how to segment the project will be determined by considering the following factors (per our understanding of the project's goals):

- Create useable HSR track segments.
- Maintain Caltrain passenger and UPRR train operations.
- Type of construction (tunneling, aerial, earthwork, buildings).
- Phasing precedent preparatory activities (e.g., environmental and utilities clearance).
- Dirt balance for overall project and within contract packages.
- Funding limits from cash flow and budget restrictions.
- Contract package size limit to attract bidders of desirable firm size and experience.
- Local jurisdictional boundaries.
- Appropriate locations for track tie-in and other joins at contract boundaries.
- Station locations for Caltrain and HSR.

Geographical contract packaging would establish route lengths that end at specific boundary locations selected according to criteria deemed suitable by the Authority. The selection would factor in the predominance of the type of work and the ability to achieve useable track segments.

Trade contract packaging brings designers and contractors with specialty experience within a certain construction type into their field of expertise. At the extreme end of the scale, in the multiple prime contractor delivery method a project owner would hire a series of specialty contractors to deliver a particular scope of work.

Stations - transit agencies try to build a certain consistency into their stations while also making them unique to their locations per accepted architectural practice. Consistency usually extends to technical details and equipment to make the maintenance of buildings and other facilities easier for the agency workforce.

A **combined** method of contracting with features of both geographic and trades may be considered. This would make the geographic general contract the fundamental method but use trades contracts for portions of the work. Work that is appropriate for separate contracts includes:

- Environmental remediation
- Demolition
- Utilities potholing and relocation
- Roadway relocations
- Utility relocations
- Initial track and signal relocation
- Stations and other buildings

There can be benefits to doing other preparatory work in advance of general contractor mobilization. Where dirt balance can be achieved across contract package boundaries, for instance, it may be economical to have an earthmoving contractor excavate and fill before the

general contracts are awarded. The same might be considered for station relocations, drilled piers for trench walls, and facilities such as railroad spurs and barge piers for transporting spoil.

There may also be benefits to contracting certain items for the entire project rather than leaving them to be arranged by individual contractors. These include:

- Disposal sites for remediated materials
- Disposal sites for clean spoil
- Rail freight for material delivery and spoil removal

The Authority has stated an intent to have rail and systems (power, controls, communications, signal) installed by specialty contractors that are separate from the builders for the civil and utilities infrastructure.

3.1 Risks

- Need to carefully craft scopes to integrate with other contract packages; otherwise projects can be difficult to coordinate, leading to conflicts, delays, and extra costs.
- Large general contractor resources can be used to generate large amounts of information, requests, and claims that can overwhelm agency staffs that do not have equivalent resources.
- Single issues that block work — such as ROW holdouts preventing certification, bankruptcy, or court order to stop work — may inordinately delay large contract packages for long route segments.
- Short contract packages increase the need for coordination and the likelihood of conflicts that must be resolved by the Owner.
- General contractors may not have expertise in certain construction types, leading to heavy reliance on its subcontractors for that work creating communications problems that inhibit problem solving.
- Numerous prime contractors tasked with work in a single location increases the Owner's coordination duties and its liability for coordination issues that delay contractors.

3.2 Recommendations

- Award the following Construction Contract Packages:
    - Contract Package 1 – Early Interim Service between Santa Clara and Gilroy
    - Contract Package 2 – Tunneling Packages
    - Contract Package 3 – At Grade, Viaduct, and Trench Packages
    - Contract Package 4 – Rail Infrastructure and Testing
    - Contract Package 5 – Stations and Maintenance Facilities

  (See Appendix E for potential packages and estimated schedules)
- Use a single contractor to install rail and systems.

4 GENERAL CONSTRUCTION METHODS

A portion of the San Jose to Merced section of the HSR alignment construction will occur immediately adjacent to in-use and operating roadways, operating UPRR tracks, and electrified Caltrain tracks. The construction process must accommodate for these facilities remaining operational during construction.

4.1 Clearing and Grubbing

This consists of the removal of top soil, trees, minor physical objects, and other vegetation from the construction site with the use of specialized equipment for raking, cutting, and grubbing.

Production rates for clearing and grubbing can vary from one (1) to ten (10) acres a day depending on the following

- Utility relocations required
- Urban or rural areas
- Amount of wooded areas
- Dedicated construction equipment and resources

4.2 Demolition

Demolition consists of removing buildings, existing bridges, and other large features that conflict with the planned construction. Different methods of demolition could be employed depending on resources available. Relocation of building occupants and roadways will need to take place prior to demolition. A typical two-story building can be demolished in one day.

A demolition survey and plan will be developed for structure demolition. If any hazardous materials such as asbestos are identified, a specialist will need to be brought in to remove and dispose of the hazardous materials in a safe controlled way.

4.3 Earthwork

Earthwork consists of both excavation and embankment. Excavation is the removal of soils by mechanical equipment. Embankment is the placement and compaction of soils for the construction process by means of mechanical equipment.

All material used for the embankment and roadbed of the tracks must be classified to determine the amount of organics, liquid limits, plasticity index, and gradation. A standard system of soil classification will be established to provide requirements for the anticipated individual soil types that will be used for the track and roadway foundations. Material with high organics will be classified as muck and must not be used in the construction of the bed for the tracks or roadways. It is anticipated that muck will be disposed of by placing it along slopes to provide optimum growing conditions for sod and other vegetation. High plastic material with liquid limits greater than 50 will have limited use in the embankment and it is anticipated it will be placed outside the 2:1 control line of the slope from the bed of the tracks and roads.

Soil surveys will be performed to determine the classifications of existing soils within the proposed alignments. The soils survey will be used to determine the dispositions of existing soils. Poor soil conditions will pose significant construction issues and lead to compounded problems for permanent construction with settlement issues. Representative samples of existing soils will be taken at frequencies recommended by the project team and agreed to by the Authority.

Sampling of existing soils and soils expected to be transported to the project site for use as embankment will be tested to provide information needed during the construction process. Proper compaction of soils must be achieved with certified test results to document all compaction requirements. Proctors for each sampled soil type will be established during the construction and will detail optimum moisture for the particular soil type being used, and graphically show the range of densities associated with the different moisture contents. Proctors will be performed in the laboratory to simulate field operations. Target compaction densities and moisture contents will be provided for all material types. All earthwork must be constructed within the optimal ranges of moisture for the particular soil type being used. This will allow for proper densities of the soil and result in a firm and unyielding foundation.

Embankment areas will need to be staged to allow minimal handling of material. Storage areas must be identified that do not conflict with the construction, while also being close to the borrow material placement to avoid repetitive handling. Temporary construction easements must be considered during plan development to ensure sufficient storage areas are established. Excavation and removal of unsuitable soils will have to be stockpiled at determined locations for ease of transport off site to locations identified by the design-build firm. All earthwork will need to follow recommendations of the Geotechnical Investigation Report, which will address issues such as soil types, subsidence, consolidation, liquefaction, seismic response etc., and will provide recommendations for the mitigation of these factors in design and construction.

Earthmoving will be done using conventional methods. For very short distances (less than 300 feet), dozers will be used to shift earth. For distances from 300 feet up to 2,500 feet, scrapers will be used. For distances greater than 2,500 feet (e.g., when moving earth for underpasses and overpasses), trucks will be employed. See Figure 4-1 for the expected haul distances for various types of equipment as outlined in the Caterpillar Performance Handbook, Edition 38.

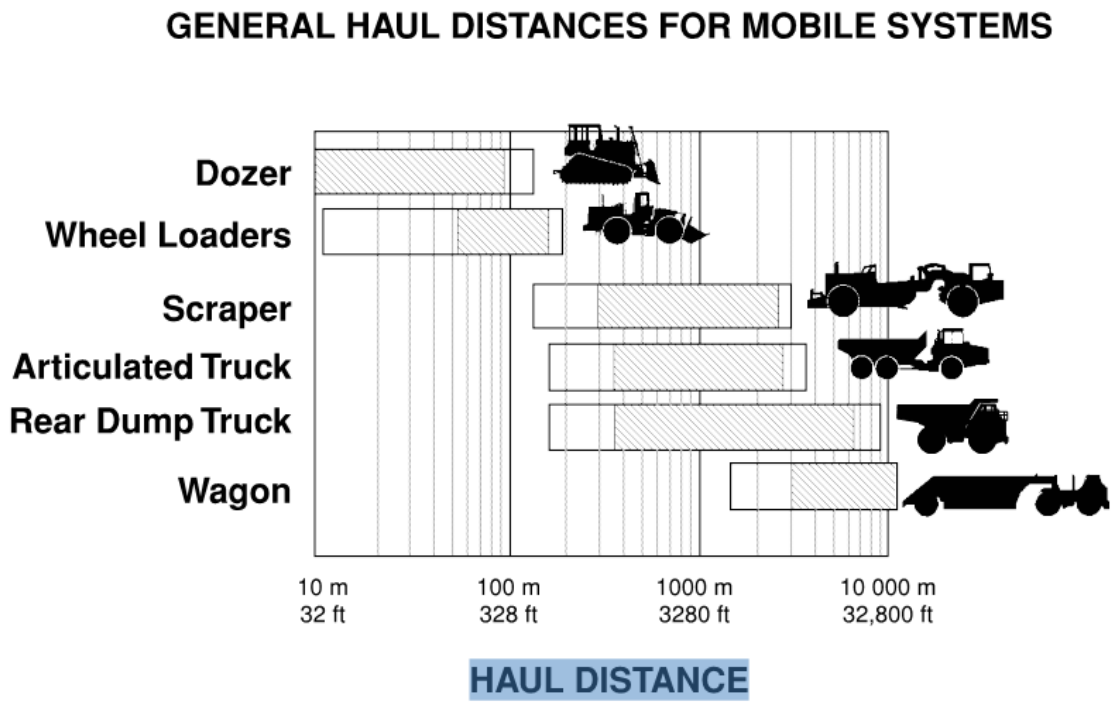


Figure 4-1 Expected Haul Distances from Various Types of Equipment

Production rates for excavation and embankment can range from 900 cubic yards to 7,500 cubic yards per day. Factors that affect production rates include:

- Haul route distances
- Compaction rates of different soil types
- Types of excavation required – lateral, ditch, subsoil, trench, or foundations

4.4 Roadway

Roadway reconstruction is a major component of the HSR project. Due to the alignment of the HSR, roads are being proposed to be raised, lowered, realigned, and constructed as overpasses or undercrossings, and at various locations, new frontage roads are proposed. After the earthwork operations are performed, roadway subgrade, base, and final pavement sections will be constructed. It is assumed major diversions to the existing roadways that will be grade separated will be avoided or minimized if necessary. Detours and temporary traffic control measures will be required to maintain traffic circulation during construction. The duration of each grade separation construction will vary depending on the type of temporary traffic control measure used (e.g. general detours provide a shorter construction duration).

It is anticipated that full and partial street closures will be needed for the reconstruction of roadways. The type of closures will be based on the proximity of alternate routes (these are analyzed in further detail in the environmental Transportation technical report). In general, a full roadway closure will result in a significantly shorter overall construction period than if a partial closure was to be used. This shorter period could be as much as a 50% reduction depending on the location. Preliminary staging concepts have been developed as part of these studies and detailed staging and maintenance of traffic will be developed during the final design phase.

It is anticipated that highway and roadway work associated with the HSR Project will be done using conventional methods and in the following sequence as necessary:

- Demolition.
- Utility relocations (utility relocation timing may influence highway work schedule), which could require trenching, segmental pipe construction, concrete pipe or conduit poured in situ, and storm drain catch basins poured in situ or placing precast units.
- Excavation.
- Grading.
- Placing aggregate base.
- Constructing concrete curb and gutter (in some cases this may be carried out before the previous stage), which can be done by building forms and pouring concrete in place or by using a curb and gutter placing machine.
- Placing concrete or asphalt concrete base and top surfaces.

Coordination with all local agencies and Caltrans (for state highways) will be required as final design by the design-builder progresses.

Assumed Production Rates:

- Subgrade ranges from 1,400 square yards to 1,800 square yards per day.
- Base construction ranges from 1,000 square yards to 4,500 square yards per day.
- Asphalt pavements ranges from 500 tons to 2,000 tons per day. Thickness of pavement section must be factored to determine the square yards that can be placed per day.
- Concrete pavements range from 3,000 square yards to 5,000 square yards per day.

4.5 Drainage

Drainage will involve both permanent and temporary systems for track and road construction. Temporary systems will be developed to allow for construction activities that must be performed in dry conditions. Means and methods for temporary dewatering could include well point systems, sock drains, and bypass pumping from one retention area to another. Ground water considerations will need to be considered for all operations involving dewatering.

Permanent drainage features are anticipated to include closed pipe systems, open channels, swales, box culverts, inlets, and manholes. Production rates for installing permanent drainage will vary depending on depth of cut, soil conditions, installation methods, and structure type.

The HSR project drainage requirements are as follows:

- Maintain existing drainage flow patterns.
- Disperse on-site runoff to encourage local infiltration.
- Improve existing drainage capacity if the HSR design exacerbates existing drainage problems or flooding where the existing system is known to be undersized.
- Treat runoff from pollution-generating impervious surfaces to the maximum extent practicable to meet water quality objectives and water quality standards set forth by the California Regional Water Quality Control Board (RWQCB) before discharging to receiving waters.

The at-grade or track-on embankment segments will require drainage ditches or swales on both sides of the track to collect rainfall. The emphasis will be placed on on-site retention of runoff which will require the construction of detention basins or infiltration basins. These basins will be unlined and will be designed to remove litter, settleable solids (debris), total suspended solids, and pollutants; and encourage infiltration. For embankment segments supported by retaining walls, trackbed drainage will be collected and conveyed in a pipe system. Storm drains may also be incorporated behind the top of the retaining walls to accommodate peak events. All concentrated flow will be addressed in a noneroding manner.

Tracks set below grade or in a trench section will have drainage systems to collect stormwater and direct it to a pump station. Stormwater will be pumped to a retention/treatment basin outside the trench and released into a drainage facility.

For elevated track segments where the HSR crosses an unpaved rural landscape, the runoff will be collected and conveyed in pipes down the sides of the pier columns to infiltration swales. Where the guideway crosses developed urban areas, the runoff will again be conveyed in pipes down the sides of the piers but typically it will be discharged into the local stormwater drainage system.

Inside flood areas, transversal drainage would be designed to allow water permeability through the subgrade to avoid generating a dam effect. This drainage system will be composed of distributed transversal pipes.

4.6 Structures

Five construction methods are being considered for the guideway. Methods include aerial structures, trench excavation and construction, at-grade construction, bored tunneling, and cut-and-cover tunneling. Costs and schedule are primary concerns for selection of any one alternative. Typically means and methods used by construction companies will drive both cost and schedule, but for this Constructability Assessment Report, production will be based on estimated values typically experienced during construction of similar magnitude.

4.6.1 Aerial Structures

The typical HSR bridge consists of a single-cell pre-stressed concrete box girder supporting two parallel tracks spanning approximately 110 ft. At certain locations, there are geometric constraints that require the bridge span to exceed 110 ft. up to a factor of 4. For this reason, it is unlikely that only one method of construction will be used.

The type of construction method selected by the contractor will depend on the geometry and location of the structure. The typical aerial sub-structure consists of cast-in place (CIP) bent cap, column(s) and a pile cap supported by structural steel, precast/pre-stressed piles, or cast-in-drilled hole (CIDH) piles. There are five types of superstructure construction methods proposed for the aerial guideway:

1. Full-span precast
2. Segmental precast
3. Balanced cantilever
4. CIP construction on falsework,
5. Steel plate girder or steel truss

A. Full Span Precast Construction

In this construction method, the box girder is precast as a full span and transported along the length of the previously constructed aerial guideway.

The precast 110-foot girder weighs approximately 900 tons and would be set in place using a special gantry system. This gantry system was used on the Taiwan High-Speed Rail Project for girders of a similar size. The girders will be transported to the leading end of the viaduct using the constructed viaduct and a special launching carrier.

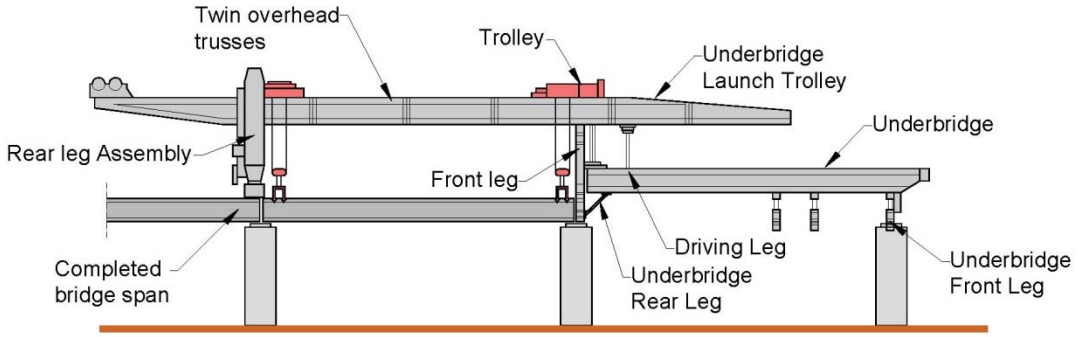


Figure 4-2 Precast Full Span Construction Schematic

The typical construction sequence is as follows:

i. The substructure (footings and columns) is constructed using traditional methods.

ii. Precast girders are cast and pre-stressed in advance and stored in the precast yard.

iii. The launching gantry is set up and construction proceeds by progressively installing the precast spans with a minimum of one span erected per day.

iv. At locations where spans are cast-in-place on falsework or other construction method, the construction needs to be completed as an early item in order for the launching equipment to get across these areas without interrupting the construction process.

Figure 4-3 Taiwan High Speed Rail *(Courtesy of Uwe Baier)*

The advantages of the full span precast construction method are:

- Fabrication of the box girder at the precast plant.
- Rapid installation.
- No ground level space requirements during the box girder installation phase.
- Independent of the weather conditions.

The disadvantages are:

- Need to have a large precast plant that can adapt to the dimensions and installation rate.
- Need for dimensioning the structure for the extra load of box girders transported during the installation phase.
- Need to acquire hoisting cranes, transport vehicles, and special placement machinery to position the box girders on the structure.
- Dependent upon two machines (one per direction); therefore, any faults or equipment failure could impact the overall schedule.
- Requires a different method for spans that exceed the typical length of 110 feet.

The erection rate will depend on how far the construction site is from the casting yard. The paper *"Full-span Precast Launching Method (FPLM) Analysis with Dynamic Simulation – Case Studies of the Taiwan High-Speed Rail (THSR) Project",* Nai-Hsin, Tsung-Chih Chiu, Kuei-Yen Chen, October 2007, indicates an average of 1.1 segments per day is an assumed erection rate based on the historical production rates of each THSR segment. A precast casting yard can be placed at the center, next to the aerial to be constructed, that can deliver segments to each end of the aerial. The pre-casting yard would have to produce 2.2 segments per day to deliver segments to both ends of the viaduct.

The sequence of construction and estimated construction duration is illustrated in Figure 4-4 Precast Full Span Sequence and Production Rate.

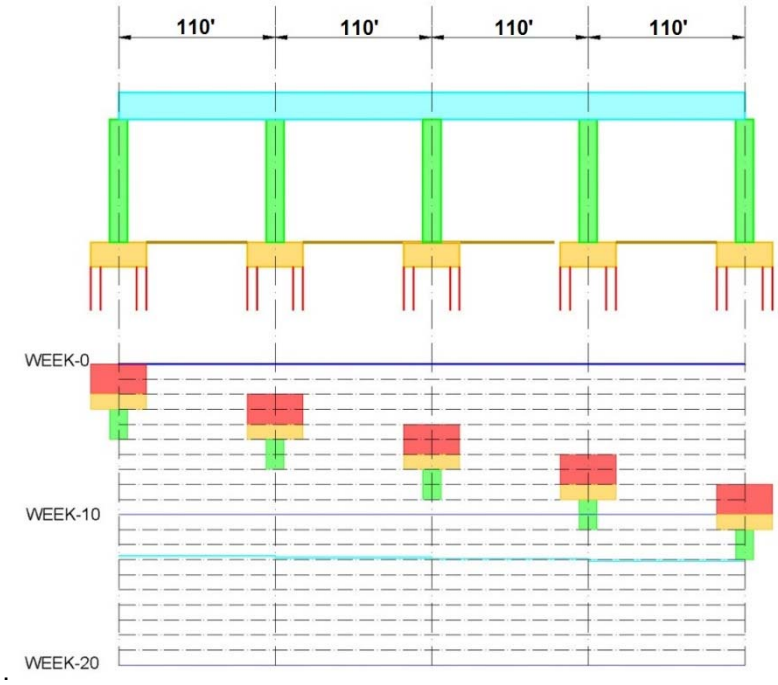


Figure 4-4 Precast Full Span Sequence and Production Rate

The cost of this method will depend on the schedule constraints and the size of the contract. The main expenses are the cost of the launching equipment and the requirement of having large precasting/storage yards next to the viaduct. For example, for a 25-mile aerial it is estimated that two launching gantries (each serving a half of the aerial) and two 20-acre casting/storage yards would be required to meet a 2.5-year superstructure construction duration. Prior to superstructure erection, the schedule should factor one year for design and manufacture of the gantry equipment and three months for installation. This procurement can occur at the same time as the precast yard construction and foundation installation. Cost can be reduced when the schedule is extended allowing the contractor to use the same erection equipment on each half of the aerial.

Appendix A includes illustrations of equipment layout and space requirements for typical full span precast construction along the Monterey Highway Guideway.

B. Span-by-Span (Precast) Segmental Construction

In this construction method, the box girder is constructed with precast segments that are individually brought to the construction site and are joined together using prestressing tendons. This construction method, as well as the full span precast method, can be applied to long aerials with repetitive span length and with minimal angular variation. Both construction types are adequate for standard mass-produced structures typical in long viaducts. Generally, girders are simply supported to avoid having cast-in-place closure joints but continuity tendons can be provided at the bents when required. Having simple-supported girders allows a simpler post-tensioning layout.

The usual range for segmental construction is 100 ft. to 150 ft. For spans shorter than 100 ft., box girders are not as economical as beams. For spans longer than 150 ft., the

size/number of the segments becomes difficult to handle, the post-tensioning tendons become difficult to anchor to the pier tables, and the erection truss size becomes unpractical.

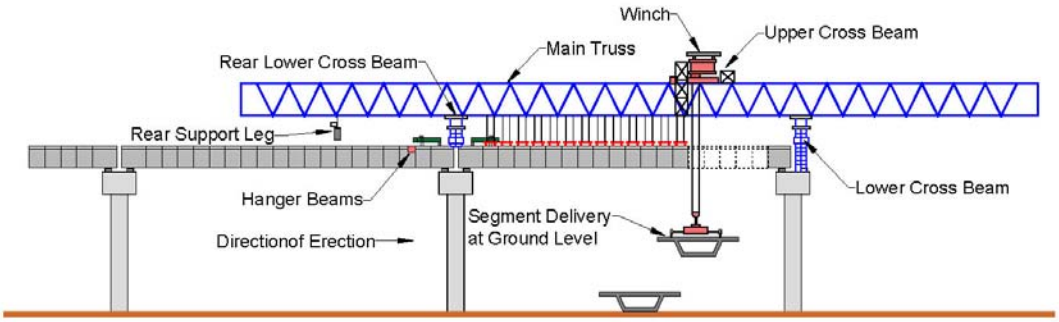


Figure 4-5 Precast Segmental Construction Schematic

The segment length is determined by the method of transport and the erection requirements. If the segments are transported using the existing ground infrastructure, each one is limited to a length of to 10 feet to 12 feet and weight of around 70 tons.

The typical construction sequence includes:

i. The substructure (foundations and columns) are constructed using traditional methods.

ii. The precast girder segments are precast in advance and stored in the precast yard.

iii. The launching gantry is set up and construction proceeds by progressively hoisting the segments and installing and tensioning the prestressing. A minimum of one span can be erected every four days.

iv. At locations where spans are cast-in-place on falsework or other construction method, the construction needs to be completed as an early item for the launching equipment to get across these areas without interrupting the construction process.

Figure 4-6 Precast Segmental Construction

The advantages of this construction method are:

- Fabrication of the box girder segments at the precast plant.
- Rapid assembly compared with other methods.
- Independent of the weather conditions.
- Segments are shipped by highway.

The disadvantages are:

- Weight and dimensions of the 70-ton segments requires the use of special carriers.
- Need to have a large precast plant that can adapt to the dimensions and necessary installation rate.
- Need to acquire special machinery for positioning the segments.
- Depend on two machines (one per direction); therefore, any faults or equipment failure could impact the overall schedule.
- Require a different method for spans that exceed 150 feet.
- Field work includes epoxying seams at the adjacent segments and post-tensioning the span prior to advancing the gantry.

The typical production rate for the precast segmental construction is estimated to be four days per span, as shown in Figure 4-7.

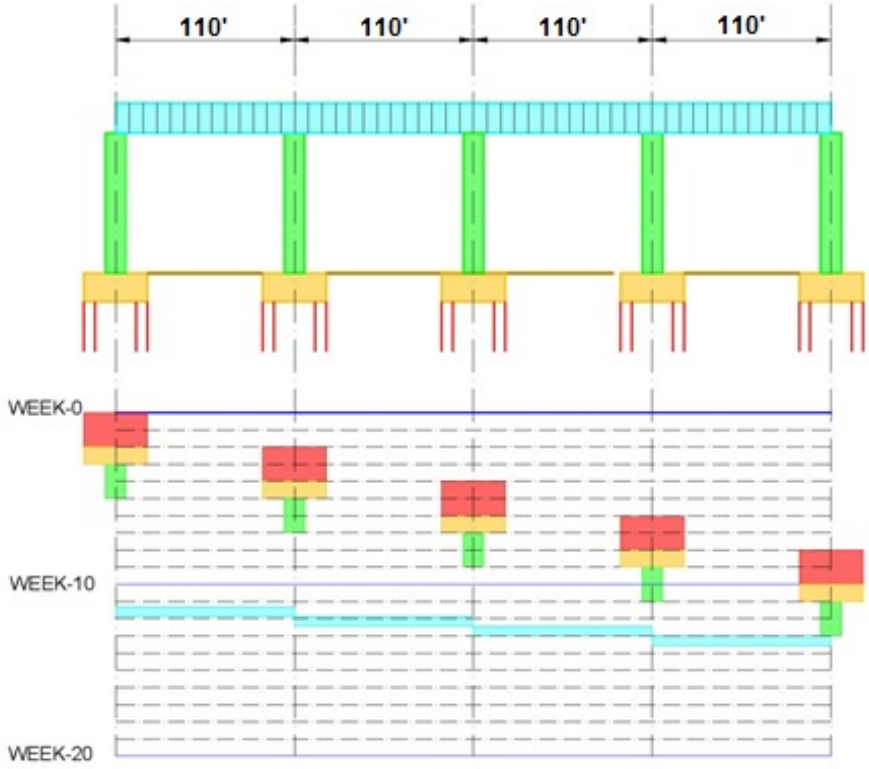


Figure 4-7 Precast Segmental Sequence and Production Rate

C. Balanced Cantilever (BC) Segmental Construction

In this construction method, segments are placed in a symmetrical fashion about a bent. This construction method is well suited for long span construction over existing facilities that prevent placing equipment and temporary supports on the ground. The cantilever tendons are located in the deck slab and are anchored at the ends of the segments. The midspan tendons are responsible for transferring the positive moment between two completed cantilevers.

In the precast BC construction method, the segments are precast off-site in a precast yard. A single cell box girder is preferred for precast construction to minimize the segment weight and to allow for a 3-point support under the webs during storage.

The segments are transported to the construction site and installed incrementally onto the existing portion of the cantilever. The erection can be performed by ground cranes hoisting devices located atop of deck or by a self-launching gantry. This method has more flexibility than the span-by-span segmental construction method because the span length can be increased without modifying the erection equipment.

In the CIP BC construction method, form travelers are used to form, reinforce, and cast a segment at the tip of the cantilever. Form travelers work in pairs (one at each end of the balanced cantilever) to maintain the balanced condition. The construction cycle takes up to one week from when the segment reinforcement is placed, concrete is cast, and the traveler advances to the next position. The segment length is typically longer than with precast segment construction because no transportation is required.

In both methods, temporary supports may be required to avoid over-stressing the bent column during erection.

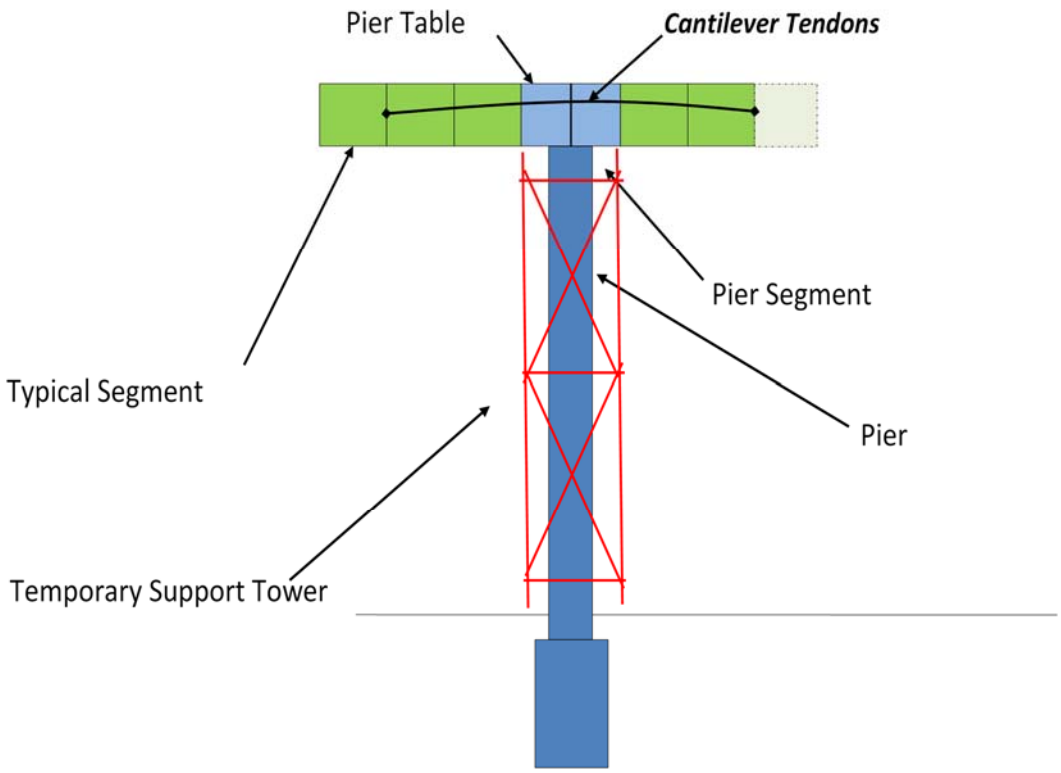


Figure 4-8 Balanced Cantilever Construction Components

Figure 4-9 Form Travelers and Temporary Supports in Balanced Cantilever Construction

The typical production rate for the balanced cantilever section is estimated to be 33 weeks per section, as shown in **Error! Reference source not found.** The rate of construction is conservatively assumed to be three weeks per segment.

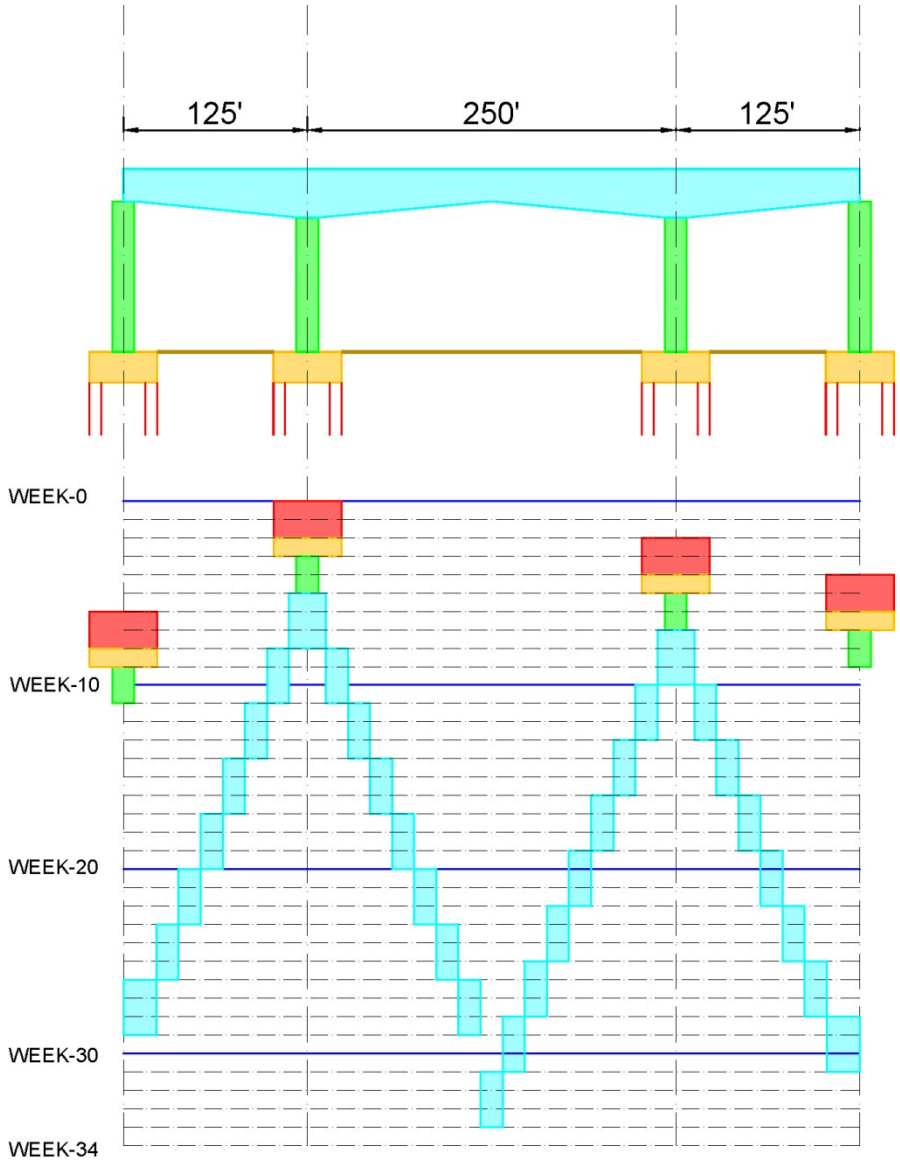


Figure 4-10 Balanced Cantilever Sequence and Production Rate

Appendix B includes illustrations of layout and space requirements for typical balanced cantilever construction at locations along the Monterey Highway Guideway.

D. Cast-in-Place (CIP) Construction on Falsework

Traditional Caltrans box girder construction is not feasible for the typical aerial spans due to the length of time required to erect the falsework. However, a method of CIP construction has been

used on HSR in other countries where a traveling formwork system is used. See Figure 4-11 Traveling Formwork System from HSR Tech Memo TM 2.3.3 Figure 3-12, for an example.

Figure 4-11 Traveling Formwork System from HSR Tech Memo TM 2.3.3 Figure 3-12

The typical construction steps include:

i. Construction of substructure using traditional methods.
ii. Advance the suspended formwork with either a launching girder or launching gantry.
iii. Lock the suspended formwork into position
iv. Place reinforcement and prestressing.
v. Pour concrete.
vi. Stress the prestressing.
vii. Strip formwork and advance to the next segment.

The estimated production rate for CIP concrete construction on falsework is two weeks per span, as illustrated in Figure 4-12 CIP Concrete Construction Sequence and Production Rate.

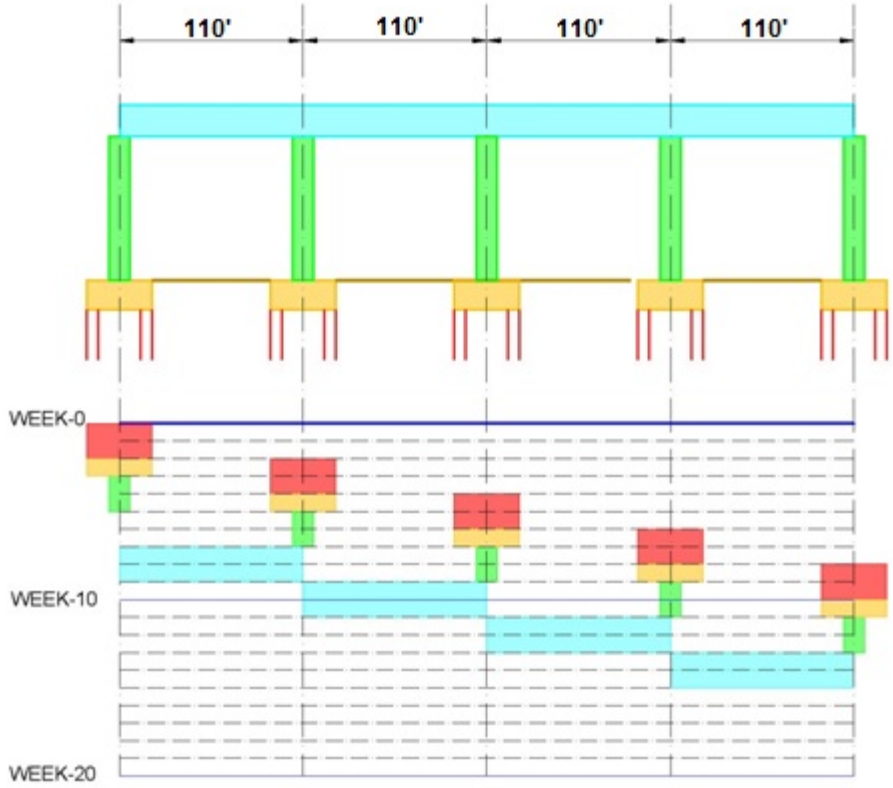


Figure 4-12 CIP Concrete Construction Sequence and Production Rate

E. Steel Plate Girder or Steel Truss

This type of structure is proposed for use only in special occasions when relatively long spans are required, and/or vertical clearance is limited. This type of structure can be considered during the 30% design when long spans are required, and a balanced cantilever structure becomes too deep, which can have a significant impact on the approach structure. This type of structure has high fabrication and maintenance cost in California.

4.6.2 Open-Trench Excavation

Open-trench construction is proposed to be CIP construction using temporary shoring and/bracing for deeper excavations and/or where ROW is limited. Secant pile or slurry construction can be recommended in places construction staging is an issue, or when next to structures and/or roadways sensitive to settling. This issue will be addressed at the 30% design level when the geotechnical exploration has been completed. The conventional CIP-shored construction has the advantage over the secant-pile construction to seal better when high-water table conditions exist.

The proposed structural system consists of a CIP cantilever concrete wall and invert slab. For deeper trenches, transverse precast pre-stressed struts will be used to reduce the demand on the cantilever walls and reduce wall width. Roadway trench crossings will consist of precast or CIP lids. For longer roadway crossings or under water bodies, cut-and-cover tunnels will be used.

Open trenches have the disadvantage of disrupting traffic going through the excavation. Traffic must be closed or detoured and/or relocated during the construction process. They also require

the relocation of underground utilities running perpendicular to the trench. Ground water management may be required depending on the depth of the water table. Also, this construction method may require temporary shoring/bracing during the construction process. Considerations to roadways nearby must be addressed to ensure settlement or undermining of the roadway is not occurring. Settlement and vibration monitoring is recommended during this process where construction is close to existing roadways and/or structures. Production rates can vary depending on the types of soils/rocks/obstructions encountered, types of equipment employed, and the contractor's means and methods.

4.6.3 Cut-and-Cover Tunnel

The construction method for cut-and-cover tunnels is similar to the open trench construction with the added component of constructing a CIP top slab to cover the trench. With cut-and-cover tunnels, roadway crossings will have to be detoured and/or closed during construction. Temporary diversion channels will need to be provided when tunnels cross through bodies of water. Construction staging is important to building cut-and-cover tunnels. Under certain circumstances, this type of construction is more cost effective than tunneling with tunnel boring machines.

4.6.4 Bored Tunnels

Bored tunnels are only considered when the length and depth of the tunnel allows it to be cost effective compared to the cut-and-cover construction. Bored tunnels are considered primarily for the Pacheco Pass Subsection. Construction considerations are addressed in the Conceptual Tunnel Design and Constructability Considerations for Pacheco Pass prepared by HNTB Corporation dated November 2017.

4.6.5 Retaining Walls

CIP retaining walls are anticipated where limited construction space is a concern. Production rates for casting retaining walls are estimated between 100 to 200 square feet per day.

Retained Earth Walls are anticipated in conjunction with retaining walls. Retained Earth Walls require straps or rods connected to the backside of the wall panels and are placed in the embankment for wall stability. Since the walls are placed as panels with the embankment, this method of construction expedites the overall embankment sequence. Production rates for these walls must be correlated to the production rates for placing embankment which is covered under the earthwork section. The walls require well-draining soils with no organics.

4.7 Track

At this stage of the project, a track system has not been selected. The design assumes conventional ballast track for at-grade alignments with the provision for ballastless or direct fixation track on the aerial viaducts/bridges, trenches, and tunnels.

Since the HSR must meet FRA Class 8/9 Track Standards, the construction methods and Track Tolerance Testing (FRA's Track Safety Standards Compliance Manual, Chapter 6) will follow 49 CFR 213 requirements for HSR. *Note:* Trackwork for the blended, at-grade alternative will meet standards for FRA Class 6 for operating speeds up to 110 mph.

A. Conventional Ballast Track

Worldwide, the most common system is the ballasted track system. This system includes the track roadbed, sub-ballast, ballast, ties, and rail with rail fasteners. Construction rates depend on the rail equipment and skilled team composition of the contractor. Mats can also be used with ballasted track to minimize vibrations.

Figure 4-13 Ballast Track - Schotteroberbau

Figure 4-14 Ballast Track with Mats - Japan

Figure 4-15 Ballast Track Turnouts

B. Direct Fixation or Slab Track System

This type of track system does not have any ballast in the Guideway. In its simplest form, this consists of a continuous slab of concrete (like a highway structure) with the rails supported directly on its upper surface (using a resilient pad). Variations include continuous in situ placing of a reinforced concrete slab or the use of pre-cast pre-stressed concrete units laid on a base layer. Units can be produced in casting yards with bridge/viaduct precast units and installed with them.

Figure 4-16 Slab Track - China HSR

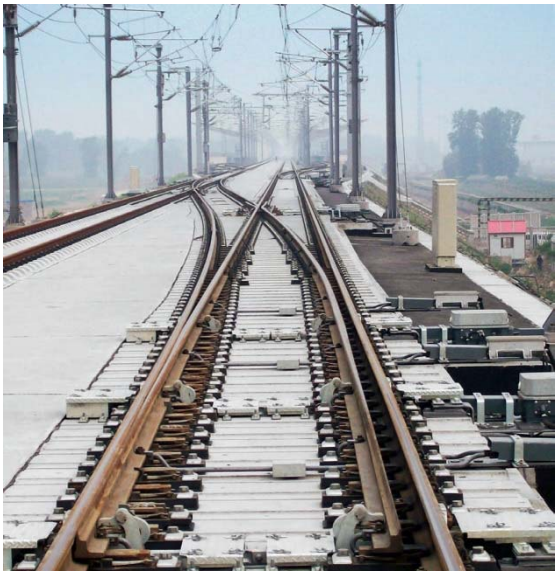


Figure 4-17 Track Turnouts - China HSR

C. Curve Straightening

The primary trackwork construction for the blended, at-grade alternative will be for curve straightening to allow for increased operational speeds on the corridor. This work has been categorized into four types of track shifts:

1. Less than one foot – Existing track is shifted in one work window and the existing OCS poles will remain.
2. More than one foot and less than 10 feet – Existing track is shifted over several work windows and the existing OCS poles will need to be relocated (via construction of new OCS poles to maintain existing operations during non-work windows).
3. More than 10 feet and less than 21.34 feet – New OCS poles and tracks are constructed alongside the existing tracks while allowing existing service to be maintained. Temporary OCS poles may be required where the existing OCS poles will need to be removed to construct the new track.
4. More than 21.34 feet – New OCS poles and tracks are constructed alongside the existing tracks while existing service will remain unaffected.

See Appendix H for additional information on track shift work and approach.

D. Vertical Alignment Adjustments

The existing track profile will need to be modified to allow for increased operational speeds on the corridor. With the assumption that the existing ballast layer is 18 inches deep, this work has been categorized into three types of vertical adjustments:

1. Raising or Lowering up to six inches – The track profile will be adjusted through changes to the ballast layer only. The sub-ballast layer would remain intact. The OCS poles can remain in place and only the contact wire would be adjusted.
2. Raising greater than six inches – The track profile will be adjusted through reconstruction of the trackbed (ballast and sub-ballast layers). The OCS poles will need to be reconstructed.
3. Lowering greater than six inches - The track profile will be adjusted through reconstruction of the trackbed (ballast and sub-ballast layers). The OCS poles will need to be reconstructed.

See Appendix H for additional information on track shift work and approach.

E. OCS Adjustments

The existing OCS system between CP Coast to south of the Caltrain Tamien Station will need to be modified based on the alignment modifications to allow for increased operational speeds on the corridor. This work has been categorized into four types of OCS modifications:

1. New OCS System – As noted above, based on the horizontal and/or vertical adjustment to the track profile, new OCS poles will need to be constructed.
2. OCS Pole Displacement – As noted above, based on the horizontal and/or vertical adjustment to the track profile, new OCS poles will need to be relocated.
3. OCS Contact Wire Displacement - As noted above, based on the horizontal adjustment to the track alignment, the OCS contact wire would be adjusted, and the existing OCS pole would remain.
4. OCS Contact Wire Vertical Displacement - As noted above, based on the vertical adjustment to the track profile, the OCS contact wire would be adjusted, and the

existing OCS pole will need to be reconstructed if the adjustment was more than could be accommodated on the existing pole.

See Appendix H for additional information on OCS adjustments and approach.

4.8 Utility Relocations/Adjustments/Construction

Since the HSR alignments traverses developed urban areas and farmland, existing utilities such as water supply facilities, etc., are anticipated to be constructed during the site preparation stage. Detailed information for utility relocations/adjustments is contained in the High Risk and Major Utilities Conflict Memorandum. Schedule and contract arrangements will need to be developed for utility relocation; oil pipelines, high pressure gas lines, major irrigation, fiber optic, water mains, and wells.

5 SUBSECTION CONSTRUCTION

Specific subsection construction challenges and issues are described in this section. The engineering drawings will provide construction staging and phasing plans. The drawings will also underline how some of the constructability issues are proposed to be resolved.

5.1 San Jose Diridon Station Approach

5.1.1 Alternative 1

This is an aerial structure option to build the San Jose High-Speed Station over the existing Caltrain San Jose Diridon Station with a connection between both stations through an intermediate mezzanine.

The HSR alignment begins to rise at station 2403+00 with the aerial structure beginning at station 2415+00 and continuing into the next section.

The structure is composed of an initial stretch on retained fill and a second one supported by a viaduct, including a 450-ft. long span over the Guadalupe Freeway. Different construction methods will be used, such as CIP, precast, or BC. This viaduct will pass over existing facilities allowing them to maintain their functionality. See Appendix D for a possible constructability process.

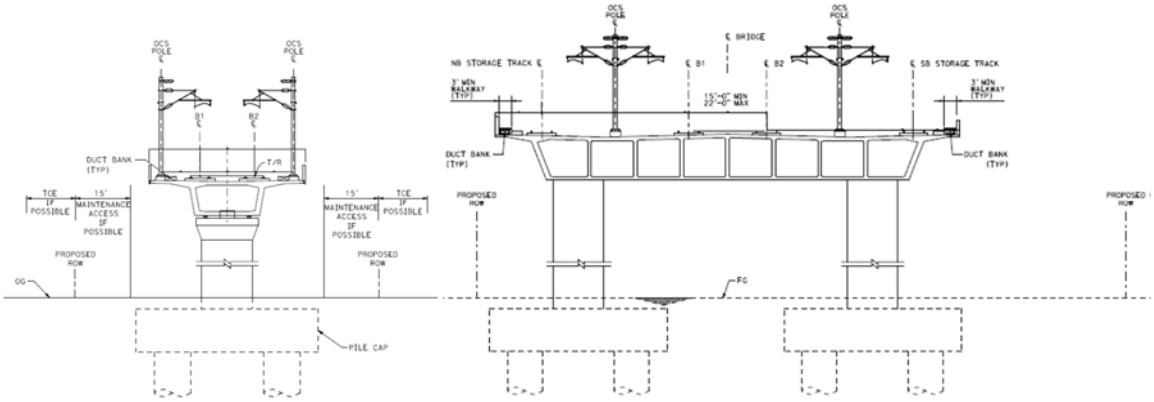


Figure 5-1 Typical Section in Subsection San Jose Diridon Station Alternative 1

Immediately following the San Jose Diridon Station, the HSR alignment continues on a viaduct over I-280 and SR-87. Viaduct foundations and columns within the highway median and shoulders will be required and consequently temporary traffic controls will be needed during the construction process. See Appendix F for possible construction sequences for the columns located with the I-280 median and shoulders.

5.1.2 Alternative 2

This alternative is structurally similar to Alternative 1, with the main difference being a longer structure length beginning at station 2288+00.

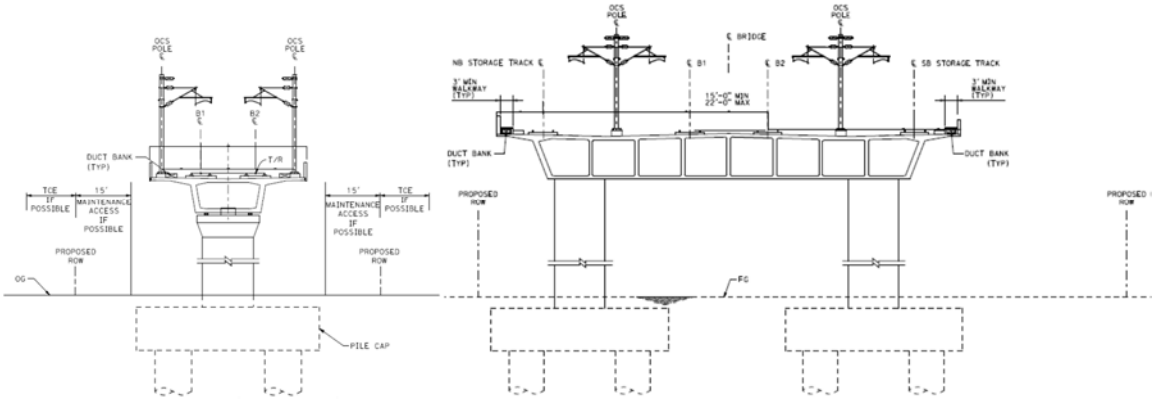


Figure 5-2 Typical Section in Subsection San Jose Diridon Station Alternative 2

For both Alternatives 1 and 2, temporary traffic controls will be required on the local roadways to construct the HSR. In some instances, significant changes to the local street movement, such as two-way traffic control or full street closures and detours will be required. Coordination with the City of San Jose will be required in the next project phase to develop detailed traffic management plans.

5.1.3 Alternative 4

This is a blended at-grade alternative to build the San Jose HSR Station at-grade within the existing Caltrain San Jose Diridon Station by raising and extending two existing platforms, and constructing a pedestrian overcrossing to connect the station building to the HSR platforms.

South of the San Jose Dirdion Station, the track alignment will follow the existing Caltrain corridor and add a third track from Los Gatos Creek to the Caltrain Tamien Station. The alignment is on retained fill to minimize the need for additional ROW. Some of the existing structures will be replaced where shifting of the track or a change in the track profile will preclude use of the existing structure. There will be new single-track structures over I-280 and SR87 (Guadalupe Freeway). The construction of the structure over SR87 will require single-track operations of the VTA light rail system between the Tamien and Virginia stations. Different construction methods for these new structures will be used, such as CIP, precast, or BC. See Appendix D for a possible constructability process.

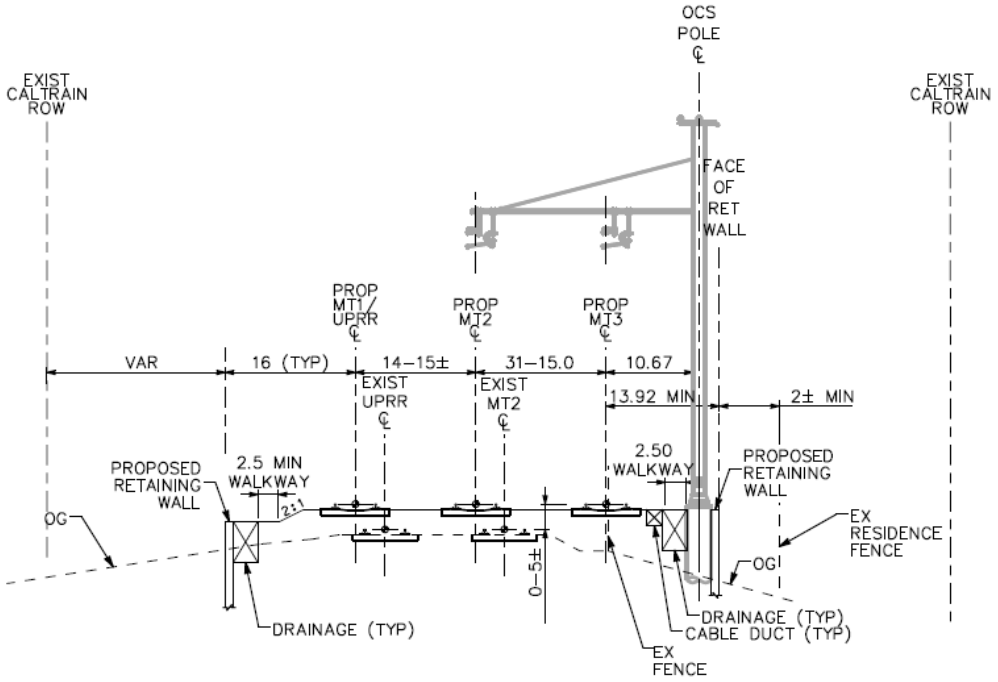


Figure 5-3 Typical Section South of I-280 in Subsection San Jose Diridon Station Alternative 4

Viaduct foundations and columns within the highway median and shoulders will be required and consequently temporary traffic controls will be needed during the construction process.

5.2 Monterey Corridor

Three different alternatives are designed for the Monterey Corridor: 1) an at-grade/embankment alignment adjacent to the existing UPRR ROW, 2) an aerial alignment adjacent to the existing UPRR ROW, and 3) a blended, at-grade alignment within the existing UPRR ROW.

Each alternative has its own alignment and construction methods that should be adapted to their surrounding conditions.

5.2.1 Monterey Corridor At-Grade/Embankment (Alternative 2)

This section alignment runs parallel to and in between Monterey Road and the UPRR railway line with cut-and-fill slopes, retaining walls, and intrusion barriers as required. This subsection includes several roadway grade separations that are both over- and undercrossings.

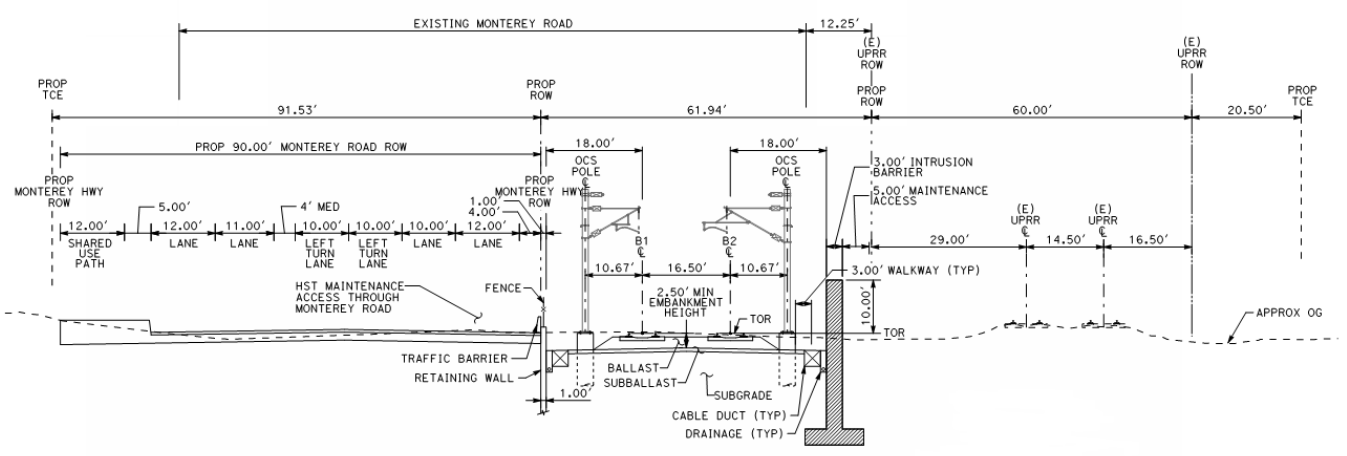


Figure 5-4 Typical Section in Subsection Monterey Corridor (At Grade)

Due to site constraints and the need for Monterey Road and UPRR to maintain operations, it is assumed that the construction process will begin with the relocation of existing utilities, then the construction of Monterey Road and the grade separations, and then the construction of HSR structures and facilities including retaining walls and bridges. In general, shoofly tracks will be constructed near the HSR tracks for UPRR use during construction of the UPRR bridge at undercrossing locations. Then, the final HSR bridge and tracks will be constructed after the UPRR permanent alignments are restored. For construction staging sequencing at the grade separations see the plan sets in the March 2019 PEPD submittal.

5.2.2 Monterey Corridor Viaduct (Alternative 1)

This is an elevated alignment which generally runs within the Monterey Road median and is supported by a 2-track girder box. The viaduct structure deck should be precast for 110 ft. spans and BC for larger spans.

Due to the viaduct foundation dimensions, the adjacent roadway areas must be temporarily occupied during the construction process so temporary traffic control measures will be required. One possible process would be to construct the viaduct foundations in three stages to maintain two lanes of traffic in each direction. Dedicated left-turn lanes would be eliminated during the process (to stay within existing ROW), but major, signalized intersections would remain open. Nighttime work involving lane closures resulting in one lane of traffic in each direction may also be utilized. See Appendix G for conceptual plans.

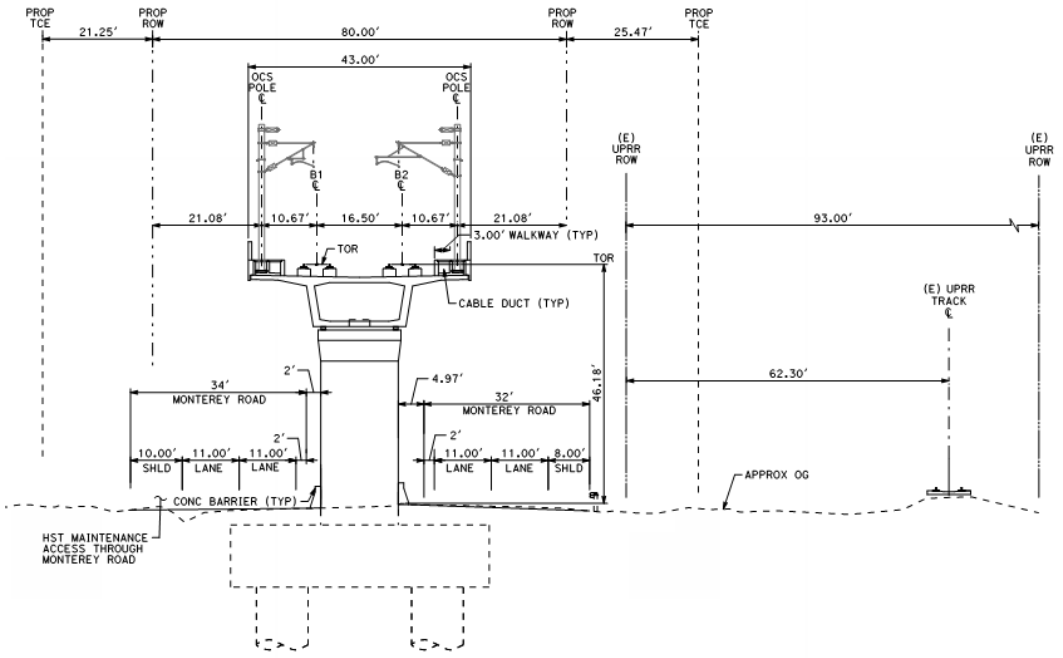


Figure 5-5 Typical Section in Subsection Monterey Corridor (Viaduct

5.2.3 Monterey Corridor Blended At-Grade (Alternative 4)

This section runs at grade and parallel alongside Monterey Road through San Jose. It is in the UPRR ROW so temporary traffic handling measures are minimal. UPRR and Blended/HSR tracks are substantially within the existing UPRR ROW.

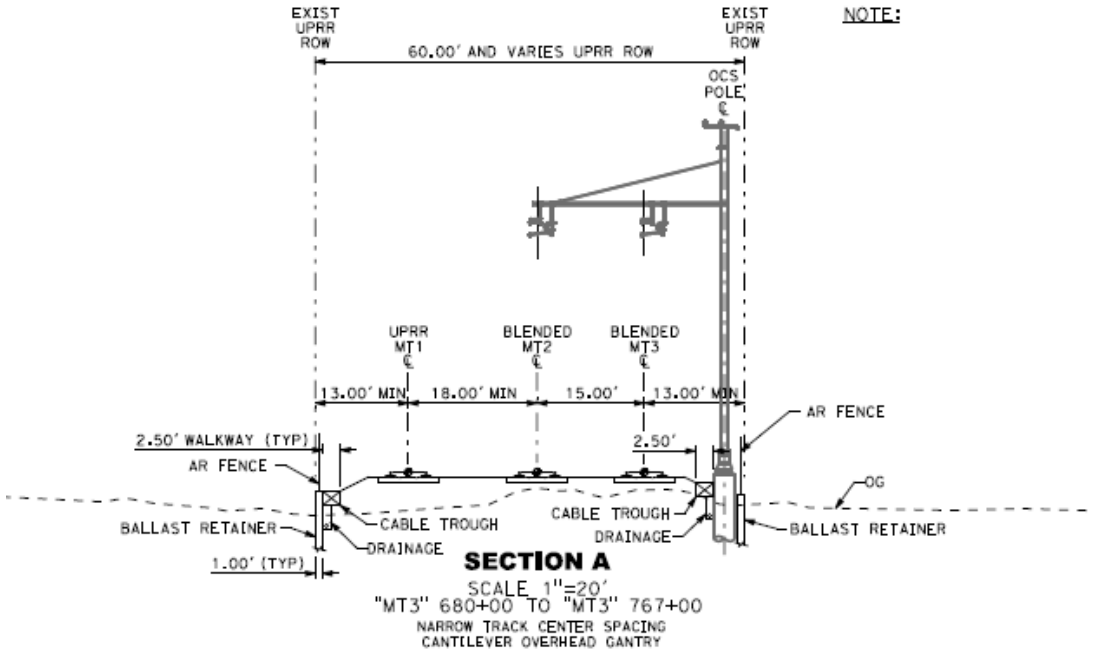


Figure 5-6 Typical Section in Subsection Monterey Corridor (Blended At-Grade)

The assumed construction process is retaining walls/ballast retainers, UPRR trackbed construction, single/UPRR track shifting or new track construction, blended track construction, and associated roadway construction (paving, etc.) at the at-grade crossings.

In areas of curve straightening outside the existing UPRR ROW, the assumed construction process is:

- Demolition
- Retaining wall construction
- UPRR track construction
- Blended track construction

5.3 Morgan Hill and Gilroy

This is a long stretch where four alternatives are studied.

5.3.1 Viaduct to Downtown Gilroy (Alternative 1)

This subsection continues the viaduct from the Monterey Corridor Viaduct subsection all the way to the Downtown Gilroy Station. As in the previous section, the alignment runs along the Monterey Road median then deviates to the east towards U.S.101 and runs parallel to the freeway for approximately four miles through Morgan Hill. The alignment turns back to the west to run parallel with Monterey Road again until the Downtown Gilroy Station. Following the station, the alignment continues on a viaduct, passing over U.S. 101. Following the viaduct, the alignment runs on an embankment where the Gilroy MOWF is located.

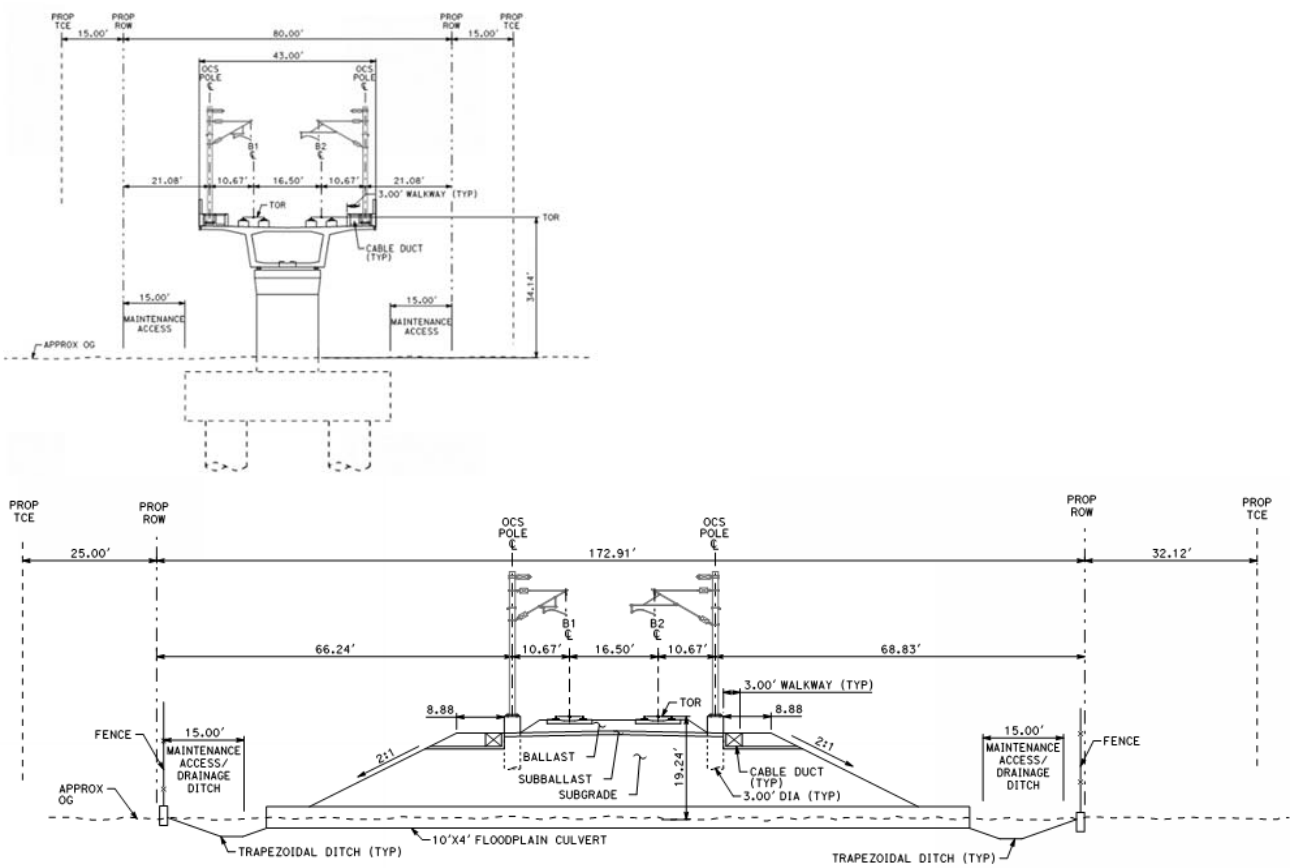


Figure 5-7 Typical Sections in Subsection Morgan Hill and Gilroy (Viaduct)

There are different construction methods assumed for this section.

At the beginning, where the HSR alignment is over roadway median, the median will be redesigned to accommodate the viaduct foundations. The foundation dimensions will encroach into the roadway lanes, so temporary traffic handling measures will be required for the construction process.

Within Morgan Hill, where the alignment deviates to the east, no roadways are affected and some buildings will need to be demolished before beginning construction.

It is assumed the viaduct will be constructed using standard methods and decks will be precast except at long spans where BC is assumed.

For purposes of discussion, the following provides an overview of probable construction activities and durations for the long viaduct.

- The total elevated viaduct structure for this segment is approximately 138,000 feet long, composed of several different structure types:
    - Typical Spans (110 feet long), approximately 1,185 spans total
    - Longer Spans (up to 150 feet long), approximately 30 spans total
    - Balanced Cantilever Spans (up to 410 feet long), approximately 47 spans total
    - Straddle Bent Spans (900 feet total length) crossing UPRR
- Factors that affect the viaduct work and control the construction schedule include:
    - Ordering, fabricating, delivery, and setup of specialized gantries used for installing the full span precast girders and establishment of the precast yards, including equipment procurement, operations startup, and production rates. It is estimated that two precast yards will be needed for the Monterey Highway Aerial Structure (1-1/2 years).
    - Construction of 1,266 foundations and columns: 11,394 days (based on nine days per foundation using CIDH and columns) of total construction time, assuming completion in 3-1/4 years with 10 teams.
    - Estimate that two gantries will be needed for the entire Monterey Highway Aerial Structure to achieve the 2-year construction schedule (based on 1 span per day per gantry).
    - Scheduling the completion of the balanced cantilever spans and straddle bents prior to advancing the gantries over those locations.
    - It is estimated that 3.5 years will be needed for the Monterey Highway Aerial Structure.

The remaining part of the section involves the construction of large embankments, which requires drainage/floodplain control measures and short viaducts to allow water flow.

5.3.2 Embankment to Downtown Gilroy (Alternative 2)

This section runs at grade parallel alongside Monterey Road through Morgan Hill. It is placed between UPRR tracks and Monterey Road so temporary traffic handling measures will be needed. UPRR and HSR tracks are separated by a concrete retaining wall.

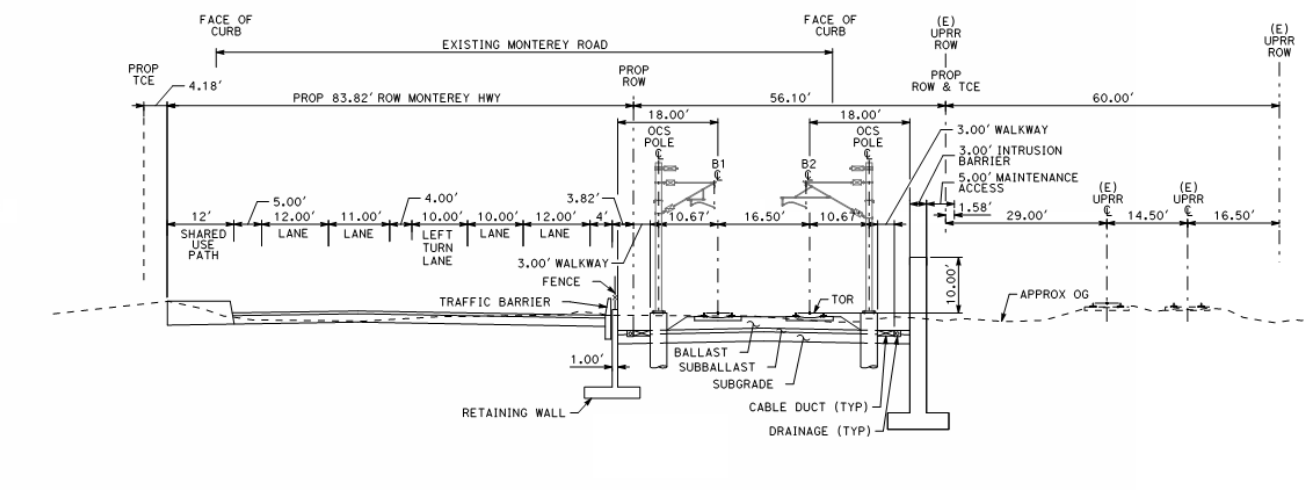


Figure 5-8 Typical Sections in Subsection Morgan Hill and Gilroy (Embankment)

The assumed construction process is temporary traffic handling measures, then retaining walls, and finally the HSR embankment and required structures.

Through Gilroy, the alignment is no longer alongside Monterey Road except where it crosses the roadway.

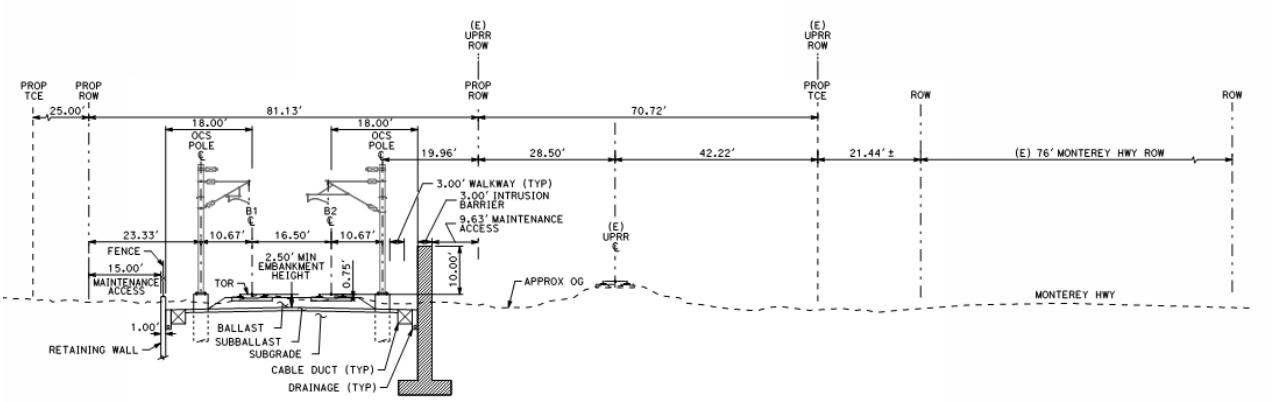


Figure 5-9 Typical Sections in Subsection Morgan Hill and Gilroy (Embankment)

The assumed construction process is:

- Demolition
- Monterey Road/crossing roadway temporary traffic measures
- Retaining wall construction
- HSR track construction

The HSR Downtown Gilroy Station will be built above the existing Gilroy Station and it will be elevated, so walls will be needed to retain the embankment. Following the station, the alignment passes under U.S.101 through a combination trench and cut-and-cover structure. Following the trench, the alignment runs on an embankment where the Gilroy MOWF is located.

Under U.S.101, the track section will be a cut-and-cover trench and will require reconstruction of the highway bridges. It is anticipated that major temporary traffic control measures will be needed, such as (but not limited to):

- Construction of temporary highway bridges to divert the northbound and southbound traffic off the existing bridges during bridge construction.
- Shifting one direction of traffic to the other, to share an existing bridge with a reversible lane.

A future design phase will develop and finalize the stage construction plans in coordination with Caltrans. The remaining part of the section involves the construction of large embankments, which requires drainage/floodplain control measures and short viaducts to allow water flow.

5.3.3 Viaduct to East Gilroy (Alternative 3)

This subsection follows the same alignment and design as the Viaduct to Downtown Gilroy until station 1337+49 where the alignment deviates to the east, crosses U. S. 101, and continues to the East Gilroy Station location. Following the station, the MOWF is located on an embankment before the Pacheco Pass tunnels. Construction methods and processes are assumed to be the same as the Viaduct to Downtown Gilroy section.

5.3.4 Blended At-Grade to Downtown Gilroy (Alternative 4)

This section runs at-grade and parallel alongside Monterey Road through Morgan Hill. It is in the UPRR ROW, so temporary traffic handling measures are minimal. UPRR and Blended/HSR tracks are substantially within the existing UPRR ROW.

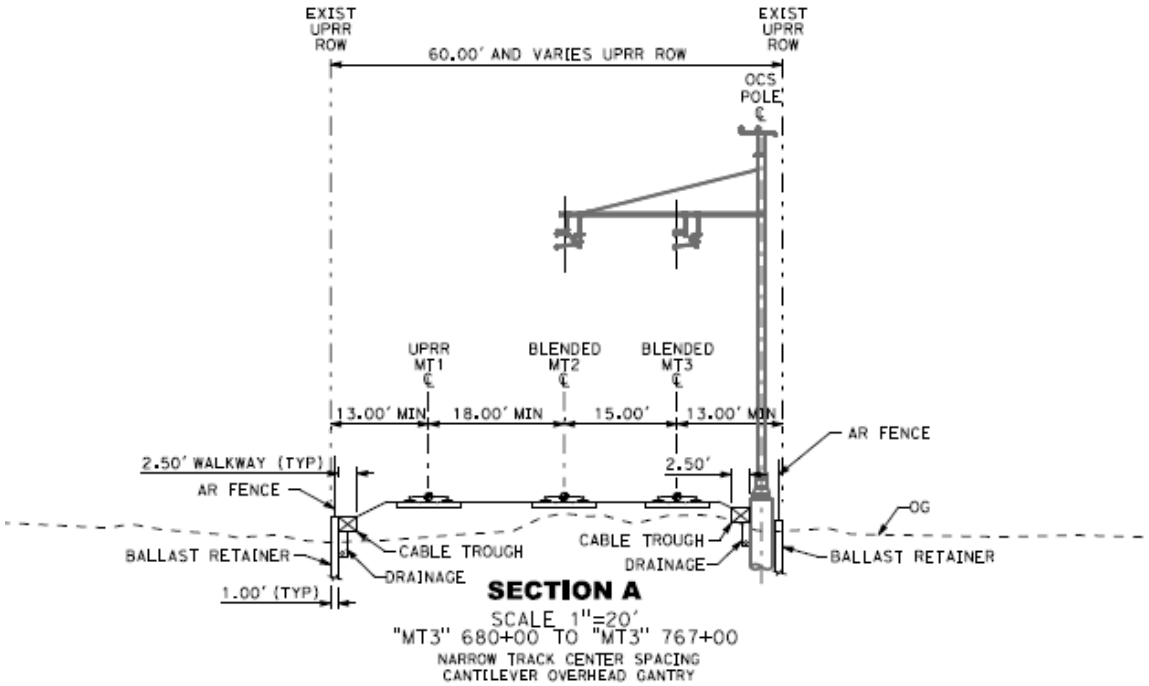


Figure 5-10 Typical Section in Subsection Morgan Hill and Gilroy (Blended At-Grade)

The assumed construction process is retaining walls/ballast retainers, UPRR trackbed construction, single/UPRR track shifting or new track construction, blended track construction, and associated roadway construction (paving, etc.) for the at-grade crossings.

In areas of curve straightening that is outside the existing UPRR ROW, the assumed construction process is:

- Demolition
- Retaining wall construction
- UPRR track construction
- Blended track construction

The HSR Downtown Gilroy Station will be at-grade and built on the existing Gilroy Station tracks and platforms. Following the station, the alignment passes under U.S.101 on the existing tracks. Following south of U.S.101, the UPRR tracks will be realigned with the HSR alignment running on an embankment where the Gilroy MOWF is located.

No impacts are expected to U.S.101.

5.4 Gilroy and Pacheco Pass Tunnels (Alternatives 1-4)

There are two HSR alignments for the area in southern Gilroy through Pacheco Pass, both include two tunnels. The only difference between the two alternatives is the alignment of Tunnel 1, with the first alternative coming from Downtown Gilroy and the second alternative coming from East Gilroy. Both alternatives have the same east portal location for Tunnel 1.

The tunnels lengths are as follows:

Table 5-1 San Jose to Merced Tunnel Lengths

TUNNEL 1		
TUNNEL 1 - DOWNTOWN GILROY ALIGNMENT		
PORTAL 1	PORTAL 2	TUNNEL LENGTH (ft)
2252+02.00	2339+16.00	8,714
TUNNEL 1 - EAST GILROY ALIGNMENT		
PORTAL 1	PORTAL 2	TUNNEL LENGTH (ft)
2184+53.00	2268+86.00	8,433
TUNNEL 2 - DEEP ALIGNMENT		
PORTAL 1	PORTAL 2	TUNNEL LENGTH (ft)
3322+62.00	4034+00.00	71,138

Both tunnels have typical sections with 28 foot interior diameters. Track centerline distances vary: Tunnel 1: 66 ft. apart and Tunnel 2: 132 ft. apart.

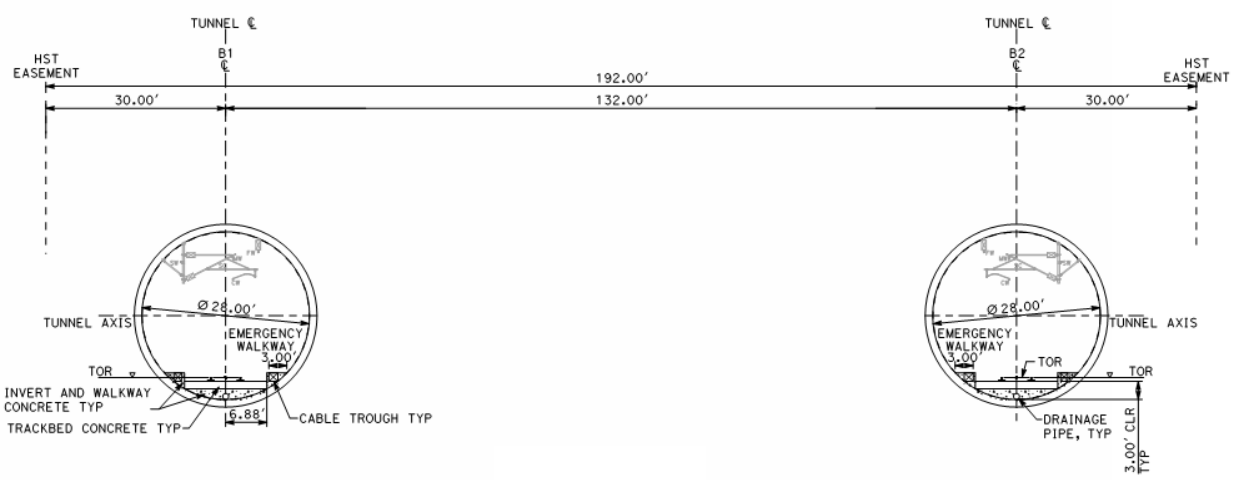


Figure 5-11 Typical Sections in Subsection Pacheco Pass (Tunnel)

Constructability considerations are addressed in the Conceptual Tunnel Design and Constructability Considerations – Pacheco Pass Report.

A large level area will be constructed at each tunnel portal, first to be used as a working area during construction and then as a permanent area for tunnel facilities. The portal areas will require walls to limit significant grading and slope work.

A key characteristic of this section is the alignment runs along a very rugged area, so there are numerous structures and major earthwork areas required outside of the tunnel limits. This includes an area necessary to install a significant cut slope to construct a viaduct.

5.5 San Joaquin Valley (Alternatives 1-4)

This subsection was studied for at-grade construction and aerial structures. At-grade construction will require elevating existing roadways and providing additional fill material for the embankments leading to the roadway bridge approaches. Detours or temporary diversions of existing streets would be required while roadway and bridge construction progressed. Phasing of road construction should be sequenced to construct the roadway overpass before the HSR alignment. This is the most efficient method to save on costs and time. After completion of the individual roadway overpasses, this portion of the HSR could be constructed without interruption.

The aerial structure is proposed as a full-span precast construction method using simply supported precast 120 foot girders. The superstructure would consist of typical 120-foot-long pre-stressed concrete, single-cell concrete box girders supporting two parallel train tracks. Direct fixation track configuration is assumed, saving in weight and therefore seismic demand over the ballasted track alternative.

For the purposes of this report, a 14-foot diameter single-shaft foundation was found competitive and was selected due to installation speed compared to a pile cap system. The final foundation system will be selected depending on actual soil conditions, final seismic design response, and contractors' equipment availability as well as speed of construction.

Assuming the design of the gantry/equipment takes six months, its manufacture another six months, and final assembly at the site takes three months, the gantries will be available to launch girders 1-1/2 years after notice to proceed was issued to the contractor.

With the alternative alignments, bridge lengths will vary. For the purposes of this report, one option from Henry Miller Road to Carlucci Road is considered to provide a basis for scheduling.

Structures total length is 26,943 feet, so estimated working timetables are:

- Gantry/equipment design, procurement, assembly: 1-1/2 years
- 120 foot spans for 26,943 feet of bridge with approximately 225 foundations: 2,025 days of total construction time (based on nine days per foundation using CIDH and columns), assume completion in 405 days with five teams.
    - Spans per day was estimated in Section 4. General Construction Methods. Substructure construction must be complete before the superstructure can begin and with an assumed lag time of 100 days between the start of substructure work to the start of superstructure work, it is estimated that the entire 26,943 foot bridge would take approximately 205 days to complete.

Other specific constructability concerns in the San Joaquin Valley Crossing subsection include:

- Major waterway crossings including large irrigation canals and:
    - San Luis Creek
    - San Luis Wasteway
    - Los Banos Creek
    - San Luis Drain No. 1
    - Mud Slough
    - Boundary Drain
    - Devon Drain
    - Drain #1
    - West Delta Drain
    - Poso Drain
    - Belmont Drain
    - West San Juan Drain
    - West San Juan Drain #1
- Minimizing disturbances in Caltrans ROW
- Spanning across I-5 and Whitworth Road
- Maintaining access for agricultural operations
- Interface between San Joaquin Valley Crossing and Merced to Fresno Wye

6 CONSTRUCTION STAGING AREAS

The construction staging areas will house: incoming materials; areas for material preparation, storage and maintenance of equipment, operations preparation, and construction offices; and allow good housekeeping throughout the alignment (see the plans for all the construction staging areas).

Each method of construction will have its own staging area requirements. Staging areas for span-by-span segmental, BC, and CIP construction methods are not as critical to the construction footprint as the full span method for the following reasons, the site does not need to be as large and bridge elements can be transported to/from the site using local streets. On the other hand, staging areas for methods other than full span construction impact local roads more in terms of lane closures and detours. The larger construction staging areas (for use as viaduct pre-casting yards) for Alternatives 1 and 3, as well as limited construction staging areas available for Alternative 4 are shown below.

6.1 Monterey Viaduct Alignment Using Full Span Construction

6.1.1 Location

Figure 6-1 Far North End Staging Area, Alternatives 1 and 3 (Sta 310+00 near Capitol Caltrain)

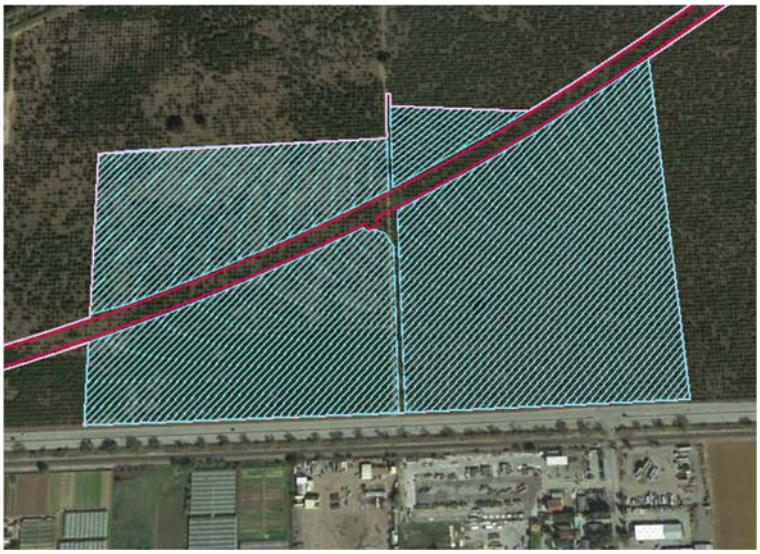


Figure 6-2 Central Staging Area, Alternatives 1 and 3 (Sta 920+00 near Morgan Hill)

Figure 6-3 South End Staging Area, Alternative 1 (Sta 1575+00 in Gilroy)

Figure 6-4 South End Staging Area, Alternative 3 (Sta 1605+00 in Gilroy)

6.1.2 Description of Site

Three in-line staging areas are shown in Section 6-1:

- Figure 6-1 Far North End Staging Area, Alternatives 1 and 3 (Sta 310+00 near Capitol Caltrain)
- Figure 6-2 Central Staging Area, Alternatives 1 and 3 (Sta 920+00 near Morgan Hill)
- Figure 6-3 South End Staging Area, Alternative 1 (Sta 1575+00 in Gilroy)
- Figure 6-44South End Staging Area, Alternative 3 (Sta 1605+00 in Gilroy)

The alignment between the Far North End and South End staging areas is constrained because the HSR alignment runs between the UPRR ROW and Monterey Highway.

6.1.3 Criteria Compliance

Each of the three staging areas comply with the criteria required for the full-span precast construction method: in-line with the HSR alignment and at least 35 acres. The 35 acres includes 21 acres for the precast yard (see Appendix C) and 14 acres for the movement of precast spans onto the alignment.

6.1.4 General Size, Shape, Location

- Far North End staging area (Alternatives 1 and 3)
  - 67 acres
  - In San Jose near the Capitol Caltrain Station (Sta 310+00)

- Central staging area (Alternatives 1 and 3)
  - 78 acres
  - In Morgan Hill (Sta 920+00)
- South End staging area (Alternative 1)
  - 36 acres
  - In Gilroy (Sta 1575+00)
- South End staging area (Alternative 3)
  - 38 acres
  - In Gilroy (Sta 1605+00)

6.1.5 Site Summary

Each of the in-line staging areas are already impacted to a certain extent from the HSR alignment itself. Expanding the site to include a staging area will have the following additional impacts.

- The Far North End staging area would displace several businesses including an auto wrecker.
- The Central staging area encompasses mainly undeveloped area but does include several residences. A nearby alternate site could be located adjacent to Monterey Road.
- The South End staging area (Alternative 1) encompasses a mainly undeveloped area adjacent to UPRR railway and Monterey Highway.
- The South End staging area (Alternative 3) encompasses a mainly undeveloped area between Cohansey and Las Animas avenues east of U.S.101.

6.2 Blended At-Grade Alignment Construction

6.2.1 Location

Figure 6-5 Coyote Valley Staging Area, Alternative 4 (Sta 795+00 near Bailey Avenue)

Figure 6-6 San Martin/Upper Llagas Creek Staging Area, Alternative 4 (Sta 1290+00 near south end of Morgan Hill)

6.2.2 Description of Site

Two in-line staging areas are shown for Alternative 4 in this section (see 6.2.1, Figures 6-5 and 6-6). The alignment for Alternative 4 has been designed to stay within the existing UPRR ROW to the greatest extent possible to minimize the need for additional ROW acquisition. The Coyote Valley Staging Area is the northernmost location possible (used as a temporary construction easement) while the San Martin/Upper Llagas Creek Staging Area is located where there is curve straightening outside the existing UPRR ROW. The MOWF just south of Gilroy could also be used as a staging area since it is within the permanent HSR ROW (however, this location is not shown as a potential construction staging area).

6.2.3 Criteria Compliance

The Coyote Valley staging area is suitable for staging construction materials associated with the blended, at-grade construction elements (track, ballast, ties, ballast retainers, etc.). The San Martin/Upper Llagas Creek staging area is limited to the parcel acquired for the curve straightening of the alignment. There are no minimum size requirements for these areas in Alternative 4.

6.2.4 General Size, Shape, Location

- Coyote Valley staging area (Alternative 4)
  - 6 acres
  - Near Bailey Avenue (Sta 795+00)
- San Martin/Upper Llagas Creek staging area (Alternative 4)
  - 4 acres
  - South of Morgan Hill (Sta 1290+00)

6.2.5 Site Summary

Each of the in-line staging areas are already impacted to a certain extent from the HSR alignment. Expanding the site to include a staging area will have the following additional impacts.

- The Coyote Valley staging area encompasses undeveloped agricultural land adjacent to the existing UPRR ROW.
- The San Martin/Upper Llagas Creek staging area is whole parcel of a business (RV storage) that would be impacted as a result of the curve straightening of the alignment (Alternative 4).

7 PRECASTING OPERATIONS AND YARD REQUIREMENTS

The approximate dimensions of a typical precast yard take into account the following elements and associated space requirements:

- Beam Manufacture and Casting Beds
- Concrete Manufacture
- Steel Storage
- Beam Storage
- Heavy Equipment Parking
- Administration Building & Staff Parking
- Access Road

A typical precast yard with estimated size requirements for each element is shown as follows:

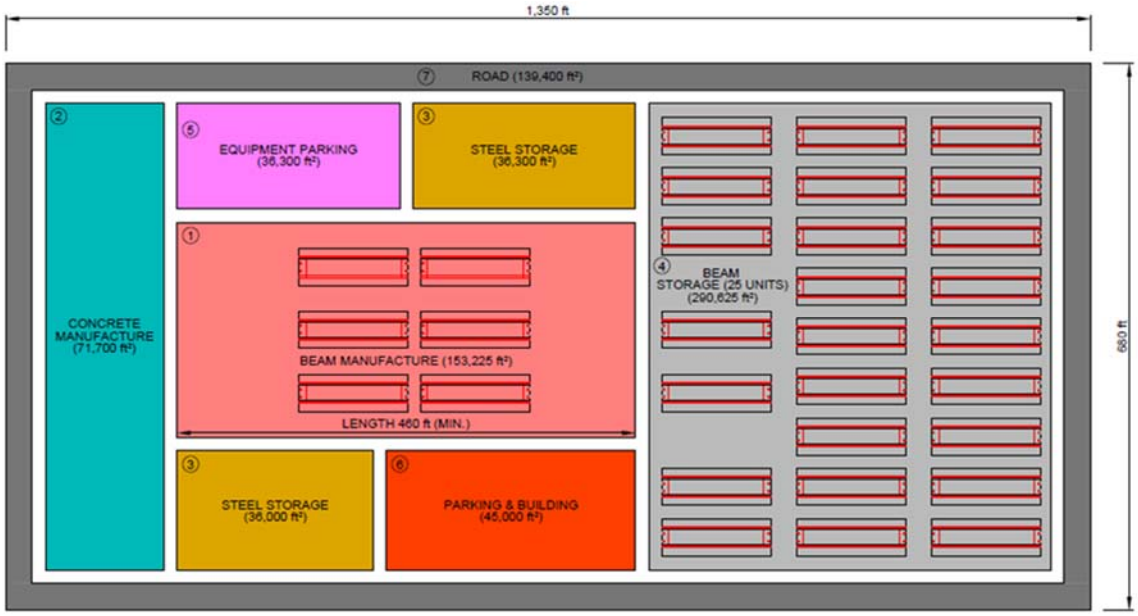


Figure 7-1 Precast Yard Layout

To meet the 2-1/2-year construction schedule, two precast yards will be needed to produce the spans for the 142,800-foot-long Monterey Highway Viaduct Structure.

Appendix C includes detailed information about each of the precast yard elements, estimated sizes, and layout.

8 CONSTRUCTION SEQUENCING

8.1 Construction Timing Constraints

Environmental constraints, including nesting bird season and seasonal flooding, can constrain the timing of certain construction activities. Tree removal would ideally be conducted during the non-breeding season to avoid potential impacts to actively nesting birds. Dewatering for foundation construction in sensitive areas may be restricted to dry months.

Key activities that may constrain the construction schedule and impact the critical path if not properly sequenced include:

- ROW acquisitions (permanent and temporary)
- Utility relocations
- Railroad realignment
- Roadway rerouting
- Order and delivery of long lead items.

Critical path construction activities include:

- Standard viaduct construction – setting up staging areas and precasting facilities

8.2 Enabling Works

Enabling works include:

- ROW acquisition.
- Obtaining necessary construction permits.
- Setting up staging areas and precasting facilities.
- Setting up worker health, safety, and welfare facilities.
- Setting up contractor administration offices.
- Site clearance and demolition.
- Constructing construction access roads.
- Critical utility relocations and protection works.
- Canal relocations.
- Railroad relocations.
- Permanent grade crossing closures.

Temporary construction facilities should be acquired and cleared early in the construction schedule to provide flexibility.

If possible, utility relocations should be done before the main work commences to allow for more efficient excavations, grading, and foundation construction. The staging areas will need to be connected to the utility network (water, electricity, telecommunications) as early as possible.

8.3 Typical Construction Sequencing and Durations

Typical construction sequencing will include:

- Permanent and temporary ROW acquisitions by the Authority.
- Contractor mobilization – staging areas, pre-casting facilities, and supporting offices.
- Critical area utility relocations (by contractor and/or third parties).
- Railroad relocations
- Roadway relocations.
- Canal relocations.

- Hydraulic crossings.
- Wildlife crossings.
- Berm construction.
- Demolition of buildings and roadway structures.
- Roadway overcrossing structures.
- Roadway modifications.
- HSR at-grade earthwork construction.
- HSR retained fill construction.
- HSR viaduct construction (standard and non-standard).
- Demobilization.

A preliminary version of the project contract schedule that will be provided in the environmental documentation can be found in Appendix E. This version is subject to change.

9 TRAFFIC CONTROL AND DETOURS

Impacts to traffic must be minimized during construction and efficient movement through and around construction zones must be maintained throughout the duration of the construction. Extensive coordination with Caltrans, UPRR, and cities will be required. Detours allow for the most expeditious approach to completing the construction; however, they can cause public relation concerns within local communities. Detours require that current studies are performed to determine traffic volumes and movements that will be affected. Also, signal timing for proposed detour routes will need to be evaluated and signal phasing at intersections along detour routes will need to be adjusted to accommodate the new traffic volumes. Detour durations must be held to a minimum to avoid prolonged disruption to the traveling public. These are analyzed in further detail in the Environmental Transportation Technical Report.

9.1 At-Grade Crossing Replacement

The Blended At-Grade Alternative 4 will require reconstruction of a number of existing grade crossings between Santa Clara and Gilroy to accommodate shifted and new tracks.

Trackwork will be predominantly performed at night and on weekends, requiring short term roadway closures and establishment of roadway detours while roadway approach grading and paving is performed and new crossing panels are set. Crossing protection will be maintained through all phases of construction. Minor track work changes may be accomplished with temporary crossings permitting vehicular crossings between work shifts.

9.2 Monterey Corridor Grade Separations

For the grade separations required in the Monterey corridor, an assumed general approach is as follows:

- Close the crossing street, reduce the number of travel lanes on Monterey Road, and shift traffic to construct a portion of the new roadway including structures.
- Shift reduced number of travel lanes on Monterey Road to a newly constructed portion and complete the construction of the new roadway.
- Restore Monterey Road traffic to the new permanent roadway alignment and connect the crossing street.
- Complete the construction of HSR and UPRR alignments including structures to finish the grade separation.

For the grade separations required in the Morgan Hill and Gilroy corridors an assumed general approach is as follows:

- Install temporary roadway detours as necessary.
- Construct the HSR and UPRR embankment and structures (including UPRR shoofly tracks).
- Construct portions of new grade separated roadways. Temporarily reduce and shift travel lanes. Roadway closures will be evaluated in aggregate so appropriate detours are available.

9.3 Caltrain Station Access

There are six existing Caltrain stations that will need to remain in service during construction.

Caltrain Capitol Station

The existing Caltrain Capitol Station is in UPRR ROW under the dedicated HSR alignment viaduct as the alignment transitions from the west to the east side of the transportation corridor. To ensure public safety, the construction of the viaduct over the existing station would require either falsework over the station should the construction be done with CIP methods or the relocation of the station to the south should the construction be done with precast segments.

For the relocation option, we have developed an alternate location approximately 500 feet south of the existing station. This relocated station would be accessed using the existing Caltrain parking lot at Fehren Drive using the existing sidewalk on the east side of Monterey Road. A new mid-block, signalized pedestrian crossing would be constructed to access the station on the west side of Monterey Road. This relocated station could be either temporary or permanent since it is located outside of the construction area required for the HSR viaduct.

Caltrain Tamien, Blossom Hill, Morgan Hill, San Martin, and Gilroy Stations

The Tamien Station would remain in service and not require relocation. The Blossom Hill, Morgan Hill, San Martin, and Gilroy stations would be temporarily relocated so existing parking and access can be maintained. These relocations will be in conjunction with the UPRR shooflies associated with the at-grade alternative. The station relocations will need to be coordinated with the VTA as they operate and maintain them.

Additionally, roadway construction will impact local transit (non-rail) facilities, such as bus services, that will need to remain operational throughout construction. Temporary facilities will be provided (e.g. temporarily relocated bus routes and stops) with consideration for key transit locations and will be factored into the overall temporary traffic handling measures.

Traffic control features, such as construction signs and pavement makings, must be installed and maintained per current California Manual on Uniform Traffic Control Devices (CAMUTCD) Standards. Clearly identified construction zones and associated hazards must be in place prior to commencement of any construction activities to warn the traveling public and avoid potential liability claims. All traffic control measures must be reviewed twice daily, once at night and once during the daytime. Reports documenting all devices in use and the current status of the devices must be completed and submitted to the Design-Build team so deficient items can be immediately corrected.

To avoid logistical inconveniences for both construction crews and for the public, movements of materials and equipment will be made using the HSR ROW wherever practical.

Local and interstate highways will be affected by the movement of materials and equipment, and the contractor will be required to develop a Construction Transportation Plan to minimize this impacts. This plan will address in detail the activities to be carried out in each construction phase while maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the route and schedule for material deliveries, material staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if needed. The plan will provide traffic controls pursuant to the CAMUTCD sections on temporary traffic controls (Caltrans 2014) and will include a traffic control plan.

Major construction traffic components are as follows:

- Import of construction materials, such as:
    - Fuel, oil
    - Water
    - Concrete
    - Steel

  - Cement
  - Aggregates
  - Fill material
- Mobilization/demobilization of equipment.
- Daily movements of craft labor.
- Export of earth or other unsuitable materials.

Planned traffic detours and modifications to existing traffic flows will be required for the construction of roadway overpasses and for periodic hauling operations.

For safety, security, and logistics reasons, this ROW area will be fenced, and access will be controlled. Access to the site will be via specific gates along the ROW that will be strategically located with easy access to roads and freeways.

10 CONSTRUCTION POLLUTION CONTROL

Dust, chemicals, noise, and vibration generated from the construction will pose significant concerns to the local communities. Control measures will be established to regulate these according to the mitigation and permit requirements outlined in the Environmental Impact Report/Environmental Impact Statement (EIR/S).

10.1 Air Quality

Air quality mitigation measures and permit requirements will be detailed in the EIR/S and will include:

- Wet down stockpiles and areas of incomplete construction for road beds and tracks.
- Dust palliative application.
- Provide soil tracking devices to remove dirt build-up on construction equipment tires at access points to construction. Soil devices would consist of broken rock and/or rubble placed on filter fabric to vibrate off loose mud and dirt.
- Provide street cleaning equipment.
- Provide temporary sediment barriers.

10.2 Noise and Vibration

The noise and vibration limits chosen for construction and operation of the HSR System satisfy the federal guidelines of the FRA and Federal Transit Administration (FTA) for trains and HSR facility operations and Federal Highway Administration (FHWA) as defined for California application by Caltrans for traffic noise.

During construction, some equipment, most notably pile driving equipment, may cause ground-borne vibrations. Pile-driving is only one of the several proposed construction methods, and it is only expected to occur where there is the need for a bridge, aerial structure, or road crossing. Construction equipment can produce vibration levels at 25 feet that range from 58 vibration decibels (VdB) for a small bulldozer to 112 VdB for a pile driver. With pile driving, there is potential for severe vibration impacts during construction that would have substantial intensity under the National Environmental Policy Act (NEPA) and would be significant under the California Environmental Quality Act (CEQA). Without pile driving, the impact would have moderate intensity under NEPA and would be less than significant under CEQA.

Mitigation measures and permit requirements for noise and vibration levels will be detailed in the EIR/S and will include:

- Restrict certain activities such as pile driving and hauling of borrow material to daytime operations only.
- Provide sound walls around generators and other stationary equipment.
- Monitor noise levels to ensure proper measures are taking place.
- Perform vibration and settlement monitoring.
- Cease operations with excessive vibration and evaluate alternative construction methods.

10.2.1 Water Quality

Water quality mitigation measures and permit requirements will be detailed in the EIR/S and will include:

- Prepare and adhere to approved Stormwater Pollution Prevention Plan (SWPPP).
- Comply with water quality permits (401/WDRs, 402, 404, dewatering)

11 CONSTRUCTION PERMITS

All construction permits must be obtained before starting construction. The Contractor must identify what permits will be necessary for the construction, ROW, easements, environmental protection, etc. for contract execution.

Below is a preliminary list of anticipated permits that may need to be acquired:

Table 11-1 Construction Permits

Jurisdiction	Potential Permit Required
California Department of Water Resources	Encroachment Permit
California Public Utilities Commission	Authority to Construct
Caltrain/Peninsula Corridor Joint Powers Board (PCJPB)	Right-of-Entry Survey Permit
Central Valley Flood Protection Board	Encroachment Permit
City of Gilroy	Building Permit, Encroachment Permit, Maintenance Agreement, Memorandum of Understanding (MOU)
City of Morgan Hill	Building Permit, Encroachment Permit, Maintenance Agreement, MOU
City of San Jose	Building Permit, Encroachment Permit, Flood Hazard Zone, Geological Hazard Clearance, Grading & Erosion Control, Maintenance Agreement, MOU, Utility Permit
County of Merced	Building Permit, Construction Detours, Encroachment Permit, Environmental Health Permit, Maintenance Agreement, MOU
County of San Benito	Maintenance Agreement, MOU, Encroachment Permit
County of Santa Clara	Building Permit, Encroachment Permit, Maintenance Agreement, MOU
Irrigation and Water Districts: See Hydrology and Hydraulics Report – PEPD	Encroachment Permit, Maintenance Agreement, MOU
Pajaro River Watershed Flood Prevention Authority	MOU
RWQCB, Central Coast Region 3	NPDES permit
RWQCB, Central Valley Region 5	NPDES permit
RWQCB, San Francisco Bay Region 2	NPDES permit in association with SWPPP
Santa Clara Valley Transportation Authority	Construction Access Permit, Restricted Access Permit
South County Airport	Encroachment Permit
Union Pacific Railroad	Right-of-Entry Survey Permit
United States Bureau of Reclamation	Encroachment Permit, Construction Access Permit, Maintenance Agreement

12 THIRD PARTY COORDINATION AND AGREEMENTS

12.1 Caltrans

The project crosses Caltrans property and facilities at numerous locations, and the San Jose to Merced section crosses Caltrans Districts, 4, 5 and 10. Throughout the HSR facilities construction, regardless of the alignment chosen from San Jose to Merced, the rail construction will require a working relationship with Caltrans and a binding agreement.

Prior to construction, an interagency agreement(s) between Caltrans and the Authority would clearly identify the agreements made for both the construction and ongoing operations and maintenance of both rail and highway facilities.

In this interagency agreement(s), the joint use of ROW with the rail either under or over Caltrans highway facilities needs to be accurately defined. Once defined, it must be recorded with the State of California State Lands Commission pursuant to the provisions of Section 101.5 of the Streets and Highway Code.

The impact of the rail construction on Caltrans facilities and highway traffic must be evaluated which should include, but is not limited to, the resulting change in the seismic safety of the highway structures. The change may occur from modified earthwork around bridge columns or abutments. If the highway structure is affected by the rail construction, the correctional mitigations should be included in the rail construction bid documents.

For the HSR project, it is possible several Caltrans divisions would be involved in developing an interagency agreement and conflicting recommendations are possible. Caltrans headquarters in Sacramento oversees the legal aspects of any agreement and typically gives final approval. Development of a typical agreement with Caltrans takes several months, so this agreement could take years to finalize due to the complexity of the agreement and the decision-making structure.

During development of the interagency agreement(s), there may issues that will arise. Since the design is not yet fully developed, the following issues are most likely not the only ones that may be experienced, but they provide a basic understanding of issues that have arisen in the past:

- Caltrans has required that structures built over state highways be built to Caltrans specifications.
- Design of a structure spanning a state highway could require multiple reviews by the Caltrans Bridge Department.
- Erection of the structure over the state highway will be dictated by Caltrans. Seven to ten locations will require rail line construction below a Caltrans bridge structure.
- Design of Caltrans bridges has been performed using planned site conditions.
- Planned rail construction can affect state highway ancillary facilities.
- Active construction under a Caltrans structure will pose several concerns for Caltrans and the agency will demand an oversight role.
- Address the future maintenance responsibilities for the project's constructed facilities and maintenance of the joint ROW in a section of the agreement.

12.2 Utilities

Constructability will be affected by the presence, characteristics, and handling of utilities within the project. Handling includes planning and executing both temporary and permanent changes to utility configuration. Each utility crossing that will be affected should be the subject of a definitive plan for construction. Utilities, being predominantly placed underground, are often the subject of claims for unforeseen conditions. Contractors also lodge claims when utility companies fail to act promptly and cause delay to the contractor's progress.

Utility companies possess certain rights to have and maintain facilities in easements within the HSR construction area, including in Caltrain, UPRR, Caltrans, and other local agency ROW and in the overall project vicinity. Utilities services must be kept in continuous operation except for short and well-planned outages related to cutovers and emergency repairs. For purposes of this discussion, a utility in the ROW is any non-railroad pipeline, conduit, channel, or other conveyance, including electrical or telecommunications.

In some cases, utility companies may own rights via easements, licenses, and permits to use property even where they do not have existing physical facilities. In nearly every case where utilities lines exist in the ROW they are subject to being moved and altered to accommodate the new construction of the HSR project. ROW expansion will encompass utilities that are not currently in the ROW.

The mutual duties established between the Authority, as project Owner, with each utility should be recorded in formal agreements that provide guidelines for what work is to be done, by whom, when, and how.

City and county jurisdictions operate utility enterprises as financial entities distinct from their general funds. Some utilities, notably telecommunications, may run in joint facilities such as duct banks and trenches. Relocation of these facilities requires multi-party negotiation and coordination that be time-consuming as various parties review proposals by others. Utilities sharing facilities may also have different design standards that can conflict with each other and require resolution.

Relocation of utilities that make use of the ROW for conveyance (longitudinal utilities) may require extensive design, including temporary relocations and tie-ins. These utilities may include telecommunications, electrical power, fuel and gas pipelines, and others.

The construction drawings should have detailed and accurate depictions of the utilities in the project vicinity. It is important to pothole critical utilities to assure the utilities are where they are believed to be.

12.3 Railroads

12.3.1 Caltrain

Constructability will be affected by the timeliness and provisions of agreements made with the PCJPB, which operates commuter rail service along the San Francisco Peninsula, through the South Bay to San Jose and Gilroy and maintains various systems and safety operations. PCJPB owns the ROW north of CP Lick.

Under the blended system concept, the HSR will operate using the same main tracks as Caltrain trains north of Diridon Station (or north of Gilroy under Alternative 4), so the HSR project will require thorough and detailed coordination of design, systems integration, construction planning, construction coordination, operational testing, and operations when HSR is in service.

Construction of the PCJPB Caltrain Modernization (CalMod) Project is expected to precede the HSR project. CalMod will install electrification and controls systems that will be compatible with and jointly used with HSR. When HSR is put into operation, Caltrain will exercise central control over the system including HSR trains.

New turnouts, switches, crossovers, and other installations on the existing main track will require several hours of train outages. Without agreed-on regular days and hours of operational outages, bidders will be unable to provide realistic bids and would most likely increase their bids to account for scheduling uncertainty.

Without detailed and mutually agreeable policies and procedures for joint usage of track areas during construction, HSR contractors will face unexpected and unscheduled interruptions in work causing delays and extra cost. Before construction, it is important to establish thorough and complete plans for site safety coordination in the form of a Project Safety Plan that is reviewed and interactively worked out with Caltrain. During construction, the team should practice joint

planning for specific work through Site Specific Work Plans, and investigate and troubleshoot any and all failures of safety planning, communication, and execution.

It will be important to establish a joint operations safety board including representatives of Caltrain, UPRR, Authority construction managers, and contractors that meets regularly and confines its discussion to operations and safety. The board will disseminate lessons-learned to project participants and the Authority for general distribution.

12.3.2 Union Pacific Railroad

Constructability will be affected by the timeliness and provisions of agreements made with UPRR. North of CP Lick, UPRR has retained certain rights for use of the Caltrain ROW that include revenue-producing ownership of utility easements and operation of freight rail trains. HSR construction will require that UPRR's utility easements be altered or bought to allow both temporary and permanent relocation. Our investigation of rail conditions and spurs indicates that a low volume of freight traffic runs along the Caltrain ROW; however, the Authority should expect UPRR to defend any ROW rights they possess vigorously. South of CP Lick, UPRR owns the ROW which Caltrain operates on. In areas both north and south of CP Lick, the construction of HSR will result in numerous impacts to the Caltrain and UPRR ROW. Negotiations with UPRR can be protracted and difficult.

HSR construction will require UPRR agreement and cooperation in five areas:

1. Freight Operations Schedule – Without agreed upon days and hours of operation by UPRR in this corridor, the contractor will be unable to provide a realistic bid and would most probably increase his bid to account for uncertainty.
2. Freight Operations Accessibility – Maintaining continuous access to spurs, sidings, and junctions during construction will be important to UPRR.
3. Material Transportation – An umbrella agreement would stabilize freight pricing in advance of bidding, giving contractors reliable costs and ground rules. Negotiation of prices and terms by the Authority could also be advantageous to the project by offering UPRR motivation to cooperate on other issues.
4. Using Off-Route Right-of-Way – It may be advantageous for the Authority to use UPRR ROW outside the HSR/Caltrain route as paths for non-rail methods of material movement. These could include spur tracks at Quint Street in San Francisco, the junction leading to the old Dumbarton railroad bridge, and the Milpitas and Oakland Subdivisions.
5. Utilities Relocation – Some UPRR-owned third-party easements will have to be relocated or purchased by HSR or Caltrain to accommodate construction.

It is recommended that the Authority complete a full and accurate study to identify all utilities running in the Caltrain ROW, conduct multi-party negotiation, and finalize multilateral binding agreements that will provide the basis for utilities relocations into new easements and for interim relocations appropriate for staging during construction process.

12.4 Local Jurisdictions

12.4.1 Discussion

The JM Section of the HSR route passes through three cities, three counties, and several unincorporated areas. Contractors will need to access the HSR site through these jurisdictions. Issues, including utility relations, street conforms, property takes, and many others will need to be agreed upon preferably before awarding contracts. Prior to a construction bid, detailed agreements with jurisdictions would fully inform and formalize the project's proposed construction details, environmental mitigations, and operating parameters.

Municipal codes and policies will vary in each jurisdiction affecting rules involving working hours, haul routes, noise, and other factors in construction. Failure to obtain binding and detailed legal

agreements with the local jurisdictions will result in possible additional project costs and delays. Uncooperative cities and counties have the power to close haul routes, restrict traffic movements, restrict movement of oversize loads, and place weight limits on streets necessary for import and export of material.

Cities and counties may have locally-owned utilities that will be affected by the rail construction. These often include sewer, storm drain, and traffic signal conduits. The protection or rerouting of these utilities where they are affected needs to be detailed in the agreement, including who will be responsible for the work and how payment will be made if the city or county does the required work. Since both sewer and storm drainage systems rely on gravity for flow, the utility relocation or protection cost could be extensive, requiring rerouting or, in some cases, pump stations.

The following are some of the most important local construction work concerns that should be included in the local agency agreements.

- Building Permits
- Haul Routes and Traffic
- Street Closures
- Work Hours
- Use of City Standards
- Dust, Air Pollution, and Odor Control
- Sound Control
- Project Appearance

12.5 Coordinating Betterments and Adjoining Third Party Work

12.5.1 Discussion

Constructability will be affected by work the Authority agrees to undertake on behalf of other agencies and stakeholders. For instance, a city may wish to increase the size of a sewer pipeline crossing the right-of-way that must be rerouted to clear a bridge footing. Since the increase in pipe size is mandated by its sewer master plan, the cost difference between the smaller and the larger pipe would be paid by the city because the Authority is responsible for a replacement not a better facility.

Likewise, any major project is often accompanied by work done by other agencies and adjoining landowners at that stakeholder's expense. Although this can be referred to as "adjoining work", in some cases this work takes place within the HSR project limits. Both kinds of work are prone to disagreements on cost and can affect the schedule.

The construction agent (i.e., the stakeholder's design and construction representative) for this work may be the Authority through a negotiated agreement, a stakeholder, or another party. Many betterments are best incorporated into contracts for the major project for unified coordination of the schedule and budget.

A good interagency C&M agreement must be thorough and clear about the financial responsibility for all betterments, and the costs should be agreed on prior to beginning work. In a design-build contract without unit price bids, this will be difficult, but better than after the work is performed when it could not be modified. Agreements should provide for additional payment to HSR for price escalation, unforeseen conditions, and other possible occurrences that increase costs.

13 POTENTIAL EXCAVATION HAZARDS

13.1 Surface Soils

The project area is underlain by sedimentary soils from the surface to a depth below the likely depth of project excavations. Soils include combinations of sands, gravel, cobbles, silts, and clays. Granular soils can “run”, pouring from excavation surfaces and creating instability. Fine sands can also be saturated with water and be difficult to compact without using methods to drain the water or chemically stabilize them with cement or lime. These conditions should be expected and provisions made in the contract documents for remedies.

13.2 Deep Excavations

With deep excavation, the contractor is likely to encounter site conditions that differ from those depicted in the contract documents. Groundwater may also differ from what is shown in soil borings. Differing site conditions often result in disputes and then change orders or claims. Deep cuts will require that soft native soils be shored and reinforced to avoid settlement of soil structures. Groundwater intrusion and settlement can be minimized by specifying the means of shoring at the trench boundaries to create a water seal that keeps drawdown at a minimum in areas adjoining the trenches. These might include overlapping drilled piers, slurry walls, and watertight sheetpile walls.

In the project area, the water table can be high enough to seep into excavations, requiring collection and disposal of groundwater. Flowing groundwater can cause settlement in the ground above drawn-down soil volumes. Also, the groundwater may include contaminants and its disposal may require treatment and/or costly disposal. Likely contaminants and volumes to be disposed should be estimated and methods of disposal agreed upon before beginning construction.

Reinforcing methods such as anchors or soil nailing may require ROW actions be taken when they will be placed under adjoining properties. A survey of engineering solutions to prevent ground movement should be undertaken early in the 30% design phase when the final railroad alignment is determined, , including a constructability review and a detailed estimation of probable costs to serve as a decision-making guide for the most appropriate methods.

Some of the areas adjacent to the project are densely populated with residential and commercial structures that could sustain damage if the ground under them subsides or moves laterally. A pre-construction condition survey should be performed to document the condition of adjacent properties.

14 RIGHT-OF-WAY ACQUISITION

The Authority plans to acquire all needed ROW including TCEs prior to the start of construction. Property acquisition for the HSR section from San Jose to Central Valley Wye will involve over 1,000 parcels for each of the alternatives. Under rules and statutes, both State and federal, acquisition of property is time-consuming and not predictable regarding method or timeliness. Properties that will have to be acquired include private properties, state and local ROW, and utility property.

HNTB gathered existing ROW information from the counties within this section from digital assessor's parcel map data, including the assessor's parcel number and the parcel size. ROW and parcel boundaries, parcel information, and HSR footprint were displayed in GIS format, and the areas of acquisition and remnant and excess parcels were calculated.

Most parcels will require a partial acquisition of their total area resulting in a remnant that is not needed for the project. In some cases, a full acquisition of the parcel was determined to be necessary. This will be the case if the Regional Consultant (RC) observed that either (a) the remainder is not a viable economic unit that retains its highest and best use or (b) the impact to remaining land and improvements is too great to continue to function. In other cases, damages to an area of a parcel were determined to be necessary. An area was classified to be damaged if the RC observed that there will be no legal access, in addition to the criteria used for full acquisitions.

Property acquisition for HSR has occurred already in Merced, Fresno, Kings, and Kern counties. Lessons learned from this process are expected to help establish and improve HSR guidelines and practices for property acquisition.

Failure to acquire ROW for the project will delay both the start and the progress of construction. If construction is commenced without cleared ROW, it is most likely to result in costly ROW delay claims and an overall project delay. Because of the significant amounts of ROW that must be acquired, there is a risk that a lack of qualified ROW engineers, appraisers, title professionals, and acquisition staff will result in project delay.

In the past, taking too many properties has caused a backlash of public opinion and resulted in more restrictive and time-consuming ROW practices which would further slowdown the acquisition process.

Property acquisition from UPRR and other governments can be lengthy. If acquisition work on those properties is not started early, these difficult properties will delay the project.

ROW acquisition will likely be on the critical path for those segments that have numerous properties to acquire before starting construction. When prioritizing construction projects, it may be wise to select the segments with more challenging acquisitions.

As soon as an option is decided on and approved, negotiations with cities and counties for their properties needed for the rail construction and operation should begin. See Section 12.4 Local Jurisdictions. Also, negotiations should begin with each identified utility that will be affected by the project. These negotiations would include the party performing utility relocation or protection, when the relocation would be accomplished, and who would be paying for the required work. See Section 12.2 Utilities.

15 CONSTRUCTION POLLUTION CONTROL

Hazardous Materials – Portions of the project area has been in use for decades for transportation, industrial, and commercial purposes. The soil in numerous locations has accumulated pollutants, some of which may have been deposited or migrated to the project area in groundwater.

Contaminated materials that must be removed or may be reused by the project will need to be retested for disposal or reuse to assure that disposal or reuse is proper and legal. The soil adjacent to operating rails is often contaminated with either lead or petroleum products. Some of the material from the abated structures and contaminated soils may require removal to a Class 1 landfill. For California, this type of material is usually transported to Kettleman City or Coalinga — about 200 miles southeast of the project. Cost of the disposal is high at the Class 1 landfills and the Authority could have future costs from the Class 1 landfill disposal since generators are held responsible for the materials in perpetuity.

In the San Francisco Bay Area, there are specialty contractors that undertake abatement of toxic materials and obtain regulatory permits to clear the property. These specialty contractors can either work as prime or subcontractors for the prime rail contractor.

Noise and Vibration – Construction equipment and processes create noise and vibration that can affect nearby stakeholders in their residences, commercial establishments, work places, and outdoors. The EIS will provide an analysis of these effects and recommend mitigations in areas where noise/vibration effects are excessive. Construction contracts should require observation of mitigation measures and set performance standards. A pre-construction study of ambient conditions should be conducted to measures noise and document conditions in structures close enough to construction activities to be potentially damaged by vibrations.

Dust Control – Much of the project will take place near residential and commercial land uses. Contract documents should include stringent provisions requiring builders reduce dust emissions to a minimum.

16 CONCLUSIONS

This phase of the San Jose to Merced Project Section project development does not lend itself to concrete technical conclusions and recommendations about constructability, project delivery, and contract packaging. Rather, this report focused on constructability issues that are appropriate to the current plan development stage.

We concluded that each of the four alternatives, as currently presented, can be built but they present varying degrees of complexity, cost, duration, and impact on the environment and the public. Physical and other constraints on each alternative will vary the expense, duration, and impact of each alternative.

Costly concerns that should be addressed in detail before the project is built include:

- Property acquisition will be long and complex. The Authority should carry out property acquisitions itself and not delegate this to the design-build contractors.
- Construction work should not begin on the route segment before all property acquisitions are completed.
- Responsibility, processes, and payment mechanisms for dealing with unforeseen environmental contamination should be established in construction contract documents.
- C&M agreements with stakeholders including local jurisdictions, Caltrans, and utilities should be comprehensive, detailed, and executed before beginning construction.
- Reflect stakeholder agreements in the construction contract documents and bind contractors to perform in accordance with them.
- Accommodation of Caltrain and UPRR train operations will constrain construction operations and increase the construction cost and duration.
- At-grade and viaduct cross-sections are the most buildable cross-sections.
- Trench and embankment cross-sections present the most difficult staging challenges mostly due to constrained ROW width, earthmoving operations, and difficulties stemming from keeping Caltrain, UPRR, and Caltrans operational without modification.
- Identified laydown and staging areas are not large enough to efficiently support the work. Property acquisitions by the Authority will be needed to provide adequate areas.

17 REFERENCES

Caterpillar. *Caterpillar Performance Handbook*. 38th ed. January 2008.

Parsons. *California High-Speed Train San Jose to Merced Section Draft Constructability Assessment Report.* 2011.

URS/HMM/Arup Joint Venture. *PE4P Record Set Submission, Fresno to Bakersfield, Sierra Subdivision, Construction Package 4, Constructability Assessment Report*. 2014.

Pan, N-H., Tsung-Chih Chiu, Kuei-Yen Chen. *Full-span Precast Launching Method (FPLM) Analysis with Dynamic Simulation – Case Studies of Taiwan High-Speed Rail (THSR) Project*. Automation in Construction, 17:592-607. 2008.

APPENDIX A: MONTEREY HIGHWAY VIADUCT, TYPICAL SECTION INSTALLATION – FULL SPAN PRECAST

APPENDIX B: MONTEREY HIGHWAY VIADUCT, BALANCED CANTILEVER INSTALLATION

APPENDIX C: MONTEREY HIGHWAY VIADUCT, PRECAST BOX GIRDER YARD DIMENSIONS

APPENDIX D: SAN JOSE STATION APPROACH CONSTRUCTABILITY ANALYSIS

APPENDIX E: POTENTIAL CONTRACT PACKAGES AND SCHEDULE

APPENDIX F: POTENTIAL CONSTRUCTION SEQUENCE AT I-280

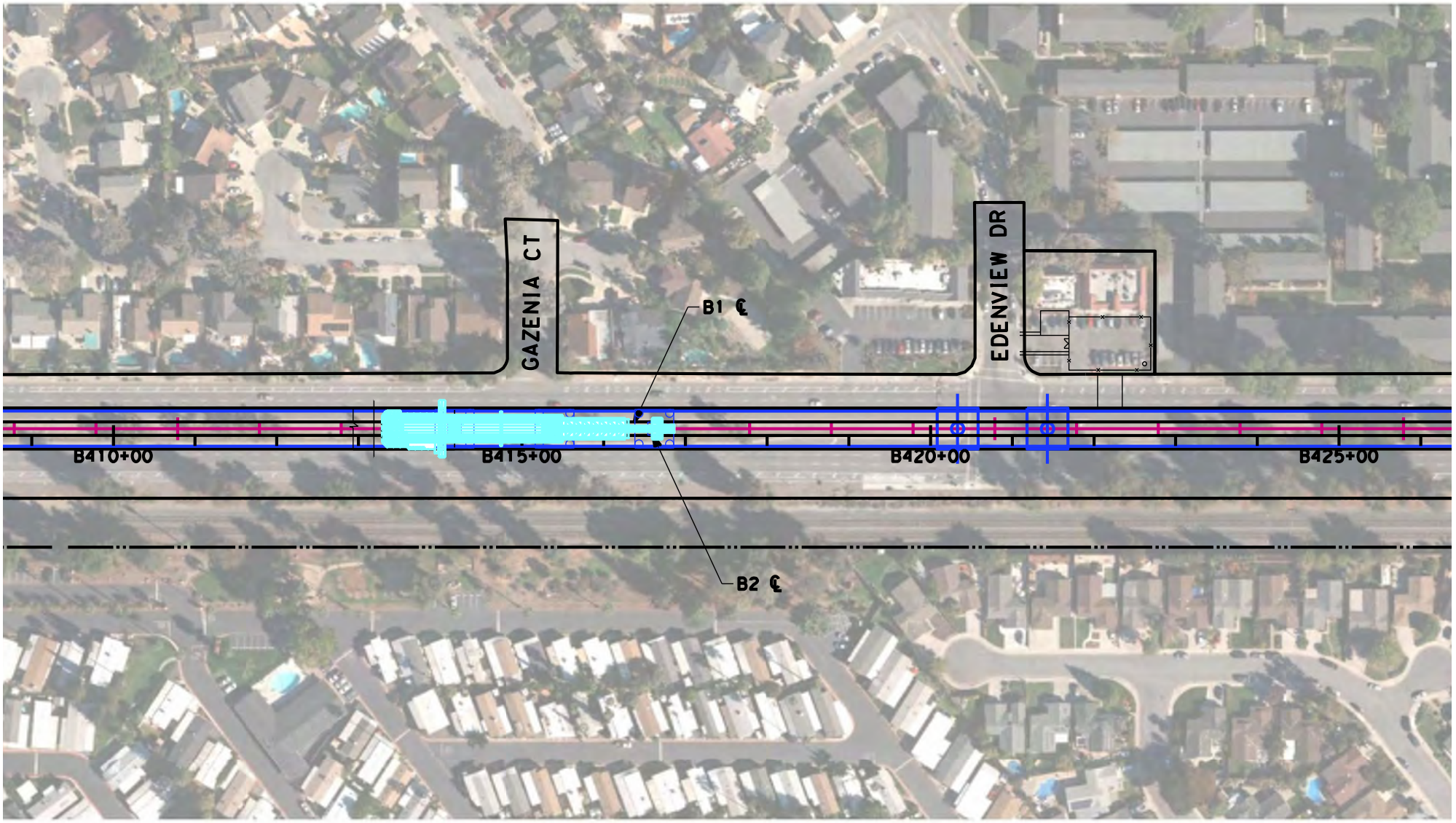
APPENDIX G: POTENTIAL CONSTRUCTION SEQUENCE AT MONTEREY HIGHWAY

APPENDIX H: TRACK SHIFT WORKS

APPENDIX A: MONTEREY HIGHWAY VIADUCT, TYPICAL SECTION INSTALLATION – FULL SPAN PRECAST

Appendix A
Monterey Highway Viaduct
Typical Section Installation – Full Span Precast

prointec



PLAN

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1"=200' HOR

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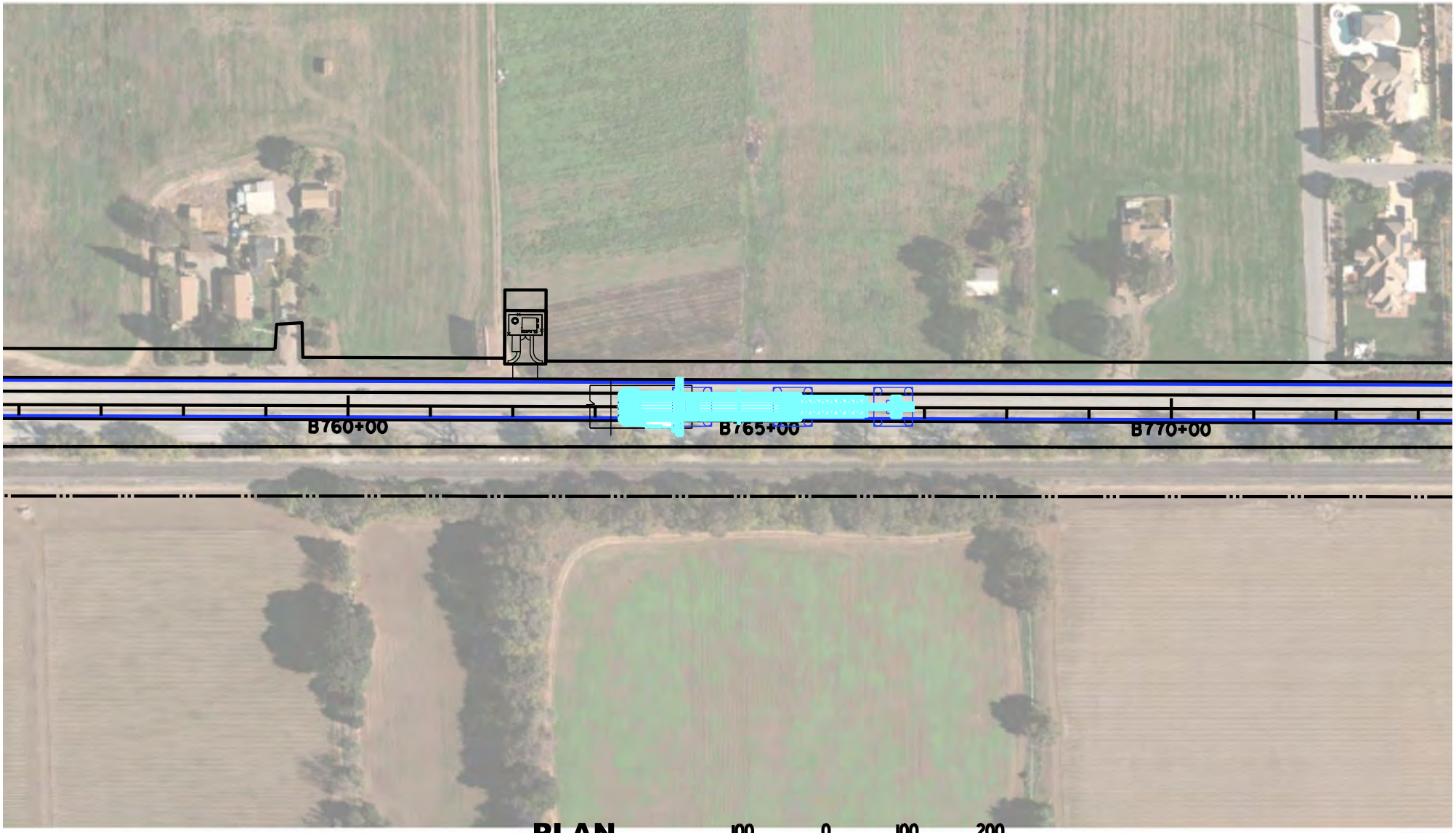

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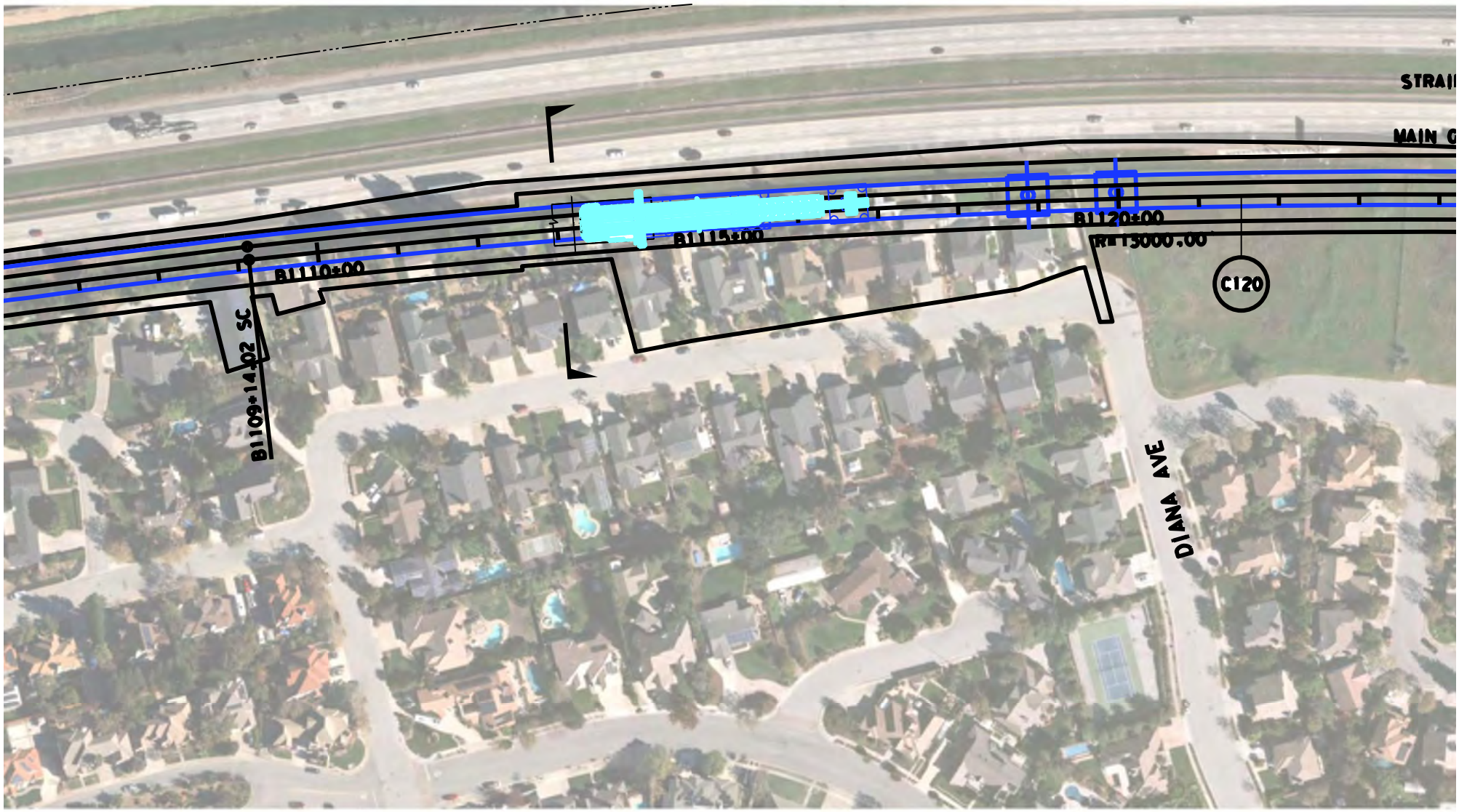

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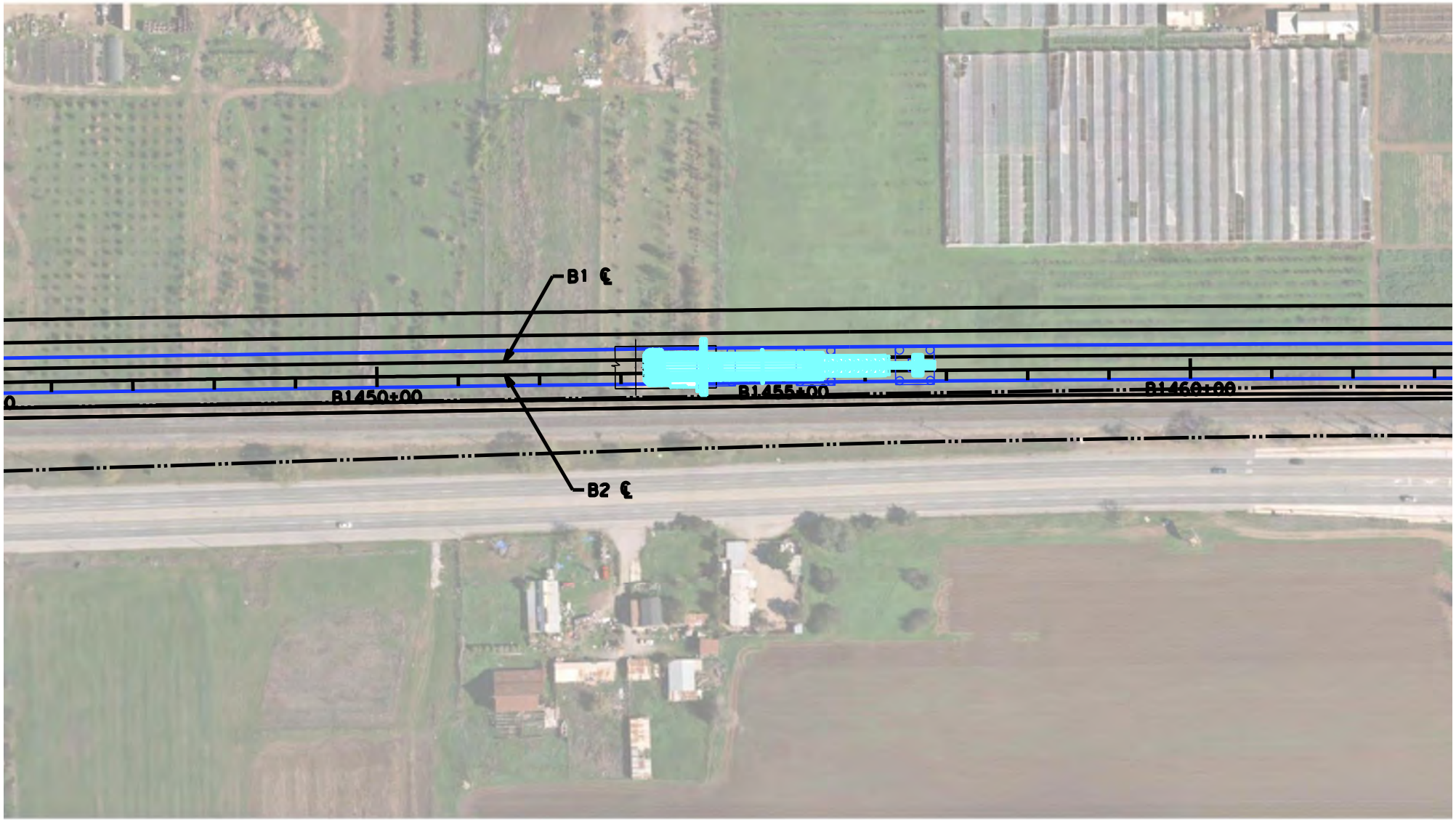

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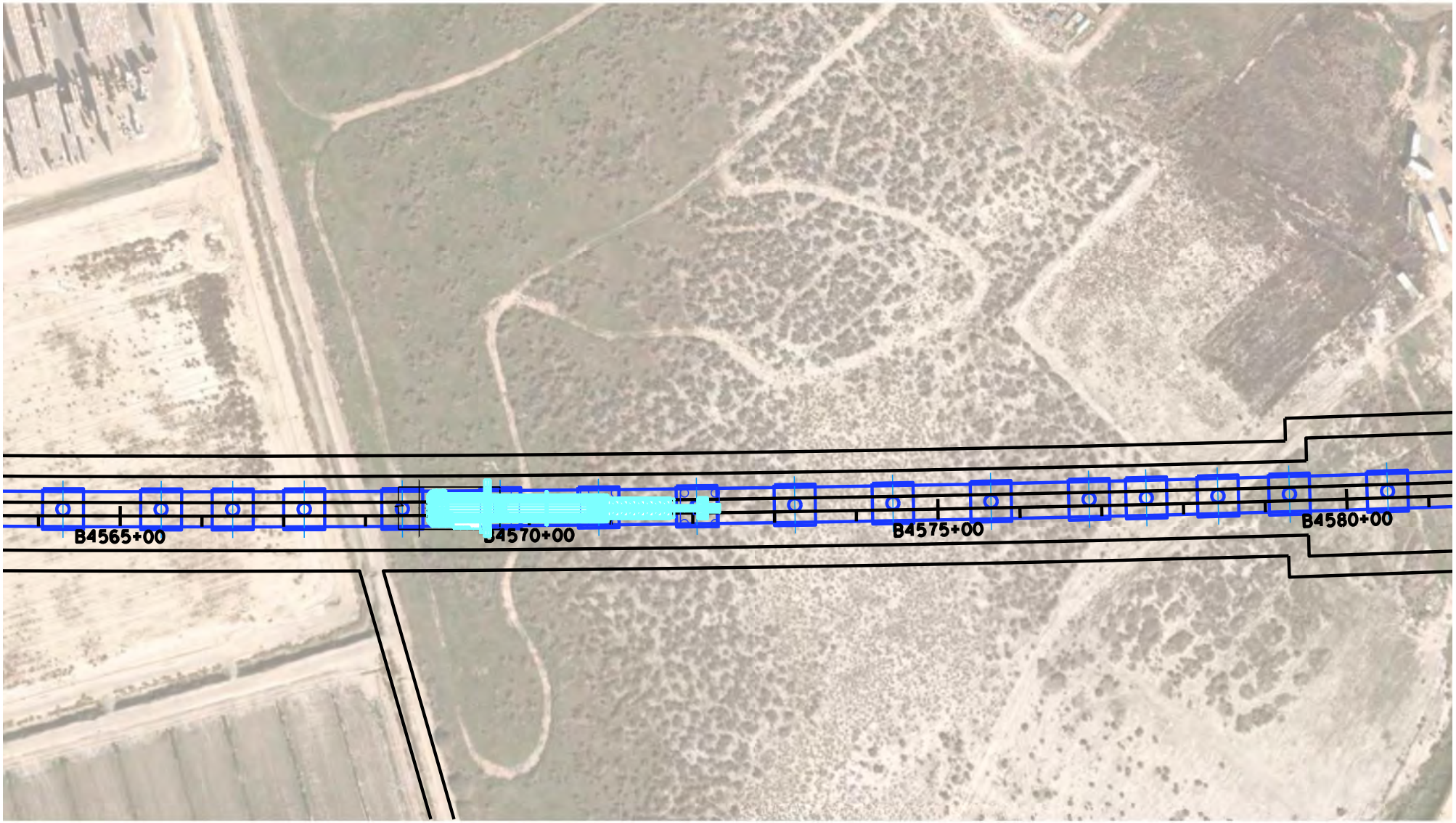

PLAN

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1"=200' HOR

STATION B4570+00

PLAN
SCALE: 1"=200'

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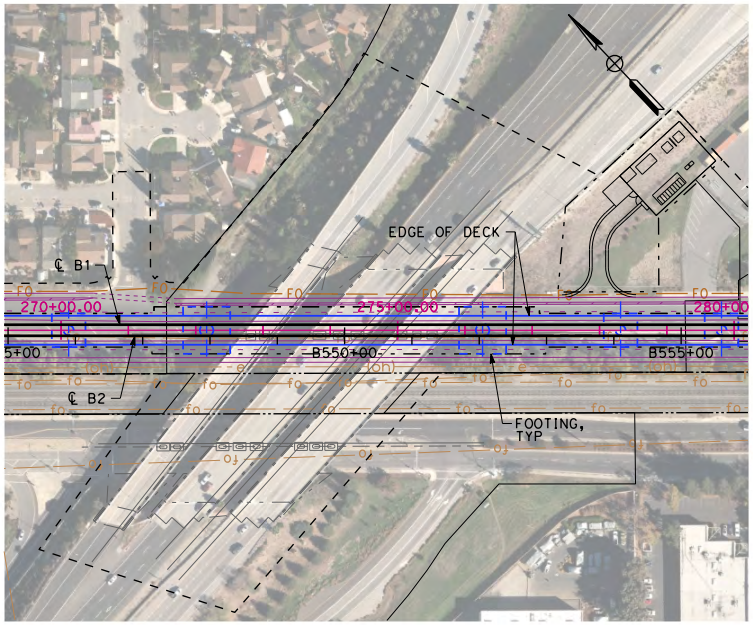
1"=200' HOR

STATION B4755+00

APPENDIX B: MONTEREY HIGHWAY VIADUCT, BALANCED CANTILEVER INSTALLATION

Appendix B
Monterey Highway Viaduct
Balanced Cantilever Installation

prointec



PLAN - STATE ROUTE 85
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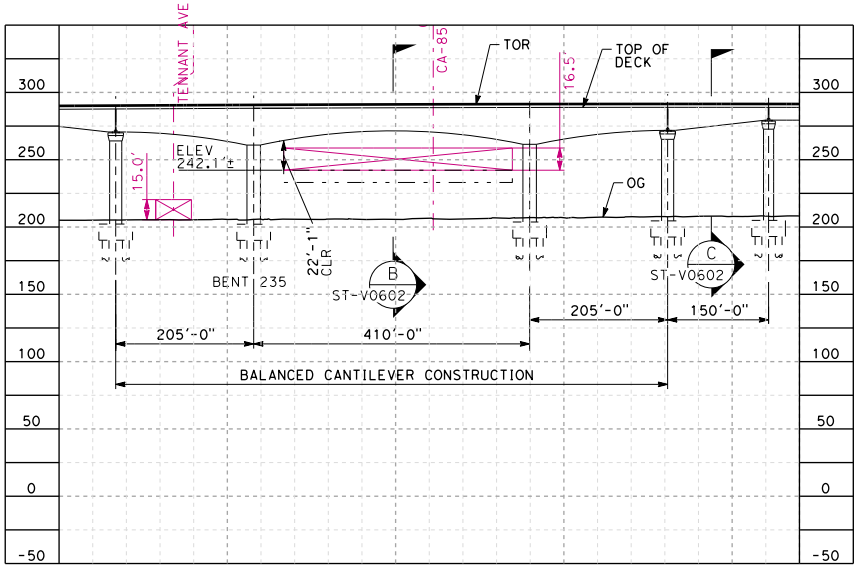
1"=200' HOR



PROFILE - STATE ROUTE 85
SCALE: 1"=200' HOR, 1"=100' VERT

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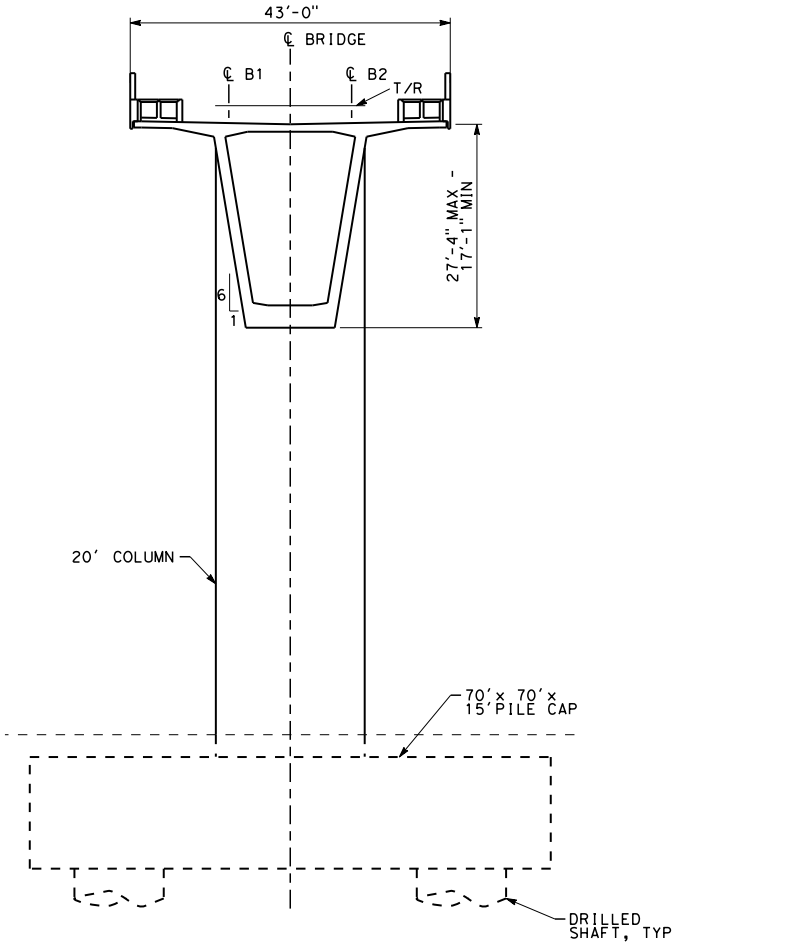
1"=100' VERT



SECTION B
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1"=20'

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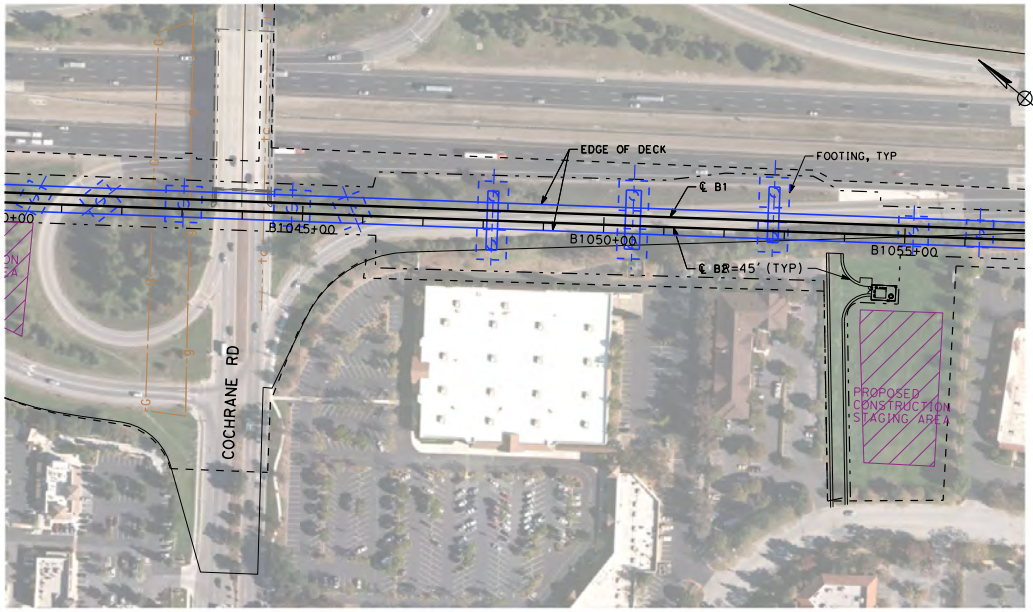

PLAN - COCHRANE RD ON-RAMP TO SB 101

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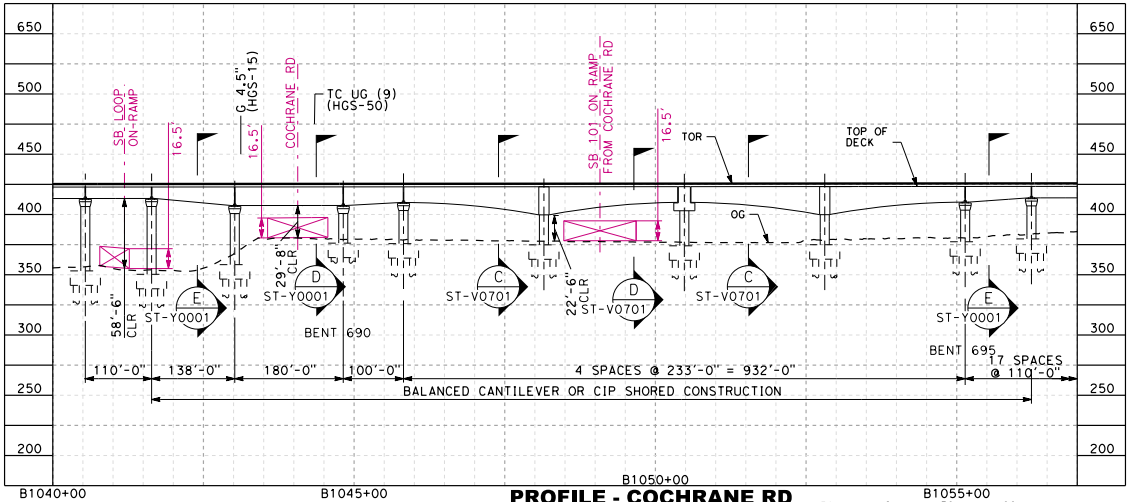
1"=200' HOR



PROFILE - COCHRANE RD ON-RAMP TO SB 101

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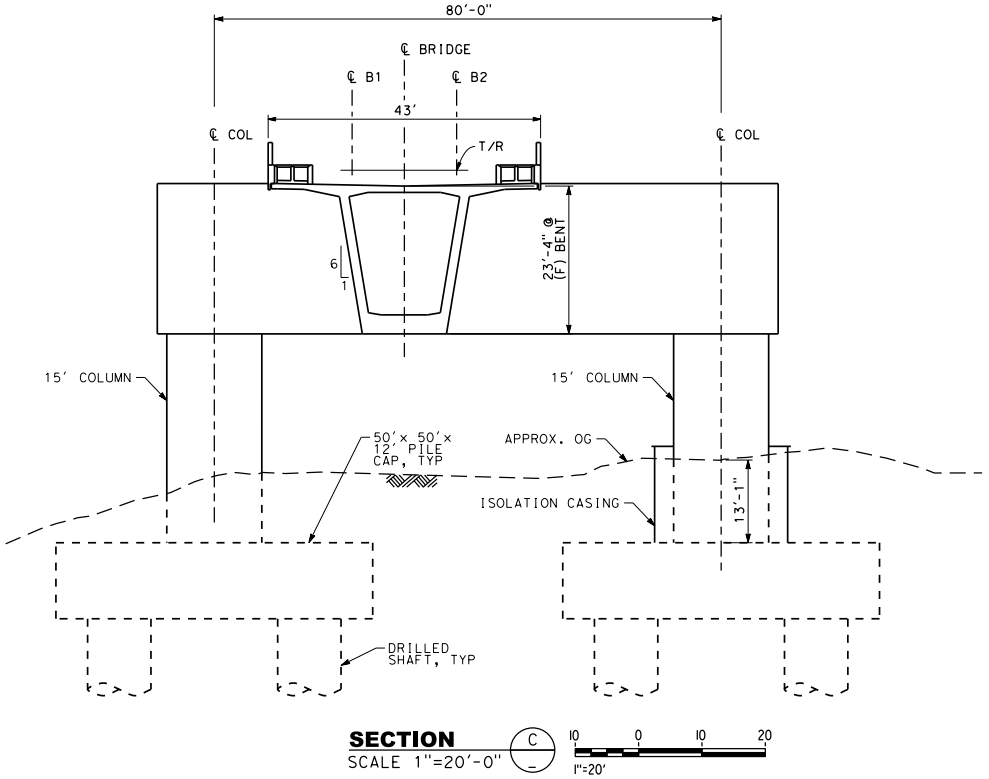
1"=100' VERT



SECTION C

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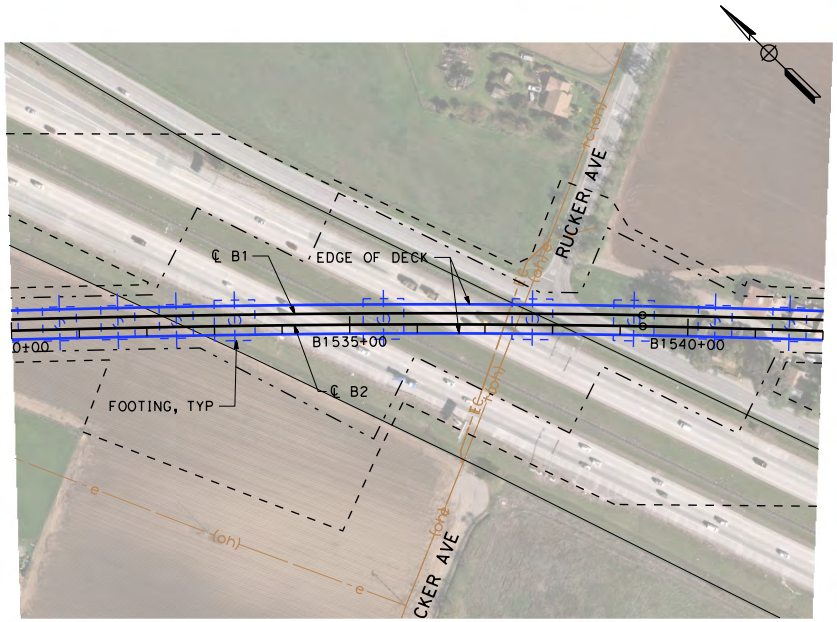
1"=20'

STATION B1050+00



PLAN - US 101
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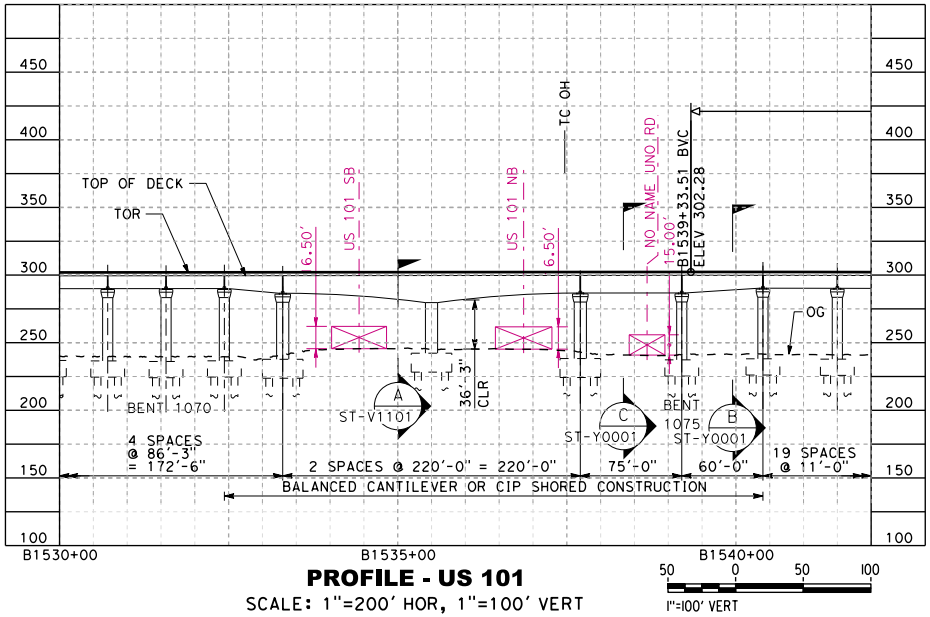
1"=200' HOR



PROFILE - US 101
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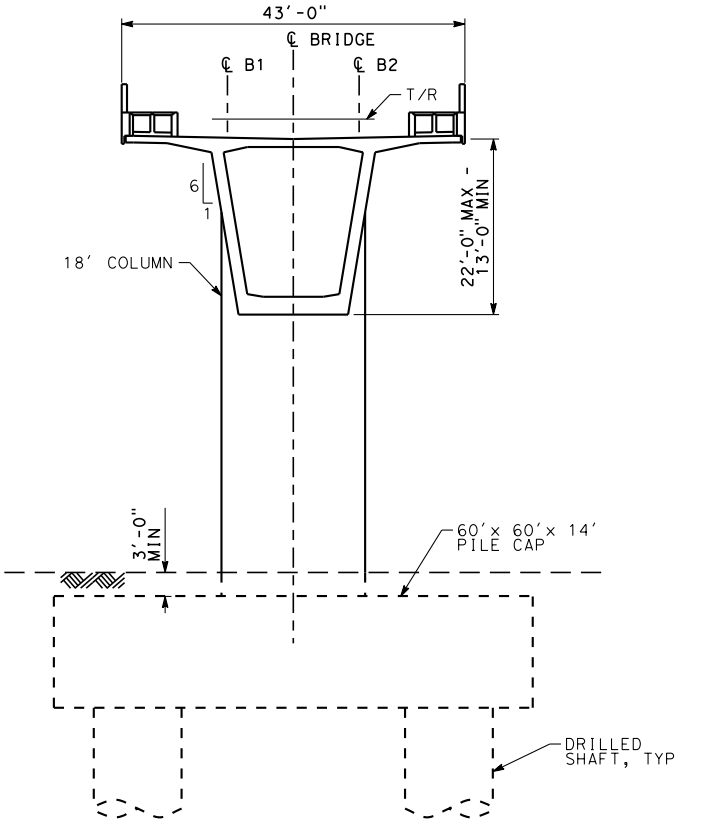
1"=100' VERT



SECTION A
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1"=20'

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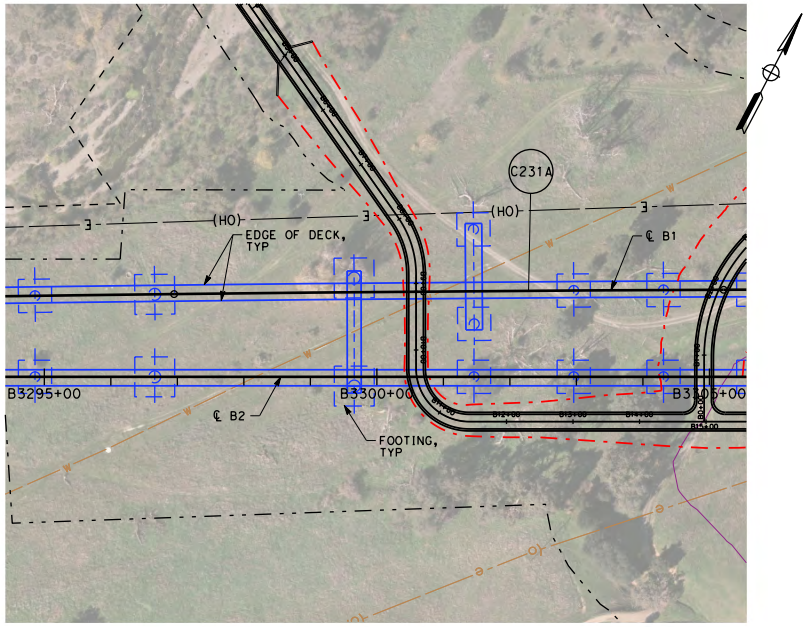

PLAN - PACHECO CONDUIT
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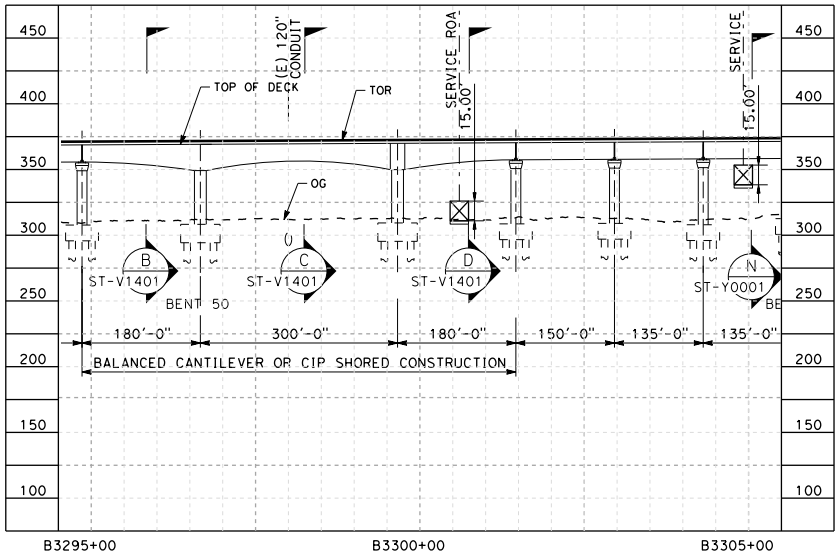
1"=200' HOR



PROFILE - PACHECO CONDUIT
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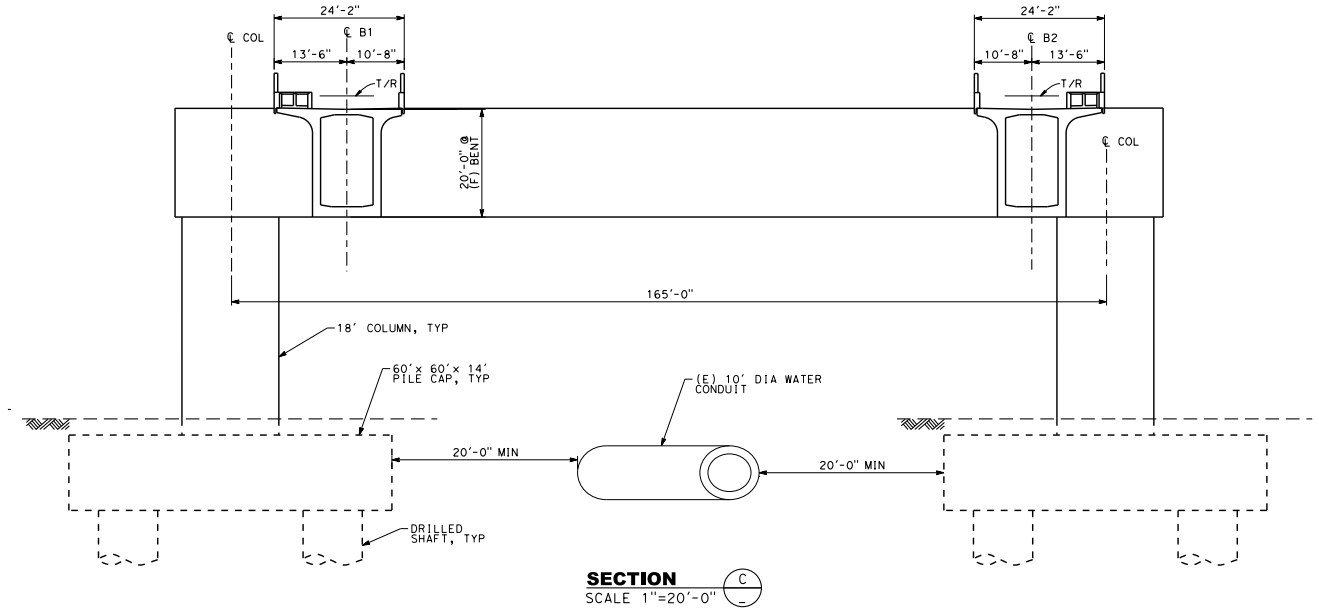
1"=100' VERT



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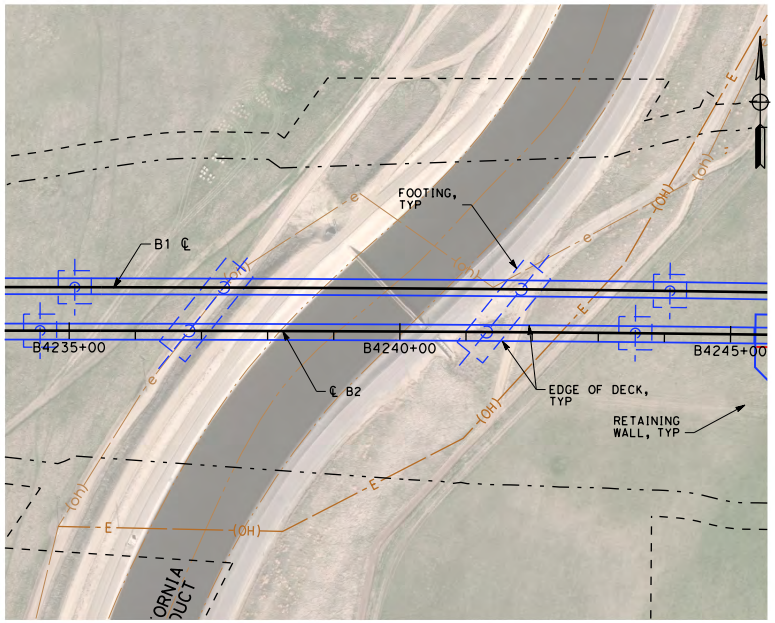

PLAN - CALIFORNIA AQUEDUCT
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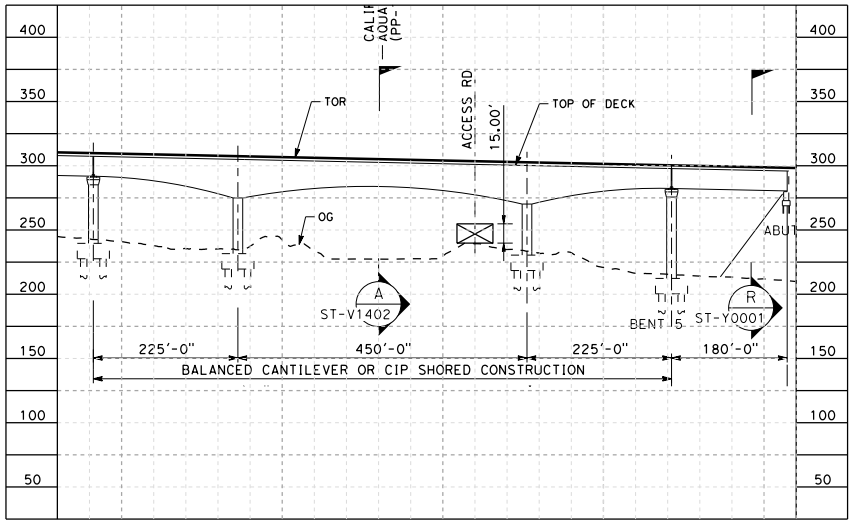

PROFILE - CALIFORNIA AQUEDUCT
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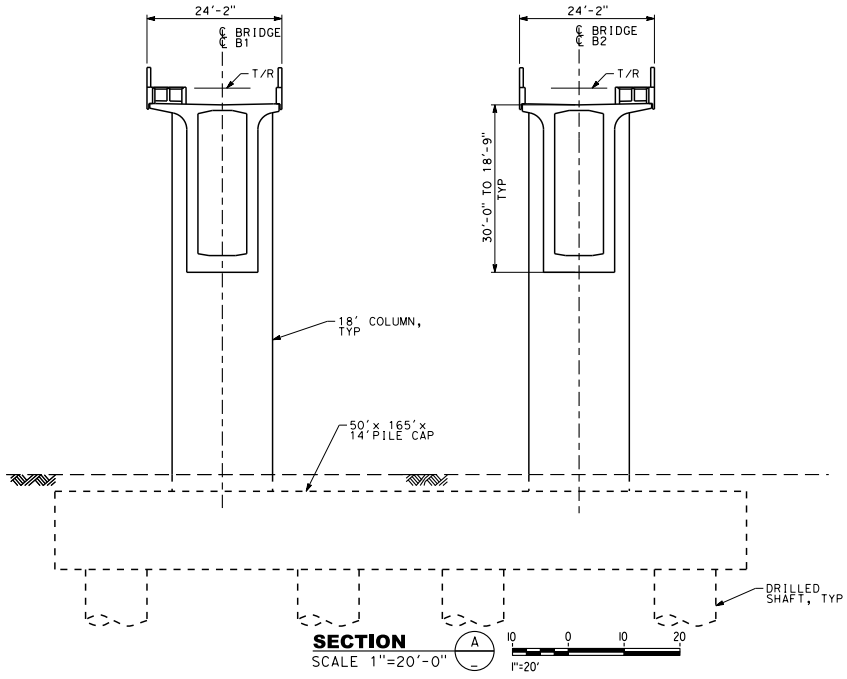
1"=100' VERT



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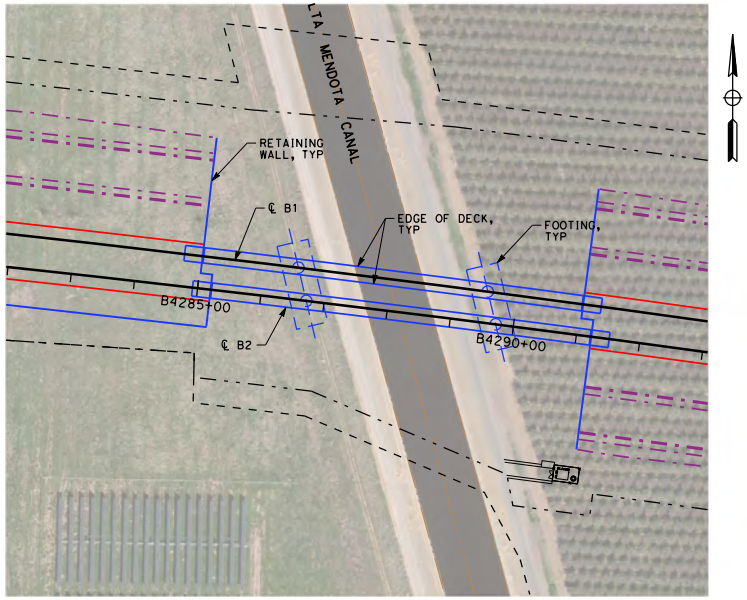
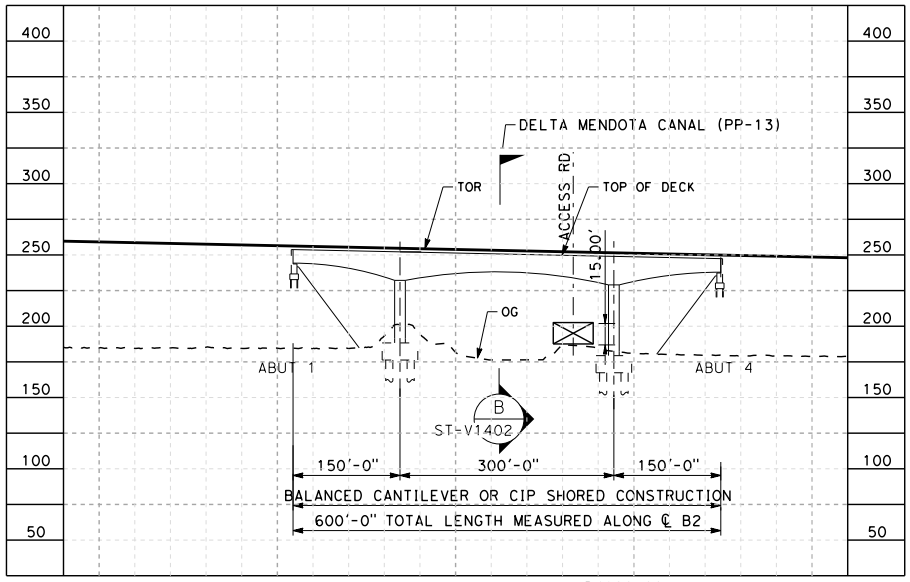
1"=20'

STATION B4240+00



PLAN - DETLA MENDOTA
SCALE: 1"=200'



PROFILE - DELTA MENDOTA
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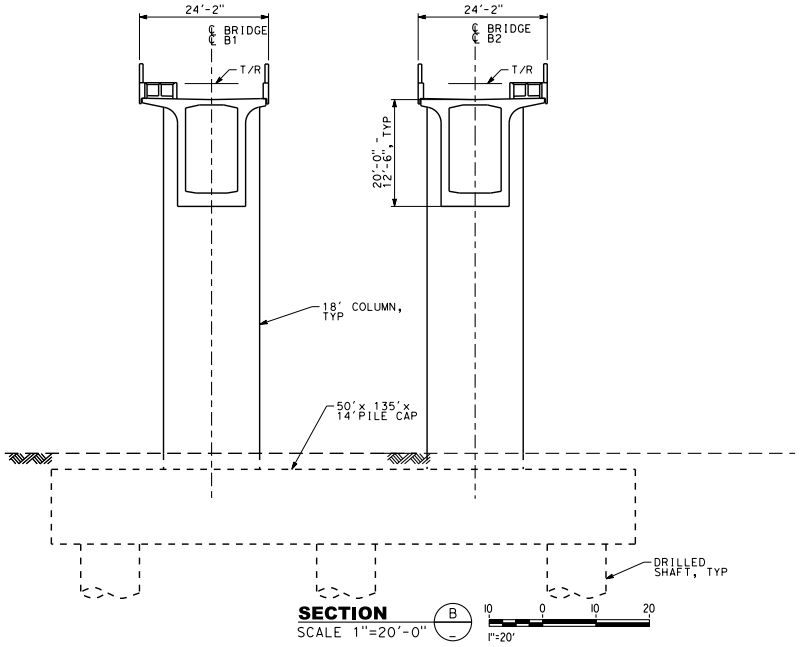

SECTION B
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APPENDIX C: MONTEREY HIGHWAY VIADUCT, PRECAST BOX GIRDER YARD DIMENSIONS

Appendix C
Monterey Highway Viaduct
Precast Box Girder Yard Dimensions

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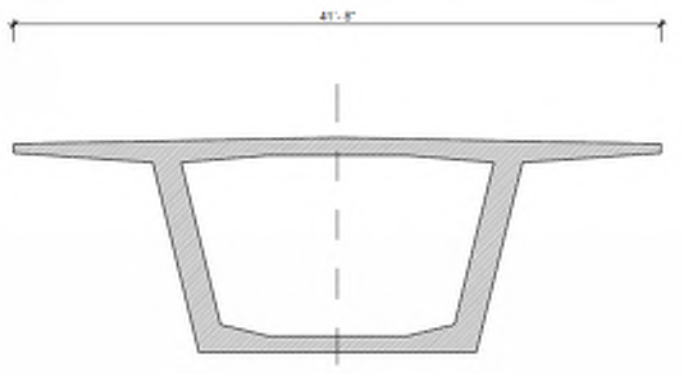
1. Introduction

To establish the necessary dimensions of a box girder precast manufacturing yard, the required production rate, beam manufacturing process, yard layout and the installation/erection equipment must be considered.

The precast yard will need to produce typical single cell box girder sections up to 130 ft. in length.



As a baseline scenario, the beams production and installation/erection must meet the constuction schedule of 2.5 years (30 months). The number of precast yards and installation/erection equipments must fit within this construction schedule considering their individual production and installation rates.

1. Introduction

Supply needs:

The total length of the Monterey Highway Viaduct is 142,798 ft., and consists of four different structure types:

• Typical single column spans:	122,200 ft	(85.57%)
• Multi-column straddle bents:	9,800 ft	(6.86%)
• Long Span balanced cantilever spans:	5,500 ft	(3.85%)
• CIP continuous spans:	5,300 ft	(3.71%)

Typical single column spans and straddle bent spans will be constructed sing precast beams, since they cover more than 92% of the total viaduct length.

The precast yard must be capable of producing 132,000 ft box girder beams.

Manufacture Planning:

In order to meet the overall construction schedule the beam installation/erection rate is estimated at 1,023 feet per week. The required number of beam launching gantries and associated support equipment is estimated as follows:

• Total precast beam length:	132,000 ft
• Construction Schedule:	30 months (129 weeks)
• Precast beam installation rate/week:	132,000 ft/129 weeks = 1,023 ft per week
• Number of launching gantries:	1,023 ft/ 650 ft per week per team = 1.57 -> 2 gantries

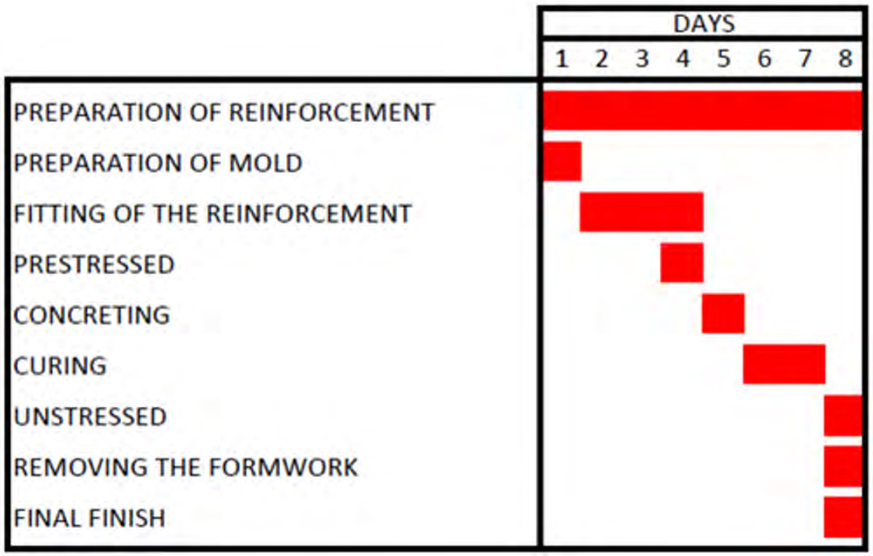
1. Introduction

Production needs:

The precast yard will need to produce 1,300 ft. of precast beams a week in order to supply each of the two installation/erection teams with 650 ft. of precast beams per week.

Yard Production Rate:

A precast yard with 3 –260 ft. casting benches can produce 780 ft. of preast beams per week. The work would alternate between the benches, including work tasks such as armouring, concreting or removing the formwork.



1. Introduction

Precast yards

As stated previously, a single precast yard production rate is estimated to be 780 ft. of precast beam per week.

In order to keep up with the two installation/erection teams combined rate of 1300 ft/week, the number of precast yards needed is estimated as follows:

- Total precast beam length: 132,000 ft
- Installation/Erection per week (ft): 1,300 ft/week (650 ft / week * 2 gantries)
- Number of precast yard needed: 1,300 ft/week installation / 780 ft/week production = 1.66 -> 2 precast yards needed

2. Dimensions of the precast yard

To overall dimensions and layout of a precast yard should take into account the following elements and its space requirements:

1. Beam Manufacture
2. Concrete Manufacture
3. Steel Storage
4. Beam Storage (25 Units
5. Equipment Parking
6. Parking & Building
7. Road

2. Dimensions of the precast yard - Beam Manufacture

1. Beam Manufacture

Beam manufacture is the most important element of the precast yard, as it will be where the precast beams are manufactured. In order to match the beam manufacturing pace to the erection pace, it is necessary to have 3 - 260 foot long benches that are capable of holding two beams each. For the purposes of sizing the precast yard, the beams are assumed to be single cell box girders, up to 130 feet in length, and 43 foot deck width.

The facility cranes must be able to lift 130 ft. long beams, each weighing an estimated 1,000 tons.

The estimated dimensions needed for beam manufacture is 460 ft. x 333 ft., representing an area of approximately 153,225 ft.^{2}.

2. Dimensions of the precast yard- Concrete Manufacture

2. Concrete Manufacture

The precast yard requires an exclusive concrete mixing plant to supply the concrete necessary for the manufacturing of the beams.

The daily production capacity must equal the volume of concrete required for two 130 ft. beams. This daily concrete production is estimated at 8,400 ft.³/day. The concrete manufacturing plant must have an output of 1,150 ft³ / hour. The space for the concrete manufacturing area includes room for:

- Cement silos
- Stockpiles of aggregates
- Additive silos

The estimated dimensions needed for concrete manufacturing is 485 ft. x 150 ft., representing an area of approximately 71,700 ft.².

2. Dimensions of the precast yard- Steel Storage

3. Steel Storage

A reinforcing and prestressing steel stockpile area is needed for steel supplies, which will also include a scrap metal processing area.

The estimated dimensions needed for reinforcing and steel storage is 280 ft. x 130 ft., representing an area of approximately 36,300 ft.^{2}.

2. Dimensions of the precast yard- Beam Storage

4. Beam Storage (25 Units)

The beam storage area will be used to cure and store the beams prior to erection.

Given the large dimensions of the beams, the storage area must take into account space for the movement of mobile gantries for loading and access to the transport roads.

The estimated dimensions needed for this beam storage is 525 ft. x 435 ft., representing an area of approximately 290,625 ft.^{2}.

2. Dimensions of the precast yard- Equipment Parking

5. Equipment Parking

The precast yard will have other machinery and heavy equipment needed for the production the beams and transport, loading and unloading of different materials and handling of the beams. This equipment includes: mobile gantries, overhead cranes, loaders, truck cranes, forklifts, etc.

The estimated dimensions needed for heavy equipment parking is 280 ft. x 130 ft., representing an area of approximately 36,300 ft.^{2}.

2. Dimensions of the precast yard- Building & Parking

6. Building & Parking

The precast yard will have buildings for technical and construction staff, cafeteria, changing rooms and other necessary facilities, plus a space reserved for staff parking.

The estimated dimensions needed for the buildings and parking is 300 ft. x 130 ft., representing an area of approximately 45,000 ft.^{2}.

2. Dimensions of the precast yard- Road

7. Road

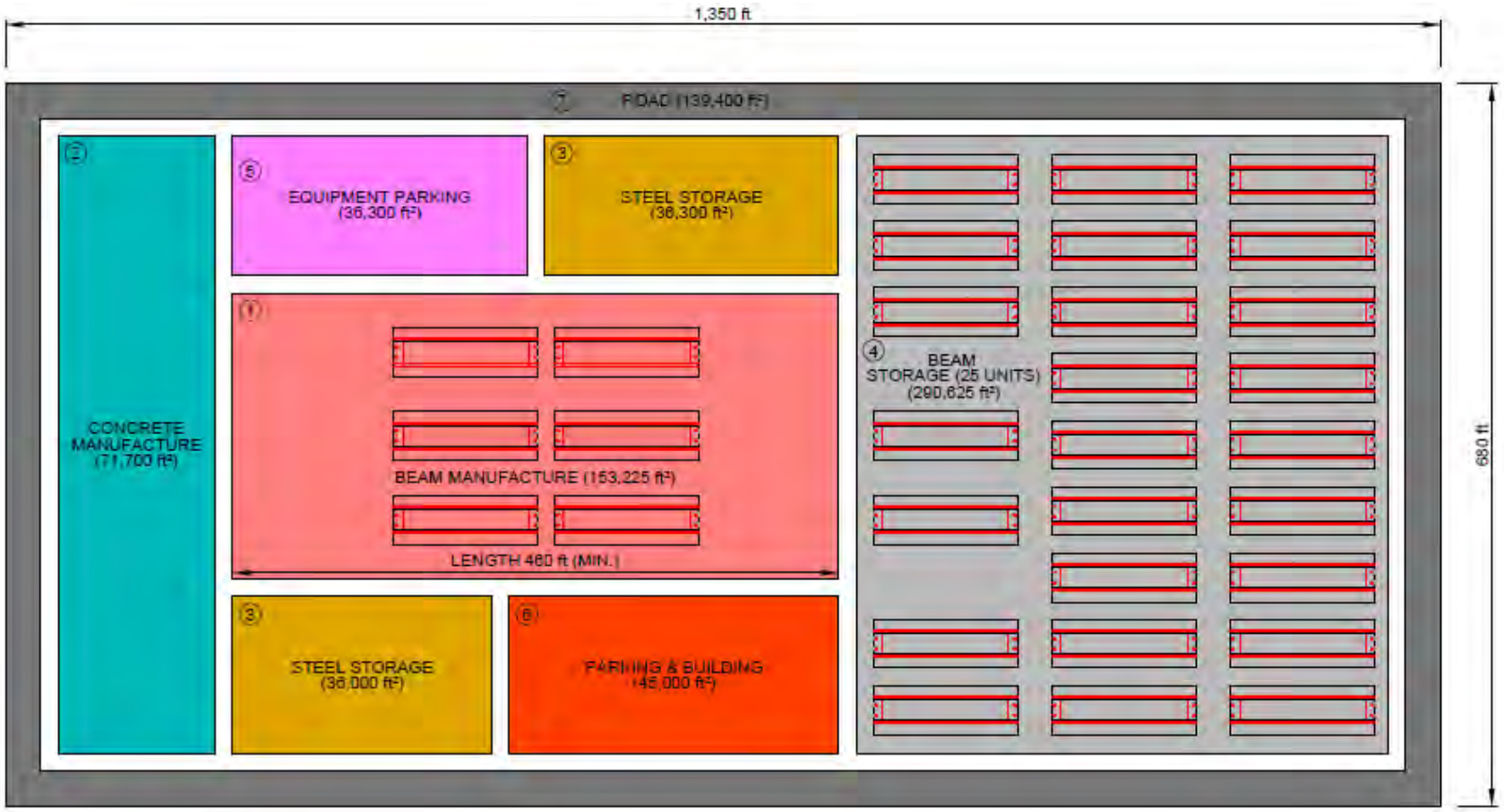
The precast yard will have a road around the perimeter of the yard, which provides access to all facilities. The road must provide access to the prefabricated beam stockpile area, and must consider the space needed for beam movement and other transporatation limitations.

The road occupies an area of approximately 139,400 ft.^{2}.

3. Precast yard layout

Total yard dimensions

The sum of all the above items requires a total area of 21.07 acres, with approximate dimensions of 1,350 ft. x 680 ft.



Precast Yard

APPENDIX D: SAN JOSE STATION APPROACH CONSTRUCTABILITY ANALYSIS

SAN JOSE STATION APPROACH CONSTRUCTABILITY ANALYSIS

REPORT

APRIL 2017

prointec

SAN JOSE STATION APPROACH CONSTRUCTABILITY ANALYSIS

Index

1. General approach and main criteria 1
1.1 Current situation description 1
1.2 Future situation. Alternative options 1
1.3 Railway services operation and works progress compatibility 2
2. Construction activities sequence. 3
3. Summary and main comments 6

SAN JOSE STATION APPROACH CONSTRUCTABILITY ANALYSIS

1. General approach and main criteria

1.1 Current situation description

At present the existing non-electrified double tracked railway line is operated by Caltrain for combined traffic (both passengers and goods). The main purpose of this railway line is to provide a service for commuters and short distance journeys. This line is envisioned to be electrified in a near future.

This railway line runs in a high density urban environment between San Francisco and San Jose Diridon, from where it continues on its way down to Gilroy.

Next to the existing railway alignment, at certain locations, there are other railway infrastructure systems, such as the Bay Area Rapid Transit (BART) and the Light Rail Transit (LRT).

The current railway line has 25 existing railway stations, the main ones being:

- San Francisco. Final stop at the end of the line.
- Millbrae. Railway station for mixed rail traffic together with the BART station, beside San Fransisco International Airport.
- Mountain View. Railway station for mixed rail traffic together with the LRT station.
- San Jose Diridon.

The route is generally at-grade, generating a large number of at-grade crossings with other existing infrastructure. Crossings with major communications routes are resolved by raising the alignment above the existing railway line.

Along the railway scheme there are several railway yards and tie-ins, amongst them for example is the one coming from Oakland and the railway facilities (workshops, garages ...) next to the San Jose station.

1.2 Future situation. Alternative options

The project aims to connect San Francisco and San Jose Diridon by a high-speed corridor, integrating the new high-speed railway (HSR) line with the existing Caltrain railway. For this purpose there will be four tracks in some segments (San Carlos Station, Bayshore Station, San Jose Statión).

Being a high density urban area, the allowance for the Right of Way (ROW) is low, which forces the tracks to be depressed or raised at some locations.

Most of the existing railway station configurations are to be adjusted under the new layout for the Caltrain tracks, because of variations in the functional organization.

Two alternatives have been studied for San Jose Diridon Station (Wide and Narrow), both are similar in San Jose Station and are aerial, the difference is the length of aerial segment.

A four-track, aerial HSR station in San Jose would be located above the existing San Jose Diridon Station. Two 30-foot-wide and 800-foot-long dedicated HSR platforms would be constructed above the existing Caltrain tracks and platforms. The new HSR station facilities, including a station house area for ticketing and support services and an indoor station room for passengers, would be located north of the existing historic Caltrain corridor. The design of the station areas would provide pick-up and drop-off facilities along Cahill St., as well as intermodal connectivity with BART, Santa Clara Valley Transportation Authority (VTA) light rail, proposed Bus Rapid Transit (BRT) lines, and buses. Circulation linkages between the station house and the station platforms may include hallways, an access bridge to cross over railroad tracks, stairs, escalators, elevators, and moving sidewalks. Parking would be provided at two parking lots along Cahill Street and Stockton Avenue, and a net 156 additional parking spaces would be provided.

1.3 Railway services operation and works progress compatibility

The purpose of this constructability analysis is to define a works organization to make the railway service operation feasible during construction. In order to fulfil this goal a number of conceptual sketches and phases have been defined.

This analysis provides solutions to make the work progress compatible with the rail service; however there is more than one way for implementing the final layout and this will be established in more detail in proceeding further steps.

This conceptual works arrangement has been established taking into account a number of criteria:

- Safety. All the works features and components (temporary and final ones) have been defined to guarantee the maximum safety standards. This applies to the

railway operations, the construction process and any road users (road traffic, pedestrians...) in the influence area of the line and the works.

- Construction feasibility. To maintain the existing railway corridor in operation, a number of specific construction methods and track layouts have to be taken into consideration. All of them have been devised from the point of view of the works progress feasibility.
- Process economy optimization. The need to maintain trains in operation during construction requires some specific actions. All the solutions have been devised in order to minimize additional cost or time increases.
- Railway operations performance level. To get a realistic balance between the construction cost and the railway´s service performance, some limits on this have to be introduced. Taking into account the temporary nature of the limitations on the railway service, some partial line functionality and capacity will be redefined.
- Temporary additional ROW need minimization.
- Other disturbances limited to a minimum (pedestrians, road traffic...)

To achieve the goal of maintaining the trains in operation in accordance with these criteria, the following main procedures have been applied:

- Temporary railway components construction. In order to make it feasible and efficient to build different pieces of the new system, some additional tracks or platforms will be introduced with a temporary function.

2. Construction activities sequence.

The infrastructure construction process is a complex one that can be organised in order to optimize different parameters (budget flow, time schedule, uncertainties). For this particular railway corridor the construction sequence has been defined in order to optimize the balance between cost, time schedule and railway's service performance level, **in this study an electrified line is considered**. In accordance with this, the following main criteria have been applied:

- Final elements / temporary layouts. For every single section that the corridor has been divided into, a specific track layout has been proposed that combines future infrastructure elements with those of a temporary nature.

These temporary components and track layouts have been designed specifically for the following different kinds of infrastructure construction:

- at grade
- elevated
- in a trench
- underground or tunnel

- "Railway capacity enlargement" as a main criterion. The construction process sequence has been developed on the basis that the future infrastructure railway capacity will be higher than the current one. To take advantage of this, the sequence has been defined giving priority to build components that contribute to increased operational capacity without disturbing the existing service.

  Temporary tracks are introduced into these segments and phases, where the continuity of the works requires the removal of the existing tracks.

  With this approach, a "construction-demolition-construction" process is introduced. The priority is given to the construction of final additional tracks. After the commissioning of these tracks the existing ones can be removed. Finally the remaining tracks for the final layout can be built where the old ones lie.

- Partial completion and commissioning. The railway operation performance can be optimized through the combination of all of these criteria. Particularly, the combination of splitting the corridor into segments and independent commissioning of ready segments, not only reduces the length where the railway performance is limited but also allows the introduction of a higher level standard of operation that contributes to a balancing out of restrictions existing in other segments.

  A specific treatment is devoted to the different main passenger terminals as they are very specific facilities.

- Railway operation during works. Condition limitation. Maintaining the railway's service performance standards when the corridor is experiencing major works, is a real challenge.

To keep the unavoidable additional costs or works time schedule increase at reasonable levels, the rail operational performance can be temporarily reduced to acceptable limits.

There are two main parameters of the railway that will be influenced by the construction process: the line's functionality and capacity.

- Influence on line's functionality.

  The line's functionality will be limited to some extent for the different phases and segments. The quantification of this limitation will be linked to the actual time scheduling of the different segments along the corridor.

  As a general rule, this limitation will have common attributes: the speed restrictions that will limit to some value the partial travel times and the availability of platforms at stations that could limit the number of destinations or intermediate stops.

- Influence on line's capacity.

  The line's capacity will also experience some reductions. These will arise from a number of sources and some of them will have to be especially taken into account.

  The main one is the presence of some temporary single track segments. It has to be considered that for longer sections above a certain length, the resulting capacity reduction could be unacceptable.

  Some single platforms stations could contribute to additionally reduce the network capacity.

  Two other sources of capacity reduction would be the speed restrictions along temporary alignments and local track short breaks for connections during non-peak periods.

3. Summary and main comments.

The scope for this constructability analysis is to define a feasible way of organizing the works programme to make it compatible with keeping the railways in-service and in an efficient manner.

The main design criteria takes into account safety, construction feasibility, economical optimization of processes, quality of railway's service and minimization of temporary ROW needs.

The procedures to meet the objective are based on the division of the scheme into independent sections and on temporary railway components construction.

In order to optimize the balance of the cost/time ratio and railway's service performance, the following criteria have been applied: final elements/temporary layouts combination; "railways capacity enlargement" processes; partial completion and commissioning; and acceptable constrains in railways operational conditions.

The works organization will have a limited influence on the railway's service performance. This will have regard specifically for the line's functionality and capacity.

The analysis includes some especially complex segments where specific arrangements and track layouts have to be implemented to make the works progress and railway operation feasible.

At detailed design stage, a more specific analysis for the selected option will contribute to reducing to a minimum the railway's operation restrictions through a more detailed work plan and track layout definition.

CURRENT TRACK
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TRACK REMOVAL
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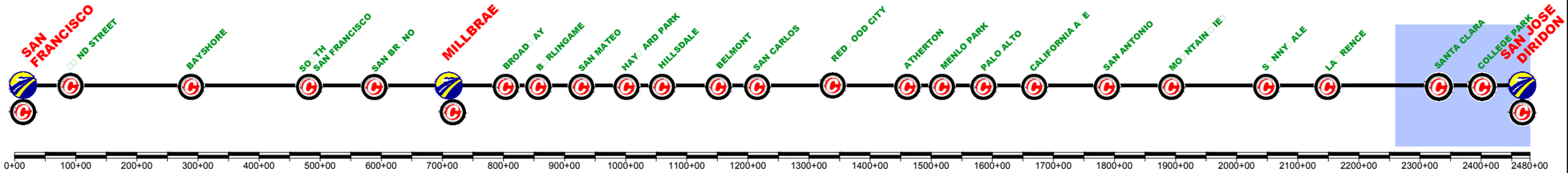

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SAN FRANCISCO TO SAN JOSE
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CONSTRUCTION PHASES
PLAN
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CONTRACT NO.
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SCALE 1"= 200'
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SAN MATEO
HAYWARD PARK
HILLSDALE
BELMONT
SAN CARLOS
REDWOOD CITY
ATHERTON
MENLO PARK
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COLLEGE PARK
SAN JOSE DIRIDON

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CITY OF SAN JOSE
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DAHLIA LOOP
NEWHALL ST.

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BELLARMINE
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EMORY STREET

CHESTNUT STREET
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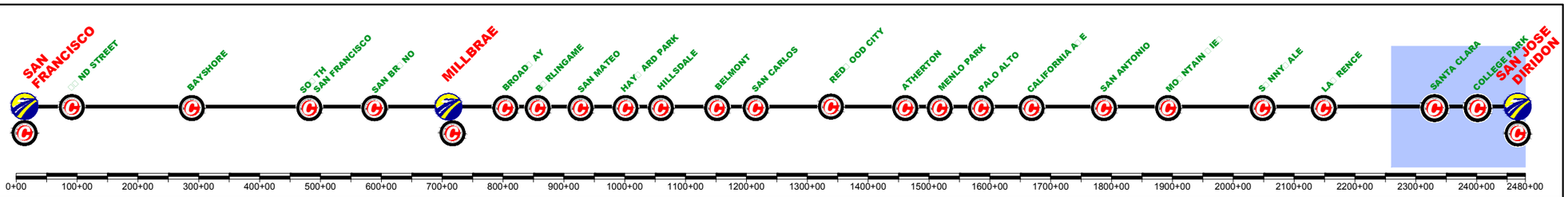

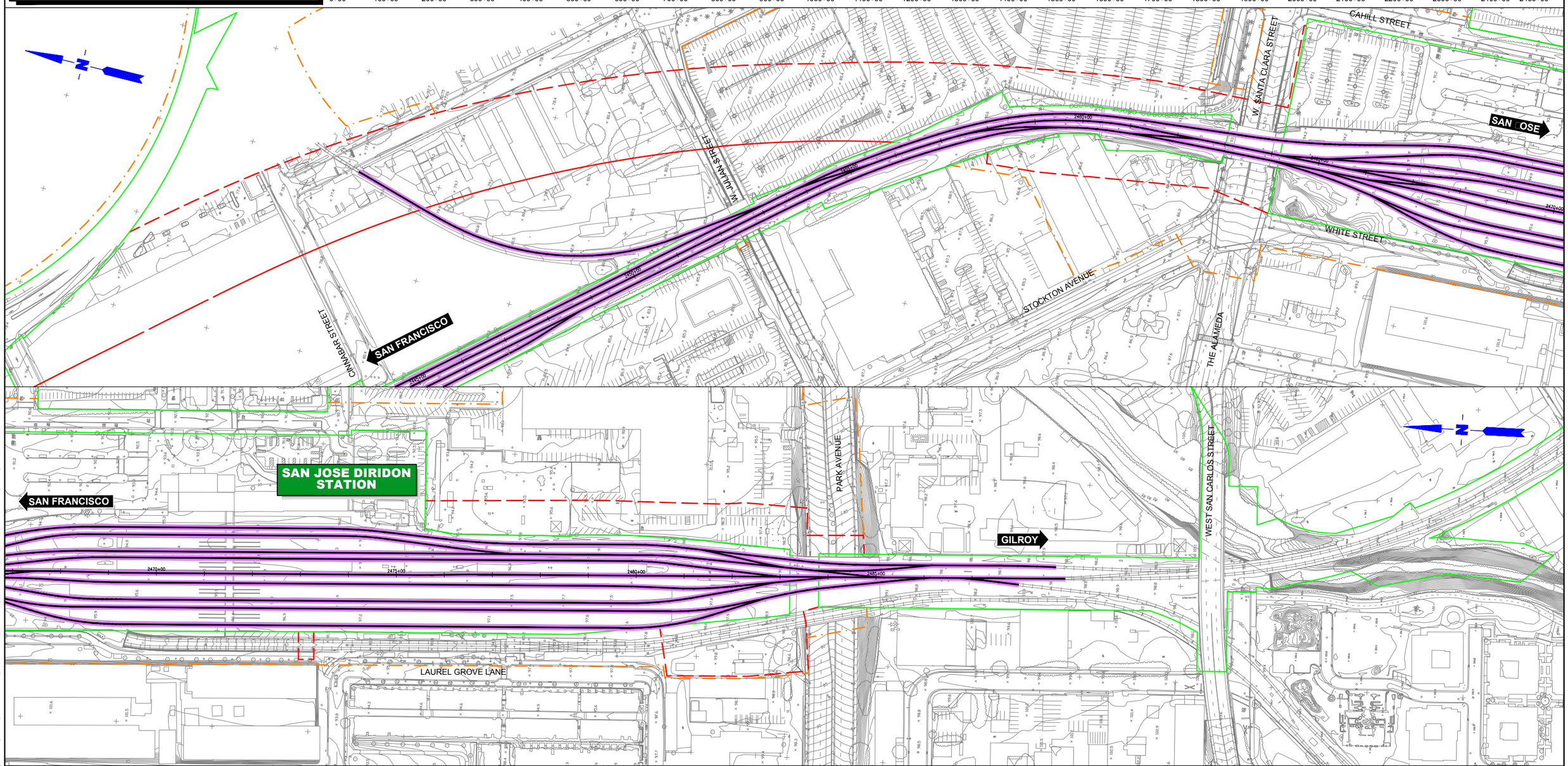

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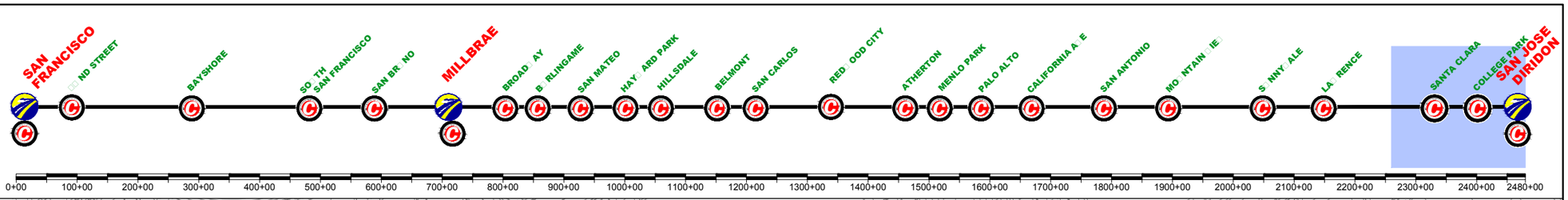

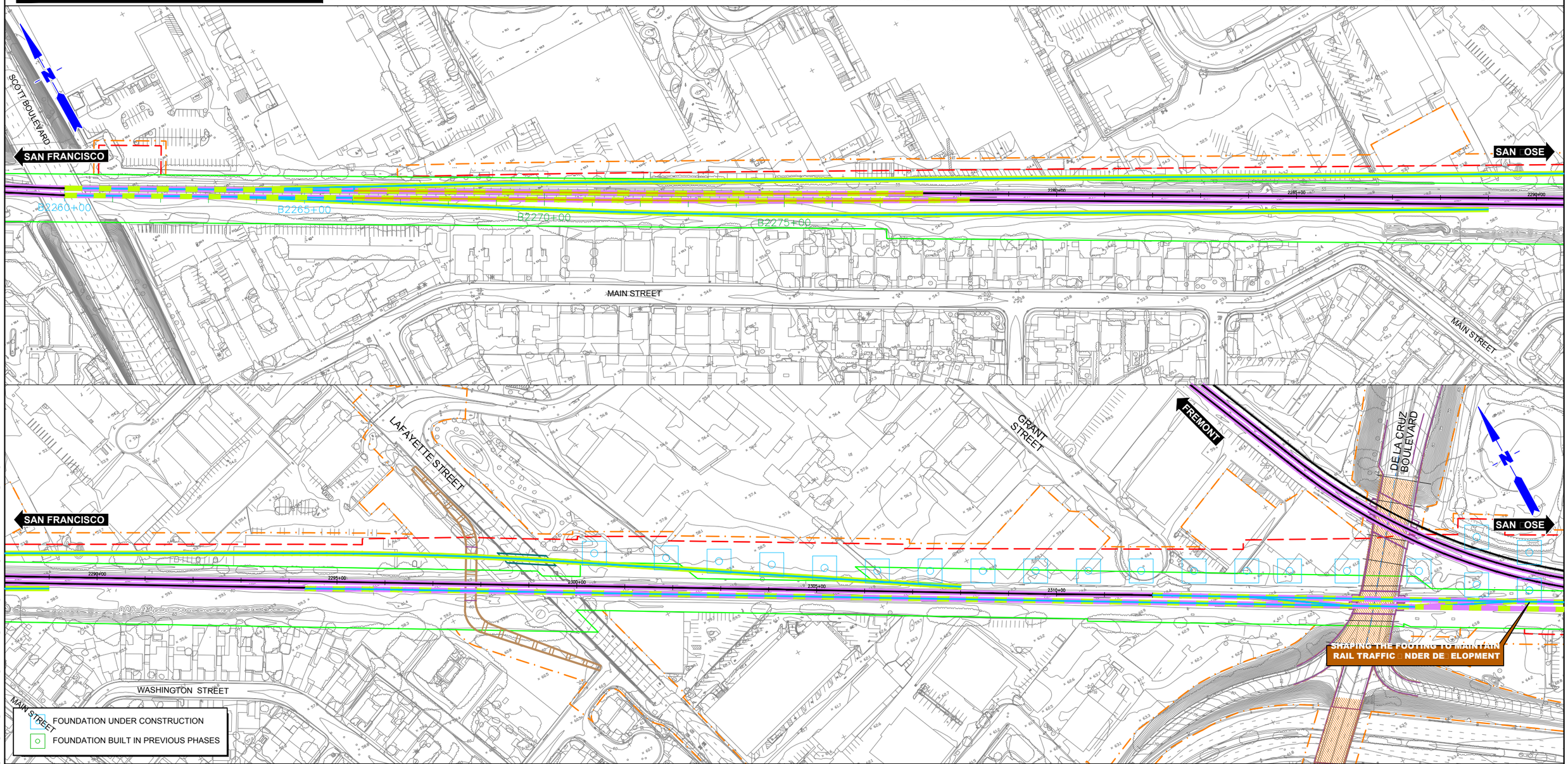

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BROKAW ROAD

RAILROAD AVENUE

BENTON STREET

DAHLIA LOOP

NEWHALL ST.

CITY OF SANTA CLARA
CITY OF SAN JOSE

SAN FRANCISCO

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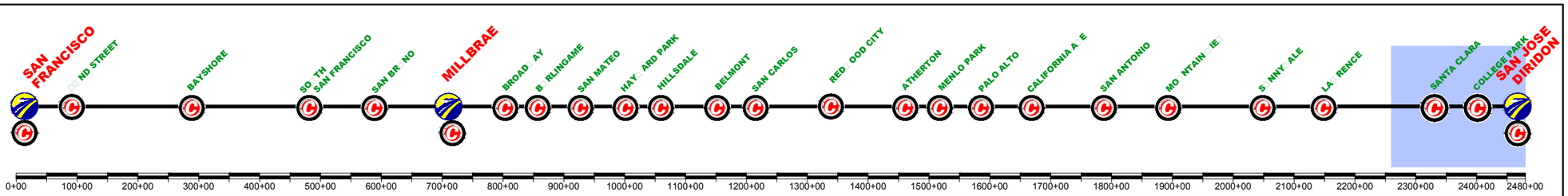

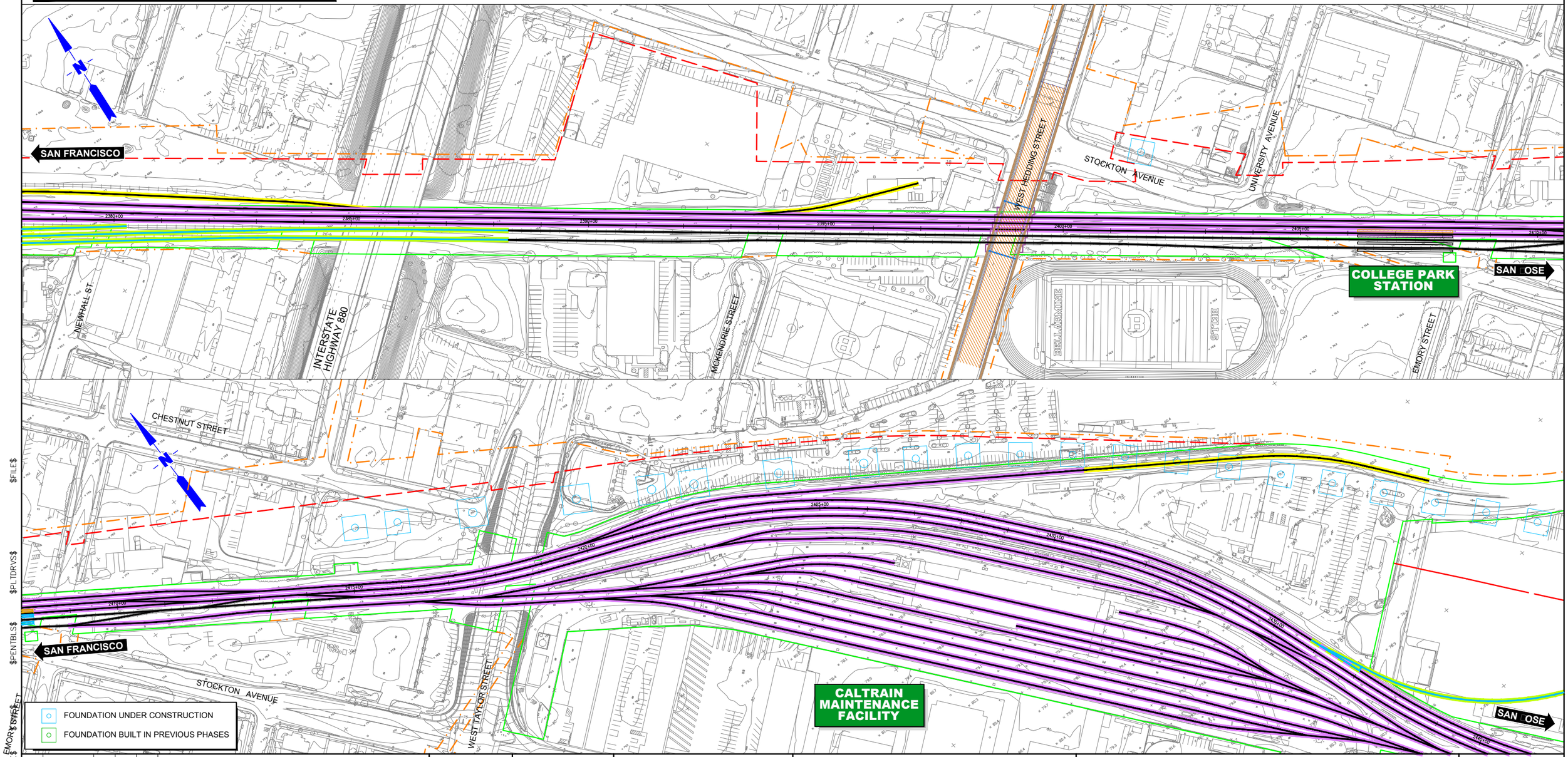

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CONTRACT NO.
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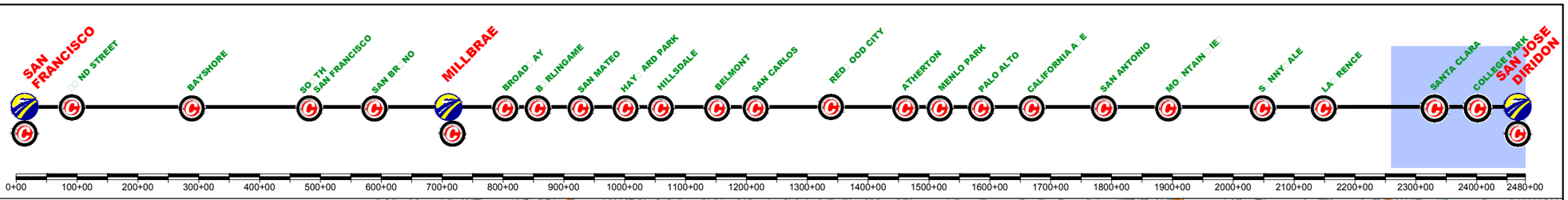

SHAPING THE FOOTING TO MAINTAIN RAIL TRAFFIC UNDER DEVELOPMENT

SAN FRANCISCO

SAN JOSE DIRIDON STATION

SAN JOSE

GILROY

CAHILL STREET

W SANTA CLARA STREET

W JULIAN STREET

WHITE STREET

STOCKTON AVENUE

THE ALAMEDA

CINNABAR STREET

PARK AVENUE

WEST SAN CARLOS STREET

LAUREL GROVE LANE

2465+00
2470+00
2475+00
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CONTRACT NO.
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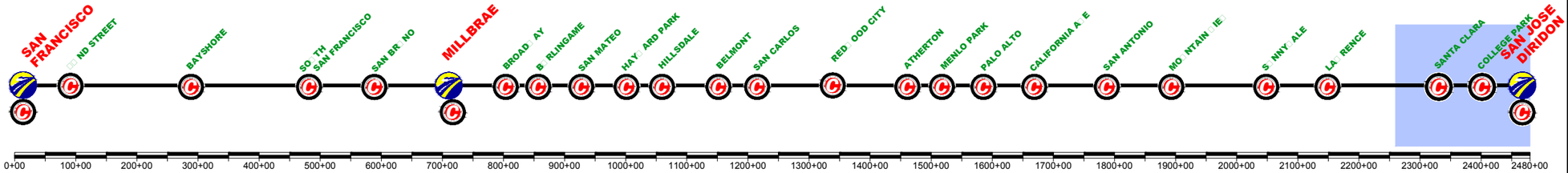

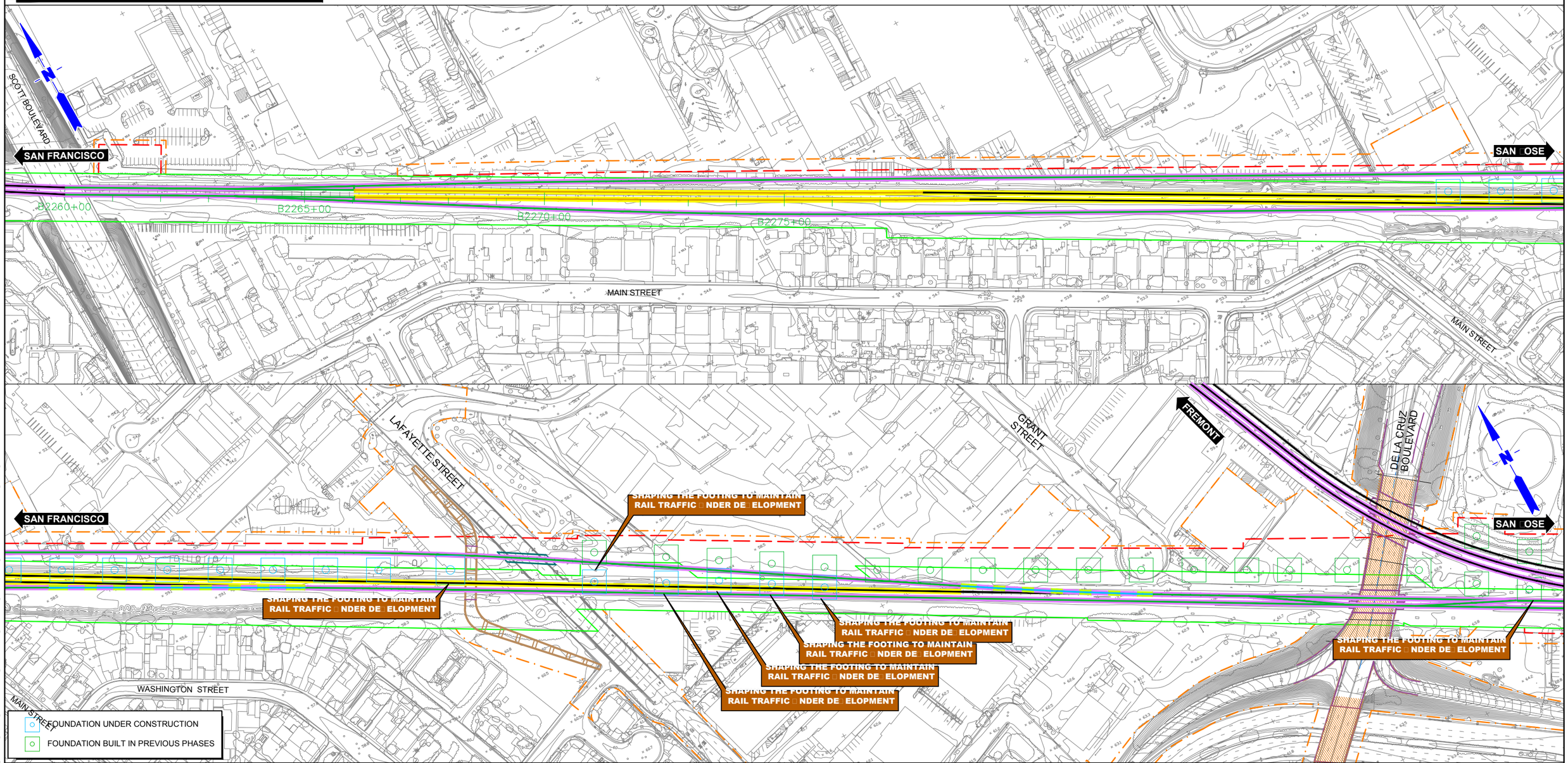

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TRACK REMOVAL
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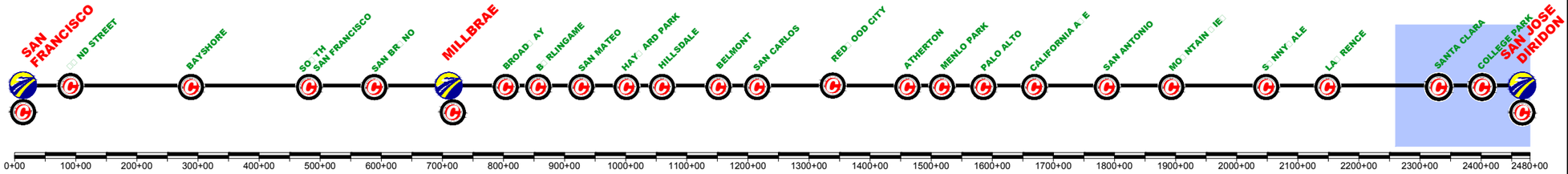

SHAPING THE FOOTING TO MAINTAIN RAIL TRAFFIC UNDER DEVELOPMENT

BROKAW ROAD

SANTA CLARA STATION

CITY OF SANTA CLARA

CITY OF SAN JOSE

SAN JOSE

SAN FRANCISCO

RAILROAD AVENUE

BENTON STREET

SHAPING THE FOOTING TO MAINTAIN RAIL TRAFFIC UNDER DEVELOPMENT

SHAPING THE FOOTING TO MAINTAIN RAIL TRAFFIC UNDER DEVELOPMENT

SAN FRANCISCO

CITY OF SANTA CLARA

CITY OF SAN JOSE

SAN JOSE

SHAPING THE FOOTING TO MAINTAIN RAIL TRAFFIC UNDER DEVELOPMENT

DAHLIA LOOP

NEWHALL ST.

FOUNDATION UNDER CONSTRUCTION

FOUNDATION BUILT IN PREVIOUS PHASES

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE APRIL/2017

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW

SAN FRANCISCO
[illegible] ND STREET
BAYSHORE
SO TH SAN FRANCISCO
SAN BR NO
MILLBRAE
BROAD AY
B RLINGAME
SAN MATEO
HAY ARD PARK
HILLSDALE
BELMONT
SAN CARLOS
RED OOD CITY
ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA A E
SAN ANTONIO
MO NTAIN IE
S NNY ALE
LA RENCE
SANTA CLARA
COLLEGE PARK
SAN JOSE DIRIDON

0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

SAN FRANCISCO
NEWHALL ST.
INTERSTATE HIGHWAY 880
MCKENDRIE STREET
WEST HEDDING STREET
STOCKTON AVENUE
UNIVERSITY AVENUE
COLLEGE PARK STATION
BELLARMINE
STEHR
EMORY STREET
SAN OSE
2390+00
2400+00
2410+00

CHESTNUT STREET
2415+00
2420+00
2425+00
2430+00
2435+00
2440+00
2445+00
SAN FRANCISCO
STOCKTON AVENUE
WEST TAYLOR STREET
CALTRAIN MAINTENANCE FACILITY
SAN OSE
EMORY STREET

FOUNDATION UNDER CONSTRUCTION
FOUNDATION BUILT IN PREVIOUS PHASES

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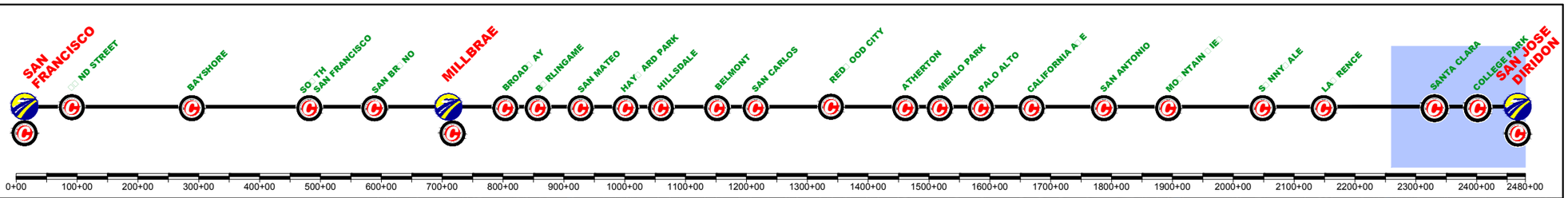
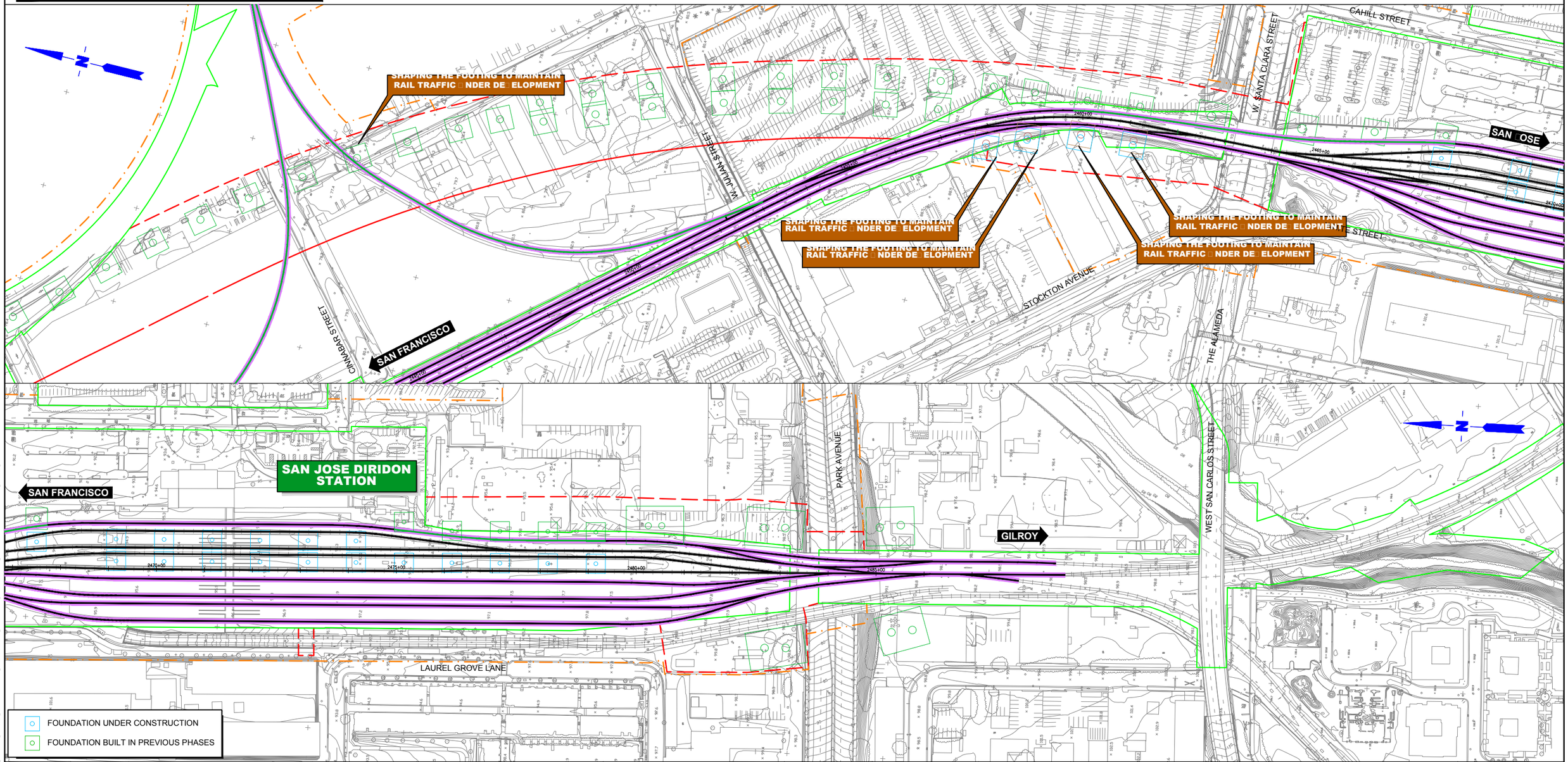
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW





FOUNDATION UNDER CONSTRUCTION
FOUNDATION BUILT IN PREVIOUS PHASES

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SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

MOVAL

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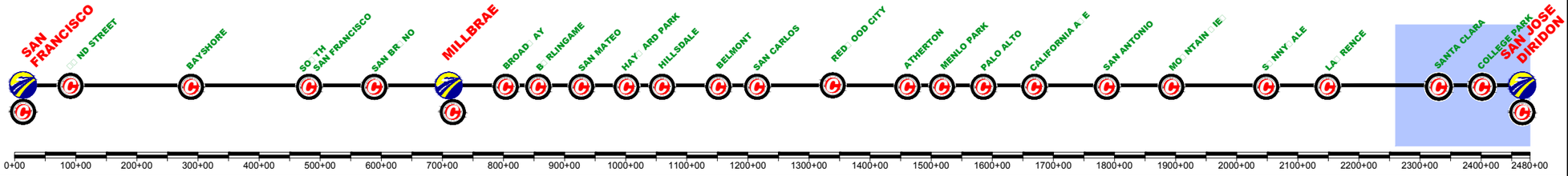

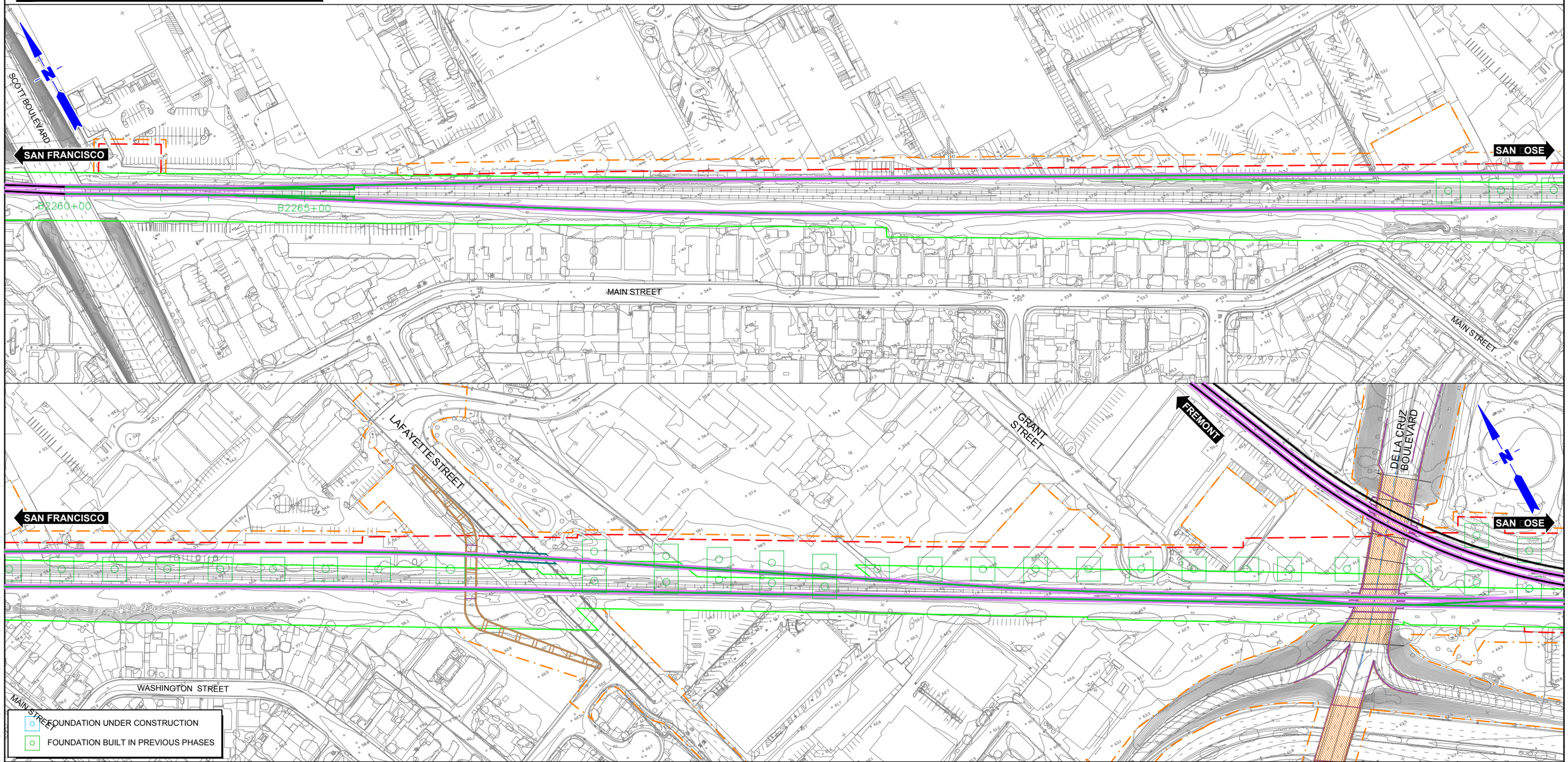

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SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.

DRAWING NO.

SCALE 1"= 200'

SHEET NO. 1 OF 4

CURRENT TRACK
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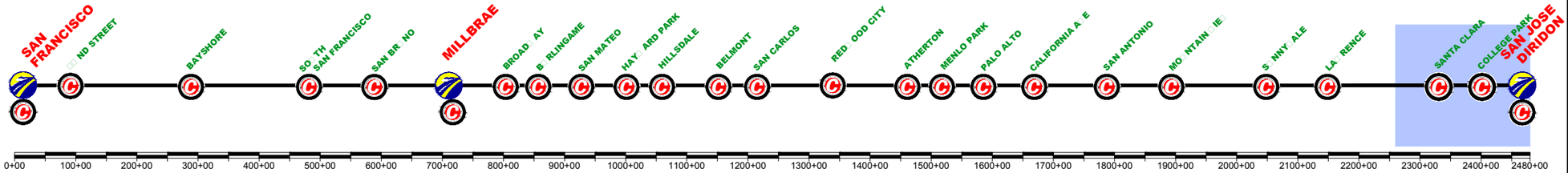
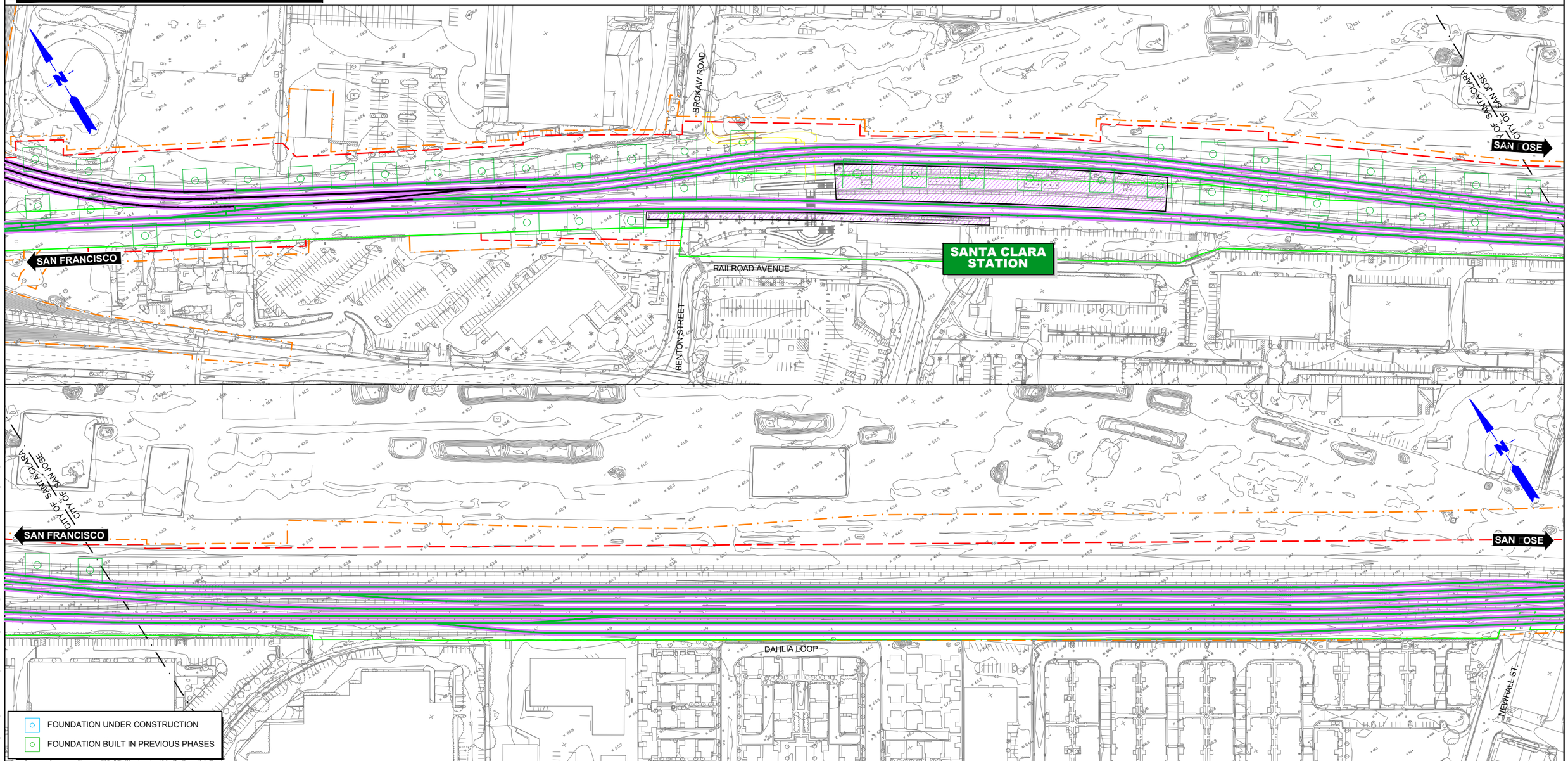
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW





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CONTRACT NO.
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CURRENT TRACK
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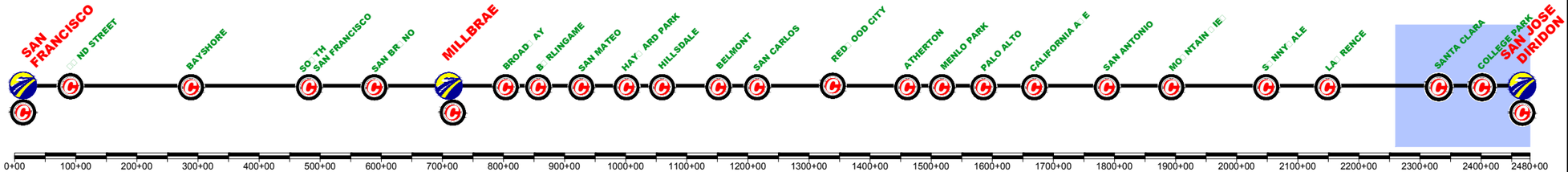

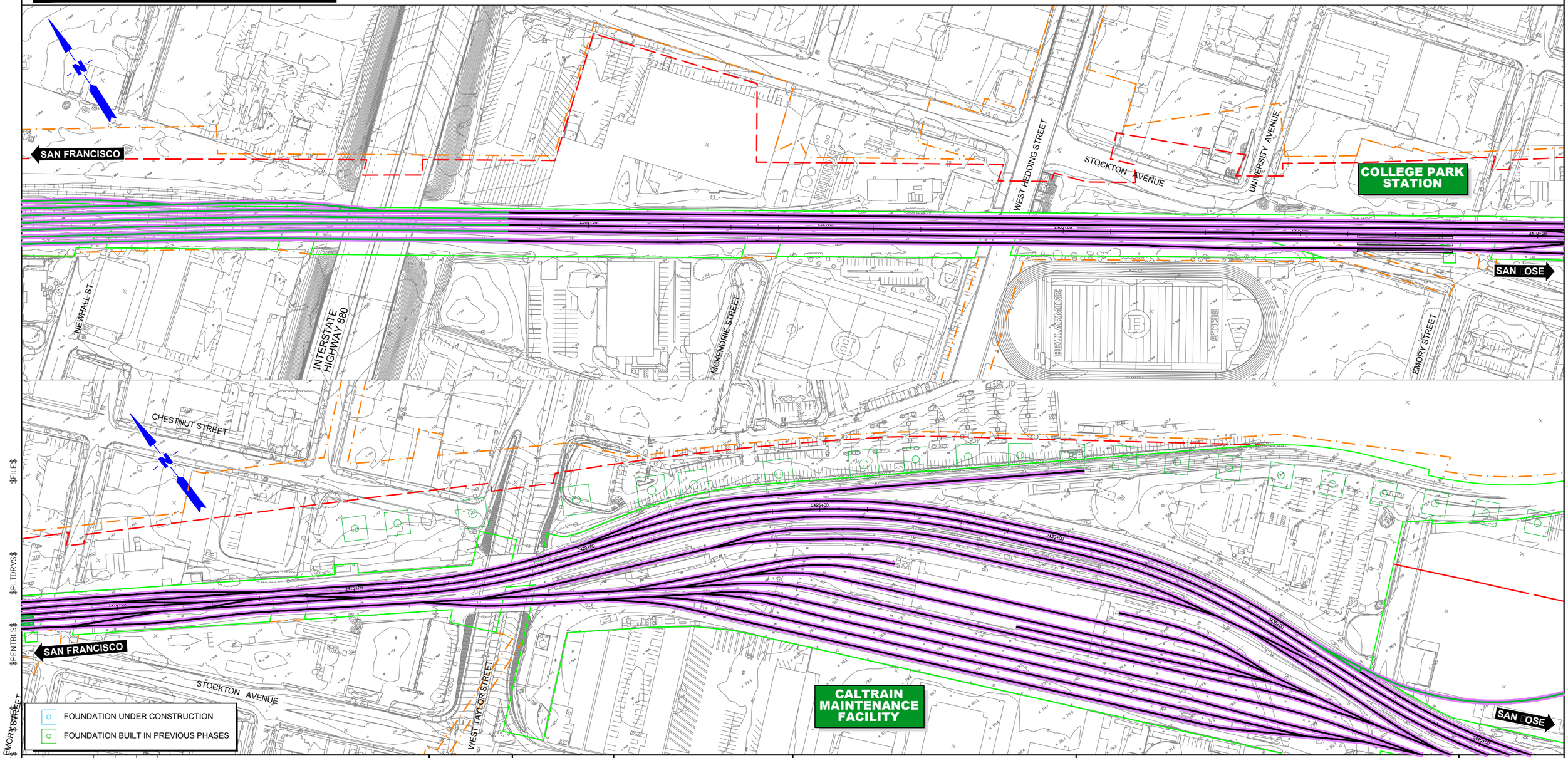

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SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
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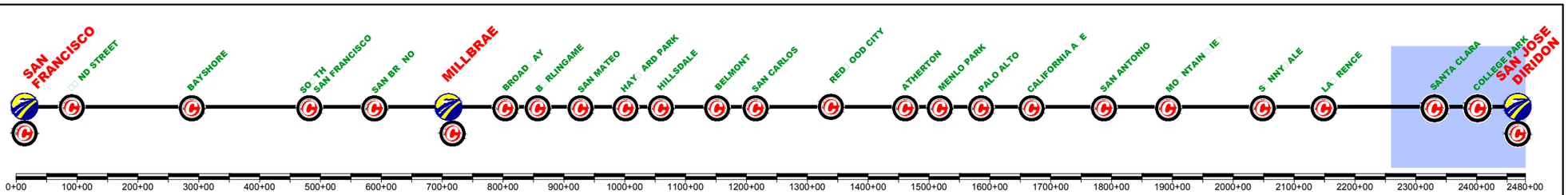
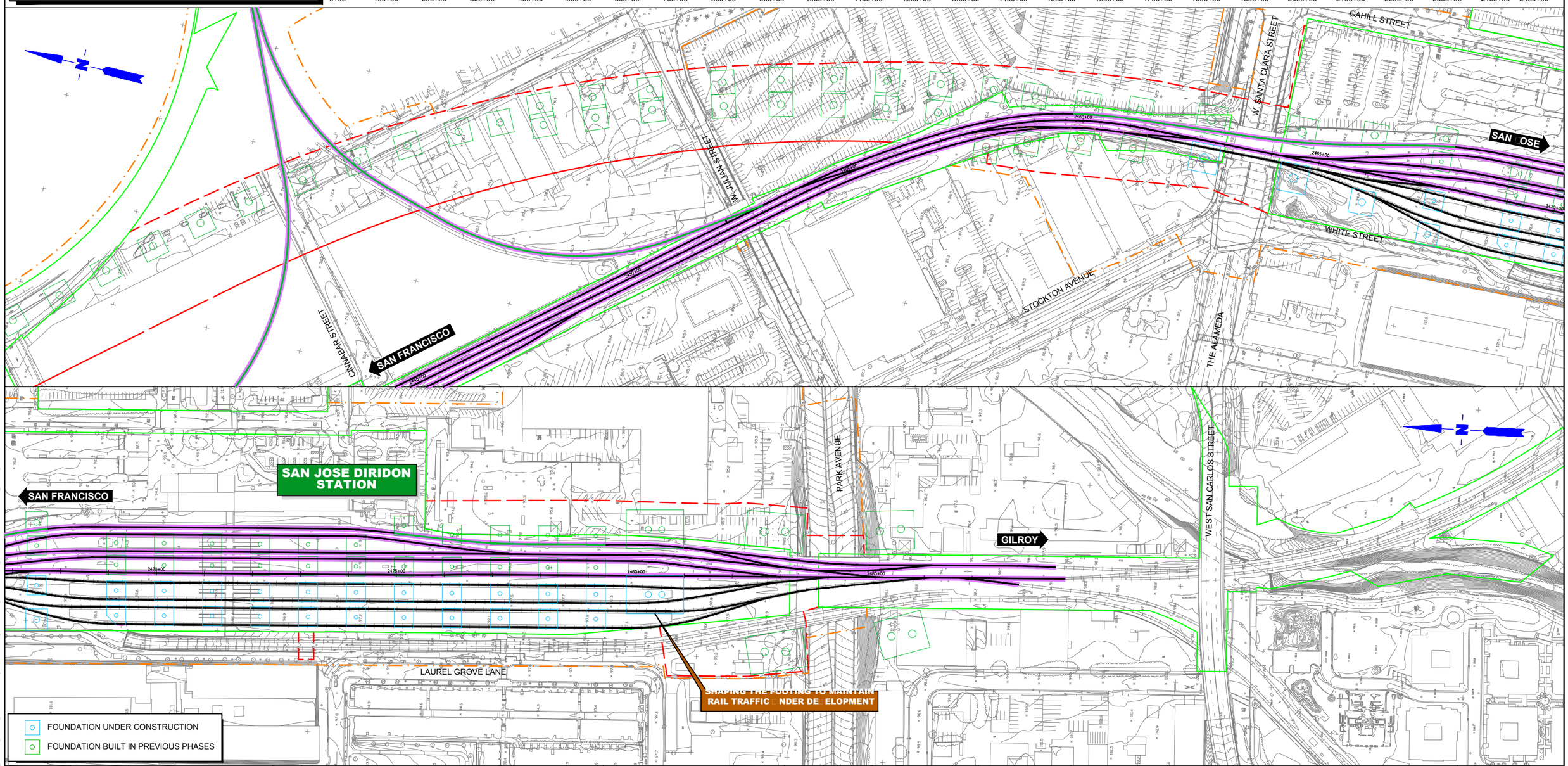
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW





SHAPING THE FOOTING TO MAINTAIN RAIL TRAFFIC UNDER DEVELOPMENT

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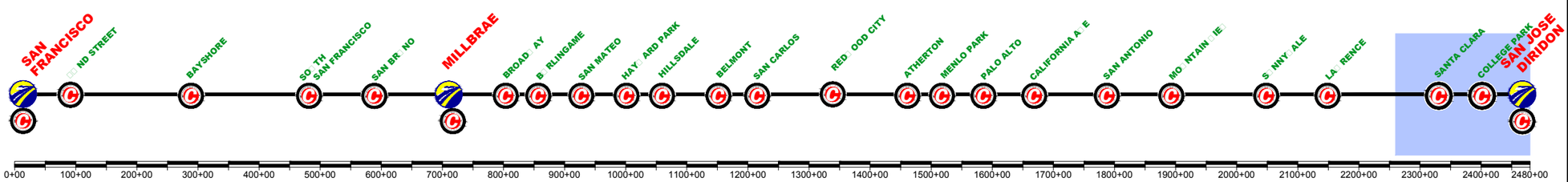
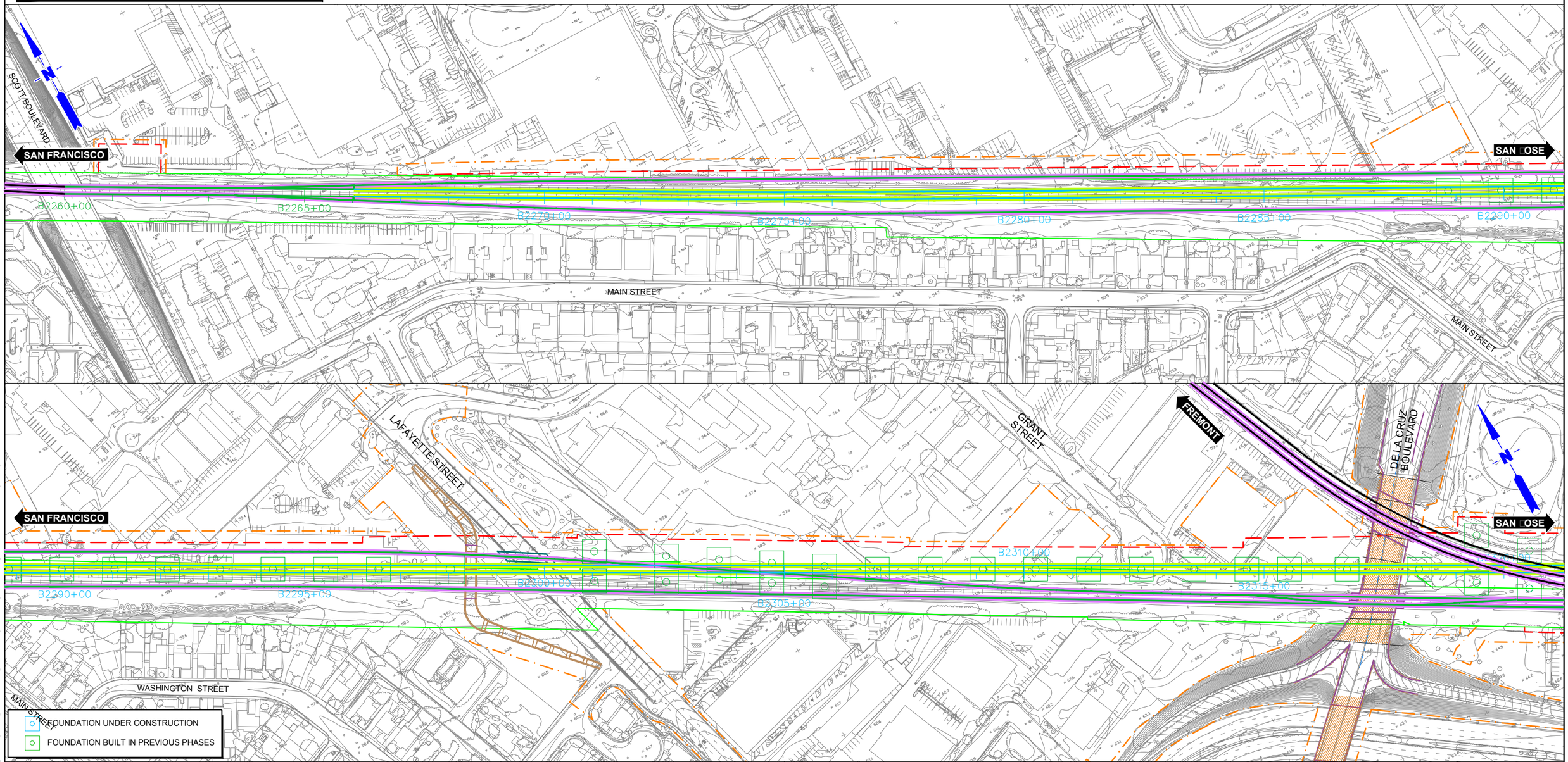
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW





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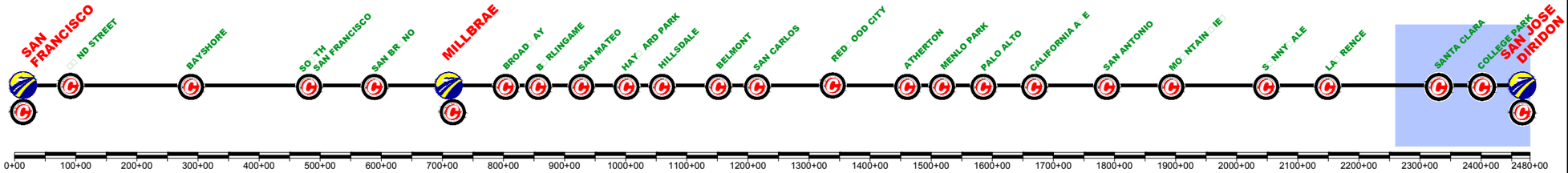
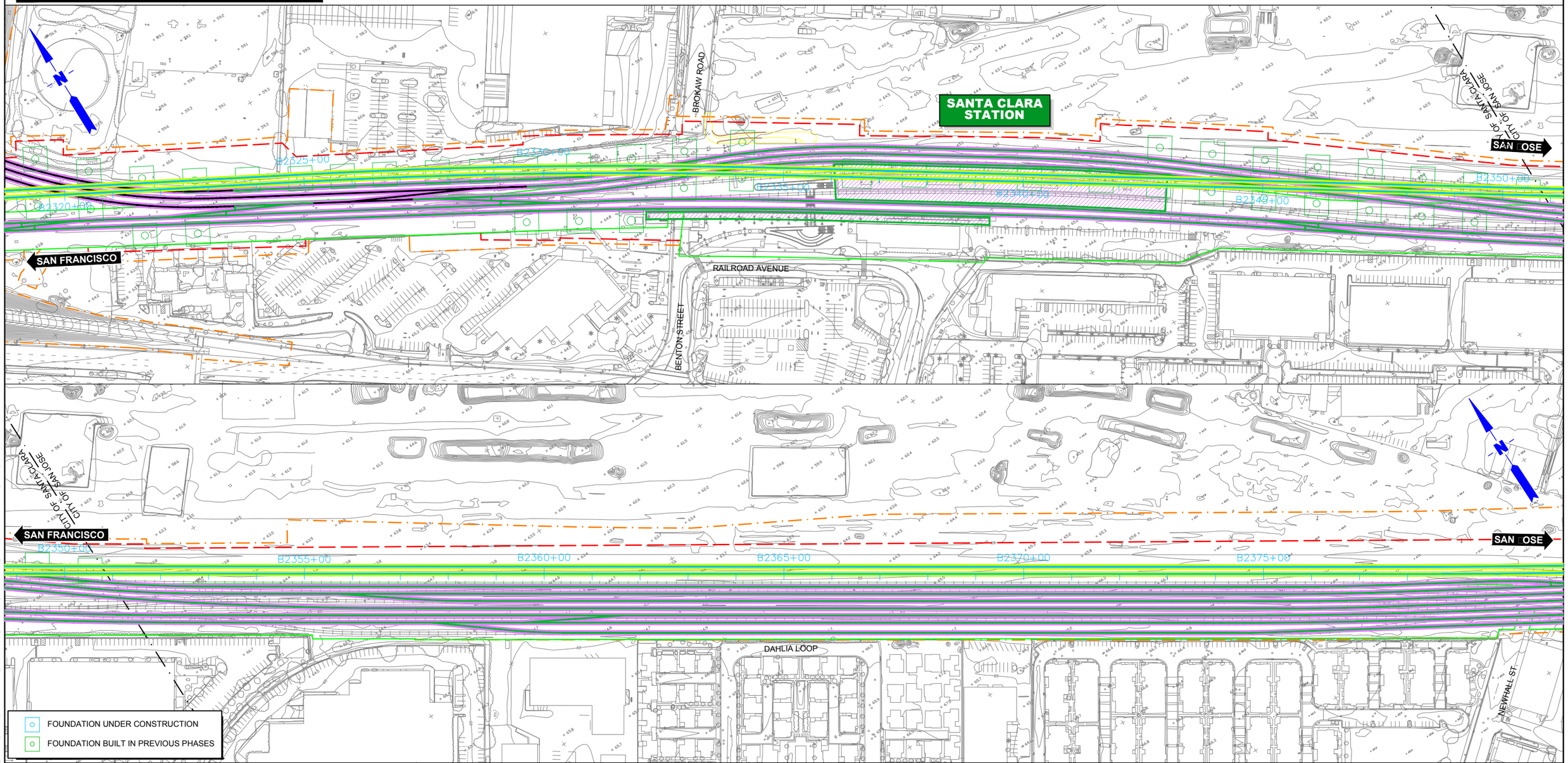
CALIFORNIA HIGH□SPEED TRAIN PRO□ECT
SAN FRANCISCO TO SAN □OSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW





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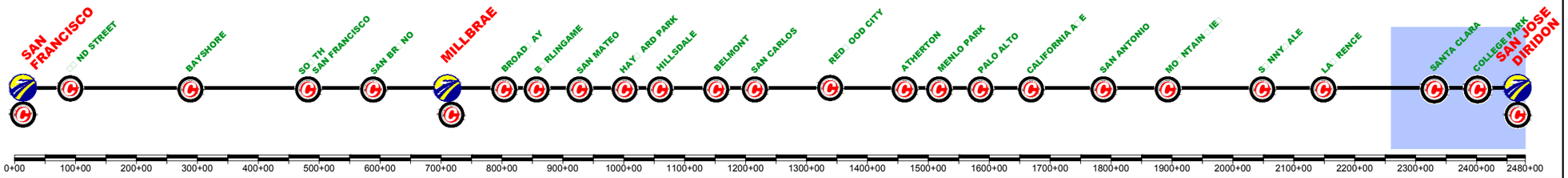
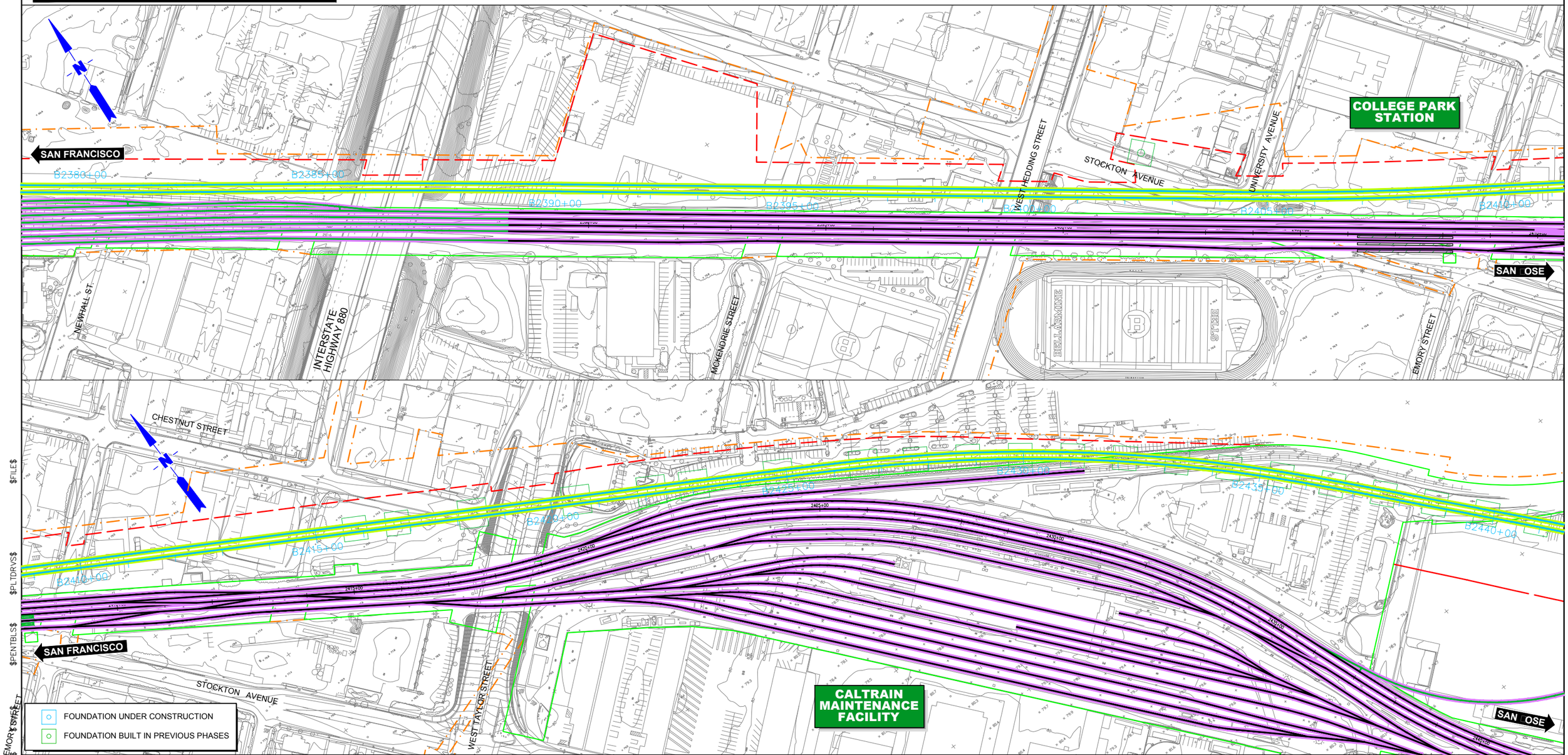
CALIFORNIA HIGH□SPEED TRAIN PRO□ECT
SAN FRANCISCO TO SAN □OSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW





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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW

SAN FRANCISCO
22ND STREET
BAYSHORE
SOUTH SAN FRANCISCO
SAN BRUNO
MILLBRAE
BROADWAY
BURLINGAME
SAN MATEO
HAYWARD PARK
HILLSDALE
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REDWOOD CITY
ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA AVE
SAN ANTONIO
MOUNTAIN VIEW
SUNNYVALE
LAWRENCE
SANTA CLARA
COLLEGE PARK
SAN JOSE DIRIDON

0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

CAHILL STREET
W. SANTA CLARA STREET
SAN JOSE
WHITE STREET
STOCKTON AVENUE
THE ALAMEDA
W. JULIAN STREET
CINNABAR STREET
SAN FRANCISCO
SAN JOSE DIRIDON STATION
PARK AVENUE
WEST SAN CARLOS STREET
GILROY
LAUREL GROVE LANE

FOUNDATION UNDER CONSTRUCTION
FOUNDATION BUILT IN PREVIOUS PHASES

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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
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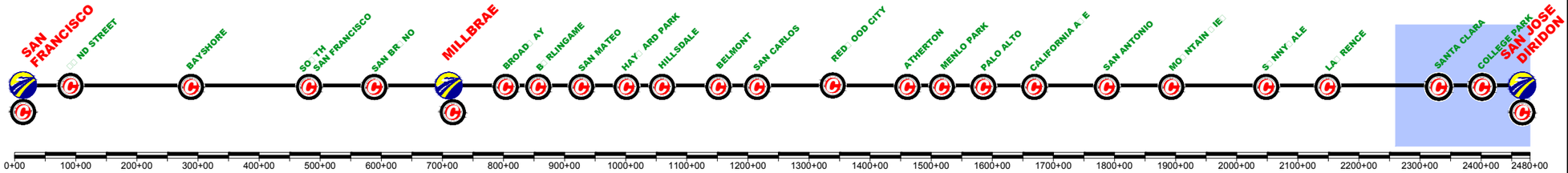

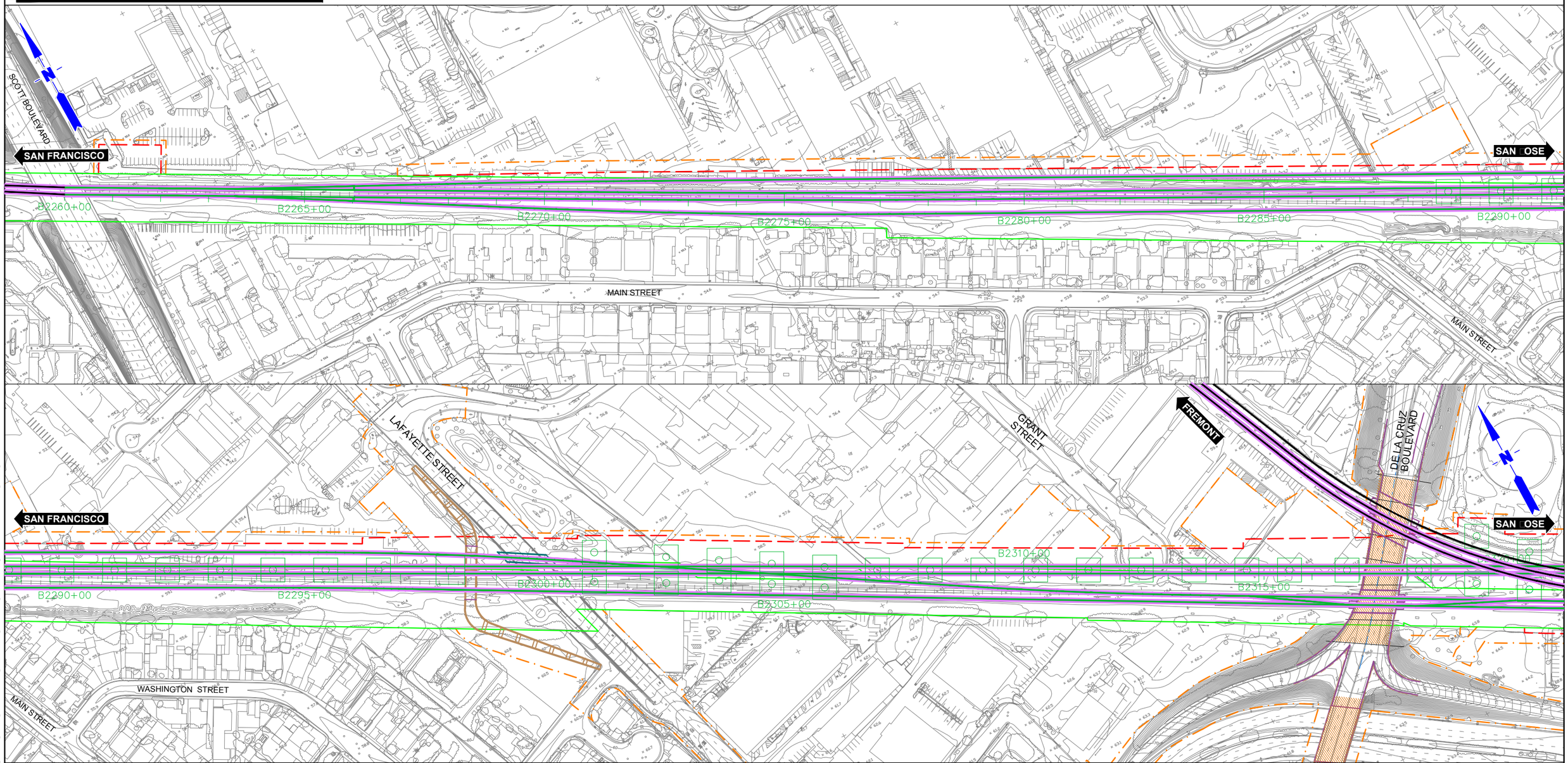

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SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
FINAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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SAN FRANCISCO
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BAYSHORE
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B2320+00 B2325+00 B2330+00 B2335+00 B2340+00 B2345+00 B2350+00

BROKAW ROAD
RAILROAD AVENUE
BENTON STREET
SANTA CLARA STATION
CITY OF SANTA CLARA
CITY OF SAN JOSE
SAN FRANCISCO
SAN JOSE

B2350+00 B2355+00 B2360+00 B2365+00 B2370+00 B2375+00 B2380+00

DAHLIA LOOP
NEWHALL ST.

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CALIFORNIA HIGH□SPEED TRAIN PRO□ECT
SAN FRANCISCO TO SAN □OSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
FINAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW

SAN FRANCISCO
22ND STREET
BAYSHORE
SOUTH SAN FRANCISCO
SAN BRUNO
MILLBRAE
BROADWAY
BURLINGAME
SAN MATEO
HAYWARD PARK
HILLSDALE
BELMONT
SAN CARLOS
REDWOOD CITY
ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA AVE
SAN ANTONIO
MOUNTAIN VIEW
SUNNYVALE
LAWRENCE
SANTA CLARA
COLLEGE PARK
SAN JOSE DIRIDON

0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

SAN FRANCISCO
B2380+00
B2385+00
B2390+00
B2395+00
B2400+00
B2405+00
B2410+00
WEST HEDDING STREET
STOCKTON AVENUE
UNIVERSITY AVENUE
COLLEGE PARK STATION
SAN JOSE
NEWHALL ST.
INTERSTATE HIGHWAY 880
MCKENDRIE STREET
BELLARMINE
STREET
EMORY STREET

CHESTNUT STREET
B2415+00
B2420+00
B2425+00
B2430+00
B2435+00
B2440+00
2405+00
2410+00
2415+00
2420+00
2425+00
2430+00
2435+00
2440+00
SAN FRANCISCO
STOCKTON AVENUE
WEST TAYLOR STREET
EMORY STREET
CALTRAIN MAINTENANCE FACILITY
SAN JOSE

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$DATE$
$USER$

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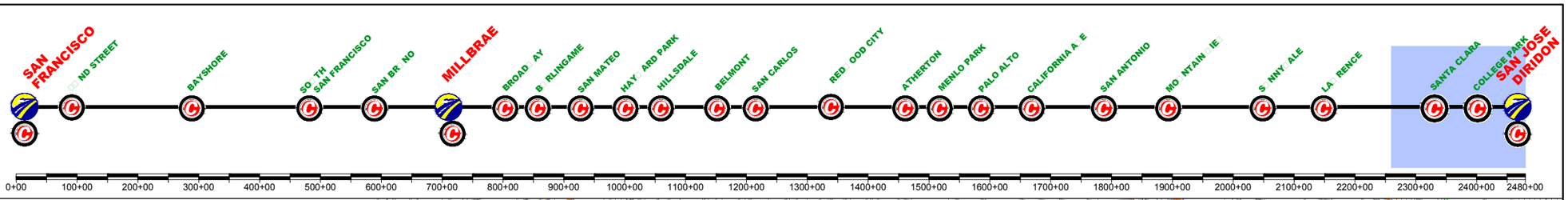
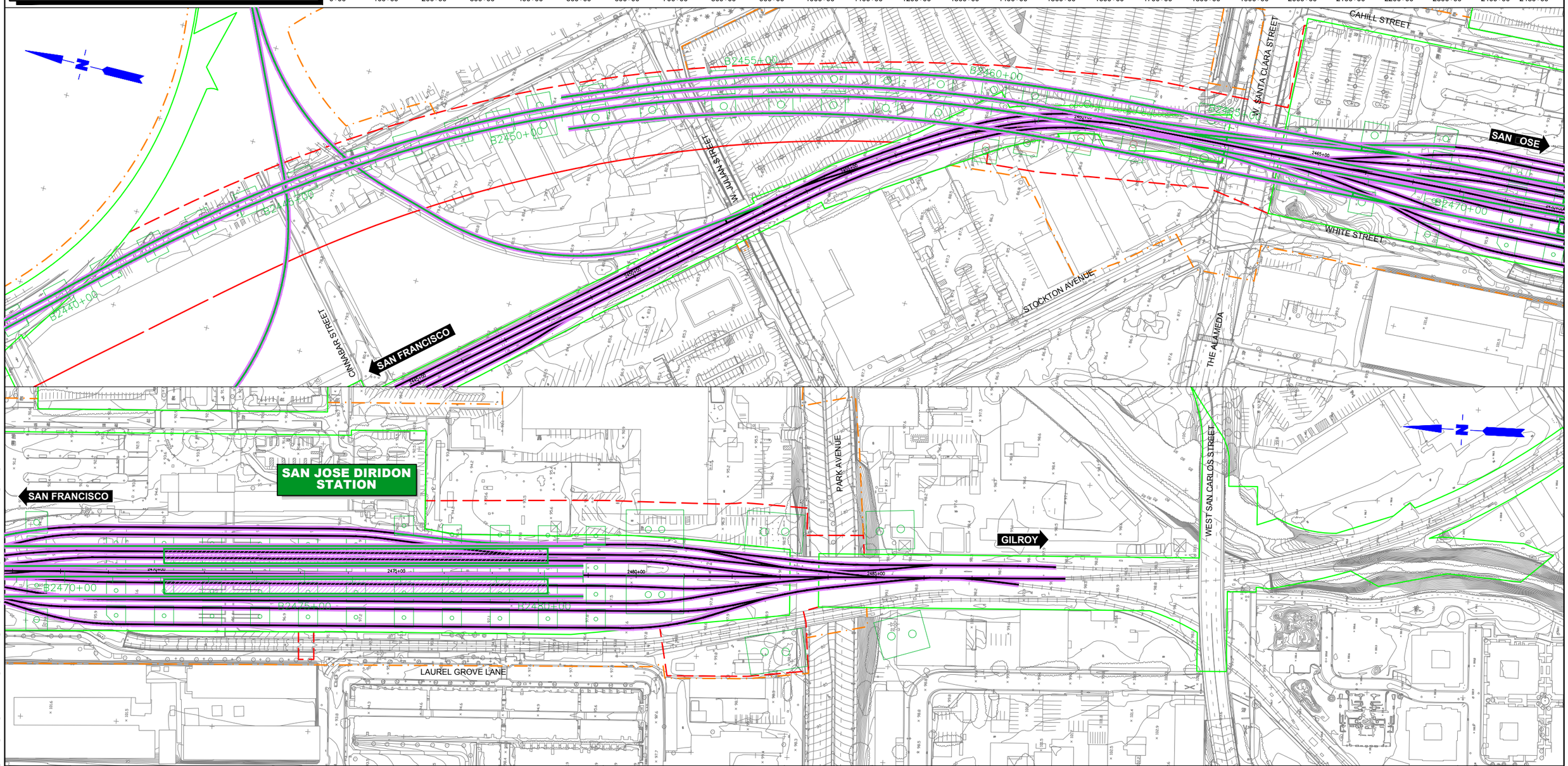
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
FINAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW





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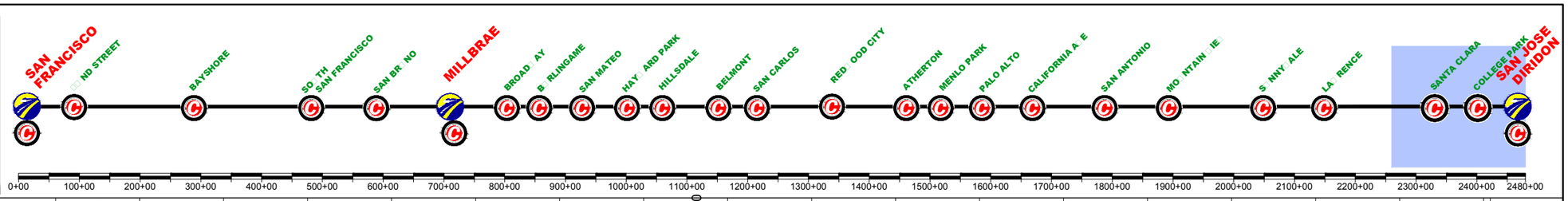
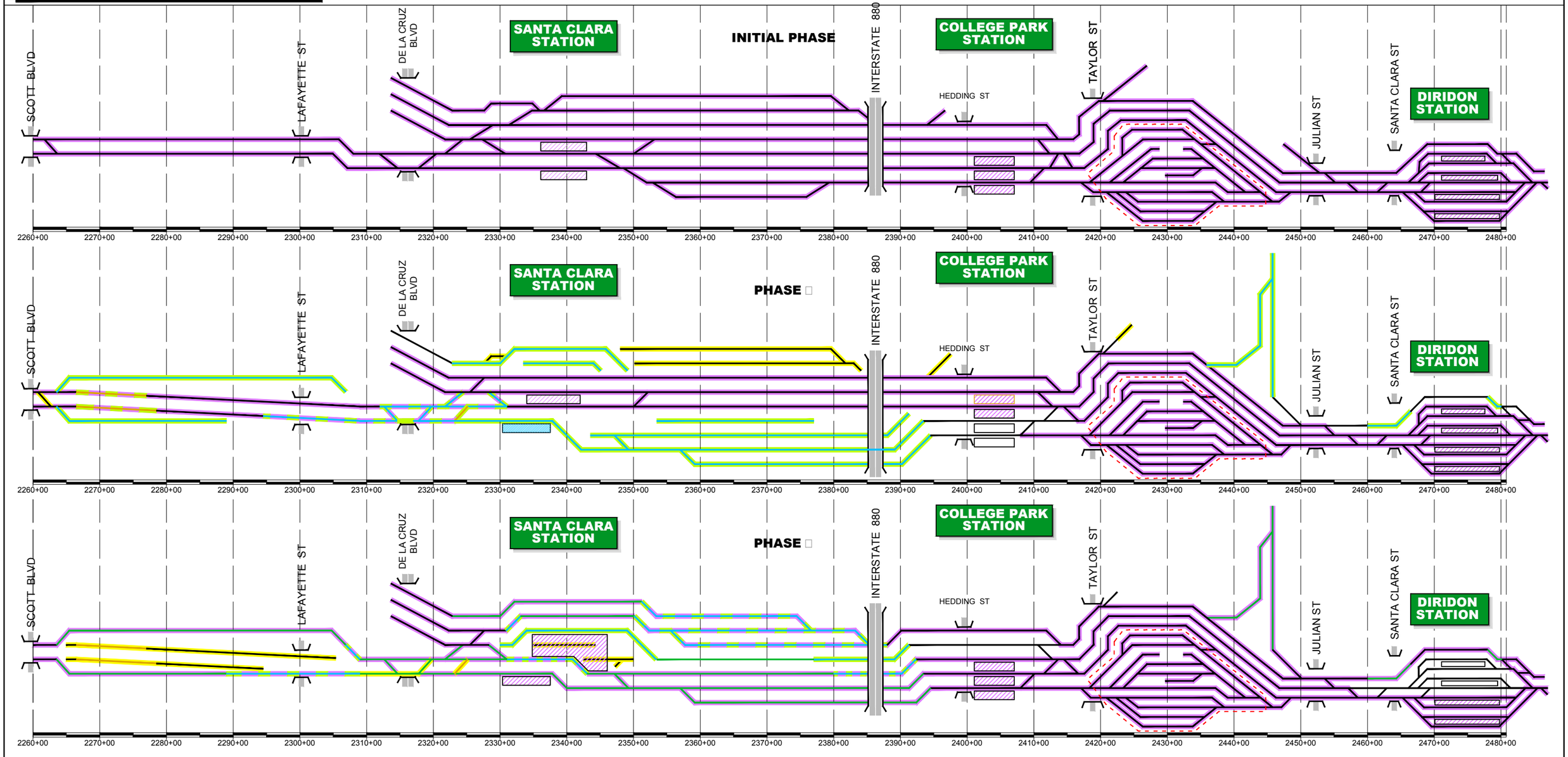
SAN FRANCISCO TO SAN □OSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN
FINAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW





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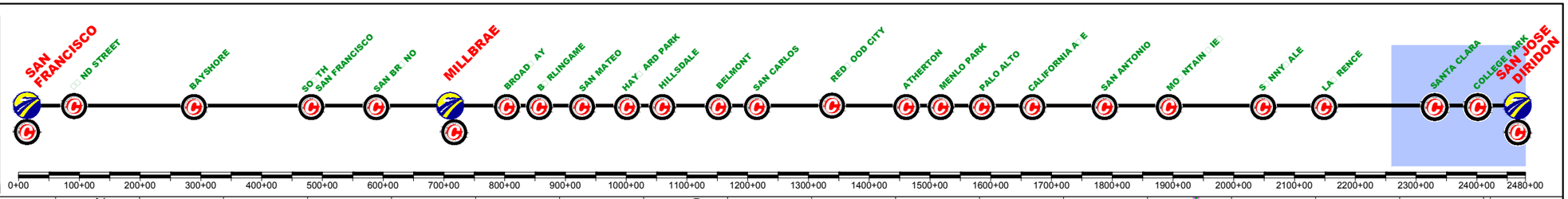
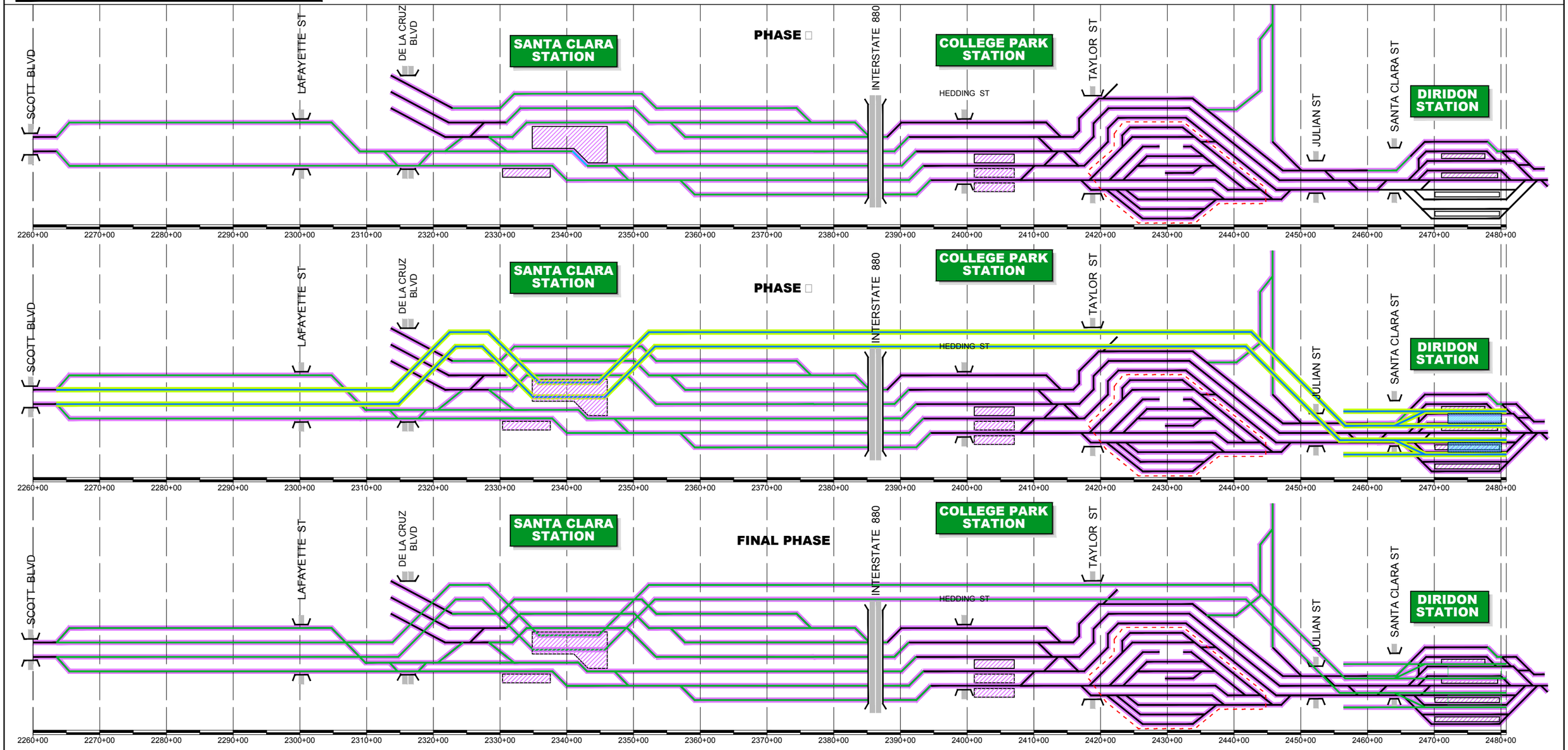
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW





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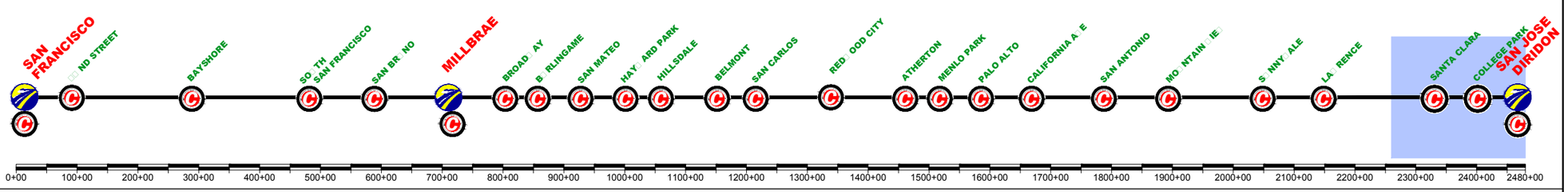
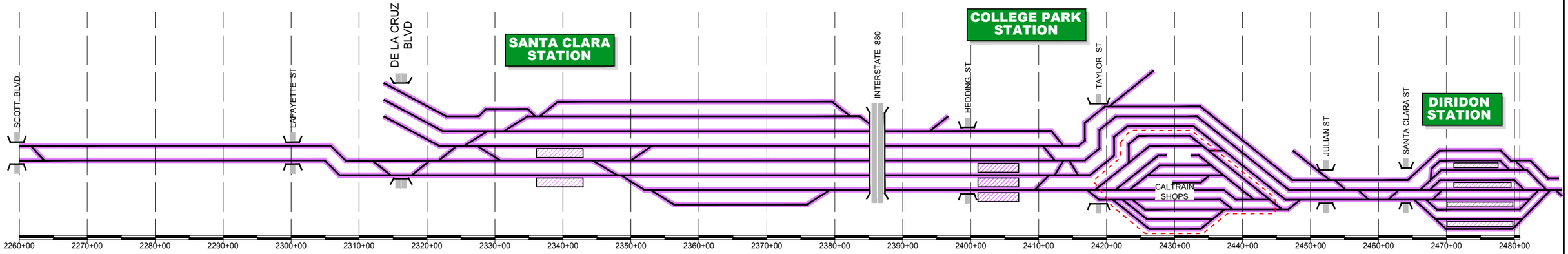
SCHEME

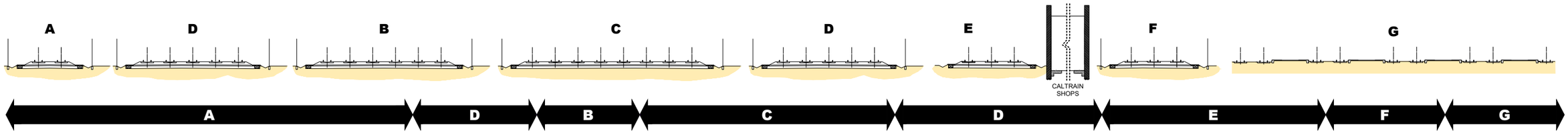
CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 2 OF 2

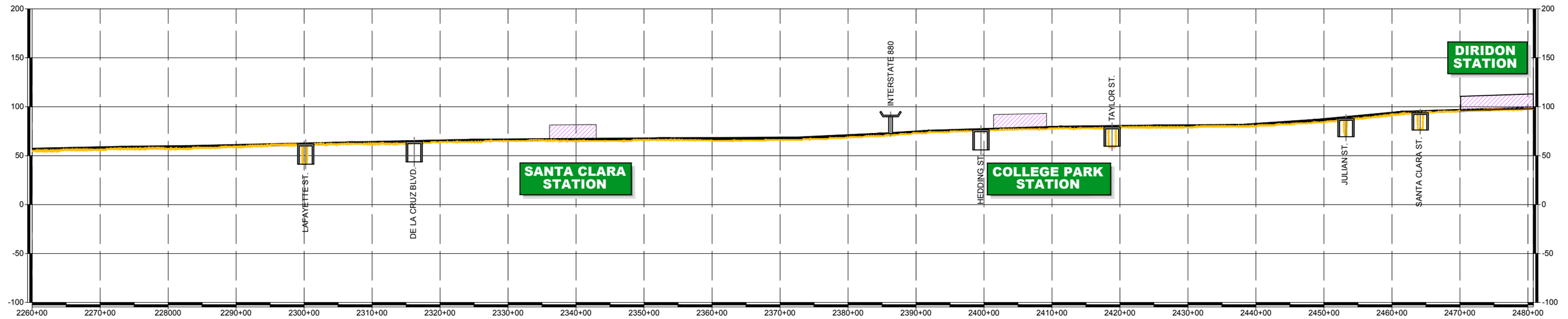
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW



INITIAL PHASE







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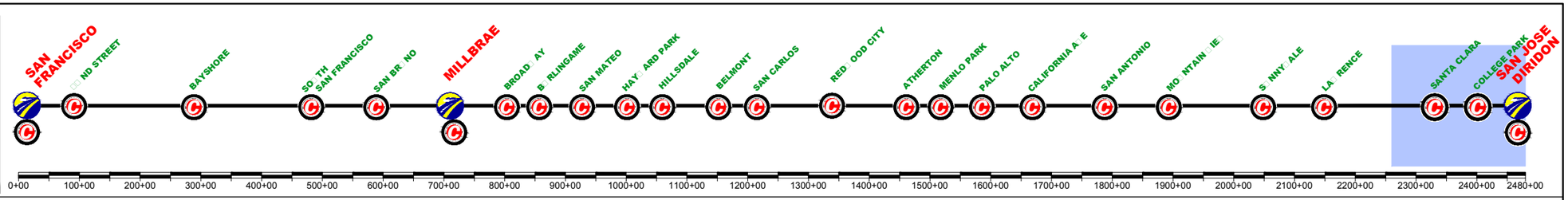
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
INITIAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 1 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW



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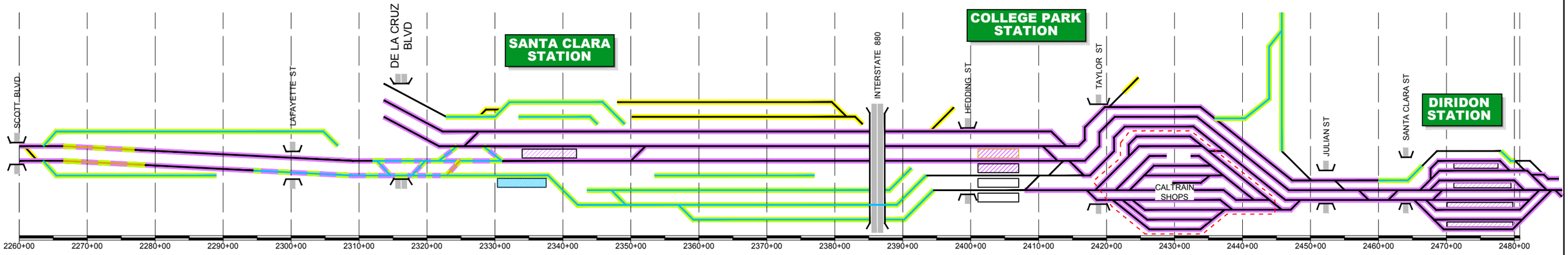

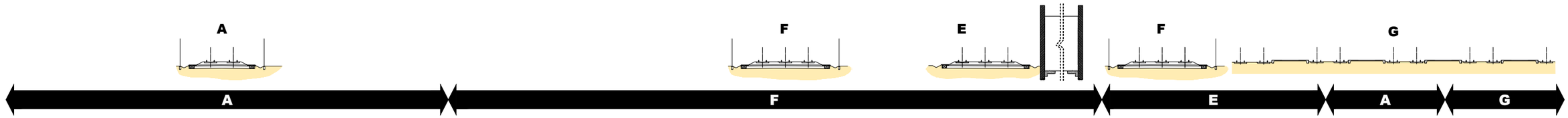

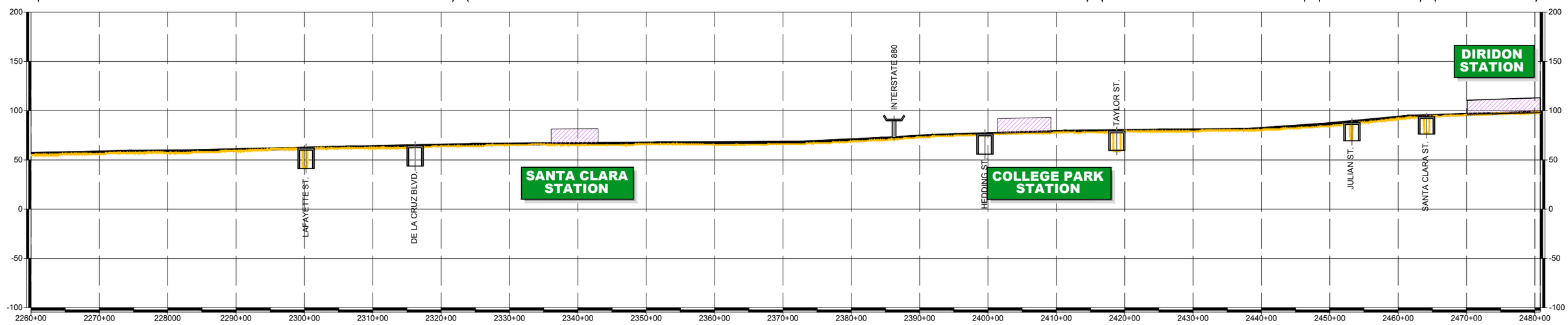

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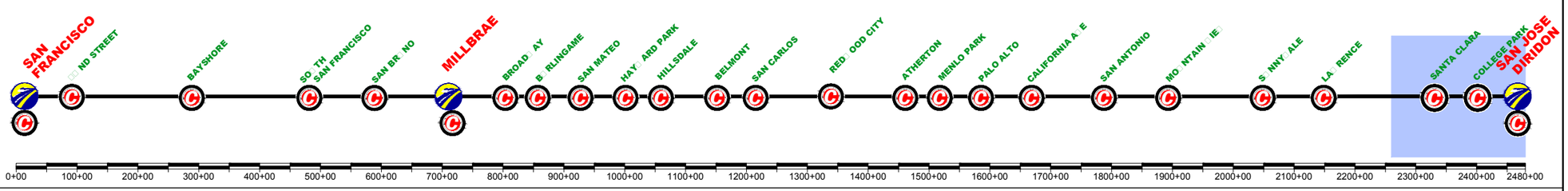
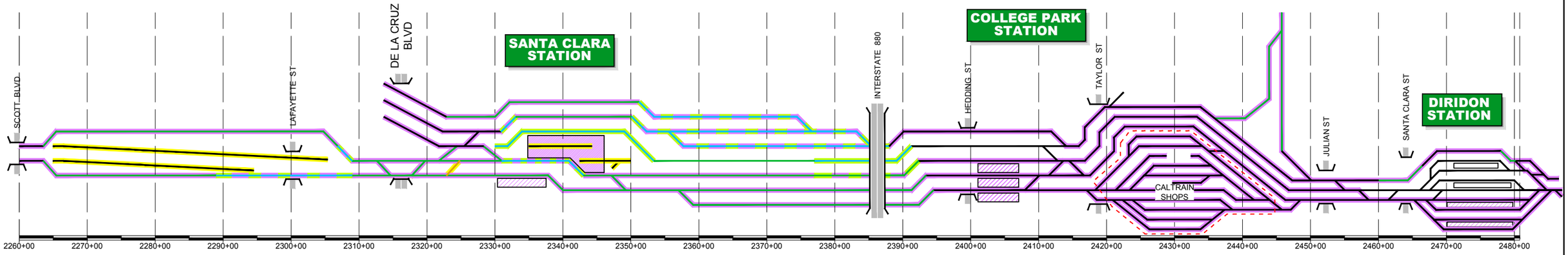
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 1

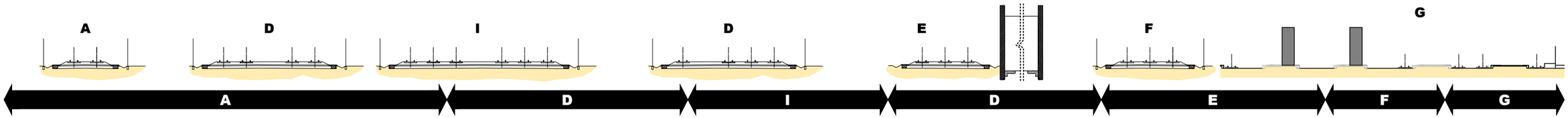
CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 2 OF 6

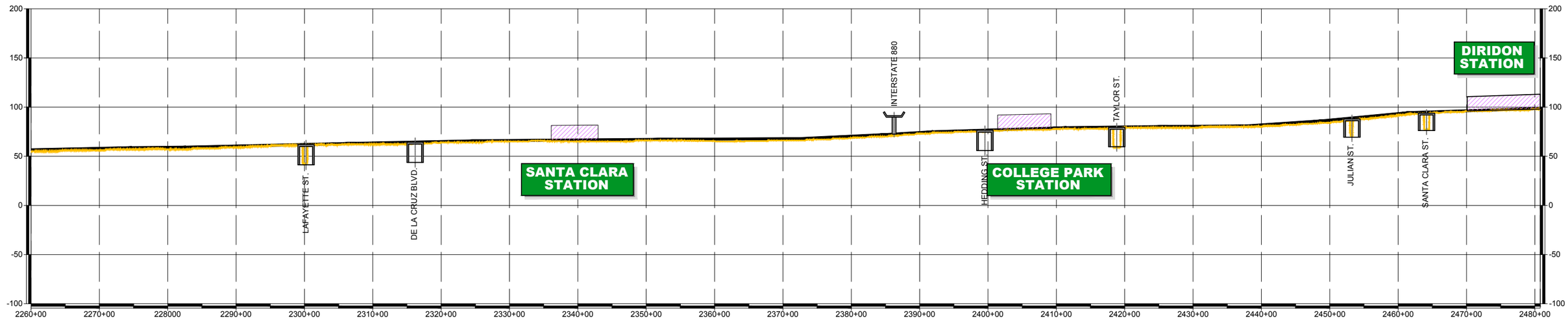
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW



PHASE 1







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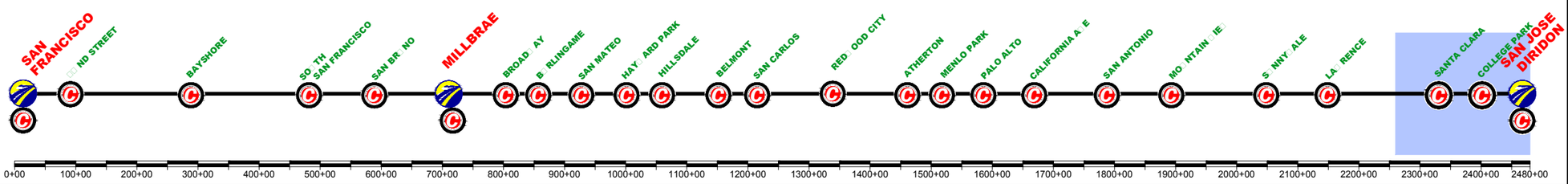
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 2

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 3 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW



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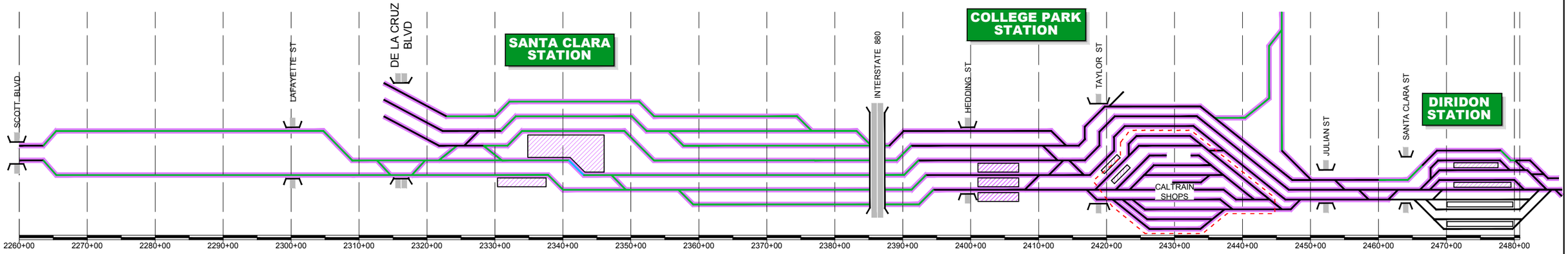

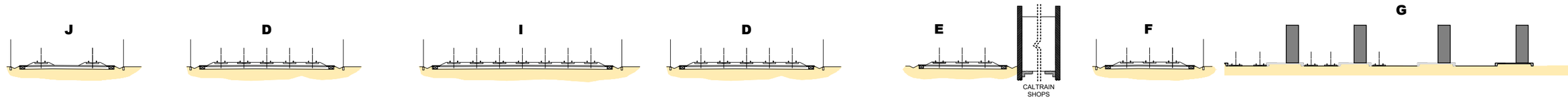

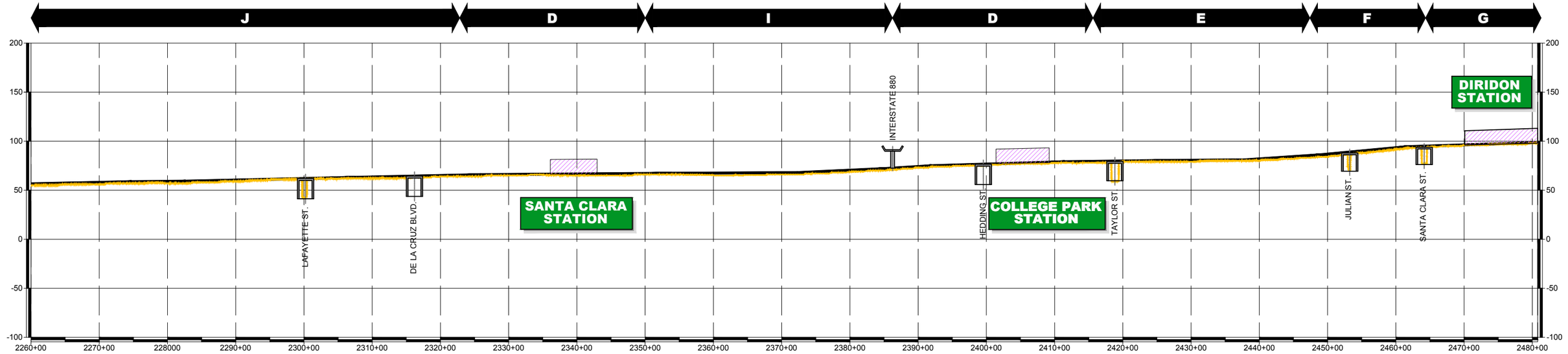

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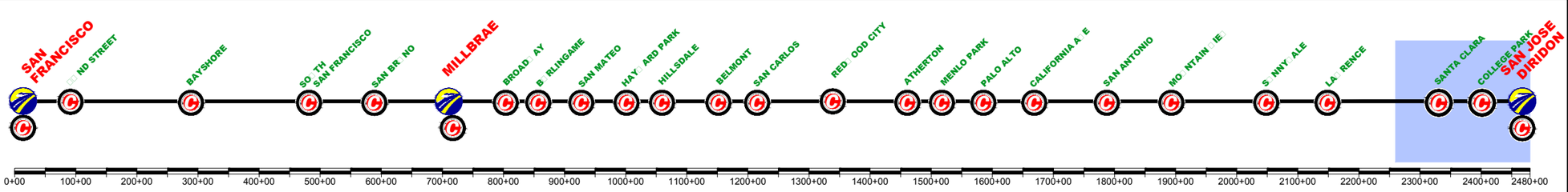
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 3

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 4 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW



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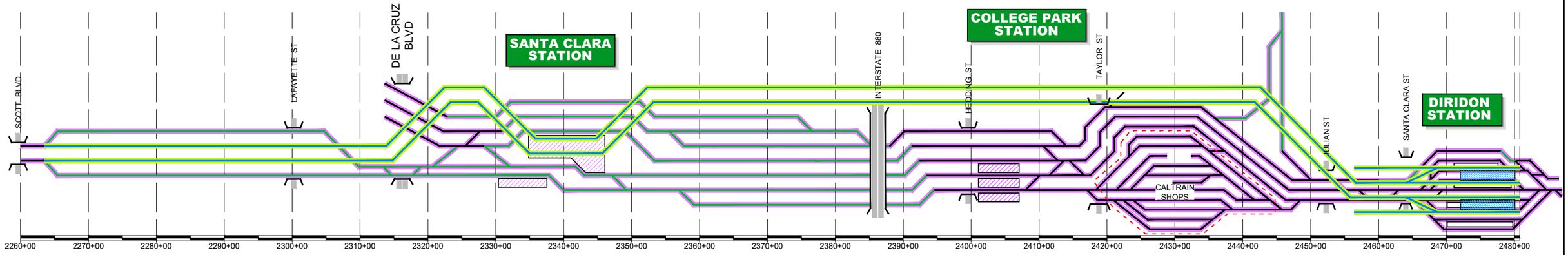

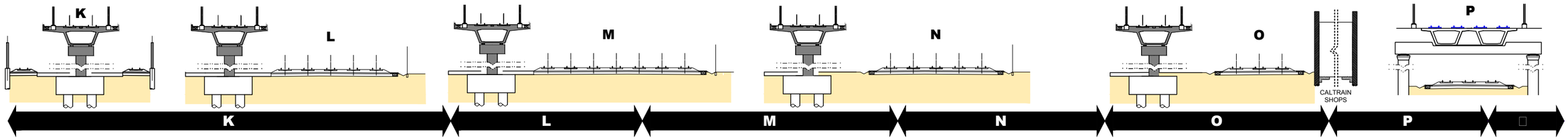

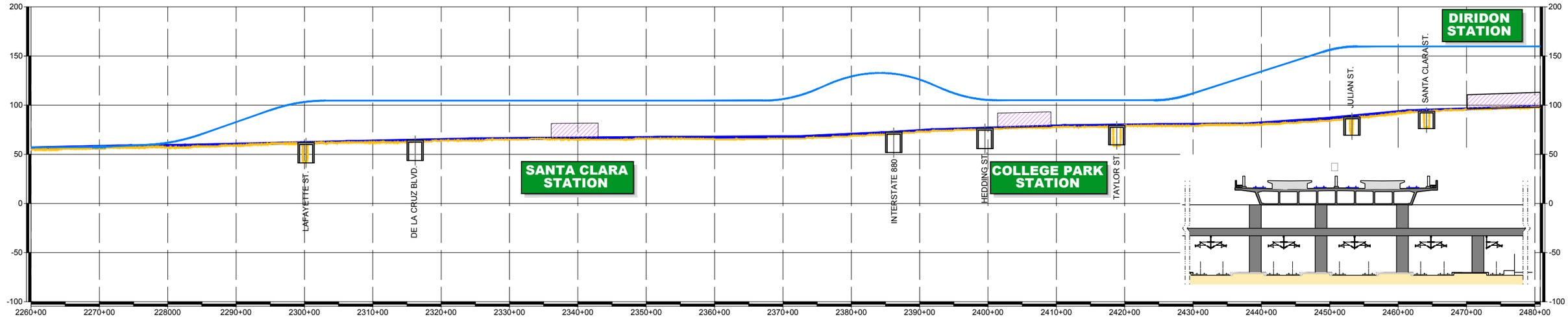

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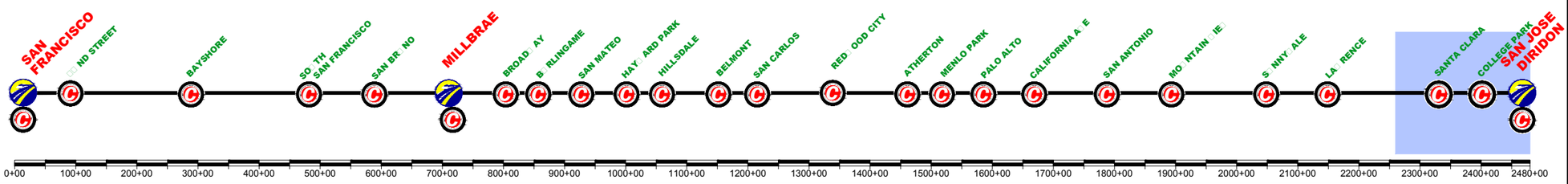
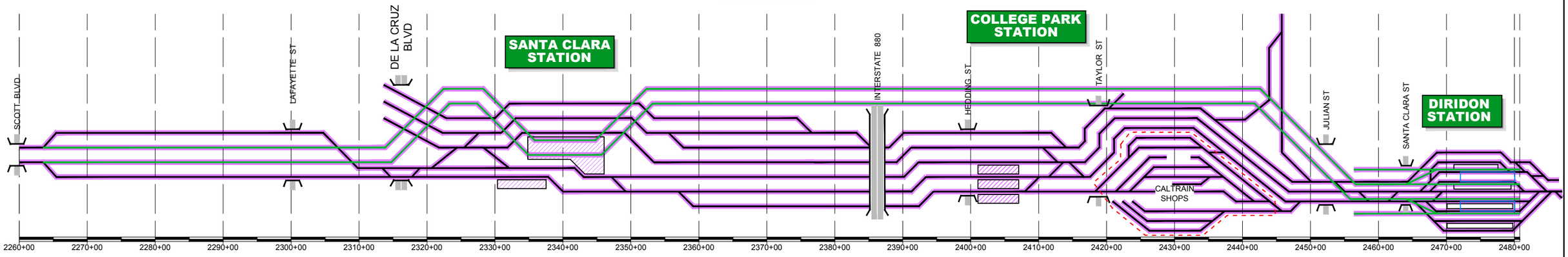
SAN JOSE. ALTERNATIVE B
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 4

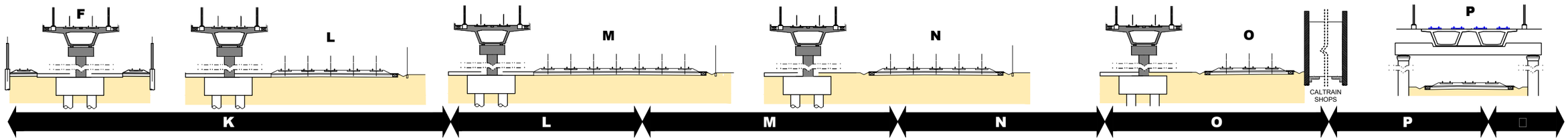
CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 5 OF 6

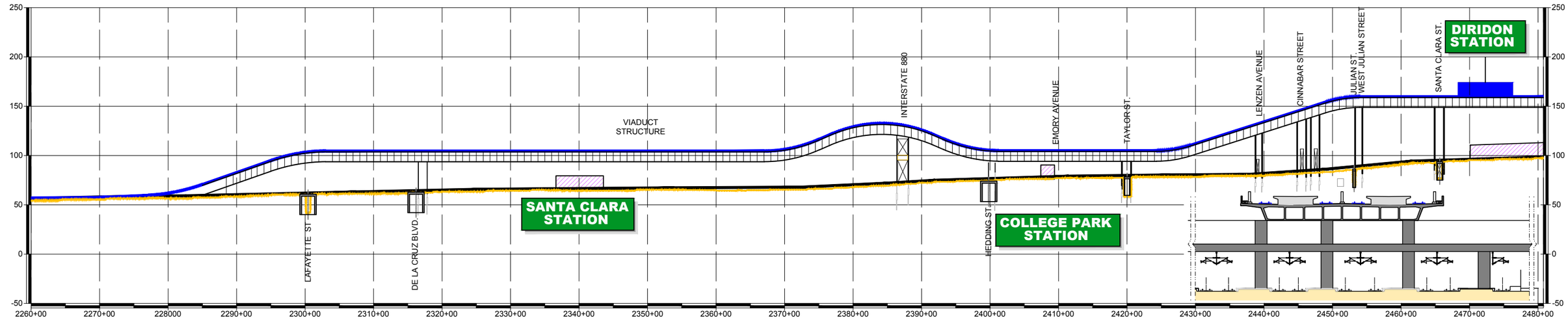
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW



FINAL PHASE







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CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
FINAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 6 OF 6

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
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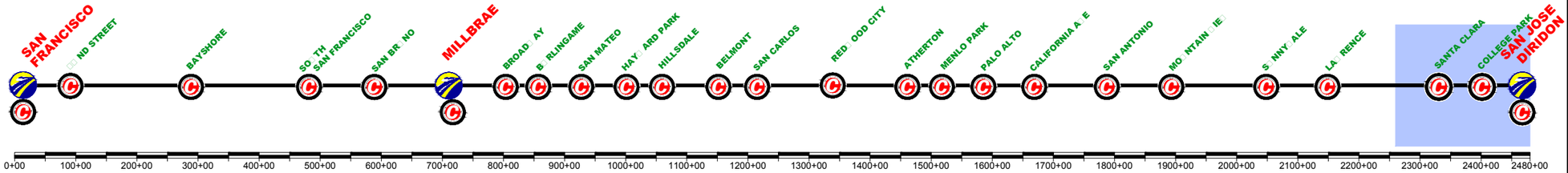
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW



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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
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CURRENT ROW
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ROW

SAN FRANCISCO
22ND STREET
BAYSHORE
SOUTH SAN FRANCISCO
SAN BRUNO
MILLBRAE
BROADWAY
BURLINGAME
SAN MATEO
HAYWARD PARK
HILLSDALE
BELMONT
SAN CARLOS
REDWOOD CITY
ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA AVE
SAN ANTONIO
MOUNTAIN VIEW
SUNNYVALE
LAWRENCE
SANTA CLARA
COLLEGE PARK
SAN JOSE DIRIDON

0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

SANTA CLARA STATION
BROKAW ROAD
RAILROAD AVENUE
BENTON STREET
DAHLIA LOOP
NEWHALL ST.
CITY OF SANTA CLARA
CITY OF SAN JOSE
SAN FRANCISCO
SAN JOSE

2320+00 2325+00 2330+00 2335+00 2340+00 2345+00 2350+00 2355+00 2360+00 2365+00 2370+00 2375+00 2380+00

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SAN FRANCISCO TO SAN □OSE
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW

SAN FRANCISCO
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BAYSHORE
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B RLINGAME
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HILLSDALE
BELMONT
SAN CARLOS
RED OOD CITY
ATHERTON
MENLO PARK
PALO ALTO
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0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

SAN FRANCISCO
2380+00
2385+00
2390+00
2395+00
2400+00
2405+00
2410+00
NEWHALL ST.
INTERSTATE HIGHWAY 880
MCKENDRIE STREET
WEST HEDDING STREET
STOCKTON AVENUE
UNIVERSITY AVENUE
COLLEGE PARK STATION
SAN OSE
BELLARMINE
STREET
EMORY STREET

CHESTNUT STREET
SAN FRANCISCO
2410+00
2415+00
2420+00
2425+00
2430+00
2435+00
2440+00
STOCKTON AVENUE
WEST TAYLOR STREET
EMORY STREET
CALTRAIN MAINTENANCE FACILITY
SAN OSE

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SAN JOSE. ALTERNATIVE A
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CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
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TUNNEL
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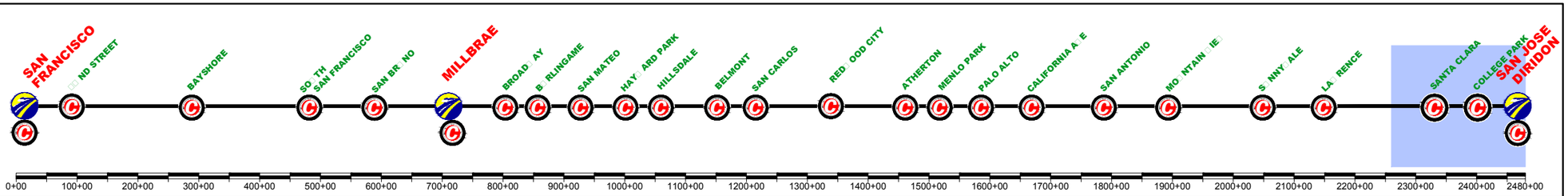

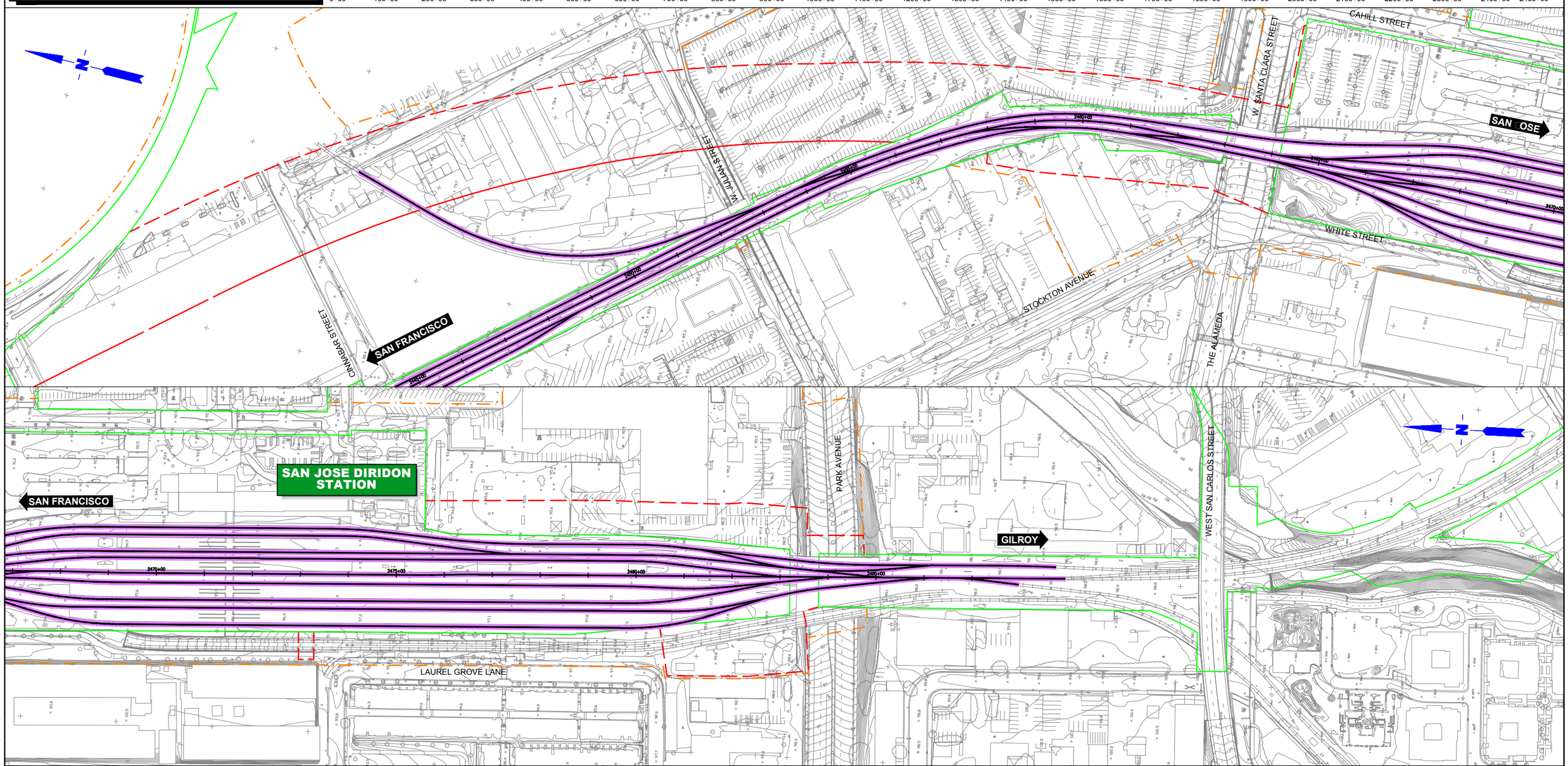

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SAN JOSE. ALTERNATIVE A
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CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
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TRACK REMOVAL
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CIRCULATION TRACK
OVERHEAD BRIDGE
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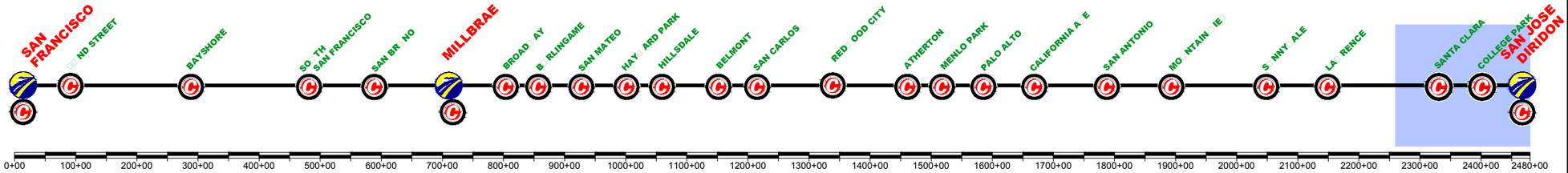

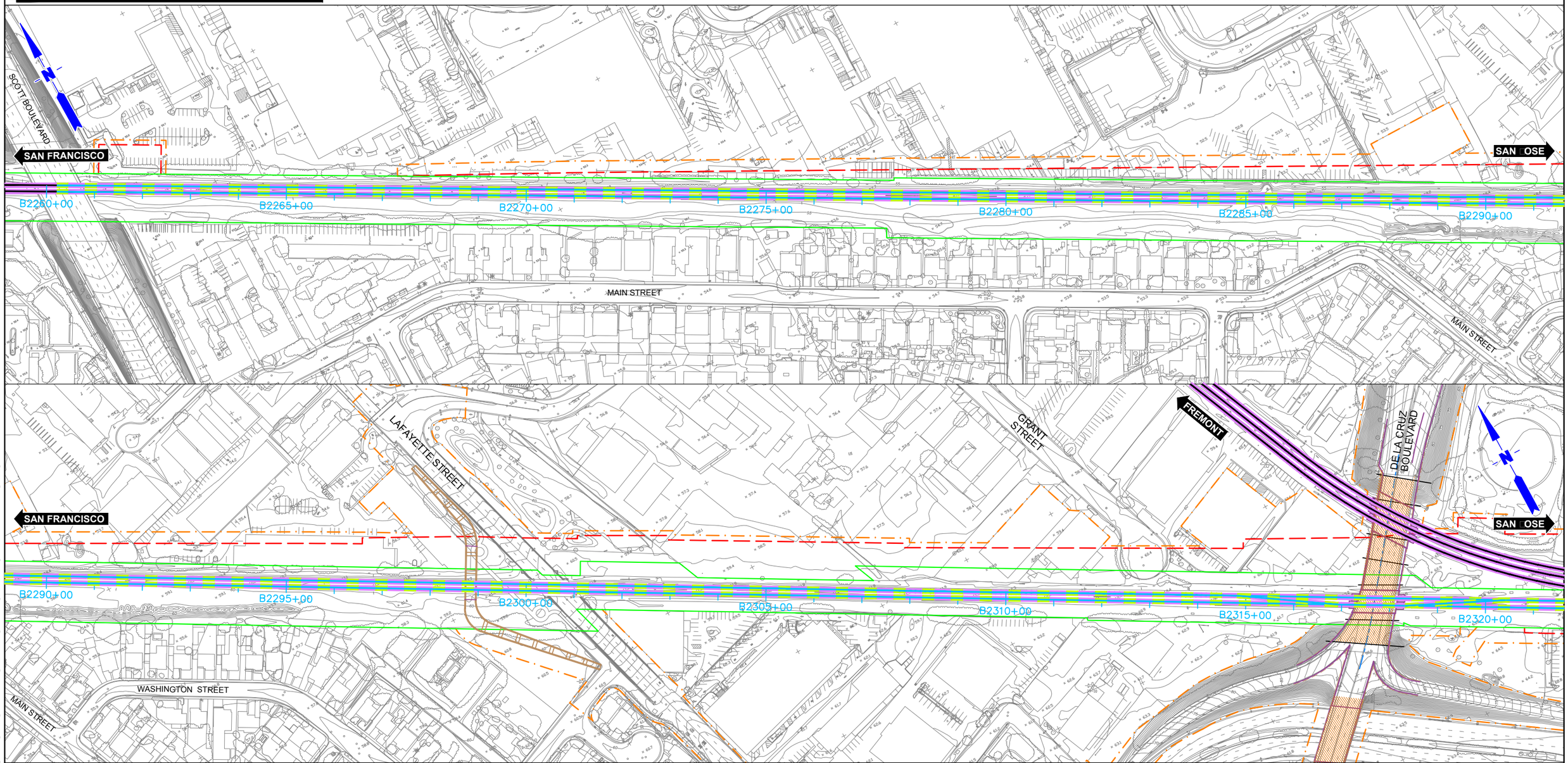

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CONTRACT NO.
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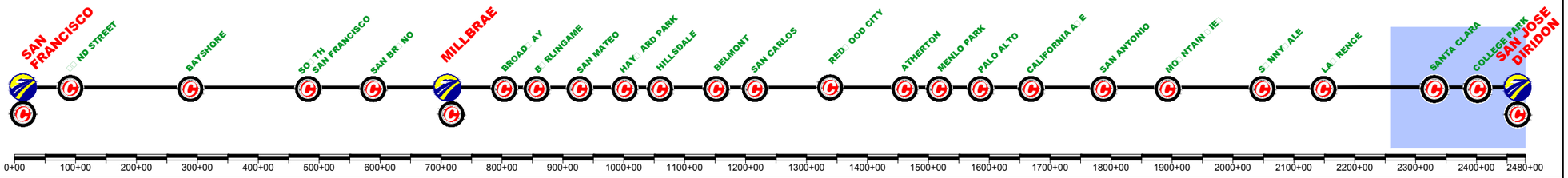

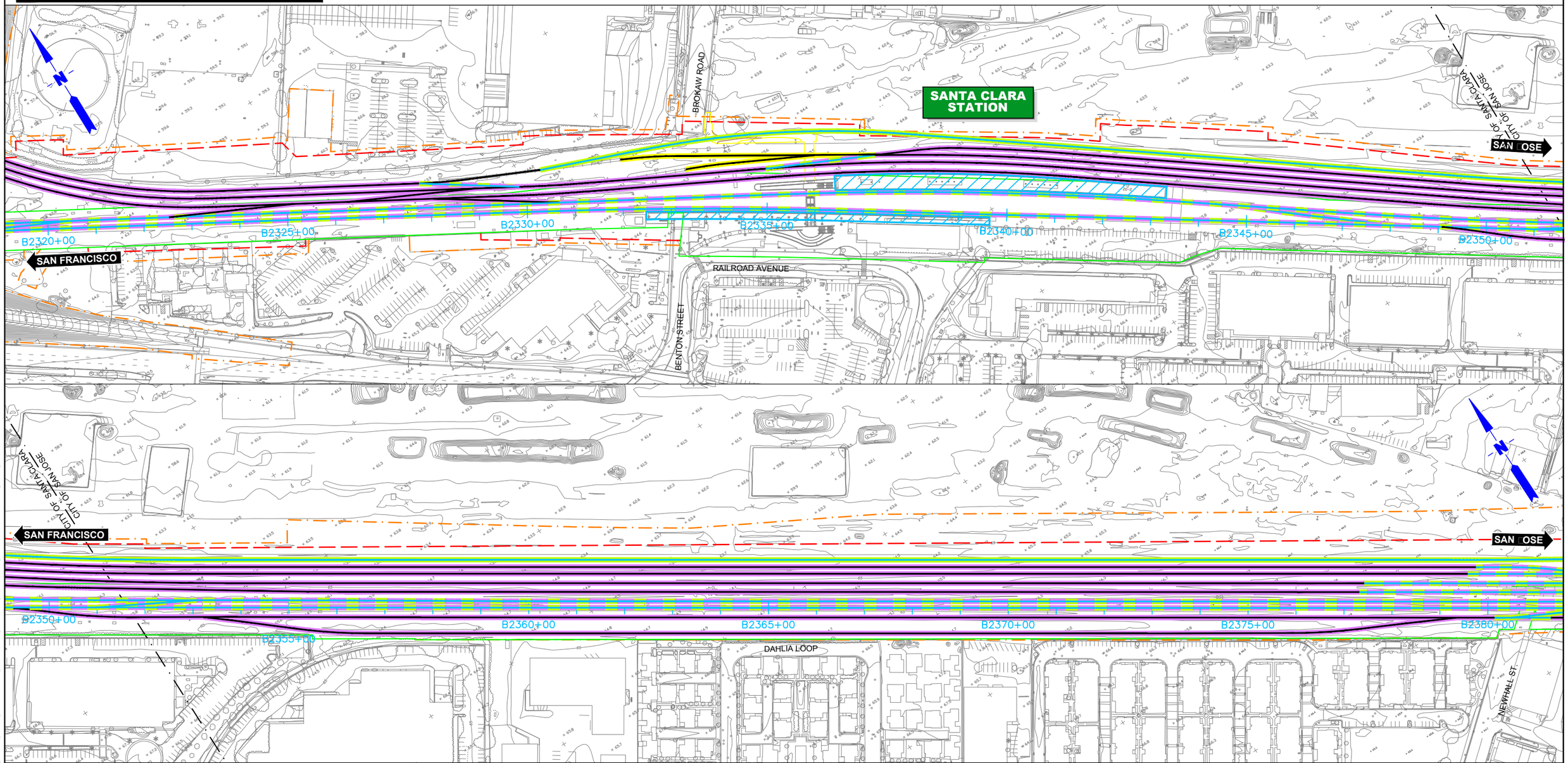

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SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW

SAN FRANCISCO
22ND STREET
BAYSHORE
SOUTH SAN FRANCISCO
SAN BRUNO
MILLBRAE
BROADWAY
BURLINGAME
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SAN FRANCISCO

COLLEGE PARK STATION

WEST HEDDING STREET
STOCKTON AVENUE
UNIVERSITY AVENUE
SAN JOSE
NEWHALL ST.
INTERSTATE HIGHWAY 880
MCKENDRIE STREET
BELLARMINE
STEHR
EMORY STREET
CHESTNUT STREET
WEST TAYLOR STREET
CALTRAIN MAINTENANCE FACILITY

FOUNDATION UNDER CONSTRUCTION
FOUNDATION BUILT IN PREVIOUS PHASES

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SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
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PHASE 1

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
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CREEK UNDERPASS
CURRENT ROW
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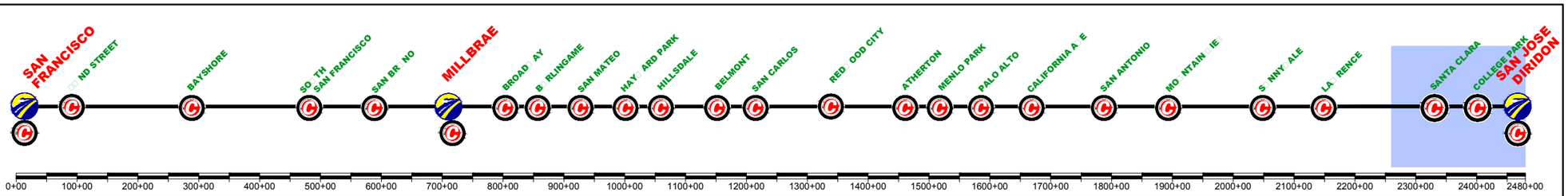

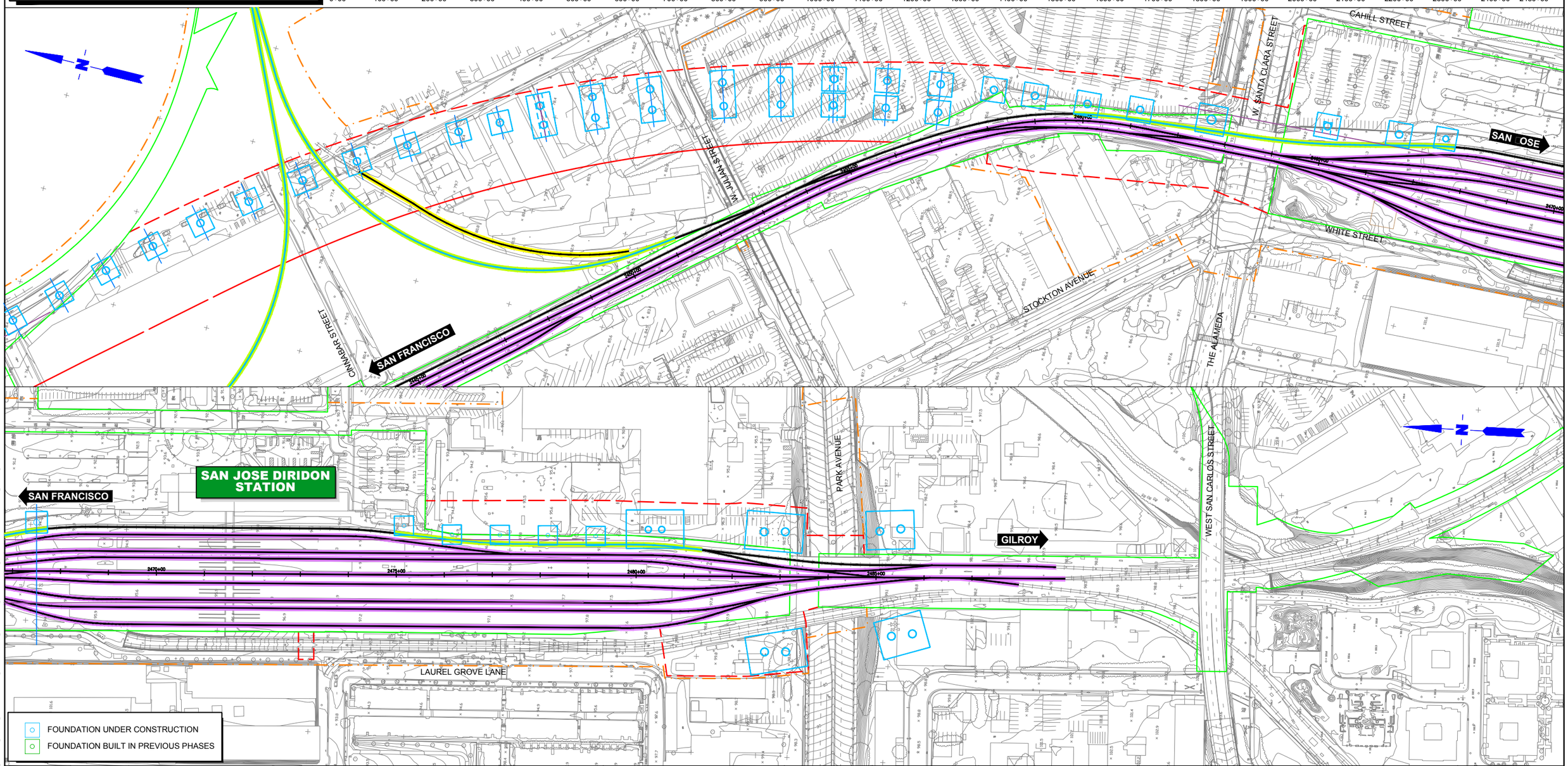

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SAN FRANCISCO TO SAN JOSE
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CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
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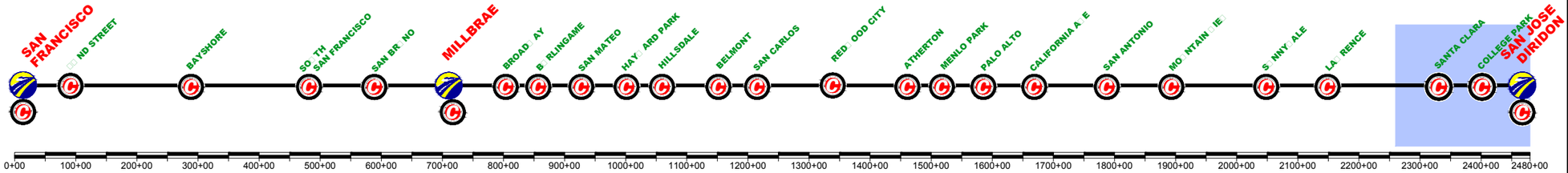

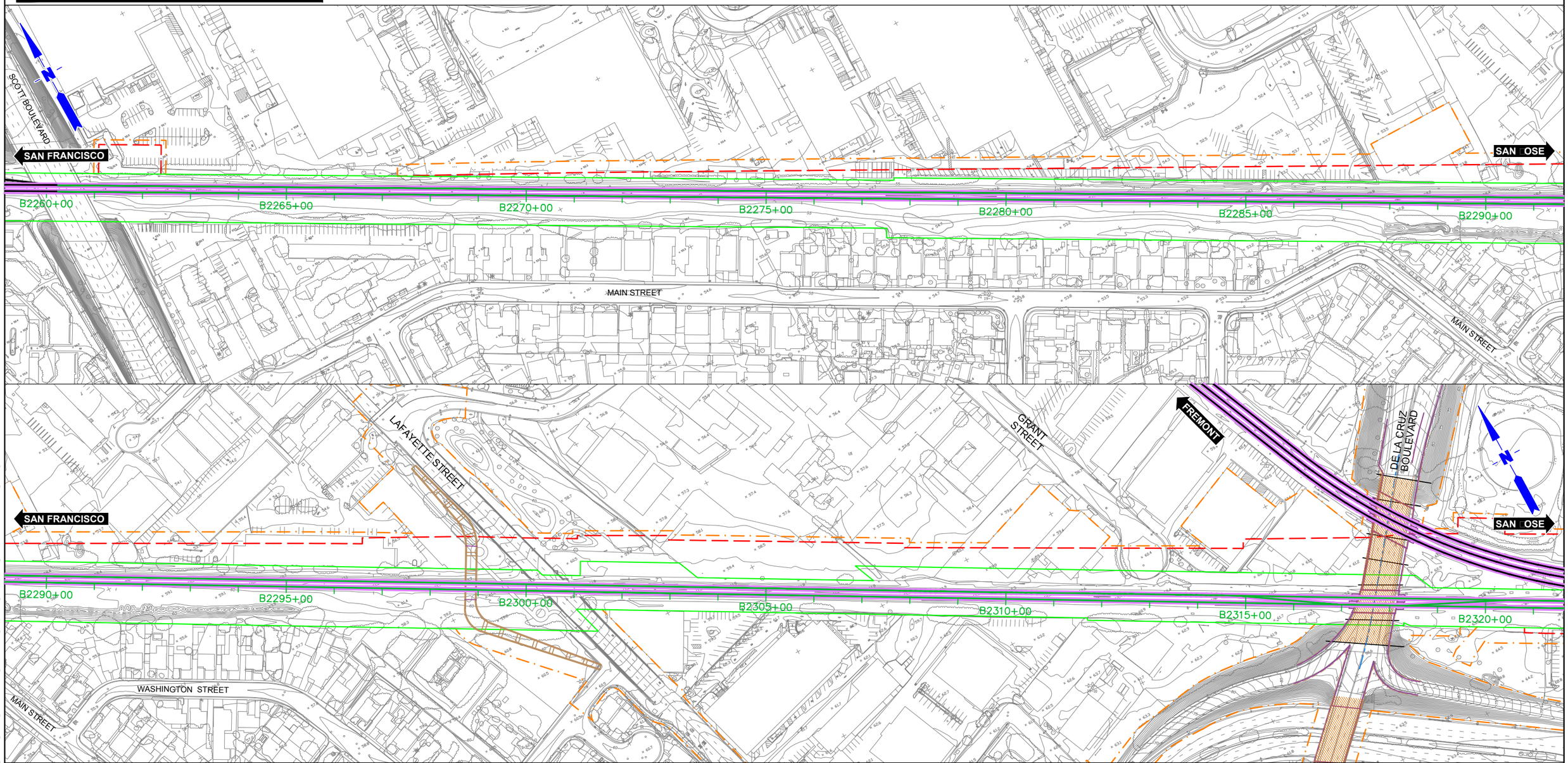

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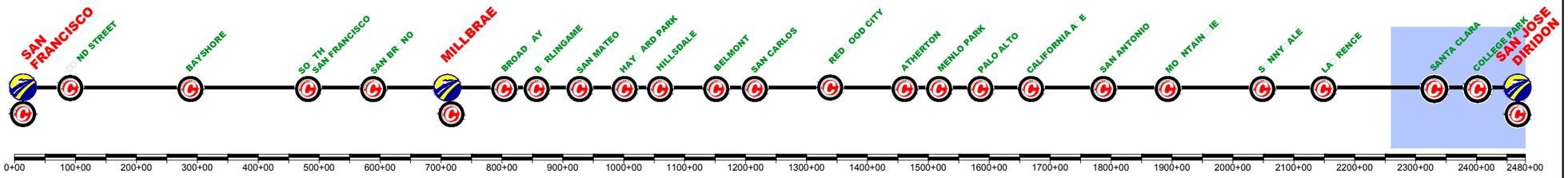
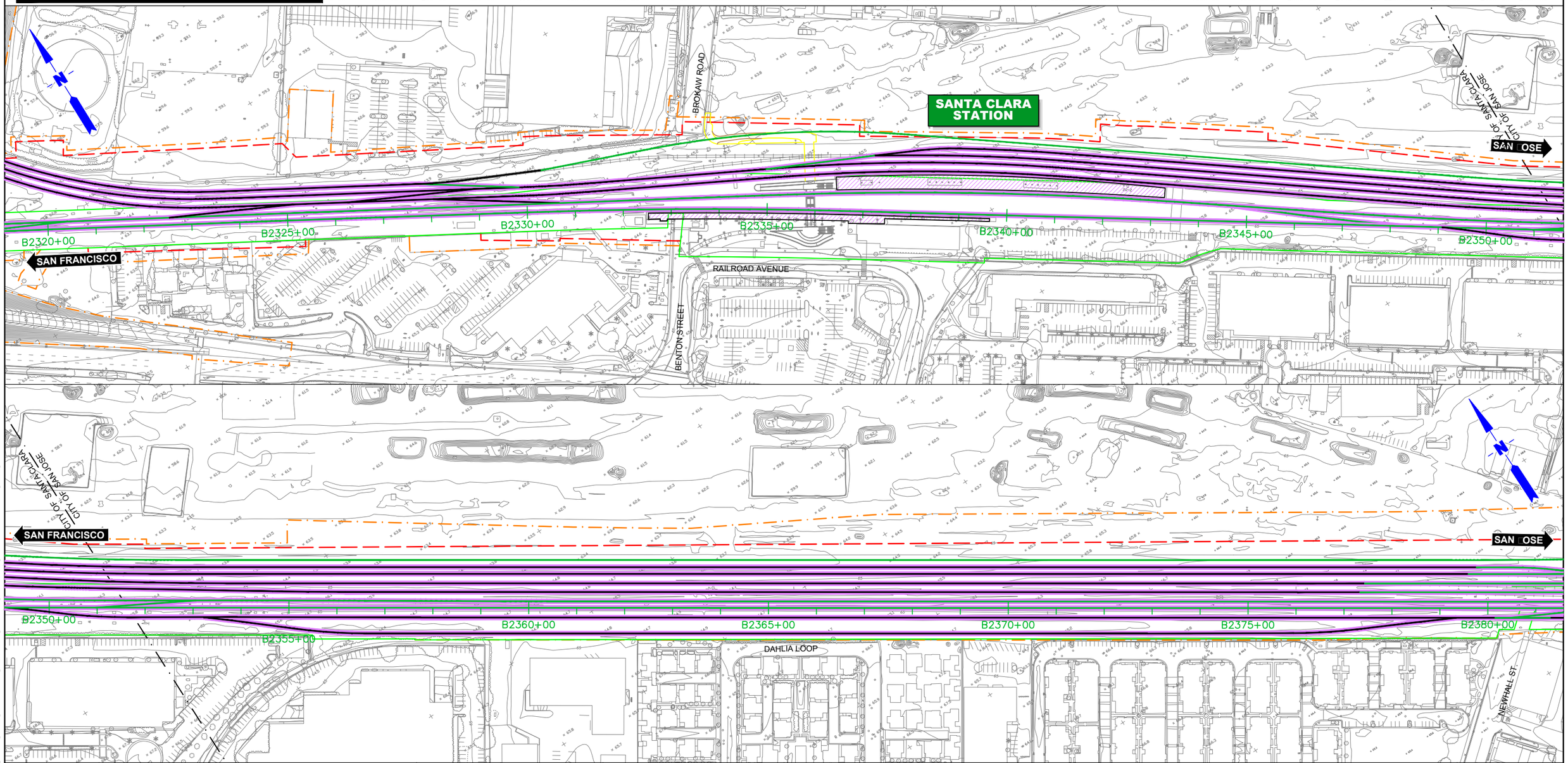
SAN FRANCISCO TO SAN □OSE
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW





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PHASE 2

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CURRENT TRACK
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BUILT IN PREVIOUS PHASES
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SAN FRANCISCO
22ND STREET
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HAYWARD PARK
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BELMONT
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ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA AVE
SAN ANTONIO
MOUNTAIN VIEW
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SANTA CLARA
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0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

COLLEGE PARK STATION

SAN FRANCISCO

SAN JOSE

WEST HEDDING STREET
STOCKTON AVENUE
UNIVERSITY AVENUE
NEWHALL ST.
INTERSTATE HIGHWAY 880
MCKENDRIE STREET
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STEHR
EMORY STREET
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WEST TAYLOR STREET
CALTRAIN MAINTENANCE FACILITY

FOUNDATION UNDER CONSTRUCTION
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SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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SAN FRANCISCO
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BAYSHORE
SO TH SAN FRANCISCO
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MILLBRAE
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HAY ARD PARK
HILLSDALE
BELMONT
SAN CARLOS
RED OOD CITY
ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA A E
SAN ANTONIO
MO NTAIN IE
S NNY ALE
LA RENCE
SANTA CLARA
COLLEGE PARK
SAN JOSE DIRIDON

0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

W JULIAN STREET
CAHILL STREET
W SANTA CLARA STREET
SAN OSE
SHAPING THE FOOTING TO MAINTAIN RAIL TRAFFIC NDER DE ELOPMENT
WHITE STREET
STOCKTON
THE ALAMEDA
CINNABAR STREET
SAN FRANCISCO
SAN JOSE DIRIDON STATION
PARK AVENUE
GILROY
WEST SAN CARLOS STREET
LAUREL GROVE LANE

FOUNDATION UNDER CONSTRUCTION
FOUNDATION BUILT IN PREVIOUS PHASES

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CONTRACT NO.
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SHEET NO. 4 OF 4

CURRENT TRACK
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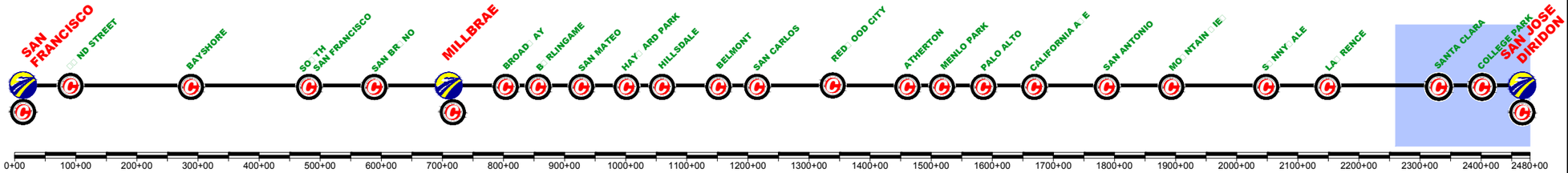

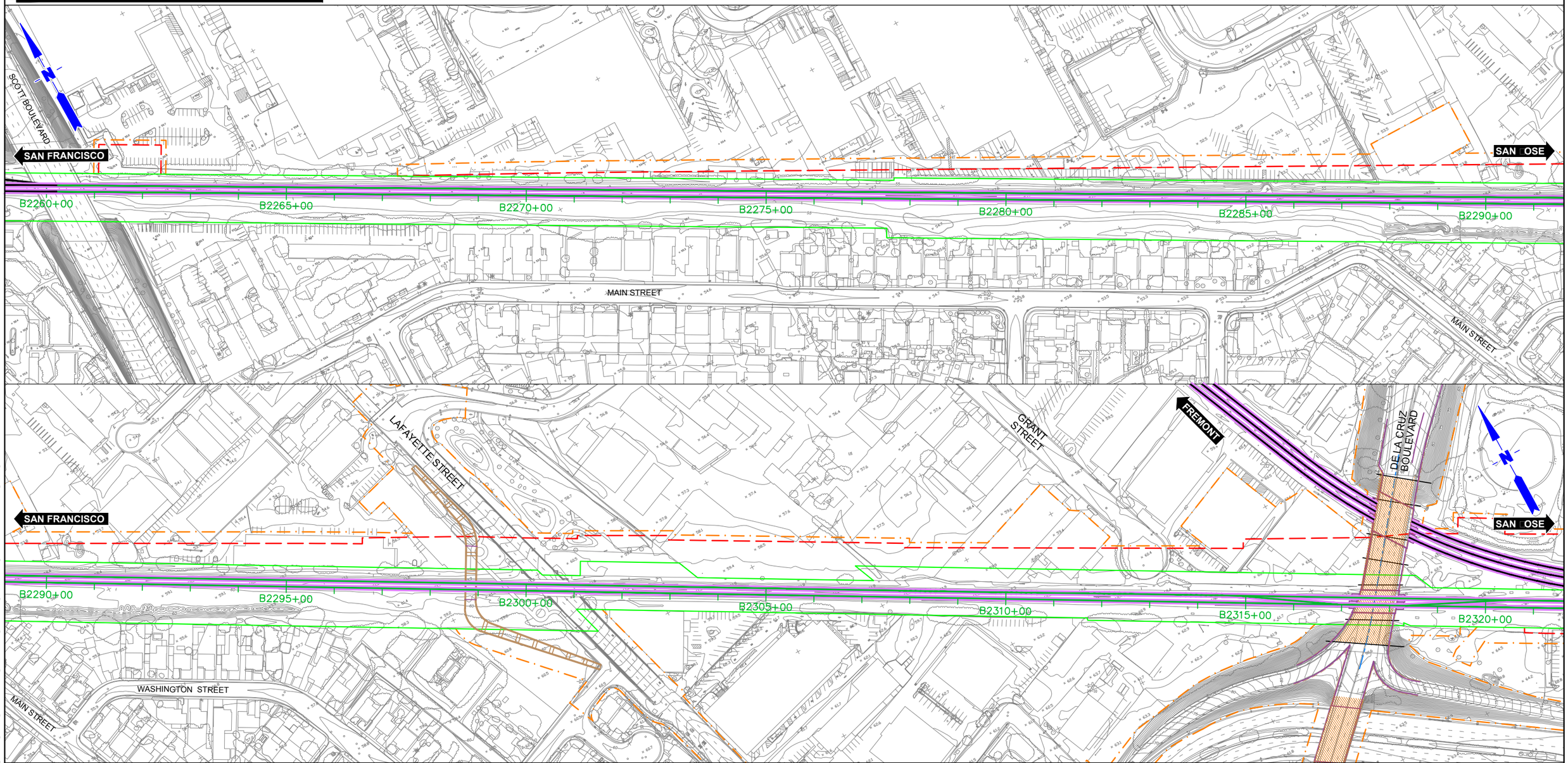

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$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW

SAN FRANCISCO
22ND STREET
BAYSHORE
SOUTH SAN FRANCISCO
SAN BRUNO
MILLBRAE
BROADWAY
BURLINGAME
SAN MATEO
HAYWARD PARK
HILLSDALE
BELMONT
SAN CARLOS
REDWOOD CITY
ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA AVE
SAN ANTONIO
MOUNTAIN VIEW
SUNNYVALE
LAWRENCE
SANTA CLARA
COLLEGE PARK
SAN JOSE DIRIDON

0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

BROKAW ROAD
SANTA CLARA STATION
CITY OF SANTA CLARA
CITY OF SAN JOSE
SAN JOSE
B2320+00
B2325+00
B2330+00
B2335+00
B2340+00
B2345+00
B2350+00
SAN FRANCISCO
RAILROAD AVENUE
BENTON STREET
B2350+00
B2355+00
B2360+00
B2365+00
B2370+00
B2375+00
B2380+00
DAHLIA LOOP
NEWHALL ST.

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SAN FRANCISCO TO SAN JOSE
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW

SAN FRANCISCO
22ND STREET
BAYSHORE
SOUTH SAN FRANCISCO
SAN BRUNO
MILLBRAE
BROADWAY
BURLINGAME
SAN MATEO
HAYWARD PARK
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SAN ANTONIO
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LAWRENCE
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SAN FRANCISCO
NEWHALL ST.
INTERSTATE HIGHWAY 880
MCKENDRIE STREET
WEST HEDDING STREET
STOCKTON AVENUE
UNIVERSITY AVENUE
BELLARMINE STREET
EMORY STREET
SAN JOSE
2390+00
2395+00
2400+00
2405+00
2410+00

CHESTNUT STREET
COLLEGE PARK STATION
SAN FRANCISCO
STOCKTON AVENUE
WEST TAYLOR STREET
EMORY STREET
CALTRAIN MAINTENANCE FACILITY
SAN JOSE
2430+00
2435+00
2440+00

FOUNDATION UNDER CONSTRUCTION
FOUNDATION BUILT IN PREVIOUS PHASES

$FILE$
$PLTDRVS$
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$DATE$
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CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
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CURRENT TRACK
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UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
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CURRENT ROW
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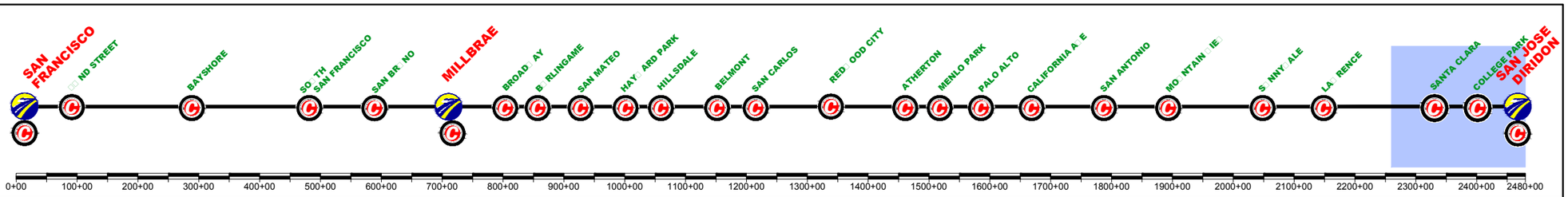
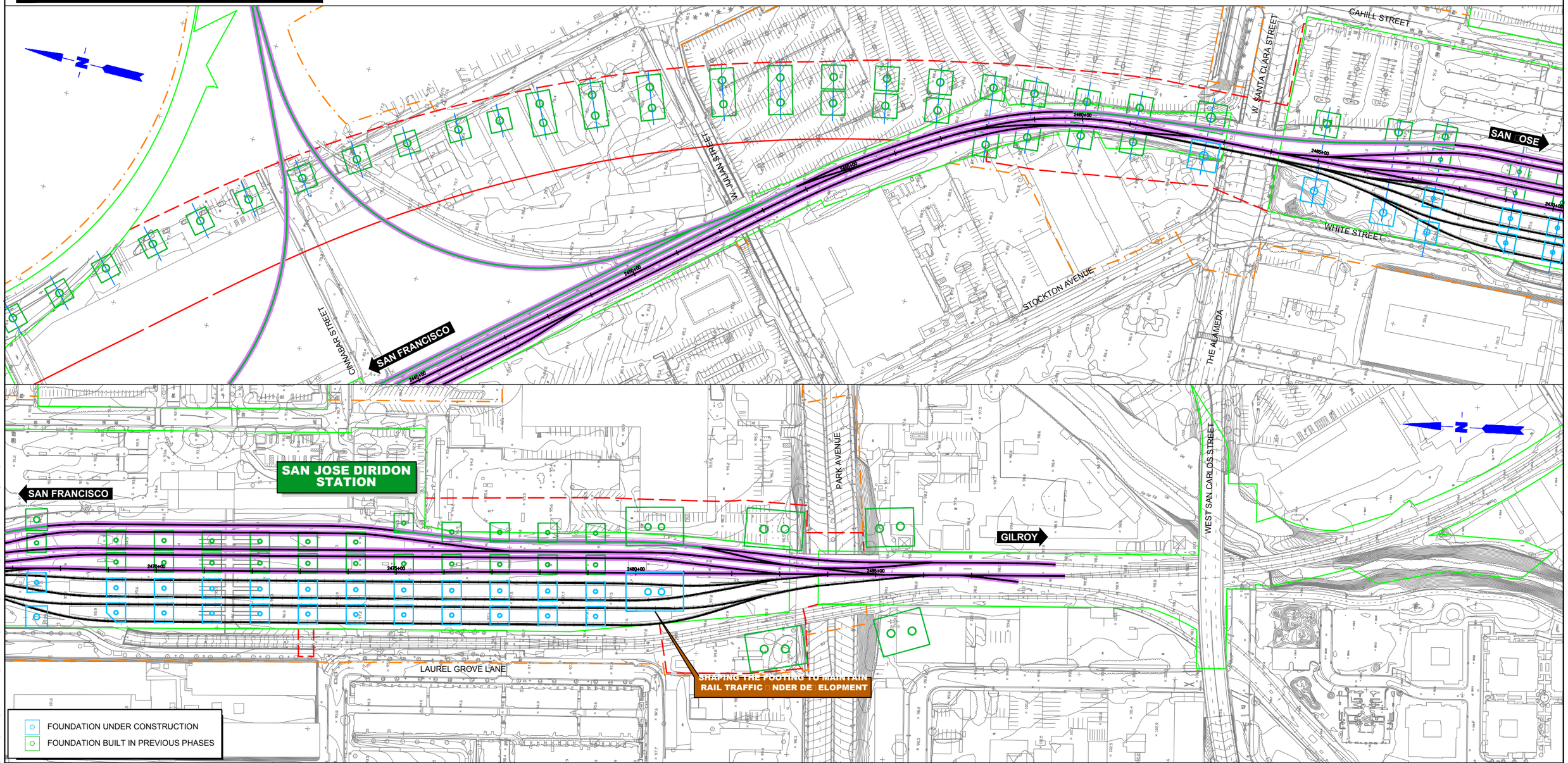
ROW





FOUNDATION UNDER CONSTRUCTION
FOUNDATION BUILT IN PREVIOUS PHASES

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CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
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MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
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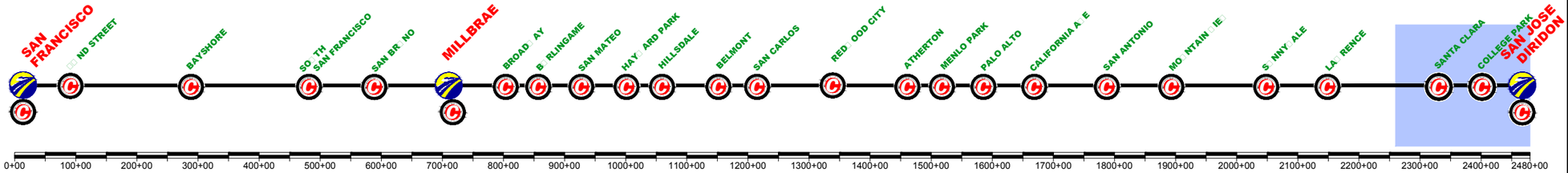

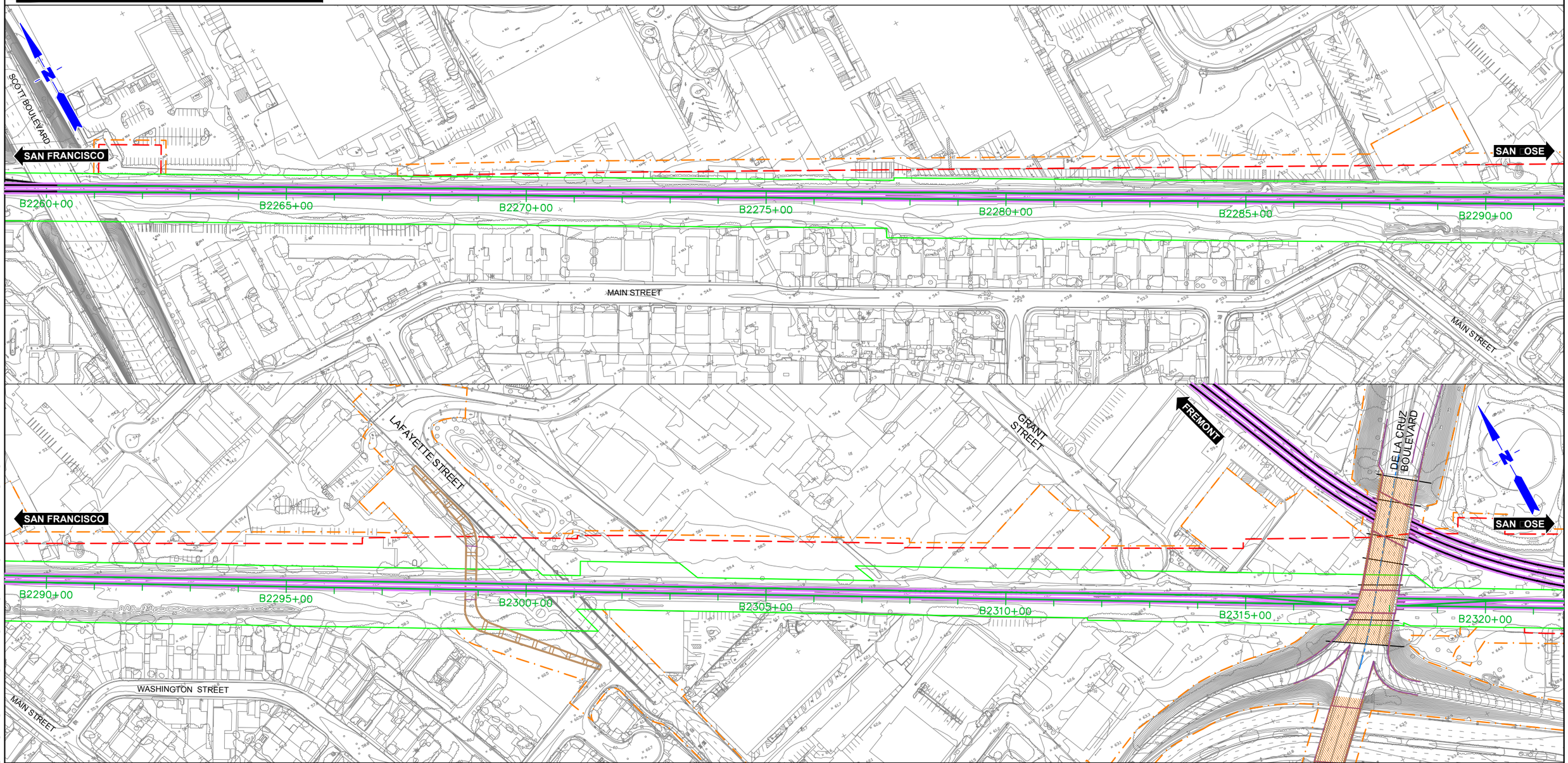

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BROKAW ROAD
SANTA CLARA STATION
CITY OF SANTA CLARA
CITY OF SAN JOSE
SAN JOSE
B2320+00
SAN FRANCISCO
B2325+00
B2330+00
B2335+00
B2340+00
B2345+00
B2350+00
RAILROAD AVENUE
BENTON STREET
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SHEET NO. 2 OF 4

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UNDER CONSTRUCTION
CIRCULATION TRACK
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CURRENT ROW
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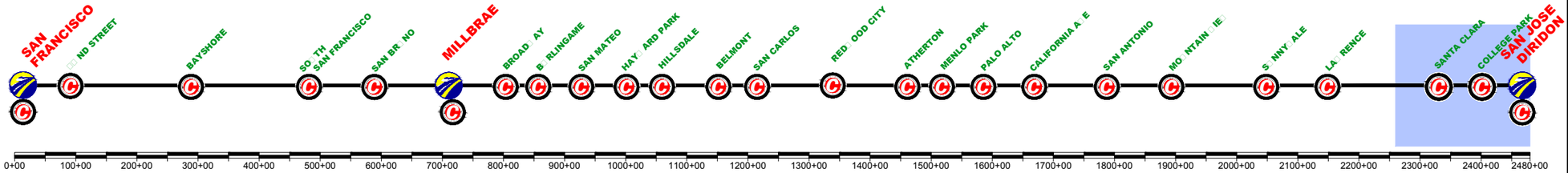

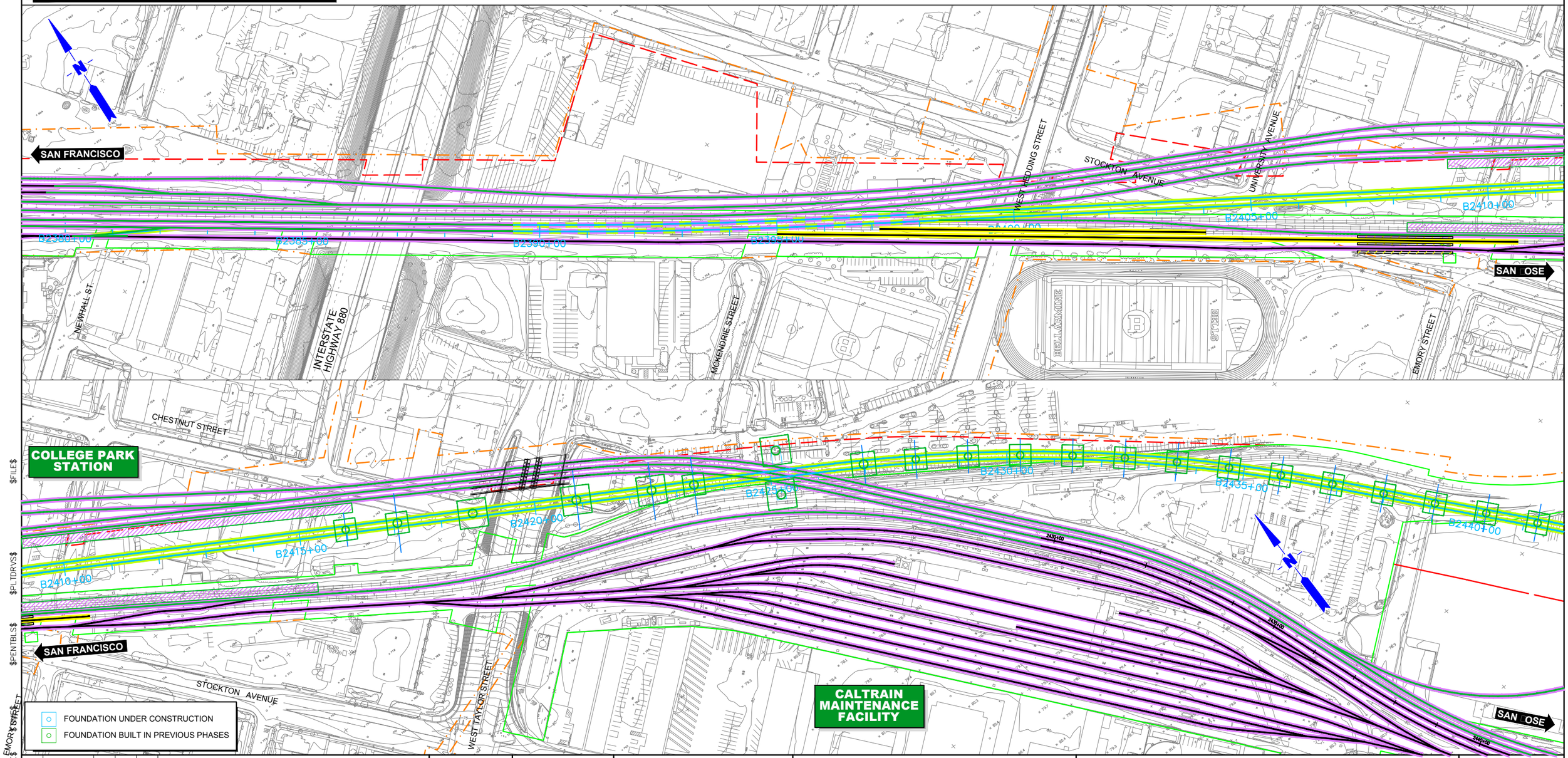

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CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
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TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
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CURRENT ROW
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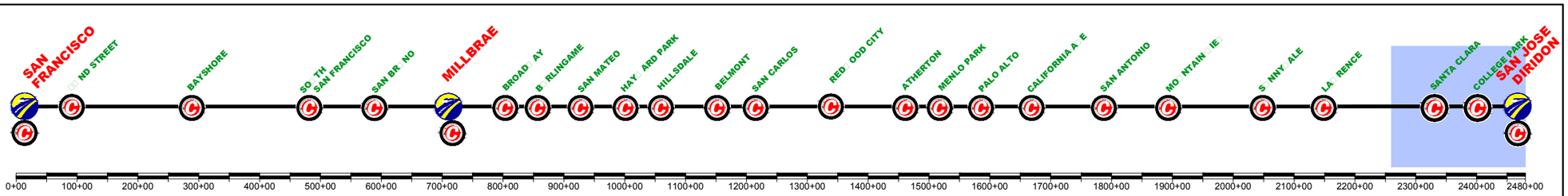

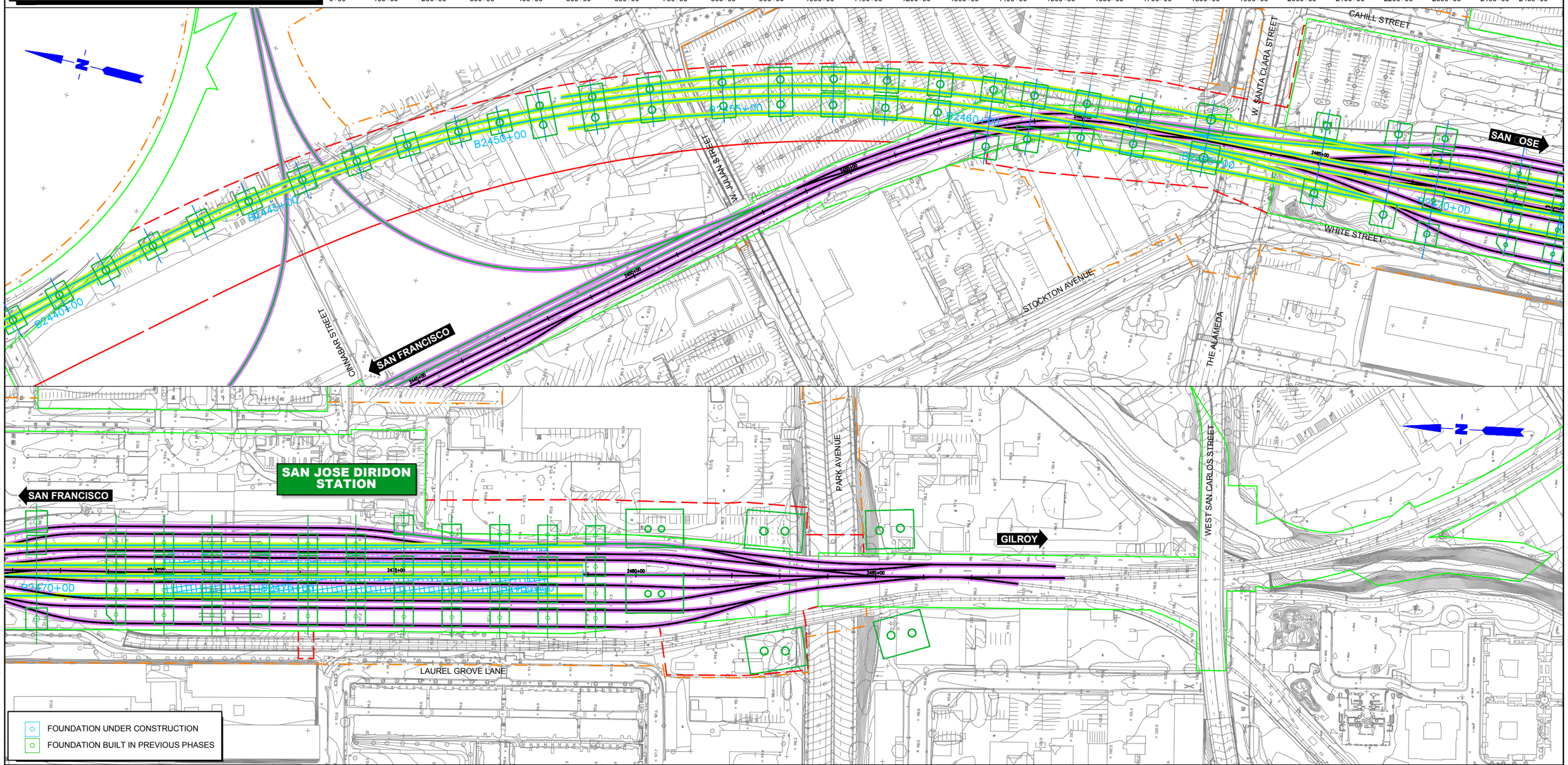

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SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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CIRCULATION TRACK
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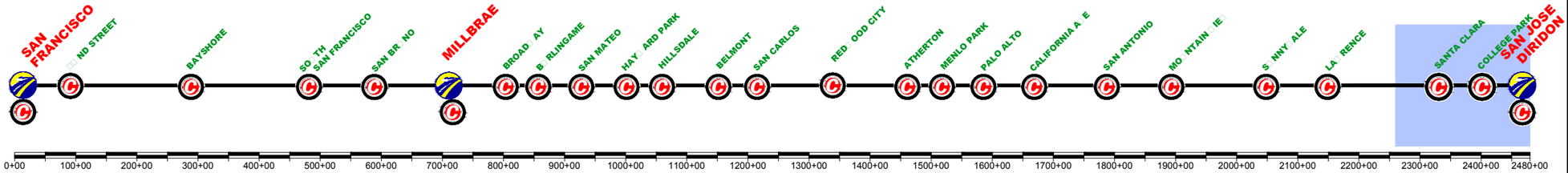

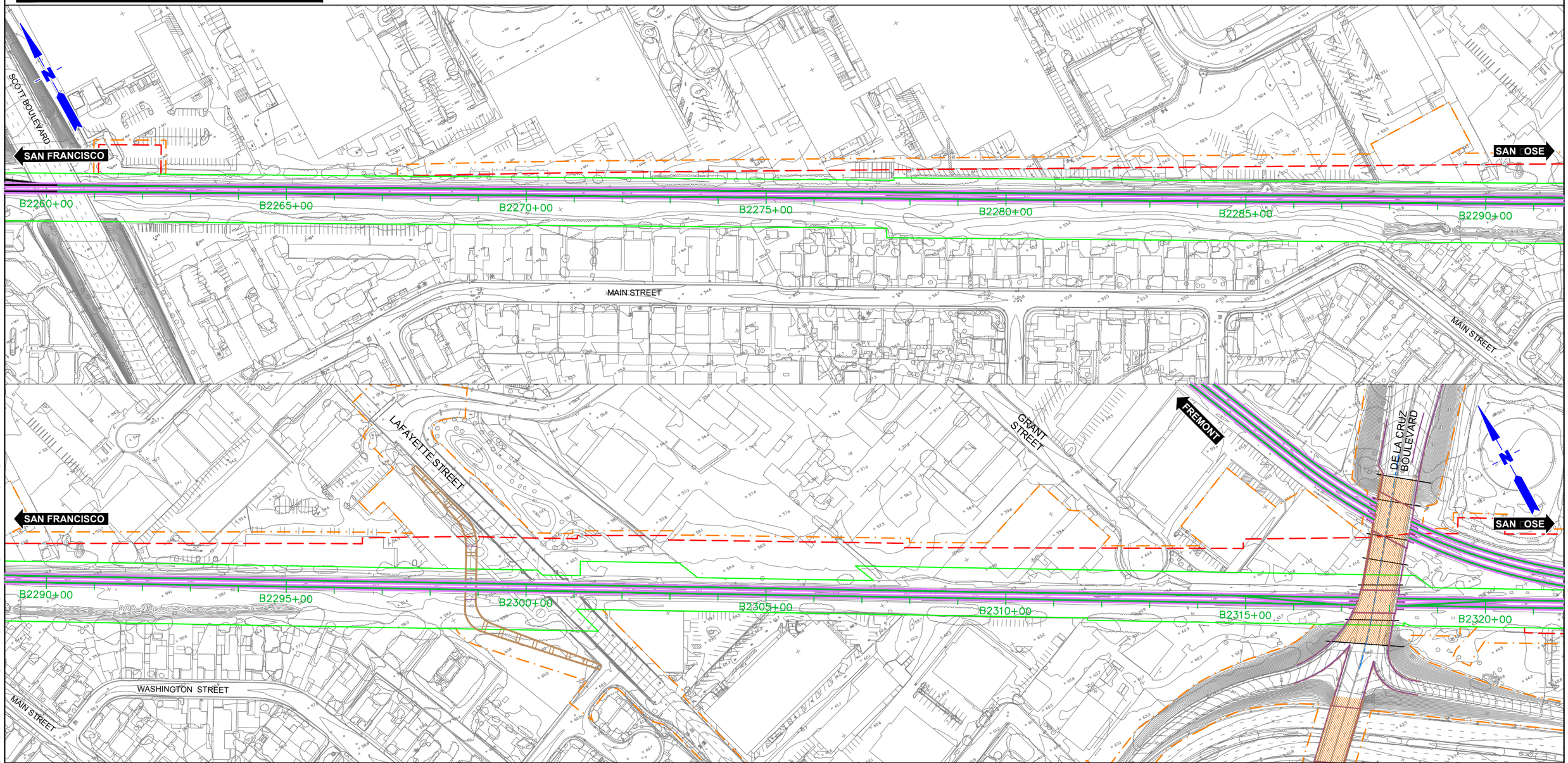

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SAN JOSE. ALTERNATIVE A
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PLAN
FINAL PHASE

CONTRACT NO.
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SHEET NO. 1 OF 4

CURRENT TRACK
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UNDER CONSTRUCTION
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SAN FRANCISCO
22ND STREET
BAYSHORE
SOUTH SAN FRANCISCO
SAN BRUNO
MILLBRAE
BROADWAY
BURLINGAME
SAN MATEO
HAYWARD PARK
HILLSDALE
BELMONT
SAN CARLOS
REDWOOD CITY
ATHERTON
MENLO PARK
PALO ALTO
CALIFORNIA AVE
SAN ANTONIO
MOUNTAIN VIEW
SUNNYVALE
LAWRENCE
SANTA CLARA
COLLEGE PARK
SAN JOSE DIRIDON

0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

BROKAW ROAD
CITY OF SANTA CLARA
CITY OF SAN JOSE
SAN JOSE
B2320+00
SAN FRANCISCO
B2325+00
B2330+00
B2335+00
B2340+00
B2345+00
B2350+00
RAILROAD AVENUE
SANTA CLARA STATION
BENTON STREET
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CITY OF SANTA CLARA
SAN FRANCISCO
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DAHLIA LOOP
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SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
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FINAL PHASE

CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
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CREEK UNDERPASS
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SAN FRANCISCO
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RED OOD CITY
ATHERTON
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0+00 100+00 200+00 300+00 400+00 500+00 600+00 700+00 800+00 900+00 1000+00 1100+00 1200+00 1300+00 1400+00 1500+00 1600+00 1700+00 1800+00 1900+00 2000+00 2100+00 2200+00 2300+00 2400+00 2480+00

SAN FRANCISCO
B2360+00
B2365+00
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WEST HEDDING STREET
STOCKTON AVENUE
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INTERSTATE HIGHWAY 880
MCKENDRIE STREET
BELLARMINE
STREET
EMORY STREET

COLLEGE PARK STATION
CHESTNUT STREET
B2410+00
B2415+00
B2420+00
B2425+00
B2430+00
B2435+00
B2440+00
SAN FRANCISCO
STOCKTON AVENUE
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CONTRACT NO.
DRAWING NO.
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
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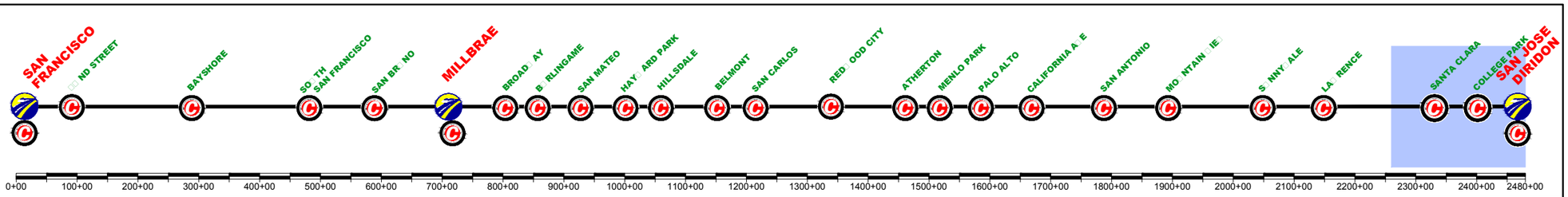

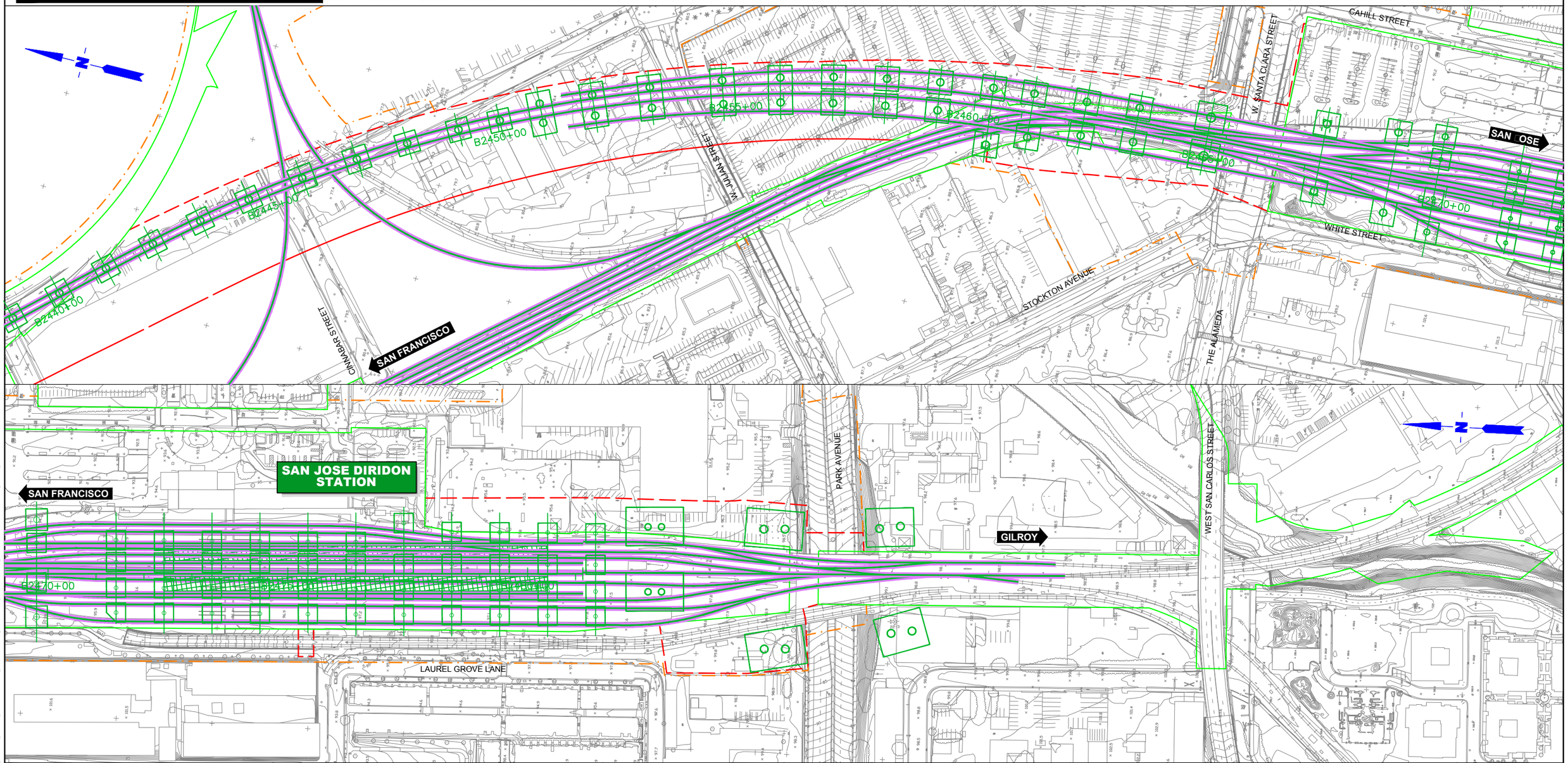

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CONTRACT NO.
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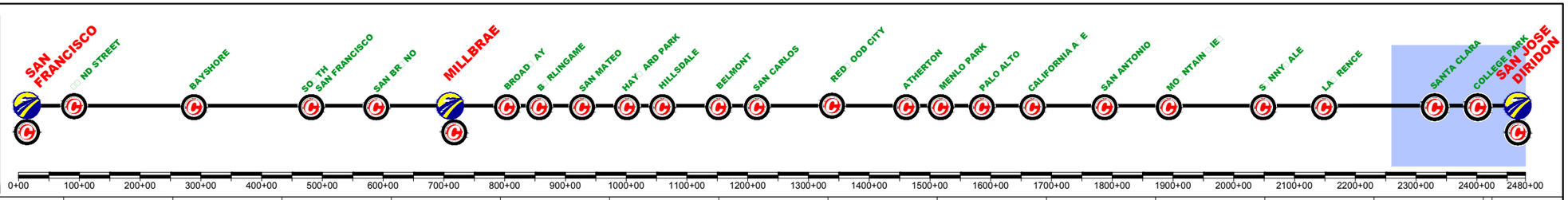
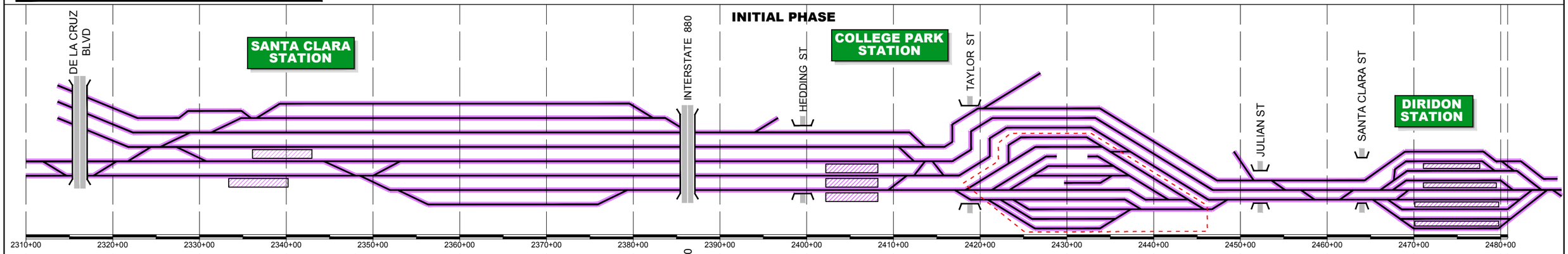


INITIAL PHASE



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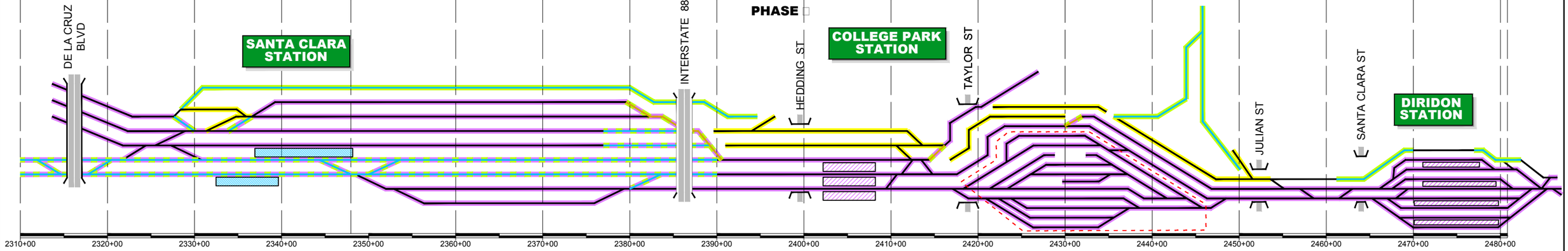

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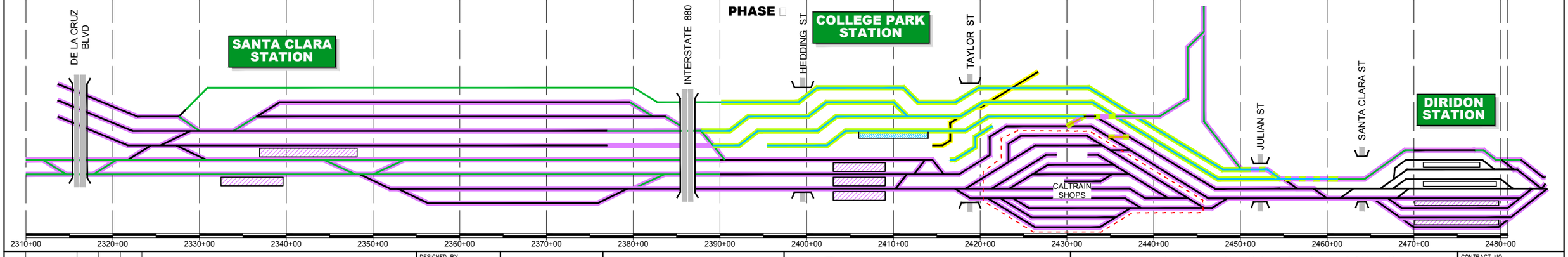

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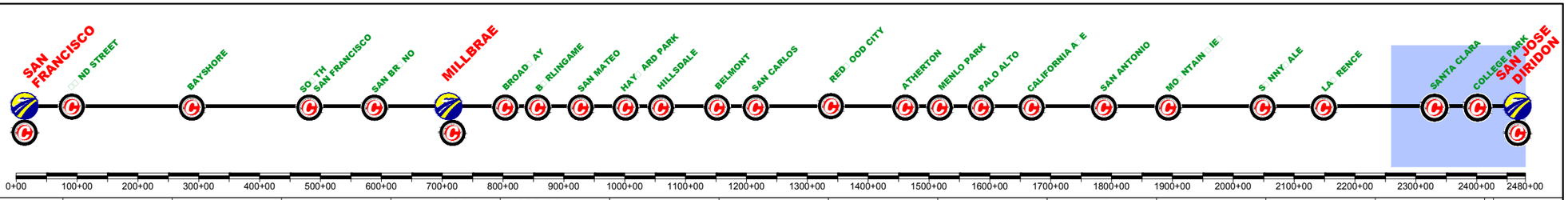
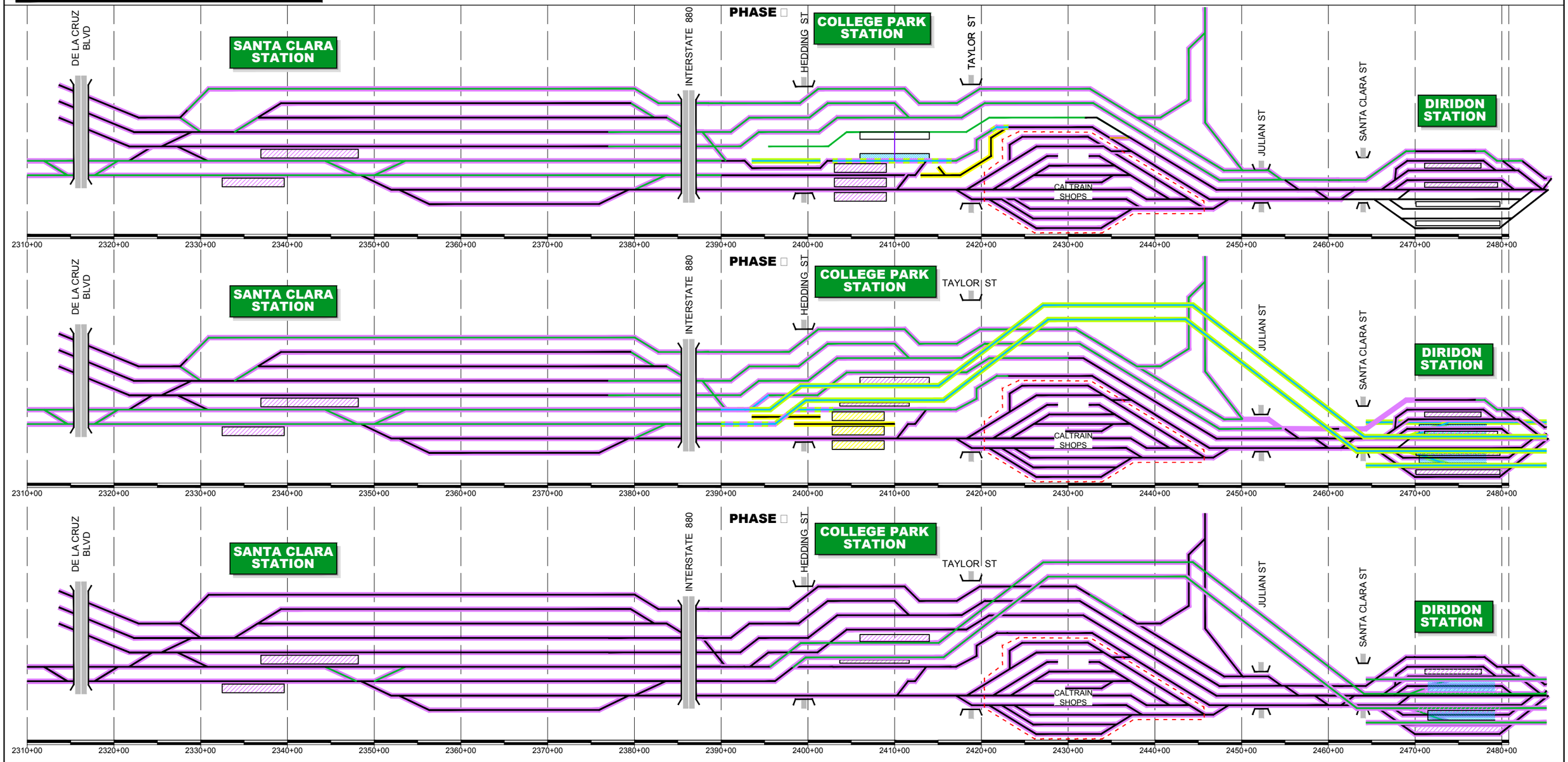
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW





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SCHEME

CONTRACT NO.
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SCALE NOT TO SCALE
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CURRENT TRACK
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CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
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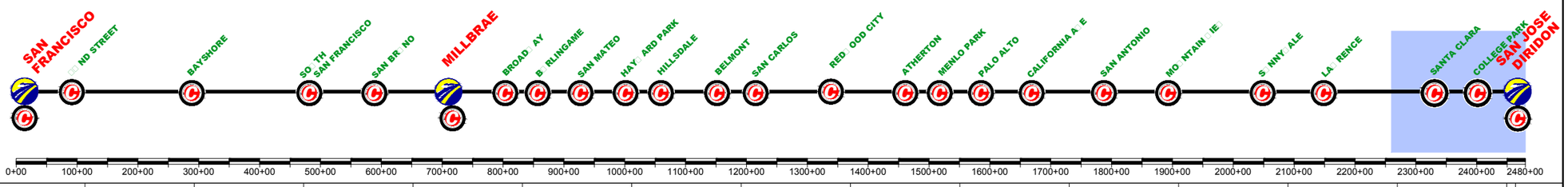
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW



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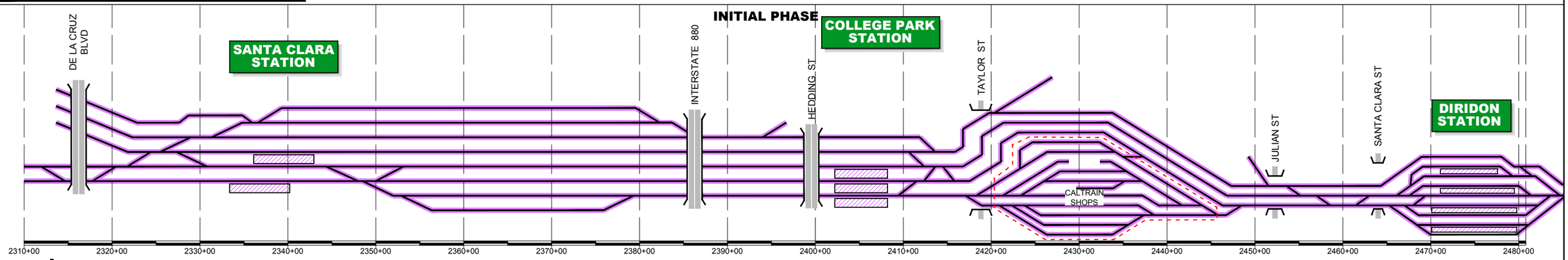

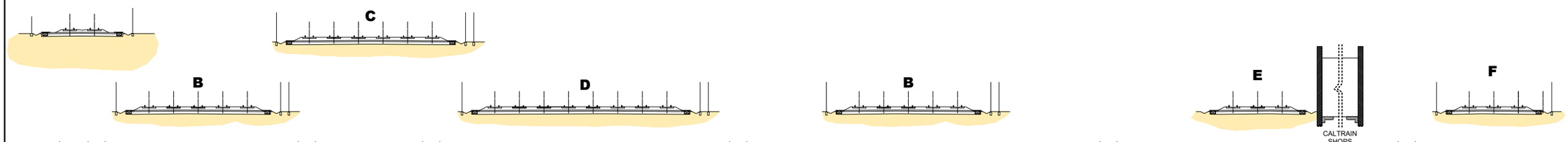

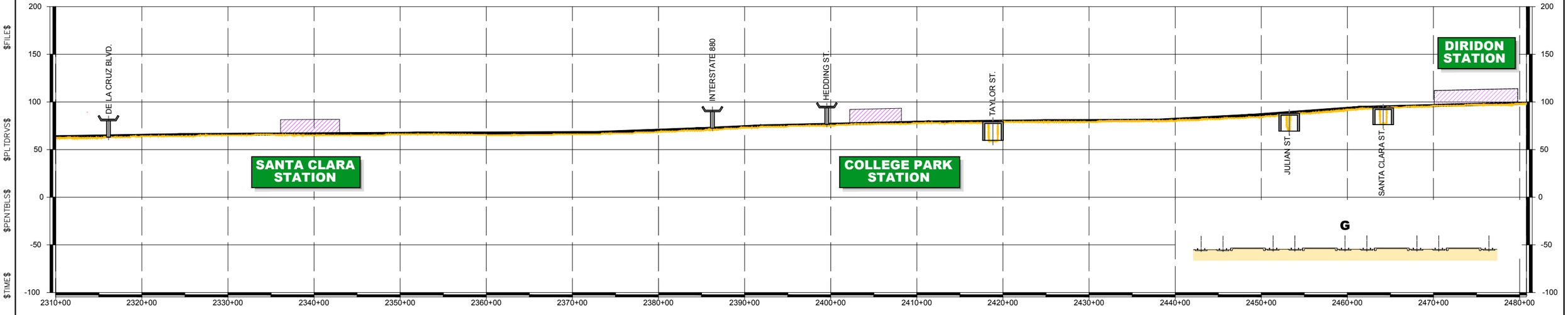

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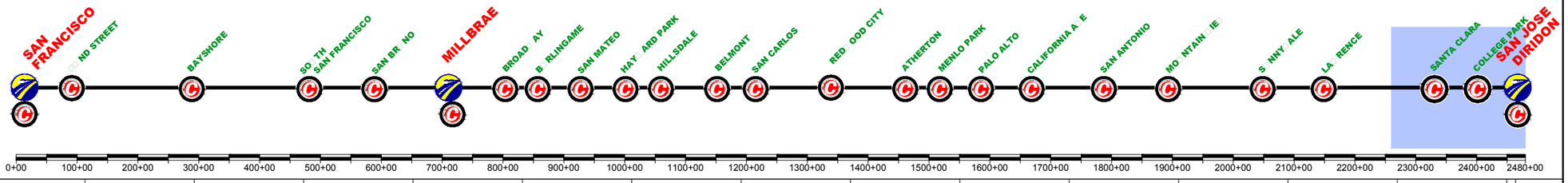
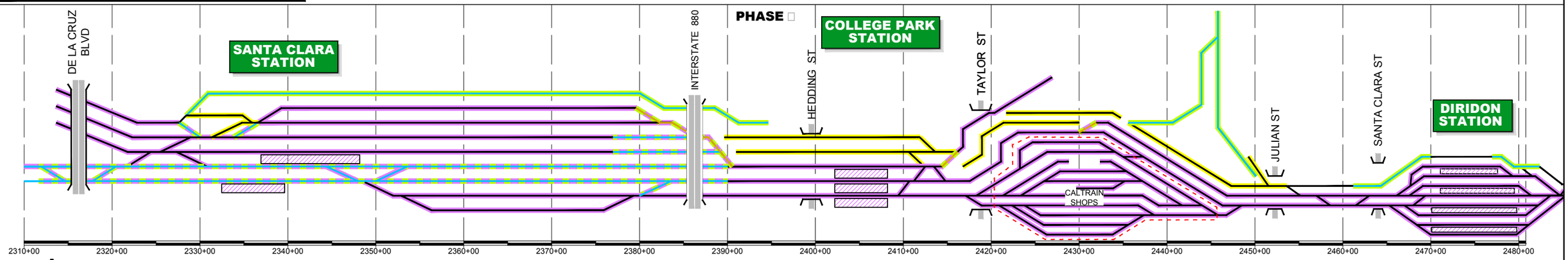
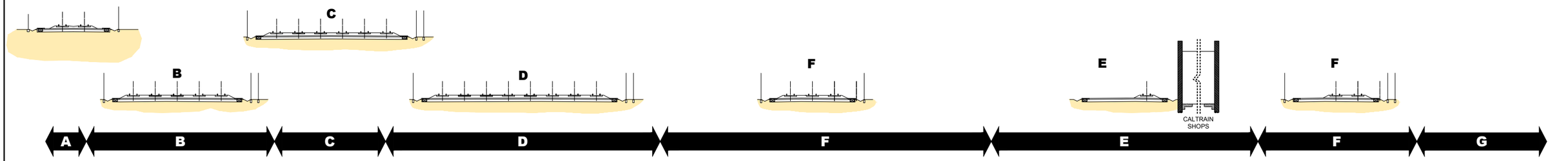
SAN JOSE. ALTERNATIVE A
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
INITIAL PHASE

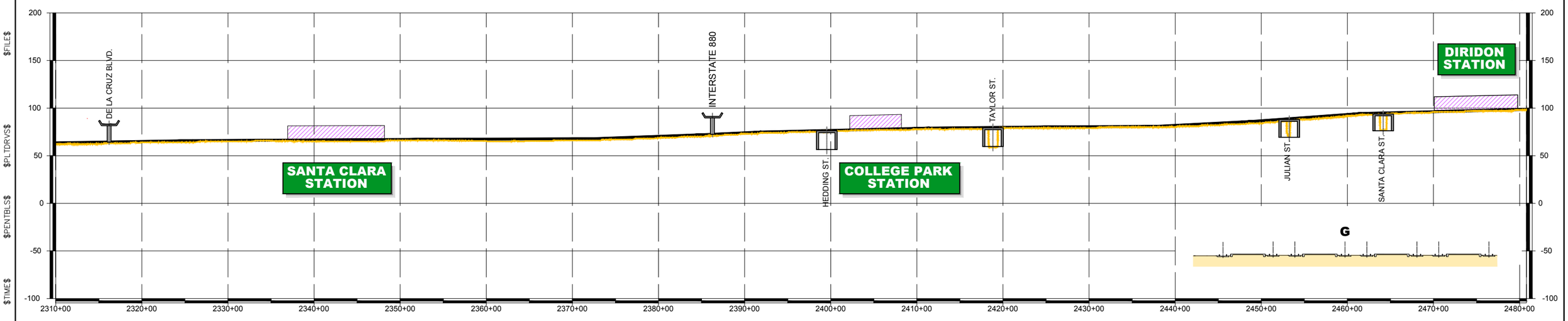
CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 1 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW









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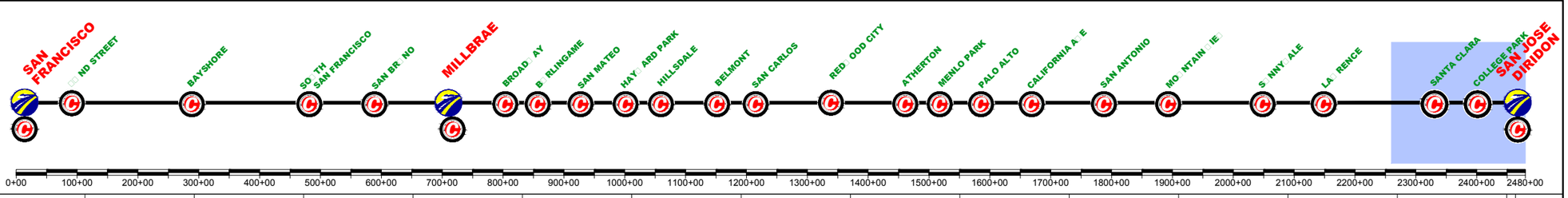
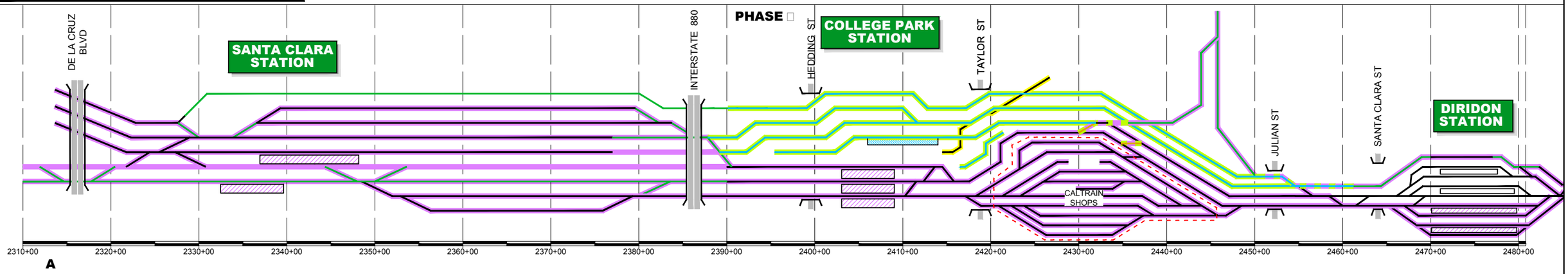
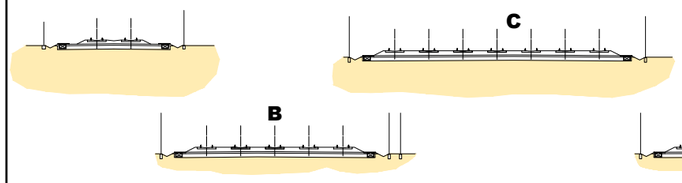
PLAN AND PROFILE SCHEME
PHASE 1

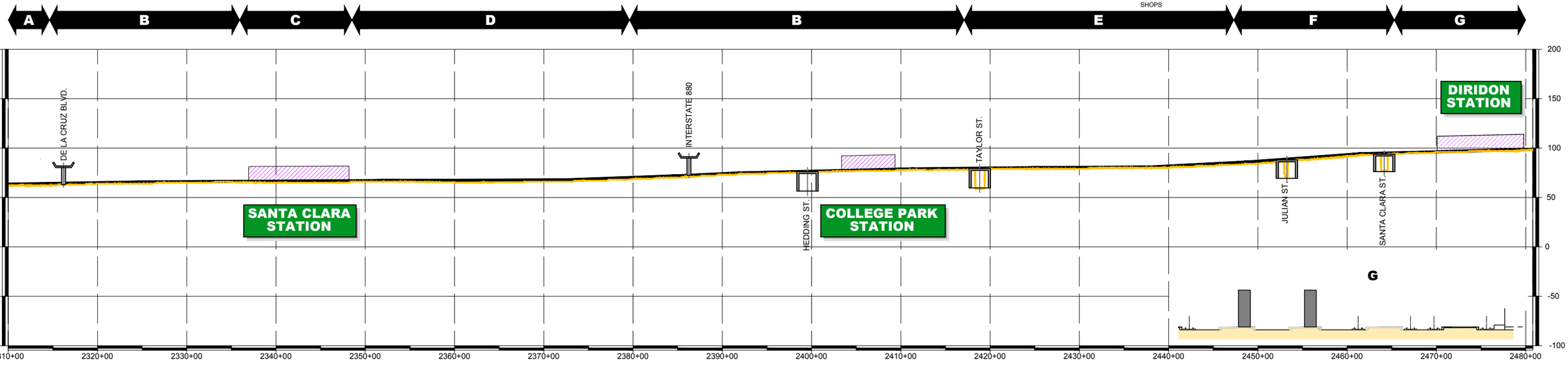
CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 2 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW









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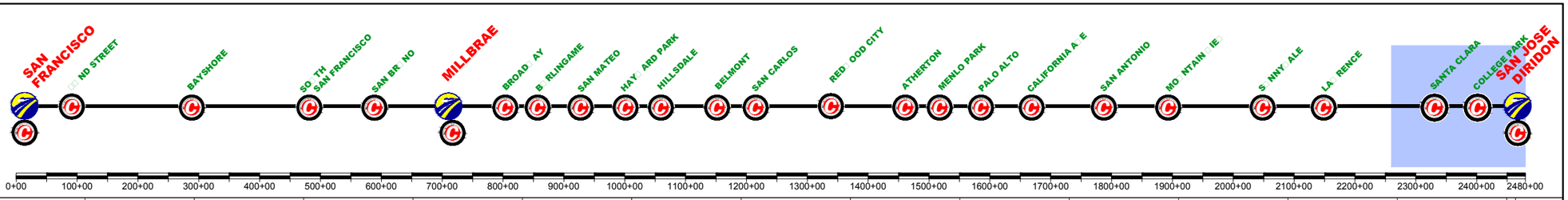
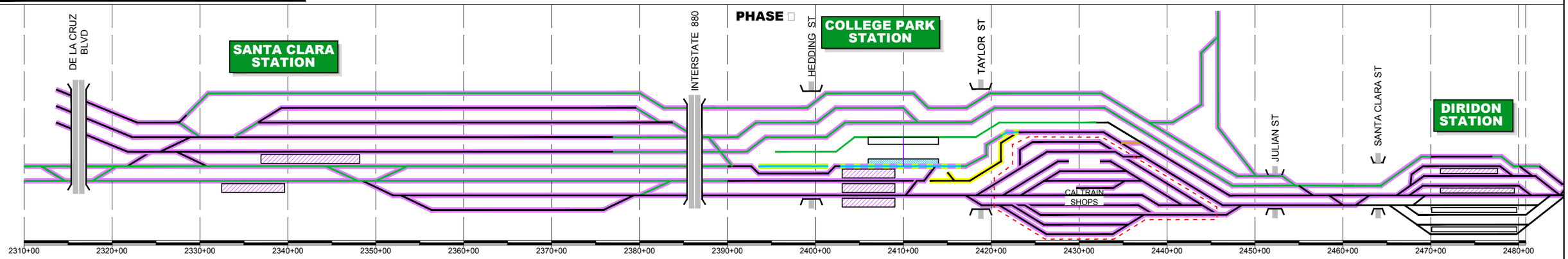
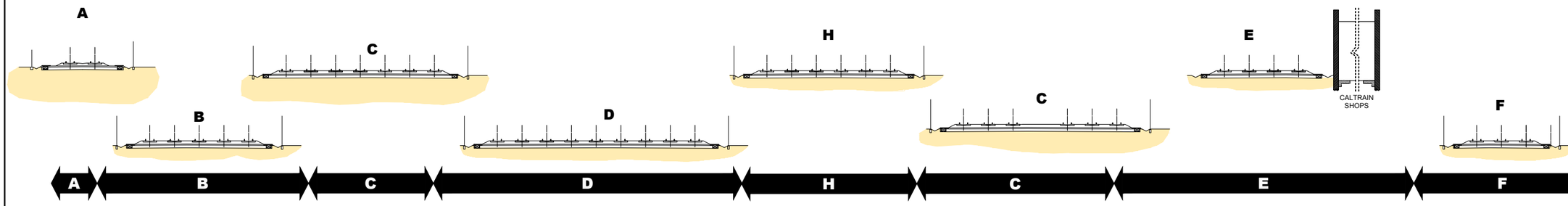
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 2

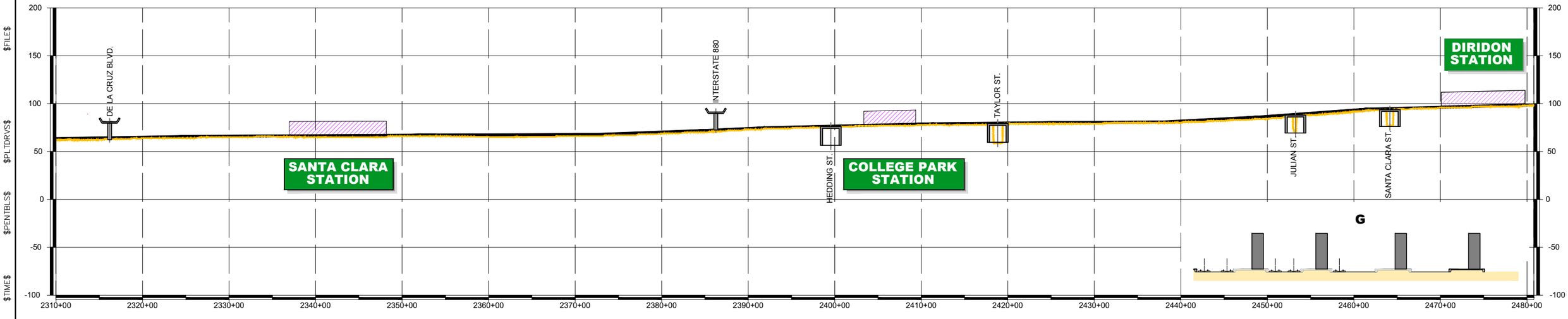
CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 3 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
ROW









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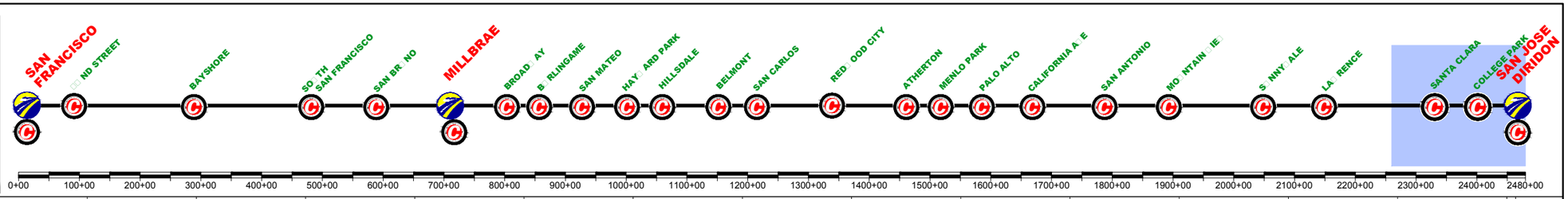
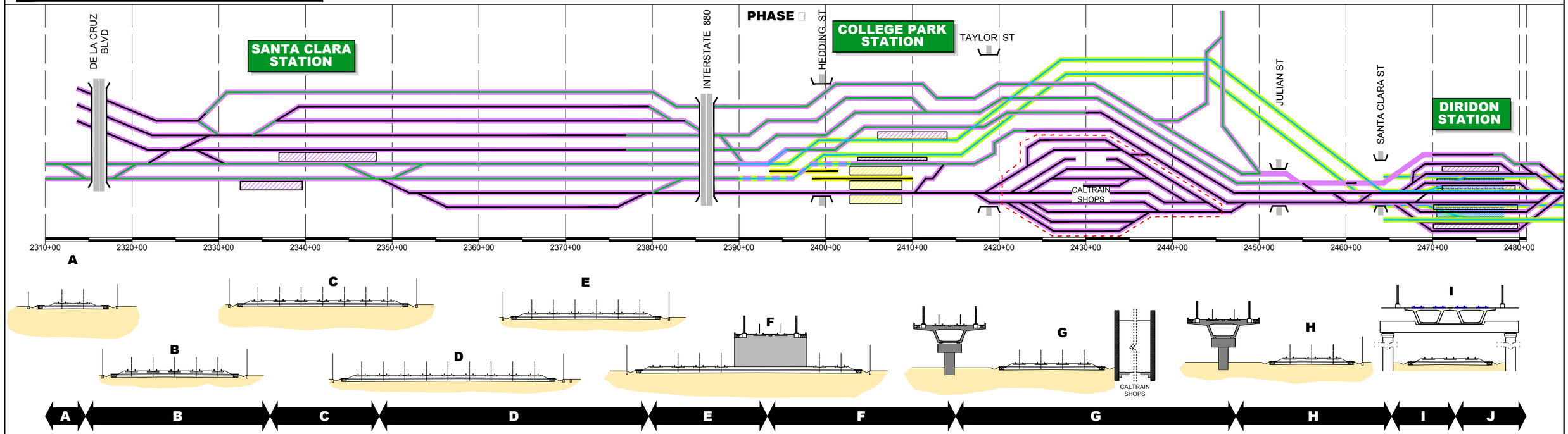
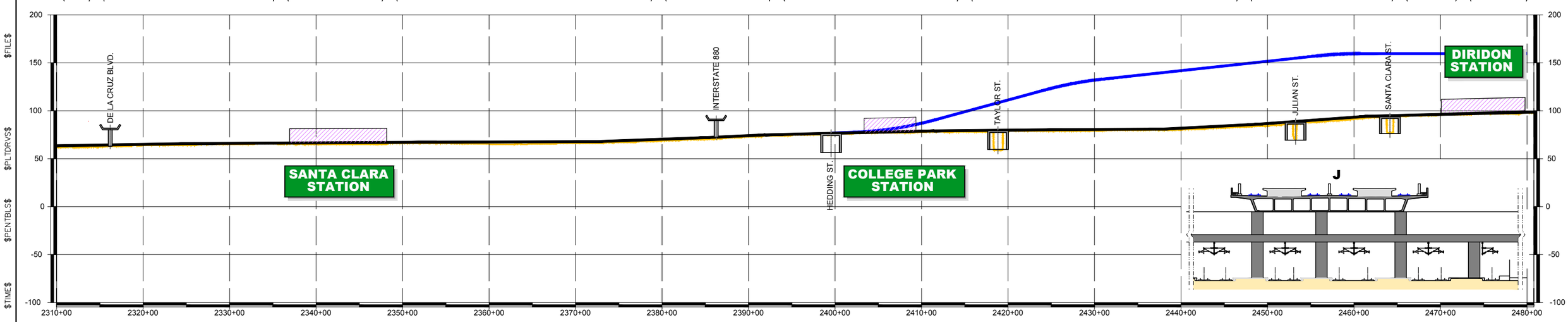
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 3

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 4 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
TUNNEL
MAJOR UNDERPASS
GRADE CROSSING
CREEK UNDERPASS
CURRENT ROW
TCE
ROW







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CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 4

CONTRACT NO.
DRAWING NO.
SCALE NOT TO SCALE
SHEET NO. 5 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
OVERHEAD BRIDGE
MAJOR UNDERPASS
CREEK UNDERPASS
TUNNEL
GRADE CROSSING
CURRENT ROW
TCE
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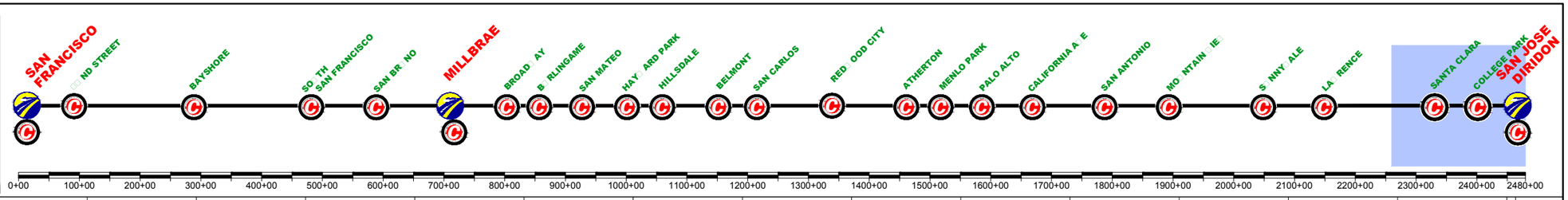

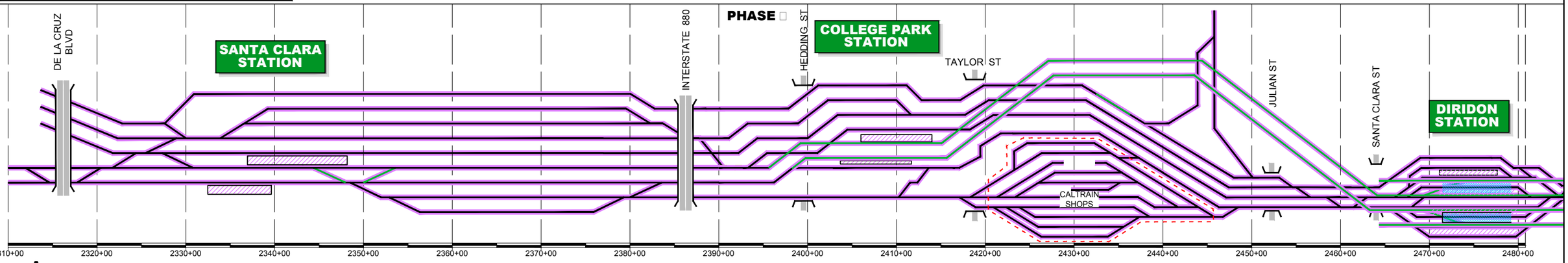

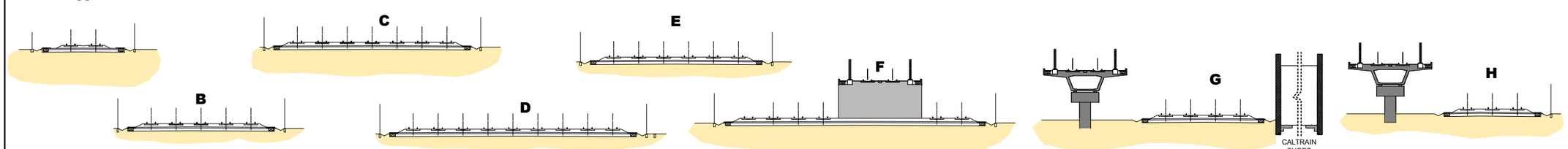

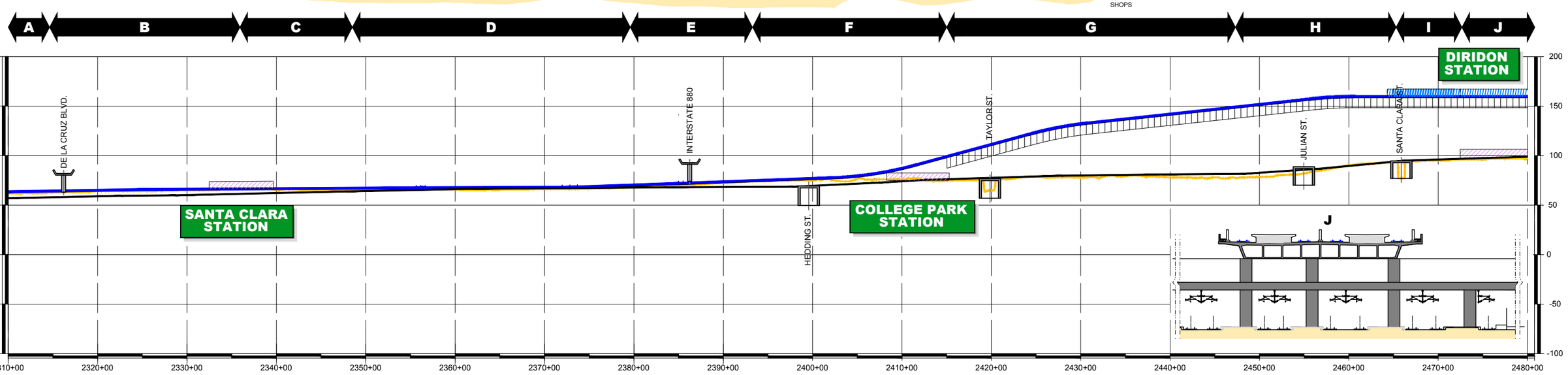

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FINAL PHASE

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APPENDIX E: POTENTIAL CONTRACT PACKAGES AND SCHEDULE

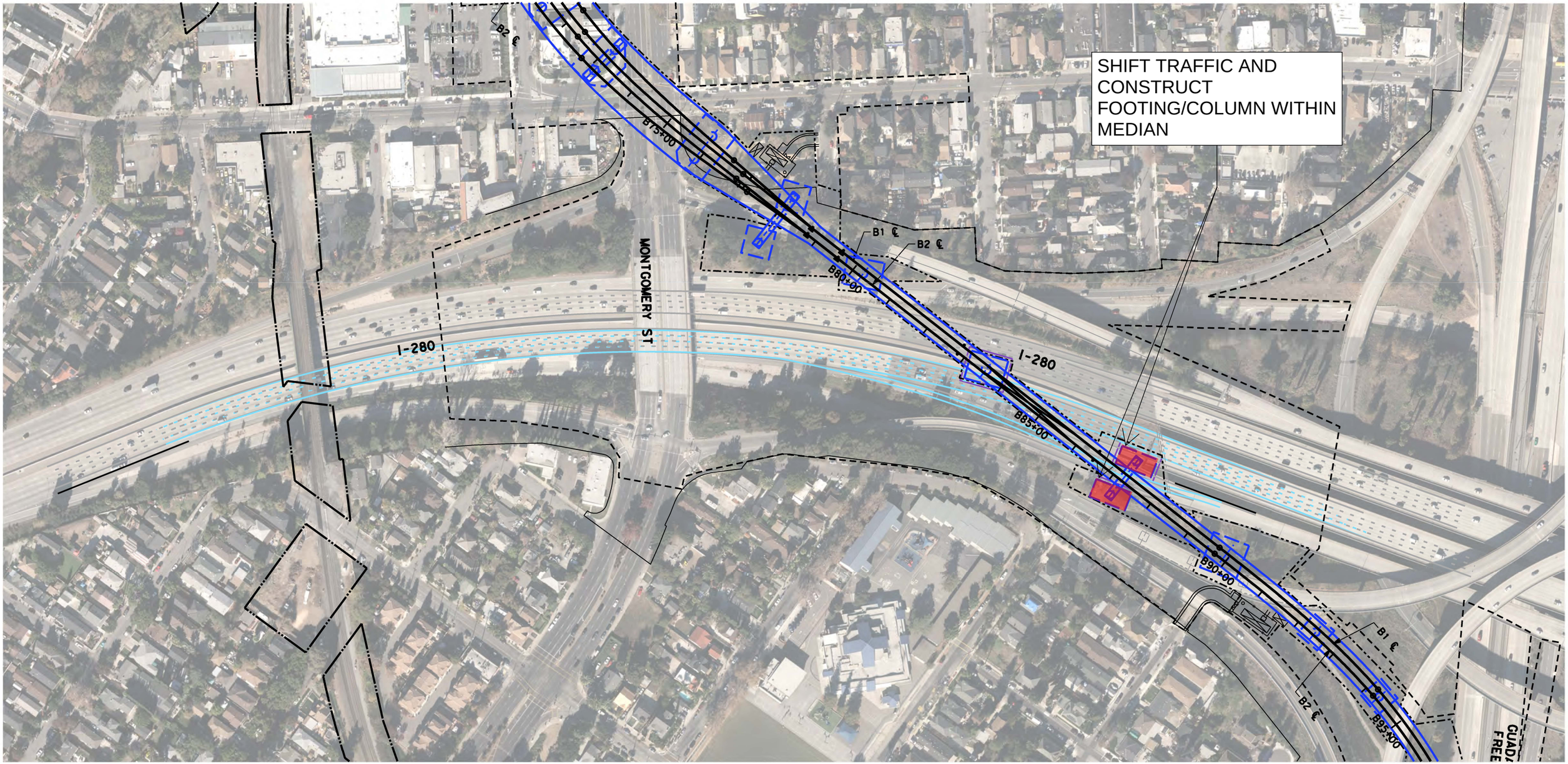
California High Speed Train, JM Section Estimated Schedules for EIS	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Contract Package 1 - Early Works													
Agreements - Utilities													
Design - Utilities													
Construction - Utilities													
Contract Package 2 - Tunneling Packages													
Right-of-way acquisition													
Environmental remediation													
Design													
Mobilization													
Demolition													
Clear and Grub													
Site prep/earthwork													
Portals													
Tunnels													
Roadbed preparation													
Track, signal, and traction power construction													
Static testing													
Dynamic testing													
Full speed testing													
Demobilize													
Contract Package 3 - At Grade, Viaduct and Trench Packages													
Right-of-way acquisition													
Environmental remediation													
Design													
Mobilization													
Utilities relocation													
Street/highway preparation													
Demolition													
Clear and Grub													
Earthwork													
Viaduct													
At-grade and below-grade x-sections (incl. stations)													
Demobilize													

California High Speed Train, JM Section Estimated Schedules for EIS	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Contract Package 4 - Rail infrastructure and testing													
Mobilization													
Track, signal, and traction power construction													
Static testing													
Dynamic testing													
Full speed testing													
Demobilize													
Contract Package 5 - Stations and Maintenace Facilities													
Right-of-way acquisition													
Design													
Mobilization													
Temporary facilities and track													
Building demolition													
Building structures and rough systems													
Building finish													
Remove/restore temporary facilities and track													
Demobilize													

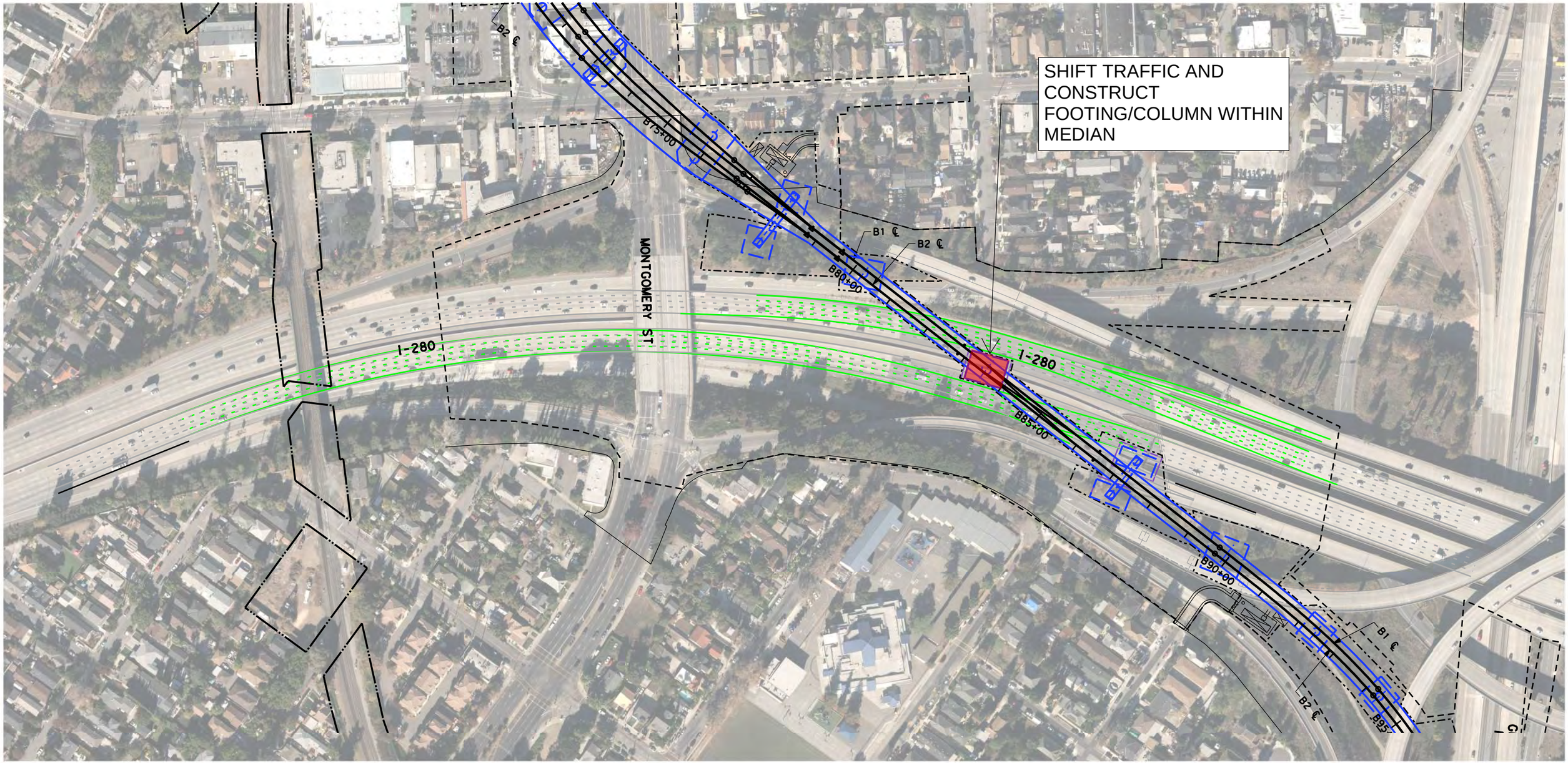
Assumed milestones per RDP:

ROD in Nov 2020	*										
Monterey Viaduct in Jun 2023				*							
Service Central Valley to San Jose at end of 2029										*	
Service SF to San Jose at start of 2027									*		
SF to SJ (FJ) Rail infrastructure assumed to start Jun 2021 (FJ ROD in Mar 2021)		*									

APPENDIX F: POTENTIAL CONSTRUCTION SEQUENCE AT I-280



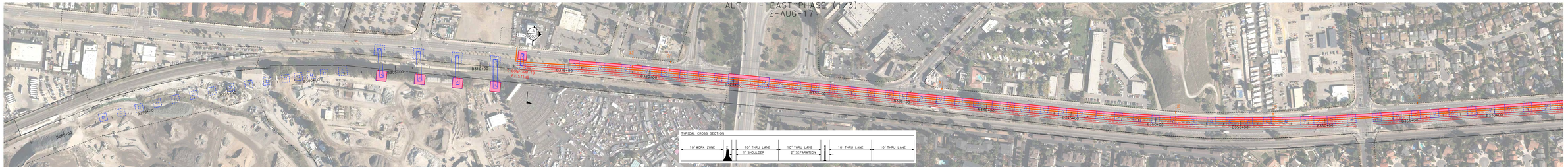
I-280 MAINLINE AND OFF RAMP TRAFFIC SHIFT FOR SHOULDER FOOTING/COLUMN CONSTRUCTION

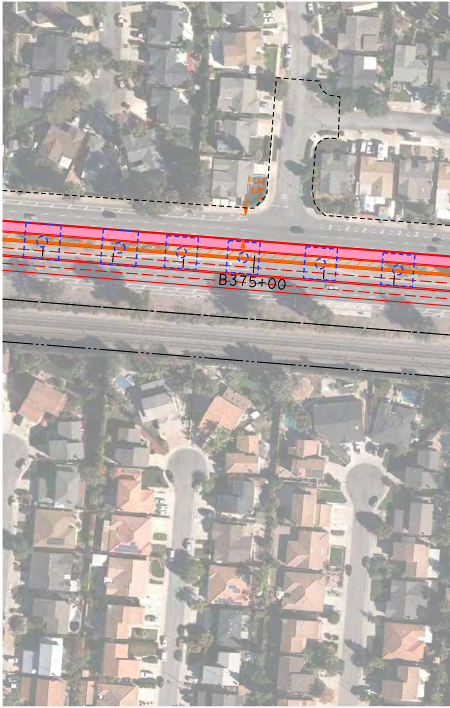


I-280 MAINLINE TRAFFIC SHIFT FOR MEDIAN
FOOTING/COLUMN CONSTRUCTION

APPENDIX G: POTENTIAL CONSTRUCTION SEQUENCE AT MONTEREY HIGHWAY

ALT 1 - EAST PHASE (173)
2-AUG-17





SIM 340+00
B380+00
B385+00
32'
B390+00
A
TT-D0603

28'
33'
B395+00
B400+00
B405+00

32'
B410+00
B415+00
B420+00

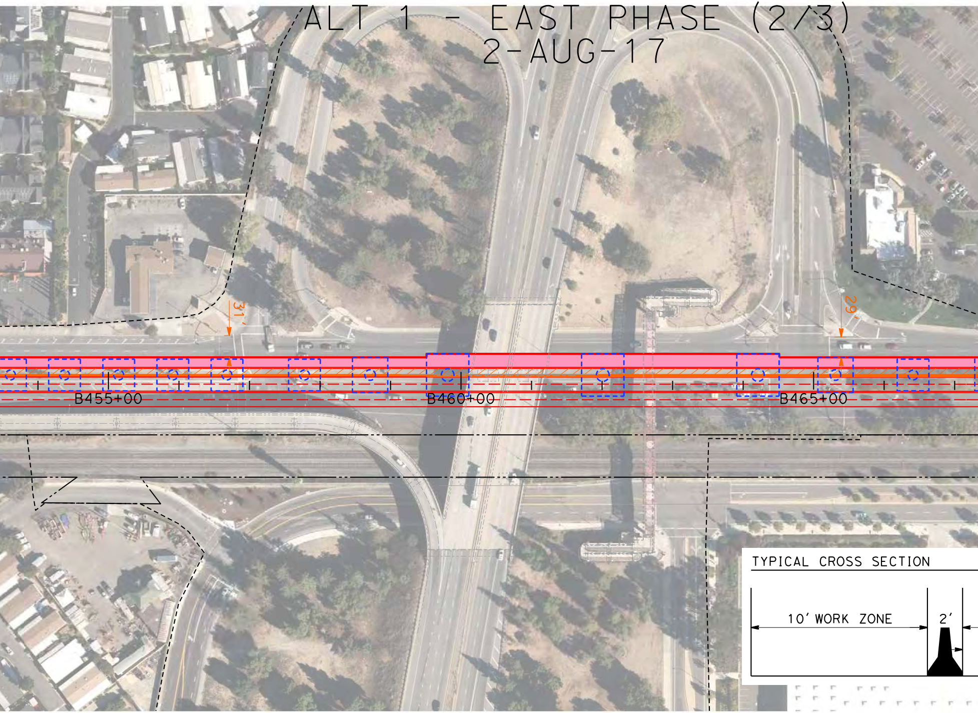
32'
B425+00
B430+00
B435+00

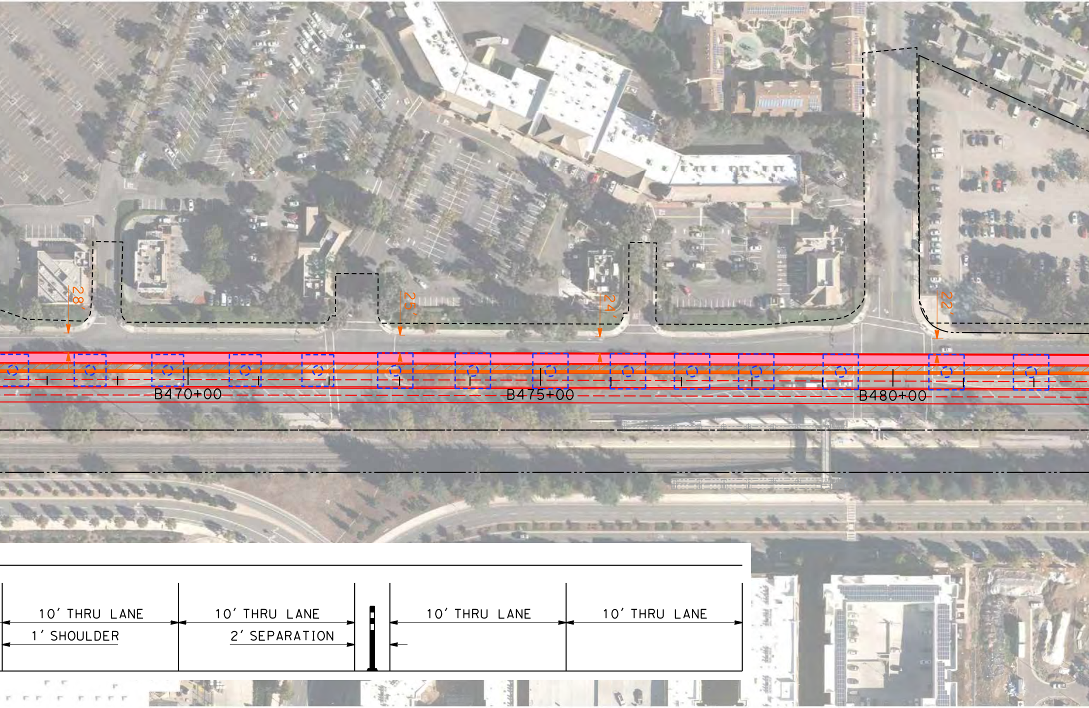
B440+00
B445+00
B450+00

MONTEREY CONSTRUCTABILITY STUDY DATED 2017-08-04

ALT 1 - EAST PHASE (2/3)

2-AUG-17


31'
29'
B455+00
B460+00
B465+00
TYPICAL CROSS SECTION
10' WORK ZONE
2'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24'
22'
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10' THRU LANE
1' SHOULDER
10' THRU LANE
2' SEPARATION
10' THRU LANE
10' THRU LANE

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18'
B500+00
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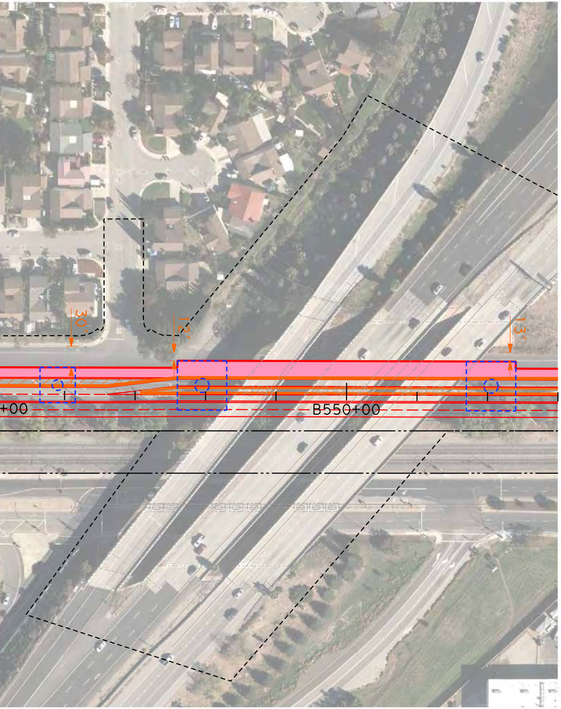
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MONTEREY CONSTRUCTABILITY STUDY DATED 2017-08-04

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MONTEREY CONSTRUCTABILITY STUDY DATED 2017-08-04

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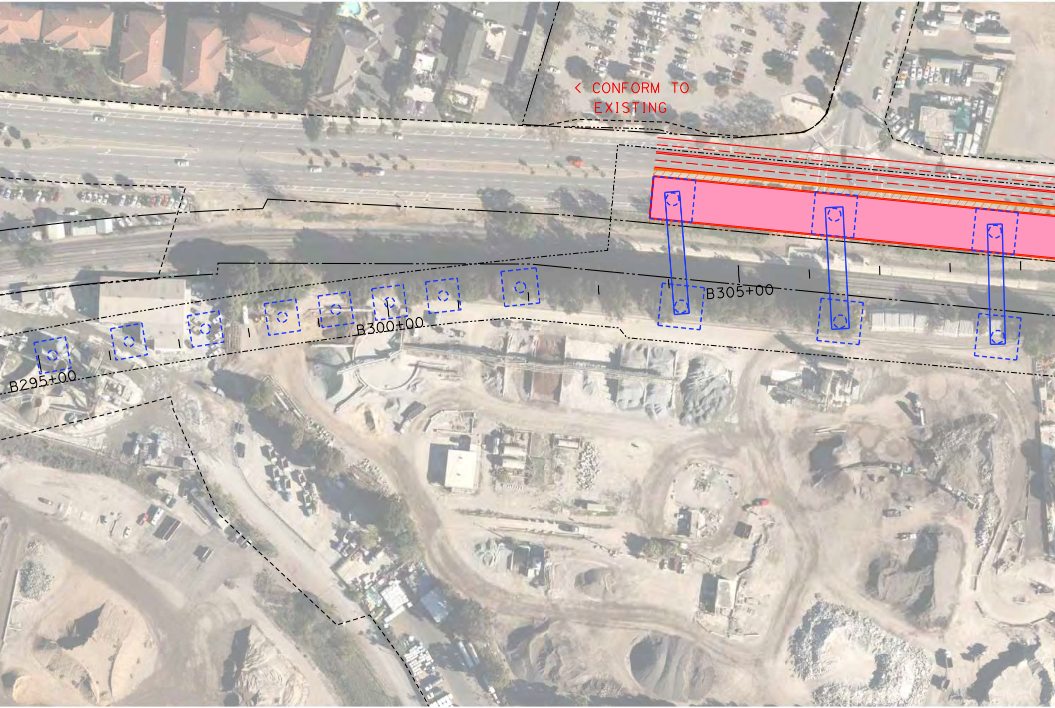
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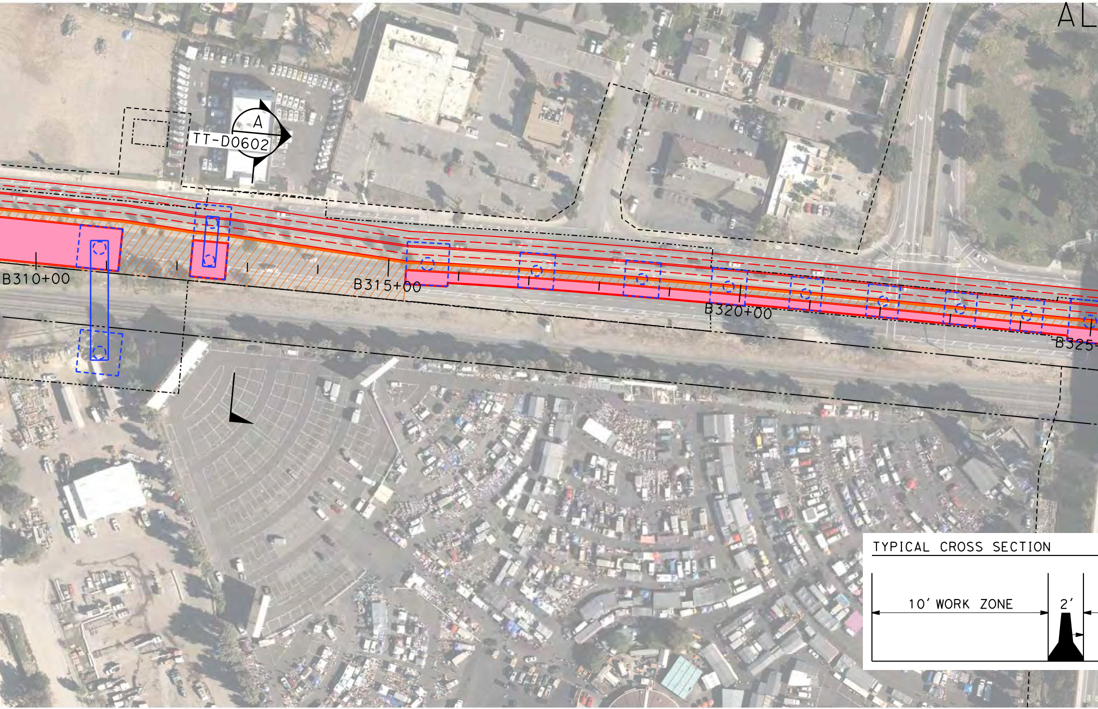
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TYPICAL CROSS SECTION
10′ WORK ZONE
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MONTEREY CONST

T 1 - WEST PHASE (1/3)
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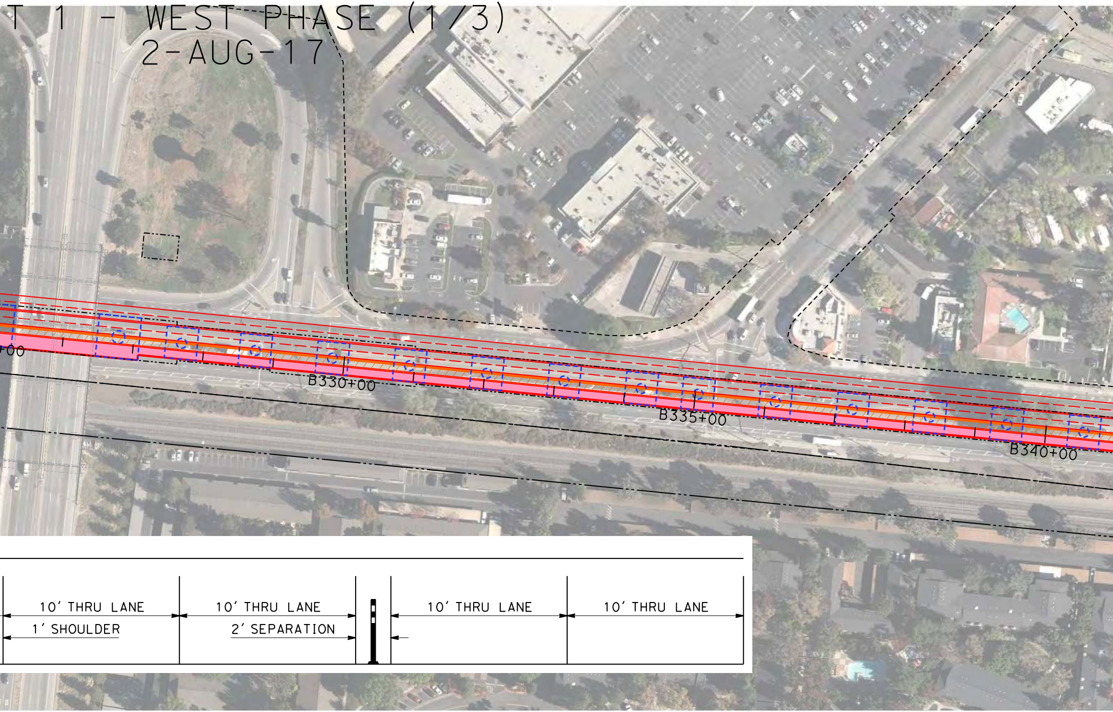
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2' SEPARATION
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RUCTABILITY STUDY DATED 2017-08-04

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MONTEREY CONSTRUCTABILITY

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B430+00
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STUDY DATED 2017-08-04

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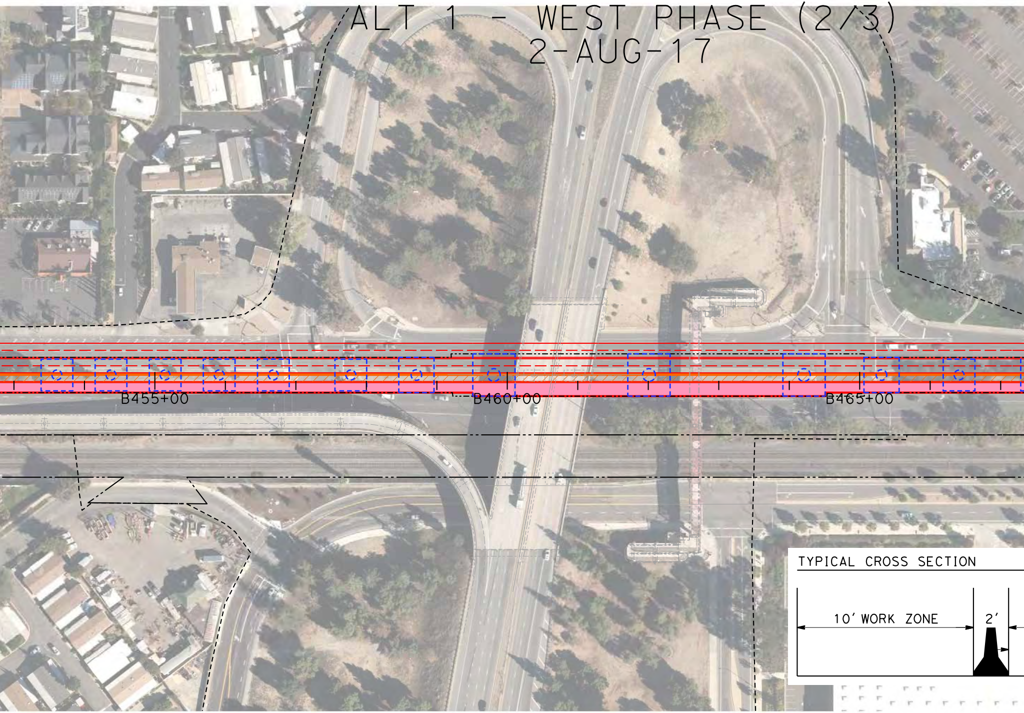
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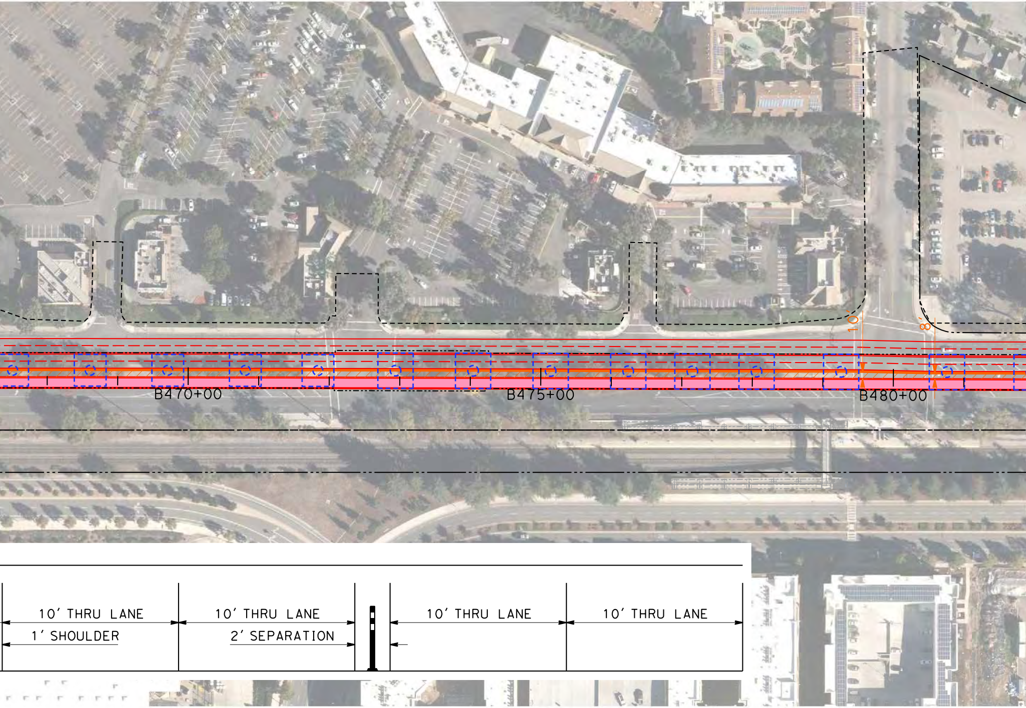
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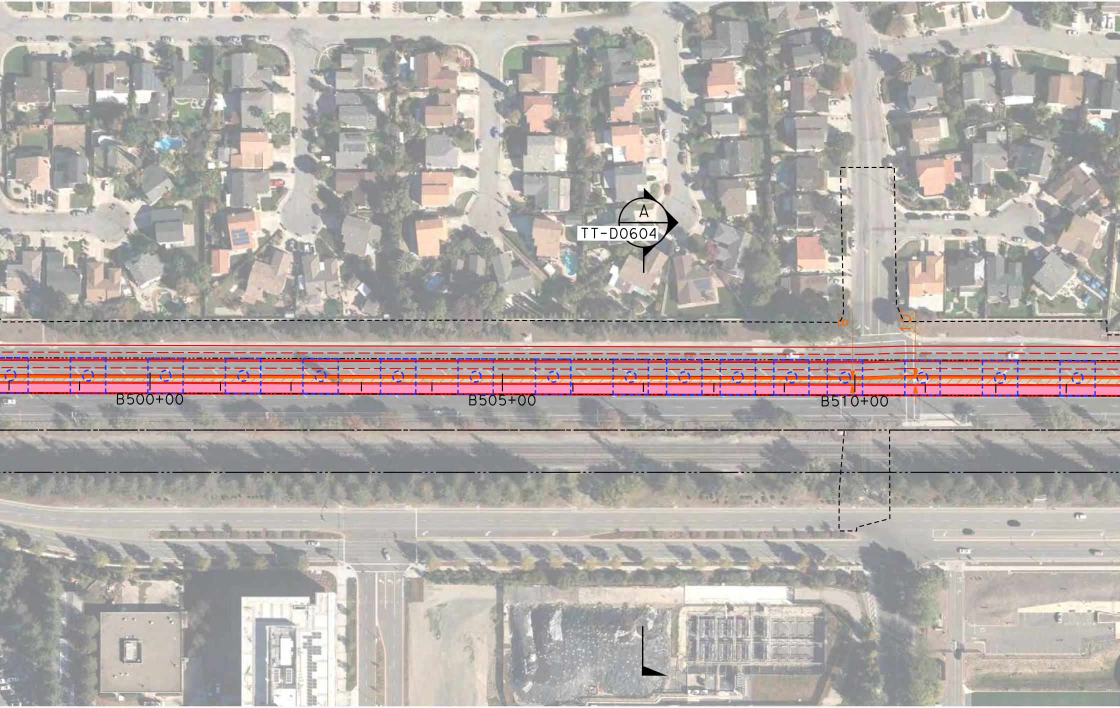
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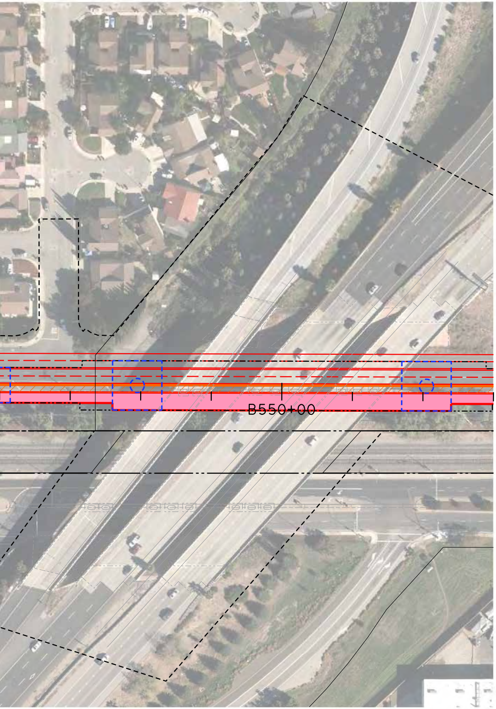

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MONTEREY CONSTRUCTABILITY STUDY - DATED 2017-08-04

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MONTEREY CONSTRUCTABILITY STUDY - DATED 2017-08-04

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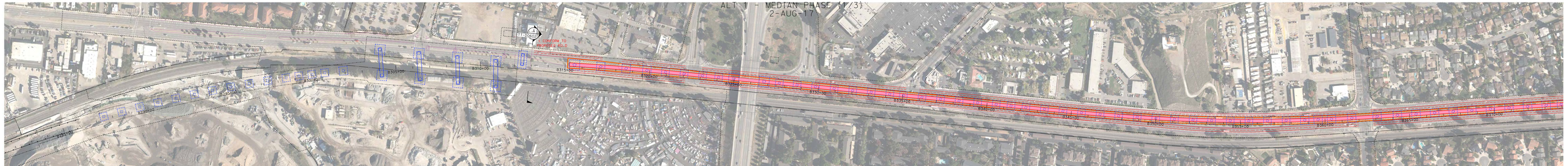
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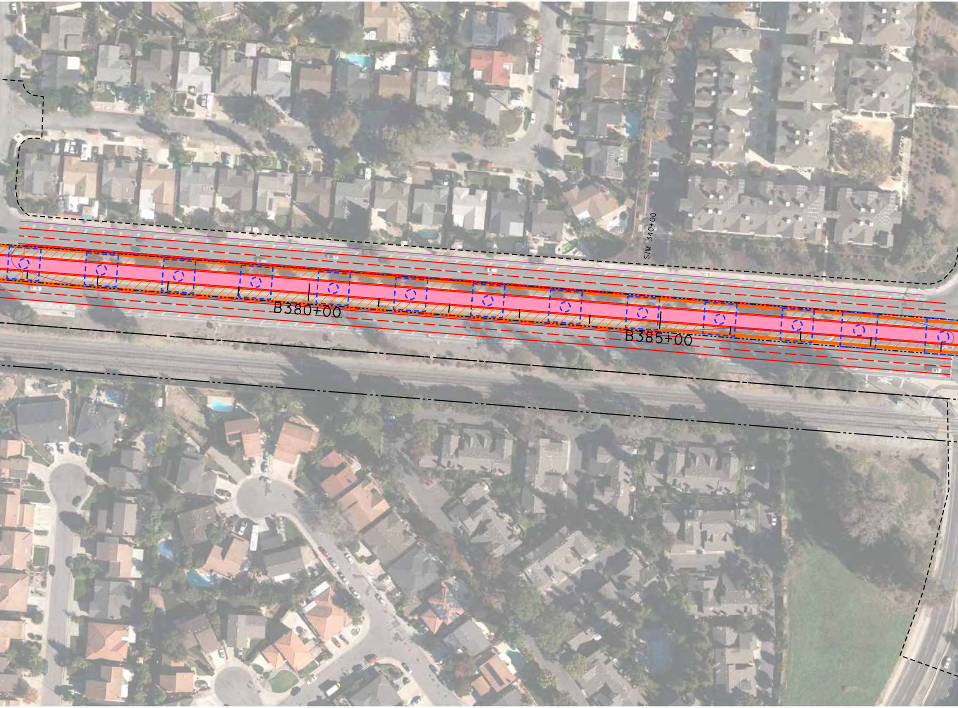
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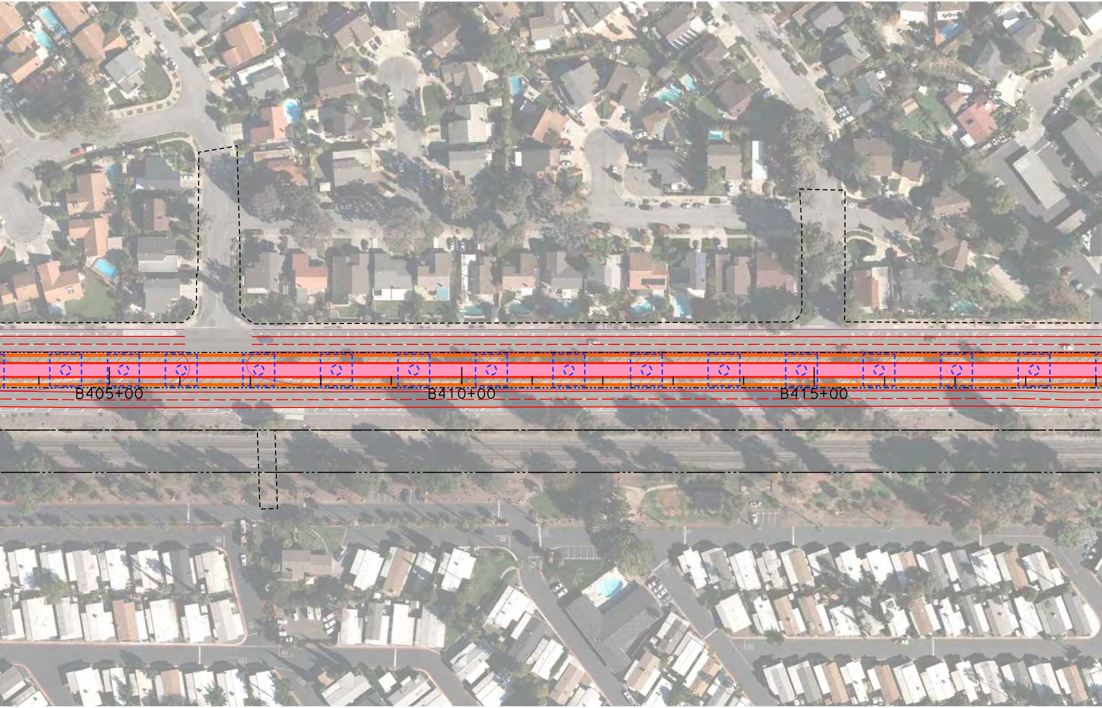
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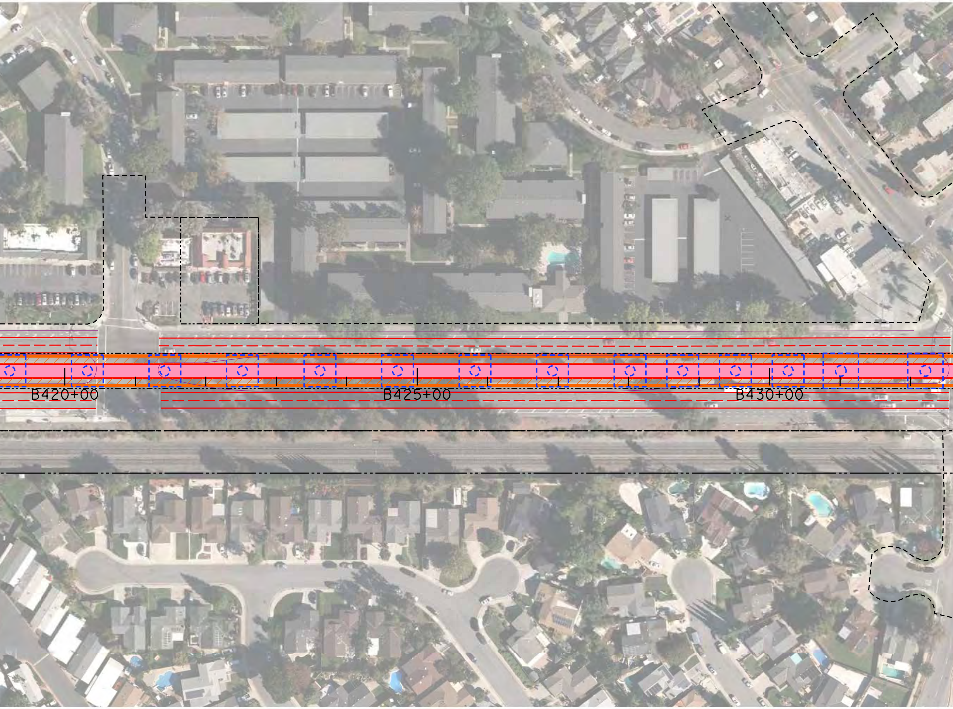
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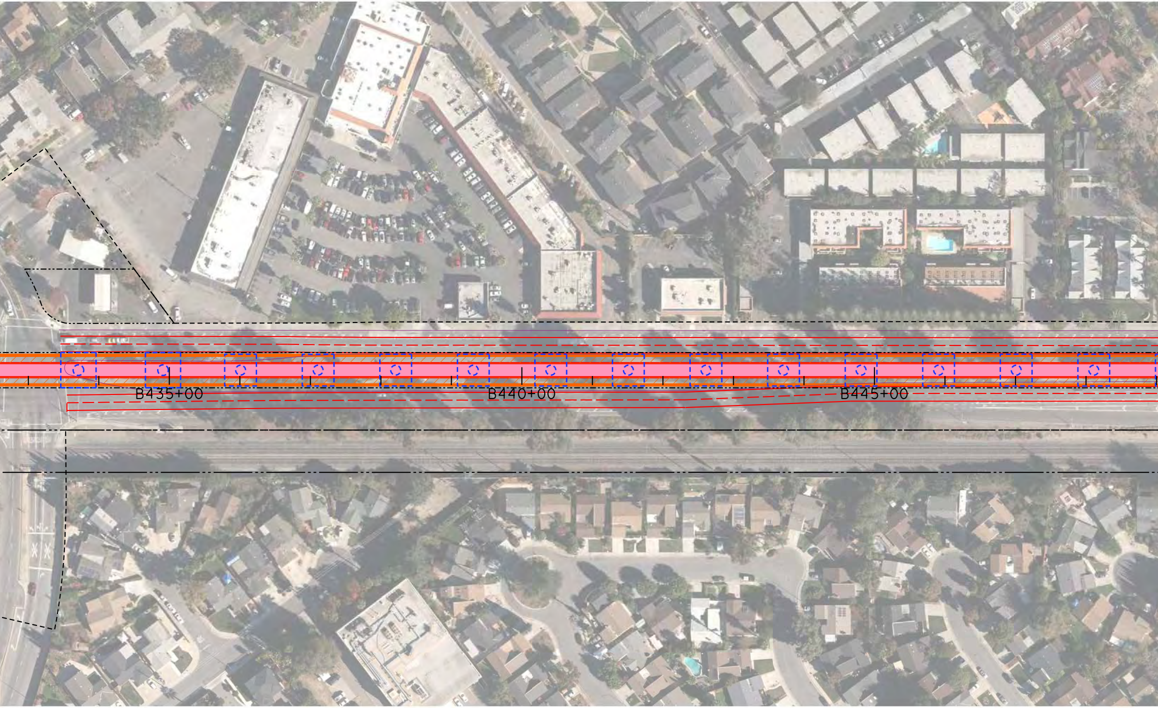
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ALT 1 - MEDIAN PHASE

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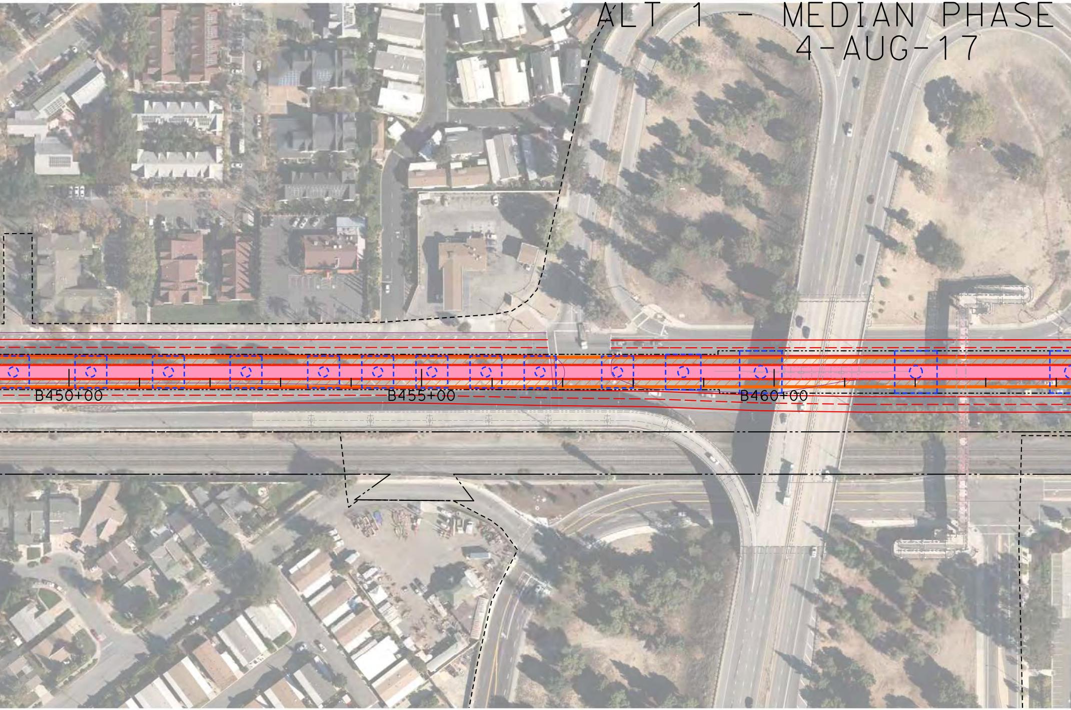
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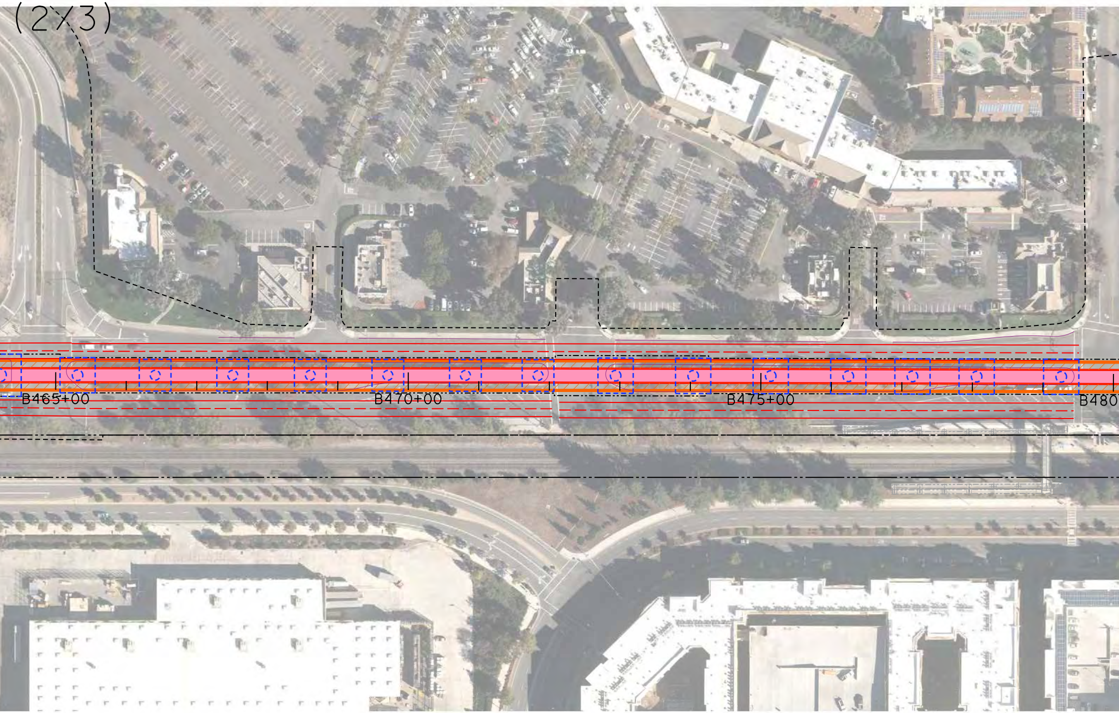
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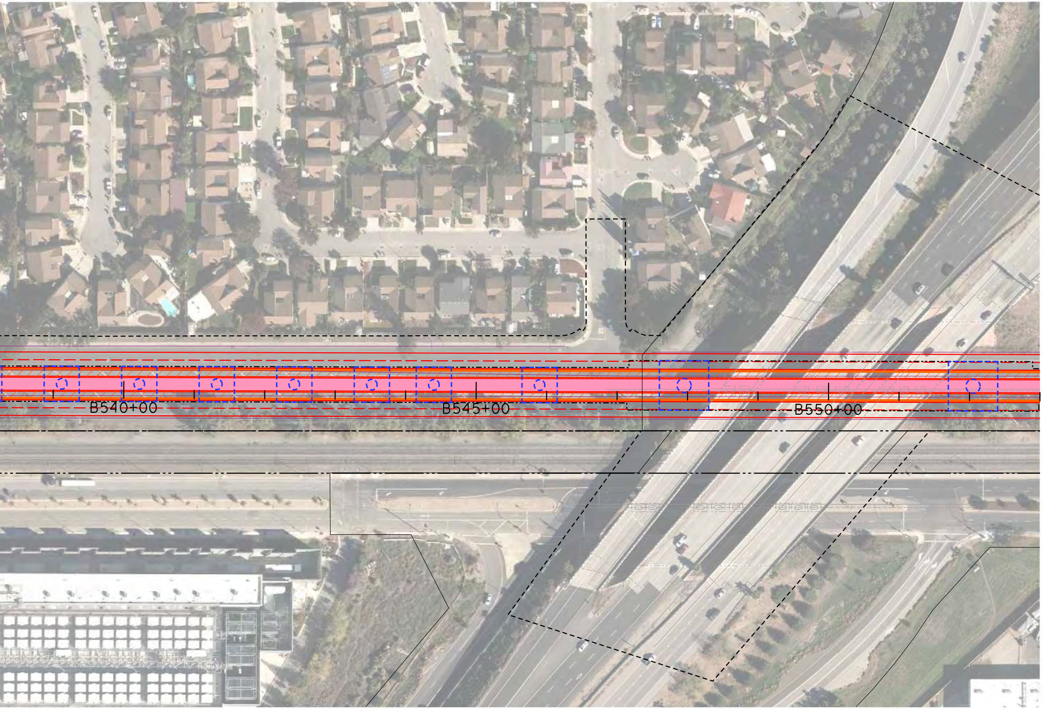
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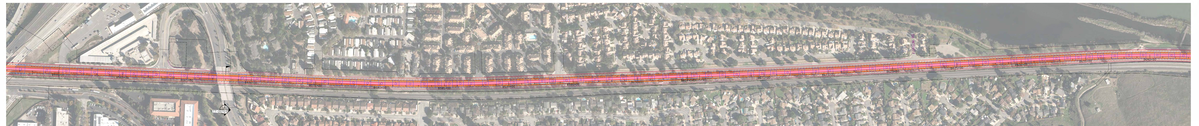
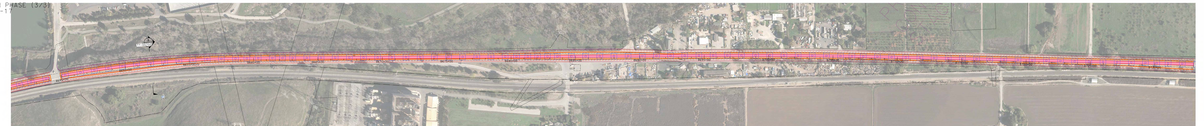


MONTEREY CONSTRUCTABILITY STUDY - DATED 2017-08-04

ALT 1 - MEDIAN PHASE (3/3)
4-AUG-17



MONTEREY CONSTRUCTABILITY STUDY - DATED 2017-08-04

APPENDIX H: TRACK SHIFT WORKS

SCOTT BOULEVARD TO GILROY
ALTERNATIVE 4
CONSTRUCTABILITY ANALYSIS

GENERAL CONSIDERATIONS FOR TRACK WORKS

December 2018

prointec

SCOTT BOULEVARD TO GILROY. ALTERNATIVE 4. CONSTRUCTABILITY ANALYSIS. GENERAL CONSIDERATIONS FOR TRACK WORKS

INDEX

1. WORKING APPROACH 1
1.1 Purpose 1
1.2 Existing Operational Assumptions 1
1.3 Regulations Applied 2
1.4 Analysis Assumptions 3
1.5 Input data 3
2. CURRENT SITUATION 3
3. FUTURE ACTIONS 4
3.1 Actions in the horizontal layout 5
3.1.1 Classification 5
3.2 Actions in elevation 8
3.2.1 Impacts on the Existing Traffic 11
3.3 Turnouts 13
3.4 Actions on Platforms. 16
3.5 Actions on At-Grade Crossings. 16
4. SPECIAL CASES 18

APPENDIX

- Appendix A Electrification
- Appendix B Jacked box undercrossing
- Appendix C Micropiles wall undercrossing
- Appendix D Wildlife crossing under Monterey Rd
- Appendix E Grade crossing analysis
- Appendix F Alternative 4 Constructability analysis
- Appendix G Track shift works Scott Boulevard to CP Lick
- Appendix H Proposed Construction Staging Areas
- Appendix I Construction Phases Alternative 4. Plan, schemes, profile and sections

1. WORKING APPROACH

1.1 Purpose

The purpose of this report is to define the improvements to be made in corridor to increase its performance so that in the future it can be used by Caltrain, UPRR and high speed.

For this reason, a series of construction phases and construction procedures are proposed that minimize the traffic disorders during the works and making the circulation through the corridor compatible with the works of modernization of the line.

Currently, San Jose to Gilroy Corridor is operated by Caltrain and UPRR. Caltrain provides commuter services between both cities and UPRR freight services. In the future, this corridor will be used by high-speed, commuter and freight circulations. The line adaptation will involve the realization of a series of works. The planning of these works has been carried out reducing the impact to the current services, for this reason the constructions phases have been adapted.

In addition, they have taken into account the indications of Caltrain in terms of temporary windows to undertake the work.

1.2 Existing Operational Assumptions

The works along the corridor, are mainly consisting on track realignment along the route and track layout reconfiguration at some stations. Maintaining the service in operation under an electrified line is the main assumption considered to develop the inception and organization of the works to adapt the line to the future blended system including high speed trains.

The definition and organization of the construction described herein was developed to comply with the criteria included in the “Caltrain Operating Conditions and Constraints” (RFP Design-Build Electrification Services, 2014) developed for the Caltrain electrification project (CalMod). The guidelines for construction are based on taking advantage of the lower density services on weekends by running service on a single track in segments and conducting preliminary and follow-up activities during night periods without traffic. According with the CalMod criteria, this approach will be managed within a flexible frame: “When possible, Caltrain will maintain an operating profile that matches the 2014 operation. However, adjustments will be made as construction and ridership necessitates”.

The track realignment construction is being defined based on the same criteria: working in single track by segments on weekends and on both tracks night both closures. Due to the nature of the construction for of the trackway, the needs of track possession will be

substantially greater than the required just for building the OCS, but it will be maintained within the frame of the main criteria.

Regarding service operations, it will be necessary to take into account that some temporary speed restrictions will be introduced in limited segments; crossovers functionality could be temporarily limited during relocation works and at critical stages some stations and platforms could be closed to carry out special tasks.

In summary, the assumptions considered are:

- The line is in operation from Scott Boulevard to Gilroy and the OCS is in service between Scott Boulevard and CP Michael in the corridor prior to construction.
- The track realignment construction will be carried out according to track possession work windows:
    - Weekday days, each day (Monday-Friday): Mid-day during week between morning and afternoon rush hours. Single tracking 9am – 5pm.
    - Weekday Nights (Monday and Thursday only): Single tracking 8pm until 4am, Monday night and Thursday nights, with both tracks out of service after completion of revenue operations 1am until 4am.
    - Weekends (Friday night to Monday morning): Weekend, single-tracking, 56-hour continuous work window from 8pm Friday night until 4am Monday morning, with both tracks out of service after completion of revenue operations 1am until 4am Friday, Saturday and Sunday night.

  The above Work Window hours include the track time required for mobilization and set-up.
- Station platforms will be closed occasionally.
- Speed restrictions will be limited to the minimum required period.
- Crossovers functionality could be temporarily limited during relocation works.

1.3 Regulations Applied

The regulations applied for the checking of the geometric layout of the Scott to Gilroy realignment are as follows:

- “California High-Speed Train Project Design Criteria September 2014, Rev 2.
- SECTION 01040. WORK HOURS AND TRACK ACCESS of the CalMod Design-Build Electrification Services.

1.4 Analysis Assumptions

Currently the San Francisco to Gilroy Caltrain corridor is not electrified, but it is assumed to be for the purposes of this study. The segment between SF and SJ is assumed that the electrification is complete. The segment between SJ and CP Michael only the right track is electrified. The rest of section is considered without electrified.

The main track profile is identified on the proposed plans and existing corridor track charts for the northbound track (San Jose to San Francisco direction) only. It is assumed that the southbound track (San Francisco to San Jose direction) profiles matches the northbound track, for both the existing and proposed alignments.

It is important to note that there is no information for the thickness of the ballast layer nor the condition and characteristics of the railway platforms. Therefore in this study it will only be reflected if there will be increases or decreases in the future track level regarding the existing one.

1.5 Input data

The starting point for the analysis of this adaptation is the developed within the study and is grouped as it follows:

- Current Situation:
  - Layout file: TT-Existing-2016.alg
  - File dgn: X-FJ-TT-ALGN-EXST-CALTRAIN-2016.dgn
- Future situation:
  - Layout file: Alt4-CPCST-CPLK.alg
  - File dgn: X-JM-TT-ALGN-PROP-ALT4-CPCST-CPLK.dgn Scott to CP Lick
  - File dgn: X-JM-TT-ALGN-PROP-ALT4-CPLK-GLRY.dgn CP Lick to Gilroy

2. CURRENT SITUATION

The existing Caltrain corridor is a non-electrified, two track configuration, with shared commuter service (operated by Caltrain) and freight service (operated by UPRR). The main purpose of the existing corridor is to provide a service for commuters and short distance journeys. Construction of the CalMod project, prior to the construction of High Speed Rail (HSR), will provide electrification and control systems to the Caltrain service.

The Caltrain corridor runs in a high density, urban environment between San Francisco-4th & King Station and San Jose-Diridon Station; then continues south to Gilroy.

Next to the existing railway alignment, at certain locations, there are other railway infrastructure systems, such as the Bay Area Rapid Transit (BART) and the Light Rail Transit (LRT).

Caltrain current has 9 existing railway stations between Scott and Gilroy, the main ones being:

- San Jose
- Gilroy

The route is generally at-grade, with a large number of at-grade crossings with local roadways. Crossings with major communications routes have been resolved by raising the utility above the existing railway line.

Along the railway corridor there are several railway yards and tie-ins; such as the connection to the UPRR Coast Subdivision (with service from Oakland) and the railway facilities (workshops, garages, etc.) connection located next to the San Jose station.

3. FUTURE ACTIONS

Implementing high speed service along the Caltrain corridor will mean adapting the existing layout to the higher standards. Among the actions to be carried out are:

- Adaptation of the existing alignment to various degrees, both in horizontal and elevation; increasing the value of the existing radii and the track centers.
- Implementation of new platforms for the current stations.
- Remodeling of existing stations accordingly for high-speed services.
- Actions on the main track to include new railway facilities.
- Removal, replacement and installation of turnouts.
- Adaptation of electrification to the new layout.

The Caltrain stations along the route will undergo an adaptation where existing platforms will be remodeled to a length of 700 ft. and some of the stations will be relocated. The San Jose and Gilroy stations will be equipped with exclusive high-speed platforms with lengths of 1,400 ft. and 800 ft. respectively.

Future railway operations will combine high speed and commuter and freight services along the same corridor, creating a blended system.

3.1 Actions in the horizontal layout

3.1.1 Classification

The actions on the railway grade consist of moving it to improve the existing route or increase the distance between track centers. These lateral displacements (track shifts) will be conditioned by the presence of poles for electrification.

The following classification is established:

- **Lateral displacements of the track between 0 and 1 ft.**

  In this case, it is assumed that the tolerances of the existing electrification system will allow the lateral displacements of the track without needing any new OCS posts. For displacements between 0 and 1 ft. a tamping machine is used.

Figure 1. Tamping machine used for lateral displacements of the track between 0 and 1 ft.

- **Lateral Displacements of the track between 1 and 10 ft.**

  In this case, the poles of the existing electrification are affected so it is necessary to remove them to move the track. When it may be required to maintain the service during construction, it will be necessary to install an auxiliary electrification system.

  In this distance, a lateral displacement of the existing track to its definitive position would be constructible, but it would not possible to construct new track parallel to the existing while keeping service in operation since the ties would overlap.

Figure 2. Lateral Displacements of the track between 1 and 10 ft

- **<u>Lateral Displacements of the track between 10 and 21.34 ft.</u>**

  In this case, the poles of the existing electrification will be affected so it is necessary to remove them to move the track.

  This distance allows the construction of the new track parallel to the existing one, while keeping the railway traffic in service, as long as the existing electrification pole is removed.

Figure 3. Lateral Displacements of the track between 10 and 21.34 ft

- **Lateral displacements of the track greater than 21.34 ft.**

  The works are carried out outside the area of influence of the existing railway track, so the railway traffic is not affected.

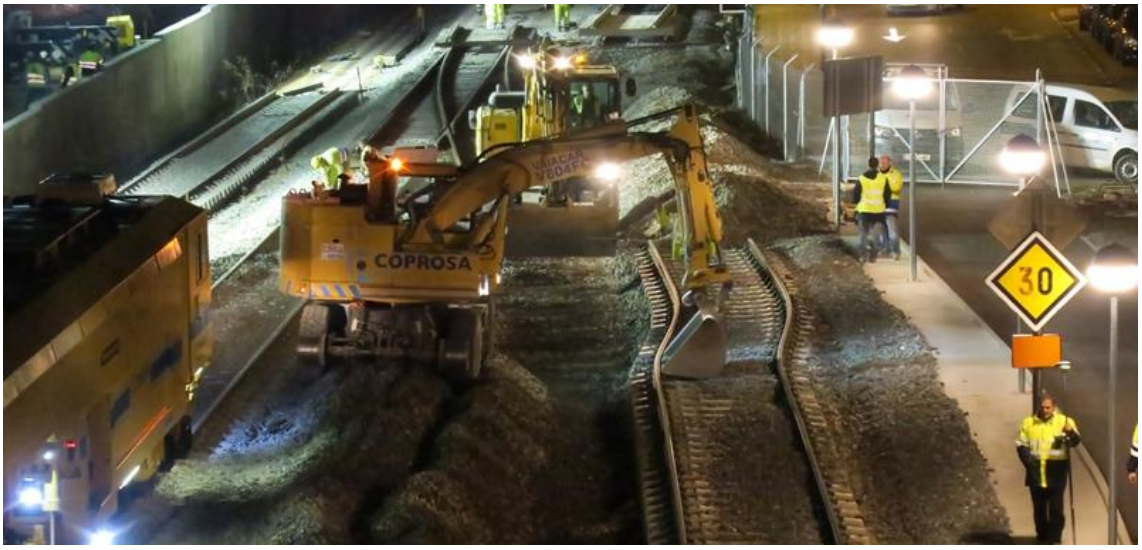


Figure 4. Lateral Displacements of the track greater than 21.34 ft

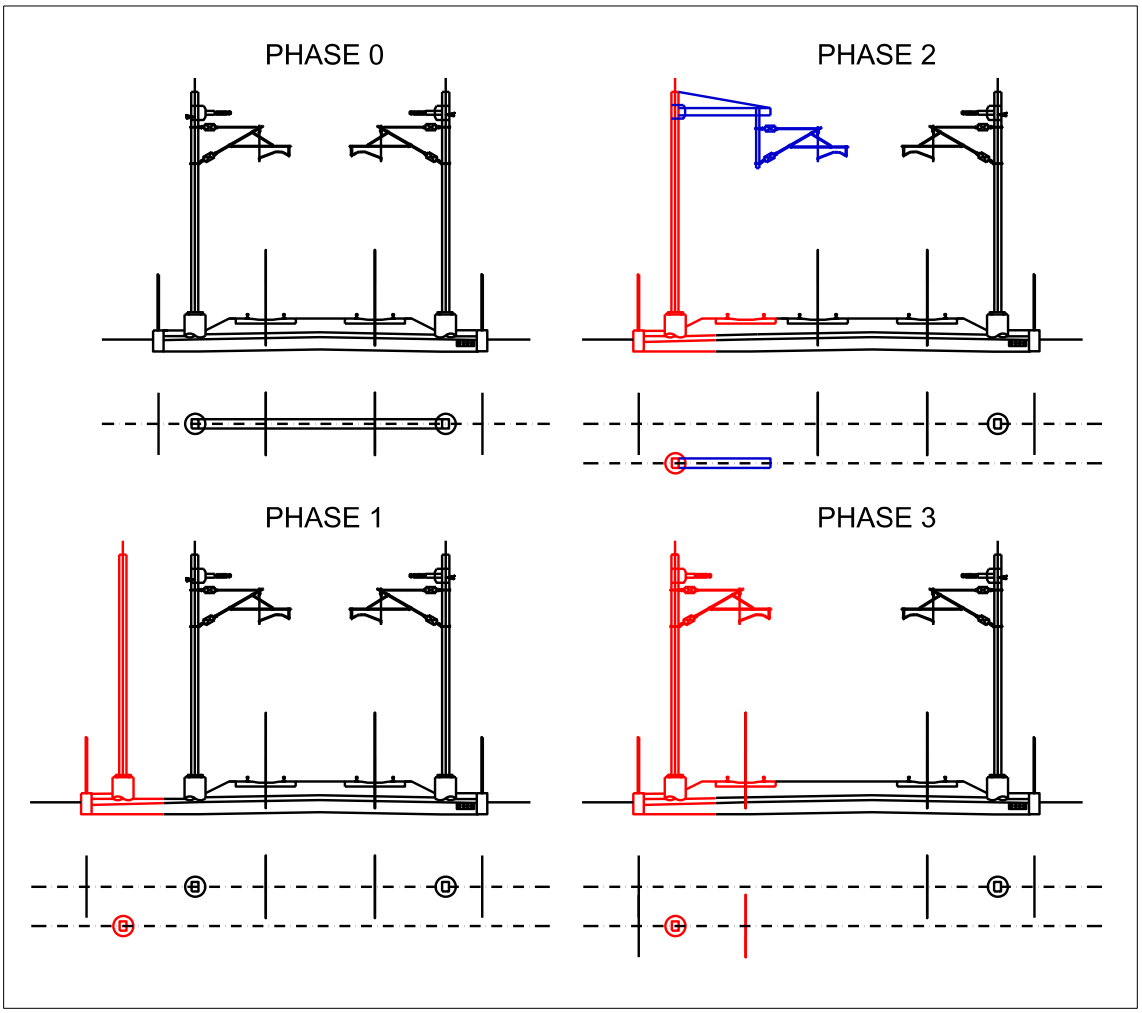


Figure 5. Classification of actions in the horizontal layout

3.2 Actions in elevation

Actions needed in elevation are required due to variation of the longitudinal profile of the new track adapted for high speed service and the existing one.

The required action on the track related to the elevation depend directly on its position in the plant and will define the actions to take. Three possible cases is possible define according to lateral displacement:

- **Case 1: When lateral displacements of the track is between 0 and 1 ft.**

  The axis of the future track is located at a horizontal distance lower than 1ft from the current one in these cases. In this case, there is no variation of the railway grade extension, that is, the cross section is practically the same.

  In turn, this case is subdivided into the following cases:

- *Raising of the longitudinal profile:*

Depending on the proposed profile changes, the thickness of the existing ballast layer and the existing platform characteristics, the following cases are distinguished:

- Adjust by tamping the existing ballast layer, valid for increases in elevation of up to 0.01 ft.
- Adjustment by tamping with addition of ballast for elevations between 0.01 and 0.167ft.
- Overall conditioning of the entire section, including the trackbed and the rest of the layers, for greater elevations.

- *Lowering of the longitudinal profile:*

- Adjust by tamping the existing ballast layer, valid for decreases in elevation of up to 0.01 ft.
- Removal of ballast for reductions between 0.01 and 0.05ft.
- Rebuilding of the entire section, including the trackbed and the rest of the layers, for greater descents.

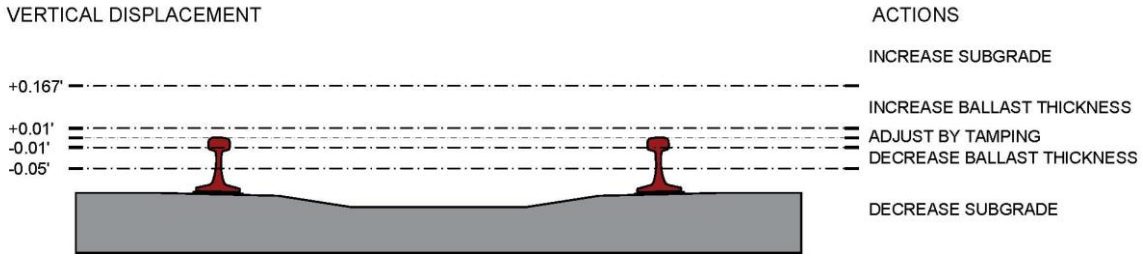


Figure 6. Actions in section for variations in vertical alignment

- **<u>Case 2: When lateral displacements of the track is between 1 and 21.34 ft.</u>**

The axis of the future track is located at a distance between 1 and 21.34 ft. from the old one in these cases.

Given the magnitude of the displacement, it is necessary to expand the existing railway grade. This means the cross section is significantly extended, not only in the upper layers of ballast, sub-ballast and form layer, but also in the embankment.

In turn, this case is subdivided into the following cases:

- *Raising of the longitudinal profile:*

  The enlarged area, where the extension of all the layers mentioned above will be carried out regardless of the amount of elevation change experienced by the longitudinal profile.

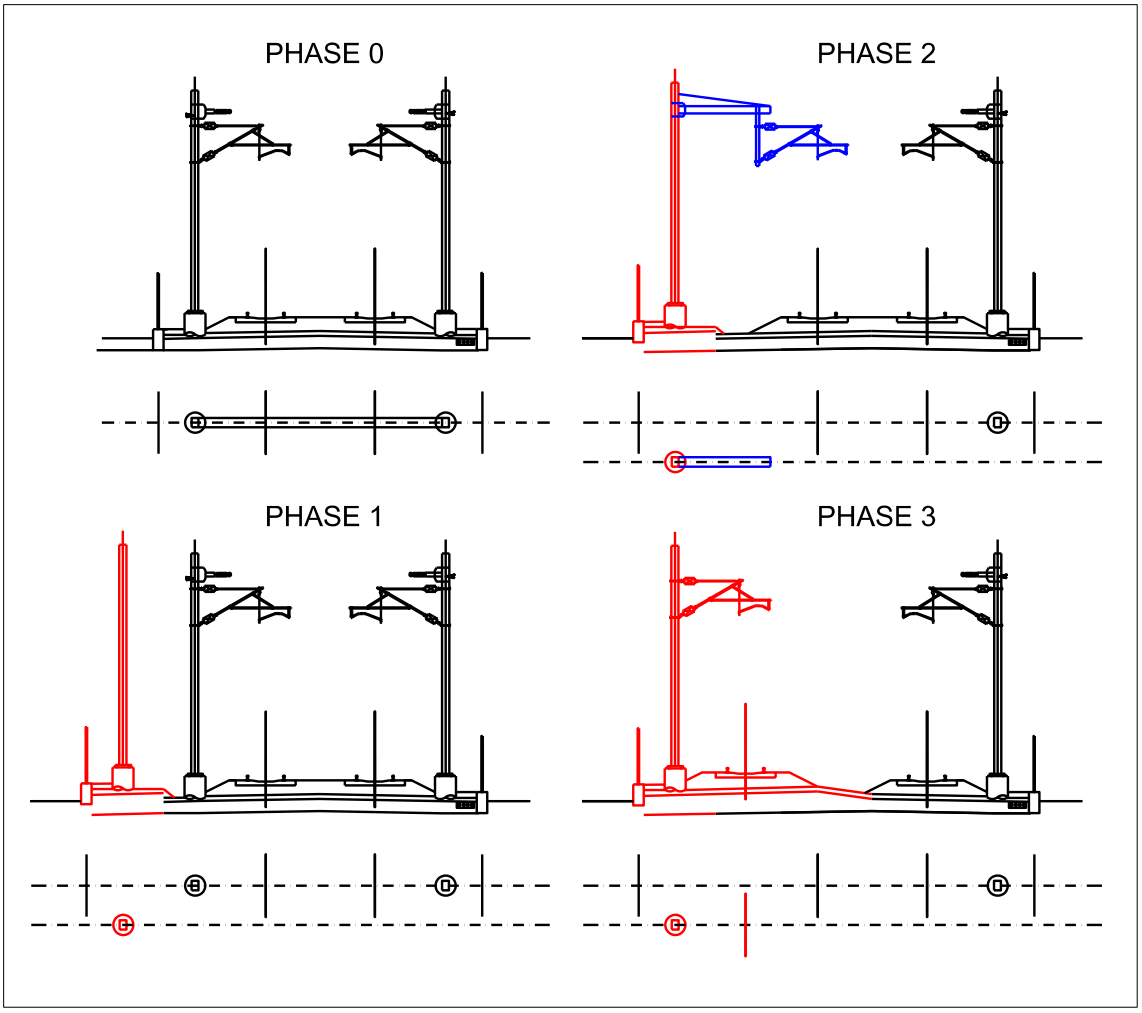


Figure 7. Phases of works for the ascent of the longitudinal profile

- *Lowering of the longitudinal profile:* In this case, it is necessary to study the current railway grade status, measure the thickness of the current ballast, sub-ballast layer, and determine the necessary actions to adapt it to the future situation of the new longitudinal profile.

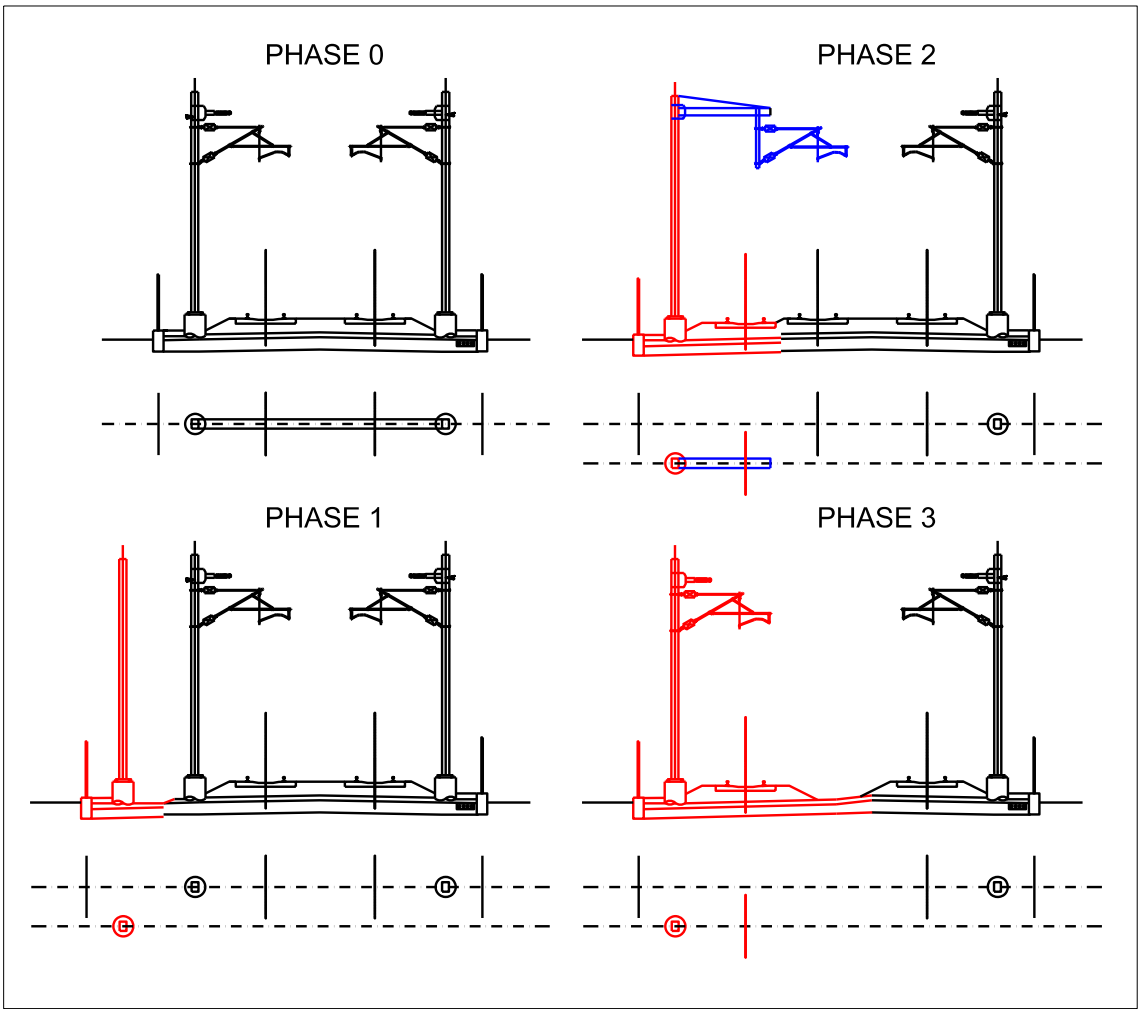


Figure 8. Phases of works for the descent of the longitudinal profile

- **<u>Case 3: When lateral displacements of the track is greater than 21.34 ft.: No influence:</u>**

  In these cases, given the magnitude of the displacement in horizontal, the variation of longitudinal profile is irrelevant since they can be considered independent and, will executed separately.

3.2.1 Impacts on the Existing Traffic

The impacts on traffic will depend on the magnitude of the lateral and vertical displacements of the track from the existing situation to the future situation and the length of the section for the construction area.

- **Lateral displacements of the track between 0 and 1 ft. without subgrade affectation**

  The impact on the existing traffic in this case is minimal since there´s no need to act on the railway subgrade or the catenary poles, just adapting the brackets for the repositioning of the contact wire.

  The works will be carried out during the Work Window hours established in the SECTION 01040. WORK HOURS AND TRACK ACCESS of the CalMod Design-Build Electrification Services and all the restrictions there mentioned.

  The only effect on traffic will be a limitation of the speed of the railway traffic during the time of action on the track.

- **Lateral displacements of the track between 0 and 1 ft. and lowering.**

  The impact on the existing traffic in this case is greater than in the case of raising of the track. Depending on the thickness of the existing ballast layer, it is likely the existing railway subgrade will be modified, so the construction activities carried out will be greater and require substantial time to complete.

  As in the previous case, the works will be carried out during nighttime periods or the weekend, with the restrictions mentioned above.

  The only effect on traffic will be a limitation of the speed of the railway traffic during the time of action on the track.

- **Lateral displacements of the track between 1 and 10 ft.**

  In this case, the relocation of the track will require the extension of the railway subgrade and removal of the catenary poles, with the following effects on traffic conditions:

  - Speed limits on railway traffic over the affected track, during the time of action.
  - The existing track and future one will share ties, so the extension of the existing railway subgrade and the lateral displacement of the track itself will be carried out during railway traffic cuts, at night or during the weekends.

When the future track is lower the railway subgrade is affected, so the construction activities will be drawn out for a longer time causing a greater impact on the current railway traffic.

Maintaining service requires the setup of a provisional electrification system, suitable for the current and future situation.

- **Lateral displacements of the track between 10 and 21.34 ft.**

  As in the previous case, the relocation of the track will require the extension of the railway subgrade and removal of the catenary poles. In addition, the maintaining service will require the assembly of a provisional electrification system.

  In this case, the work will be carried out outside the safety area, so it is possible to extend the existing railway subgrade and to build a new track without affecting the railway traffic. Only the establishment of speed limits due to the presence of construction will be necessary.

  Therefore, the only limitation to traffic will be during the execution of the connections with the existing track that must be made during railway traffic cuts in nighttime periods.

- **Lateral displacements of the track greater than 21.34 ft.**

  Since in this case the future track is more than 21.34 ft from the previous position, the execution of the new railway subgrade is completely independent of the old one. It is not necessary to remove the existing catenary poles in this case.

  Therefore, the only limitation to traffic will be during the execution of the connections with the existing track that must be made during railway traffic cuts in nighttime periods or during the weekend.

3.3 Turnouts

Along the route between Scott Boulevard and Gilroy, there are a large number of turnouts. Because of the track adaptation for high speed, the existing turnouts may be removed, displaced or kept in their position. Construction related to turnouts can be categorized as follows:

- **Removal of an old turnout**. It is the simple elimination of a turnout present in the current track and the subsequent track replacement.

- **Insertion of new turnout**. It consists of the insertion of a new turnout on the existing track.
- **Replacing a turnout**. In this case it is a matter of replacing one turnout with different type of turnout, even if the horizontal and vertical layout does not suffer any modification.
- **Relocation of a turnout**. It is the opposite case, in which the same device (same model) is still valid, but due to modifications in the horizontal and vertical layout, its relocation is necessary.

All the activities that affect turnouts will be carried out during extraordinary traffic cut periods. In order to reduce the impact period, pre-assembly of turnouts will be made at assembly bases. Once pre-assembled, they will be carried by special track machinery to the permanent location.

While the assembly work takes place, the speed limits will be maintained.

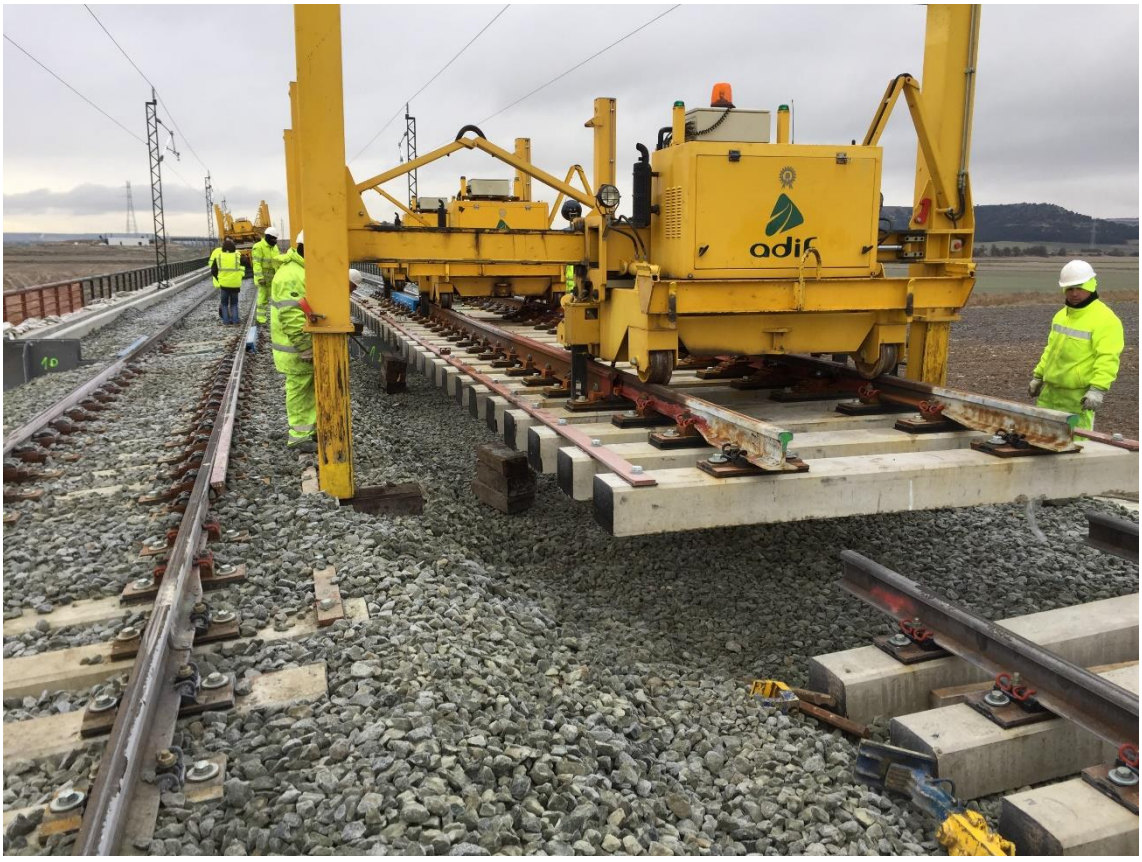


Figure 9. Assembly on the track of a pre-assembled turnout

In the event that the geometry of the track sections adjacent sections to a turnout undergoes modifications, it will be necessary to place the track in its definitive position to allow the turnout to be interested in its' final position during an extraordinary traffic-cutting period.

If it is necessary to move a track turnout either in horizontal or in elevation, it is recommended to disassemble it and replace it with a provisional track. This provisional track along with the adjacent sections will be placed in their definitive position and later the turnout will be assembled in its final location. This working cycle assumes the rail traffic diversion will be suspended while the provisional track is installed.

Figure 10. Transportation of a pre-assembled turnout

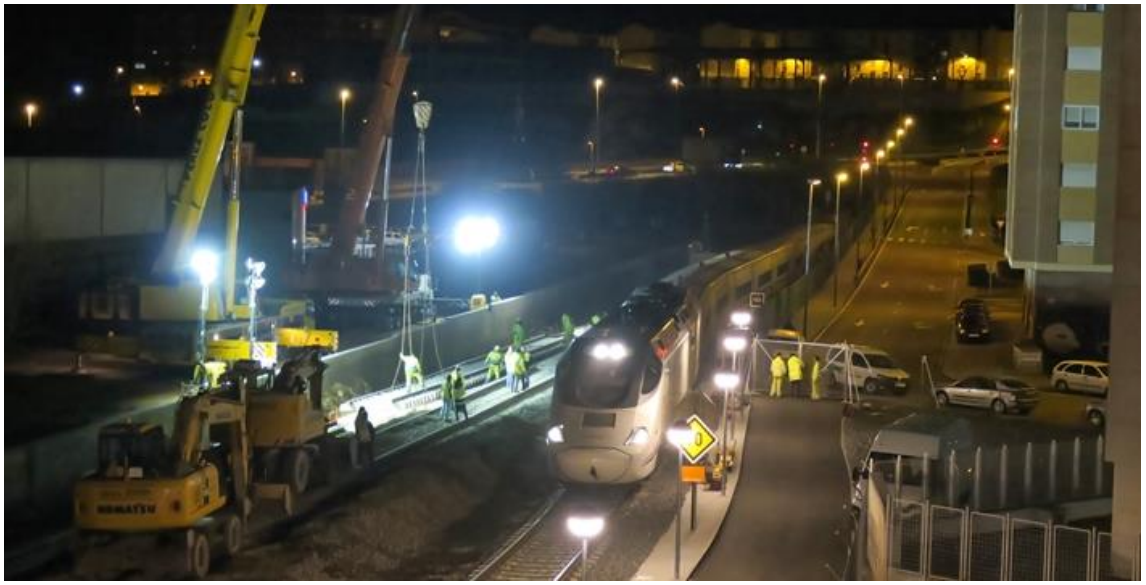


Figure 11. Assemble of a pre-assembled turnout with cranes

3.4 Actions on Platforms.

The modification of the main track and yard track alignments in stations, require corresponding modification in the platforms.

Any little track displacement, either in horizontal, elevation or in both, implies a corresponding one in the platforms, due to the need for keeping the safety and functional distances.

Figure 12. Modifications to platforms

3.5 Actions on At-Grade Crossings.

Throughout the corridor, a series of at-grade crossings allow connection between the adjacent areas and populations located on either side of the corridor. Modifications to the track require these crossings be studied, verifying the need of their adaptation to the new tracks and modification of existing horizontal layout and longitudinal profile.

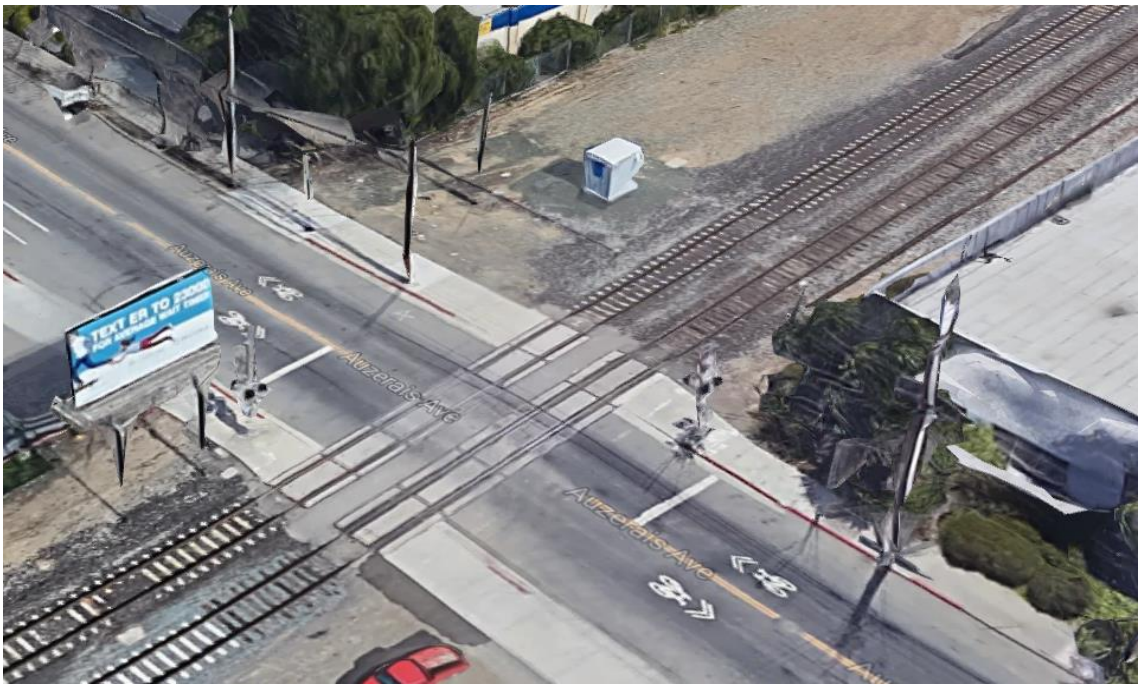


Figure 13. Typical at-grade crossing in railway line San Jose to Gilroy

The at-grade crossings that must be modified are those that will be affected by additional tracks and/or displacement of the existing track exceeding the following limits:

- Lateral displacements of the track between 0 and 0.02 ft.
- Variation of the longitudinal profile (either raising or lowering) between 0 and 0.01 ft.

Figure 14. Construction of at-grade crossing

4. SPECIAL CASES

There are seven special cases in Scott Boulevard to Gilroy constructability analysis who completed the tracks adaptation:

- Appendix A Electrification
- Appendix B Jacked box undercrossing
- Appendix C Micropiles wall undercrossing
- Appendix D Wildlife crossing under Monterey Rd
- Appendix E Grade crossing analysis
- Appendix F Alternative 4 Constructability analysis
- Appendix G Track shift works Scott Boulevard to CP Lick

These special cases are developed in seven independent appendix.

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS

APPENDIX A. ELECTRIFICATION

December 2018

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APPENDIX A. ELECTRIFICATION

The purpose of this document is to describe the different procedures available to adapt the electrification of railway lines in use to modifications of their. The proposed methods start from the premise of not interrupting railway traffic.

In general, the catenary has a greater capacity for transverse displacements than the track itself. This is due to the existence of a series of tolerances that are listed below:

- Tolerance of the catenary supports
- Decentralization of the contact wire to avoid localized wear of the pantograph
- Pantograph tolerances

The sum of these tolerances, as a general rule, is estimated at one foot. This margin can be used to carry out transverse displacements of the track without being necessary to modify poles and gantries to re-electrify the railway line. In this case it would only be necessary to adjust the position of the contact wire.

When the displacement of the track is greater than one foot, it is necessary to move the supports inside the frames or construct new structures for the catenary adaptation. Figures provided in this document show the adaptation of the catenary system. They do not include the intermediate subphases of partial displacements of both the track and the contact wire.

The existing corridor is not electrified, but construction of the CalMod project in the near future will install electrification and control systems. Subsequently, the main tracks (currently used exclusively by Caltrain) will be adapted for High Speed services. This adaptation will mean changes in the existing track configuration, requiring relocation of both tracks and catenary system elements.

As a starting point, the section between Scott Boulevard and San Jose station are fully electrified and the stretch between San Jose and CP Michael only the main right track and the refuge tracks are electrified. In the future, all tracks will be electrified except MT-1 (UPRR track).

There are apparent benefits to coordinating the CalMod and High-Speed Rail projects, so that locations were fixed elements (poles and gantries) can be designed compatible for both projects would be the most economically beneficial and ensure the least amount of railway service interruption during construction. The approach means that when High-Speed Rail is implemented the gantries will be perfectly valid and only an intermediate

period it will be necessary to relocate the track and the catenary supports. This case is called as process 0.

For the remaining situations the following describes potential construction processes:

Process 1. The first procedure is where the OCS portals are not able to house both track distributions (existing and future) so the portals must be enlarged. Depending on portal structural resiliency, it could be enlarged or directly substituted.

The process of portal enlargement is as follows:

Phase 1: New OCS pole placement. It must be aligned with the existing one.

Phase 2: Portal beam, temporary support installation.

Phase 3: Removal of the existing OCS pole. Portal beam enlargement and connection with the new pole.

Phase 4: Commissioning of the railway line.

Phase 5: Displacement of the tracks and of the OCS supports to their final location.

Phases 2, 3 and 4 must be made in the same night-time period with traffic cut. The temporary support used in phases 2 and 3 can be replaced for a crane.

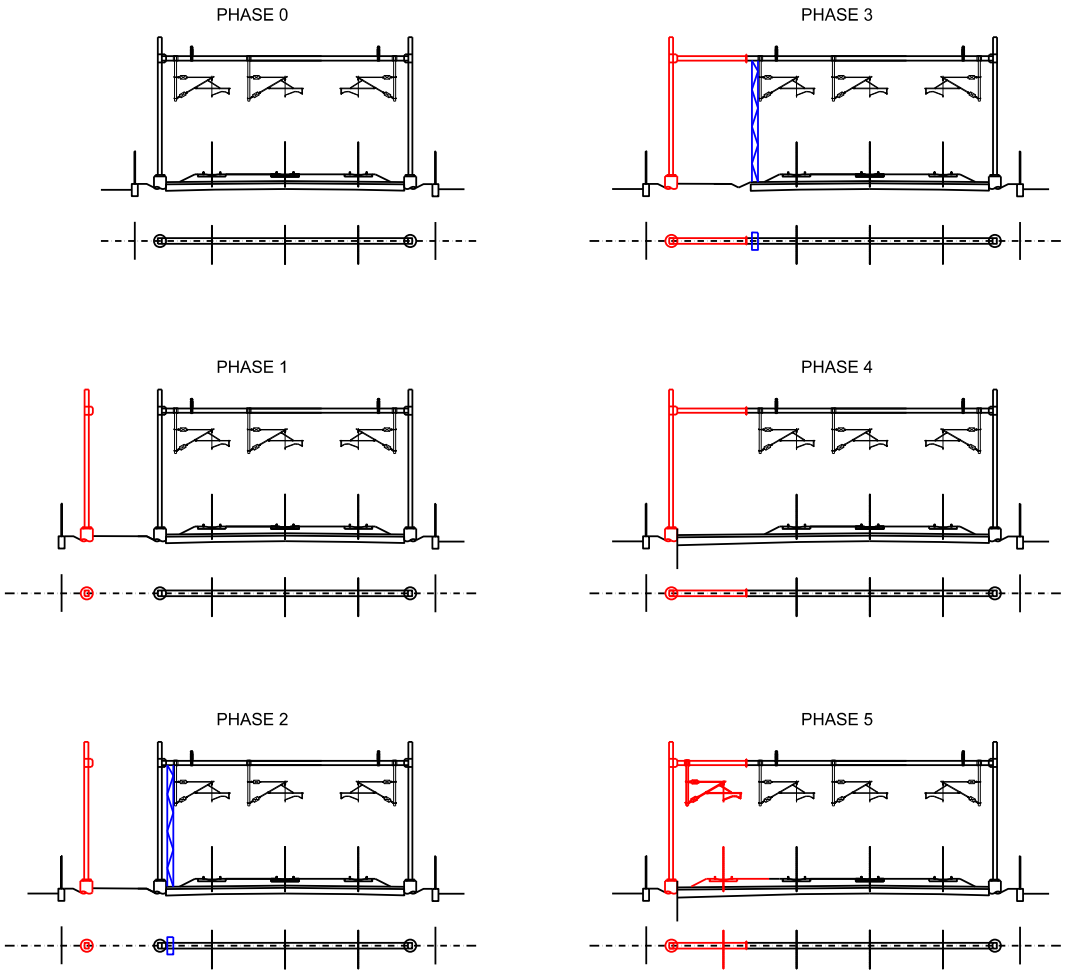

Figure 1. OCS portal beam extension

Process 2. The second process consists of designing enough long OCS portals that are able to house both track distributions (existing and future). In this case, it is necessary to build a flexible gantry located between temporary poles. This example is also suitable for the replacement of the portal beam. The working stages are:

Phase 1: Install temporary poles, outside of existing.

Phase 2: Flexible gantry is laid between temporary poles.

Phase 3: OCS and flexible gantry are linked. Existing OCS supports removed.

Phase 4: Existing OCS portals removed.

Phase 5: Placement of the new tracks in its final location.

Phase 6: Placement of the new portal in its final location.

Phase 7: Temporary flexible, gantry removed.

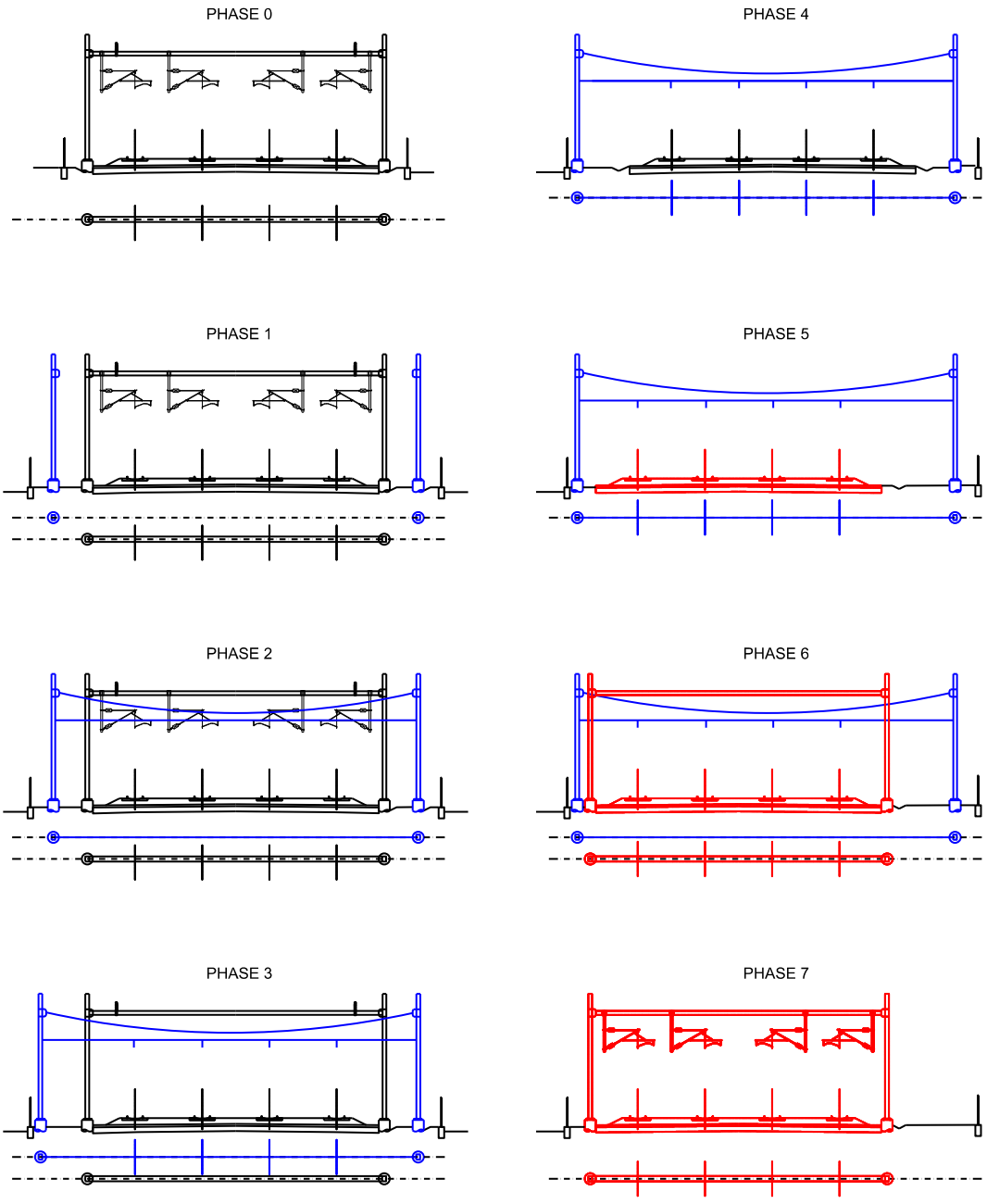

Figure -2. OCS portal replacement

Process 3. OCS portal assembly

Phase 1: Placement of the final, parallel pole and track.

Phase 2: Placement of the final OCS support.

Phase 3: Placement of the OCS portal in its final location. Placement of temporal OCS wire.

Phase 4: Placement of the final OCS wire. Removal of the existing OCS pole and temporal OCS wire.

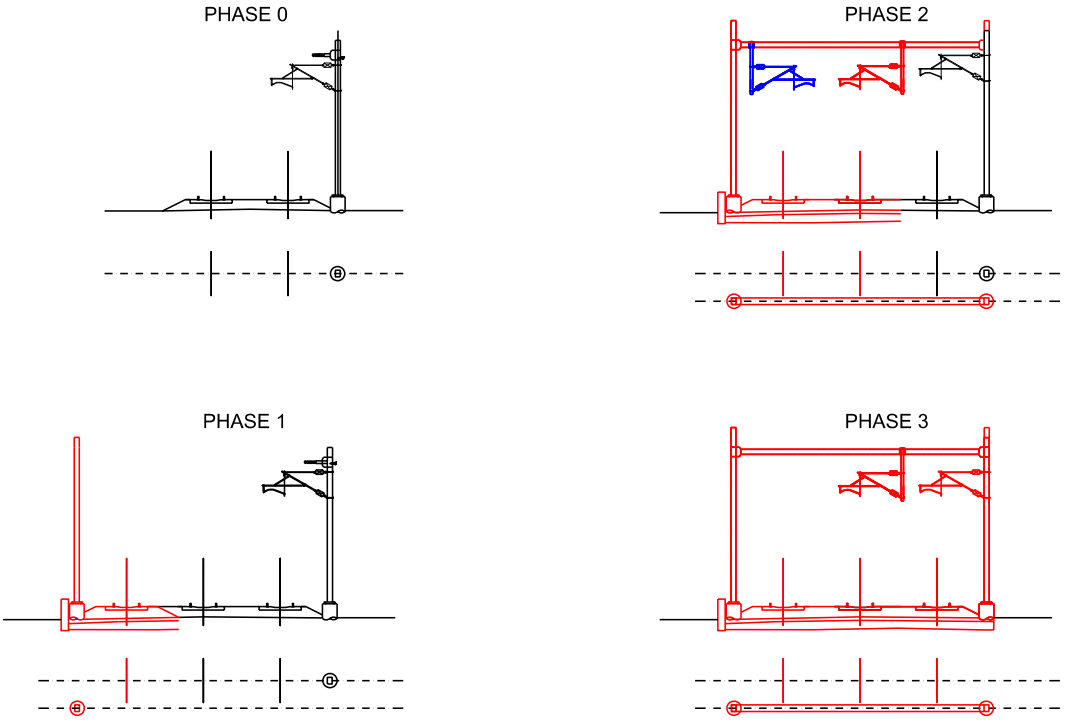

Figure 3. OCS portal assembly

Process 4. Displacement of poles outside the future clearance and displacement of two tracks.

Phase 1: Assembly of a new, parallel pole in a temporary placement

Phase 2: Removal of the existing OCS pole. Positioning of the support for two cantilevers and placement of the cantilever next to the pole.

Phase 3: Removal of the cantilever to displace and assembly of the second cantilever over its support.

Phase 4: Removal of the existing pole. Assembly of two, new parallel poles in their permanent location.

Phase 5: Placement of cantilevers. Removal of the temporary pole.

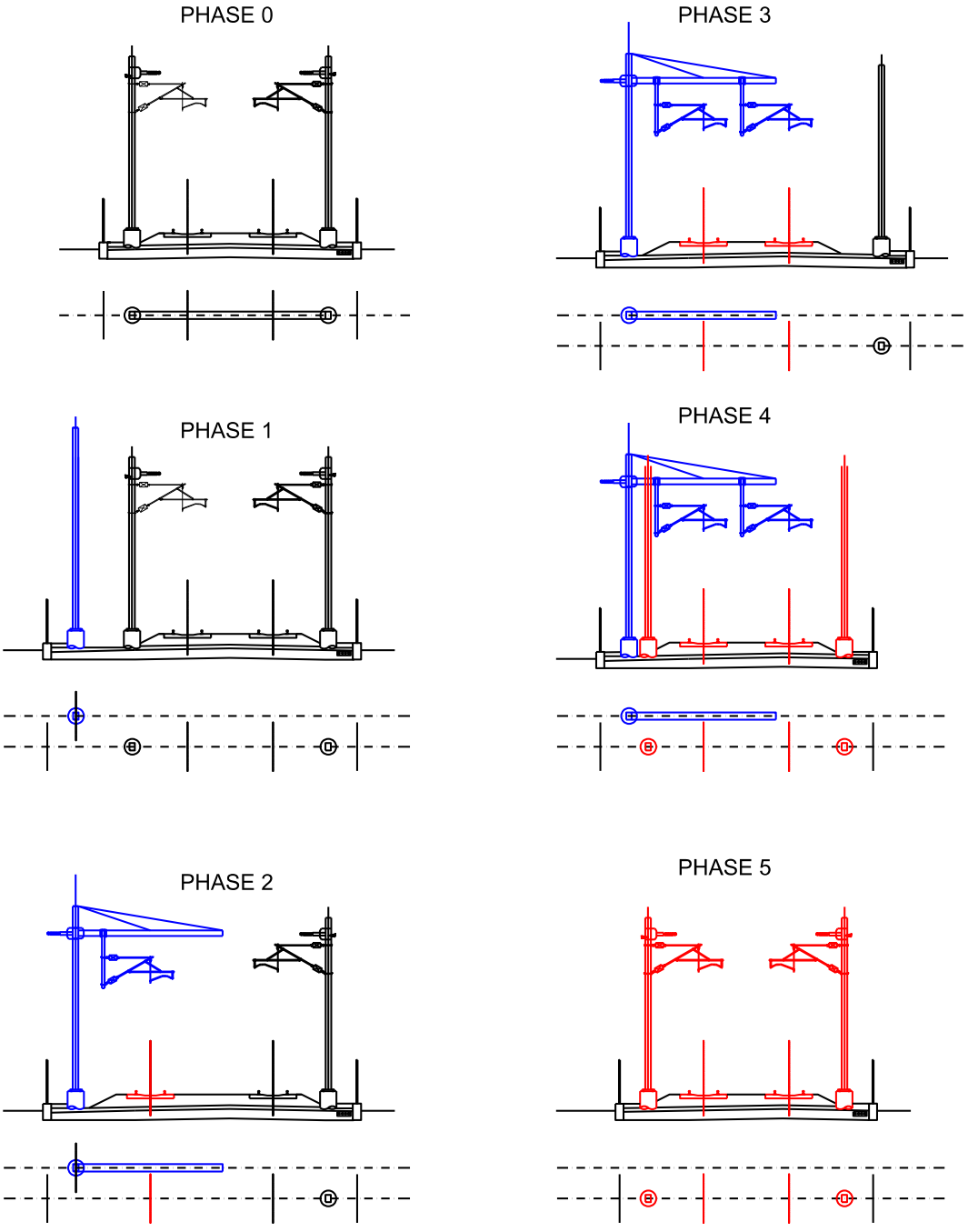

Figure 4. OCS poles displacement

In the cases described above, temporary elements are used. The foundations of these temporary elements can be made in the same way as a permanent element (using a pile) or using a temporary foundation simply supported on the existing ground.

Figure 5. OCS temporary foundation

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS

APPENDIX B. JACKED BOX UNDERCROSSING

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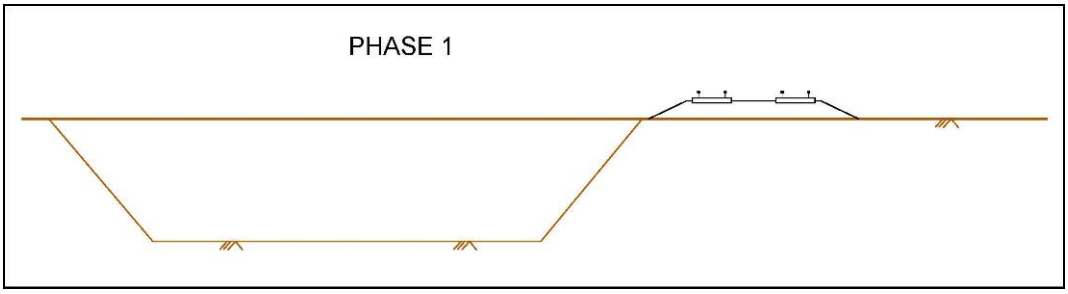
APPENDIX B. JACKED BOX UNDERCROSSING

The method of constructing an underpass by continuous jacking generally consists of the construction of the structure in an area adjacent to the installation site and then hydraulically pushing the structure into its final position at right angles to the track, with minimum disturbance to both rails and train circulations.

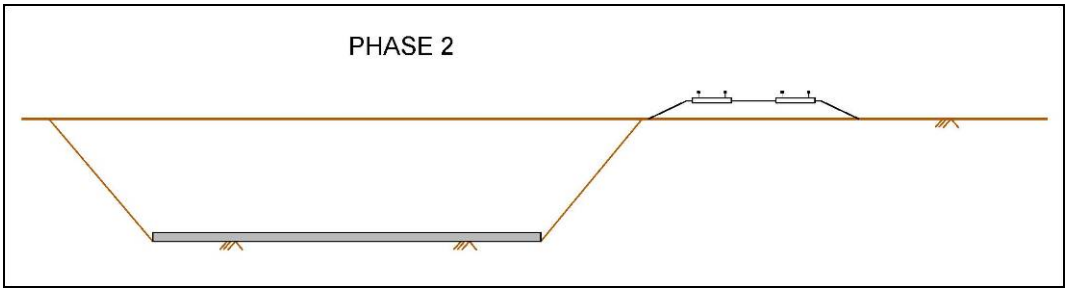
The structure is built on a concrete launch pad in the vicinity of the track and on obtaining suitable strength, is then jacked by hydraulic cylinders; which transfer the stresses to a reaction frame or the ground itself. The excavation is simultaneously carried out from within the structure or box and there is, subsequently, no risk to track stability.

The construction process is:

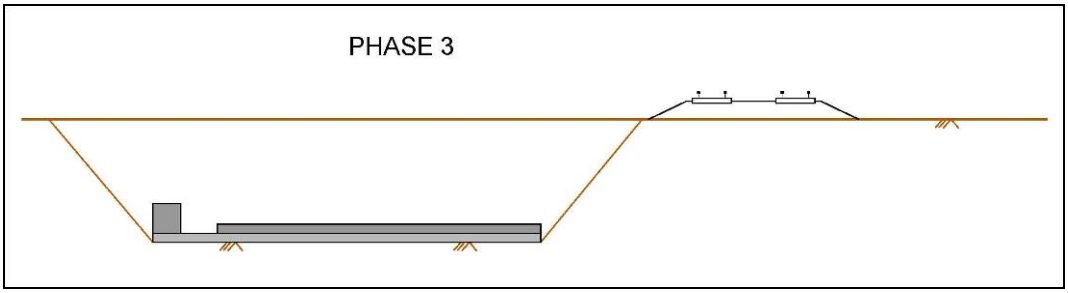
Phase 1: Ground excavation adjacent to the structure's permanent location.



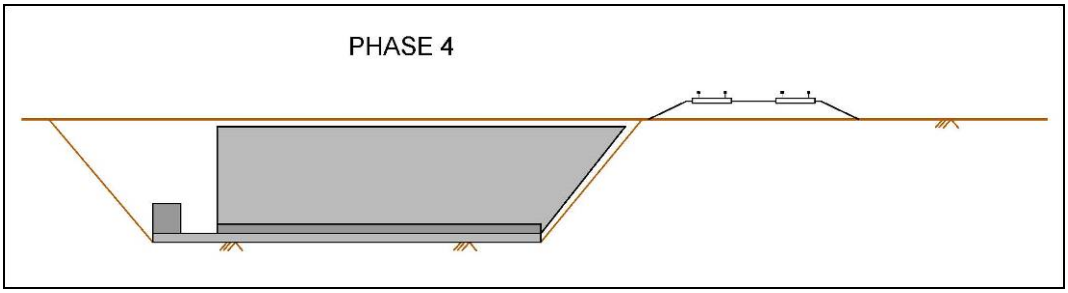
Phase 2: Concrete slab and launch pad construction. The main goal of this slab is to support box movement. This slab must be smooth and covered with a polyethylene sheet to ease the movement of the structure (Figure 1, 2 and 3).



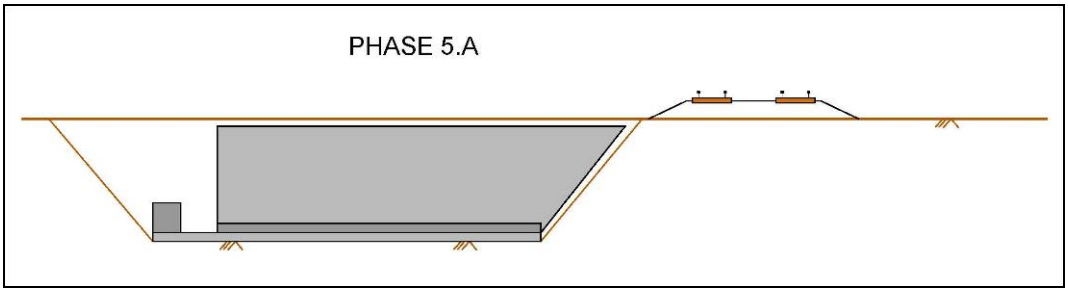
Phase 3: Construction of guiding walls. These are needed to assist with box alignment while jacking (Figure 4 and 5).

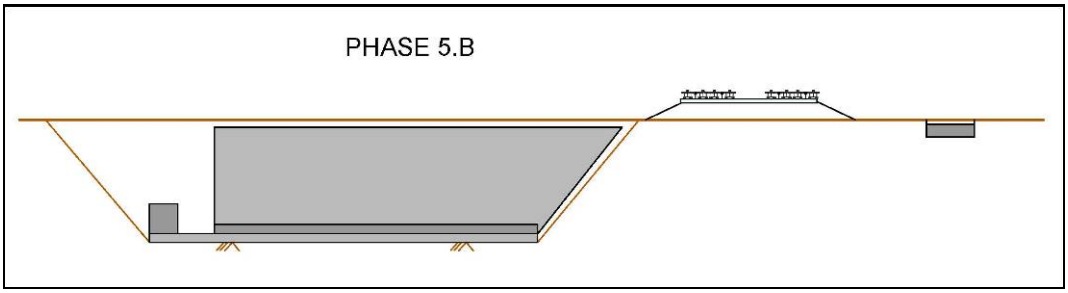


Phase 4: Reinforced concrete box construction. Box should be shaped as shown in the following figure to the jacking process (Figure 6, 7 and 8).

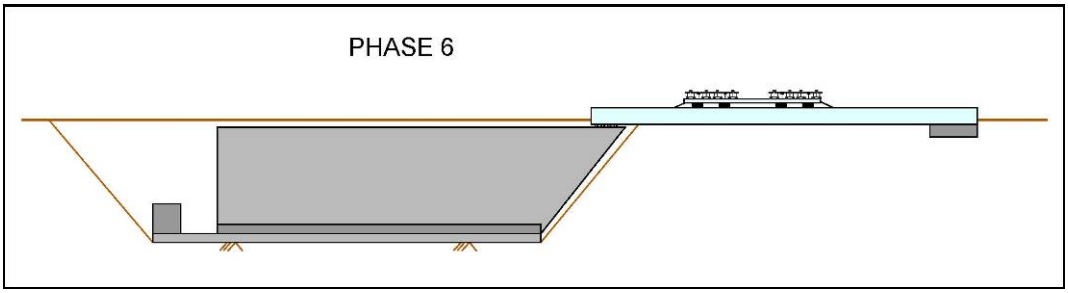


Phase 5: The subgrade will suffer limited deformations during the box movement, so it is necessary to change concrete ties to wooden ties, to provide flexibility. Additionally, a reinforcement of the track, parallel to the box movement, will designed by a special fastening system to unify rails with adjacent steel profiles to add inertia. (Figure 9, 10 and 11). Construction of a provisional foundation parallel to tracks.





Phase 6: Steel beams should be placed parallel to the track ties and placed every 6 feet. These beams are supported by the box, the provisional foundation and the existing ground. Support over the box is made by a roll in order to maintain the beam placement during works. Traffic is maintained in this stage but speed is limited (Figure 12, 13, 14 and 15).



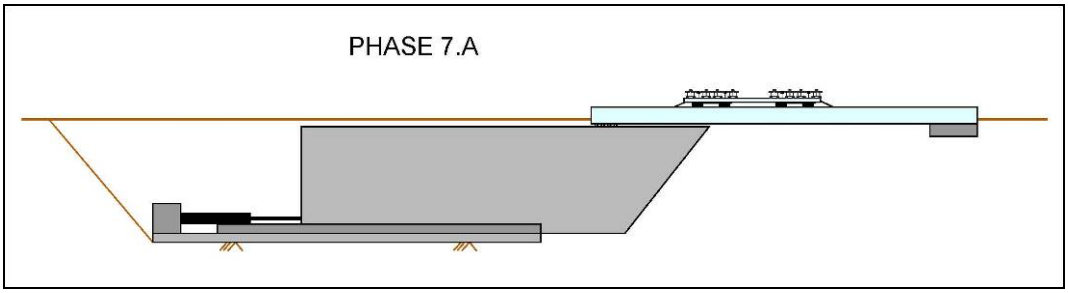
Phase 7: Box jacking by a hydraulic jacks series. This stage is subdivided into:

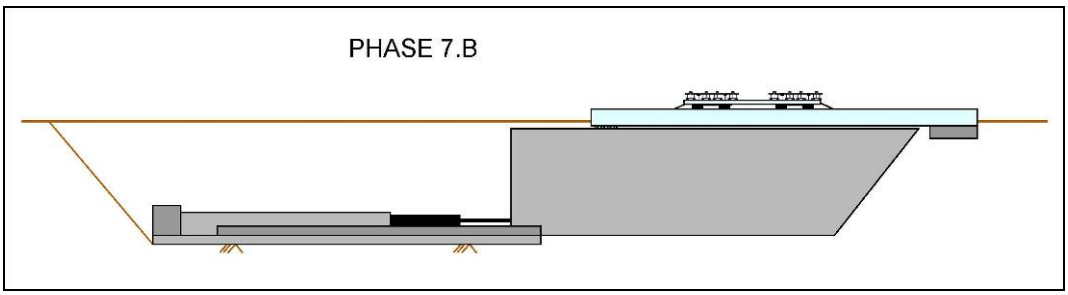
a. Excavation under the existing tracks during nighttime closures, for tie and beam placement.

b. In-box excavation. Rate of excavation is directly related with daily rate of box jacking (Figure 16 and 17).

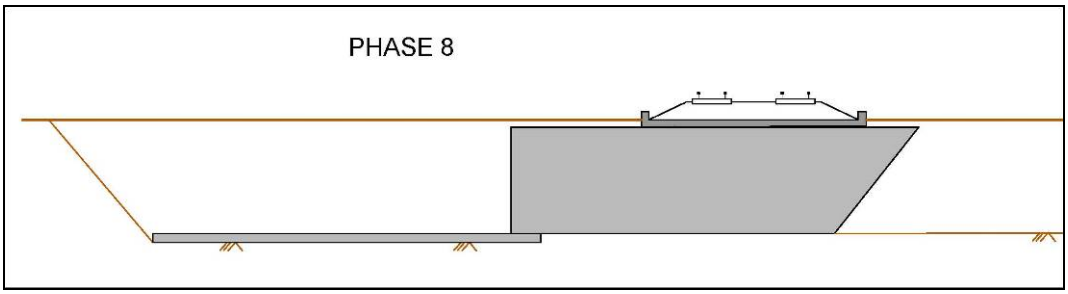
c. Jacking. Hydraulic jacks transfer homogeneous pressure to the box; which slips along the concrete slab and hammers itself in the soil (Figure 18, 19, 20, 21 and 22).

d. Left space concreting to support jacks when box has moved enough.

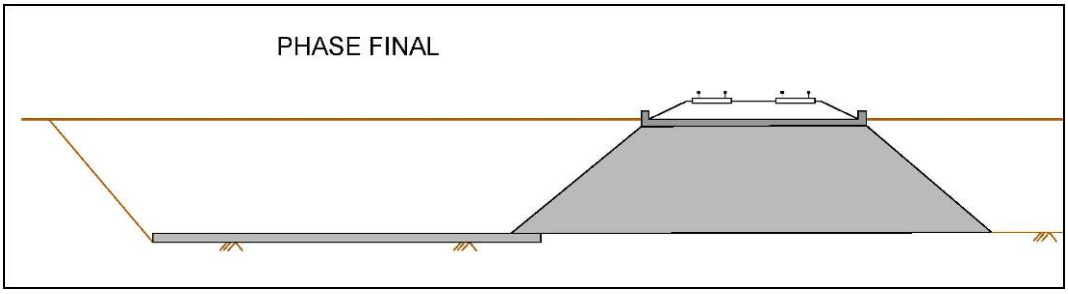




Phase 8: Material spreading between railway superstructure and box.



Phase final: Reshape the box to its final shape and landscape (Figure 23, 24 and 25).



Following pictures show several generic stages during works and the final result.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

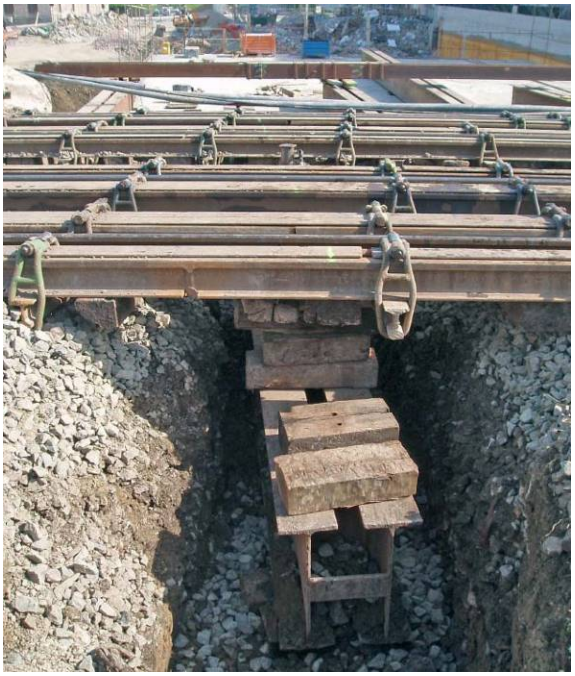


Figure 13

Figure 14

Figure 15

Figure 16

Figure 17

Figure 18

Figure 19

Figure 20

Figure 21

Figure 22

Figure 23

Figure 24

Figure 25

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS

APPENDIX C MICROPILES WALL UNDERCROSSING

December 2018

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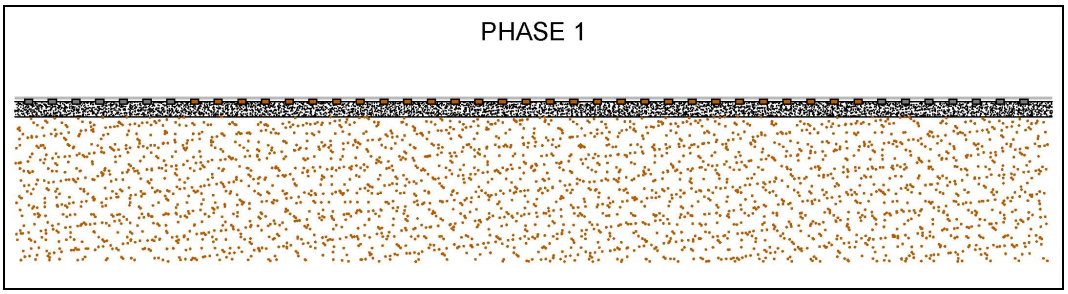
APPENDIX C MICROPILES WALL UNDERCROSSING

An alternative method to build an underpass without affecting the railway traffic is based on the execution of two groups of two parallel micropiles walls from the track. The object of these walls is to achieve two safe working places without needing a railway traffic cut for the execution of the lateral walls of the underpass. When the lateral walls are built, it is possible the positioning of the precast top slab during an extraordinary traffic-cut that may take time during a weekend time.

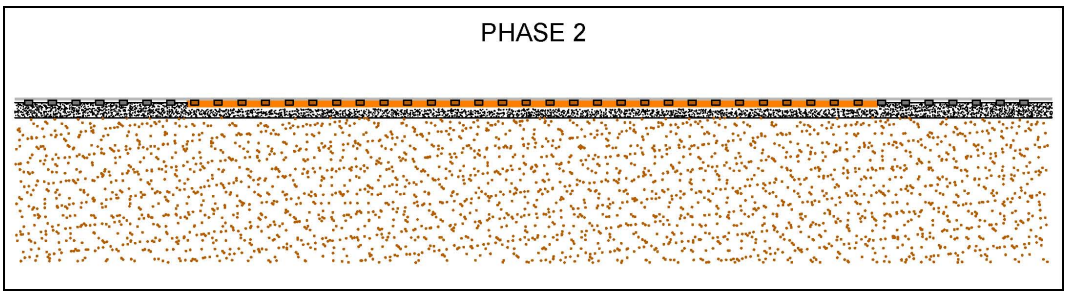
Working processes are:

Phase 0: Current situation

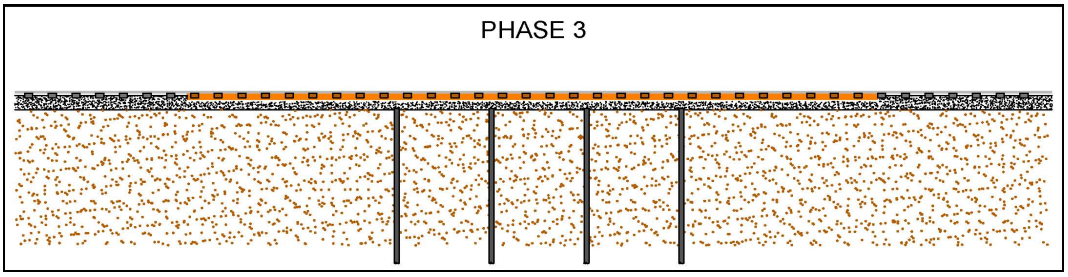
Phase 1. Replacement of the concrete sleepers for wooden sleepers. This activity will be carried out in a night traffic interruption period and when the railway traffic is restored a speed limit of 20 mph will be established.



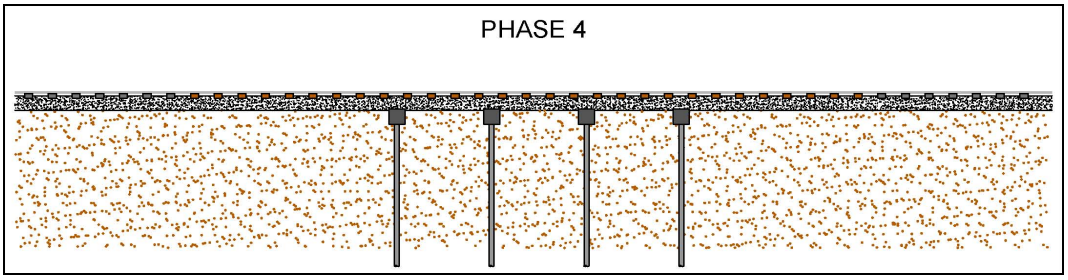
Phase 2: Track planking. In this phase, a track planking is placed in the space between rails. The aim is build a workable building surface for the micropile-driving equipment without disturbing the railway traffic and without affecting the existing rail track components. This activity will be carried out in a night traffic interruption period and when the railway traffic is restored a speed limit of 20 mph will be established.



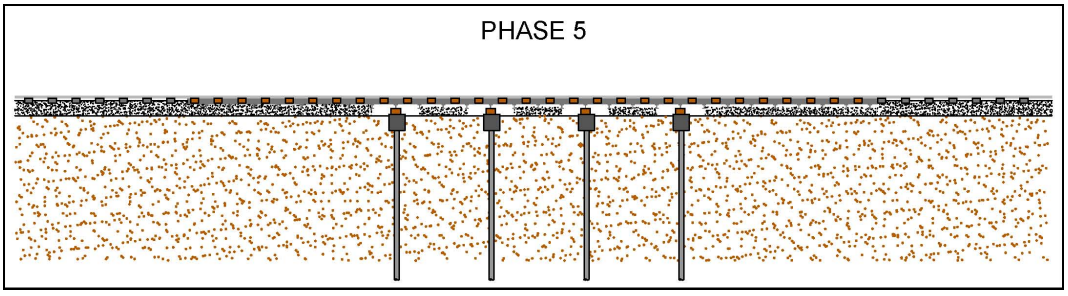
Phase 3: Construction of two groups of two micropiles retaining walls. Micropiles will be installed from the construction plank, through the ballast bed. Micropiles outside of safety area can be made when railway traffic is active. Micropiles inside of the safety area must be installed during a traffic interruption period and when the rail traffic is restored, a speed limit of 20-mph will remain in place.



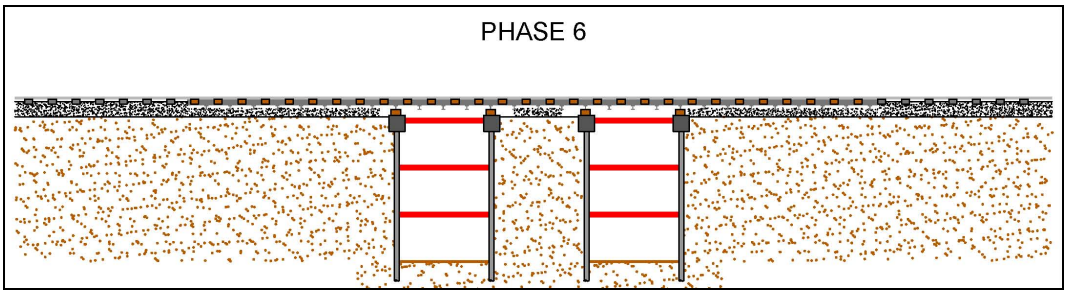
Phase 4: Building of cap beams between the micropiles. In this phase, it is necessary to remove some of the ballast for building the cap beams. This activity will be carried out during a night traffic interruption period and when the railway traffic is restored a speed limit of 20-mph will remain in place.



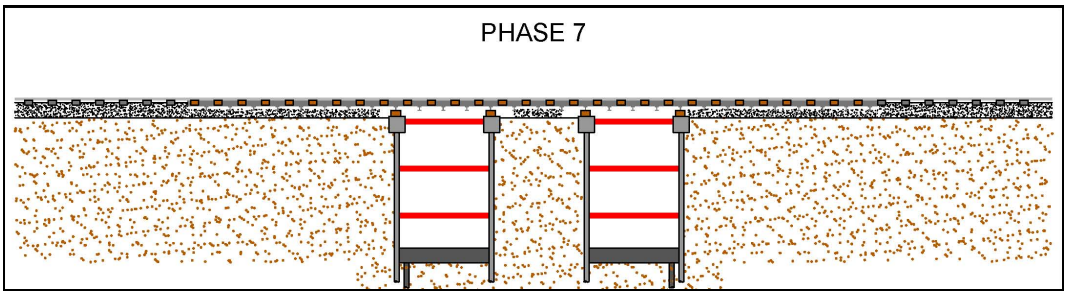
Phase 5: Reinforcing of the existing tracks. After the completion of the cap beams between the micropiles, the rails are reinforced by the grouping of rails. These groups of rails are supported over the cap beams. This reinforcement allows small segments of track to remain active without ballast (at maximum 6' section) but with restrictions in traffic speed. This activity will be carried out during a night traffic interruption period and when the railway traffic is restored a speed limit of 20 mph will remain in place.



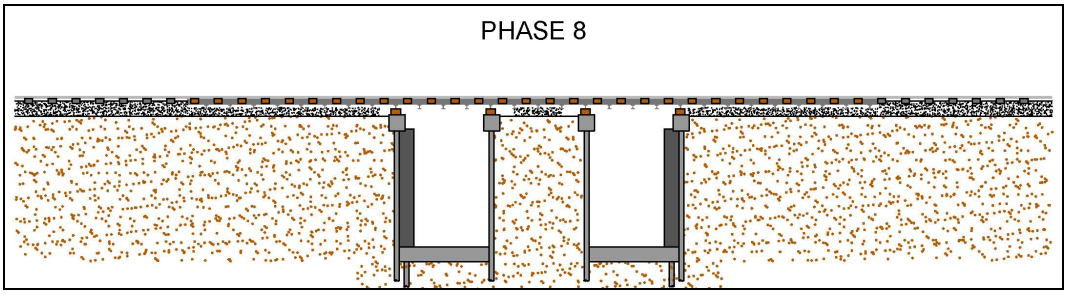
Phase 6: Excavation between retaining walls and positioning of provisional struts between retaining walls. This activity is compatible with railway traffic if safety measures are implemented. The 20-mph speed limit will remain in place.



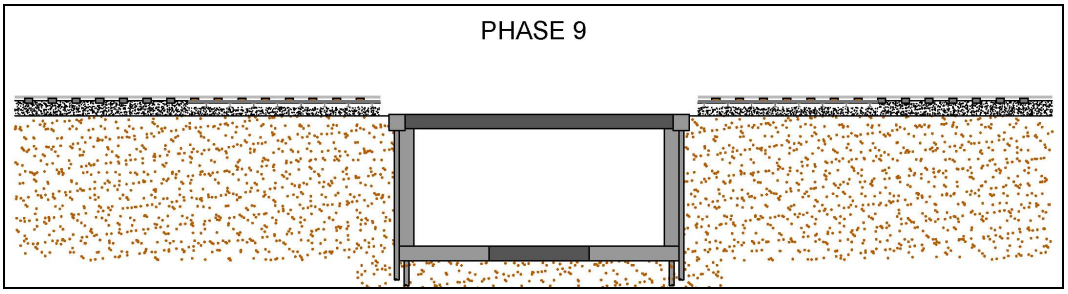
Phase 7: Partial construction of the underpass foundation slab. This activity is compatible with railway traffic if safety measures are implemented. The 20-mph speed limit will remain in place.



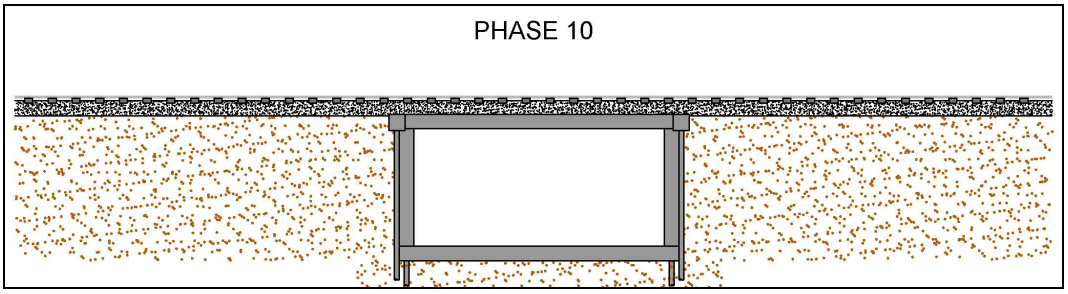
Phase 8: Erection of the underpass lateral walls. This activity is compatible with railway traffic if safety measures are implemented. The 20-mph speed limit will remain in place.



Phase 9: Track removal in the working area. Excavation of the soil between the lateral walls of the underpass. Completion of the foundation slab and positioning of the precast top slab of the underpass. This activity is incompatible with railway traffic, so it is necessary to make an extraordinary traffic-cut, anticipated to be a weekend closure.



Phase 10: Return tracks to their original state. This work must be made in a traffic interruption period. When this phase is finished, speed limits will be canceled.



CALIFORNIA HIGH SPEED TRAIN PROJECT

CONSTRUCTABILITY ANALYSIS

APPENDIX D. WILDLIFE CROSSING UNDER MONTEREY RD

December 2018

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APPENDIX D. WILDLIFE CROSSING UNDER MONTEREY RD

Index

1. WILDLIFE CROSSING UNDER MONTEREY RD 1

1. WILDLIFE CROSSING UNDER MONTEREY RD

One of the design alternatives of the HSR line between San Jose and Gilroy, uses the current corridor of the existing UPRR line. This corridor runs parallel to the Monterey Rd. The need to guarantee the transverse permeability of the future line, requires the execution of a series of wildlife crossings. These wildlife crossings will pass under the Monterey Rd and under the future HSR tracks.

The execution under the tracks will be carried out according to the dimensions of the construction element, by parts or following the methods proposed in Appendices B and C. The proposed methods for crossing under Monterey road are defined in the following appendix.

Monterey Rd is a road with 2 lanes per direction without a median. In order to maintain traffic, it is necessary to partially cut the road by reducing the traffic to a single lane or to make a temporary detour to maintain the capacity of the road. The choice of one system or another is given by the traffic intensity of the road and by the characteristics of the wildlife crossing (dimensions, precast concrete or executed on site). The proposed construction procedures are included below.

Wildlife crossings of exterior dimensions up to 10x10 ft.

In this case, for wildlife crossings with external dimensions up to 10x10 ft and with the hypothesis of a low traffic intensity. The most economic system is build the wildlife crossing by phases. Cutting a lane and placing the precast elements, once the elements are located it is possible reopening the lane of road.

The constructive phases of this process are:

1. Execution of the provisional detour of the road.
2. Excavation.
3. Concrete base.
4. Placing of the precast elements.
5. Fill.
6. Restitution of the road lane and signaling.
7. Opening of the road.

This process will be repeated as many times as necessary. The traffic detour will be adapted to the following scheme:

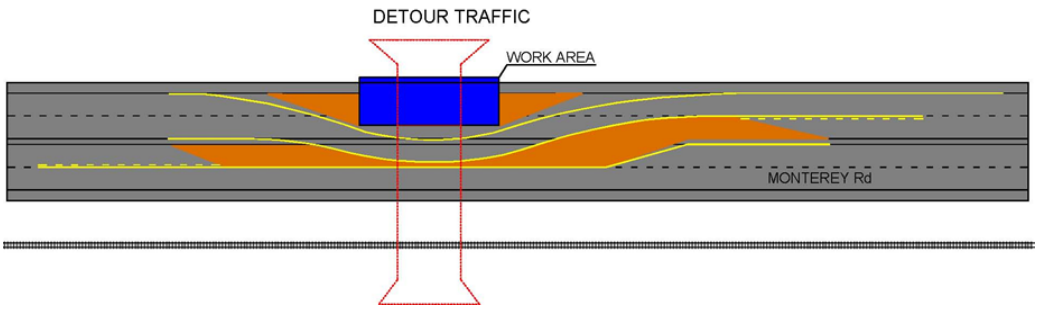

Figure 1. Detour traffic

The traffic detours will be adjusted to the progress of construction of the wildlife crossing. The direction of progress in the execution of the wildlife crossing will be from bottom to top to avoid problems with the accumulation of rainwater on the worksite.

For wildlife crossings of larger dimensions, the solution is complex. The solution to be adopted depends on multiple factors:

- Characteristics of the road. Widths, number of lanes.
- Traffic. The intensity of the traffic conditions the possibility of executing the temporary cut of one lane in each direction.
- Geotechnical characteristics of the soil.
- Height of the element to be built.
- Availability of land bordering the road for temporary detours

These factors will condition the constructive method. If it is possible to execute a traffic detour compatible with the excavation to execute, the best option is to excavate and execute the structure from bottom to top. In the case of not having enough space the alternatives go through the adoption of a constructive system that occupies the minimum. A system widely used in urban environments is known as Top-Down, the construction phases of this system are:

1. Partial cut of the road.
2. Execution of reinforced concrete diaphragm wall.
3. Execution of the upper slab.
4. Reopening the road.

These phases will be repeated the number of times necessary to form a top slab and continuous side walls. Once the upper slab of the wildlife crossing has been completed, there is no longer any impact on the Monterey Rd traffic. In order to complete the wildlife crossing the phases to be executed are the following:

5. Excavation under the upper slab
6. Execution of the lower slab

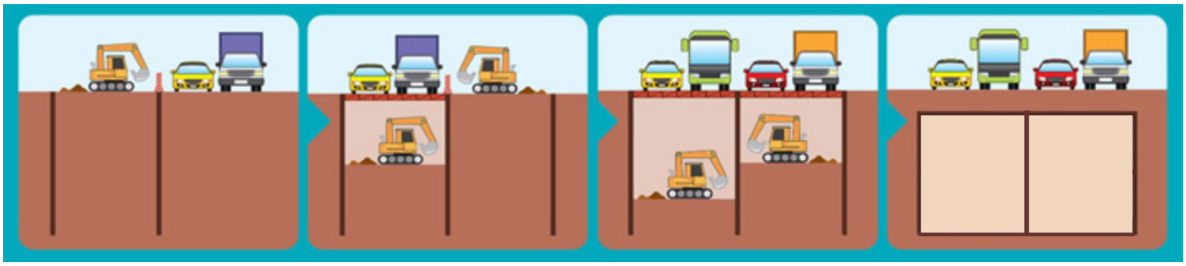

Figure 2. Top – Down Construction Phases

APPENDIX H: TRACK SHIFT WORKS

CALIFORNIA HIGH SPEED TRAIN PROJECT

CONSTRUCTABILITY ANALYSIS

APPENDIX E. GRADE CROSSING ANALYSIS

December 2018

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APPENDIX E. GRADE CROSSING ANALYSIS

Index

1. INTRODUCTION 1
2. DESCRIPTION OF EXISTING GRADE CROSSING 1
3. ACTIONS DURING THE WORKS 3
4. DESCRIPTION OF FINISHED GRADE CROSSING 4

1. INTRODUCTION

The existing rail corridor between the stations of San Jose and Gilroy has a semi-urban configuration that causes interference with the regulation of automobile traffic. Therefore, several structures are located that allow the passage to different levels, as well as grade crossings.

These grade crossing resolve intersections at the same level of the roads, both with minor roads, and streets with several lanes in each direction. Many of these grade crossing will remain in the final designed solution.

In this document, the execution methods are analyzed in such a way that the remodeling works of the grade crossing, the works of the railroad and the traffic through the grade crossing are compatible.

2. DESCRIPTION OF EXISTING GRADE CROSSING

The existing grade crossings are characterized by having the necessary elements that allow the circulation of railroads, vehicles and people, with adequate safety conditions.

Figure 1. General configuration of grade crossing

To allow the passage of vehicles on the road, a series of prefabricated concrete or metal plates are placed on the sleepers and level with the upper rail. Continuity is given to the resulting platform with concrete or asphalt, forming a continuous surface and adapting the access wedges.

Figure 2. Platform for vehicular passage on the tracks.

To condition the access to the grade crossing, they are equipped with the necessary safety systems, which vary according to the characteristics of the railway corridor and the roads.

In the case of major roads, there are automatic barriers, light and acoustic beacons, horizontal and vertical signage, as well as previous warnings to reduce the speed of vehicles.

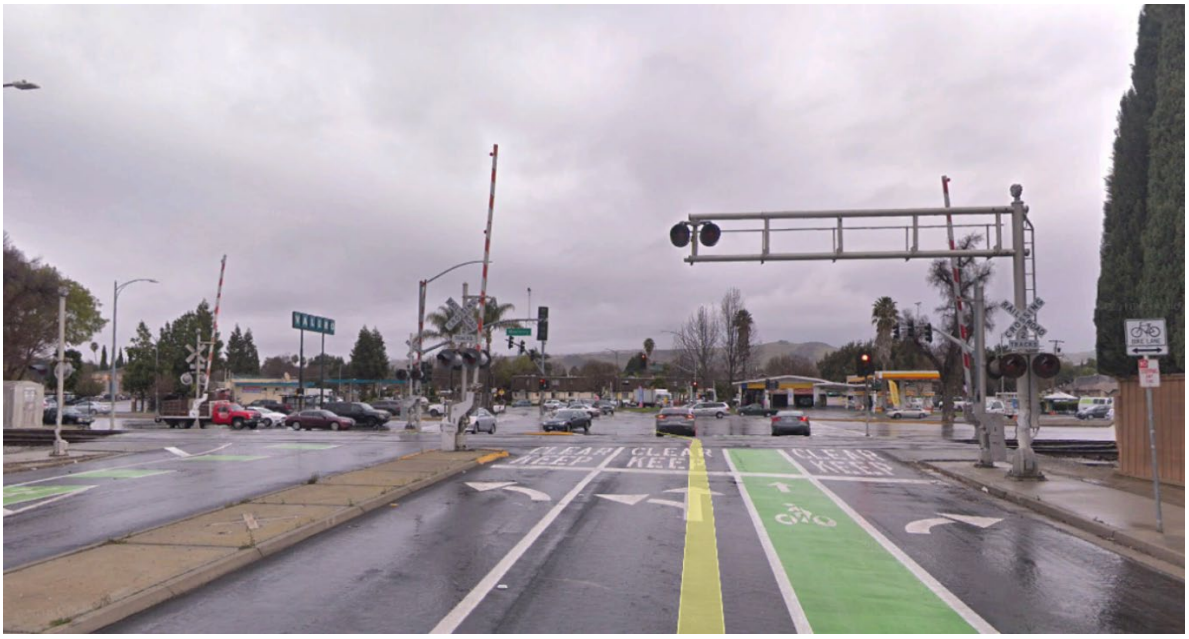

Figure 3. Access to grade crossing from urban road.

Figure 4. Access to grade crossing from non-urban road.

For pathways and roads of inferior characteristics, vertical signaling of warning and detention is placed.

3. ACTIONS DURING THE WORKS

The design of the new railway corridor contemplates the affection of the different grade crossing it intercepts. Various solutions are proposed, ranging from the remodeling of the existing crossing to the suppression of some of them.

The premise is to reduce to the minimum possible the interruption of the railway service as well as of vehicles and pedestrians, undertaking and coordinating the work as described below:

- Railway: In the case of track cuts, night work is planned during the week days, extending the period on weekends from Friday afternoon to Sunday night. In these periods of stoppage, as appropriate, proceed to:
    - Horizontal and vertical displacement of existing tracks.
    - Construction of new tracks.
    - Electrification conditioning.
    - Placement of plates to form the passage platform.
- Vehicles: The main traffic directions will be maintained, undertaking the necessary detours.
    - Signposting of the different detours according to the construction phases.

- Conditioning of the road platform in accordance with the new railway layout.

- Pedestrians: Special attention will be given to pedestrian traffic, not only by the traffic of trains and vehicles, also by the construction machinery.

4. DESCRIPTION OF FINISHED GRADE CROSSING

Both the level crossing and the accesses must remain fully operational once the works are completed, in such a way that the necessary movements of railway, vehicular and pedestrian traffic are allowed, always preserving their safety.

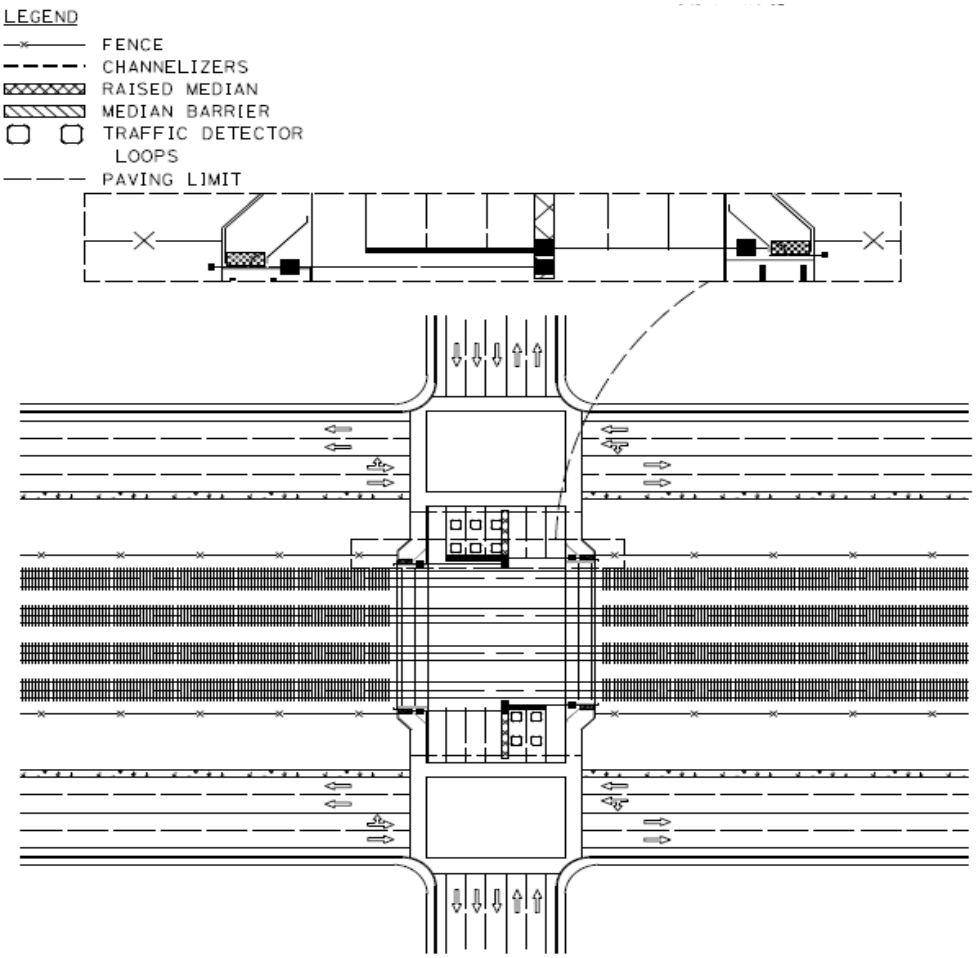

Figure 5. Scheme of grade crossing finished.

To this end, the whole of the intersection will be equipped, as the case may be, with:

- Railway corridor enclosure fence.
- Automatic barriers for the regulation of vehicle traffic.
- Loops under the pavement for the detection of vehicles in the accesses.

- Horizontal, vertical, luminous and acoustic signaling.
- Steel gates for pedestrians.

In those cases in which the existing grade crossing is suppressed, the necessary physical systems that impede the access of vehicles to the tracks will be available.

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS

APPENDIX F. ALTERNATIVE 4 CONSTRUCTABILITY ANALYSIS

December 2018

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APPENDIX F. ALTERNATIVE 4 CONSTRUCTABILITY ANALYSIS

Index

1. INTRODUCTION 1
2. BASELINE 2
3. INITIAL HYPOTHESIS 2
4. LAYOUT GENERAL DESCRIPTION 2
5. CONSTRUCTABILITY 3
5.1 Section Scott Boulevard - San Jose 4
5.2 San Jose Station 5
5.3 Section San Jose-CP Lick. 5
5.4 Section 315+00-785+00 6
5.5 Section 785+00-1265+00 7
5.6 Section 1265+00 to Gilroy Station 8
5.7 Section Gilroy Station 9
5.8 Section 1700+1922+00 10

1. INTRODUCTION

The Alternative 4 is a layout proposal between Scott Boulevard and Gilroy that is characterized by building on the existing UPRR Corridor to establish a new layout where two high speed and one UPRR tracks will go through.

The area in which this corridor is located presents a high urban density. The new railway layout will share the UPRR ROW. Generally the ROW is 60 ft. wide, space where the three tracks shall be accommodated. Due to the ROW limitation, and to avoid exceeding the current limits, the section adopted is usually located between walls.

The section type proposed has a width of 60 ft. This width will accommodate two tracks intended for high speed service (MT-2 and MT-3) and a third track aimed at maintaining the UPRR service (MT-1). Only the HSR tracks will be electrified.

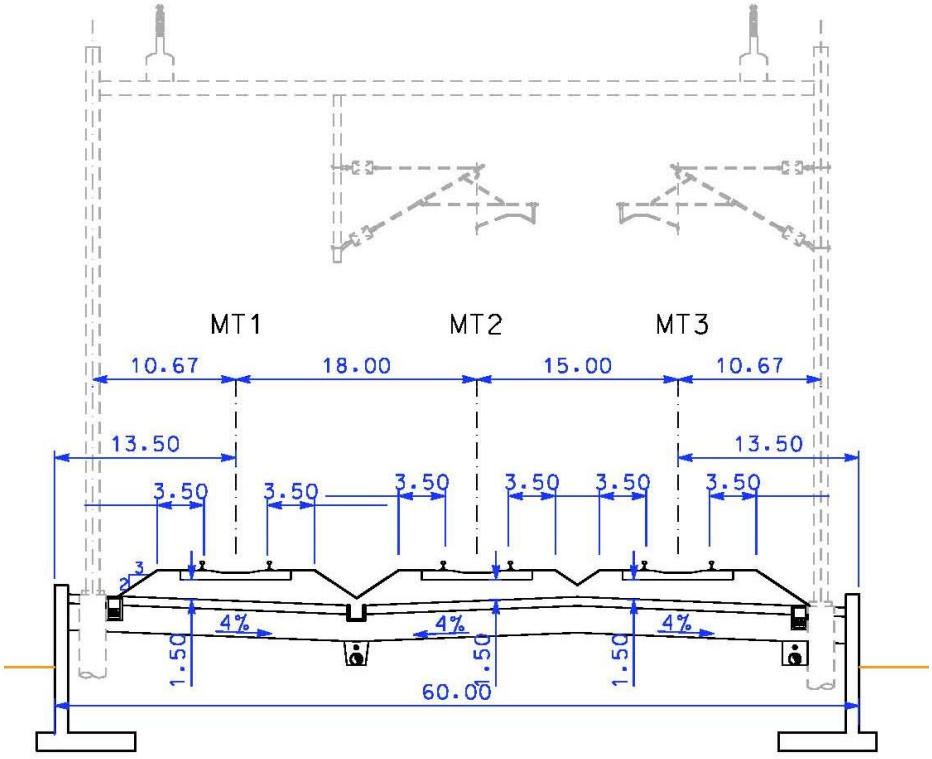

Figure 1. Typical section 60 ft.

2. BASELINE

Files used as baseline are listed below:

- Existing layout:
  - X-FJ-TT-ALGN-EXST-Caltrain-2016.dgn

    Information from this file is limited, it establishes the entire layout in the ground plan, but the profile is only available between Scott Boulevard and Tamien Station.
- Future layouts:
  - X-JM-TT-ALGN-PROP-ALT4-CPCST-CPLK.dgn
  - X-JM-TT-ALGN-PROP-ALT4-CPLK.dgn

    These files set axes MT-1, MT-2 and MT-3 in the ground plan. The profile of axis MT-3 is the only one established.

3. INITIAL HYPOTHESIS

Currently, the railway layout is not electrified, though the electrification of one of the tracks to CP Michael is foreseen in the near future. As baseline for the design solution, the section between Scott Boulevard and CP Michael will be assumed as electrified, all Caltrain tracks between and Scott and San Jose Station and only one track (right) between San Jose and CP Michael.

During works execution, at least one track will remain operational for passengers and freight.

Outage periods concerning track works will be determined following the same criteria as in San Francisco-San Jose corridor (PCEP, Caltrain).

The section between Scott and CP Lick will remain operational as long as possible, so the possibility of shifting the track will be studied. Concerning the section from CP Lick up to the end, the working hypothesis is to dismantle the existing tracks and place new ones.

4. LAYOUT GENERAL DESCRIPTION

As mentioned above, the new layout runs parallel to the UPRR line, sharing both the same corridor. The study begins on Scott Boulevard, near Santa Clara Station. Building on the existing tracks, it goes on to San Jose Station, where it adapts to high speed circulation conditions. Having passed San Jose, the layout is parallel to the UPRR double track to Tamien Station. An additional axis is designed for this area, located west (MT-3) to the

existing ones. Leaving Tamien Station, an area is included to ease parking and trains turnaround headed to San Jose.

The layout is parallel to Monterrey Rd from the Capitol Station to Morgan Hill. After passing Morgan Hill, the corridor is placed next to the road through Railroad Ave until it crosses Llagas Creek, where it becomes parallel again to Monterrey Rd to Gilroy. In Gilroy, the layout moves away from Monterrey Rd to the Station, which is adapted to high speed services through the placement of two 800 ft. platforms intended for high speed traffic and another two of 600 ft. for Caltrain.

From Gilroy Station, two UPRR axes are set, besides another two of high speed. These axes go in parallel building on the existing layout until the I-101 crossing. From the I-101 crossing, the high speed alignment is designed alone, through agricultural lands until it meets the line defined in Segment 9.

5. CONSTRUCTABILITY

For purposes of analyzing Alternative 4 Constructability, eight sections are distinguished:

WS 1. Section from Scott Boulevard to San Jose Station.
WS 2. Section San Jose Station.
WS 3. Section from San Jose Station to CP Lick.
WS 4. Section from CP Lick to 725+00.
WS 5. Section from 725+00 to 1265+00.
WS 6. Section from 1265+00 to Gilroy Station.
WS 7. Section Gilroy Station. 2027 Configuration
WS 8. Section 1700+00 to 1922+90. 2027 Configuration

The last two sections have been considered for 2027 configuration. In 2027, the HSR will be operational from San Jose to Gilroy. In this year the Gilroy MOWF will be connected to existing UPRR. The connection of Gilroy MOWF to HSR tracks will be executed in 2031.

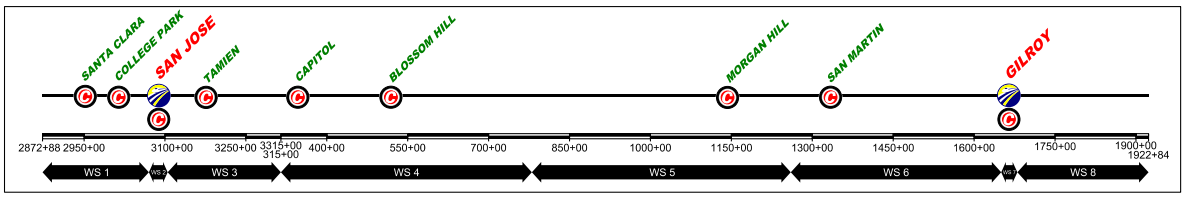

Figure 2. Works Sections scheme.

In parallel, a study of track shift works is being developed between Scott and CP Lick. The object of this analysis is to define susceptible areas of use without big adaptation works. This study analyzes lateral and vertical displacement between existing and future axis, areas of adaptation of existing OCS and actions on grade crossing and turnouts.

This section is marked by the presence of a series of wildlife transversal passages. The description of construction methods to be executed is presented in Appendices B, C and D.

It also stands out due to the maintenance of a large number of level crossings. These level crossings will be adjusted to the new tracks geometry. The description of construction methods to be executed is presented in Appendix E.

The appendix I show graphic information about construction phases for built the alternative 4. This appendix is divided in the segments indicated in this point. For each segment the appendix display plans, schemes, profile and sections organized by phases.

5.1 Section Scott Boulevard - San Jose

This section uses practically every existing track. Only a new UPRR track will be placed from the Caltrain workshops area to San Jose Station. The execution of a new track outside the existing ones requires a reconfiguration of the UPRR connection to tracks bound to Fremont.

In order to adapt the connectivity between the diverse existing tracks, the number of existing switch gears will increase.

This area currently has two Caltrain stations, Santa Clara and Collage Park. The first one remains unchanged, whereas, in the second one, the removal of existing platforms is foreseen as well as executing a single platform servicing track MT-3.

Initial assumptions in this area are that Caltrain tracks are electrified, whilst the rest aren't. Due to the high number of current tracks, electrification is supposed to be executed by using gantries.

Execution works consist in adapt the existing electrification systems in the first place, for the line to remain electrified during works and so it can be used later, in the future situation. These works will essentially consist in increasing the size of the current gantries so another axis can be added. Information on these works execution is described in Appendix A Electrification.

Once the electrification adaptation works are executed, a new UPRR axis will be placed in parallel to the existing ones.

New shifting gears will be installed in this area, and some of the current ones will be replaced by new gears. In order to install the new gears, and considering that tracks are in use, assembly systems proposed will allow to carry out a preassembly of the shifting gear in an assembling facility at an early stage to subsequently move it to its definitive location through special railway machinery. Once the gear is installed in its definitive position, the electrification system will need to be adapted. These works are generally executed in extraordinary outage periods, at night or on a weekend.

5.2 San Jose Station

Changes on San Jose Station aim at extending the available length of the platform. For this reason, east and west station heads will be modified. Works have been foreseen in such a way as that at least one platform remains in use.

East station head presents grater changes that the west one, since besides the head modification, including a double crossover is also foreseen. This double crossover must be executed on a weekend, during which the connection to Campbell will be closed to the traffic.

5.3 Section San Jose-CP Lick.

This section is characterized by its complexity. Having passed San Jose Station and up to Tamien Station, a new axis will be placed west of the existing ones. The execution of this new axis requires building a series of parallel structures to the current ones.

Currently, CP Lick layout has two tracks. As initial assumption it's been established that the right track until CP Michael is electrified.

This section shows an Station in Tamien that also has a series of siding tracks to facilitate rebound to San-Jose.

The introduction of a new axis is foreseen in the future to provide the layout with a (left) axis for UPRR only, and two axis (central and right) for the high-speed and Caltrain lines.

A significant part of the layout is based on the existing horizontal alignment, so it is partially usable. The degree of utilization is analyzed in parallel with Appendix G Track Shift Works Scott to CP Lick.

The studied section is divided in three distinct areas. A first area to the Tamien Station, the second one from Tamien Station to crossing with HWY-87 and a last area from HWY-87 to CP-Lick.

The first area builds partially on the current layout, and a parallel track will be executed on the right side of the existing tracks. The execution of this parallel track requires developing a series of structures parallel to the current track, except for those structures crossing over Bird Ave and Delmas Ave which will be demolished in order to build the definite ones. The execution of these structures will be phased to avoid closing the line.

The section between Tamien Station and the HWY-87 undercrossing currently has several siding tracks of both UPRR and Caltrain types. These tracks will be rearranged in the future creating a UPRR set of tracks around track MT-1. Between tracks MT-2 and MT-3 two siding tracks will be installed aiming at facilitating trains rebound to San Jose. **The constructability analysis has kept at least four rebound tracks in all intermediate stages.**

The final part of the section is marked by the tracks increase from two to three. The left track will be used for the execution. A new track is built on the right and the central one is carried out building on the displacement of the existing right track. Tamien Station platforms will not be affected.

As pointed earlier, the track side is electrified until CP Michael. According to work stages required to execute the tracks assembly in their definitive position, it will be necessary to execute a provisional assembly of an electrification system of the existing left track. Poles position must be compatible with the definitive position of track MT-1. Provisional electrification will be dismantled in the set of tracks location area around MT-1.

5.4 Section 315+00-785+00

This section runs from CP Lick to crossing with Bayley Rd. Almost the whole section runs in a double track. It contains the Capitol and Blossom Hill Stations, both with platforms currently on the left track. This section runs in parallel to Monterey Rd.

For the execution it is assumed that at least one track must remain operational. That's why, construction phases are based on the idea of constructing all possible track sections located on the left side of the current compatible tracks.

Once tracks on the left are executed, service will only be restored through the current left track, which allows to dismantle the right side and start the execution works of the future right track. During this phase, the definitive platforms right half on Capitol and Blossom Hill Stations will be executed.

Once the right track is installed, traffic can be restored. Thus, the left track can be dismantled and executing the rest of MT-1 and MT-2 track sections. Platforms will be finished at this stage.

The singularity of this section is its three wildlife passages. These passages are marked by being transversal works to the alignment, crossing the existing track and Monterey Rd.

From the point of view of railway traffic alterations it is planned to divide works execution in two phases, ensuring railway traffic. Planned methods for works execution are shown in Appendixes B and C.

Monterey Rd. underpass presents a greater complexity. Monterey Rd. is a two-lane road in each direction so, to secure traffic, a part of the road must be closed reducing traffic to a single lane or a temporary detour must be built in order to maintain the road capacity. Choosing one or another system will be established by the road traffic intensity and the wildlife underpass characteristics (dimensions, prefabricated or executed on site). Proposed construction procedures are included in Appendix D.

In case of track transversal crossings, Appendix D describes different execution methods of transversal crossings under circulation roads. In our case, the best method is to divide execution in several parts, since planned construction phases considered keeping one line in use.

5.5 Section 785+00-1265+00

This section is characterized by running in an almost completely single road, only one track section at the end is double, from San Pedro Ave. crossing. In this section covers Morgan Hill Station.

It can be transversely crossed through eight level passages and it overpasses Monterey Rd, as well as Fisher Creek and Little Llagas Creek courses.

Track runs on the right of Monterey Rd until their cross with San Pedro Ave, the railway layout runs on the right side of Railroad Ave.

Over time, the section will have three tracks in its entire length and will be crossed by 5 wildlife passages.

Construction phases are based on installing the left track in the area occupied by the single track. The extension of Morgan Hill Station platforms will be carried out in this phase, as well as works of those wildlife passages that do not affect the operational track.

The structure over Monterey Rd will also be executed which will accommodate track MT-1.

Next phase establishes a provisional connection, after leaving behind Morgan Hill Station between the new track MT-1, executed during the previous phase, and the right track of the existing double track section. After entry into service these tracks, the dismantling of the non-operational track follows, particularly the structure over Monterey Rd.

During phase three, tracks MT-2 and MT-3 are executed to San Pedro Ave, and track MT-3 from San Pedro Ave right up to the end. Morgan Hill right platform will also be executed in this phase.

Provisional connection of track MT-1 with track MT-3 is performed in phase four in San Pedro Ave surroundings. Once done, traffic will be restored on this continuous axis. When the line is in operation, the existing left track is dismantled from San Pedro Ave up to the end, and tracks MT-1 and MT-2 to San Pedro Ave. The structure of tracks MT-2 and MT-3 over Monterey Rd. will also be executed in this phase.

Phase five provides continuity to track MT-3 by restoring this track traffic, and also proceeds to execute tracks MT-1 and MT-2 in their final section, from San Pedro Ave.

All information regarding wildlife passages explained in the previous section is applicable to this one.

5.6 Section 1265+00 to Gilroy Station

This section runs entirely in a single track, except for a little part at the beginning. It has one station (San Martin Station), and the most singular point is the passage over Llagas Creek. It is marked by the elevated number of grade crossings.

Construction phases are conditioned by the Llagas Creek overpassage. Currently, crossing is carried out through a single track bridge. The future layout improves its existing geometry and rises the future grade elevation in the crossing point on Llagas Creek, so the existing structures must be demolished.

The first phase of the construction process raises the left track of the section and carries out the first stage of the structure over Llagas Creek as well as the embankment–structure transitions. In this area temporary earth support systems will be used to prevent the operational track to be filled by earth moving slides of the new track MT-3.

The second phase firstly executes provisional connections of the installed track MT-3 with the current track in the Llagas Creek surroundings, which is put in service. Subsequently, the previously operational track is removed and the existing structure over Llagas Creek is demolished. This phase is completed by the execution of the entire MT-1 axis that involves developing another part of the structure over Llagas Creek.

In phase three the rail traffic is moved to the MT-1 axis. Having a provisional platform available is required to maintain in service San Martin Station. This phase ends by removing the entire existing track that is no longer operational.

The fourth phase maintains the traffic in track MT-1. Tracks MT-2 and MT-3 are executed in this phase together with the San Martin Station platform between tracks MT-2 and MT-3. The structure over Llagas Creek is completed in this phase.

Phase five puts all tracks into service. Works to be executed are the dismantling of the provisional platform and the execution of a footbridge giving access to platforms, since it is placed in an area occupied by the provisional platform.

5.7 Section Gilroy Station

Gilroy Station section covers the area affected by the execution of the Gilroy Station. The analysis is conducted for the 2027 configuration. This configuration is the same as the definitive configuration except for the high-speed connection to Merced.

At present, Gilroy Station has only one passengers platform. Next to the platform there is a series of tracks to rebound to San Jose. The UPRR track arrives from Watsonville at the Gilroy Station in a single track where there is a siding track.

In the definitive situation, Gilroy Station has two high-speed platforms located outside tracks MT-2 and MT-3, and another two platforms for Caltrain circulations in two MT-2 and MT-3 siding tracks. Track MT-1, used by UPRR is doubled from the Gilroy Station. Additionally, there is a set of three tracks intended for Caltrain trains stabling.

In the definitive configuration, the UPRR track duplication and the high-speed connection to Merced are both finished.

Phasing execution in this section enables to maintain the connection service with San Jose and with the UPRR track to Watsonville throughout all phases stages.

In phase 1 all tracks not affecting the existing tracks are executed. Tracks MT-1 and MT-2 to Gilroy, UPRR tracks from Gilroy and siding tracks on the right side of track MT-3.

In phase 2, one of the UPRR tracks and two of the Gilroy rebound tracks are dismantled.

In phase 3, Caltrain and high-speed left platforms are executed as well as their corresponding tracks.

In phase 4, track MT-1 is continued by shifting the existing track. This phase will be carried out during an extraordinary outage period of the UPRR track.

In phase 5, tracks MT-1 and MT-2 are put into service. All existing tracks are dismantled except for an initial section where connection with track MT-2 is located.

In phase 6, the entirety of tracks is finished with the exception of the coincident section with the initial section of the existing track. A temporary connection of new and existing UPRR tracks is put in place.

In phase 7, traffic circulation runs on tracks MT-1 and MT-3. The initial section that hadn't been dismantled will in this phase be removed.

Phase 8 finishes track MT-2.

In the future, the connection with Merced will be performed by prolonging axis MT-2 and MT-3.

5.8 Section 1700+1922+00

It corresponds to the execution of a regular track section on embankment, highlighting the presence of the Gilroy maintenance facility. This facility will enter into service before the segment from Gilroy to Merced. During this time period, access to the facility will only be possible from the UPRR line bound for Gilroy, so it will be necessary to define two constructive solutions to allow access to the maintenance facility in the two temporary scenarios.

2027 configuration: Connection of the existing UPRR track with the MOWF. In this case, works consist in connecting the current UPRR to Hollister together with the maintenance facility:

- It is adapted to the grade alignment of the current UPRR track, so to install a switch gear to gain the facility, in the road environment of Bloomfield Rd. Planet's configuration remains. This phase must be performed during a special outage period since the only existing track could be affected.
- Construction of tracks and MOWF.

2031 configuration: Connection of the new high speed infrastructure with the existing MOWF. This scenario requires the execution of a track detour to Hollister, as existing high speed design may be affected:

- Restoration of the UPRR track to Hollister in the area of the junction and the high speed tracks by means of a newly designed branch.
- Connection of new branch with the UPRR track in both ends, during a single extraordinary outage period.

- This detour allows building without interference the high speed corridor and the access branch to MOWF. Two metallic structures prevent the disruption between the high speed tracks and the access branch, with UPRR to Watsonville and the new layout to Hollister.

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS

APPENDIX G. TRACK SHIFT WORKS SCOTT BOULEVARD TO CP LICK.

December 2018

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APPENDIX G. TRACK SHIFT WORKS SCOTT BOULEVARD TO CP LICK

Index

1. ACTIONS ON THE SCOTT BOULEVARD TO CP LICK SECTION. 1

1. ACTIONS ON THE SCOTT BOULEVARD TO CP LICK SECTION.

The section studied, between Scott Boulevard to CP Lick, presents two zones clearly differentiated by their current and future features.

The first of them covers from Scott Boulevard to San Jose station, which takes advantage of the current configuration of tracks in this area, where the station of Santa Clara, College Park and the Caltrain workshops are located. The works planned for the adaptation of the corridor to the high speed consist mainly in horizontal and vertical adjustments of the existing infrastructure.

The second zone includes from San Jose station to CP Lick. In this section, in which the Tamien station is located, a third track has been designed to the right of the current ones. Horizontal and vertical displacements of the track, of greater magnitude than the previous section, are expected in the works on this area.

Initial Hypothesis

For design the proposed solution, the files used as baseline are listed below:

- Existing layout:
  - X-FJ-TT-ALGN-EXST-Caltrain-2016.dgn.
- Existing geometry:
  - TT-existing-2016.alg. This file set axes MT-1 and MT-2 in the ground plan. The profile of axis MT-1 is the only one established.

Information from this file is limited, it establishes the entire layout in the ground plan, but the profile is only available between Scott and CP Lick.

- Future layouts:
  - X-JM-TT-ALGN-PROP-ALT4-CPCST-CPLK.dgn
- Future geometry:
  - Alt4-CPCST-CPLK.alg. This file set axes MT-0, MT-1, MT-2 and MT-3 in the ground plan. The profiles of axis MT-1 and MT-3 are established.

The collection of construction drawings that accompanies this document shows graphically the different degrees of impact to main tracks in the Scott Boulevard to CP Lick corridor. In them, the scope of the adaptation work for horizontal and vertical layout, turnouts, stations and at-grade crossings is shown.

The distance between existing and proposed tracks is shown on the drawings organized by tracks. The tracks analyzed are:

- College Park Station - San Jose Station. MT-0 new track.
- San Jose to CP Lick. MT-1, MT-2 y MT-3 tracks.

The track shift work analyses is completed with the first three segments of construction phases. From these construction phases is possible establish the action over tracks:

- Displace the existing tracks
- Build new tracks

These actions are shown on the track shift works drawings (JM-CV-I6SSC-TSW). Its used different color to distinguish between both solutions.

The range of track displacements is show with different color. The construction method to use is according to value of displacement. The description of construction methods is show in the General Considerations for Track Works. Point 3.1: *Actions in the horizontal layout*.

The actions in the **longitudinal profile** have been classified by whether the track is raised or lowered. The document General Considerations for Track Works point 3.2 *Actions in elevation* shows the range of vertical displacements. According to vertical displacement this document indicates the construction method to use. The construction methods vary from profile adjust by tamping to rebuild entire section. The range of vertical displacement is show in track shift works drawings.

The initial hypothesis considers that the electrification system to be installed by Caltrain will be executed with catenary posts. This system is not compatible with the proposed final solution because the final solution is proposed with gantries. Therefore, the removal of poles and the installation of a new electrification system executed by gantries has been contemplated.

Due to the number of stations and diversions existing along the track, impacts to the existing **track turnouts** is significant. Changes to turnouts can be classified as those that will remain on the track but that will be adjusted in their horizontal and vertical position, those that will be dismantled and the installation of new turnouts.

All the adjustments that have to do with the turnouts will be carried out in parallel with the actions on the track where it is located. Generally, the actions in turnouts are made during the weekend, since these operations are complex and if any adversity occurs there is more time available to solve it.

There is a large number of turnouts where profile changes are required. The major changes in the horizontal plane are associated with the disassembly and assembly of new turnouts.

LEGEND

- CALTRAIN PLATFORM
- HSR PLATFORM
- MT-0
- MT-1
- MT-2
- MT-3
- SIDING TRACK
- OVERHEAD BRIDGE
- MAJOR UNDERPASS
- CREEK UNDERPASS
- TUNNEL
- GRADE CROSSING

LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS

- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

PROFILE

- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

CONSTRUCTION PHASES AFECTION

- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACK CONSIDERED

ANALYSIS OF SPECIAL EQUIPMENT

- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

GRADE CROSSING TREATMENT

- ADAPT
- USABLE

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

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CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
LEGEND

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 13

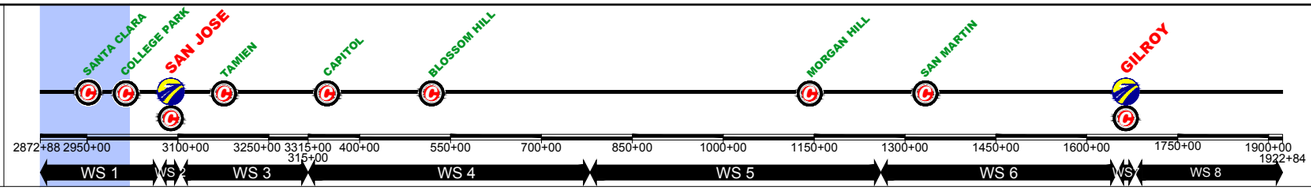
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

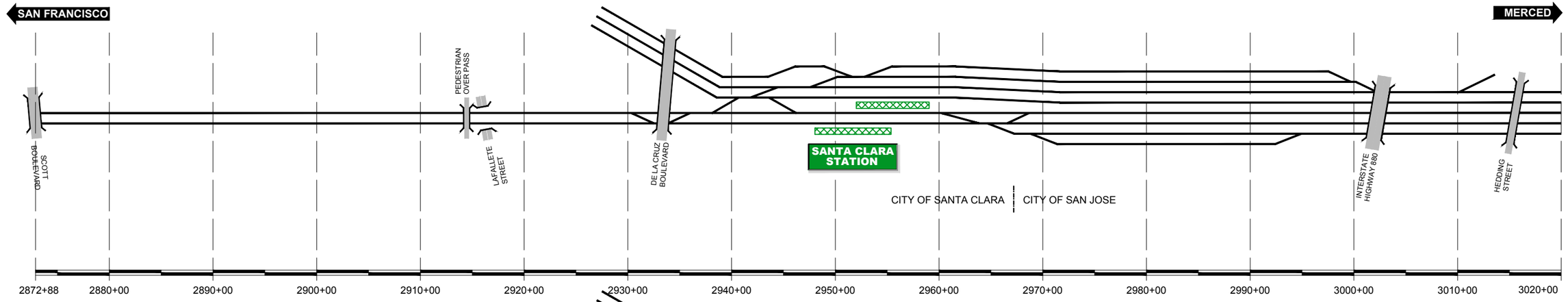
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

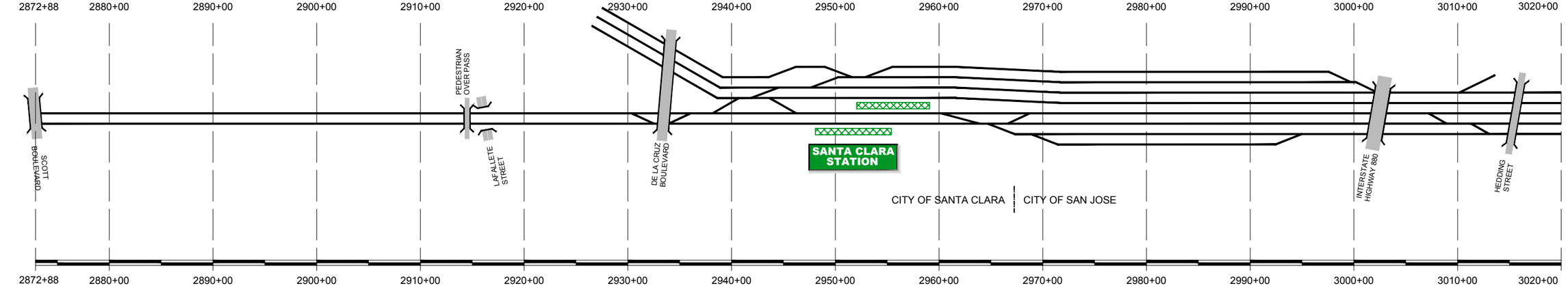
GRADE CROSSING TREATMENT
- ADAPT
- USABLE



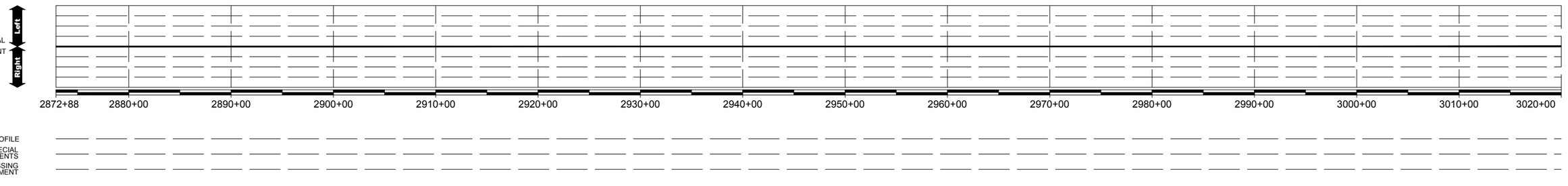
EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



MT-0



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SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-0

CONTRACT NO.
DRAWING NO. CV-16SSC-TSW-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 13

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

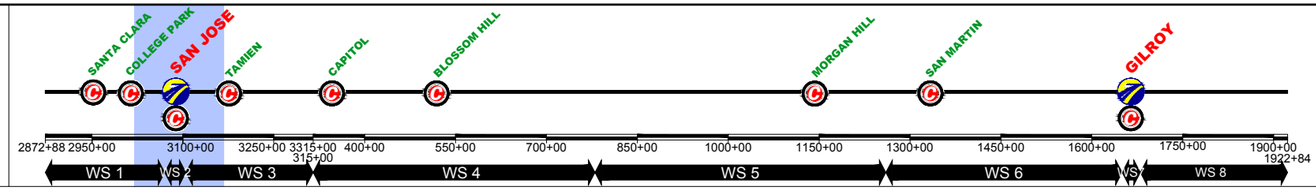
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

GRADE CROSSING TREATMENT
- ADAPT
- USABLE



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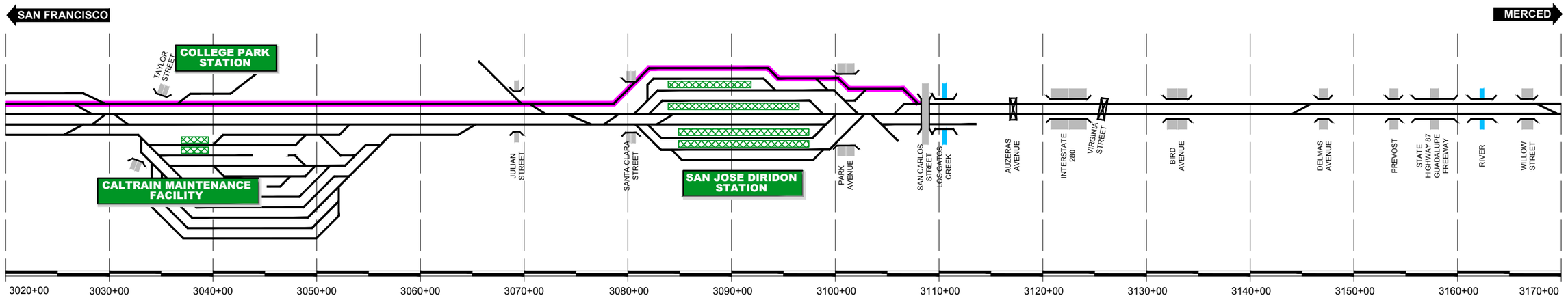
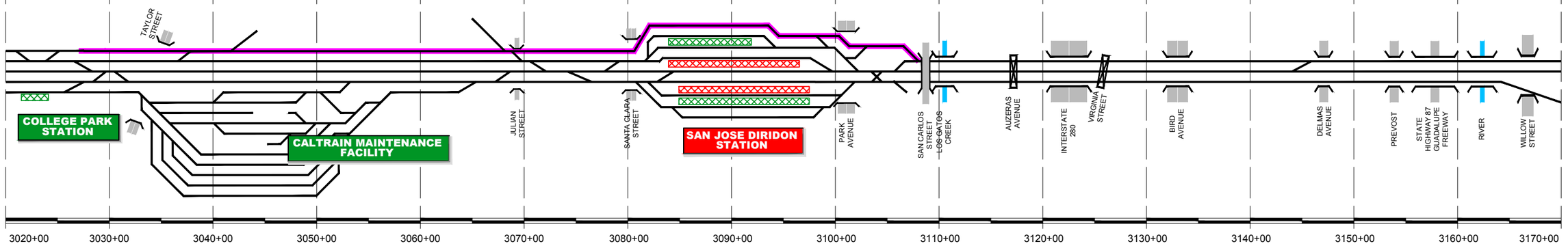
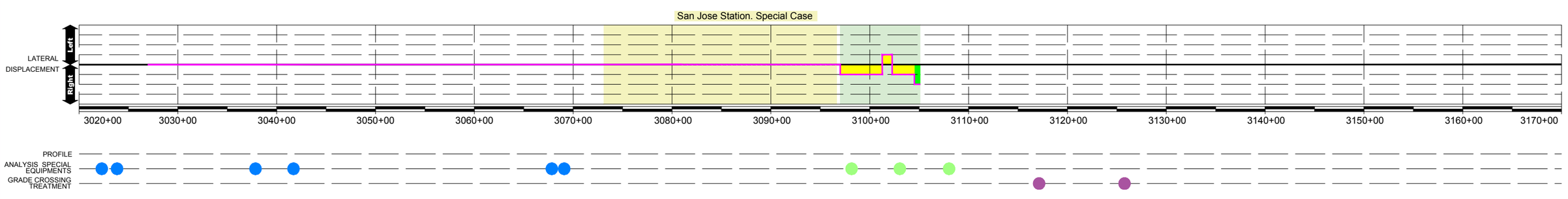


PROPOSED SCOTT TO CP LICK SCHEME



MT-0



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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-0

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 13

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

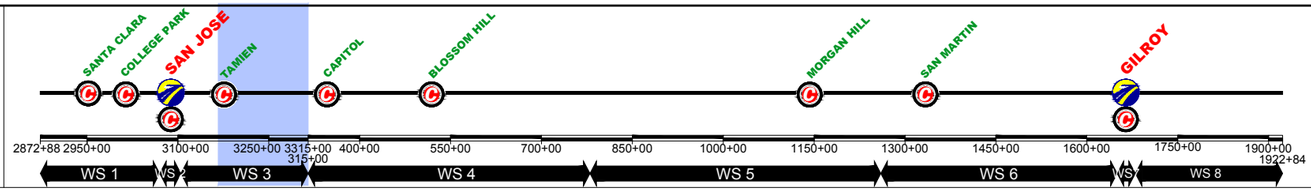
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

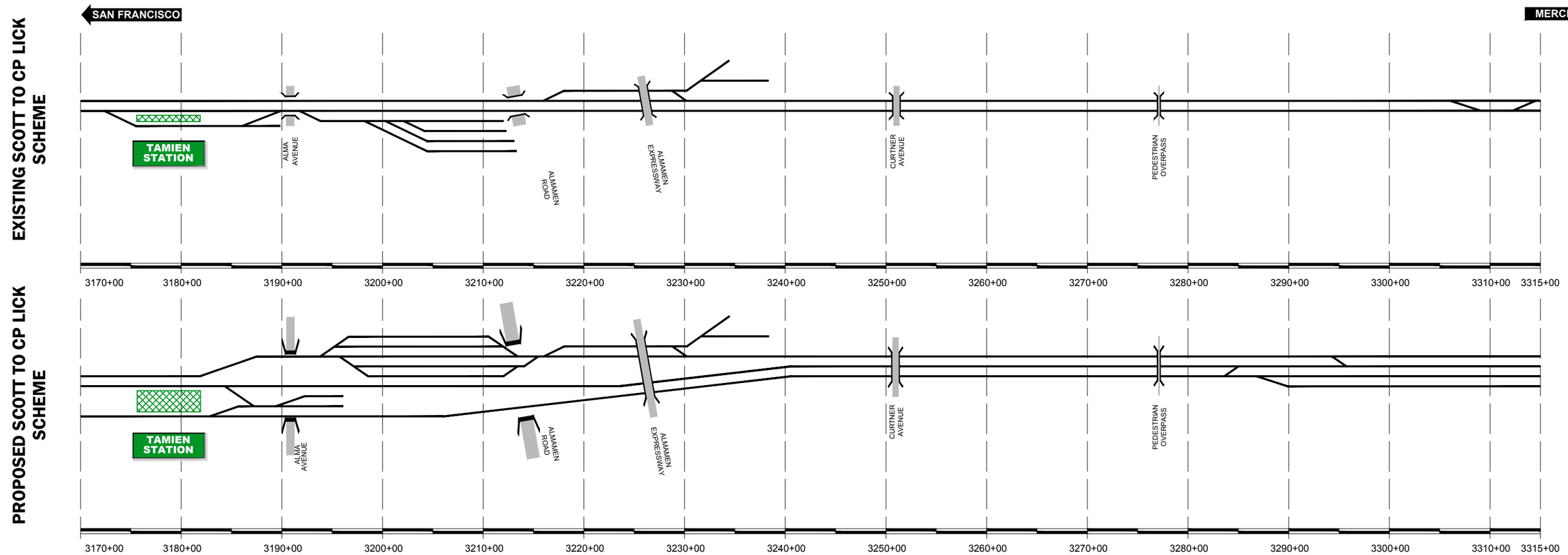
CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

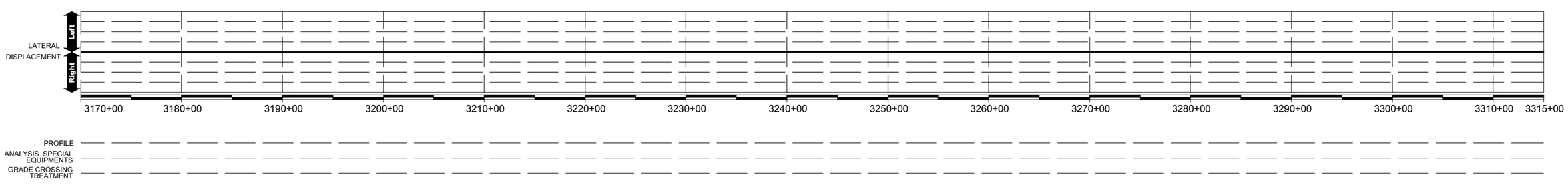
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

GRADE CROSSING TREATMENT
- ADAPT
- USABLE







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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-0

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-04
SCALE NOT TO SCALE
SHEET NO. 4 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

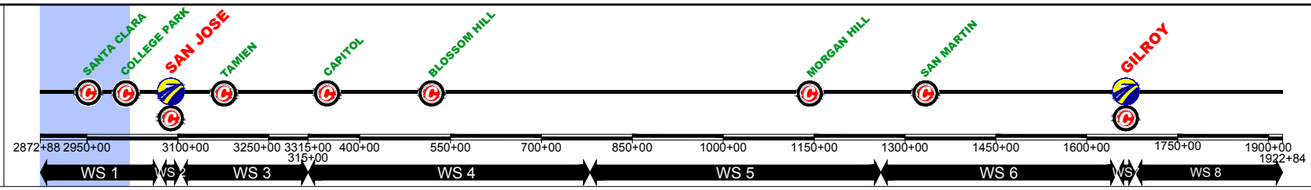
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

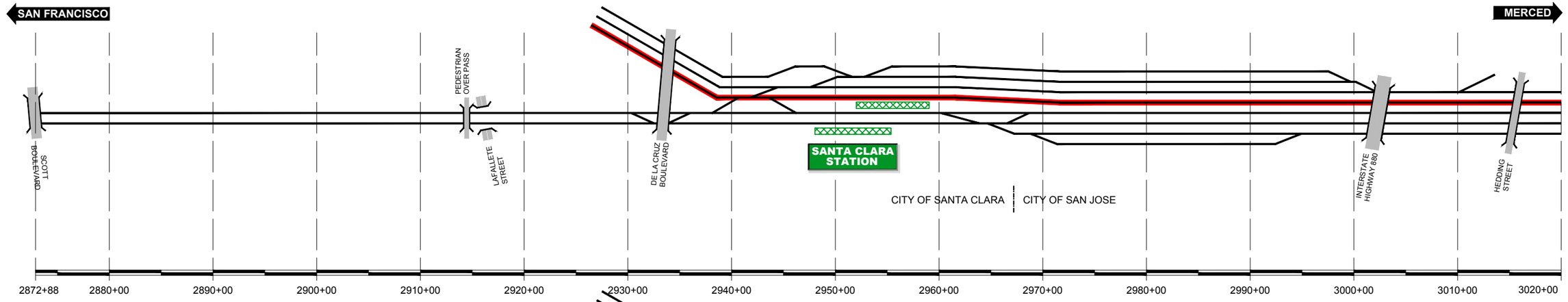
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

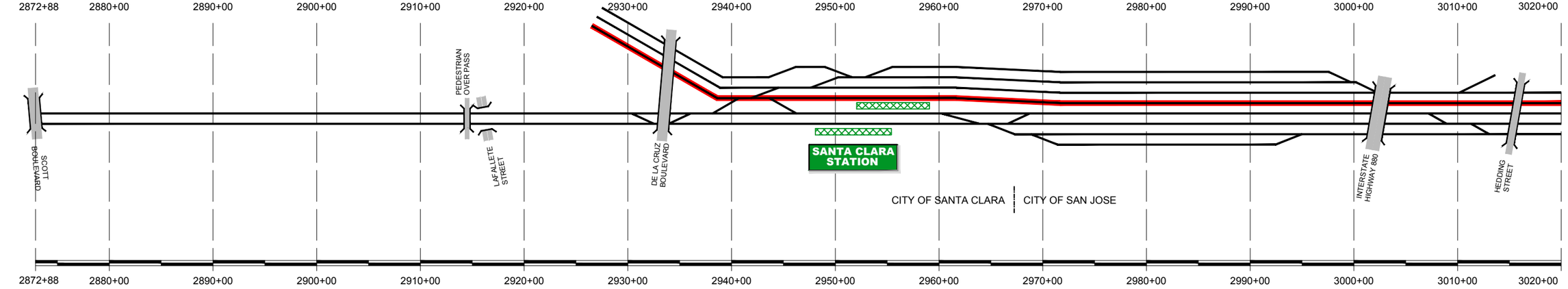
GRADE CROSSING TREATMENT
- ADAPT
- USABLE



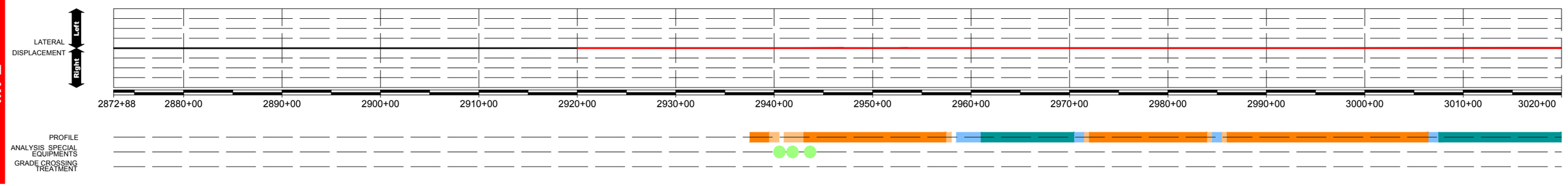
EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



MT-1



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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-1

CONTRACT NO.
DRAWING NO. CV-16SSC-TSW-05
SCALE NOT TO SCALE
SHEET NO. 5 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

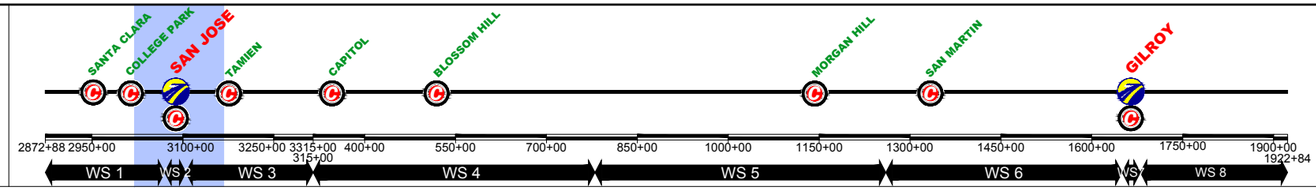
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

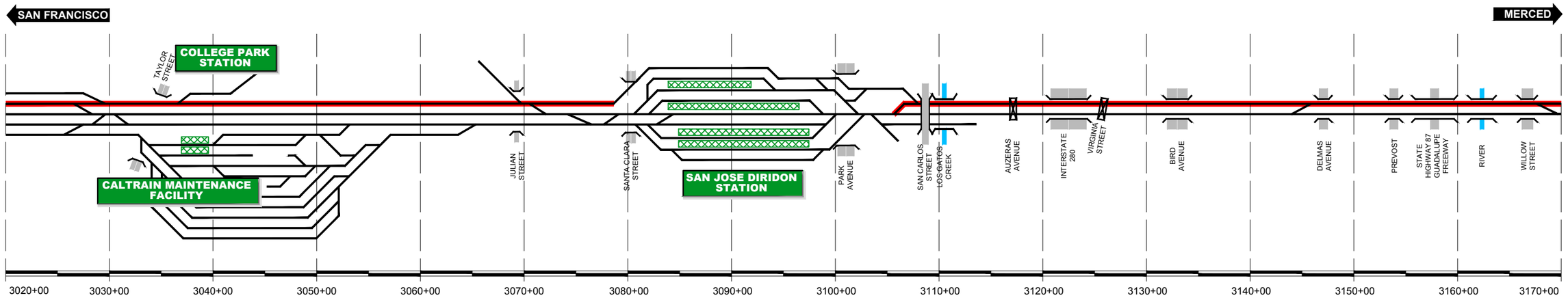
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

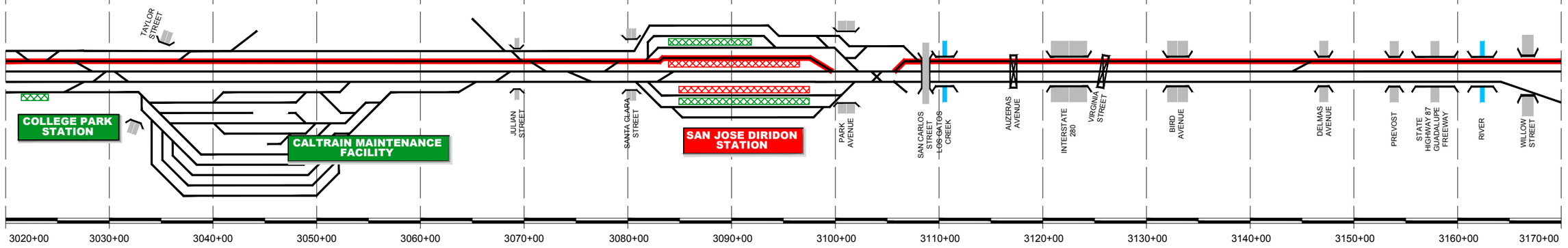
GRADE CROSSING TREATMENT
- ADAPT
- USABLE



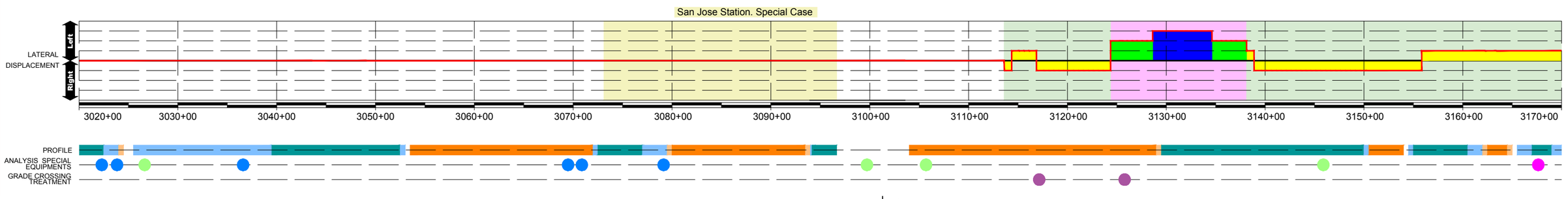
EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



MT-1



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SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-1

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-06
SCALE NOT TO SCALE
SHEET NO. 6 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS

- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION

- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

PROFILE

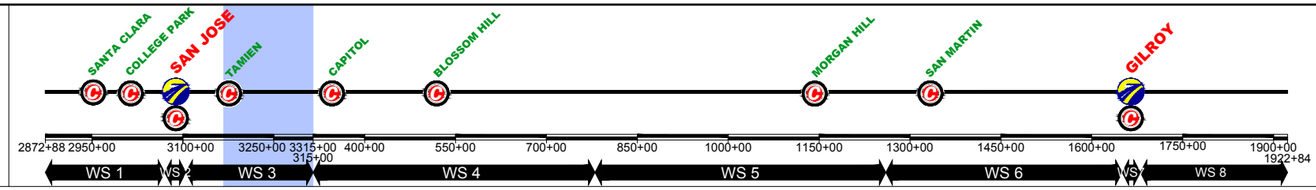
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

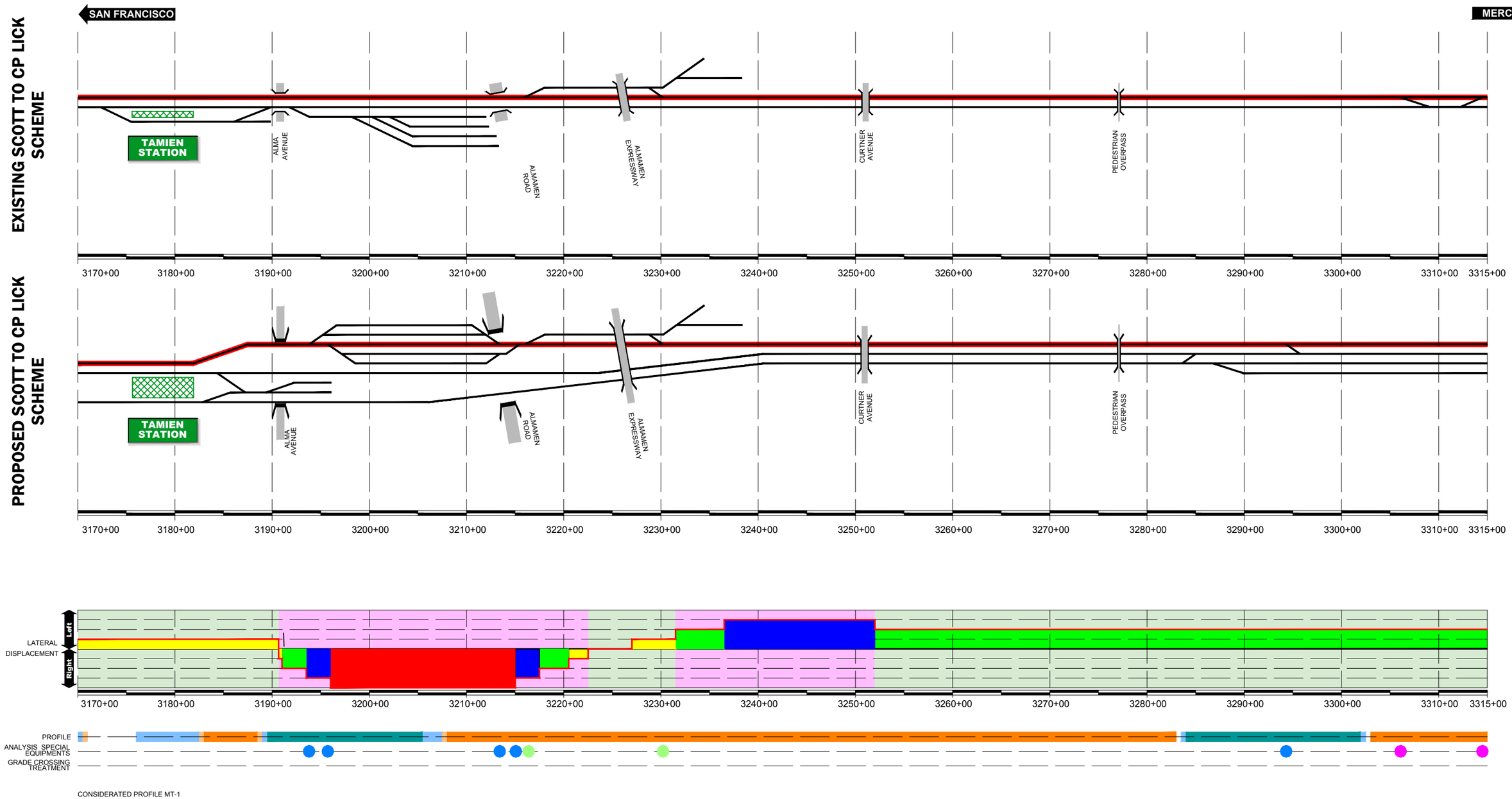
ANALYSIS OF SPECIAL EQUIPMENT

- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

GRADE CROSSING TREATMENT

- ADAPT
- USABLE





CONSIDERATED PROFILE MT-1

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CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-1

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-07
SCALE NOT TO SCALE
SHEET NO. 7 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

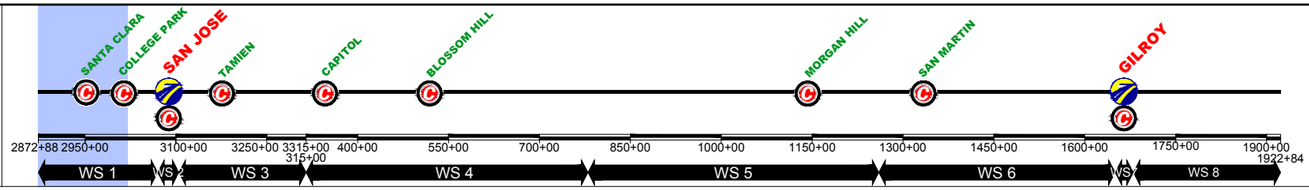
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

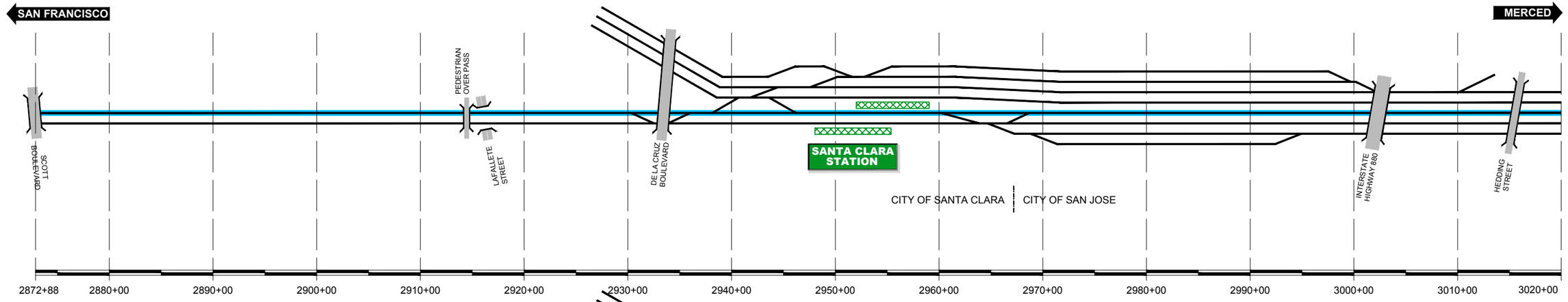
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

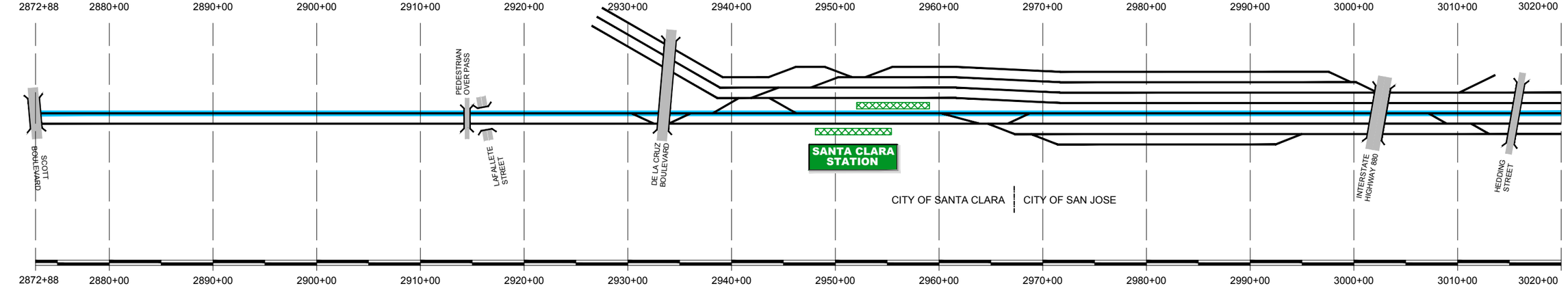
GRADE CROSSING TREATMENT
- ADAPT
- USABLE



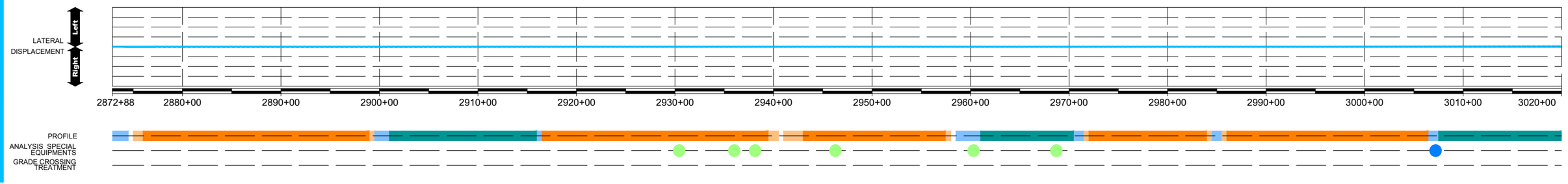
EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



MT-2



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SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-2

CONTRACT NO.
DRAWING NO. CV-16SSC-TSW-08
SCALE NOT TO SCALE
SHEET NO. 8 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

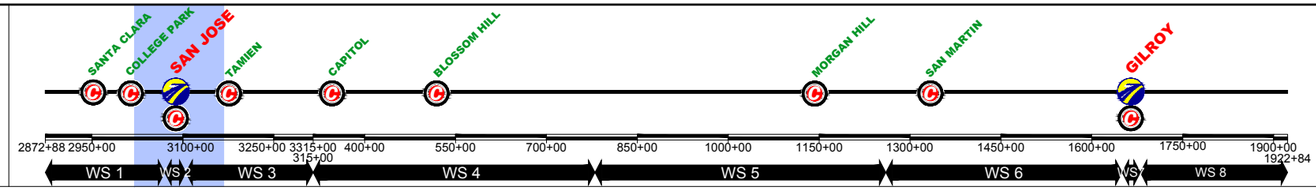
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

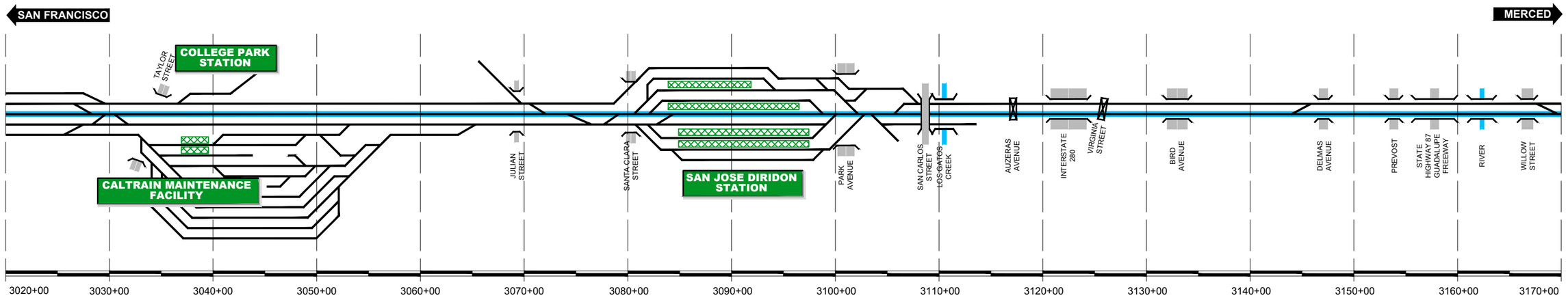
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

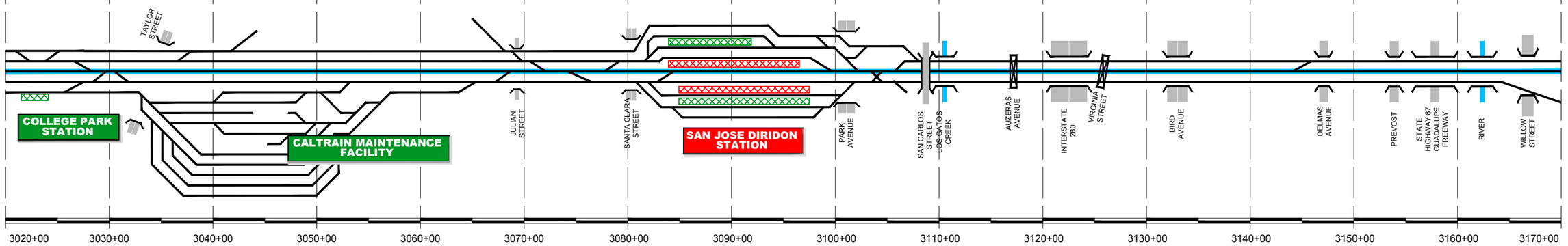
GRADE CROSSING TREATMENT
- ADAPT
- USABLE



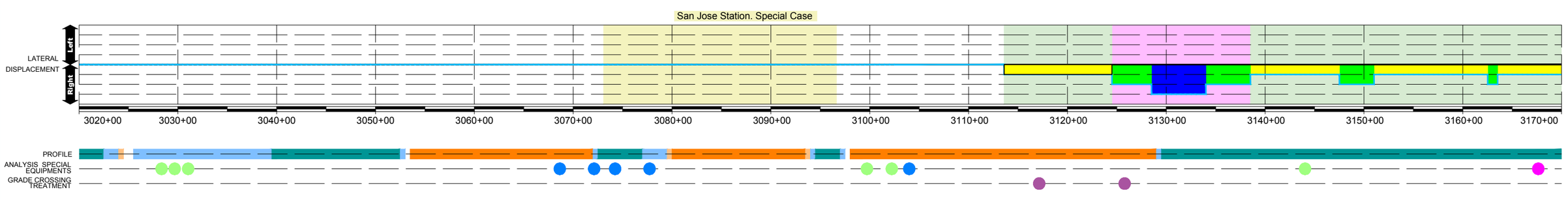
EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



MT-2



CONSIDERATED PROFILE PROJECTED FROM MT-3

REV	DATE	BY	SUB	APP	DESCRIPTION

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IN CHARGE
DATE DEC/2018

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CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-2

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-09
SCALE NOT TO SCALE
SHEET NO. 9 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

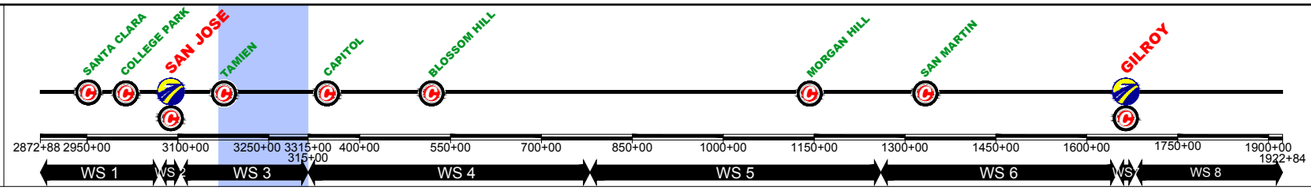
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

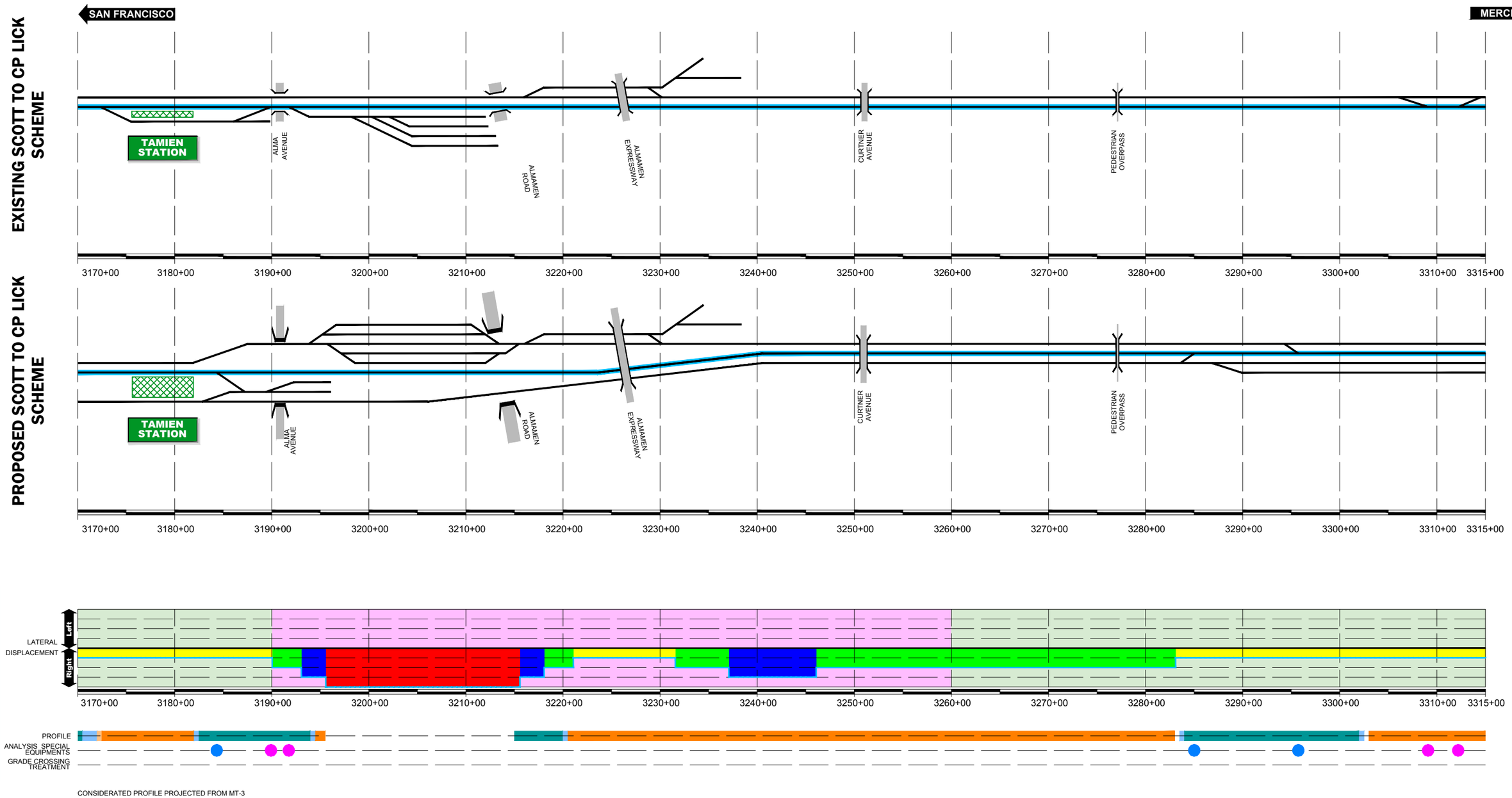
CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

GRADE CROSSING TREATMENT
- ADAPT
- USABLE





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SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-2

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-10
SCALE NOT TO SCALE
SHEET NO. 10 OF 13

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

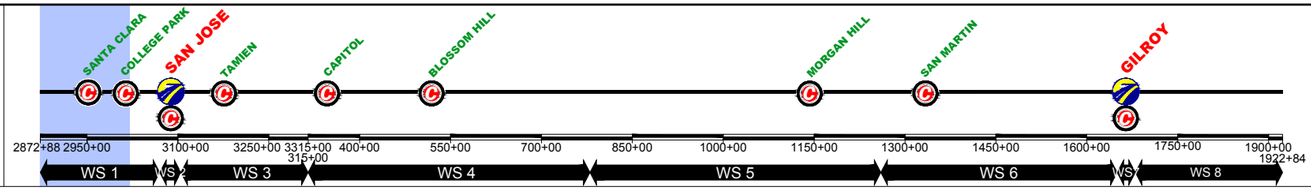
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

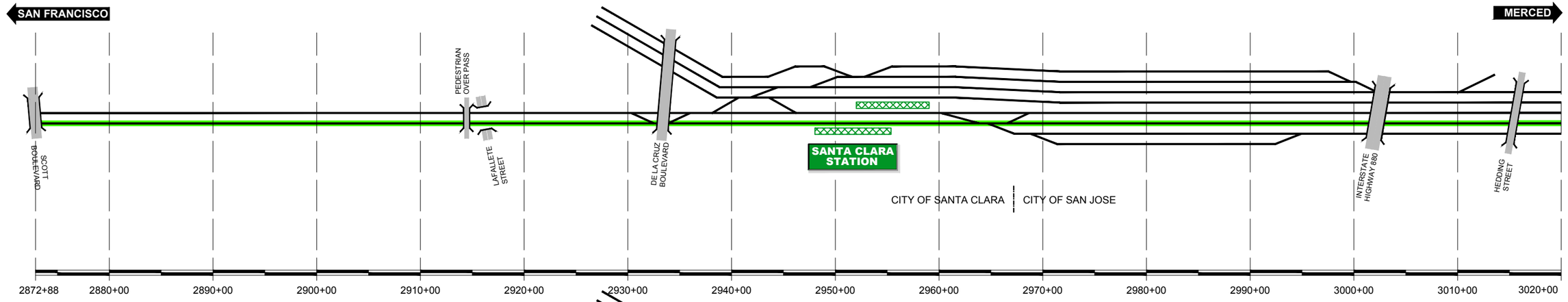
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

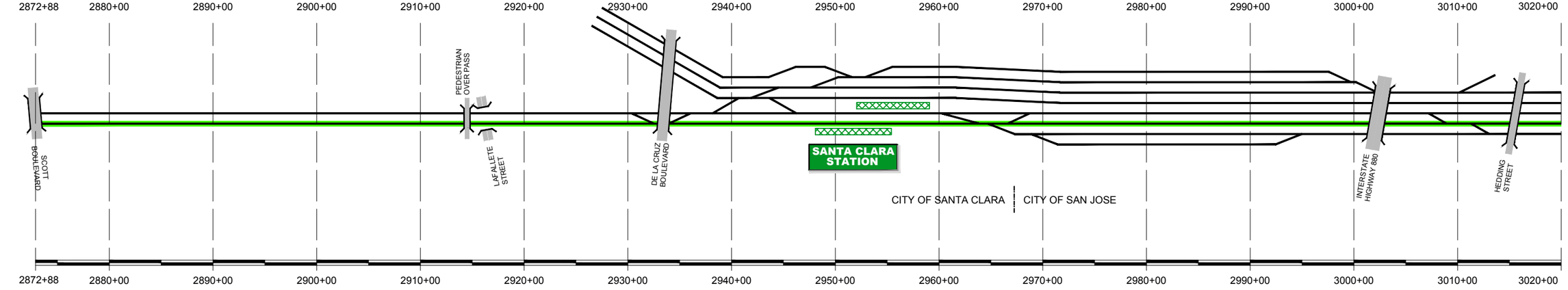
GRADE CROSSING TREATMENT
- ADAPT
- USABLE



EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



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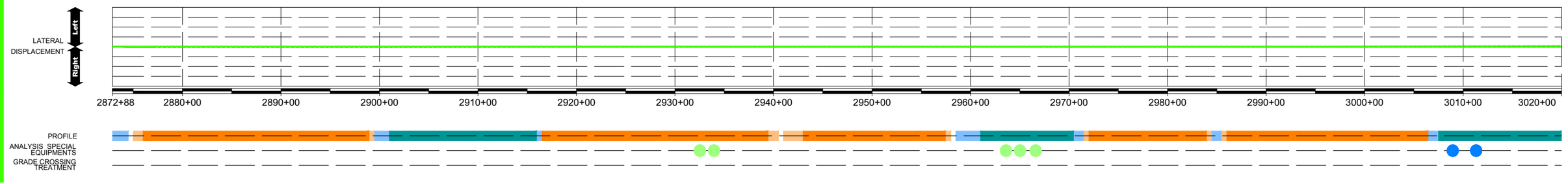

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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-3

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-11
SCALE NOT TO SCALE
SHEET NO. 11 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

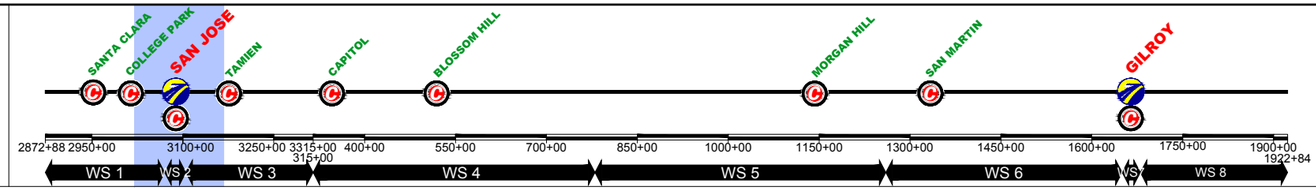
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

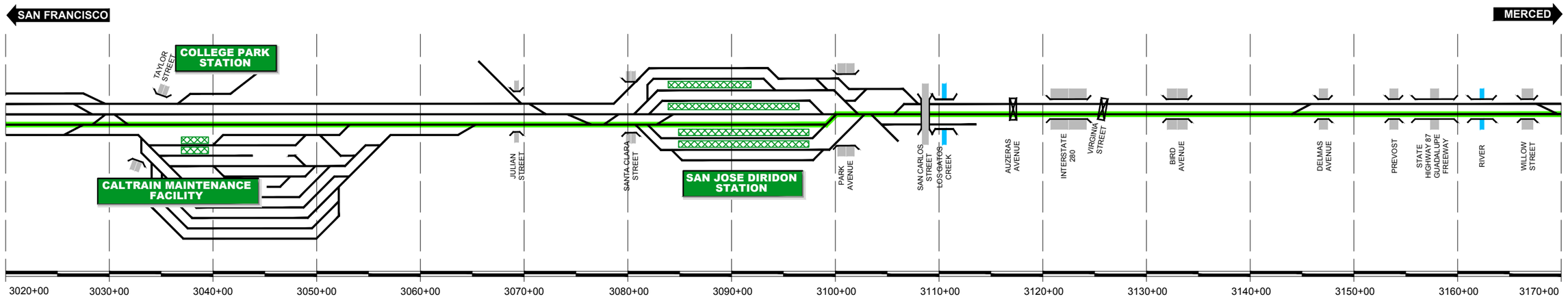
PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

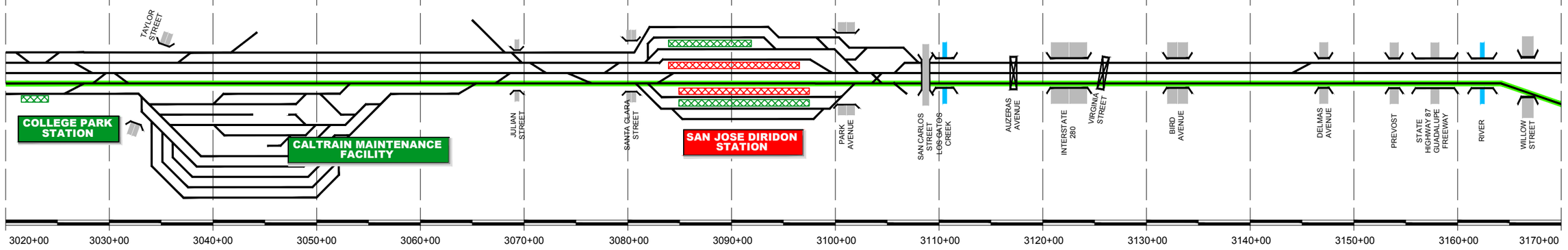
GRADE CROSSING TREATMENT
- ADAPT
- USABLE



EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



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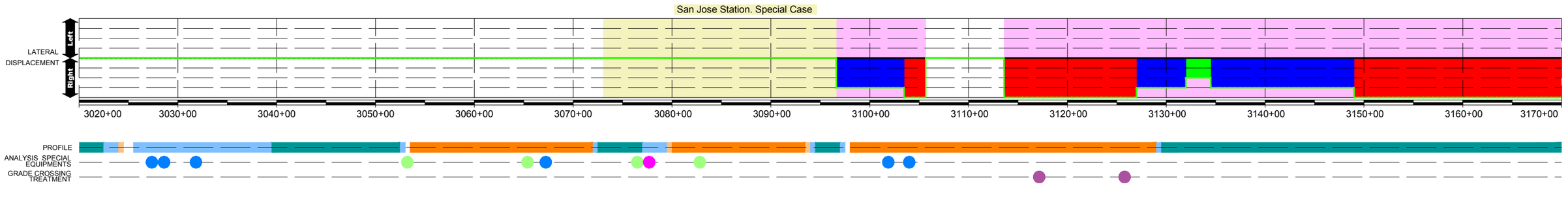

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CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-3

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-12
SCALE NOT TO SCALE
SHEET NO. 12 OF 13

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

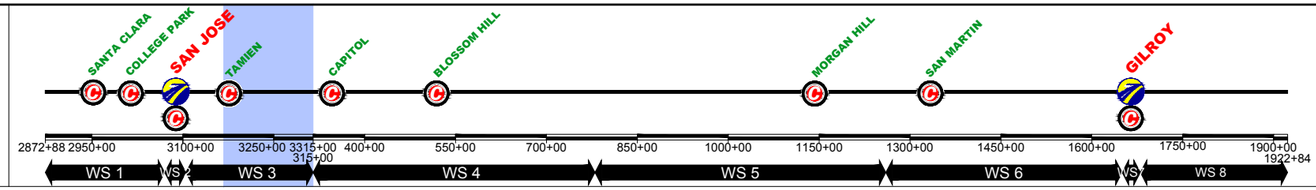
LATERAL DISTANCE BETWEEN EXISTING AND PROPOSED TRACKS
- LESS THAN 1 ft.
- MORE THAN 1 ft. AND LESS THAN 10 ft.
- MORE THAN 10 ft. AND LESS THAN 21,34 ft.
- MORE THAN 21,34 ft.

CONSTRUCTION PHASES AFECTION
- LATERAL DISPLACEMENT CONSIDERED IN CONSTRUCTION PHASES ANALYSIS
- NEW TRACKS CONSIDERED

PROFILE
- INCREASE SUBGRADE
- DECREASE SUBGRADE
- INCREASE BALLAST THICKNESS
- DECREASE BALLAST THICKNESS

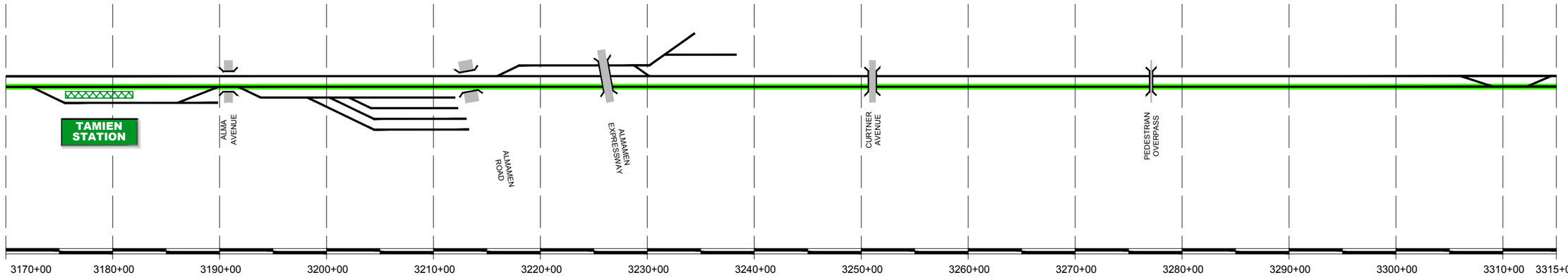
ANALYSIS OF SPECIAL EQUIPMENT
- REMOVE
- REMAIN VERTICAL ADAPTATION
- NEW EQUIPMENT

GRADE CROSSING TREATMENT
- ADAPT
- USABLE

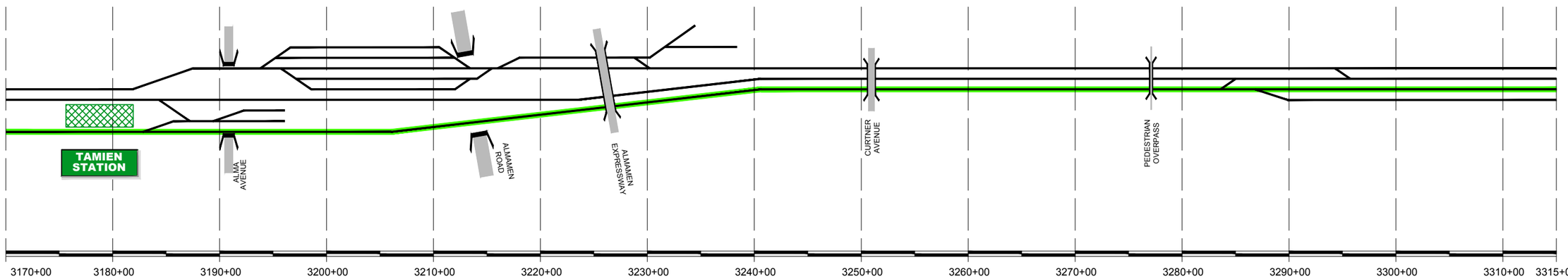


SAN FRANCISCO — MERCED

EXISTING SCOTT TO CP LICK SCHEME



PROPOSED SCOTT TO CP LICK SCHEME



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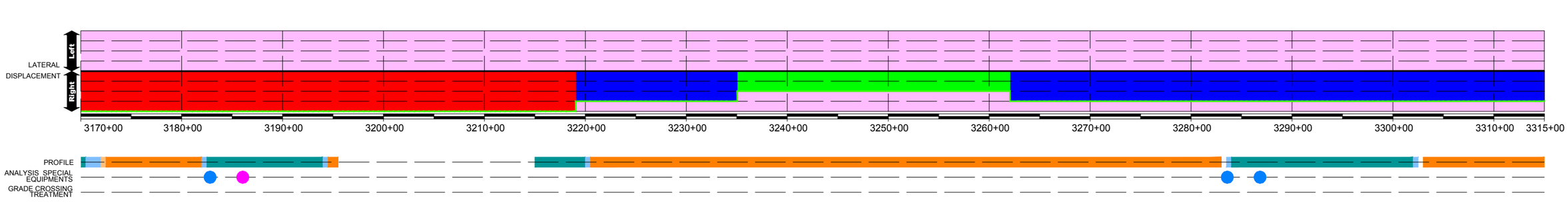

CONSIDERATED PROFILE MT-3

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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
SCOTT TO CP LICK
TRACK SHIFT WORKS
MT-3

CONTRACT NO.
DRAWING NO. CV-I6SSC-TSW-13
SCALE NOT TO SCALE
SHEET NO. 13 OF 13

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS

APPENDIX H. PROPOSED CONSTRUCTION STAGING AREAS.

December 2018

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APPENDIX H. PROPOSED CONSTRUCTION STAGING AREAS

Index

1. PROPOSED AREAS. 1

1. PROPOSED AREAS.

It has been defined four construction staging areas. These areas are characterized by access to existing roads and proximity to the rail tracks.

The proposed areas are:

1. Lafayette street st 2302+00 near of Santa Clara station
2. Coyote area st 745+00
3. Bailey Ave st 795+00
4. Llagas Creek st 1300+00

These areas and their limits are shown in the follow sheets.

PROPOSED CONSTRUCTION FACILITIES
LAFAYETTE STREET-GRANT STREET-REED STREET
N
PROPOSED CONSTRUCTION FACILITIES
LAFAYETTE STREET-GRANT STREET-REED STREET

PROPOSED CONSTRUCTION FACILITIES
COYOTE AREA
77D+00 TO 874+00: TYPICAL SECTION 3
PROPOSED CONSTRUCTION FACILITIES
COYOTE AREA

N
PROPOSED CONSTRUCTION FACILITIES
BAILEY AV
BAILEY AV
ACCESS ROAD
PROPOSED CONSTRUCTION FACILITIES
BAILEY AV

PROPOSED CONSTRUCTION FACILITIES
1288+00 - 1300+00
E MIDDLE AVE
PROPOSED CONSTRUCTION FACILITIES
1288+00 - 1300+00

APPENDIX H: TRACK SHIFT WORKS

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS

APPENDIX I. CONSTRUCTION PHASES ALTERNATIVE 4.

PLAN, SCHEMES, PROFILE AND SECTIONS

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APPENDIX I. CONSTRUCTION PHASES ALTERNATIVE 4. PLAN, SCHEMES, PROFILE AND SECTIONS

Index

WS 1. Section from Scott Boulevard to San Jose Station.

WS 2. Section San Jose Station.

WS 3. Section from San Jose Station to CP Lick.

WS 4. Section from CP Lick to 725+00.

WS 5. Section from 725+00 to 1265+00.

WS 6. Section from 1265+00 to Gilroy Station.

WS 7. Section Gilroy Station. 2027 Configuration

WS 8. Section 1700+00 to 1922+90. 2027 Configuration

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

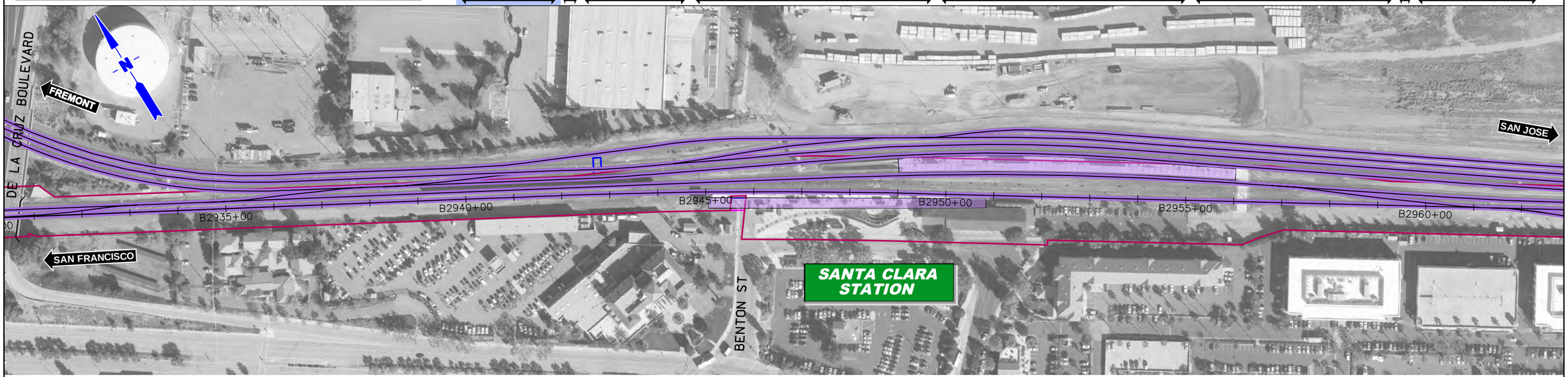
CONTRACT NO.
DRAWING NO. CV-11WS1-PH0-01
SCALE 1" = 200'
SHEET NO. 1 OF 4

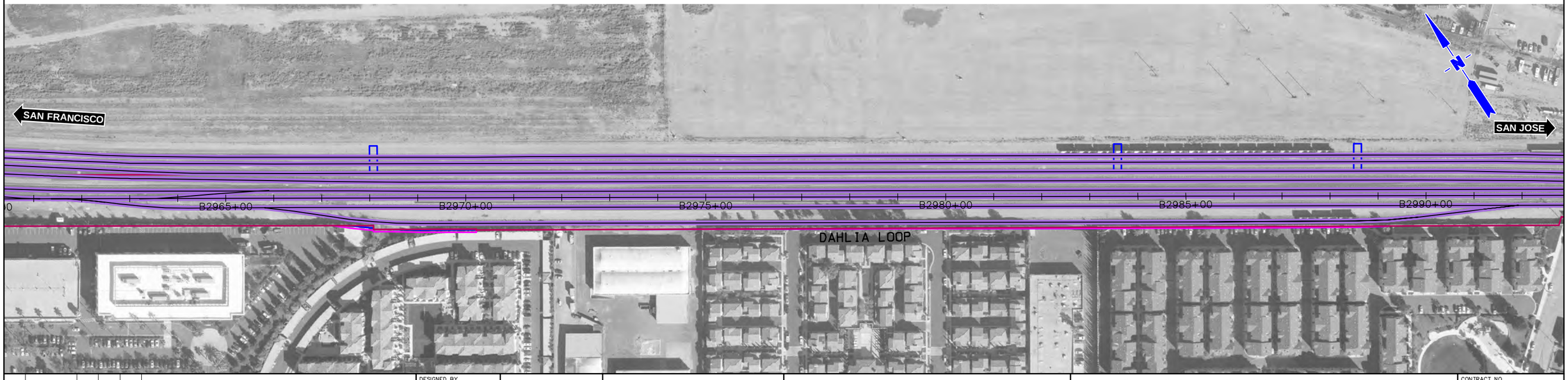
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

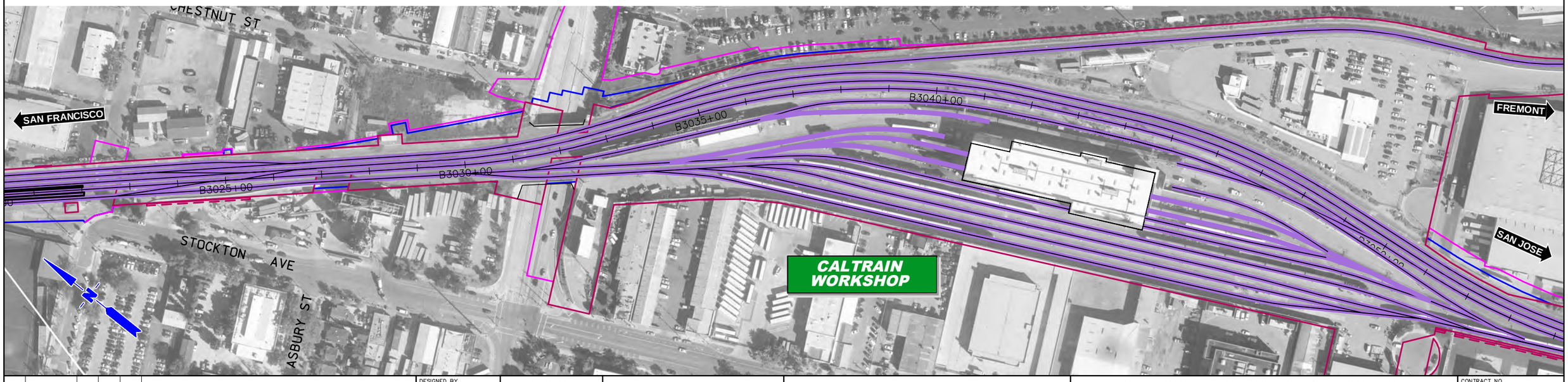
CONTRACT NO.
DRAWING NO. CV-I1WS1-PH0-02
SCALE 1" = 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8



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$PLTDRVS$
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$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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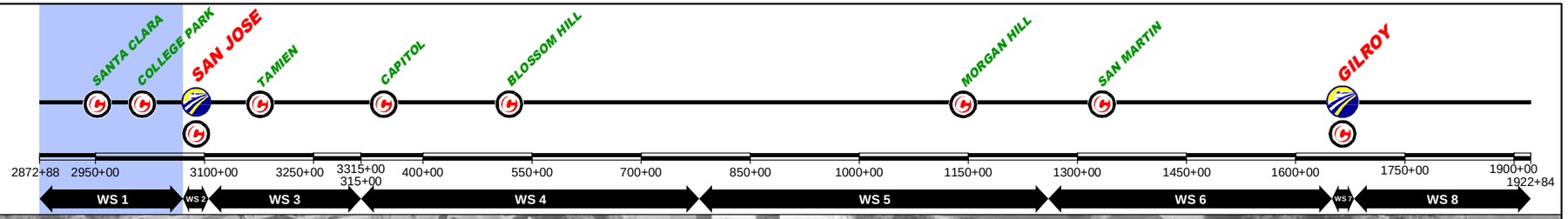
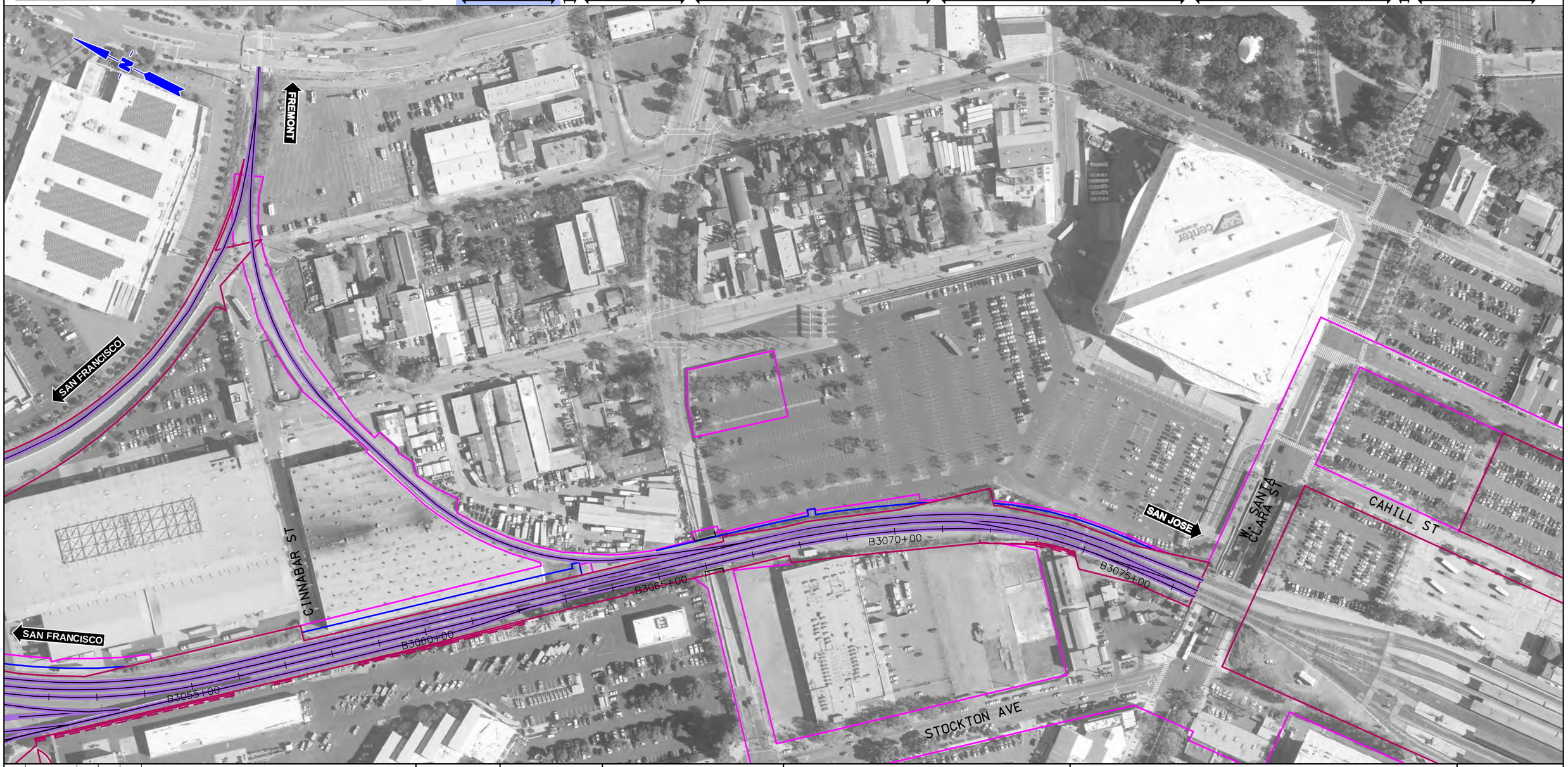
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH0-03
SCALE 1" = 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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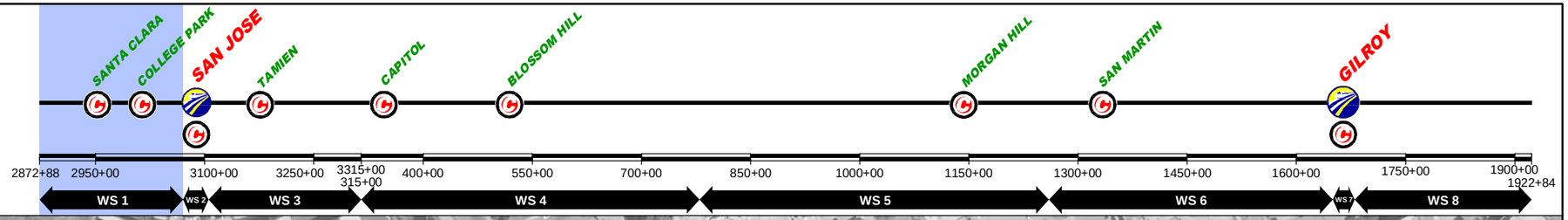
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH0-04
SCALE 1" = 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$TIME$
$DATE$
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REV	DATE	BY	SUB	APP	DESCRIPTION

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DRAWN BY
CHECKED BY
IN CHARGE
DATE NOV/2018

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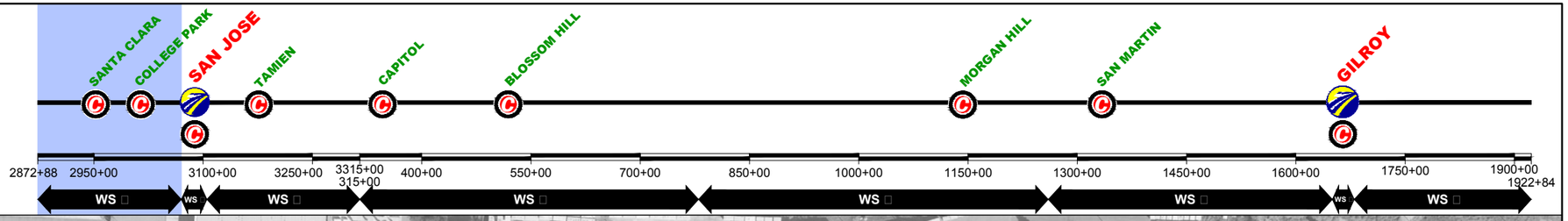
HNTB 1111 Broadway 9th Floor Oakland, CA 94607

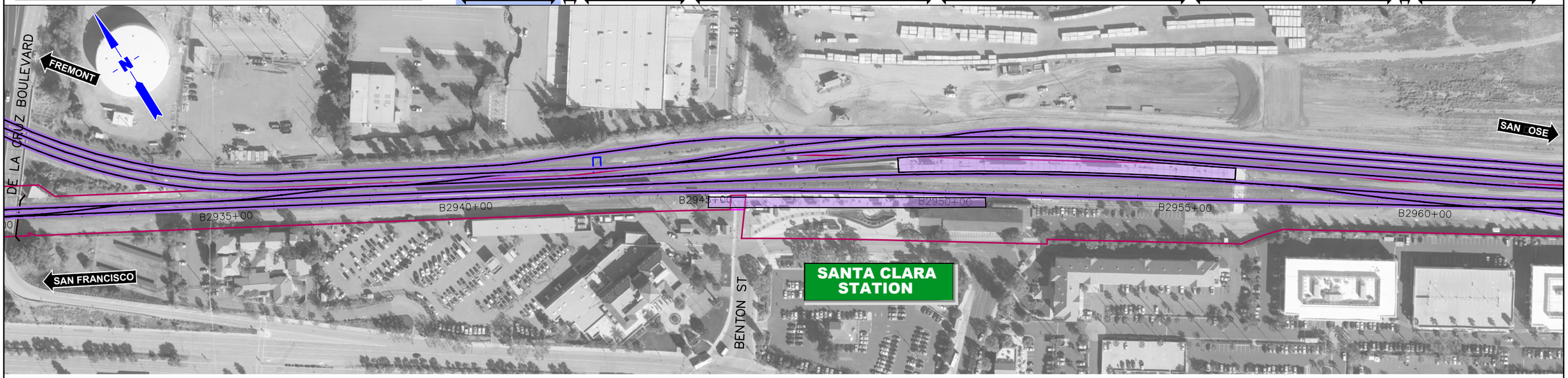
CALIFORNIA High-Speed Rail Authority

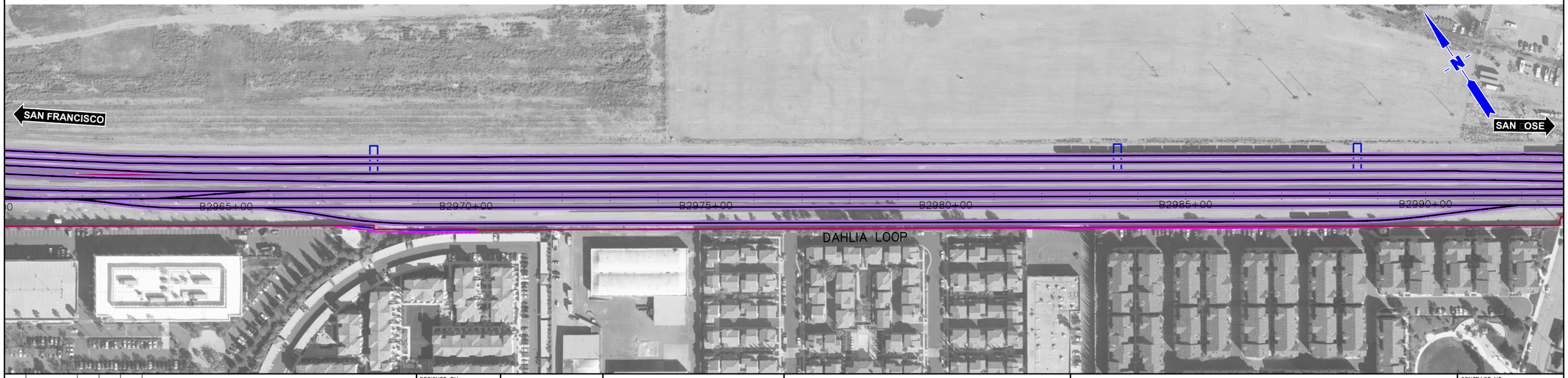
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH1-01
SCALE 1" = 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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CALIFORNIA HIGH□SPEED TRAIN PRO□ECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV–I1WS1–PH1–02
SCALE 1" = 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS WS WS WS WS WS WS WS

SAN FRANCISCO

OCS SPECIFIC STUDY

STOCKTON AVE

OCS SPECIFIC STUDY

PLATFORM UNDER CONSTRUCTION

SAN JOSE

B2995+00 B3000+00 B3005+00 B3010+00 B3015+00 B3020+00

WEST HEDDING ST

BELLARMINE

BELLS

COLLEGE PARK STATION

NEW OCS NEED TO ENVELOP EXISTING AND NEW DESIGNED TRACKS

CHESTNUT ST

OCS SPECIFIC STUDY

SAN FRANCISCO

B3025+00 B3030+00 B3035+00 B3040+00 B3050+00

STOCKTON AVE

ASBURY ST

CALTRAIN WORKSHOP

FREMONT

SAN JOSE

$FILE$
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SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH1-03
SCALE 1" = 200'
SHEET NO. 3 OF 4

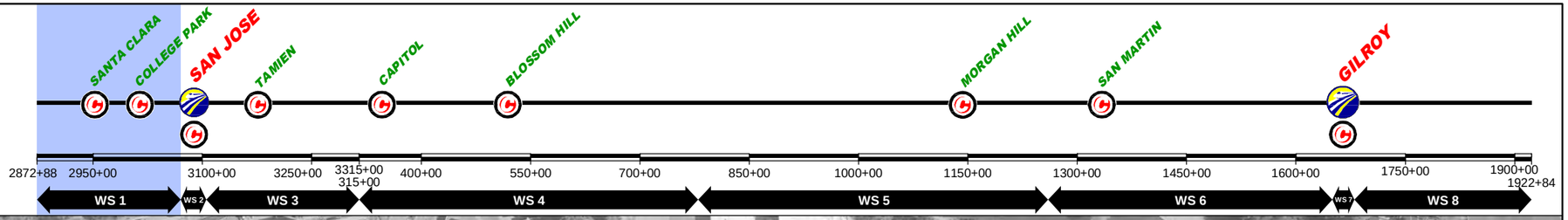
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

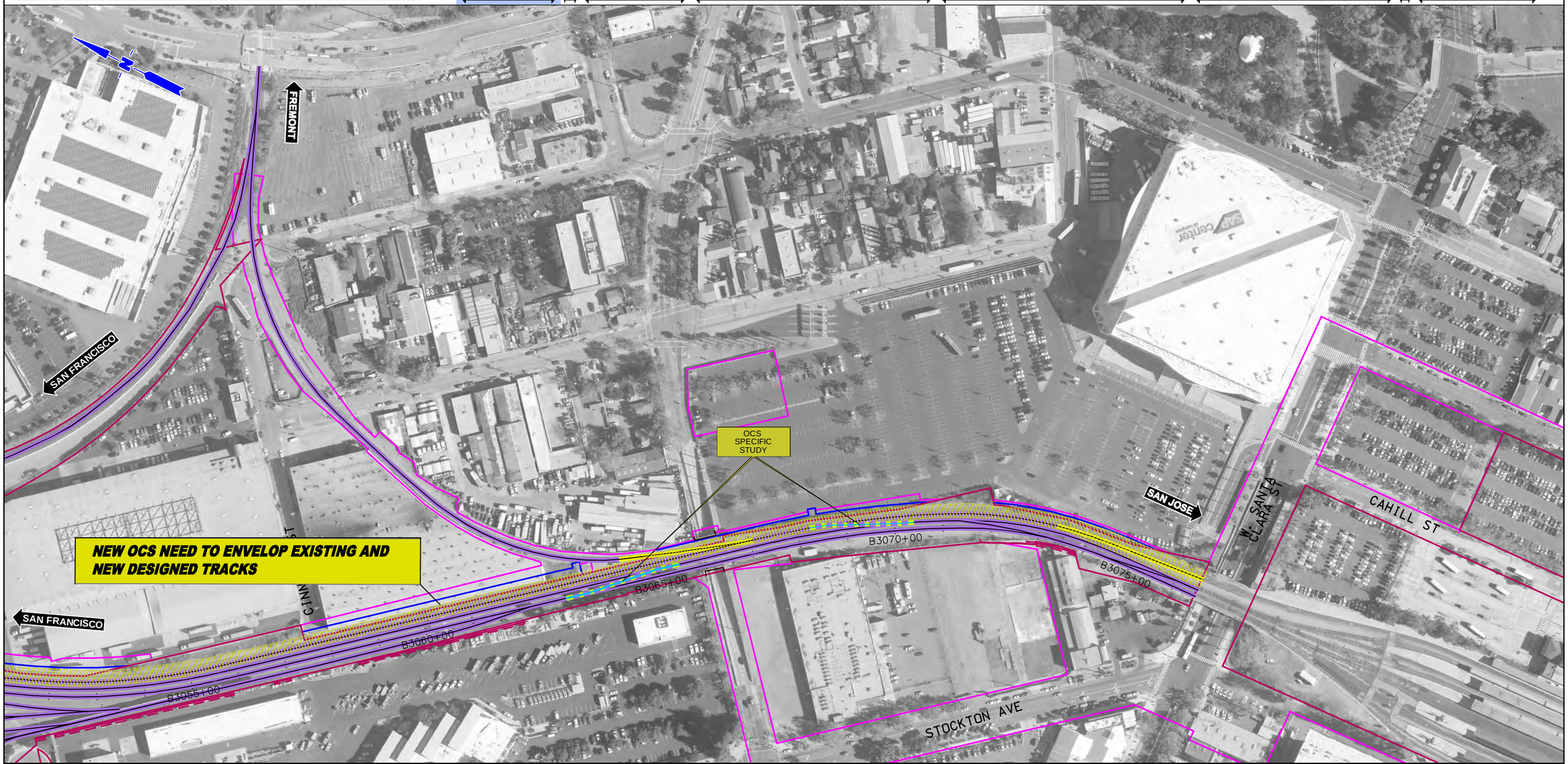
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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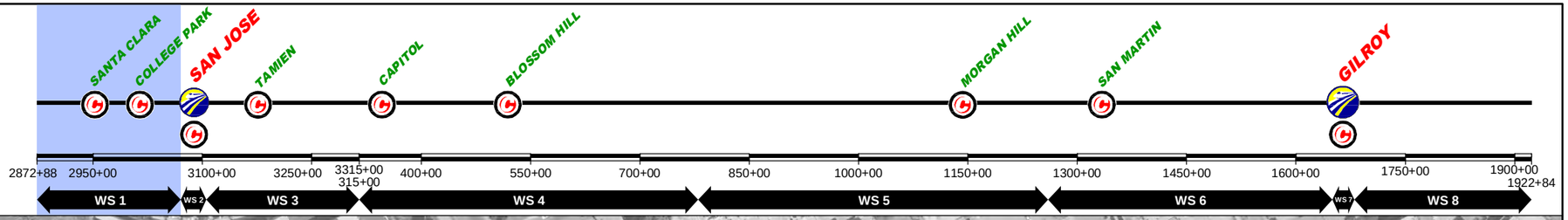
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH1-04
SCALE 1" = 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 2

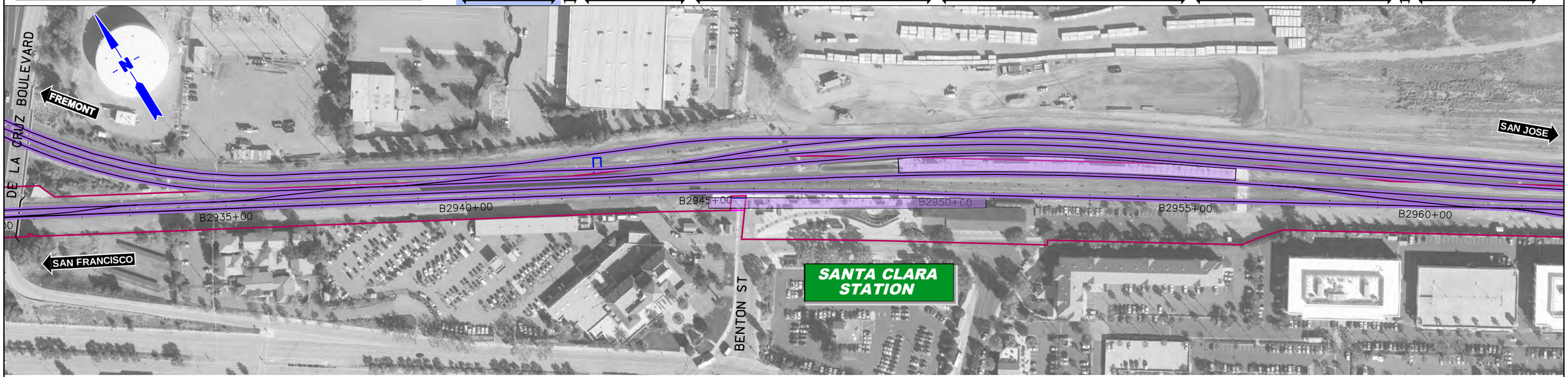
CONTRACT NO.
DRAWING NO. CV-I1WS1-PH2-01
SCALE 1" = 200'
SHEET NO. 1 OF 4

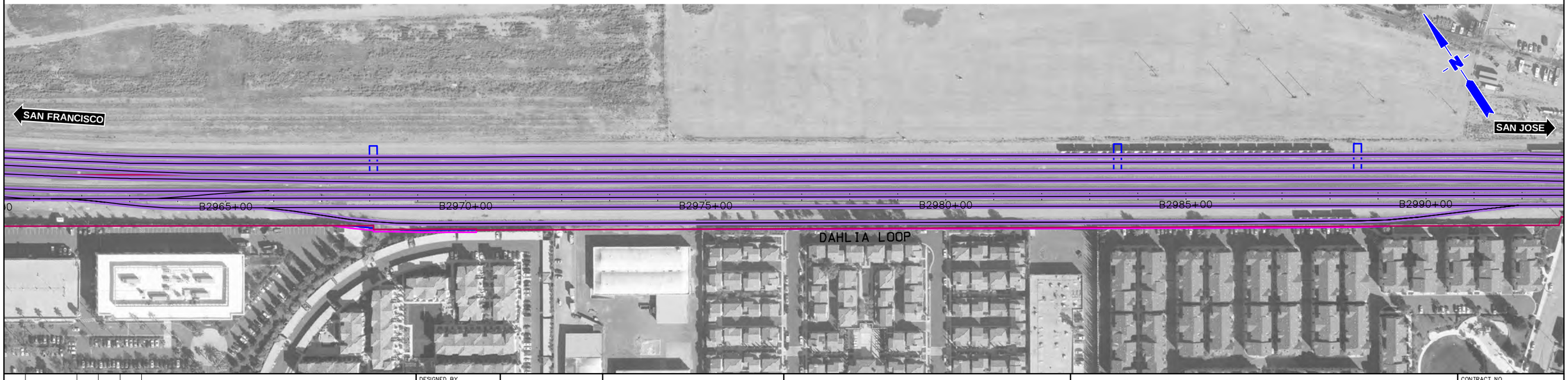
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH2-02
SCALE 1" = 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JFRANCISCO
STOCKTON AVE
PLATFORM REMOVAL
SAN JOSE
B2995+00
B3000+00
B3005+00
B3010+00
B3015+00
B3020+00
WEST HEDDING ST
BELLARMINE
BELLS
COLLEGE PARK STATION

CHESTNUT ST
SAN FRANCISCO
B3025+00
B3030+00
B3035+00
B3040+00
FREMONT
SAN JOSE
STOCKTON AVE
ASBURY ST
CALTRAIN WORKSHOP

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SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH2-03
SCALE 1" = 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
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SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
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GILROY

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WS 1 WS 2 WS 3 WS 4 WS 5 WS 6 WS 7 WS 8

FREMONT
SAN FRANCISCO
CINNABAR ST
OCS SPECIFIC STUDY
OCS SPECIFIC STUDY
SAN JOSE
W SANTA CLARA ST
CAHILL ST
B3055+00
B3060+00
B3065+00
B3070+00
B3075+00
STOCKTON AVE
SAN FRANCISCO

$FILE$
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SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH2-04
SCALE 1" = 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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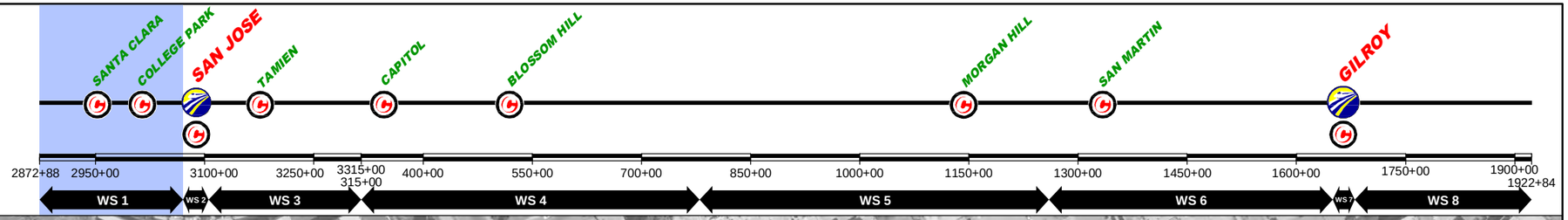
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-11WS1-PH3-01
SCALE 1" = 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

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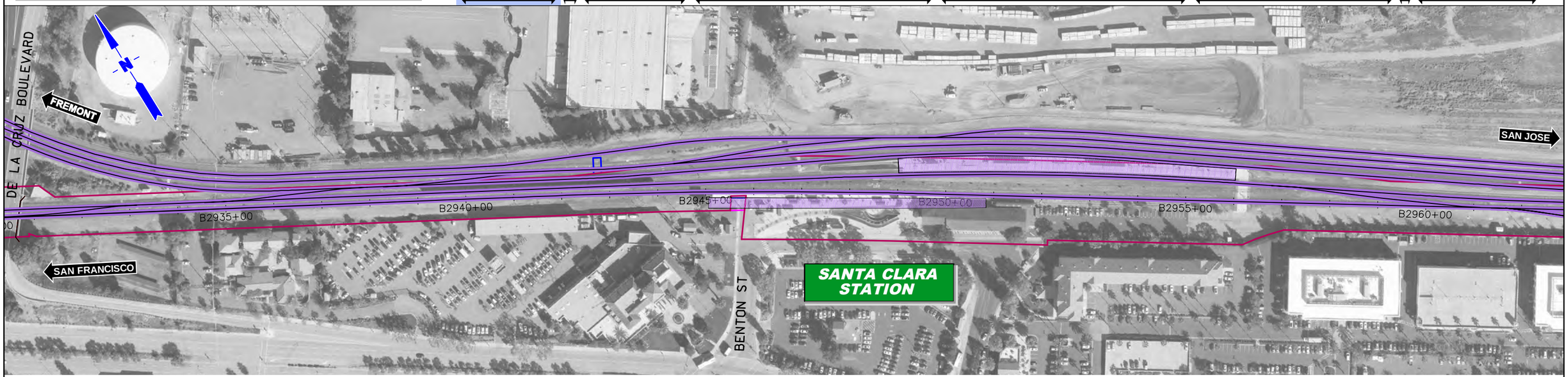
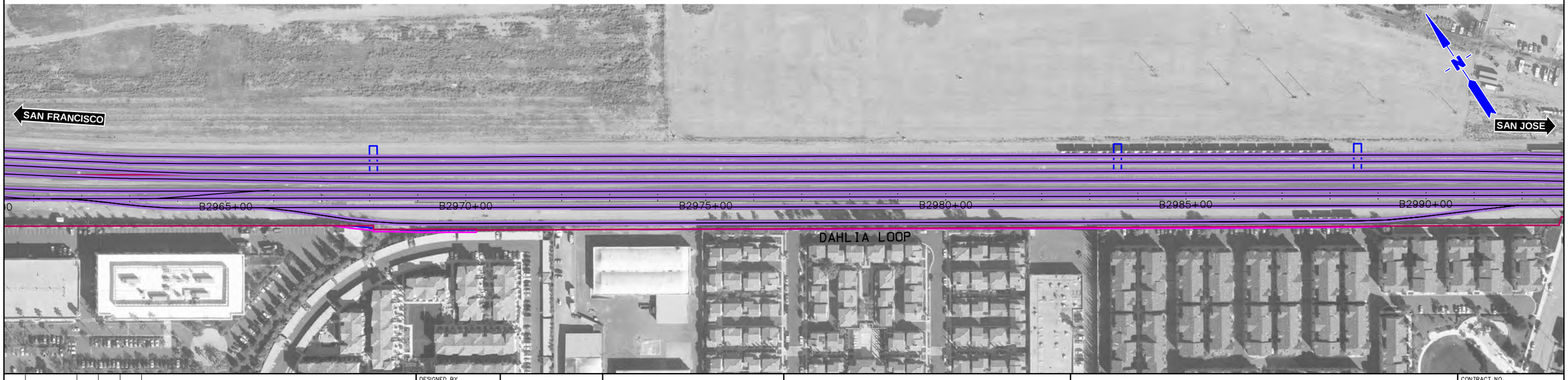
WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH3-02
SCALE 1" = 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JFRANCISCO
SAN JOSE
STOCKTON AVE
B2995+00
B3000+00
B3005+00
B3010+00
B3015+00
B3020+00
WEST HEDDING ST
BELLARMINE
BELLS
COLLEGE PARK STATION

CHESTNUT ST
SAN FRANCISCO
B3025+00
B3030+00
B3035+00
B3040+00
FREMONT
SAN JOSE
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SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
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PHASE 3

CONTRACT NO.
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SCALE 1" = 200'
SHEET NO. 3 OF 4

CURRENT TRACK
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UNDER CONST + CIRCULATION T.
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UNDER CONSTRUCTION
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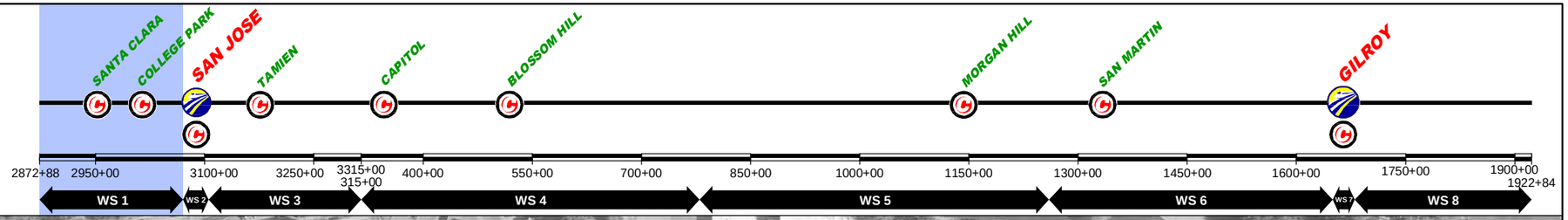
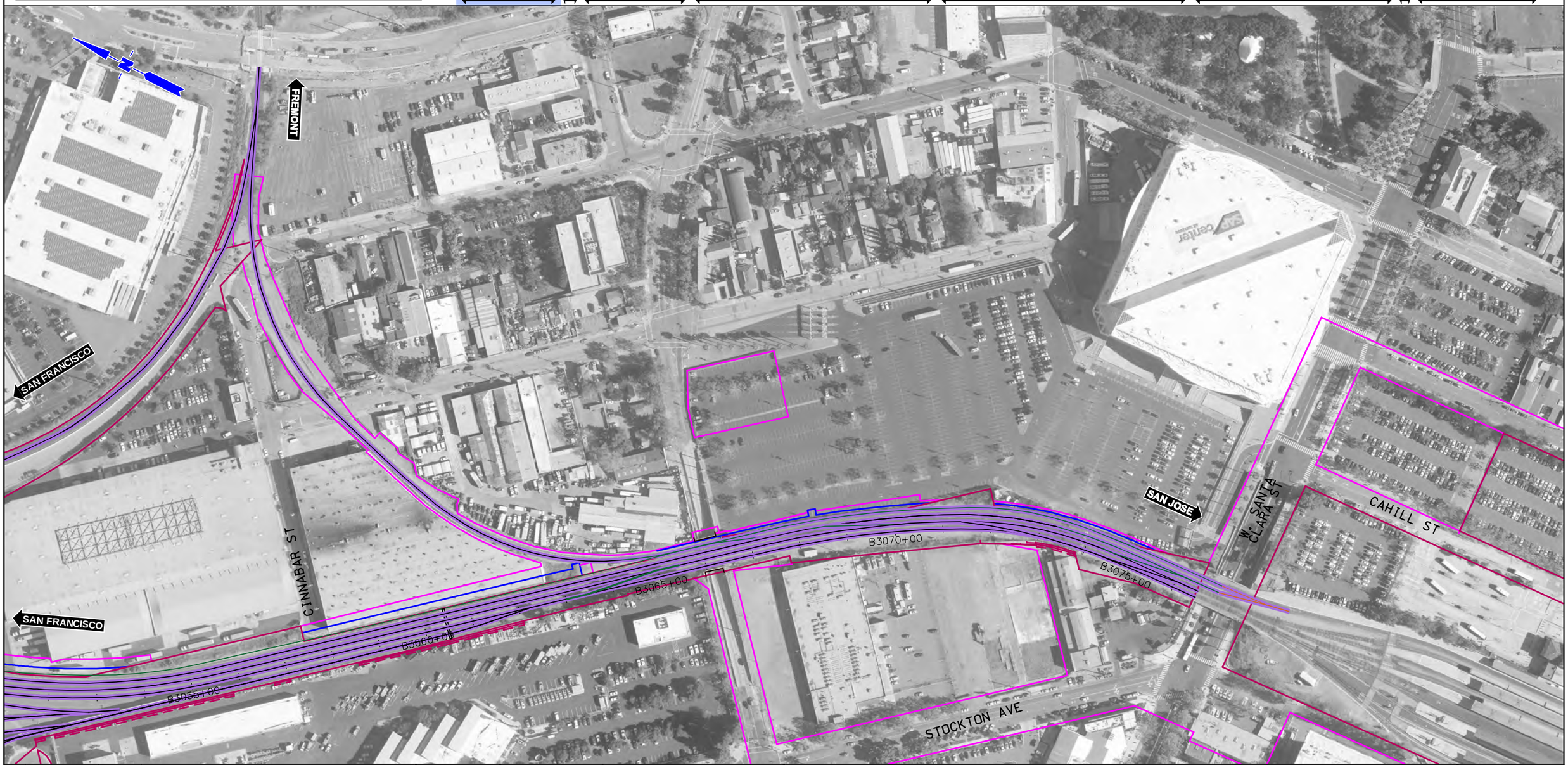
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH3-04
SCALE 1" = 200'
SHEET NO. 4 OF 4

CURRENT TRACK
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UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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EXISTING ROW
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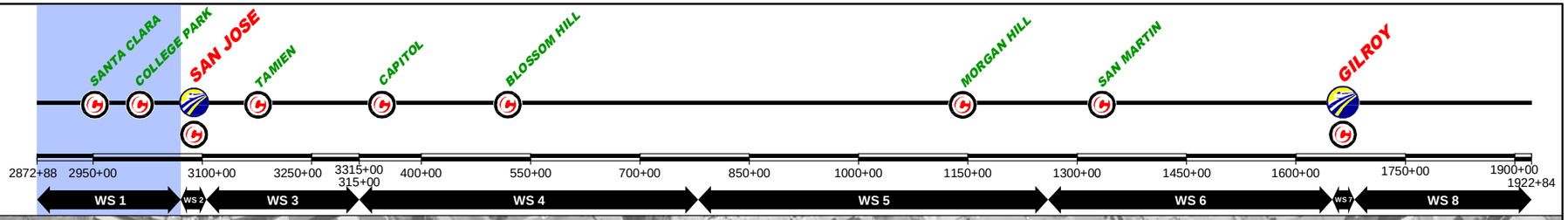

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CONSTRUCTION PHASES
PLAN
PHASE 4

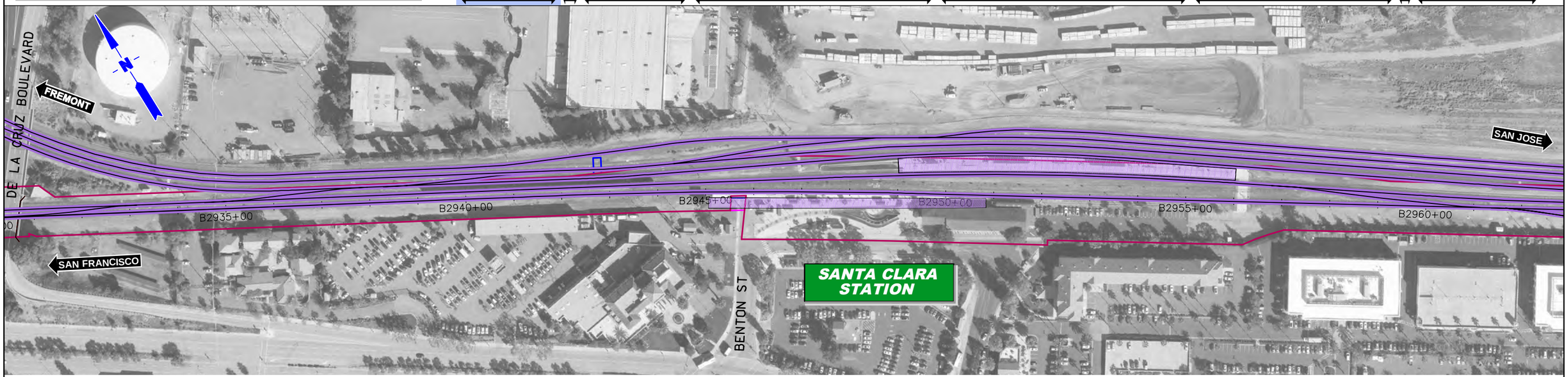
CONTRACT NO.
DRAWING NO. CV-11WS1-PH4-01
SCALE 1" = 200'
SHEET NO. 1 OF 4

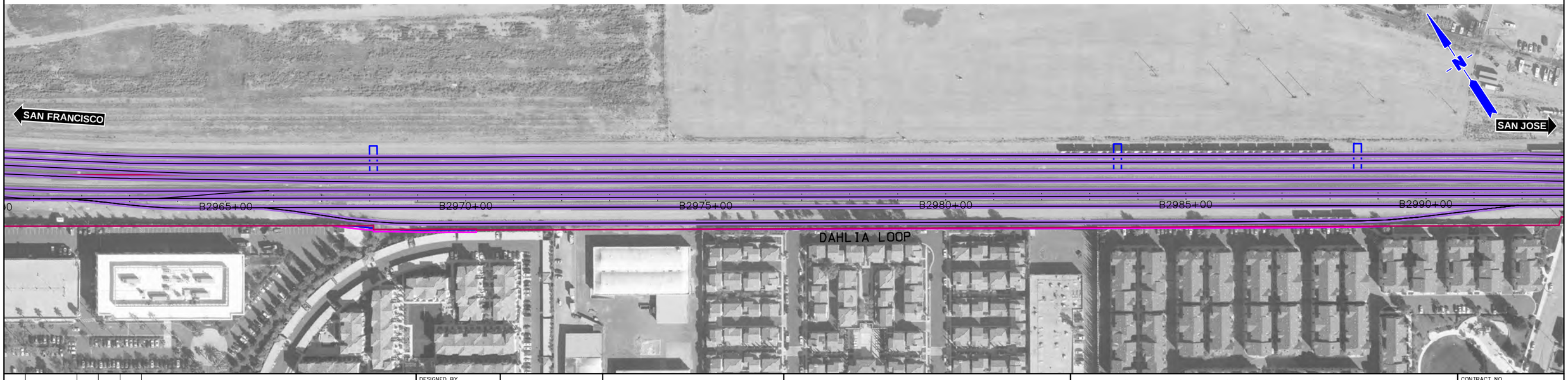
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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CHECKED BY
IN CHARGE
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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

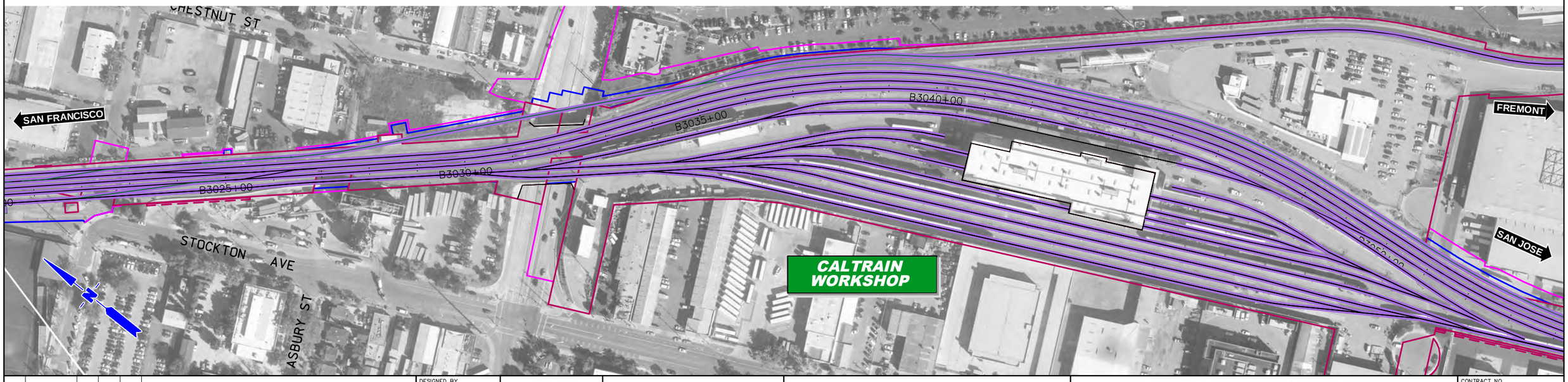
CONTRACT NO.
DRAWING NO. CV-I1WS1-PH4-02
SCALE 1" = 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8



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$USER$

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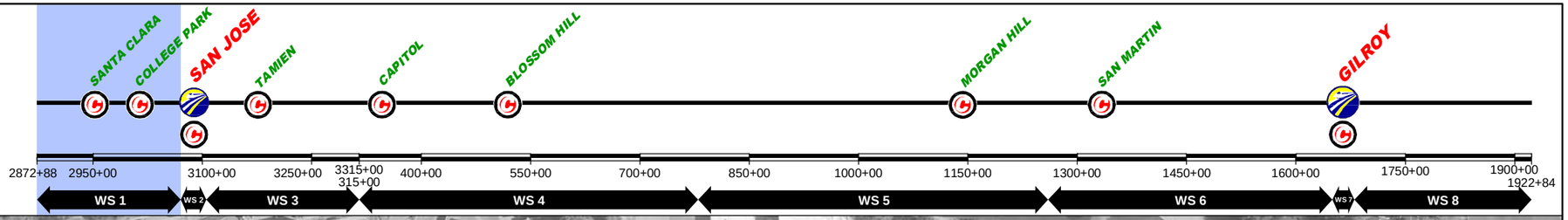
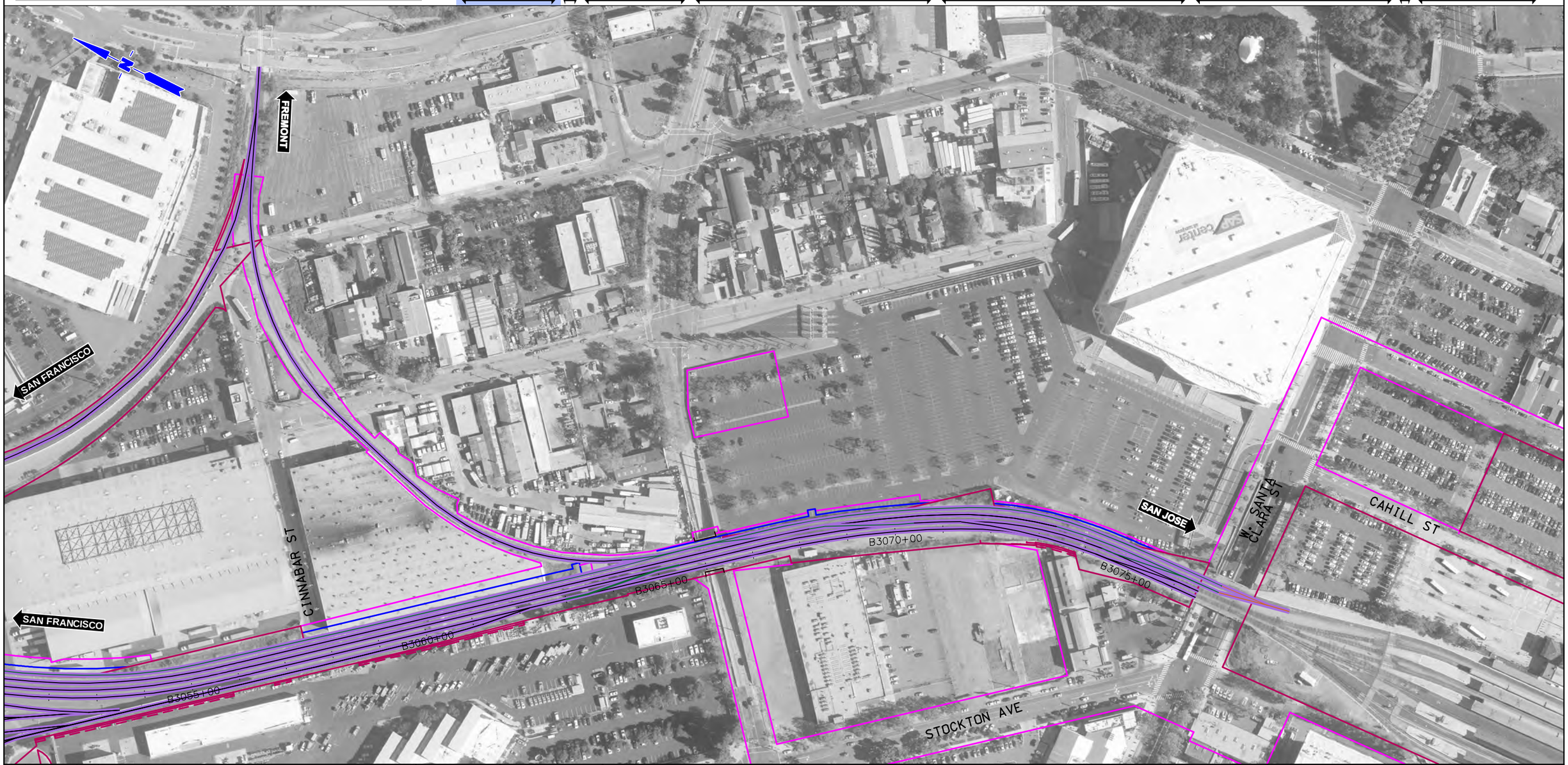
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH4-03
SCALE 1" = 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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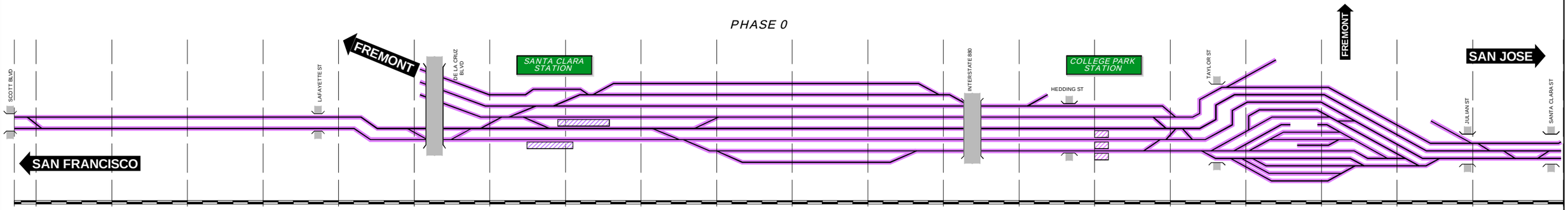
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS1-PH4-04
SCALE 1" = 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

PHASE 0



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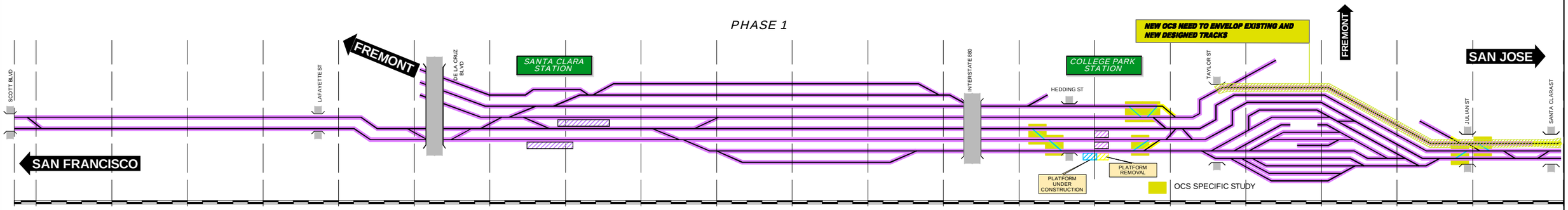

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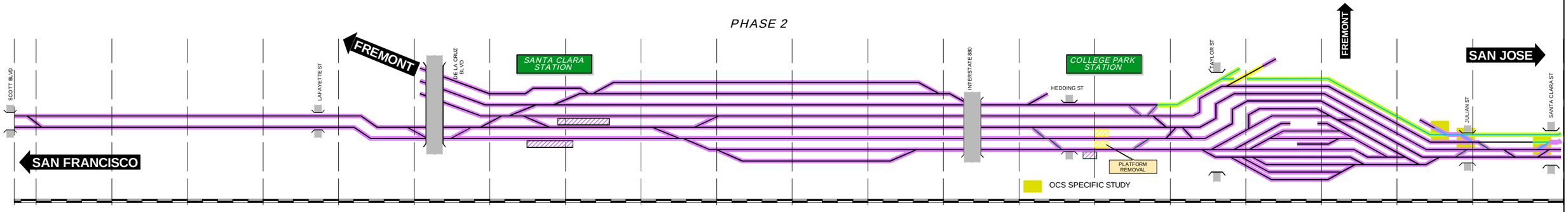

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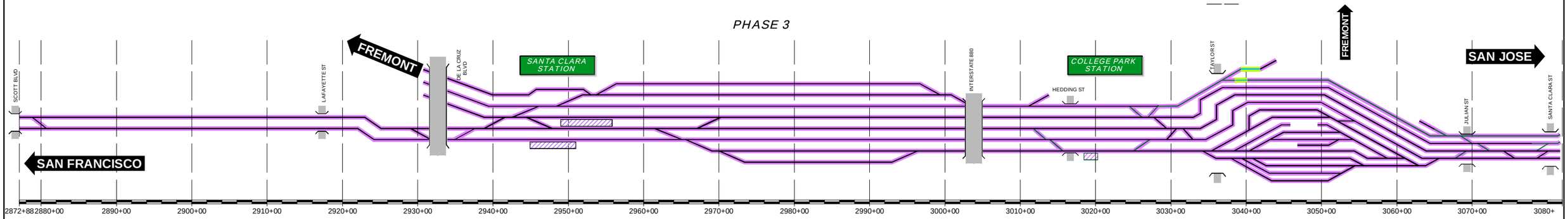
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS1-SCH-01
SCALE ---
SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

PHASE 3



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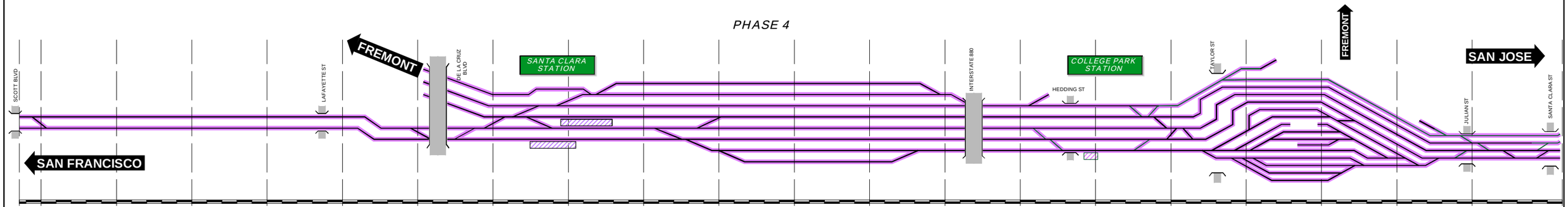

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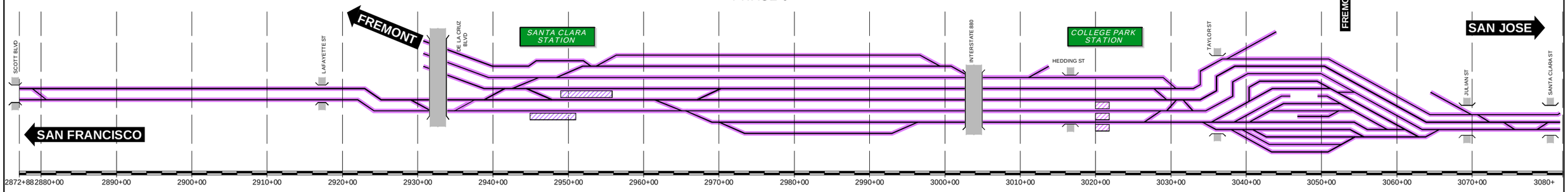
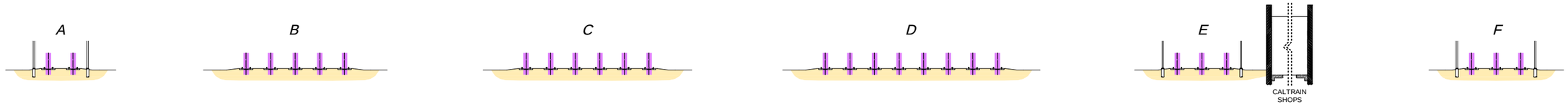
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
SCHEME

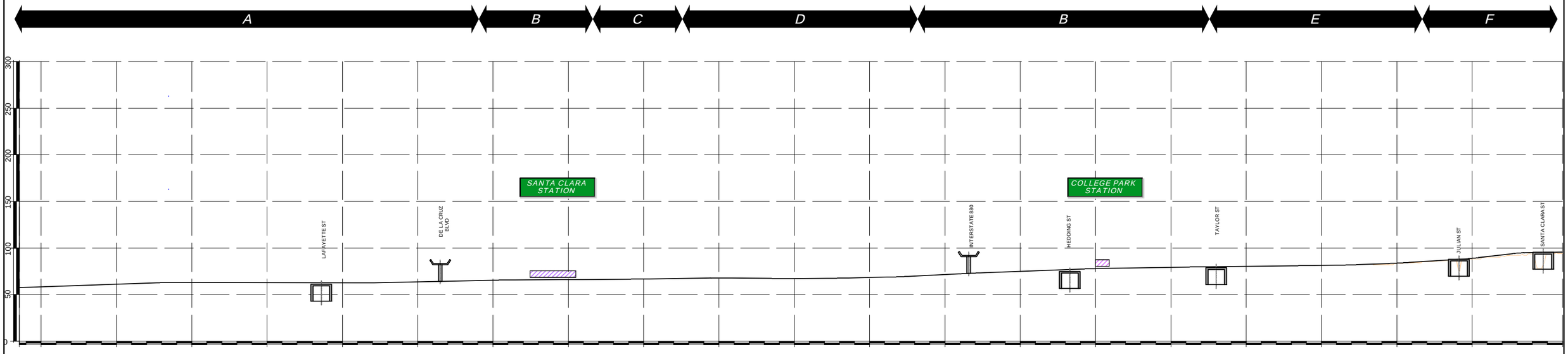
CONTRACT NO.
DRAWING NO. CV-I6WS1-SCH-02
SCALE --
SHEET NO. 2 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

PHASE 0







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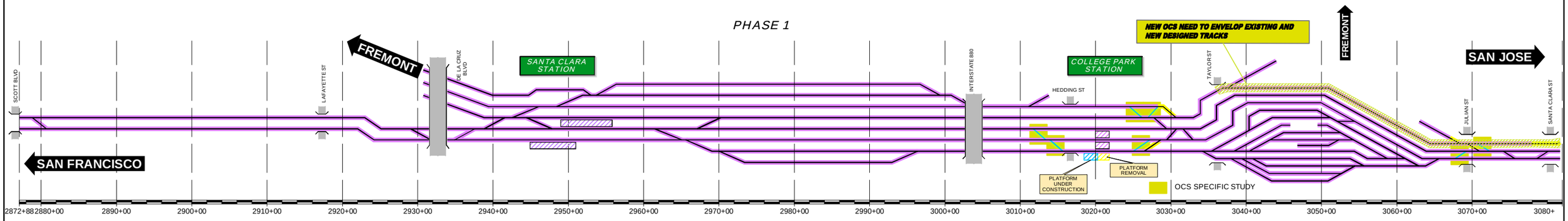
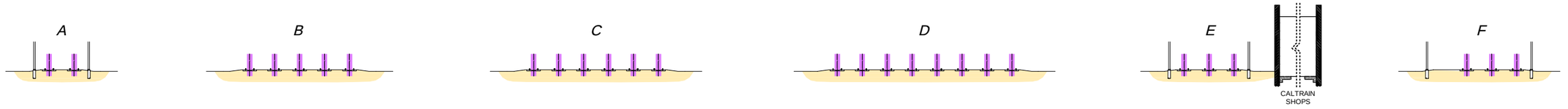
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 0

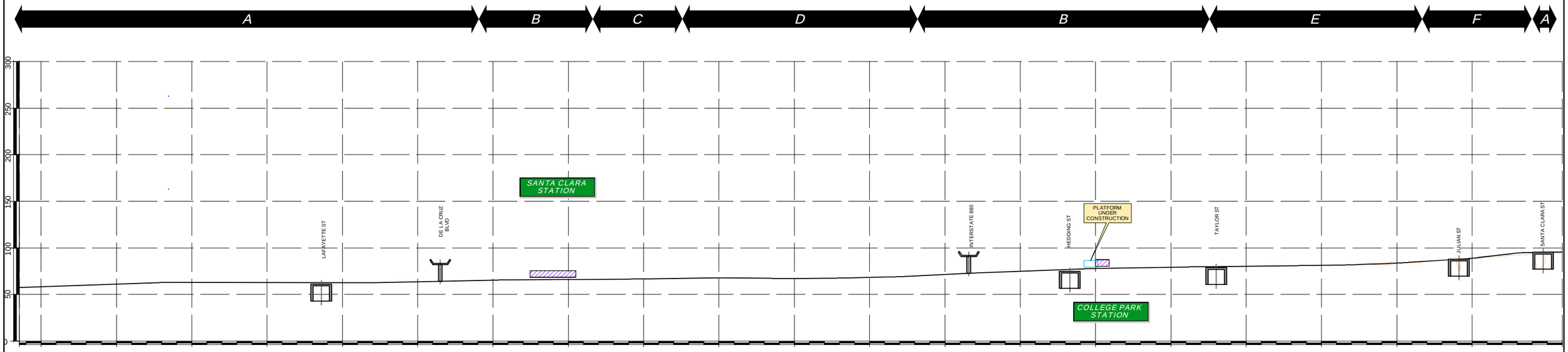
CONTRACT NO.
DRAWING NO. CV-I6WS1-SPP-01
SCALE ---
SHEET NO. 1 OF 5

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

PHASE 1







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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I6WS1-SPP-02
SCALE ---
SHEET NO. 2 OF 5

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

PHASE 2

FREMONT
SAN FRANCISCO
SAN JOSE
SCOTT BLVD
LAFAYETTE ST
DE LA CRUZ BLVD
SANTA CLARA STATION
INTERSTATE 880
COLLEGE PARK STATION
HEDDING ST
TAYLOR ST
JULIAN ST
SANTA CLARA ST
PLATFORM REMOVAL
OCS SPECIFIC STUDY

2872+88 2880+00 2890+00 2900+00 2910+00 2920+00 2930+00 2940+00 2950+00 2960+00 2970+00 2980+00 2990+00 3000+00 3010+00 3020+00 3030+00 3040+00 3050+00 3060+00 3070+00 3080+

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CALTRAIN SHOPS

A B C D B E F

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

300 250 200 150 100 50 0

SANTA CLARA STATION
COLLEGE PARK STATION
LAFAYETTE ST
DE LA CRUZ BLVD
INTERSTATE 880
HEDDING ST
TAYLOR ST
JULIAN ST
SANTA CLARA ST

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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 2

CONTRACT NO. CV-I6WS1-SPP-03
DRAWING NO.
SCALE ---
SHEET NO. 3 OF 5

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

PHASE 3

FREMONT
SAN FRANCISCO
SAN JOSE
SCOTT BLVD
LAFAYETTE ST
DE LA CRUZ BLVD
SANTA CLARA STATION
INTERSTATE 880
COLLEGE PARK STATION
HEDDING ST
TAYLOR ST
JULIAN ST
SANTA CLARA ST

2872+88 2880+00 2890+00 2900+00 2910+00 2920+00 2930+00 2940+00 2950+00 2960+00 2970+00 2980+00 2990+00 3000+00 3010+00 3020+00 3030+00 3040+00 3050+00 3060+00 3070+00 3080+

A B C D E F

CALTRAIN SHOPS

A B C D B E F

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

300 250 200 150 100 50 0

SANTA CLARA STATION
COLLEGE PARK STATION
LAFAYETTE ST
DE LA CRUZ BLVD
INTERSTATE 880
HEDDING ST
TAYLOR ST
JULIAN ST
SANTA CLARA ST

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY
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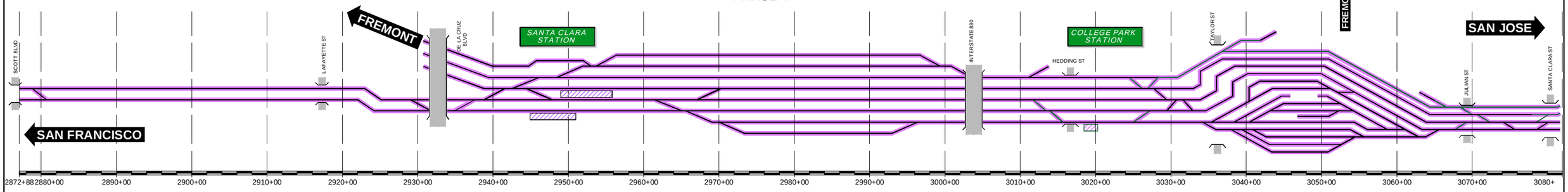
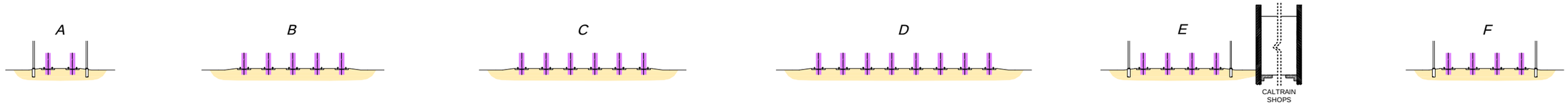
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 3

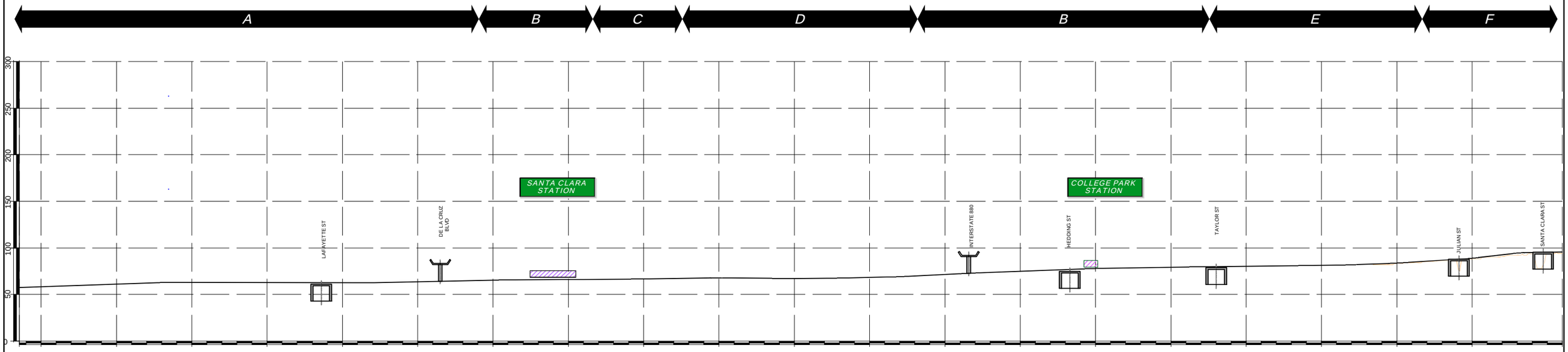
CONTRACT NO.
DRAWING NO. CV-I6WS1-SPP-04
SCALE ---
SHEET NO. 4 OF 5

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

PHASE 4







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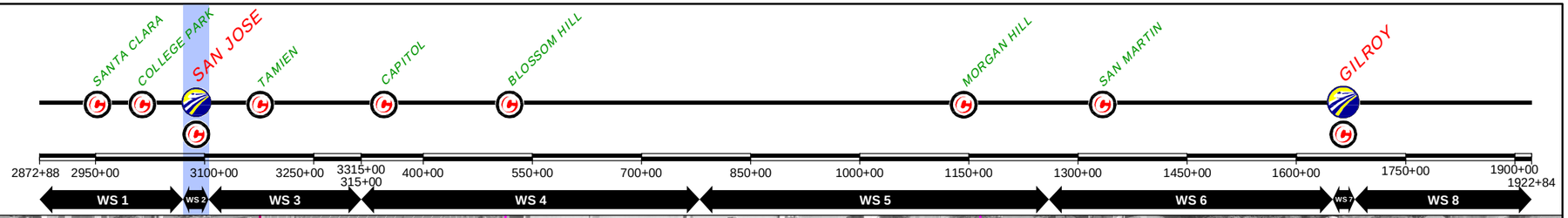
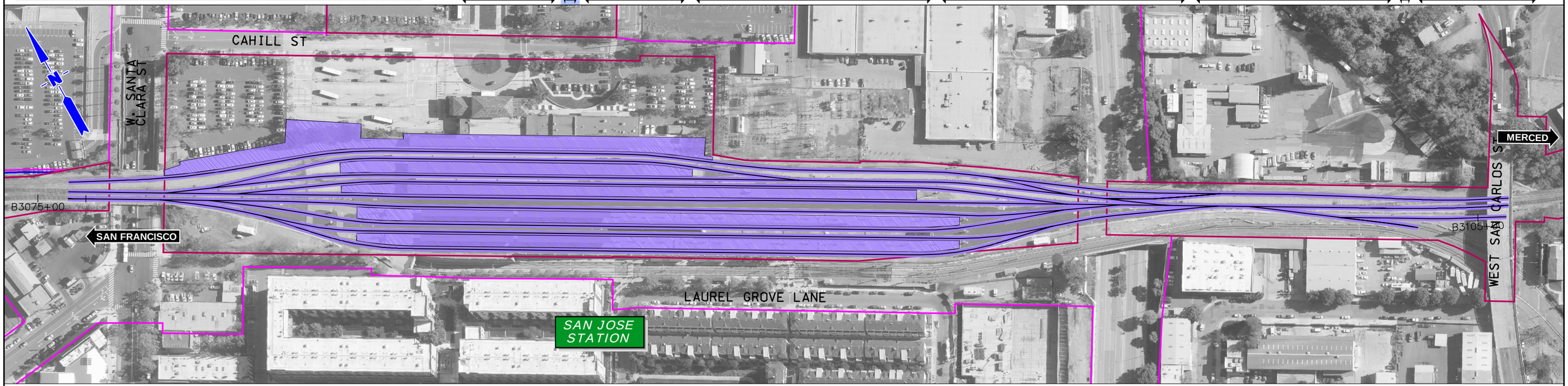
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I6WS1-SPP-05
SCALE ---
SHEET NO. 5 OF 5

APPENDIX H: TRACK SHIFT WORKS

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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DRAWN BY
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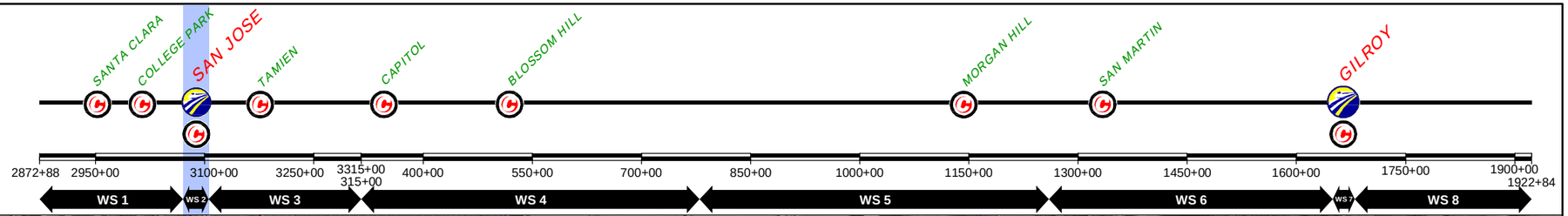
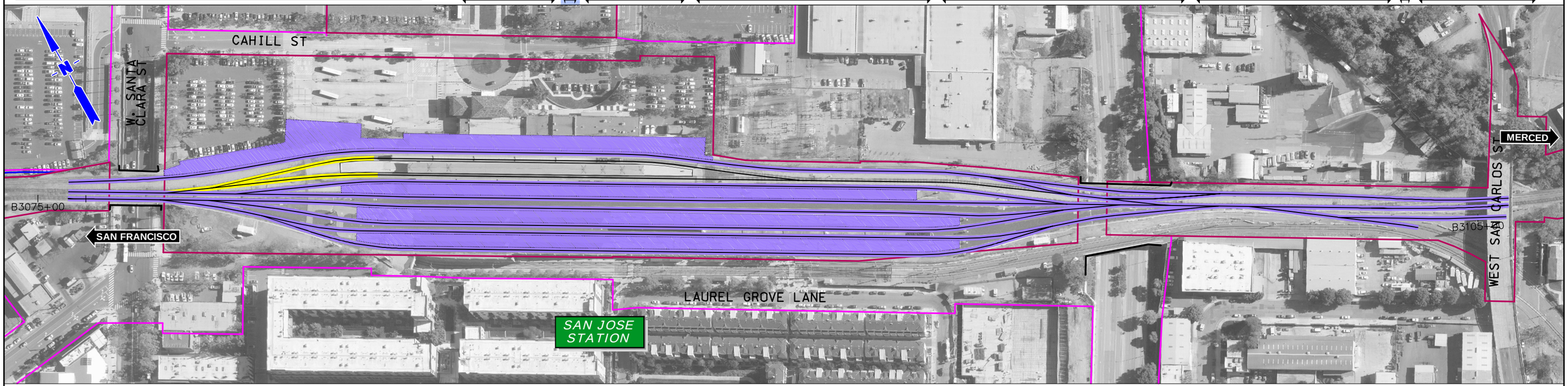
CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH0-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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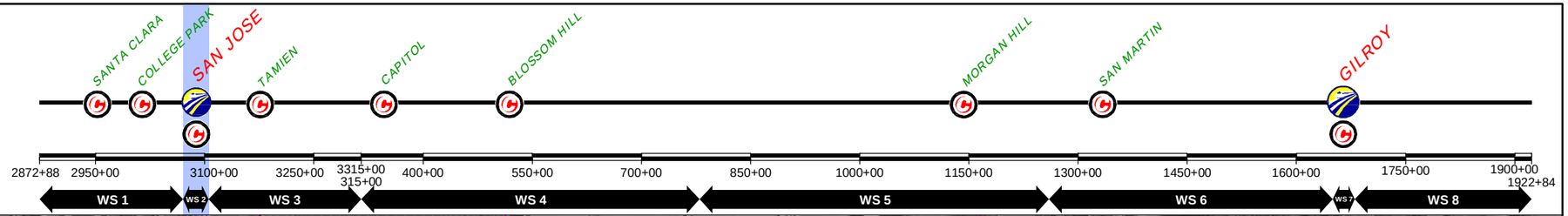
CALIFORNIA High-Speed Rail Authority

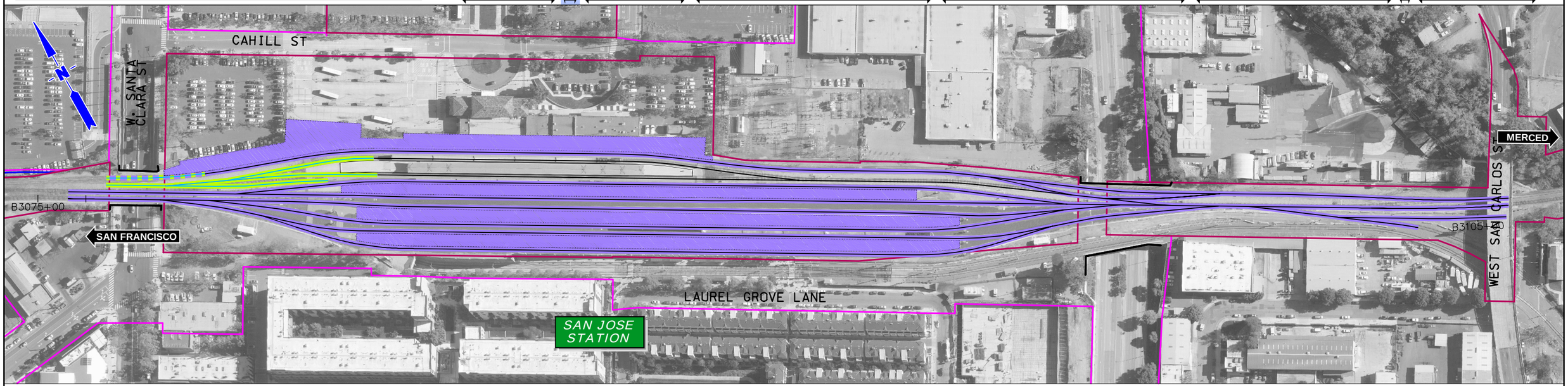
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SCOTT BOULEVARD TO SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH1-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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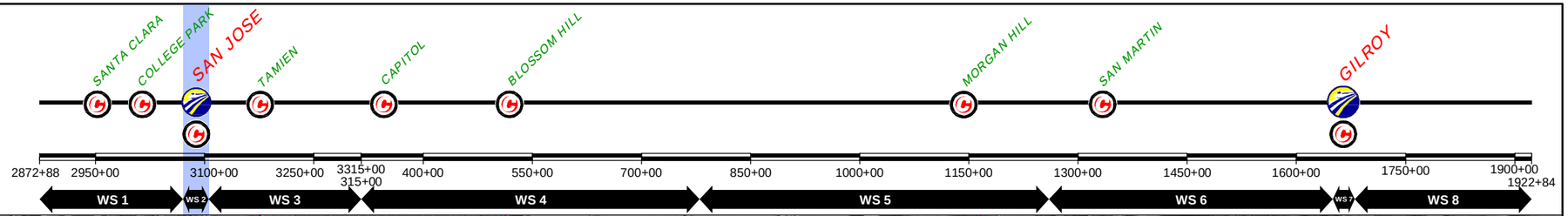
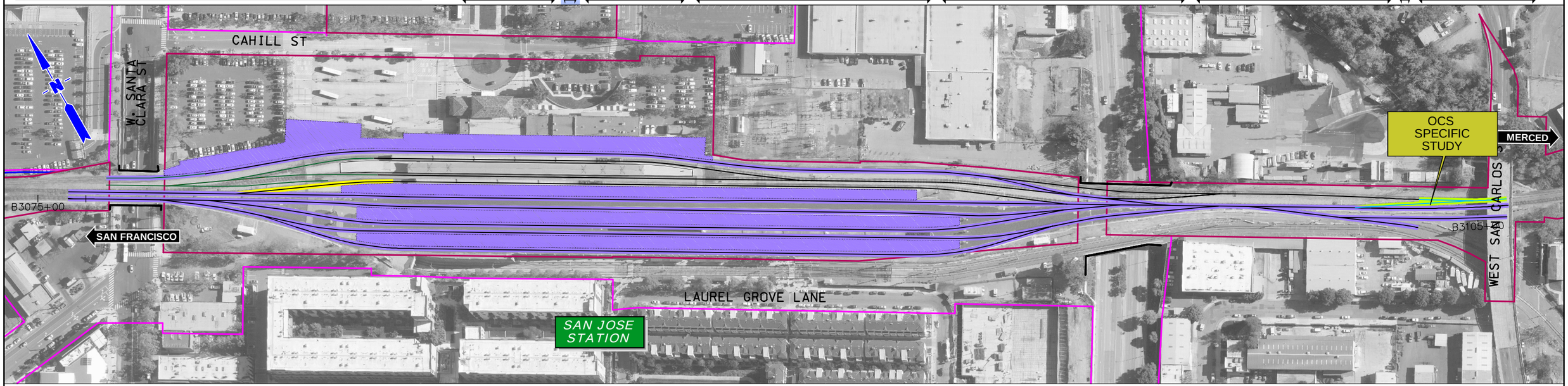
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH2-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH3-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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MAJOR UNDERPASS
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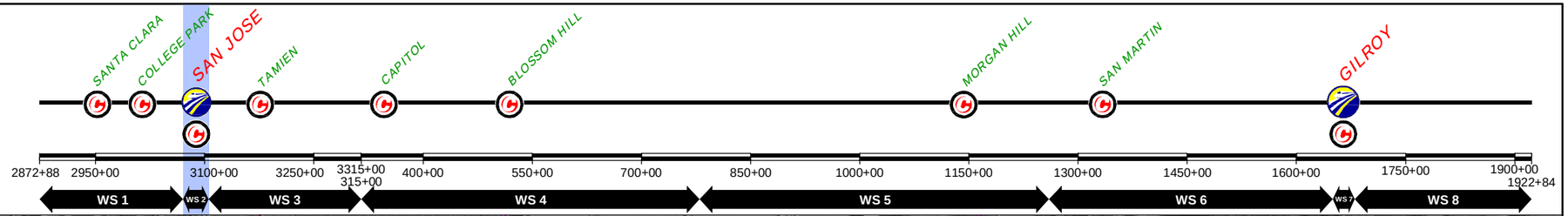
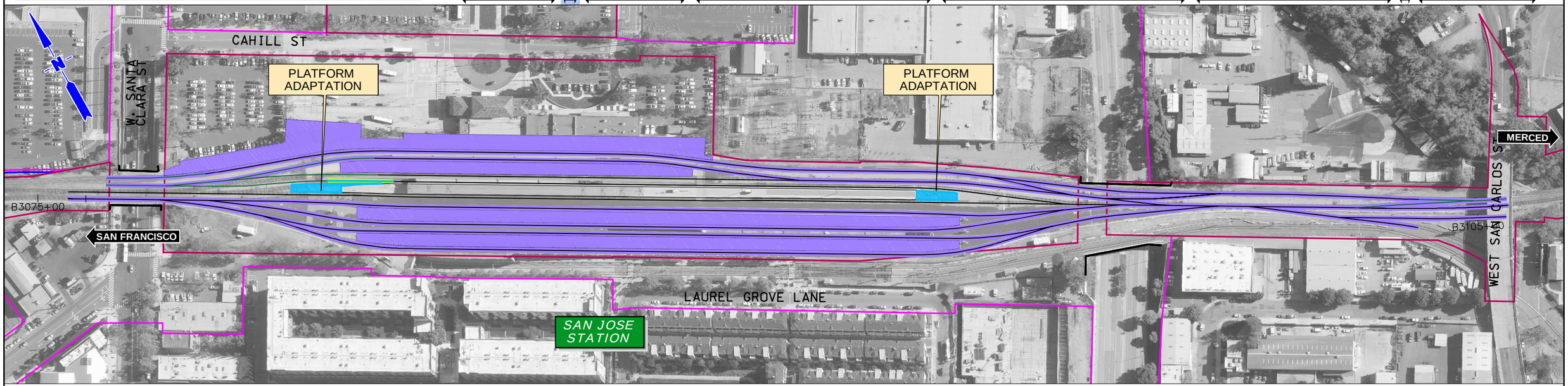
TUNNEL
CREEK UNDERPASS





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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH4-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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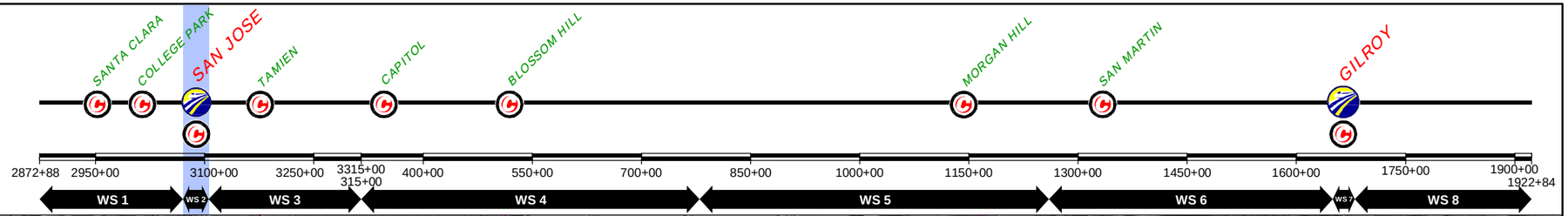
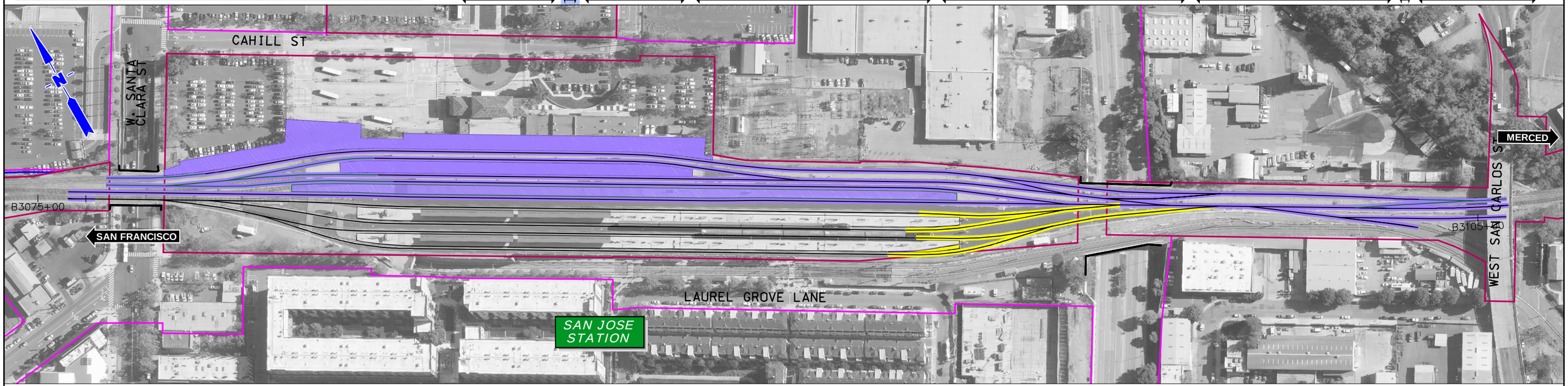
TUNNEL
CREEK UNDERPASS





$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

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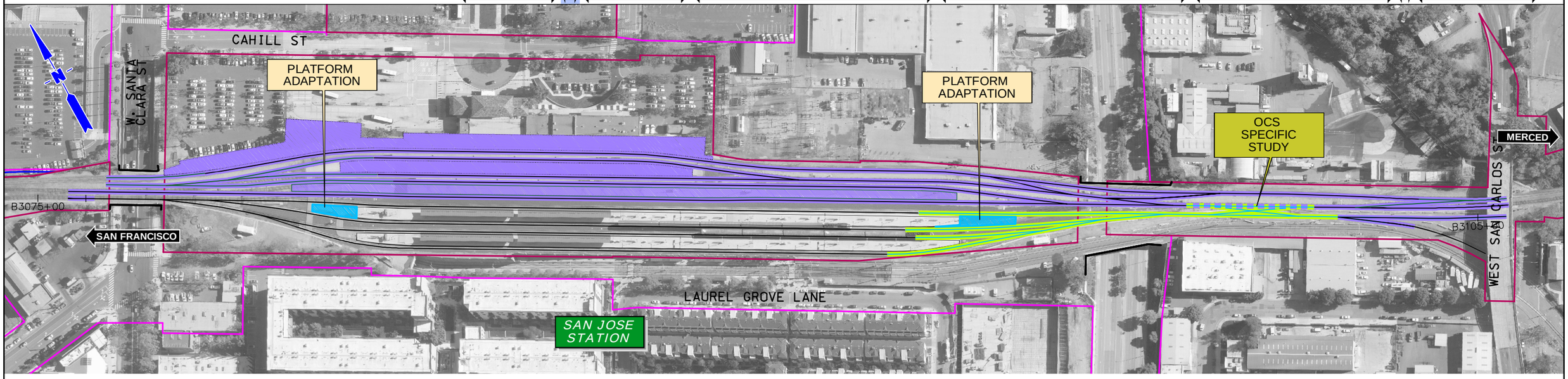
SAN JOSE TO MERCED
SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH5-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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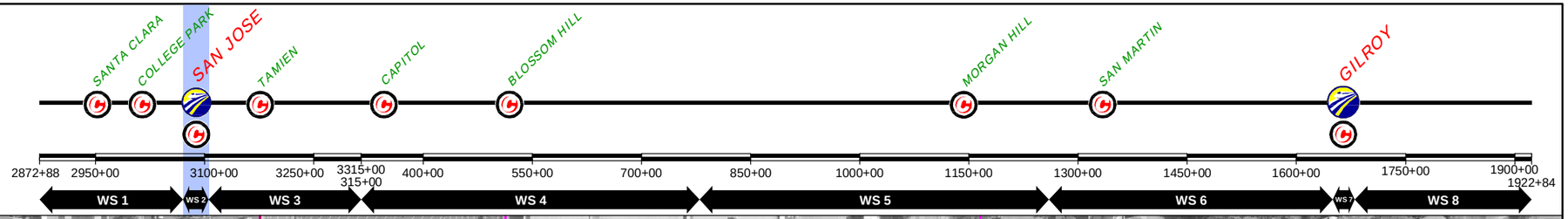
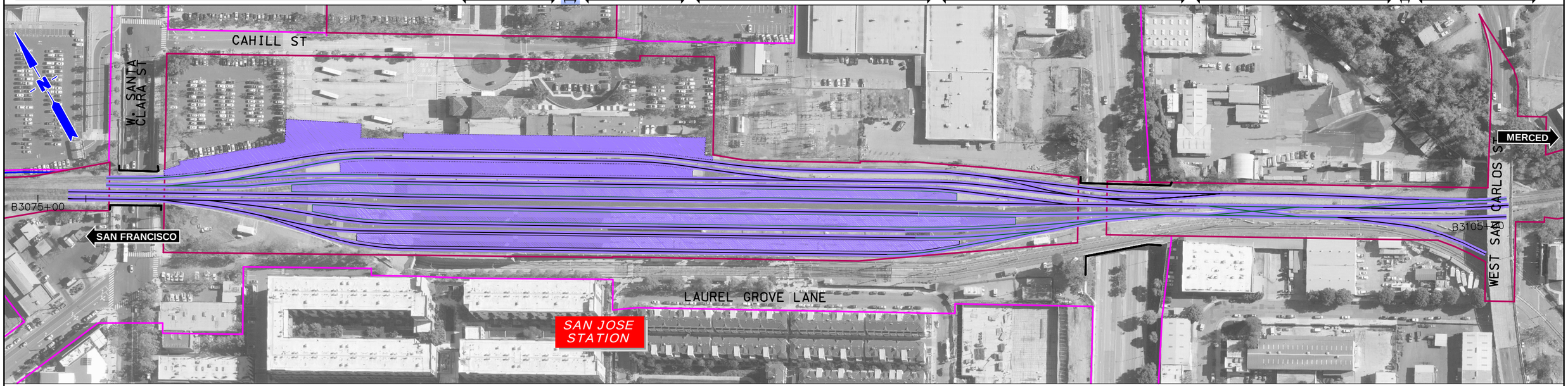
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH6-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
SAN JOSE STATION
CONSTRUCTION PHASES
PLAN-TIMELINE
PHASE 7

CONTRACT NO.
DRAWING NO. CV-I1WS2-PH7-01
SCALE 1" = 200'
SHEET NO. 1 OF 1

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

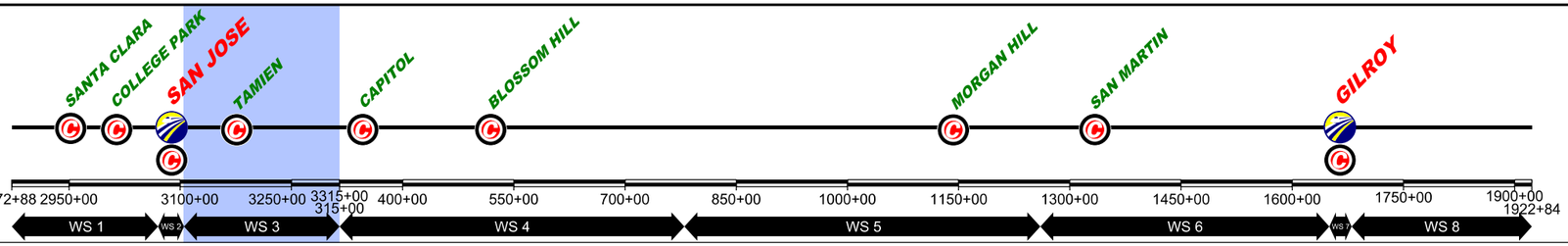
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

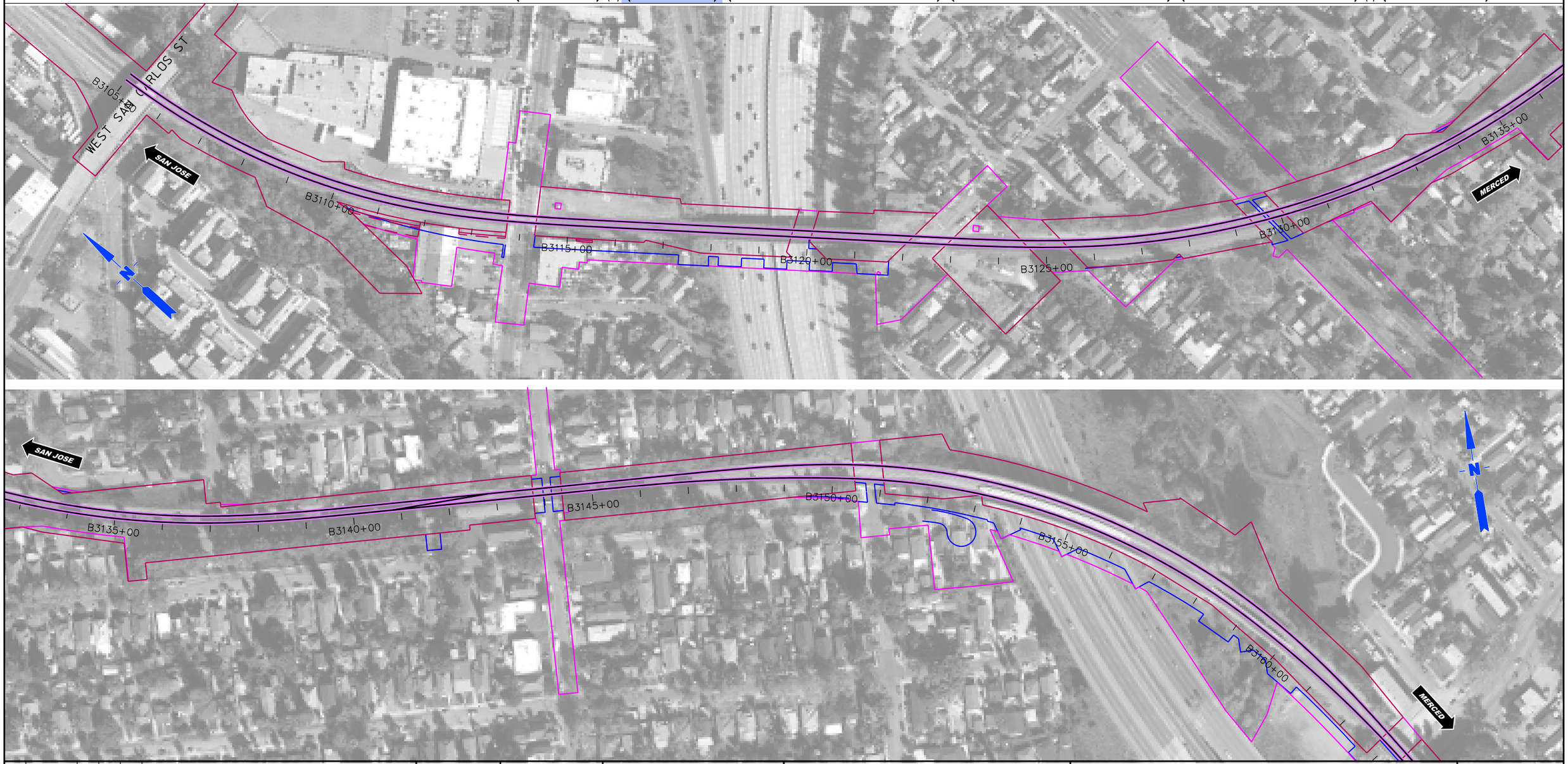
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$PENTBLS$
$TIME$
$DATE$
$USER$

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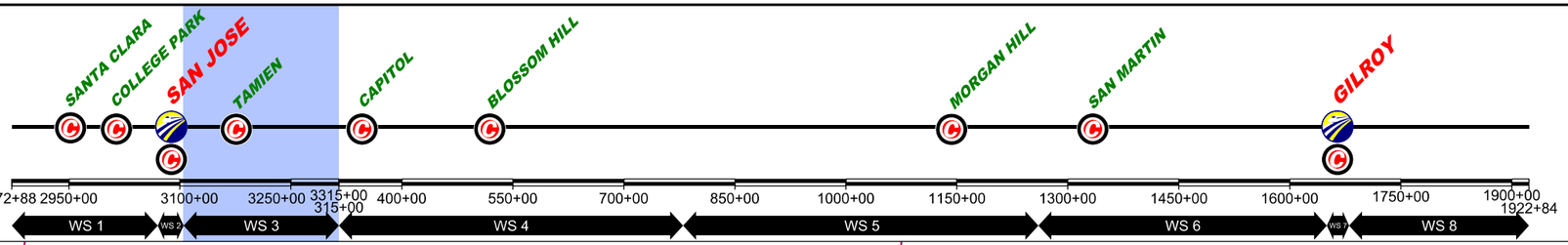
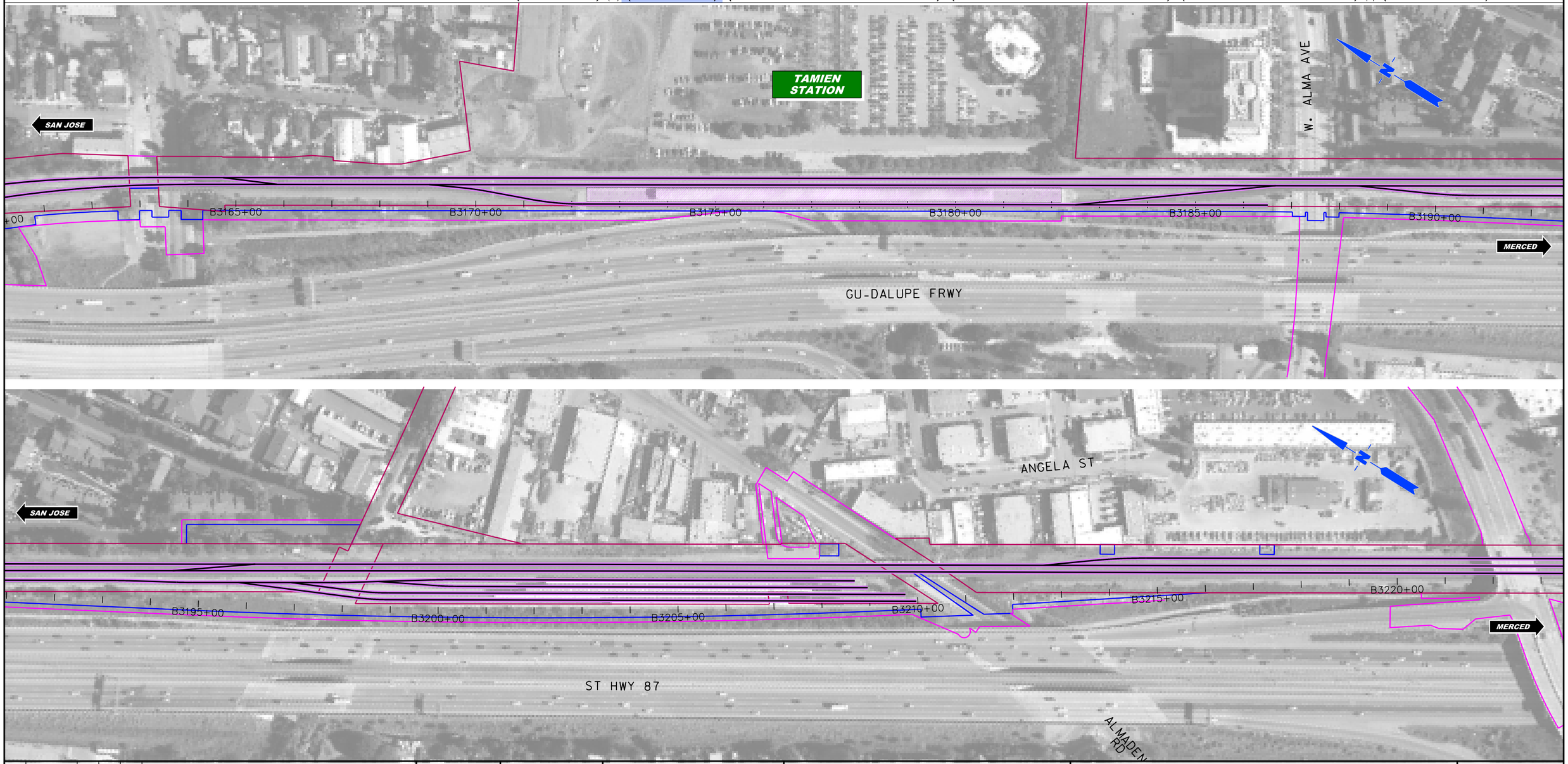
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO MERCED
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH0-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$TIME$
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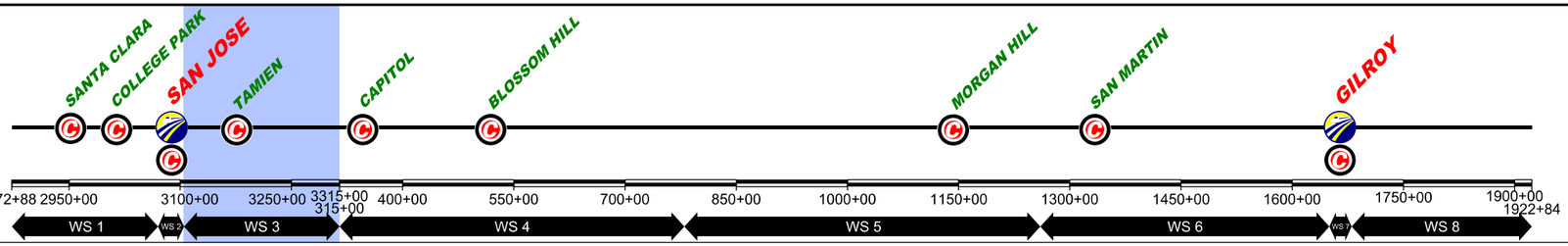
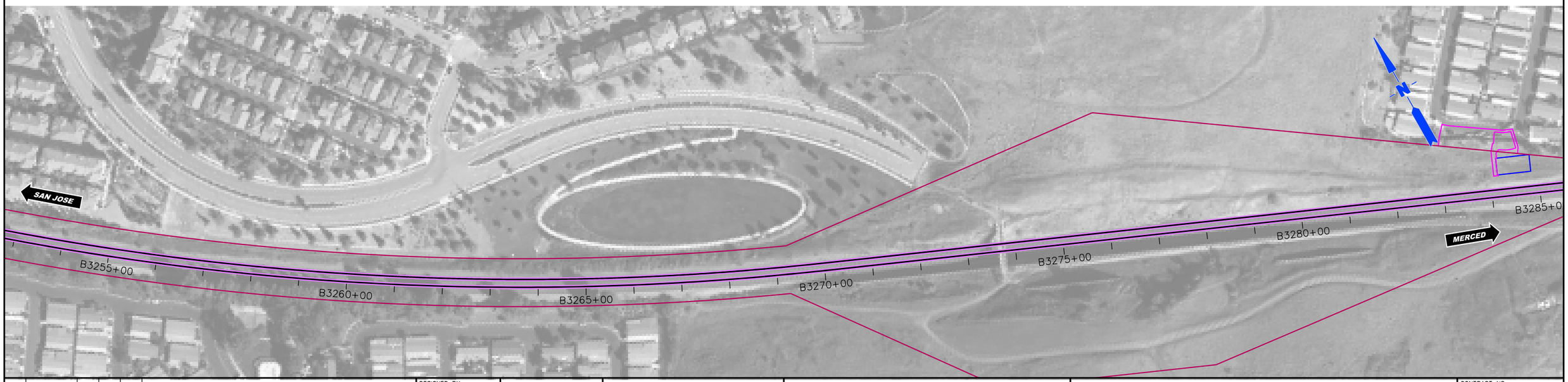
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH0-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN FRANCISCO TO MERCED
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH0-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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TUNNEL
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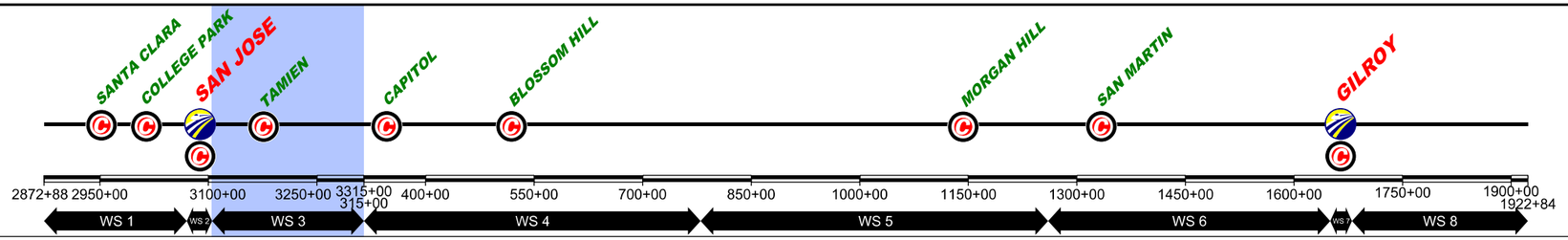

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SAN FRANCISCO TO MERCED
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH0-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

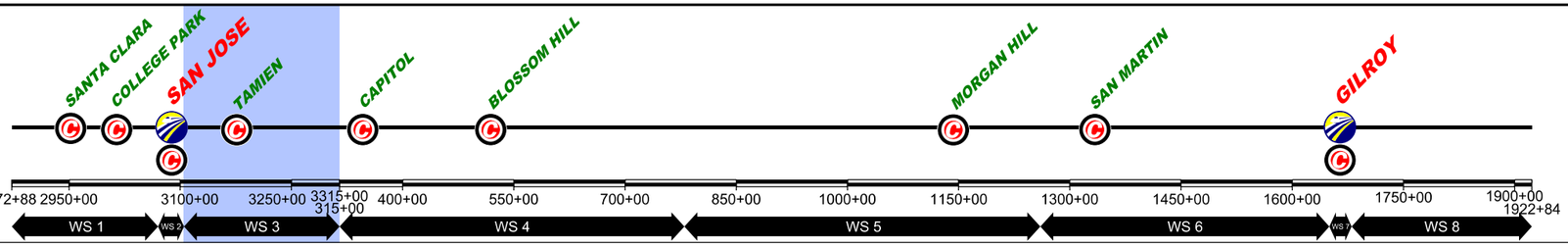
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

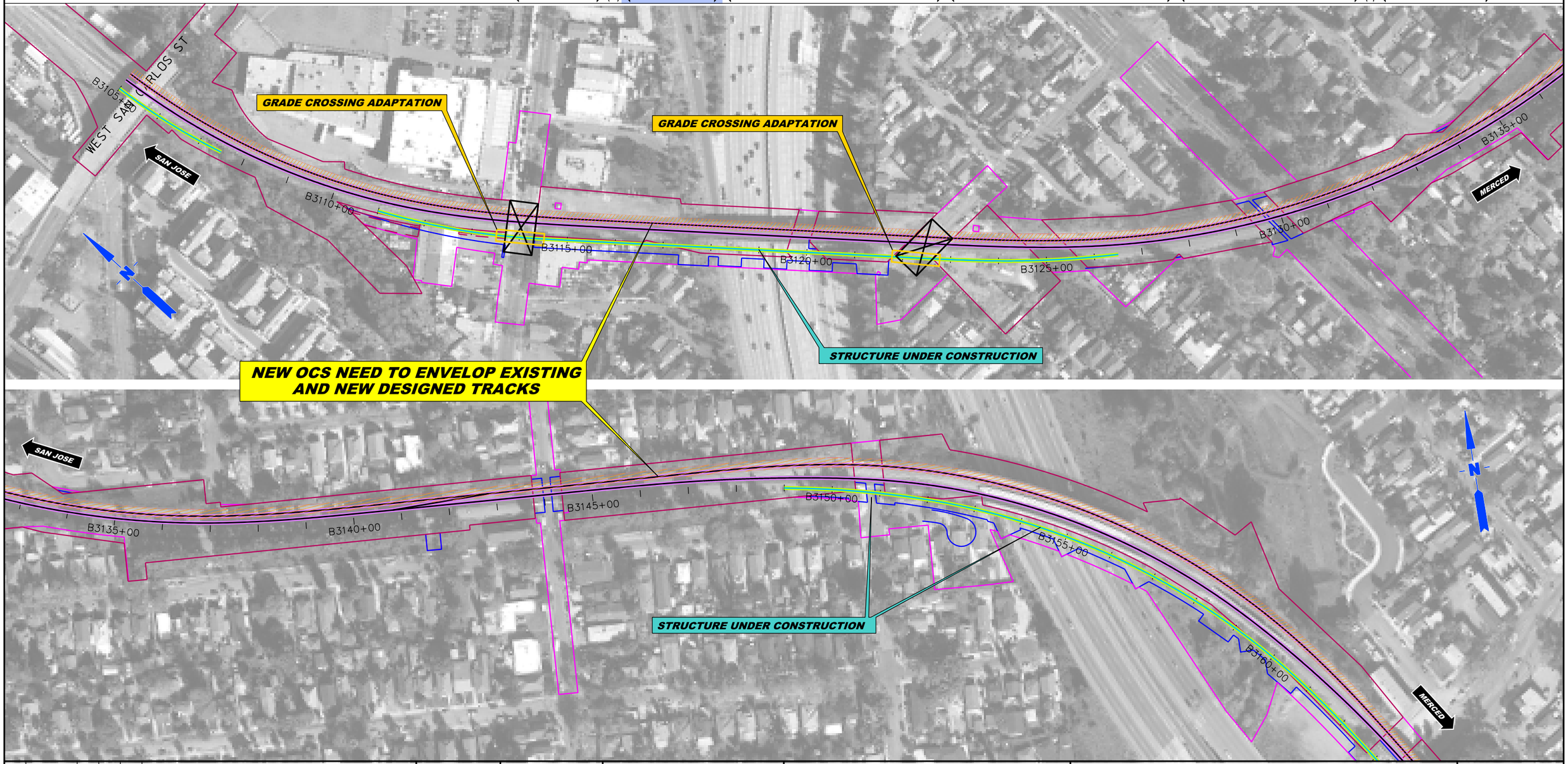
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH1-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
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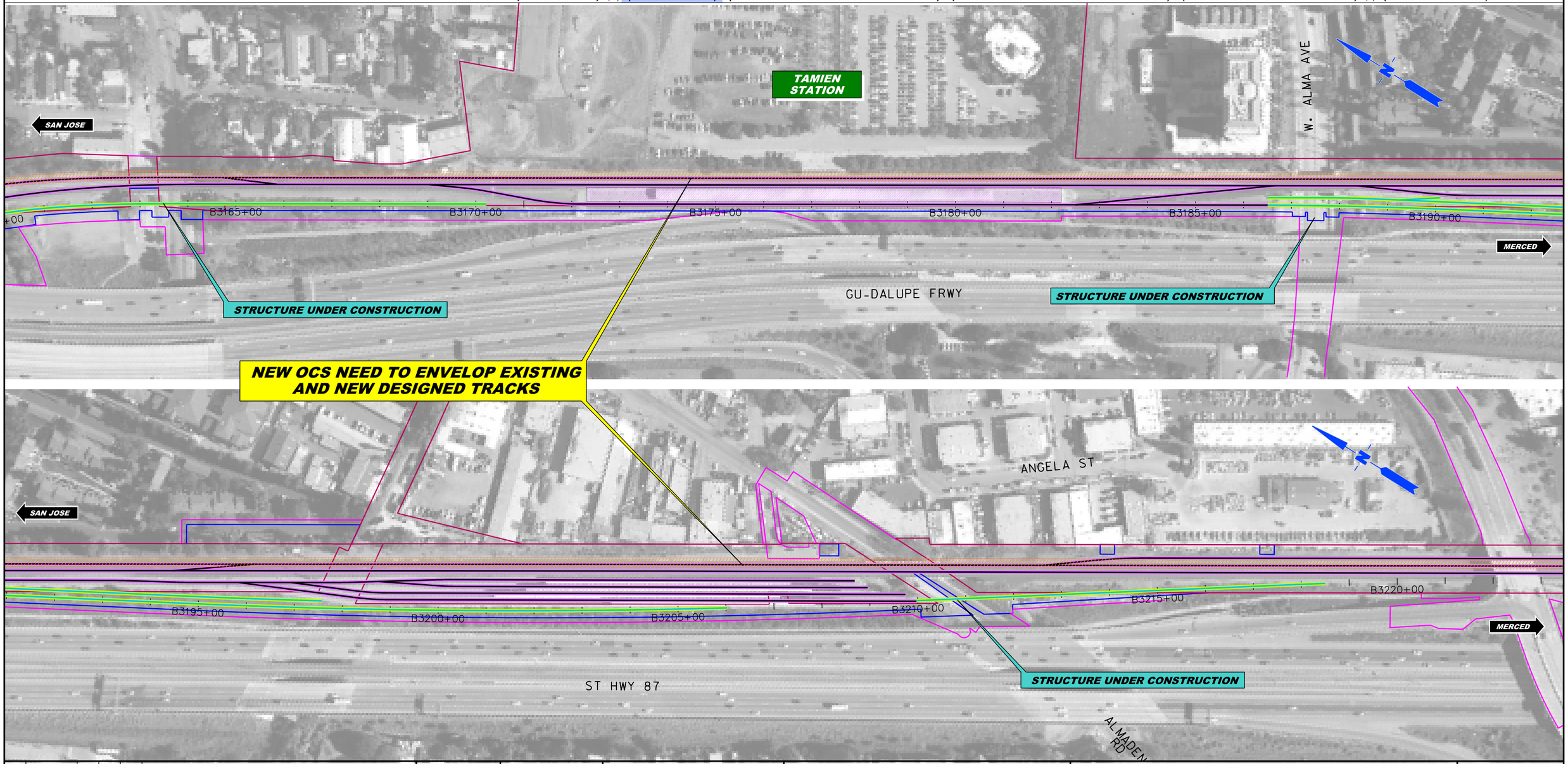

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CONSTRUCTION PHASES
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PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH1-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
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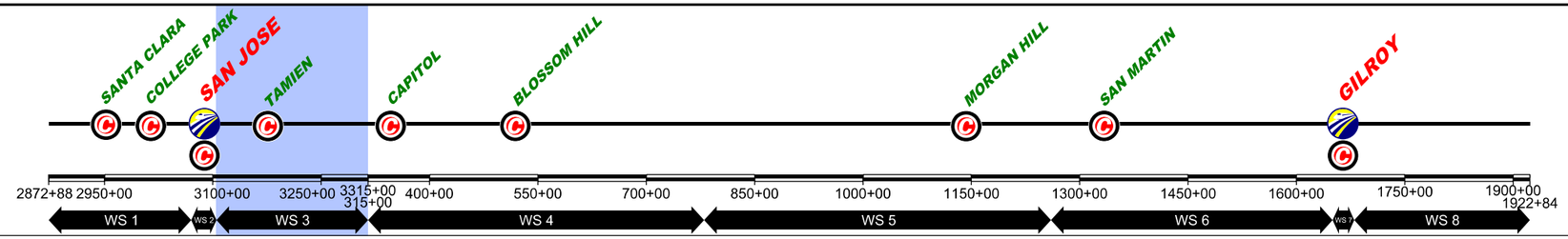

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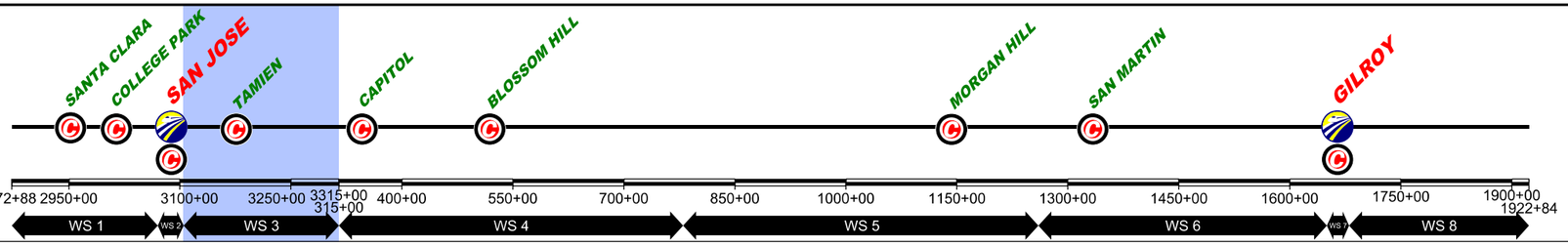
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH1-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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SAN FRANCISCO TO MERCED
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH1-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
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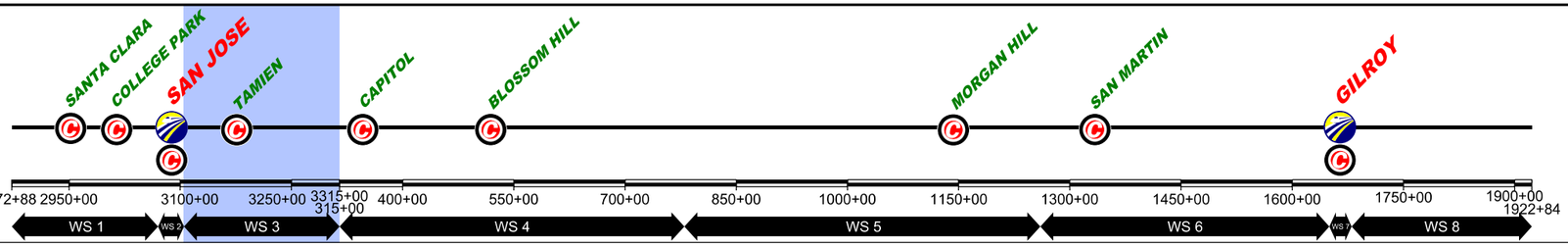
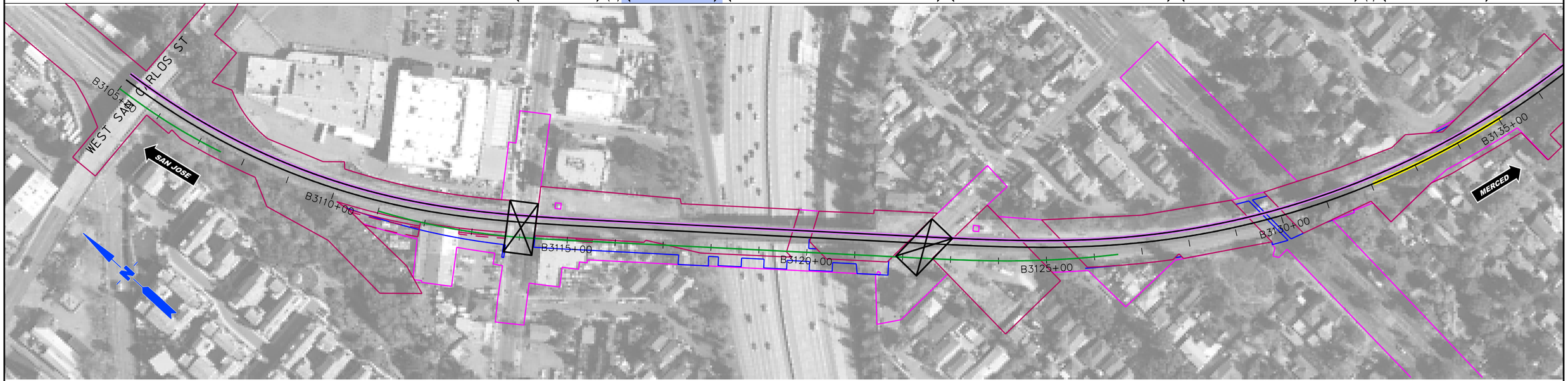
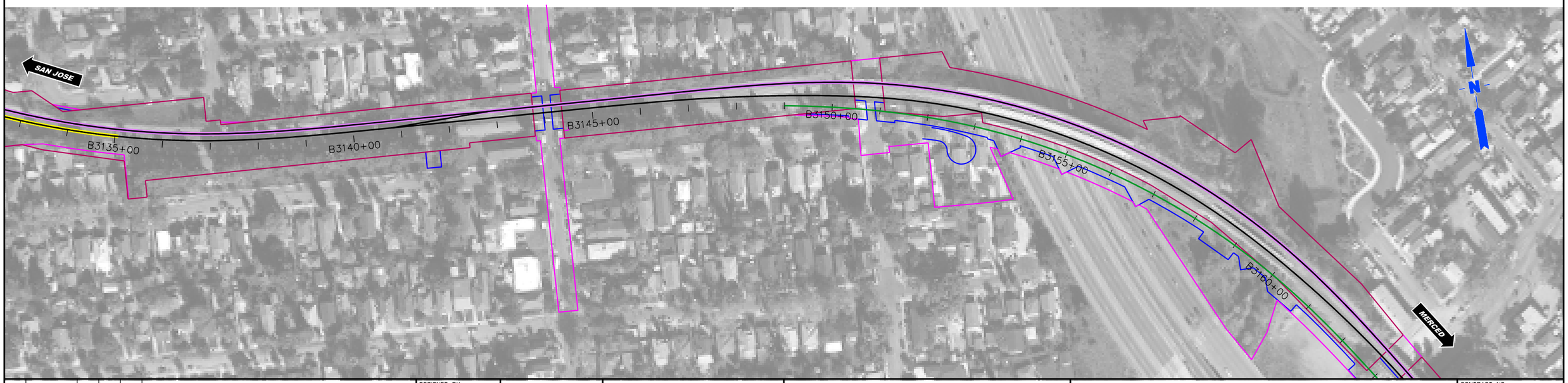
CREEK UNDERPASS







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$PENTBLS$
$TIME$
$DATE$
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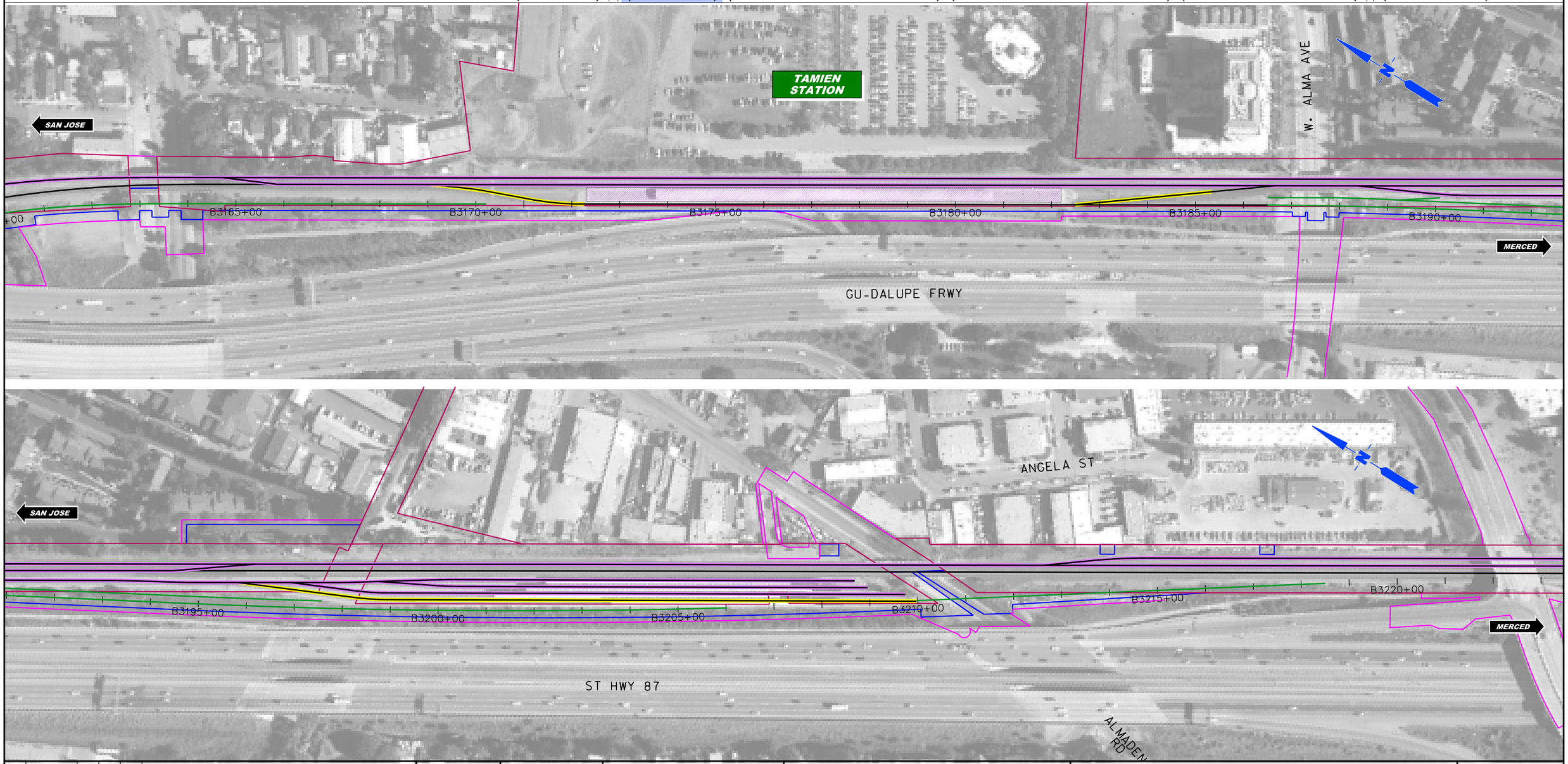
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH2-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$PENTBLS$
$TIME$
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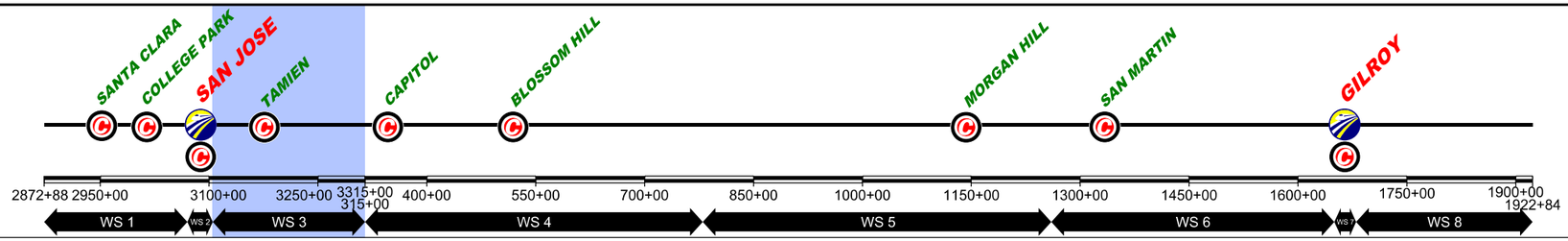
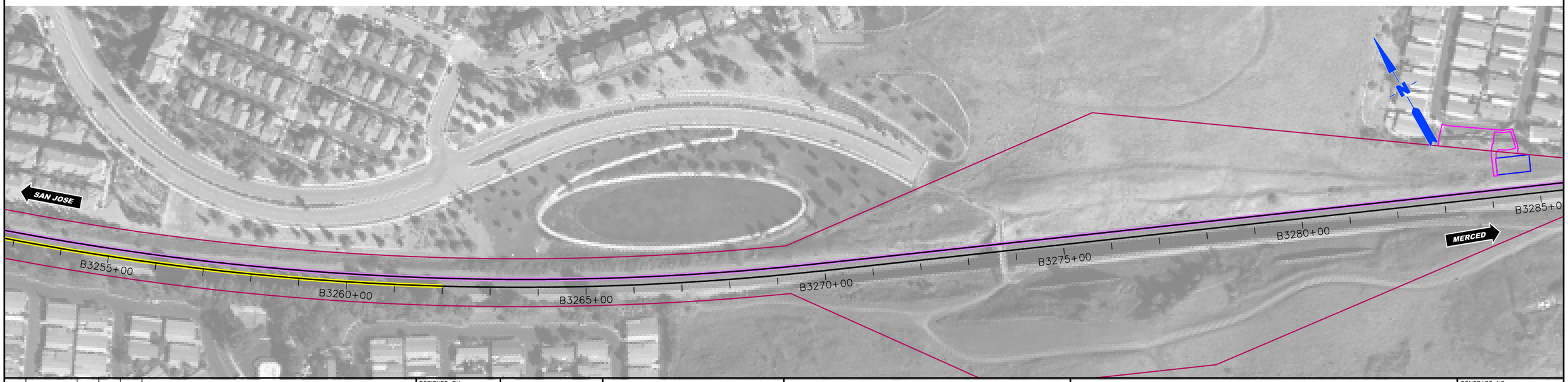
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH2-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH2-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
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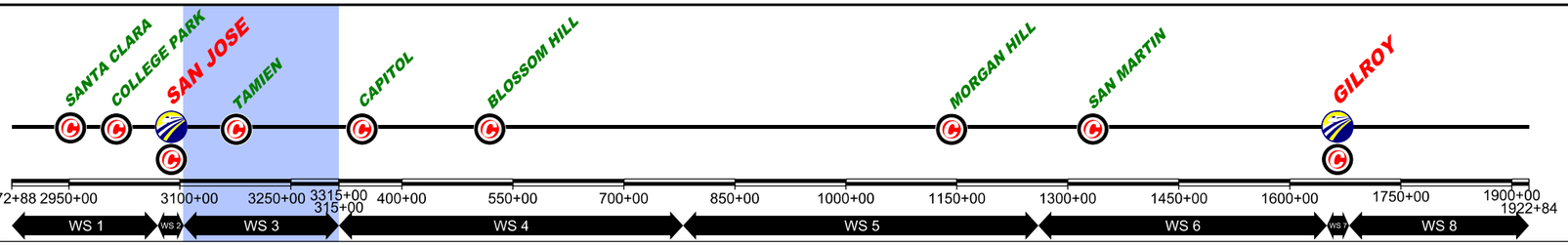

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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH2-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

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UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
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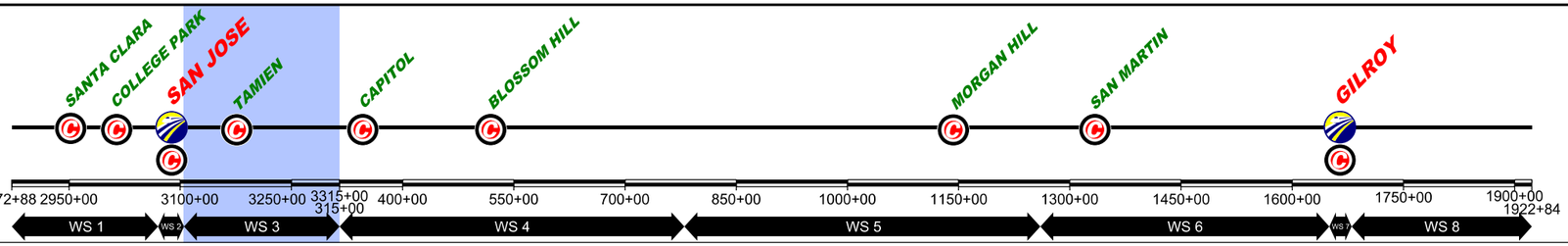

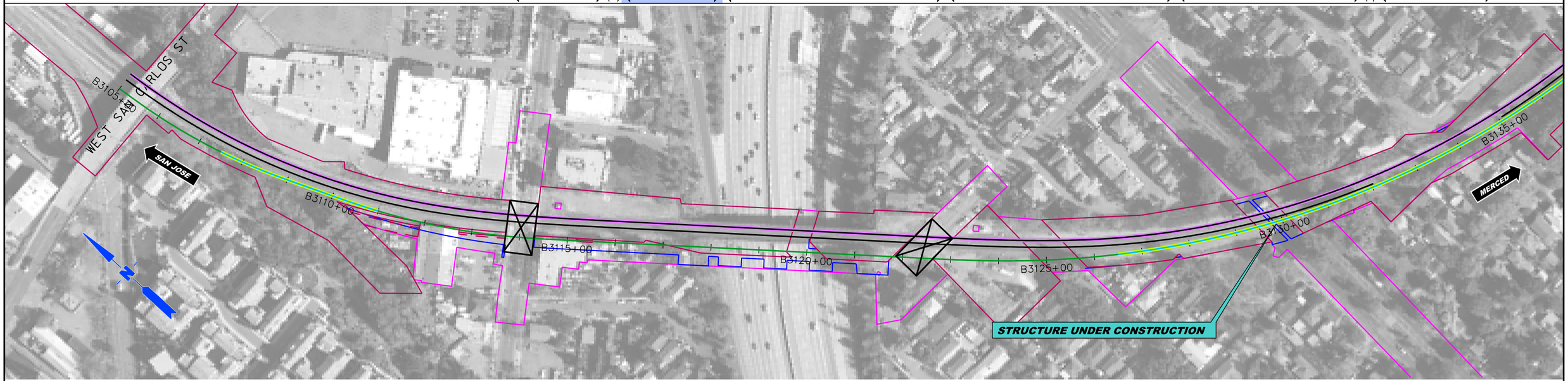

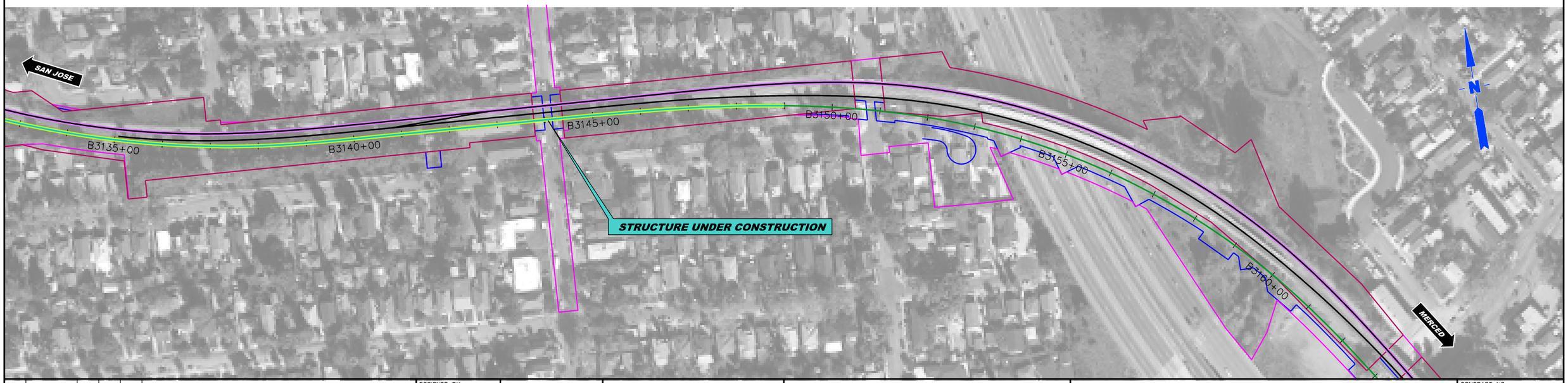

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PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH3-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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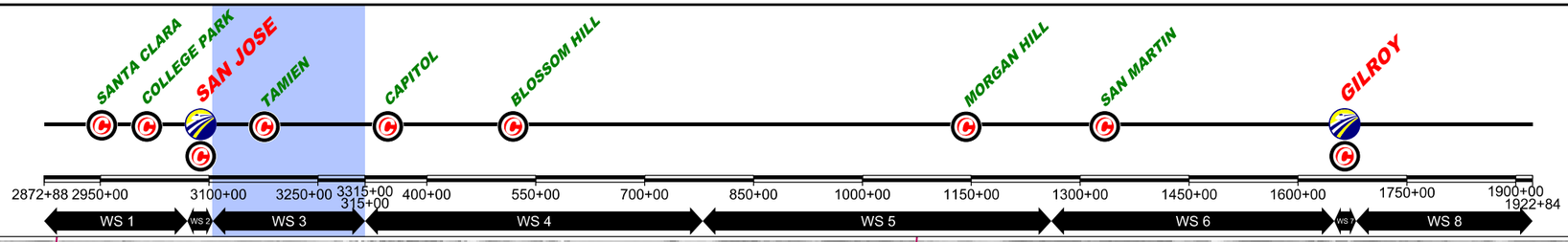
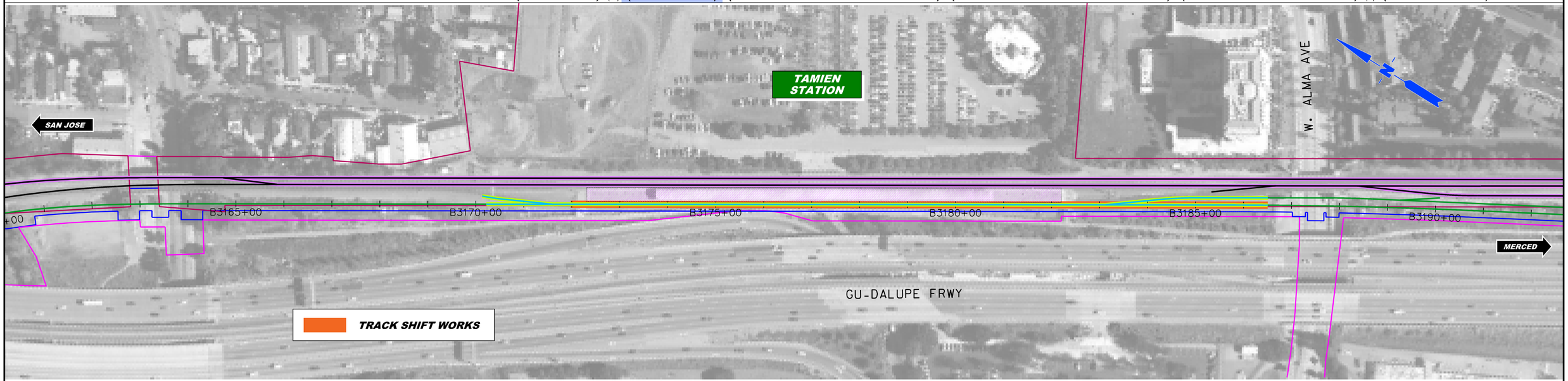
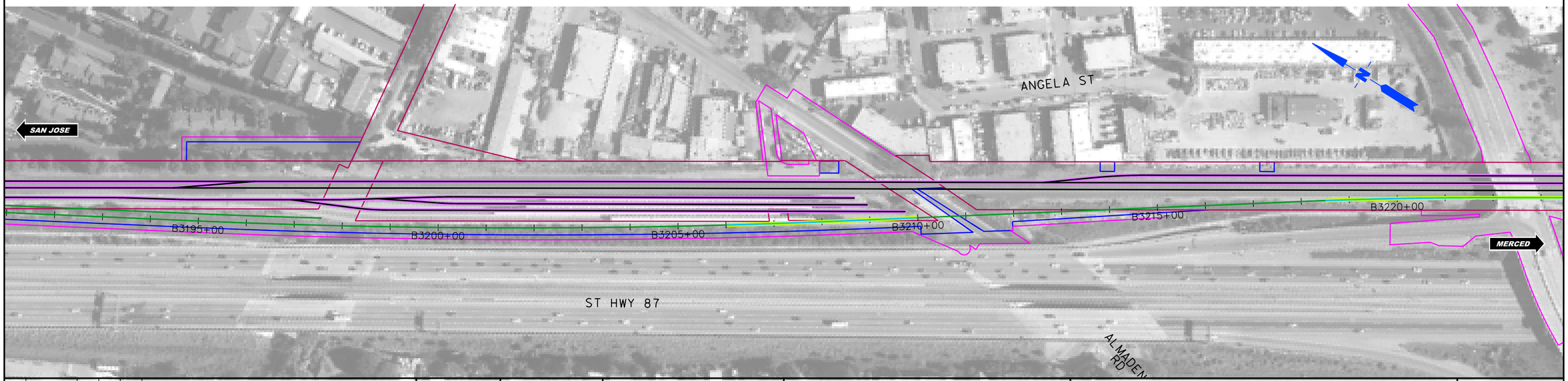
CREEK UNDERPASS







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PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH3-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

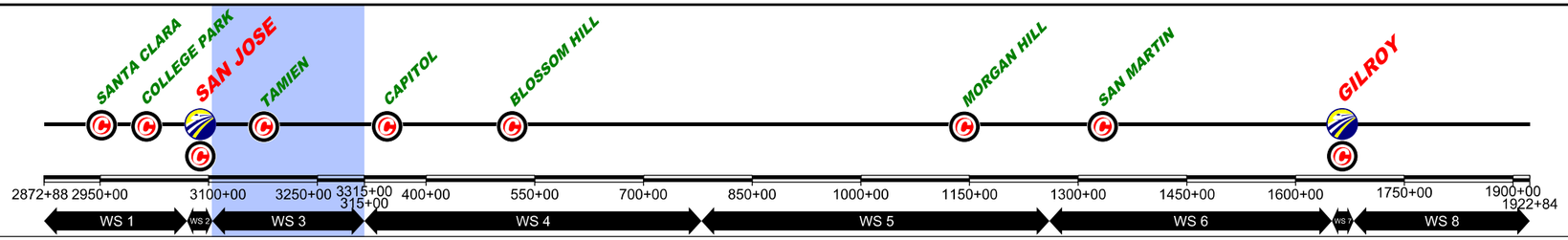
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

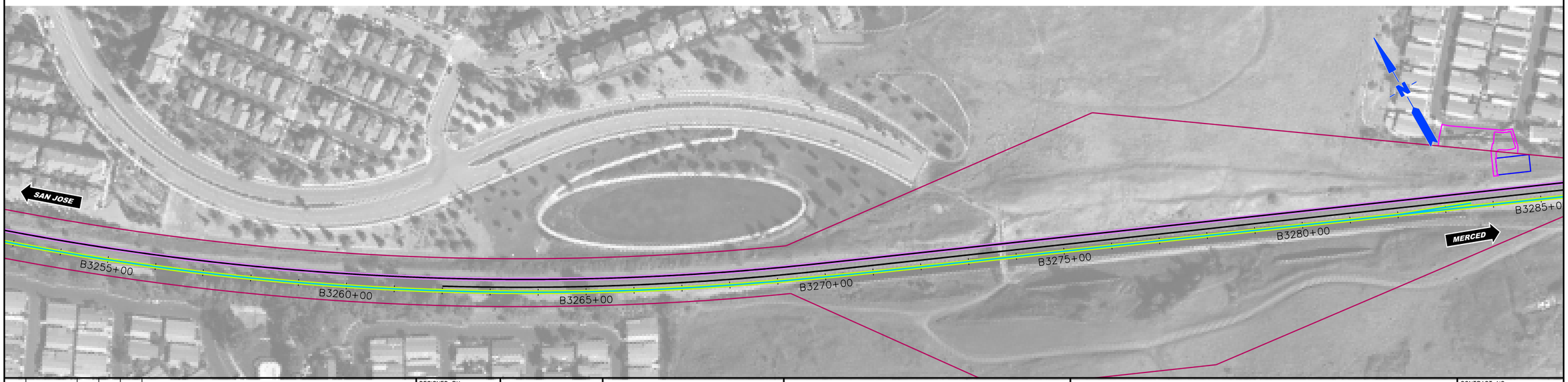
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH3-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

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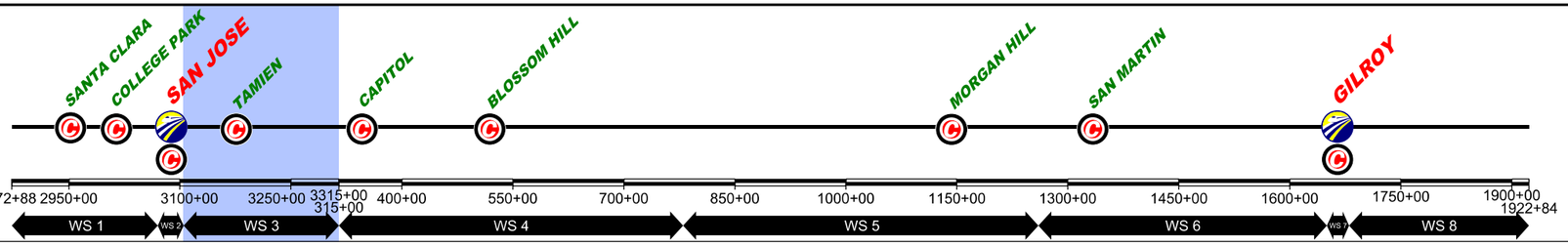
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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CONTRACT NO.
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SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
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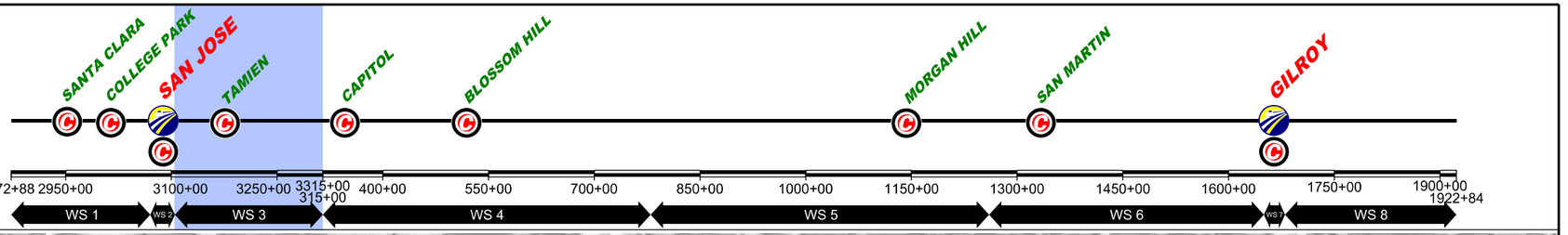

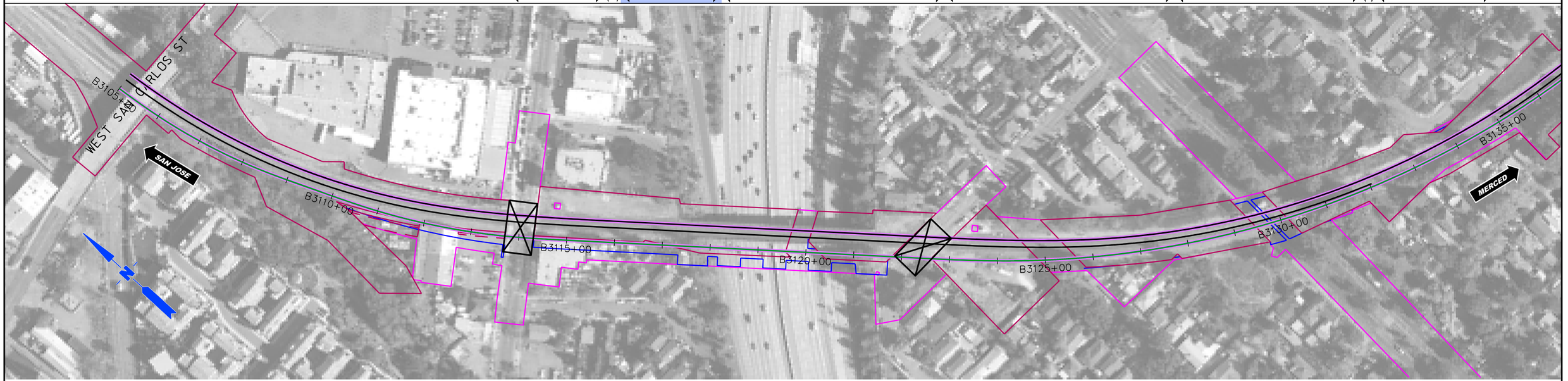

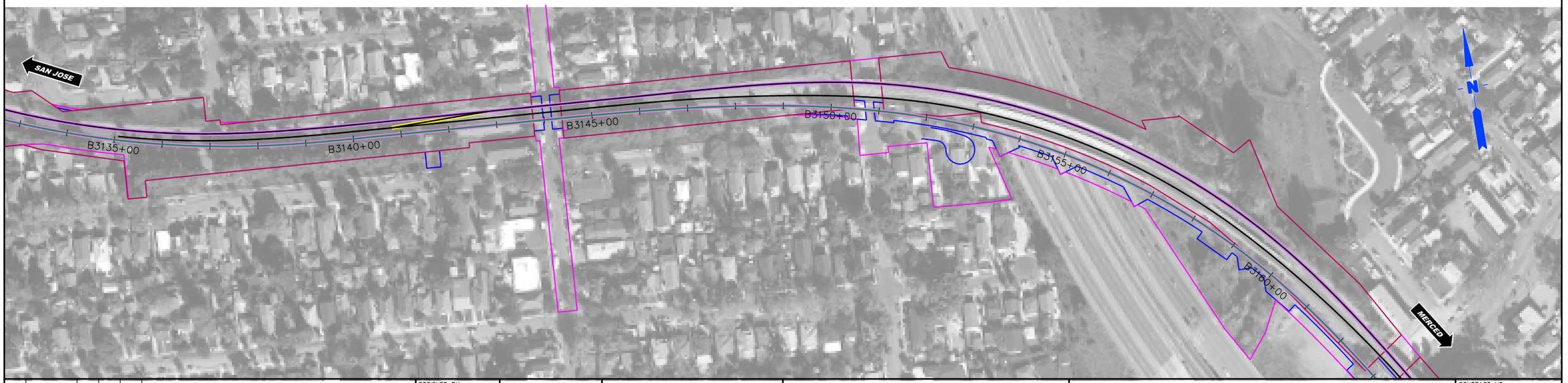

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PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH4-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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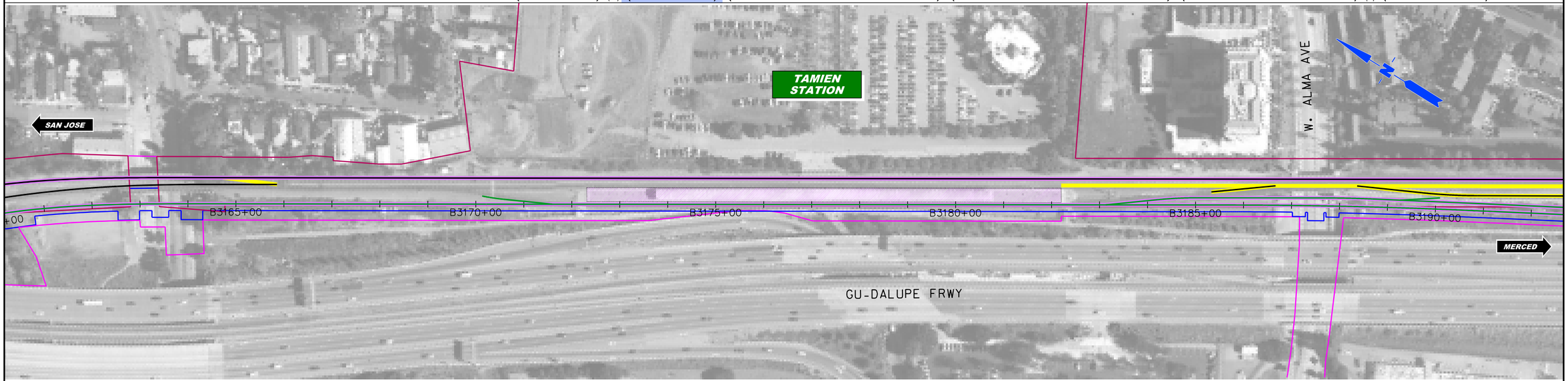
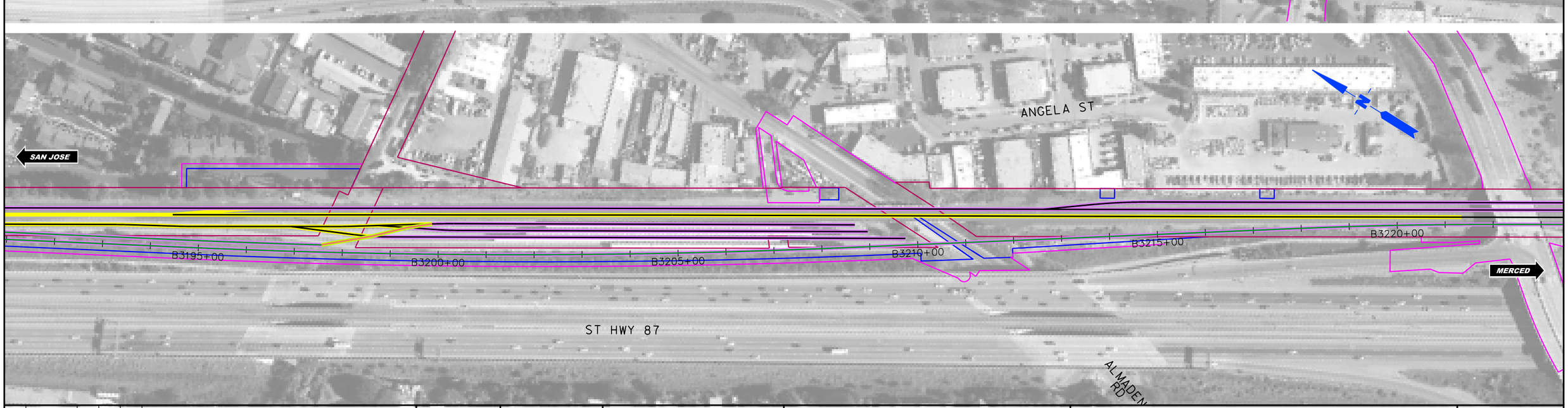
TUNNEL
CREEK UNDERPASS





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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH4-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

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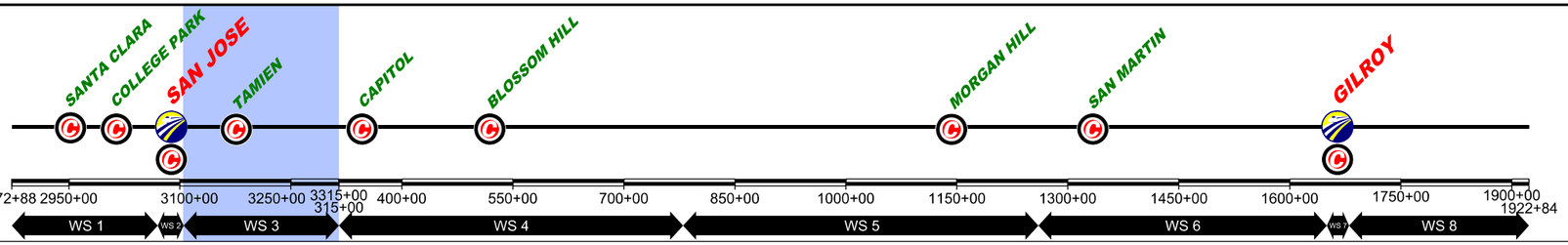

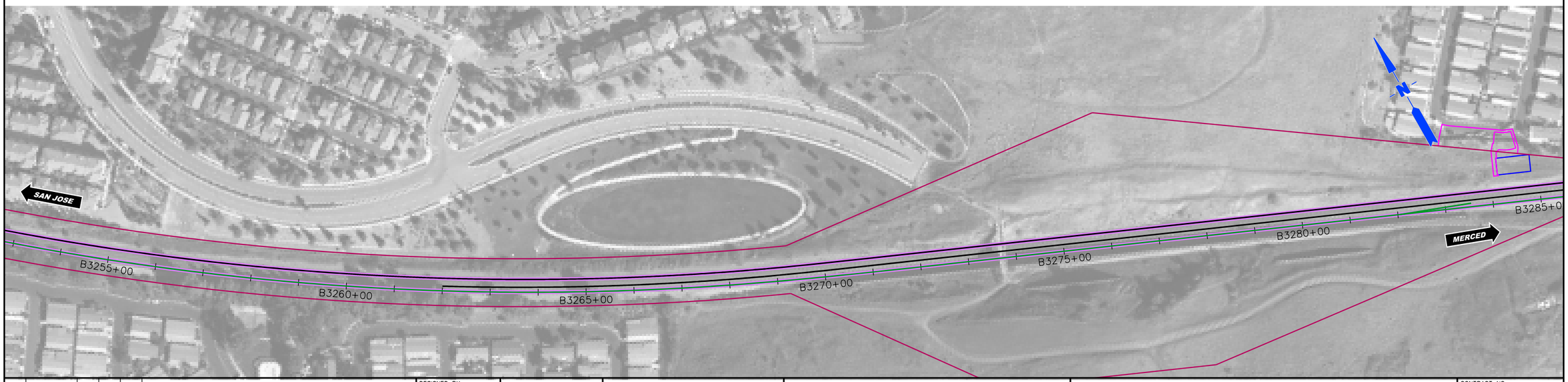

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SHEET NO. 3 OF 4

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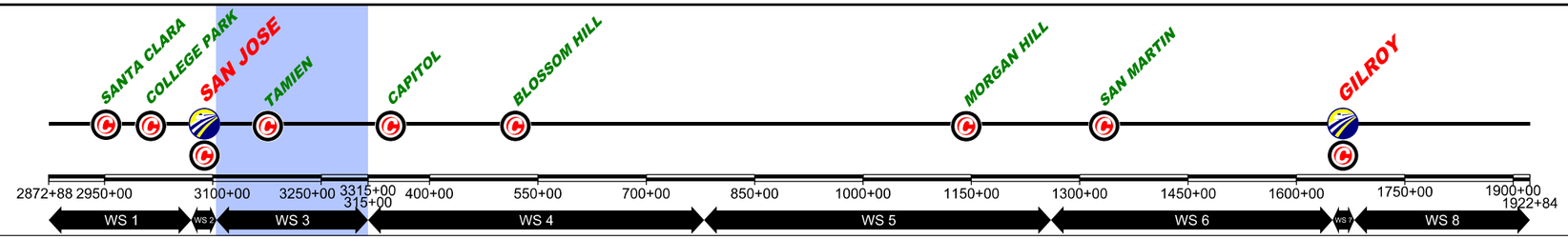

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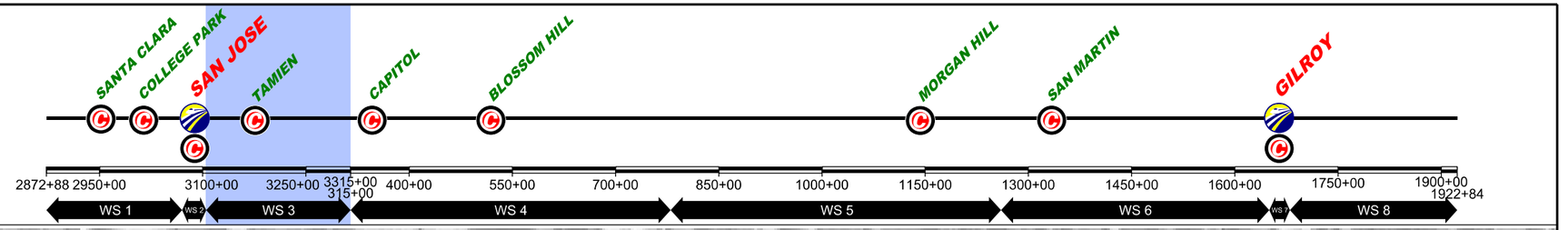
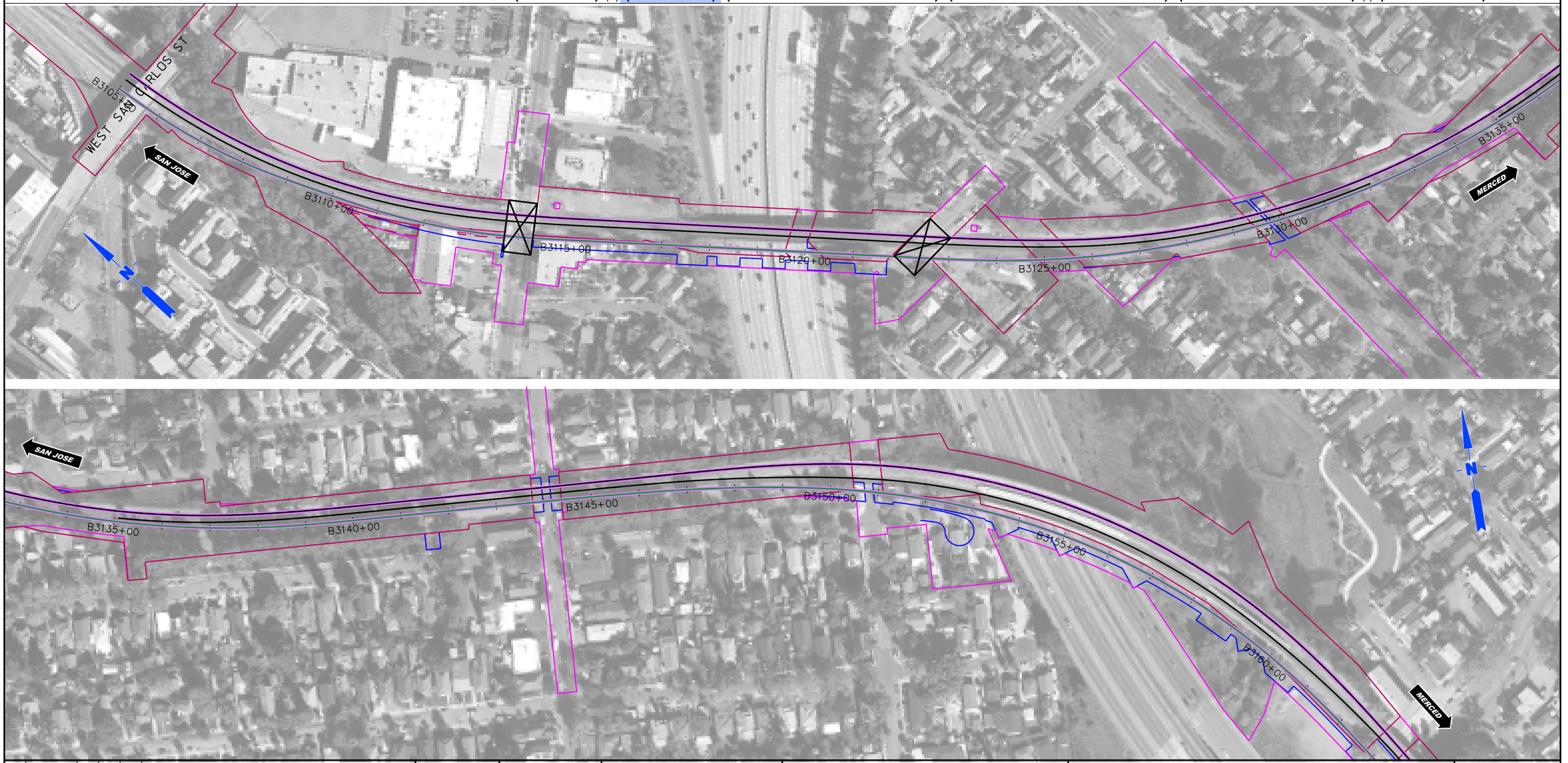
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

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SAN FRANCISCO TO MERCED
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH5-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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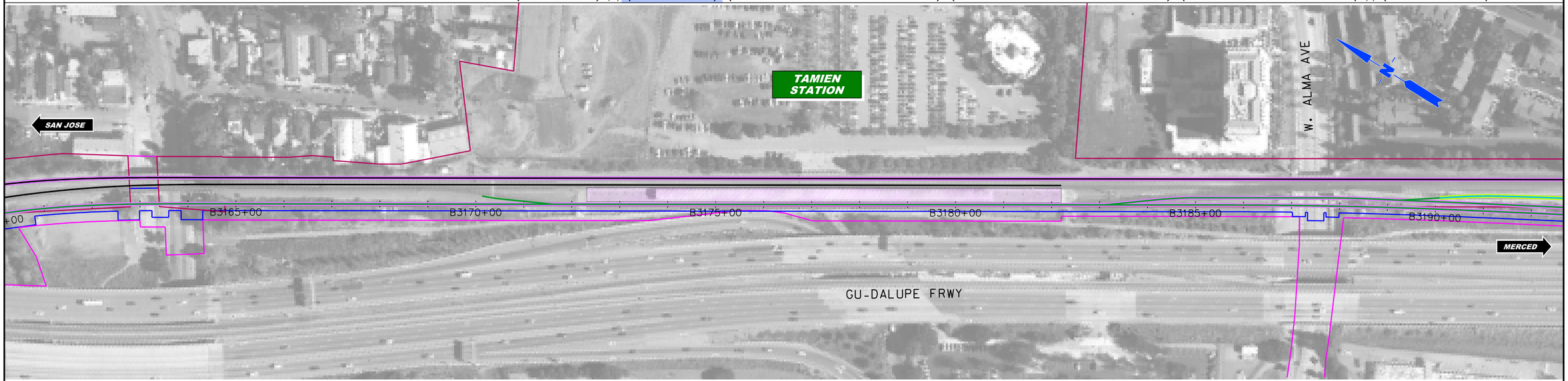
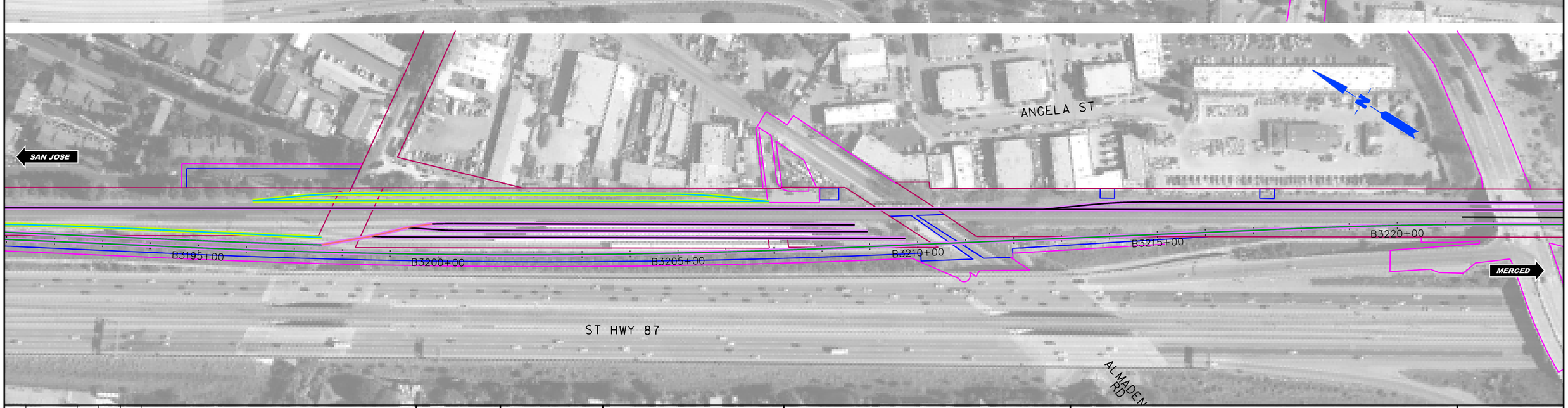
TUNNEL
CREEK UNDERPASS





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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH5-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

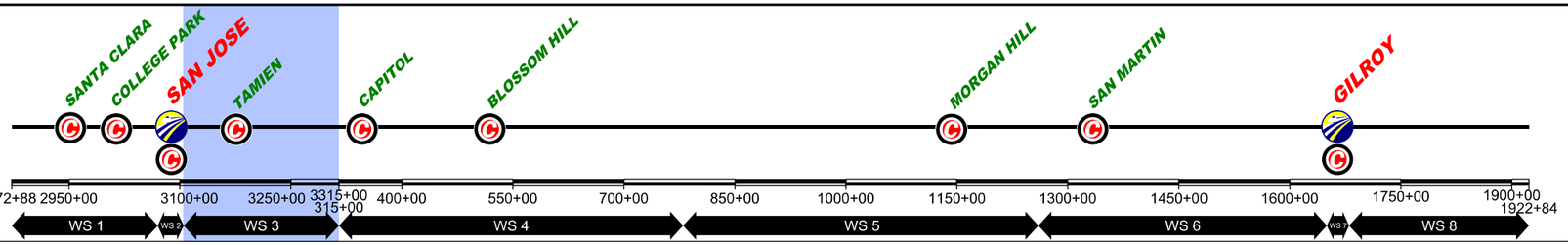
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

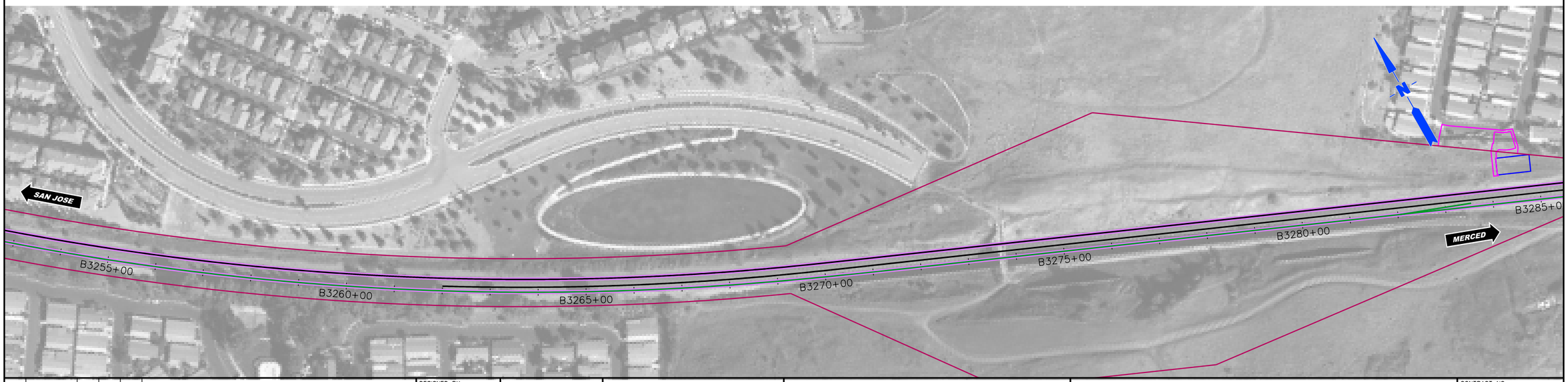
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH5-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
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PROPOSED TCE

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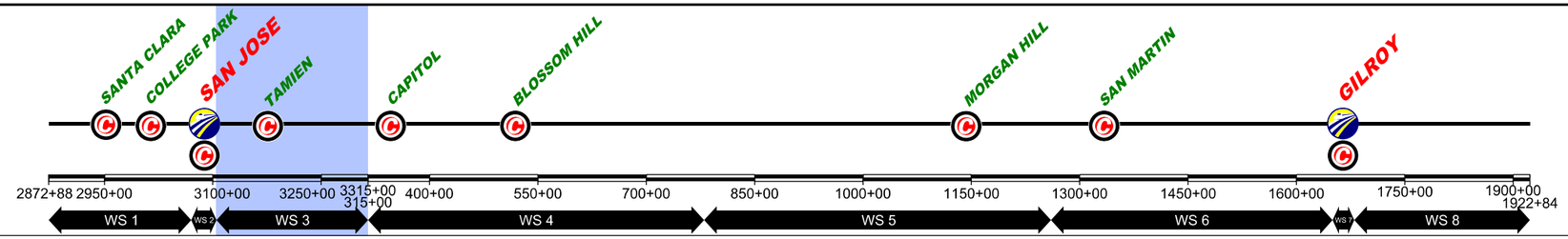
CREEK UNDERPASS



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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH5-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

$FILE$
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$PENTBLS$
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CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
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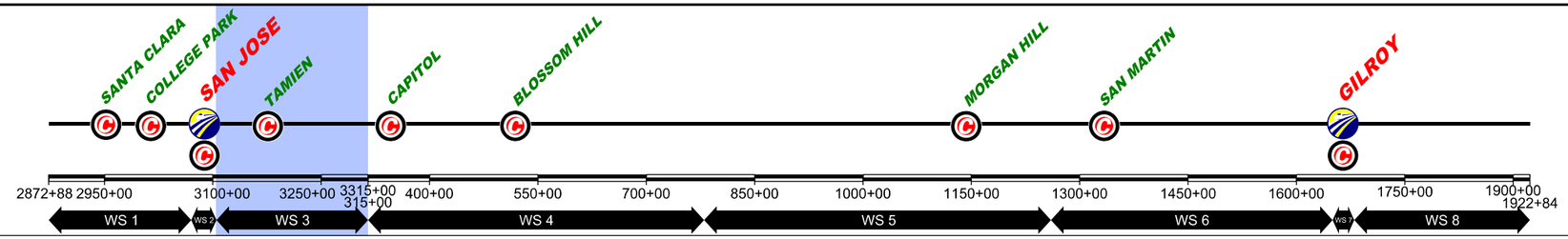

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PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH6-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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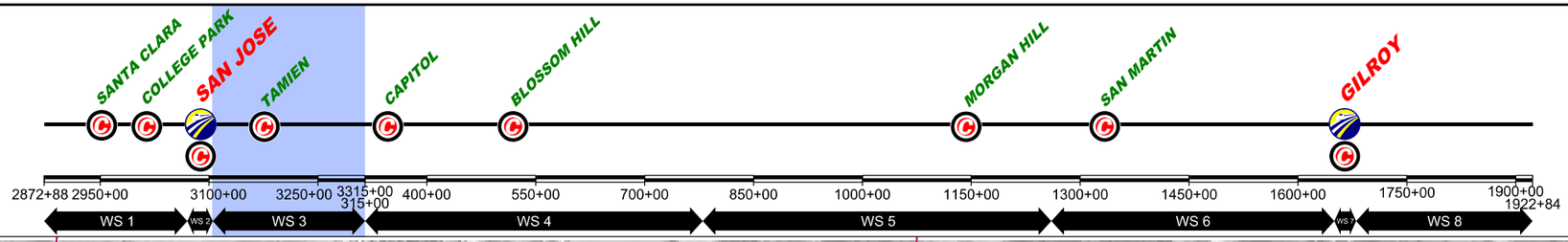
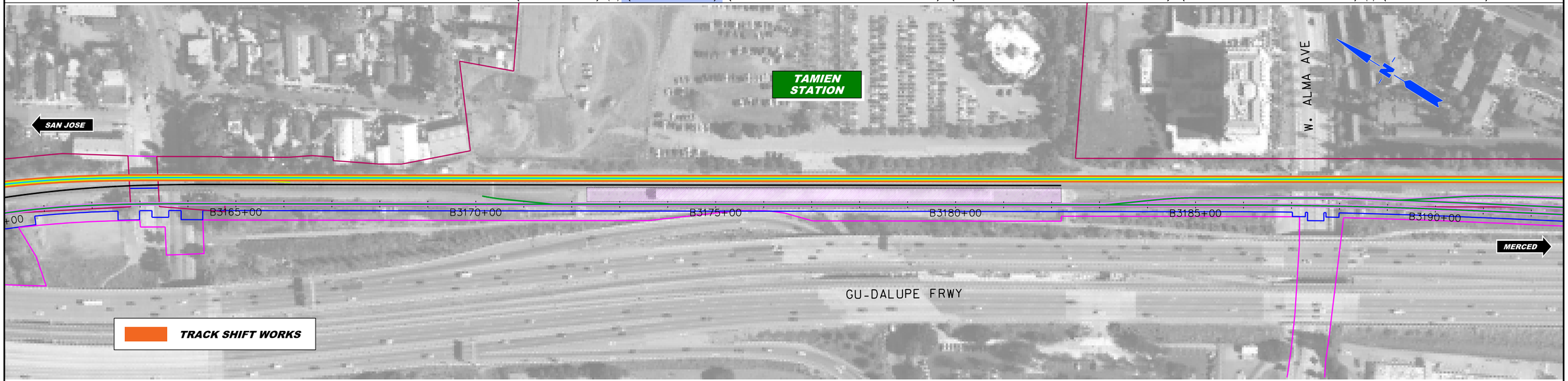
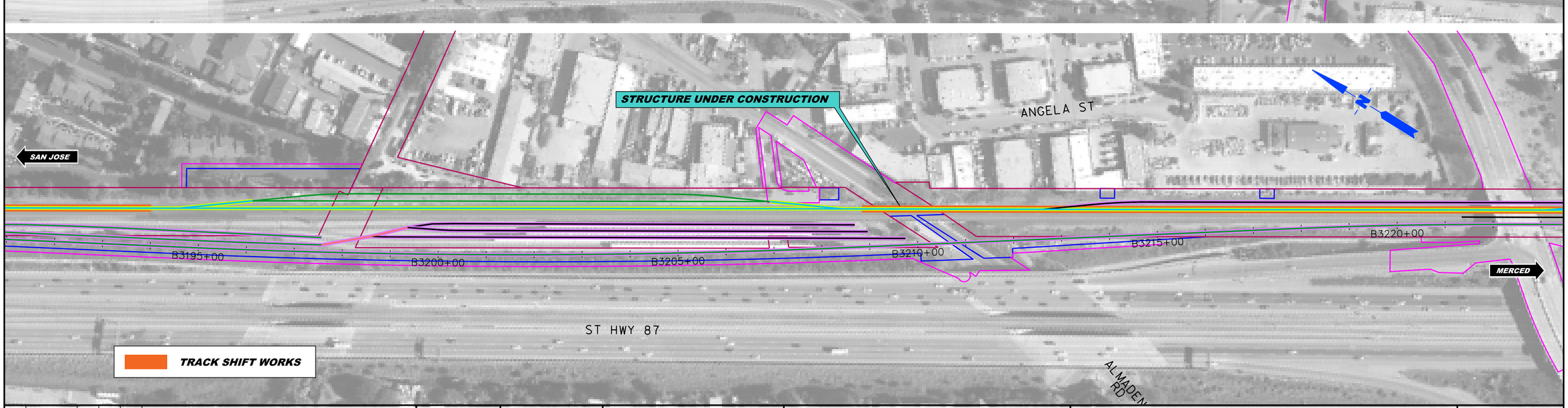
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH6-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
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MAJOR UNDERPASS

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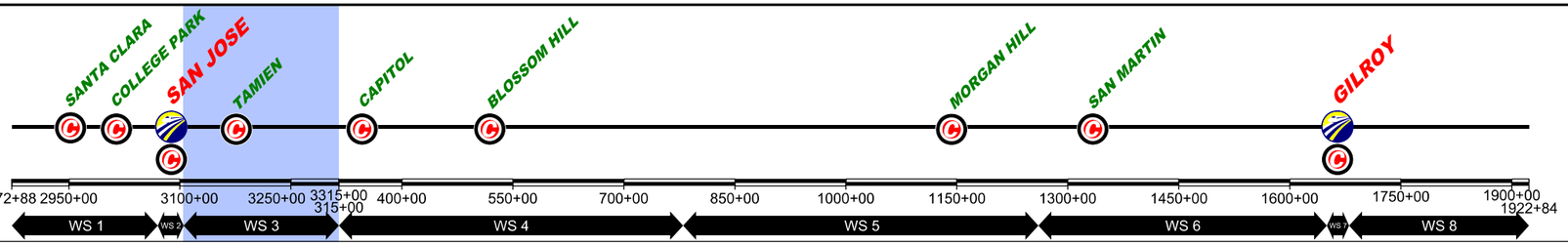
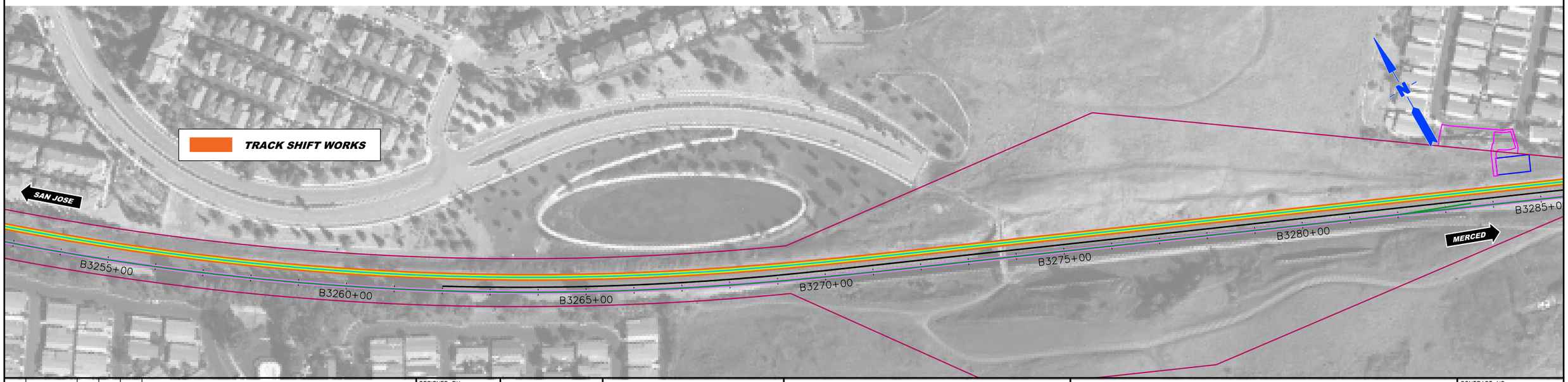
CREEK UNDERPASS





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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH6-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
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GRADE CROSSING
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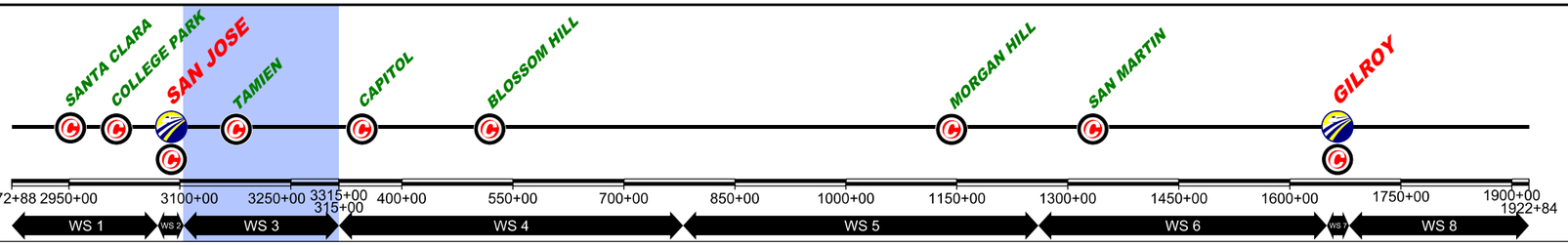
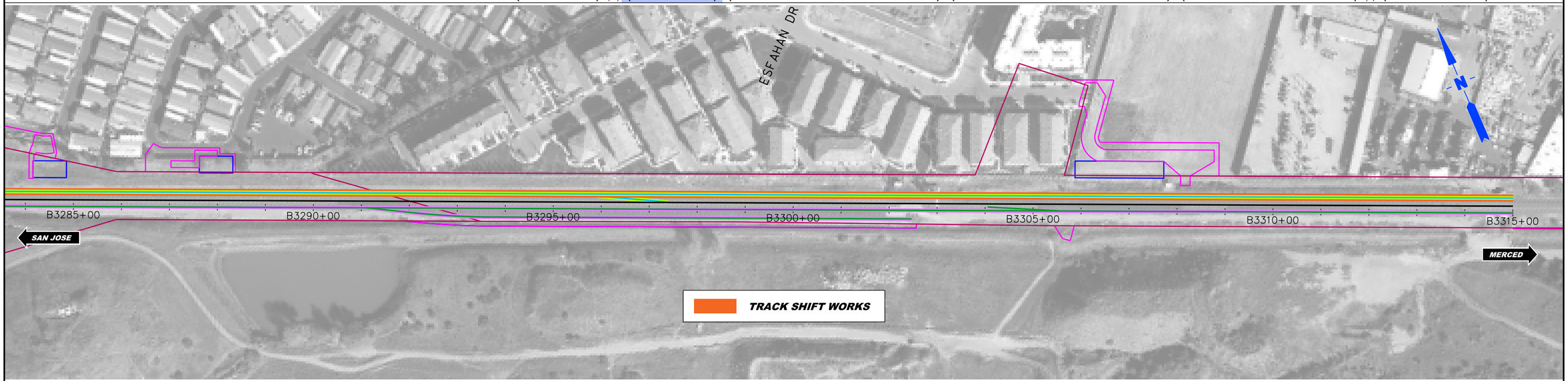
CREEK UNDERPASS





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PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH6-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
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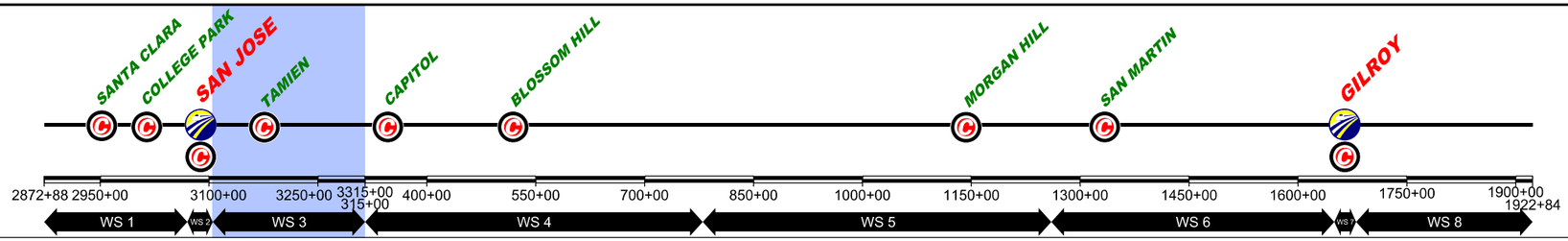

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PLAN
PHASE 7

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH7-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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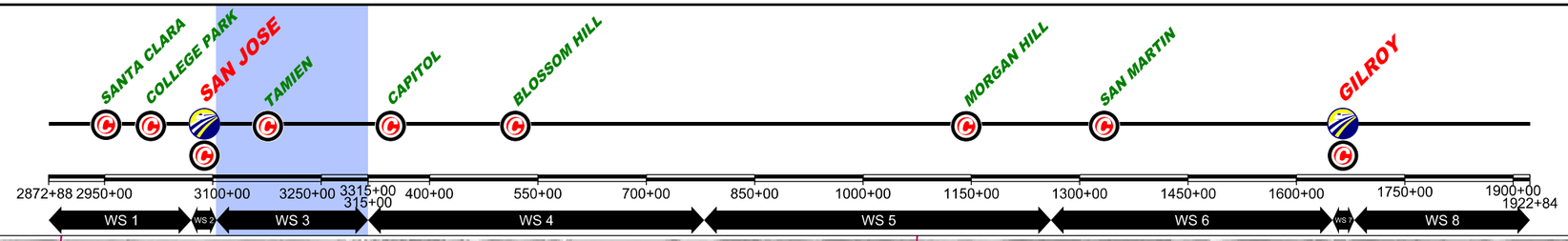

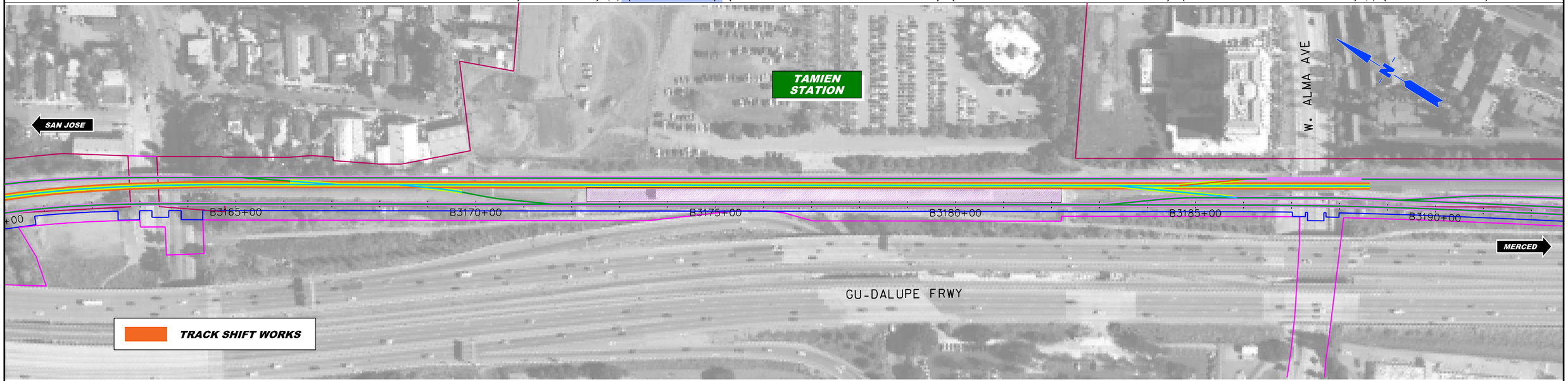

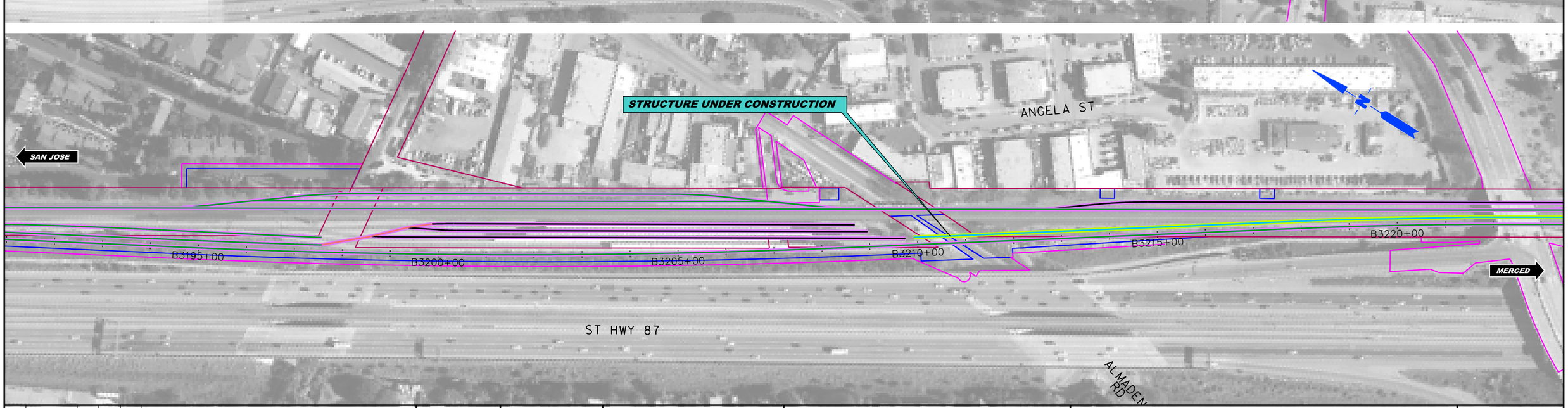

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PLAN
PHASE 7

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH7-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

$FILE$
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CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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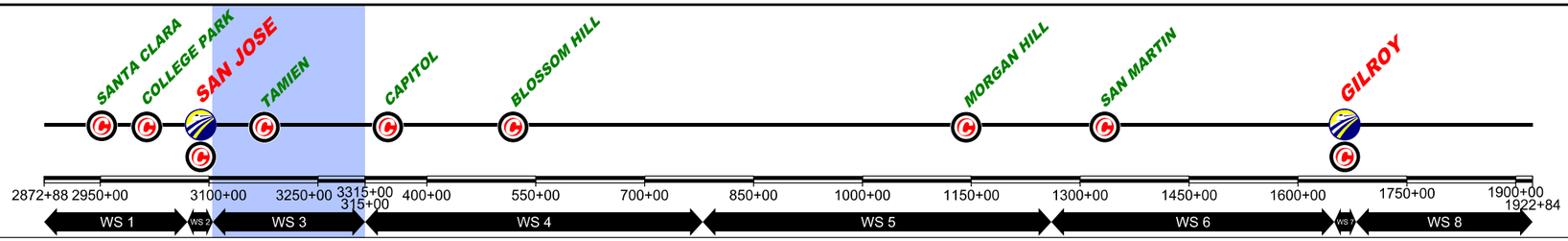

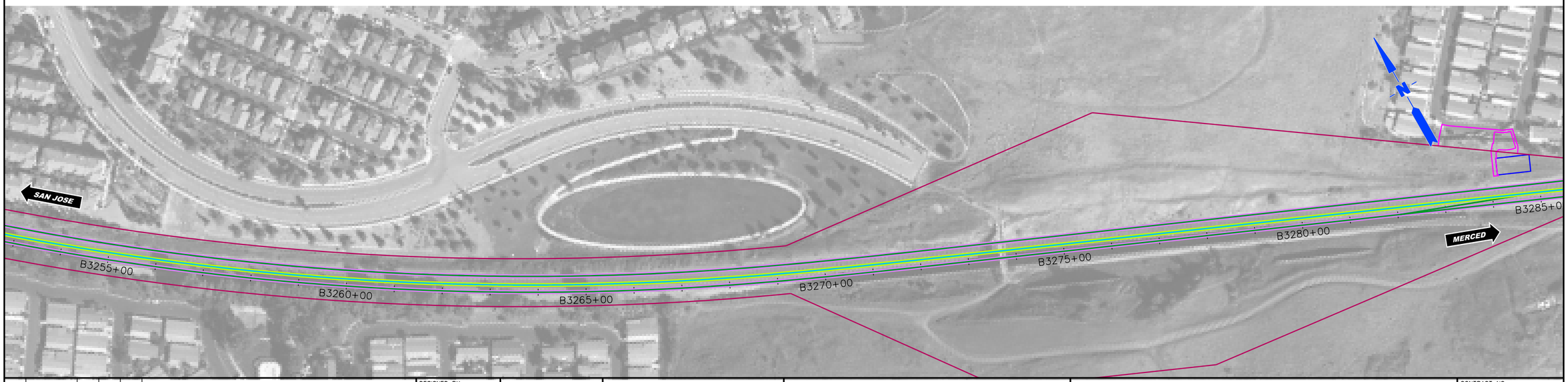

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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH7-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
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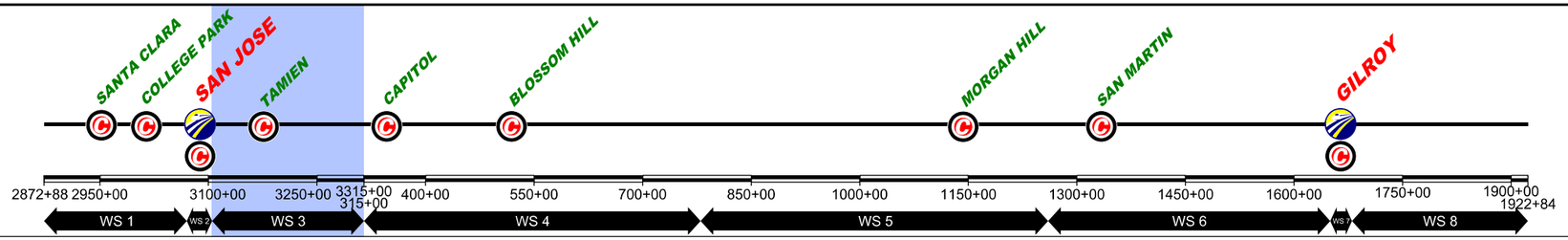

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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH7-04
SCALE 1"= 200'
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CURRENT TRACK
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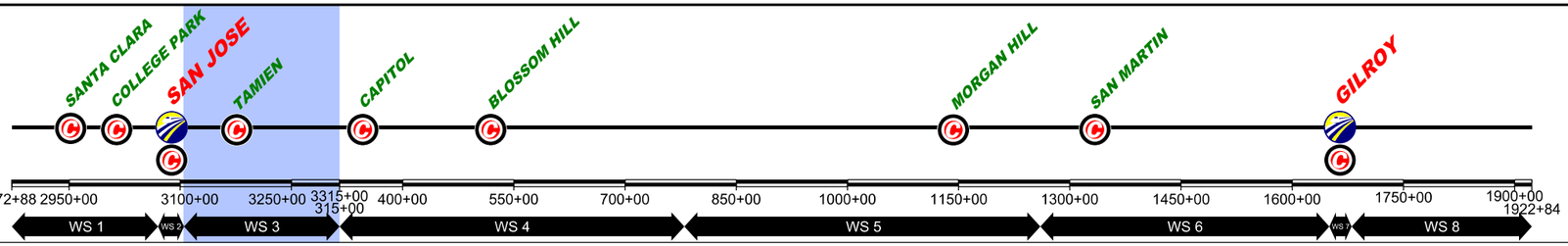

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PLAN
PHASE 8

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH8-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

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BUILT IN PREVIOUS PHASES
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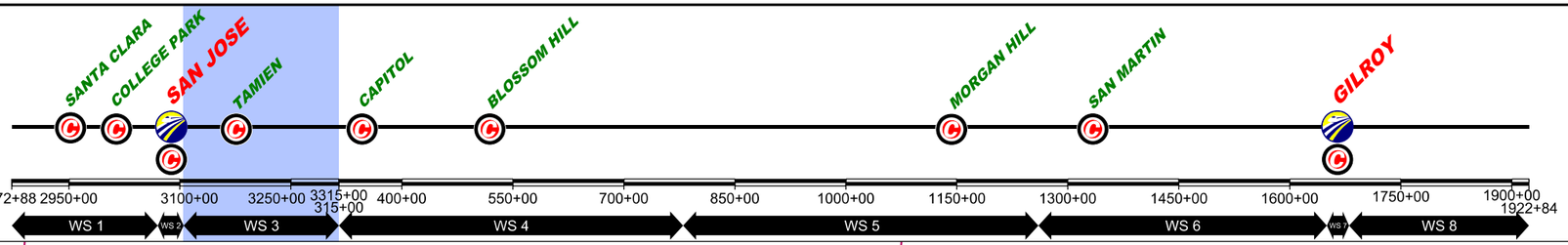

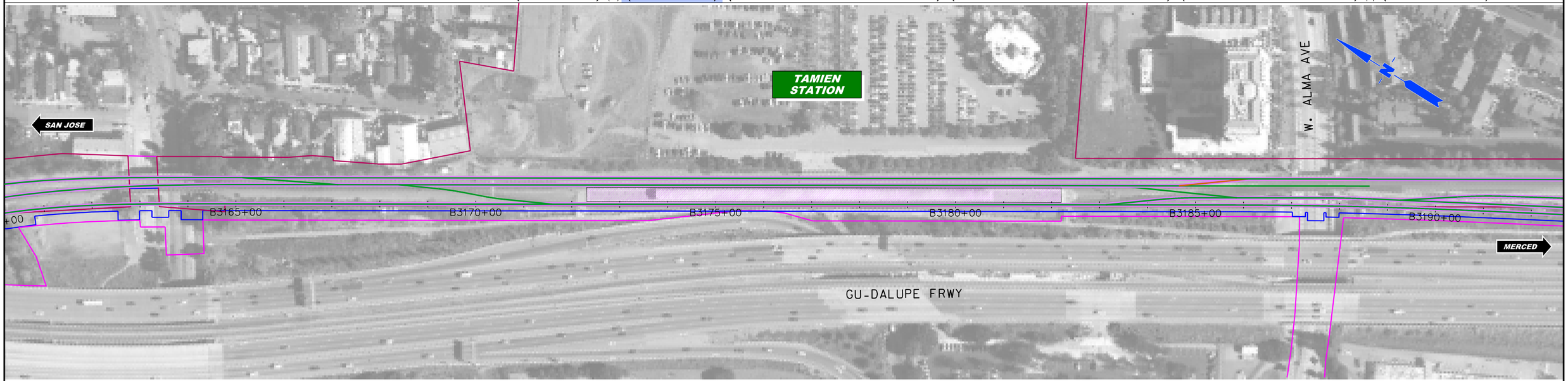

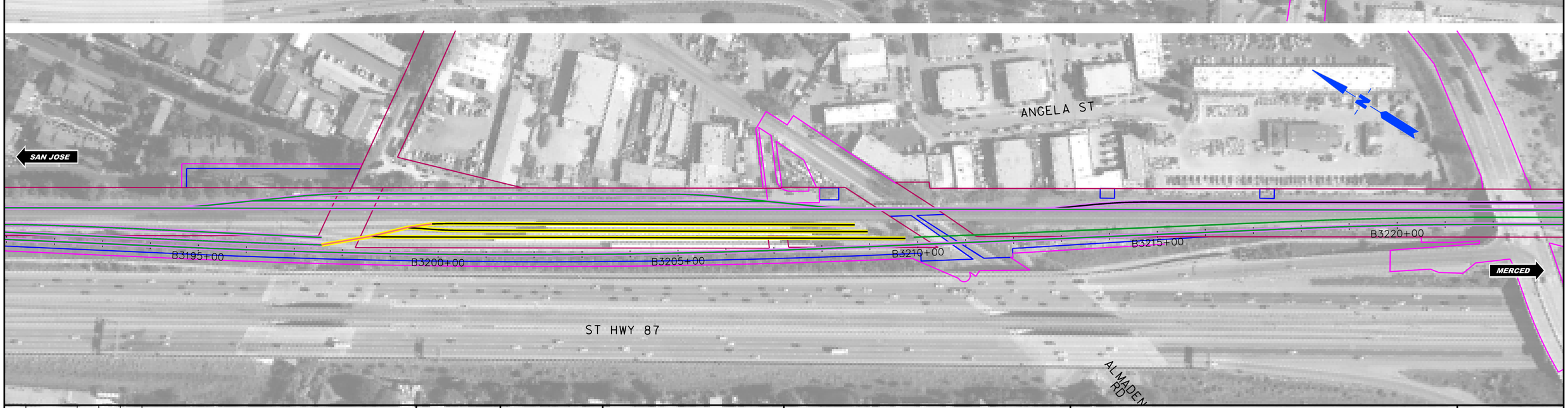

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$PENTBLS$
$TIME$
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$USER$

REV	DATE	BY	CHK	APP	DESCRIPTION

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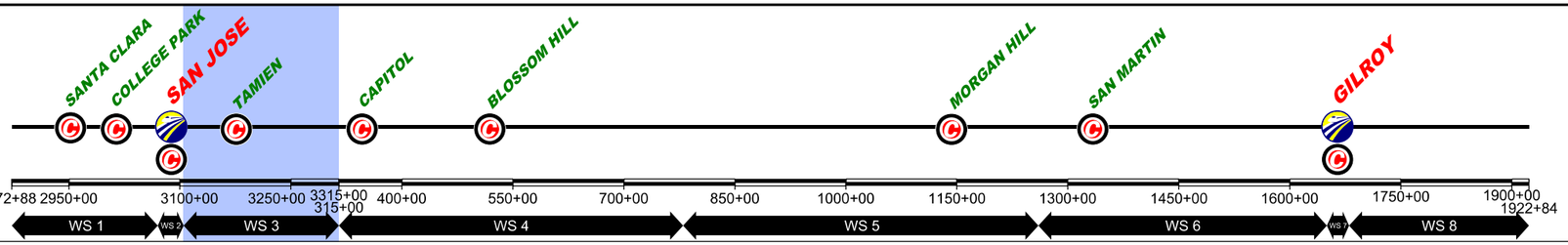
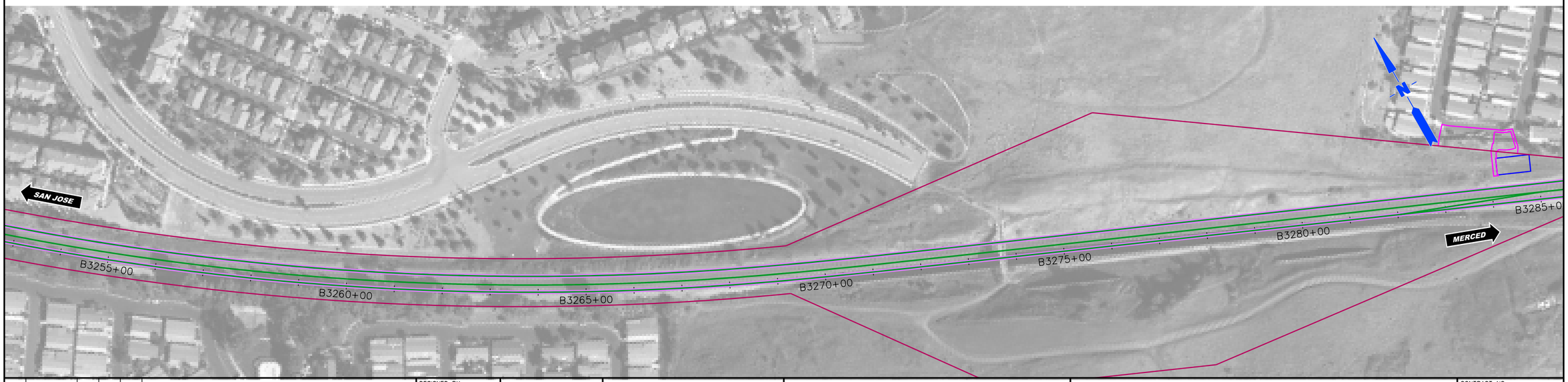
SAN FRANCISCO TO MERCED
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 8

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH8-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH8-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
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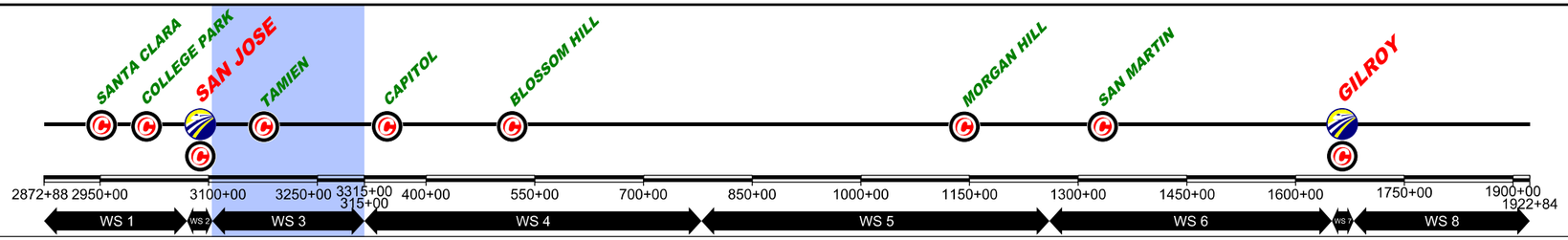

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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH8-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

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PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
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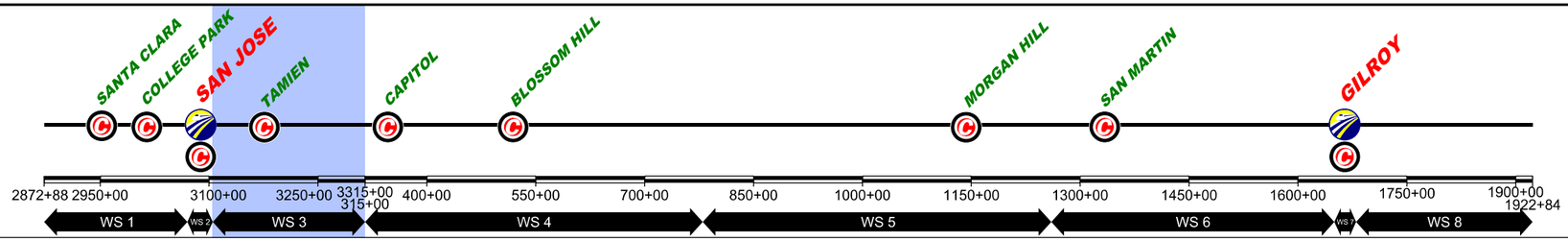

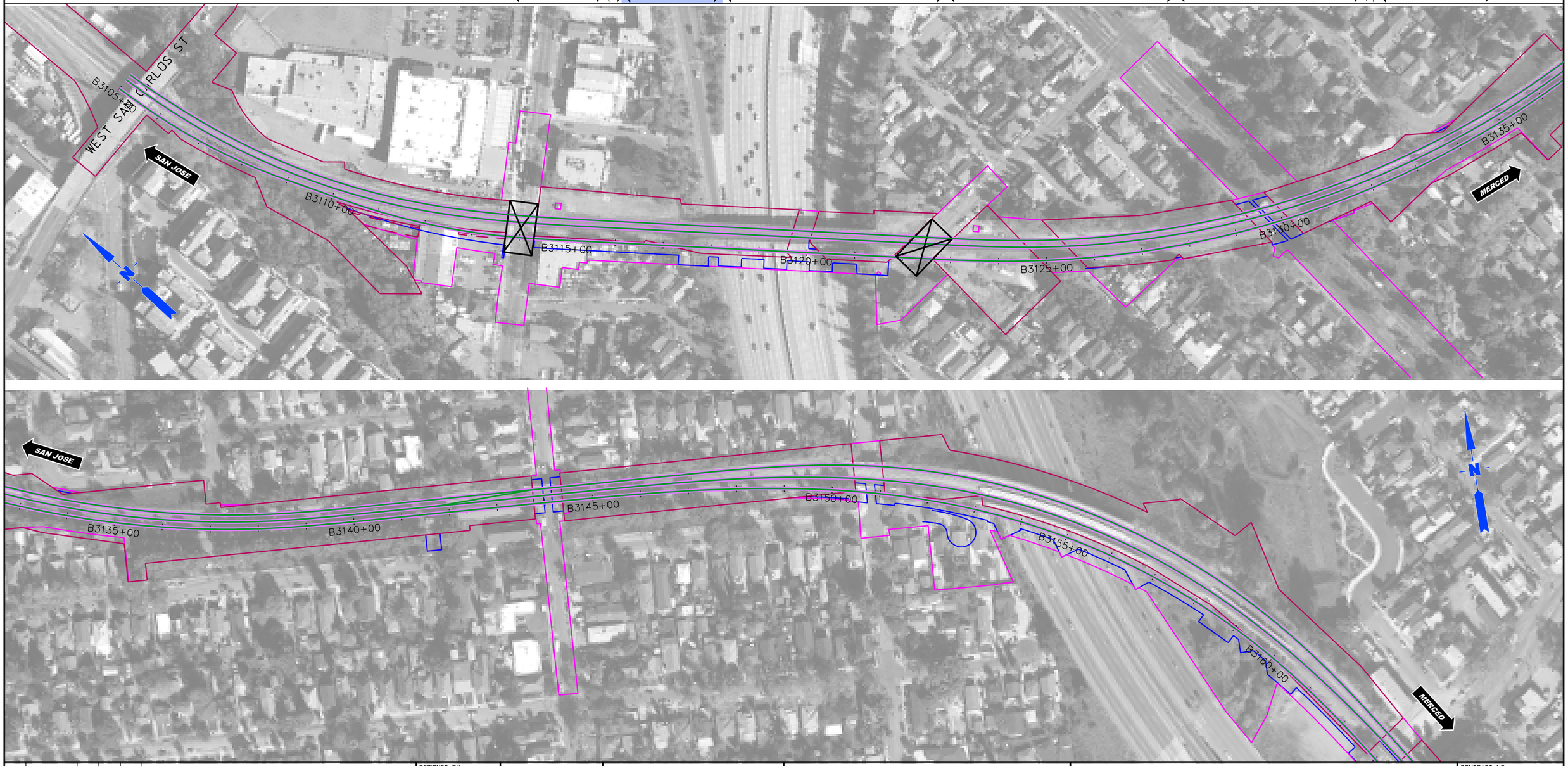

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PHASE 9

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH9-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
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CURRENT TRACK
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BUILT IN PREVIOUS PHASES
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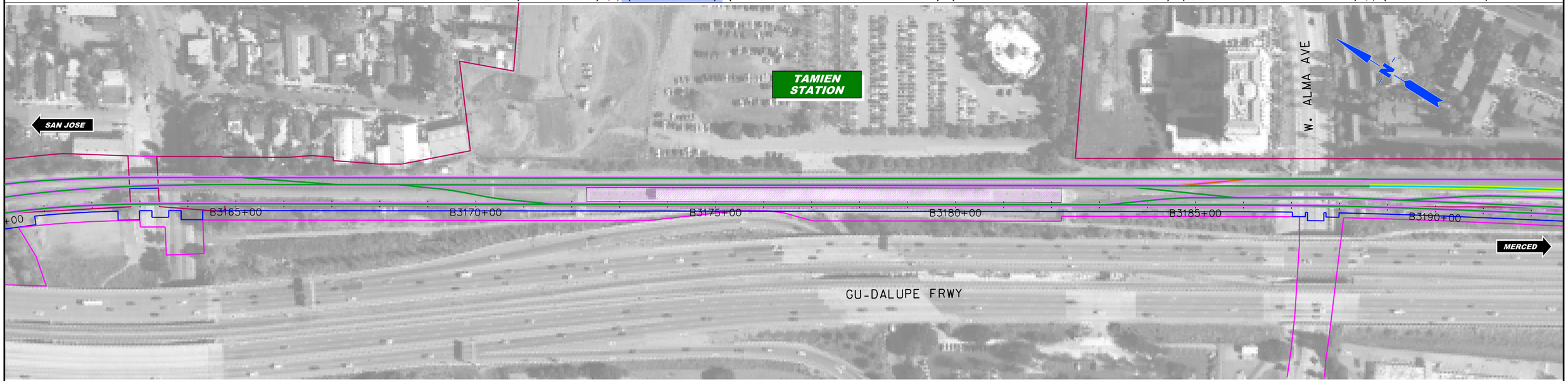

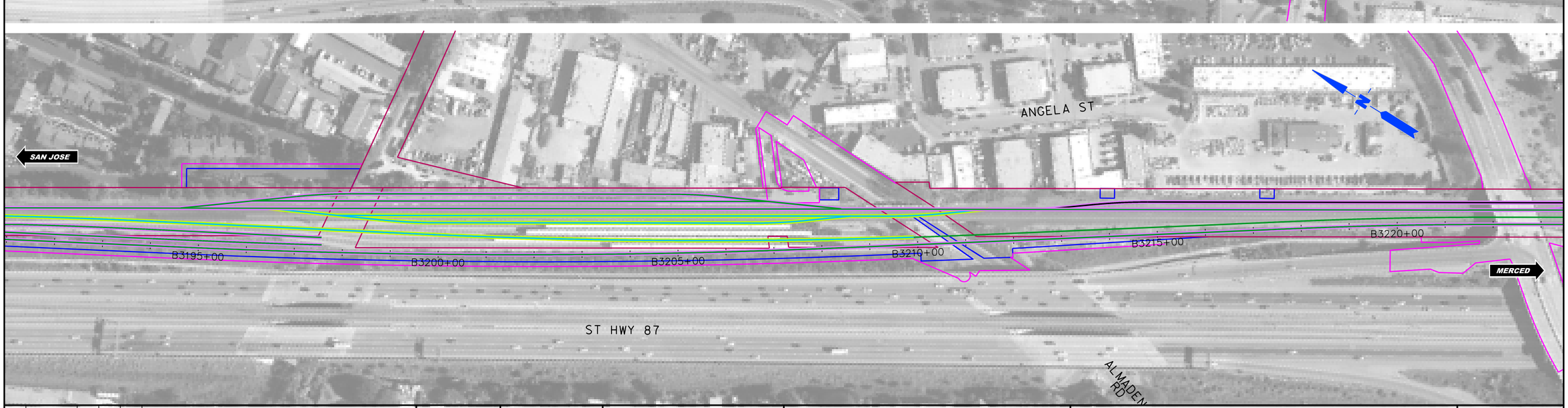

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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH9-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
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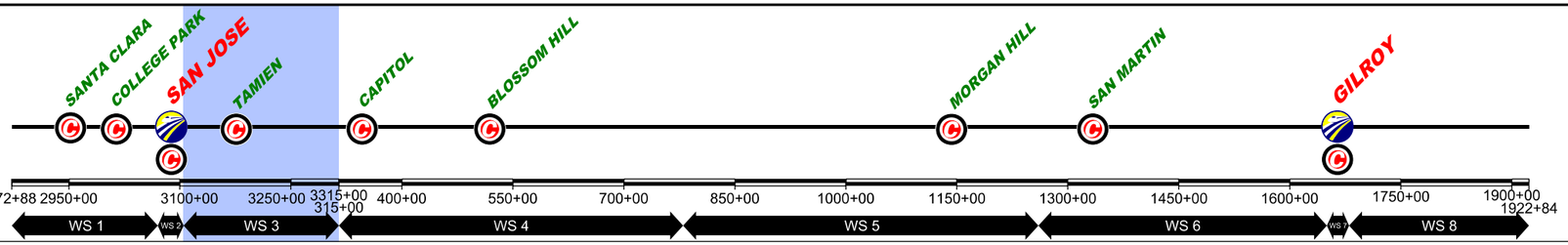

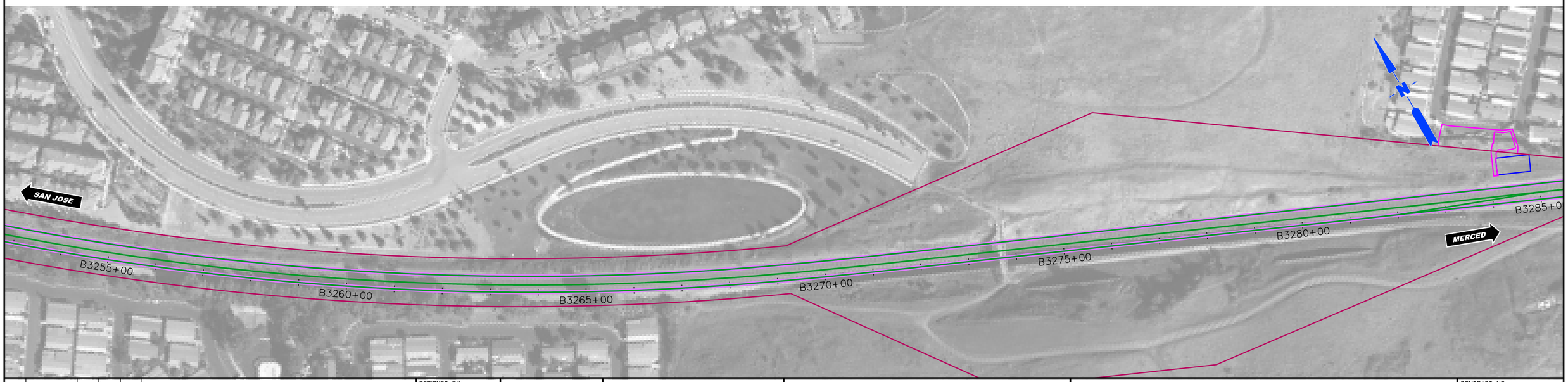

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CONTRACT NO.
DRAWING NO. CV-I1WS3-PH9-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

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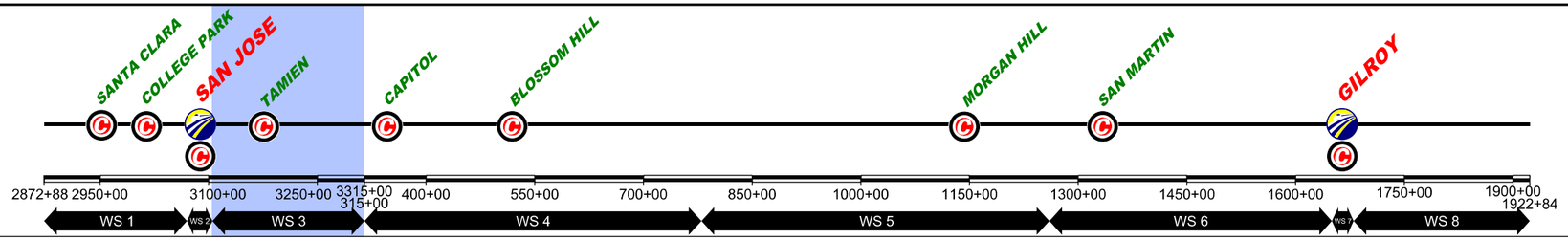

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DRAWING NO. CV-I1WS3-PH9-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

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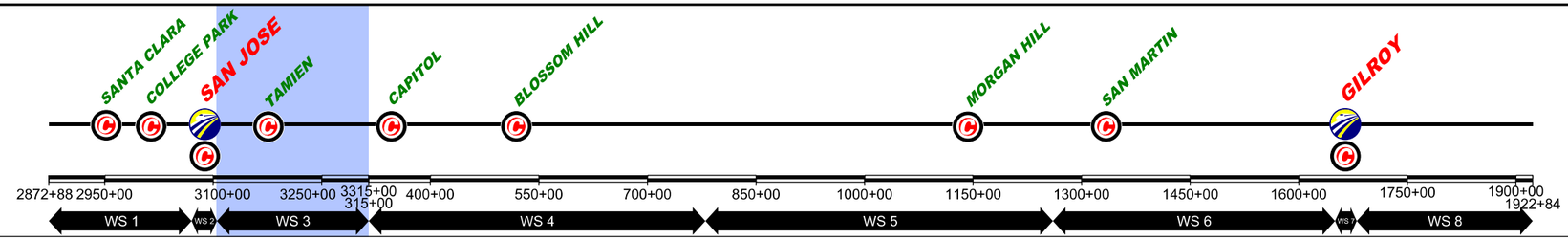

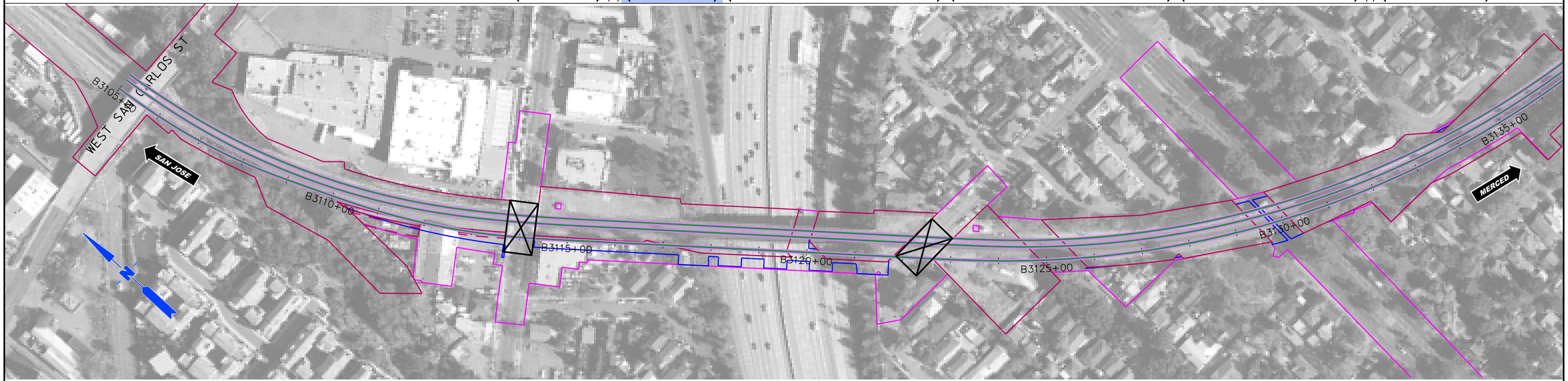

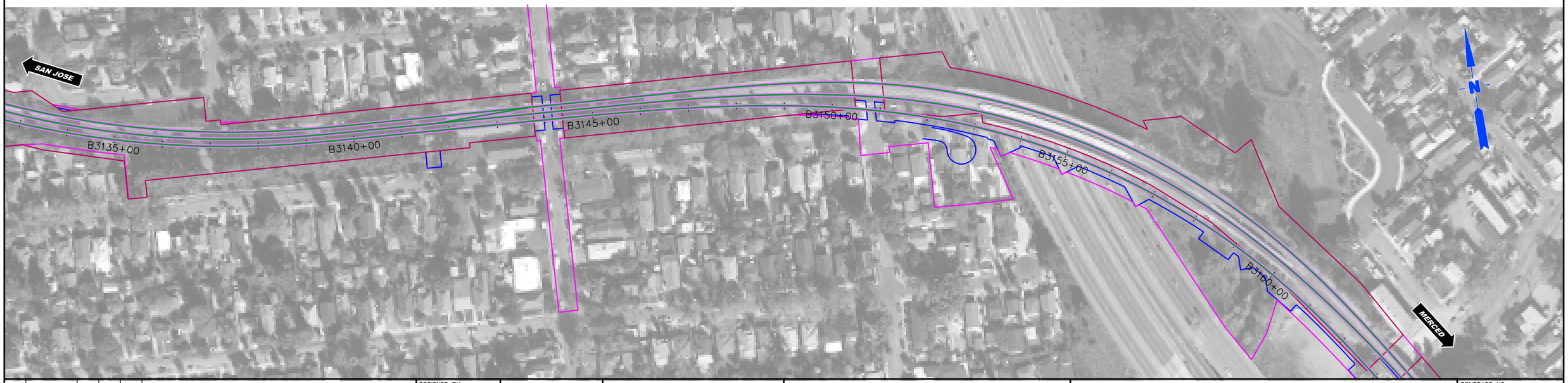

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PHASE 10

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DRAWING NO. CV-I1WS3-PH10-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

$FILE$
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$PENTBL$
$TIME$
$DATE$
$USER$

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BUILT IN PREVIOUS PHASES
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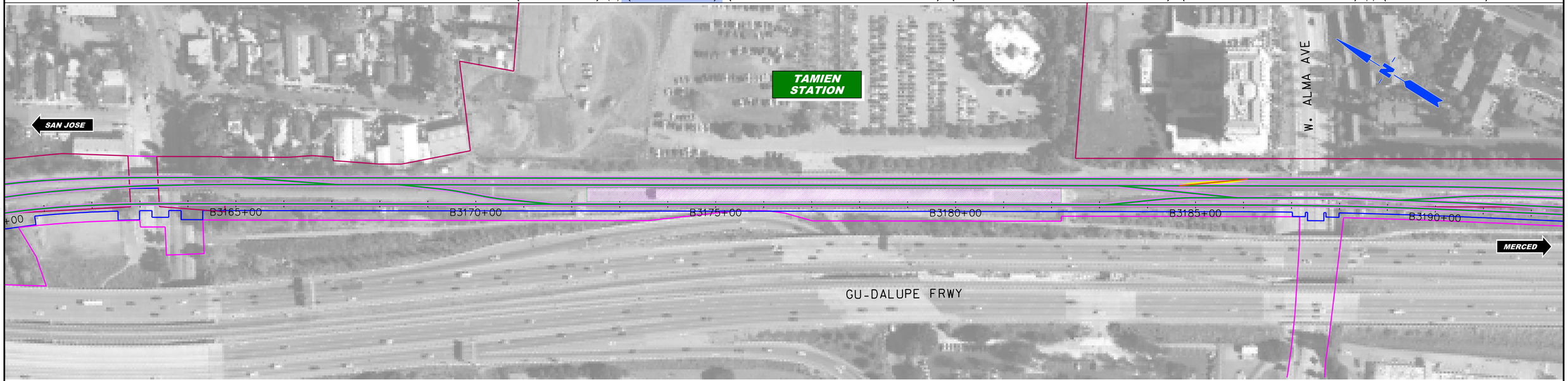

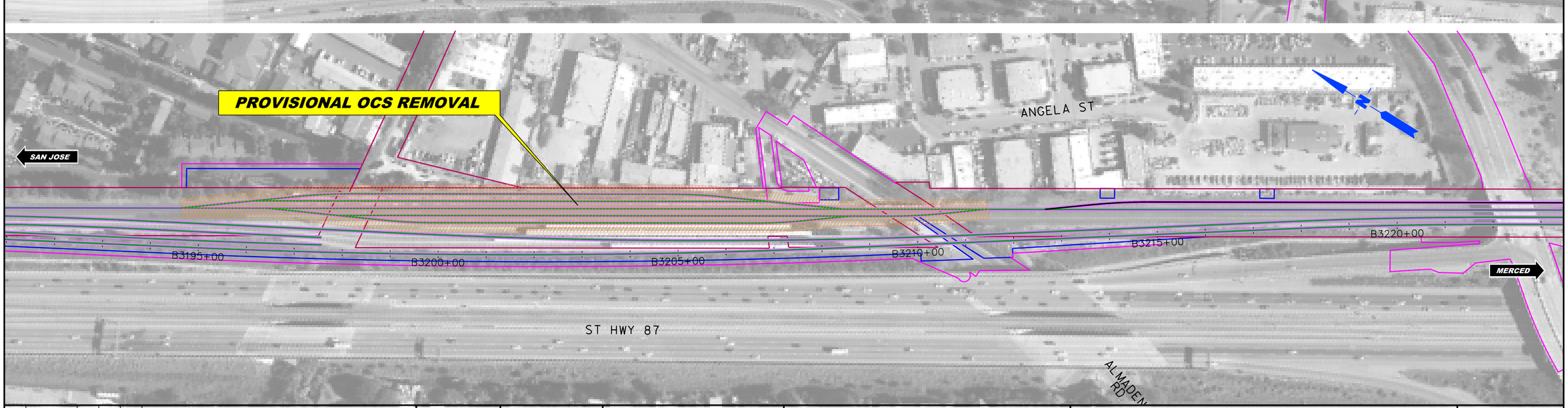

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DRAWING NO. CV-I1WS3-PH10-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
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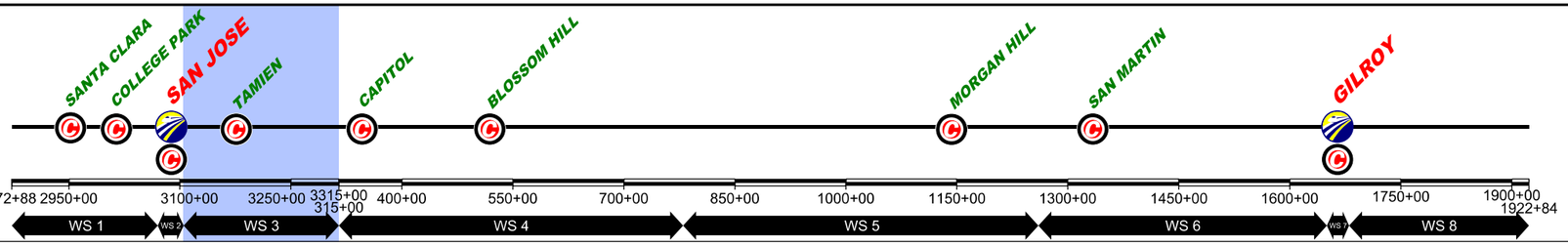

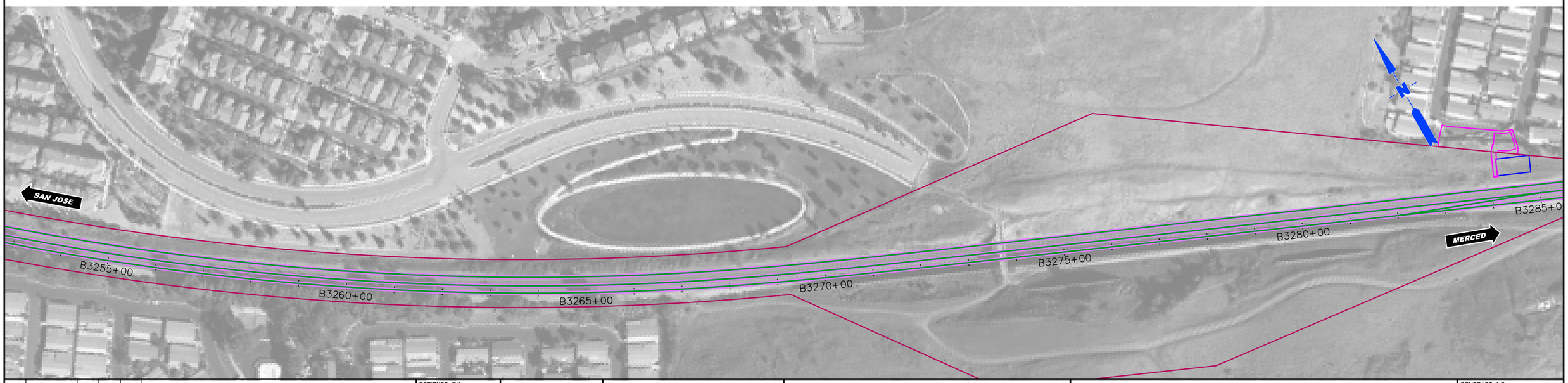

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SCALE 1"= 200'
SHEET NO. 3 OF 4

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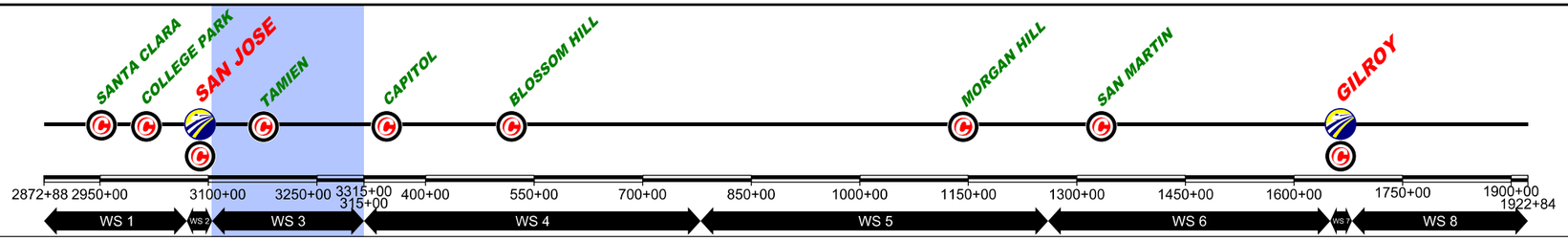

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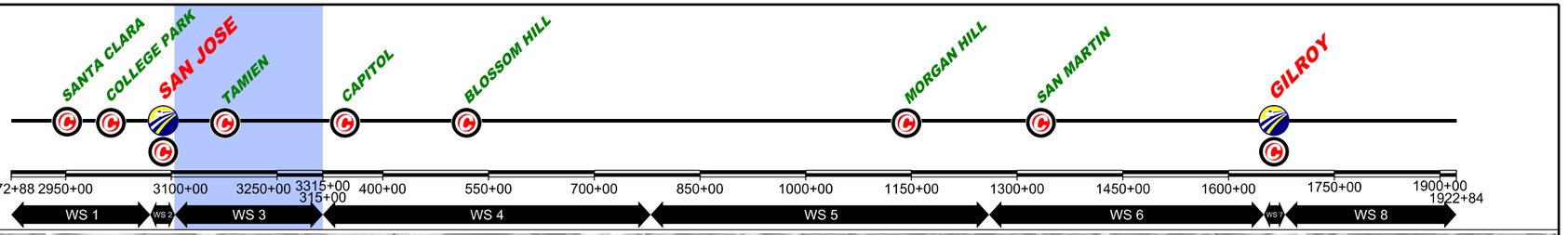

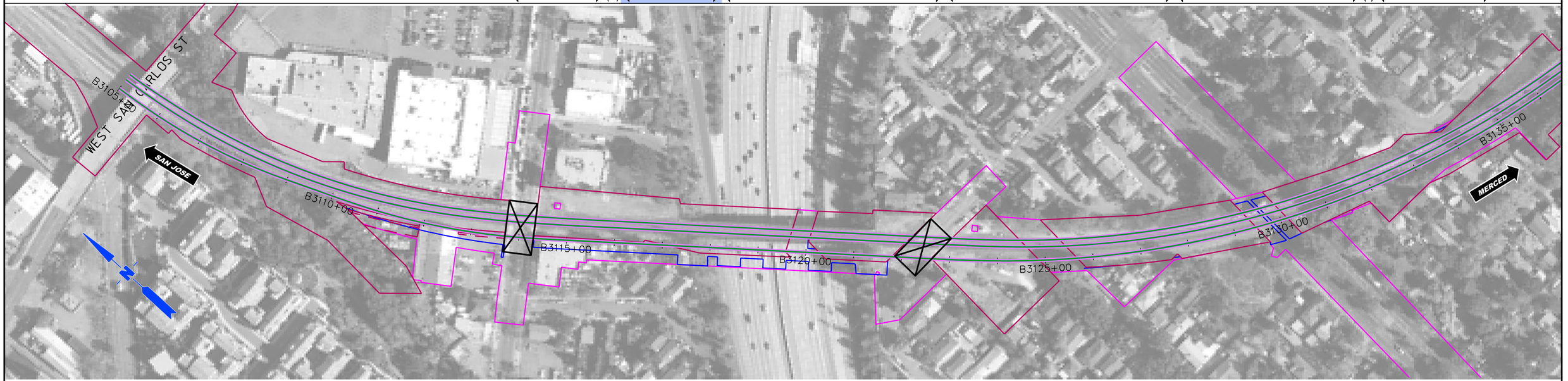

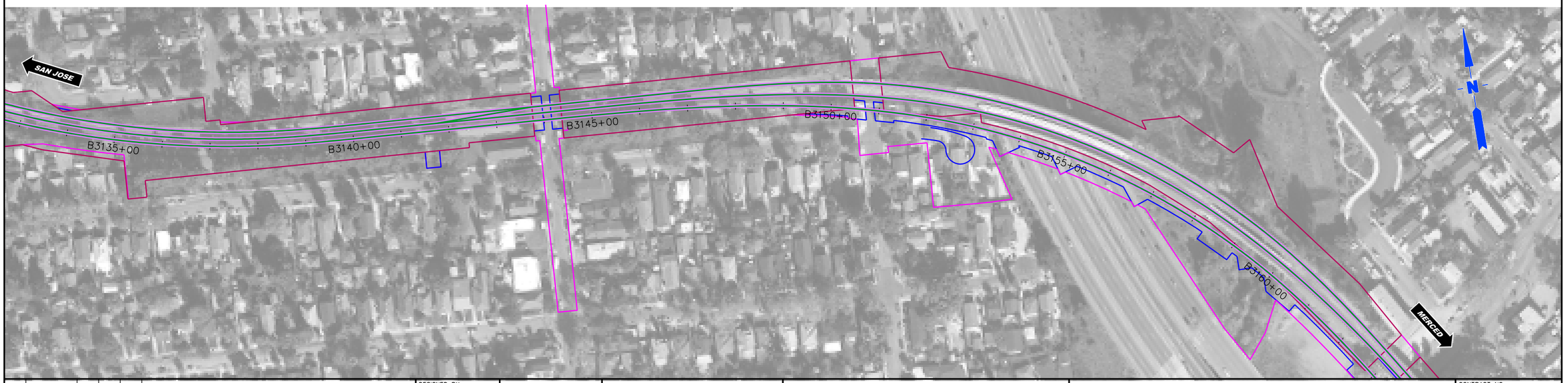

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PHASE 11

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH11-01
SCALE 1"= 200'
SHEET NO. 1 OF 4

CURRENT TRACK
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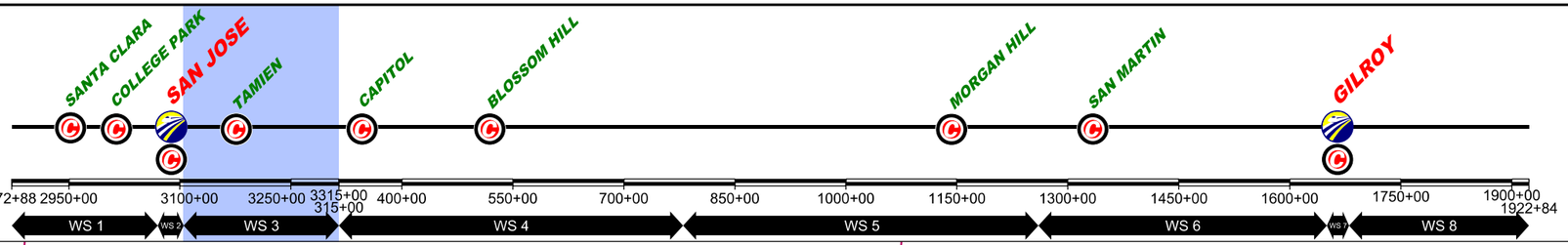

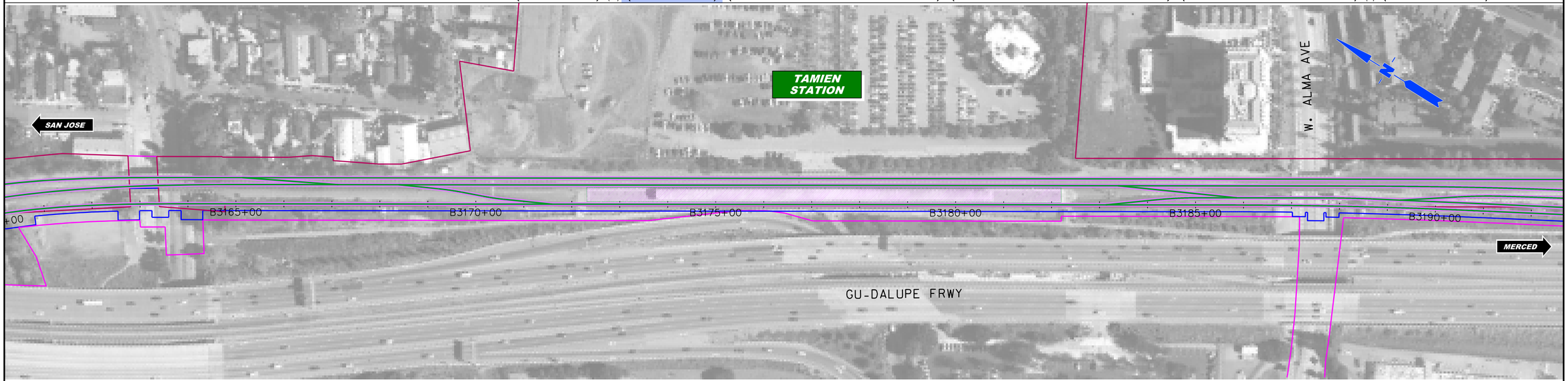

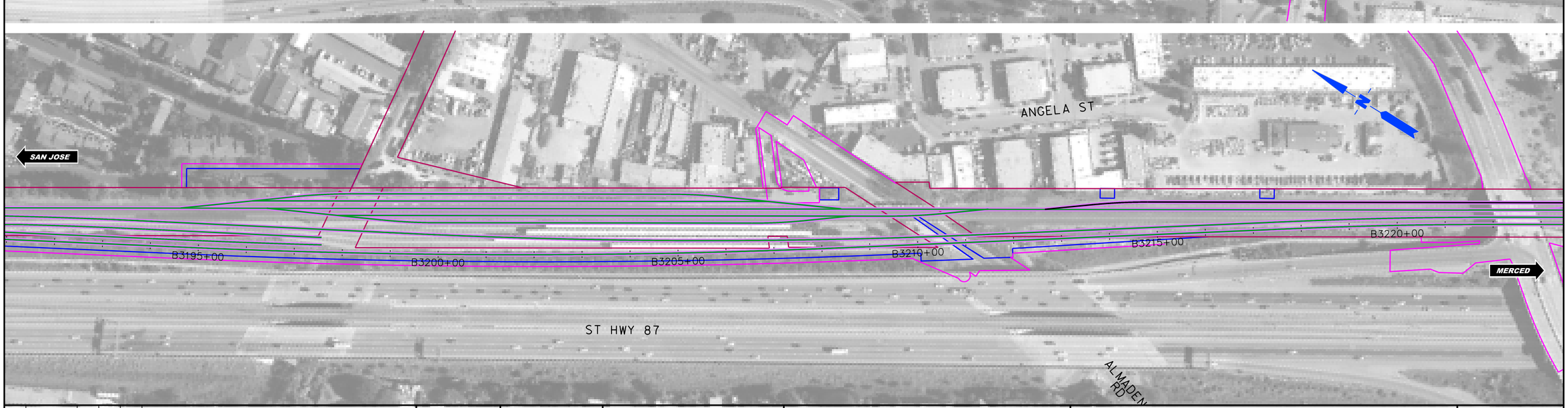

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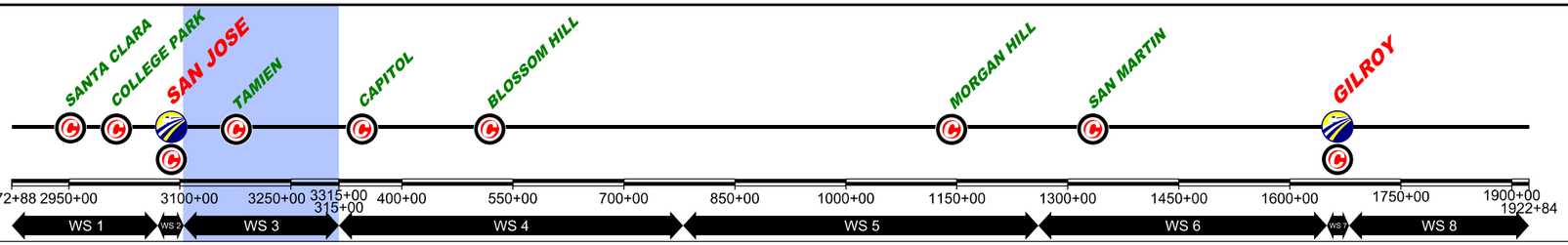
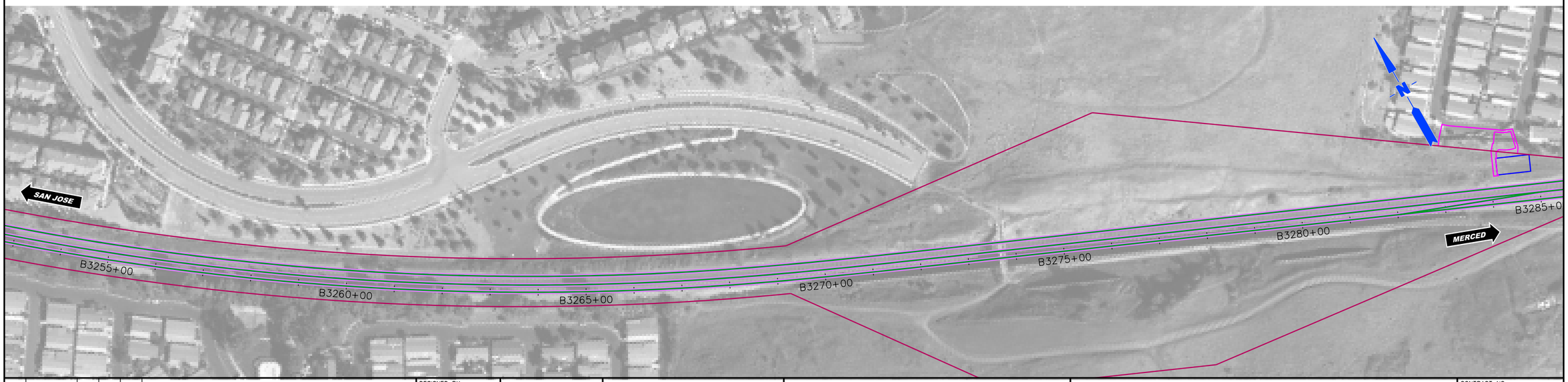
CONTRACT NO.
DRAWING NO. CV-I1WS3-PH11-02
SCALE 1"= 200'
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

REV	DATE	BY	CHK	APP	DESCRIPTION

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SAN FRANCISCO TO MERCED
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN
PHASE 11

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH11-03
SCALE 1"= 200'
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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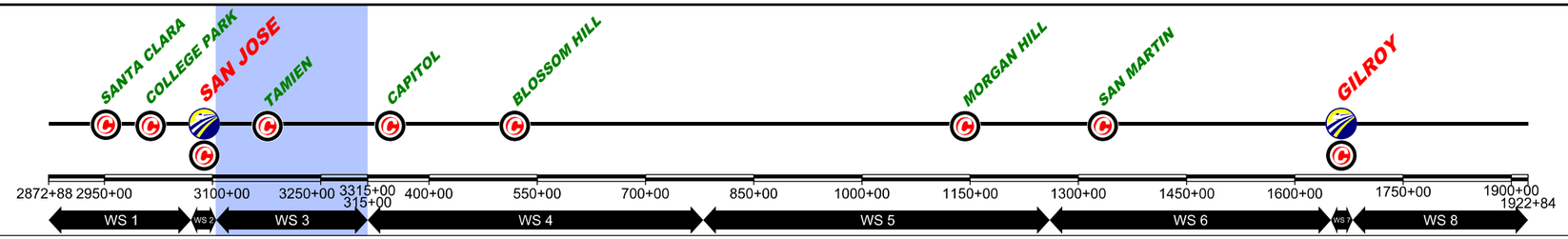
TUNNEL
CREEK UNDERPASS



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PHASE 11

CONTRACT NO.
DRAWING NO. CV-I1WS3-PH11-04
SCALE 1"= 200'
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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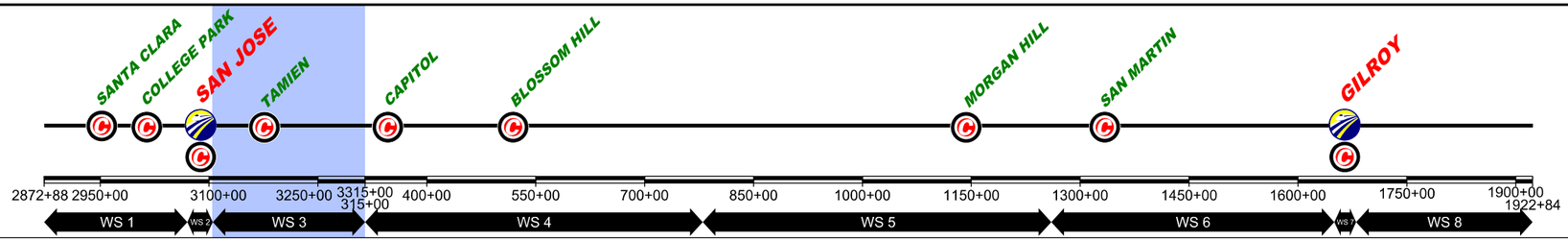
TUNNEL
CREEK UNDERPASS



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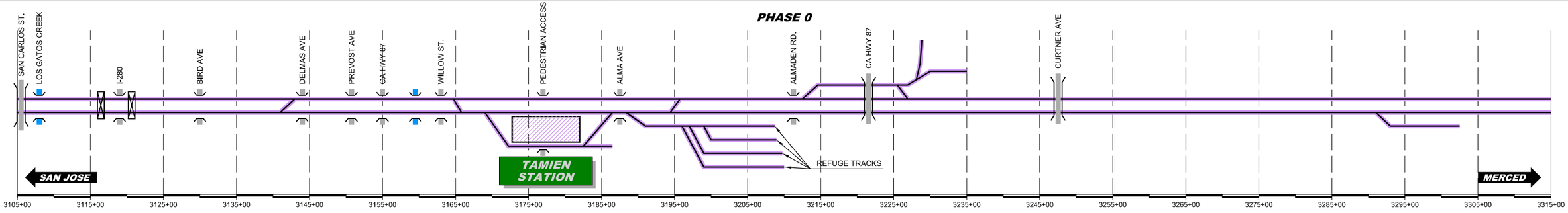
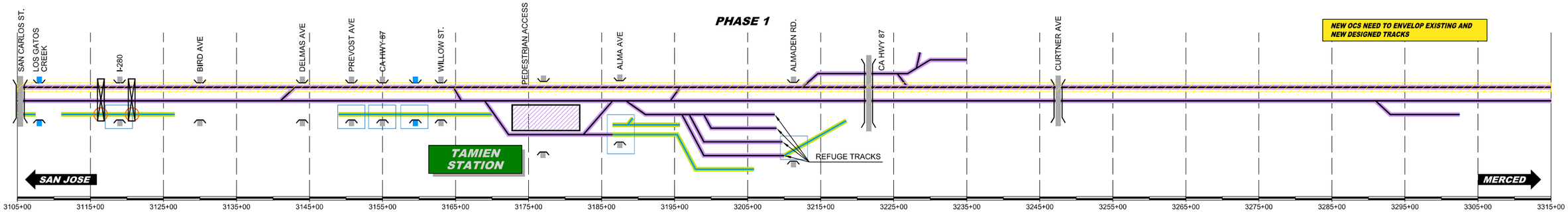
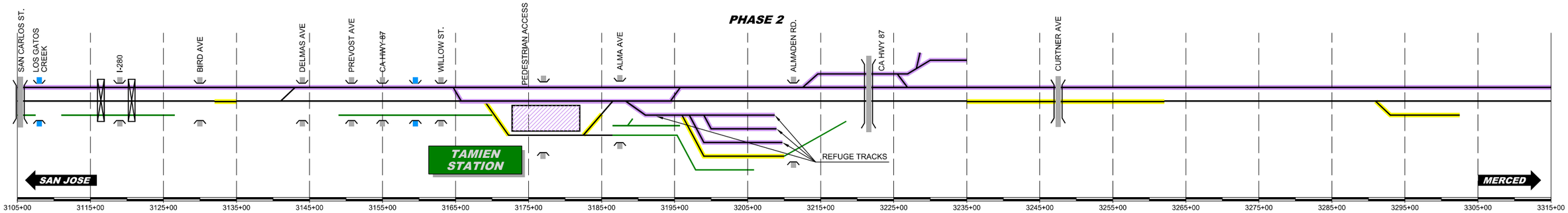


PHASE 1

NEW OCS NEED TO ENVELOP EXISTING AND NEW DESIGNED TRACKS



PHASE 2



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CONTRACT NO.
DRAWING NO. CV-I6WS3-SCH-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 4

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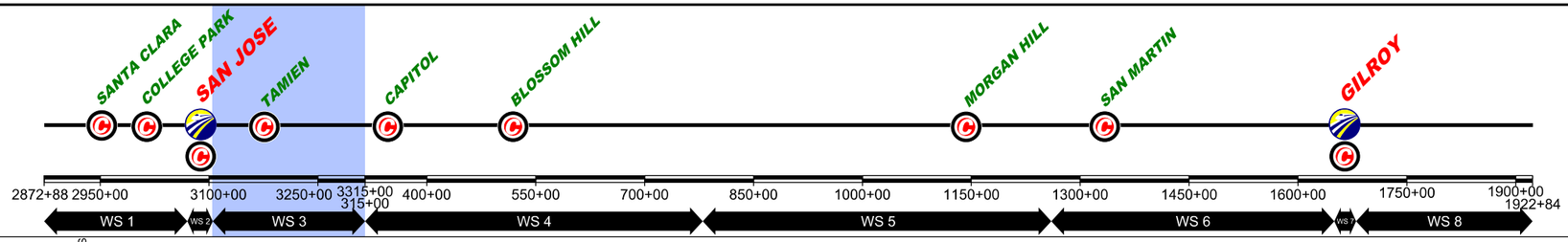

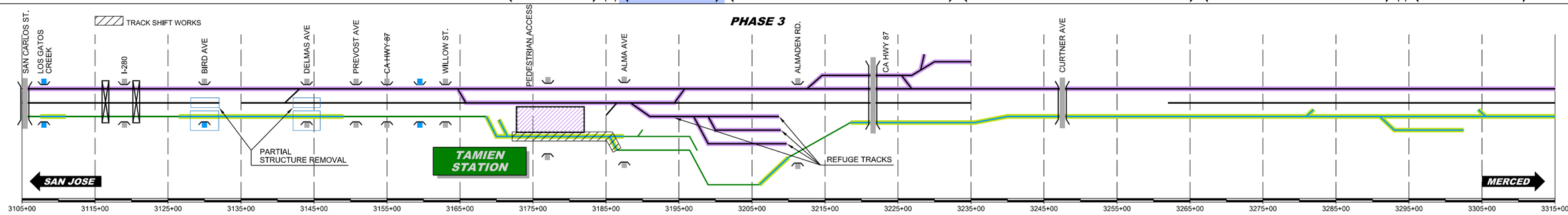

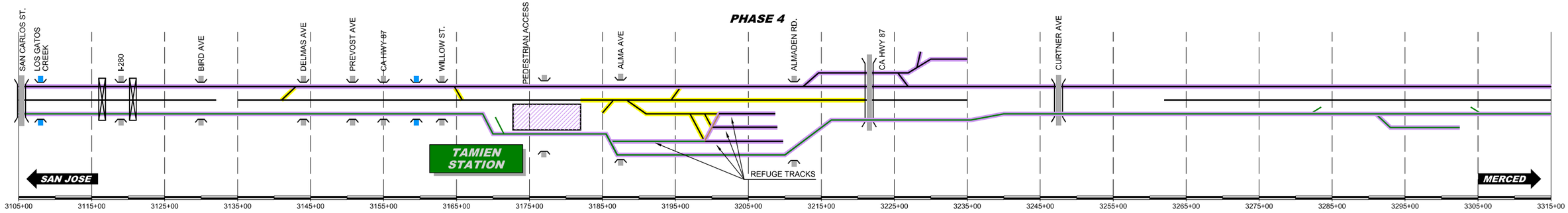

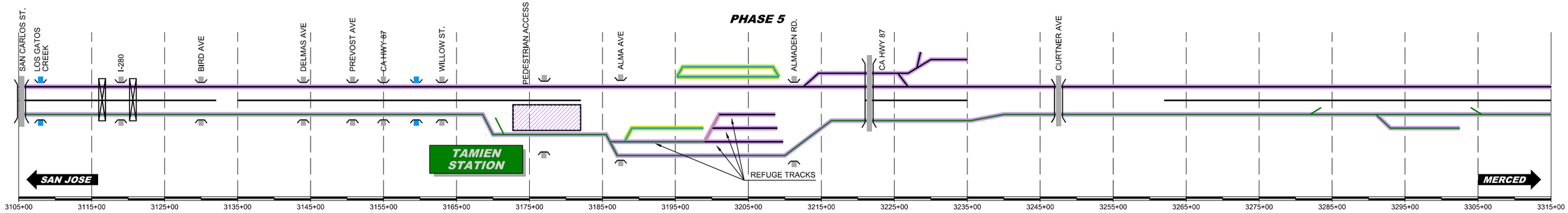

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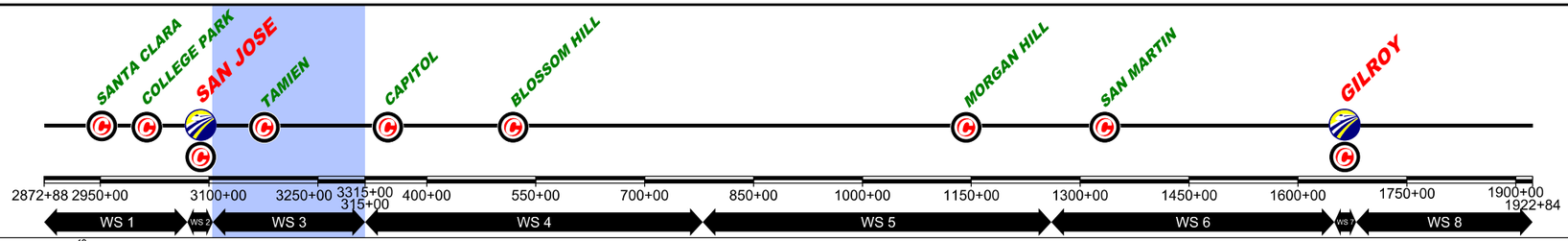

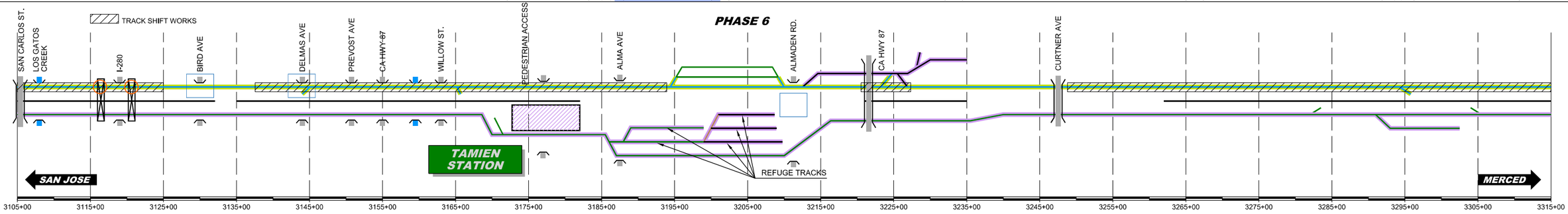

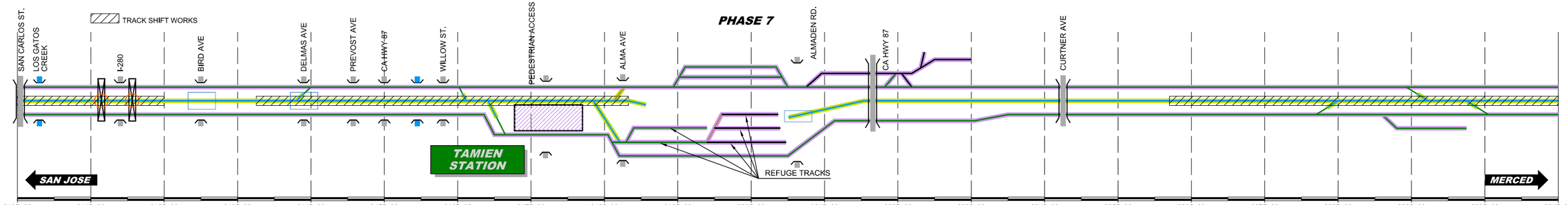

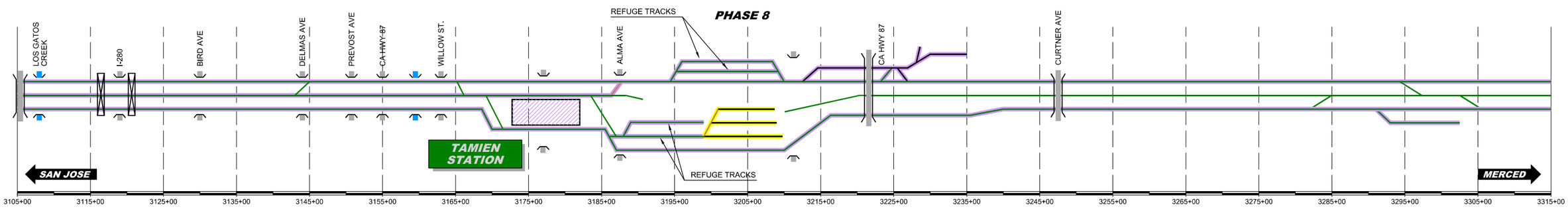

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CONTRACT NO.
DRAWING NO. CV-I6WS3-SCH-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 4

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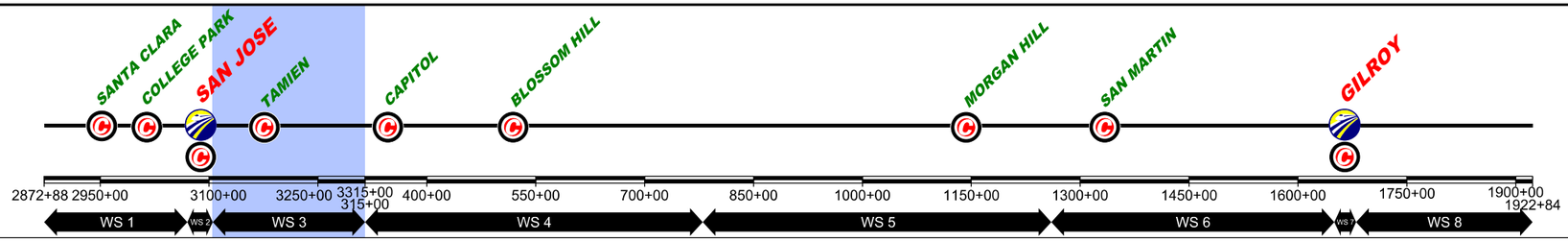

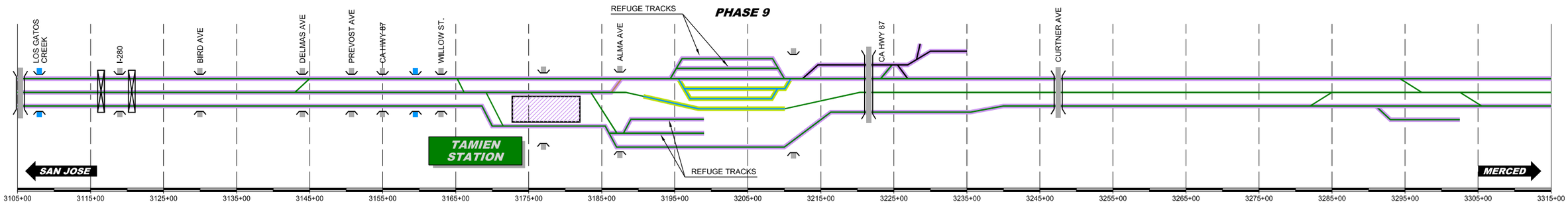

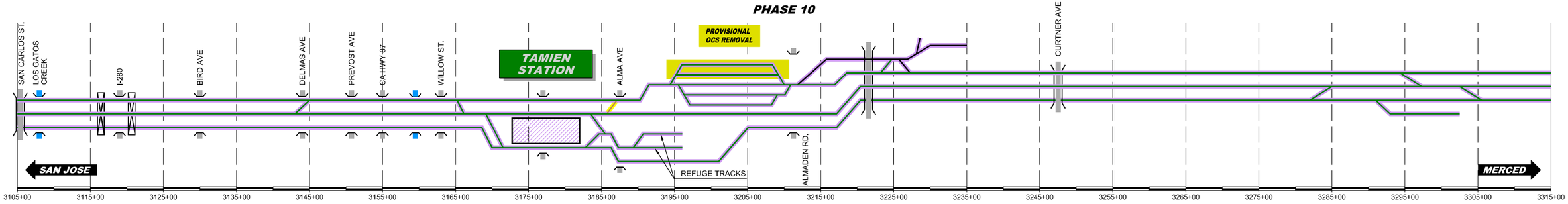

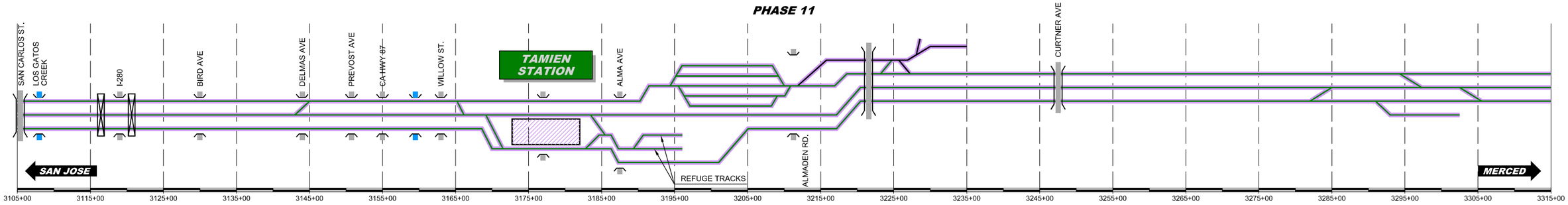

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CONTRACT NO.
DRAWING NO. CV-I6WS3-SCH-04
SCALE NOT TO SCALE
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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CIRCULATION TRACK
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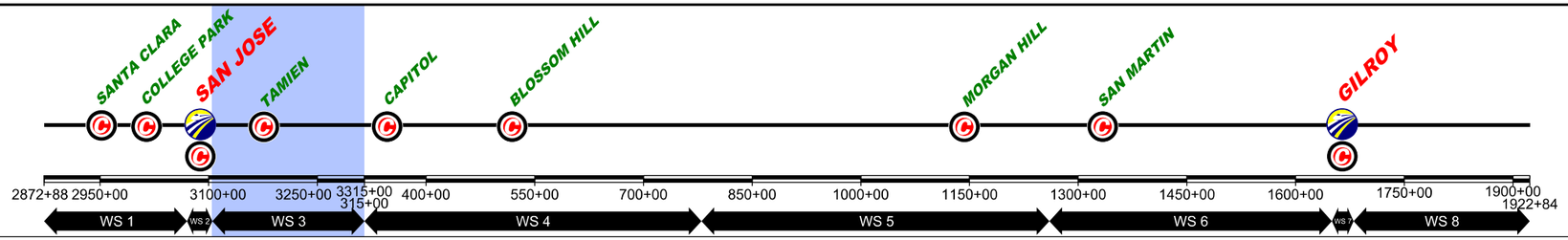

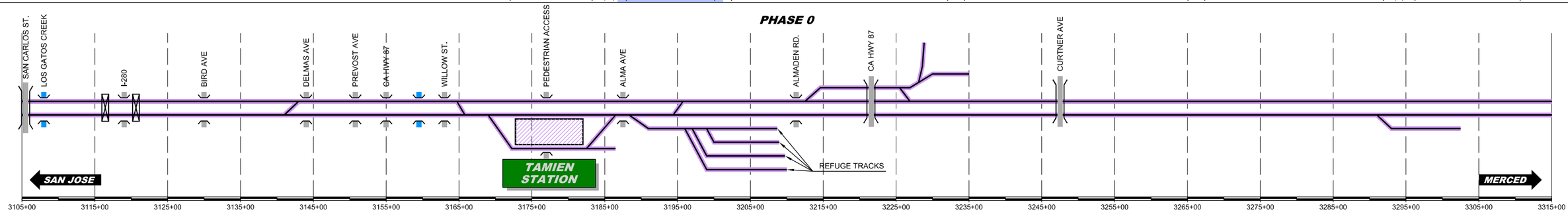

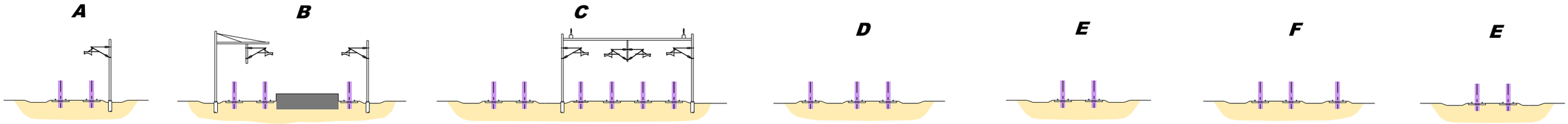

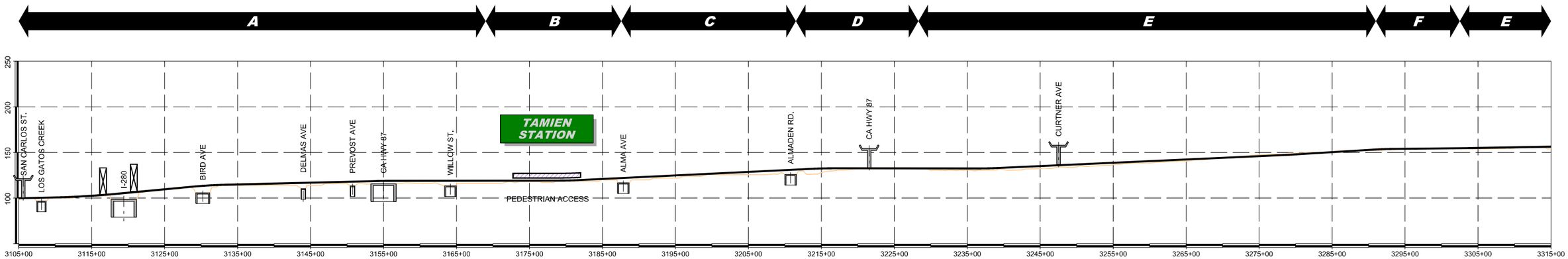

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PLAN AND PROFILE SCHEME
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 12

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
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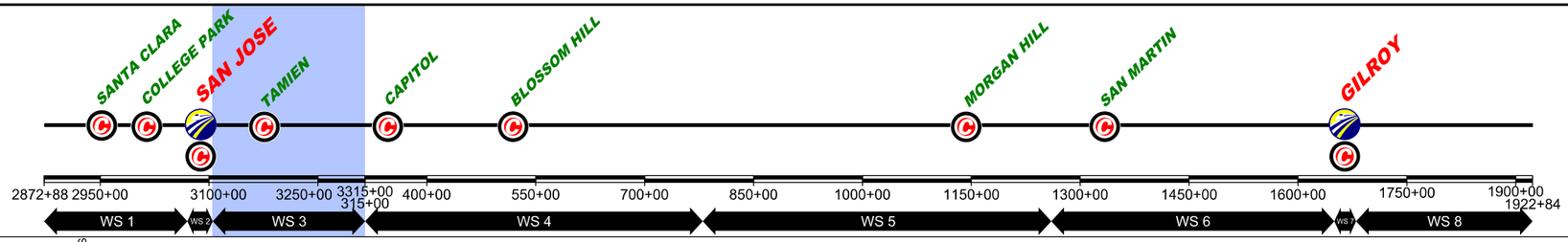

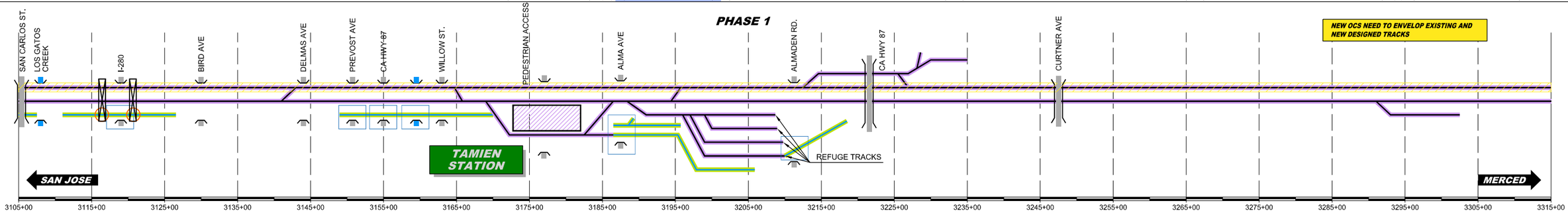

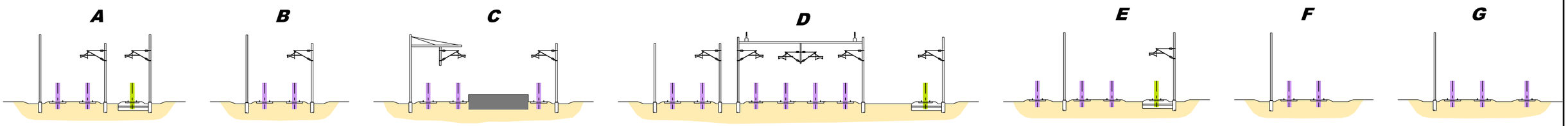

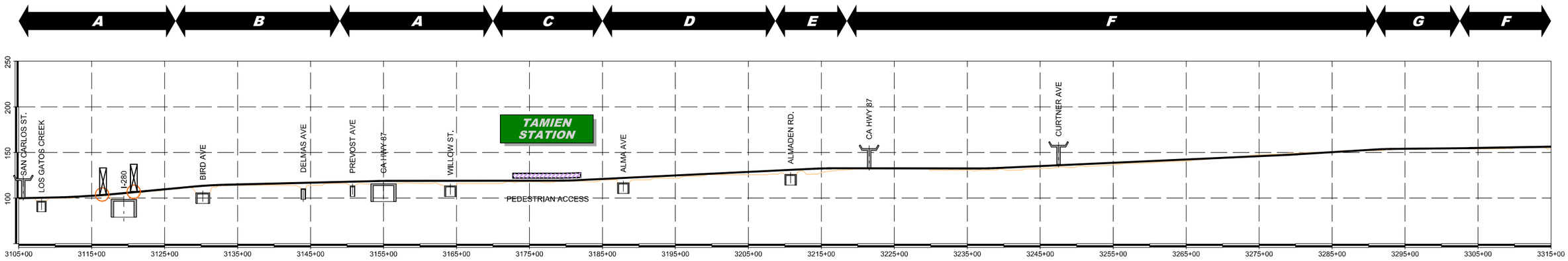

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PHASE 1

CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 12

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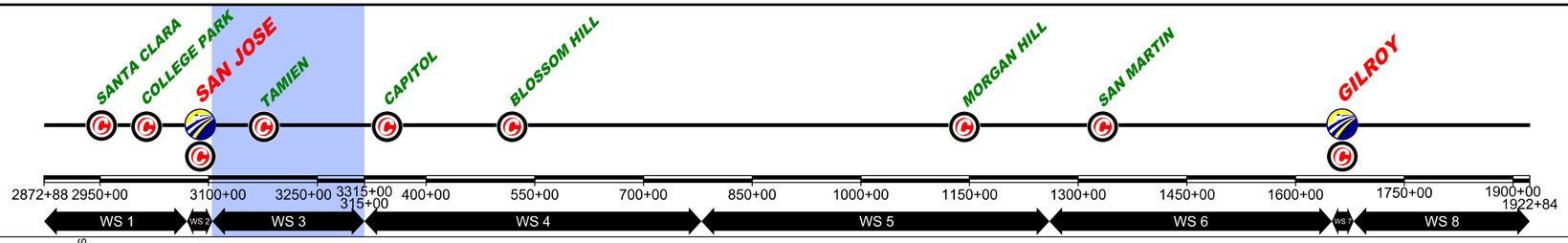

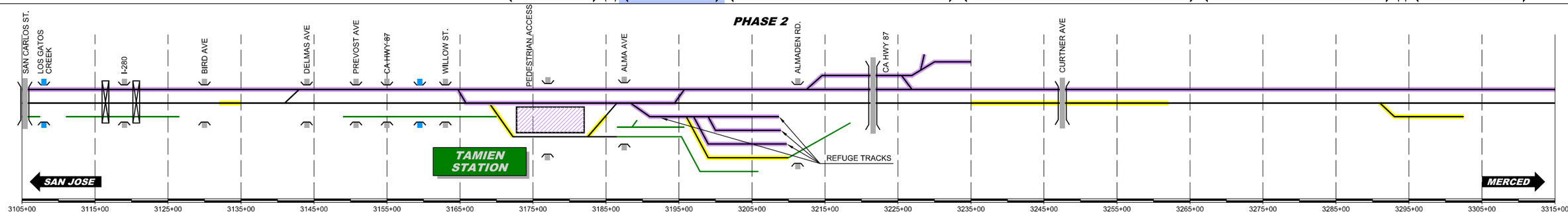

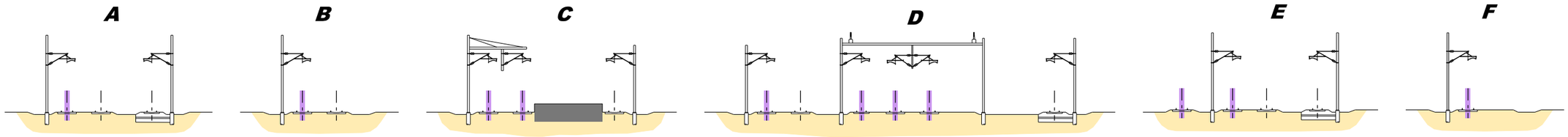

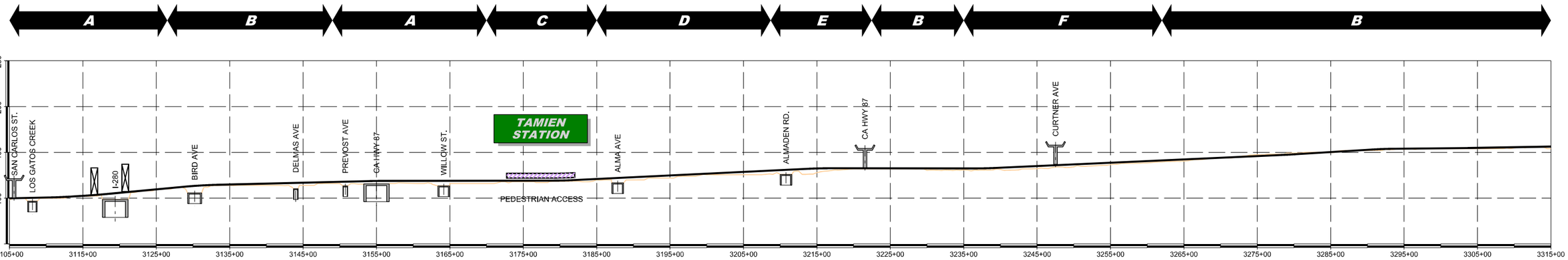

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PHASE 2

CONTRACT NO.
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SHEET NO. 3 OF 12

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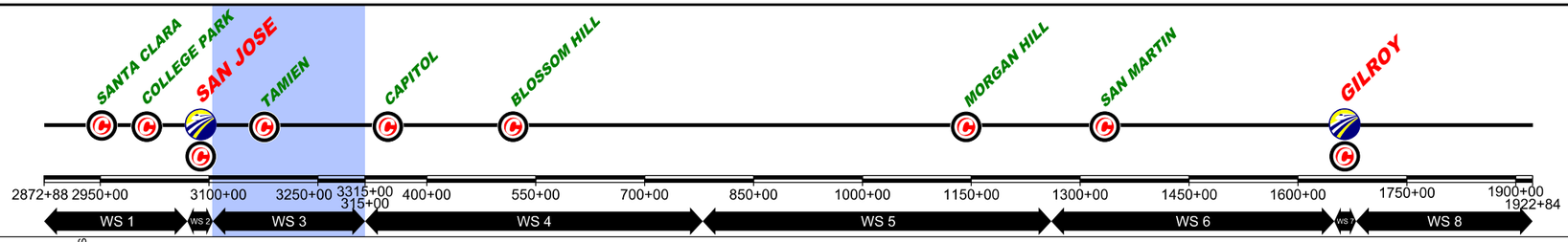

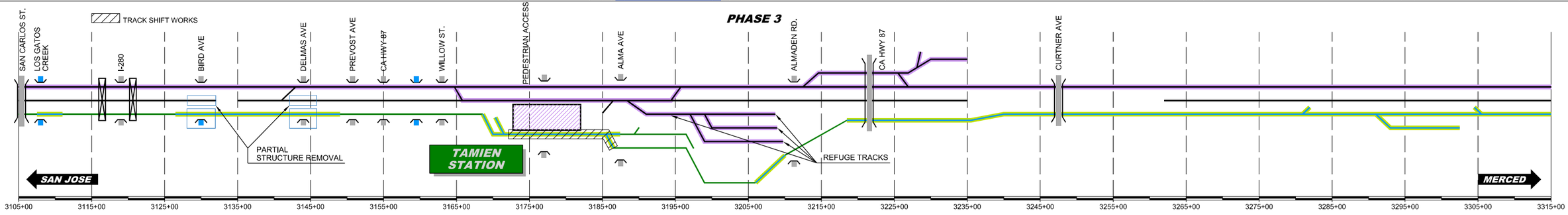

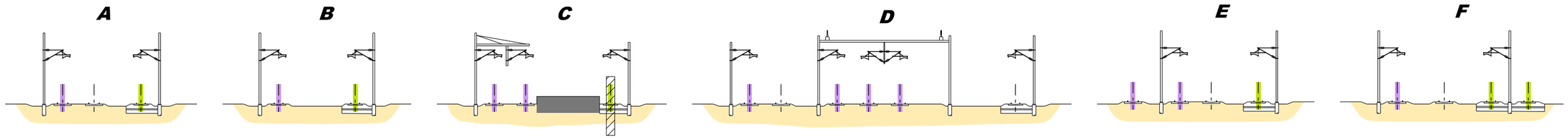

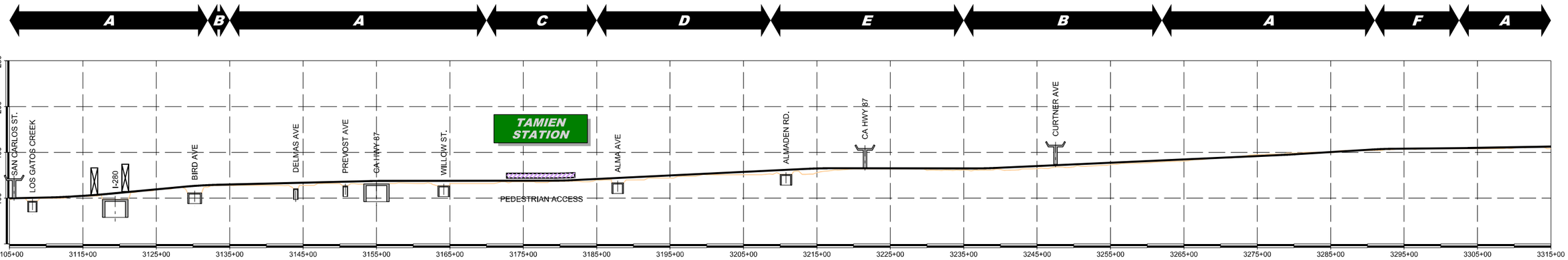

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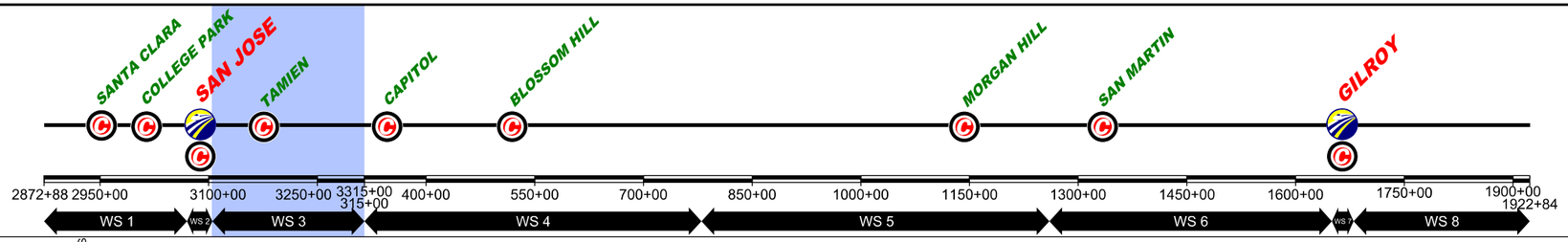
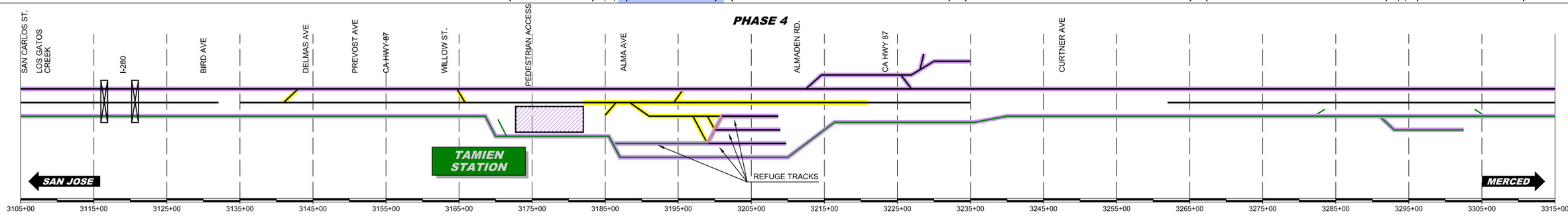
105+00 TO 315+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 3

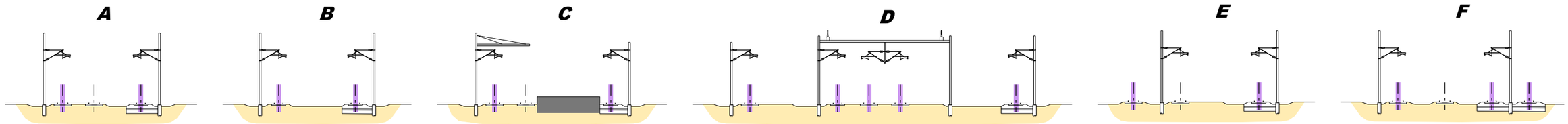
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-04
SCALE NOT TO SCALE
SHEET NO. 4 OF 12

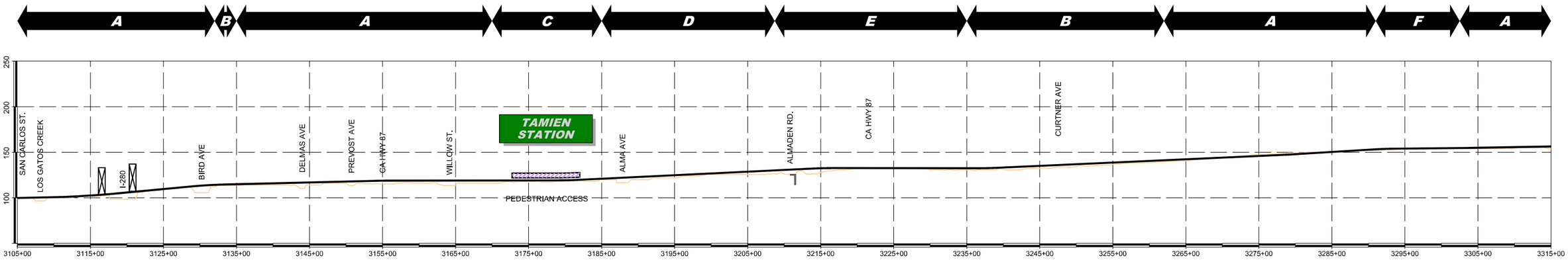
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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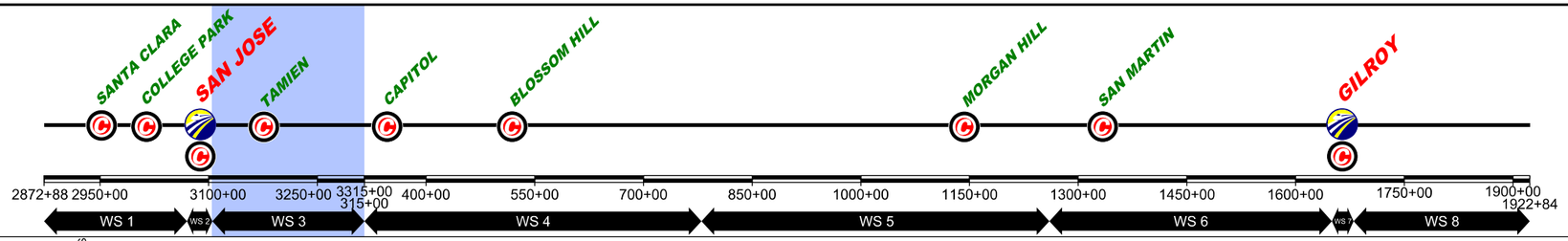
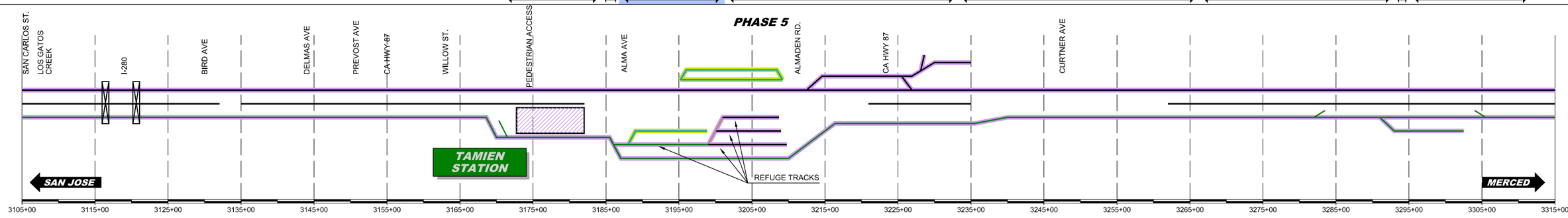
PHASE 4

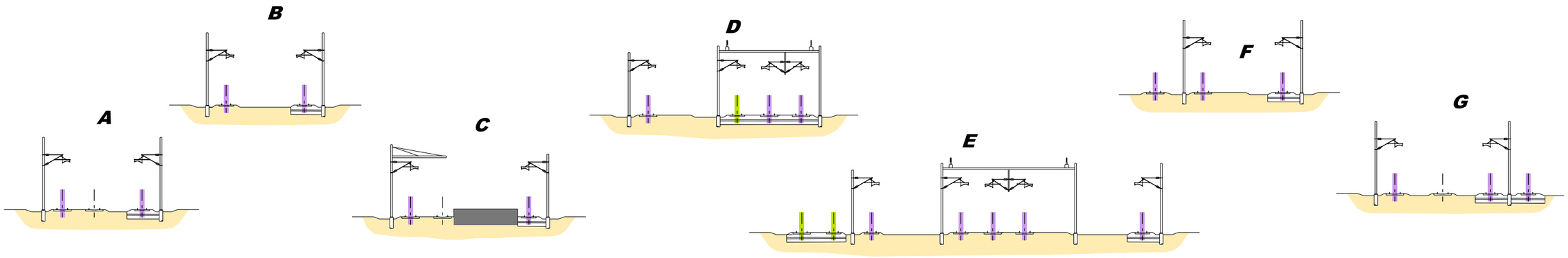
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-05
SCALE NOT TO SCALE
SHEET NO. 5 OF 12

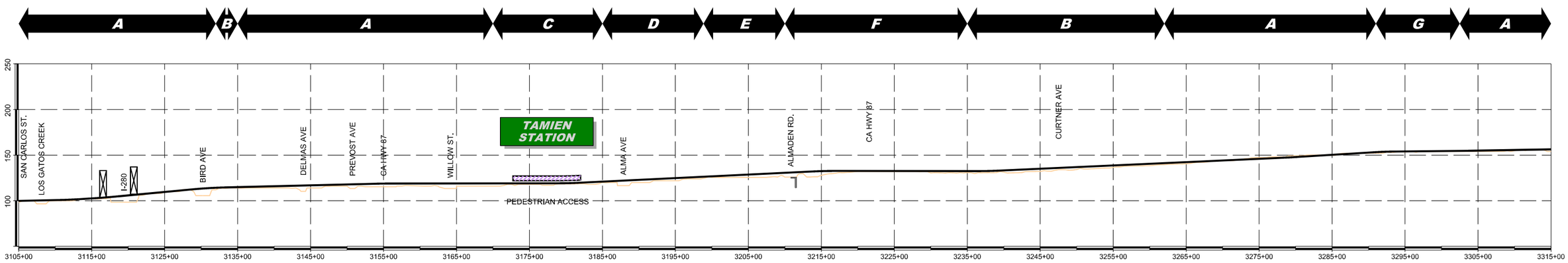
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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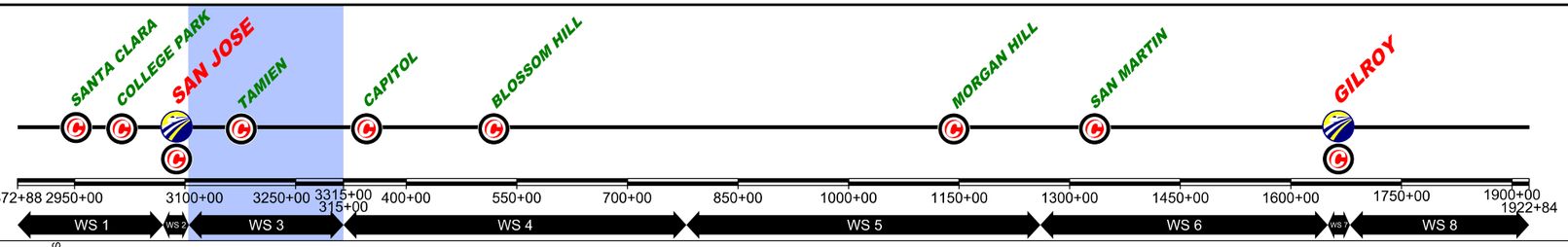
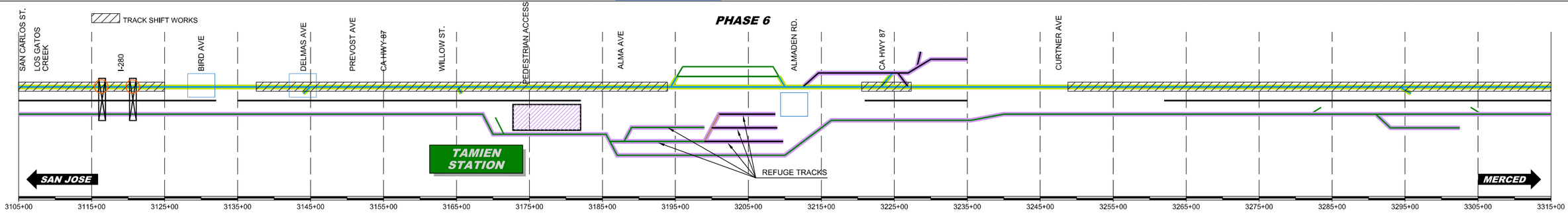
PLAN AND PROFILE SCHEME
PHASE 5

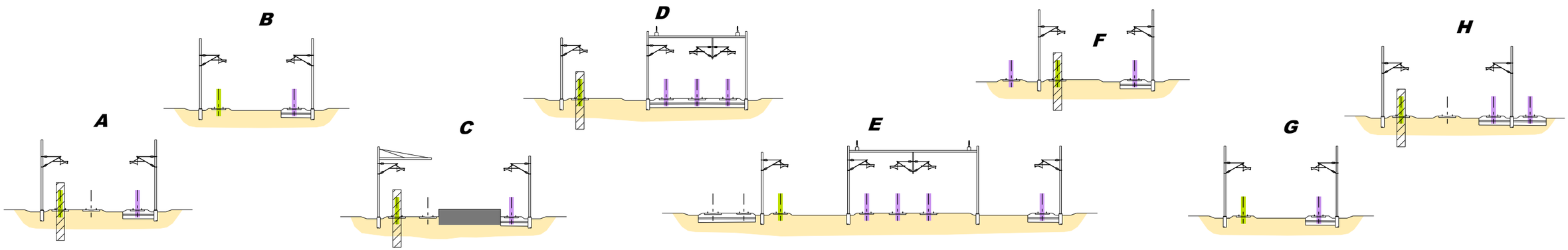
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-06
SCALE NOT TO SCALE
SHEET NO. 6 OF 12

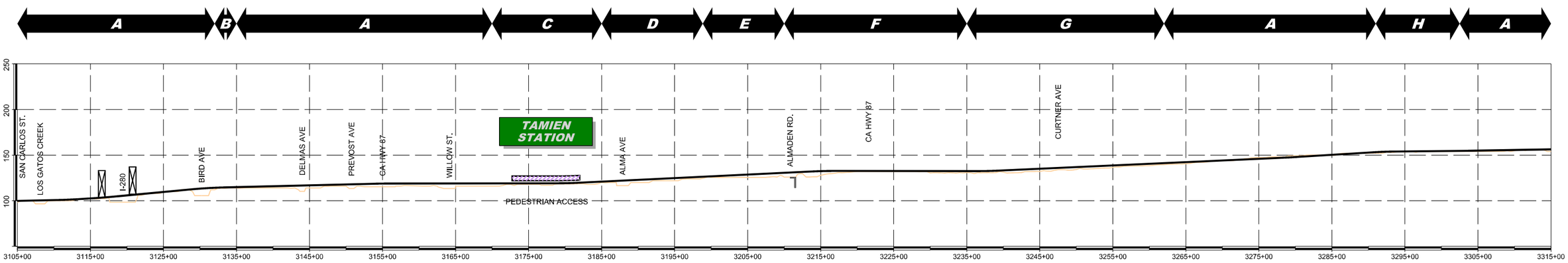
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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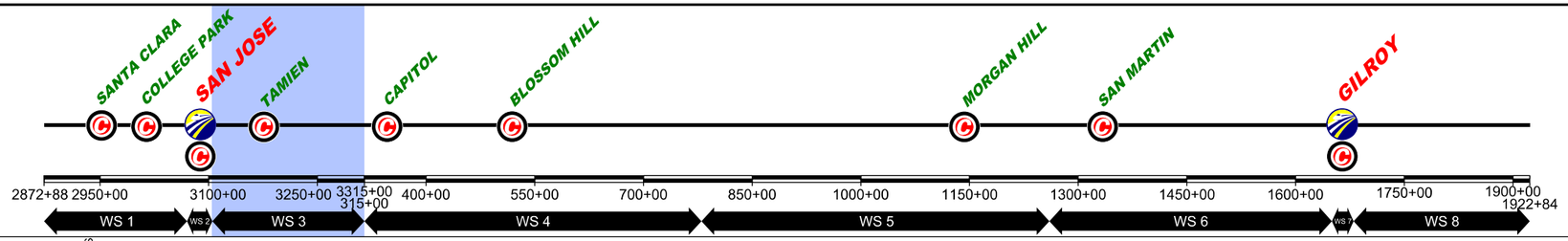
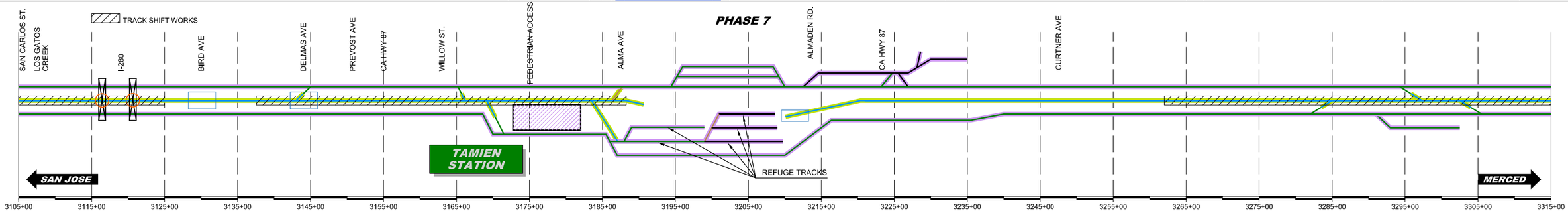
PHASE 6

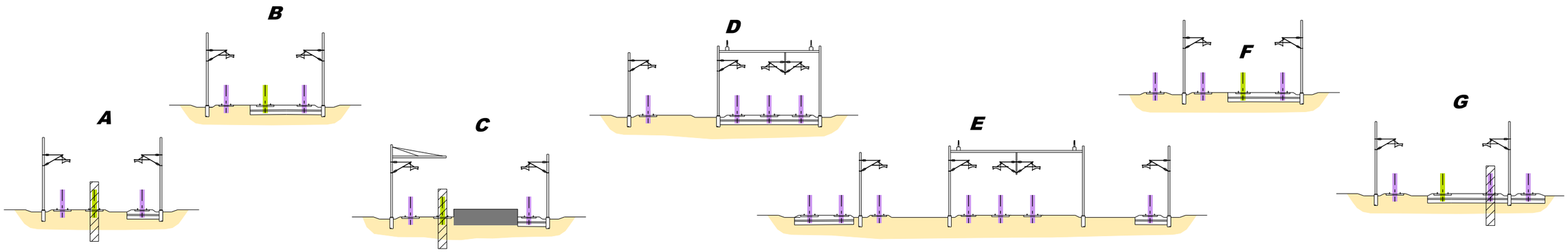
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-07
SCALE NOT TO SCALE
SHEET NO. 7 OF 12

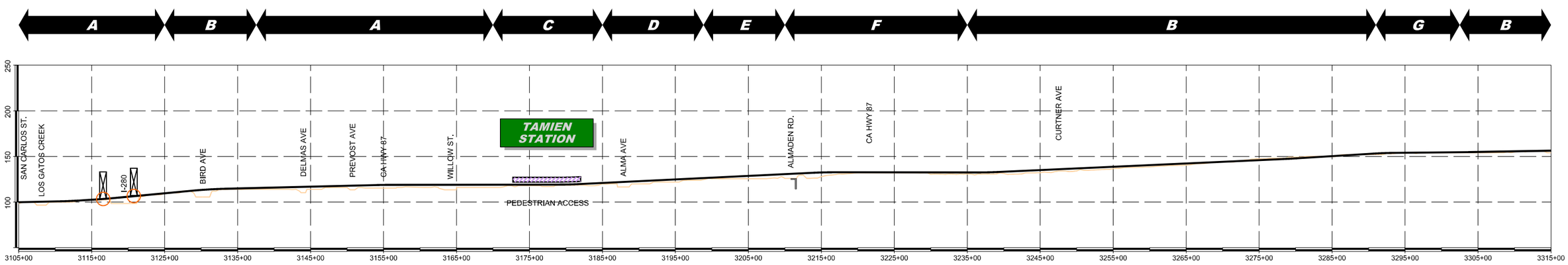
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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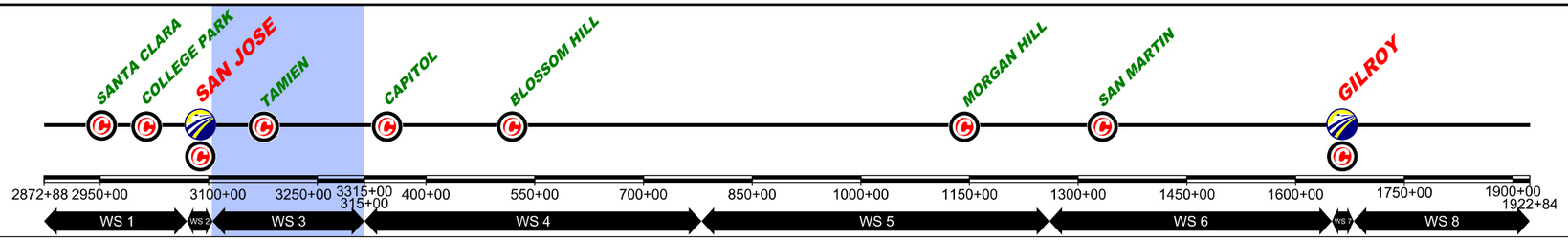
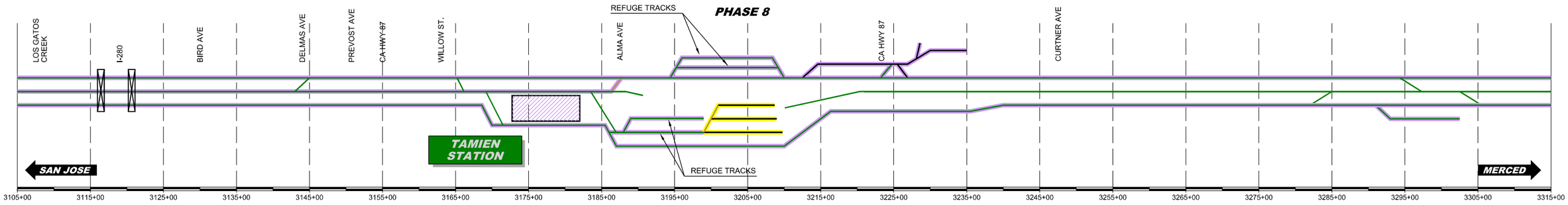
PHASE 7

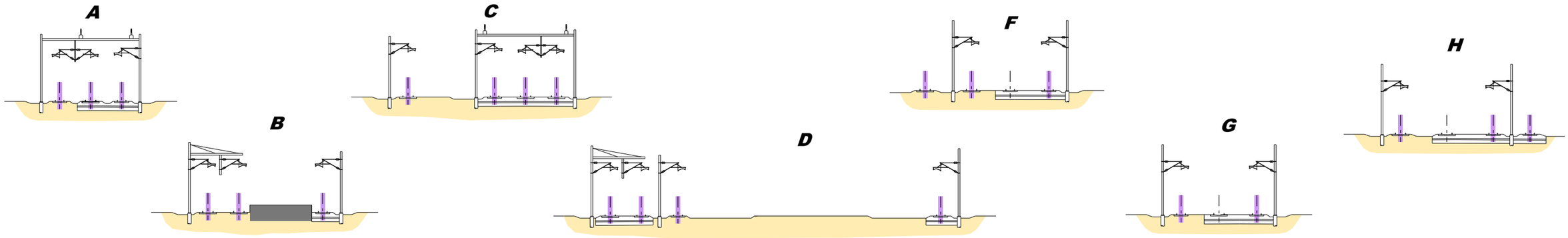
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-08
SCALE NOT TO SCALE
SHEET NO. 8 OF 12

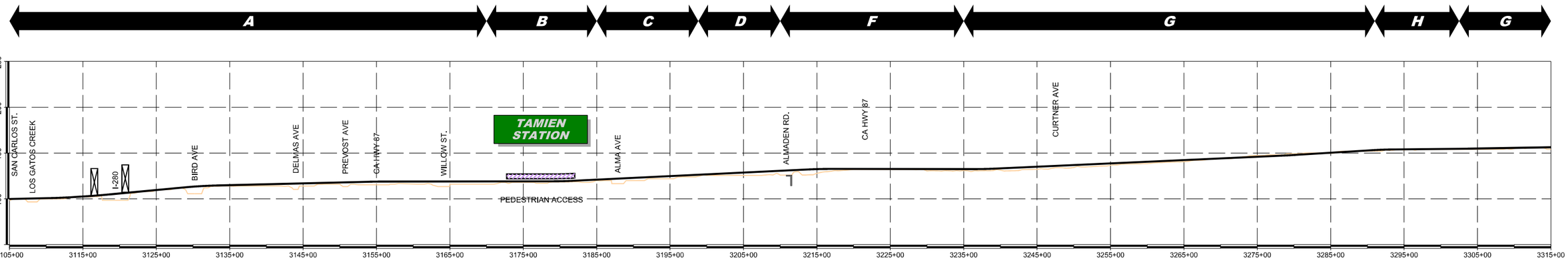
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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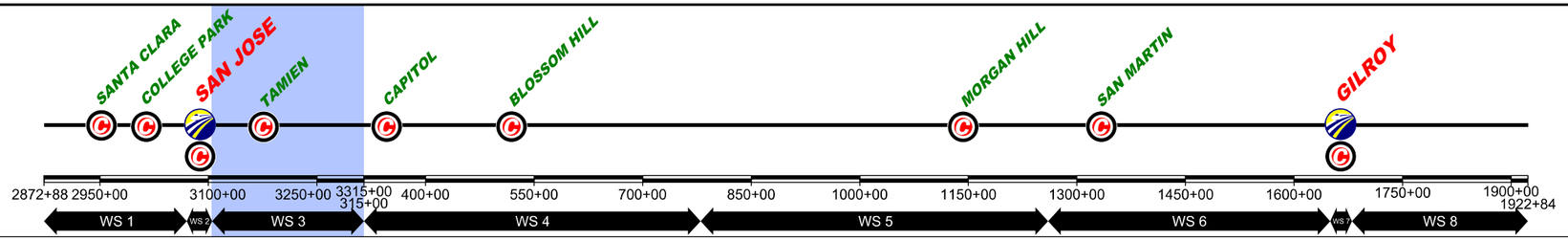
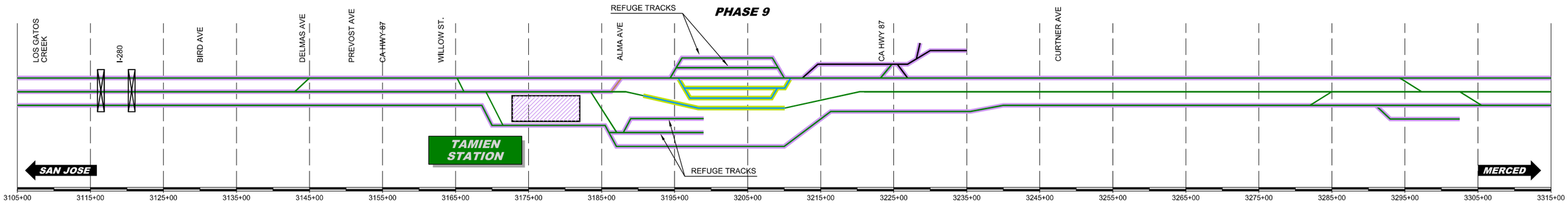
PHASE 8

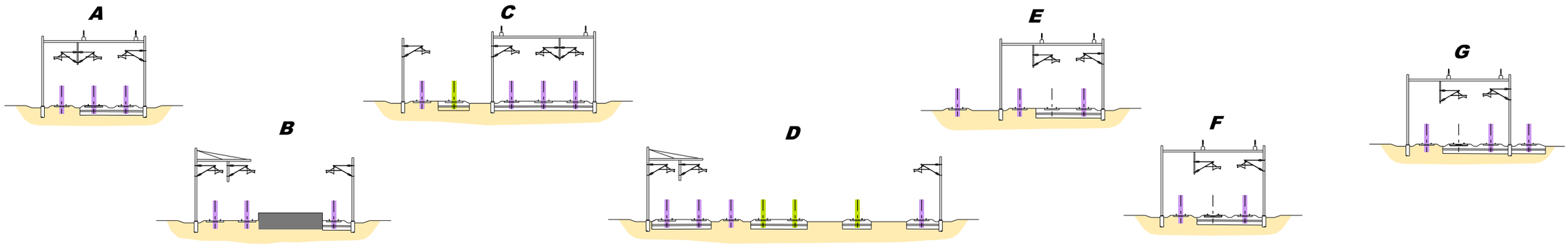
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-09
SCALE NOT TO SCALE
SHEET NO. 9 OF 12

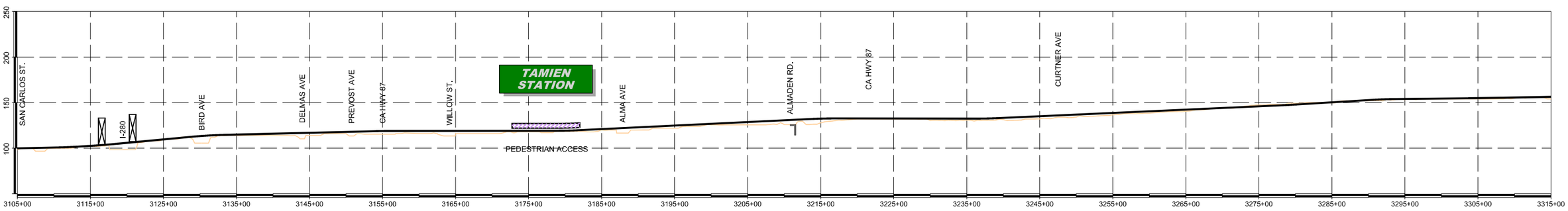
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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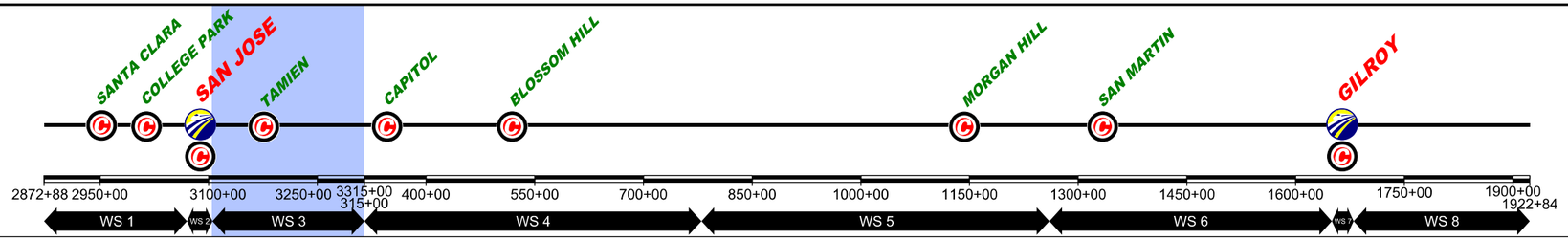
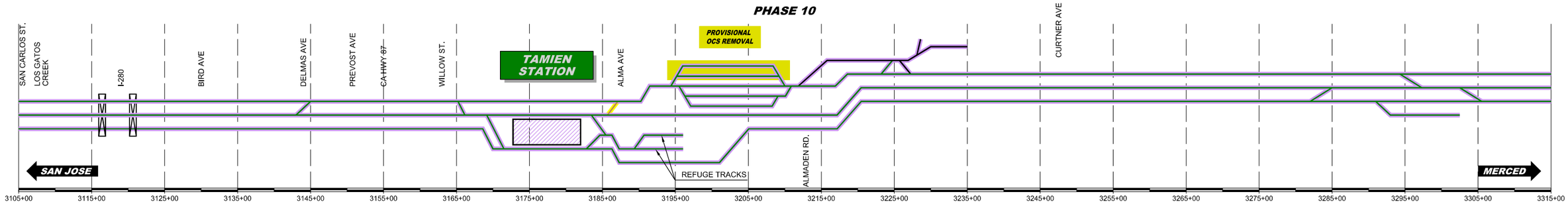
PLAN AND PROFILE SCHEME
PHASE 9

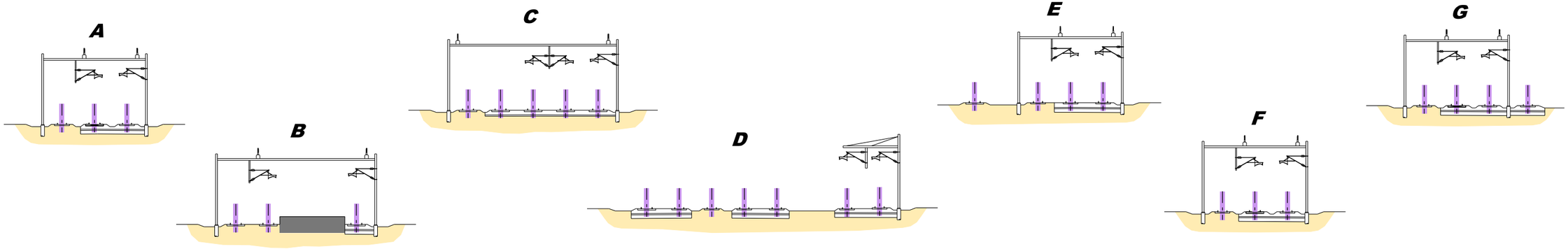
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-10
SCALE NOT TO SCALE
SHEET NO. 10 OF 12

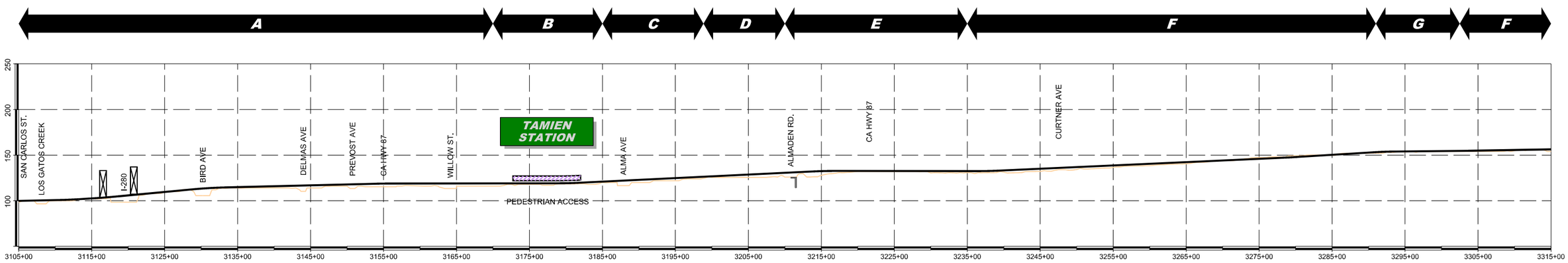
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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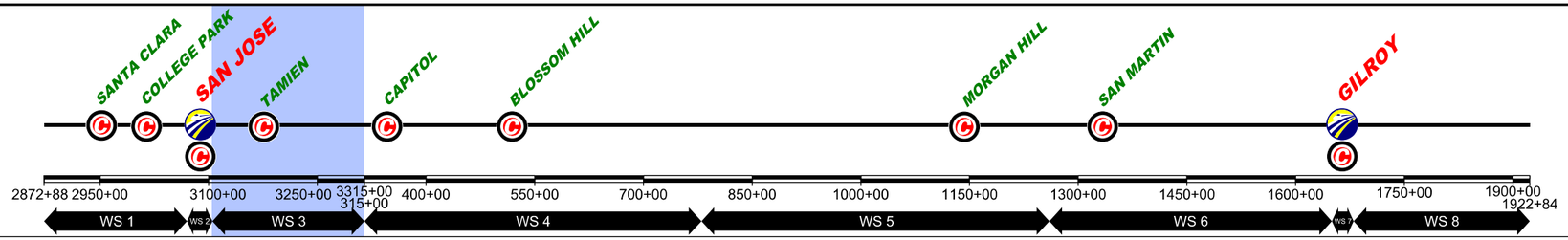
PHASE 10

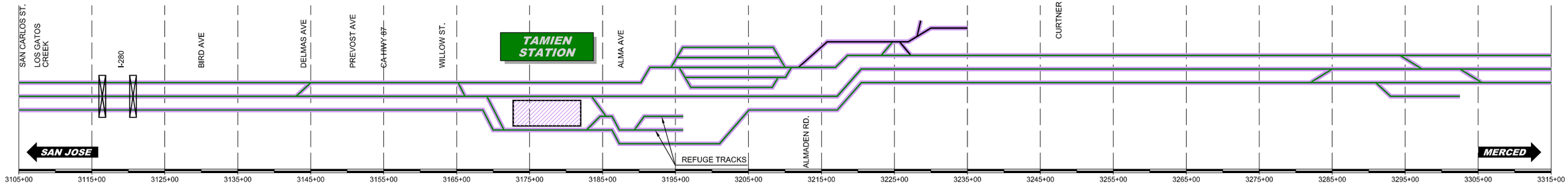
CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-11
SCALE NOT TO SCALE
SHEET NO. 11 OF 12

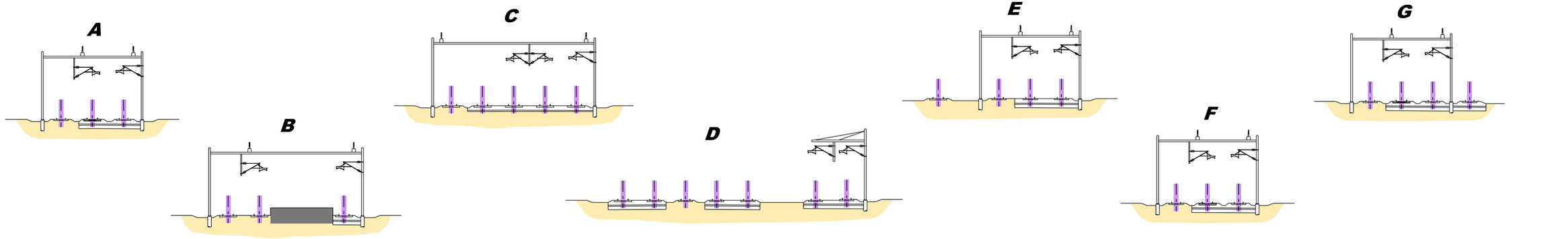
$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

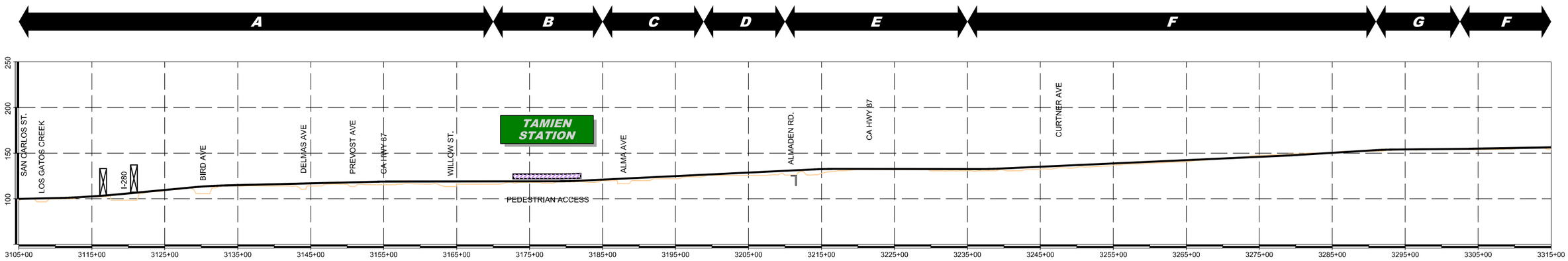
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



PHASE 11







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PLAN AND PROFILE SCHEME
PHASE 11

CONTRACT NO.
DRAWING NO. CV-I6WS3-SPP-12
SCALE NOT TO SCALE
SHEET NO. 12 OF 12

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

APPENDIX H: TRACK SHIFT WORKS

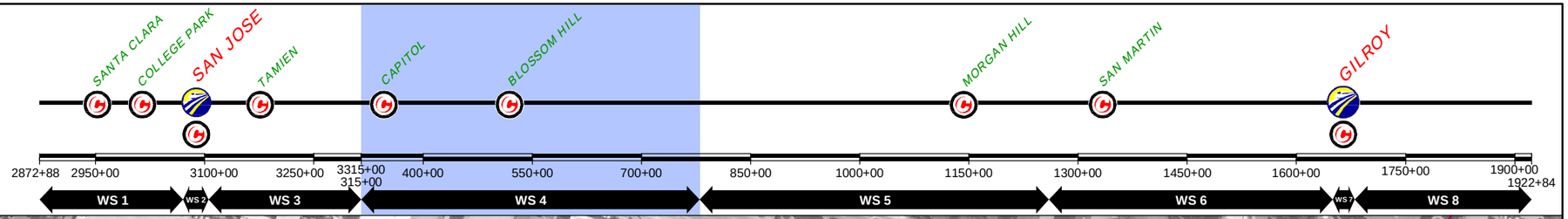
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

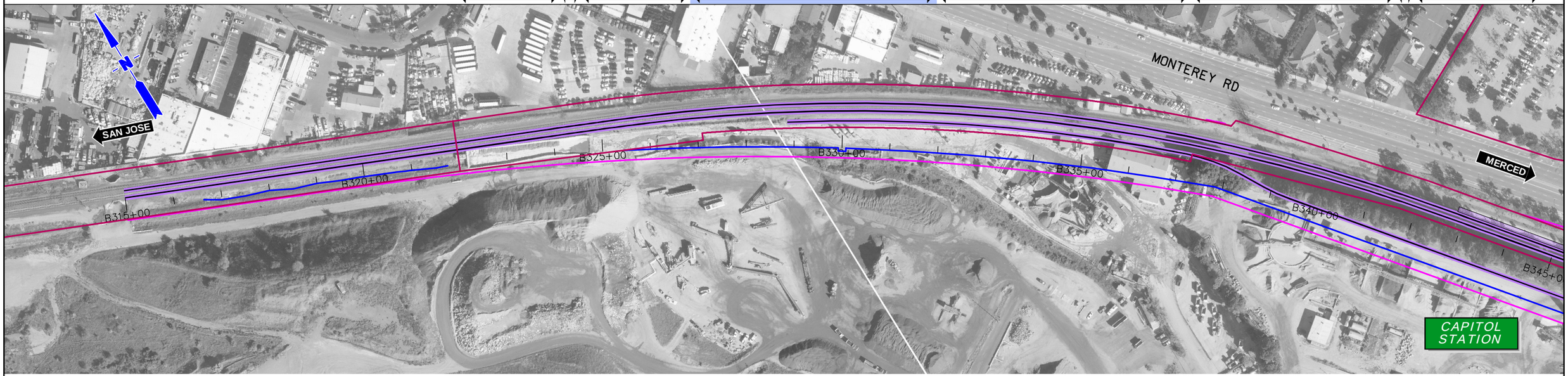
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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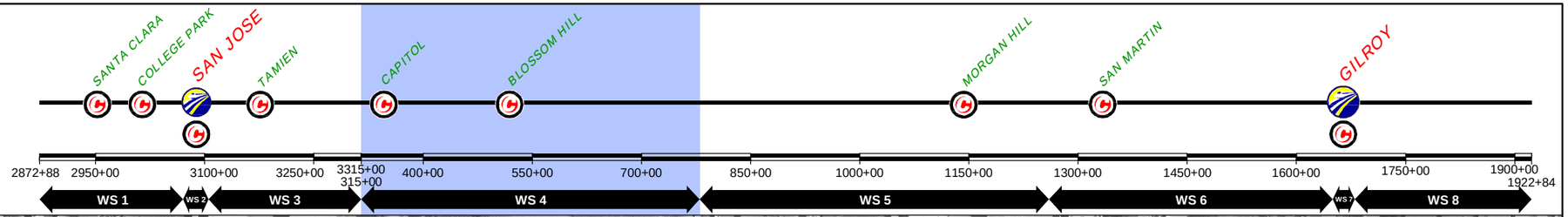
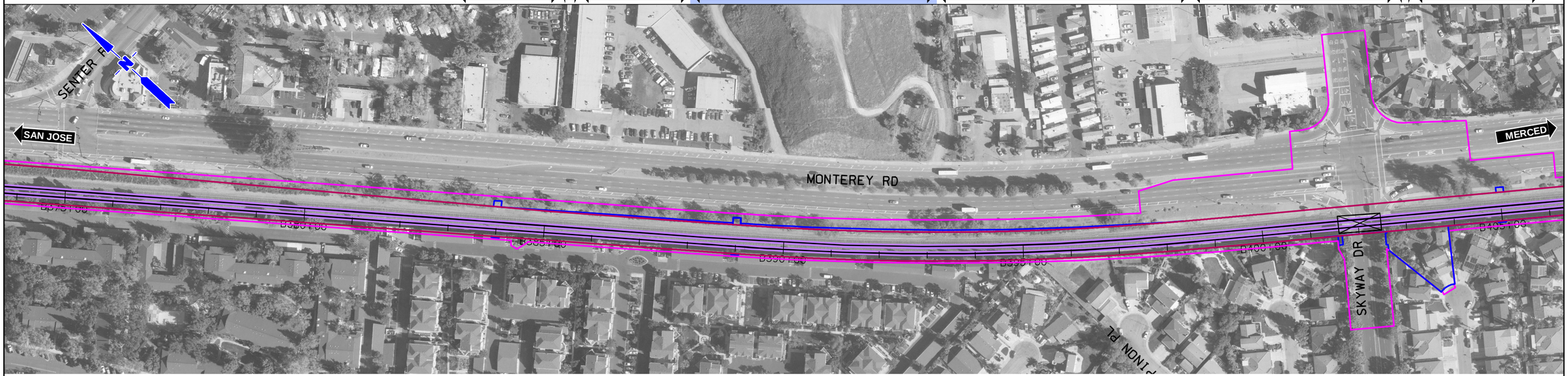
CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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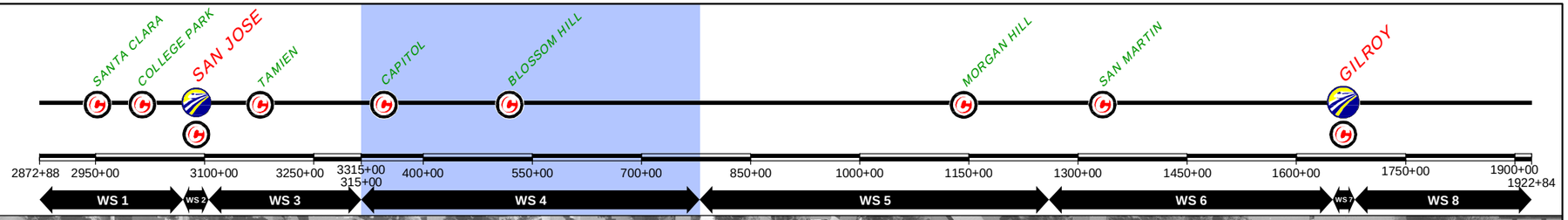
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-01
SCALE 1" = 200'
SHEET NO. 2 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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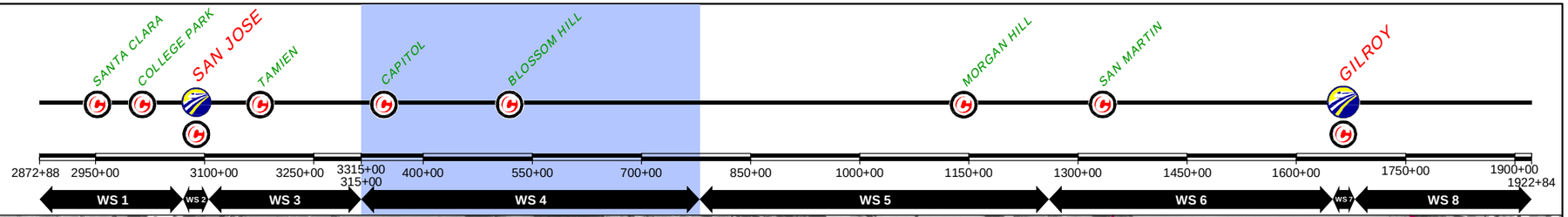
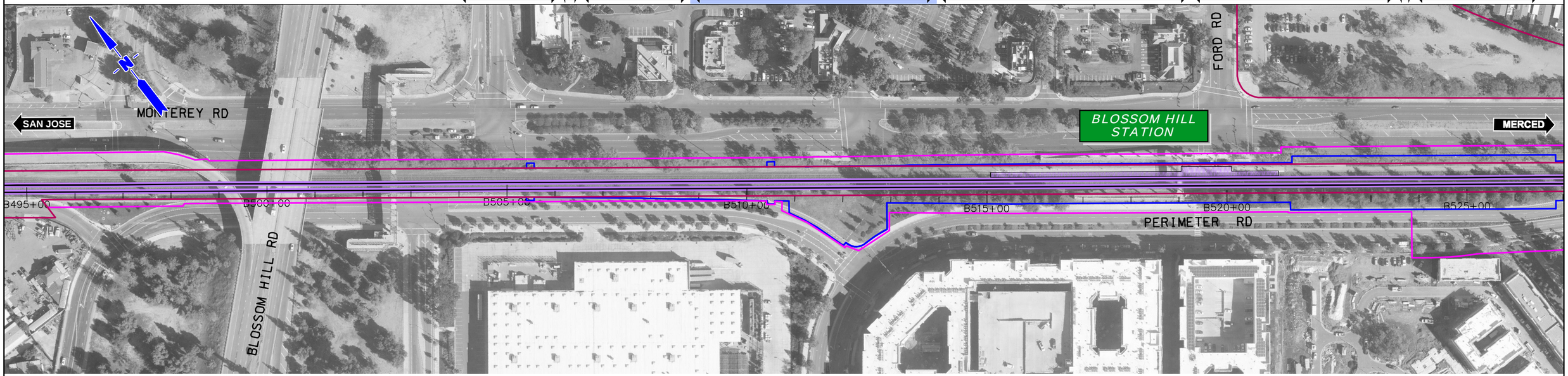
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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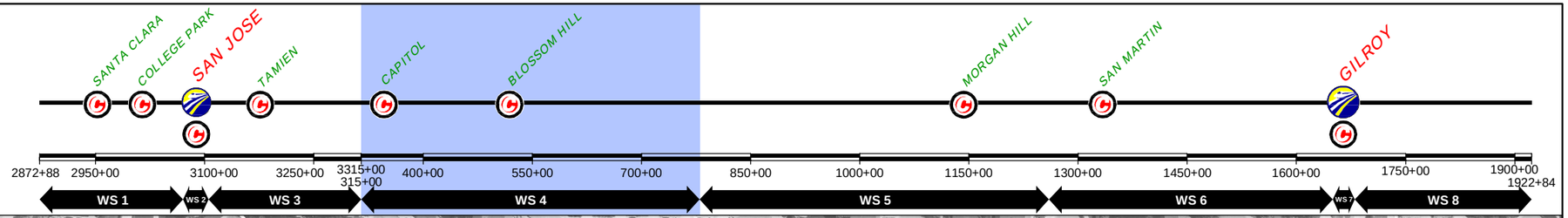
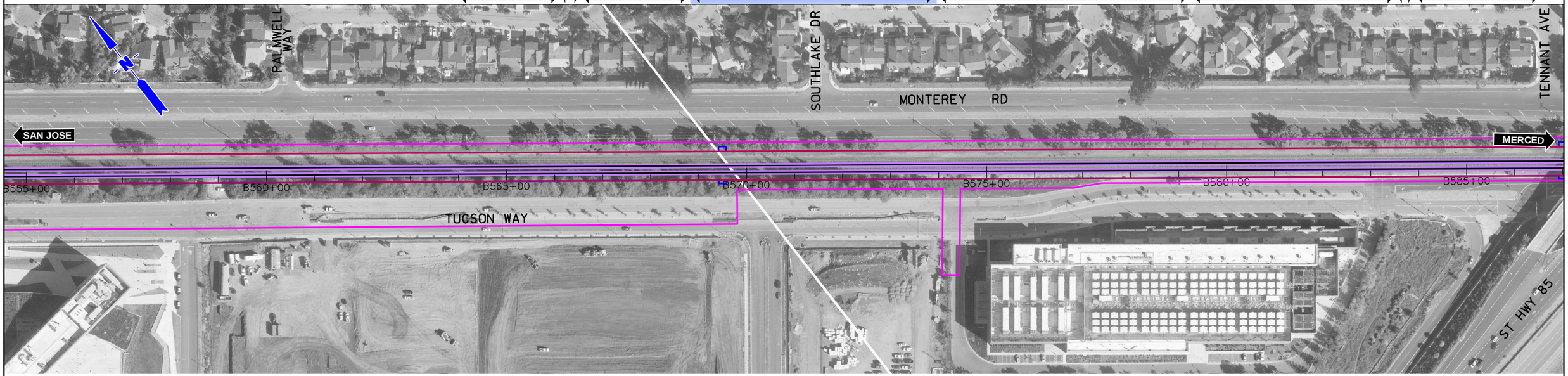
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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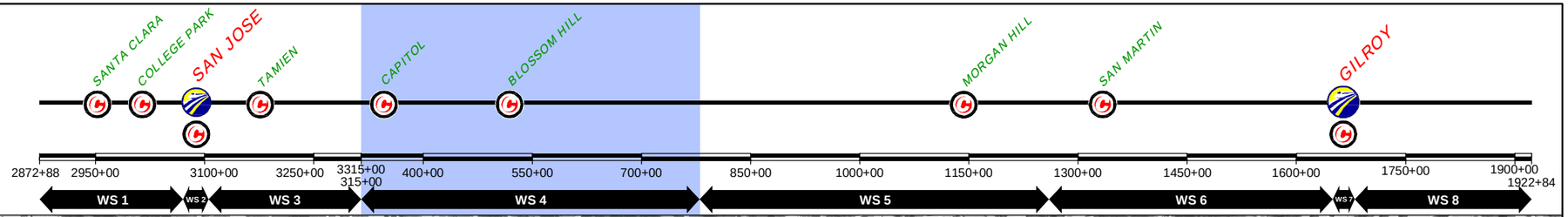
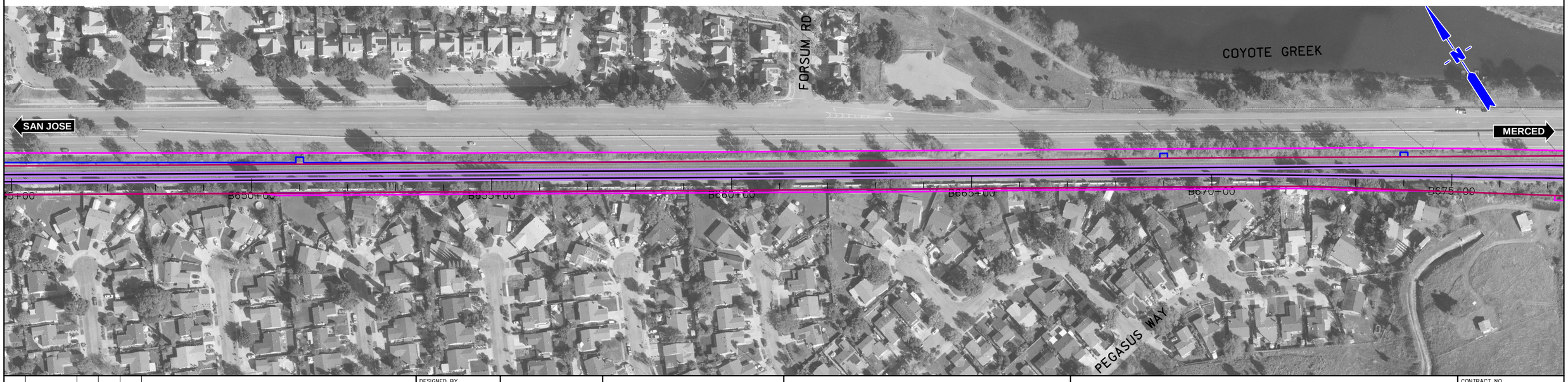
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
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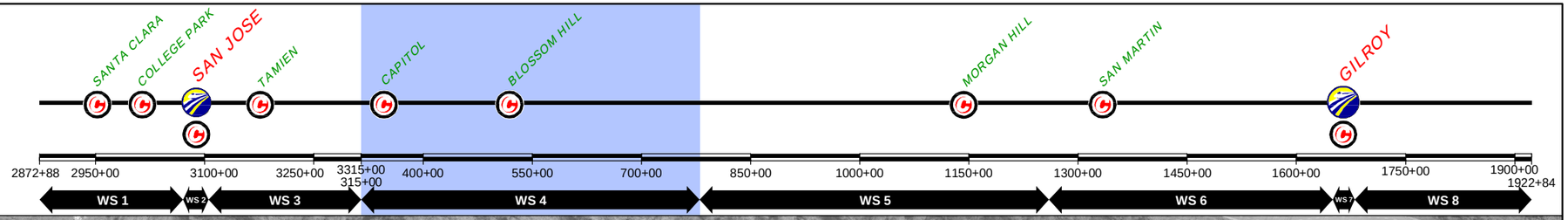
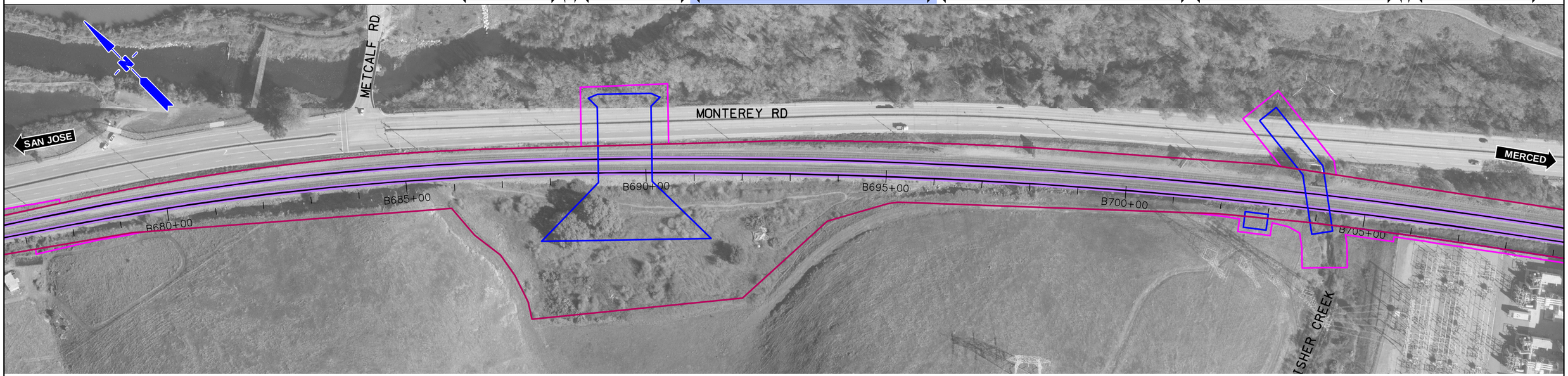
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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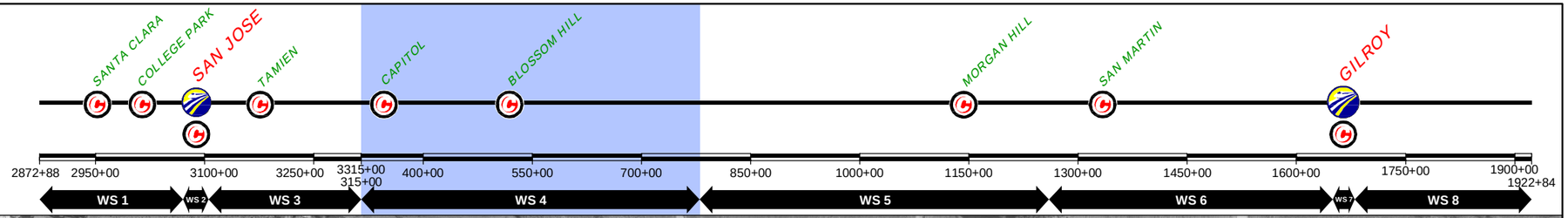
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-01
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
INITIAL PHASE

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH0-01
SCALE 1" = 200'
SHEET NO. 8 OF 8

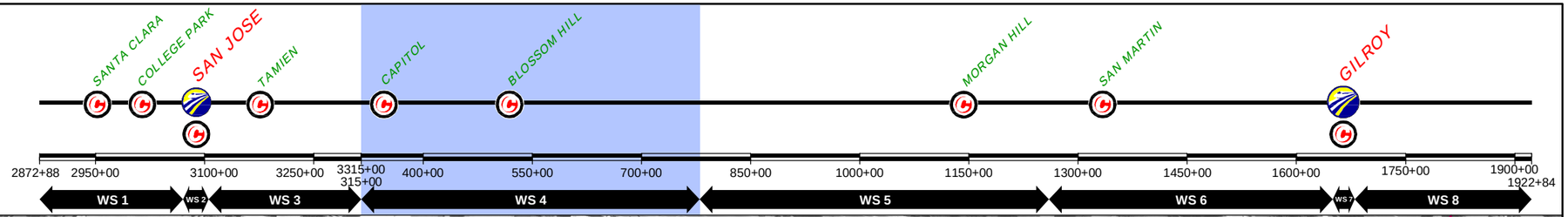
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

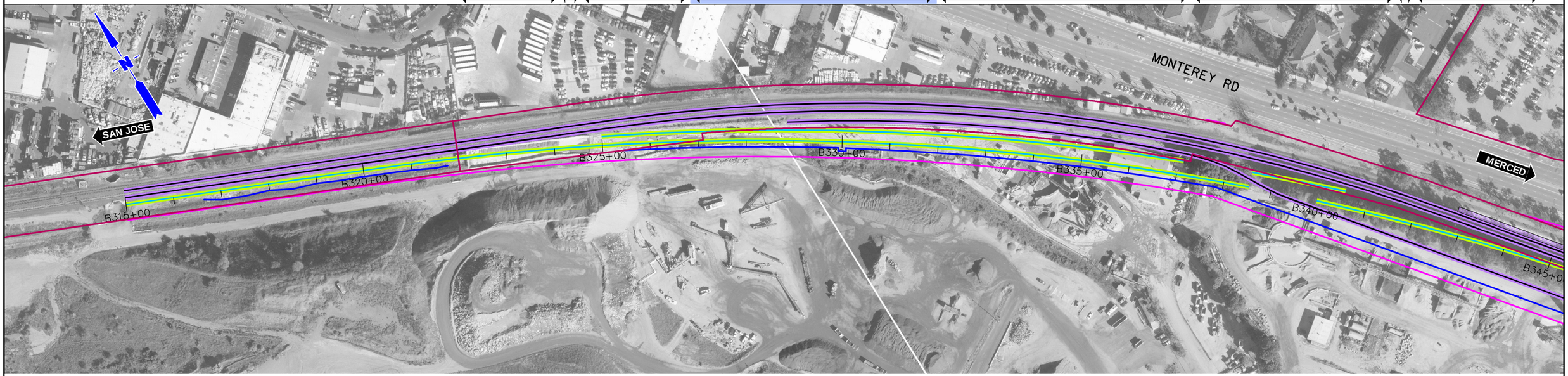
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

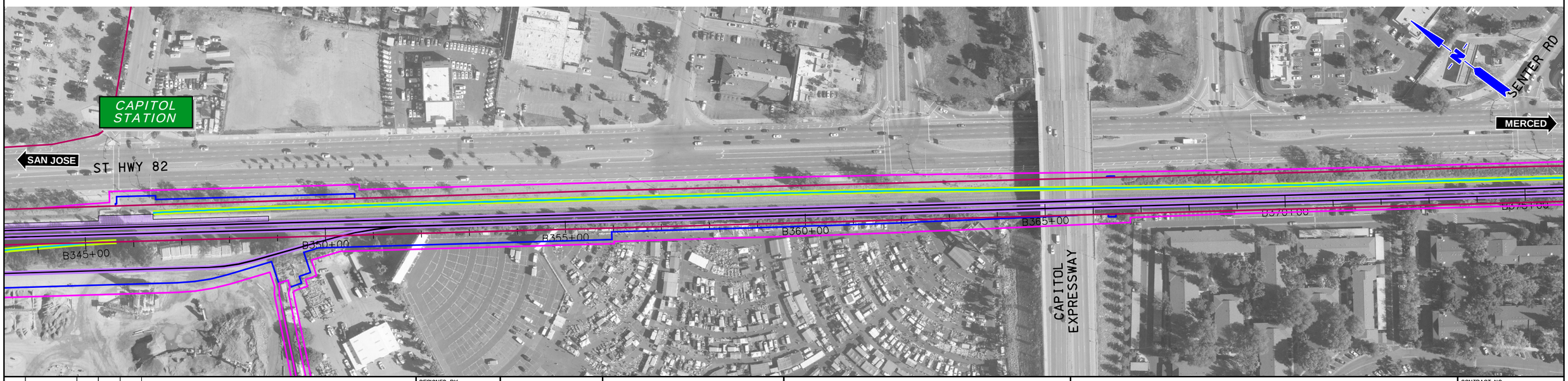
EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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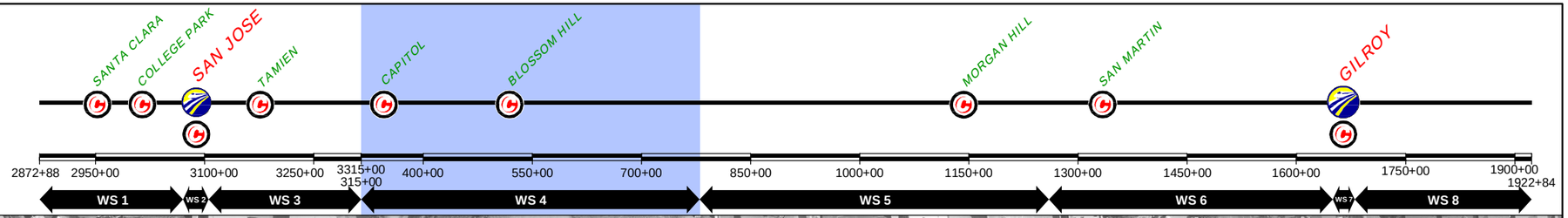
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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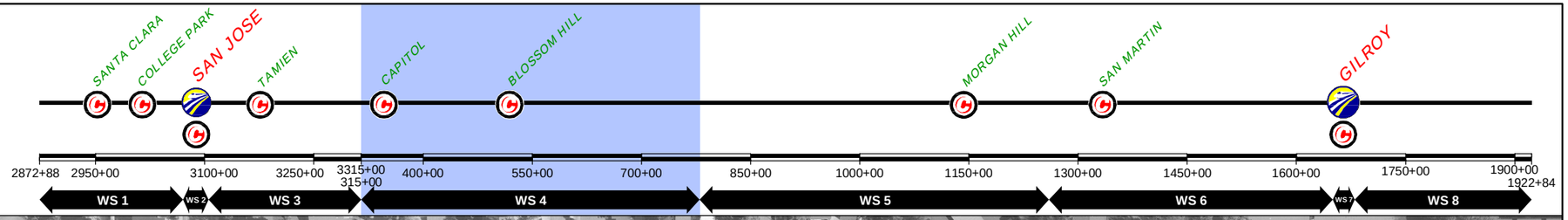
CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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CALIFORNIA HIGH-SPEED TRAIN PROJECT

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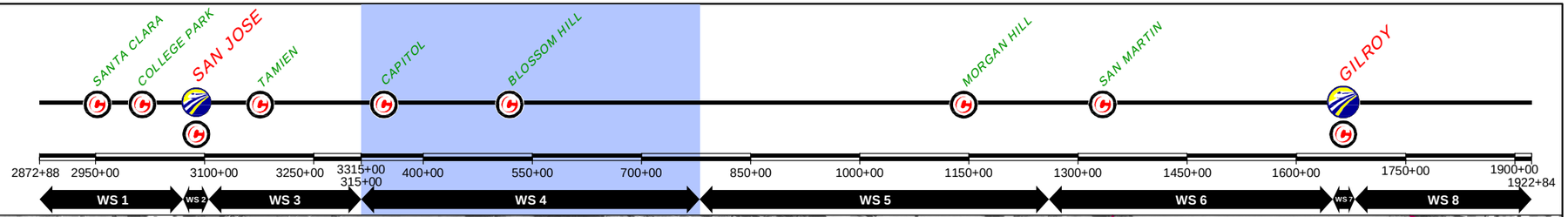
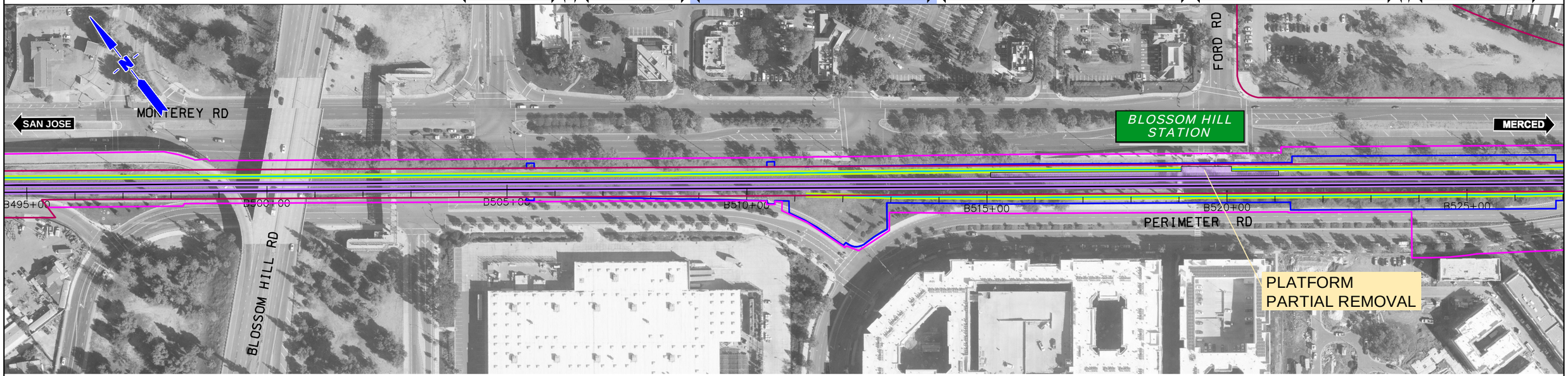
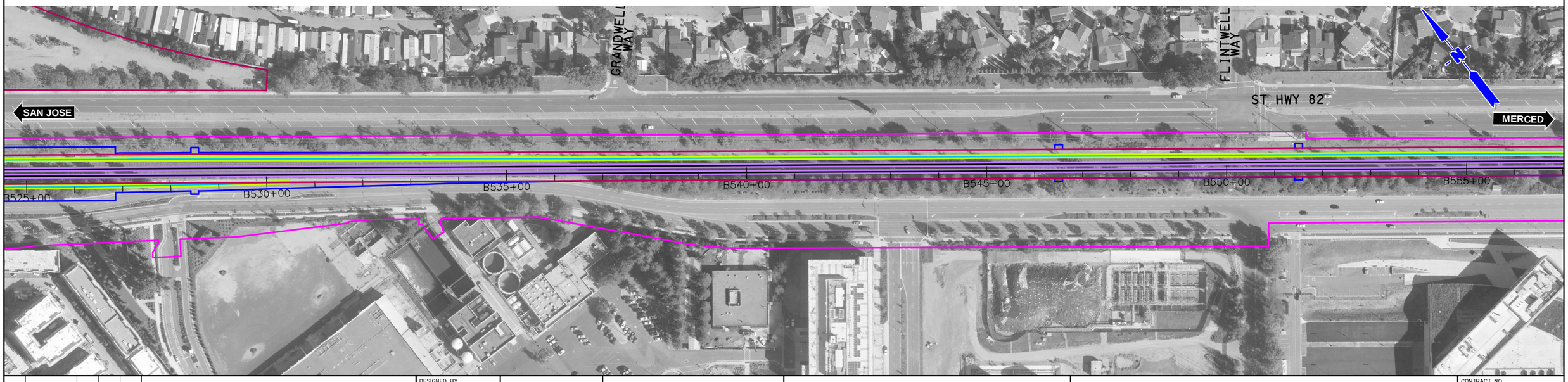
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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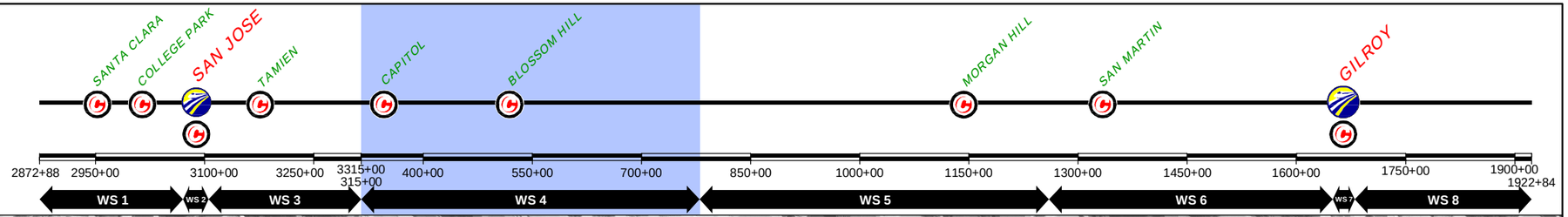
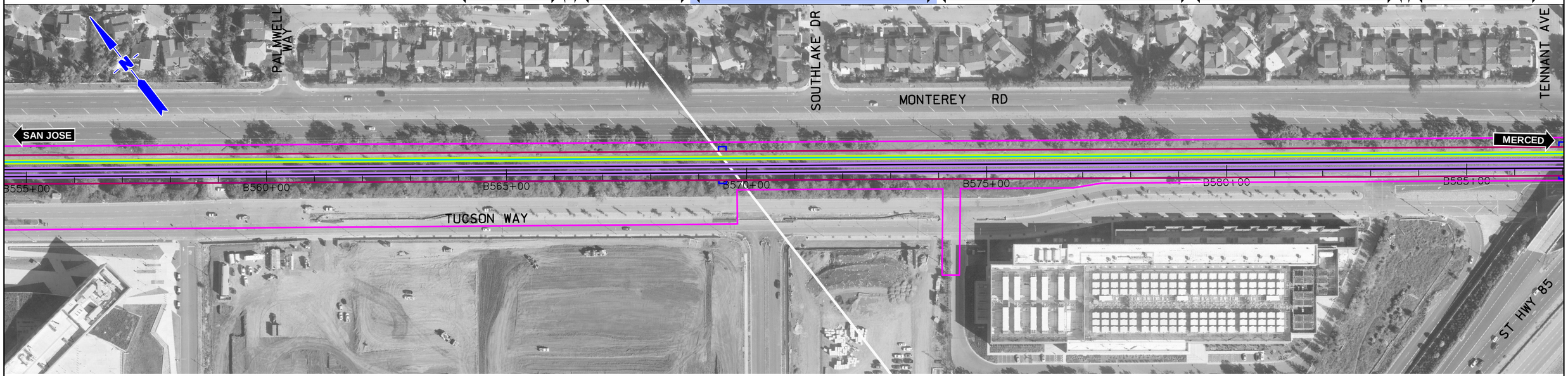
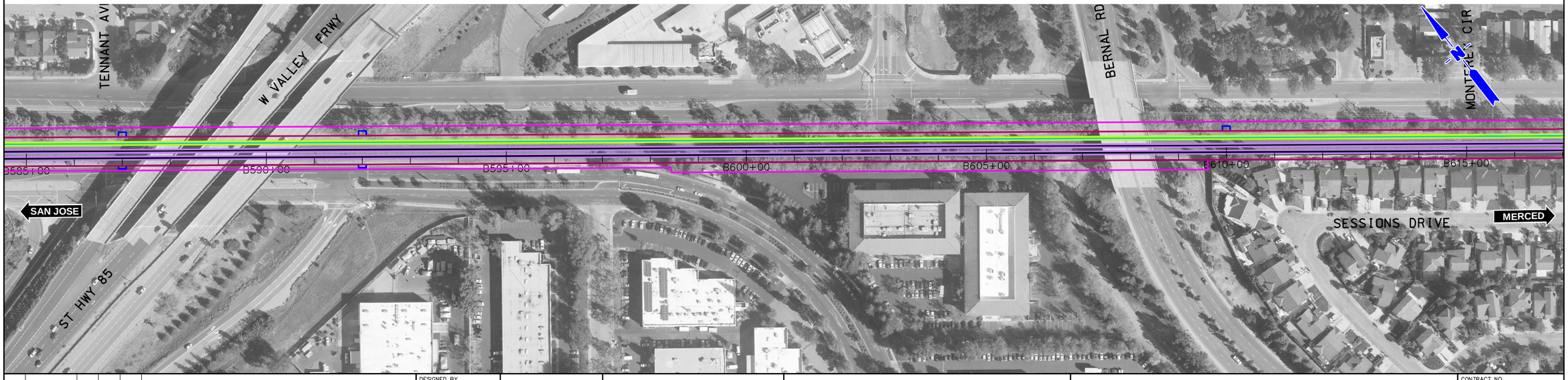
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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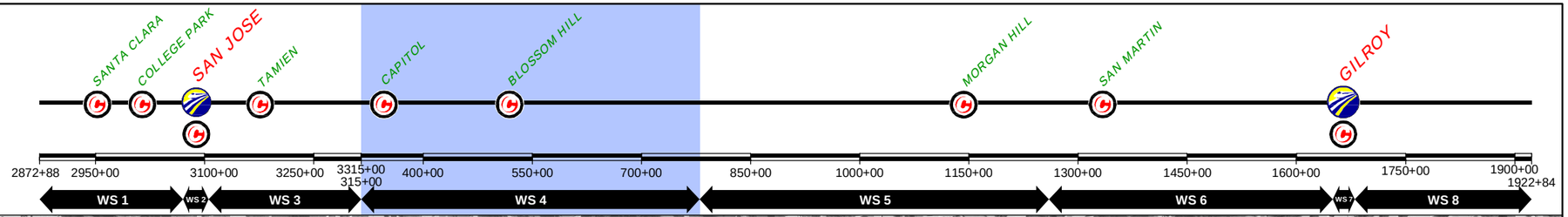
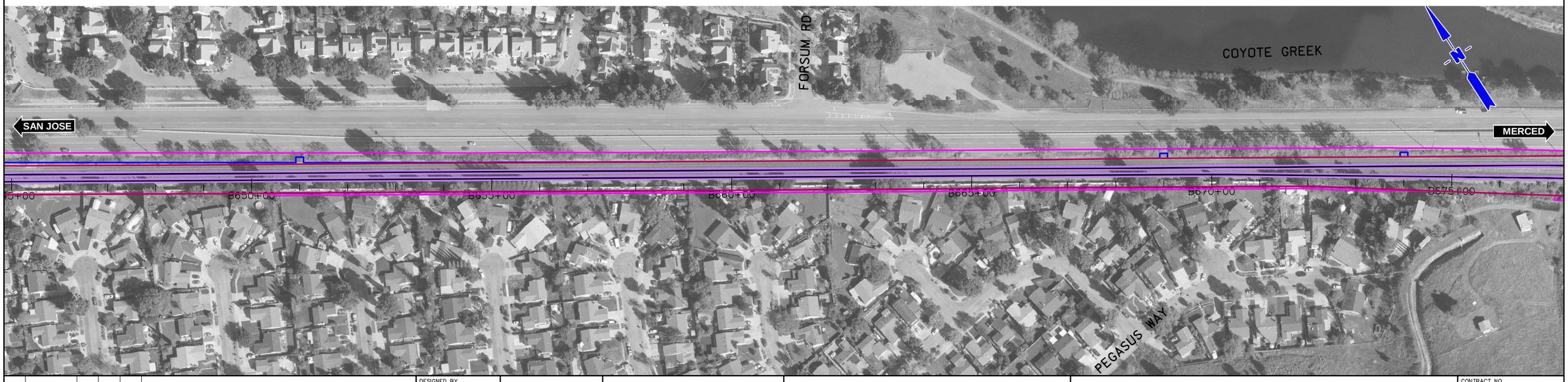
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

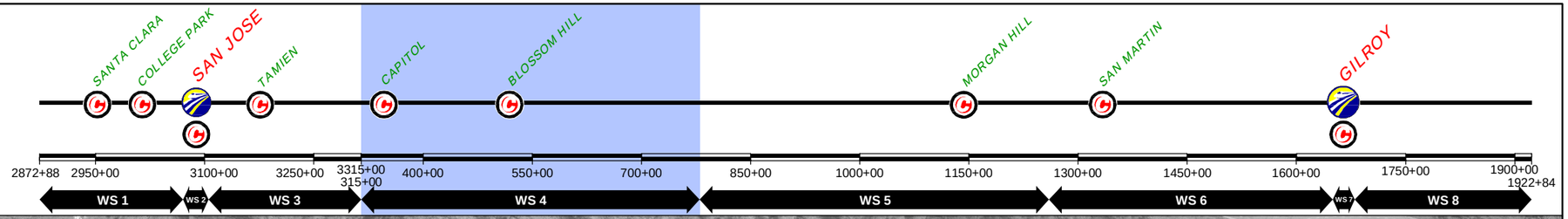
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

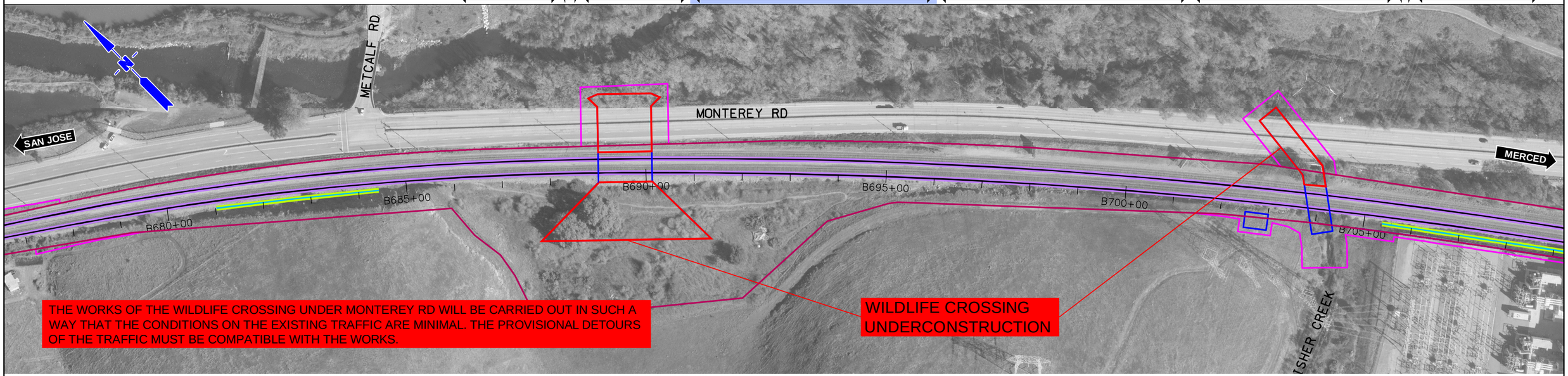
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED

785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

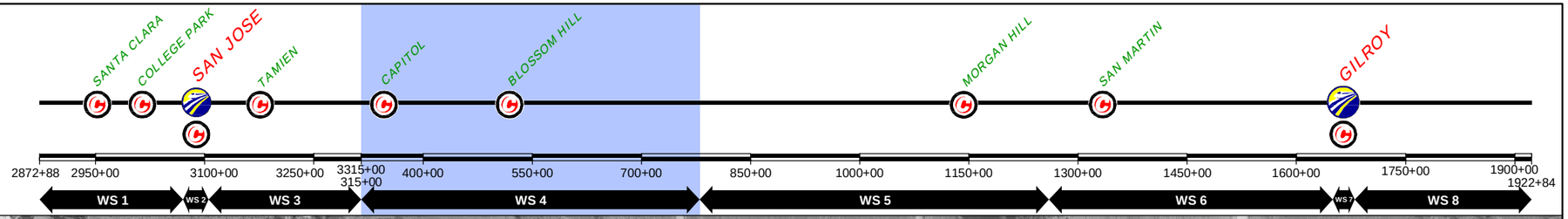
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

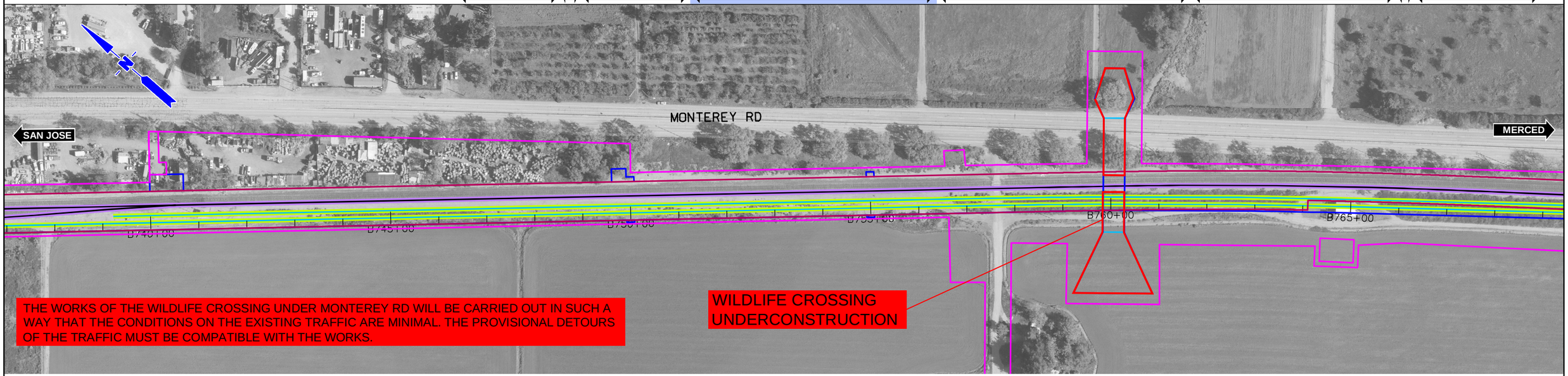
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

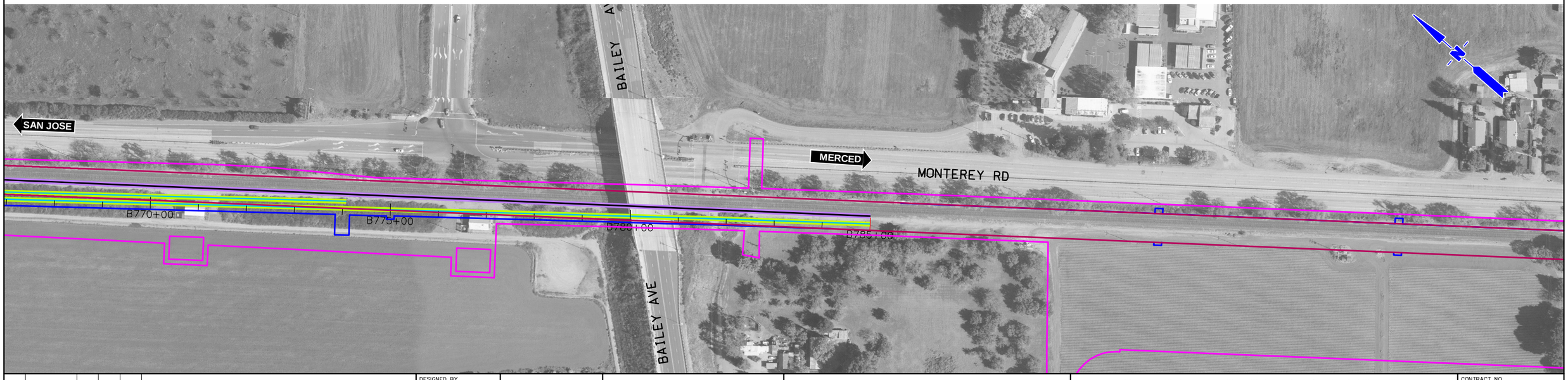
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





THE WORKS OF THE WILDLIFE CROSSING UNDER MONTEREY RD WILL BE CARRIED OUT IN SUCH A WAY THAT THE CONDITIONS ON THE EXISTING TRAFFIC ARE MINIMAL. THE PROVISIONAL DETOURS OF THE TRAFFIC MUST BE COMPATIBLE WITH THE WORKS.

WILDLIFE CROSSING UNDERCONSTRUCTION



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785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH1-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

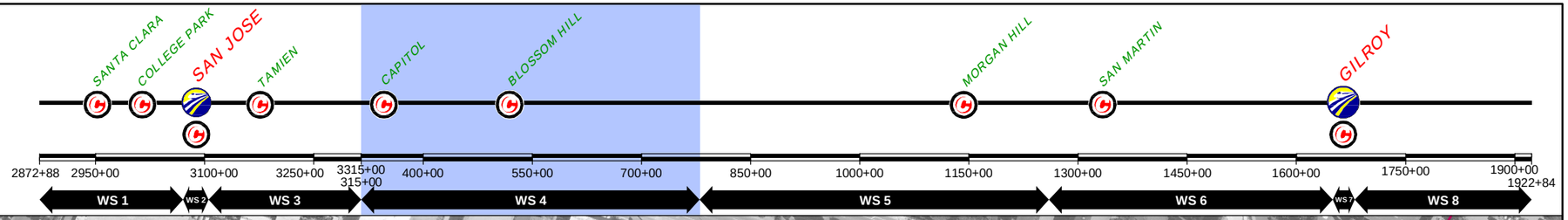
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

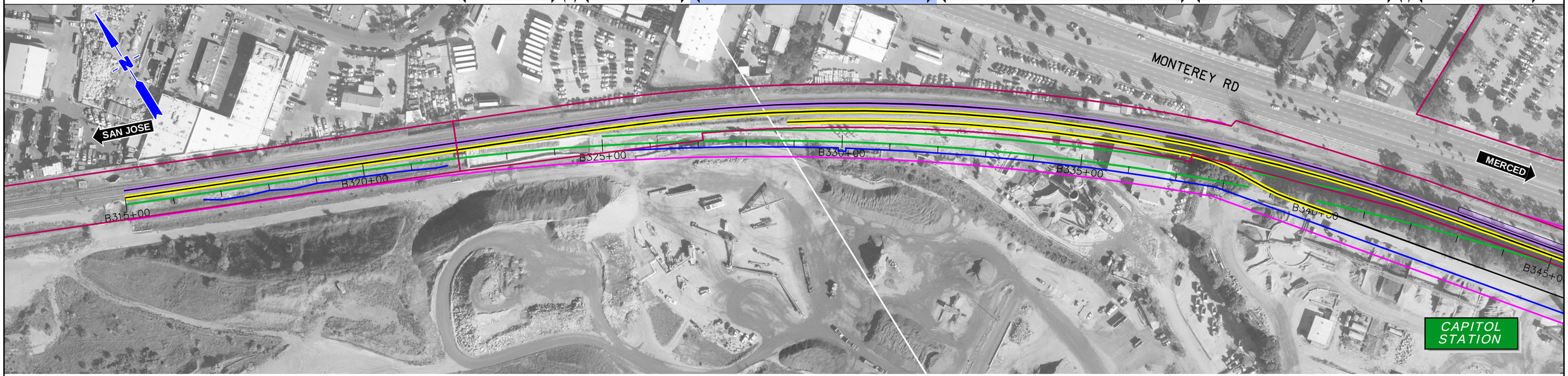
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

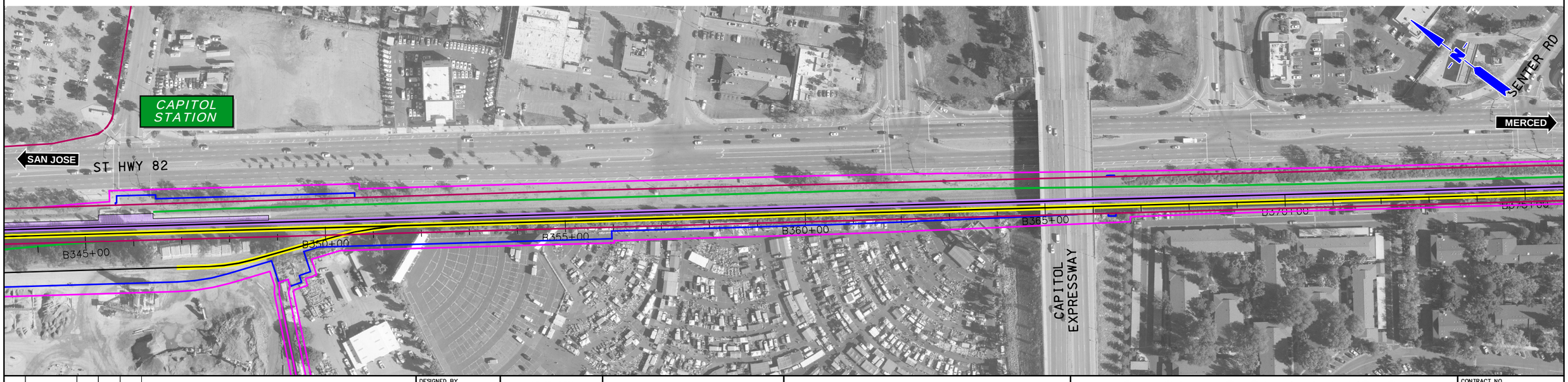
EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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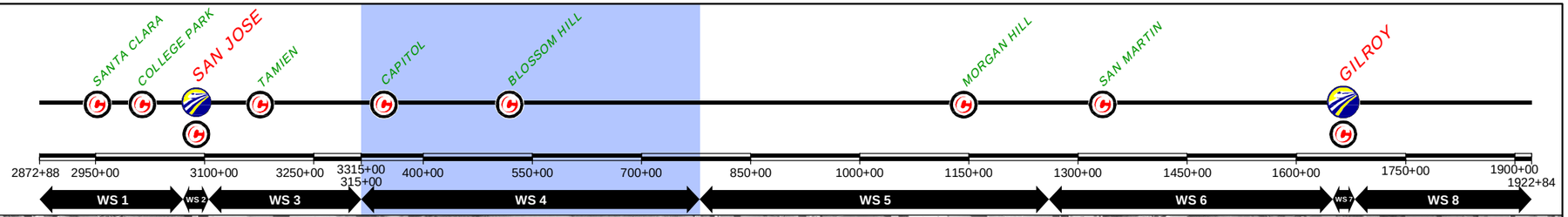
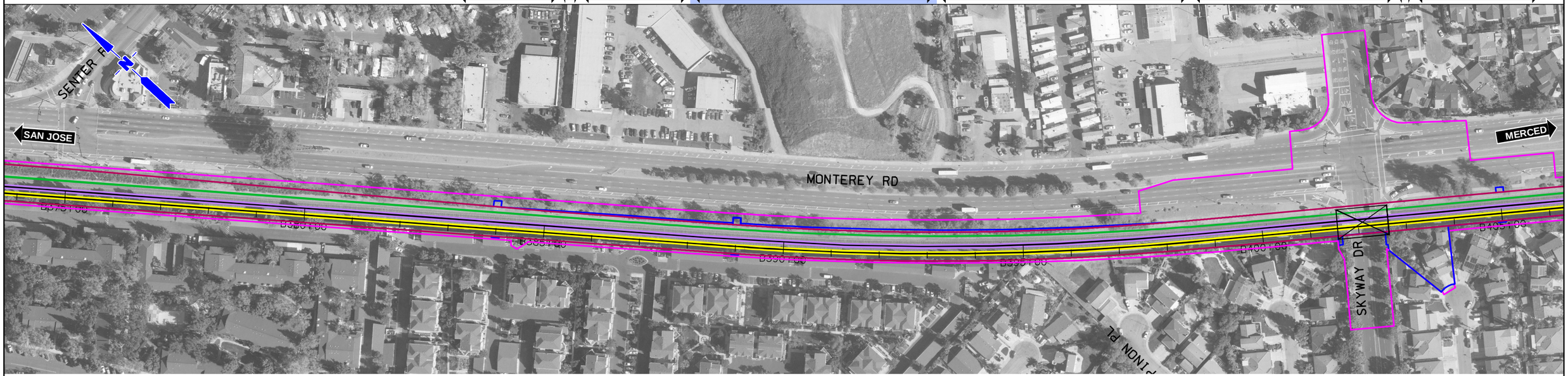
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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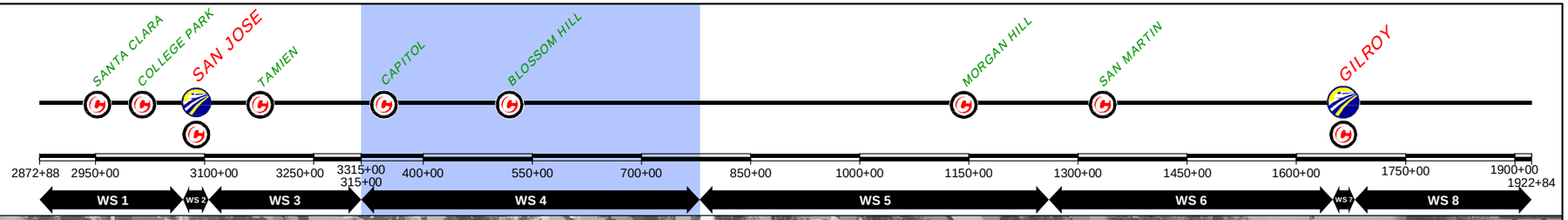
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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SAN JOSE TO MERCED
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CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

$FILE$
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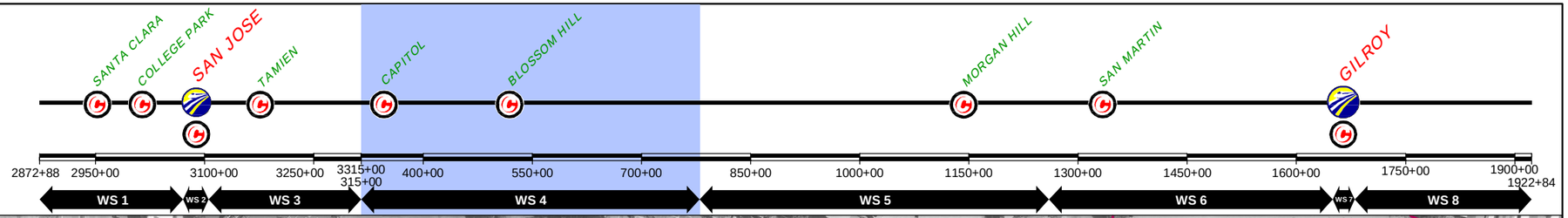
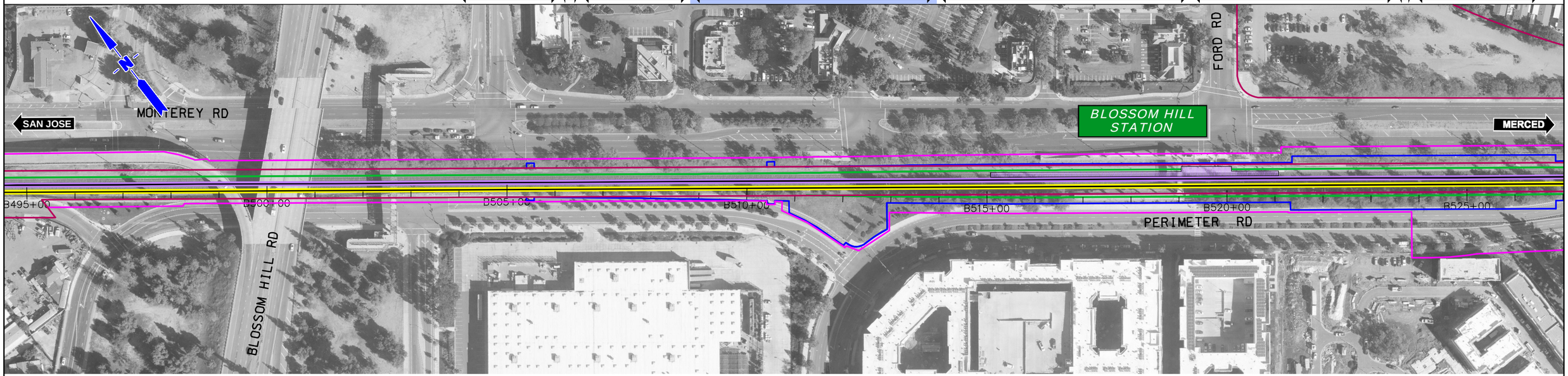
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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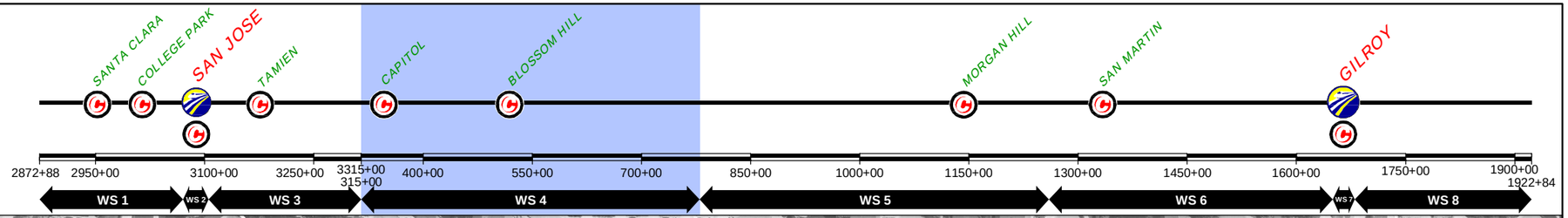
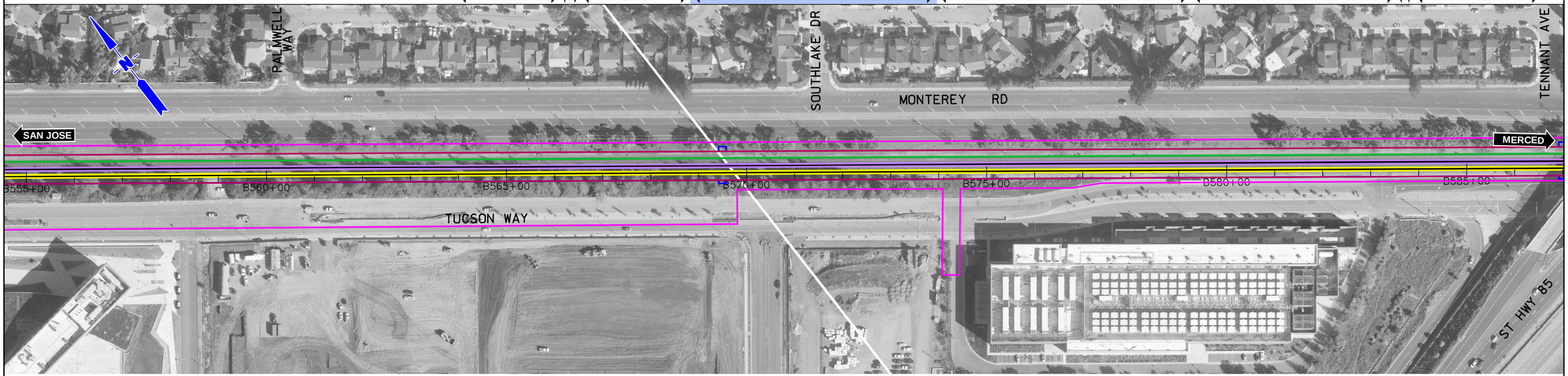
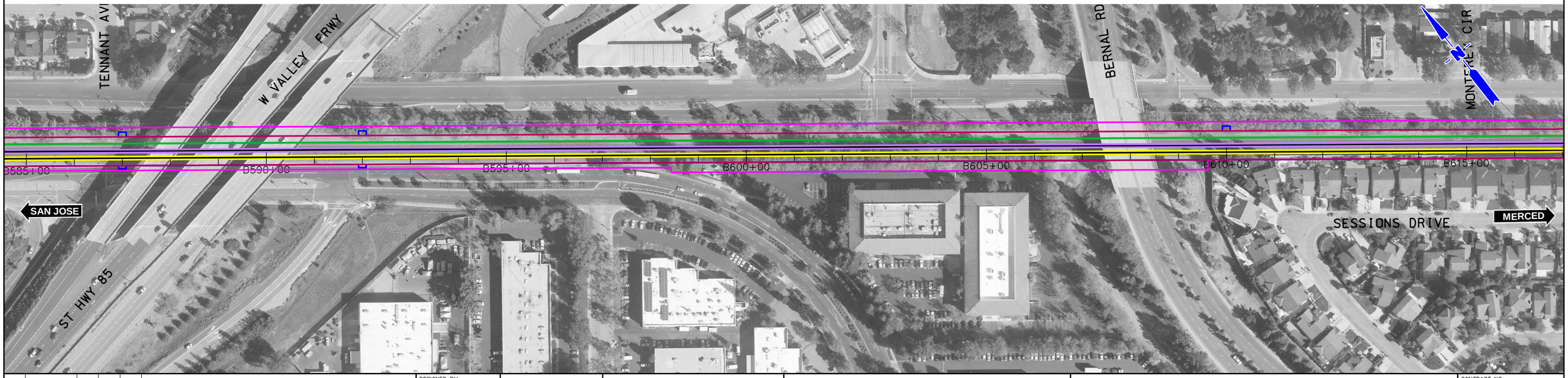
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$
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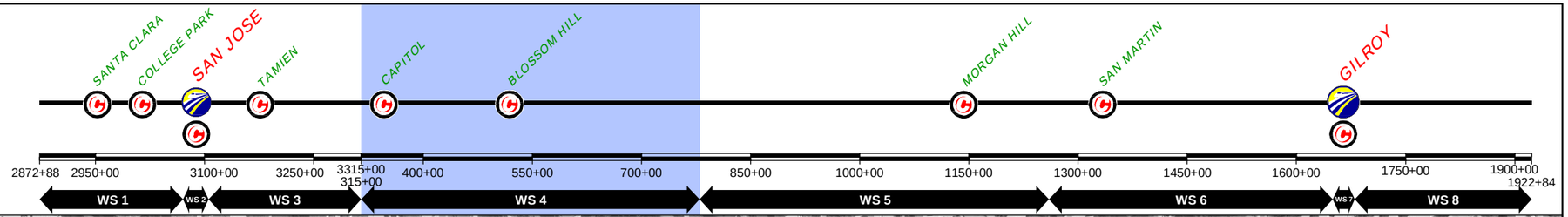
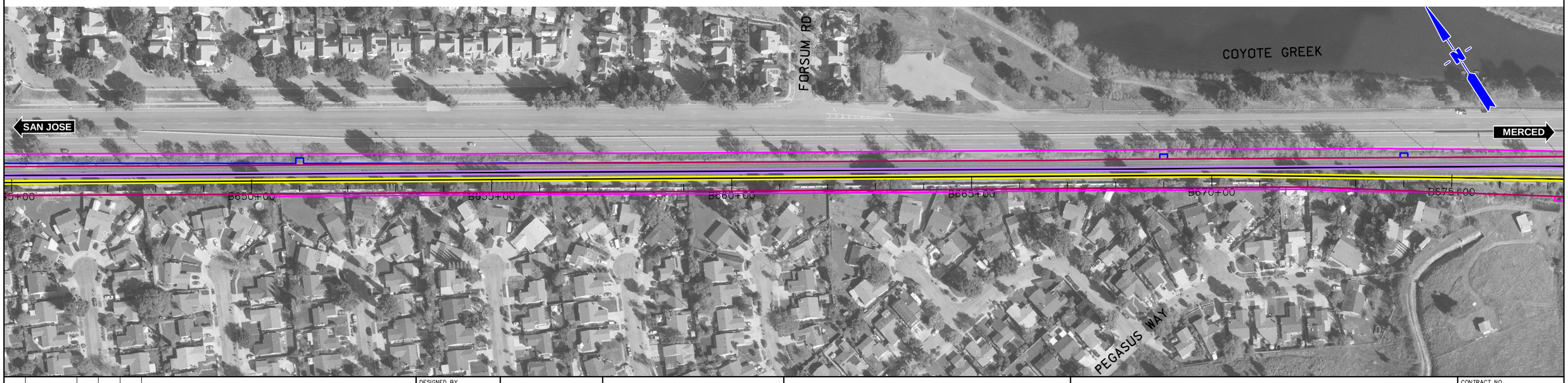
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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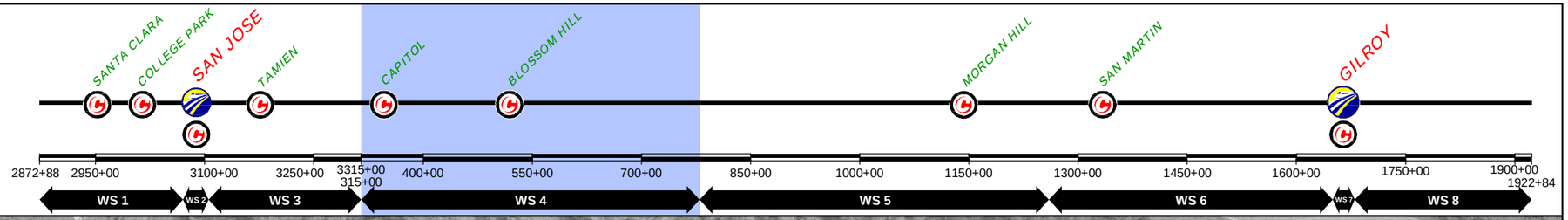
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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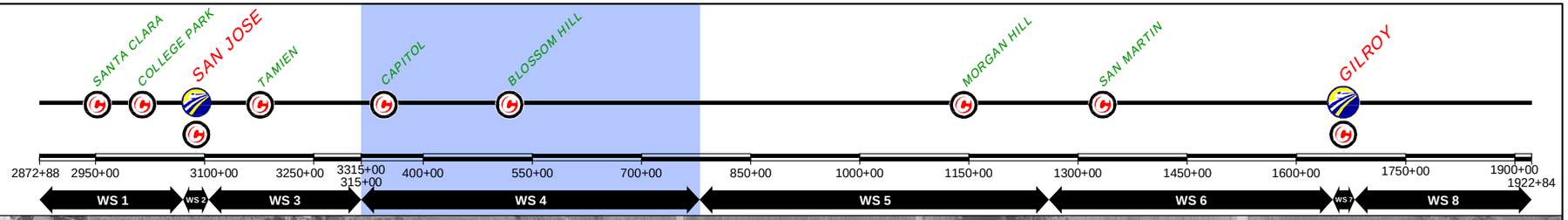
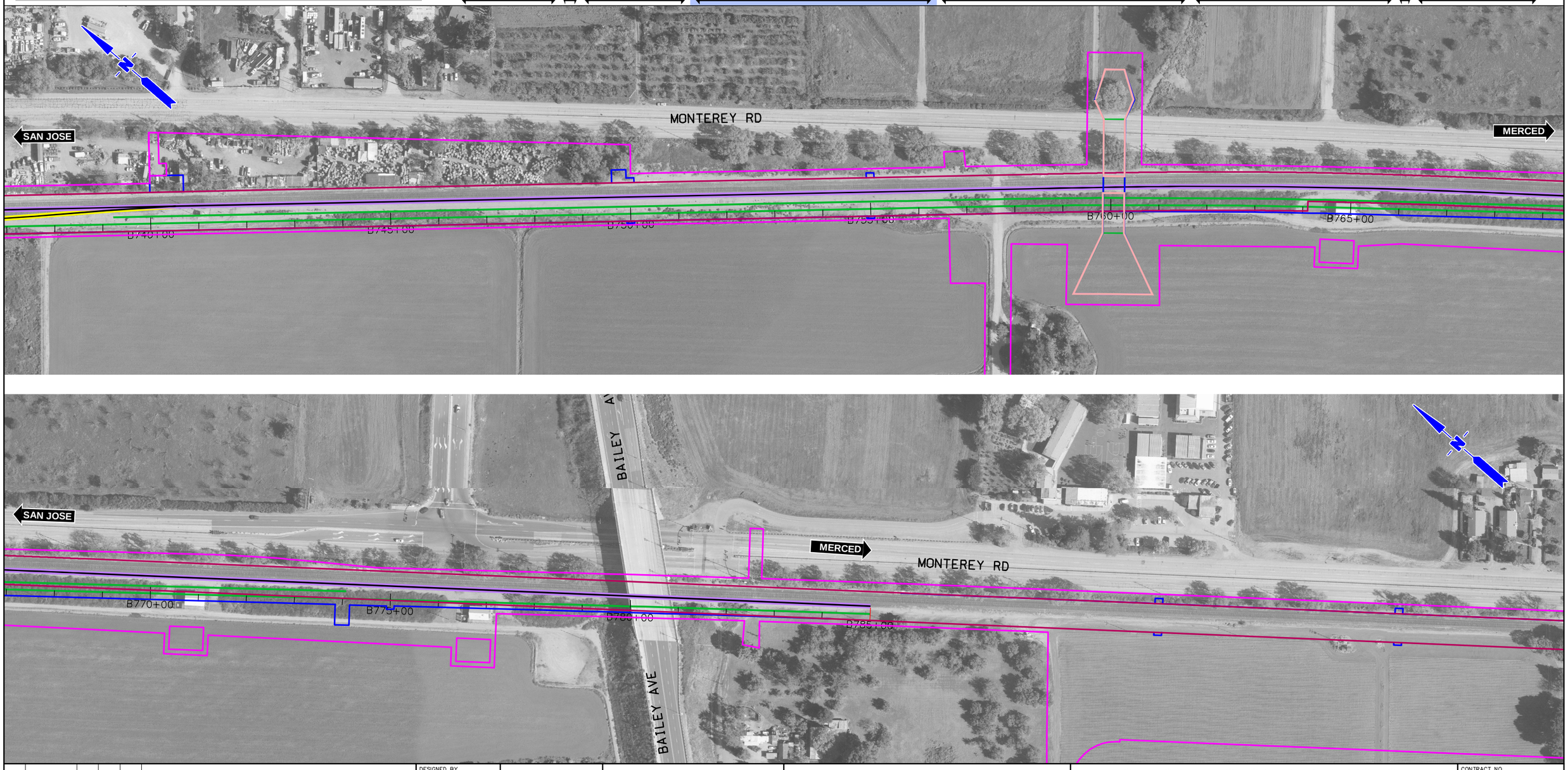
CREEK UNDERPASS





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SAN JOSE TO MERCED
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CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH2-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
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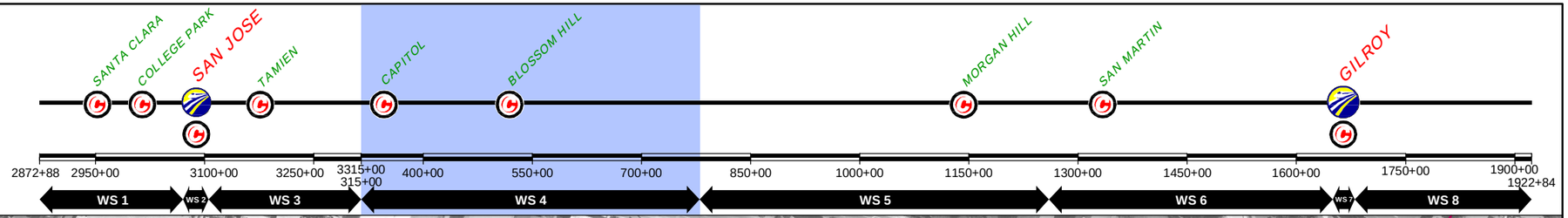
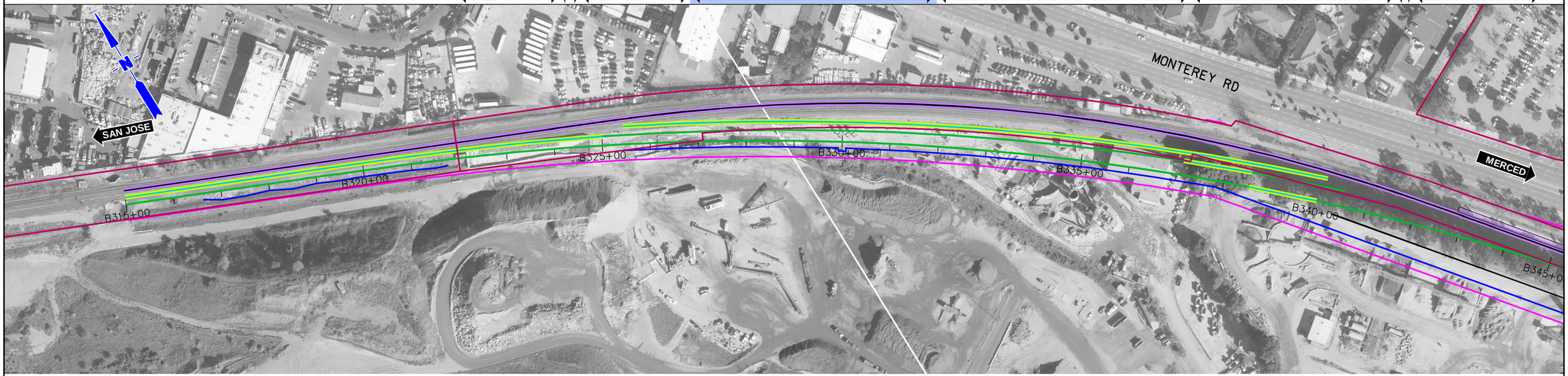
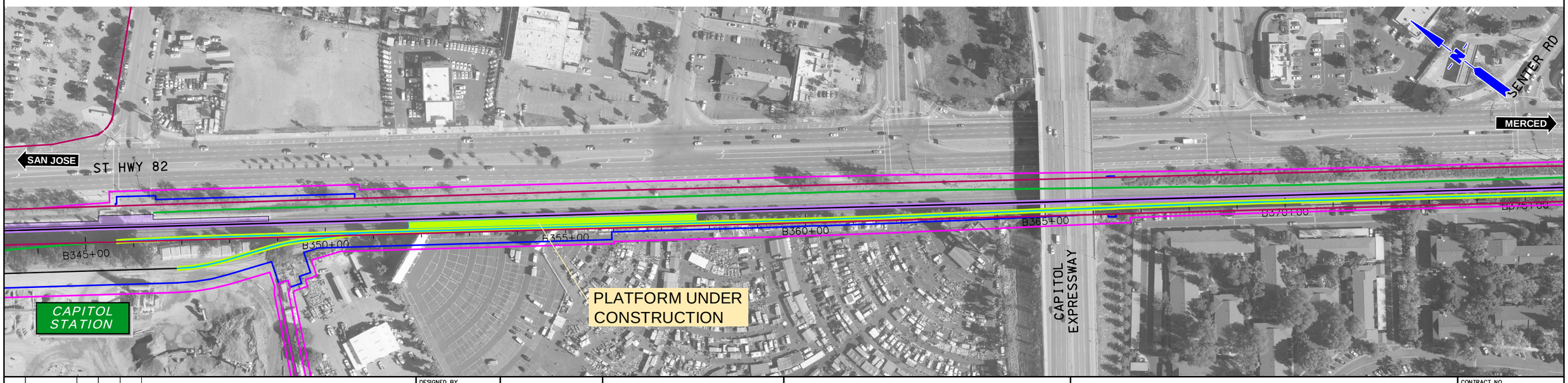
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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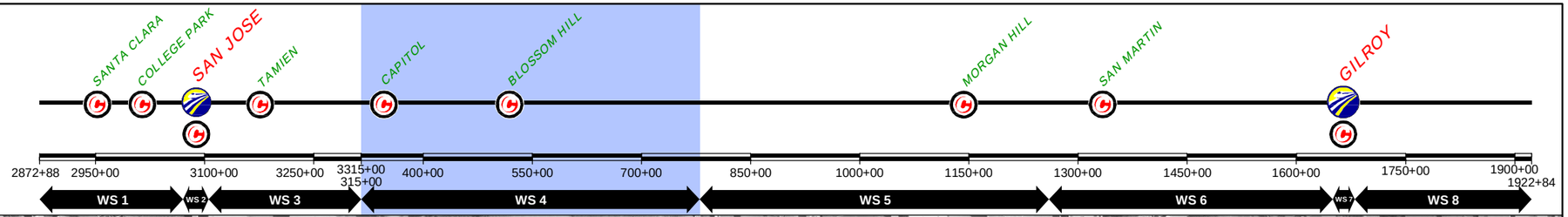
CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$TIME$
$DATE$
$USER$

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CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

RICE DR
RICE WAY
SAN JOSE
MONTEREY HWY
MERCED
EDENVIEW DR
B435+00 B440+00 B445+00 B450+00 B455+00 B460+00 B465+00
SADDLEBROOK DR
EDENVALE AVE

ROEDER RD
SAN JOSE
GRADE CROSSING ADAPTATION
MONTEREY RD
MERCED
B465+00 B470+00 B475+00 B480+00 B485+00 B490+00 B495+00
CHYNOWETH AVE
HAYES AVE

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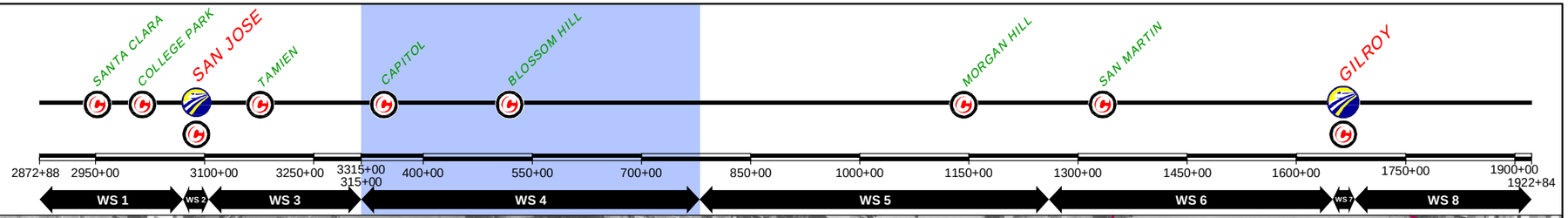
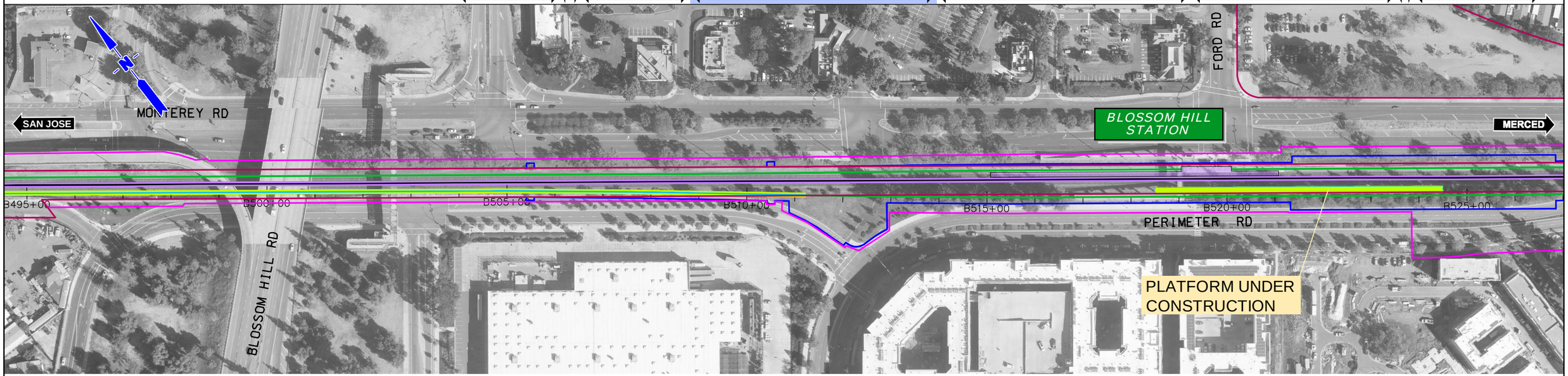
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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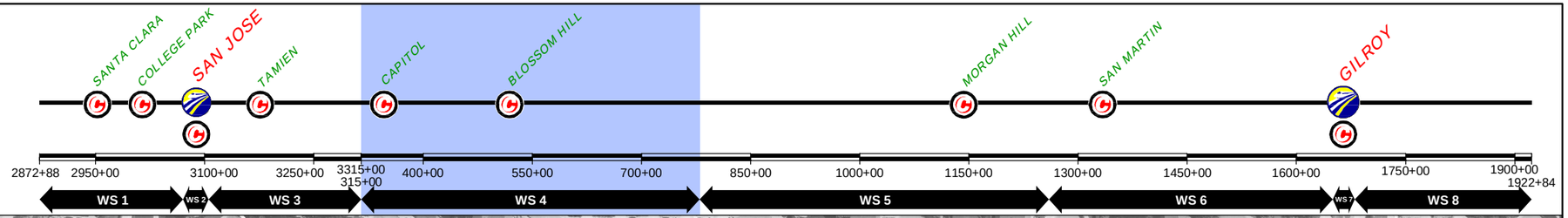
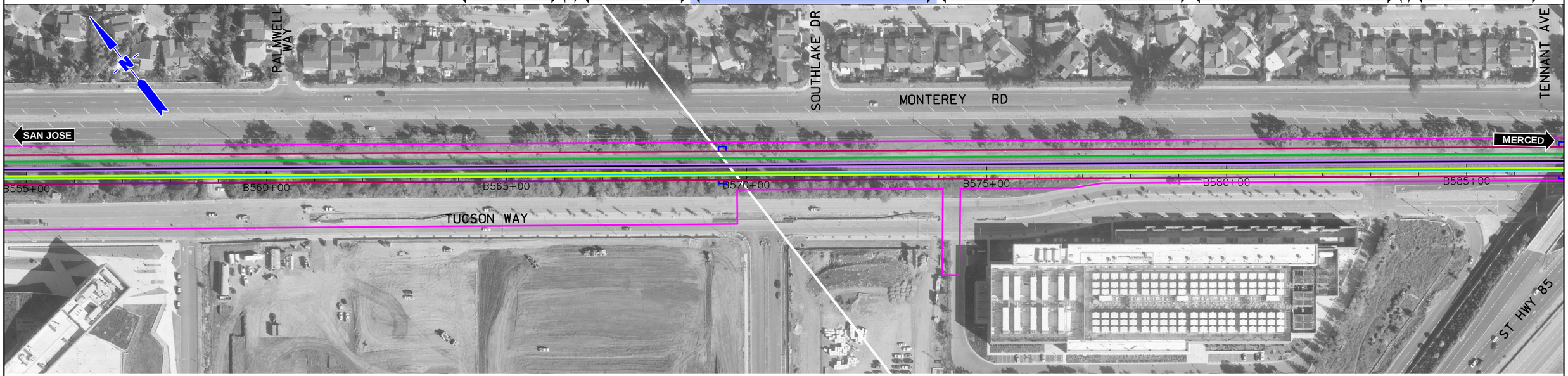
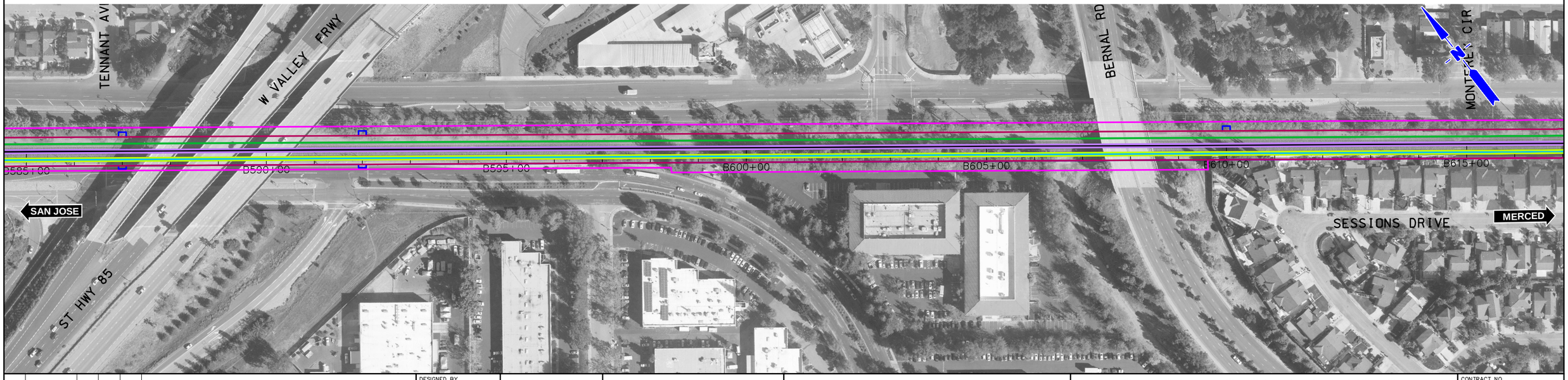
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$
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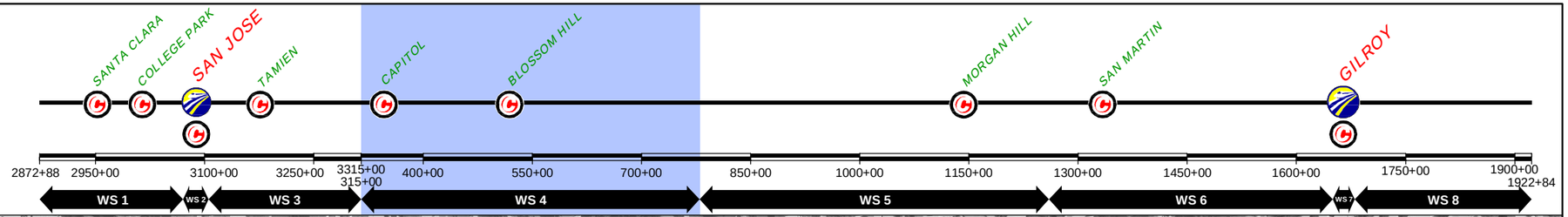
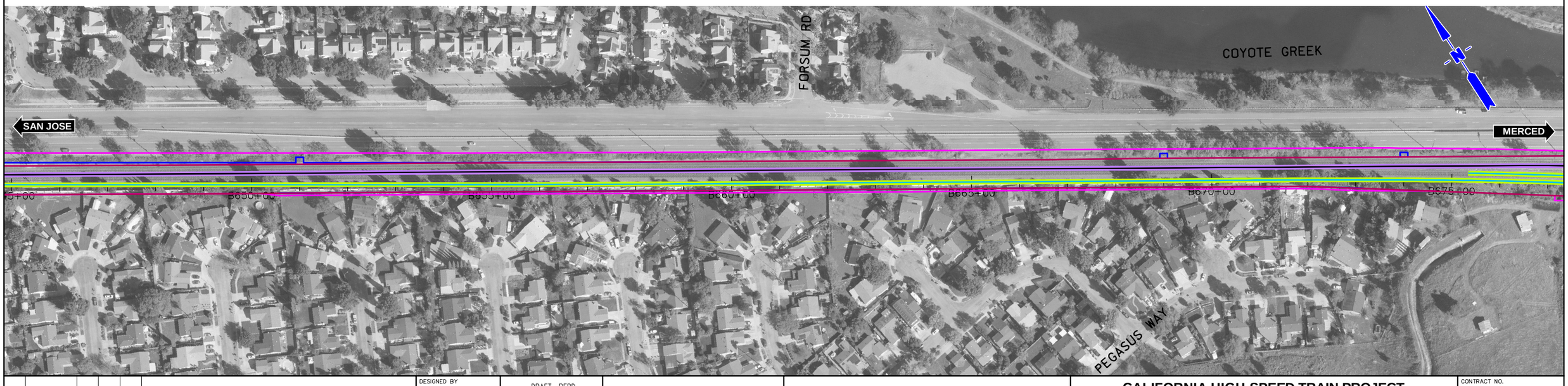
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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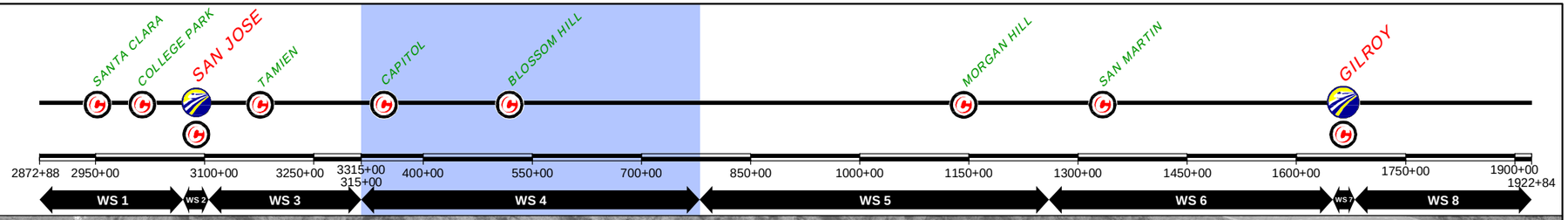
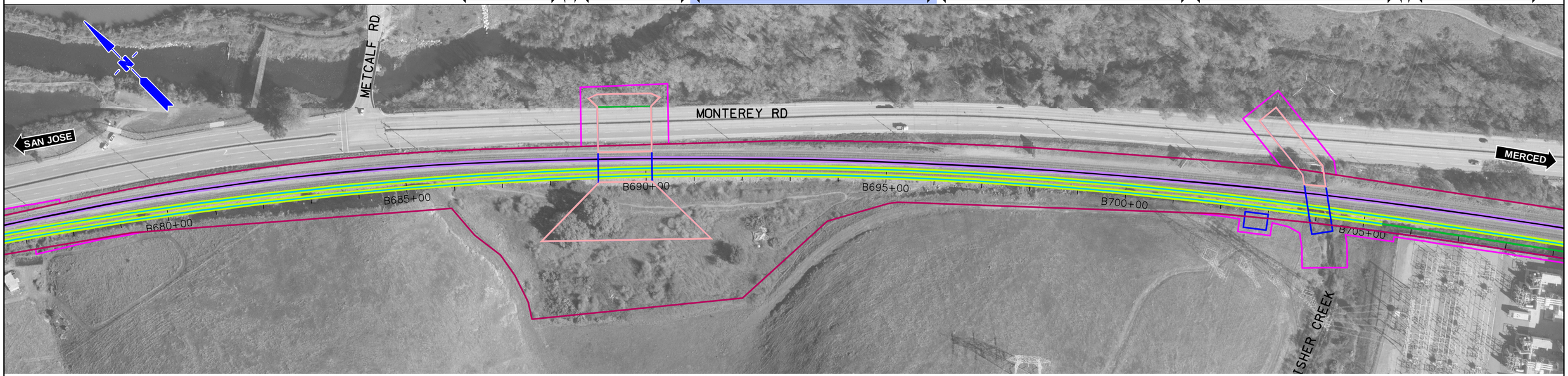
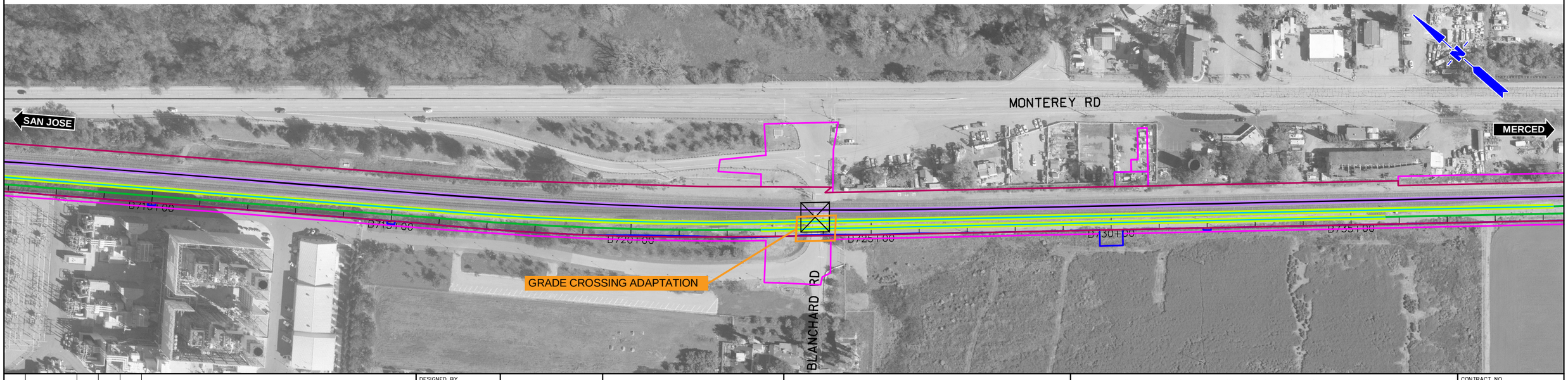
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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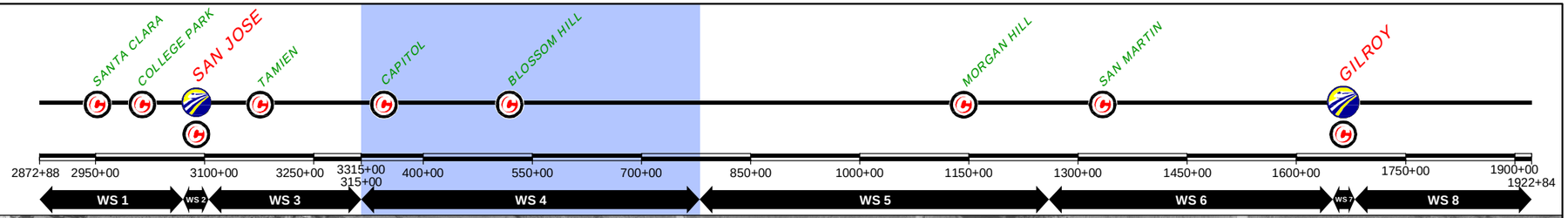
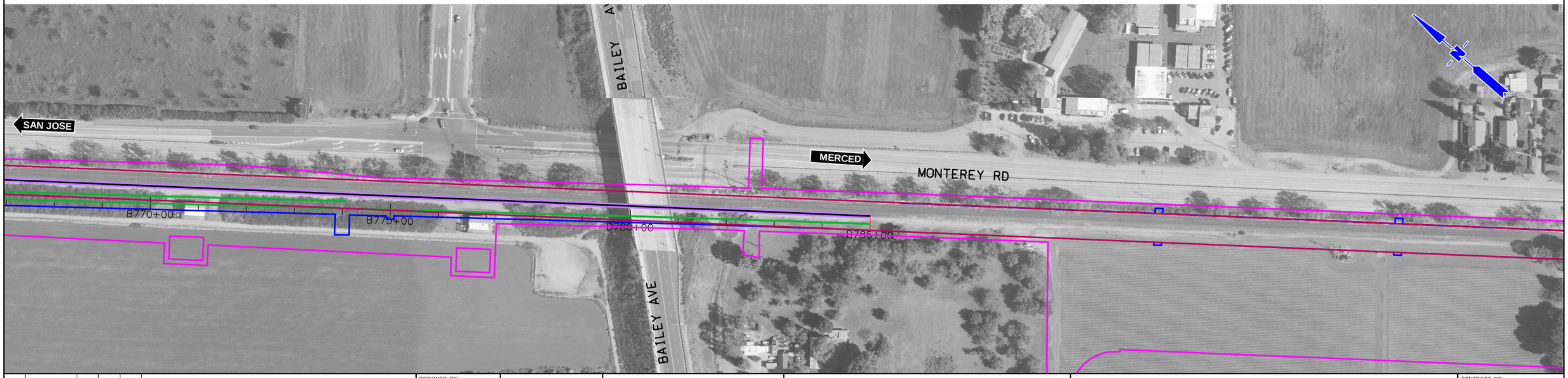
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH3-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

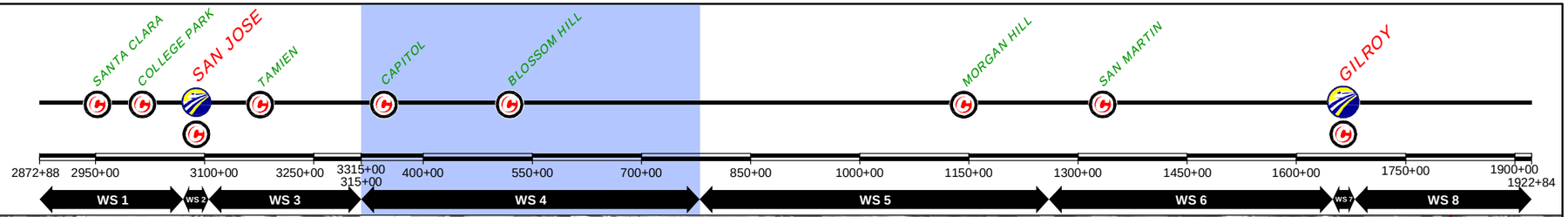
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

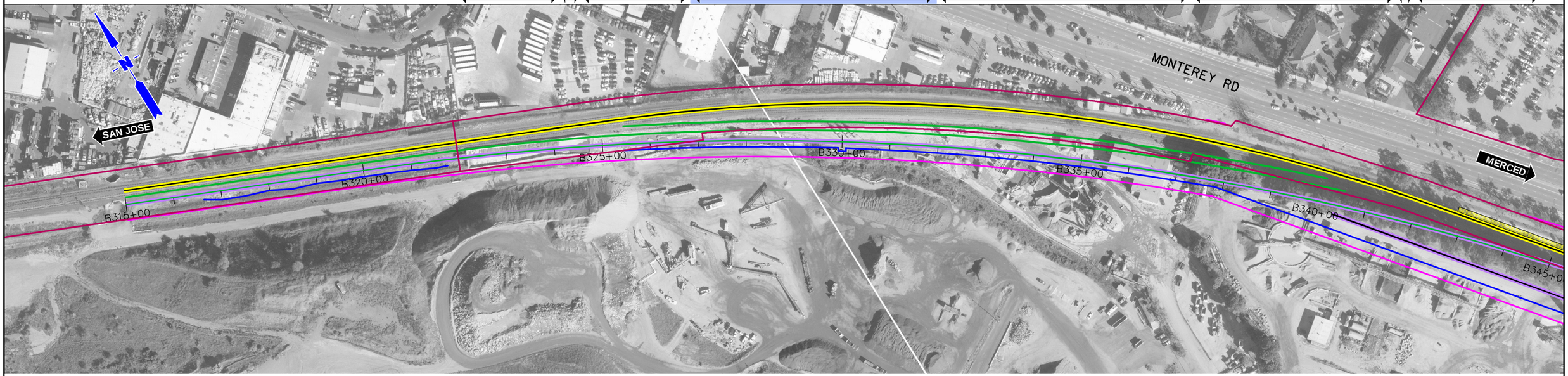
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

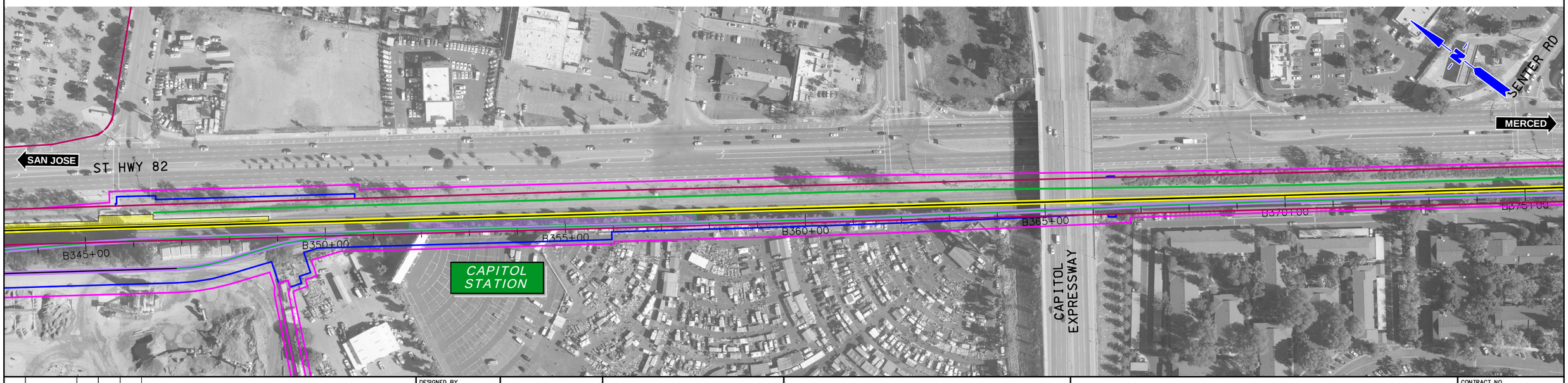
EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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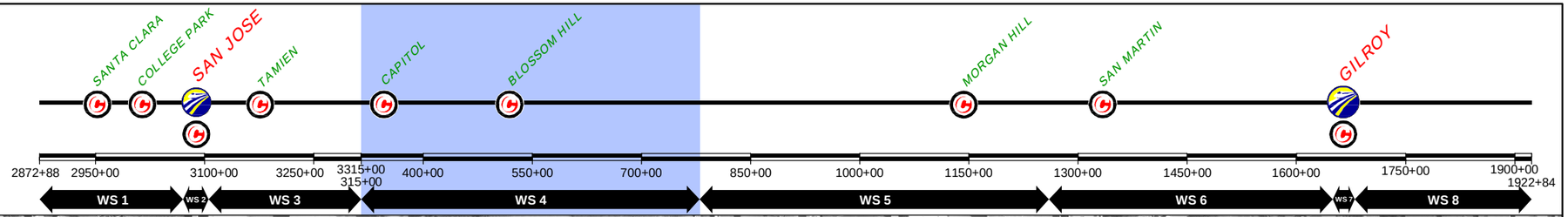
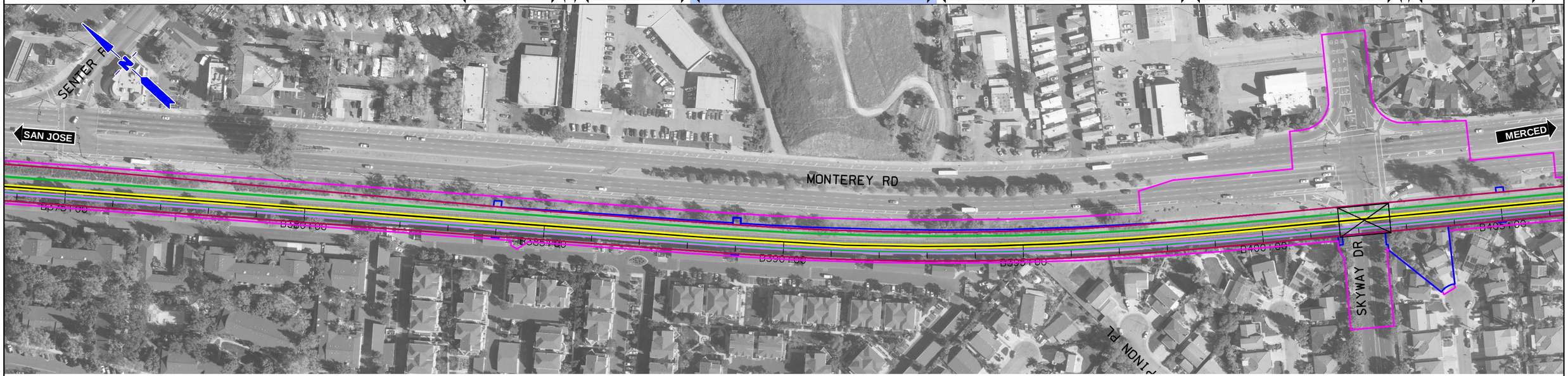
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH4-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH4-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

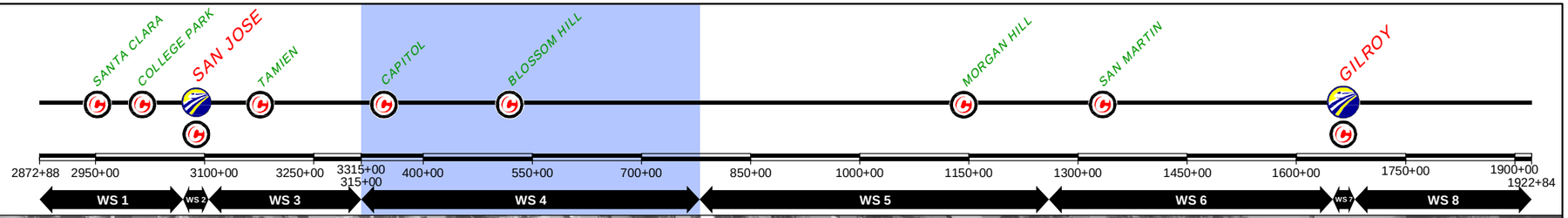
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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PHASE 4

CONTRACT NO.
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SCALE 1" = 200'
SHEET NO. 3 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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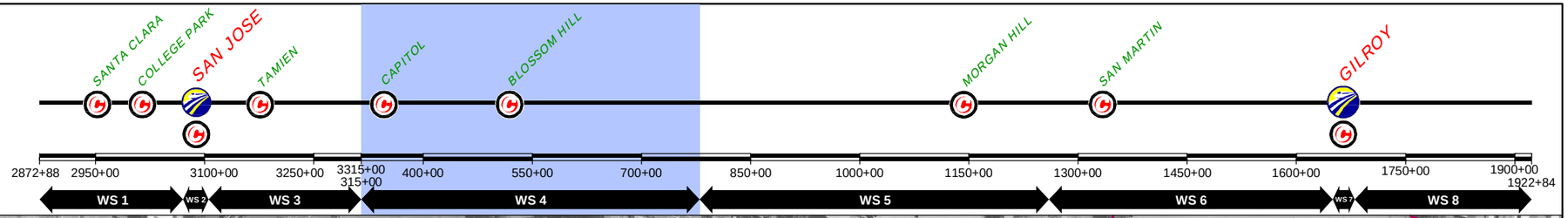
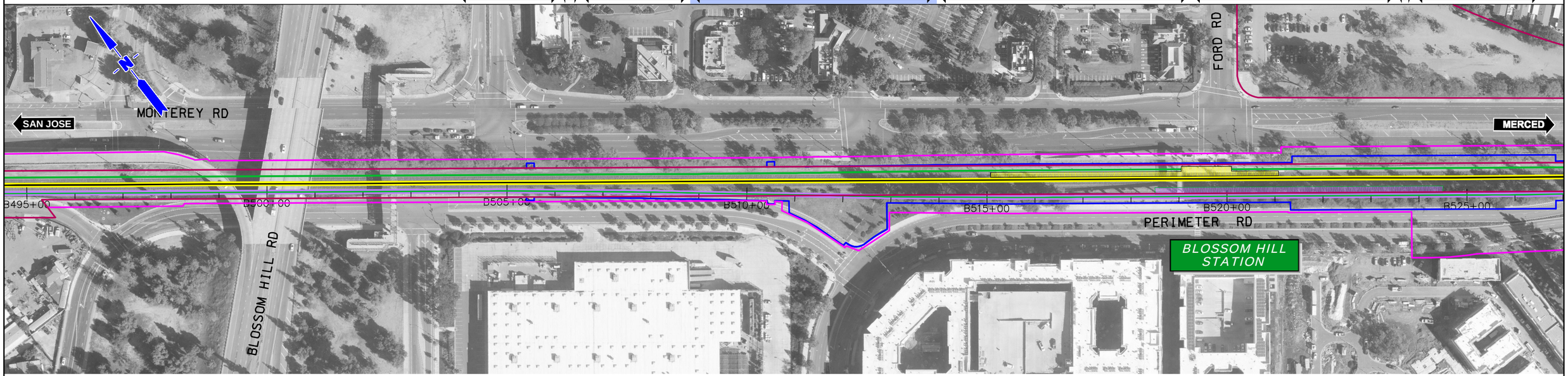
TUNNEL
CREEK UNDERPASS





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CONTRACT NO.
DRAWING NO. CV-I1WS4-PH4-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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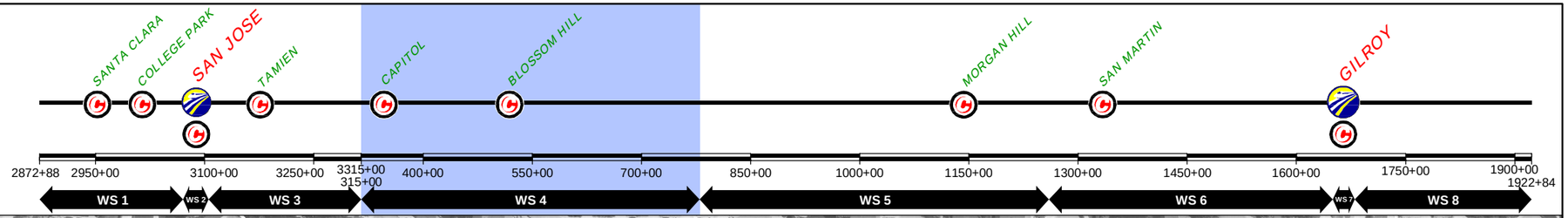
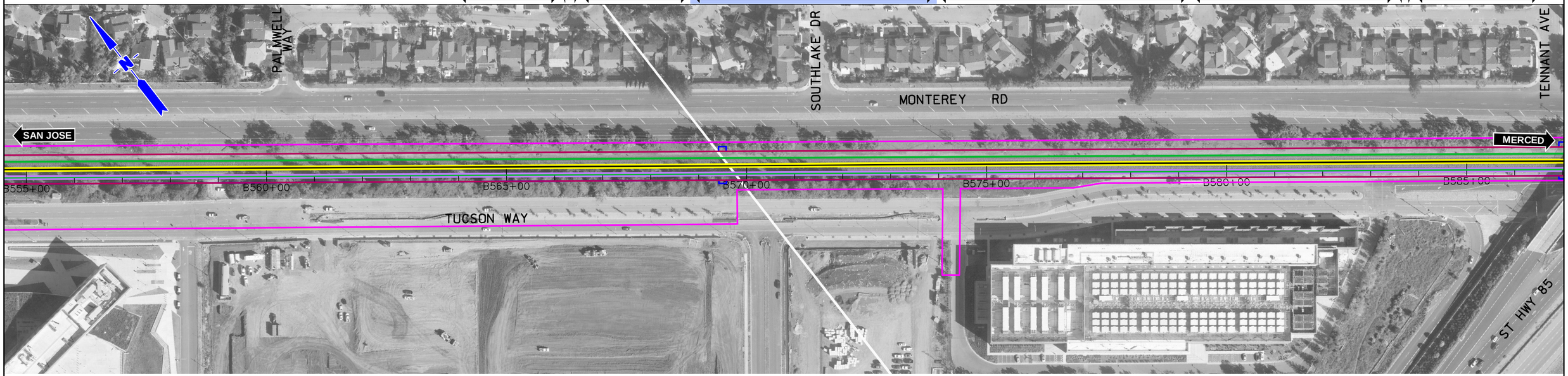
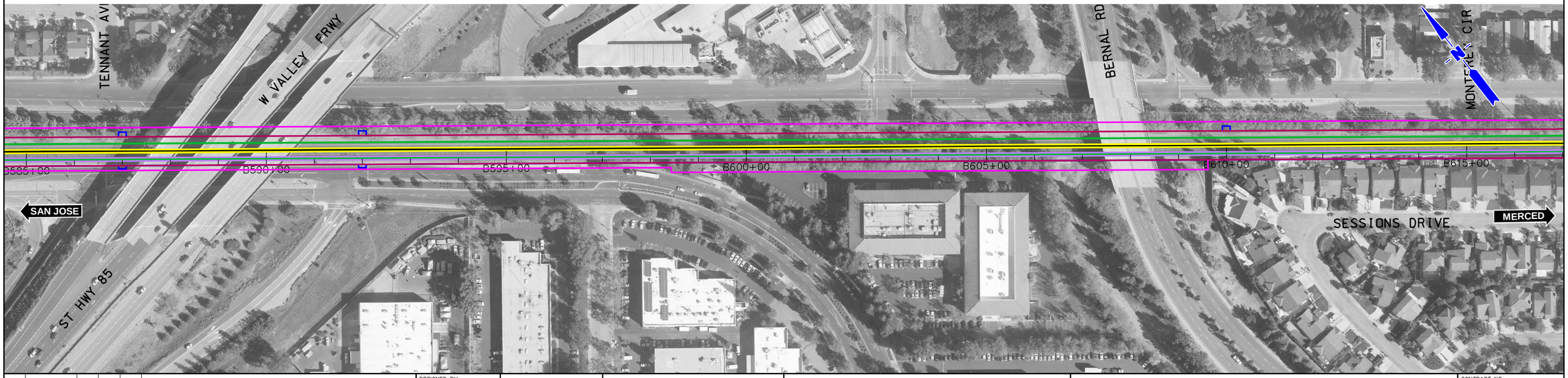
TUNNEL
CREEK UNDERPASS







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CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH4-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$
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CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
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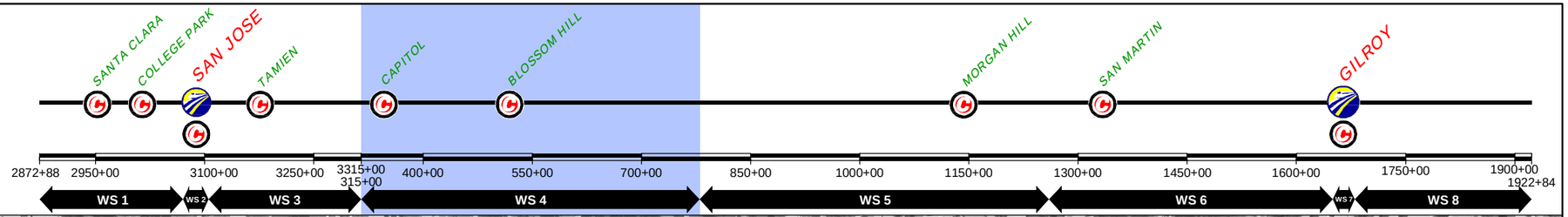
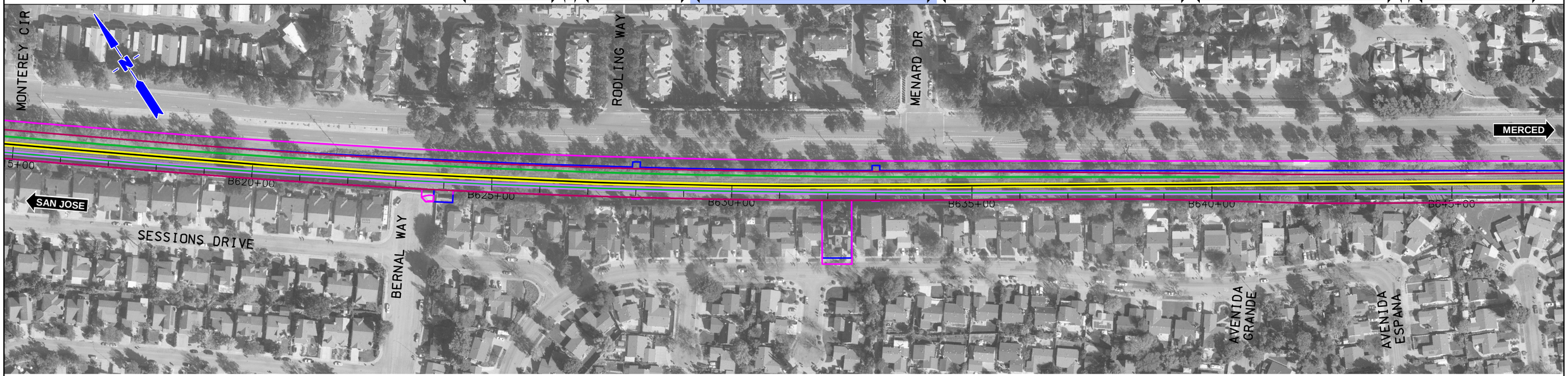
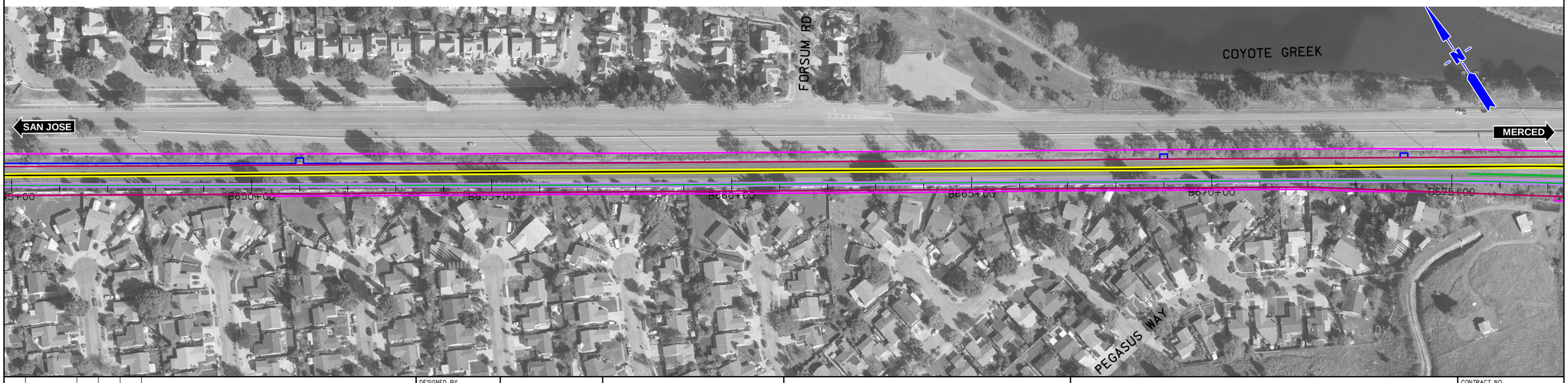
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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CALIFORNIA High-Speed Rail Authority

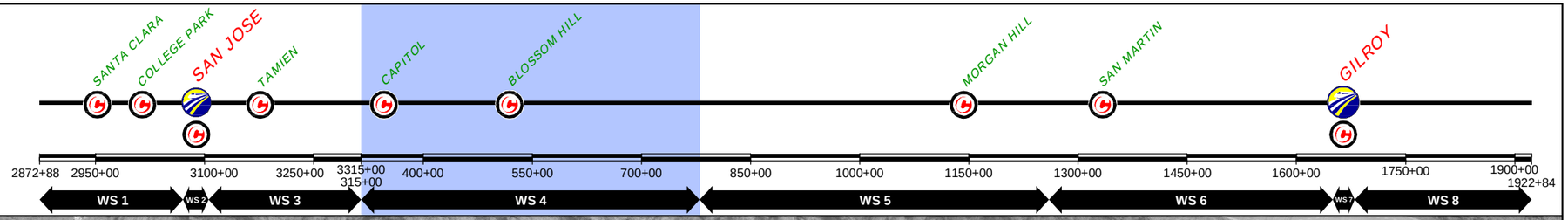
CALIFORNIA HIGH-SPEED TRAIN PROJECT

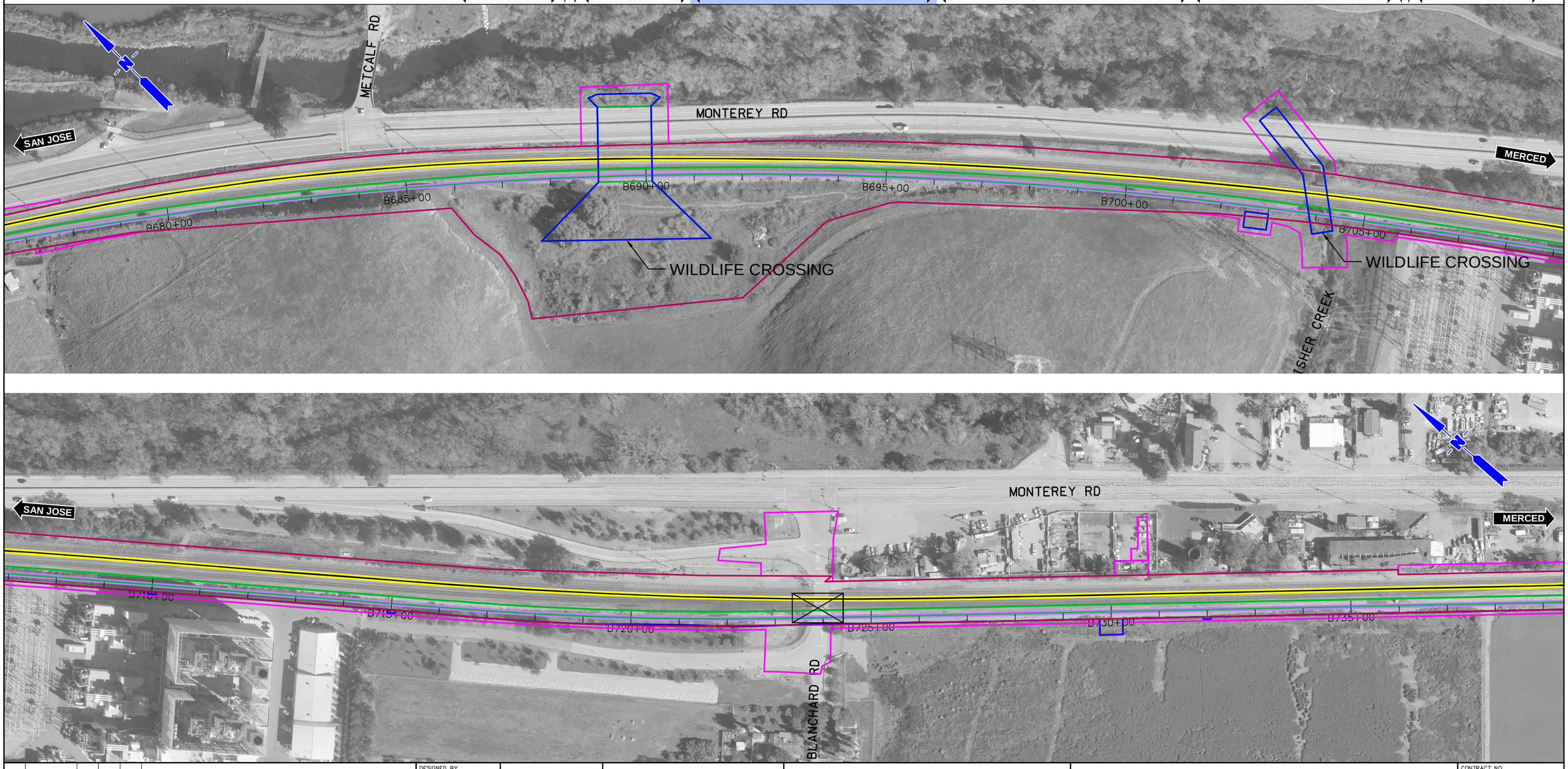
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH4-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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785+00 TO GILROY STATION TO 1265+00
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PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH4-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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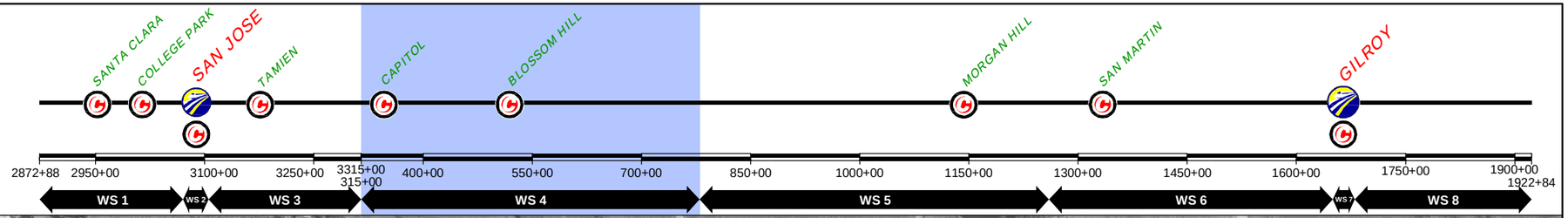
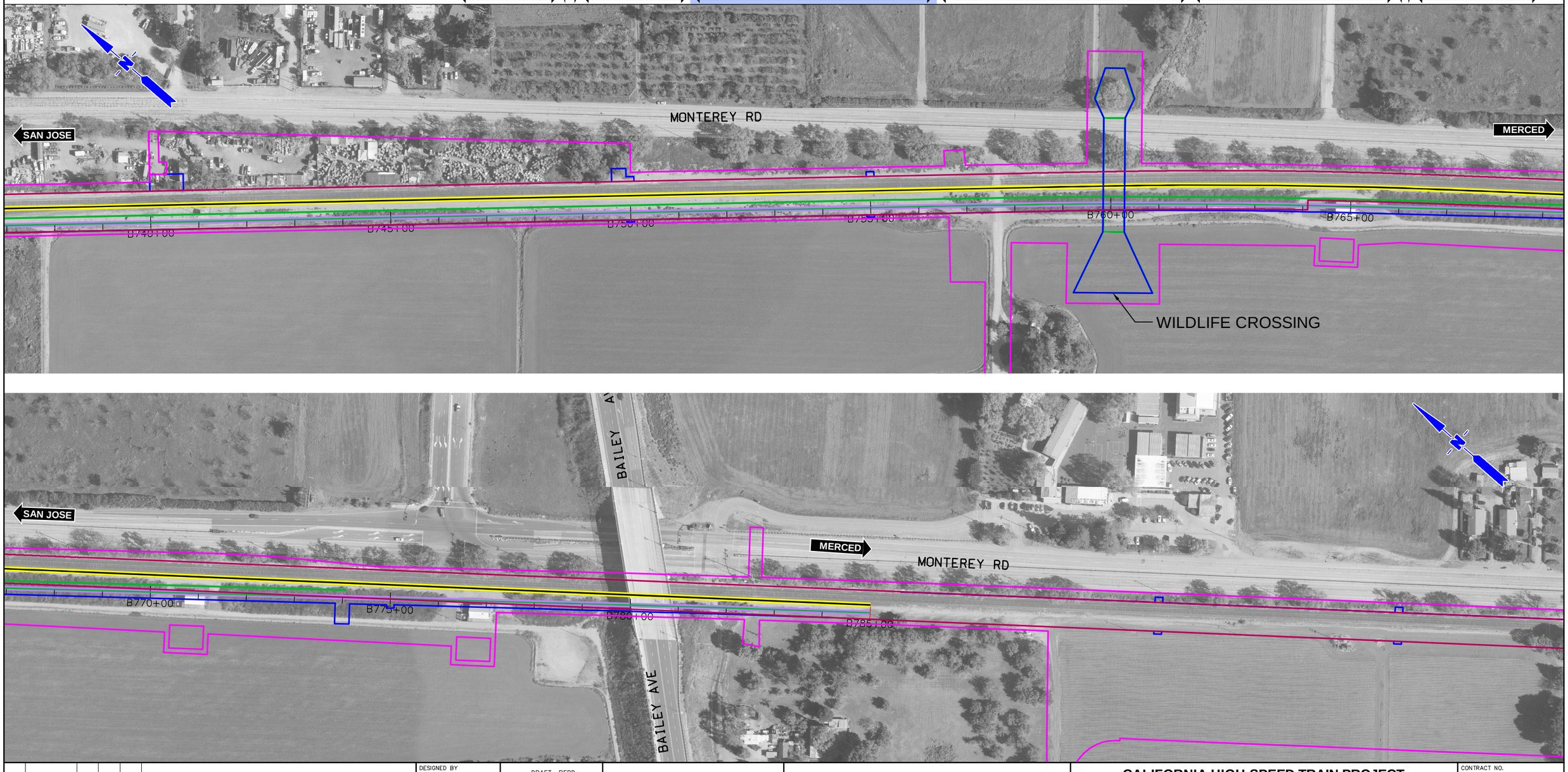
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CONSTRUCTION PHASES
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PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH4-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

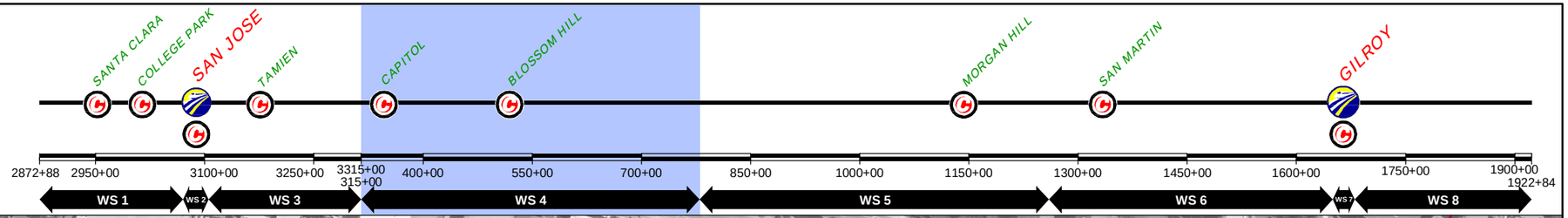
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

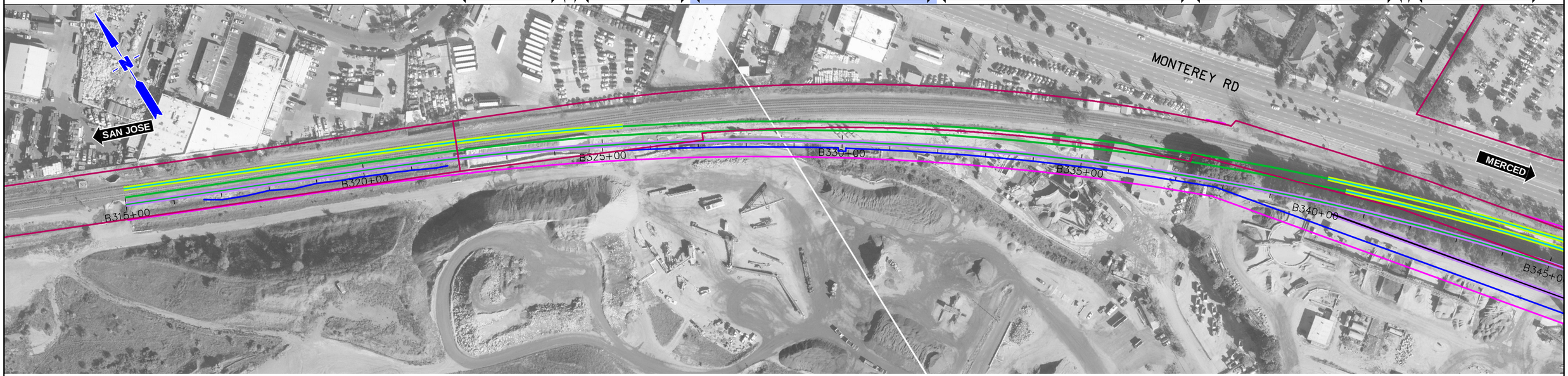
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

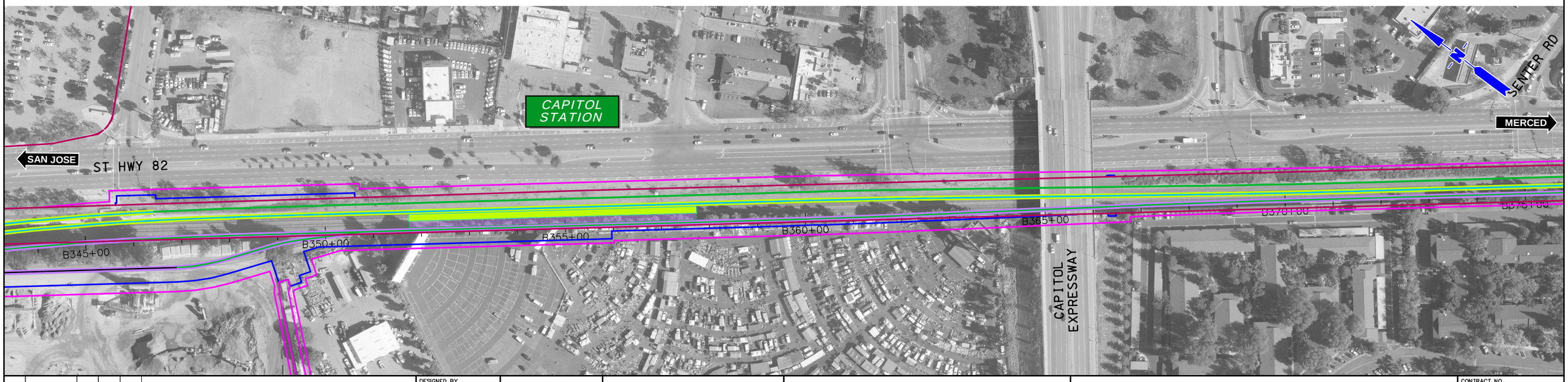
EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH5-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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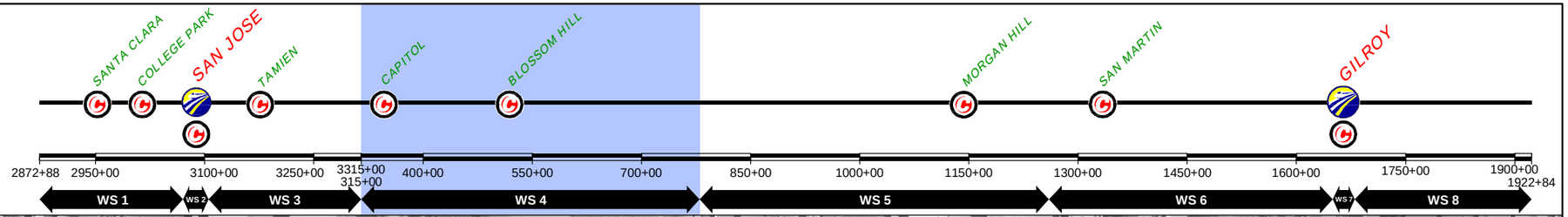
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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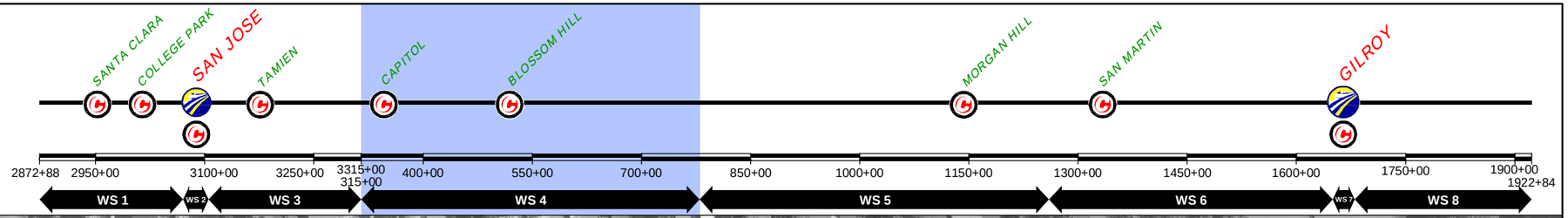
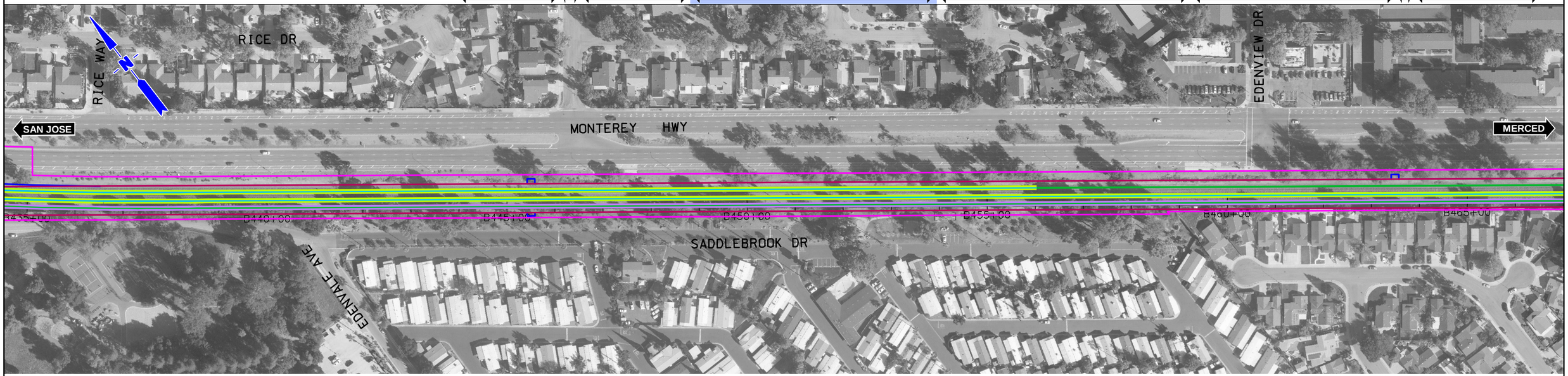
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH5-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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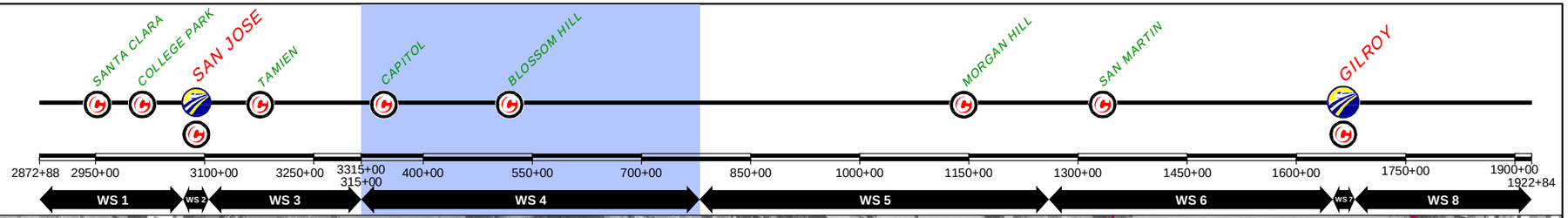
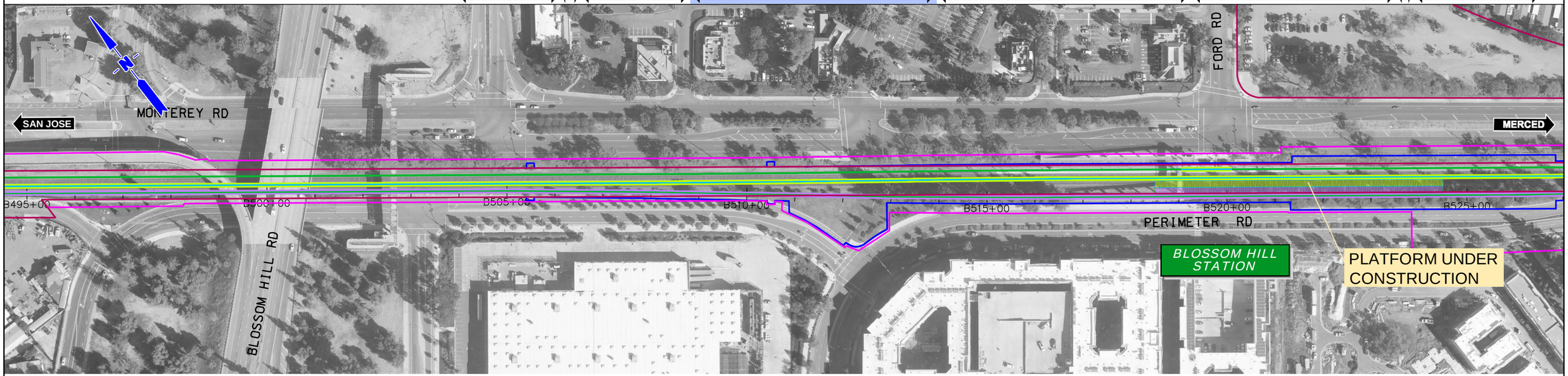
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH5-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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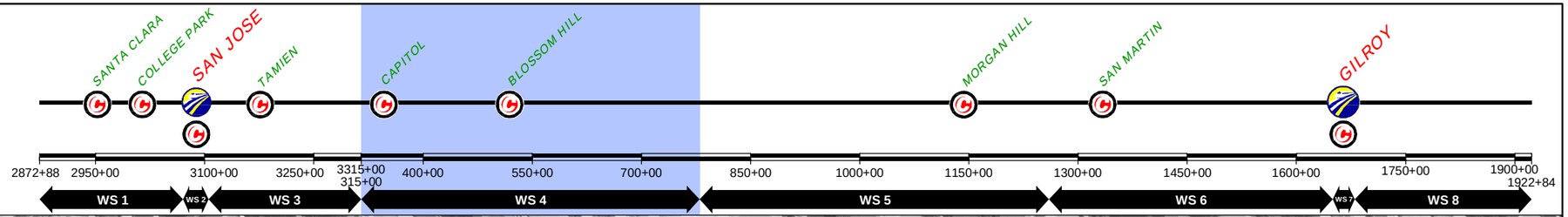
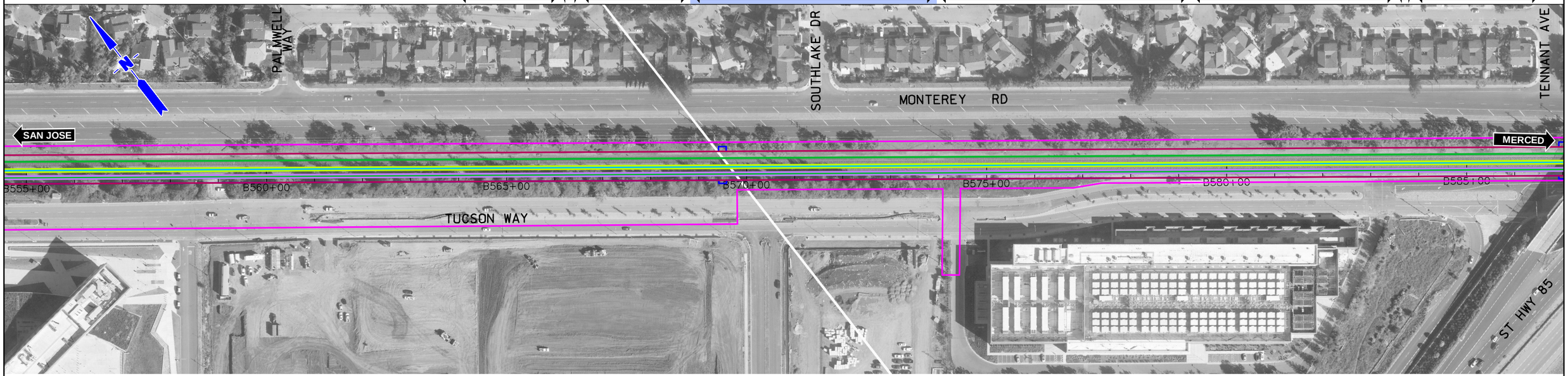
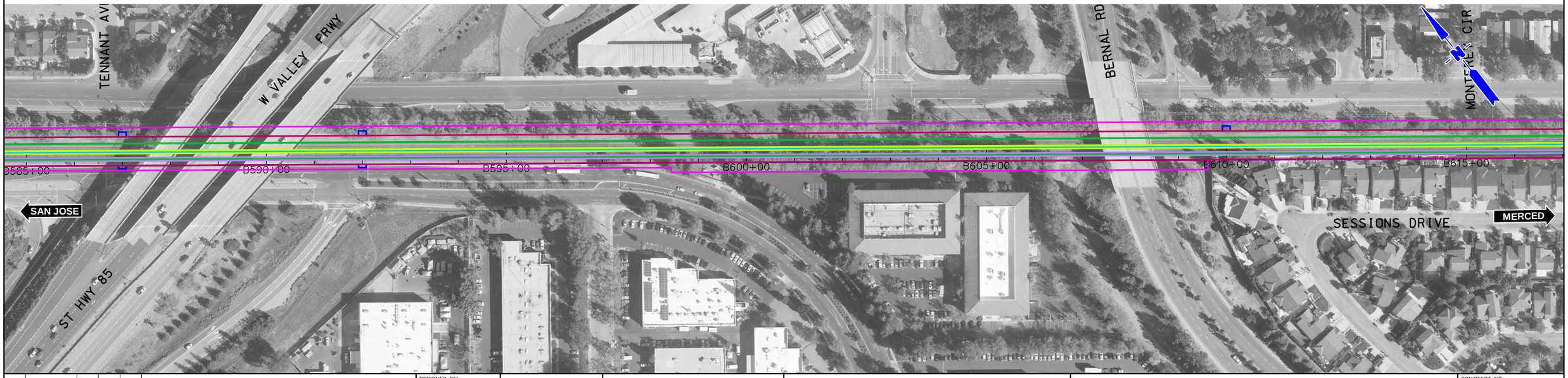
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH5-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH5-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$
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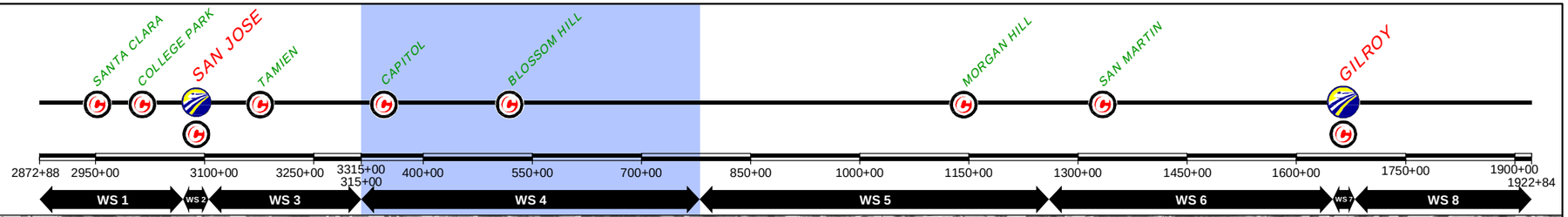
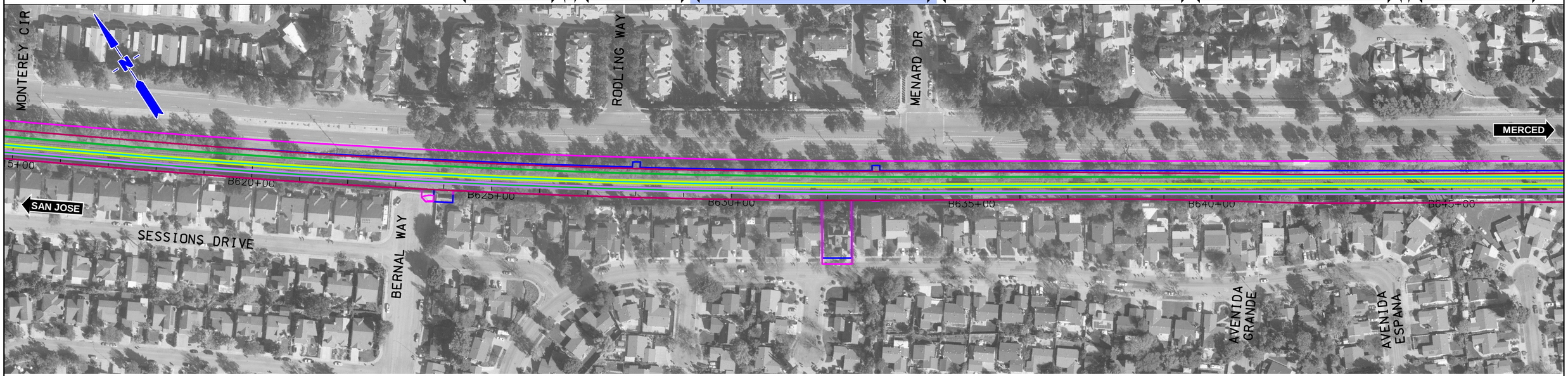
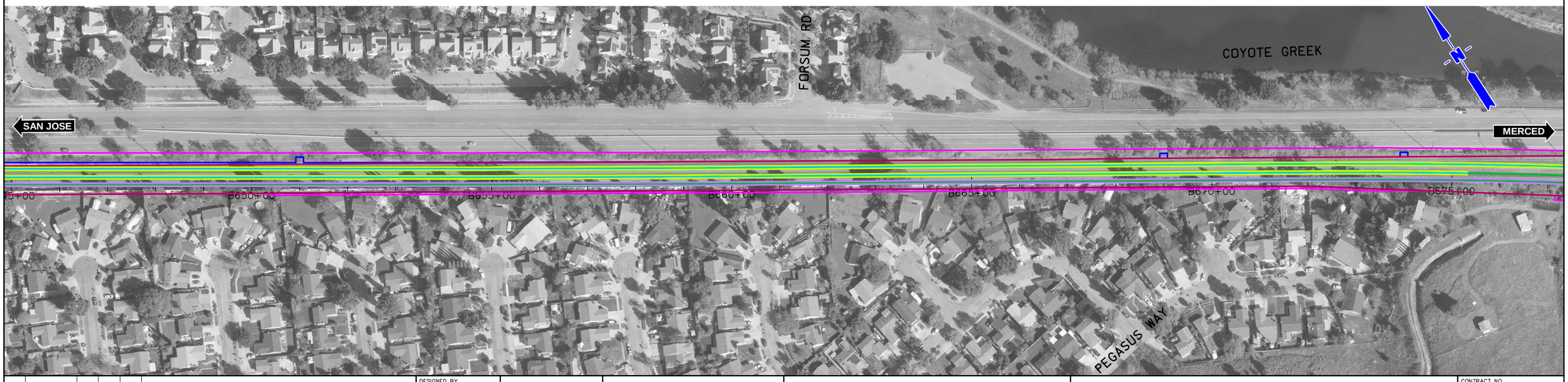
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH5-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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PROPOSED TCE
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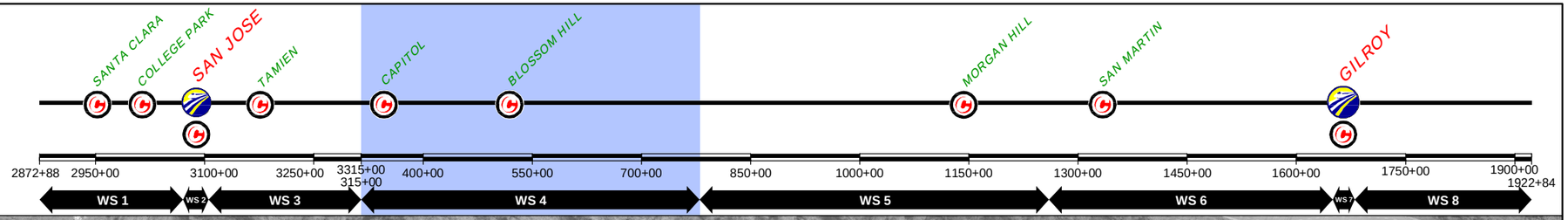
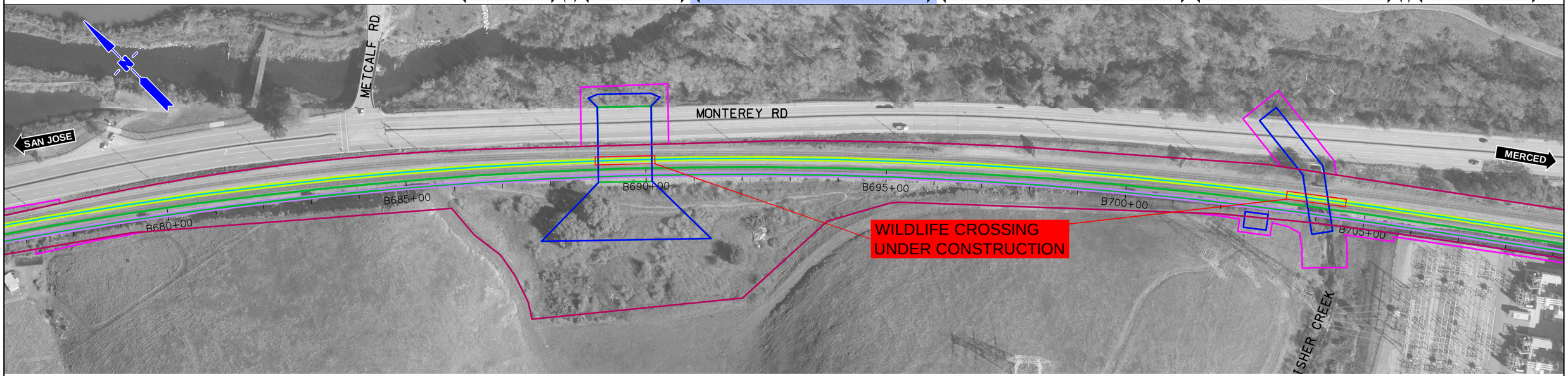
TUNNEL
CREEK UNDERPASS





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CONSTRUCTION PHASES
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PHASE 5

CONTRACT NO.
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SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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PROPOSED TCE
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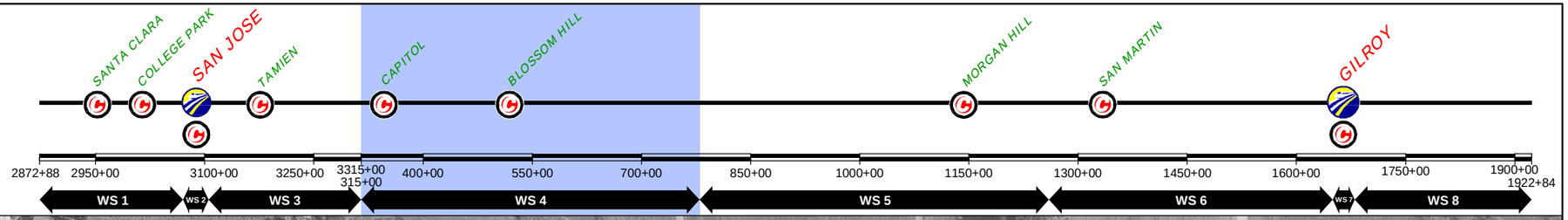
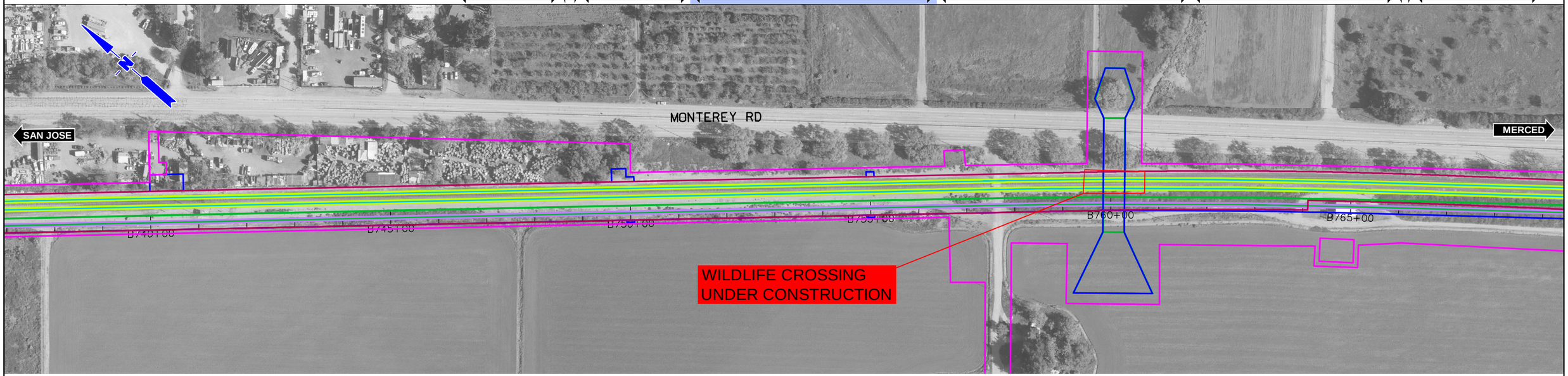
CREEK UNDERPASS





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CONSTRUCTION PHASES
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PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH5-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

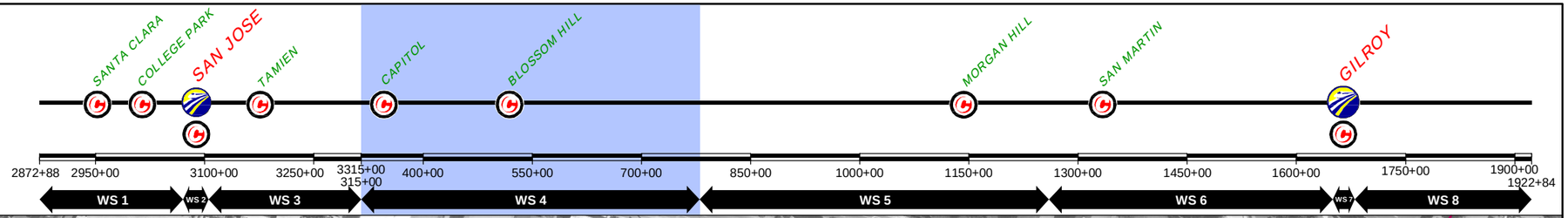
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

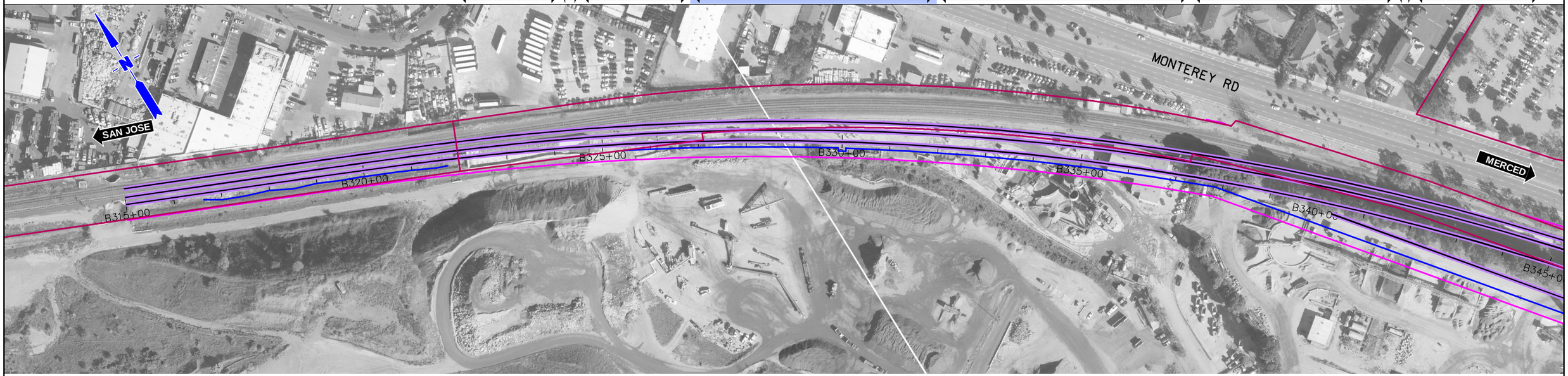
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

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CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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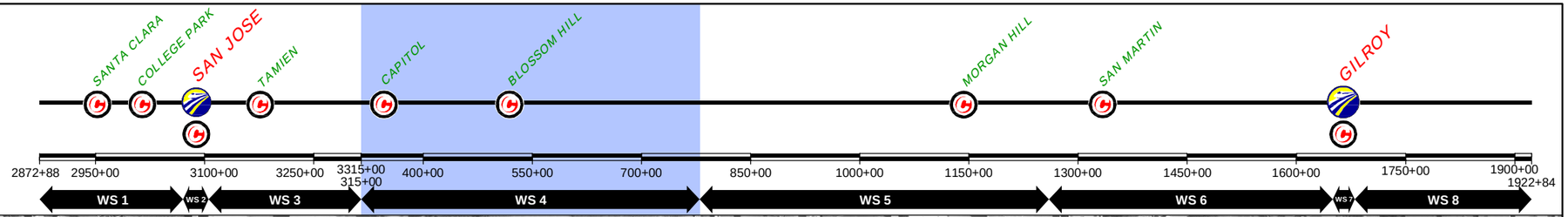
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$DATE$
$USER$

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CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

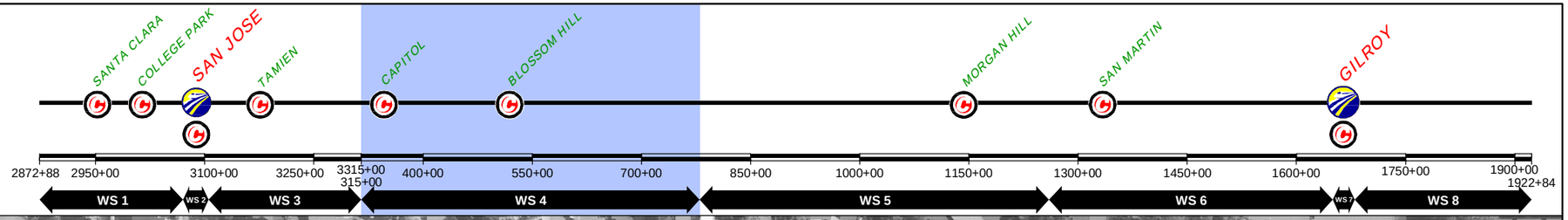
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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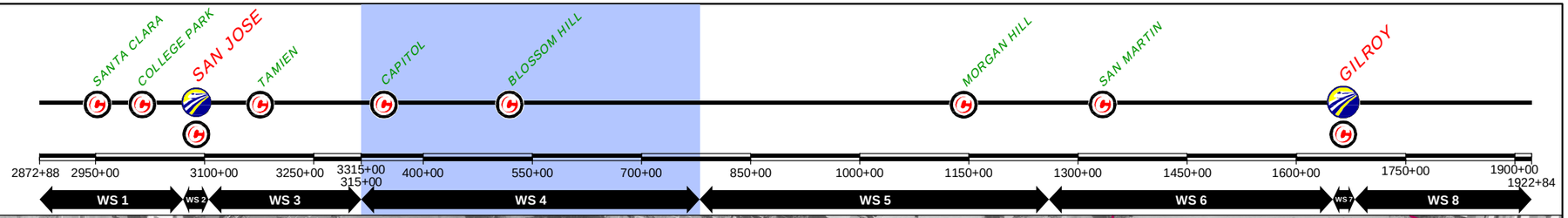
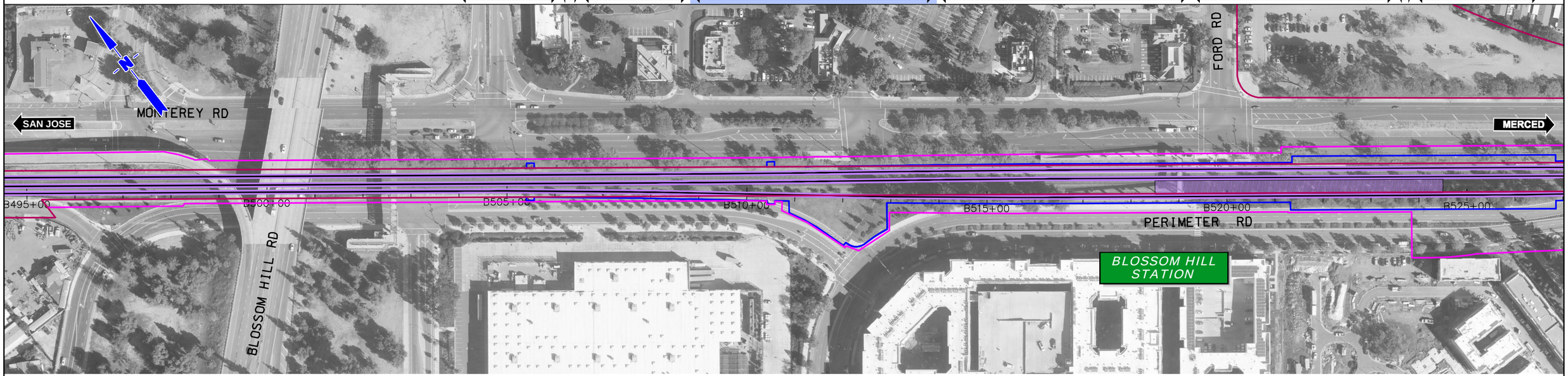
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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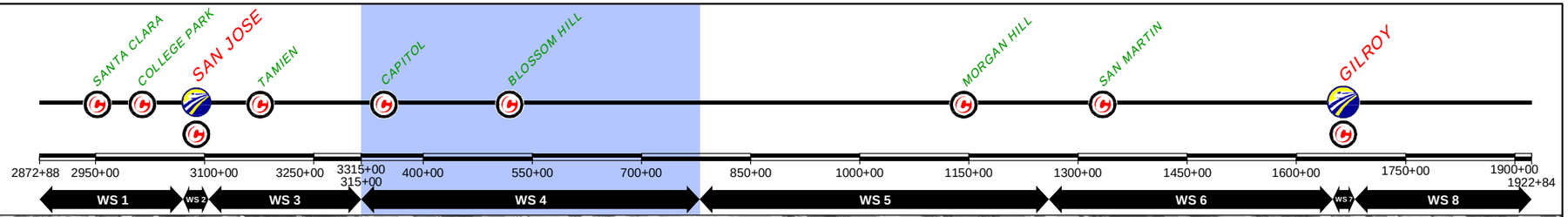
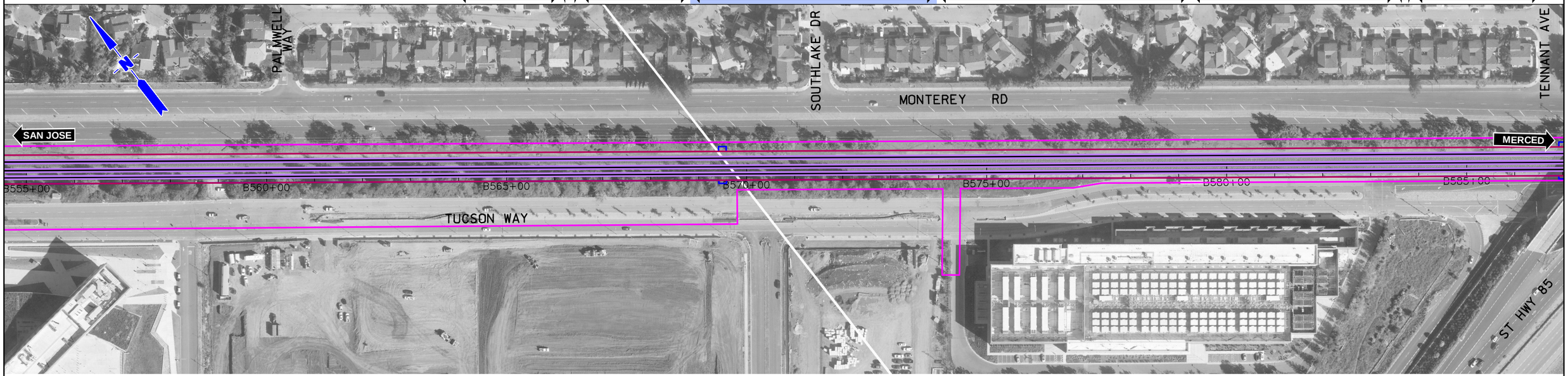
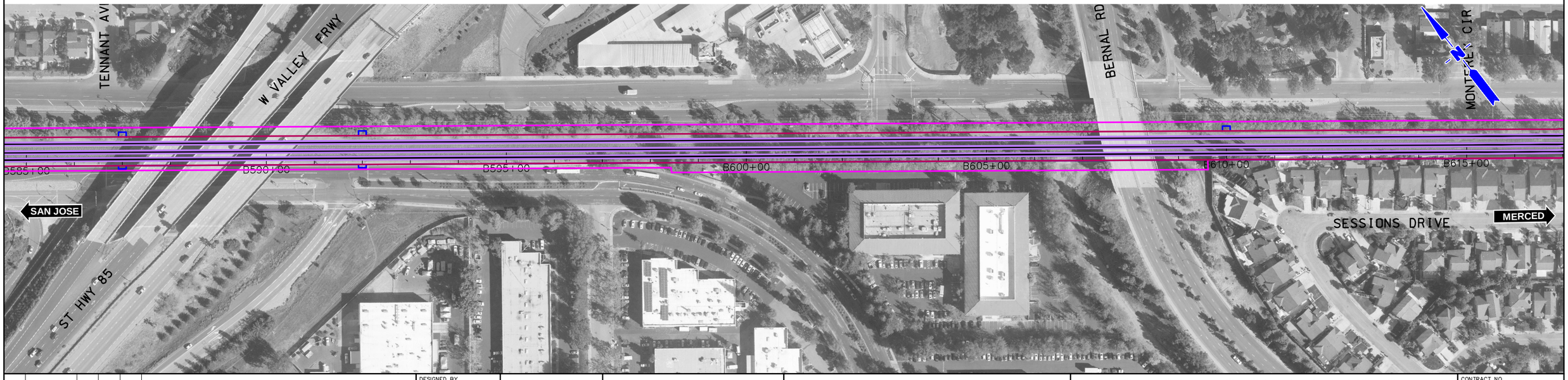
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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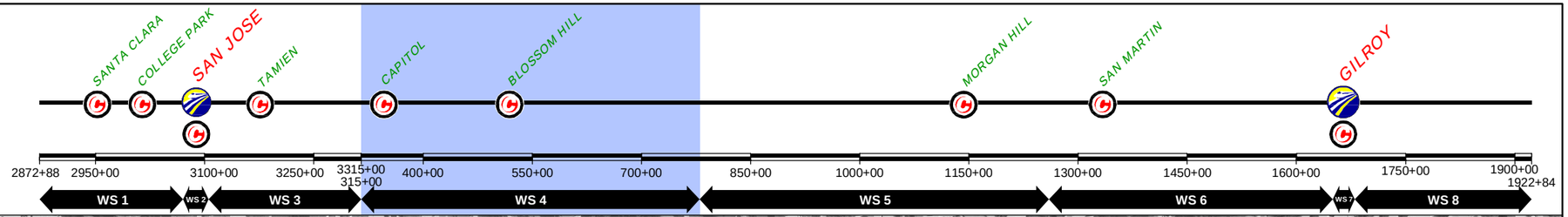
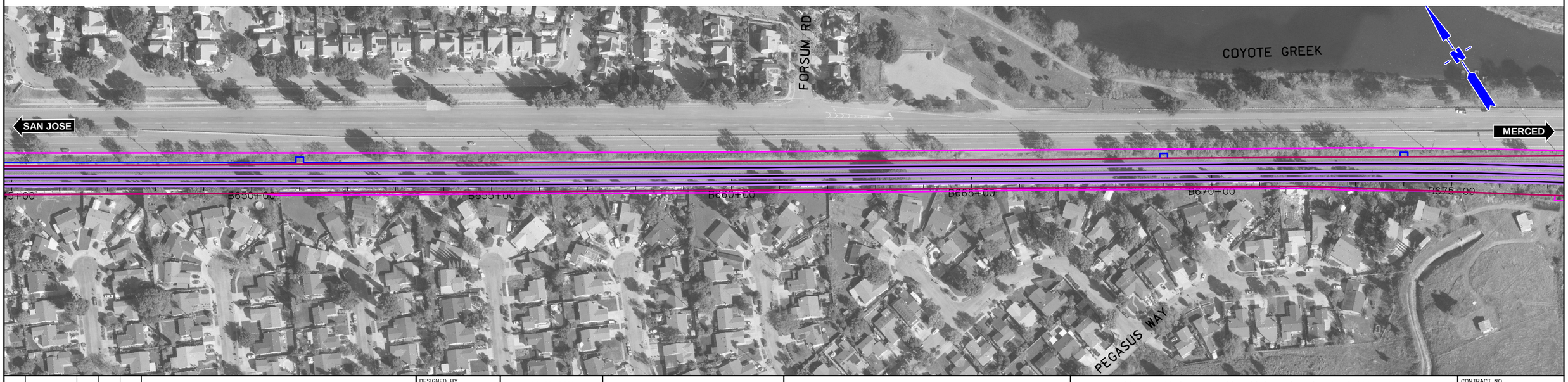
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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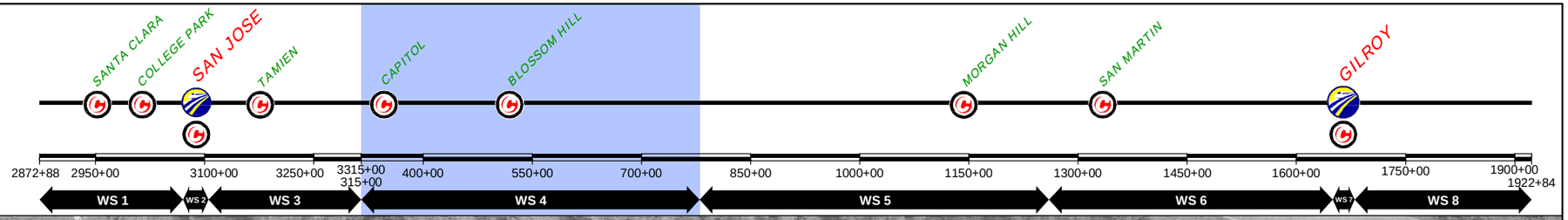
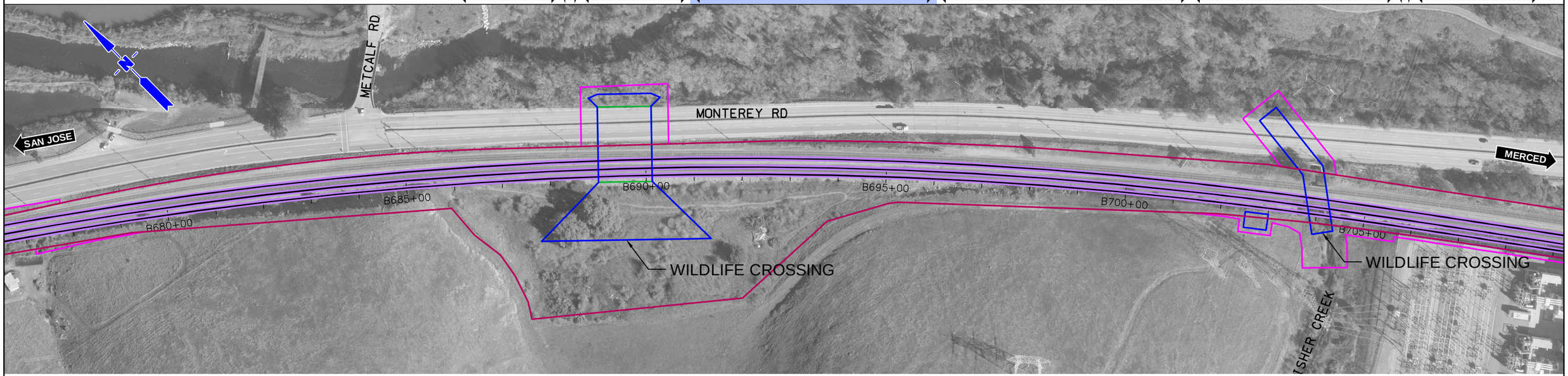
SAN JOSE TO MERCED
315+00 TO GILROY TO 785+00
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

$FILE$
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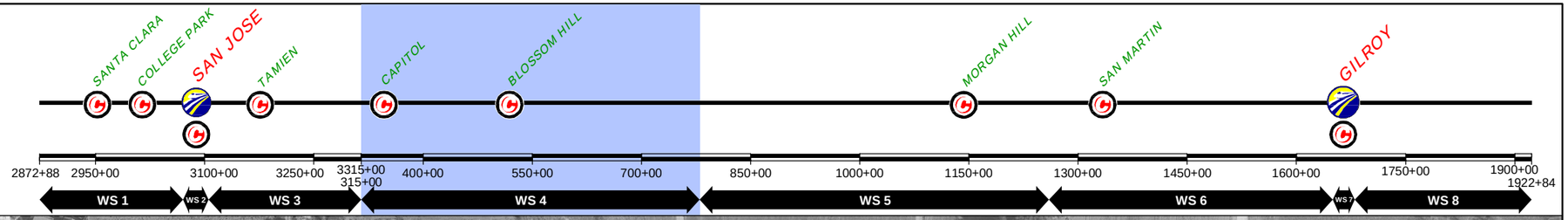
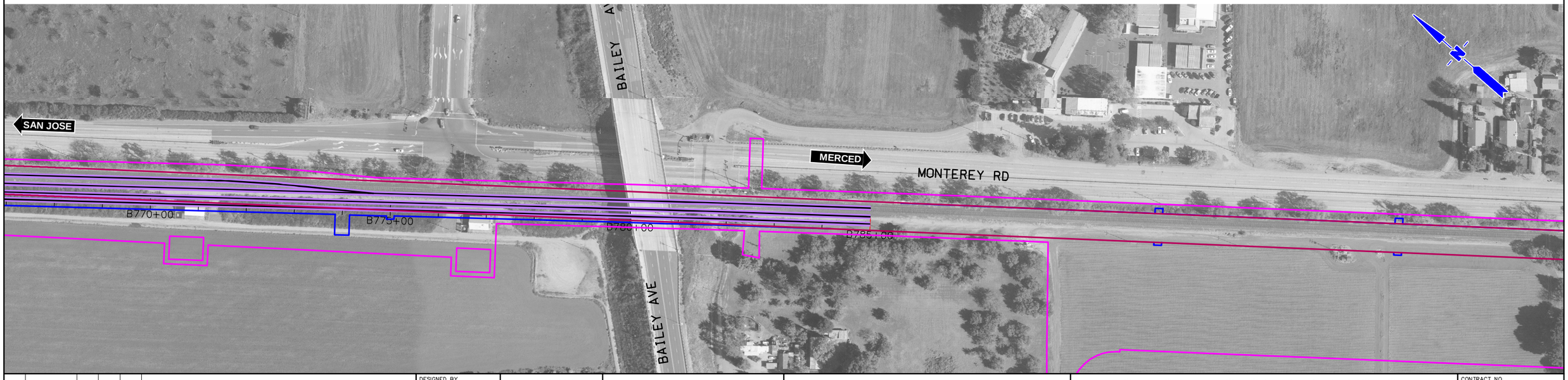
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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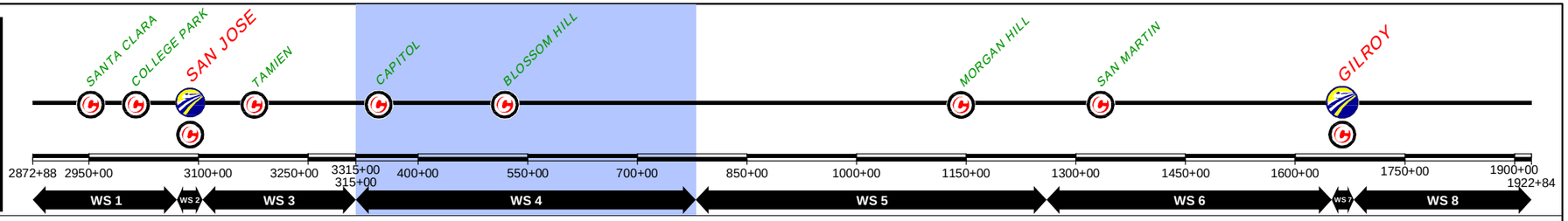
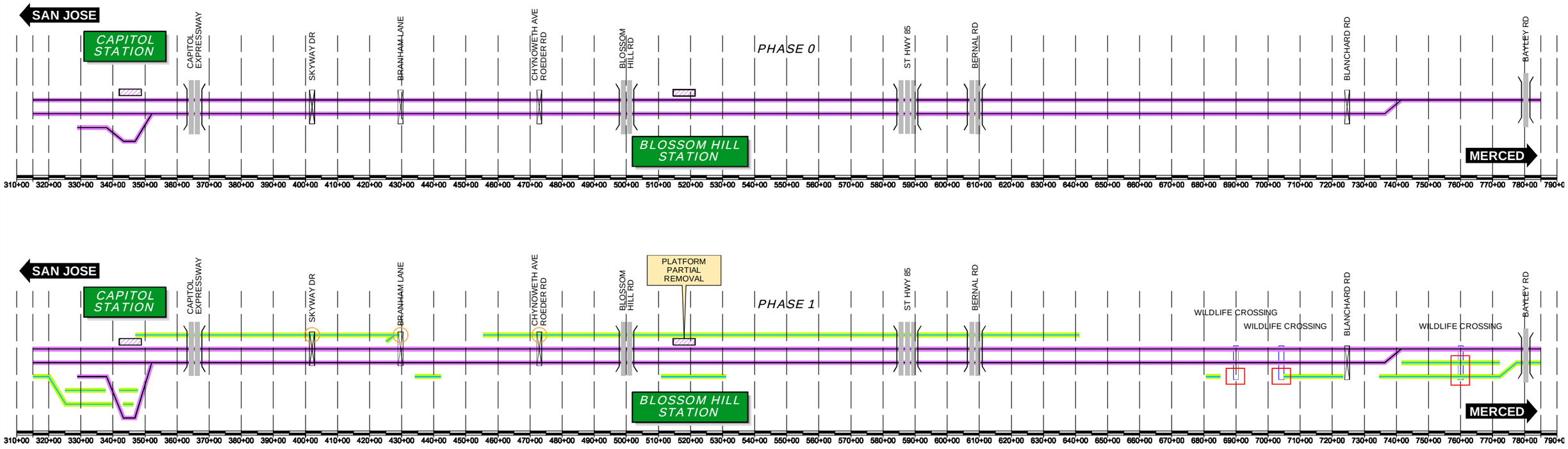
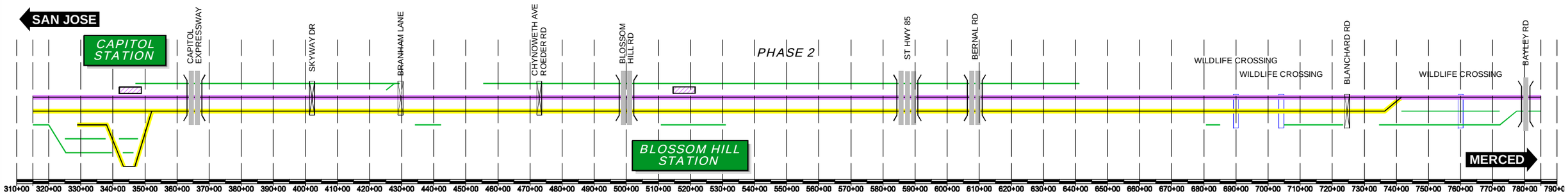
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS4-PH6-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
GRADE CROSSING
TUNNEL
MAJOR UNDERPASS
CREEK UNDERPASS







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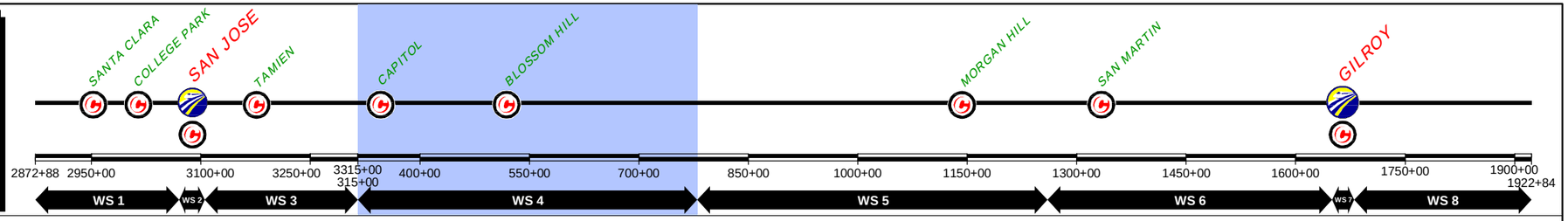
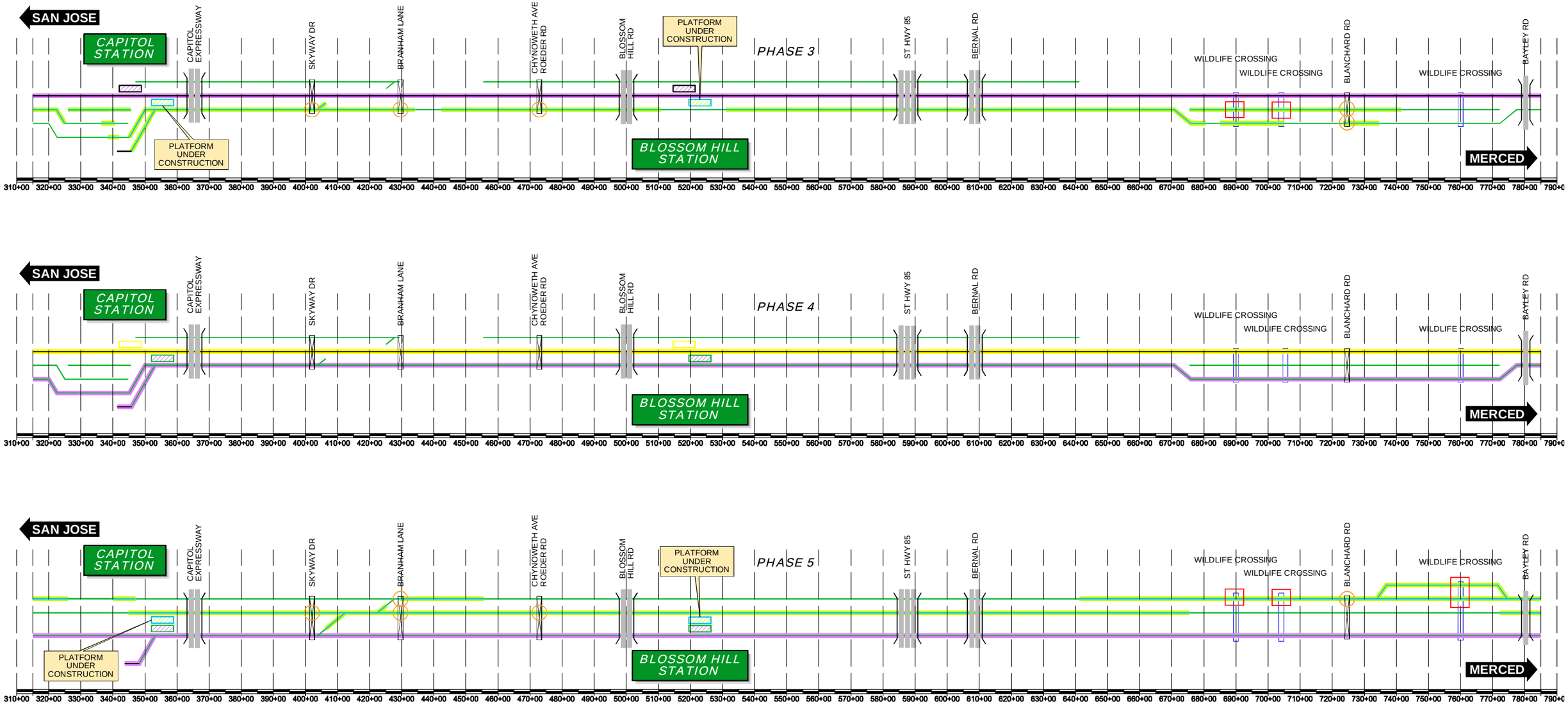
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
315+00 TO 785+00
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS4-SCH-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 3

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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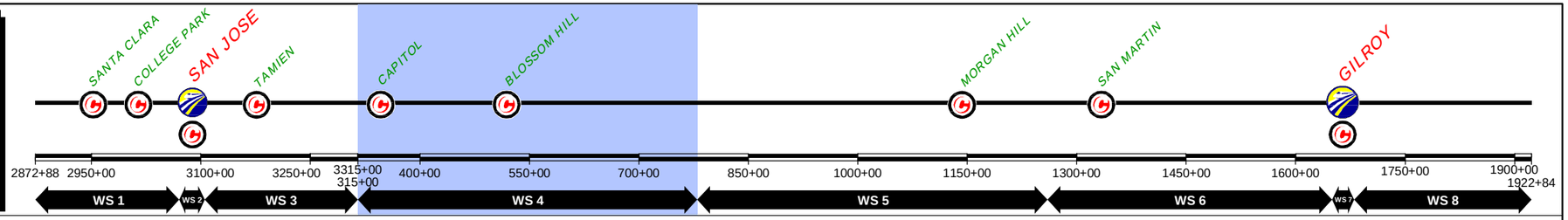
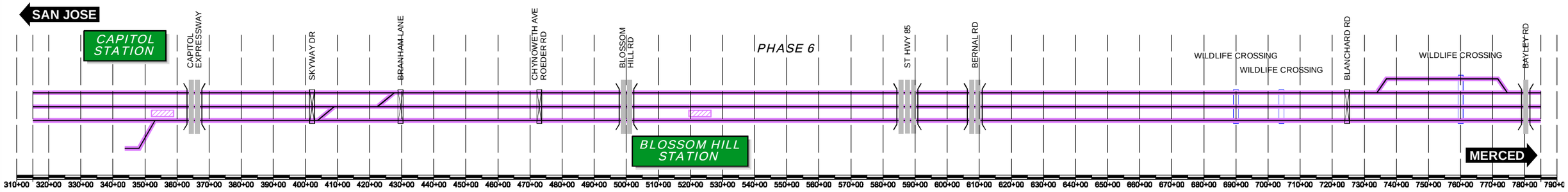
315+00 TO 785+00
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS4-SCH-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 3

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
315+00 TO 785+00
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS4-SCH-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 3

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
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OVERHEAD BRIDGE
MAJOR UNDERPASS
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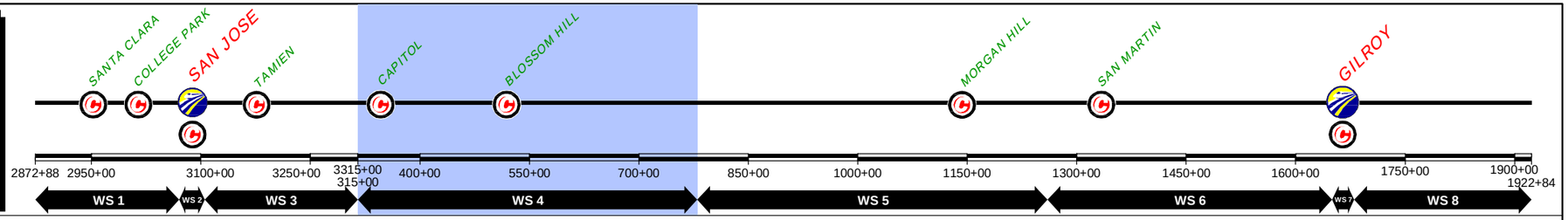
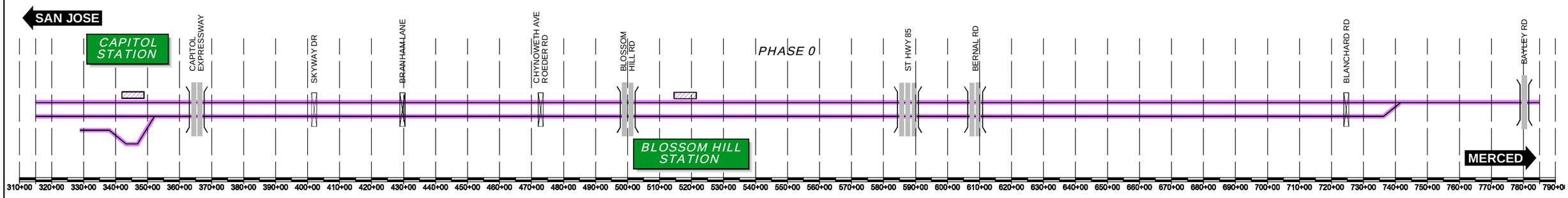
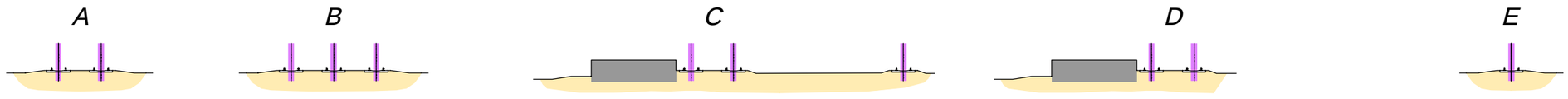
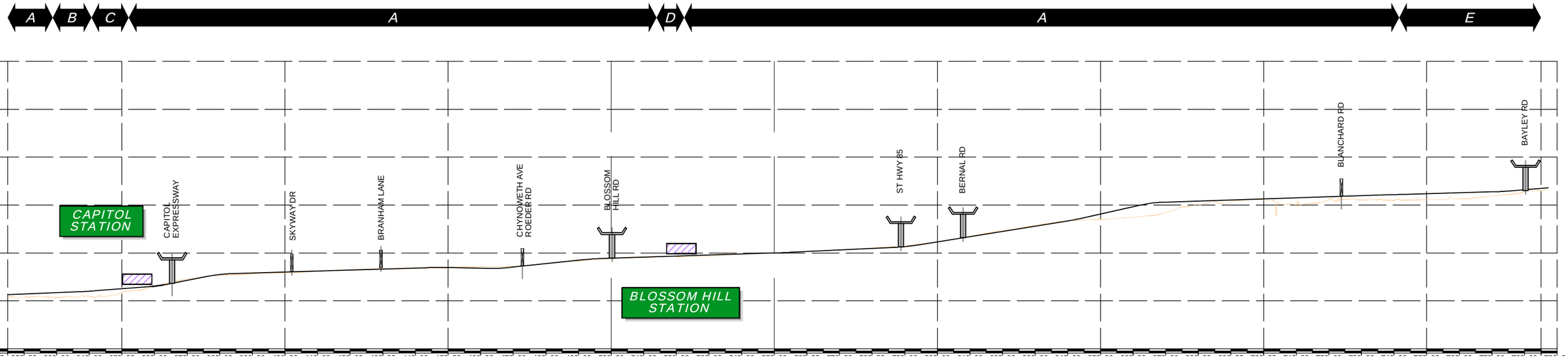
TUNNEL
CREEK UNDERPASS









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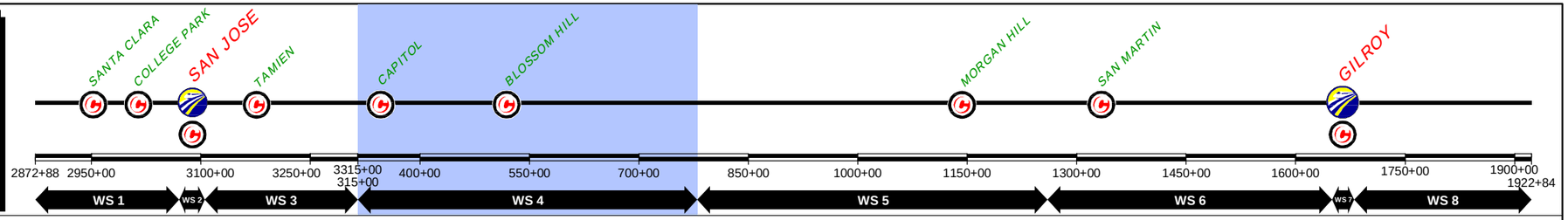
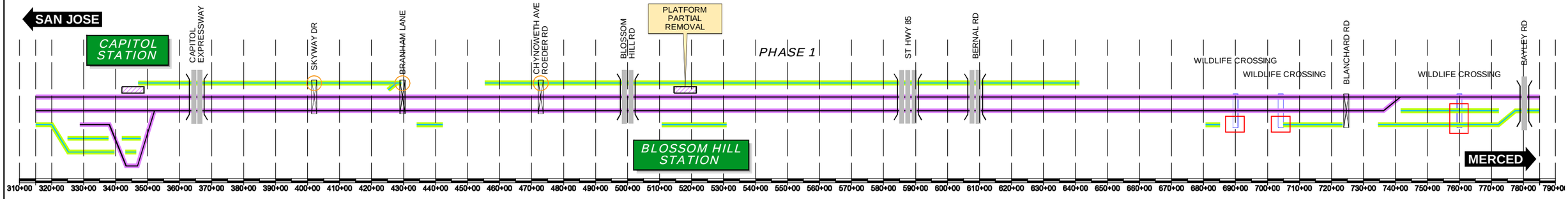
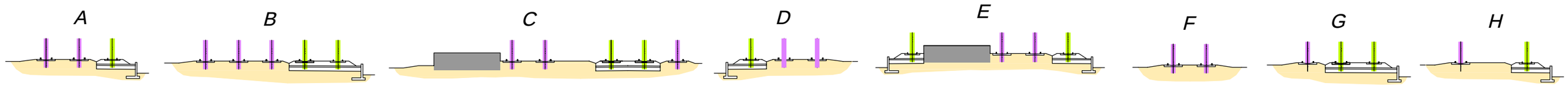
315+00 TO 785+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 0

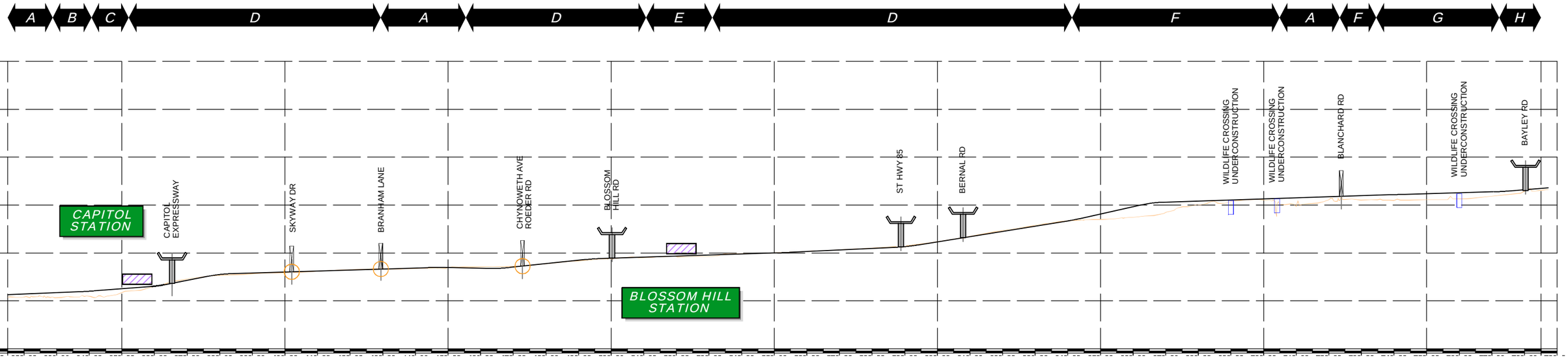
CONTRACT NO.
DRAWING NO. CV-I6WS4-SPP-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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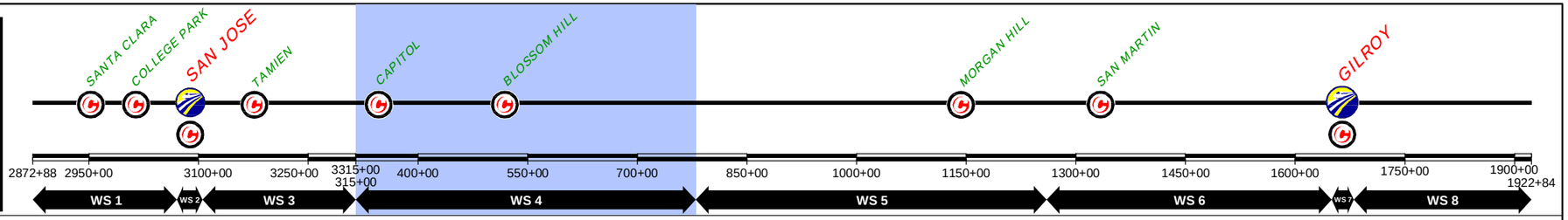
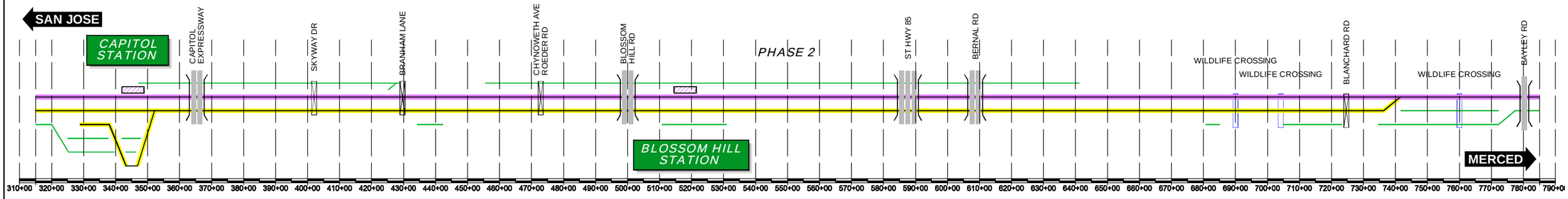
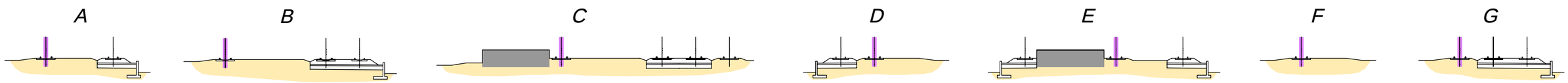
SAN JOSE TO MERCED
315+00 TO 785+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 1

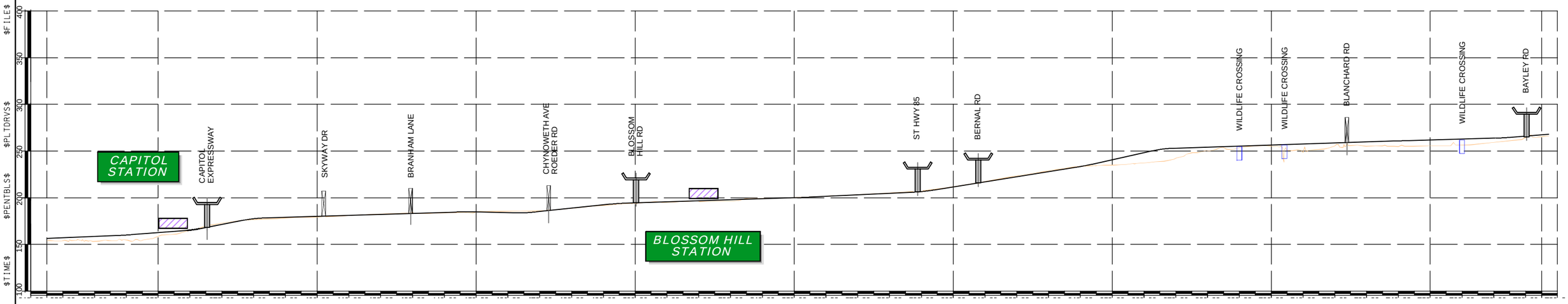
CONTRACT NO.
DRAWING NO. CV-I6WS4-SPP-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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DATE NOV/2018

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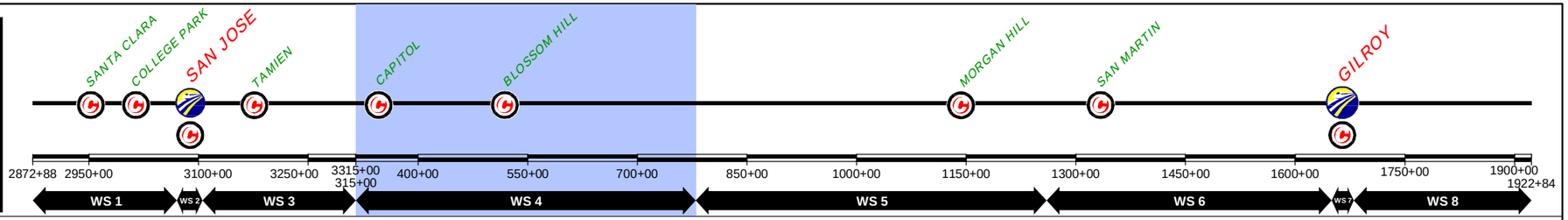
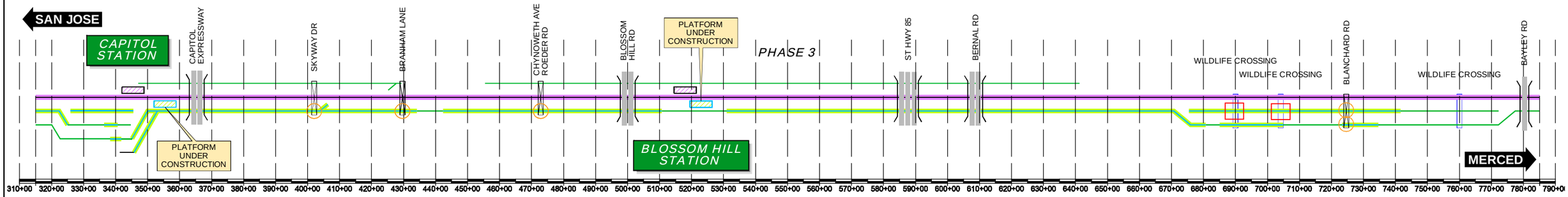
CALIFORNIA High-Speed Rail Authority

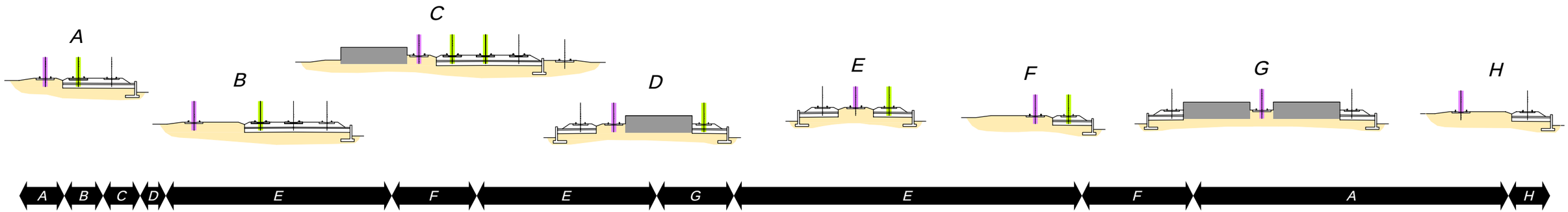
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
315+00 TO 785+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 2

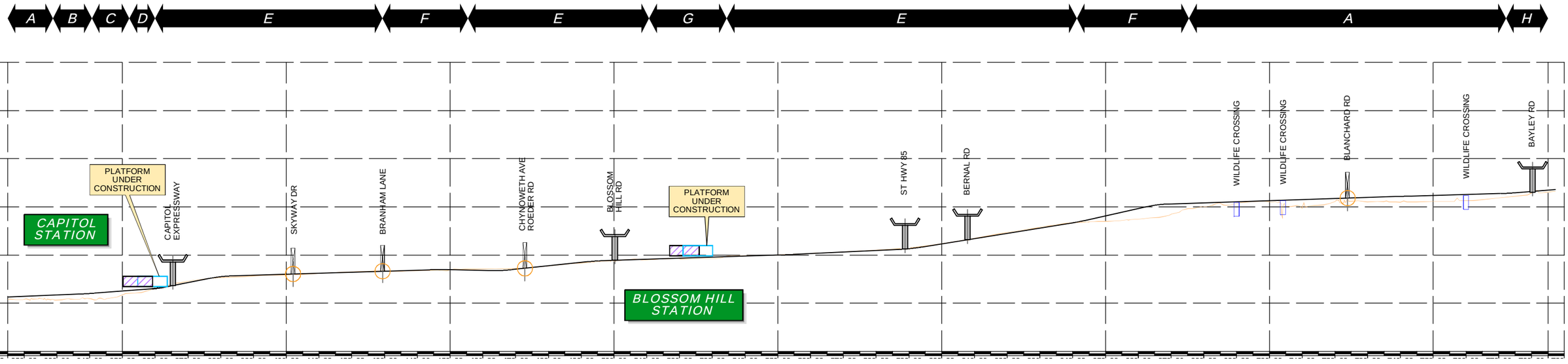
CONTRACT NO.
DRAWING NO. CV-I6WS4-SPP-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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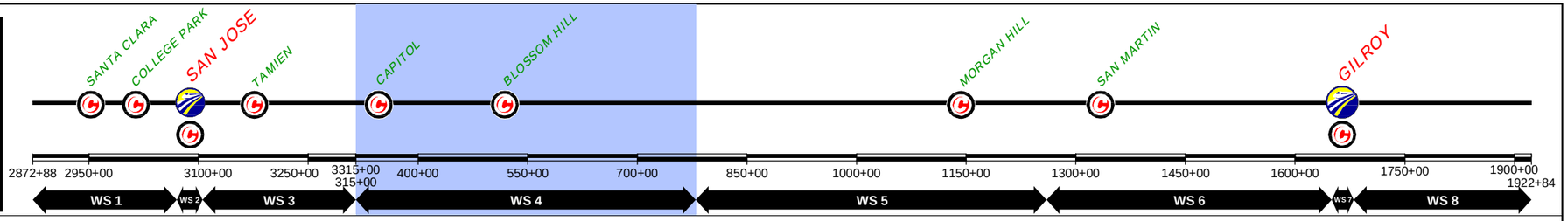
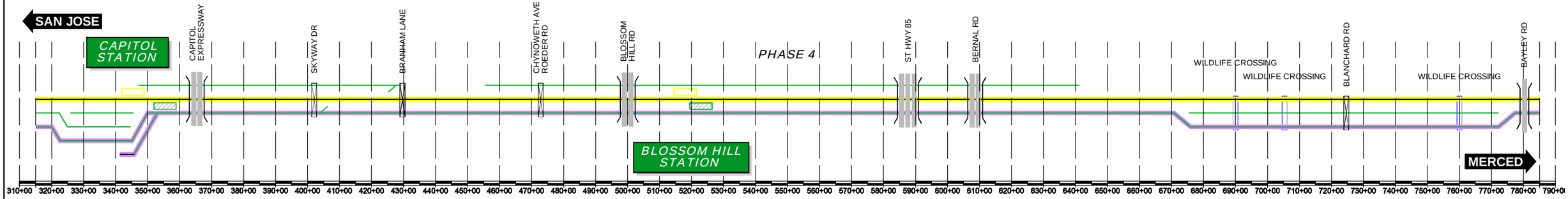
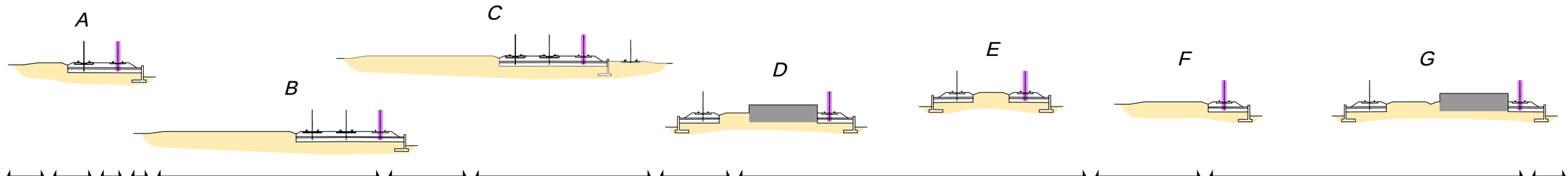
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 3

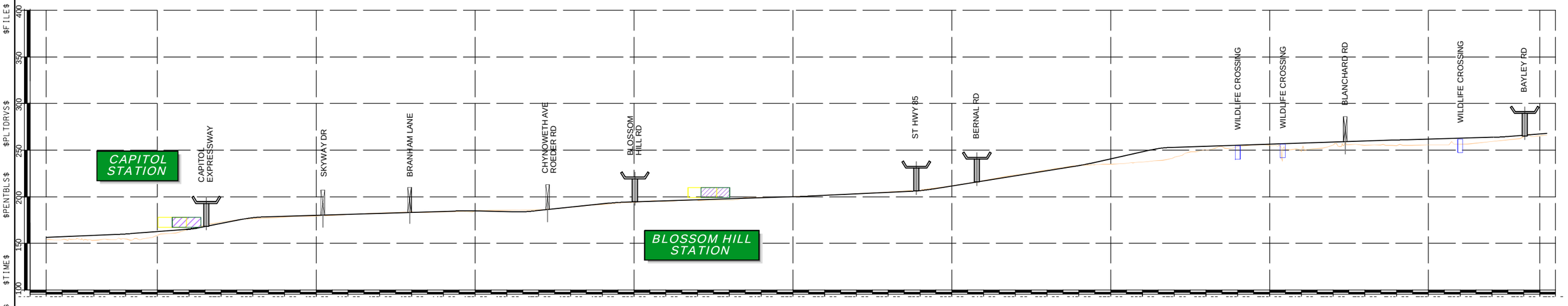
CONTRACT NO.
DRAWING NO. CV-I6WS4-SPP-04
SCALE NOT TO SCALE
SHEET NO. 4 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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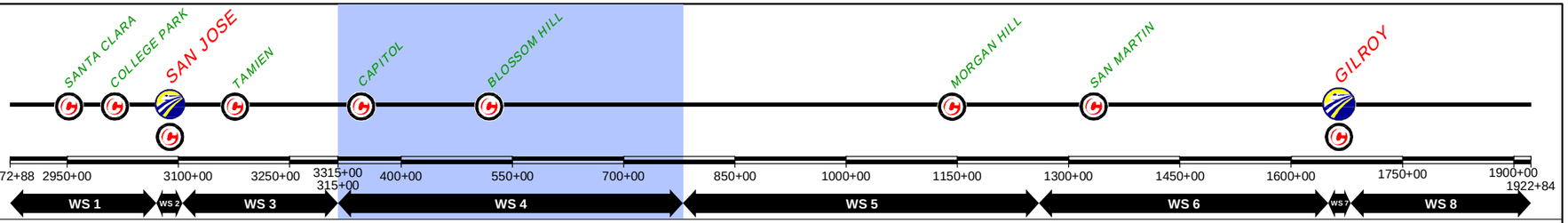
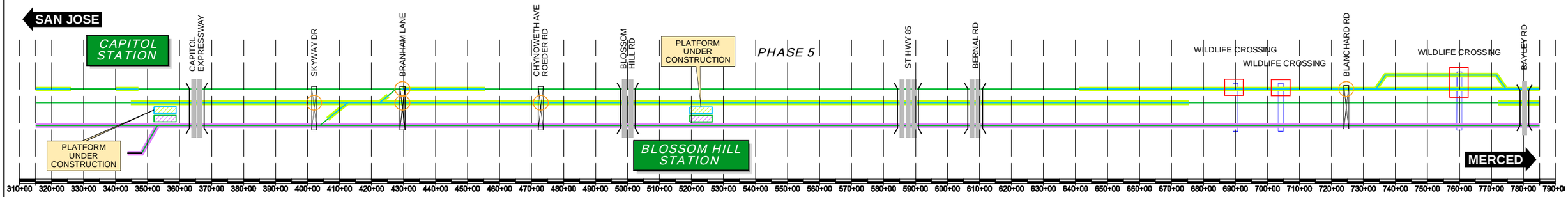
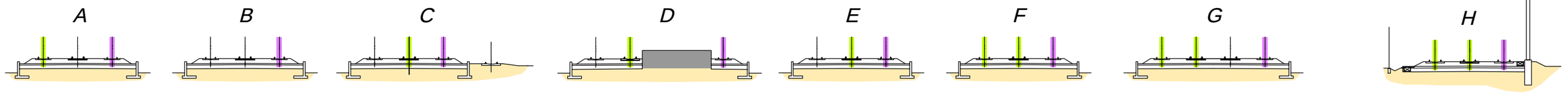
SAN JOSE TO MERCED
315+00 TO 785+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 4

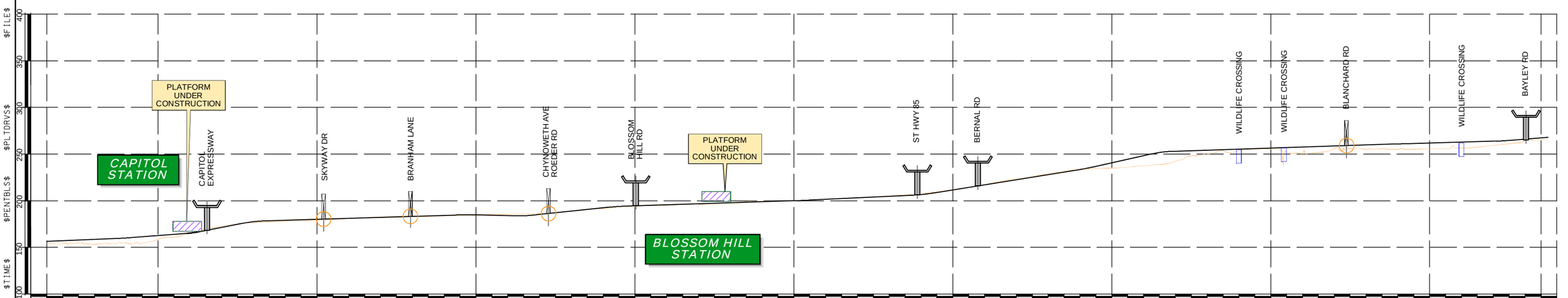
CONTRACT NO.
DRAWING NO. CV-I6WS4-SPP-05
SCALE NOT TO SCALE
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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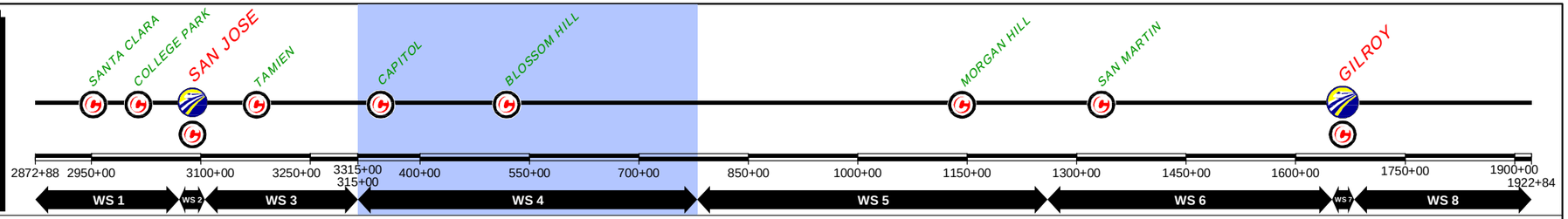
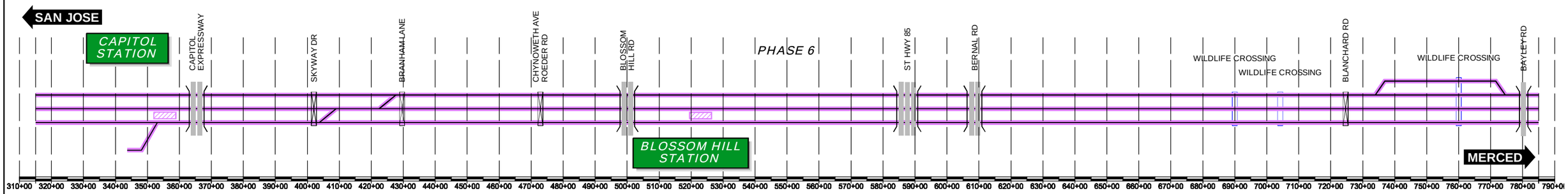
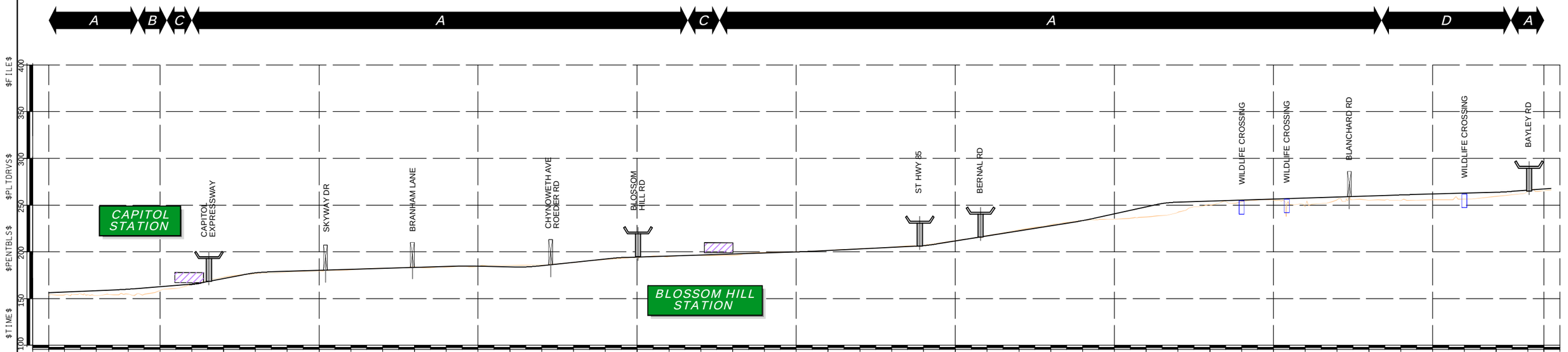
315+00 TO 785+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I6WS4-SPP-06
SCALE NOT TO SCALE
SHEET NO. 6 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I6WS4-SPP-07
SCALE NOT TO SCALE
SHEET NO. 7 OF 7

APPENDIX H: TRACK SHIFT WORKS

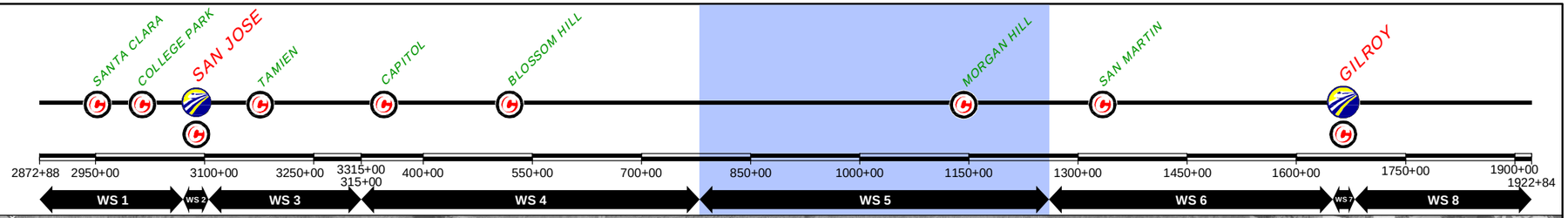
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$PENTBLS$
$TIME$
$DATE$
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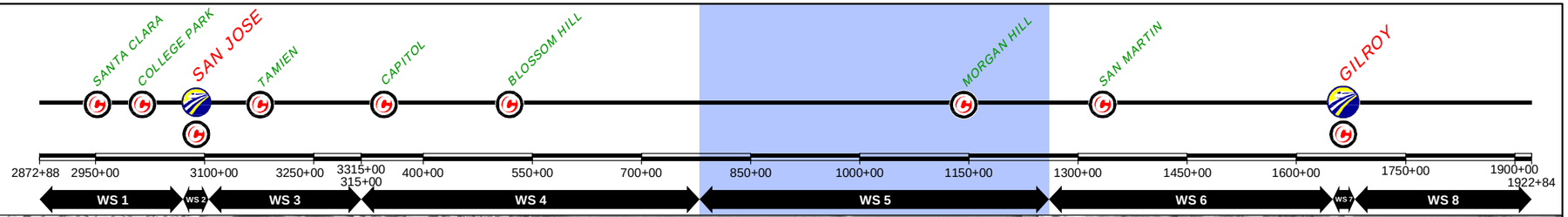
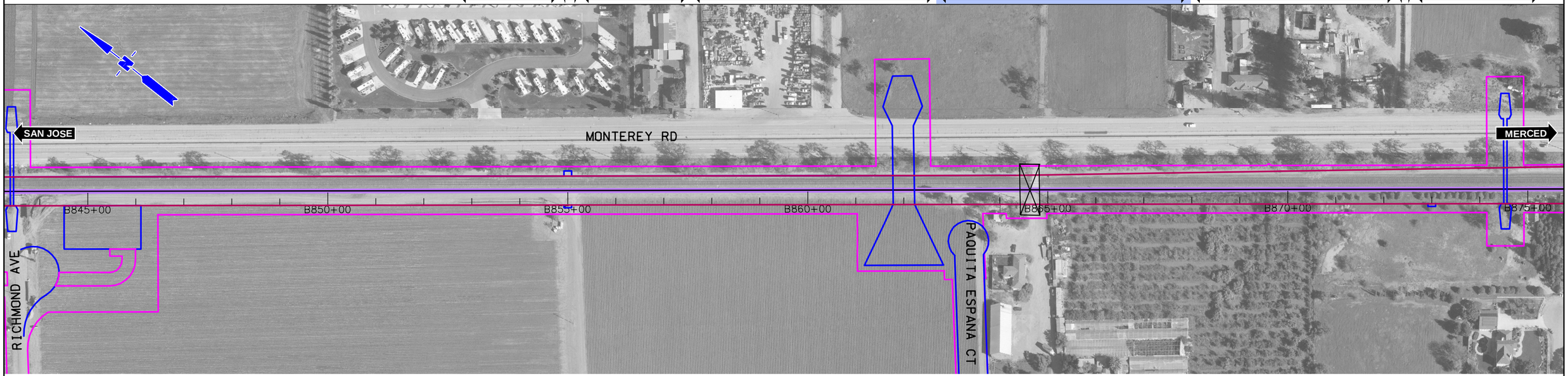
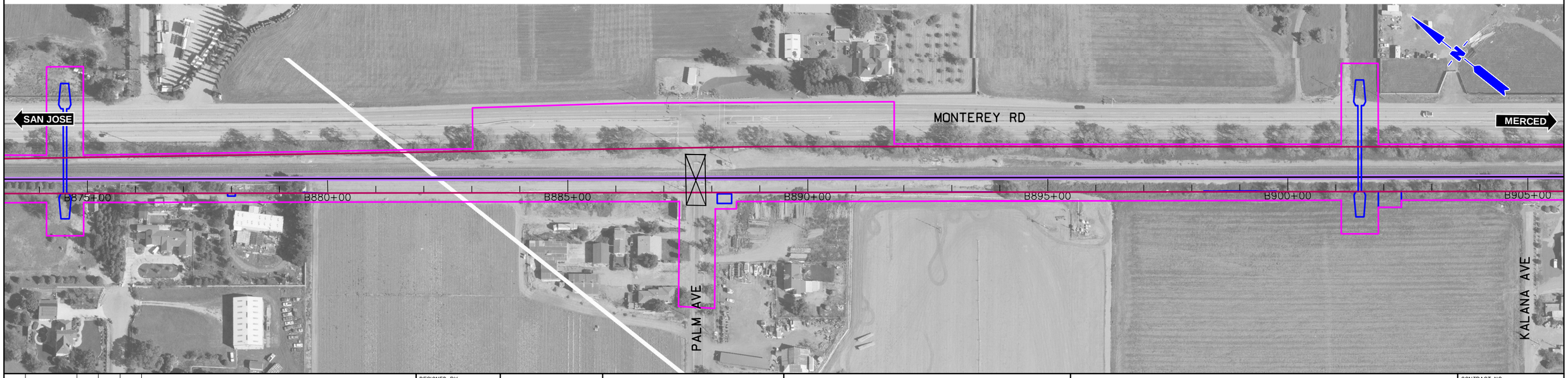
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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$PENTBLS$
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$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

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SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

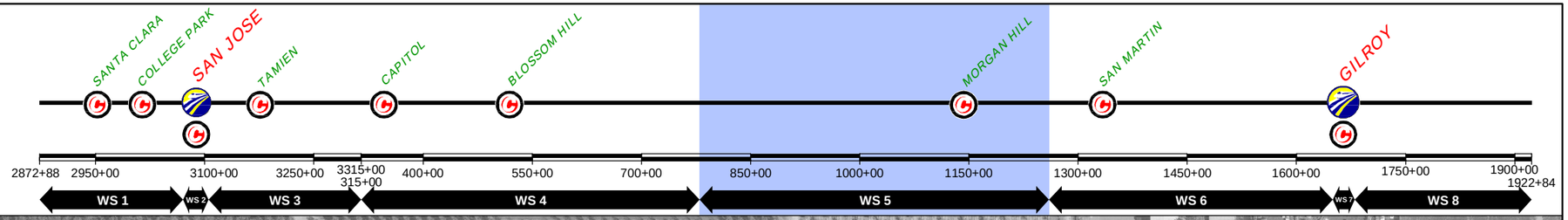
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

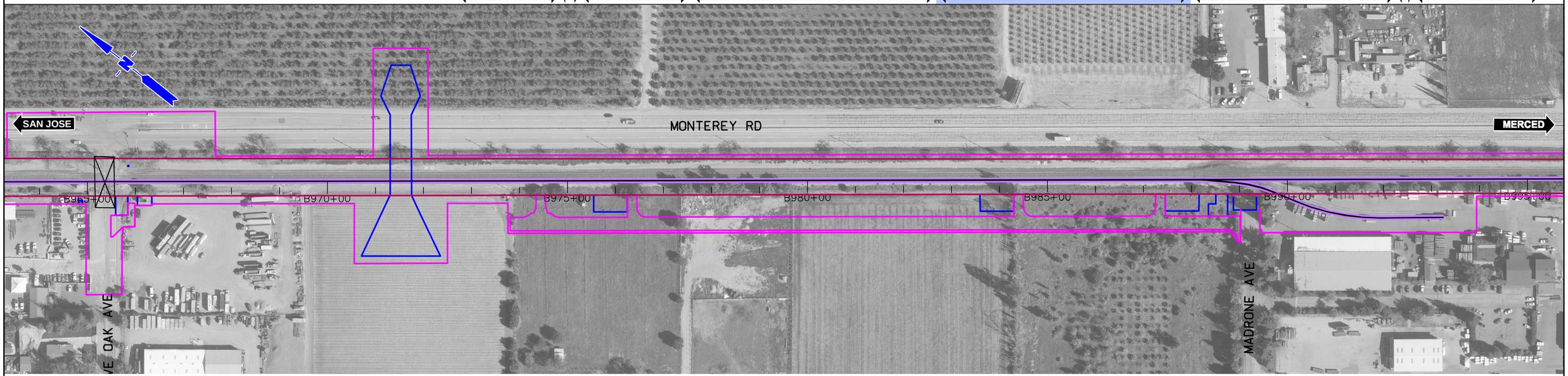
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

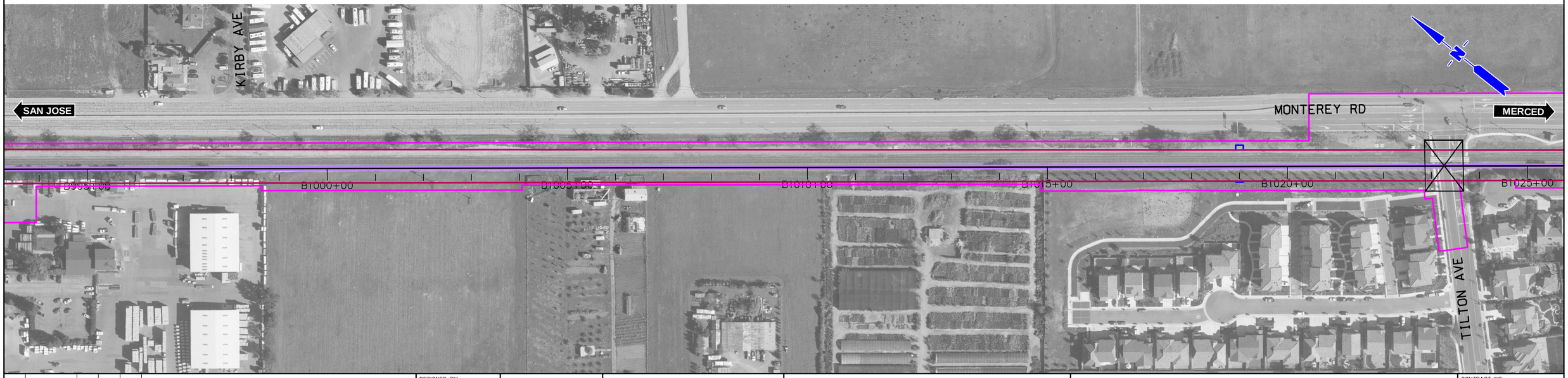
EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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$TIME$
$DATE$
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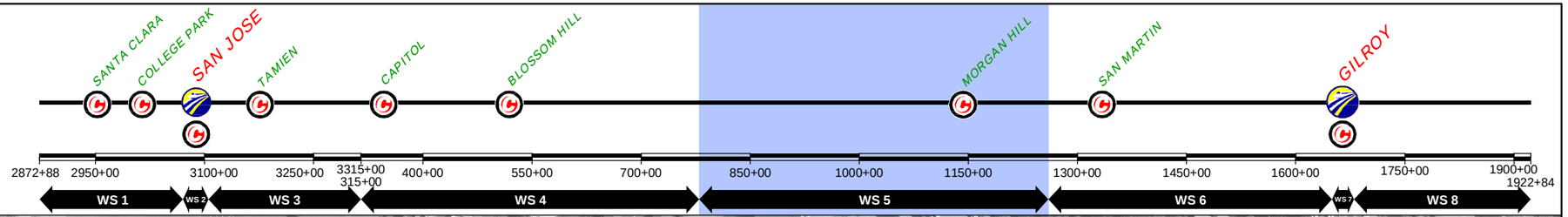
CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$DATE$
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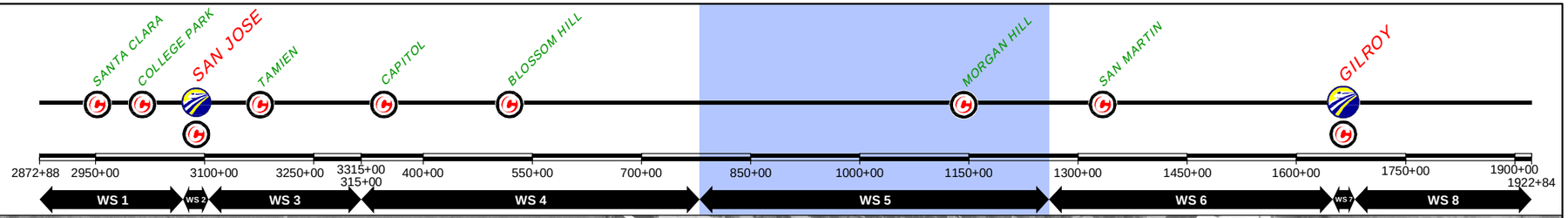
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

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$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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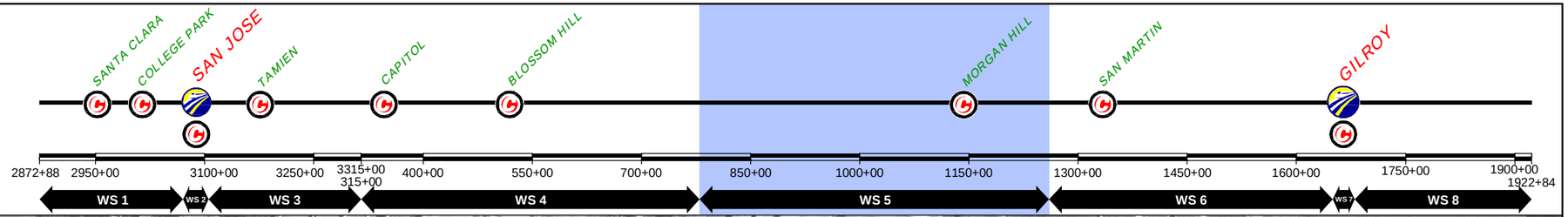
CALIFORNIA High-Speed Rail Authority

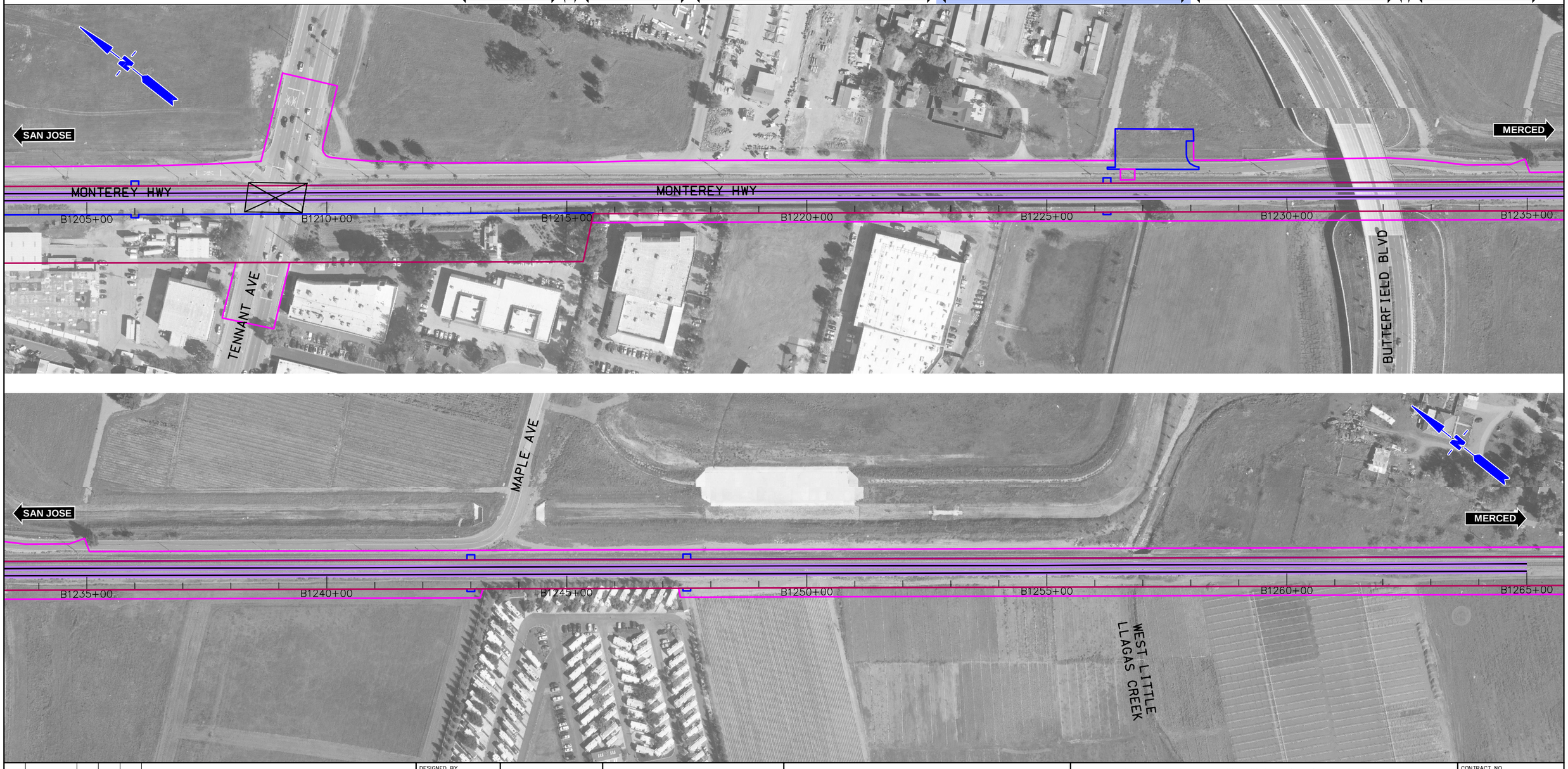
CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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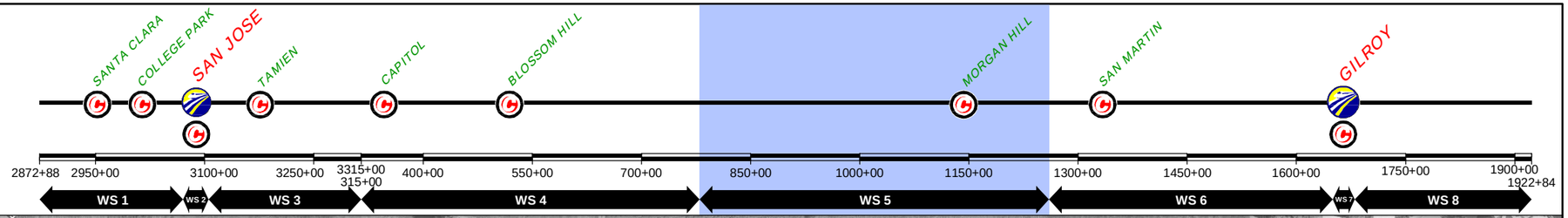
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH0-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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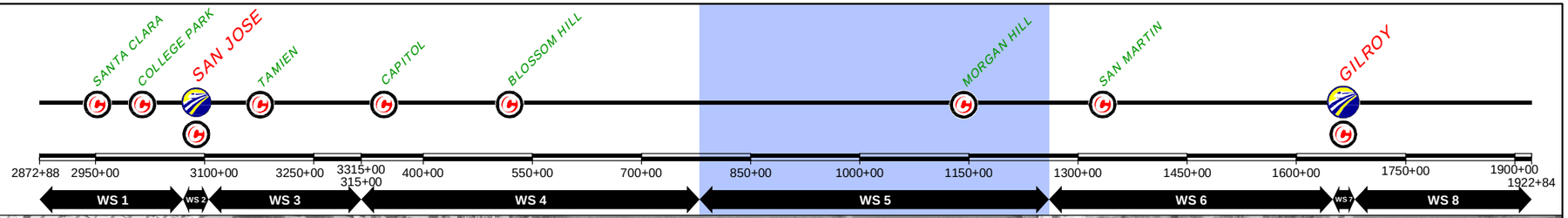
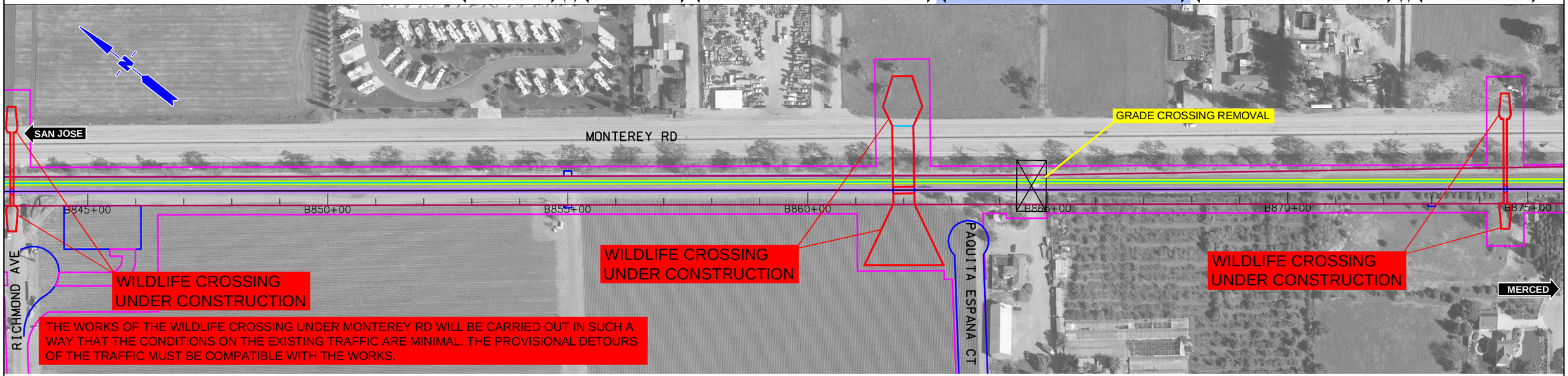
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

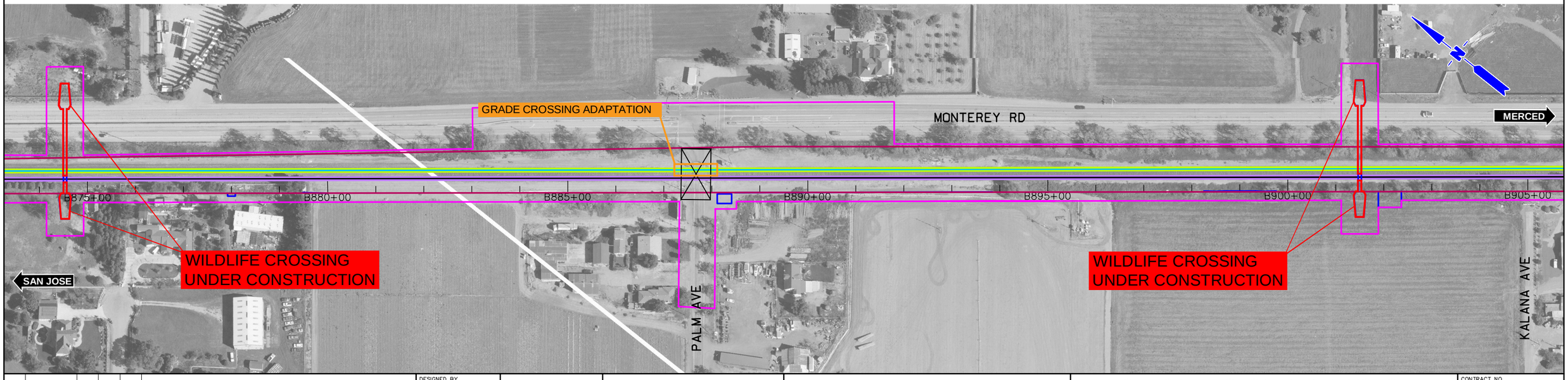
CONTRACT NO. CV-I1WS5-PH1-01
DRAWING NO.
SCALE 1" = 200'
SHEET NO. 1 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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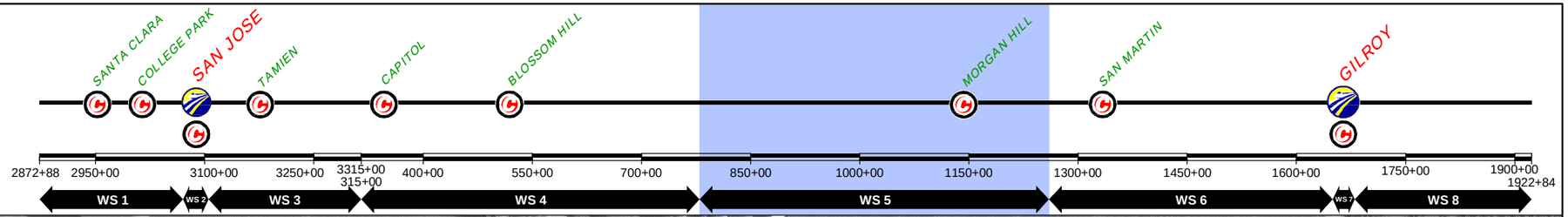
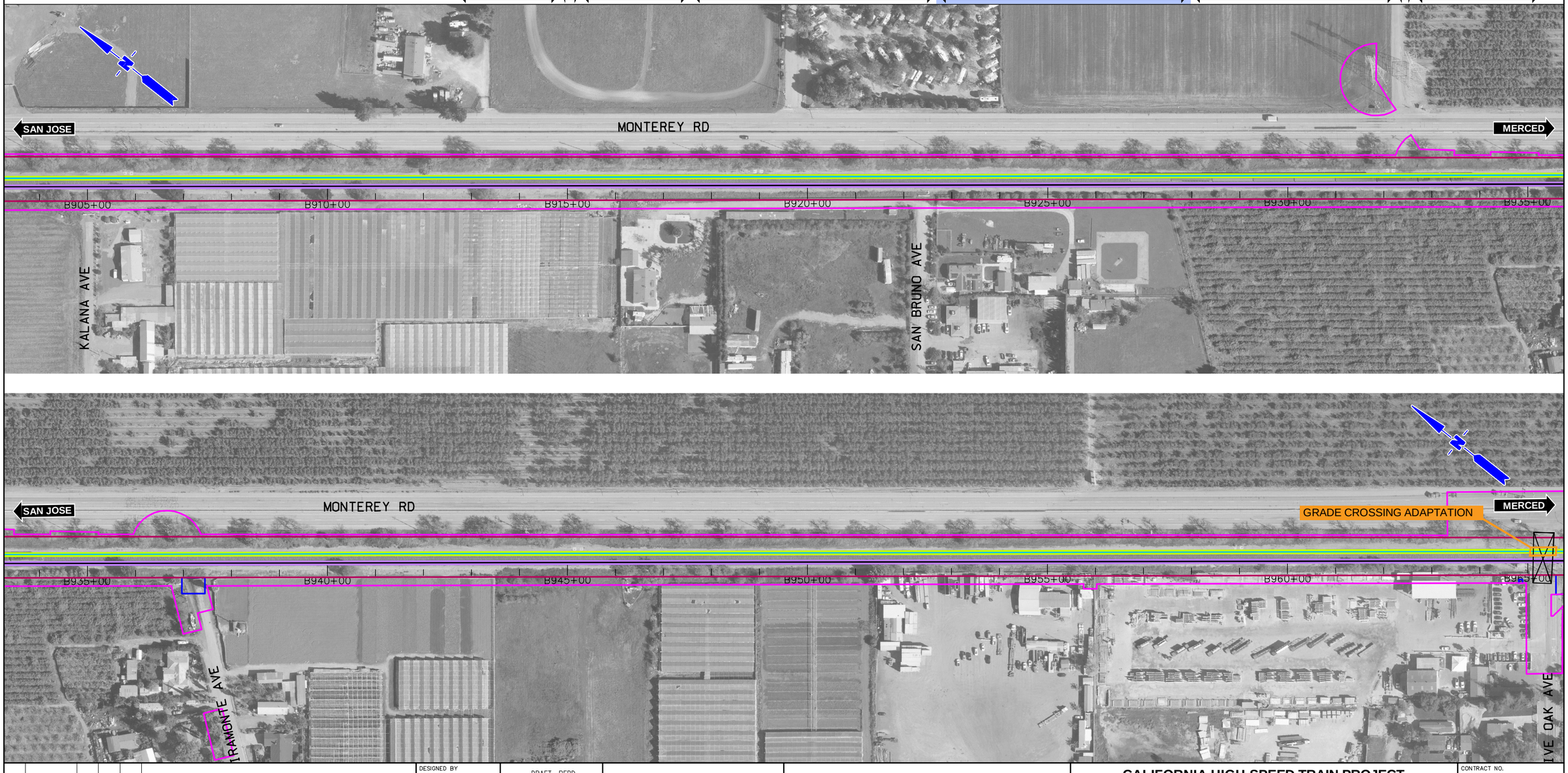
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH1-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$PENTBLS$
$TIME$
$DATE$
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785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH1-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MONTEREY RD
MERCED
B965+00 B970+00 B975+00 B980+00 B985+00 B990+00 B995+00
GRADE CROSSING ADAPTATION
WILDLIFE CROSSING UNDER CONSTRUCTION
MADRONE AVE
THE WORKS OF THE WILDLIFE CROSSING UNDER MONTEREY RD WILL BE CARRIED OUT IN SUCH A WAY THAT THE CONDITIONS ON THE EXISTING TRAFFIC ARE MINIMAL. THE PROVISIONAL DETOURS OF THE TRAFFIC MUST BE COMPATIBLE WITH THE WORKS.

KIRBY AVE
SAN JOSE
MONTEREY RD
MERCED
B995+00 B1000+00 B1005+00 B1010+00 B1015+00 B1020+00 B1025+00
GRADE CROSSING ADAPTATION
TILTON AVE

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

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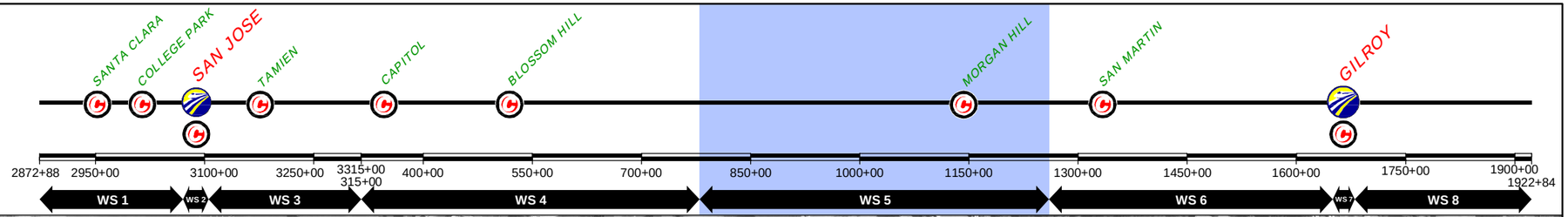
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH1-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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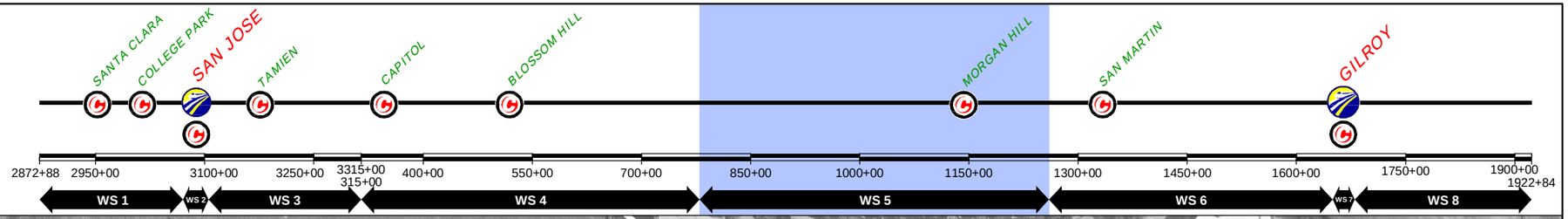
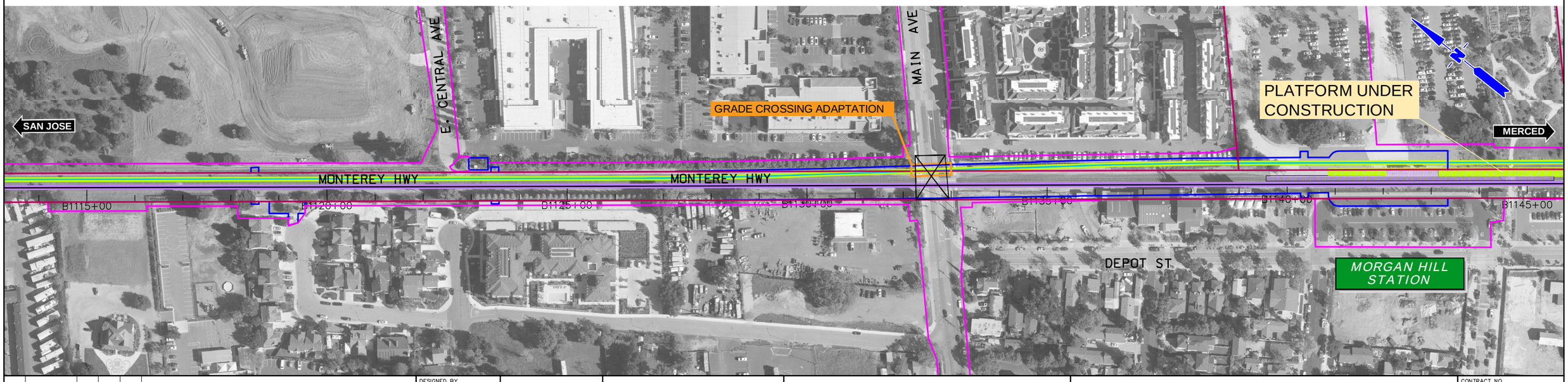
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH1-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

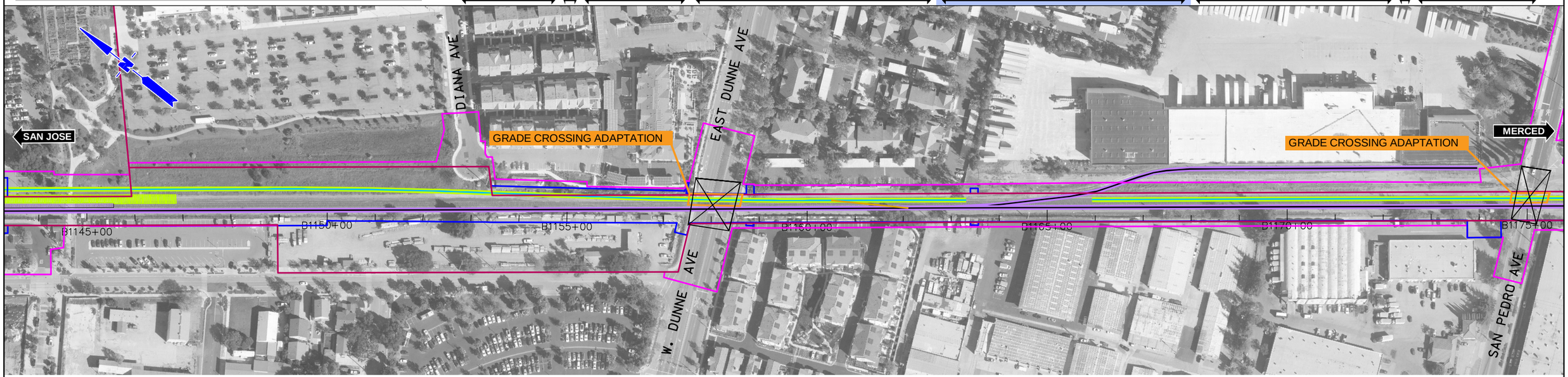
CONTRACT NO.
DRAWING NO. CV-I1WS5-PH1-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8



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SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH1-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
MONTEREY HWY
MONTEREY HWY
B1205+00 B1210+00 B1215+00 B1220+00 B1225+00 B1230+00 B1235+00
TENNANT AVE
BUTTERFIELD BLVD

MAPLE AVE
SAN JOSE
MERCED
B1235+00 B1240+00 B1245+00 B1250+00 B1255+00 B1260+00 B1265+00
WEST LITTLE LLAGAS CREEK

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CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH1-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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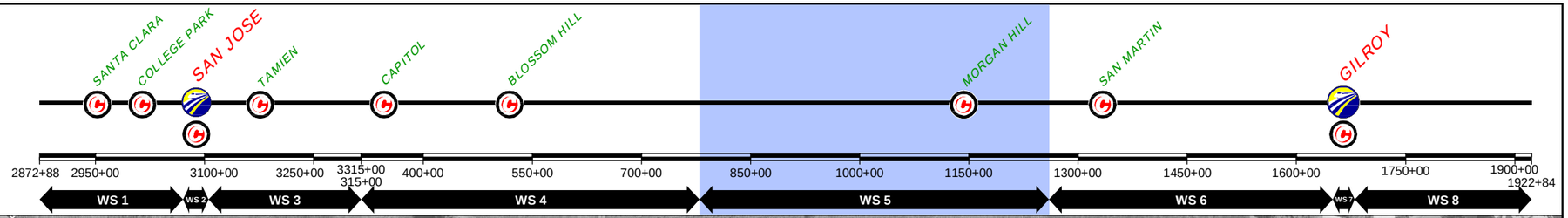
TUNNEL
CREEK UNDERPASS



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CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
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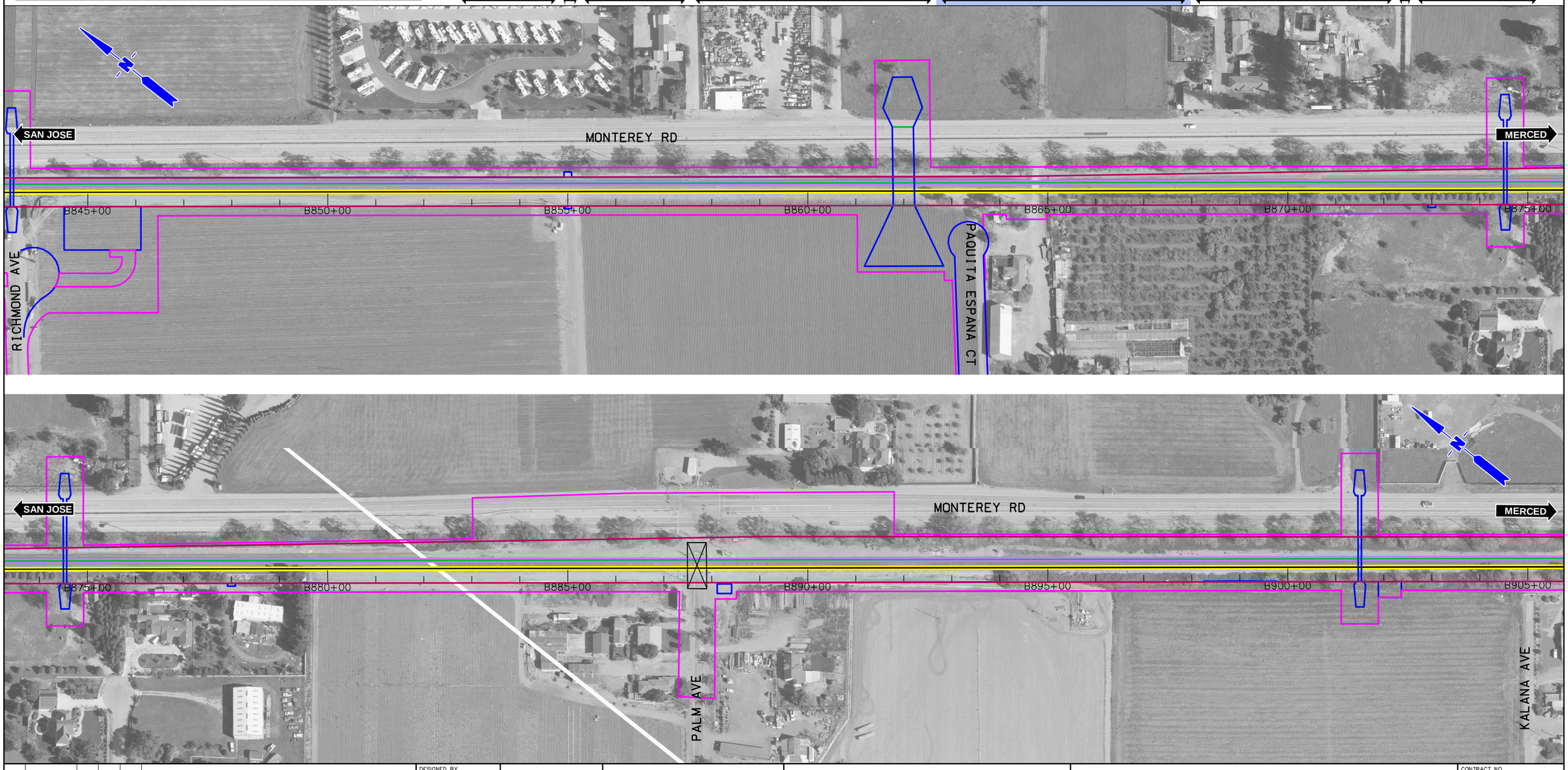
WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8



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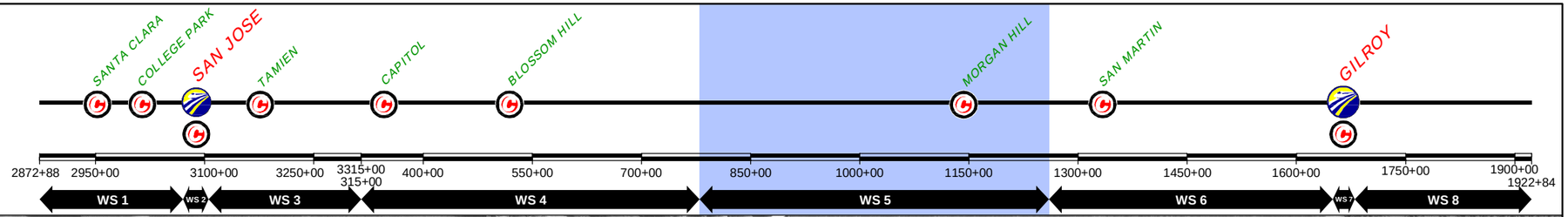
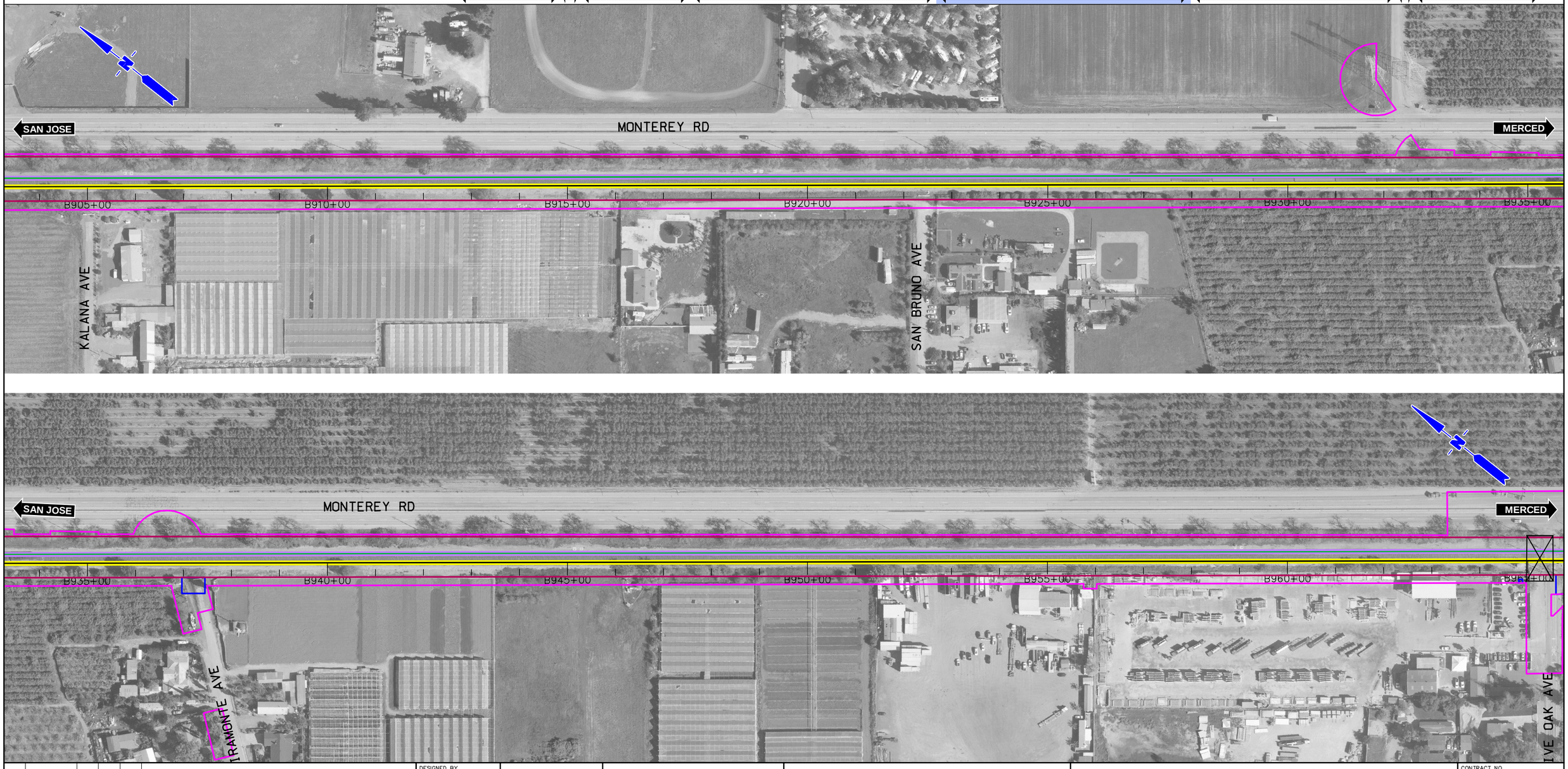
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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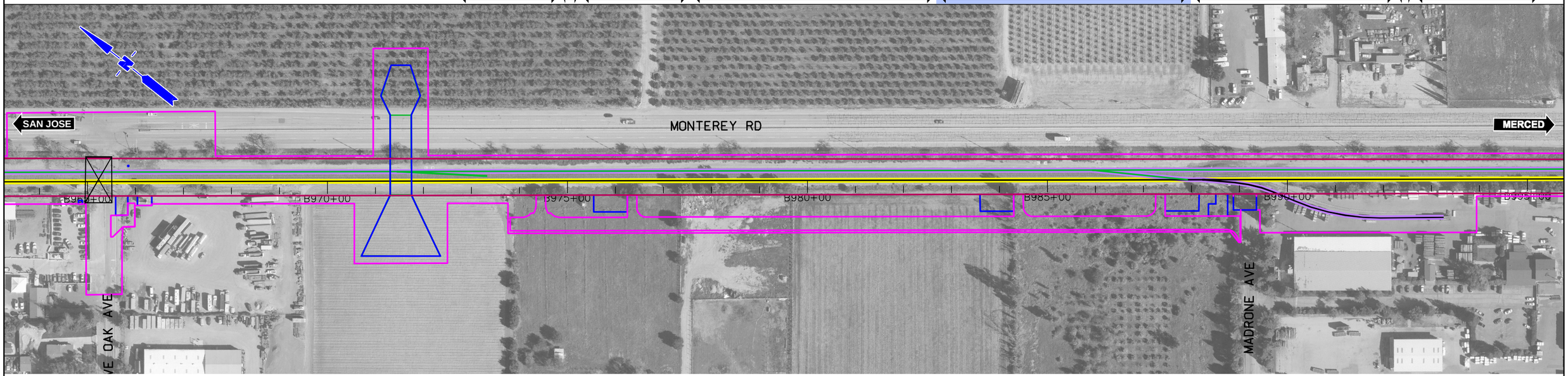
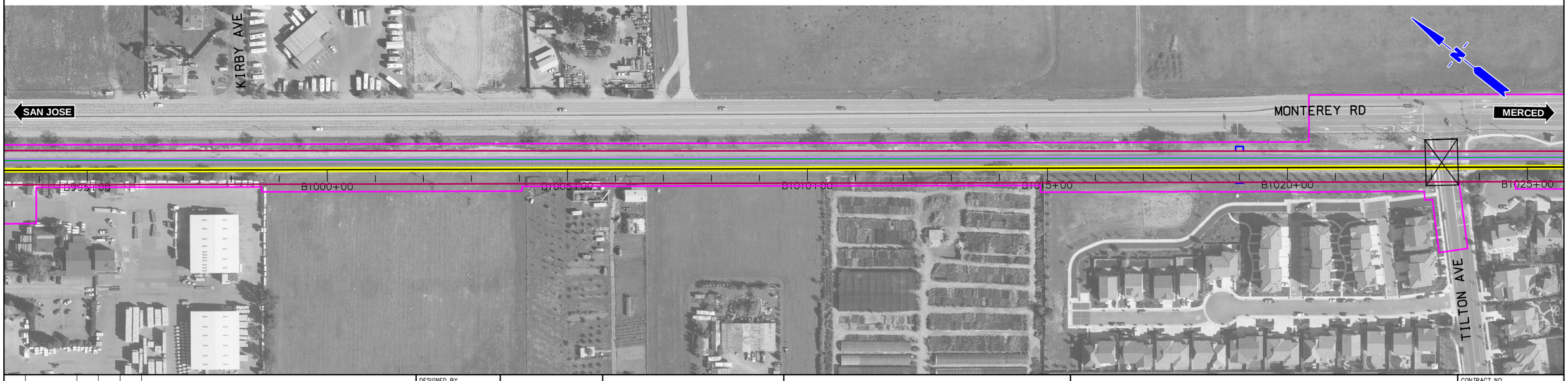
2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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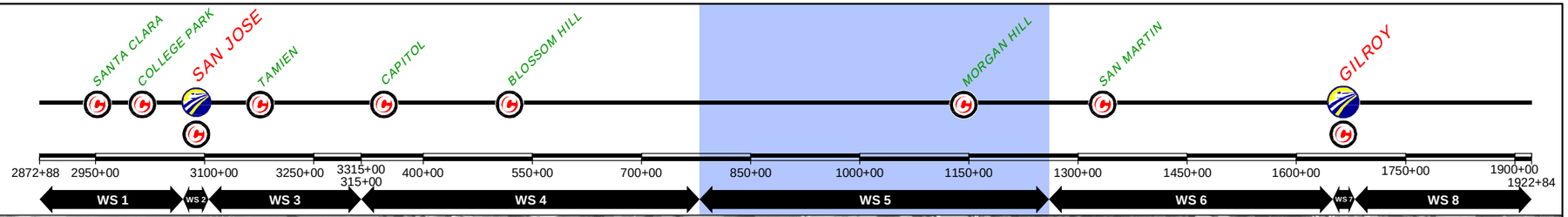
CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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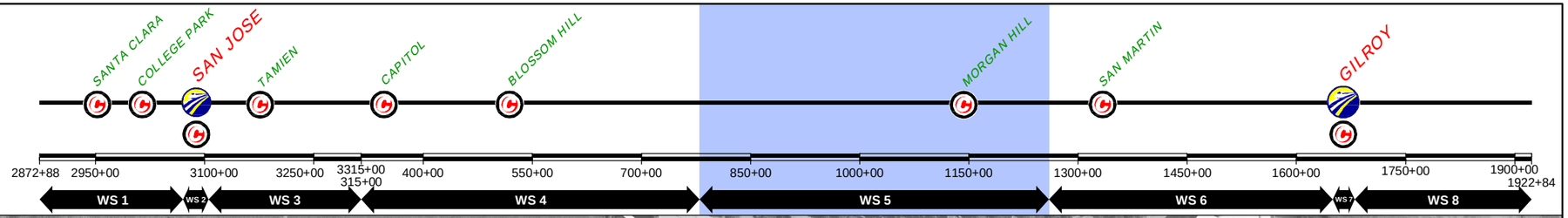
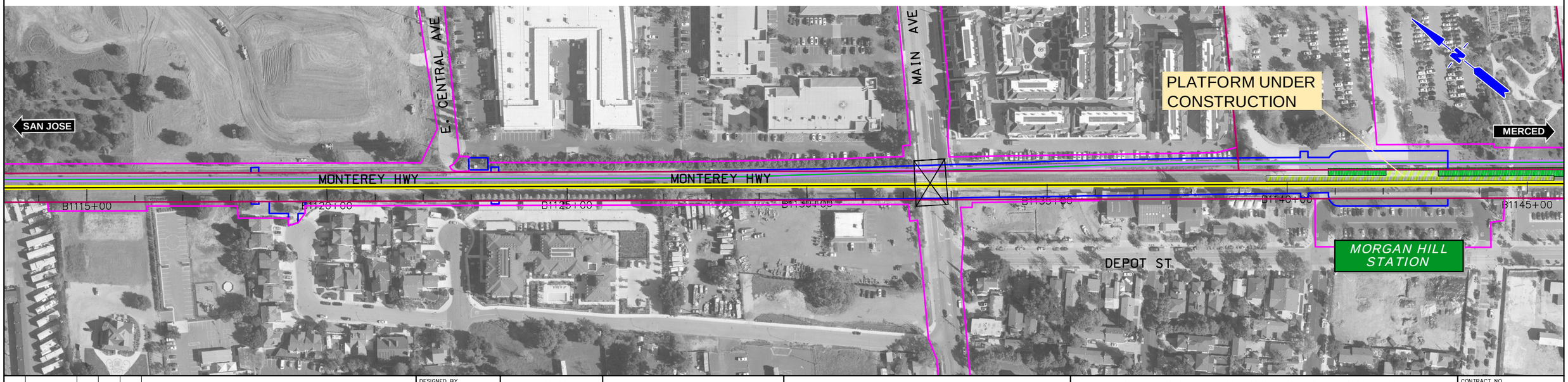
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

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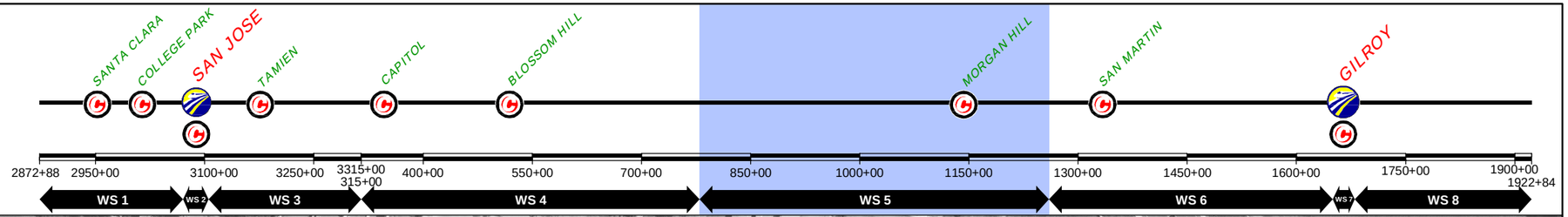
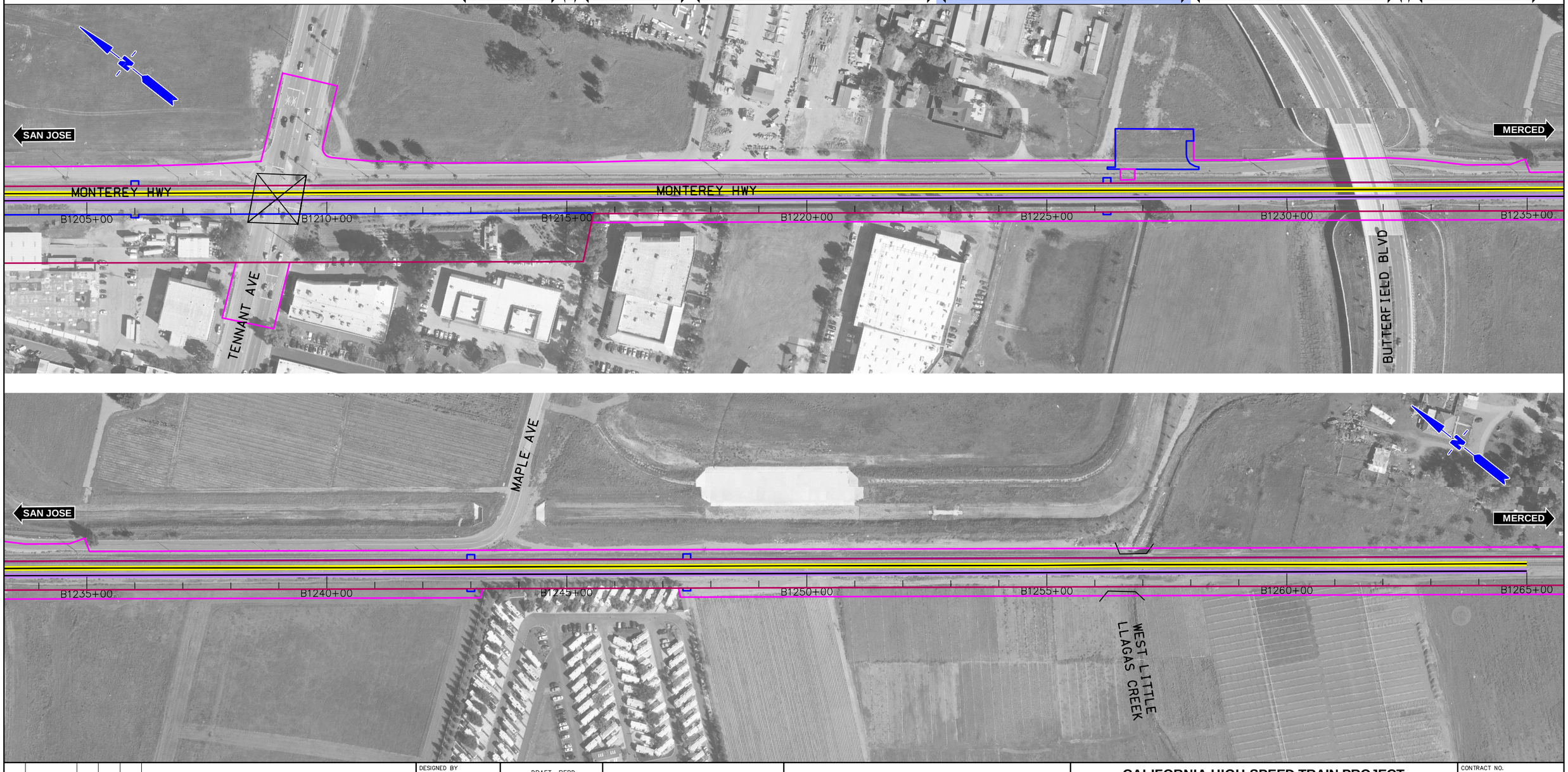
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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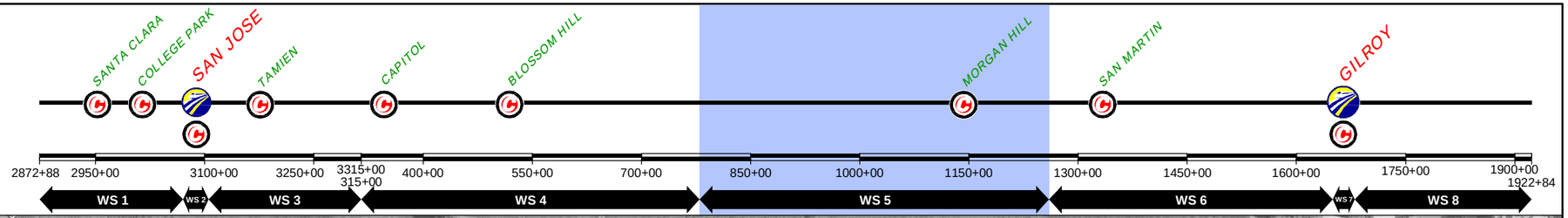
SAN JOSE TO MERCED

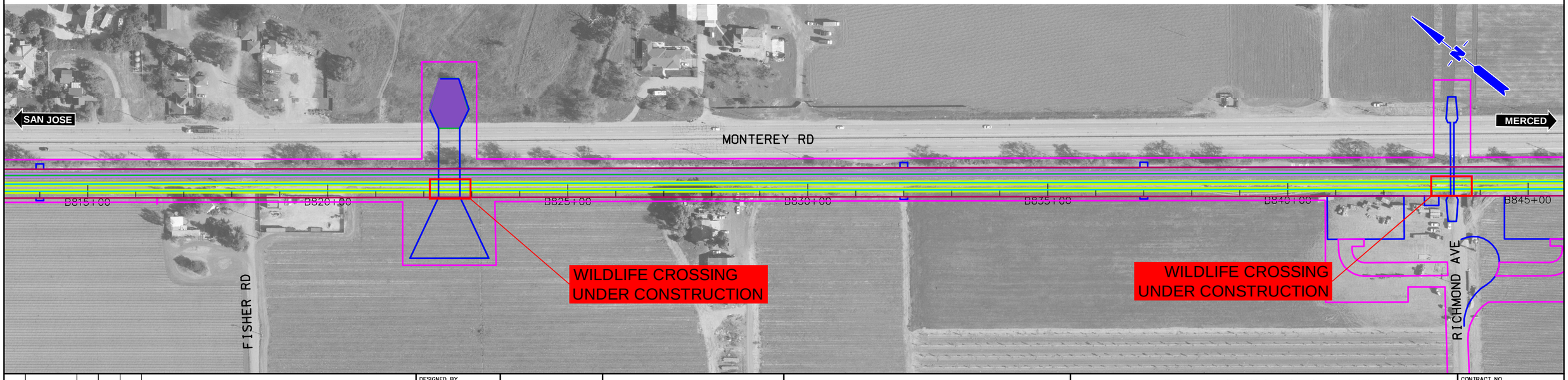
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH2-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH3-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MONTEREY RD
MERCED
B845+00 B850+00 B855+00 B860+00 B865+00 B870+00 B875+00
RICHMOND AVE
PAQUITA ESPANA CT
WILDLIFE CROSSING UNDER CONSTRUCTION

SAN JOSE
GRADE CROSSING ADAPTATION
MONTEREY RD
MERCED
B875+00 B880+00 B885+00 B890+00 B895+00 B900+00 B905+00
WILDLIFE CROSSING UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
PALM AVE
KALANA AVE

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$TIME$
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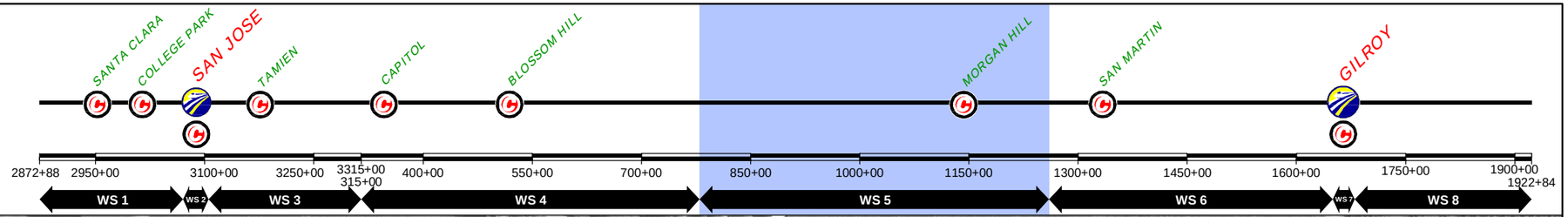
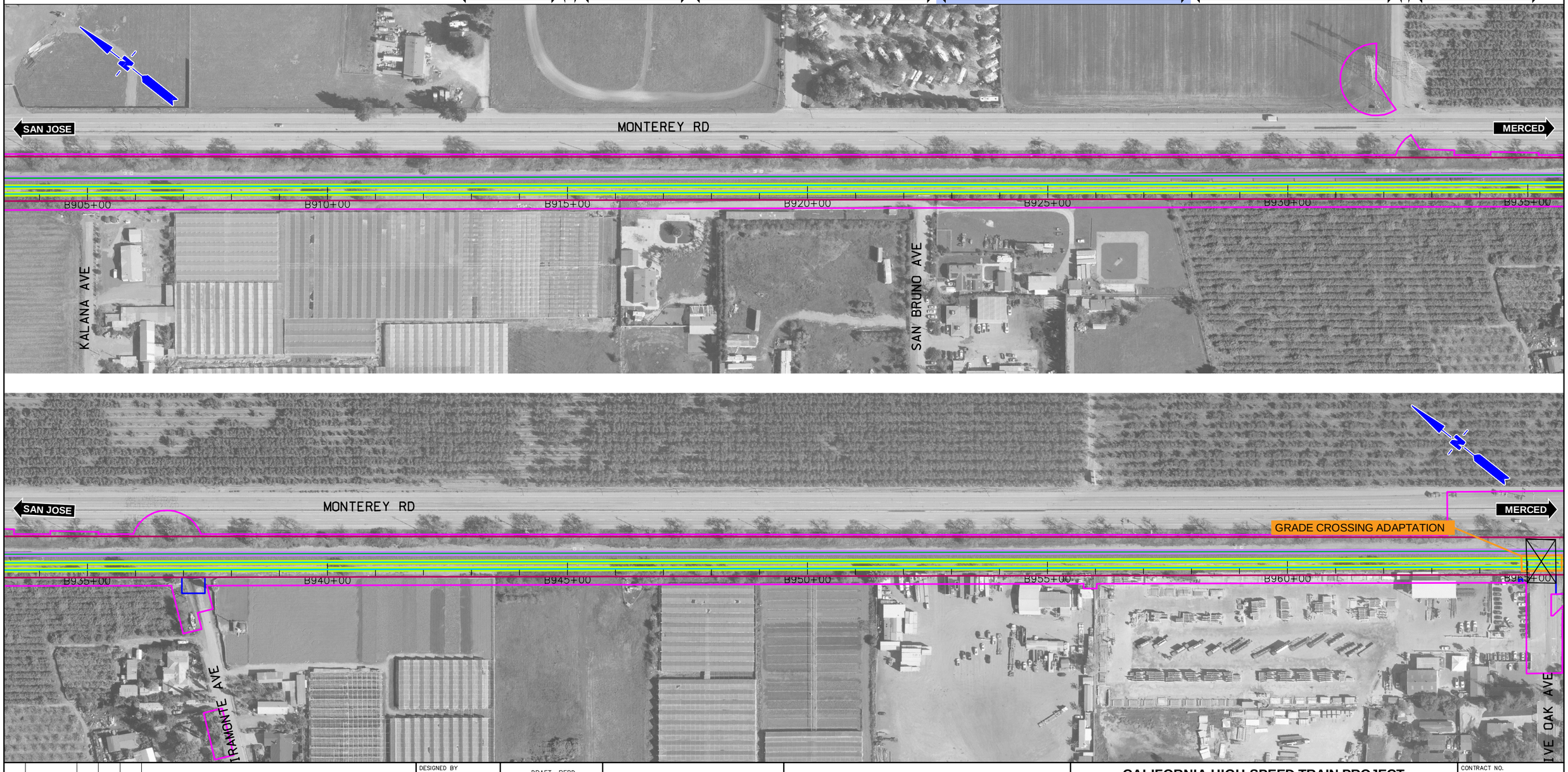
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH3-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH3-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

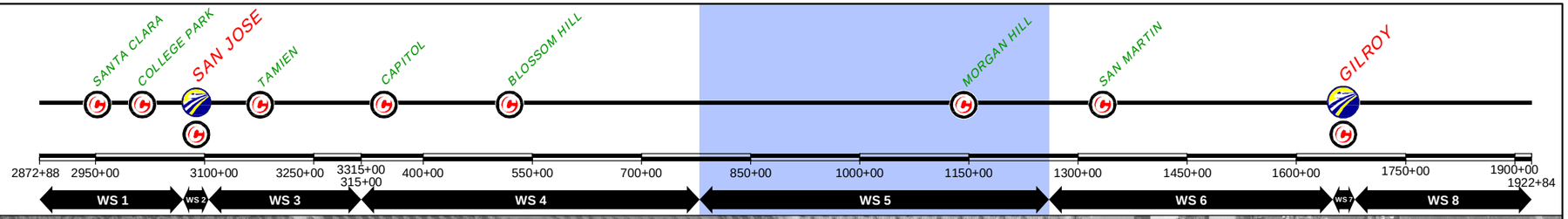
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

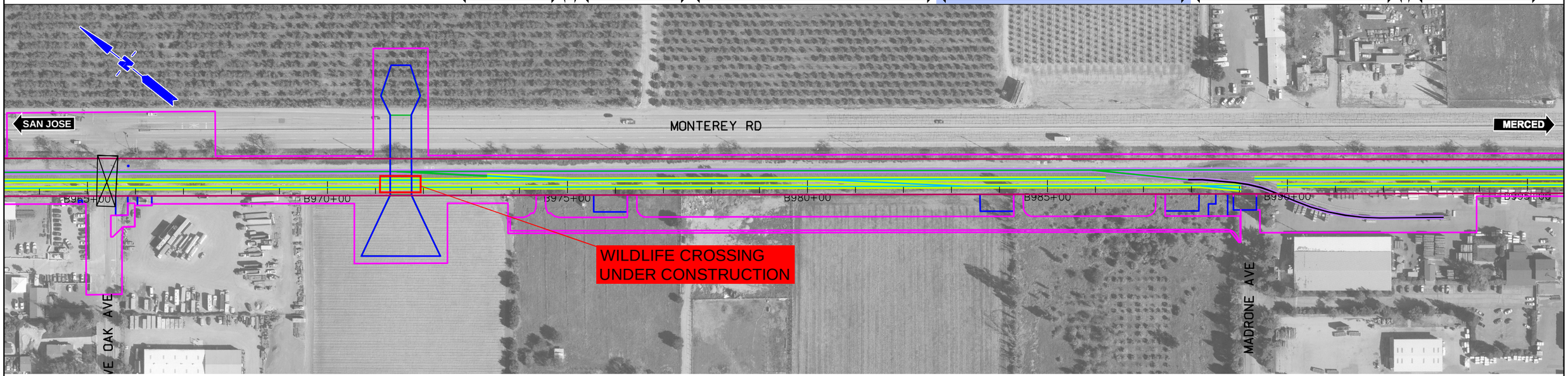
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

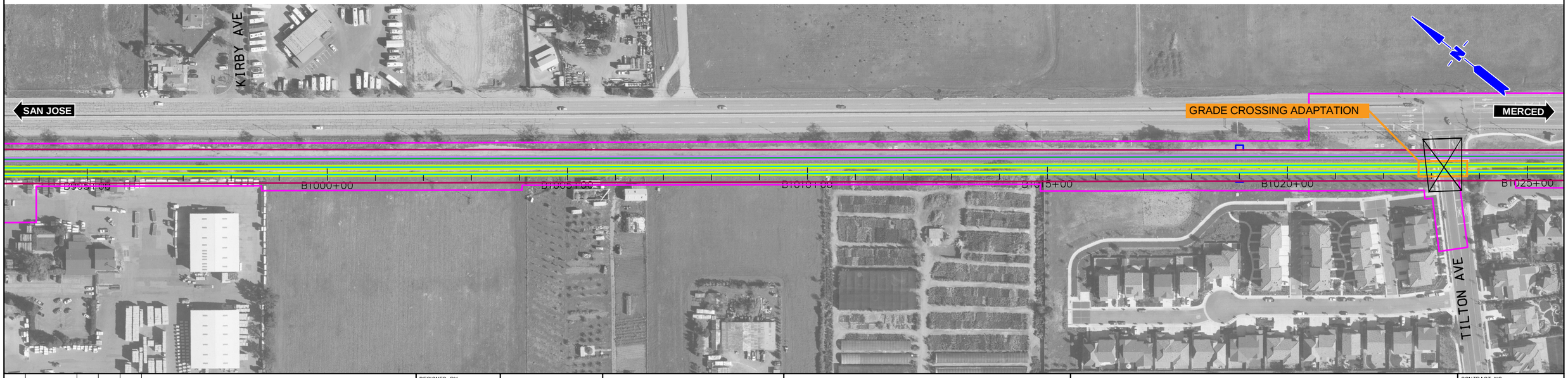
EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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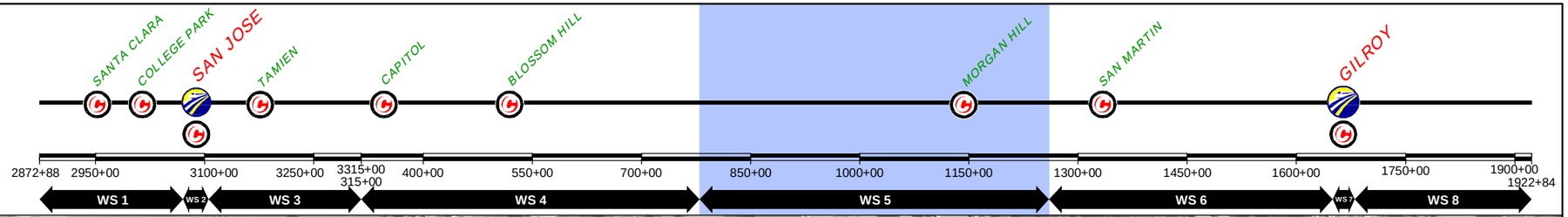
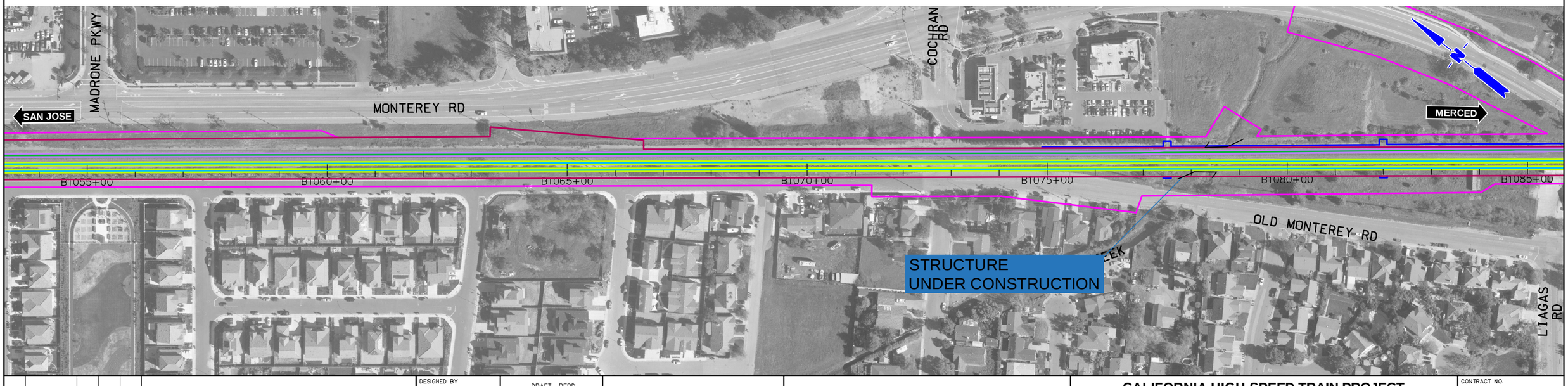
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH3-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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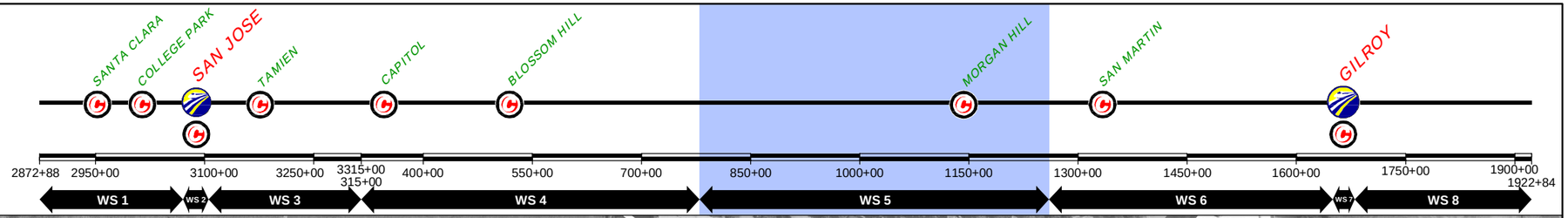
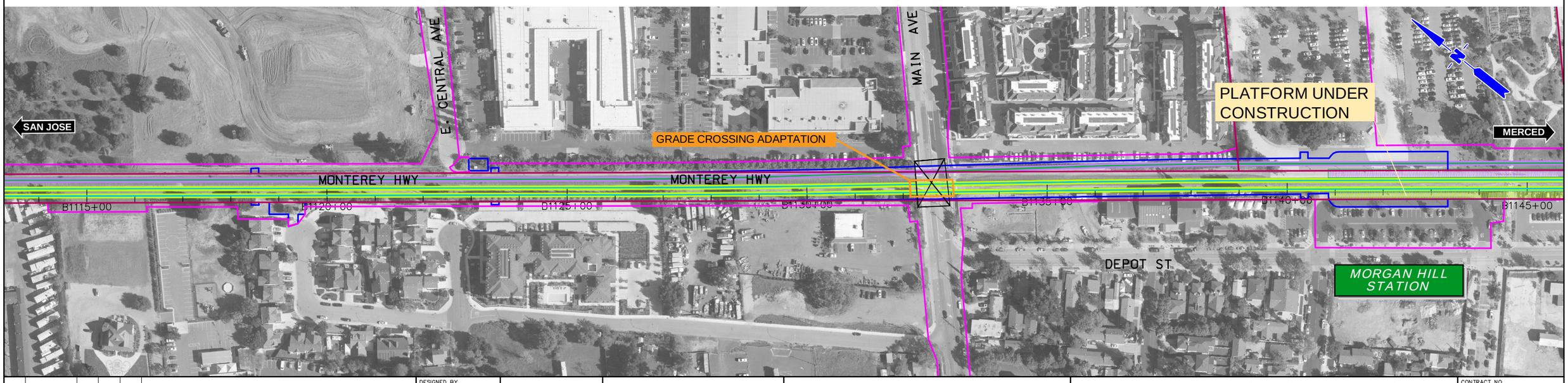
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH3-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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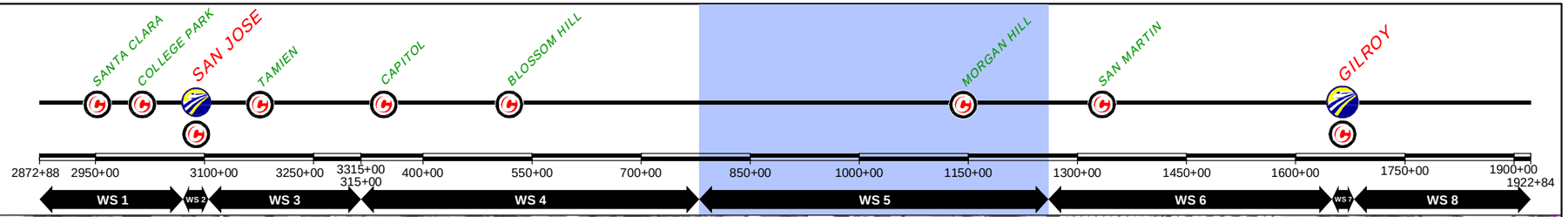
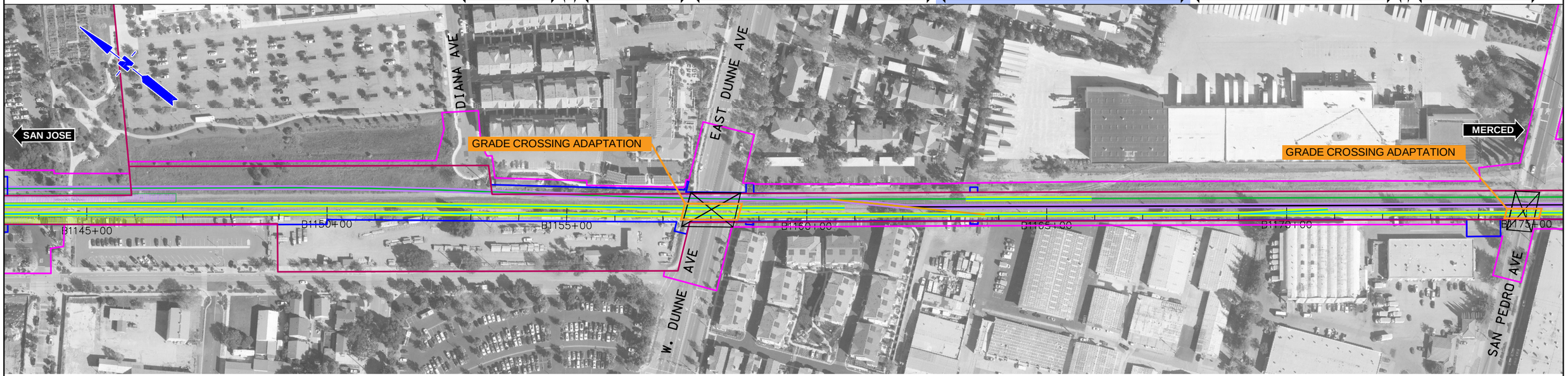
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH3-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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PHASE 3

CONTRACT NO.
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SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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TUNNEL
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SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE

GRADE CROSSING ADAPTATION

MERCED

MONTEREY HWY

MONTEREY HWY

B1205+00 B1210+00 B1215+00 B1220+00 B1225+00 B1230+00 B1235+00

TENNANT AVE

BUTTERFIELD BLVD

MAPLE AVE

SAN JOSE

MERCED

B1235+00 B1240+00 B1245+00 B1250+00 B1255+00 B1260+00 B1265+00

WEST LITTLE LLAGAS CREEK

STRUCTURE UNDER CONSTRUCTION

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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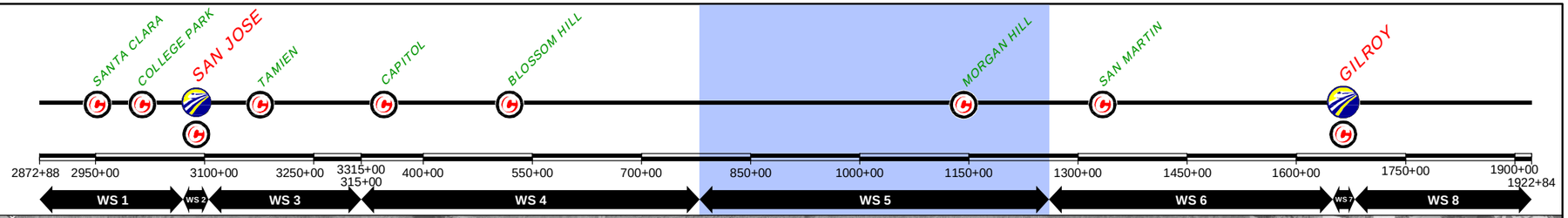
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH3-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$TIME$
$DATE$
$USER$

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CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

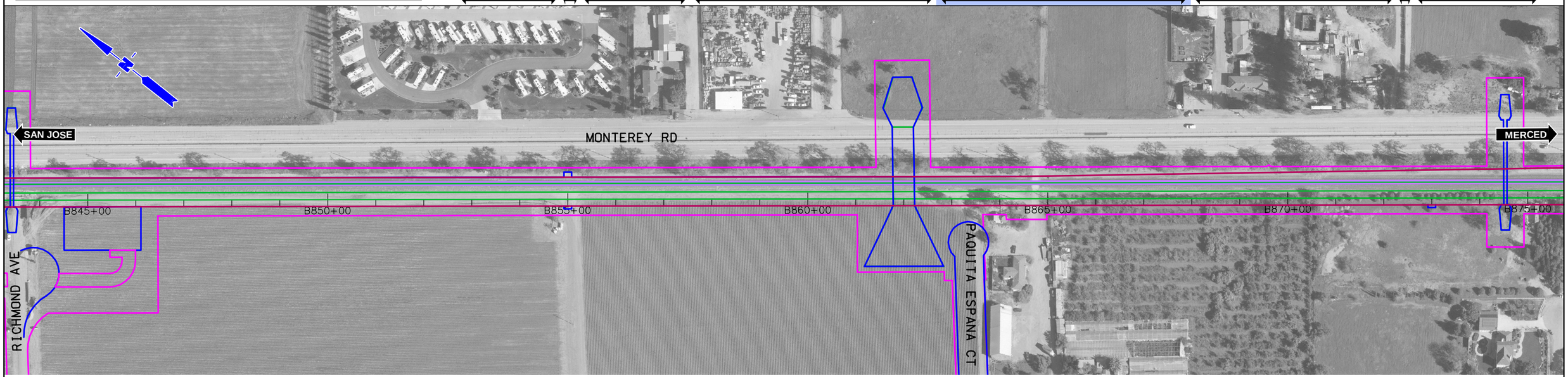
CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8



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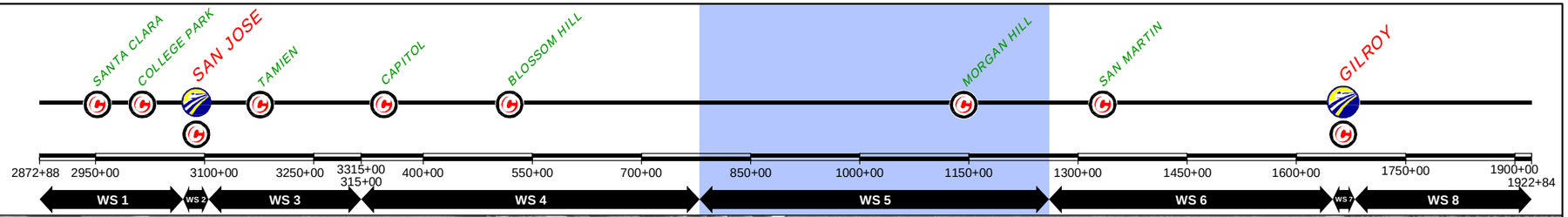
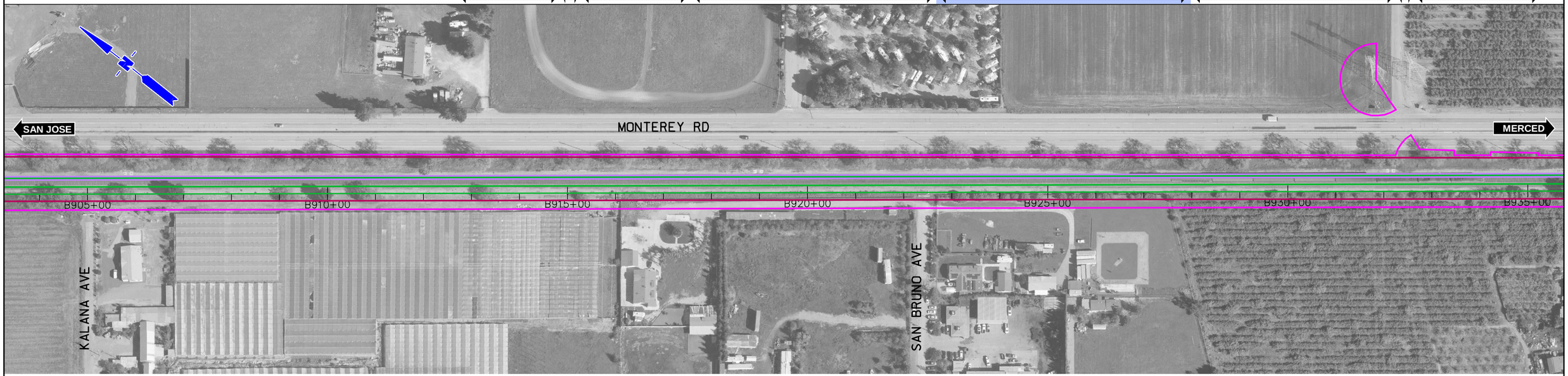
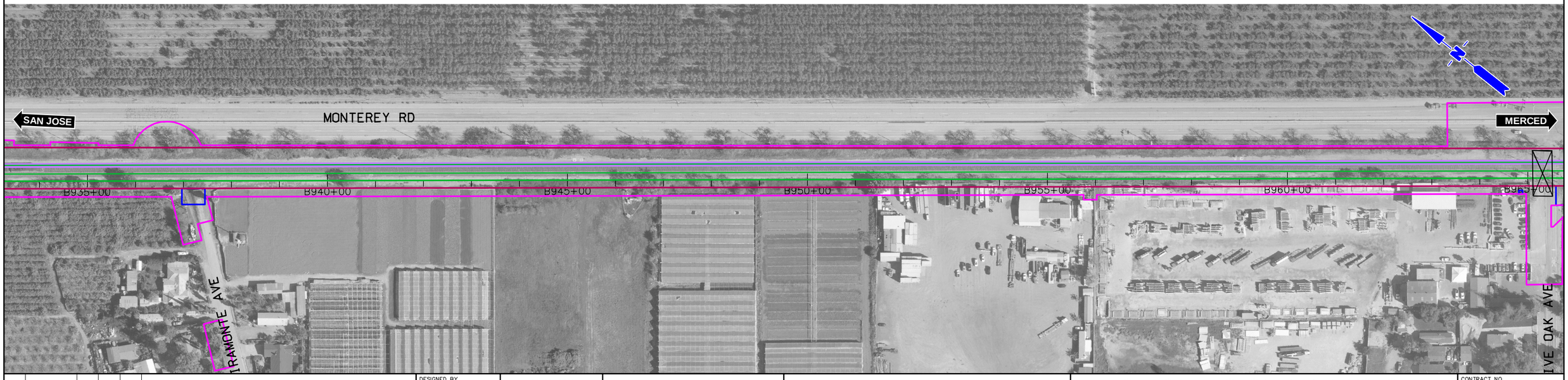
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

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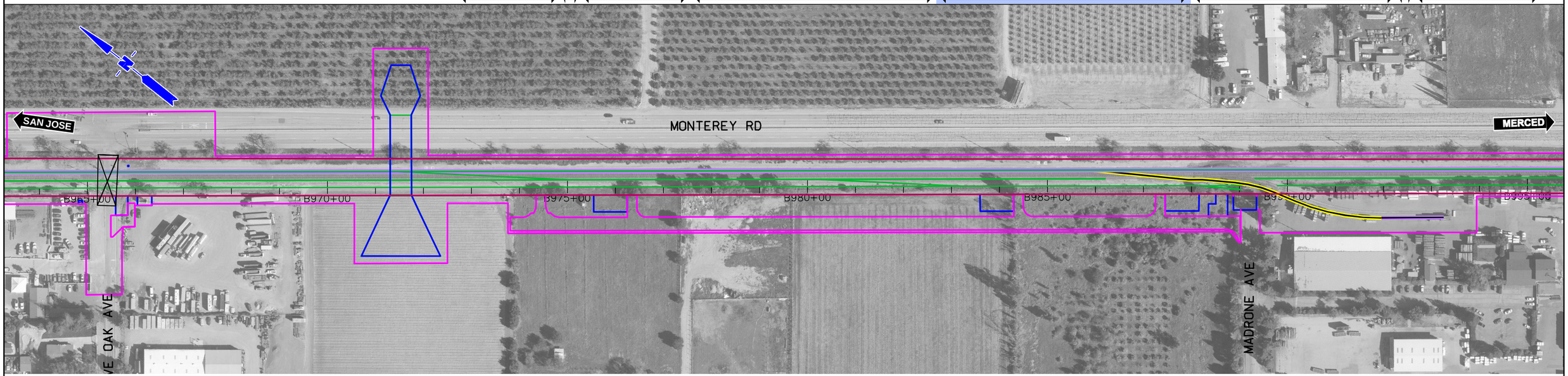
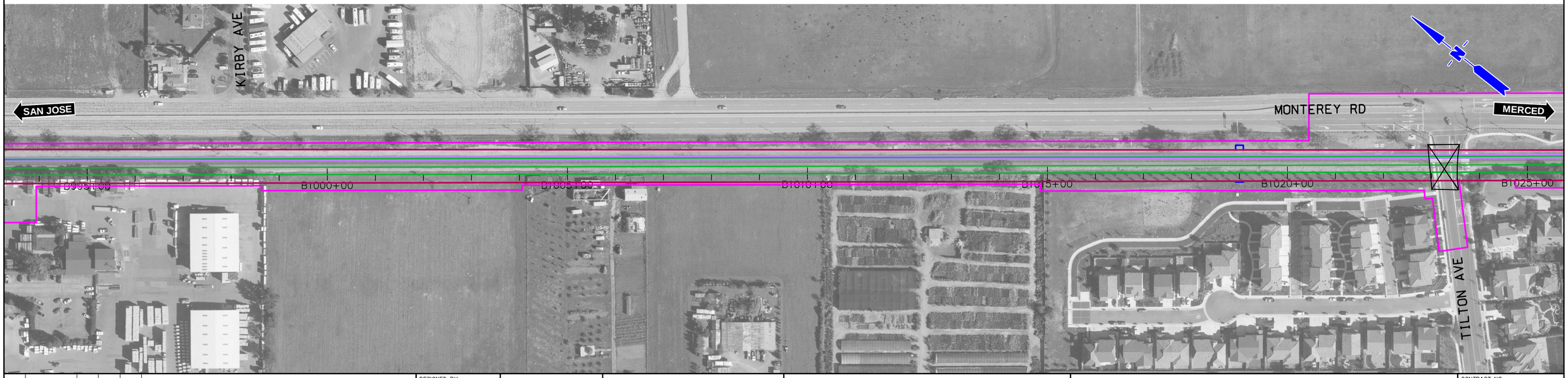
WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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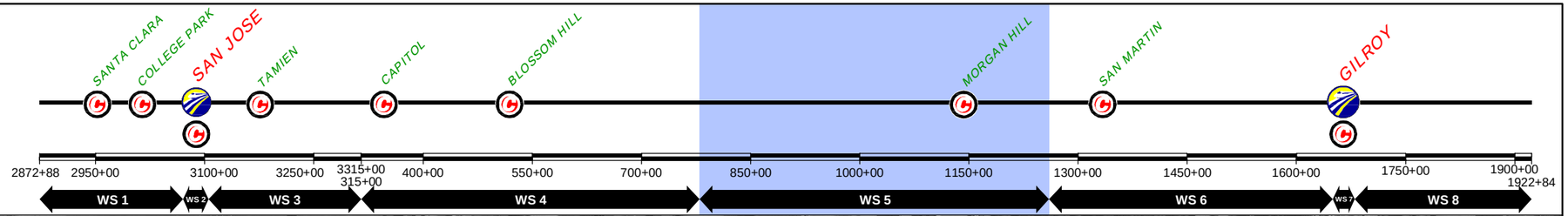
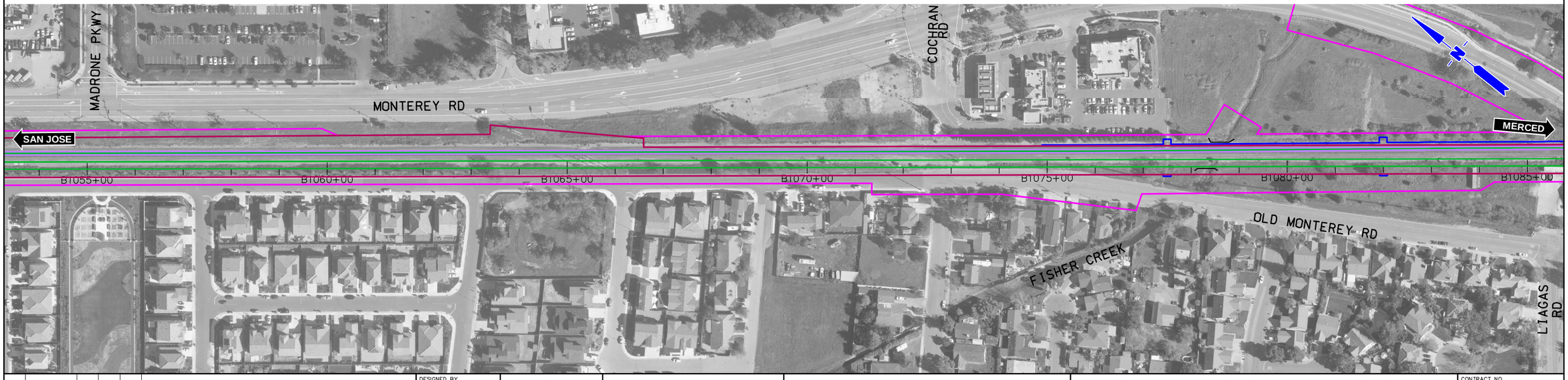
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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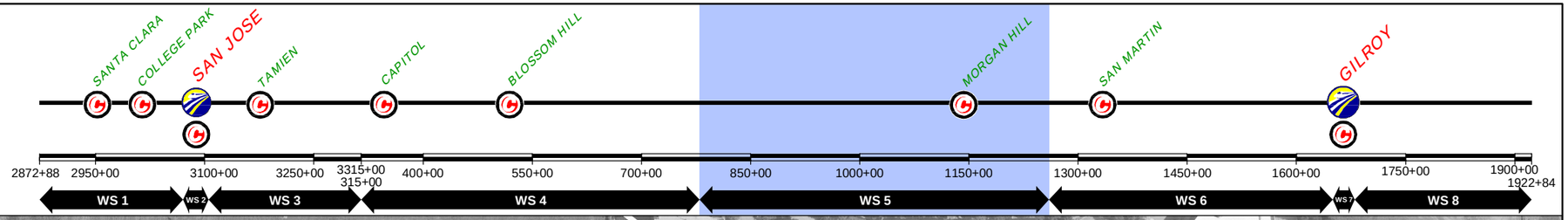
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED

785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

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785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
MONTEREY HWY
MONTEREY HWY
B1205+00 B1210+00 B1215+00 B1220+00 B1225+00 B1230+00 B1235+00
TENNANT AVE
BUTTERFIELD BLVD
MAPLE AVE
SAN JOSE
MERCED
B1235+00 B1240+00 B1245+00 B1250+00 B1255+00 B1260+00 B1265+00
WEST LITTLE LLAGAS CREEK

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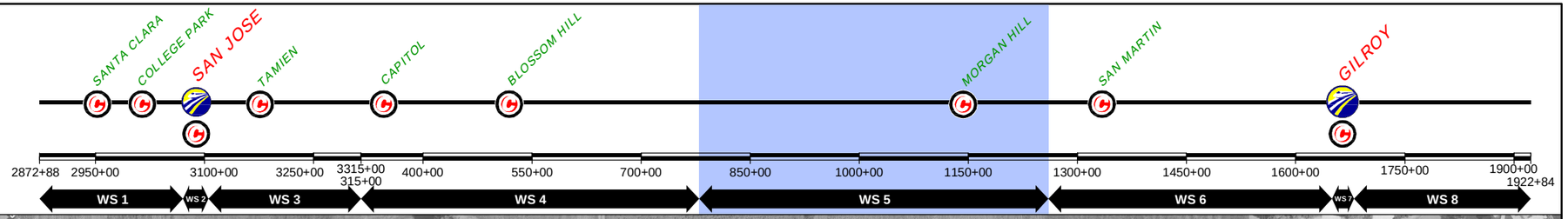
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH4-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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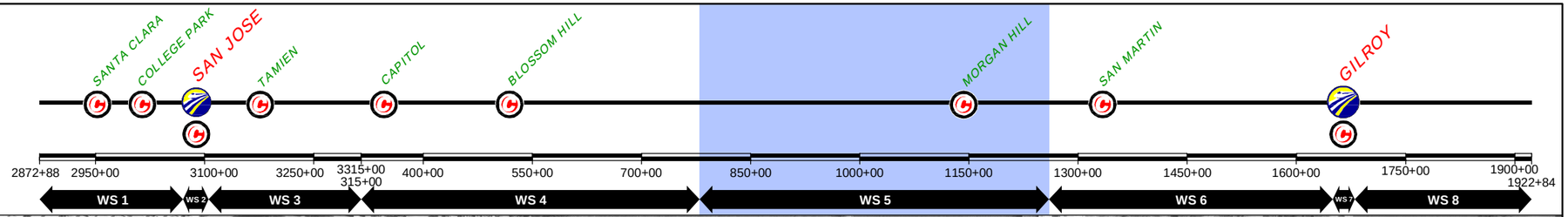
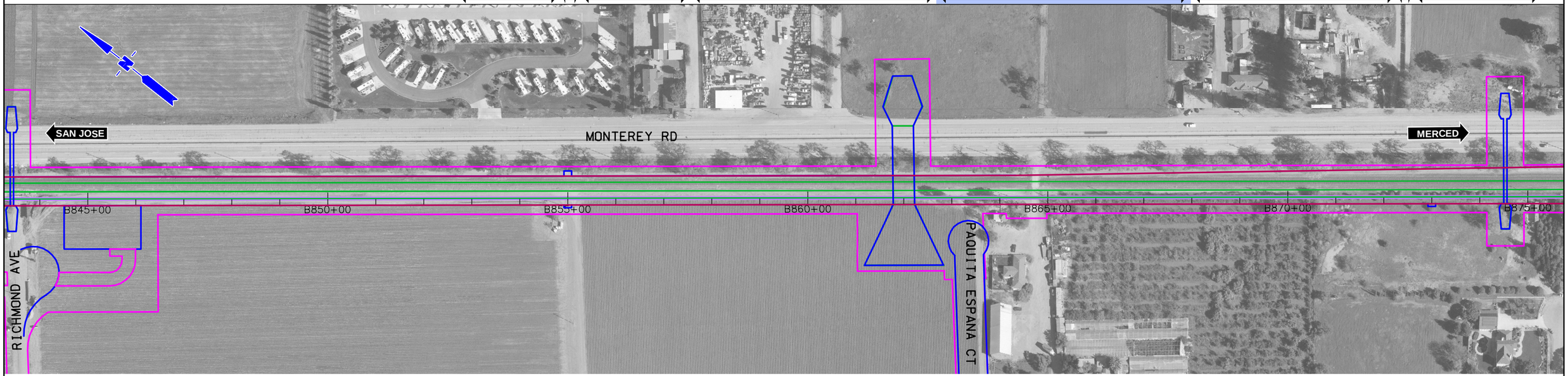
CALIFORNIA HIGH-SPEED TRAIN PROJECT

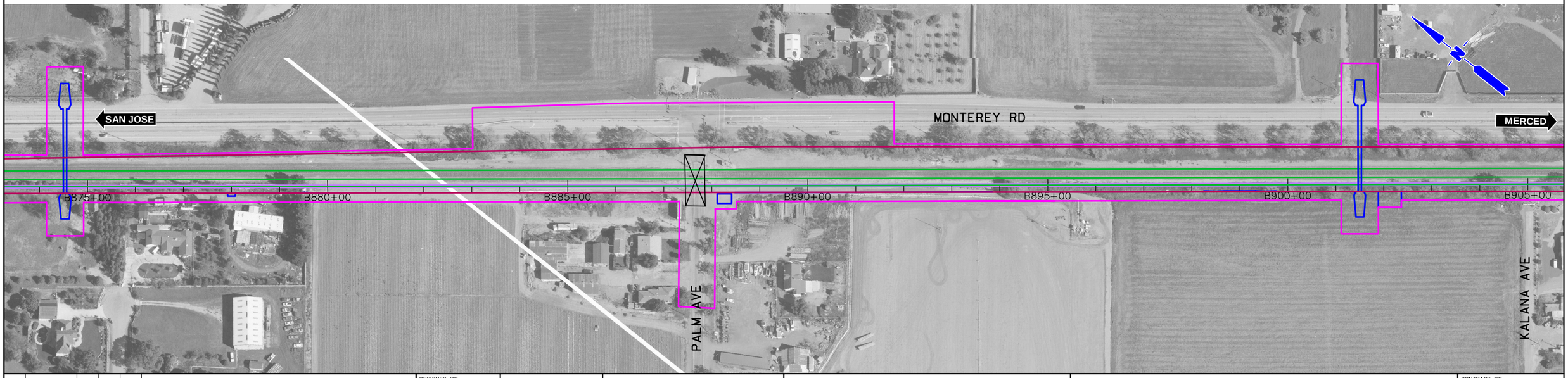
SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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GRADE CROSSING
TUNNEL
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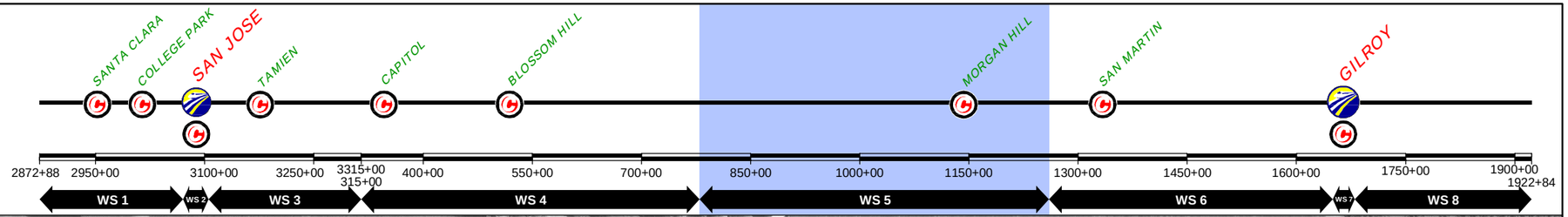

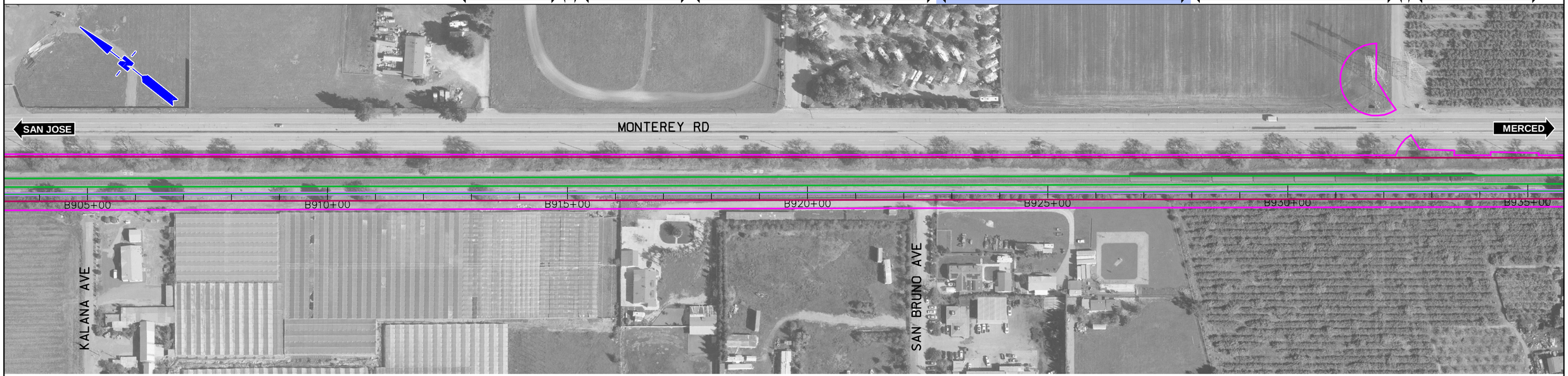

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SAN JOSE TO MERCED
785+00 TO GILROY TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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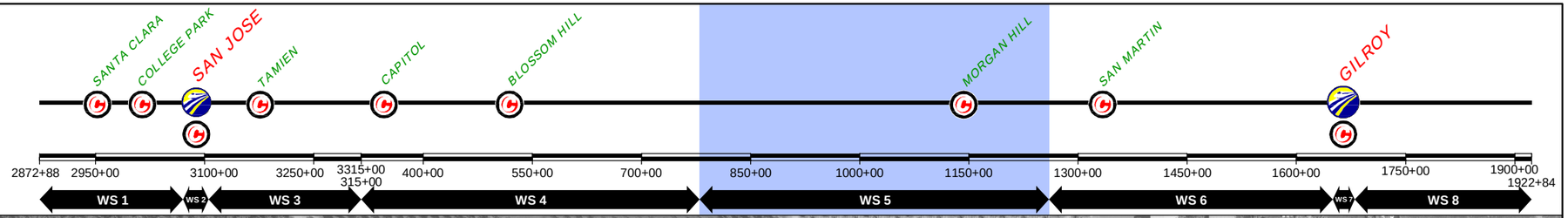
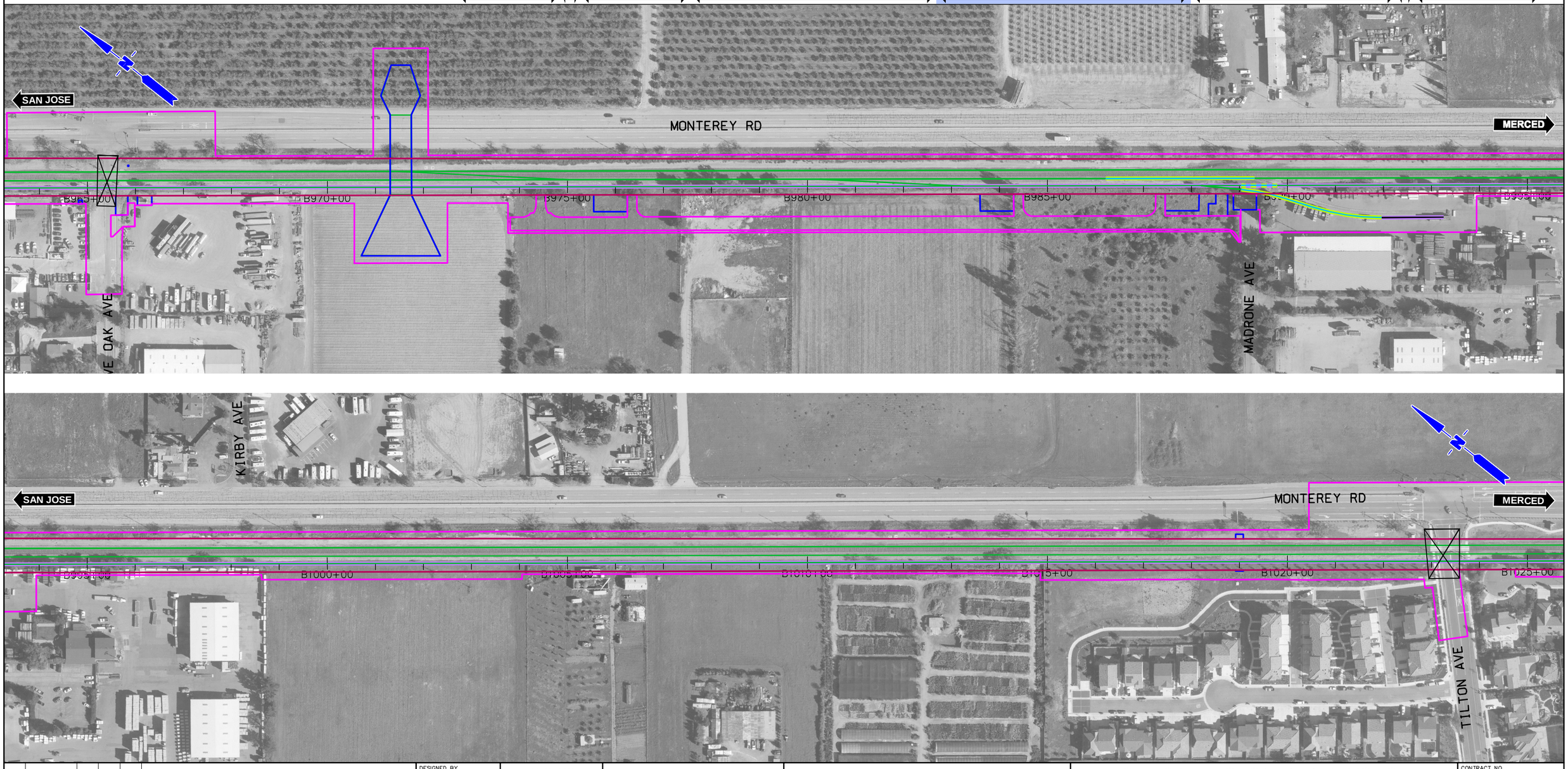
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED
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CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
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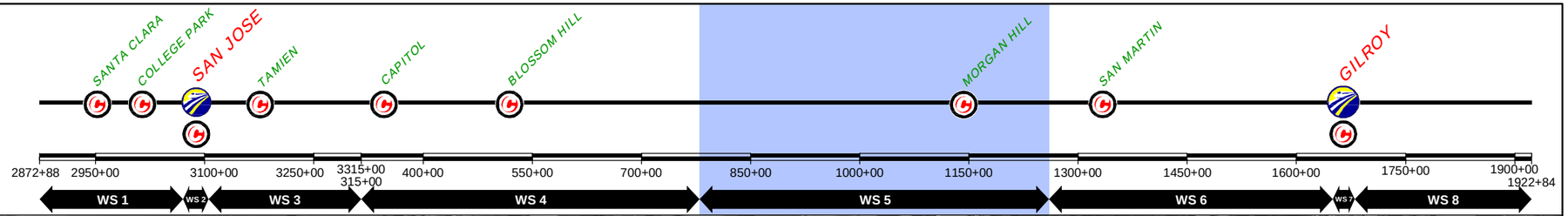
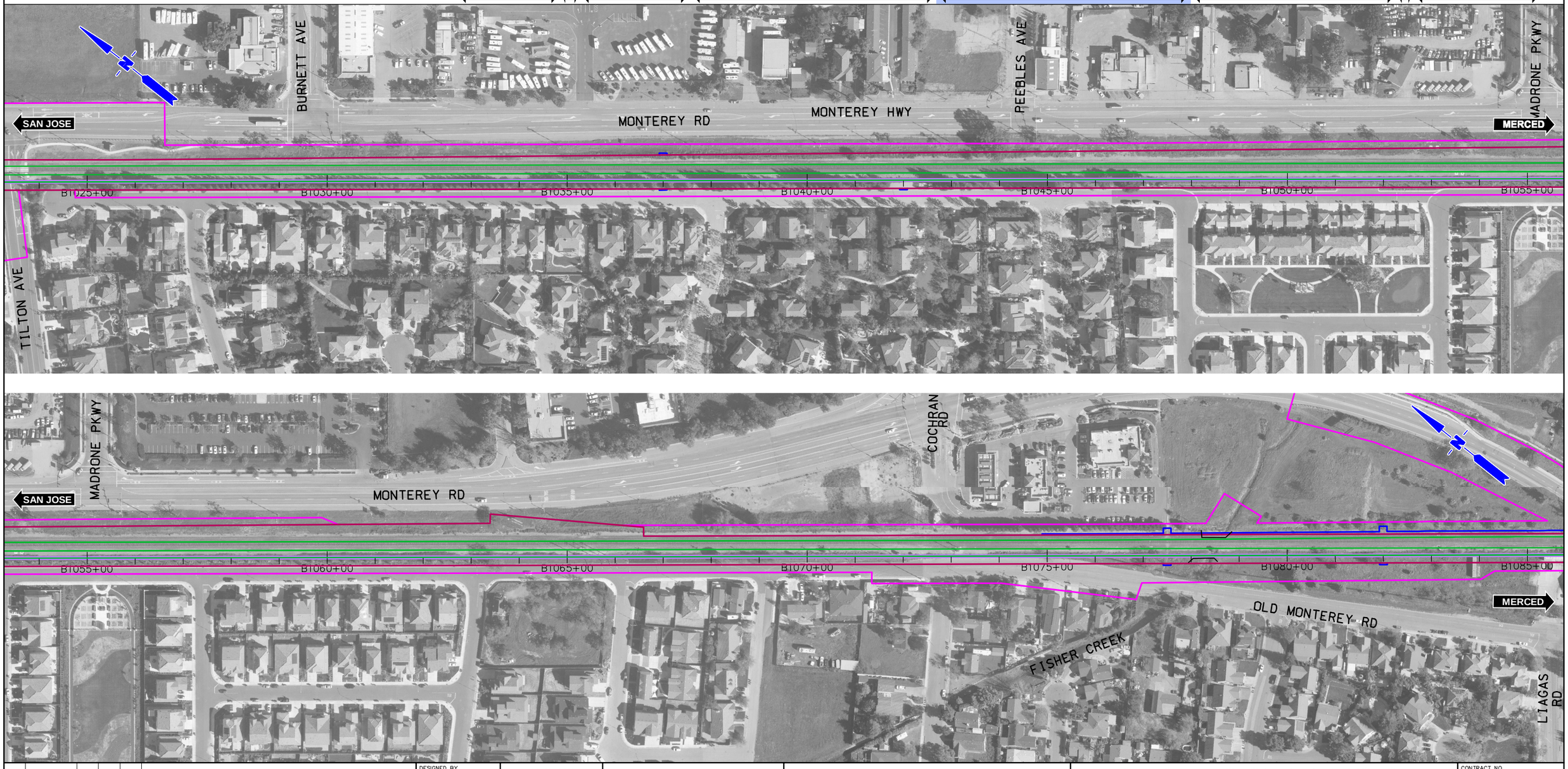
TUNNEL
CREEK UNDERPASS





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CALIFORNIA High-Speed Rail Authority

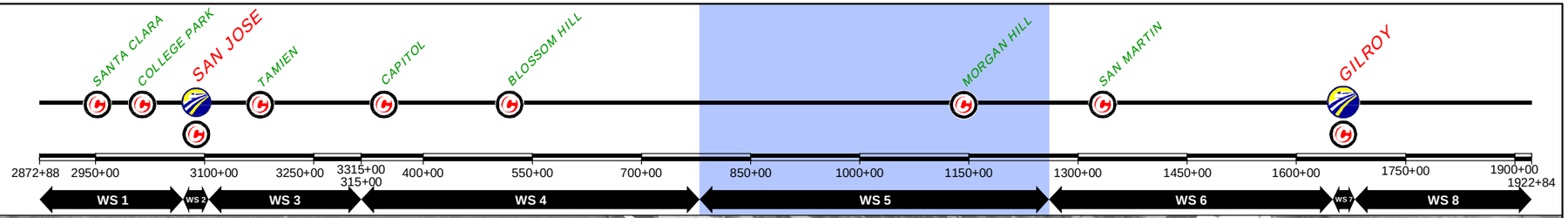
CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED

785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-05
SCALE 1" = 200'
SHEET NO. 5 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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785+00 TO GILROY STATION TO 1265+00
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

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PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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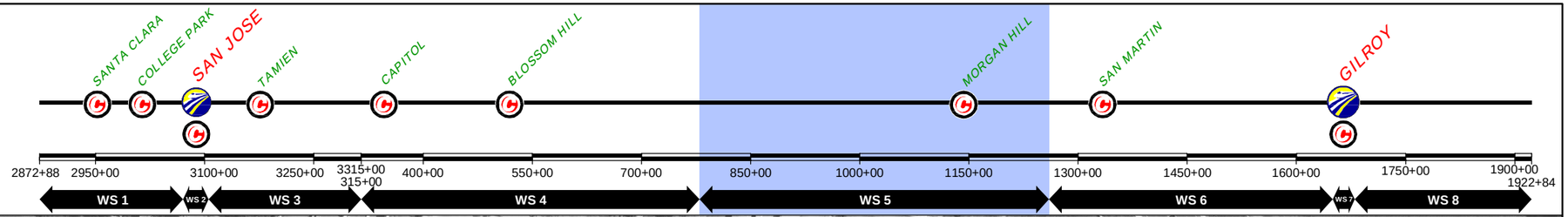
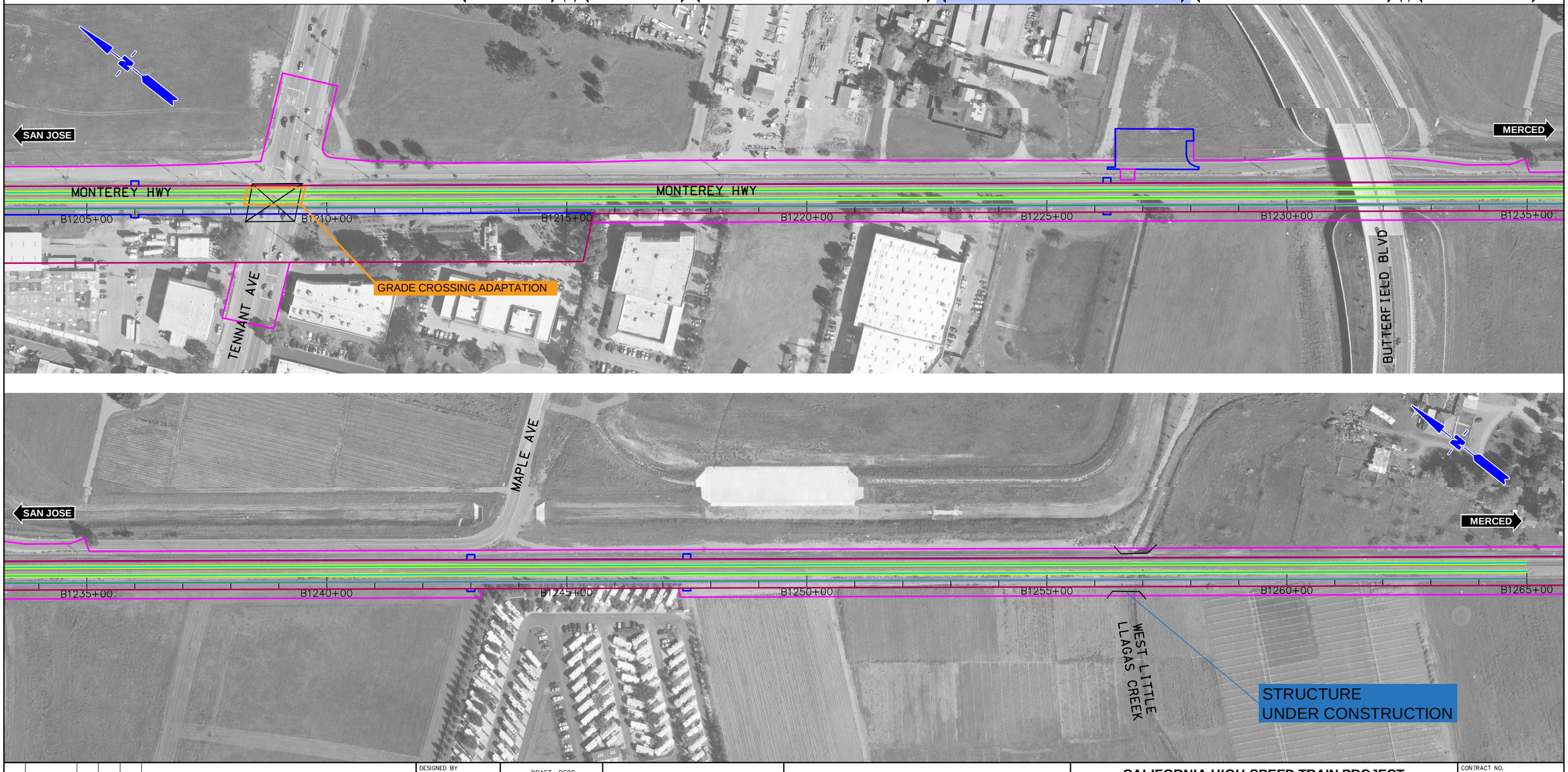
CREEK UNDERPASS





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CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH5-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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PROPOSED TCE
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GRADE CROSSING
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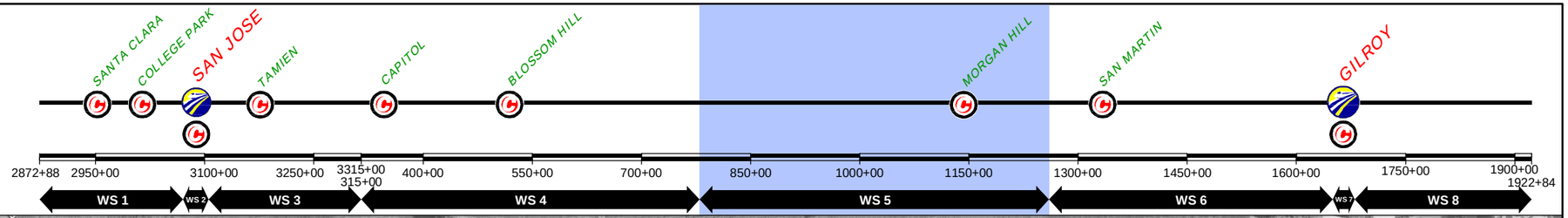

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CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH6-01
SCALE 1" = 200'
SHEET NO. 1 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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MAJOR UNDERPASS
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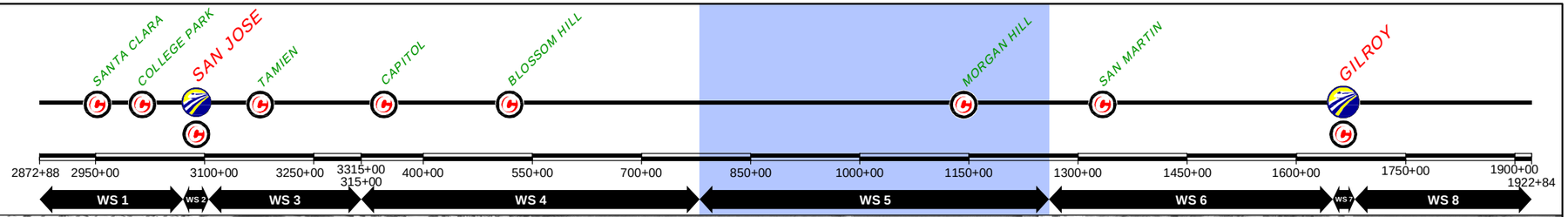
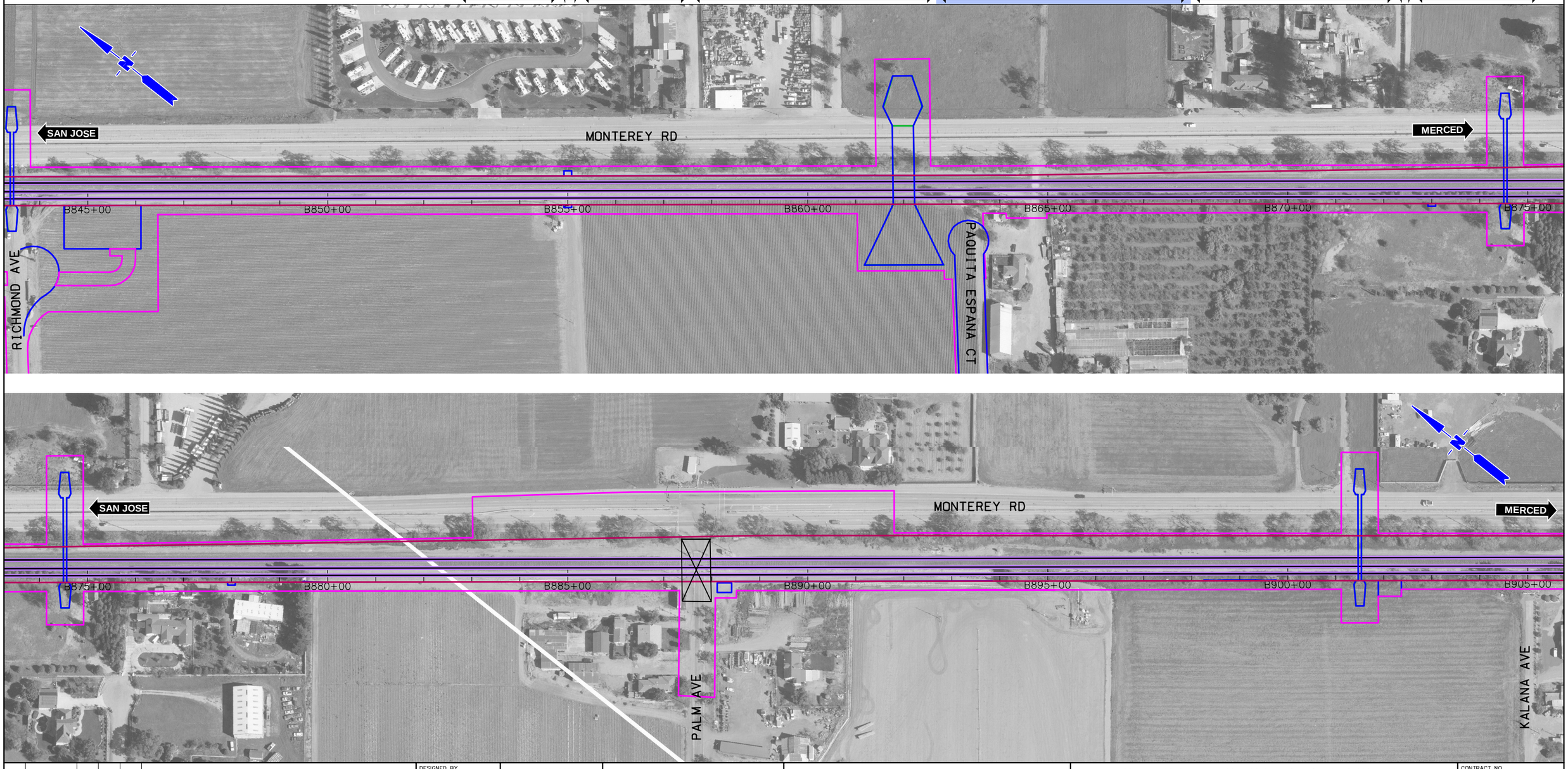
TUNNEL
CREEK UNDERPASS





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PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH6-02
SCALE 1" = 200'
SHEET NO. 2 OF 8

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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TUNNEL
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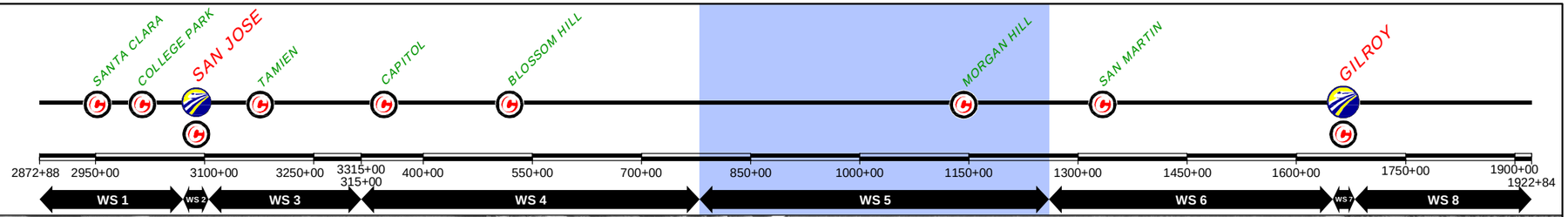

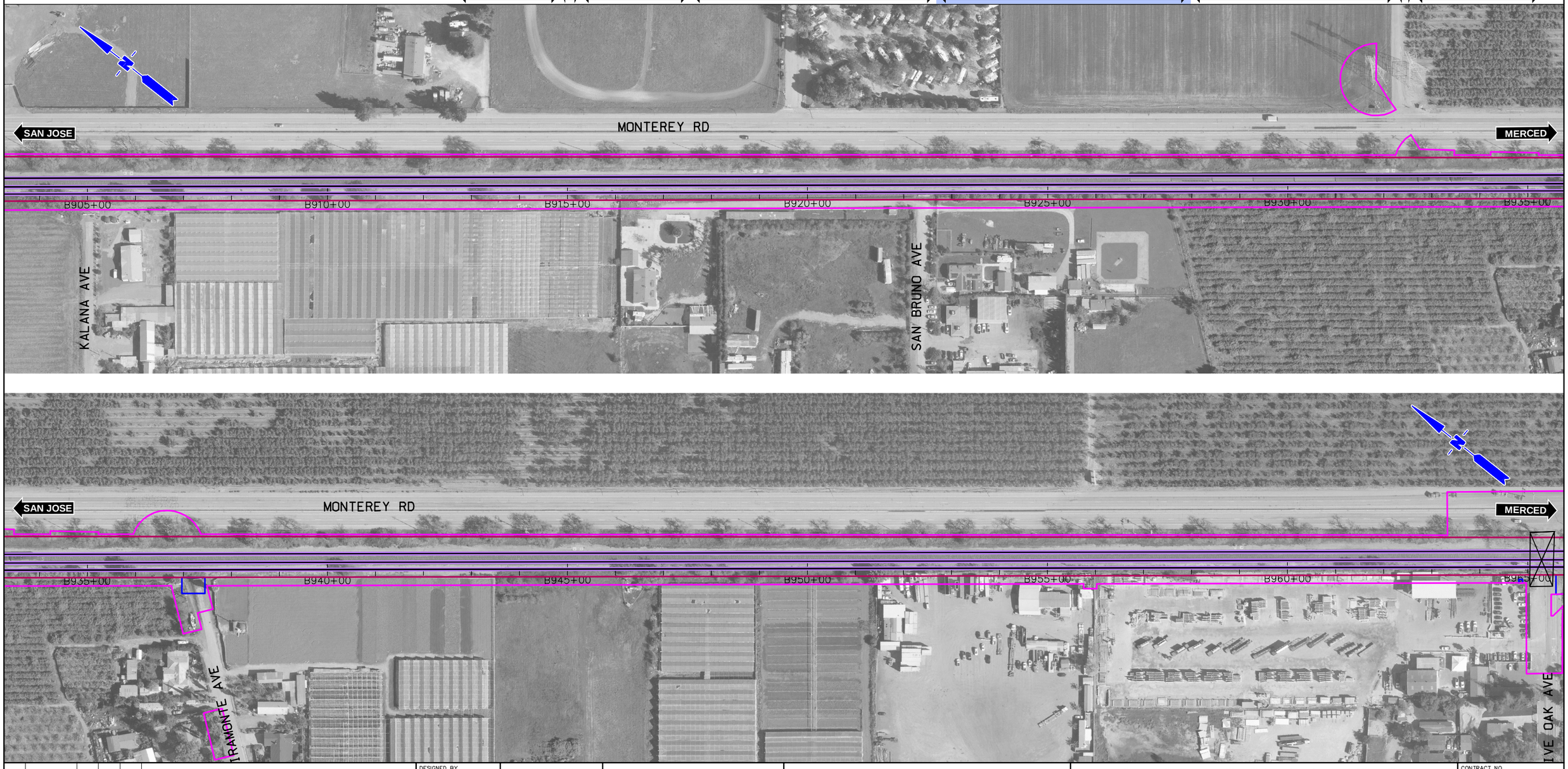

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PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH6-03
SCALE 1" = 200'
SHEET NO. 3 OF 8

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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GRADE CROSSING
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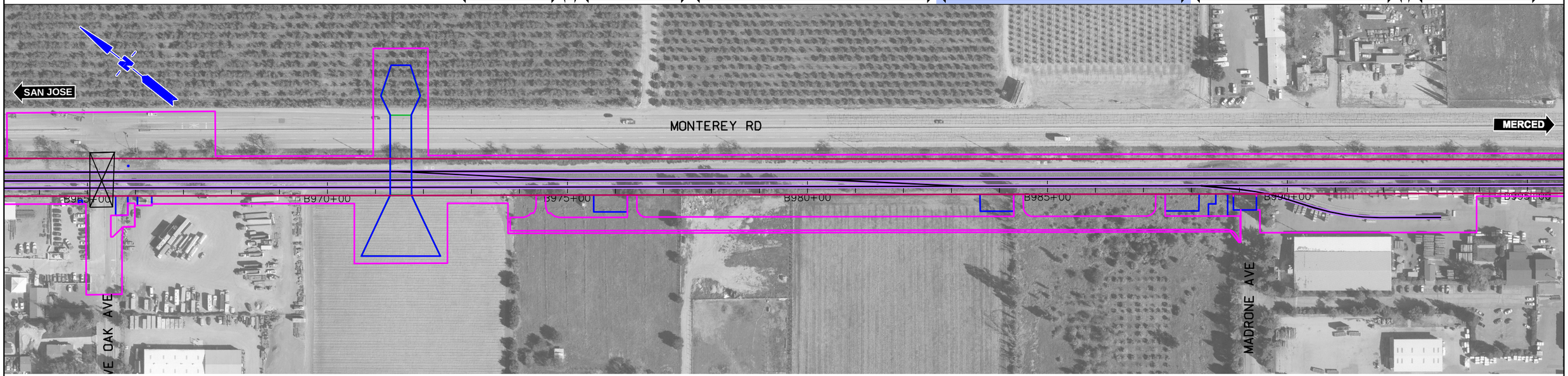
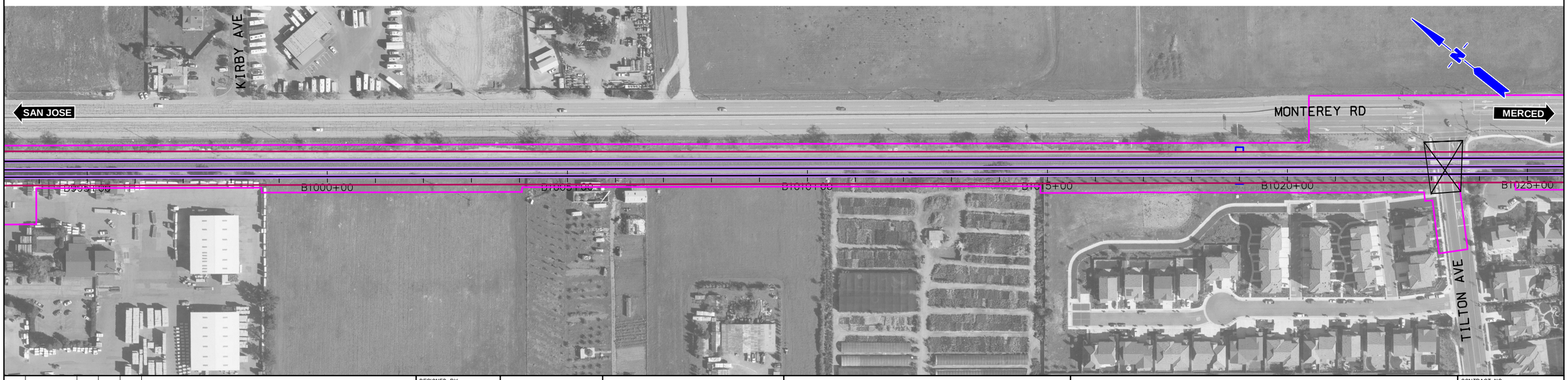
WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH6-04
SCALE 1" = 200'
SHEET NO. 4 OF 8

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$DATE$
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CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
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SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

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PHASE 6

CONTRACT NO.
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SCALE 1" = 200'
SHEET NO. 5 OF 8

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
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UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
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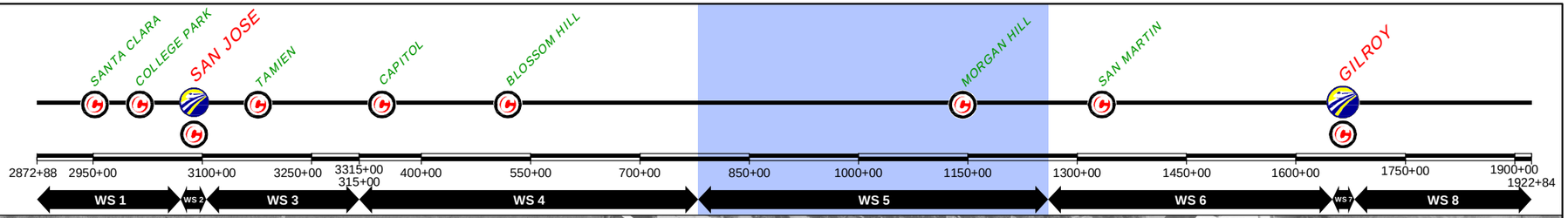
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH6-06
SCALE 1" = 200'
SHEET NO. 6 OF 8

CURRENT TRACK
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UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
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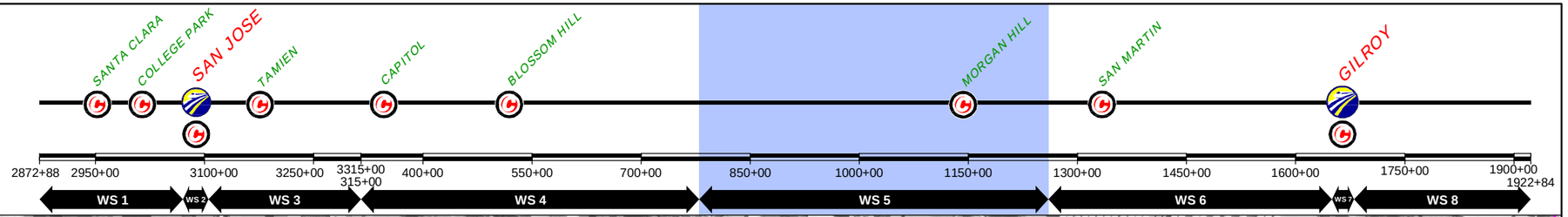

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PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH6-07
SCALE 1" = 200'
SHEET NO. 7 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
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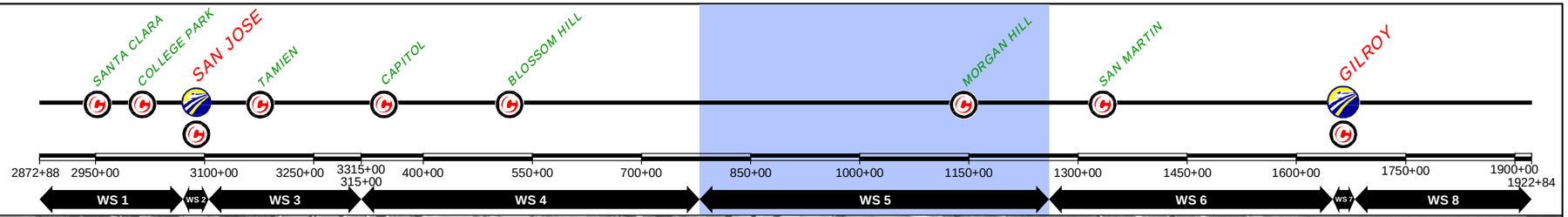

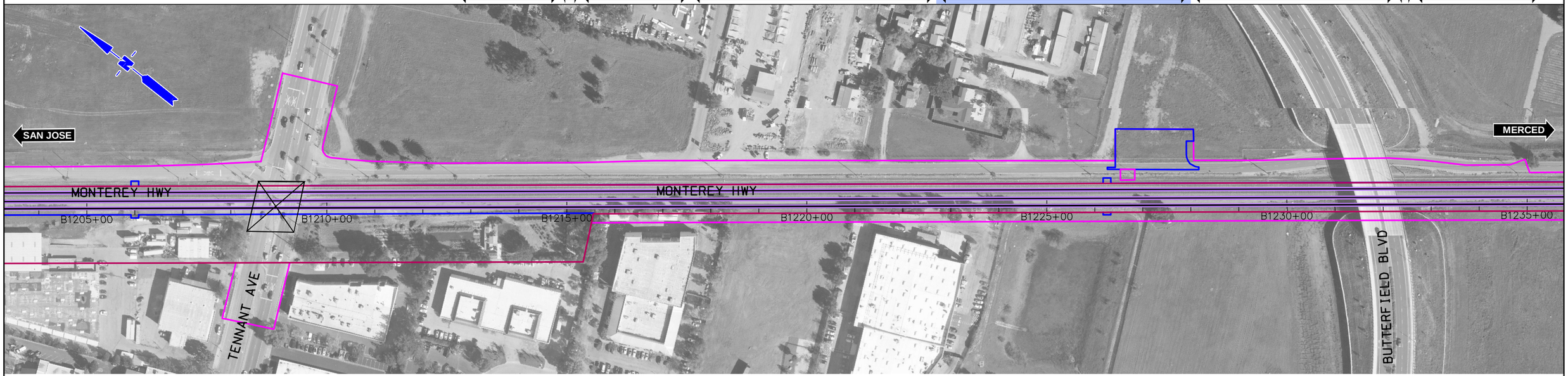

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SAN JOSE TO MERCED

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PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS5-PH6-08
SCALE 1" = 200'
SHEET NO. 8 OF 8

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
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OVERHEAD BRIDGE
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TUNNEL
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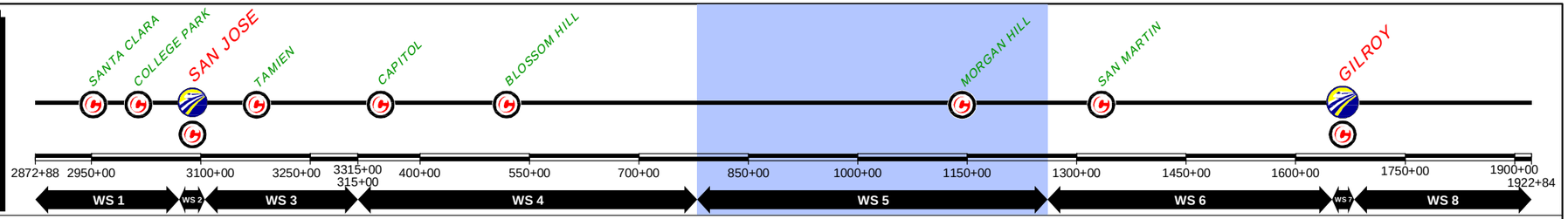

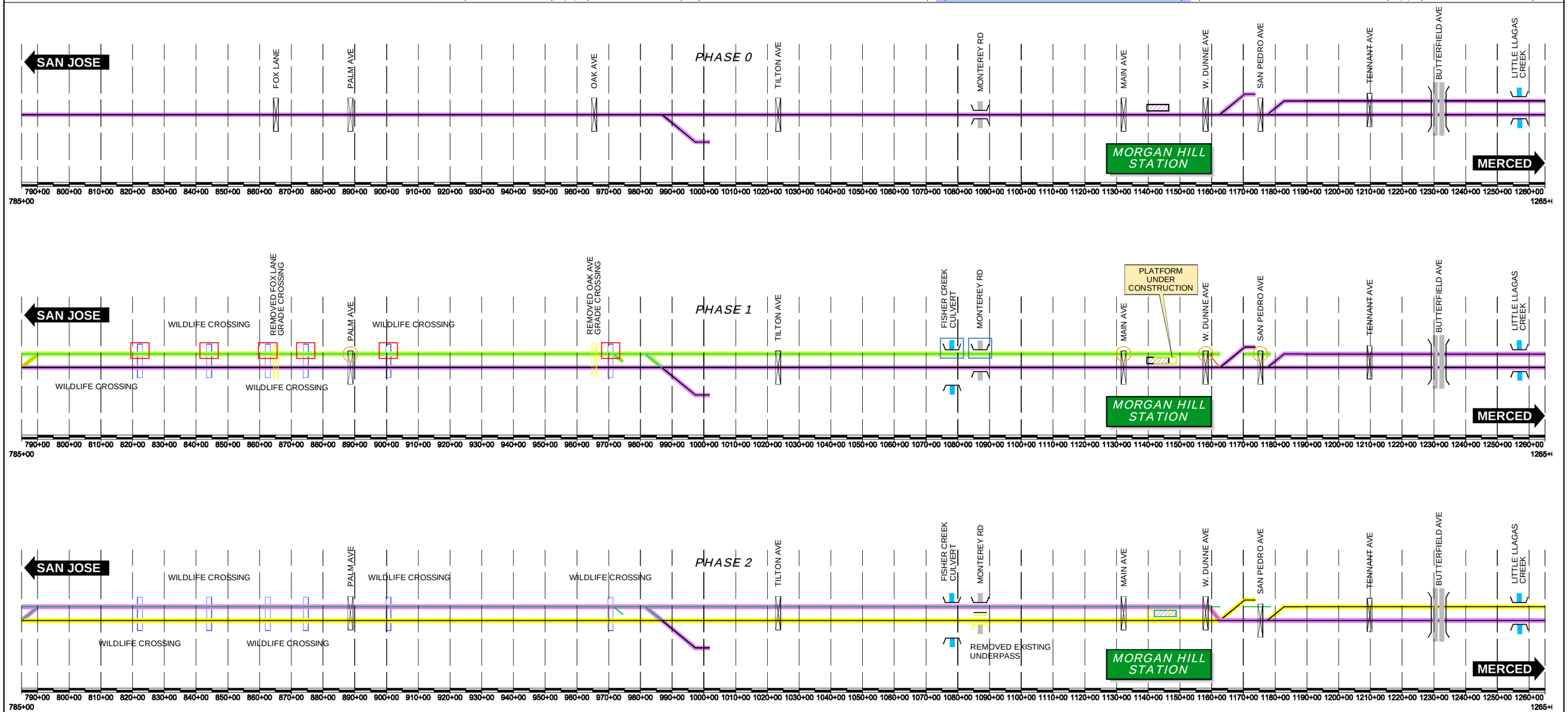

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SAN JOSE TO MERCED
785+00 TO 1265+00
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS5-SCH-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 3

CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
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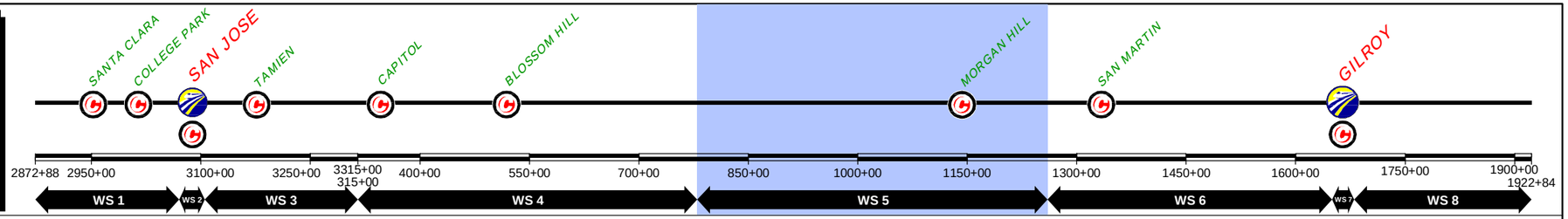
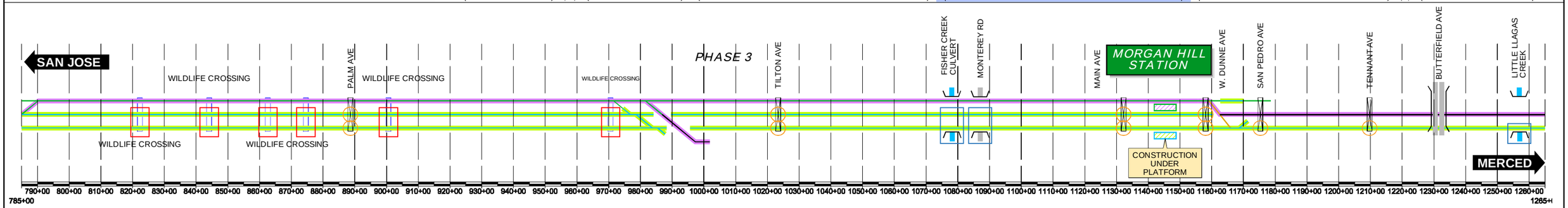
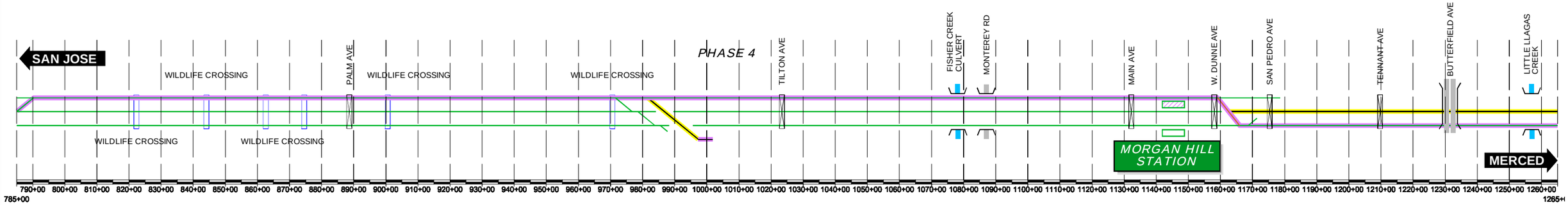
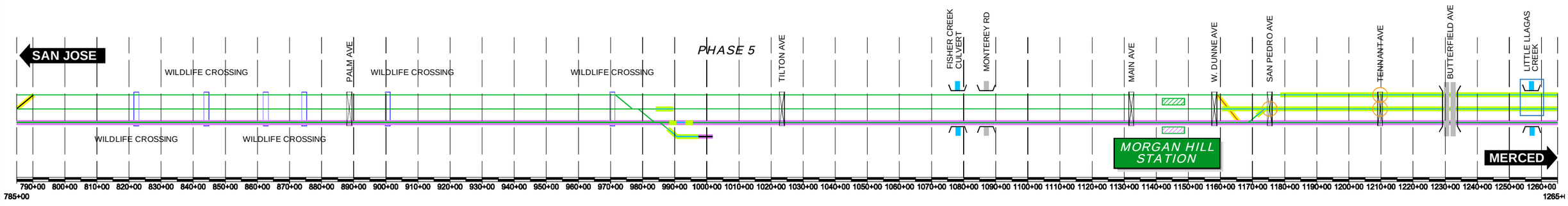
TUNNEL
CREEK UNDERPASS









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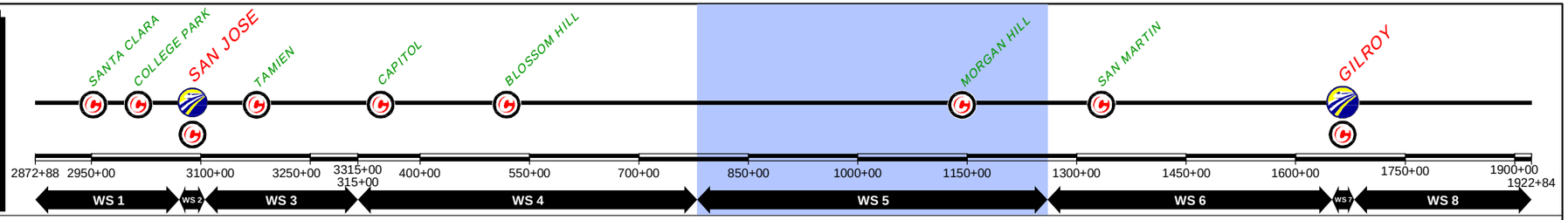
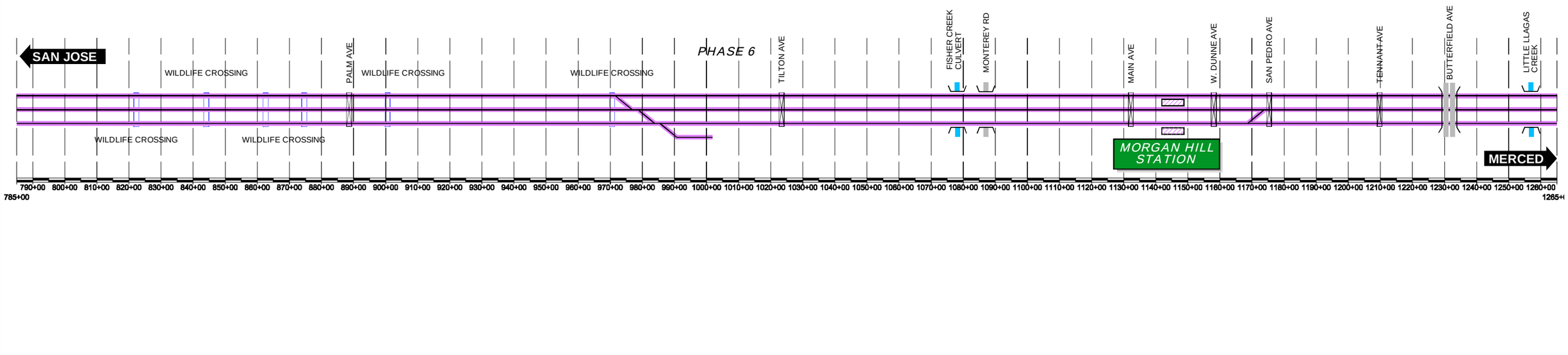
SAN JOSE TO MERCED
785+00 TO 1265+00
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS5-SCH-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 3

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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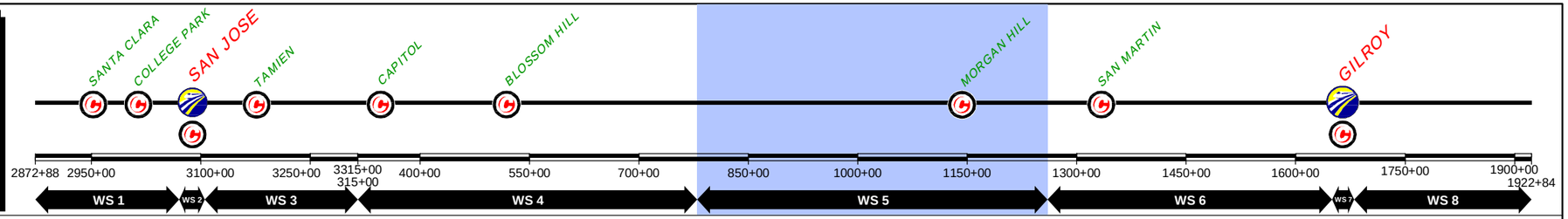
CALIFORNIA High-Speed Rail Authority

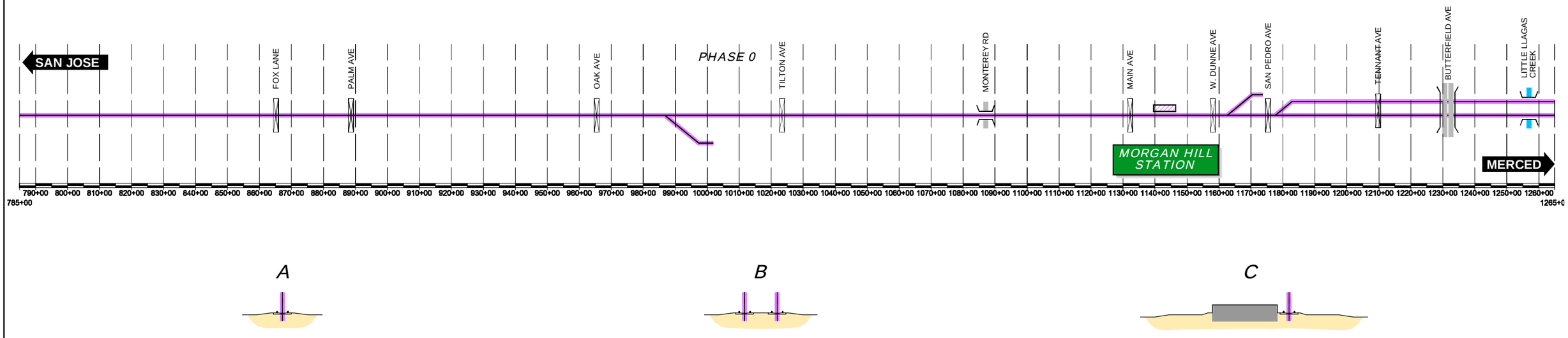
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
785+00 TO 1265+00
CONSTRUCTION PHASES
SCHEME

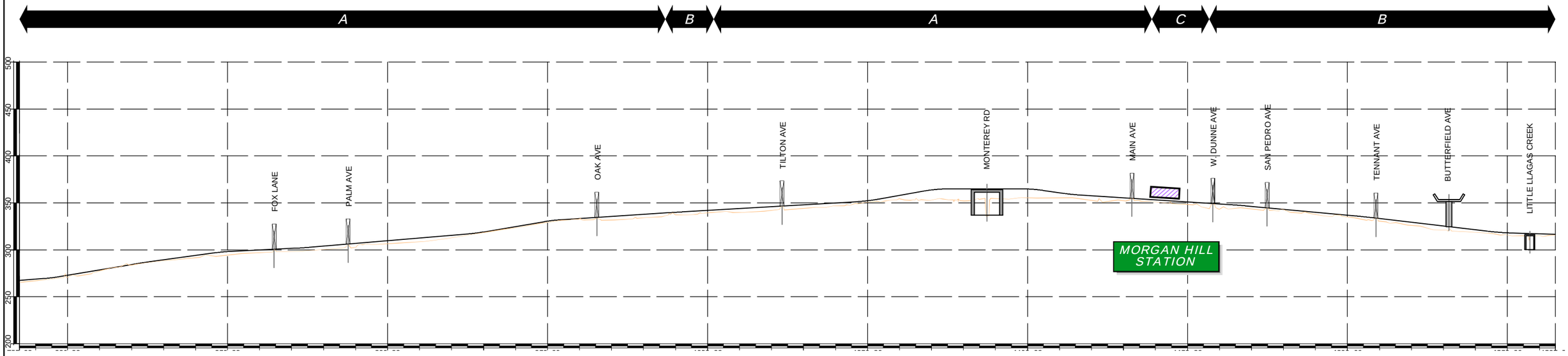
CONTRACT NO.
DRAWING NO. CV-I6WS5-SCH-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 3

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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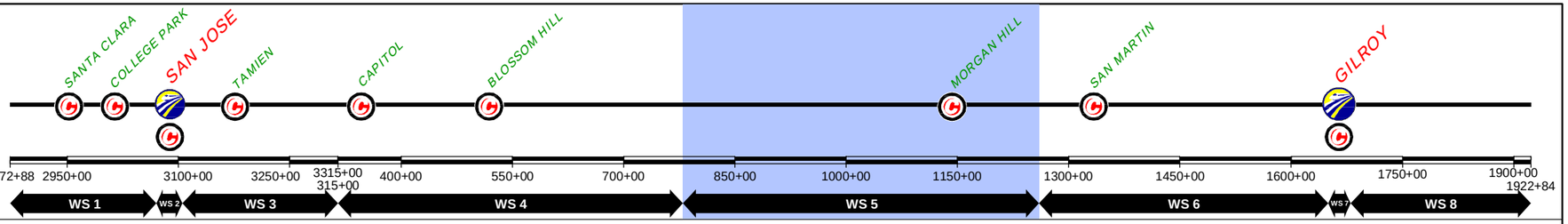
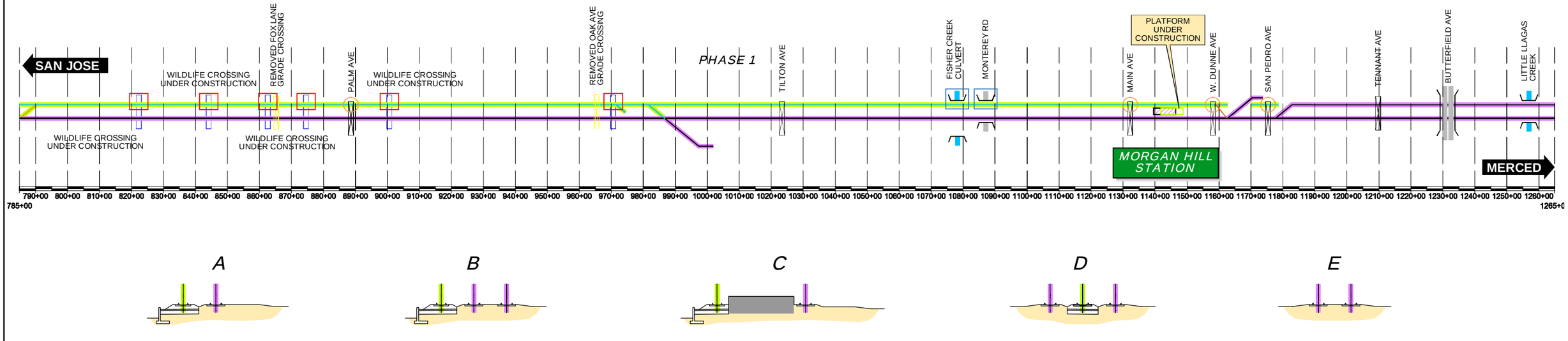
CALIFORNIA HIGH-SPEED TRAIN PROJECT

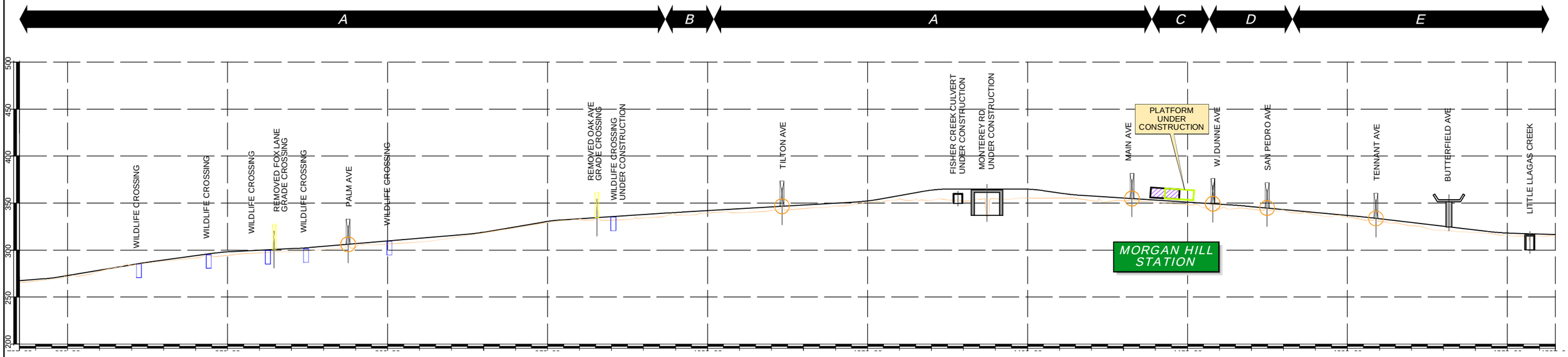
SAN JOSE TO MERCED
785+00 TO 1265+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I6WS5-SPP-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
GRADE CROSSING
TUNNEL
MAJOR UNDERPASS
CREEK UNDERPASS







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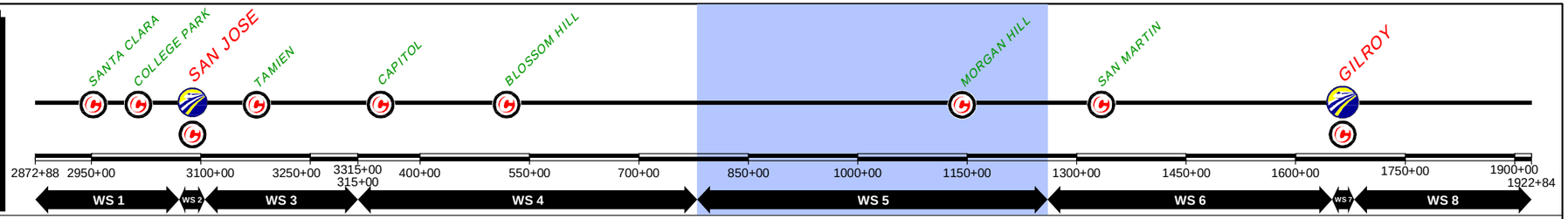
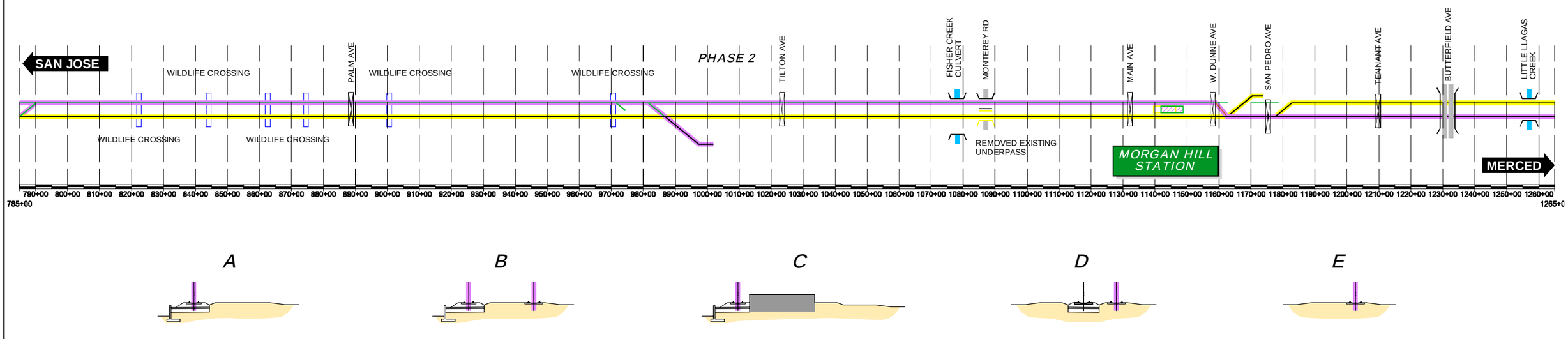
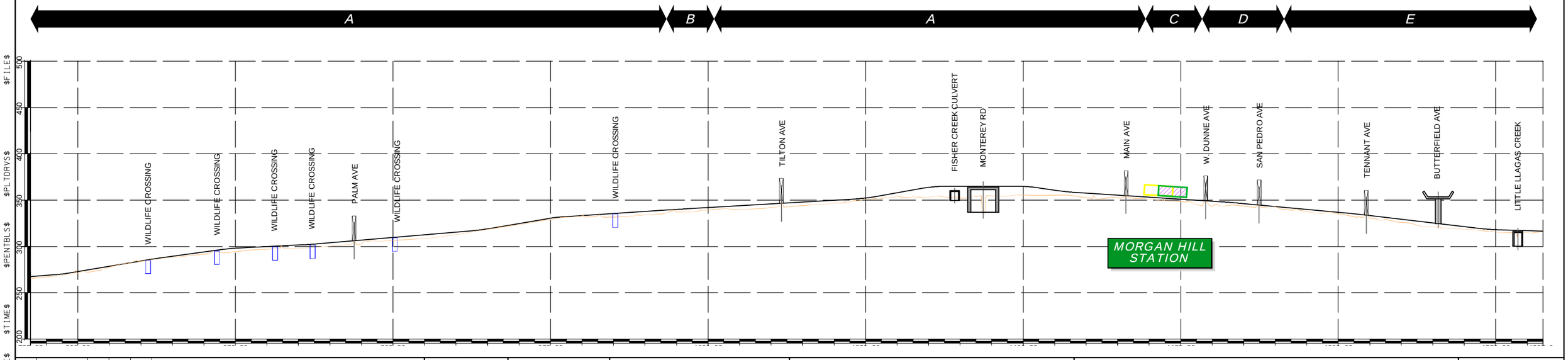
785+00 TO 1265+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I6WS5-SPP-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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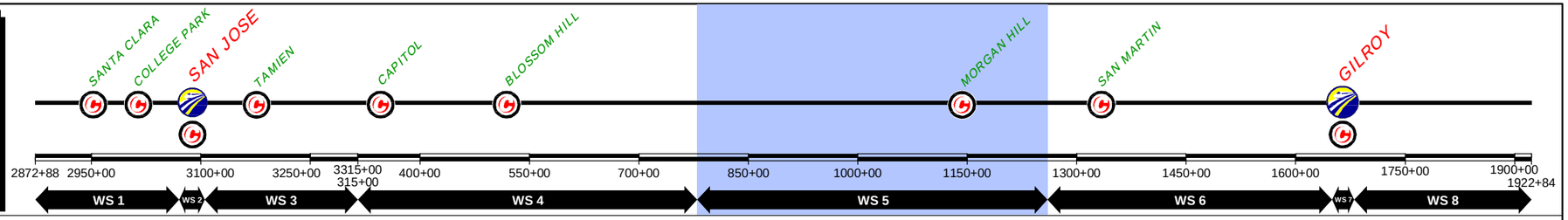
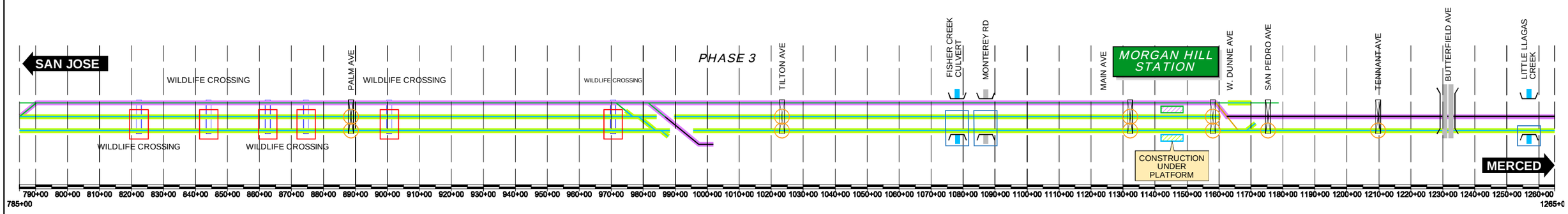
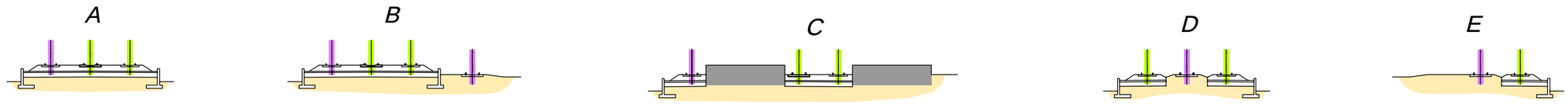
785+00 TO 1265+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 2

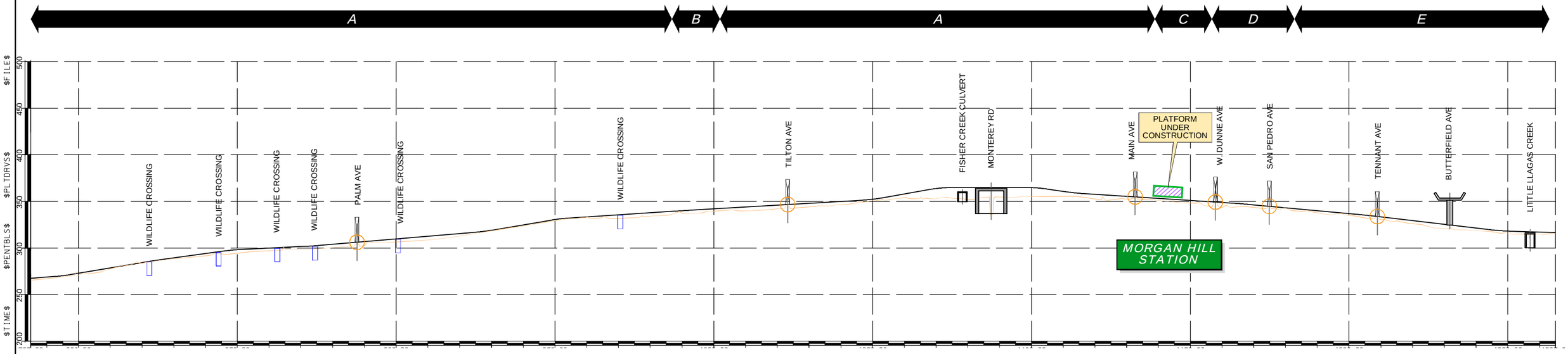
CONTRACT NO.
DRAWING NO. CV-I6WS5-SPP-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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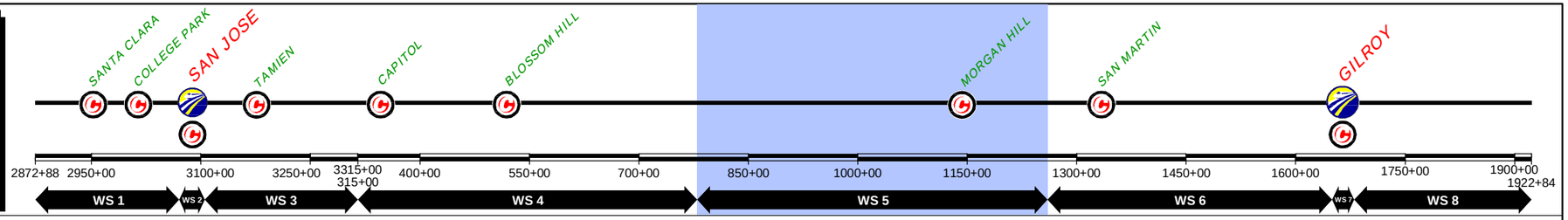
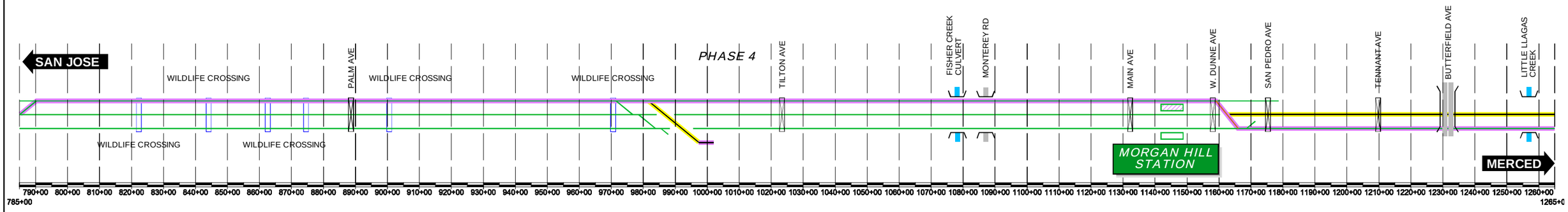
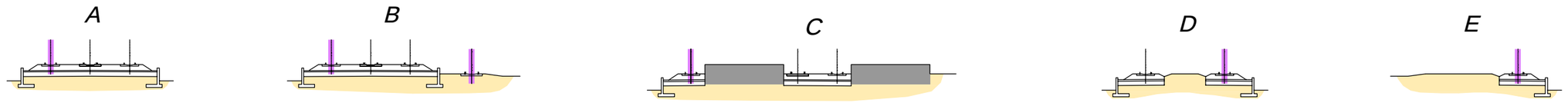
SAN JOSE TO MERCED
785+00 TO 1265+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 3

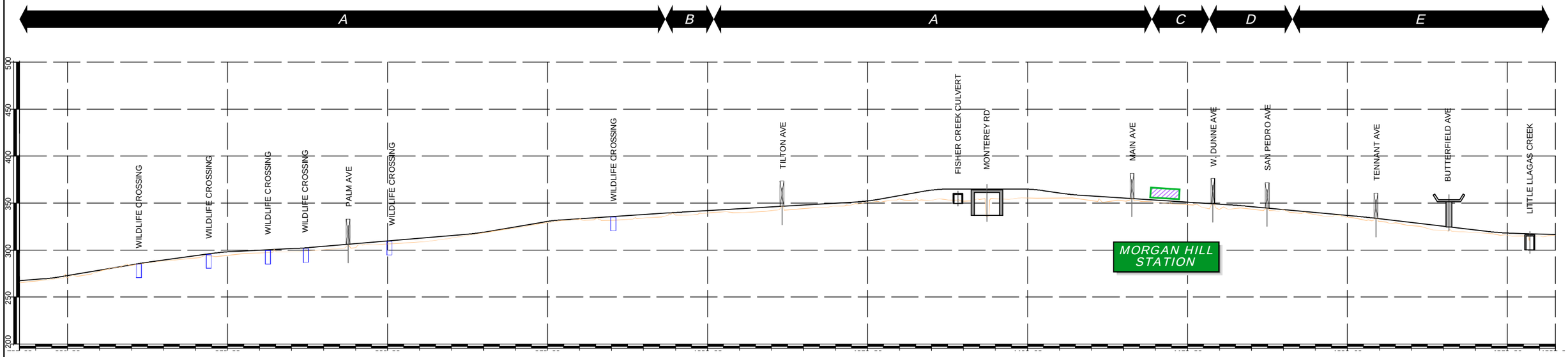
CONTRACT NO.
DRAWING NO. CV-I6WS5-SPP-04
SCALE NOT TO SCALE
SHEET NO. 4 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I6WS5-SPP-05
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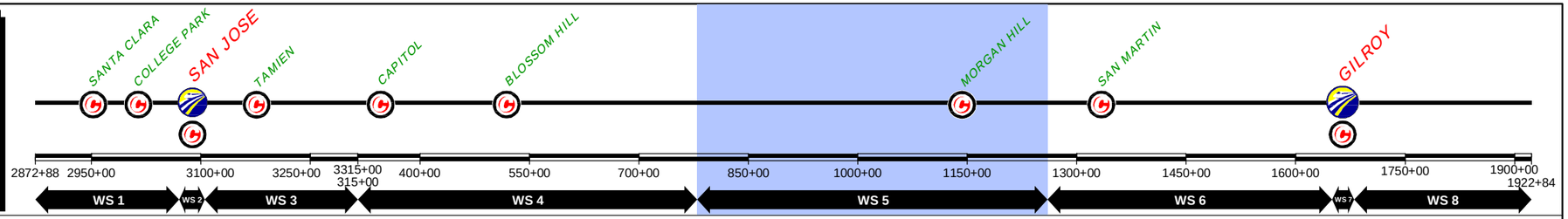
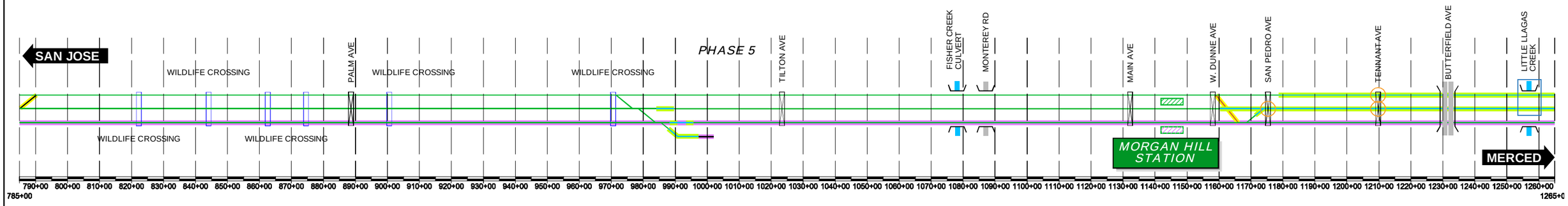
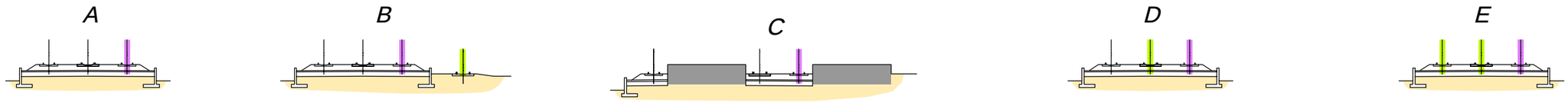
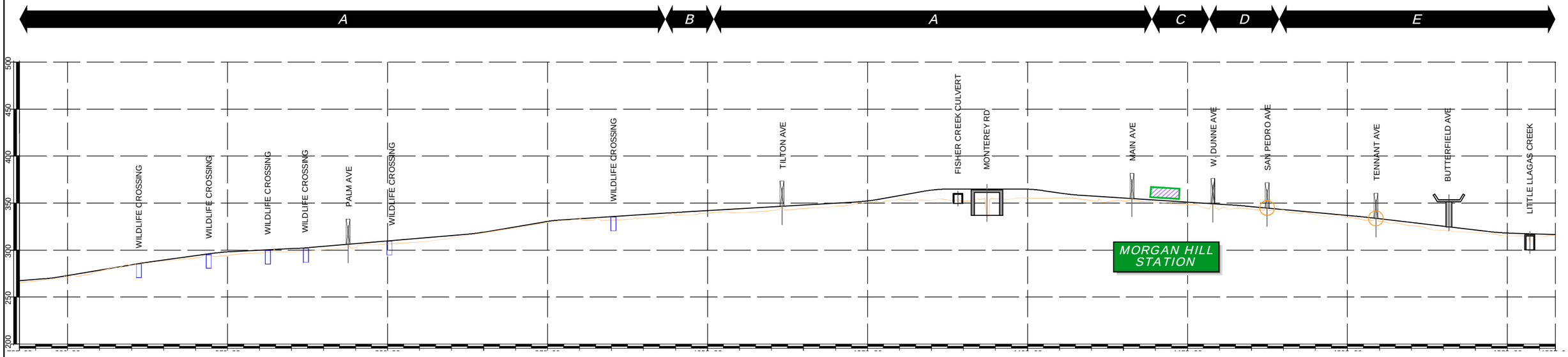
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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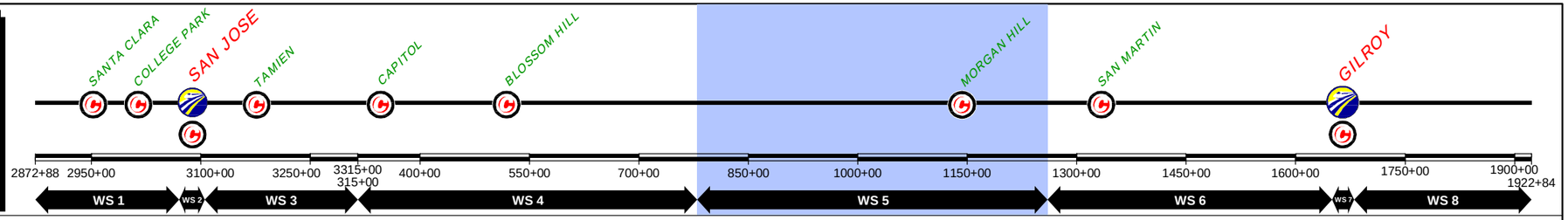
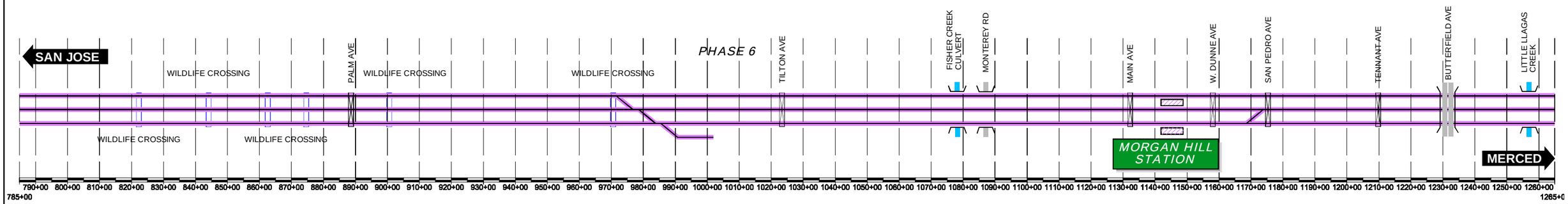
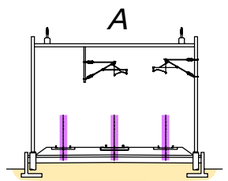
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 5

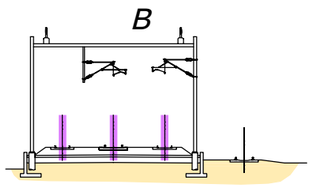
CONTRACT NO.
DRAWING NO. CV-I6WS5-SPP-06
SCALE NOT TO SCALE
SHEET NO. 6 OF 7

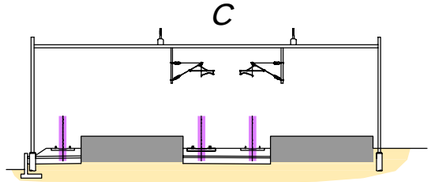
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

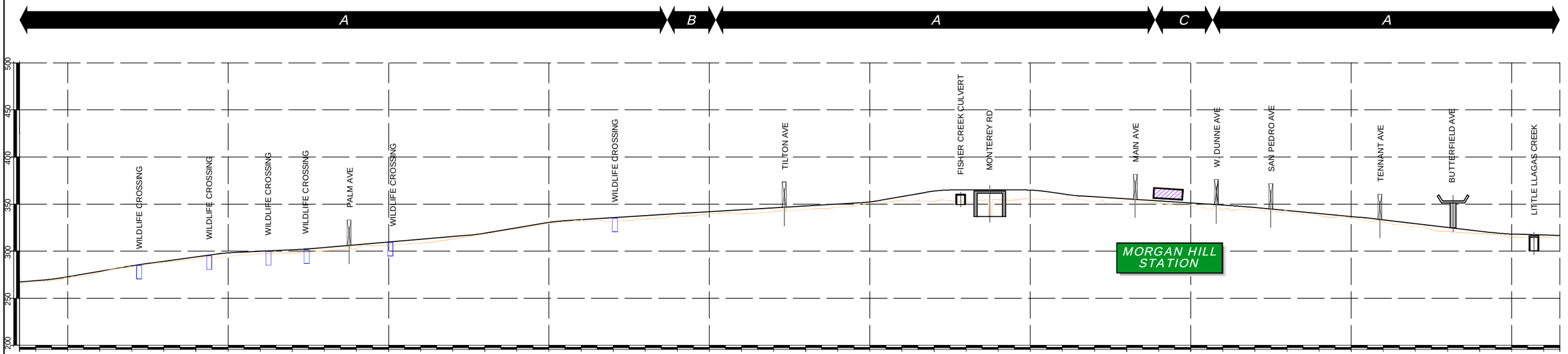












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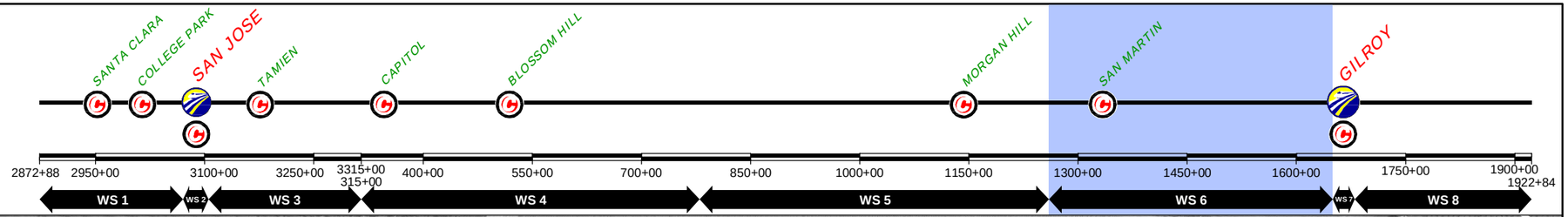
785+00 TO 1265+00
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I6WS5-SPP-07
SCALE NOT TO SCALE
SHEET NO. 7 OF 7

APPENDIX H: TRACK SHIFT WORKS

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

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CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH0-01
SCALE 1" = 200'
SHEET NO. 1 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
DEPOT ST
SAN MARTIN STATION
E. SAN MARTIN AVE
MERCED
B1325+00 B1330+00 B1335+00 B1340+00 B1345+00 B1350+00 B135
ROOSEVELT AVE
W. SAN MARTIN AVE
MONTEREY HWY

SAN JOSE
MERCED
B1355+00 B1360+00 B1365+00 B1370+00 B1375+00 B1380+00 B138
MONTEREY HWY
COX AVE

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
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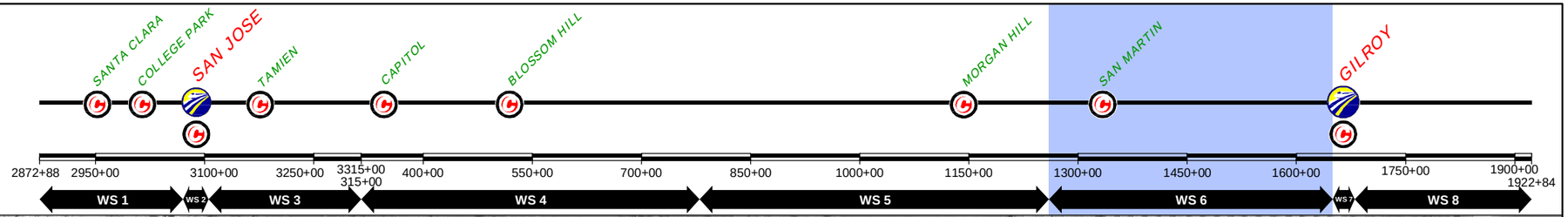
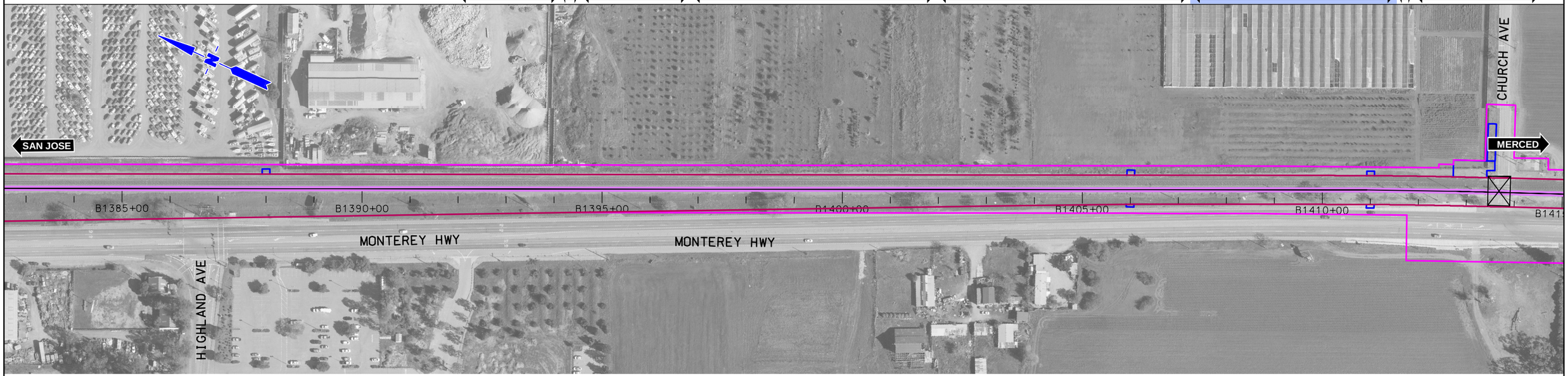
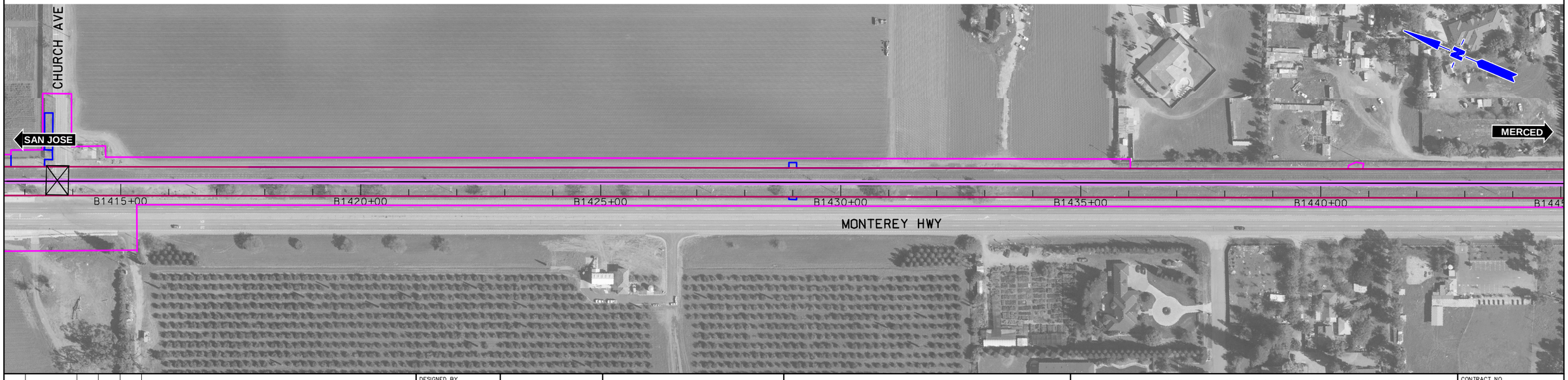
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH0-02
SCALE 1" = 200'
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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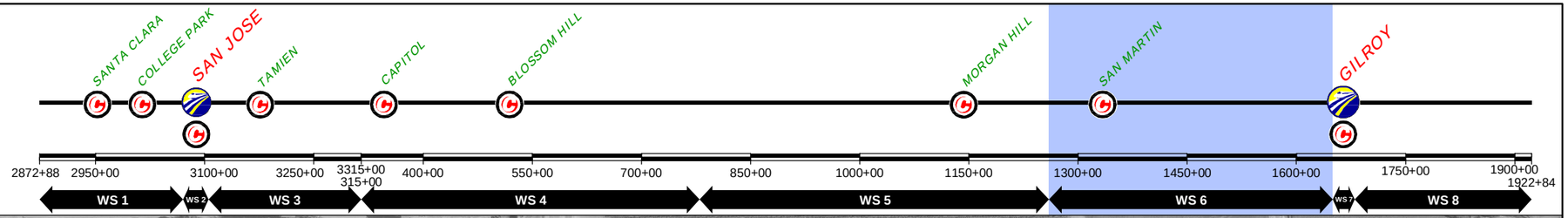
CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH0-03
SCALE 1" = 200'
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH0-04
SCALE 1" = 200'
SHEET NO. 4 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

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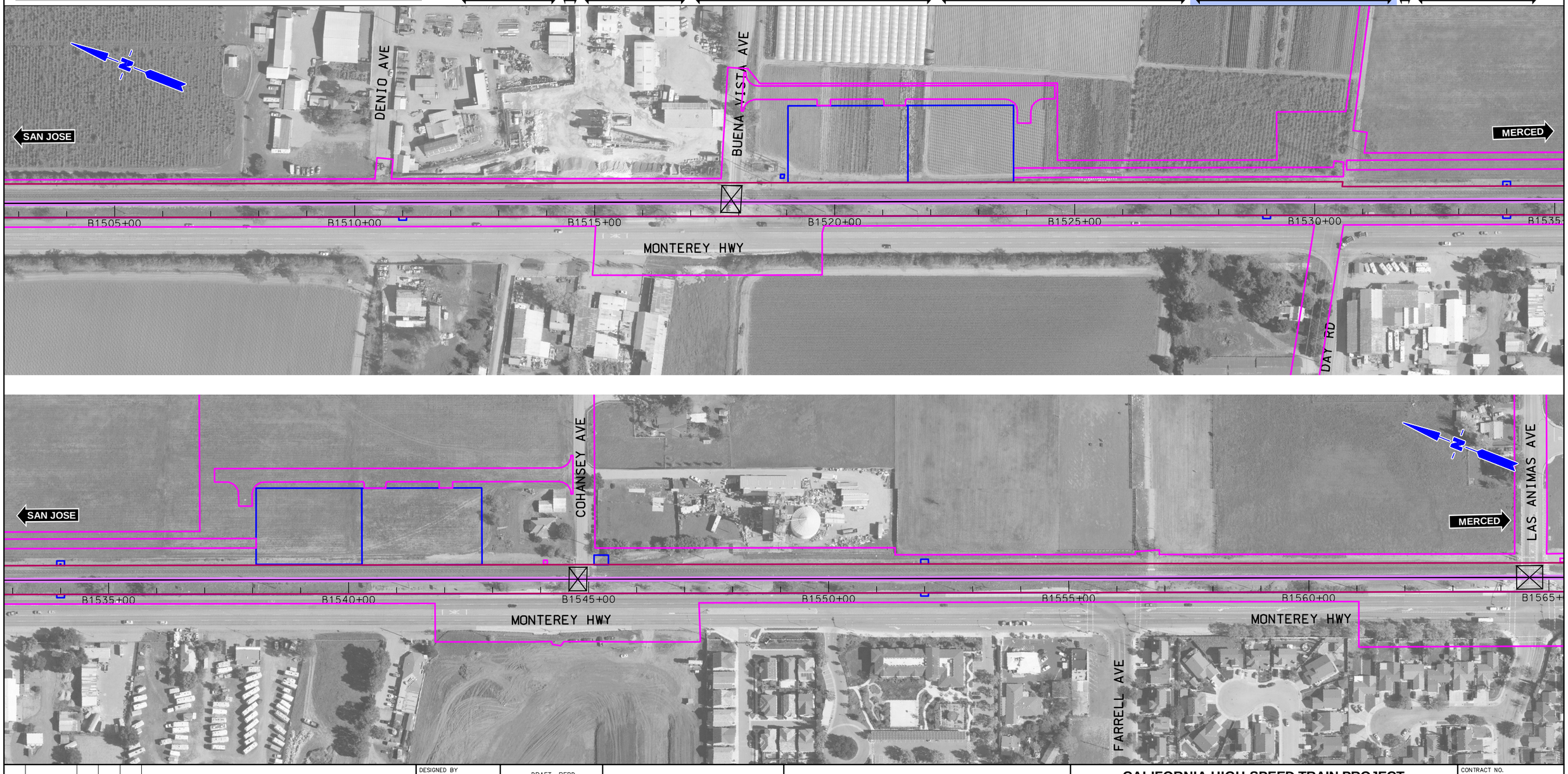

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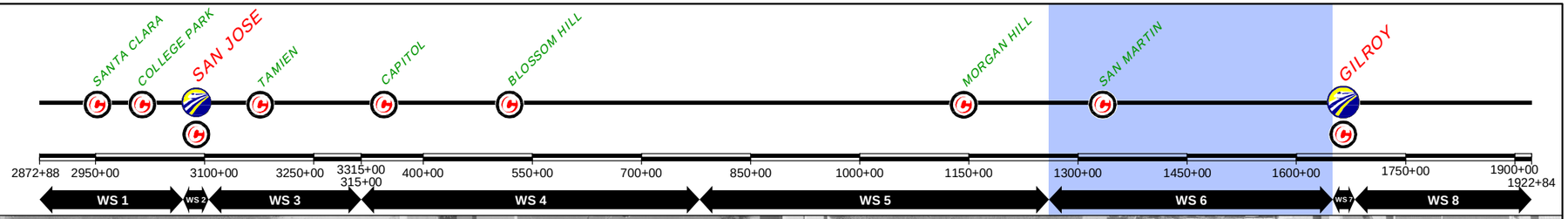
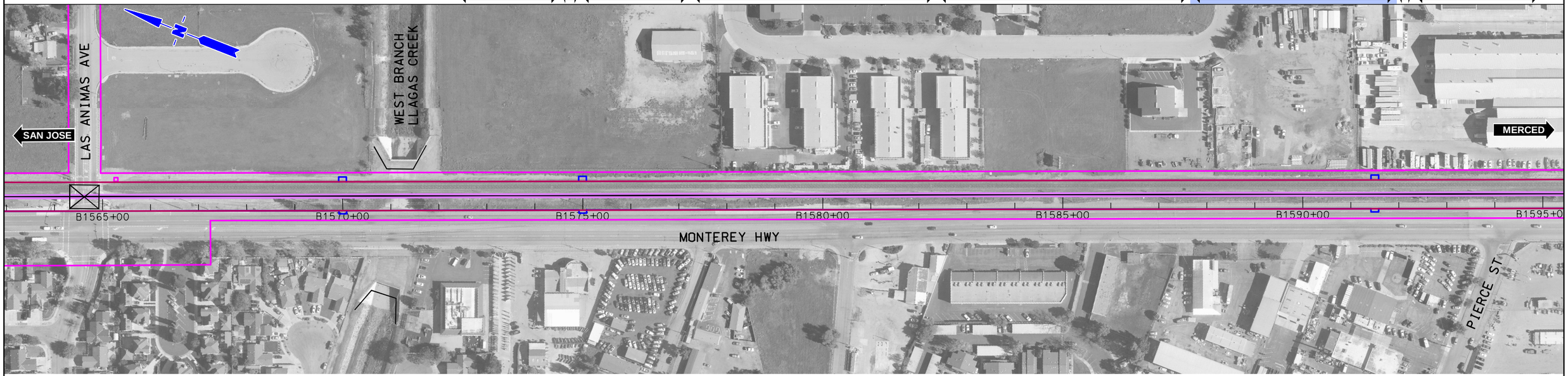
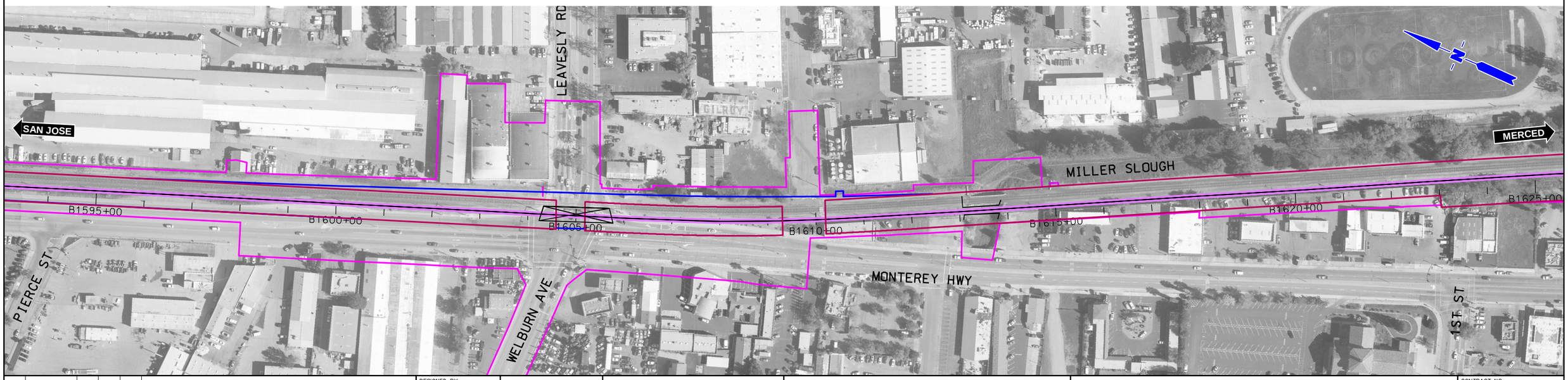
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH0-05
SCALE 1" = 200'
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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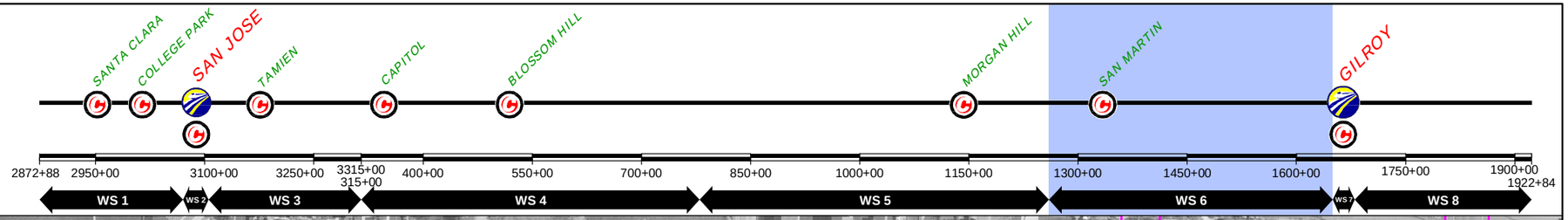
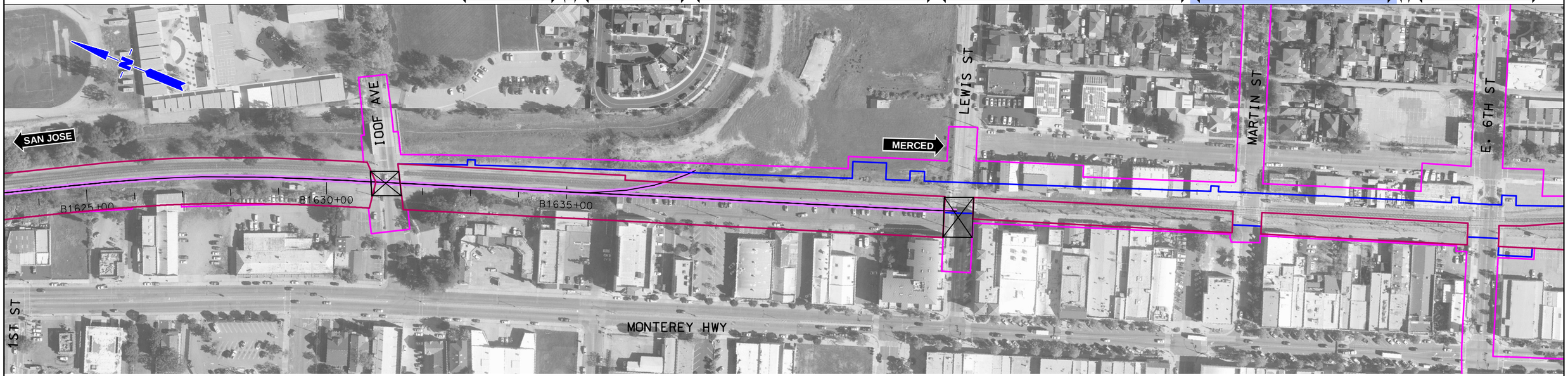
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH0-06
SCALE 1" = 200'
SHEET NO. 6 OF 7

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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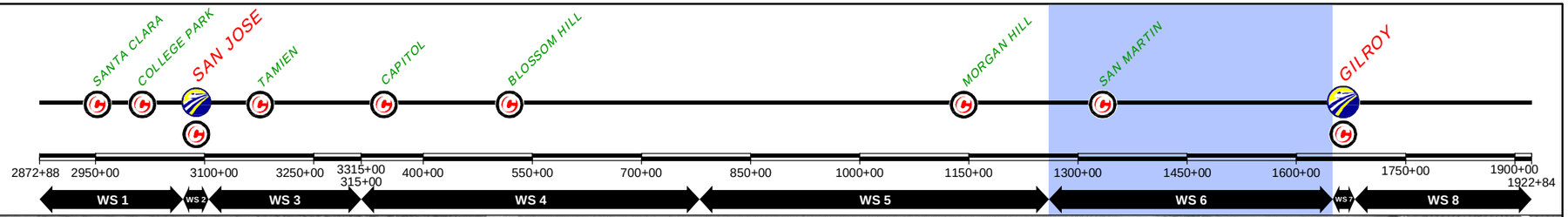
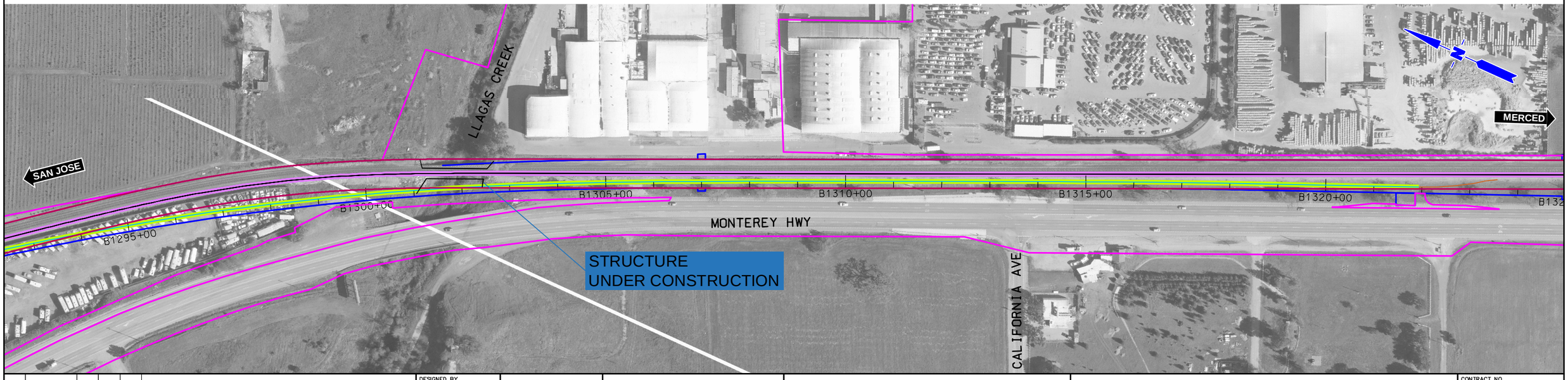
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH0-07
SCALE 1" = 200'
SHEET NO. 7 OF 7

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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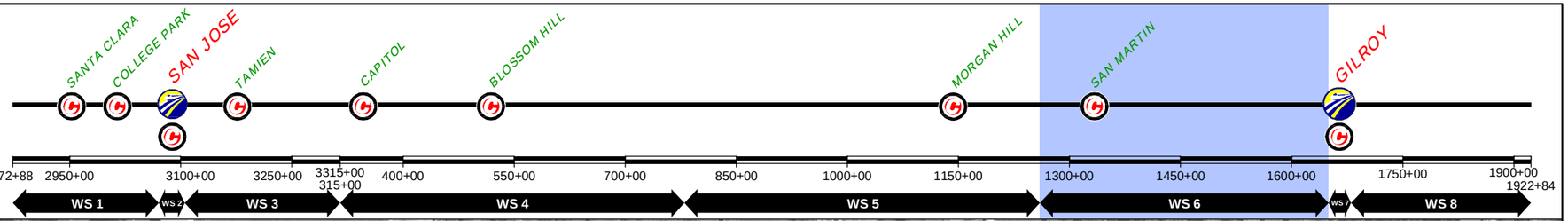
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH1-01
SCALE 1" = 200'
SHEET NO. 1 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH1-02
SCALE 1" = 200'
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
CHURCH AVE
MONTEREY HWY
HIGHLAND AVE
B1385+00 B1390+00 B1395+00 B1400+00 B1405+00 B1410+00 B141

CHURCH AVE
SAN JOSE
MERCED
MONTEREY HWY
B1415+00 B1420+00 B1425+00 B1430+00 B1435+00 B1440+00 B144

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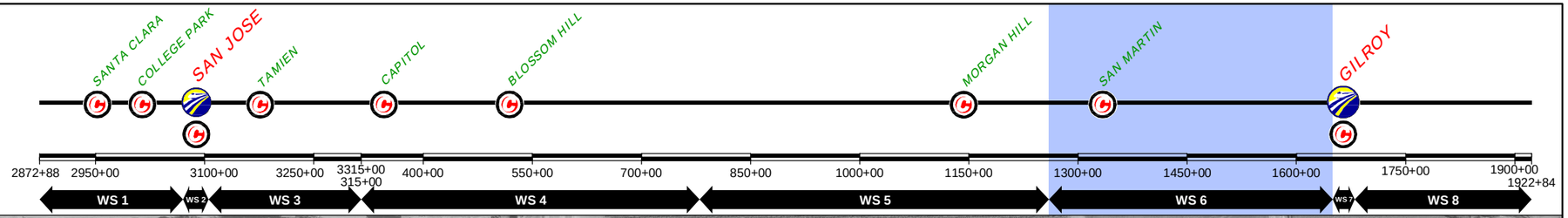
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH1-03
SCALE 1" = 200'
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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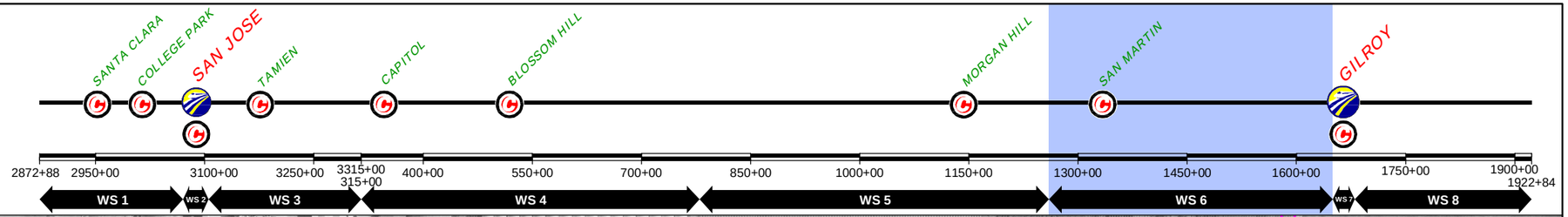
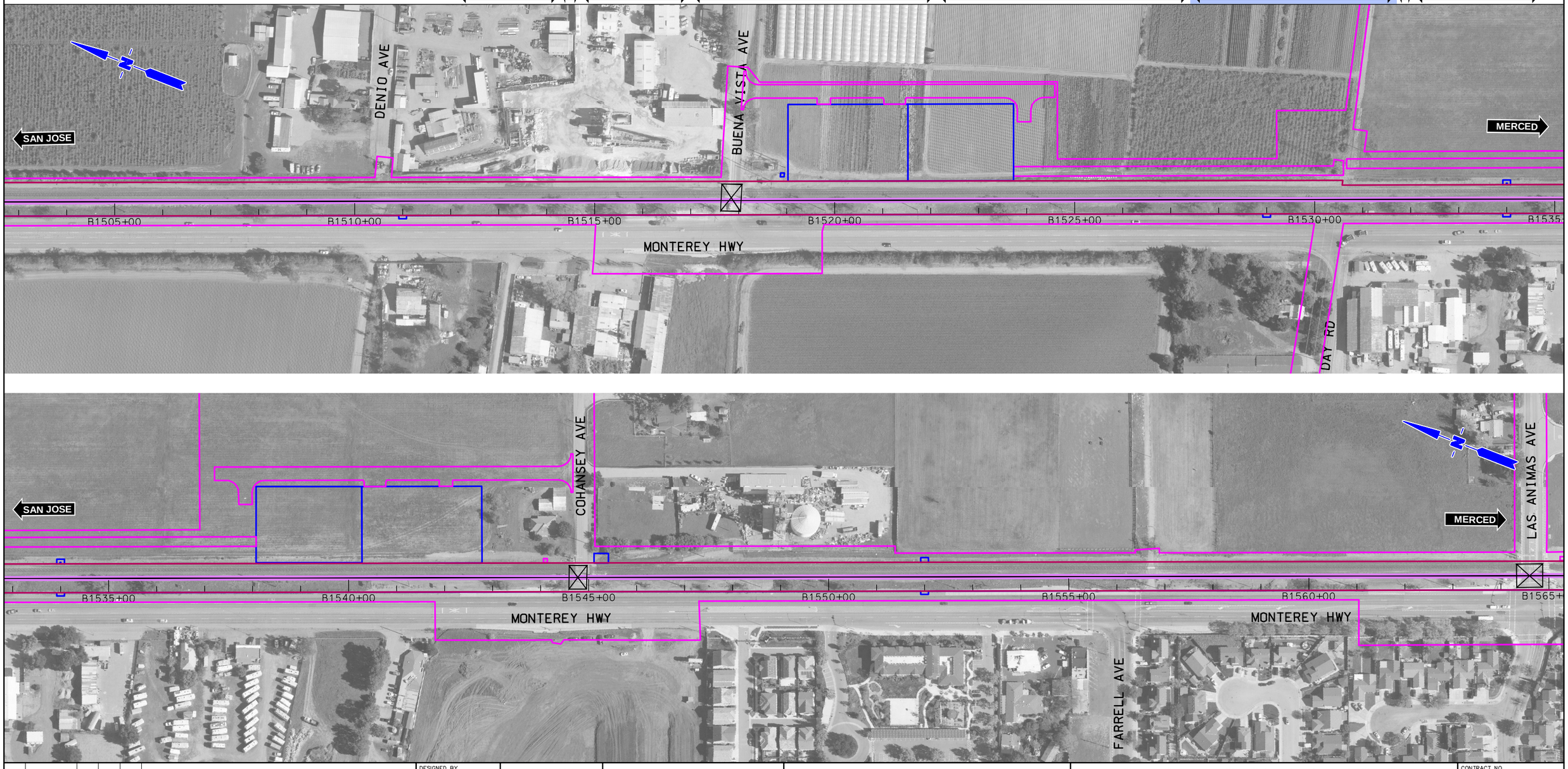
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH1-04
SCALE 1" = 200'
SHEET NO. 4 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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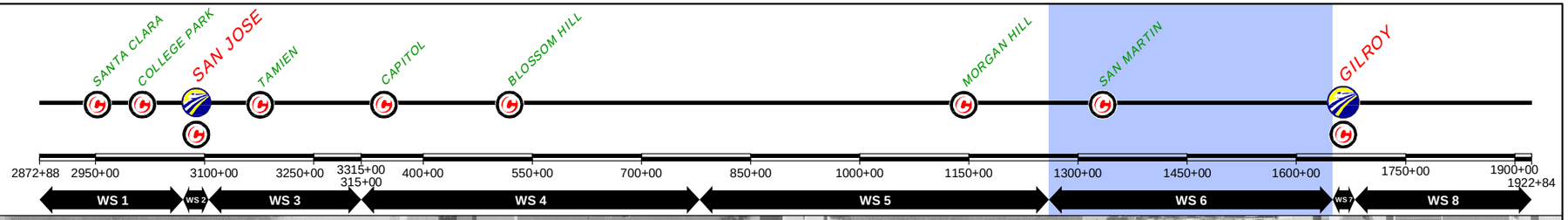
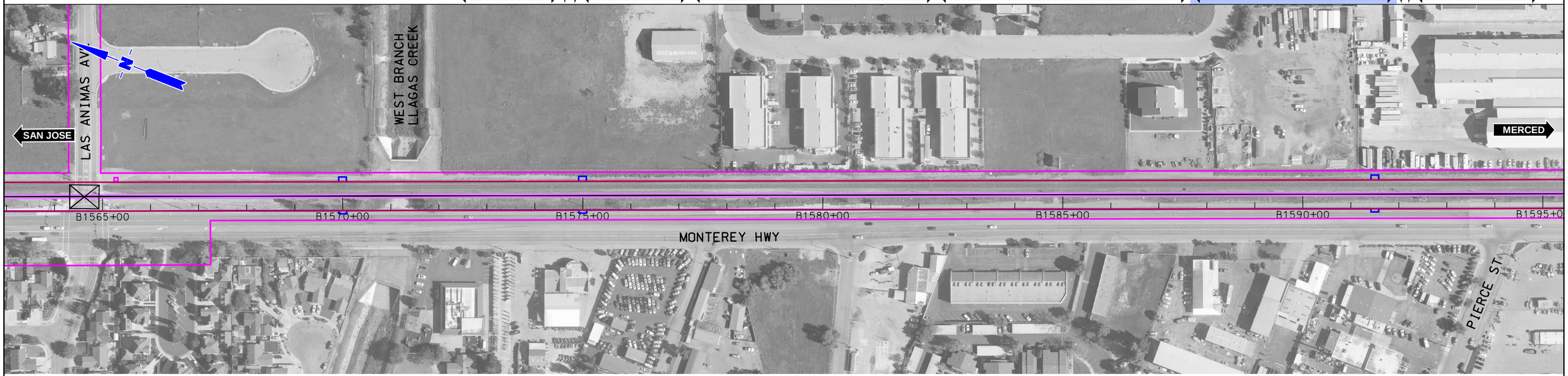
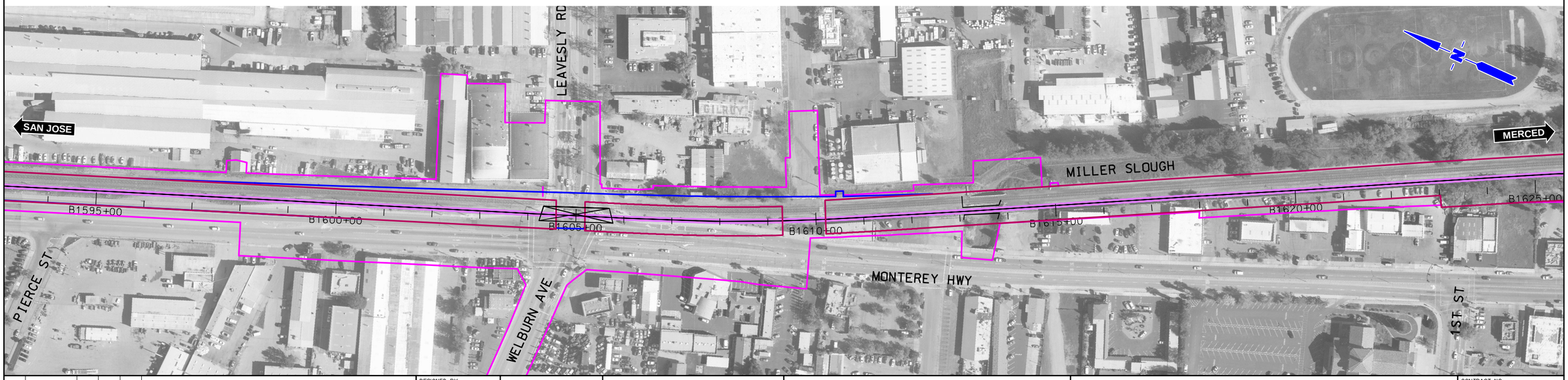
CONSTRUCTION PHASES
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH1-05
SCALE 1" = 200'
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH1-06
SCALE 1" = 200'
SHEET NO. 6 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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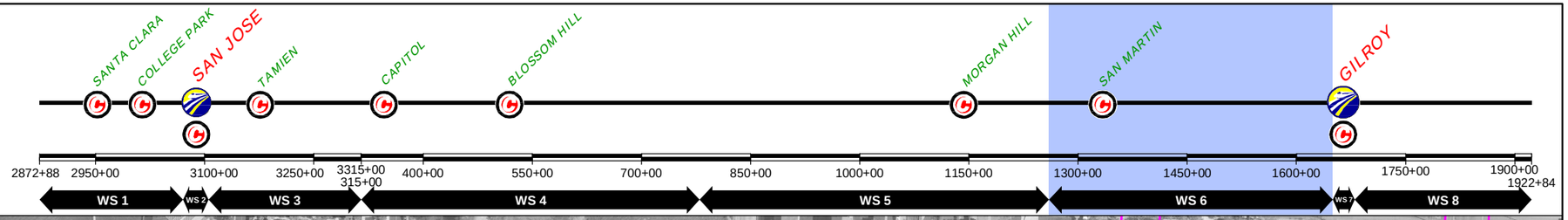
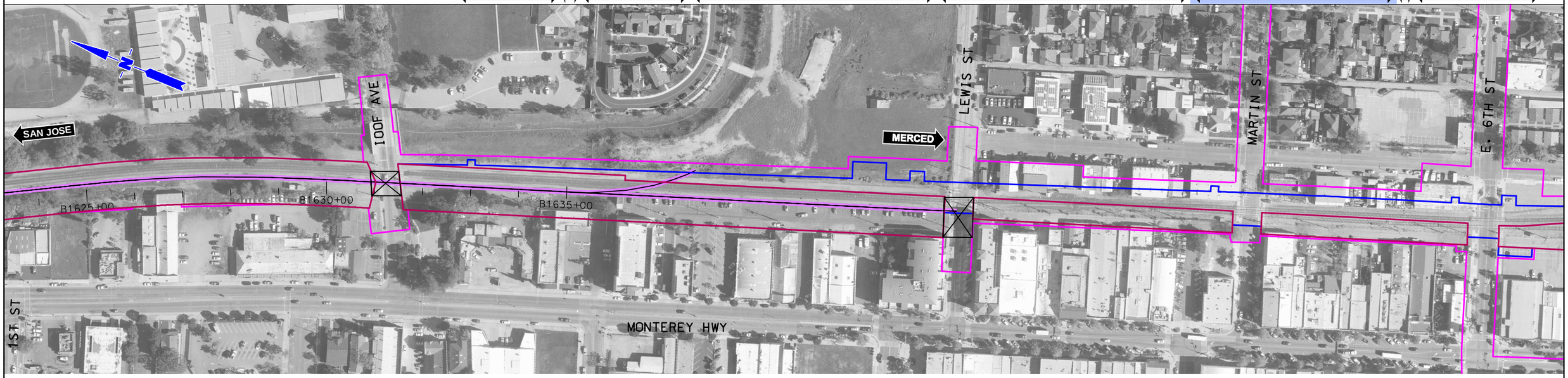
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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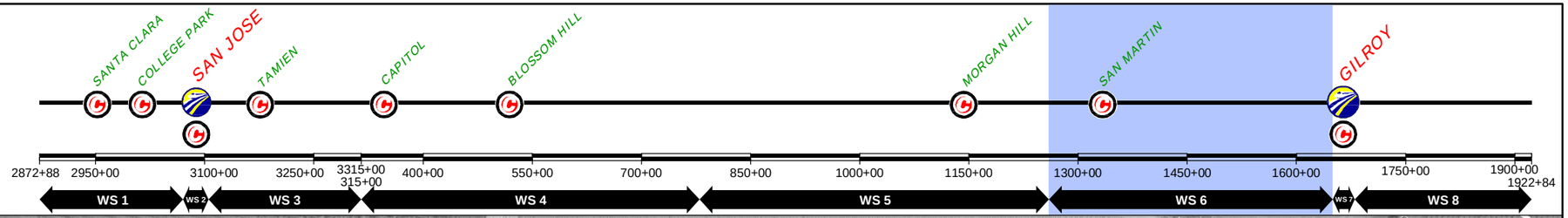
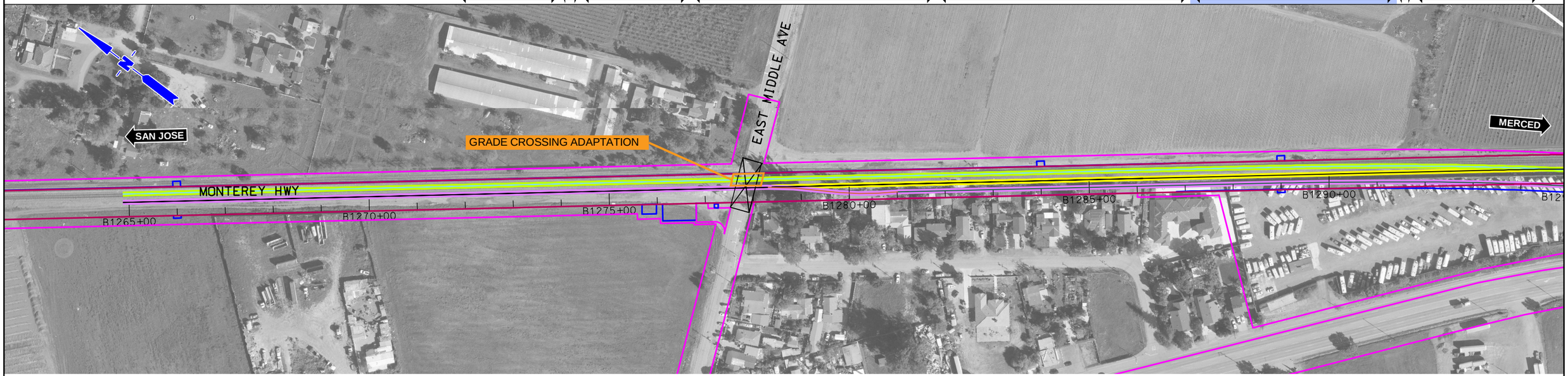
CONSTRUCTION PHASES
PLAN
PHASE 1

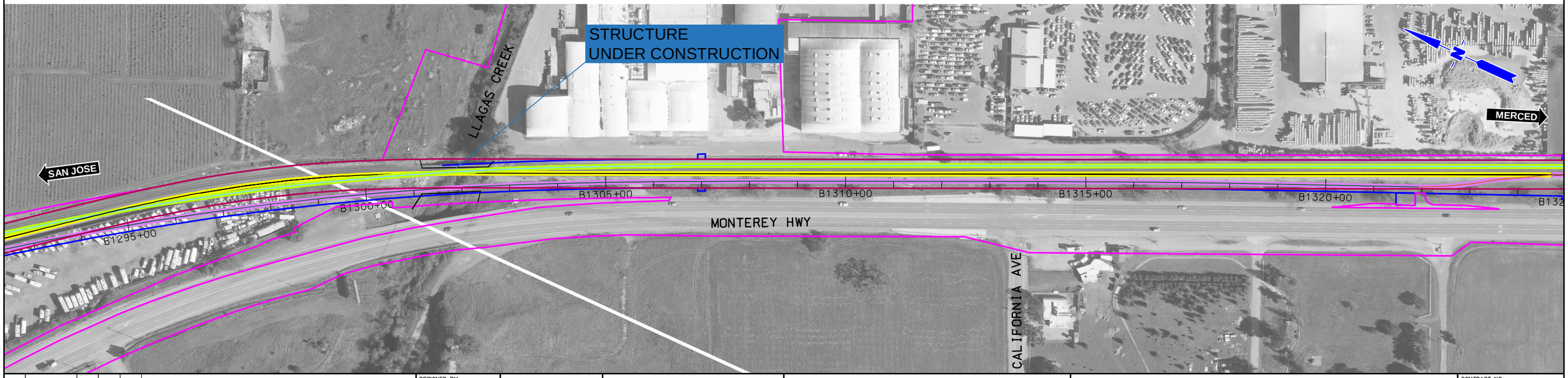
CONTRACT NO.
DRAWING NO. CV-I1WS6-PH1-07
SCALE 1" = 200'
SHEET NO. 7 OF 7

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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IN CHARGE
DATE NOV/2018

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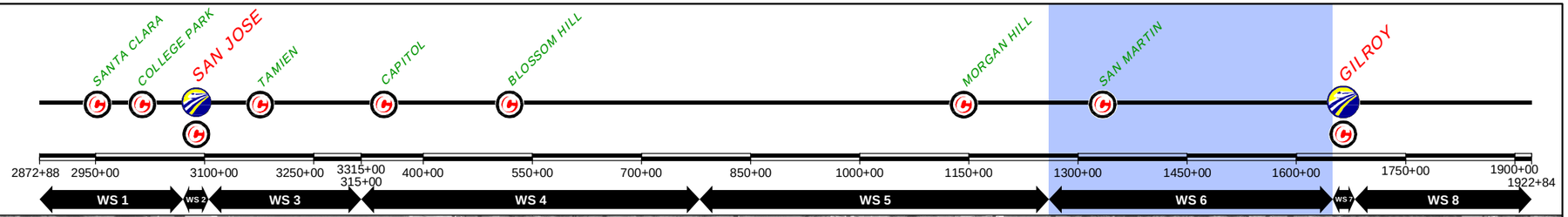
CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH2-01
SCALE 1" = 200'
SHEET NO. 1 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$TIME$
$DATE$
$USER$

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SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH2-02
SCALE 1" = 200'
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
GRADE CROSSING ADAPTATION
CHURCH AVE
HIGHLAND AVE
MONTEREY HWY
MONTEREY HWY
B1385+00 B1390+00 B1395+00 B1400+00 B1405+00 B1410+00 B141

CHURCH AVE
SAN JOSE
MERCED
GRADE CROSSING ADAPTATION
MONTEREY HWY
B1415+00 B1420+00 B1425+00 B1430+00 B1435+00 B1440+00 B144

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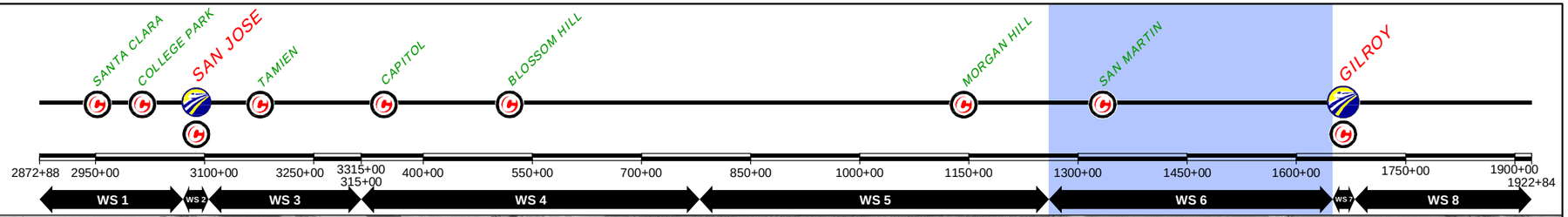
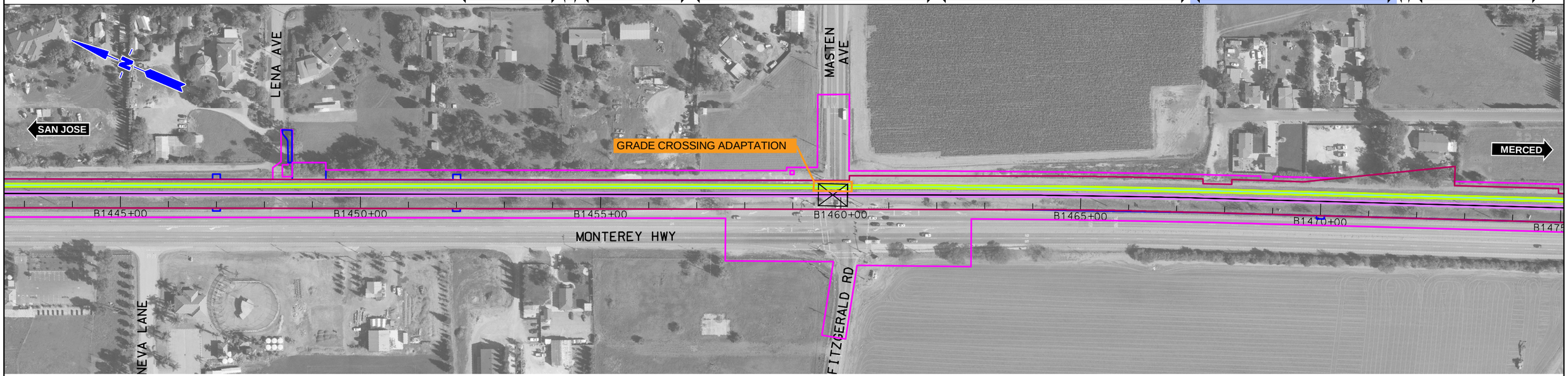
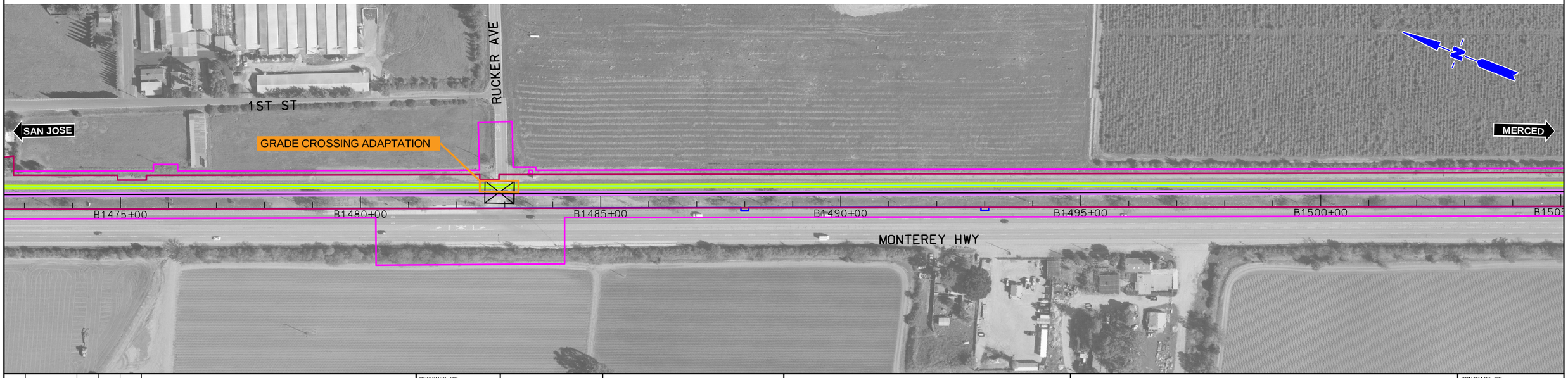
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH2-03
SCALE 1" = 200'
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH2-04
SCALE 1" = 200'
SHEET NO. 4 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

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CONTRACT NO.
DRAWING NO. CV-I1WS6-PH2-01
SCALE 1" = 200'
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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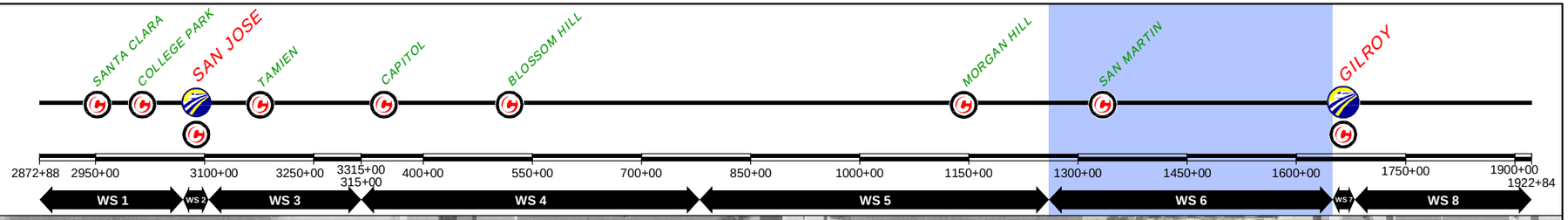
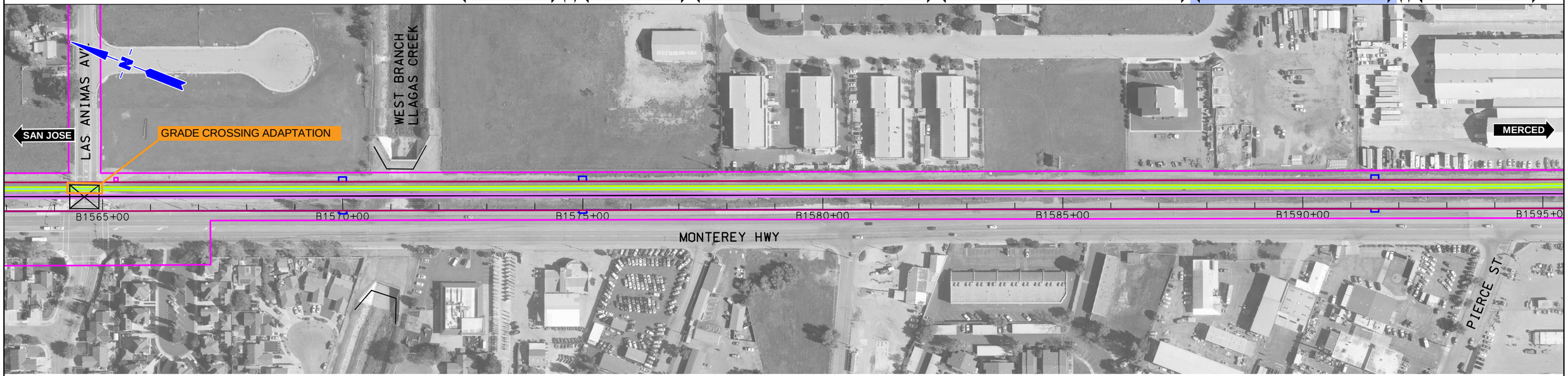
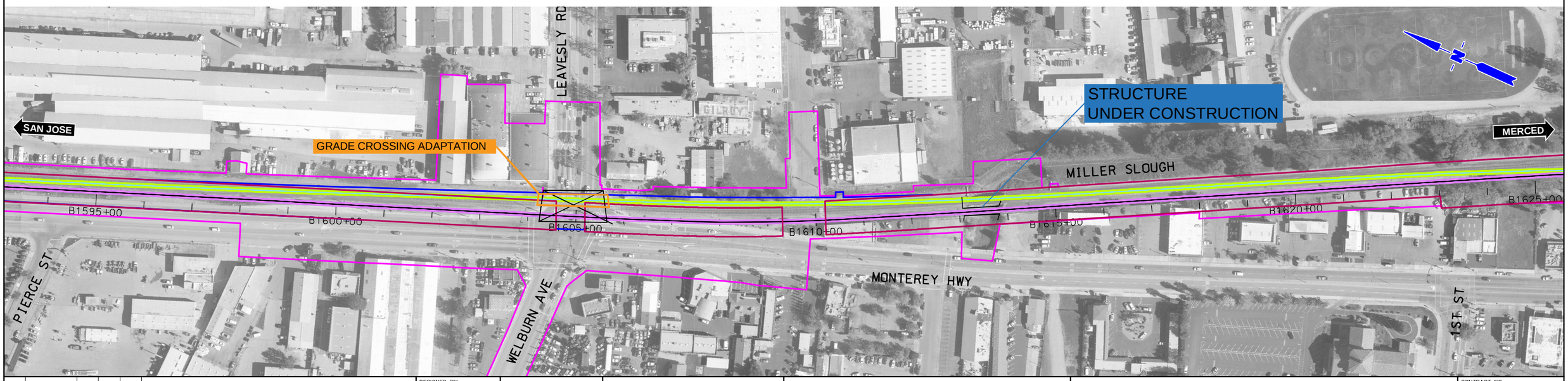
TUNNEL
CREEK UNDERPASS







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PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH2-06
SCALE 1" = 200'
SHEET NO. 6 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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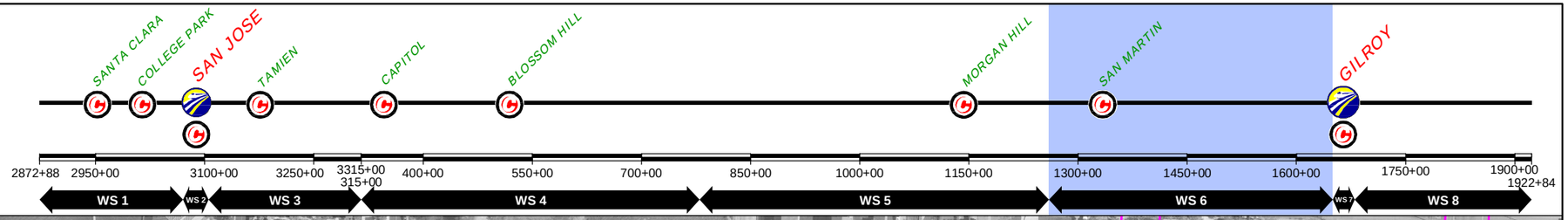

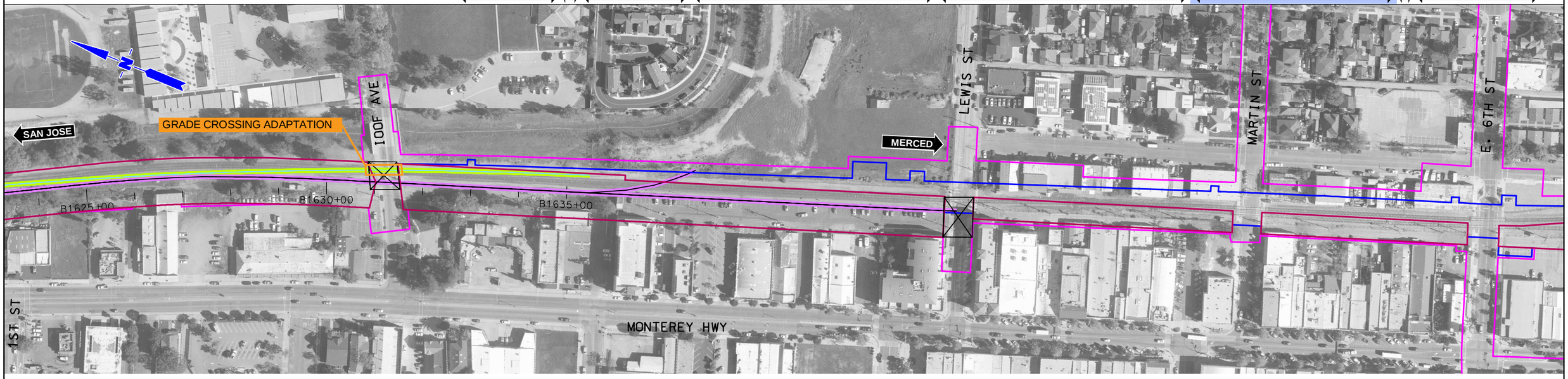

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SAN JOSE TO MERCED
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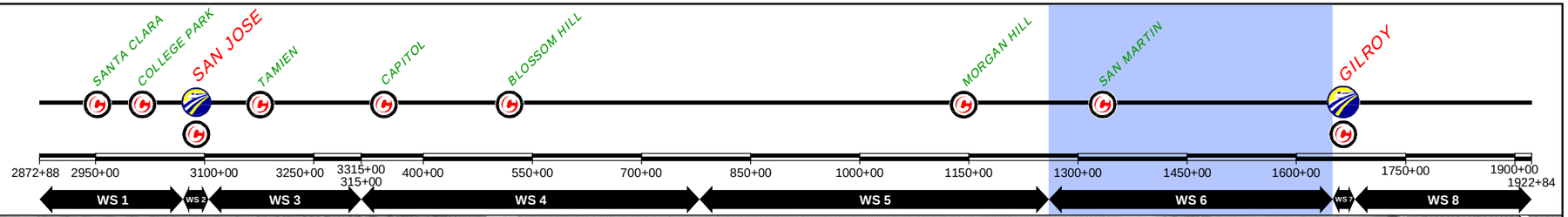
CONSTRUCTION PHASES
PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH2-07
SCALE 1" = 200'
SHEET NO. 7 OF 7

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH3-01
SCALE 1" = 200'
SHEET NO. 1 OF 7

$FILE$
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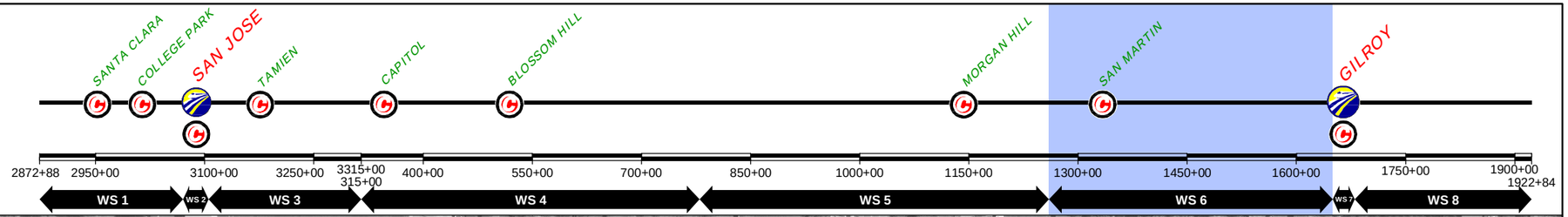
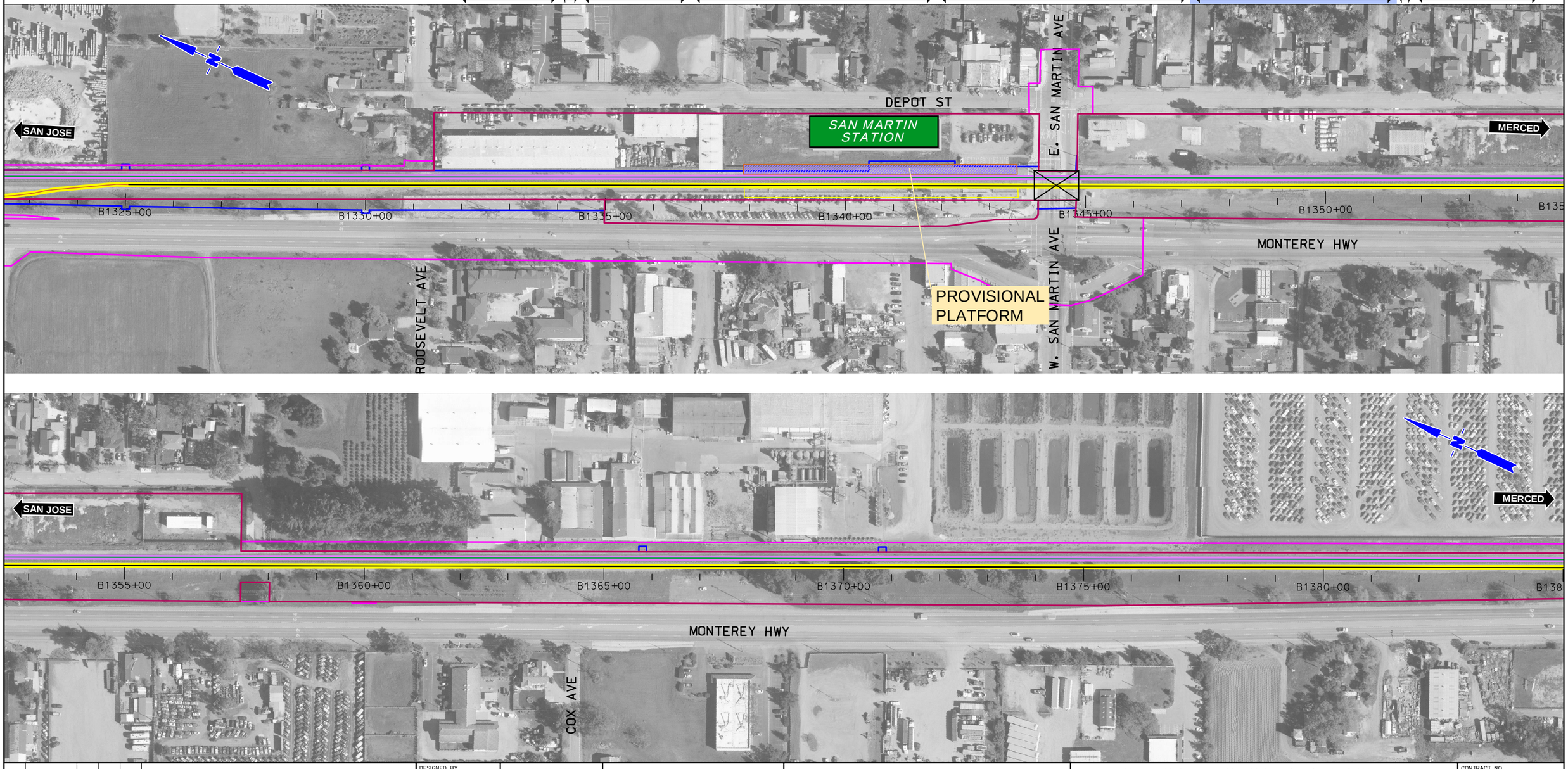
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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SAN JOSE TO MERCED

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CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH3-02
SCALE 1" = 200'
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
CHURCH AVE
HIGHLAND AVE
MONTEREY HWY
MONTEREY HWY

B1385+00 B1390+00 B1395+00 B1400+00 B1405+00 B1410+00 B141

CHURCH AVE
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MERCED
MONTEREY HWY

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CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH3-03
SCALE 1" = 200'
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
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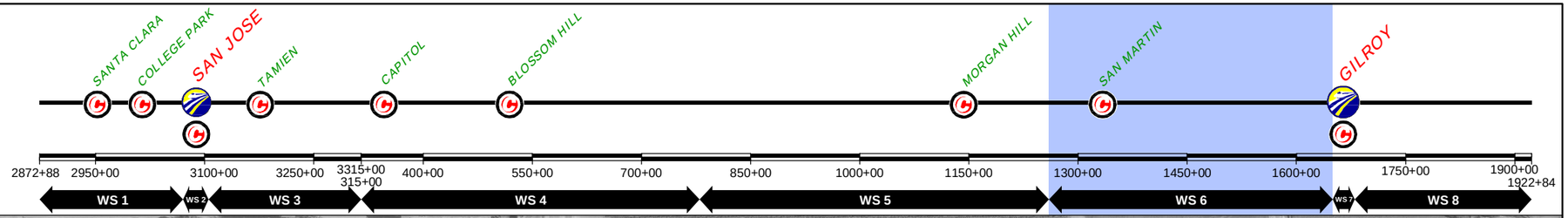
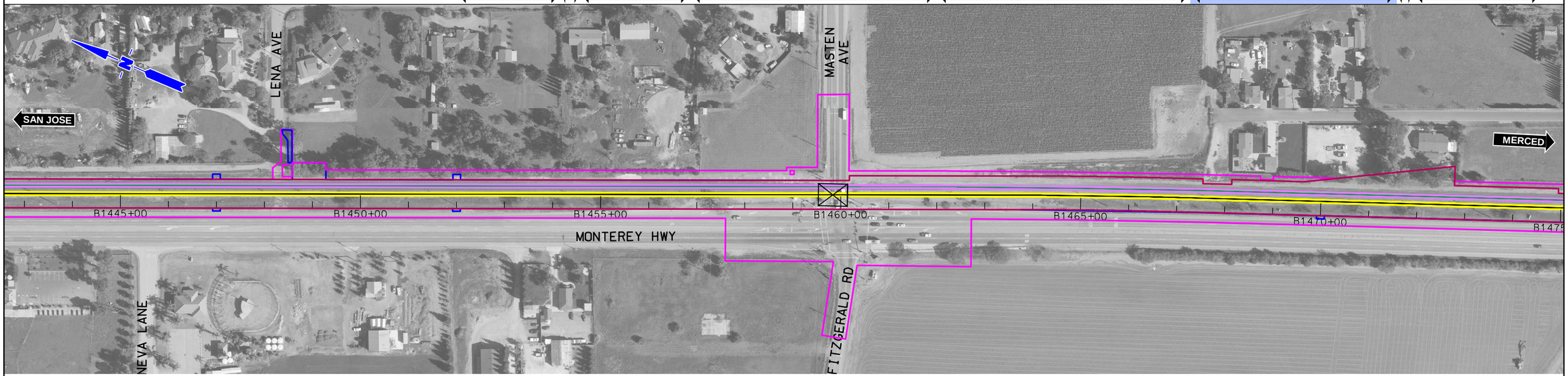
TUNNEL
CREEK UNDERPASS





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CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH3-04
SCALE 1" = 200'
SHEET NO. 4 OF 7

$FILE$
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$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
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TAMIEN
CAPITOL
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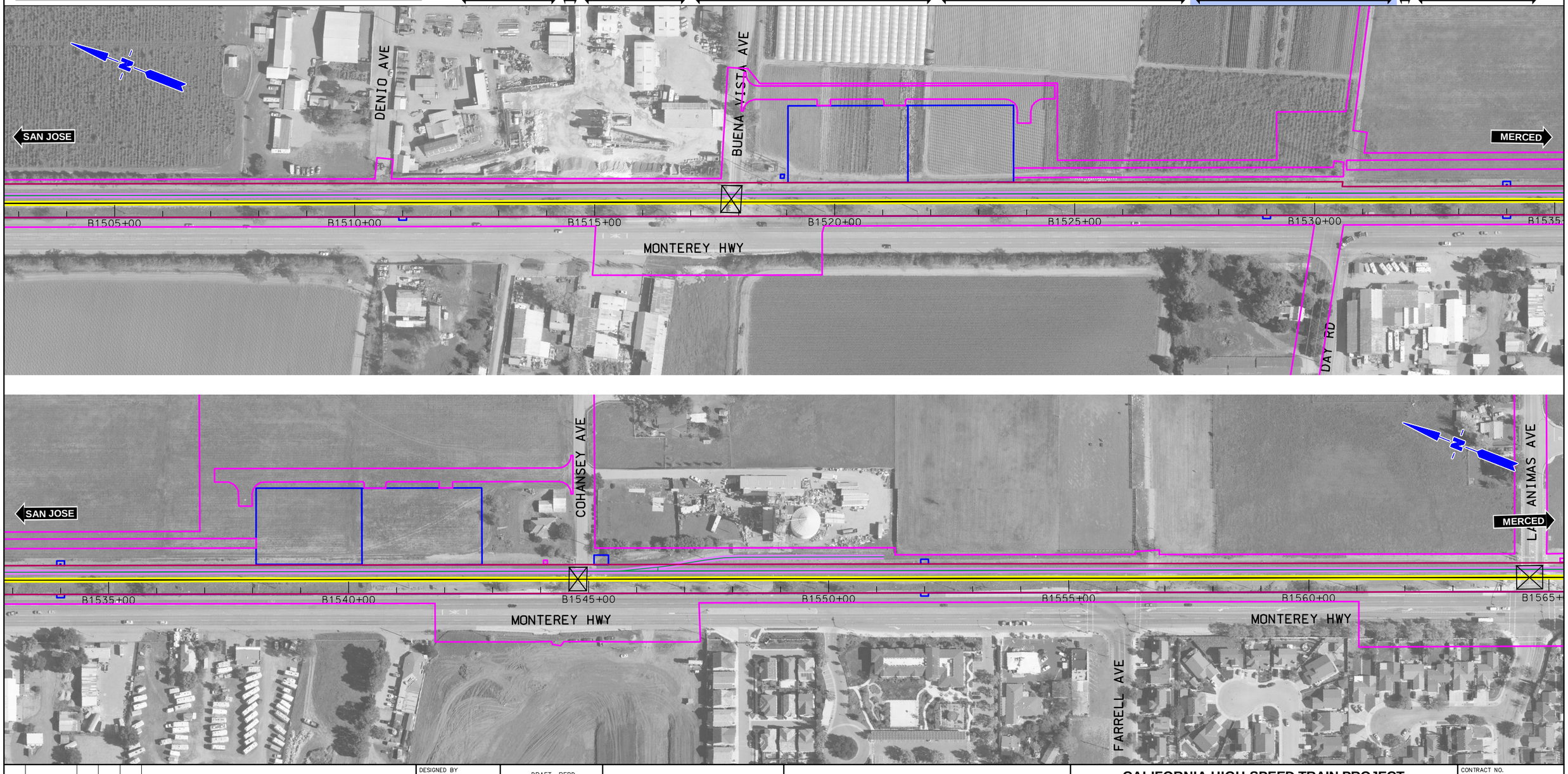

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PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH3-05
SCALE 1" = 200'
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
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PROPOSED TCE
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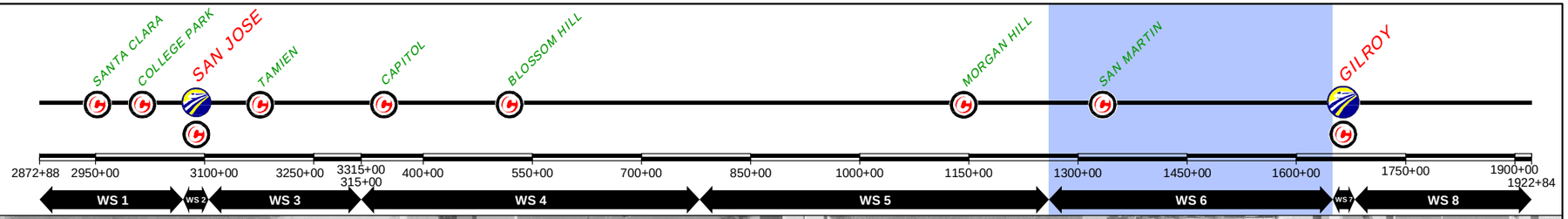
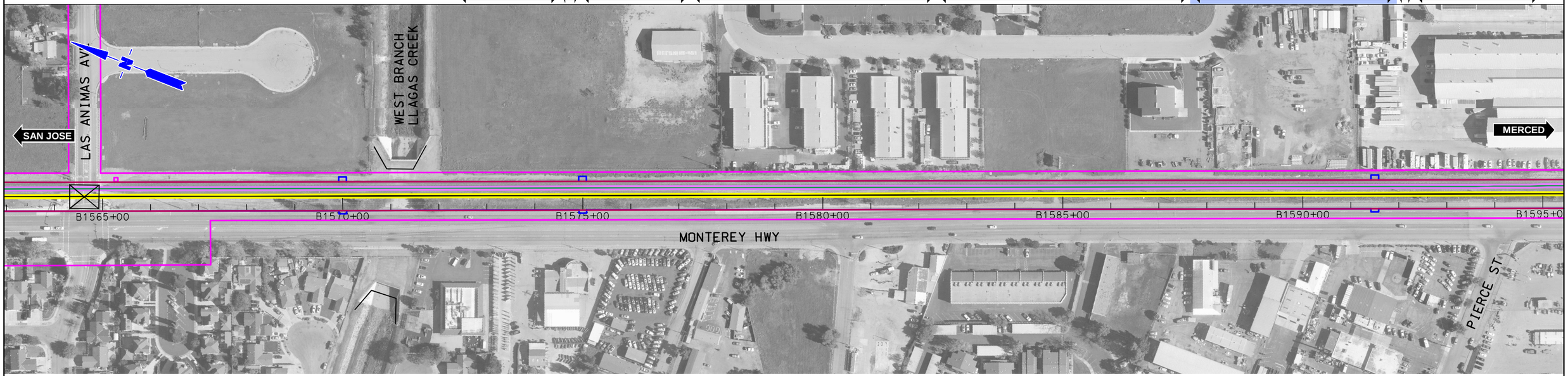
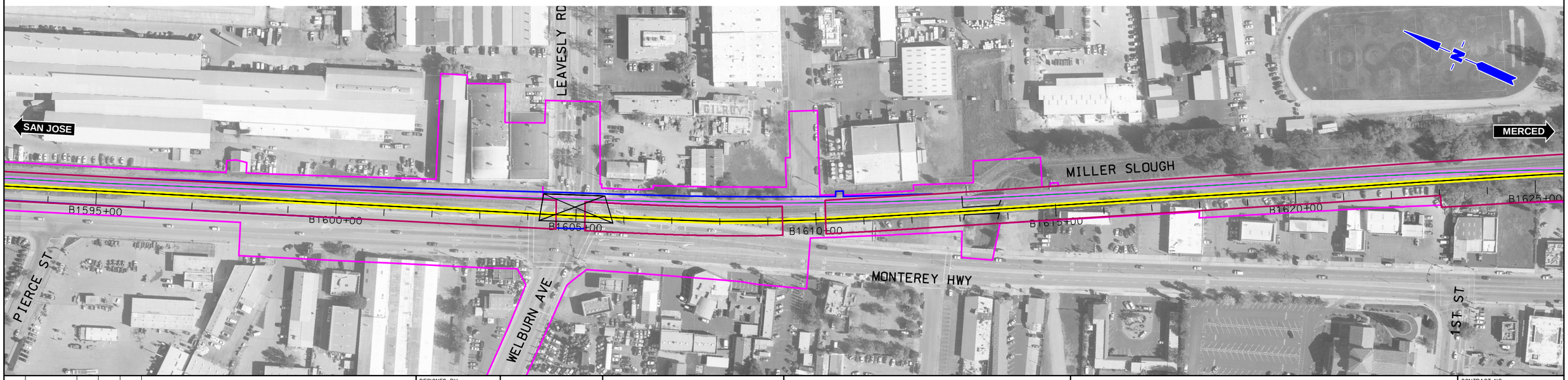
TUNNEL
CREEK UNDERPASS







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PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH3-06
SCALE 1" = 200'
SHEET NO. 6 OF 7

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CURRENT TRACK
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BUILT IN PREVIOUS PHASES
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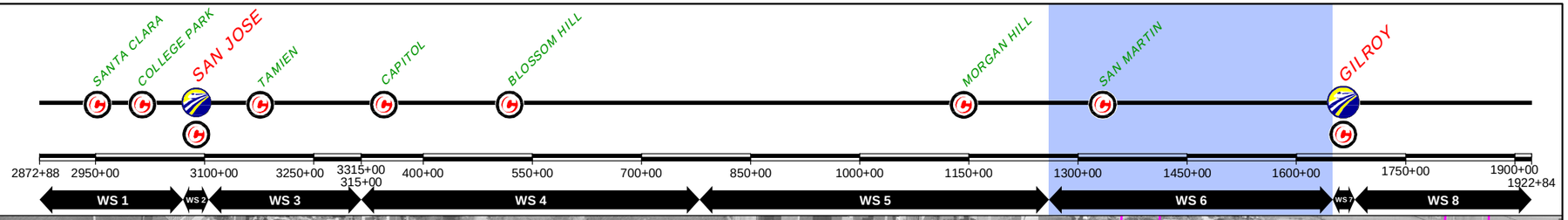
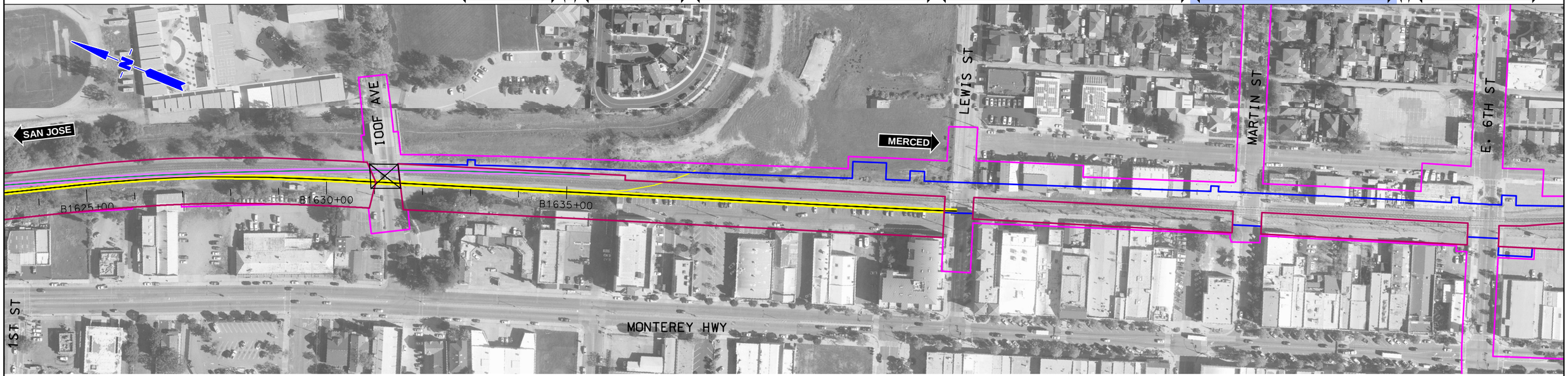
CREEK UNDERPASS





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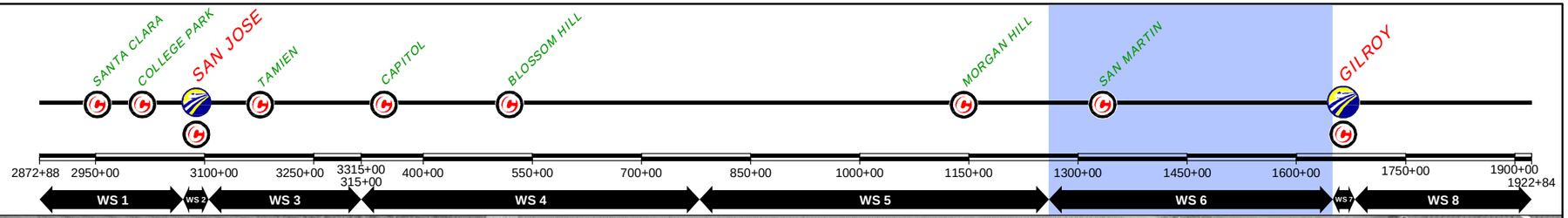
CALIFORNIA High-Speed Rail Authority

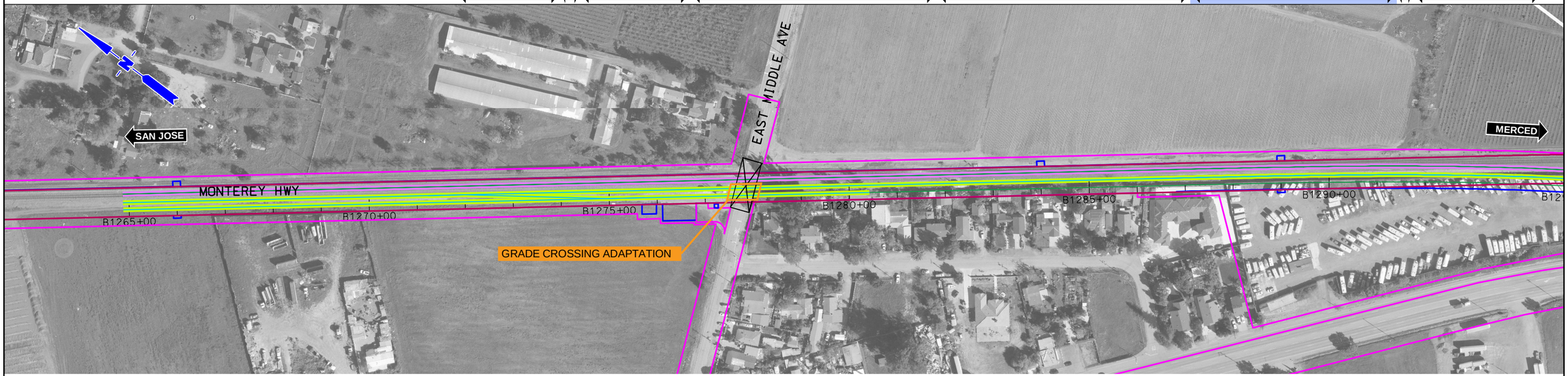
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 3

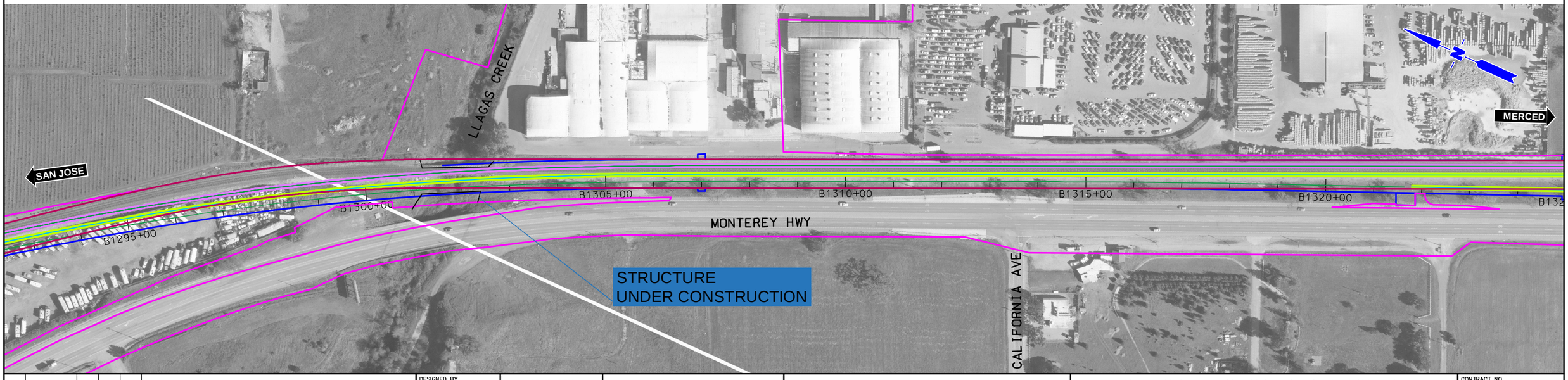
CONTRACT NO.
DRAWING NO. CV-I1WS6-PH3-07
SCALE 1" = 200'
SHEET NO. 7 OF 7

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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$PENTBLS$
$TIME$
$DATE$
$USER$

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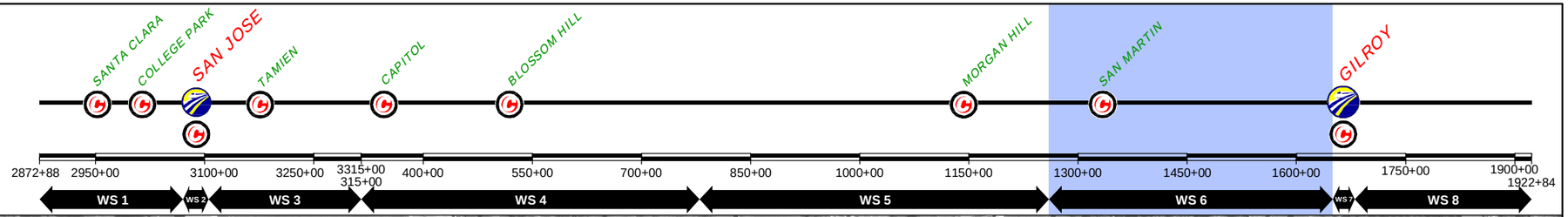
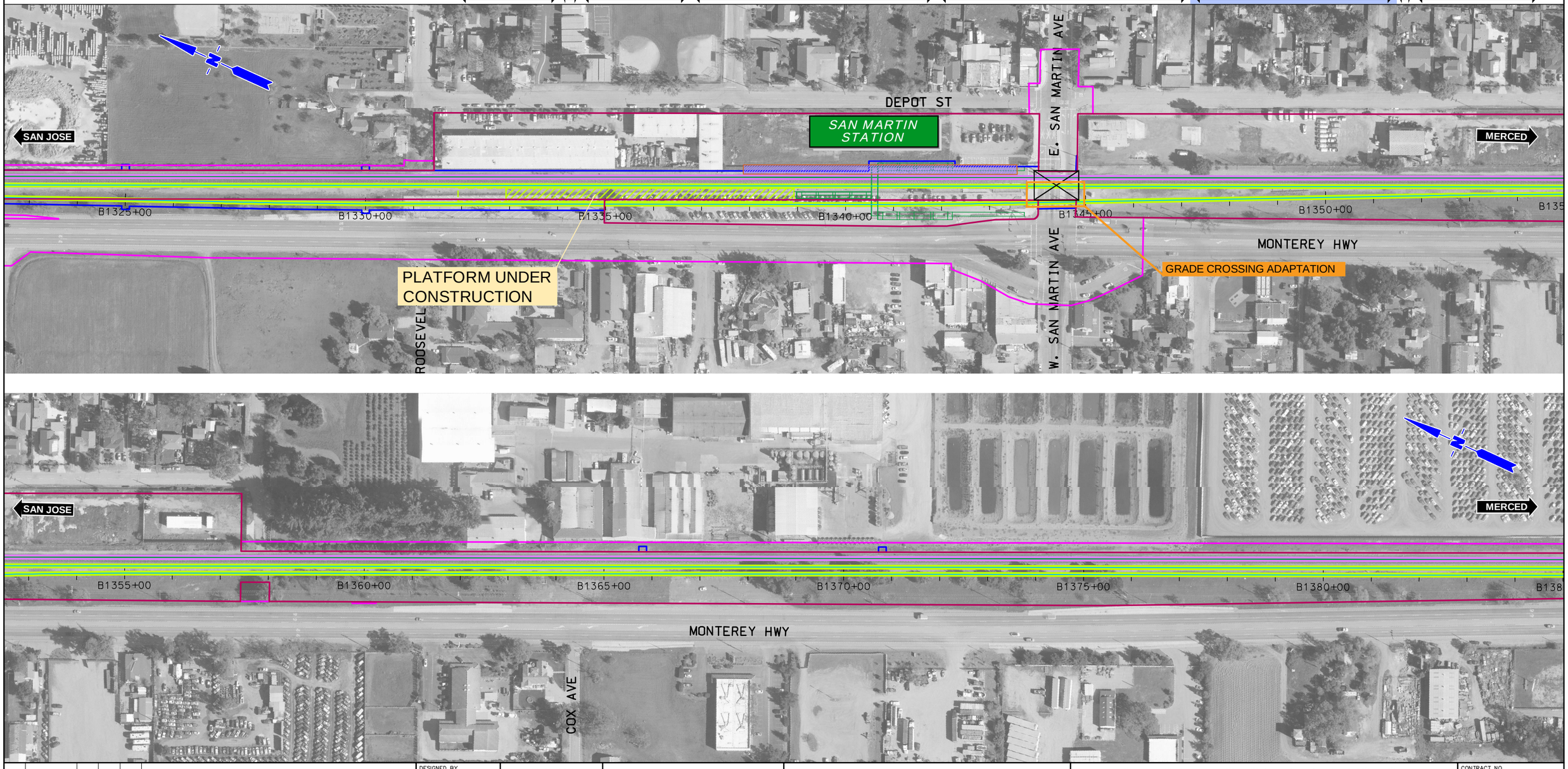
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH4-01
SCALE 1" = 200'
SHEET NO. 1 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$PENTBLS$
$TIME$
$DATE$
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PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH4-02
SCALE 1" = 200'
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA
COLLEGE PARK
SAN JOSE
TAMIEN
CAPITOL
BLOSSOM HILL
MORGAN HILL
SAN MARTIN
GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
CHURCH AVE
B1385+00 B1390+00 B1395+00 B1400+00 B1405+00 B1410+00 B141
MONTEREY HWY
MONTEREY HWY
HIGHLAND AVE
GRADE CROSSING ADAPTATION

CHURCH AVE
SAN JOSE
MERCED
B1415+00 B1420+00 B1425+00 B1430+00 B1435+00 B1440+00 B144
MONTEREY HWY
GRADE CROSSING ADAPTATION

$FILE$
$PLTDRVS$
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$TIME$
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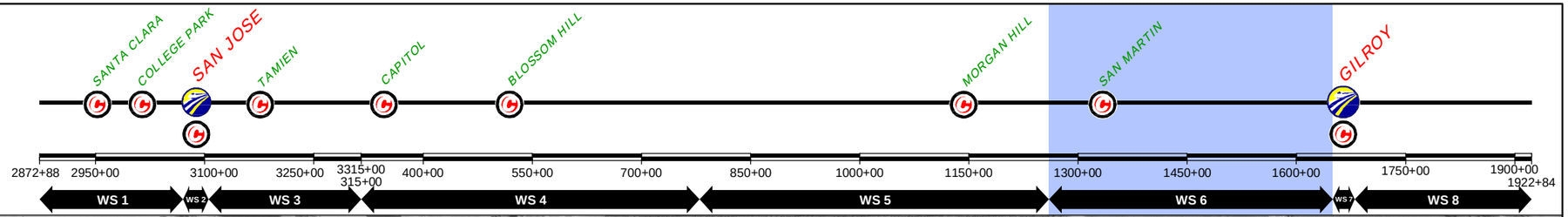
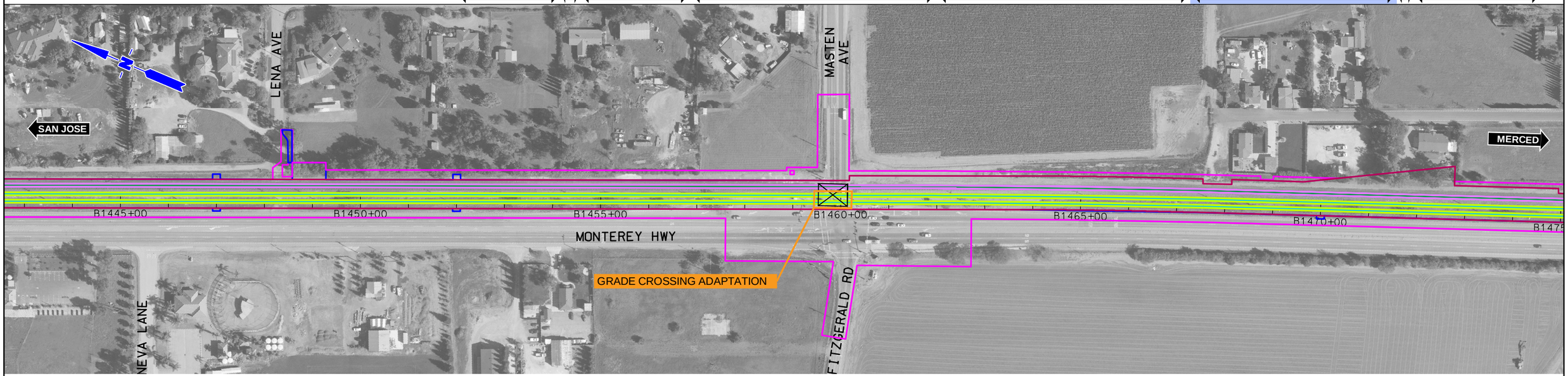
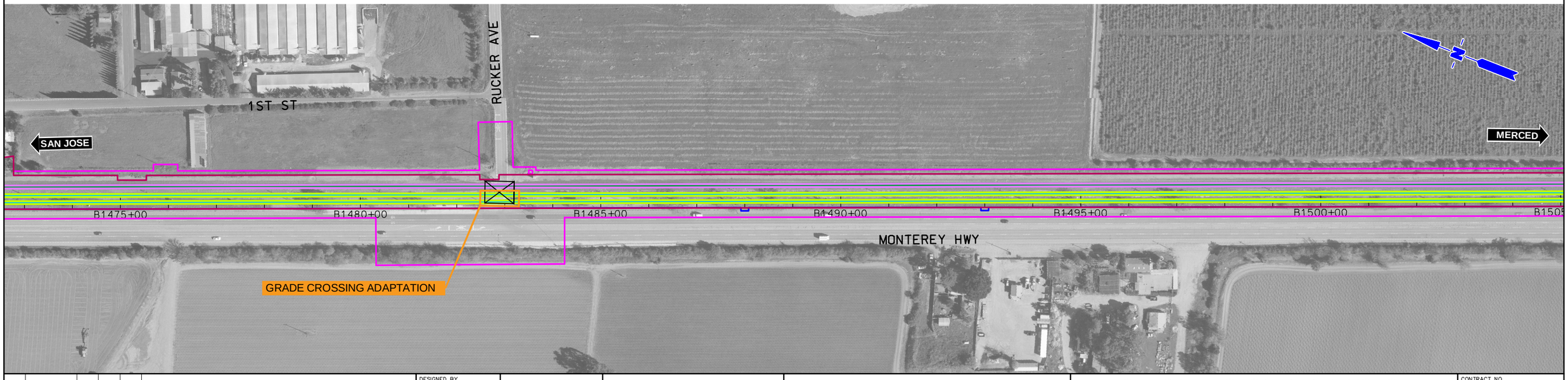
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH4-03
SCALE 1" = 200'
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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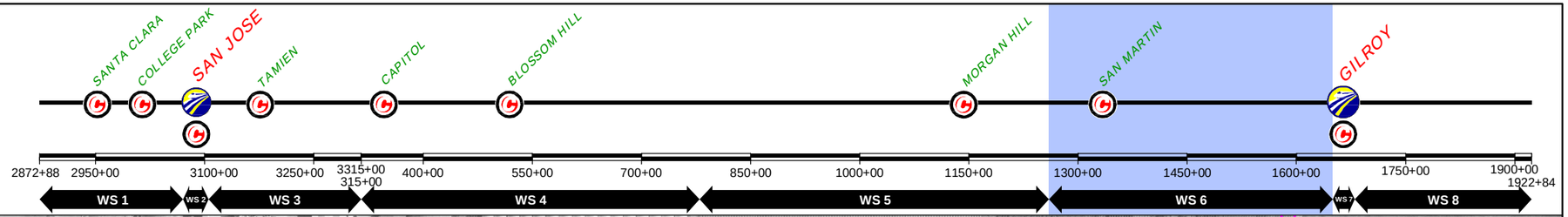
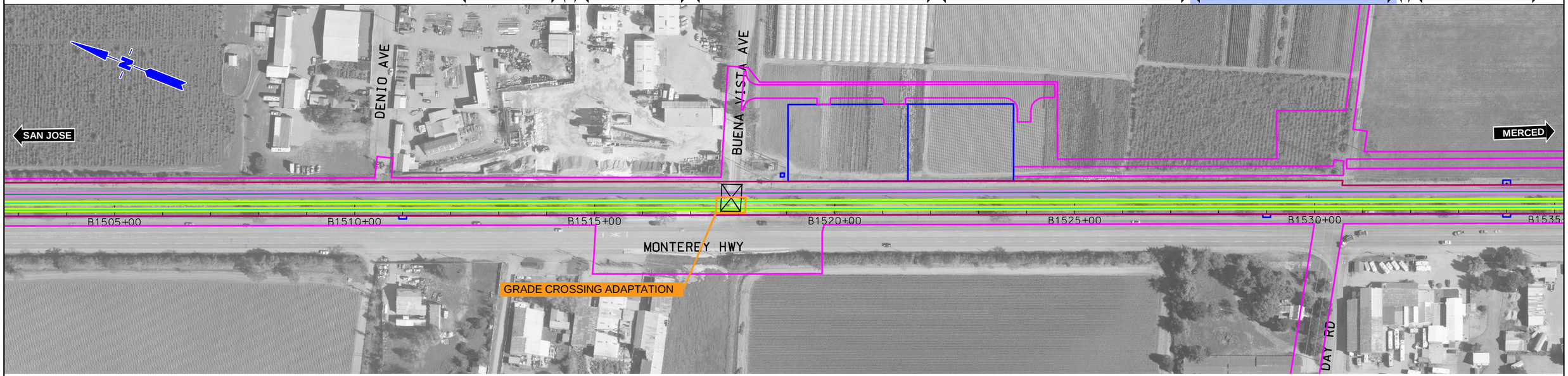
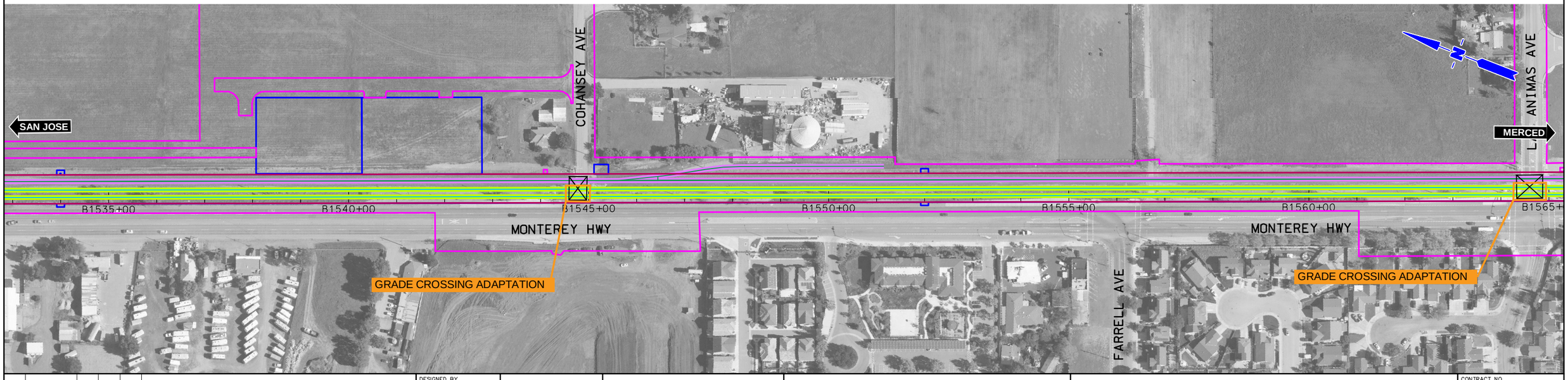
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH4-04
SCALE 1" = 200'
SHEET NO. 4 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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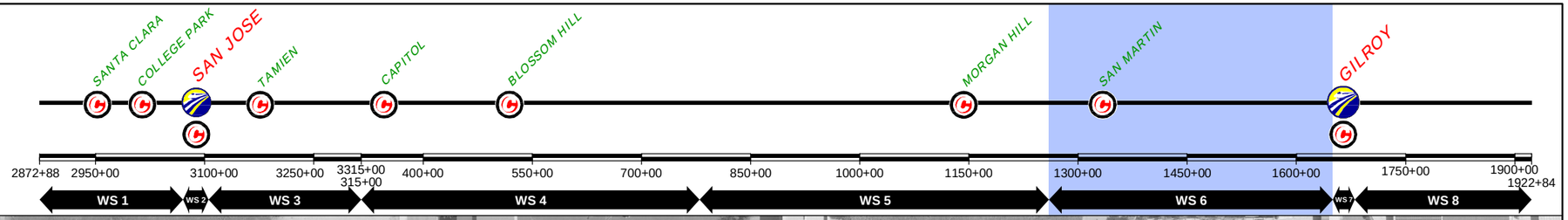
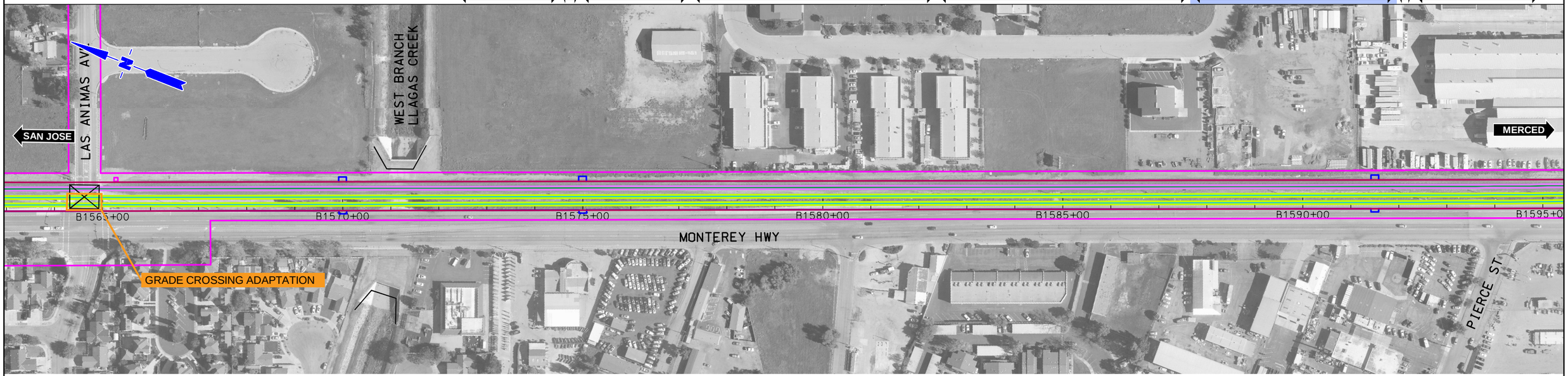
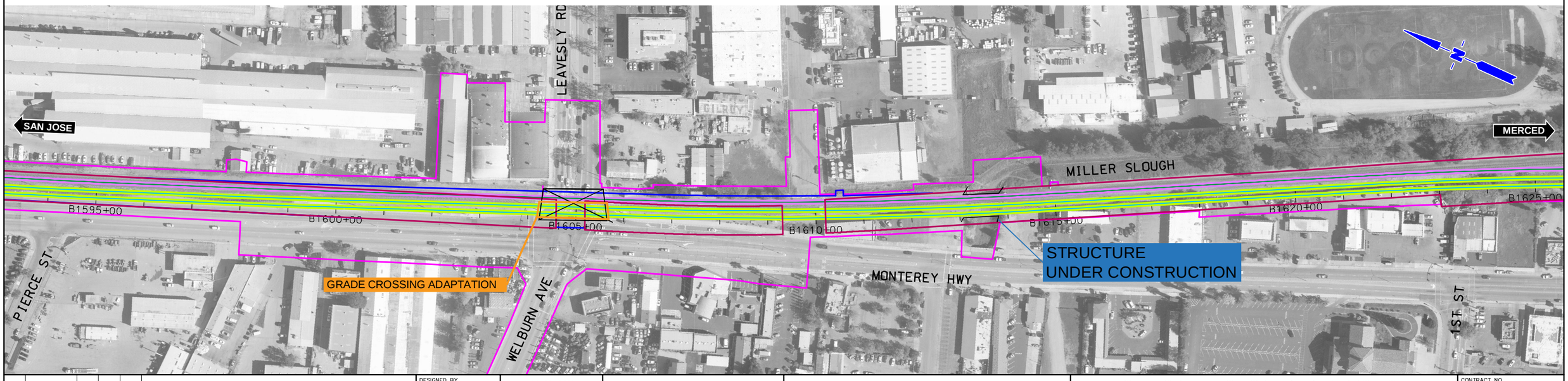
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH4-05
SCALE 1" = 200'
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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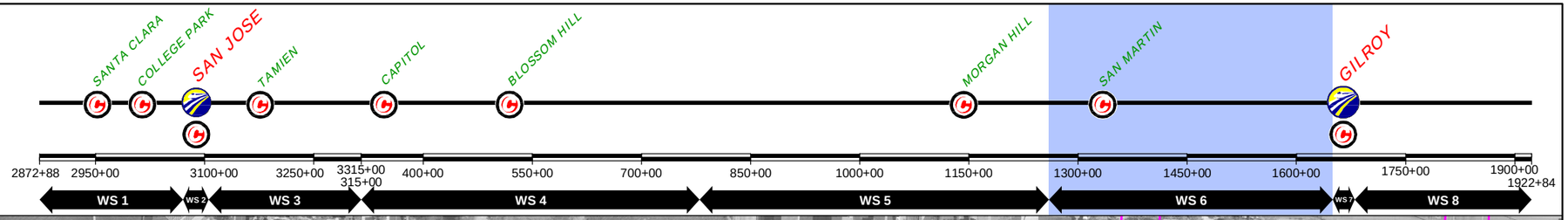
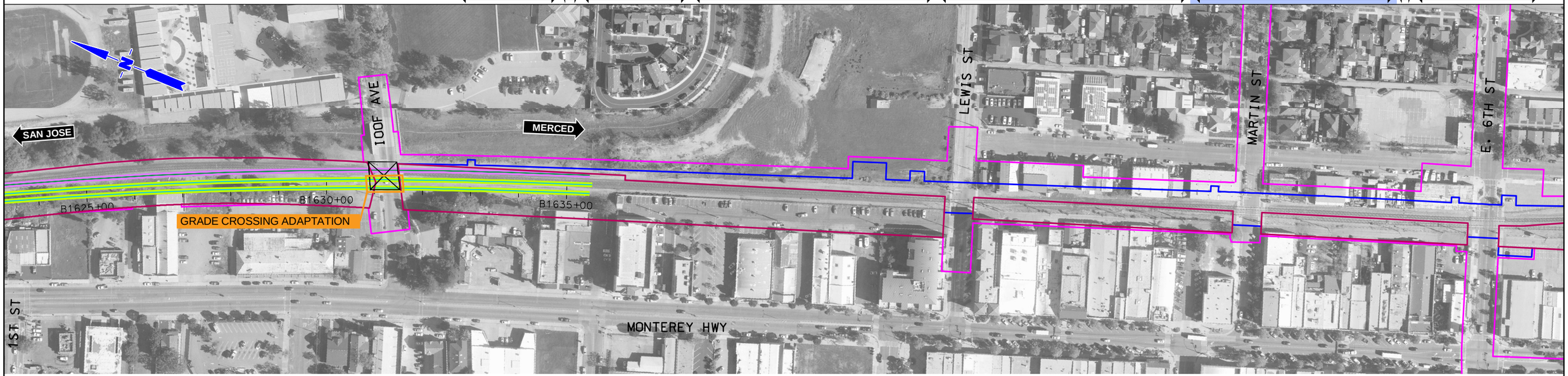
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH4-06
SCALE 1" = 200'
SHEET NO. 6 OF 7

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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PLAN
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH4-07
SCALE 1" = 200'
SHEET NO. 7 OF 7

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

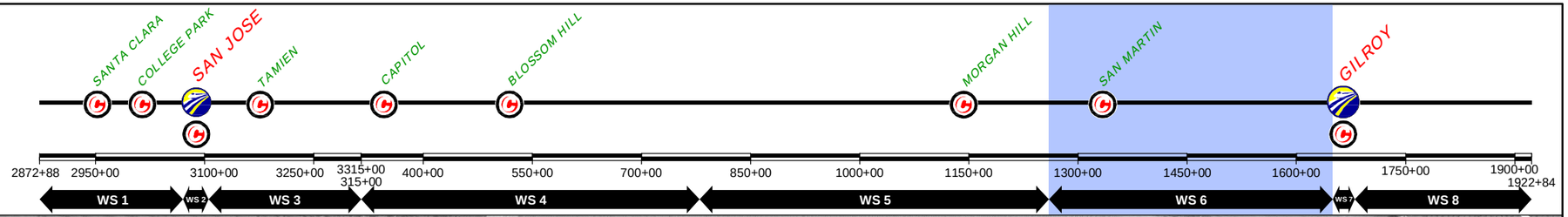
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

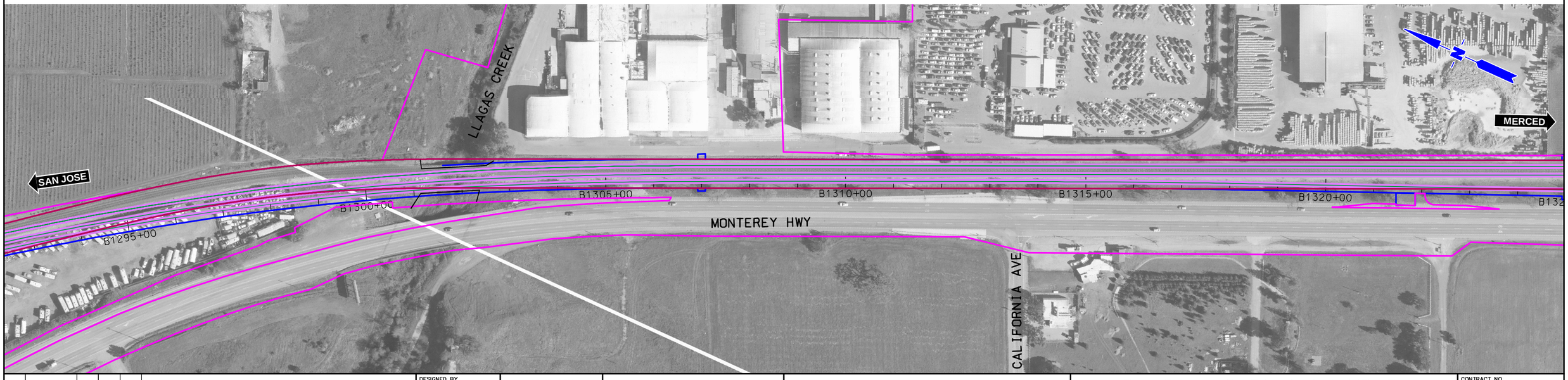
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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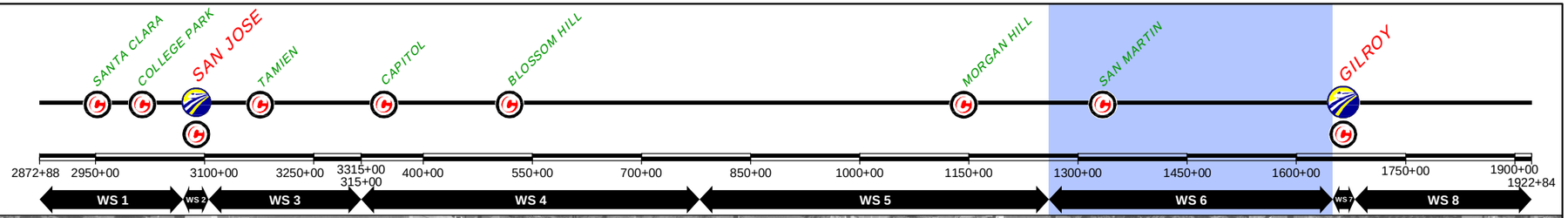
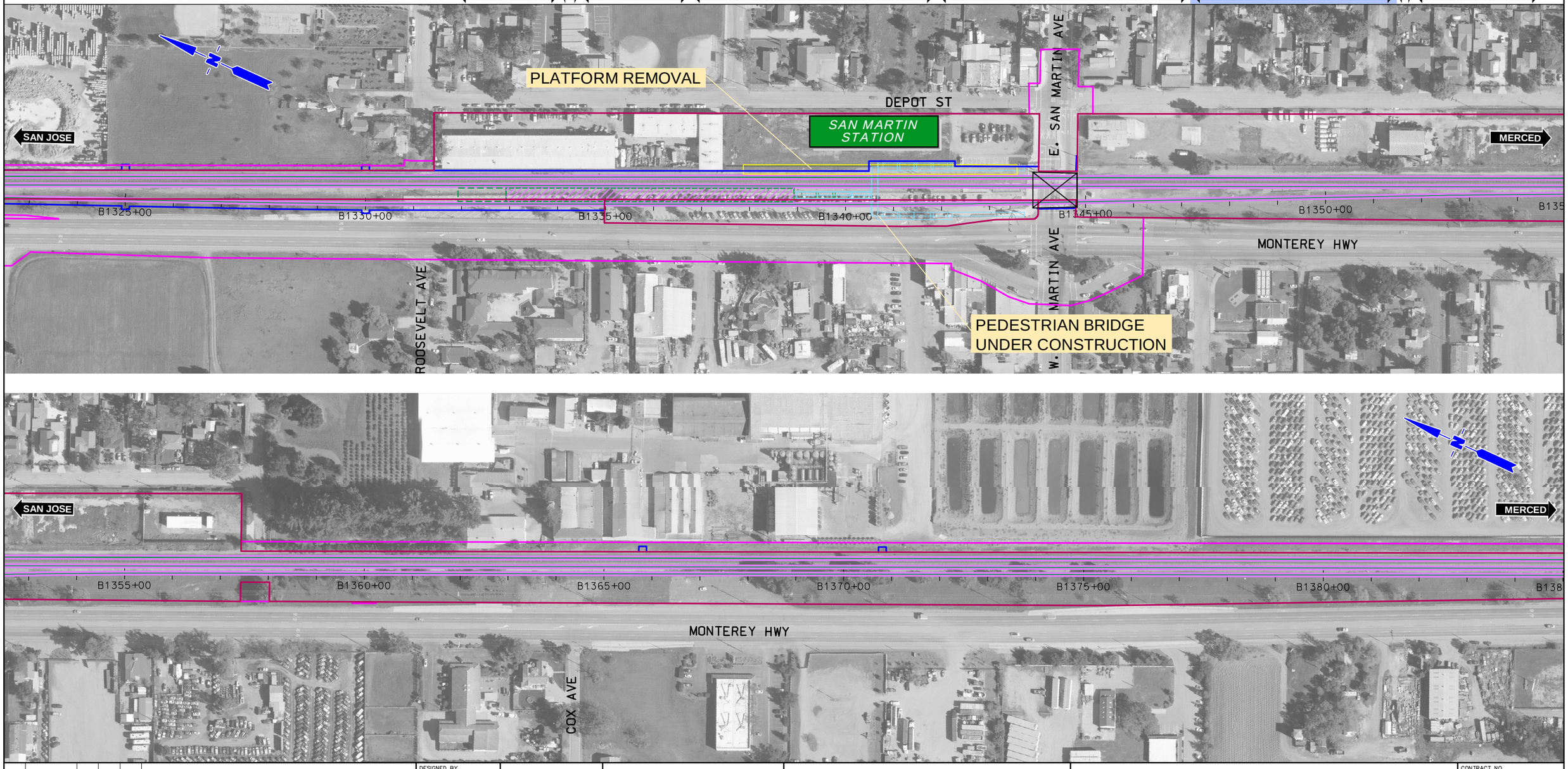
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH5-01
SCALE 1" = 200'
SHEET NO. 1 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$PENTBLS$
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1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH5-02
SCALE 1" = 200'
SHEET NO. 2 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
CHURCH AVE
HIGHLAND AVE
MONTEREY HWY
MONTEREY HWY
B1385+00 B1390+00 B1395+00 B1400+00 B1405+00 B1410+00 B141

CHURCH AVE
SAN JOSE
MERCED
MONTEREY HWY
B1415+00 B1420+00 B1425+00 B1430+00 B1435+00 B1440+00 B144

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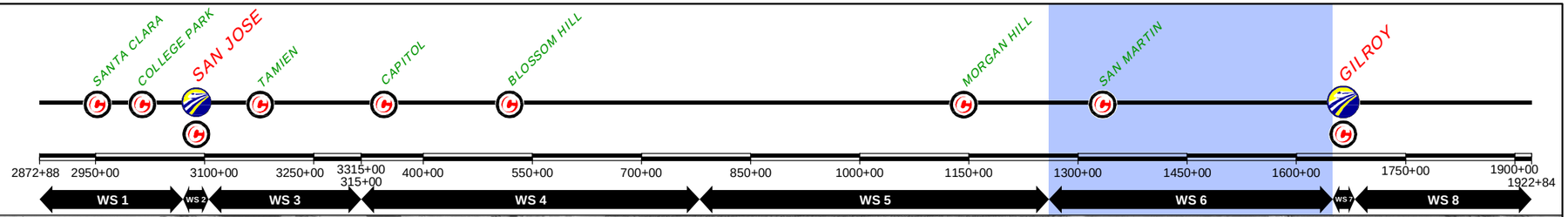
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH5-03
SCALE 1" = 200'
SHEET NO. 3 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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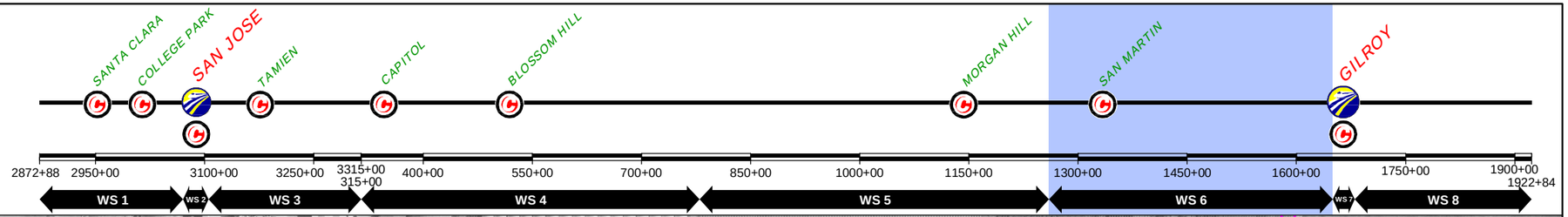
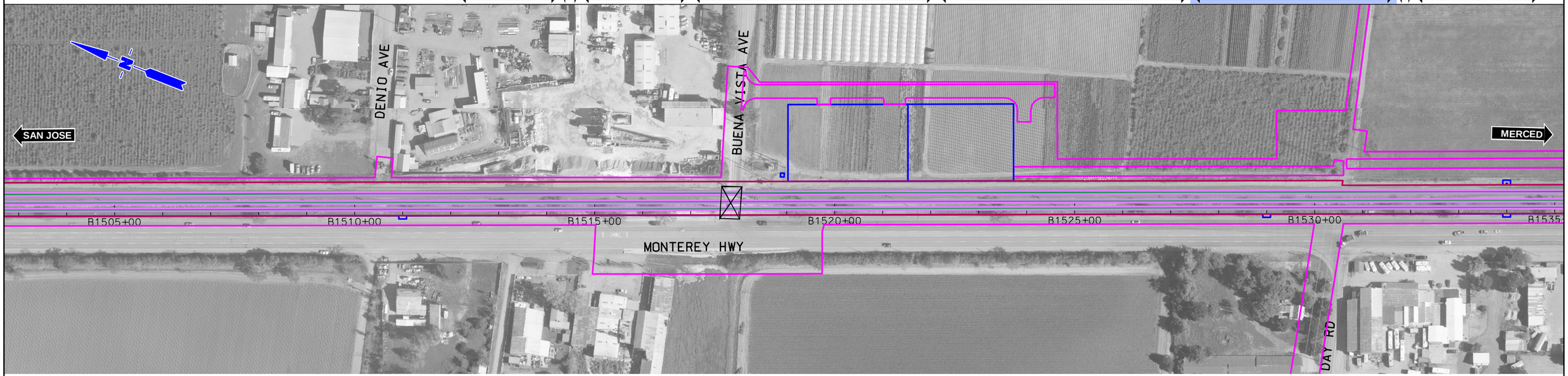
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH5-04
SCALE 1" = 200'
SHEET NO. 4 OF 7

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$TIME$
$DATE$
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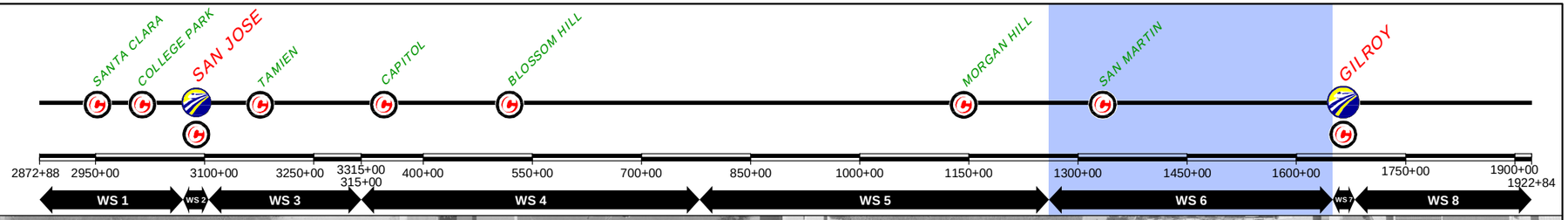
CALIFORNIA High-Speed Rail Authority

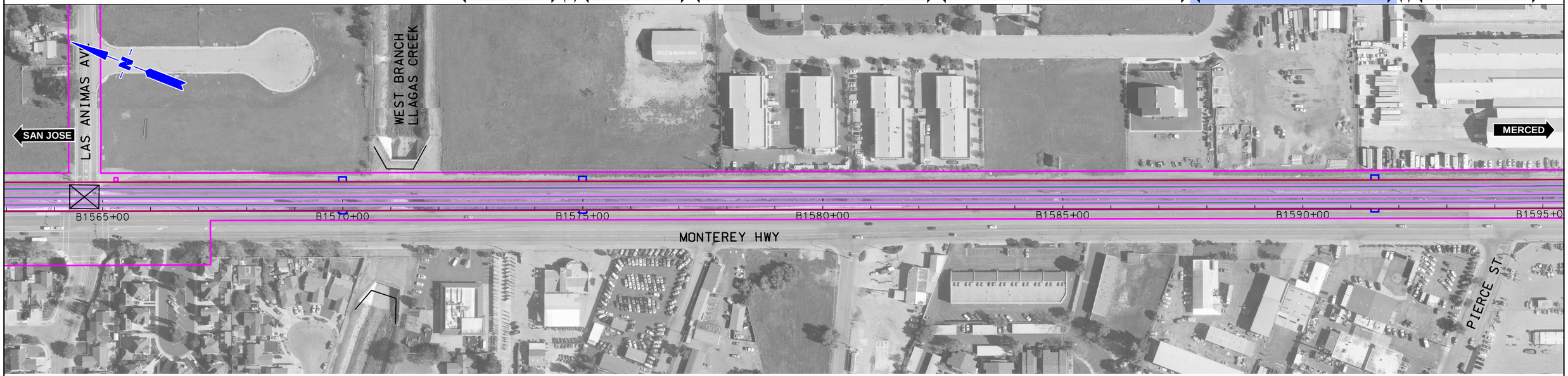
CALIFORNIA HIGH-SPEED TRAIN PROJECT

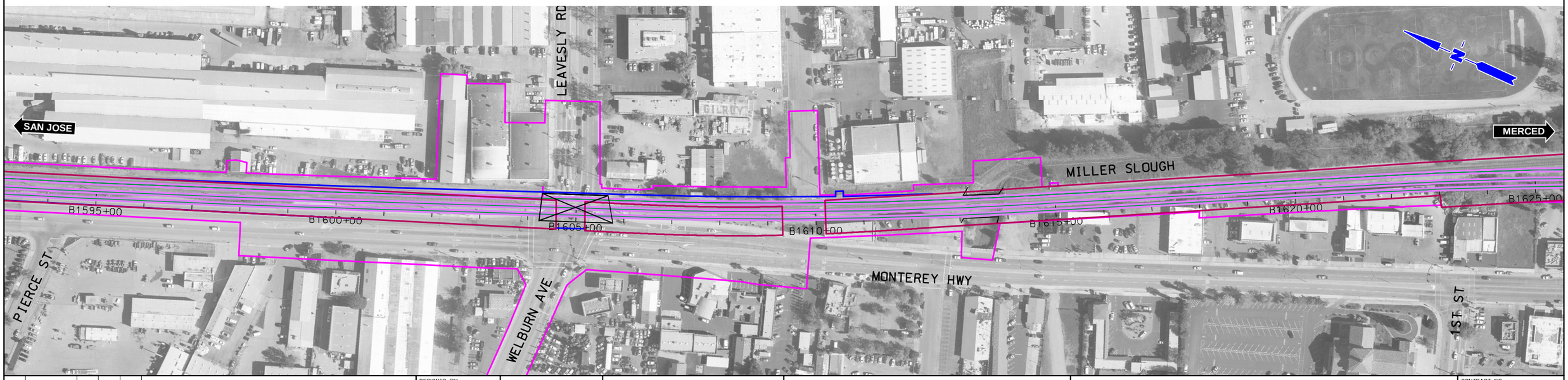
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH5-05
SCALE 1" = 200'
SHEET NO. 5 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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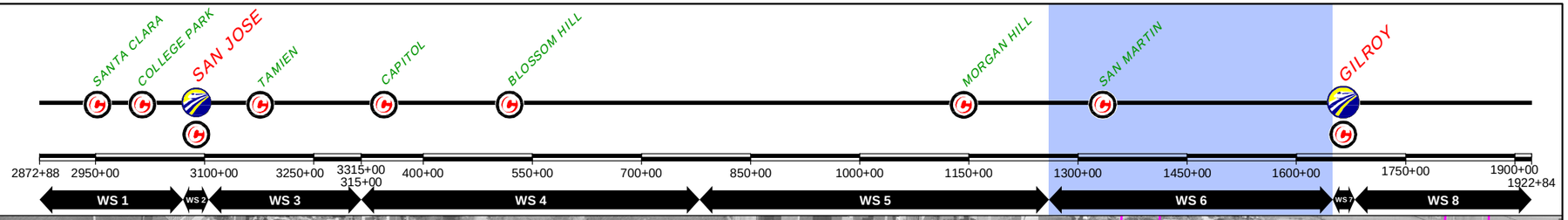
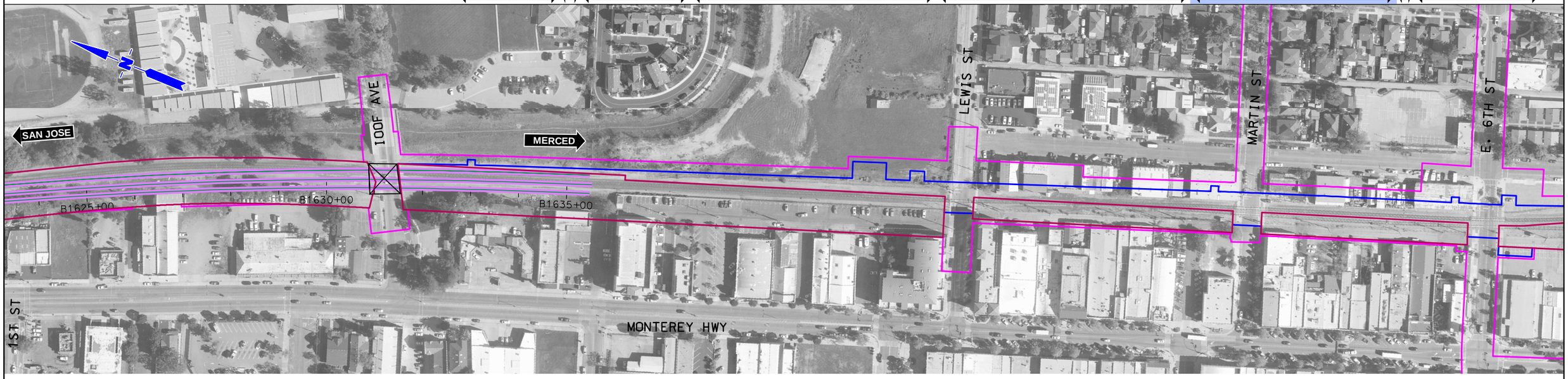
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH5-06
SCALE 1" = 200'
SHEET NO. 6 OF 7

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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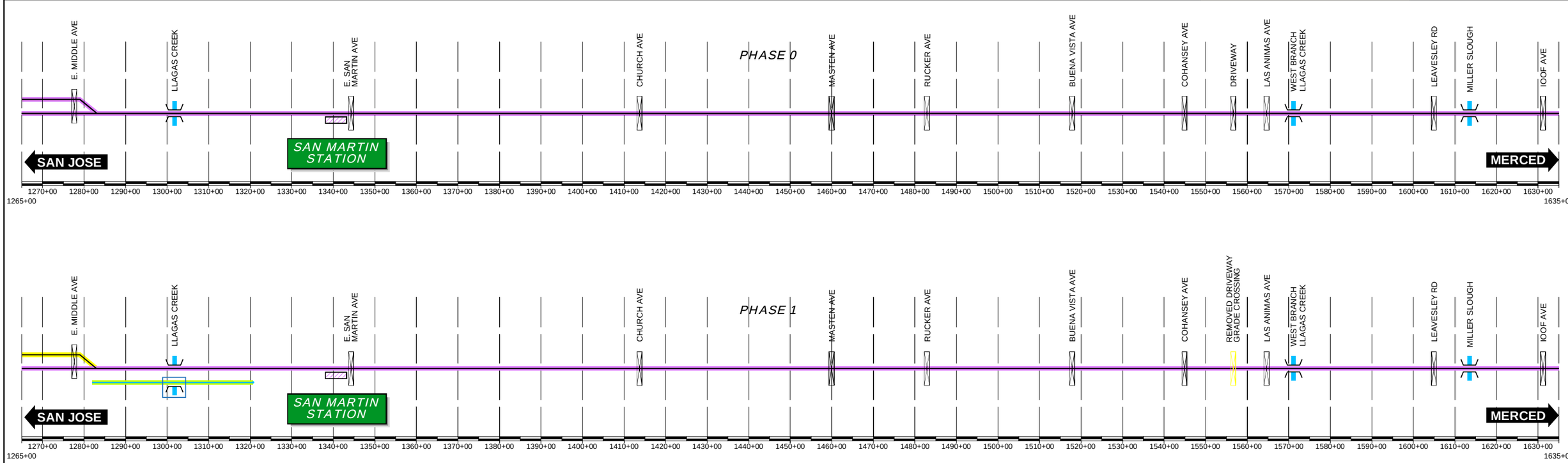
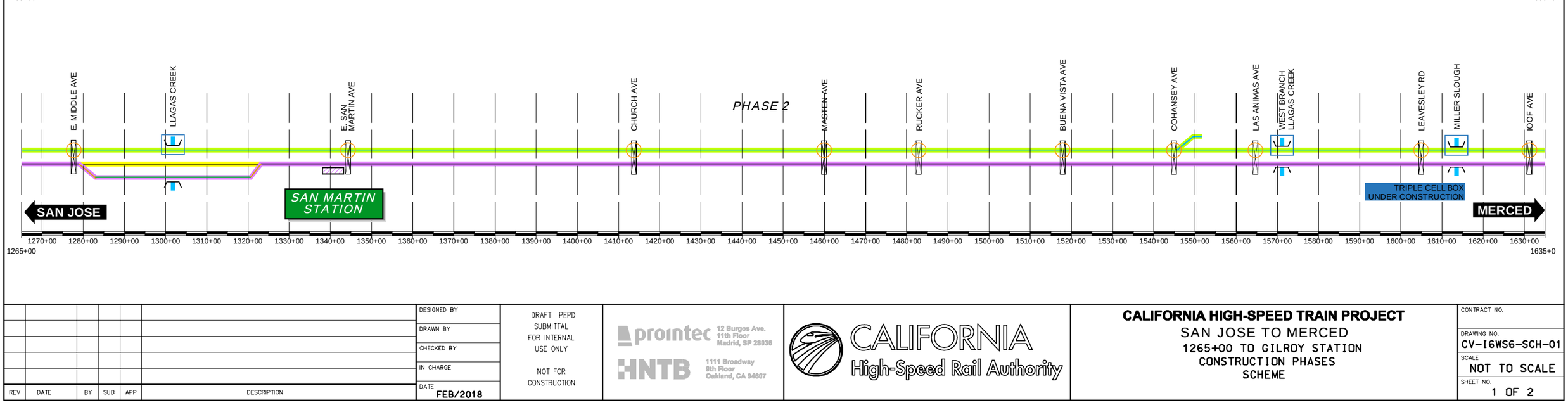
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS6-PH5-07
SCALE 1" = 200'
SHEET NO. 7 OF 7

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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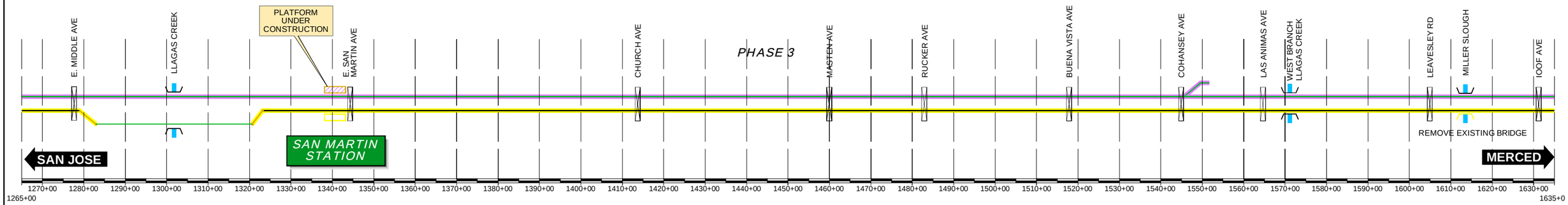
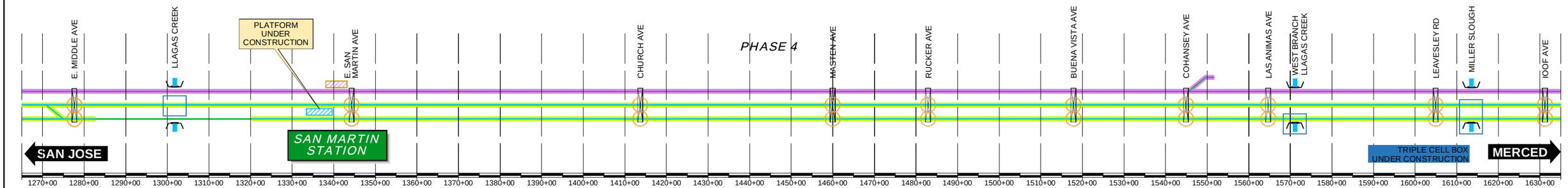
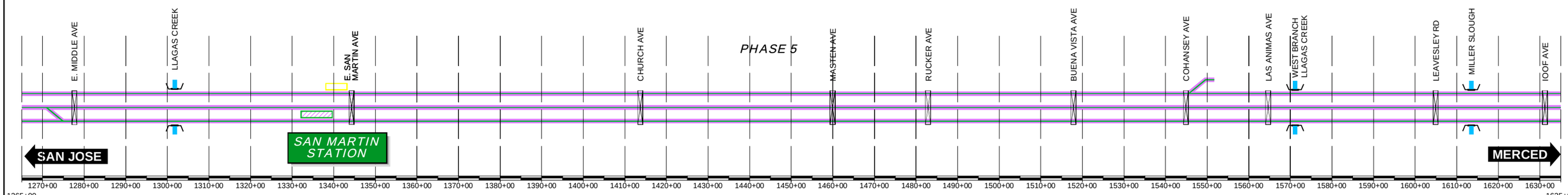
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS6-SCH-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
GRADE CROSSING
TUNNEL
MAJOR UNDERPASS
CREEK UNDERPASS







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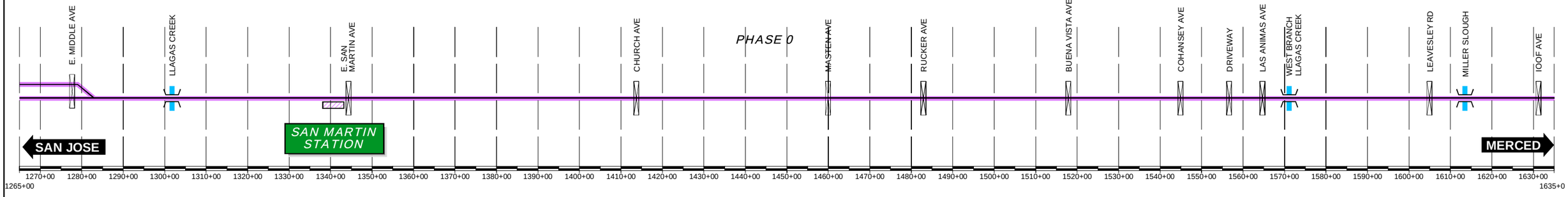
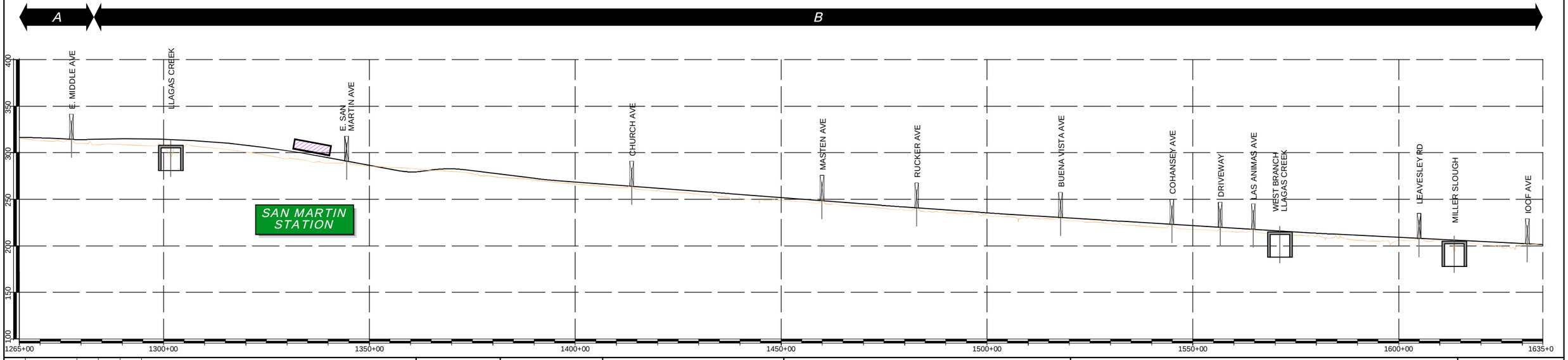
SAN JOSE TO MERCED

1265+00 TO GILROY STATION CONSTRUCTION PHASES SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS6-SCH-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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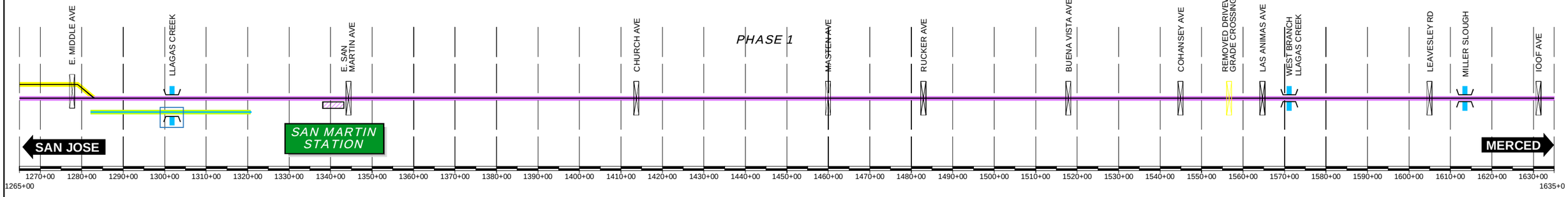
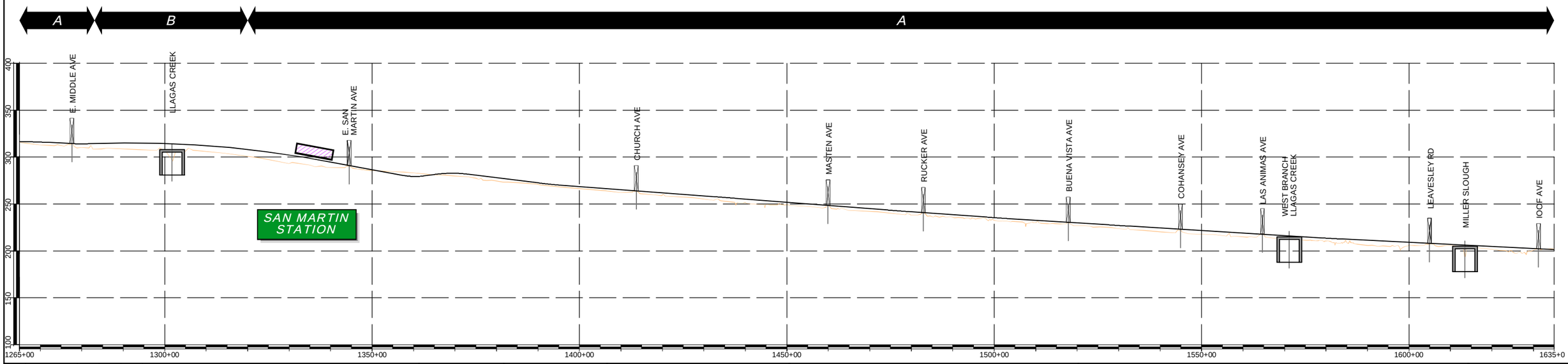
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I6WS6-SPP-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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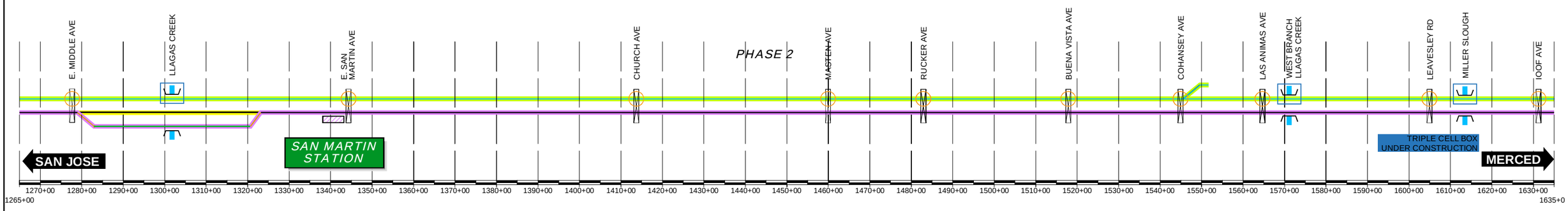
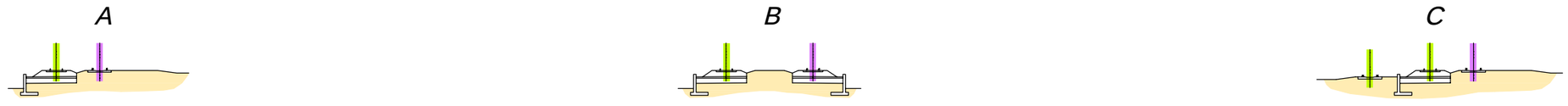
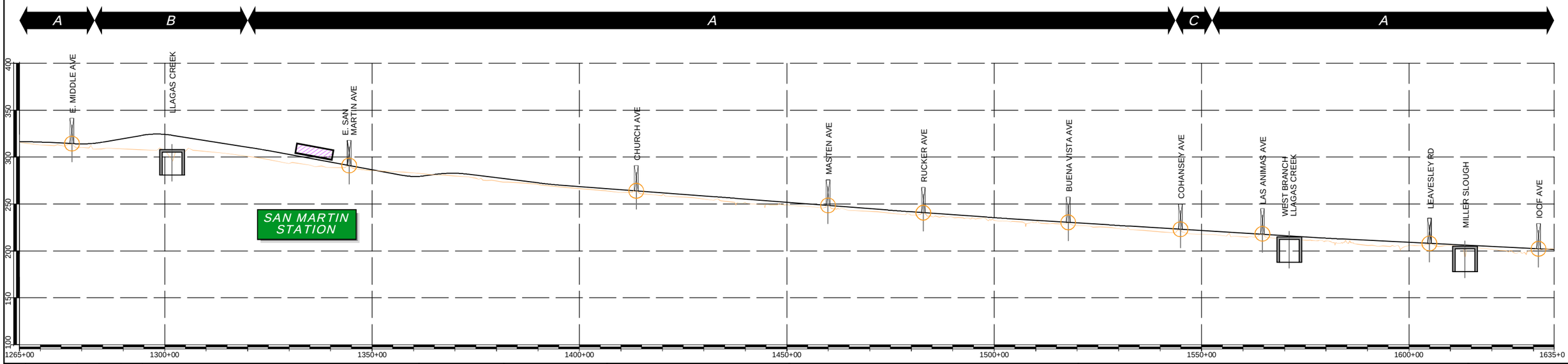
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I6WS6-SPP-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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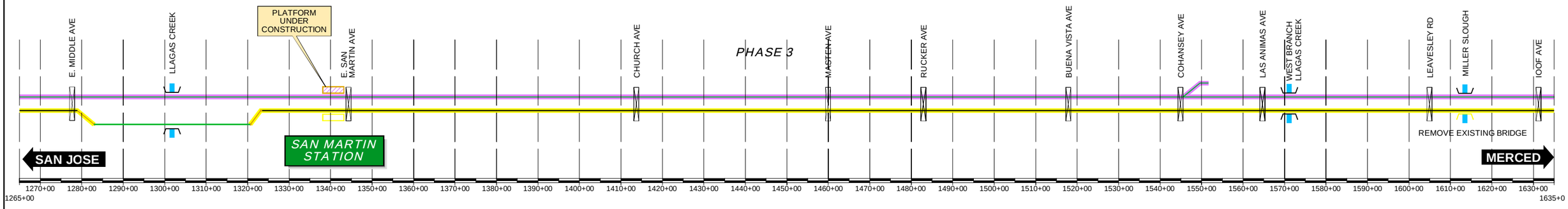
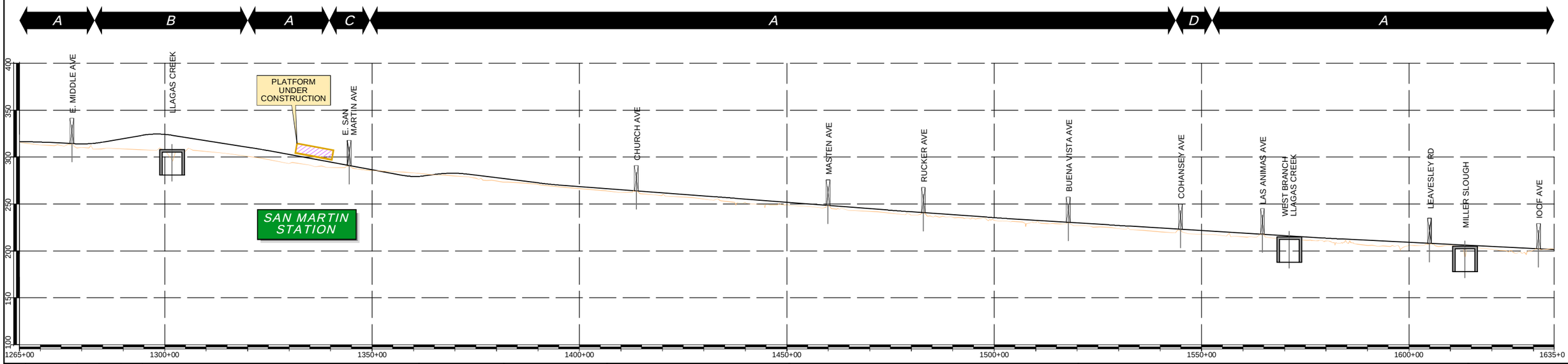
PLAN AND PROFILE SCHEME
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I6WS6-SPP-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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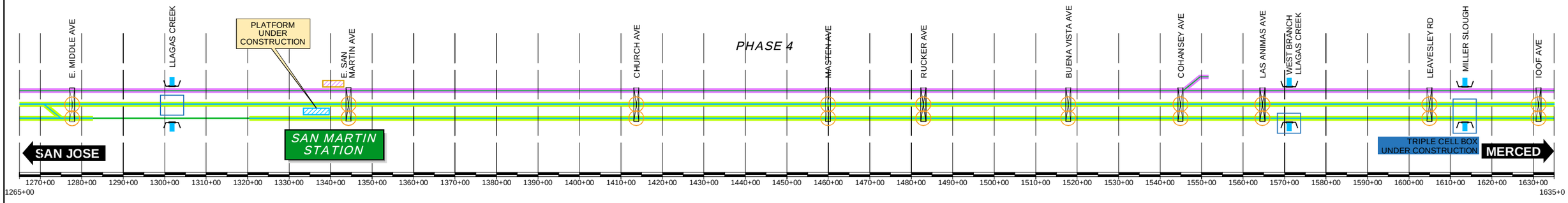
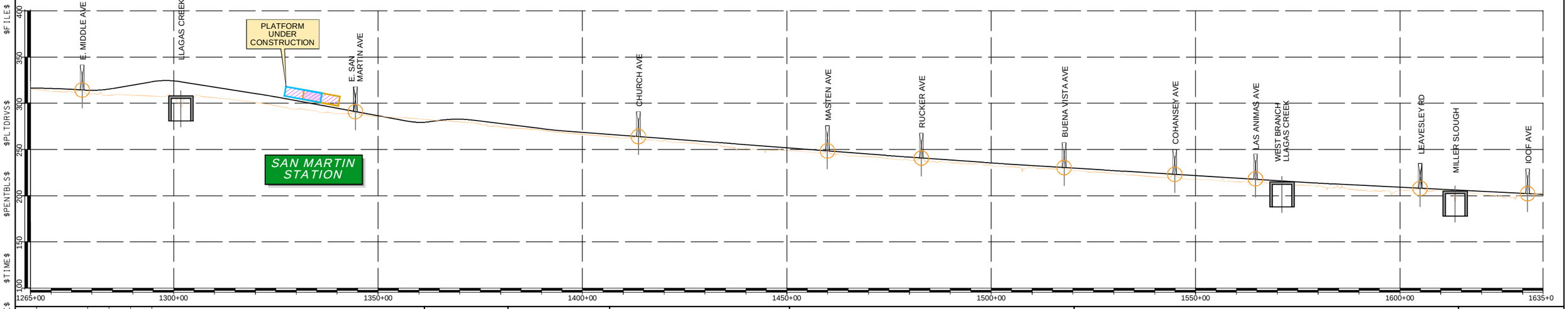
SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I6WS6-SPP-04
SCALE NOT TO SCALE
SHEET NO. 4 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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1265+00 TO GILROY STATION
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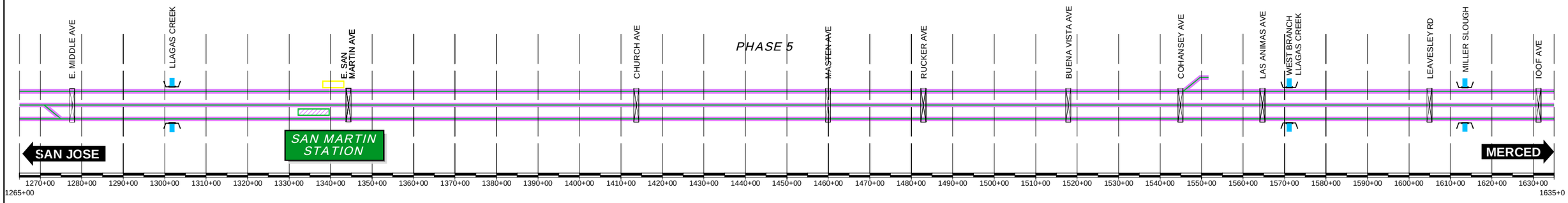
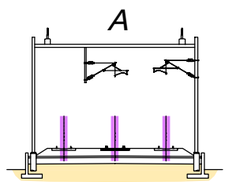
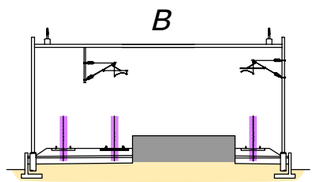
PLAN AND PROFILE SCHEME
PHASE 4

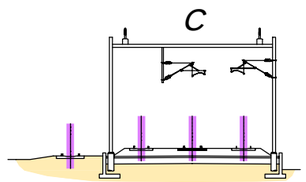
CONTRACT NO.
DRAWING NO. CV-I6WS6-SPP-05
SCALE NOT TO SCALE
SHEET NO. 5 OF 6

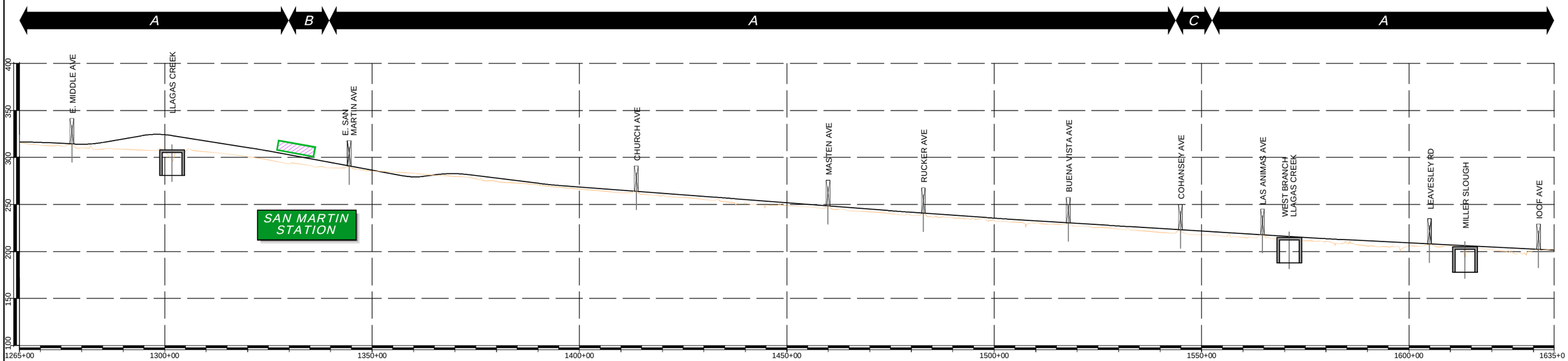
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS











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SAN JOSE TO MERCED
1265+00 TO GILROY STATION
CONSTRUCTION PHASES
PLAN AND PROFILE SCHEME
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I6WS6-SPP-06
SCALE NOT TO SCALE
SHEET NO. 6 OF 6

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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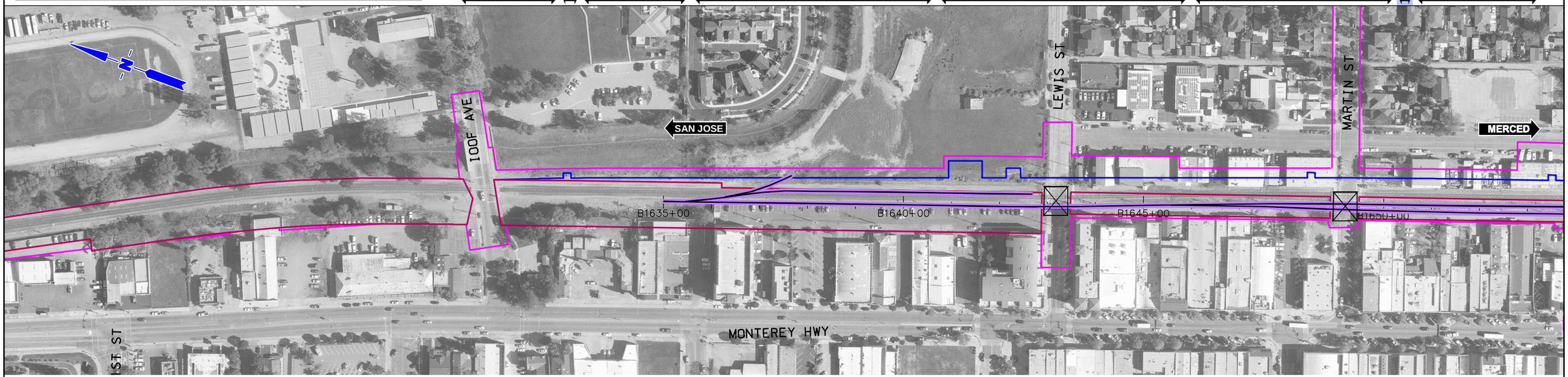
TUNNEL
CREEK UNDERPASS

SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8



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CALIFORNIA High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED

GILROY STATION

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN

PHASE 0

CONTRACT NO.

DRAWING NO. CV-I1WS7-PH0-01

SCALE 1" = 200'

SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH0-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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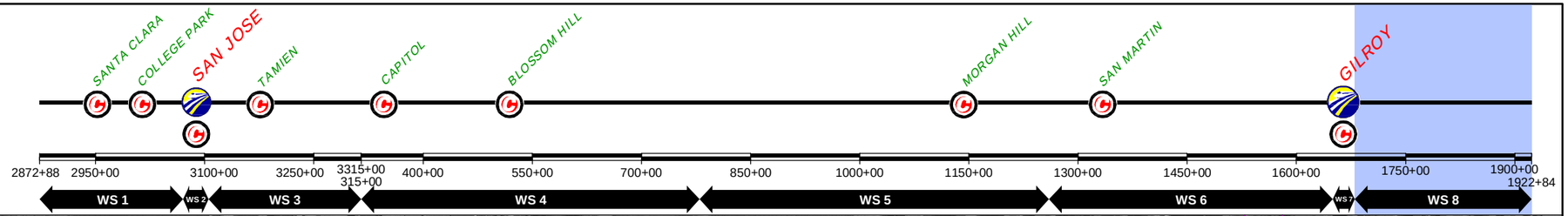

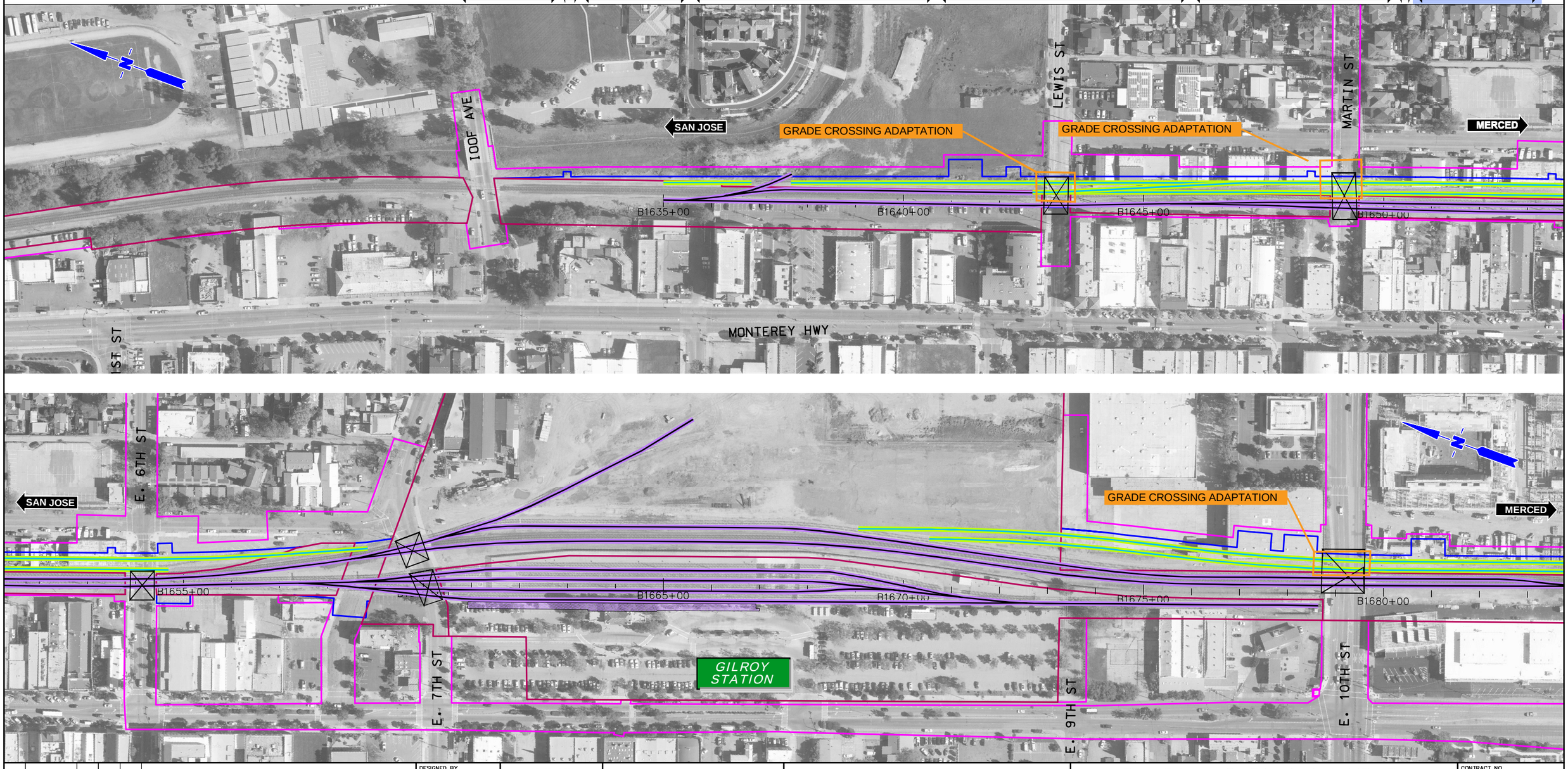

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GILROY STATION

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN

PHASE 1

CONTRACT NO.

DRAWING NO. CV-I1WS7-PH1-01

SCALE 1" = 200'

SHEET NO. 1 OF 2

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BUILT IN PREVIOUS PHASES
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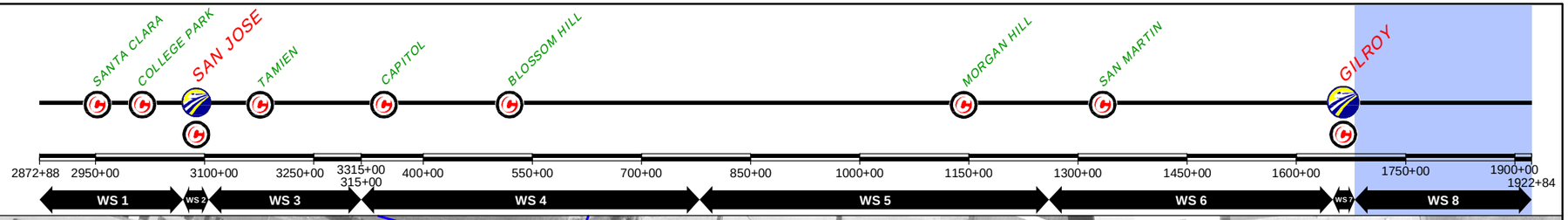

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GILROY STATION
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PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH1-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
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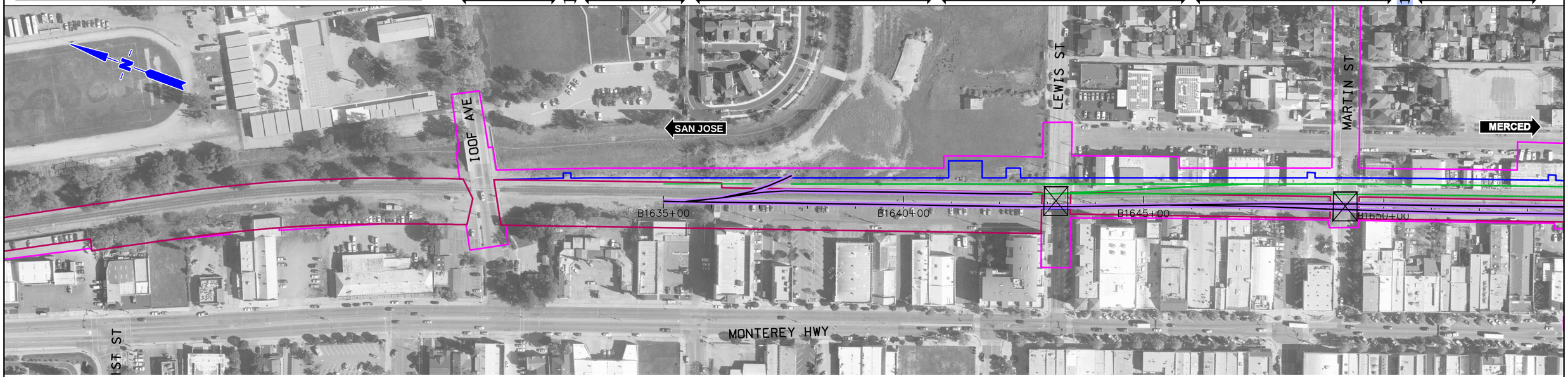
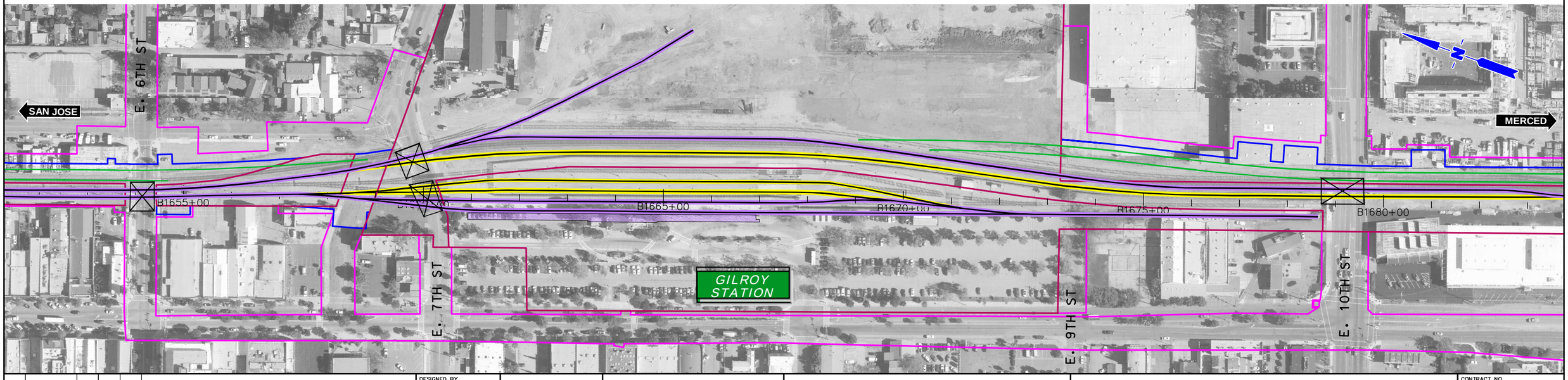
WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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GILROY STATION

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PLAN

PHASE 2

CONTRACT NO.

DRAWING NO. CV-I1WS7-PH2-01

SCALE 1" = 200'

SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
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TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
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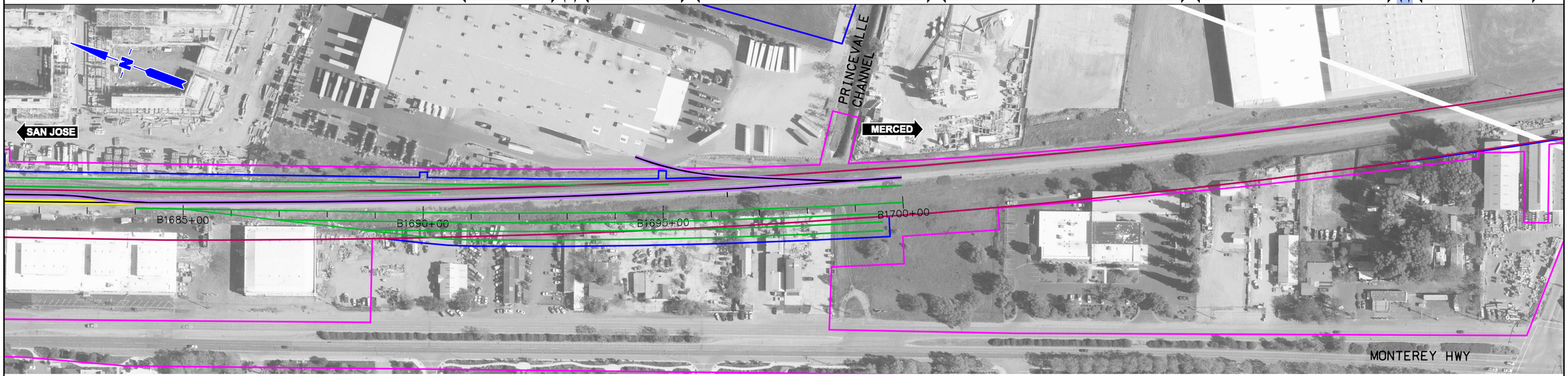
CREEK UNDERPASS



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PLAN
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH2-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
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EXISTING ROW
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GRADE CROSSING
TUNNEL
CREEK UNDERPASS

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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

100F AVE
LEWIS ST
MARTIN ST
SAN JOSE
MERCED
B1635+00
B1640+00
B1645+00
B1650+00
MONTEREY HWY
1ST ST

E. 6TH ST
PLATFORM UNDER CONSTRUCTION
SAN JOSE
MERCED
B1655+00
B1665+00
B1670+00
B1675+00
B1680+00
E. 7TH ST
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PHASE 3

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DRAWING NO. CV-I1WS7-PH3-01
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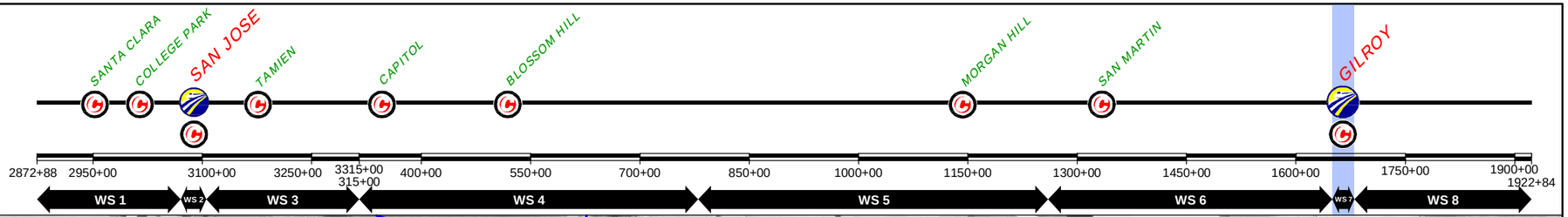

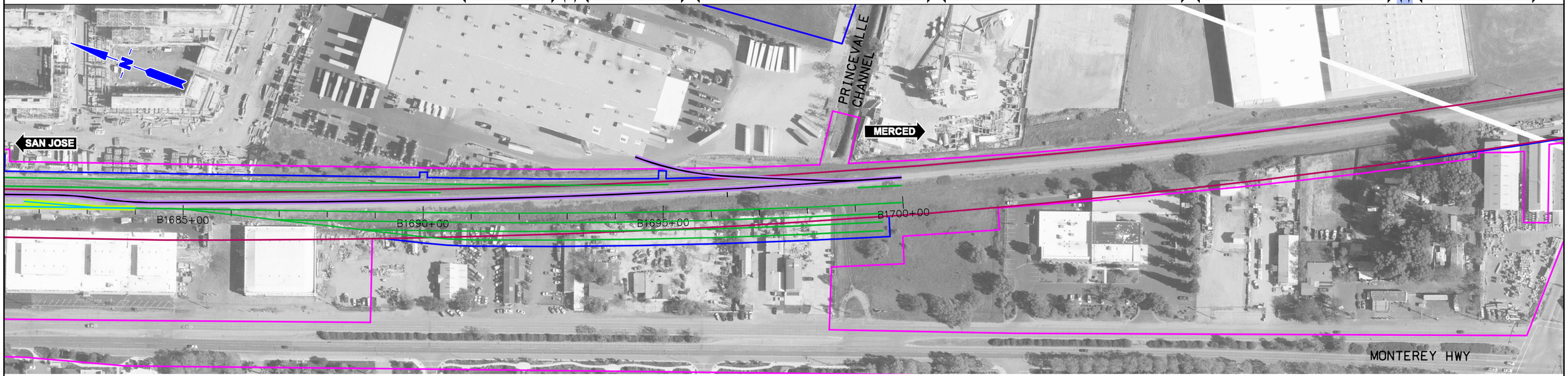

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PLAN
PHASE 3

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH3-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

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TUNNEL
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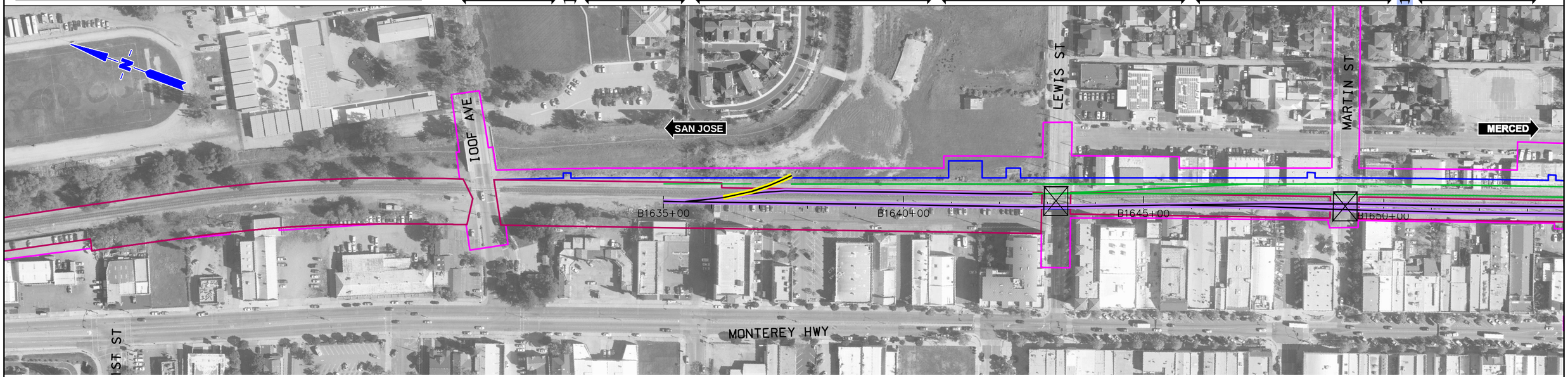

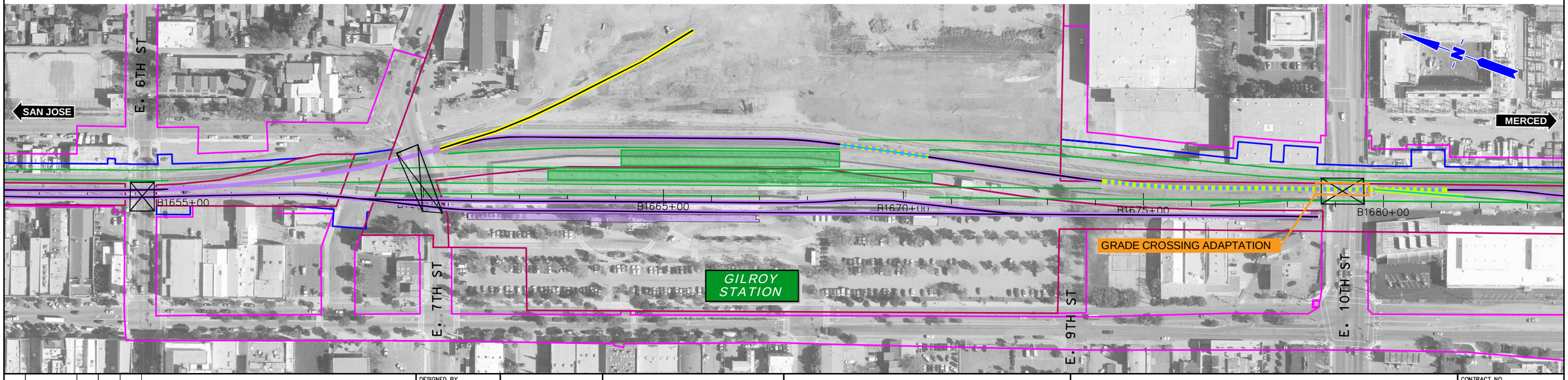

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SAN JOSE TO MERCED

GILROY STATION

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN

PHASE 4

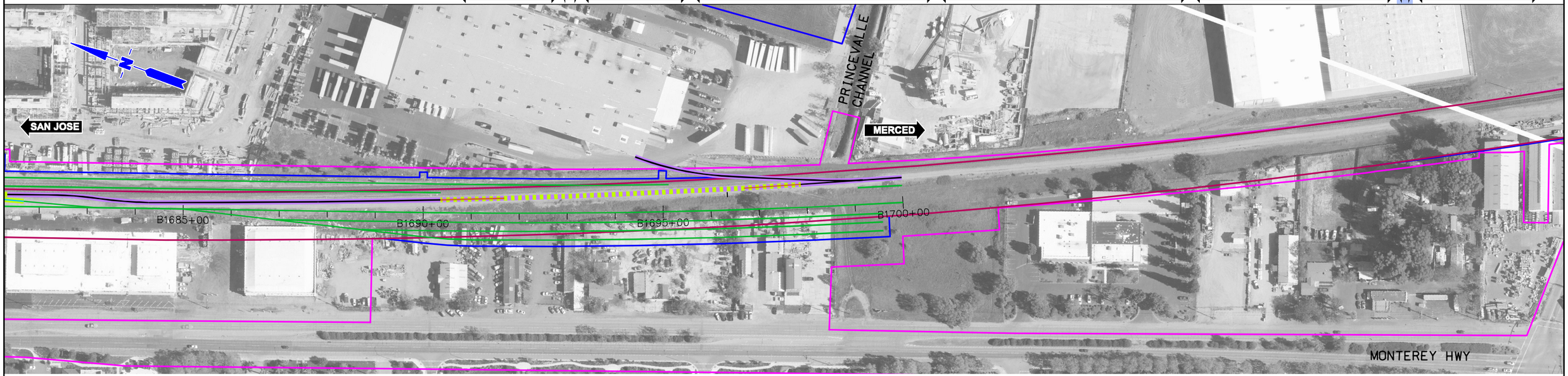
CONTRACT NO.

DRAWING NO. CV-I1WS7-PH4-01

SCALE 1" = 200'

SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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PHASE 4

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH4-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

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CURRENT TRACK
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WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8

SAN JOSE
MERCED
100F AVE
LEWIS ST
MARTIN ST
MONTEREY HWY
B1635+00
B1640+00
B1645+00
B1650+00
E. 6TH ST
GRADE CROSSING ADAPTATION
B1655+00
B1665+00
B1670+00
B1675+00
B1680+00
E. 7TH ST
GILROY STATION
E. 9TH ST
E. 10TH ST

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SAN JOSE TO MERCED

GILROY STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH5-01
SCALE 1" = 200'
SHEET NO. 1 OF 2

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TRACK REMOVAL
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PROPOSED TCE
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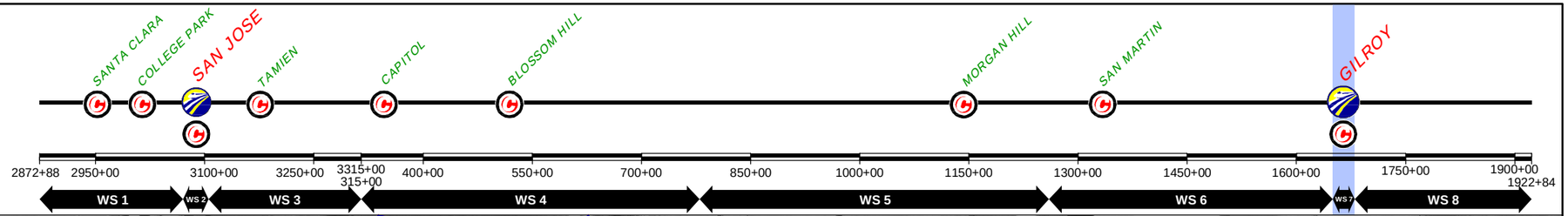
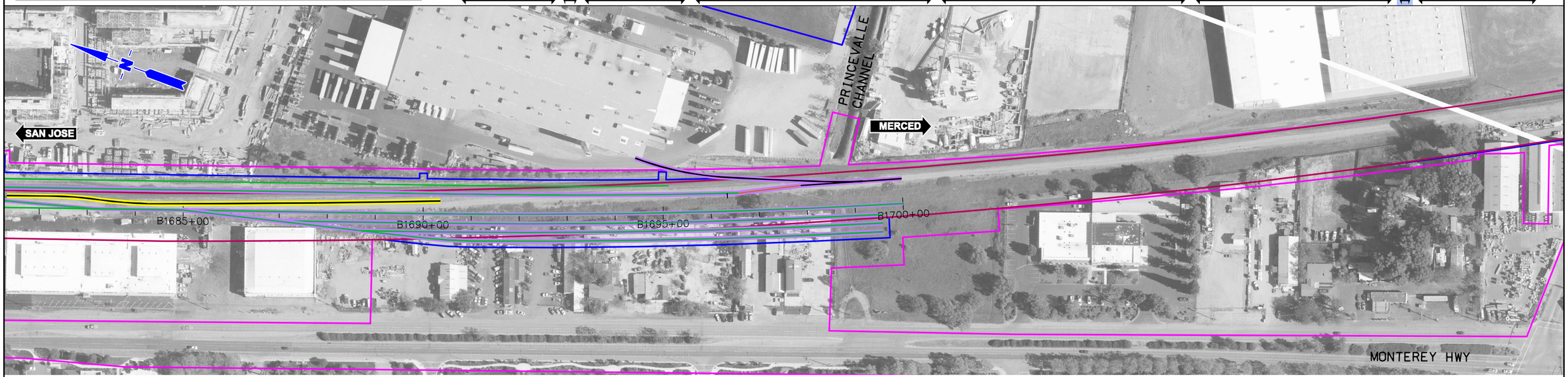
TUNNEL
CREEK UNDERPASS





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PHASE 5

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SANTA CLARA
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GRADE CROSSING ADAPTATION
MONTEREY HWY
E. 6TH ST
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E. 10TH ST
B1655+00
B1665+00
B1680+00
PLATFORM UNDER CONSTRUCTION
GILROY STATION

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CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH6-01
SCALE 1" = 200'
SHEET NO. 1 OF 2

CURRENT TRACK
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BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
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EXISTING ROW
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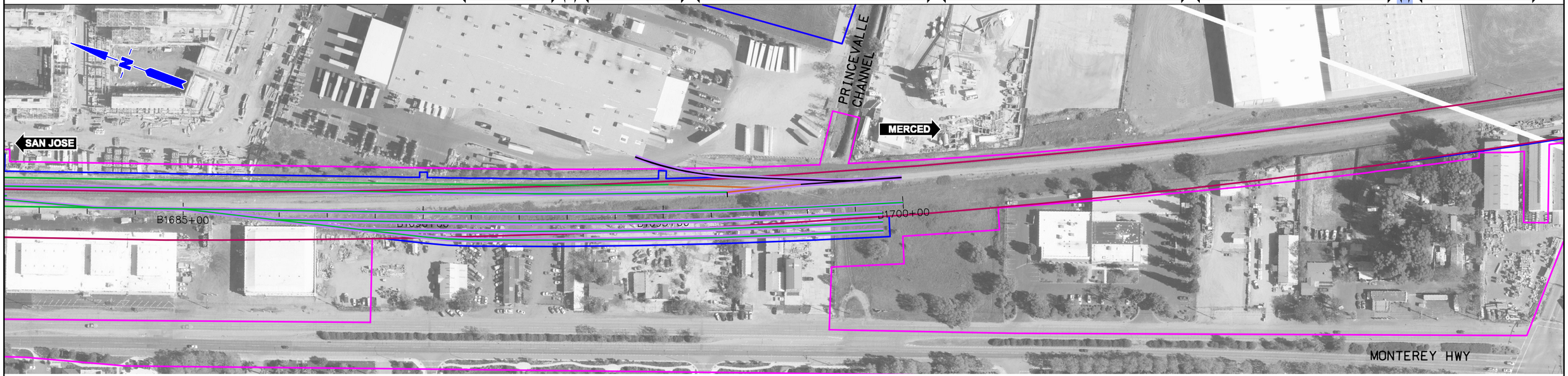
CREEK UNDERPASS



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PHASE 6

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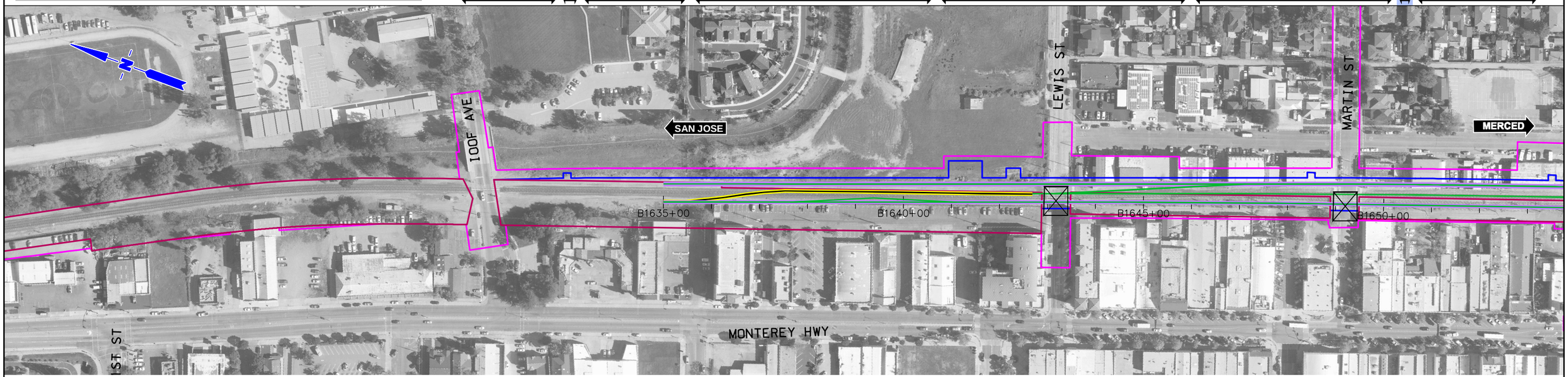
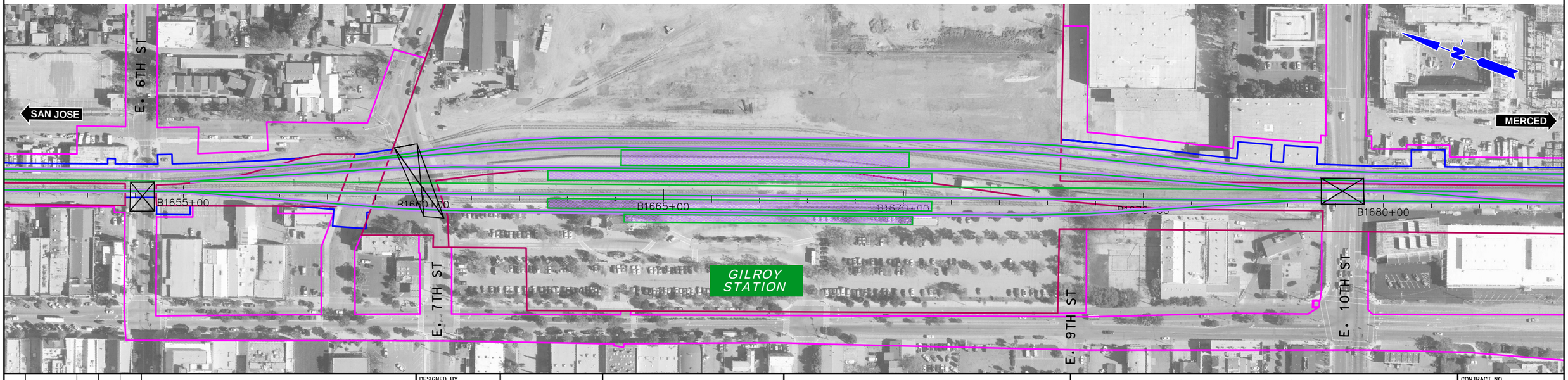
2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8





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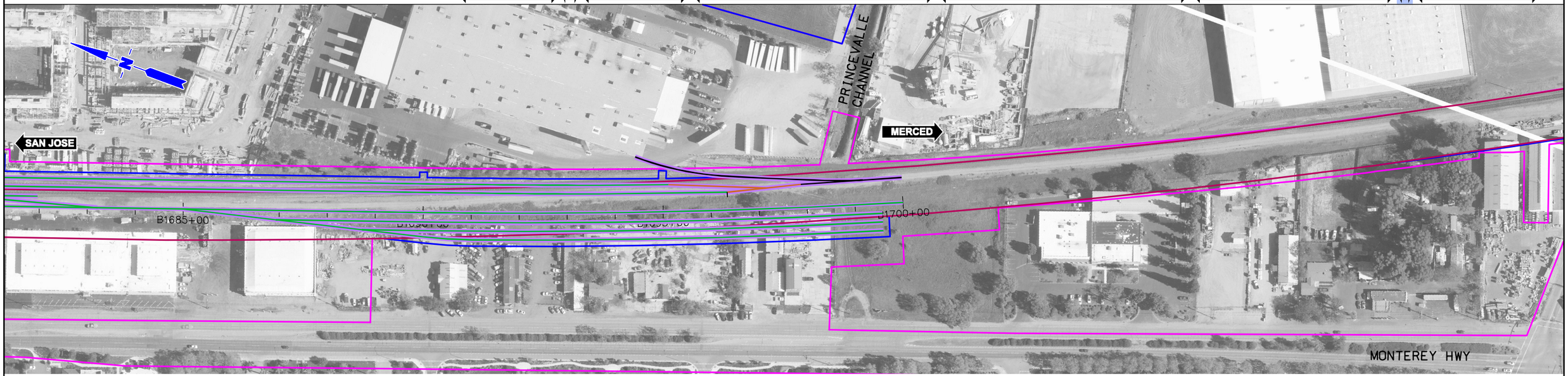
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN
PHASE 7

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH7-01
SCALE 1" = 200'
SHEET NO. 1 OF 2

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN
PHASE 7

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH7-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

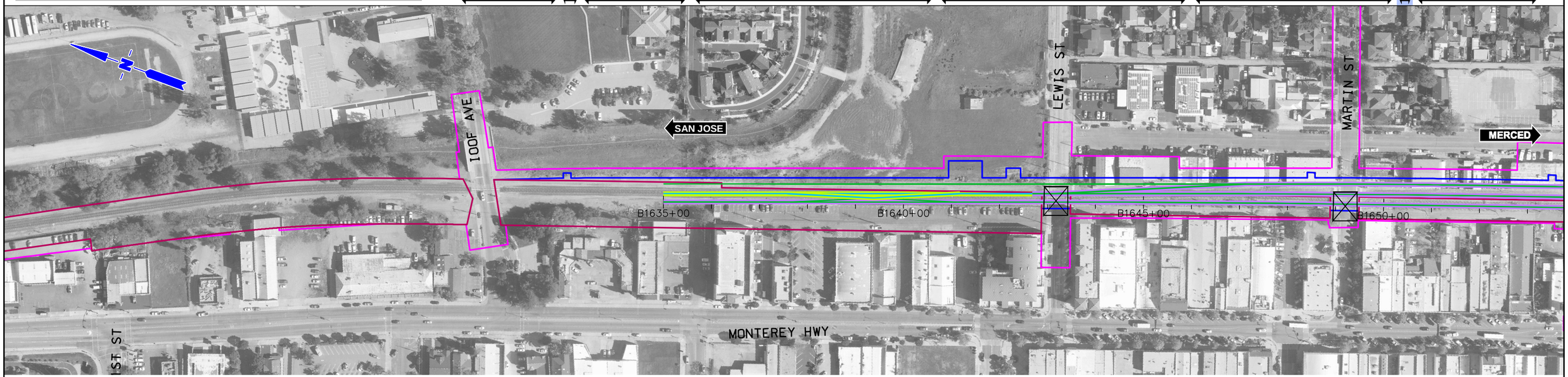
$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS

SANTA CLARA · COLLEGE PARK · SAN JOSE · TAMIEN · CAPITOL · BLOSSOM HILL · MORGAN HILL · SAN MARTIN · GILROY

2872+88 2950+00 3100+00 3250+00 3315+00 315+00 400+00 550+00 700+00 850+00 1000+00 1150+00 1300+00 1450+00 1600+00 1750+00 1900+00 1922+84

WS 1 | WS 2 | WS 3 | WS 4 | WS 5 | WS 6 | WS 7 | WS 8



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SAN JOSE TO MERCED

GILROY STATION

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN

PHASE 8

CONTRACT NO.

DRAWING NO. CV-I1WS7-PH8-01

SCALE 1" = 200'

SHEET NO. 1 OF 2

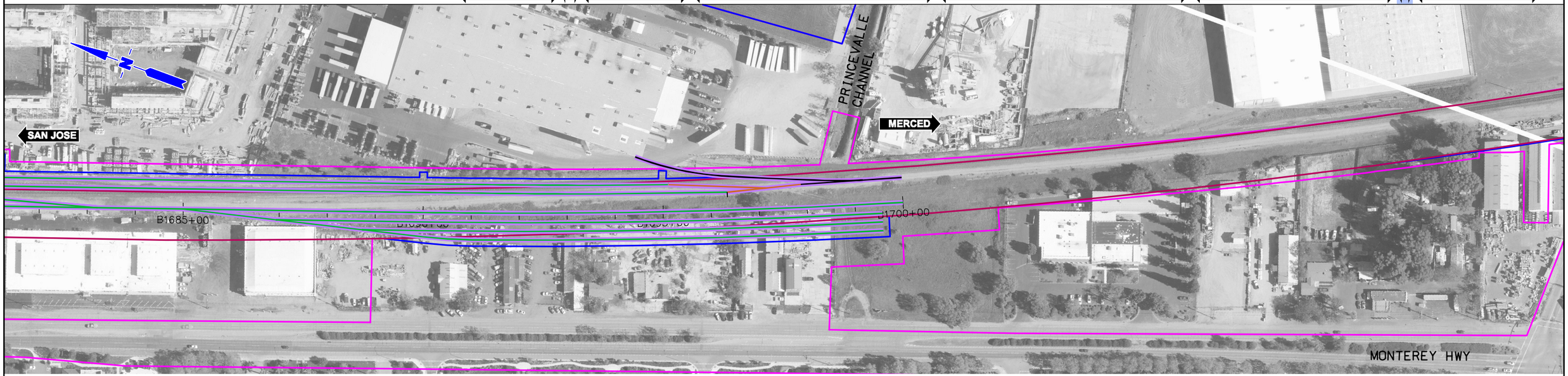
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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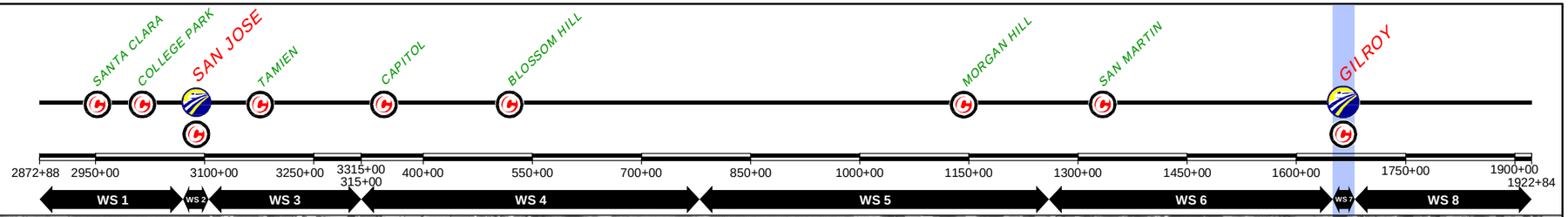
PLAN
PHASE 8

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH8-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

$FILE$ $PLTDRVS$ $PENTBLS$ $TIME$ $DATE$ $USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$TIME$
$DATE$
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GILROY STATION
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PLAN
PHASE 9

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH9-01
SCALE 1" = 200'
SHEET NO. 1 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS

$USER$ $DATE$ $TIME$ $PENTBLS$ $PLTDRVS$ $FILE$

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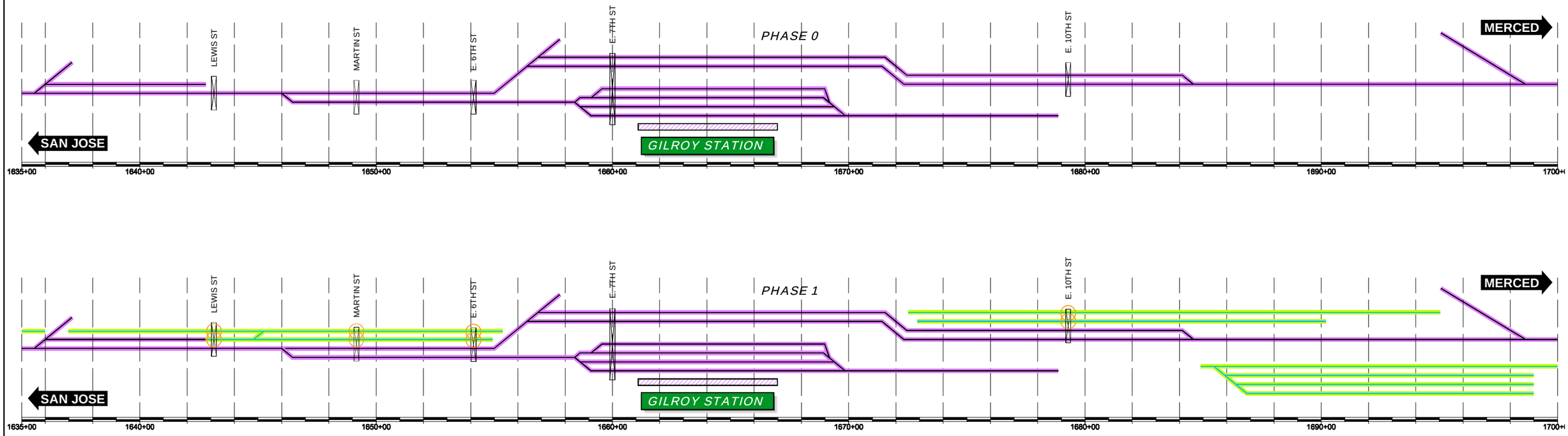
PLAN
PHASE 9

CONTRACT NO.
DRAWING NO. CV-I1WS7-PH9-02
SCALE 1" = 200'
SHEET NO. 2 OF 2

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$PENTBLS$
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SAN JOSE TO MERCED
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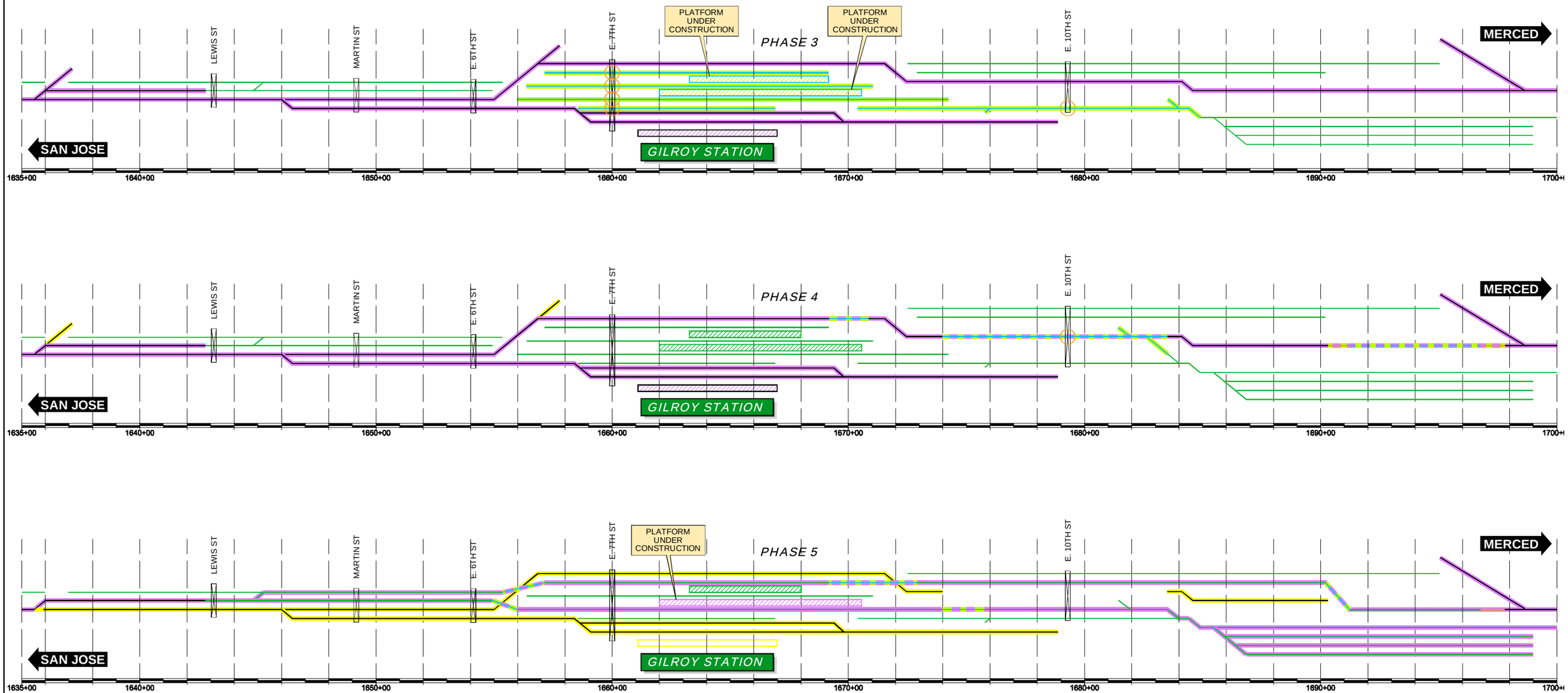
CONSTRUCTION PHASES. 2027 CONFIGURATION SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS7-SCH-01
SCALE NOT TO SCALE
SHEET NO. 1 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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$PENTBLS$
$TIME$
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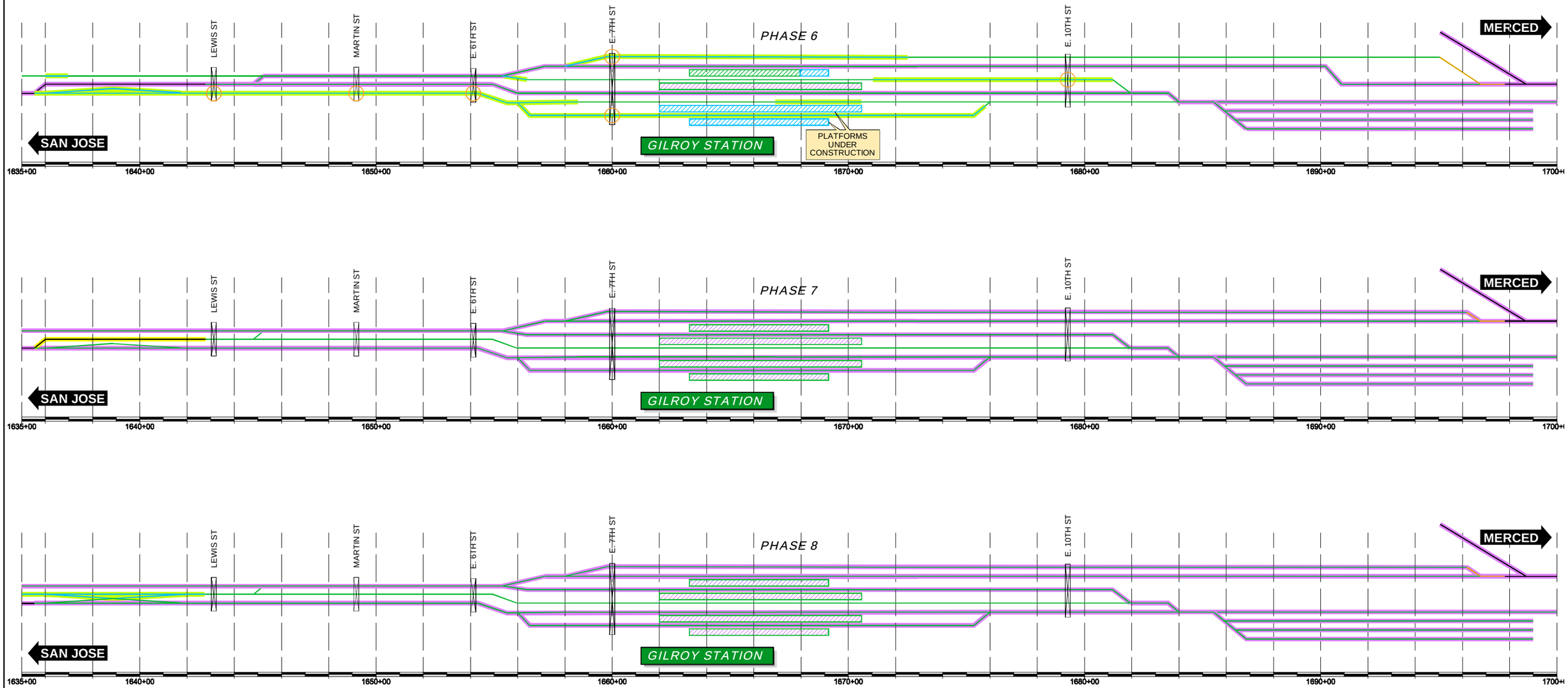
CONSTRUCTION PHASES. 2027 CONFIGURATION SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS7-SCH-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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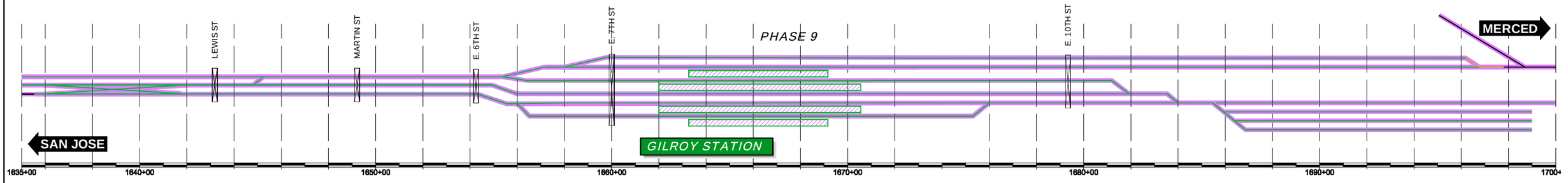
CONTRACT NO.
DRAWING NO. CV-I6WS7-SCH-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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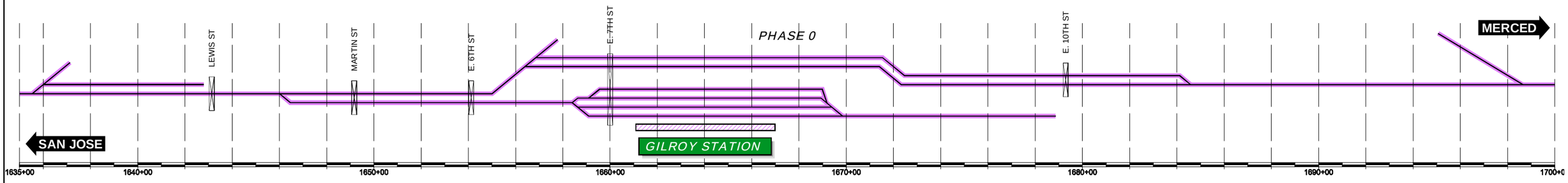
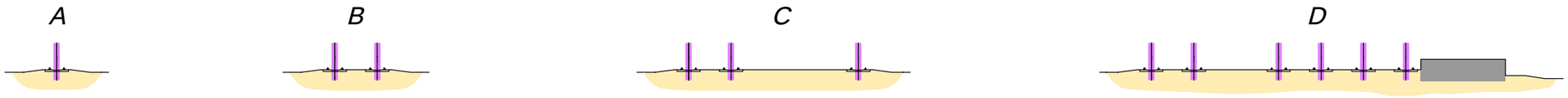
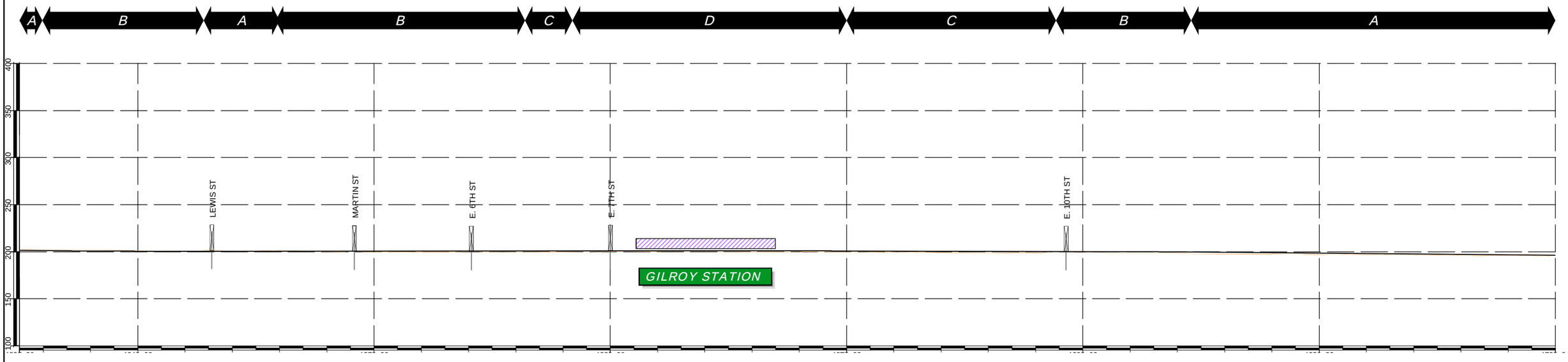
CONSTRUCTION PHASES. 2027 CONFIGURATION SCHEME

CONTRACT NO.
DRAWING NO. CV-I6WS7-SCH-04
SCALE NOT TO SCALE
SHEET NO. 4 OF 4

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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SAN JOSE TO MERCED

GILROY STATION

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN AND PROFILE SCHEME

PHASE 0

CONTRACT NO.

DRAWING NO. CV-I6WS7-SPP-01

SCALE NOT TO SCALE

SHEET NO. 1 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
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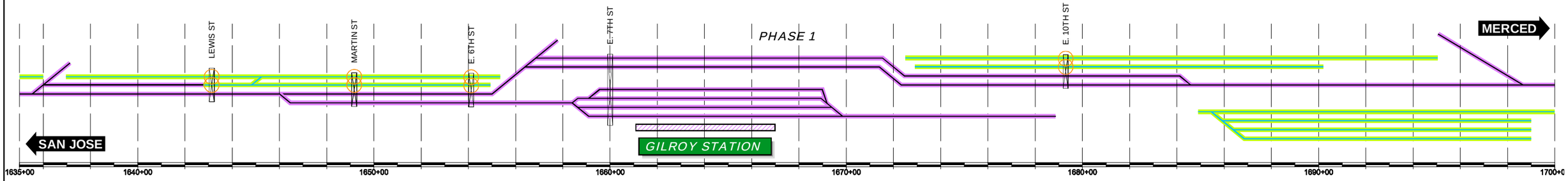

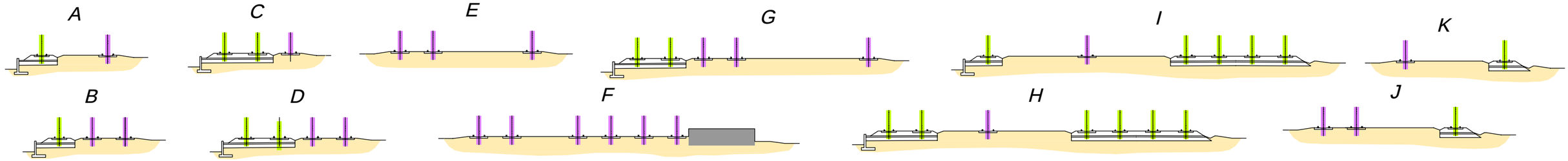

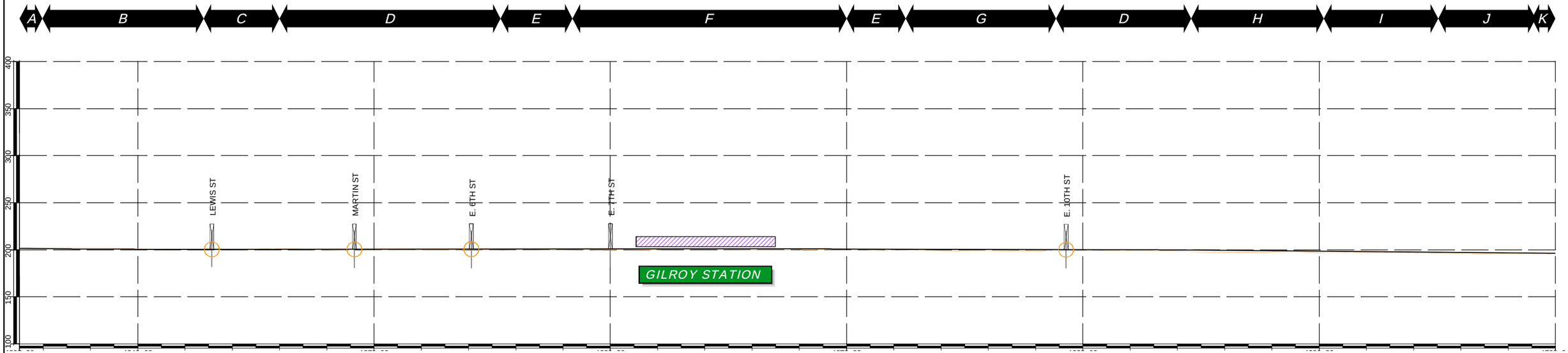

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PLAN AND PROFILE SCHEME
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I6WS7-SPP-02
SCALE NOT TO SCALE
SHEET NO. 2 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
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OVERHEAD BRIDGE
MAJOR UNDERPASS
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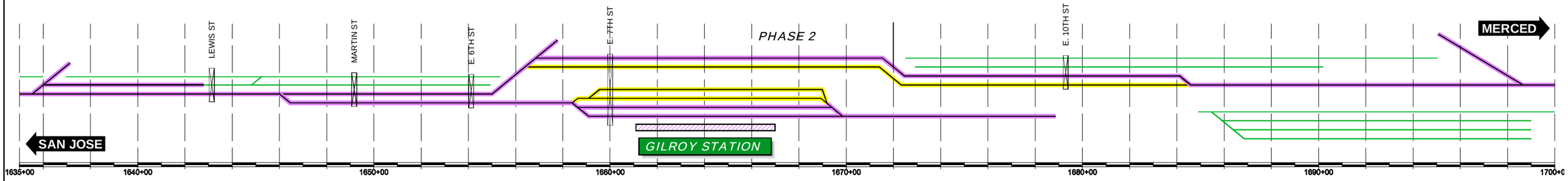

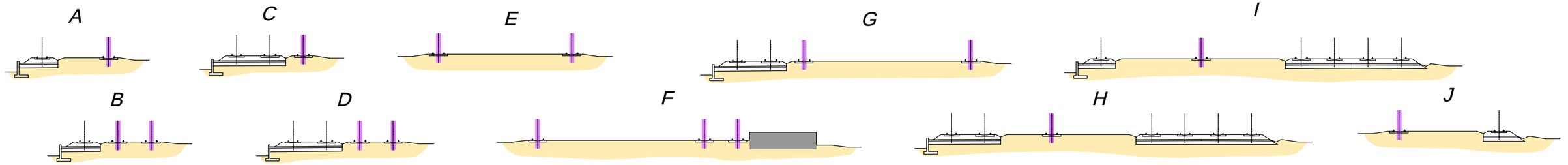

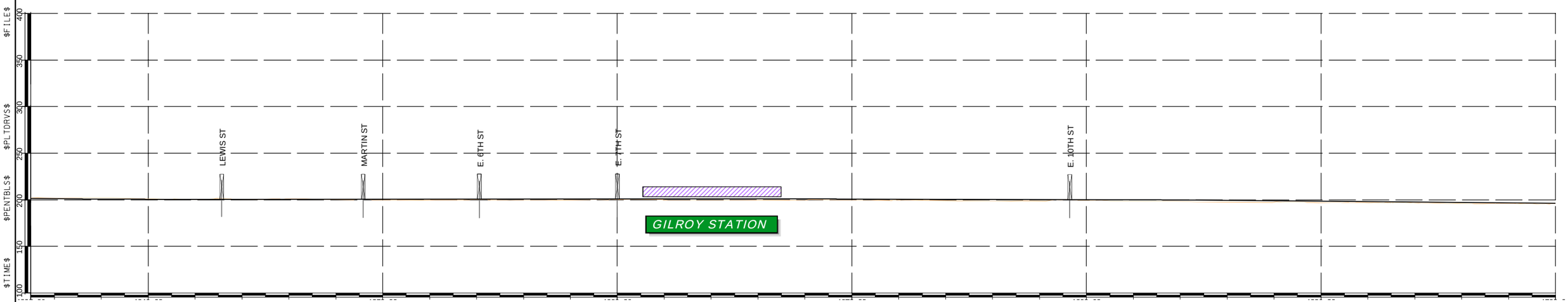

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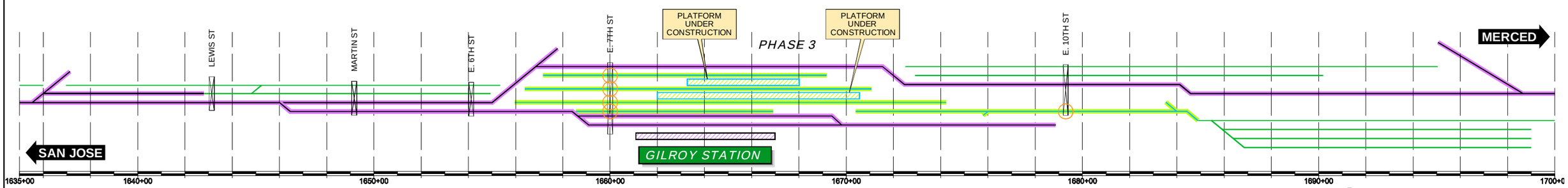
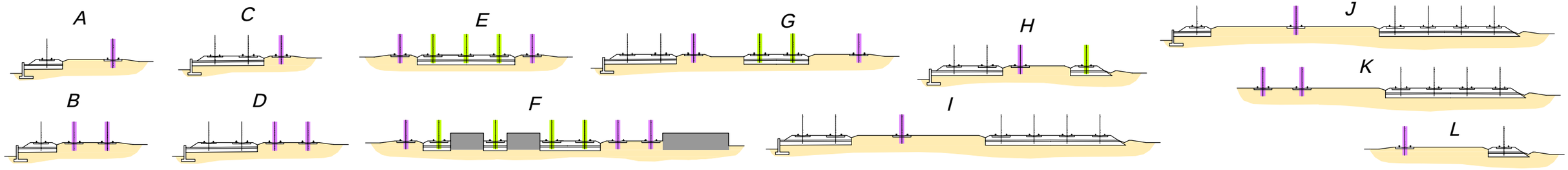
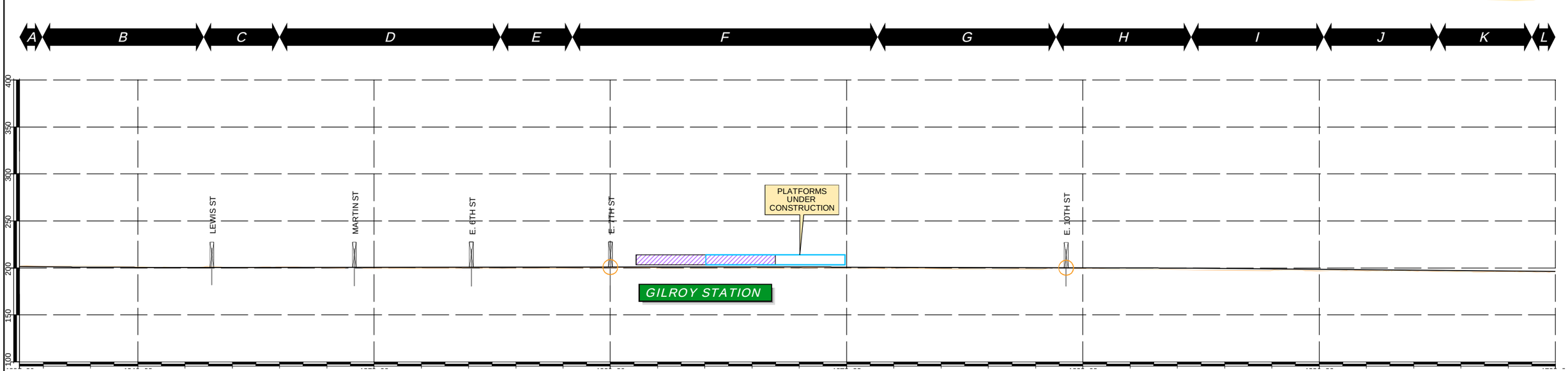
PLAN AND PROFILE SCHEME
PHASE 2

CONTRACT NO.
DRAWING NO. CV-I6WS7-SPP-03
SCALE NOT TO SCALE
SHEET NO. 3 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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SAN JOSE TO MERCED

GILROY STATION

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN AND PROFILE SCHEME

PHASE 3

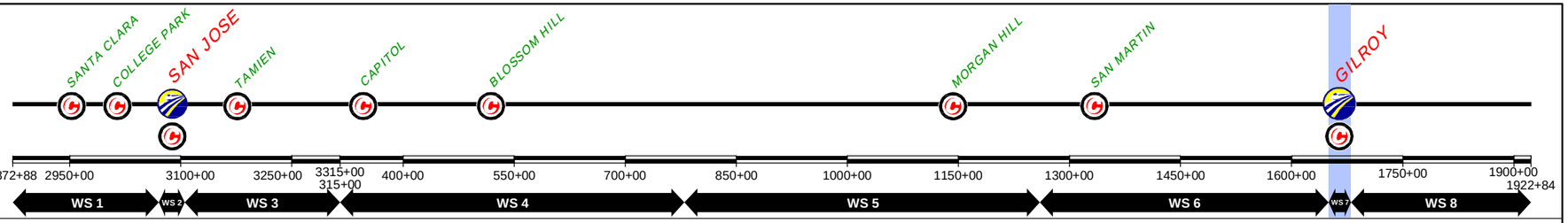
CONTRACT NO.

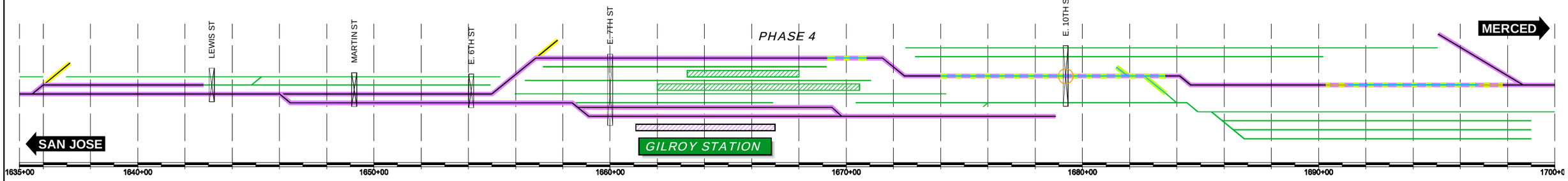
DRAWING NO. CV-I6WS7-SPP-04

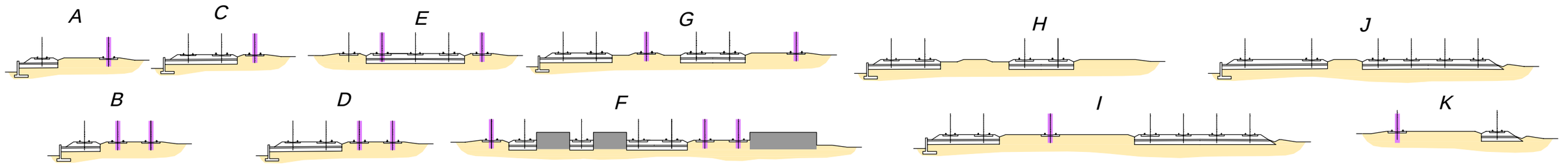
SCALE NOT TO SCALE

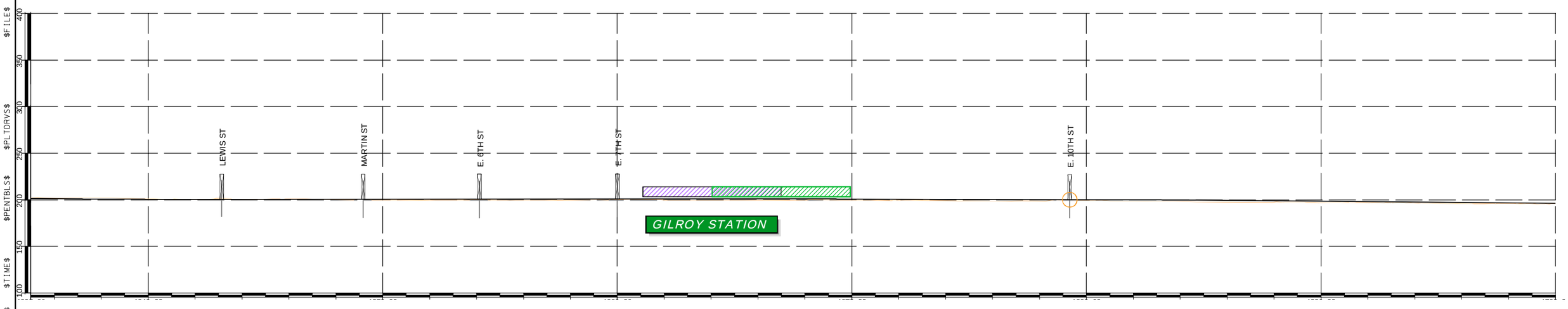
SHEET NO. 4 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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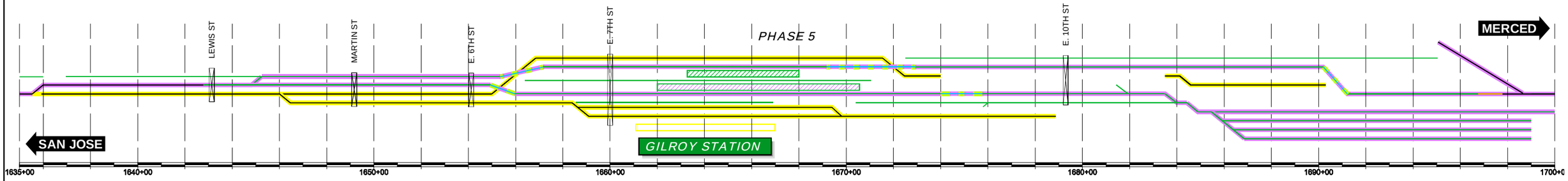
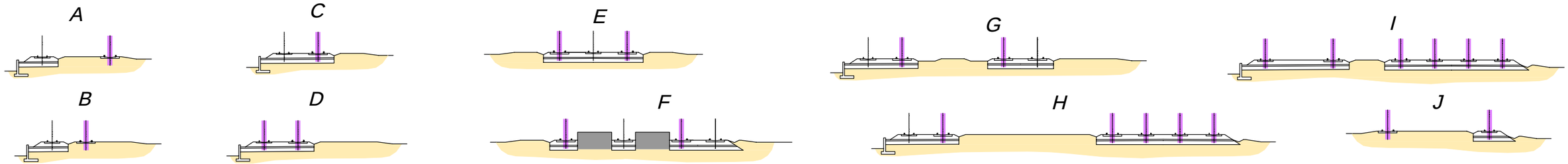
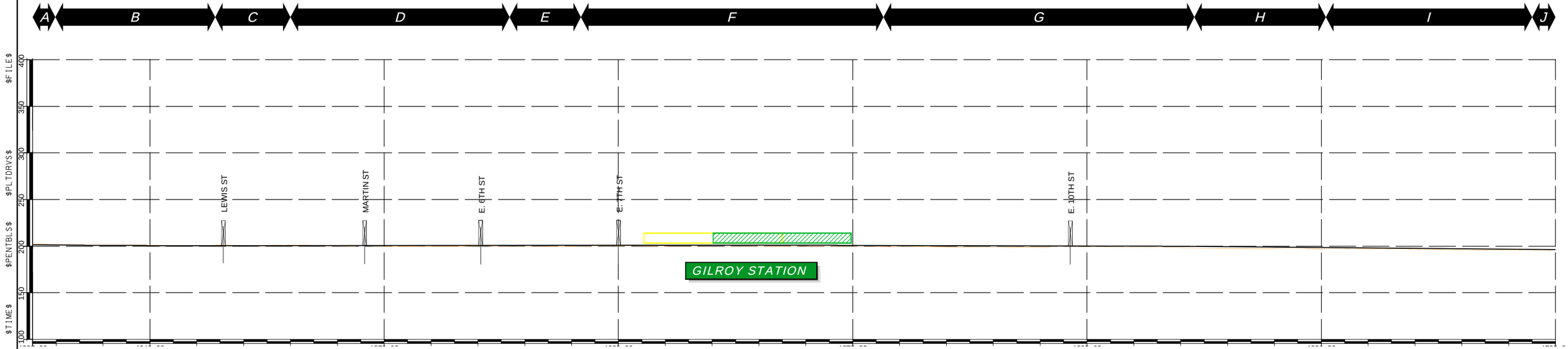
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN AND PROFILE SCHEME
PHASE 4

CONTRACT NO.
DRAWING NO. CV-I6WS7-SPP-05
SCALE NOT TO SCALE
SHEET NO. 5 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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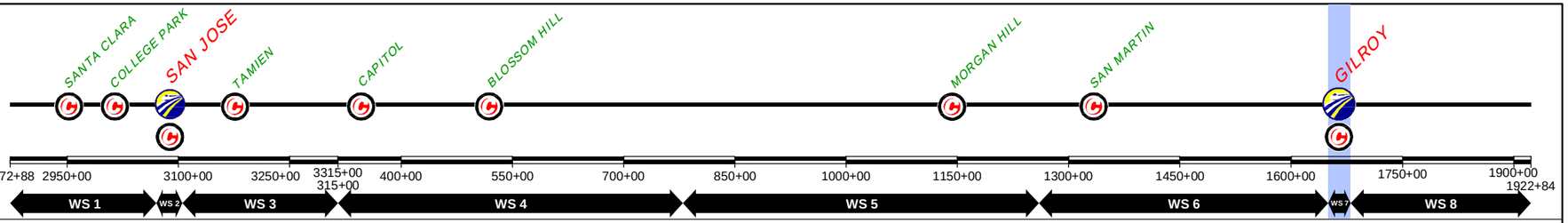
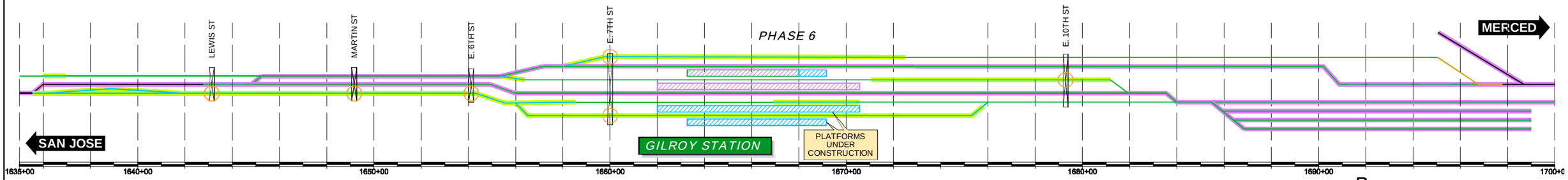
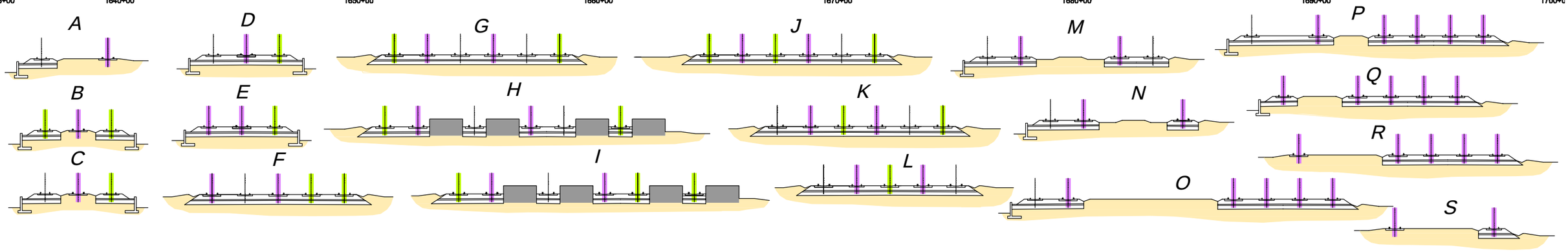
SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN AND PROFILE SCHEME
PHASE 5

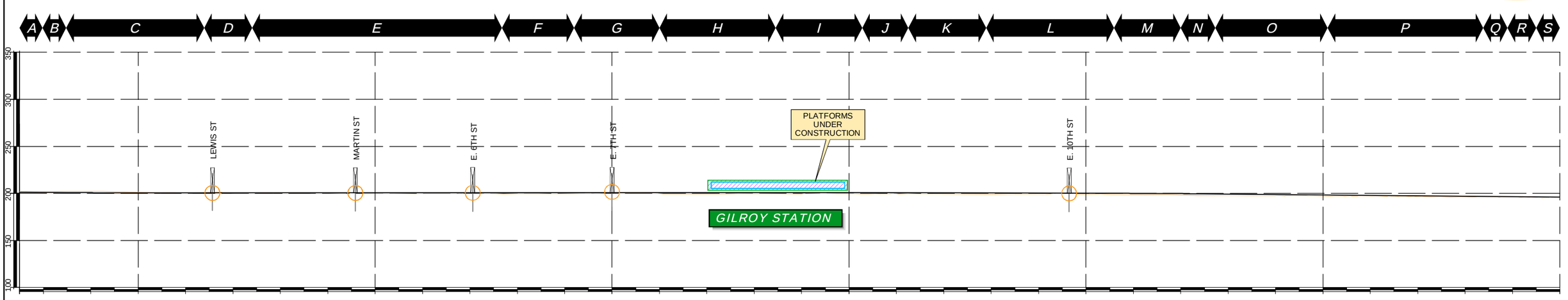
CONTRACT NO.
DRAWING NO. CV-I6WS7-SPP-06
SCALE NOT TO SCALE
SHEET NO. 6 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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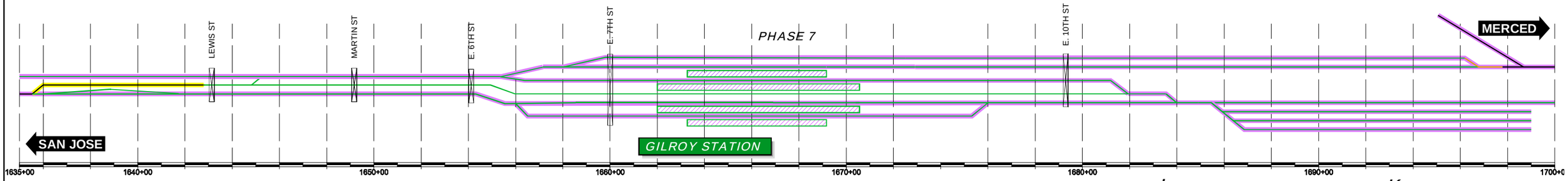
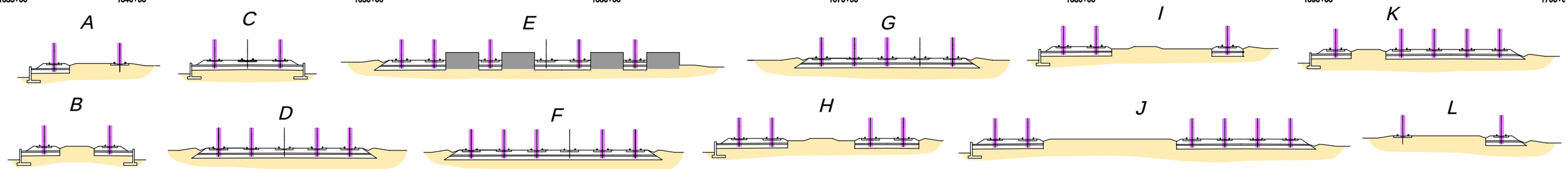
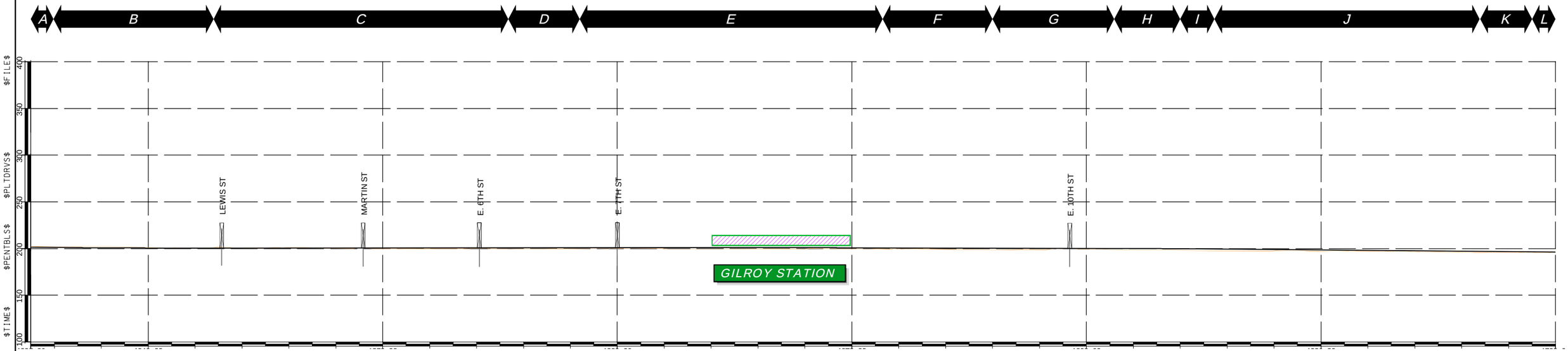
SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN AND PROFILE SCHEME
PHASE 6

CONTRACT NO.
DRAWING NO. CV-I6WS7-SPP-07
SCALE NOT TO SCALE
SHEET NO. 7 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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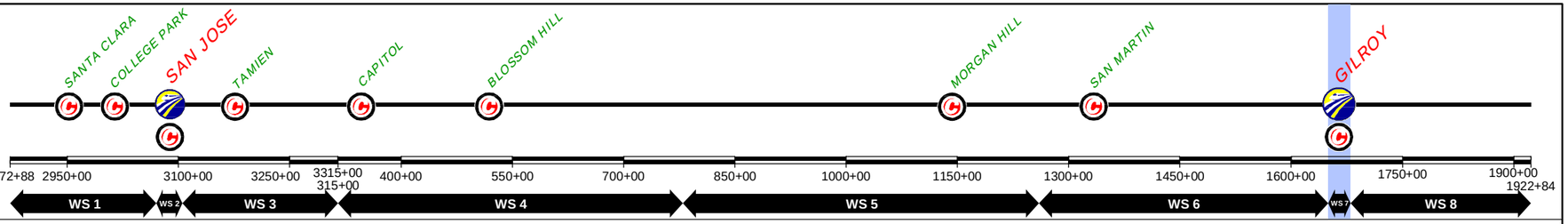
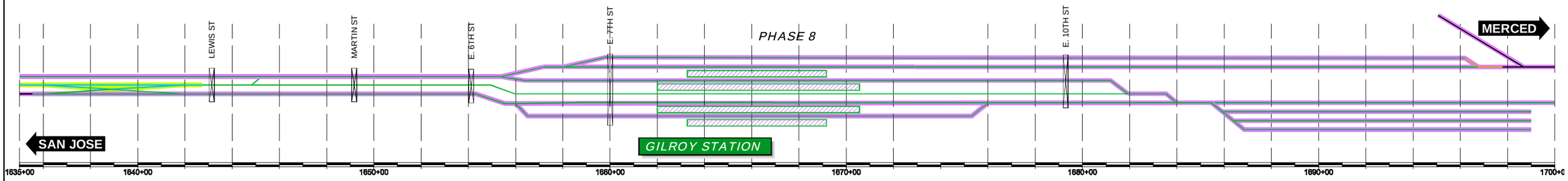
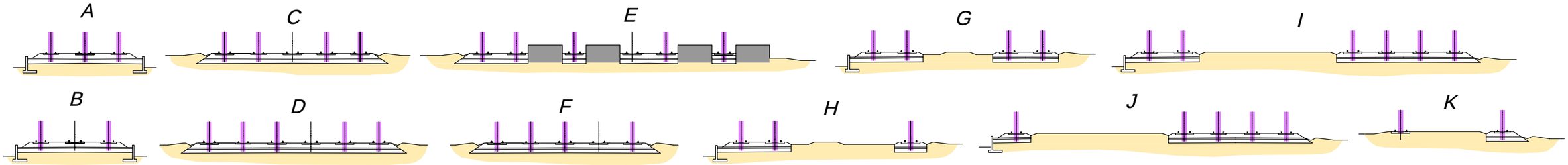
SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN AND PROFILE SCHEME
PHASE 7

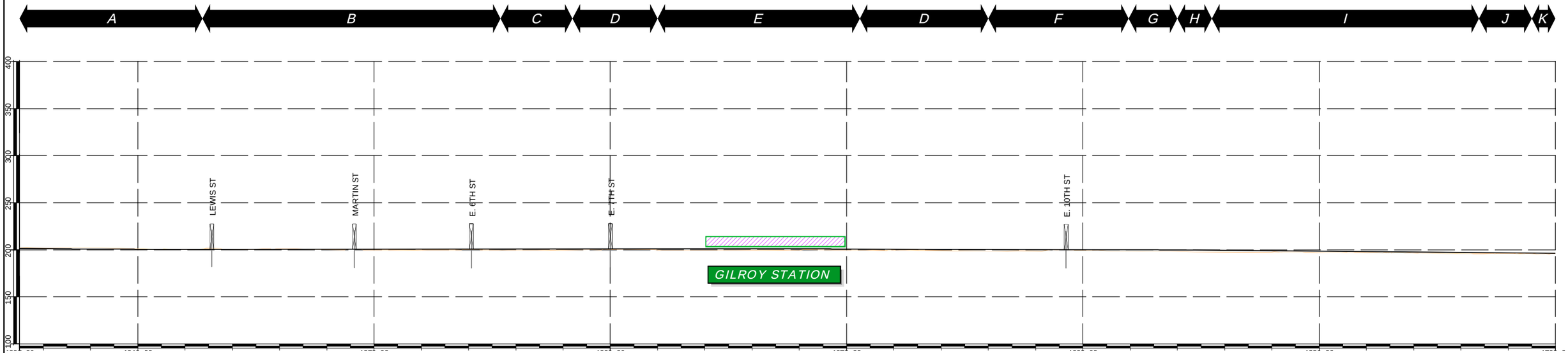
CONTRACT NO.
DRAWING NO. CV-I6WS7-SPP-08
SCALE NOT TO SCALE
SHEET NO. 8 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS









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CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED

GILROY STATION

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN AND PROFILE SCHEME

PHASE 8

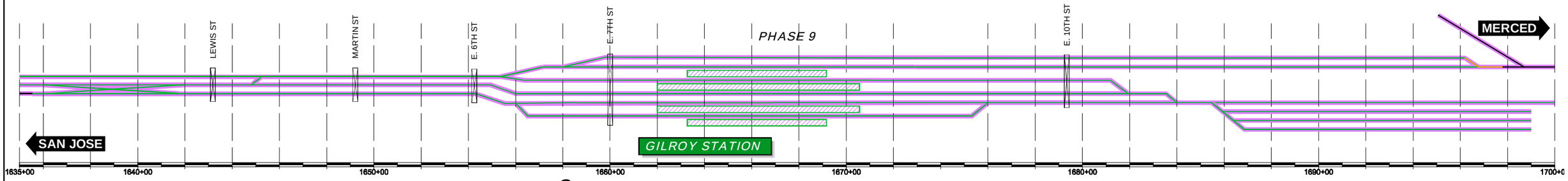
CONTRACT NO.

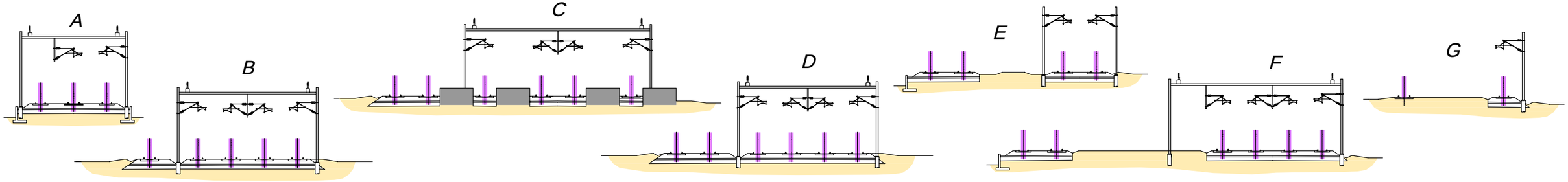
DRAWING NO. CV-I6WS7-SPP-09

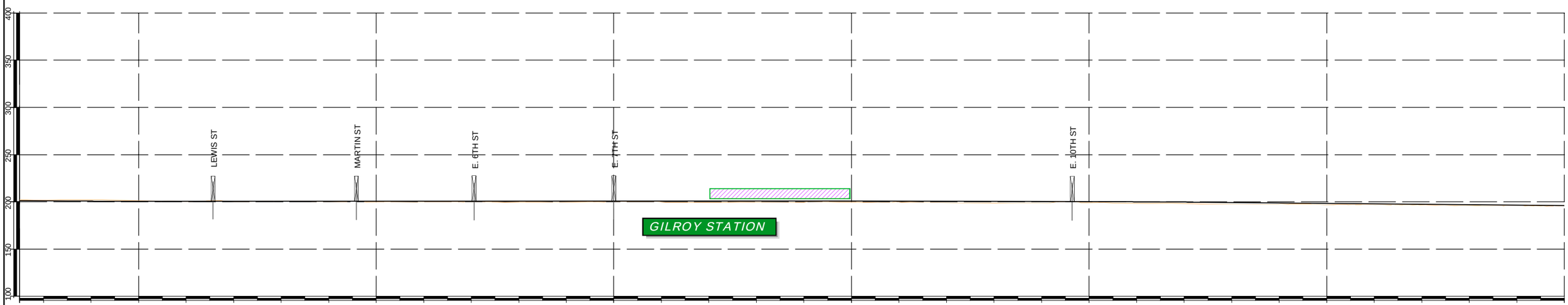
SCALE NOT TO SCALE

SHEET NO. 9 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
STRUCTURE UNDER CONSTRUCTION
WILDLIFE CROSSING UNDER CONSTRUCTION
GRADE CROSSING ADAPTATION
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS







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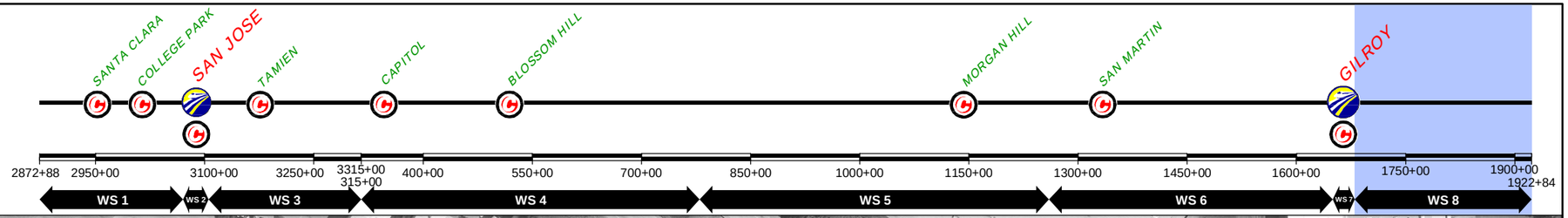
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
GILROY STATION
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN AND PROFILE SCHEME
PHASE 9

CONTRACT NO.
DRAWING NO. CV-I6WS7-SPP-10
SCALE NOT TO SCALE
SHEET NO. 10 OF 10

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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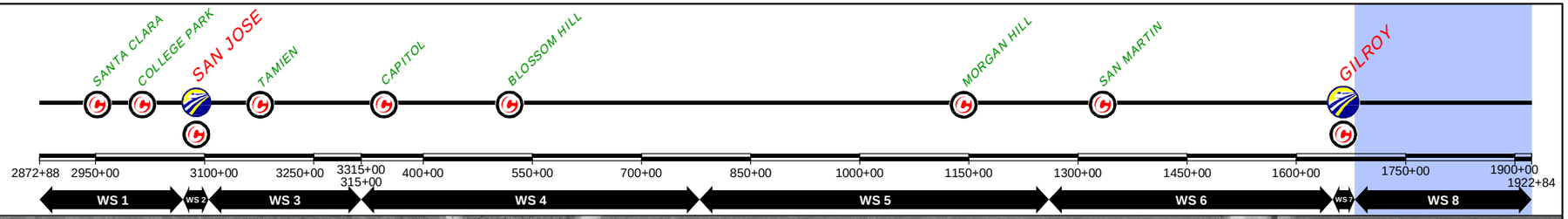
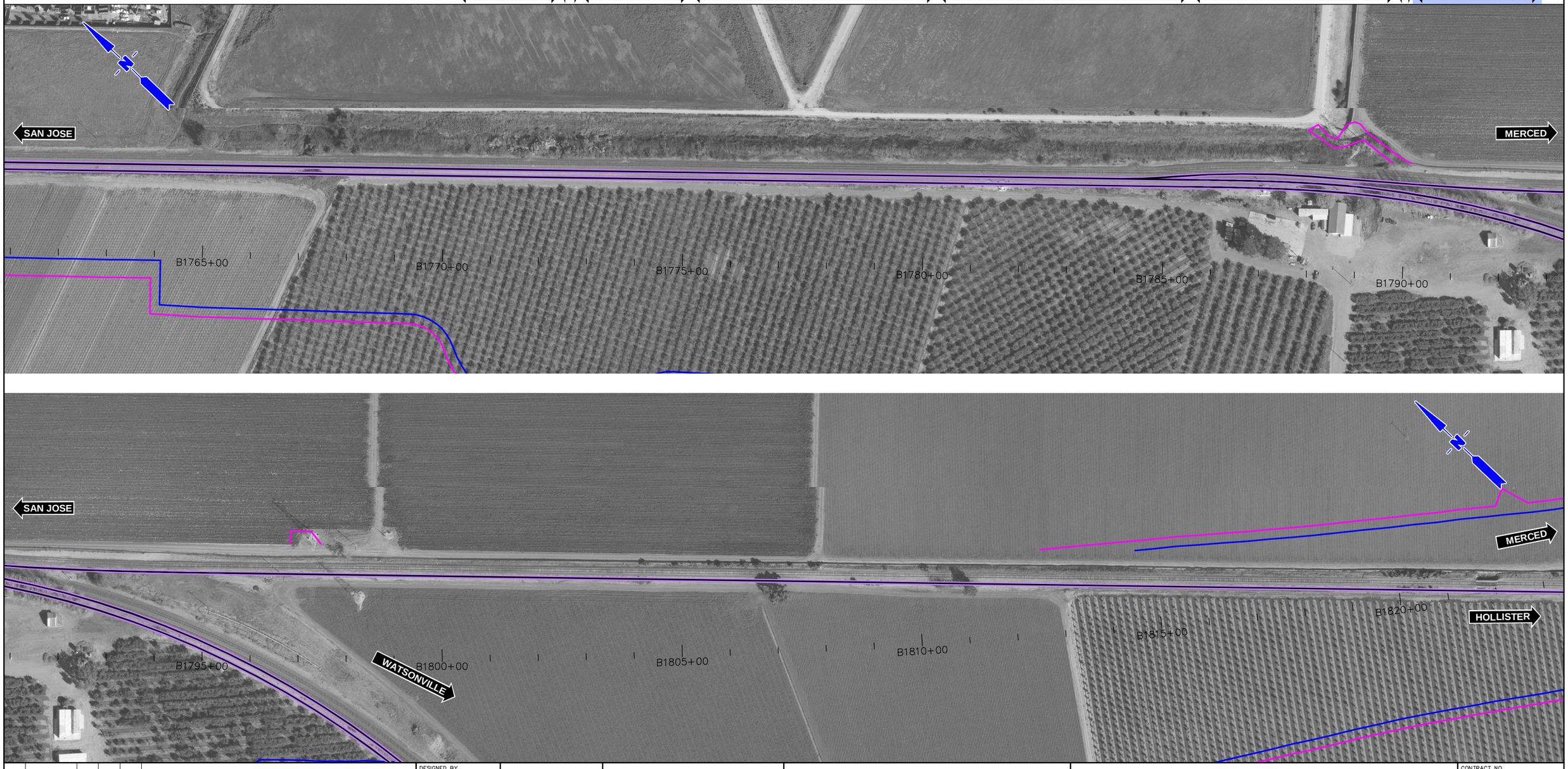
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN JOSE TO MERCED
1700+00 TO 1921+00
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS8-PH0-01
SCALE 1" = 200'
SHEET NO. 1 OF 3

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

REV	DATE	BY	SUB	APP	DESCRIPTION

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CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED
1700+00 TO 1921+00
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN
PHASE 0

CONTRACT NO.
DRAWING NO. CV-I1WS8-PH0-02
SCALE 1" = 200'
SHEET NO. 2 OF 3

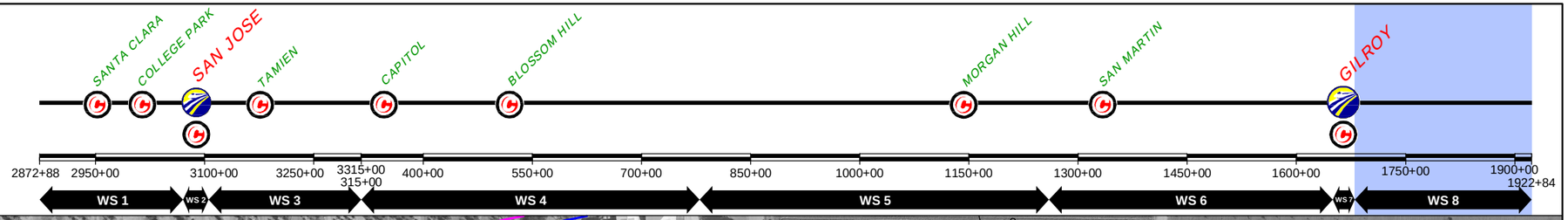
CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.

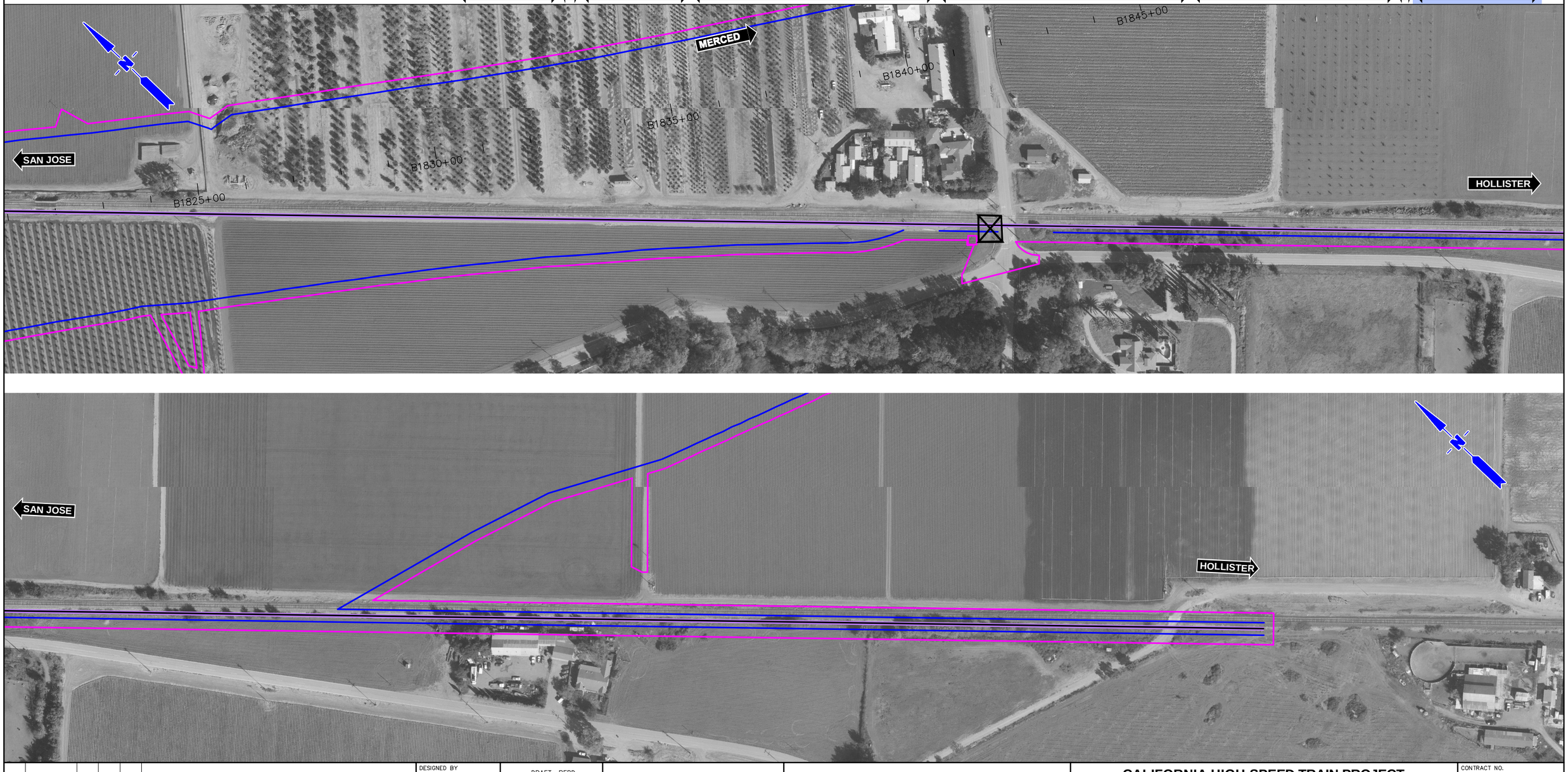
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK

EXISTING ROW
PROPOSED ROW
PROPOSED TCE

OVERHEAD BRIDGE
MAJOR UNDERPASS

GRADE CROSSING
TUNNEL
CREEK UNDERPASS





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$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

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CALIFORNIA HIGH-SPEED TRAIN PROJECT

SAN JOSE TO MERCED

1700+00 TO 1921+00

CONSTRUCTION PHASES. 2027 CONFIGURATION PLAN

PHASE 0

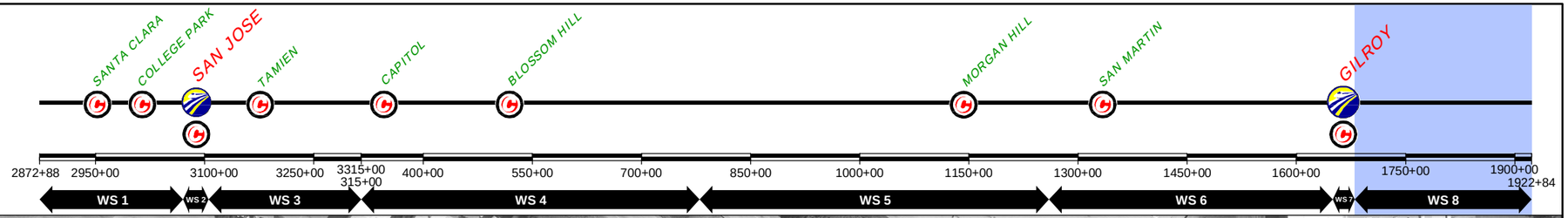
CONTRACT NO.

DRAWING NO. CV-I1WS8-PH0-03

SCALE 1" = 200'

SHEET NO. 3 OF 3

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS



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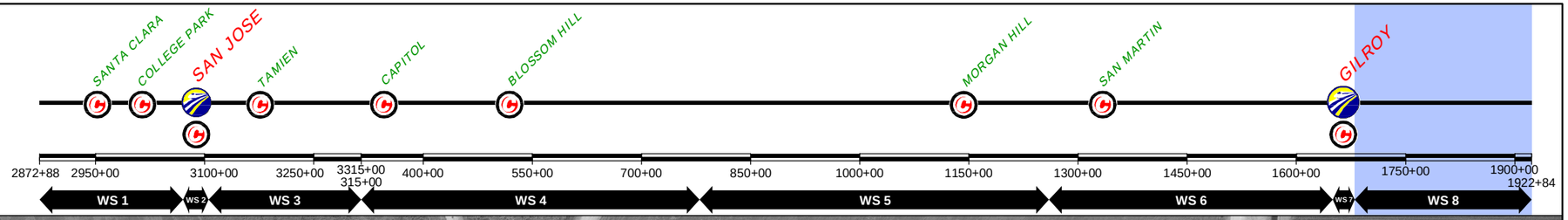
CALIFORNIA HIGH-SPEED TRAIN PROJECT

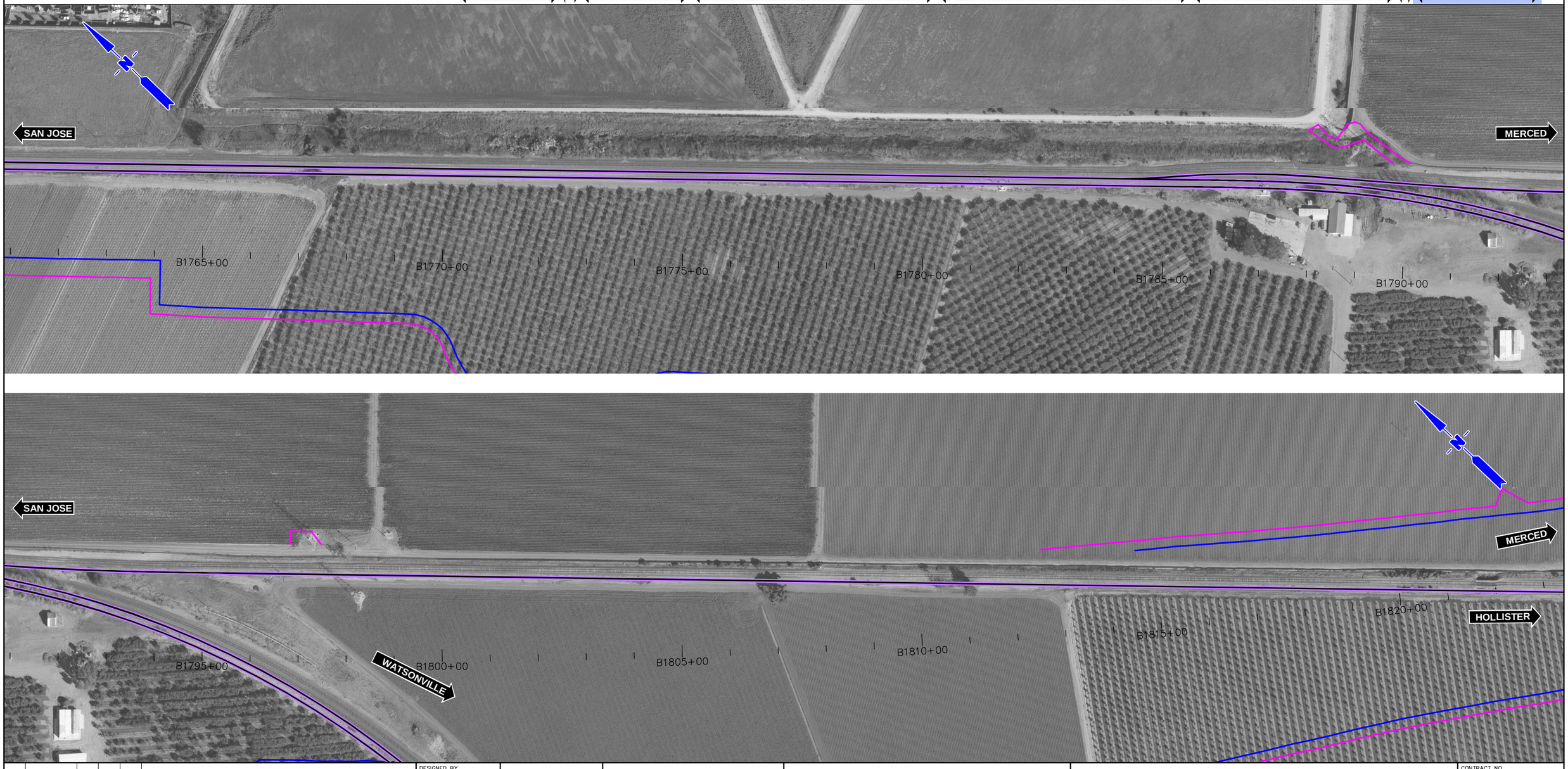
SAN JOSE TO MERCED
1700+00 TO 1921+00
CONSTRUCTION PHASES. 2027 CONFIGURATION
PLAN
PHASE 1

CONTRACT NO.
DRAWING NO. CV-I1WS8-PH1-01
SCALE 1" = 200'
SHEET NO. 1 OF 3

$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
CREEK UNDERPASS





$FILE$
$PLTDRVS$
$PENTBLS$
$TIME$
$DATE$
$USER$

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SAN JOSE TO MERCED

1700+00 TO 1921+00

CONSTRUCTION PHASES. 2027 CONFIGURATION

PLAN

PHASE 1

CONTRACT NO.

DRAWING NO. CV-I1WS8-PH1-02

SCALE 1" = 200'

SHEET NO. 2 OF 3

CURRENT TRACK
PROVISIONAL TRACK
BUILT IN PREVIOUS PHASES
UNDER CONST + CIRCULATION T.
TRACK REMOVAL
UNDER CONSTRUCTION
CIRCULATION TRACK
EXISTING ROW
PROPOSED ROW
PROPOSED TCE
OVERHEAD BRIDGE
MAJOR UNDERPASS
GRADE CROSSING
TUNNEL
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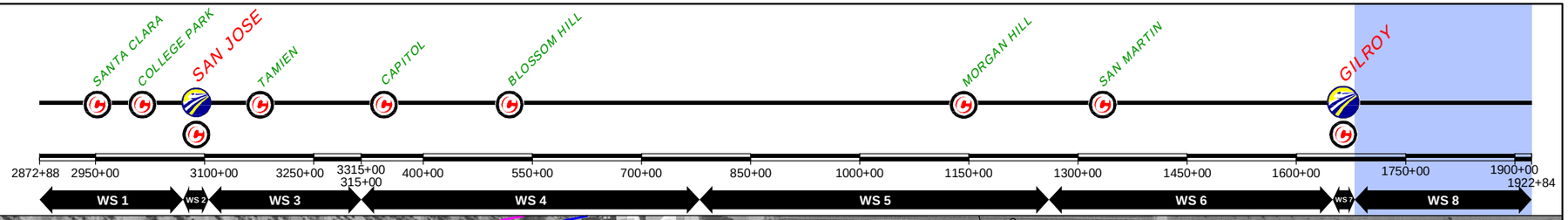

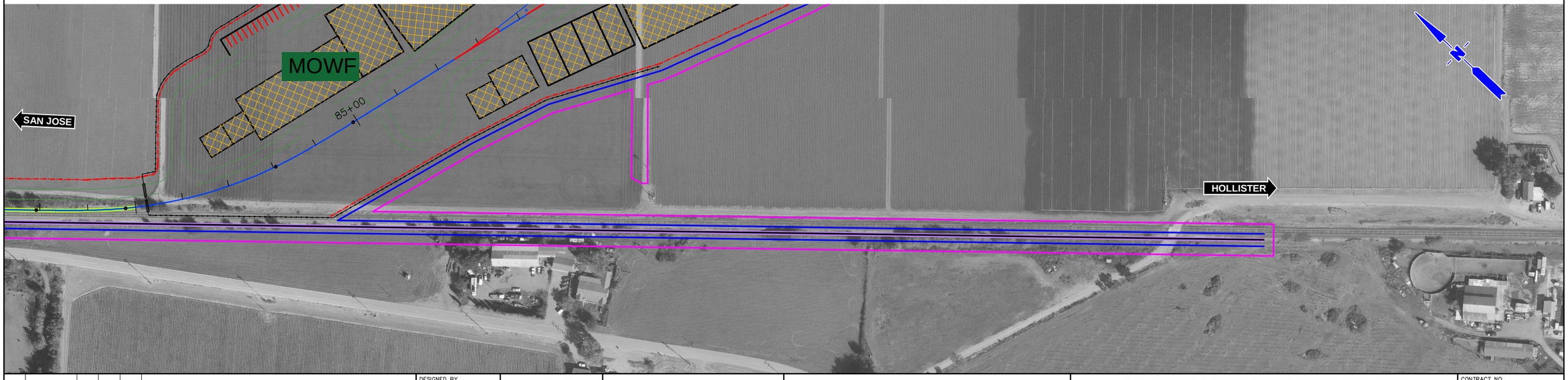

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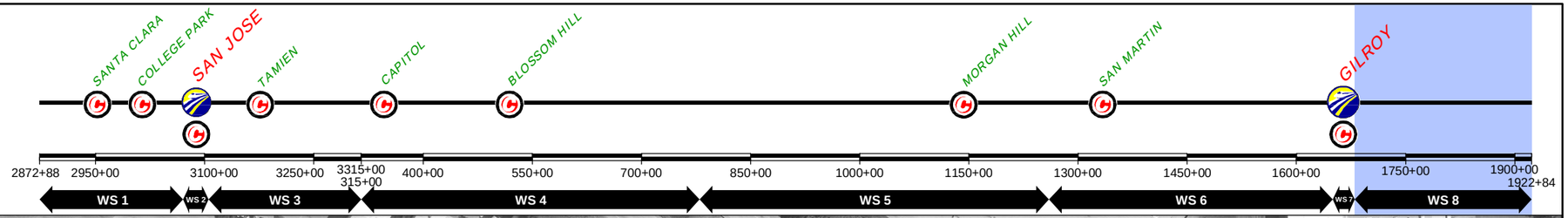

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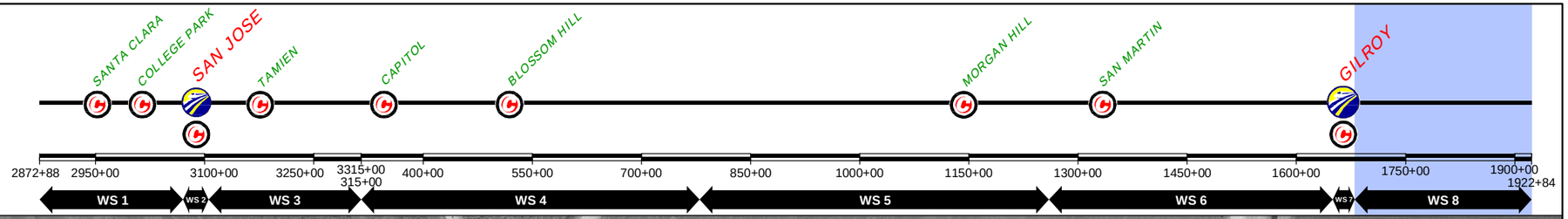

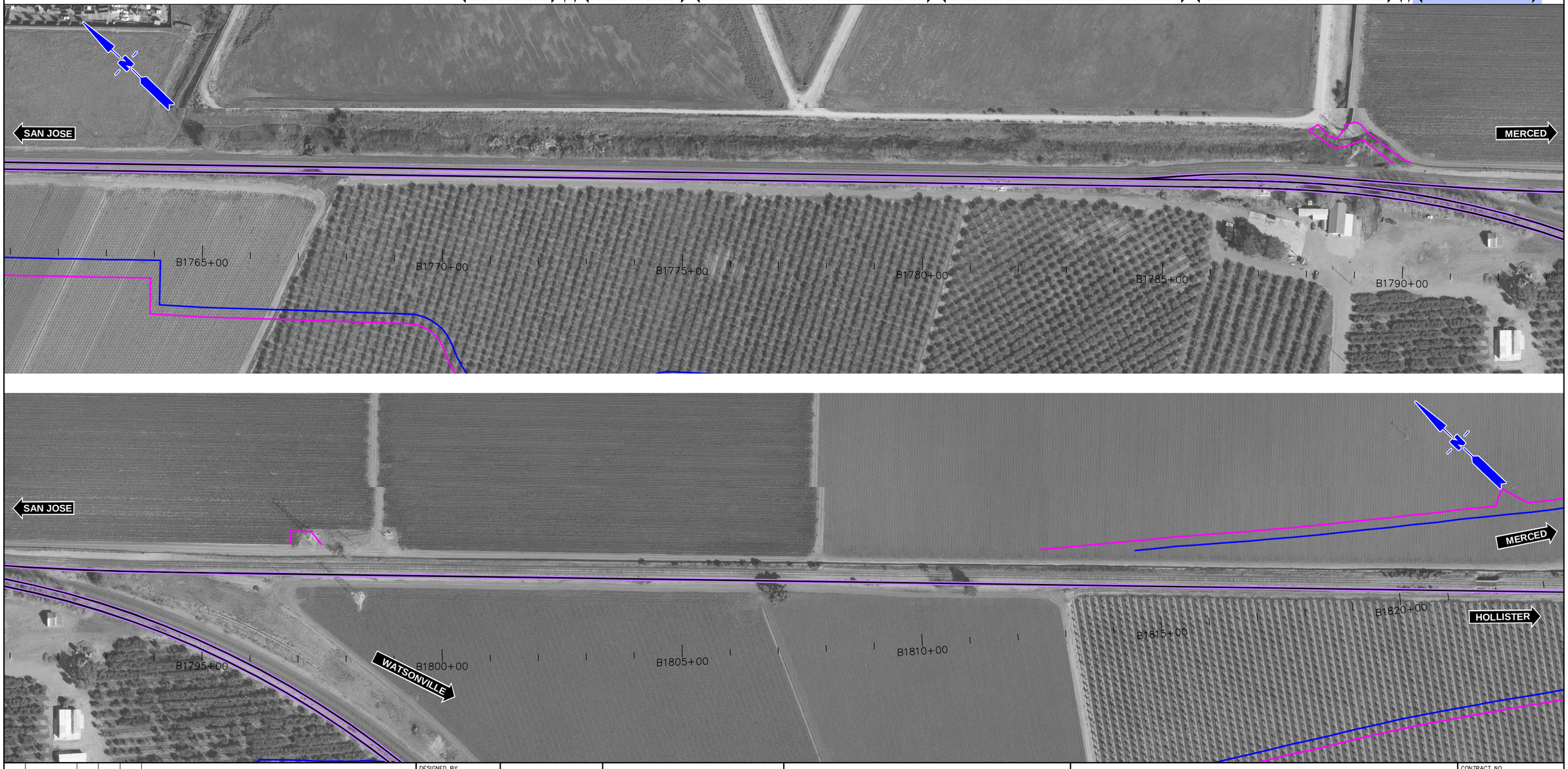

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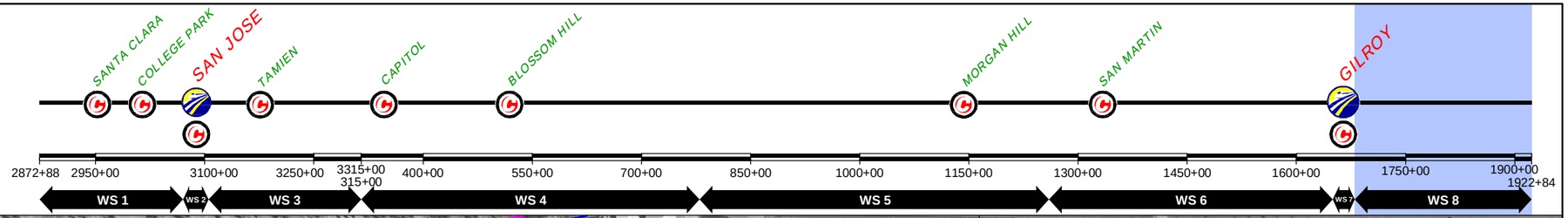

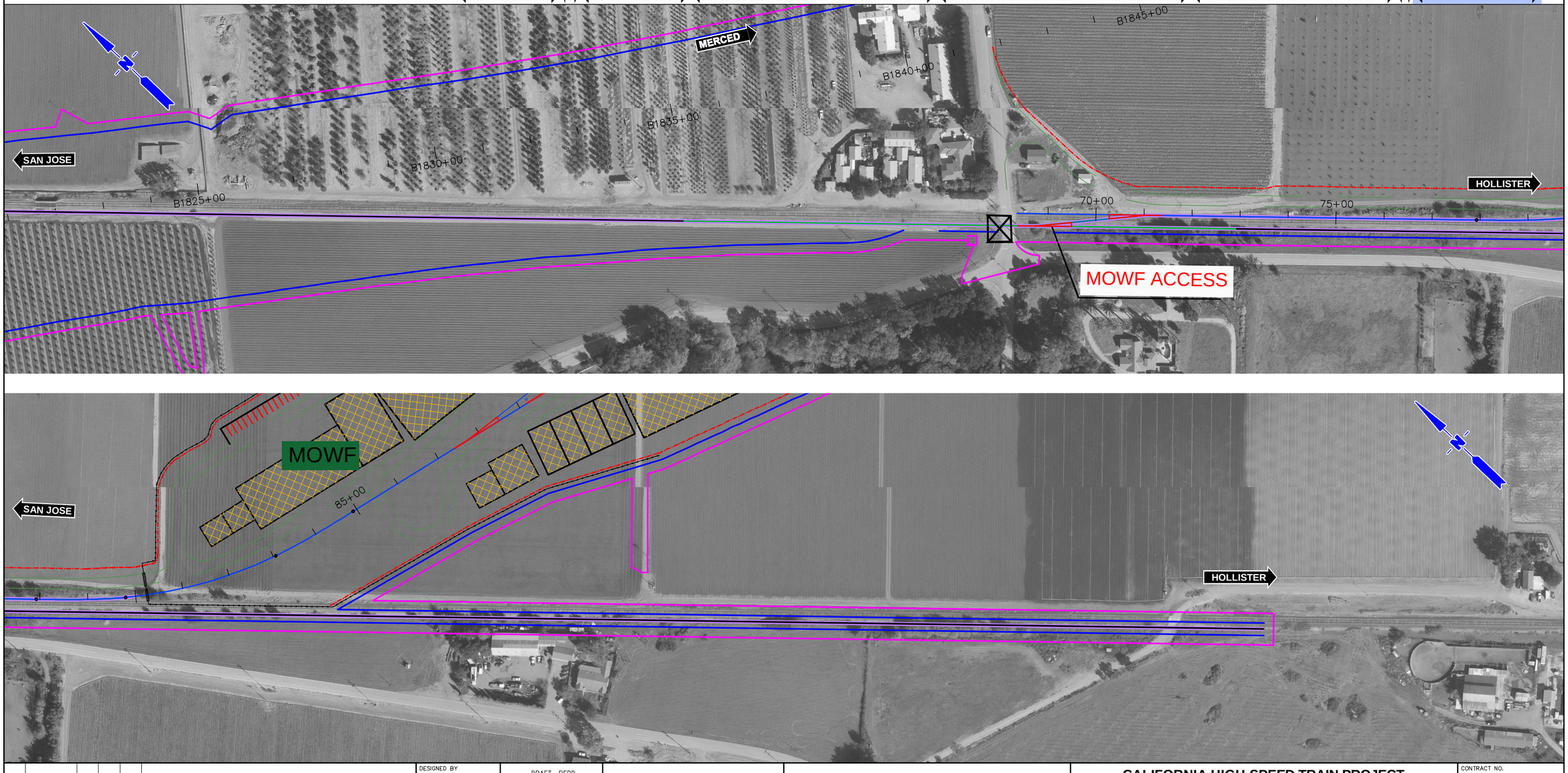

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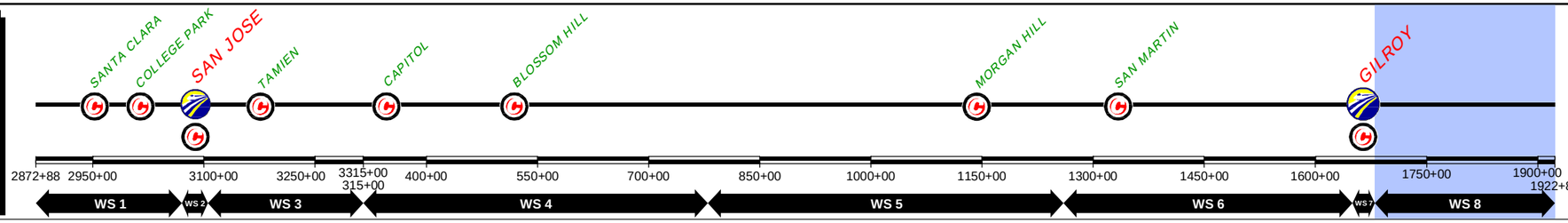

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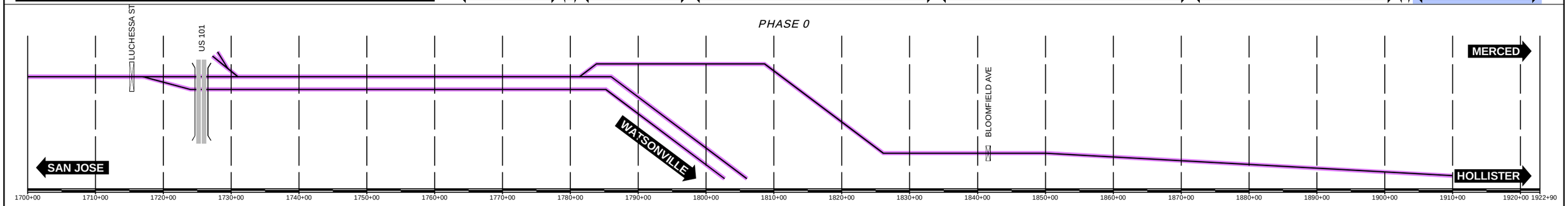

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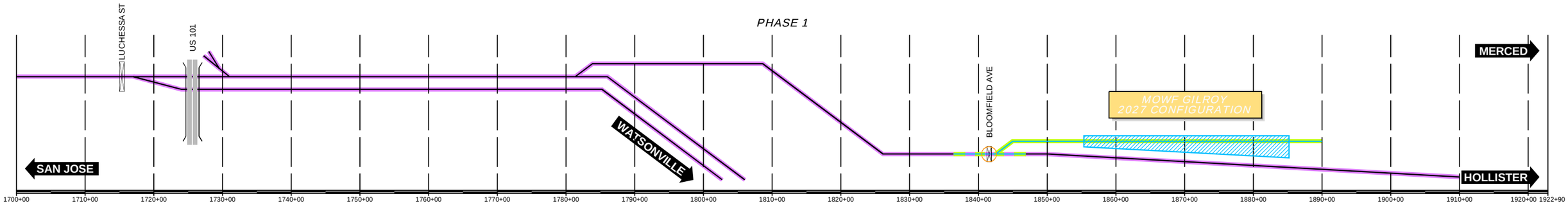

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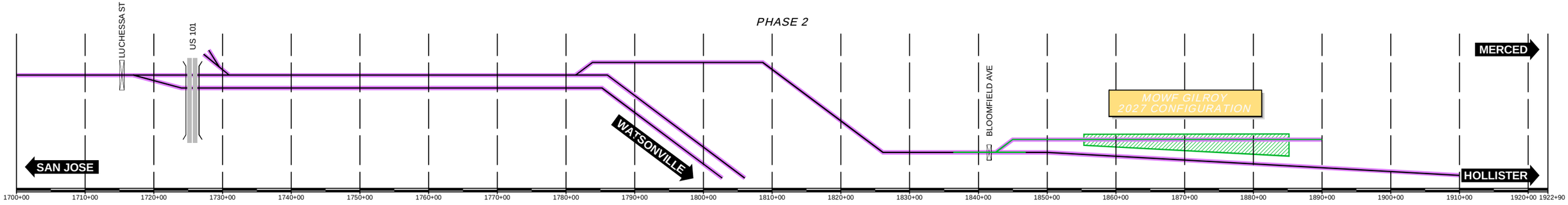

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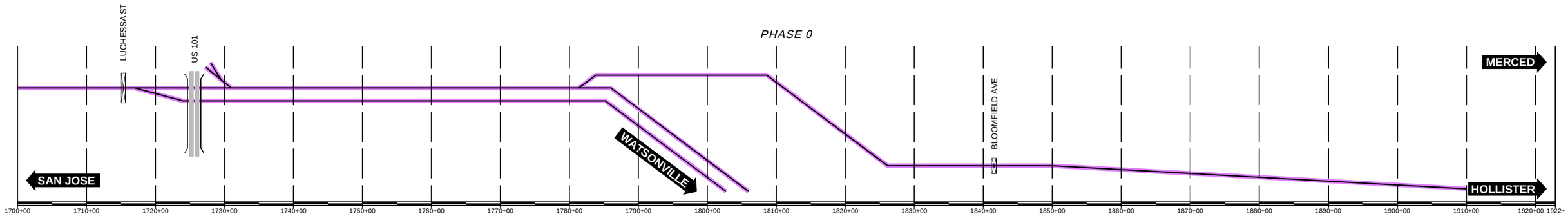

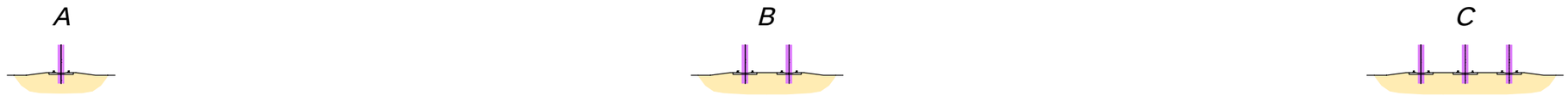

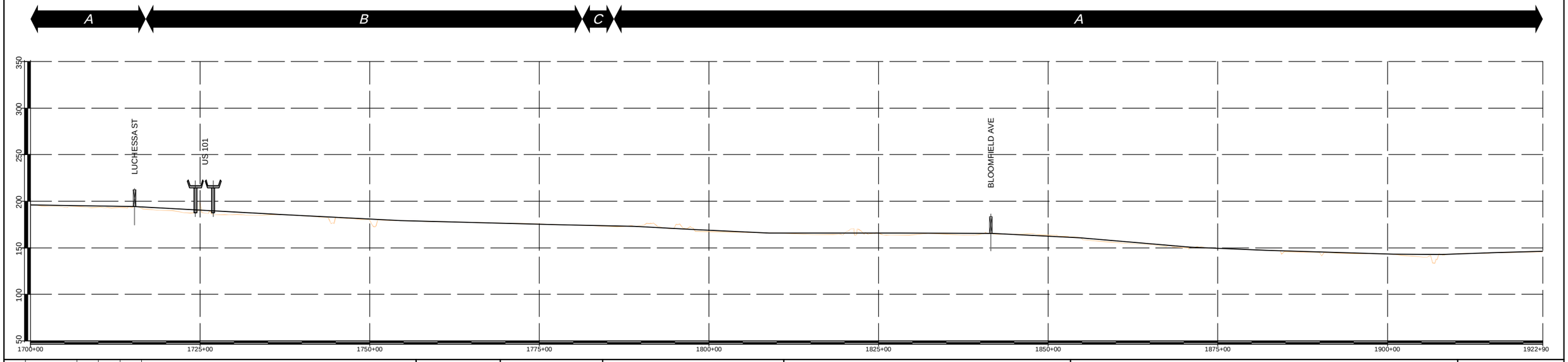

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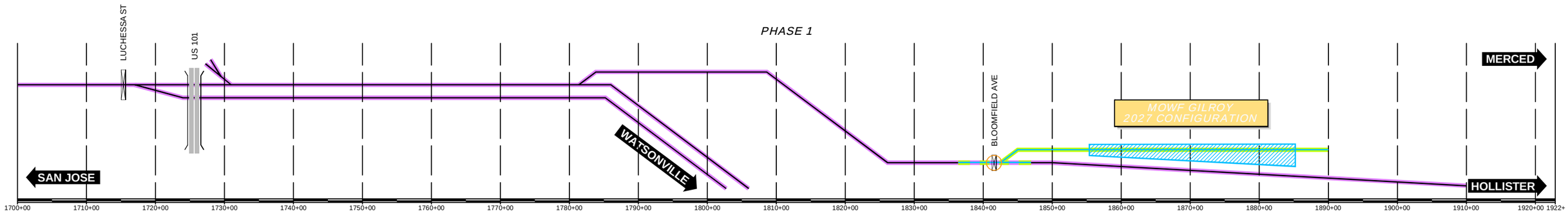

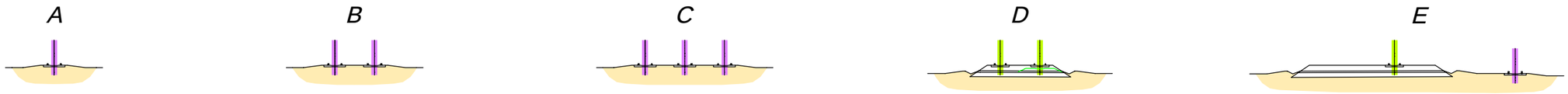

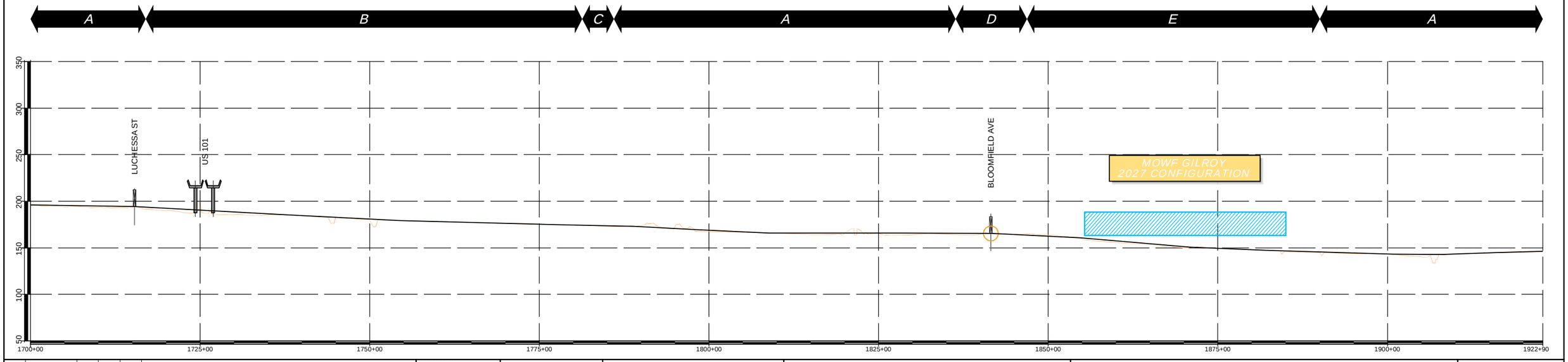

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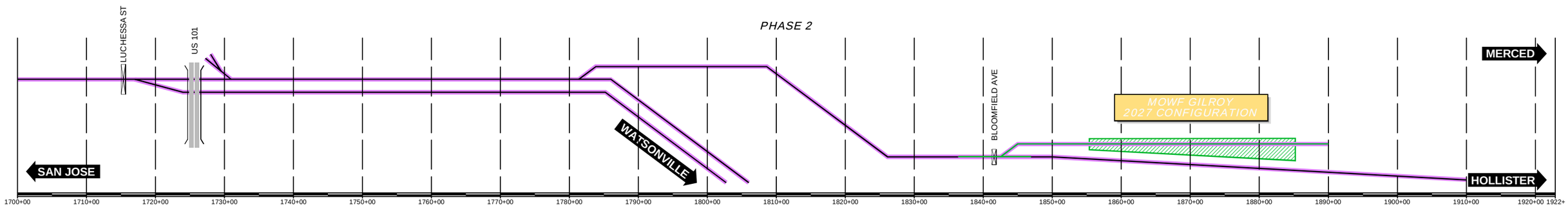

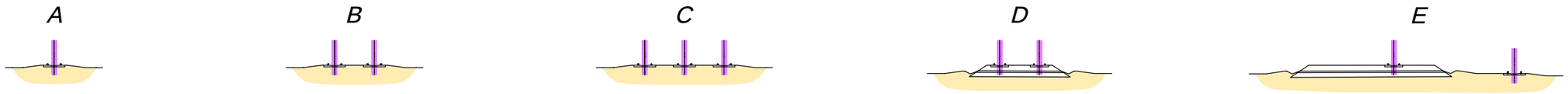

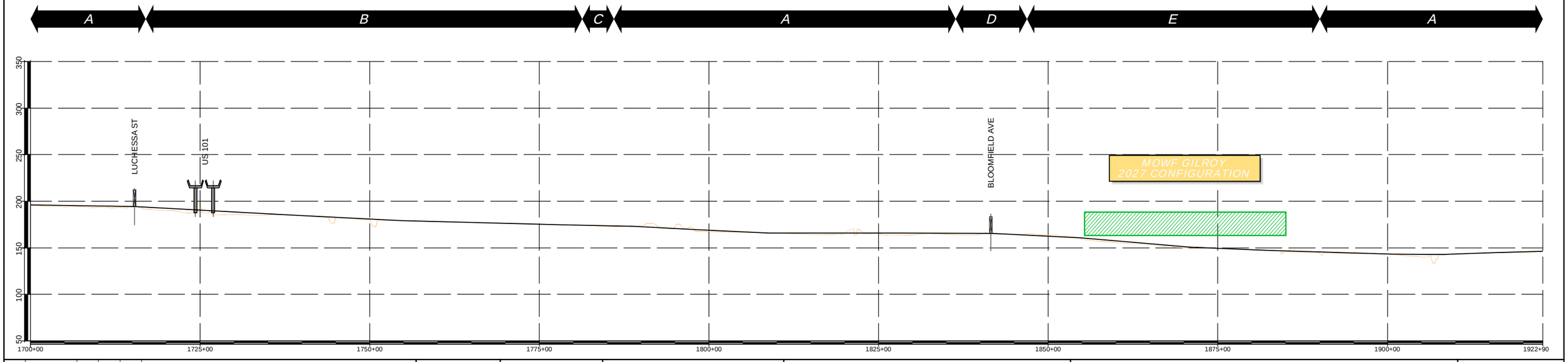

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APPENDIX 2-M: GILROY LMF OPTION CONSIDERATION AND ELIMINATION

MEMORANDUM

Date: September 3, 2021

To: Boris Lipkin, Northern California Director
Morgan Galli, Northern California Deputy Director

From: Paul Hebditch[1], Lead Operations Planning and James Tung, San Francisco to San Jose Project Manager

CC: Gary Kennerley, Northern California Director of Projects
Julian Bratina, Northern California Engineering Project Manager

Subject: Gilroy LMF Option Consideration and Elimination

Introduction

This memorandum provides the history of planning for the Light Maintenance Facility (LMF), discusses the design objectives for high-speed rail in Northern California, presents the technical requirements for an LMF, and documents the reasons for eliminating a Gilroy LMF from consideration.

Summary

The proper location of the LMF in a railway system is one of the critical elements in providing a reliable and resilient train service to customers. The LMF must provide easy access for HSR trains onto and off of the network and be located near key service termination locations to support efficient startup of the service each morning and end of service each evening and allow for overnight maintenance of the trains and the infrastructure.

The California High-Speed Rail Authority (Authority) has been studying a potential LMF site in Brisbane (with options on the east and west side of the tracks) since 2010. In response to the Authority's Draft EIR/EIS for the San Francisco to San Jose project section (published in 2020), the City of Brisbane provided comments suggesting the LMF should be (among other options) located in Gilroy. This memo describes the challenges with that location for the Authority, Caltrain, and the other users of the rail corridor between San Francisco and Gilroy (such as freight operators).

Locating the LMF in Gilroy, further away from the terminal station, would increase the distance that non-revenue trains must travel on the system, increase the need for more frequent track maintenance, and impact the operating windows for freight operators. Overall, these extra trains would increase the risk of operating incidents and decrease the reliability of the system. Because every train would need to

[1] Paul Hebditch, CHSRA Rail Operations and Delivery: Paul Hebditch has over 30 years of experience in the railroad industry working in operations roles at all levels. He spent 25 years in the UK railroad industry and in the last 5 years has supported US railroad businesses in California including the California High-Speed Rail Authority as their Operations Planning Lead. He has experience in the development and implementation of operational plans aimed at delivering reliable resilient and efficient rail operations.

travel the length of the corridor from Gilroy to San Francisco for start of its service, the impacts would be felt across the entire rail corridor for all operators and passengers. In addition to these railroad impacts, additional train travel would impact the community through additional gate down times at all vehicular crossings, which would lead to additional traffic delays, and additional noise impacts during overnight noise-sensitive hours. These challenges would be further exacerbated as service ramps up in the corridor, including through Caltrain's 2040 service vision. Other environmental factors considered for the Gilroy location include impacts to the flood plain, wildlife corridors, and agricultural and cultural resources.

Background

The LMF[2] is a critical component of the HSR system and was conceptualized in the initial planning for the San Francisco to San Jose project section in 2010 and again when the environmental review process for the project section was reinitiated in 2016.

While a total of eleven locations for the LMF were initially considered[3] (refer to Figure 1), since 2010 the only feasible options carried forward are the two locations in Brisbane. The Draft EIR/EIS for this project section, released for public review on July 10, 2020, evaluated the two LMF options in the City of Brisbane, with Alternative A on the east side of the tracks and Alternative B on the west side of the tracks (refer to Figure 2). The Alternative A and Alternative B sites in Brisbane satisfy the key engineering, financial, and operational considerations that guide the siting of an LMF. It is approximately eight miles from the terminal station in San Francisco, and the closest location that would not result in severe impacts to existing land uses. The layout was designed to minimize impacts on Caltrain and freight train operations in this heavily utilized rail corridor by providing a grade-separated junction at the entry to the facility. Among several advantages, the Brisbane sites were the only locations along the Caltrain corridor large enough to accommodate the facility needs without displacing existing neighborhoods or other land uses. Alternative A (East Brisbane LMF) was identified as the Preferred Alternative in part based on consideration of the City's plans[4] to put mixed use (including housing) on the west side of the existing rail corridor and the property owner's plans to phase development starting with the west side.

[2] The 2010 Preliminary Alternatives Analysis and 2010 Supplemental Alternatives Analysis referred to the LMF as the Maintenance Facility. Technical Memorandums 5.1 and 5.3 refer to the LMF as the Terminal Storage and Maintenance Facility (TSMF).

[3] The LMF Site Selection Memorandum evaluates 11 total LMF sites and is included in Appendix 2-K. The Preliminary Alternatives Analysis 2010 and Supplemental Alternatives Analysis 2010 evaluated and dismissed the Port Site and SFO.

[4] In November 2018, voters in Brisbane approved Measure JJ which amended the City's General Plan to allow 1,800-2,200 residential units and 7 million square feet of commercial development on the Baylands site. As of the date of this paper, the Specific Plan for the area is still under development.

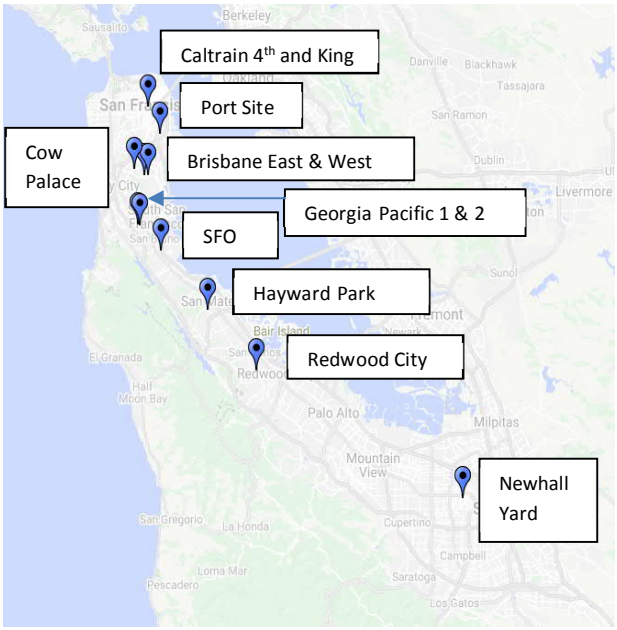


Figure 1: LMF Sites Considered

Figure 2: Alternatives in Draft EIR/EIS

LMF Function and Design Criteria

The LMF analyzed in the Draft EIR/EIS for the San Francisco to San Jose project section is one of only three such facilities[5] that would support the 520-mile Phase 1 high-speed rail system. It would serve as the day-to-day location for overnight storage, maintenance, inspection, and ongoing routine servicing of trainsets. Trains and crews would be dispatched from the LMF to the Salesforce Transit Center (STC), or the interim 4th and King Street Station, to begin revenue service throughout the day. The LMF would house standby trainsets to protect reliable operation and would function as a service point for any trains in need of emergency attention.

The LMF would also support maintenance of trainsets, which occur on a daily, monthly, and quarterly basis to meet federal safety and maintFAenance standards. Maintenance activities include train washing, interior cleaning, wheel truing, testing, and inspections. These activities may occur between runs or as a pre-departure service at the start of the revenue day.

The Authority's design criteria[6] for storage and maintenance facilities are based on best practices and experience gained by other high-speed rail system operators throughout the world. There are three primary criteria that govern the siting and location of the LMF (that would be relevant for consideration of the location between Brisbane and Gilroy): Distance from terminal station, size, and proximity to mainline tracks.

[5] As described in TM 5.3, the three maintenance facilities include: one near the northern terminus in San Francisco, one near the southern terminus in Los Angeles, and one Heavy Maintenance Faciltiy in the centrally located between Merced and Bakersfield.

[6] For more information on LMFs, please consult published Authority technical memoranda (TM). TMs 5.1 and 5.3 related to HSR operation facilities may be found online: https://hsr.ca.gov/programs/environmental-planning/project-level-environmental-engineering-guidelines-studies-reports/

- Distance from terminal station – To support the functions described above, the optimal location for the LMF would be within 1.5–3 miles of the San Francisco terminal station. The system must be designed to minimize the number and duration of non-revenue generating or "deadhead" movements to avoid increased operations and maintenance costs. Deadhead movements also reduce track capacity and revenue train service, and increase community impacts. Close proximity to the terminal station also allows operators to respond more efficiently in emergencies, including midday incidents. While the Brisbane LMF is more than 3 miles from the terminal station, it was the closest feasible location identified.
- Site Size – The LMF sizing criterion is based on ridership projections and fleet size estimates and is intended to be sufficient to handle projected system growth to the year 2040, as identified in the Authority's business plans. Because the LMF is one of three primary maintenance facilities on the high-speed rail system, the capacity of the yard needs to be of sufficient size to accommodate approximately one third of the total fleet size. An area of approximately 100 acres is required to accommodate all necessary components of storage and maintenance at the facility.
- Proximity to mainline tracks – Minimizing the distance between the LMF and the mainline or service tracks is important to reducing costs associated with track infrastructure, minimizing travel time between the mainline track and the LMF, and avoiding or reducing potential effects on existing land uses and environmental resources. The longer the lead track required to access the mainline (> 0.25 mile), the greater the operational and maintenance inefficiencies.

Examples:

For these reasons, railroad systems around the world, including in the US and California, locate storage and maintenance facilities as close as practicable to their terminal stations. For example, in the United Kingdom, the primary depots for almost every high-speed rail service serving London includes a storage and maintenance facility in the inner city suburbs and within ten miles of the main terminal. Two examples are the Great Western at Old Oak Common near Paddington station and the West Coast mainline at Wembley near Euston station. Examples can also be found much closer to home here in California. In California, rail operators, including Metrolink, Amtrak, ACE, and Caltrain, have maintenance facilities within close proximity to their stations. See Table 1, for a example list of California train operators' maintenance facility distances.

Table 1: California Examples of Maintenance Facility to Station Distances

Operator	Maintenance Facility Location/Name	Nearest Station	Distance
Metrolink	Central Maintenance Facility	LA Union Station	2 miles
	Eastern Maintenance Facility	San Bernardino	< 1 mile
	Oceanside (OSD)	Oceanside	2 miles
	Lancaster	Lancaster	< 1 mile
	Ventura	Ventura	< 1 mile
	Perris	Perris	< 1 mile

	Riverside	Riverside	< 1 mile
Amtrak Pacific Surfliner	8th Street Yard Los Angeles	LA Union Station	< 1 mile
	San Diego (SDG)	San Diego	< 1 mile
North County Transit District	Oceanside (OSD)	Oceanside	2 miles
	San Diego (SDG)	San Diego	< 1 mile
Amtrak San Joaquin	West Oakland	Oakland	< 1 mile
	Fresno	Fresno	< 1 mile
	Bakersfield	Bakersfield	< 1 mile
ACE	Stockton	Stockton	< 1 mile
	Tamien	San Jose	2 miles
Caltrain	San Jose Centralized Equipment Maintenance and Operations Facility	San Jose	< 1 mile
	SF 4th and King	SF 4th and King	< 1 mile
Capital Corridor	Sacramento	Sacramento	< 1 mile
	West Oakland	Oakland	< 1 mile
	Oakland Coliseum	Oakland Coliseum	< 1 miles
	San Jose	San Jose	< 1 mile

For California high-speed rail service, the key terminating points will be San Francisco and Los Angeles, at STC and LAUS, respectively. In Los Angeles, the Authority is proposing a storage and maintenance facility in the West Yard area, which is within one mile of LAUS. Even at less frequently used terminating locations, such as Merced and Anaheim, the Authority has designed the system in line with international best practices by ensuring that storage and maintenance facilities are in close proximity the terminal stations.

For its northern terminus in San Francisco, the Authority undertook an extensive search to identify an appropriate location for the northern-most maintenance facility. This assessment determined that the sites at Brisbane are the most consistent with operating requirements and avoid intensive existing land uses on the Peninsula.

Operational Consequences of an LMF Located in Gilroy

The LMF is a heavily utilized facility, and Gilroy is not a functionally appropriate location because it is located approximately 80 miles south of the terminal facility. As described below, a Gilroy LMF would add additional risk to the reliability of operations, increase the risk at each of the 70 grade crossings located between San Francisco and Gilroy, increase gate down time, and increase the cost of operations.

Transportation from a Gilroy LMF to the terminal station in San Francisco for the start of daily services and back to the facility at the end of daily service would require an additional 27 deadhead trains per

day to be added to the 124 revenue trains per day to be scheduled on the Caltrain corridor. This represents nearly a 25% increase in the number of high-speed train movements on the entire Caltrain corridor. The additional deadhead movements are summarized and discussed below:

Table 2: Deadhead Movement Assessment

Deadhead miles to Brisbane	240 miles per day
Deadhead miles to Gilroy	2,111 miles per day
Additional deadhead miles for Gilroy LMF	**683,000 miles per year**
First deadhead move departs Brisbane	5:20am to make 6:00am start of service
First deadhead move departs Gilroy	4:25am to make 6:00am start of service
Last deadhead move arrives Brisbane	Leave STC at 12:09am and arrival at 12:40am
Last deadhead move arrives Gilroy	Leave STC at 12:45am and arrival at 1:55am
Additional time of operations	**130 minutes per day**
Additional energy cost per day (@43kWh/mile and $0.074 per kWh)	$7,828
Additional trainset maintenance cost per day (@ $1.077 per mile)	$2,649
Additional traincrew costs per day (@ $75 per hour)	$2,250
Total additional costs	**$12,727 per day ($4.7million per year)**

The additional deadhead miles add a certain amount of risk to the operational objective of providing safe and reliable train operations in several ways. The additional trains would extend the operating period by an additional 130 minutes, thereby reducing the amount of time for track/train maintenance from 6 hours to just under 4 hours. The extra train movements would degrade the system faster but allow less time to provide maintenance. This inverse relationship significantly increases the risk for providing reliable train operations.

For rail corridors, the greatest risk occurs at interfaces with other modes of transportation. There are 70 grade crossings between San Francisco to Gilroy and only 2 grade crossings between San Francisco to Brisbane. By placing the LMF in Gilroy, the number of trains passing through grade crossings increases, thereby increasing the risk of incidents.

Furthermore, when there is an incident or during emergency train servicing scenarios, the train would, to the best of its ability, complete the trip to the terminal station in San Francisco before heading to the LMF. A LMF located in Gilroy would make this journey significantly more challenging and riskier for a train in need of servicing.

The train slots required by these movements would also absorb the limited capacity on the two-track railway corridor between Gilroy and San Francisco. Since the deadhead moves would occur after midnight and before 6am, they would have less effect on passenger revenue service. However, Caltrain conducts non-revenue moves of their trains overnight so capacity for those moves would be affected. The reduced capacity would also affect the window of operation for freight operators, which primarily

operate in the evening and overnight hours in the Caltrain corridor. These operators are also looking to increase future operations.

Finally, the additional distance that high-speed trains would need to travel (estimated at around 683,000 miles per year) would increase wear and tear, resulting in increased track and system maintenance costs for Caltrain as the infrastructure owner, and increased trainset maintenance costs for the Authority as the trainset owner. The Authority would also incur additional costs associated with additional traincrew and traction power requirements. The Authority estimates that total annual operating costs increase for full-service operations would be approximately $4.7 million. These additional costs would need to be recovered through the fare box for the Authority to meet its Proposition 1A requirement to operate without subsidy. Therefore, locating the LMF facility in Gilroy, rather than Brisbane, would directly impact ticket prices for customers.

Environmental Impacts of a Gilroy LMF

Several environmental considerations were factored into the study of LMF locations, including the Gilroy location. Below is a description of Gilroy location specific impacts followed by corridor wide (from San Francisco to Gilroy) impacts.

Location Specific Impacts

The Gilroy LMF was removed from the San Jose to Merced project with the change in program delivery direction and definition of the "Valley to Valley" section in the 2018 Business Plan. When the Valley to Valley Section changed the temporary terminal station in San Jose to a terminal station San Francisco, there no longer was an operational need to have an LMF in Gilroy. By removing the LMF from the San Jose to Merced environmental analysis, the project section's overall impacts to the following resources was minimized:

Flood Plain Impact:

Given the space requirements, a Gilroy LMF would need to be located in the Soap Lake Flood Plain, just as the Maintenance of Way Facility for each of the alternatives. During a 100-year flood event, flooding in the Soap Lake area has the potential to submerge approximately 9,000 acres. The additional encroachment of an LMF into the floodplain and additional impervious surfaces added in the floodplain would increase project effects on hydrology and water quality.

Biological Resources:

A Gilroy LMF would be located in a natural wildlife corridor associated with the lands to the south and east of Gilroy in the Soap Lake Floodplain, including the Pajaro River. This area is a valley, allowing wildlife to migrate between the Diablo Range to the east and the Santa Cruz Mountains to the west. The importance of this wildlife movement corridor to the populations of rare and common species have been documented through the work of the Santa Clara Valley Habitat Conservancy, the Nature Conservancy, and other organizations. The placement of a Gilroy LMF in this wildlife corridor would increase the project's effects on wildlife movement and require increased and more ambitious mitigation efforts. In contrast, the existing conditions of the proposed LMF location for the Preferred Alternative in Brisbane is an area of a former landfill and has much lower habitat value than the land to the south and east of Gilroy.

Agricultural Resources:

A Gilroy LMF would be located in an area of primarily agricultural resources. A Gilroy LMF would require more ambitious mitigation for such effects. In contrast, the existing conditions of the proposed LMF location for the Preferred Alternative in Brisbane is in an area of a former landfill.

Cultural Resources:

A Gilroy LMF would be located in the Soap Lake Flood Plain. This is an area that has been documented as a tribal cultural resource, a sacred place with cultural value to a California Native American tribe and is an archeologically sensitive area. Section 106 requires that this be taken into consideration with any federal project. A Gilroy LMF would require more encroachment into this sensitive area, more construction and disturbance in this archaeologically sensitive area, and potentially more impacts to tribal and archaeological resources. In contrast, the proposed LMF location for the Preferred Alternative in Brisbane is in an area of a former landfill and is not a sensitive area for tribal or archaeological resources.

Corridor Wide Impacts

The corridor wide impacts affect all the communities between San Francisco to Gilroy. As described above, this spans approximately 80 miles and 70 grade crossings.

Transportation and Traffic Impacts:

An LMF facility located in Gilroy would result in substantial deadhead train travel to and from San Francisco, the northern terminus. These increased train movements would increase the potential for incidents at 70 grade crossings between San Francisco and Gilroy, thereby increasing the risk of delay for all rail services on the Caltrain corridor. This could lead to a decline in on-time performance of all services on the Peninsula. If an incident occurs, operational protocol requires the damaged train to go to the terminal station in San Francisco to drop off passengers and then go to the LMF for servicing. Locating the LMF in Gilroy would exacerbate this issue. Not only does this location for the LMF increase the risk of incidents, it makes it harder to recover from them if they occur.

Furthermore, increasing the number of trains at the crossings directly increases gate down time. A gate is down for approximately 1 minute every time a train passes through. 27 extra trains would increase gate down time by approximately 27 minutes per day at all 70 grade crossing between San Francisco to Gilroy. In contrast, an the 27 extra trains would only affect 2 grade crossings with the LMF in Brisbane.

Safety and Security

The Authority received feedback from first response organizations regarding the potential impact on response times in this area from the increased service levels currently proposed for the San Jose to Merced project section. Locating the LMF in Gilroy would exacerbate this issue for all 70 grade crossings between San Francisco to Gilroy. Each gate crossing takes approximately a minute to open and close, depending various site-specific issues such as the speed of the train at that location, potential trains on the adjacent track, and proximity to station platforms. 27 additional trains per day per direction would increase gate down time by 27 minutes per day at each of the 70 grade crossings.

Noise:

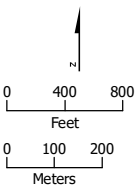
The increase in deadhead train movements would increase overnight and early morning train noise along the rail corridor due both to train movements and the sounding of horns. Trains are mandated by FRA rules to sound their horn at every grade crossing, resulting in more frequent horn noise. This noise

would occur during the more noise-sensitive overnight and early morning hours with the deadhead train movements to a Gilroy LMF. These additional noise effects are avoided with an LMF in Brisbane, because the LMF would be located close to the northern California terminus for the HSR system in San Francisco, which reduces the areas affected by deadhead moves compared to an LMF in Gilroy.

APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 1, Part 1)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



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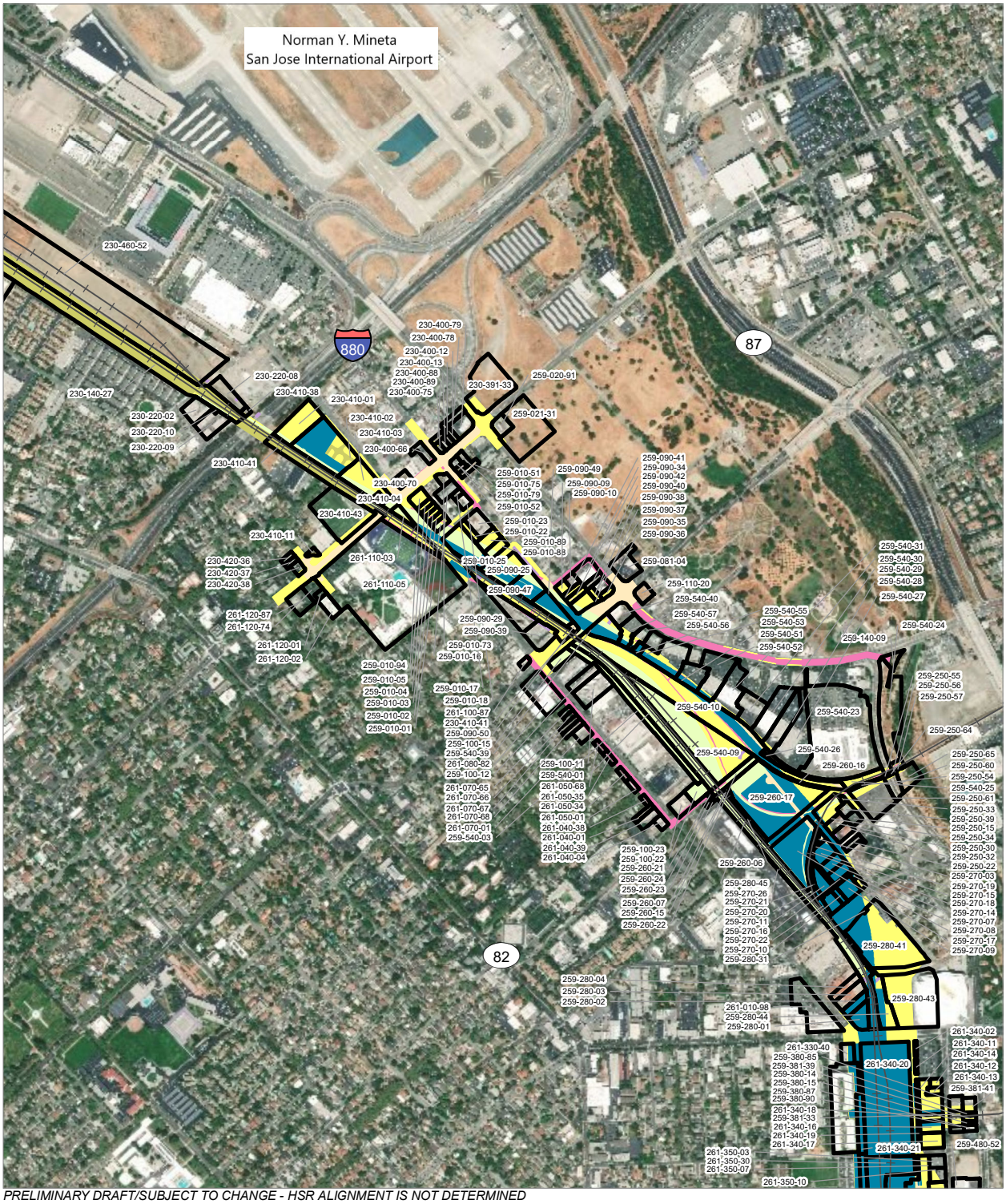
Rail Right-of-Way
HSR Permanent Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
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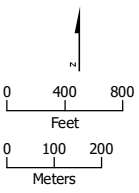
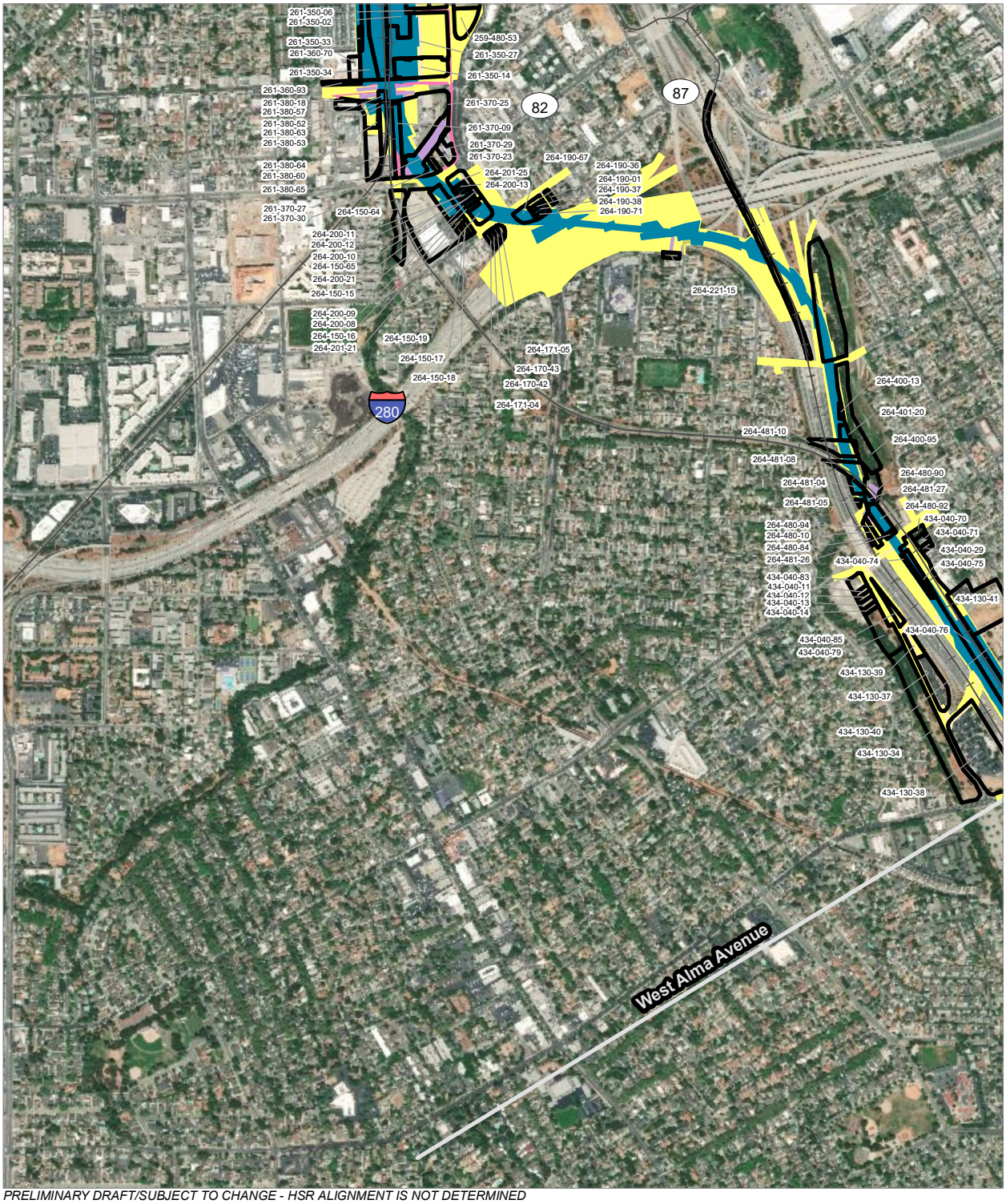
Alternative 1



HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)



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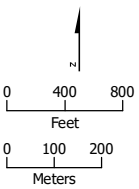

HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
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Permanent Utility Easement
Temporary Construction Easement
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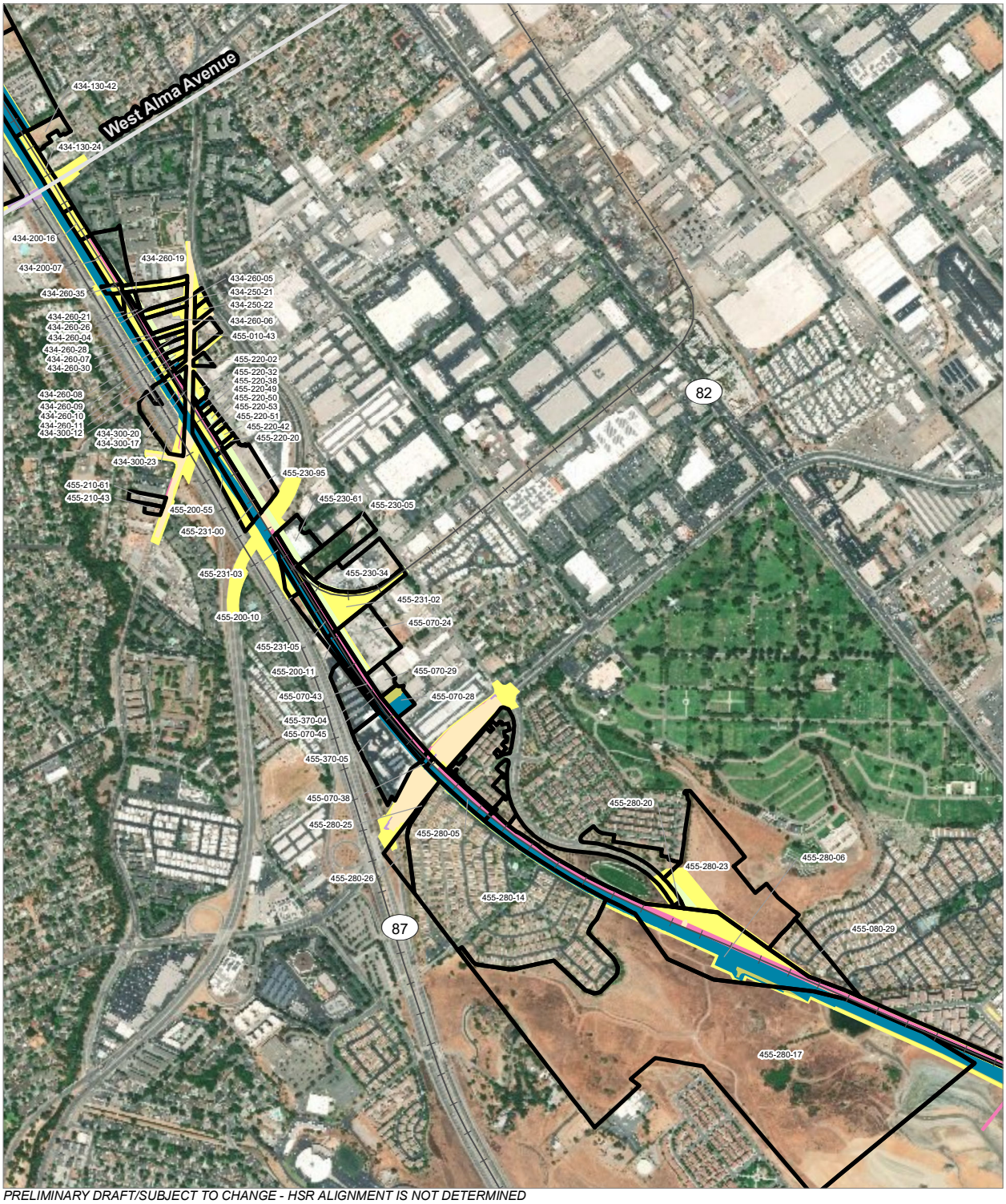
Parcel (APN Displayed)



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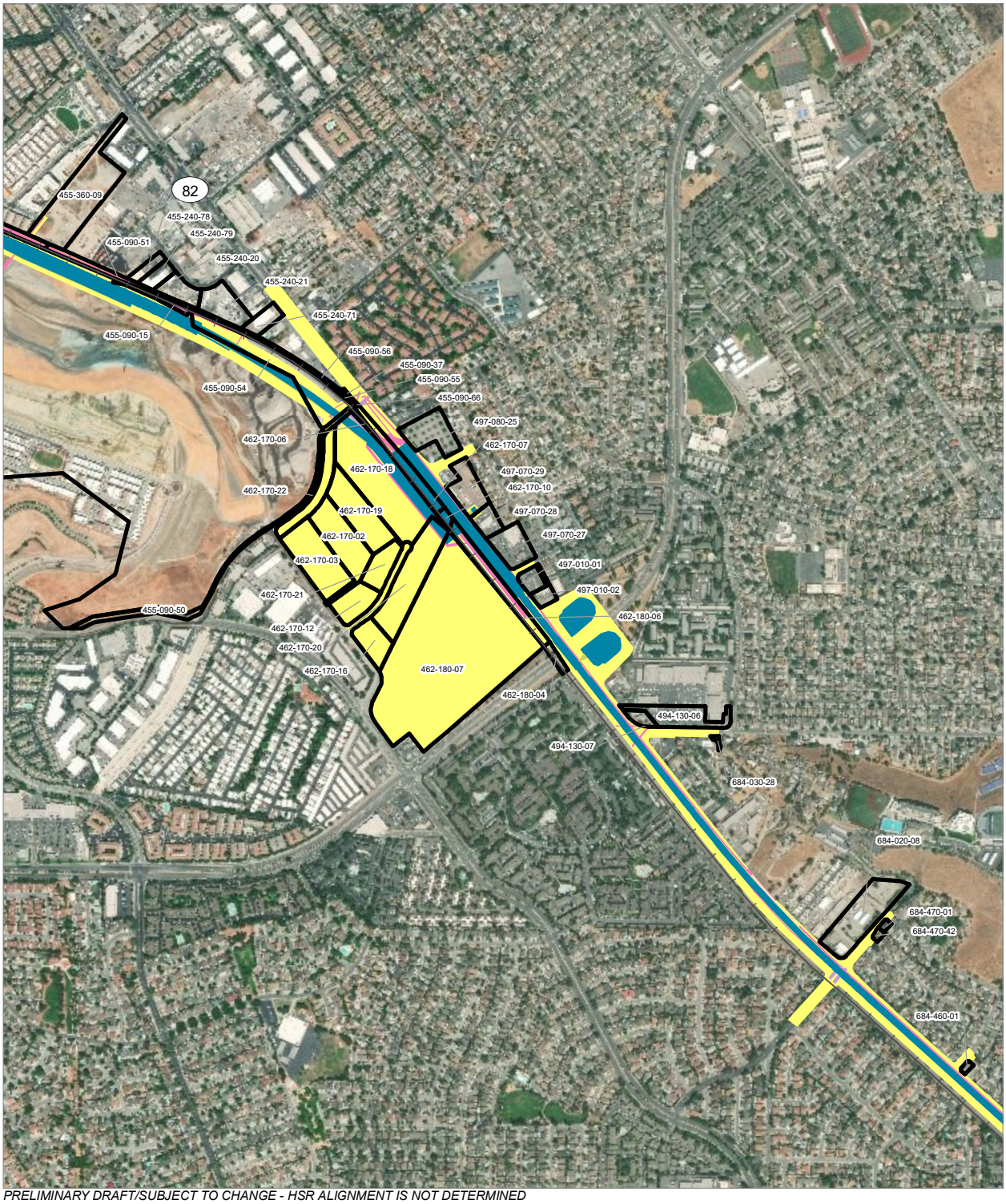
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)



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Alternative 1

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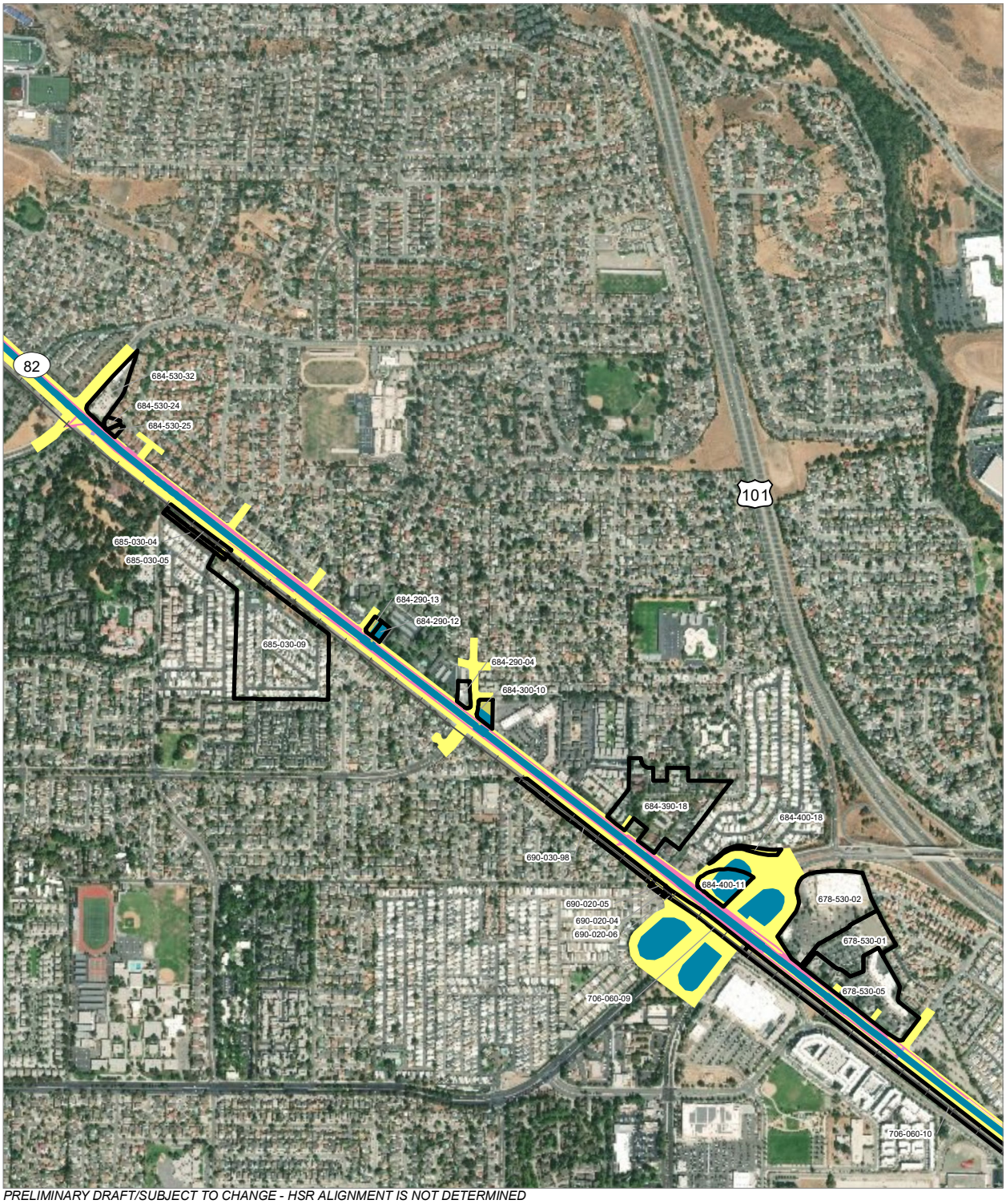
- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)



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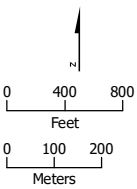

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
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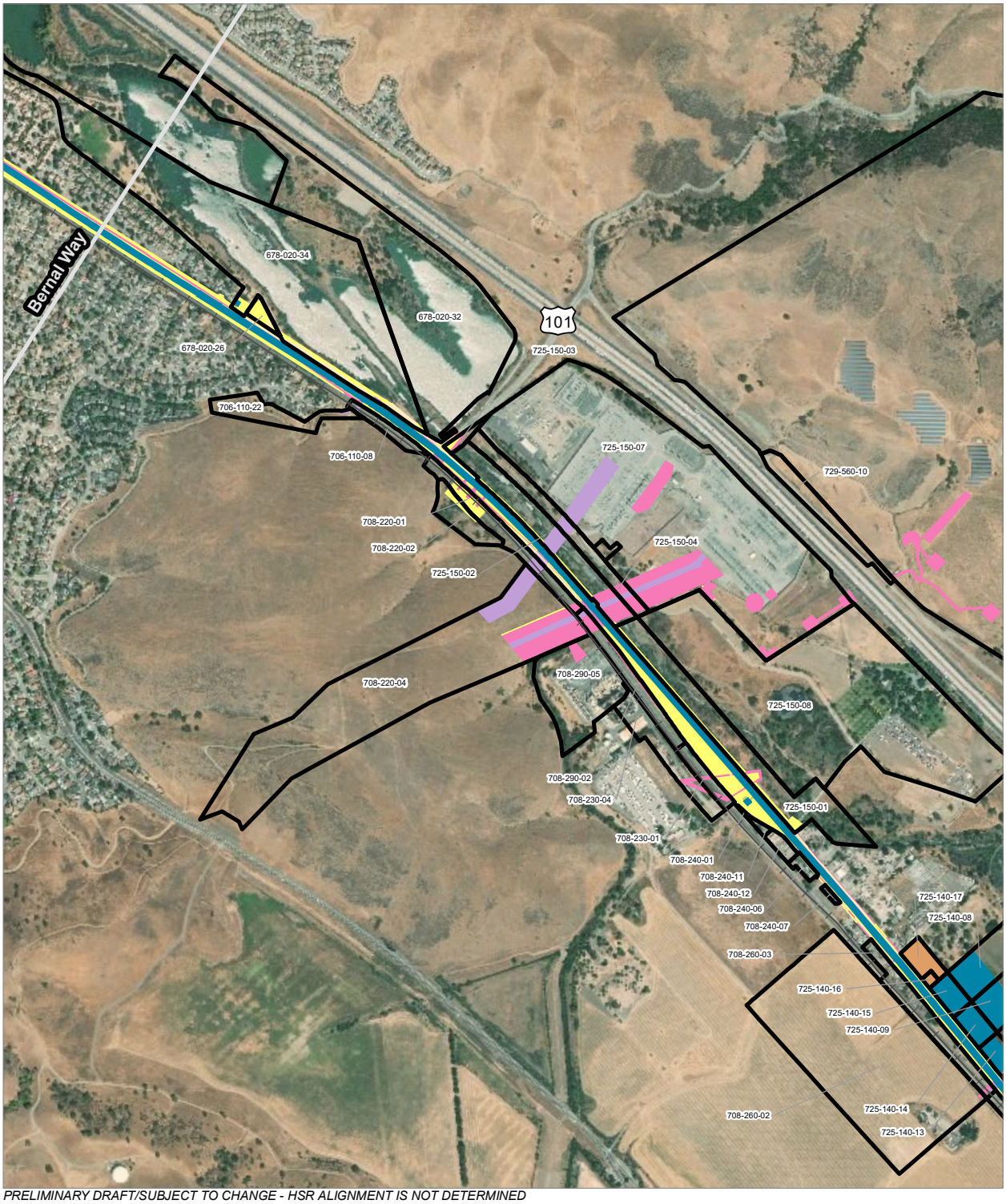

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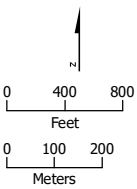

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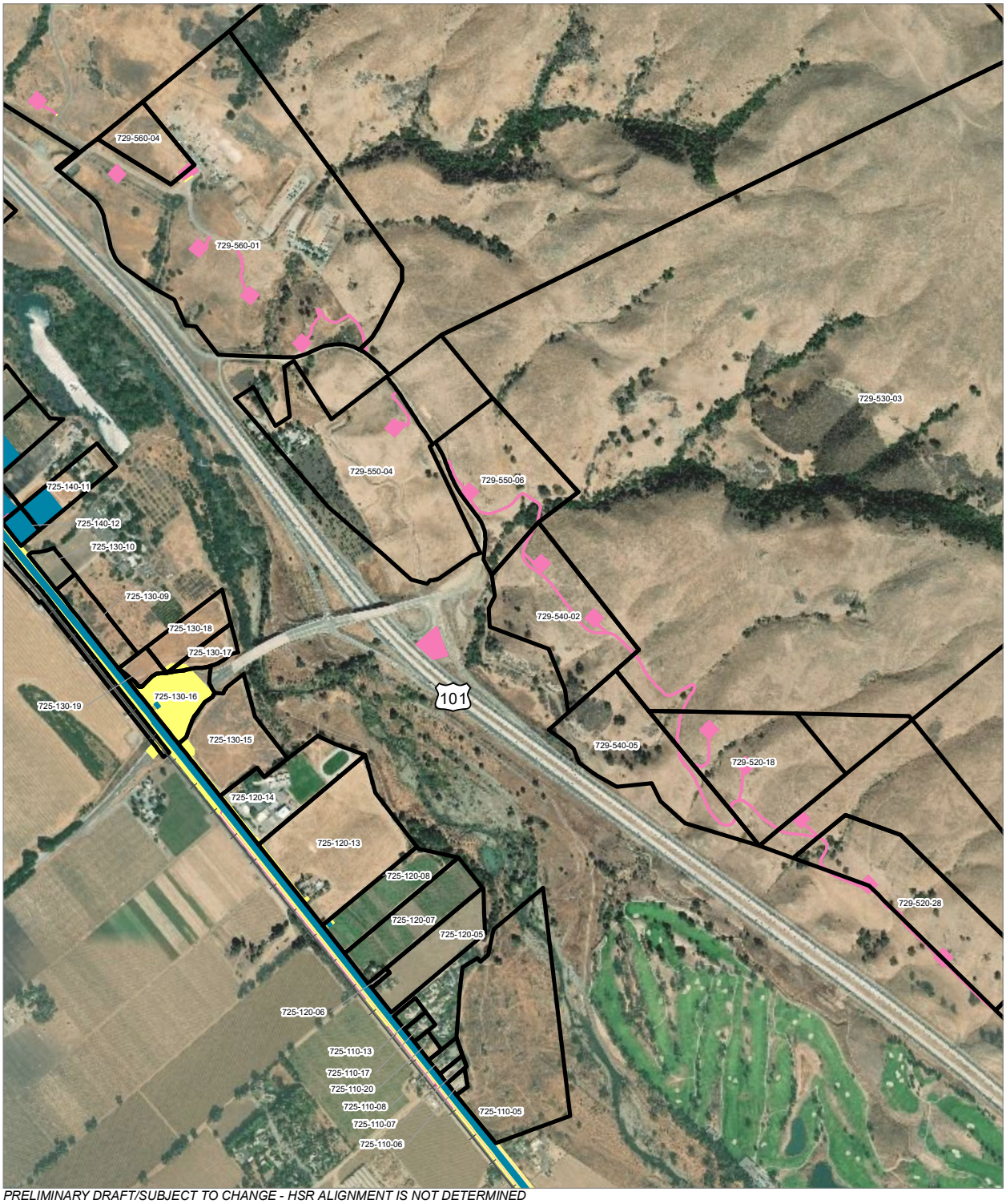
Non-Viable Remnant Parcel
Parcel (APN Displayed)



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Alternative 1

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- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

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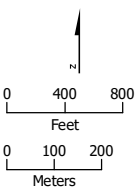

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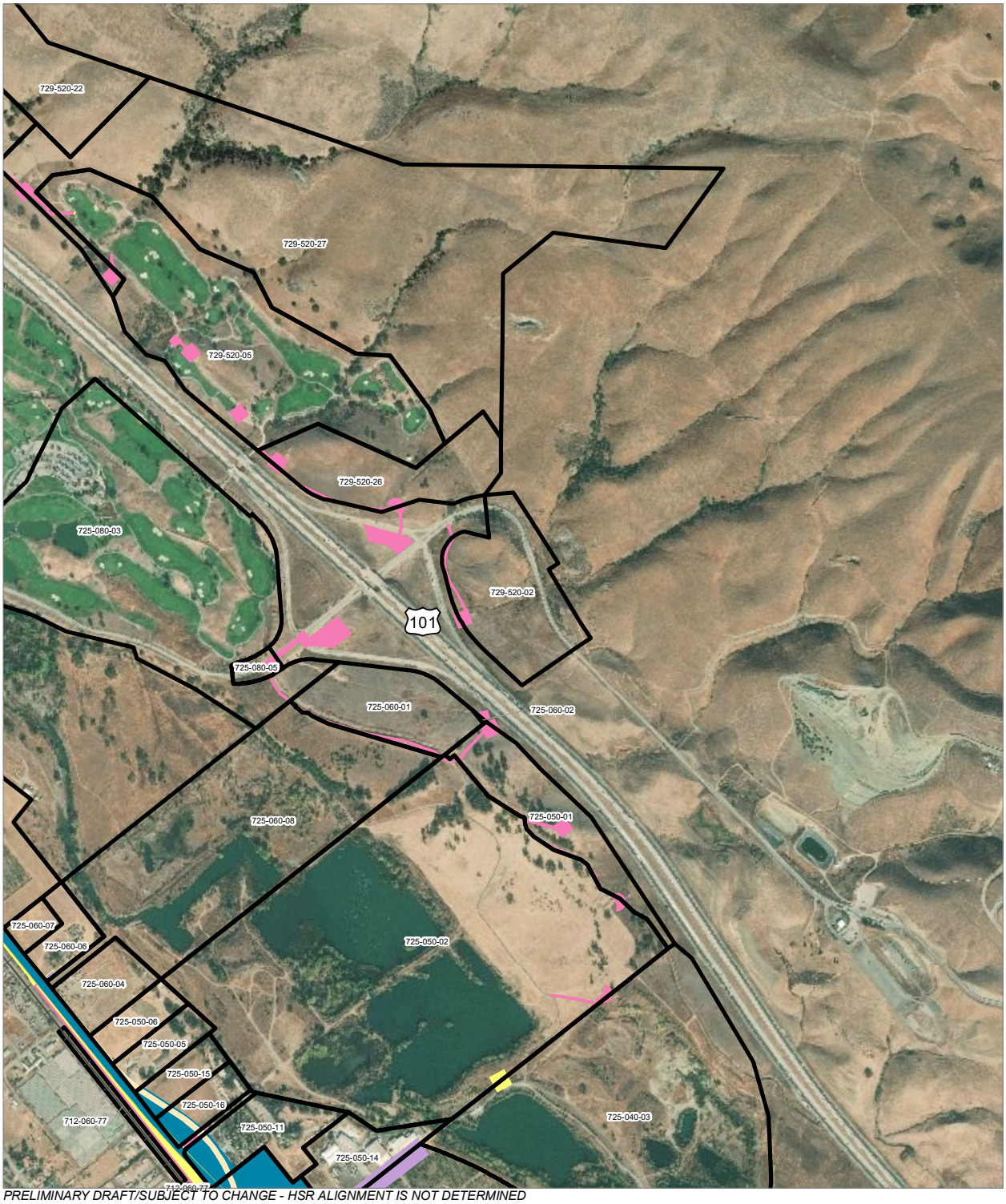

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- HSR Right-of-Way
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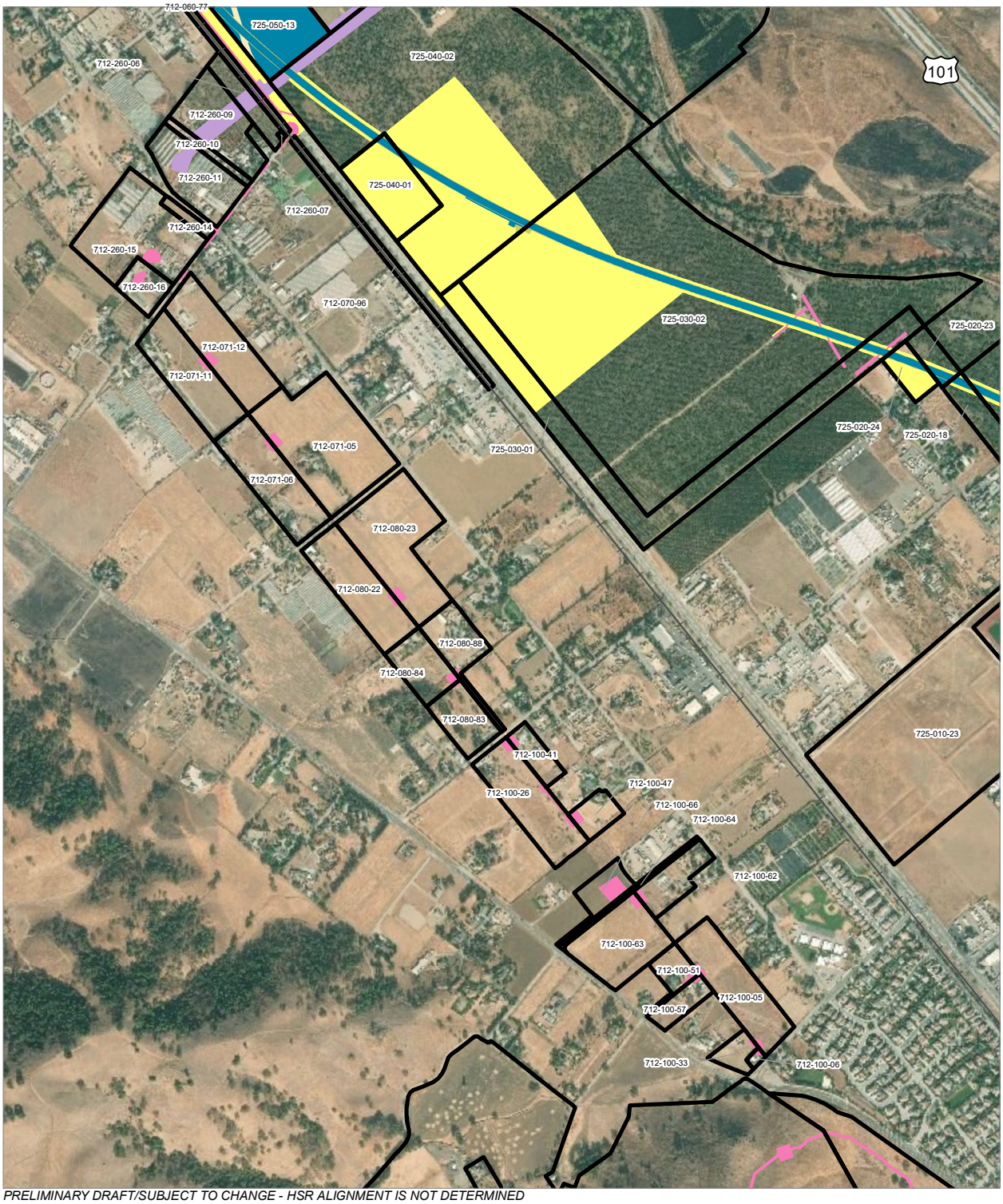
- Parcel (APN Displayed)



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Alternative 1

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- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

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Alternative 1

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- Non-Viable Remnant Parcel
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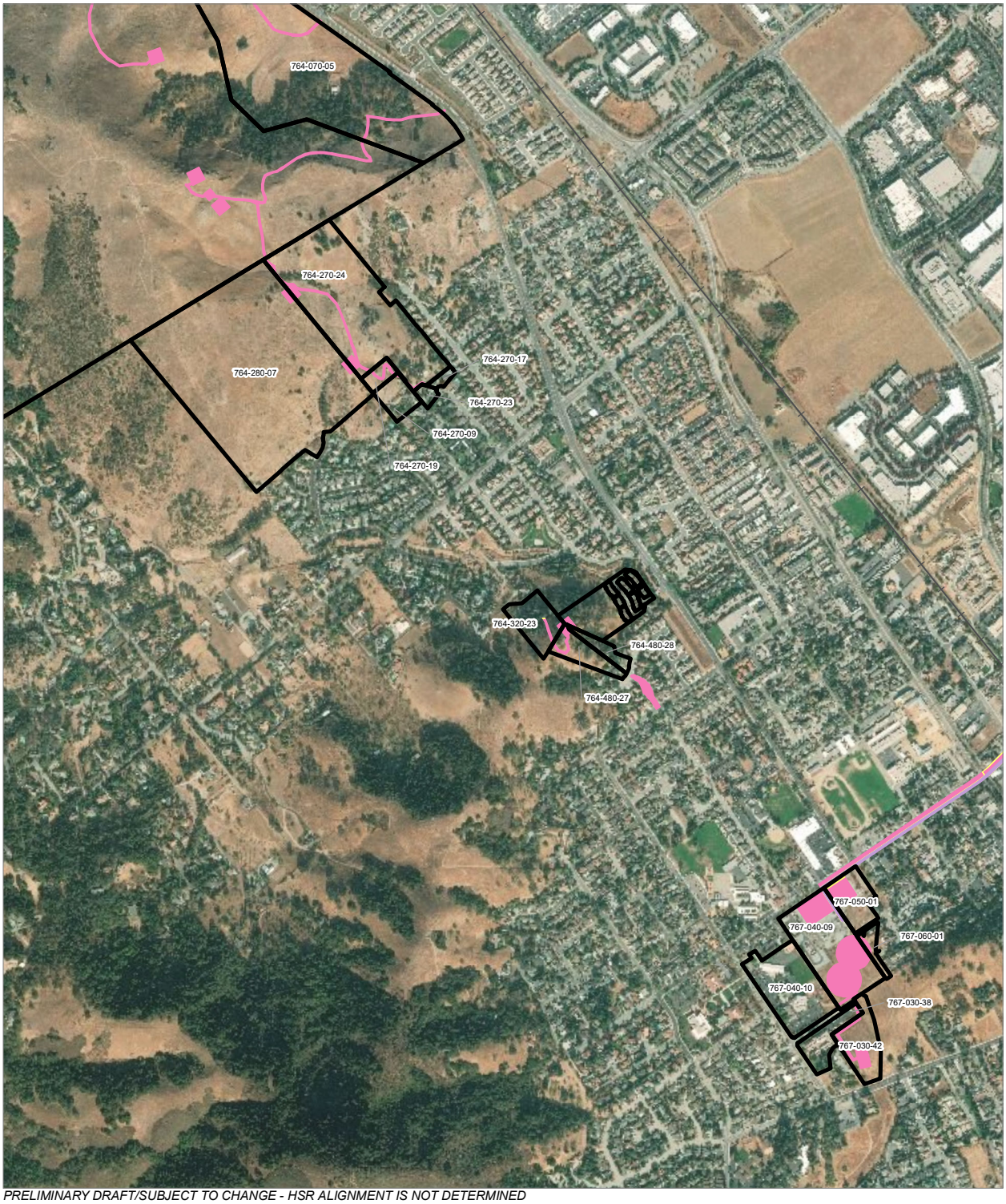

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Alternative 1

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Permanent Utility Easement
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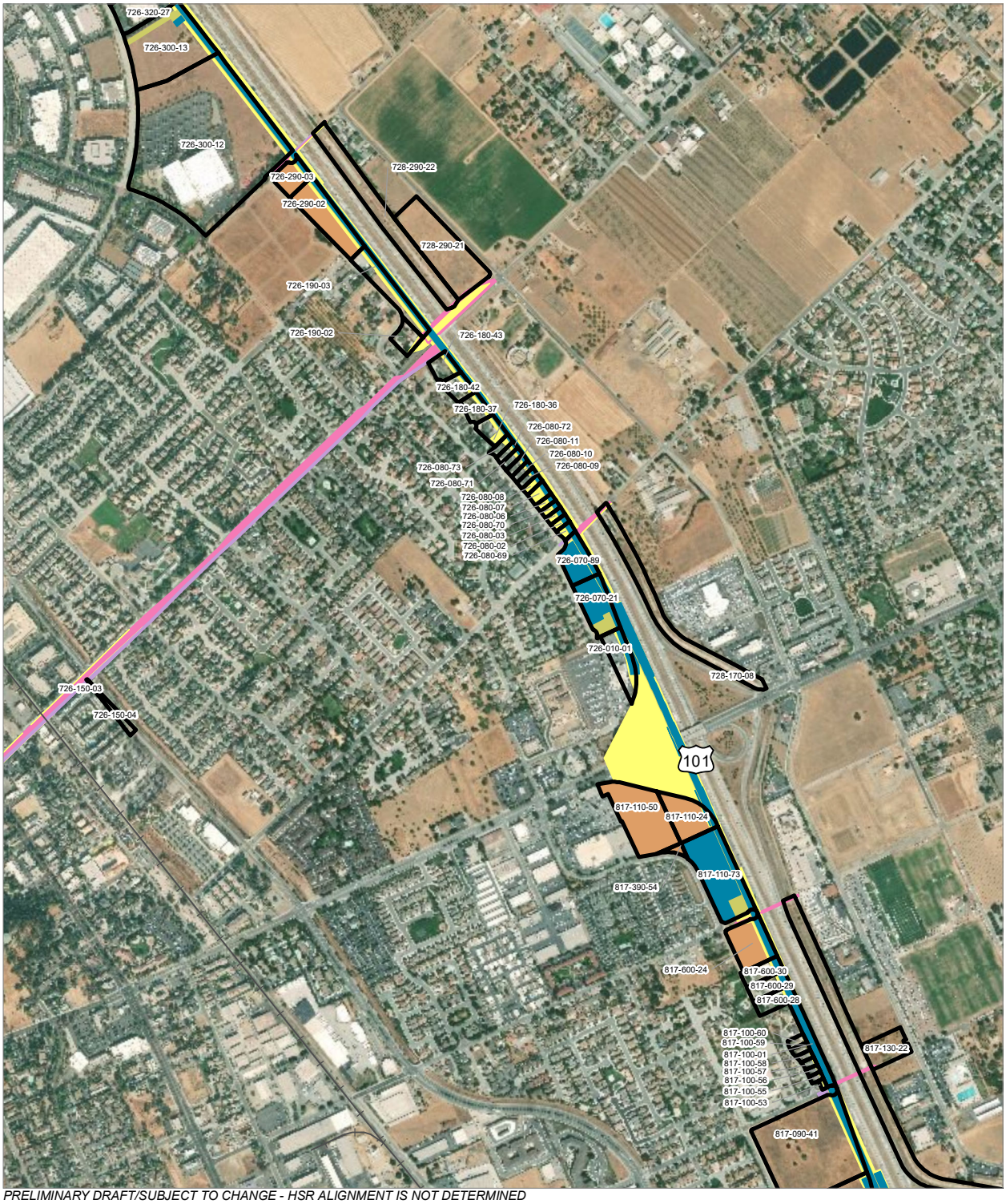
Temporary Construction Easement
Parcel (APN Displayed)



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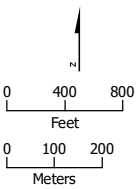

HSR Right-of-Way
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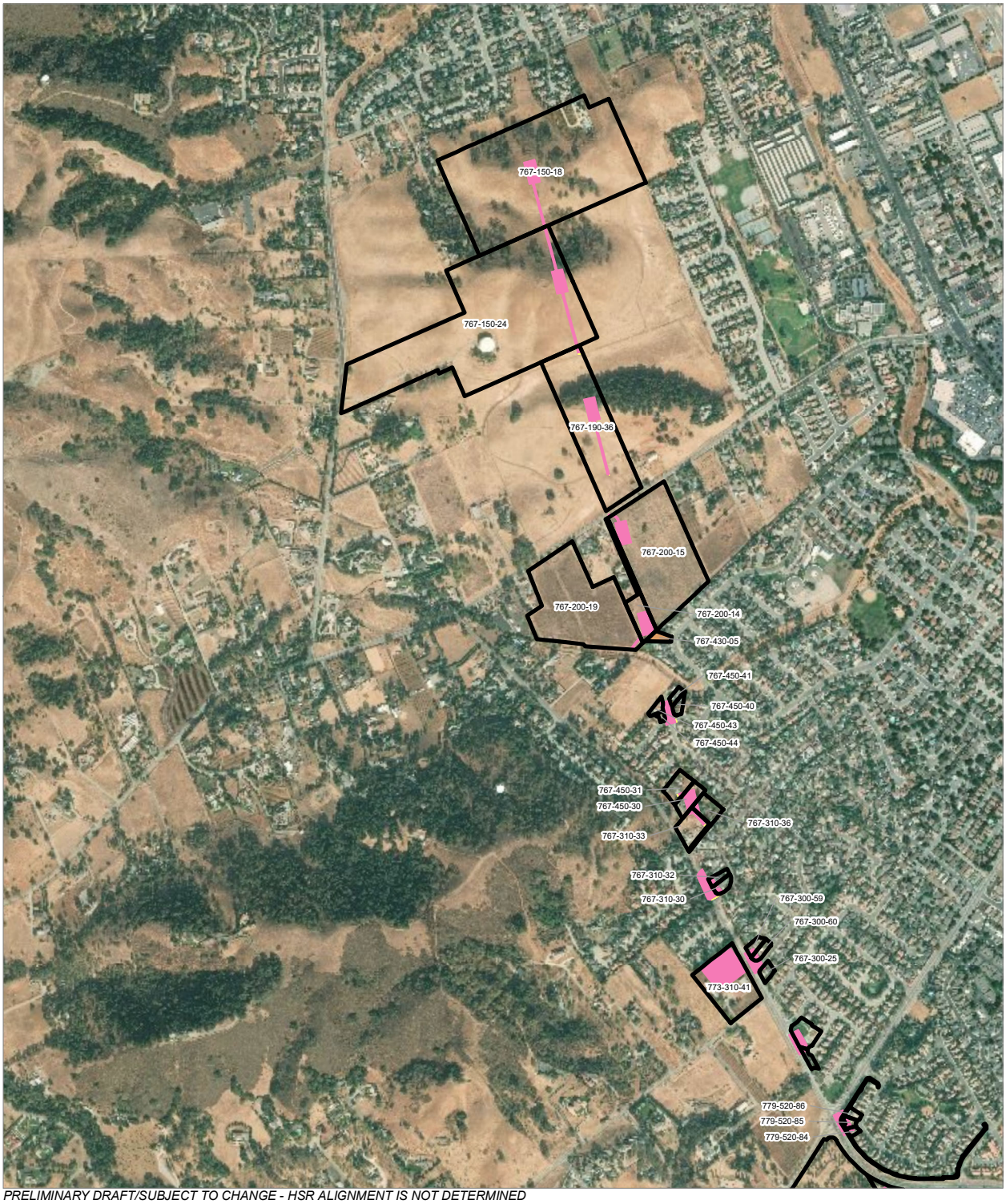
Parcel (APN Displayed)



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Alternative 1

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Permanent Utility Easement
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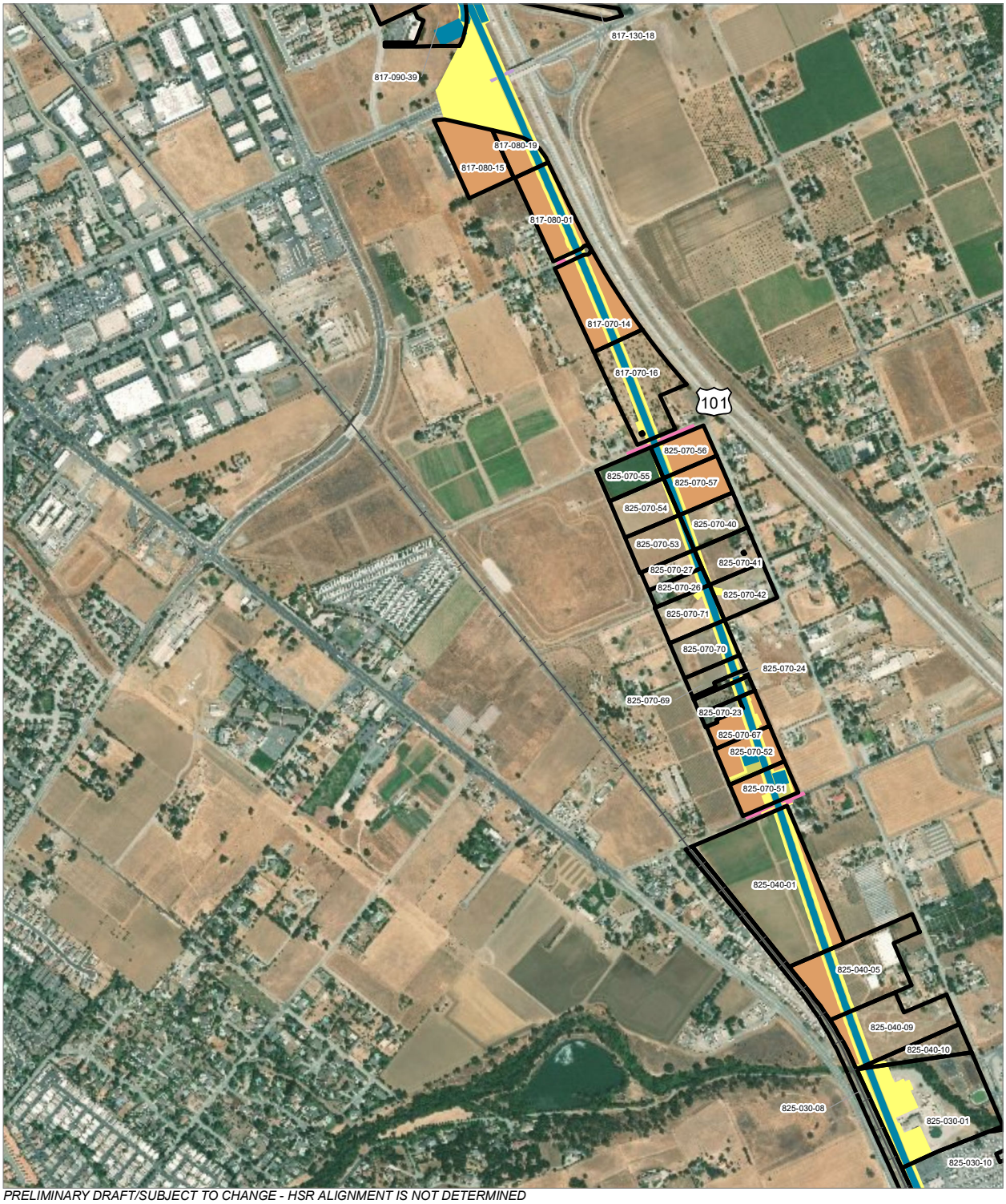
Parcel (APN Displayed)



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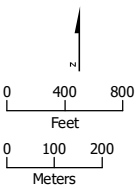

HSR Right-of-Way
Roadway Right-of-Way
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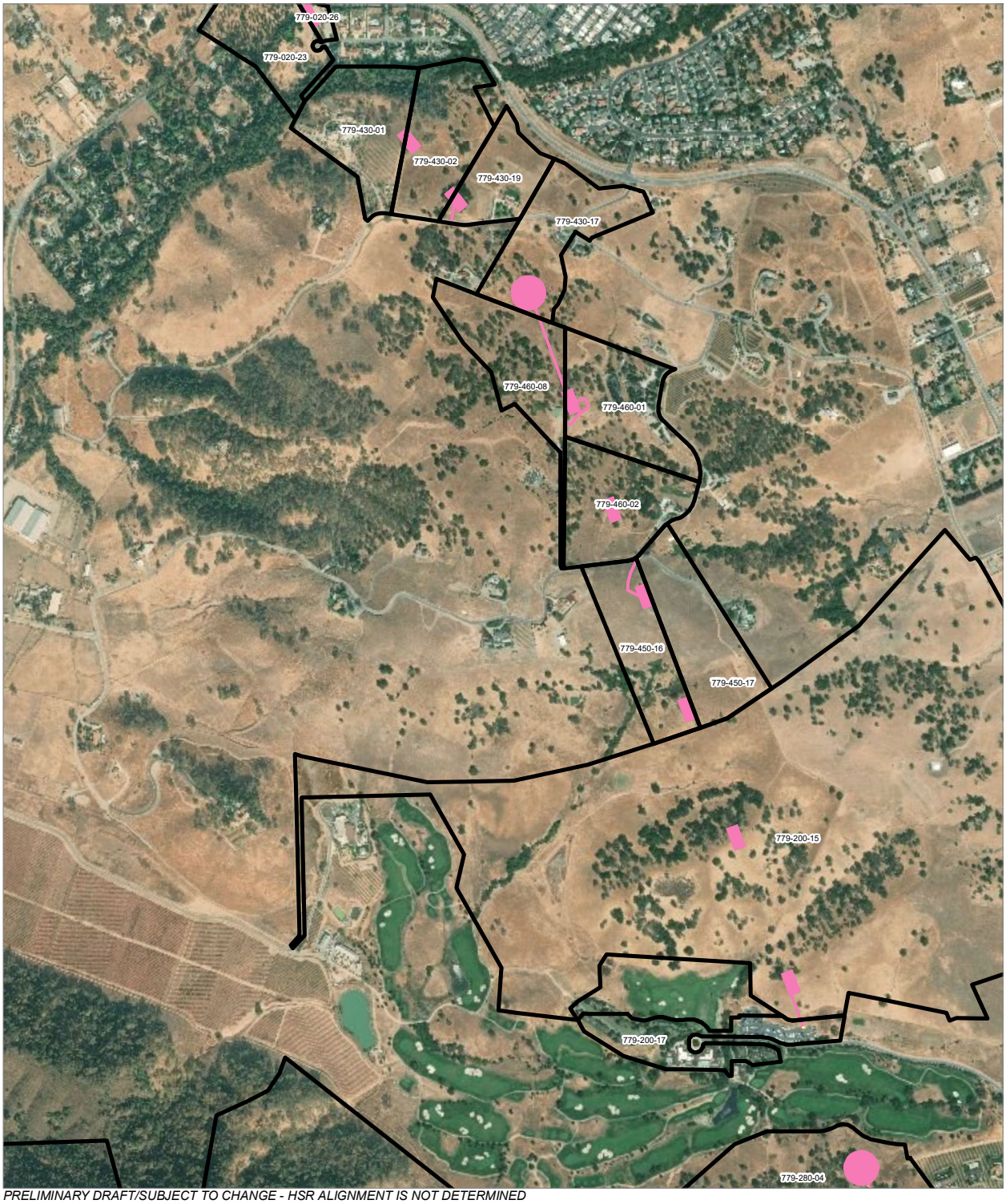
Parcel (APN Displayed)



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Alternative 1

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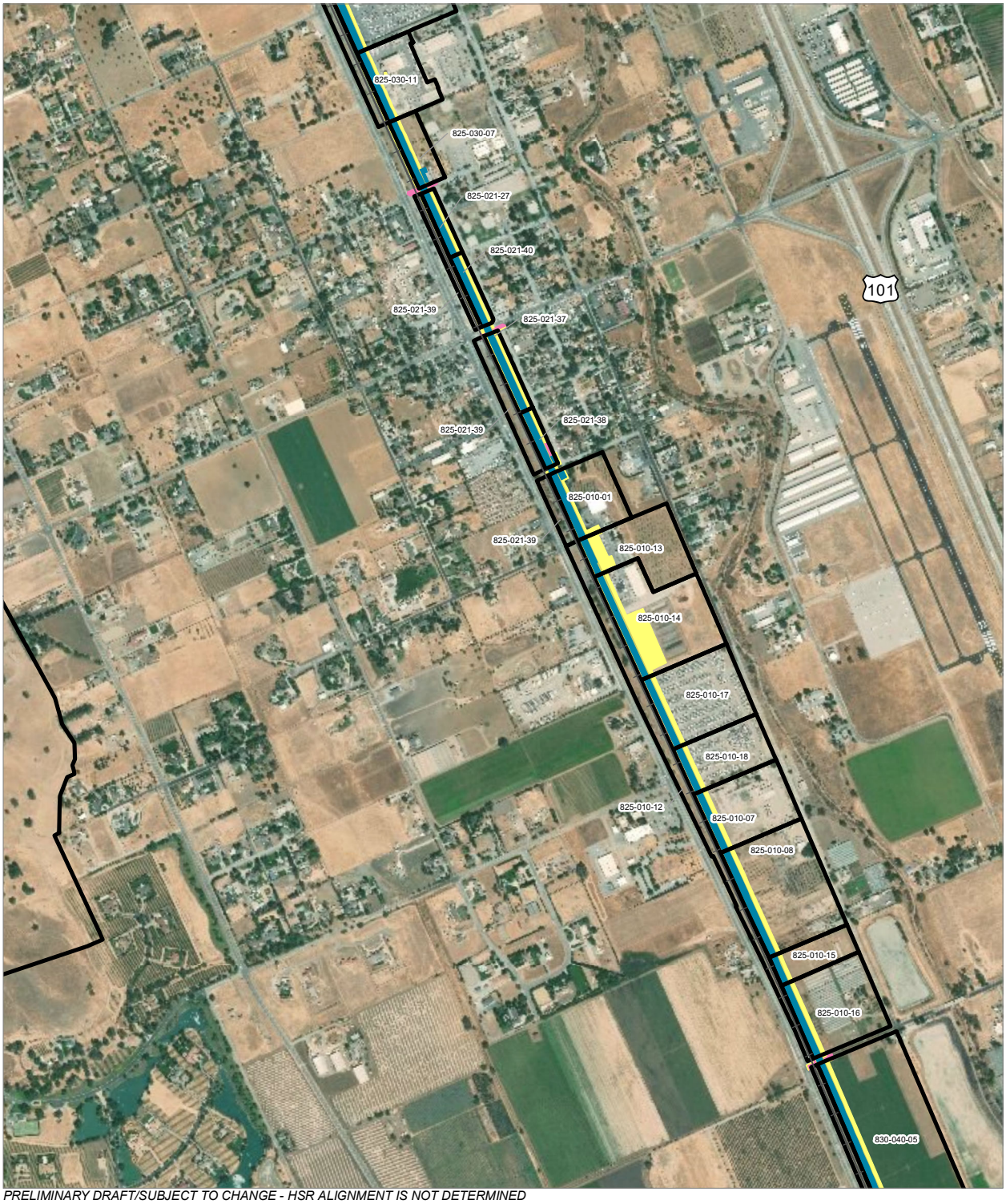
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

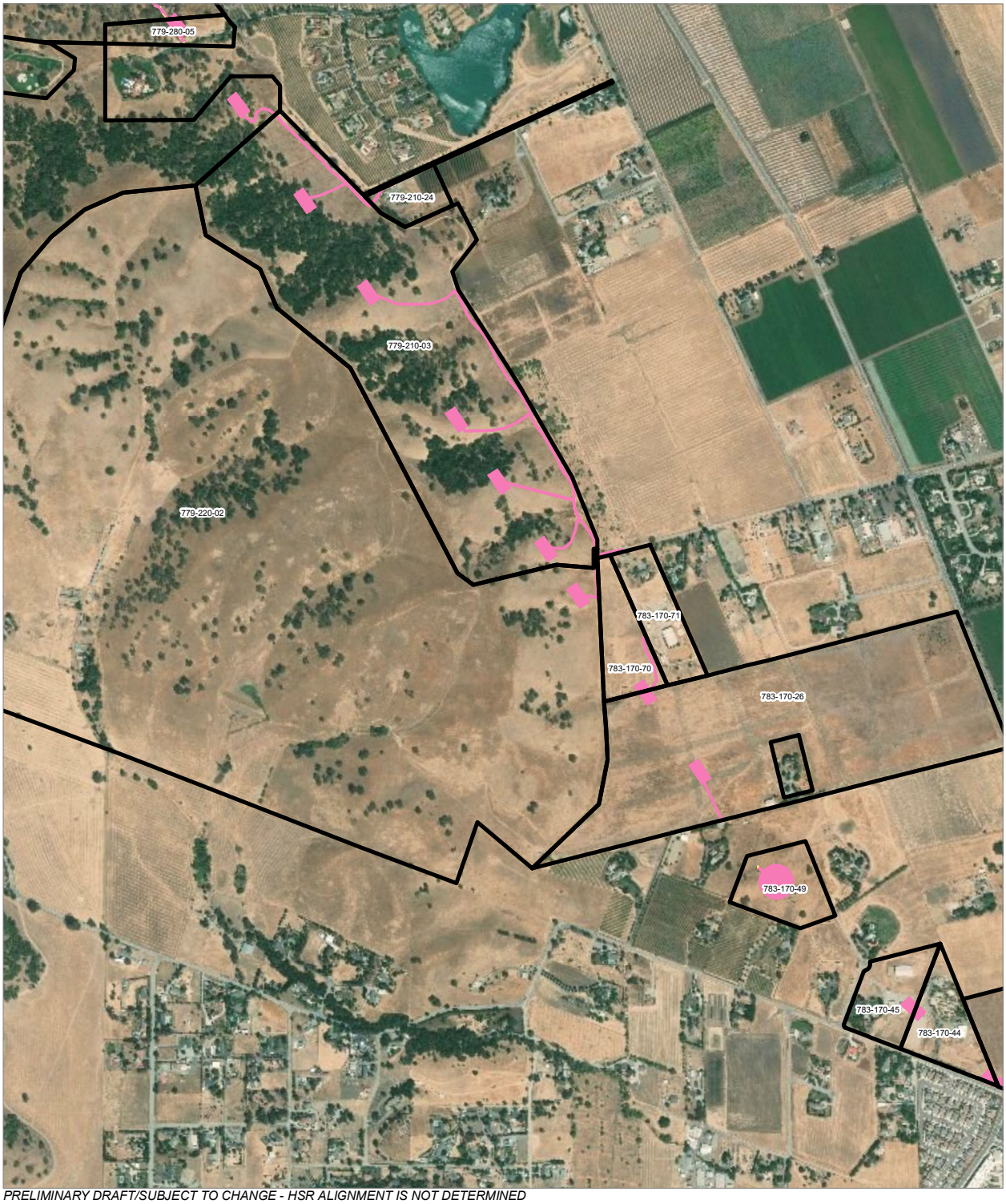


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

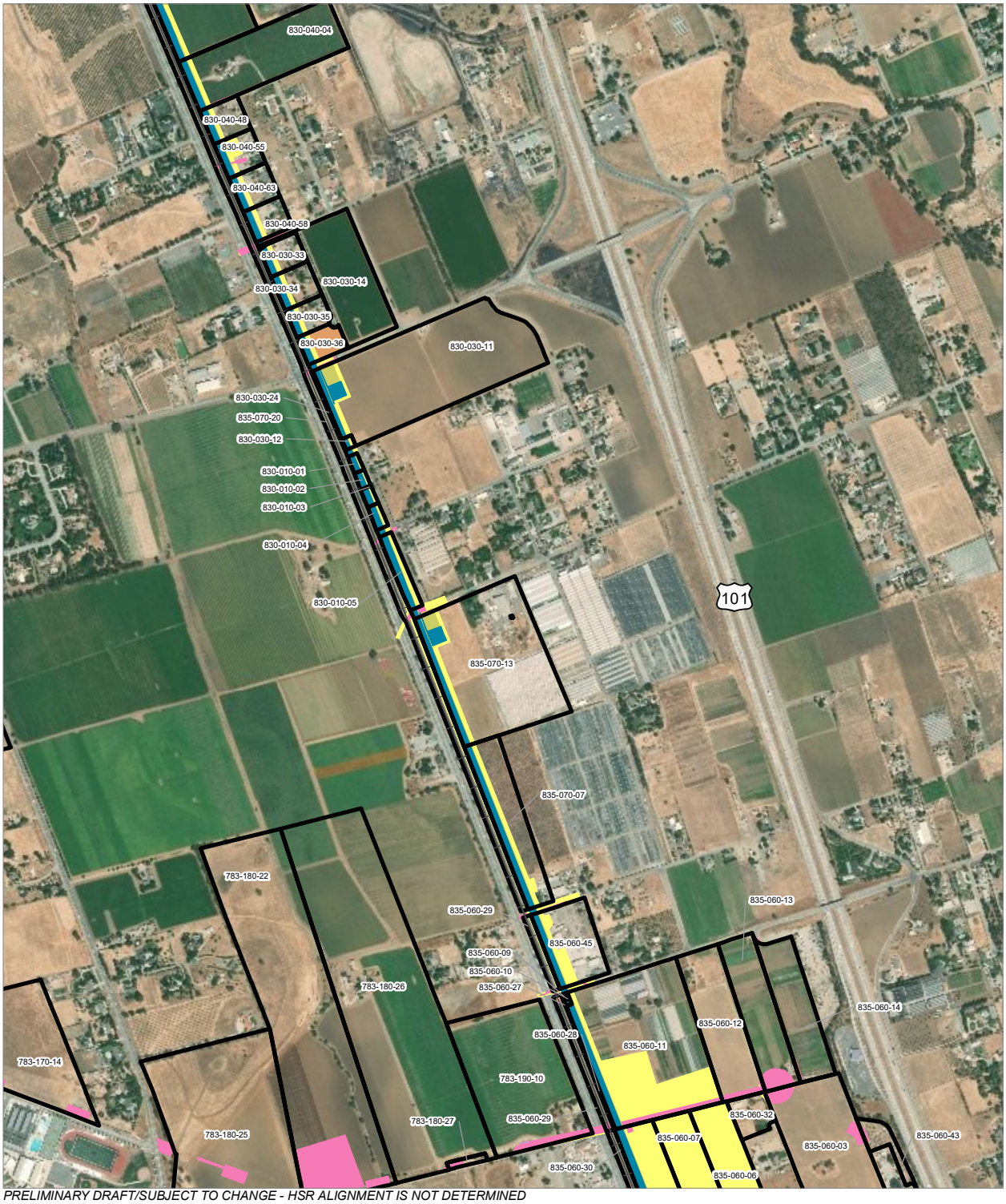


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

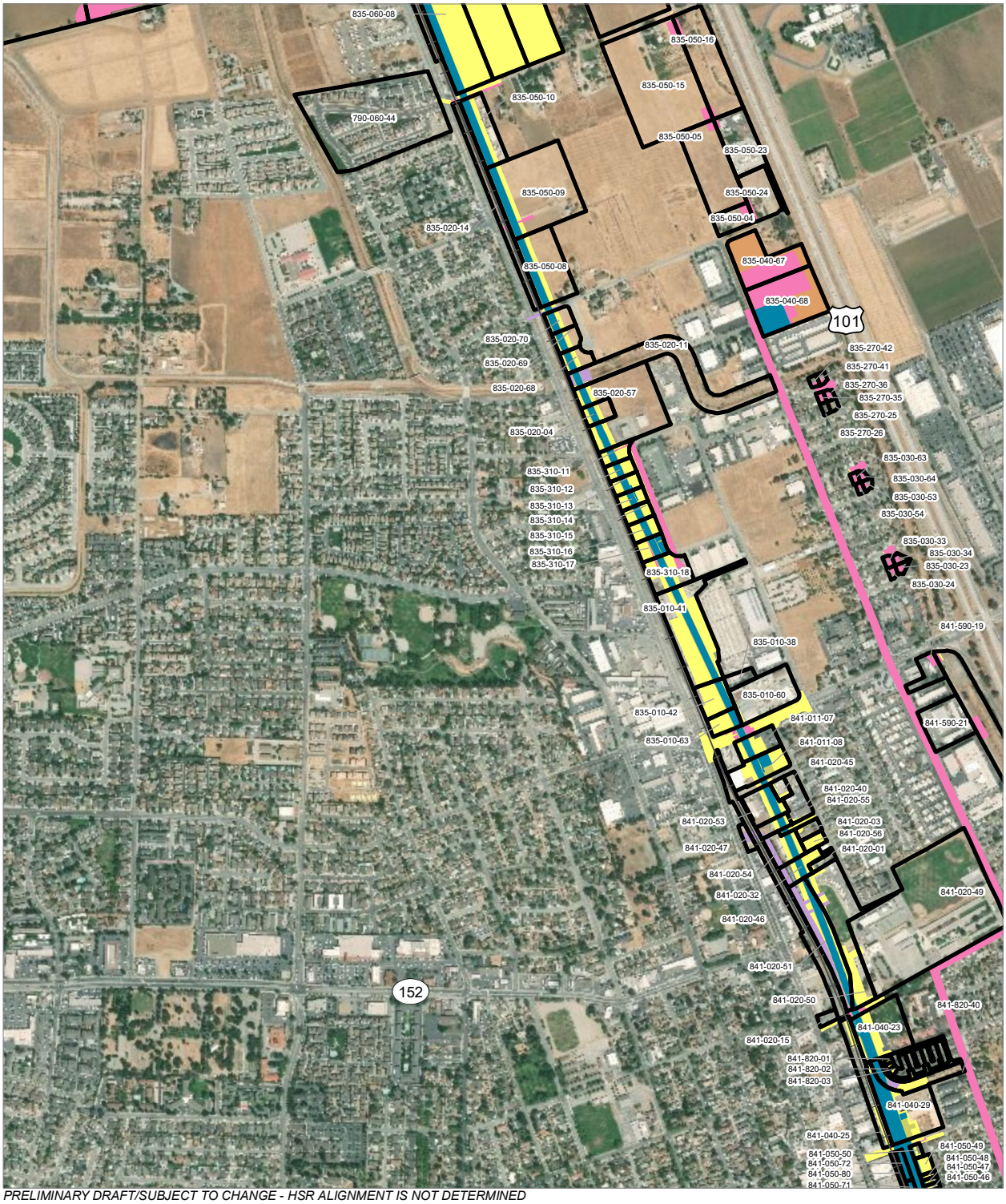


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

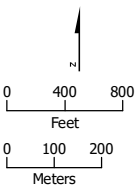
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



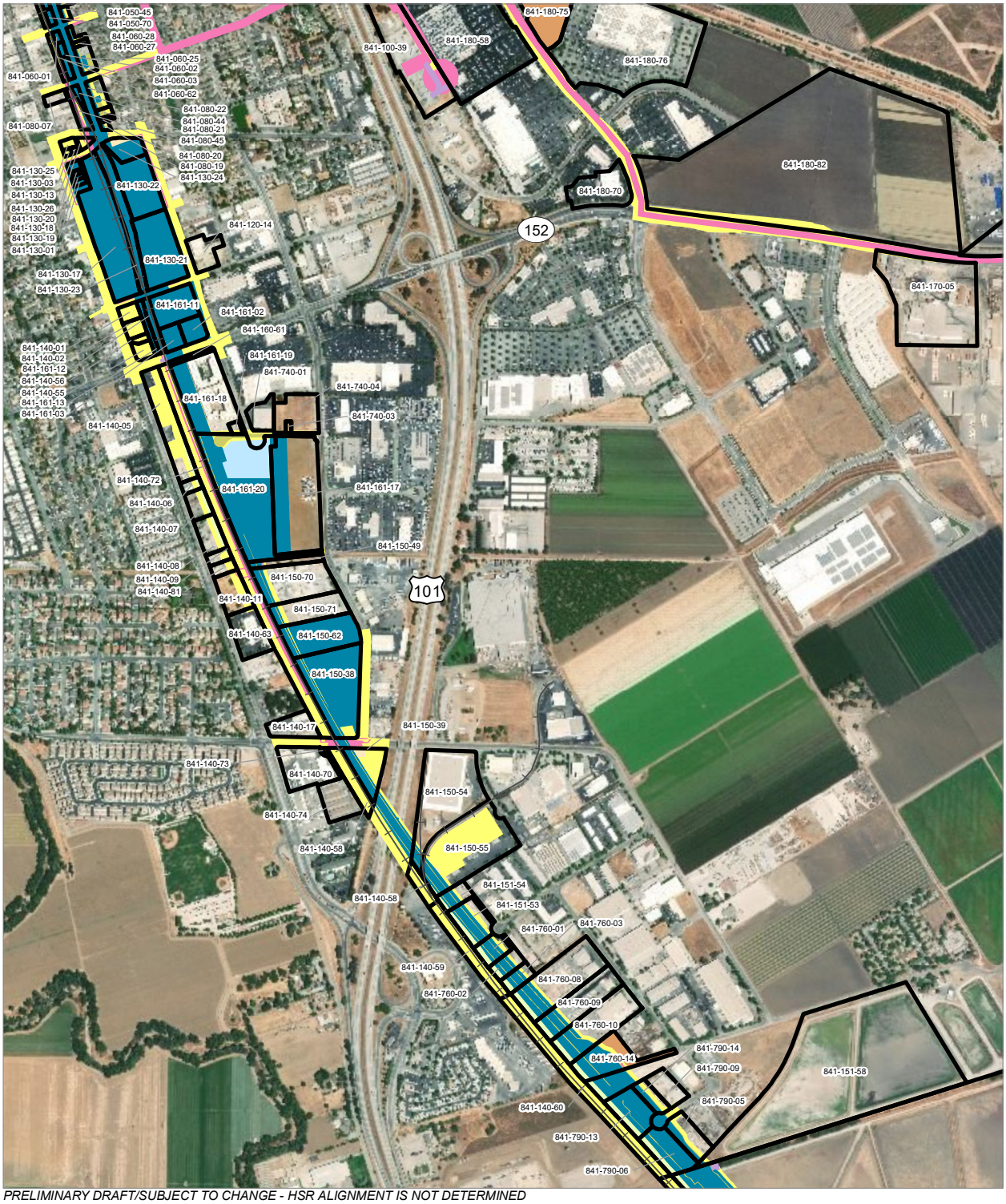
HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

HSR Right-of-Way
Other Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

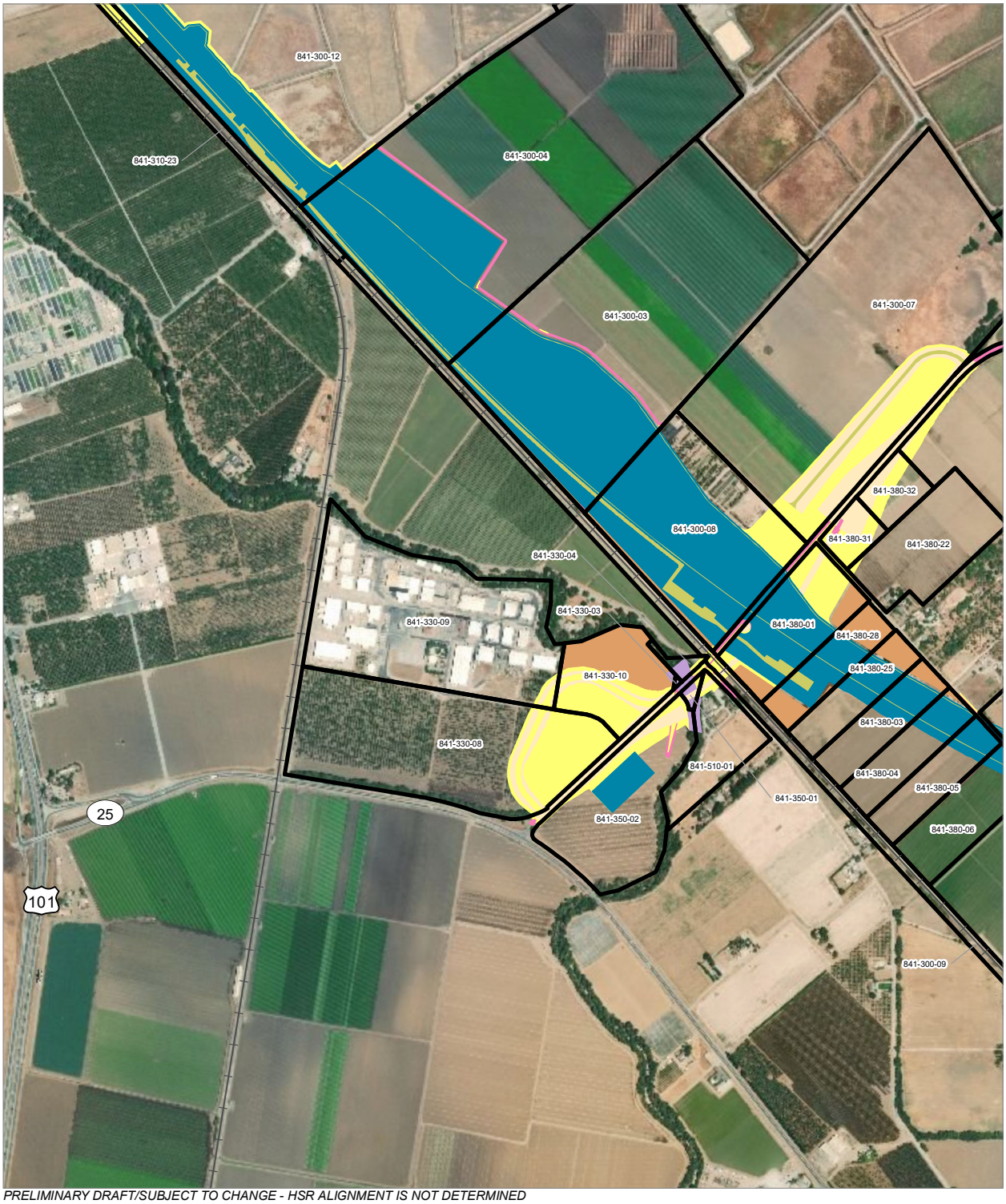
Alternative 1

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

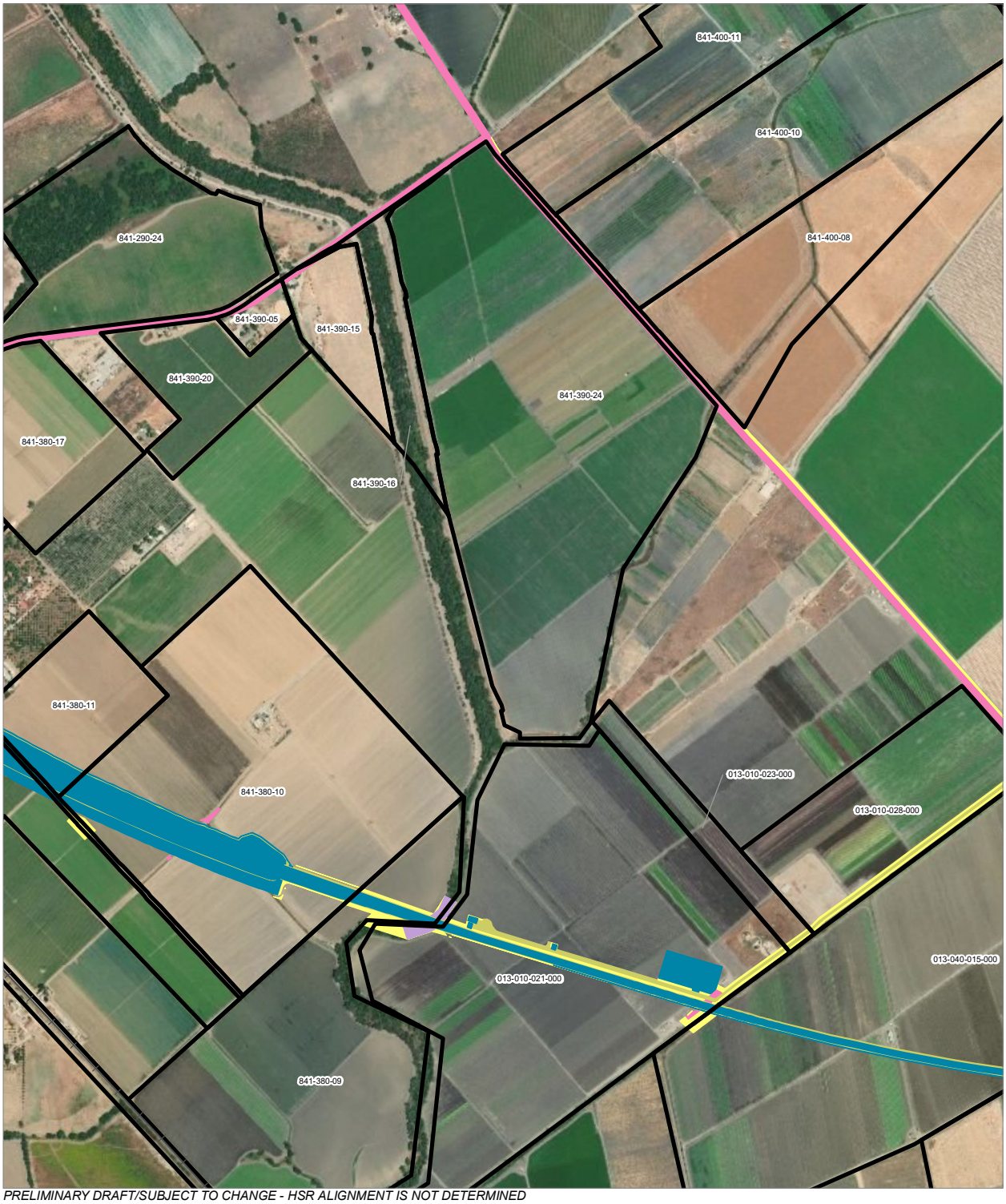


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

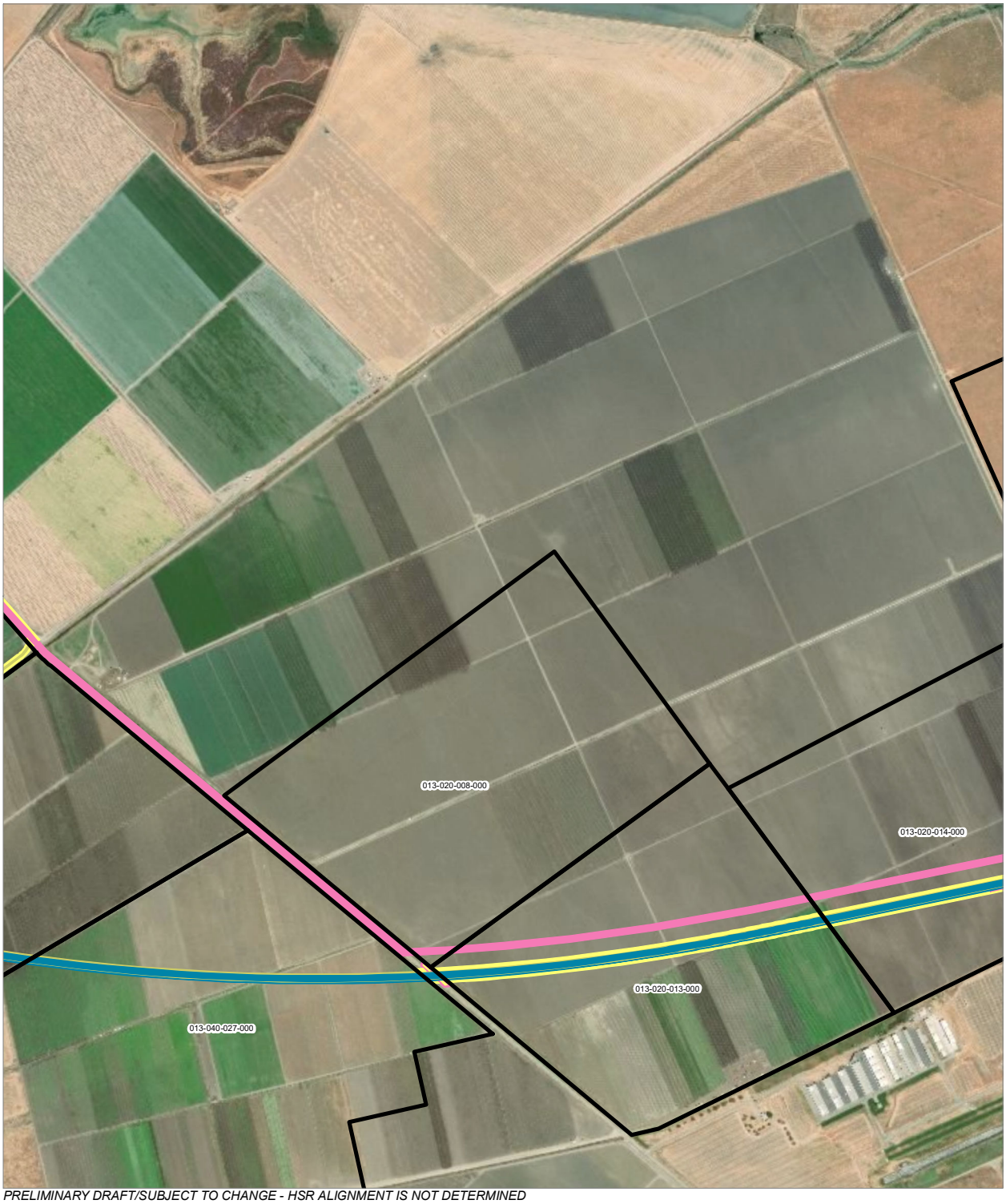


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

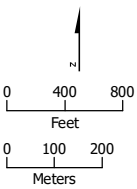
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

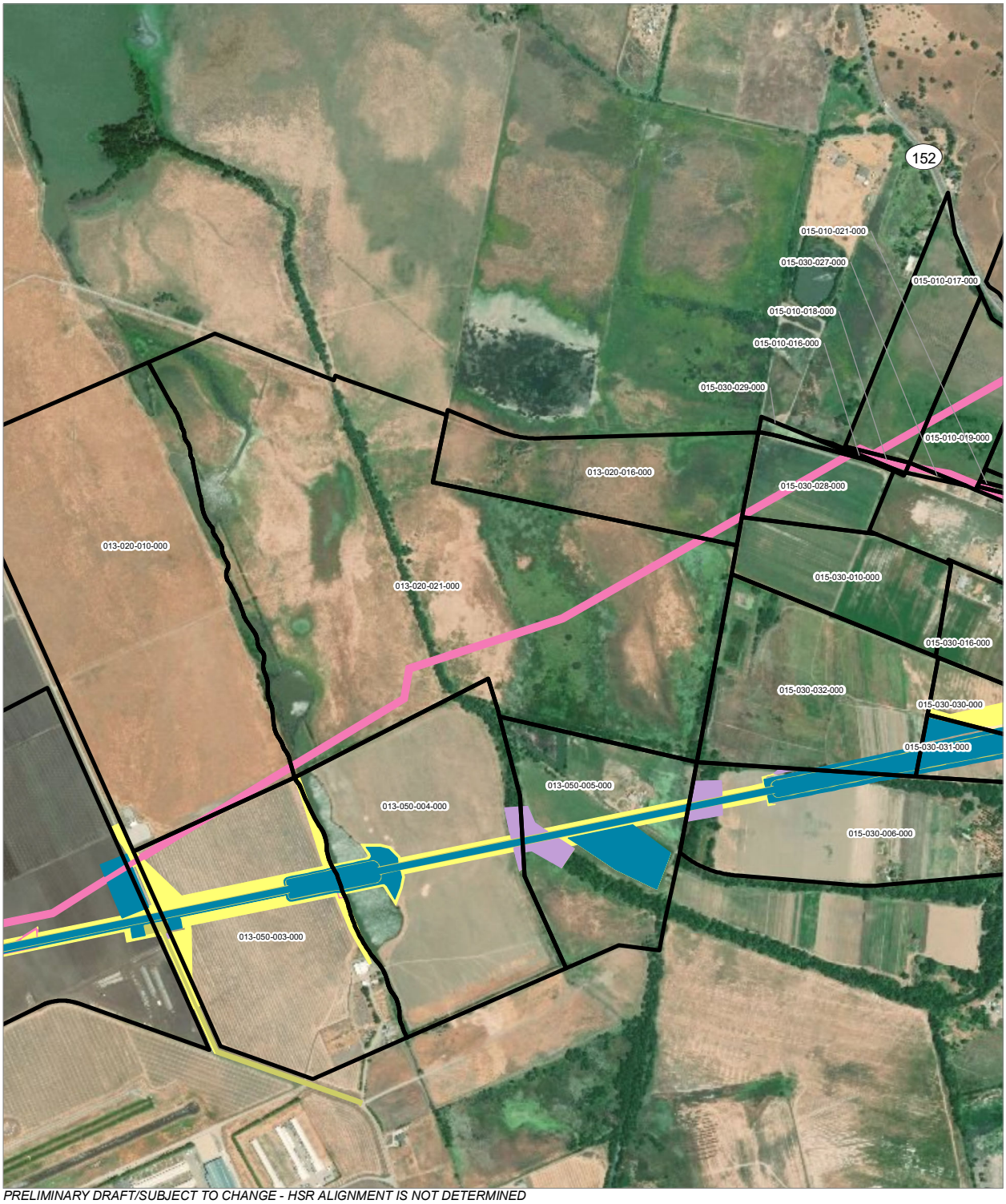


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

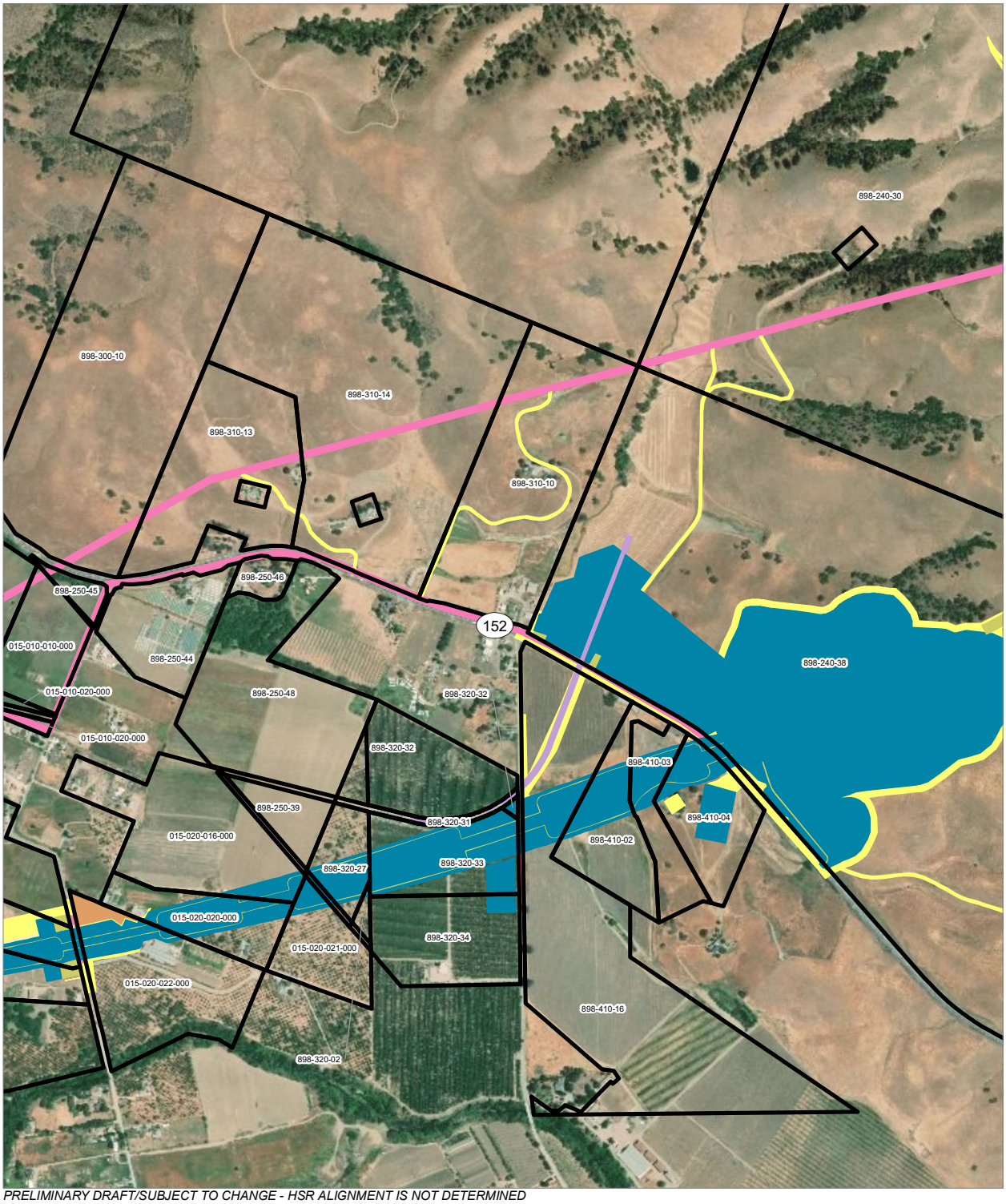


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

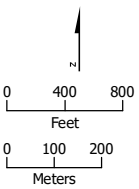
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



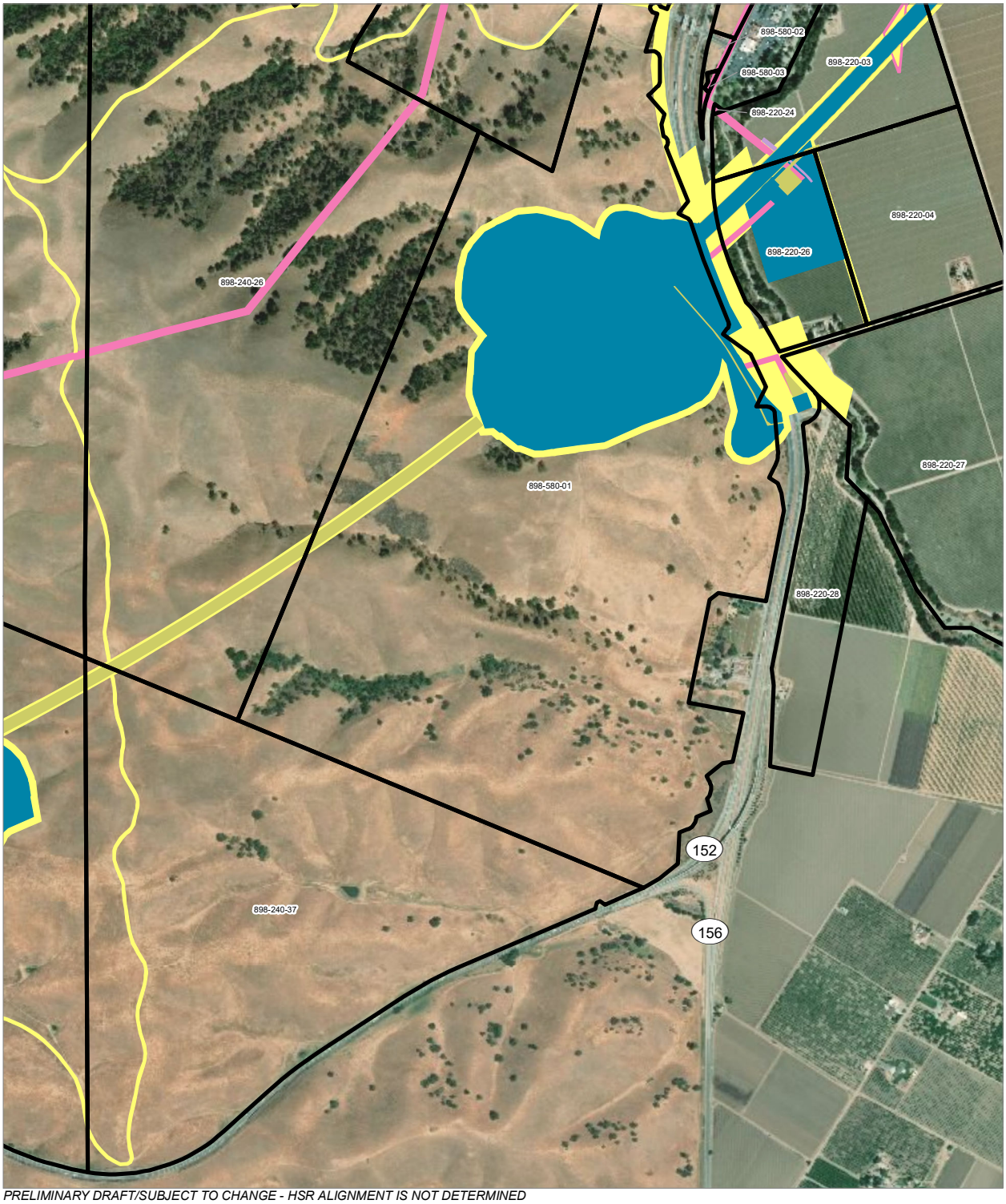
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 1, Part 2)

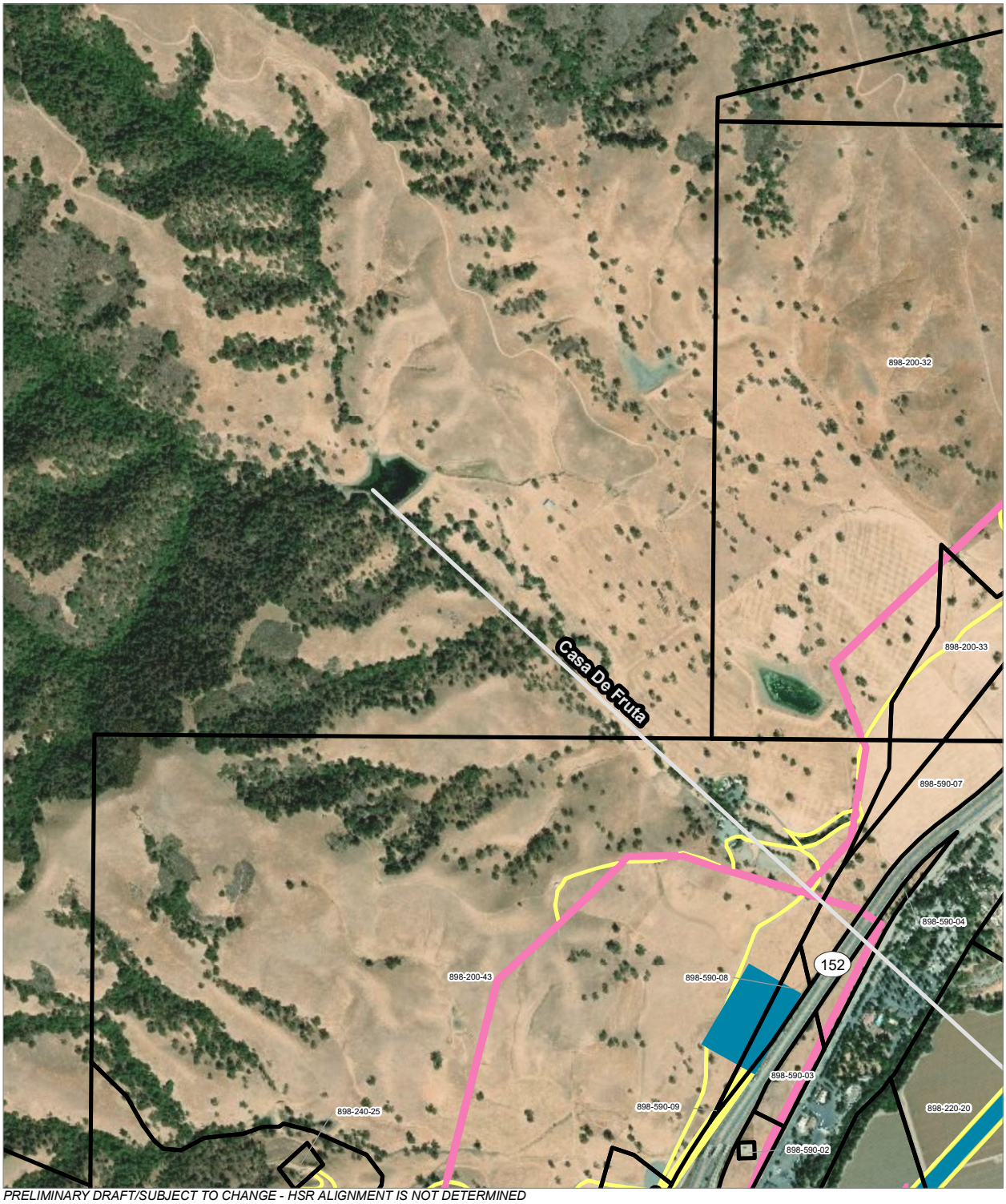


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

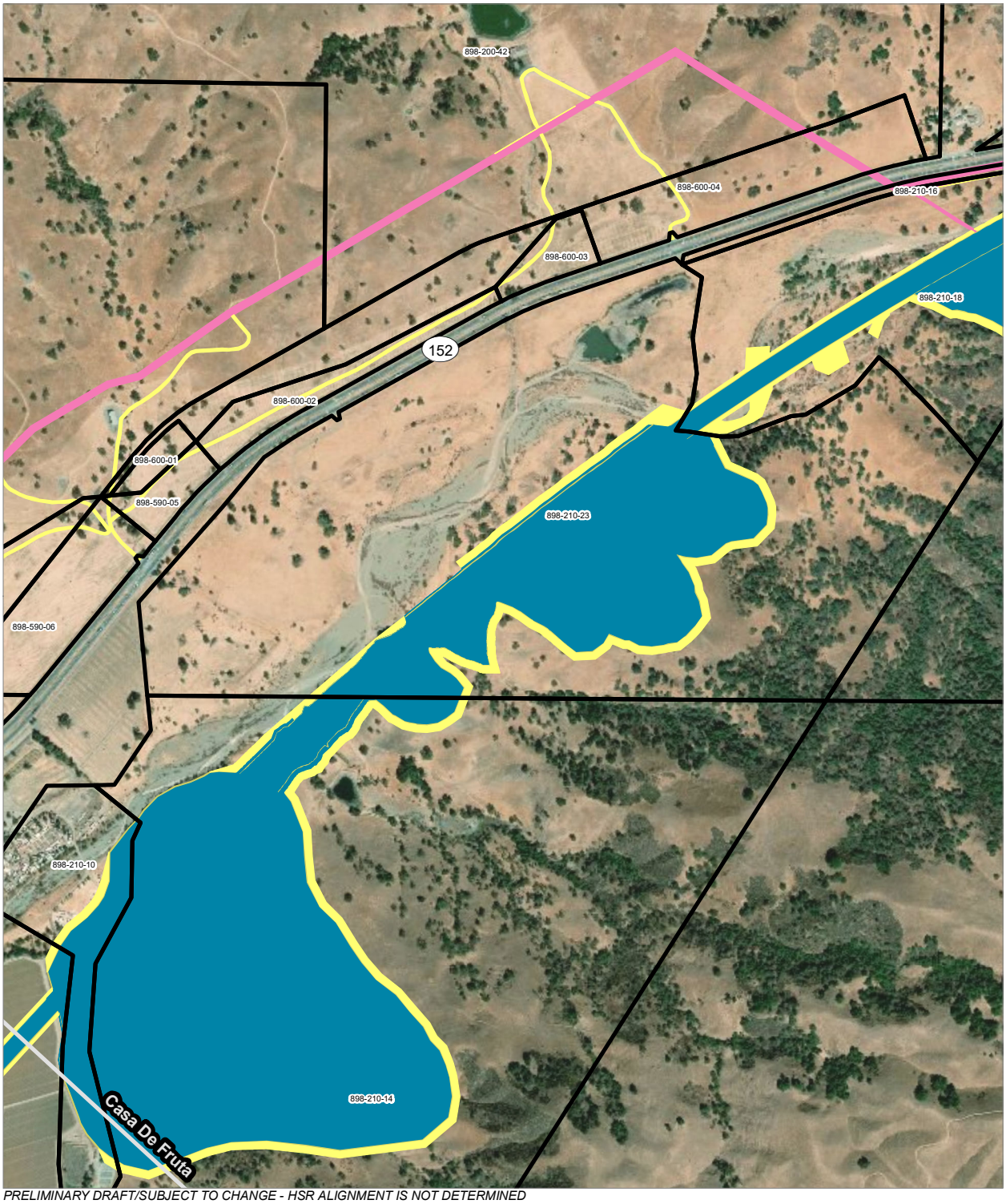


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

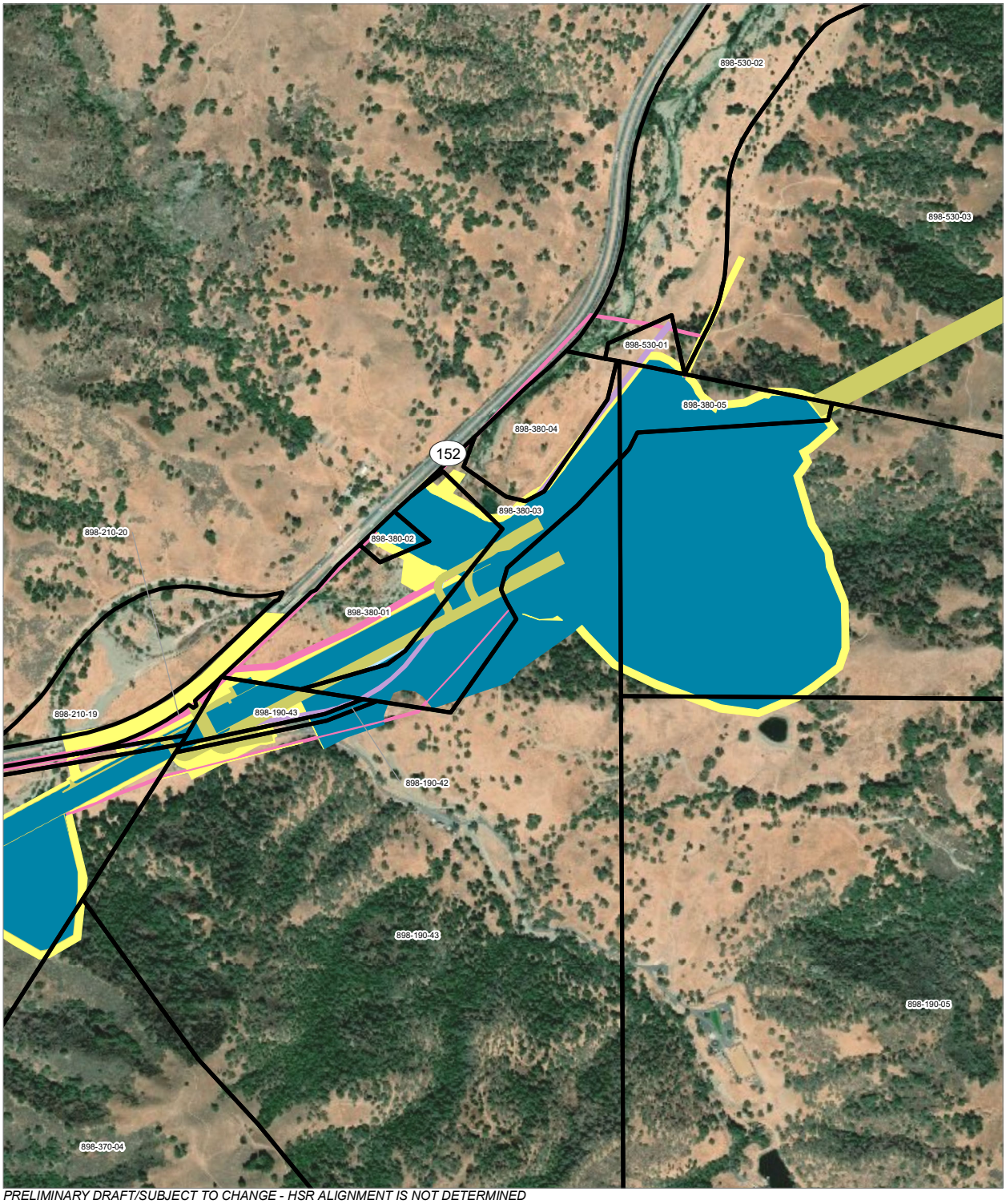


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

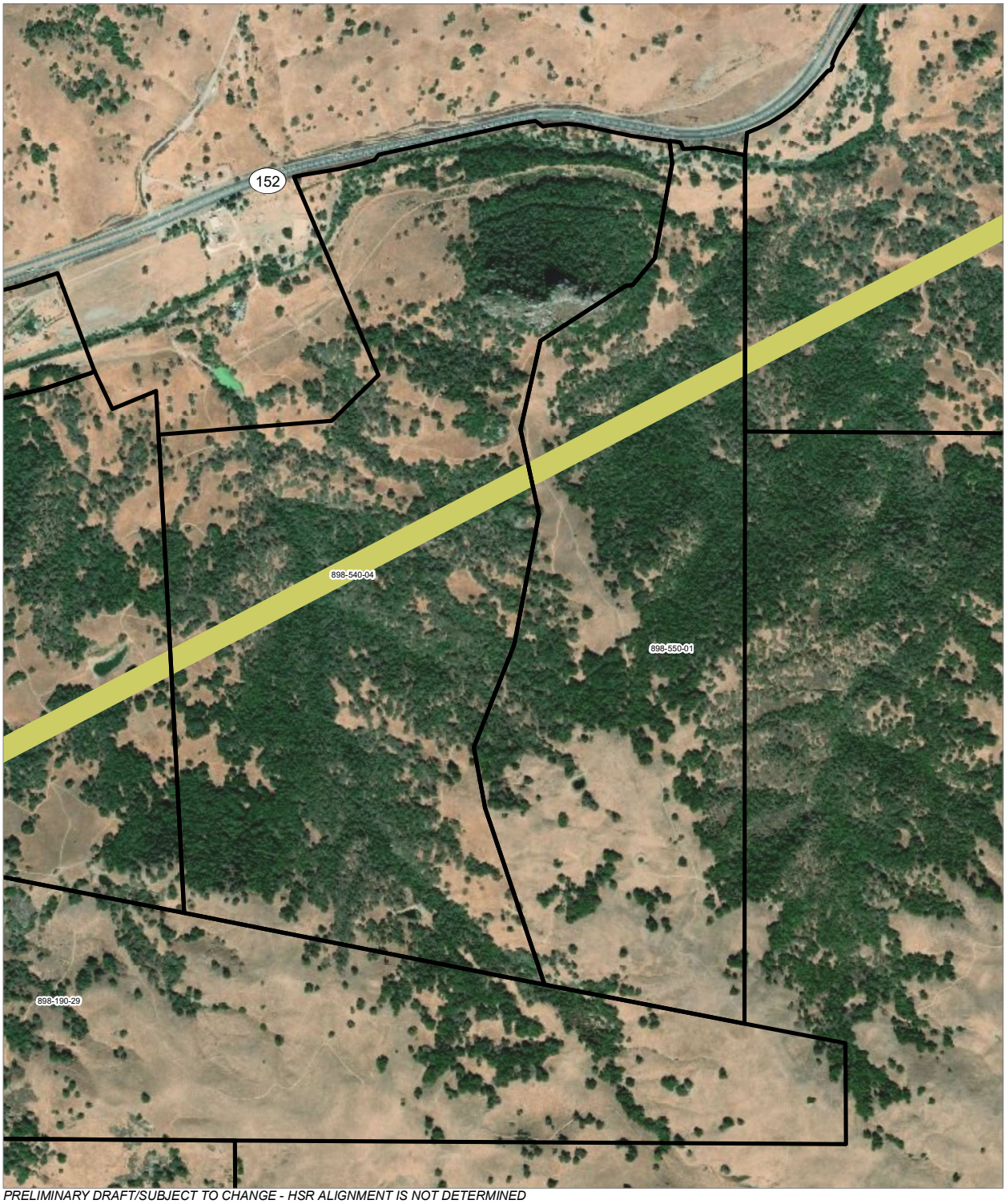


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

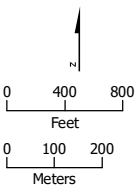
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Other Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

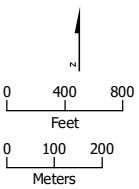


HSR Permanent Easement

Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

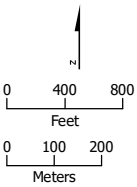
Alternative 1



HSR Permanent Easement
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

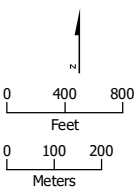
Alternative 1



HSR Permanent Easement
Parcel (APN Displayed)

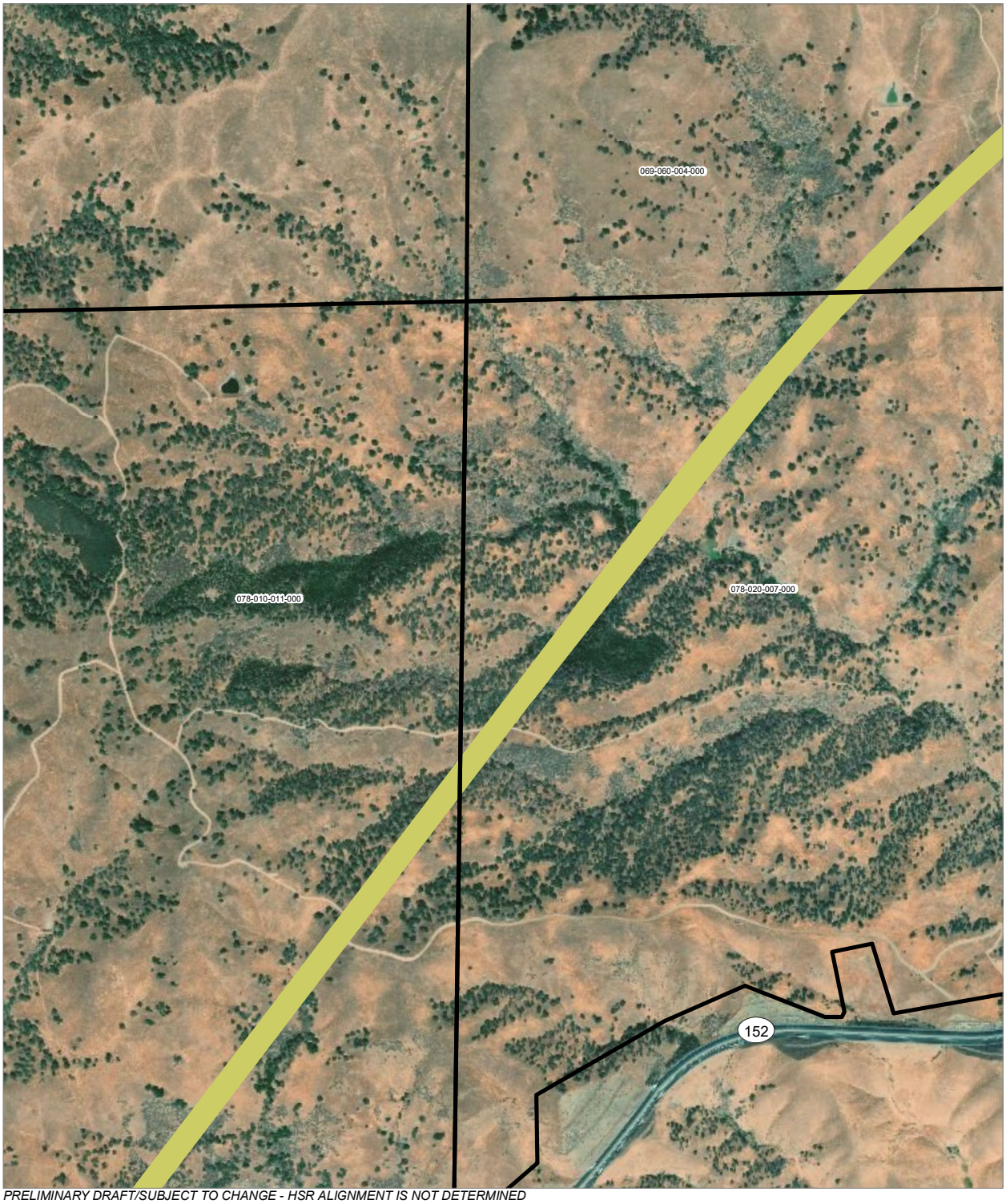
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Permanent Easement

Parcel (APN Displayed)

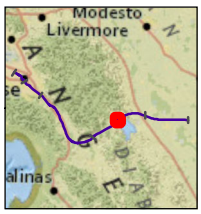


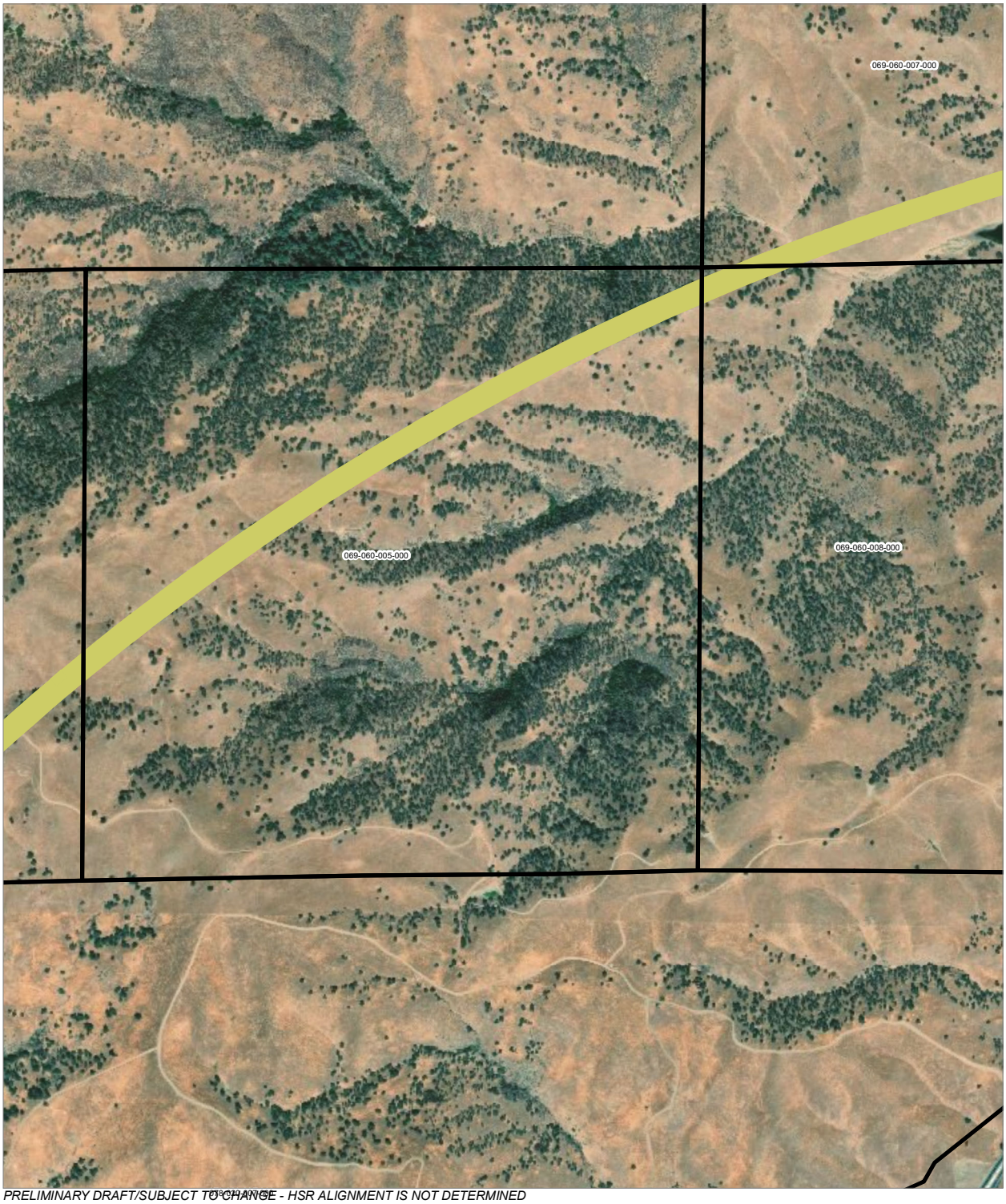
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

HSR Permanent Easement
Parcel (APN Displayed)



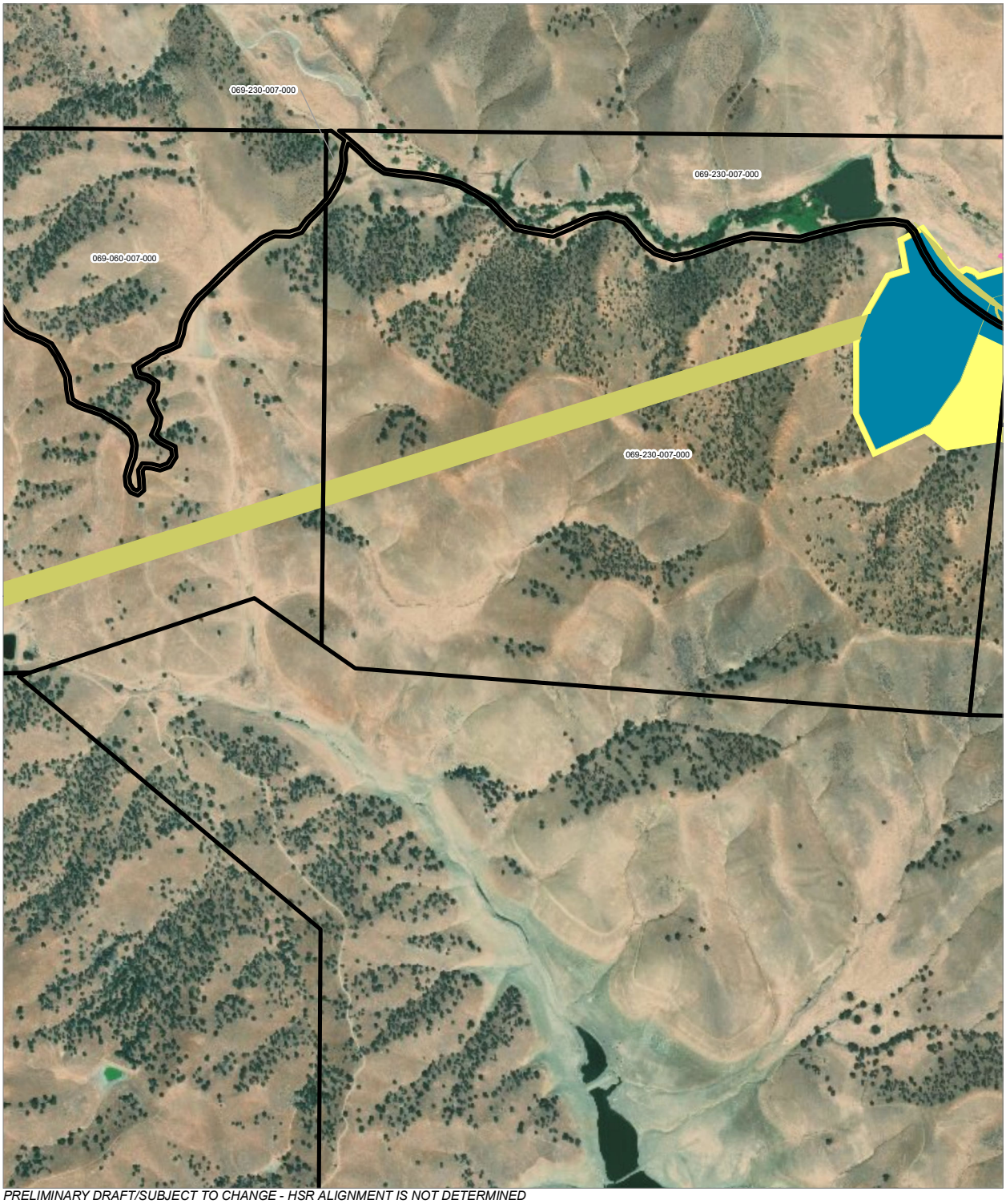


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

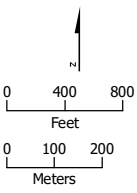
0 400 800
Feet
0 100 200
Meters

HSR Permanent Easement
Parcel (APN Displayed)

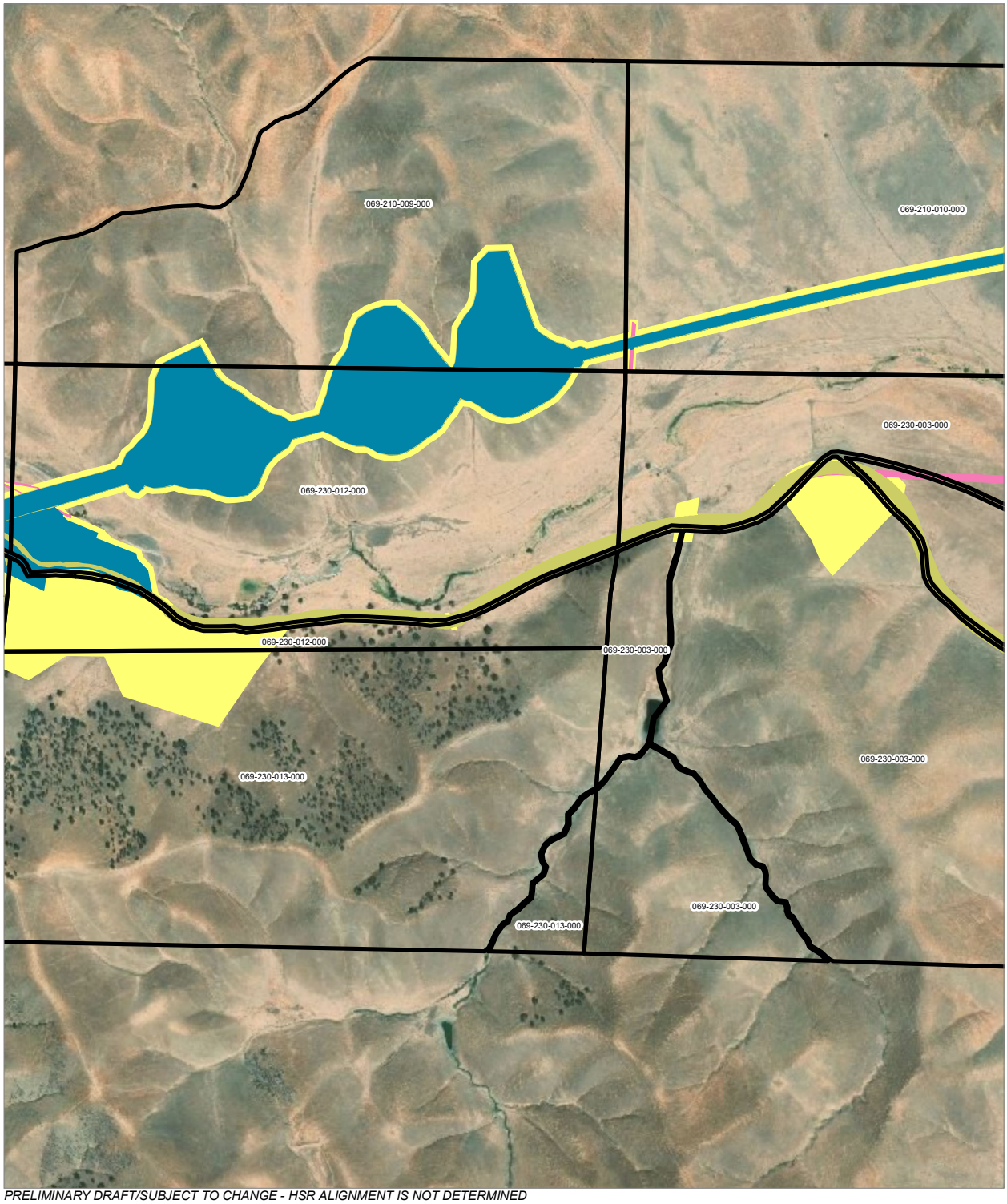


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

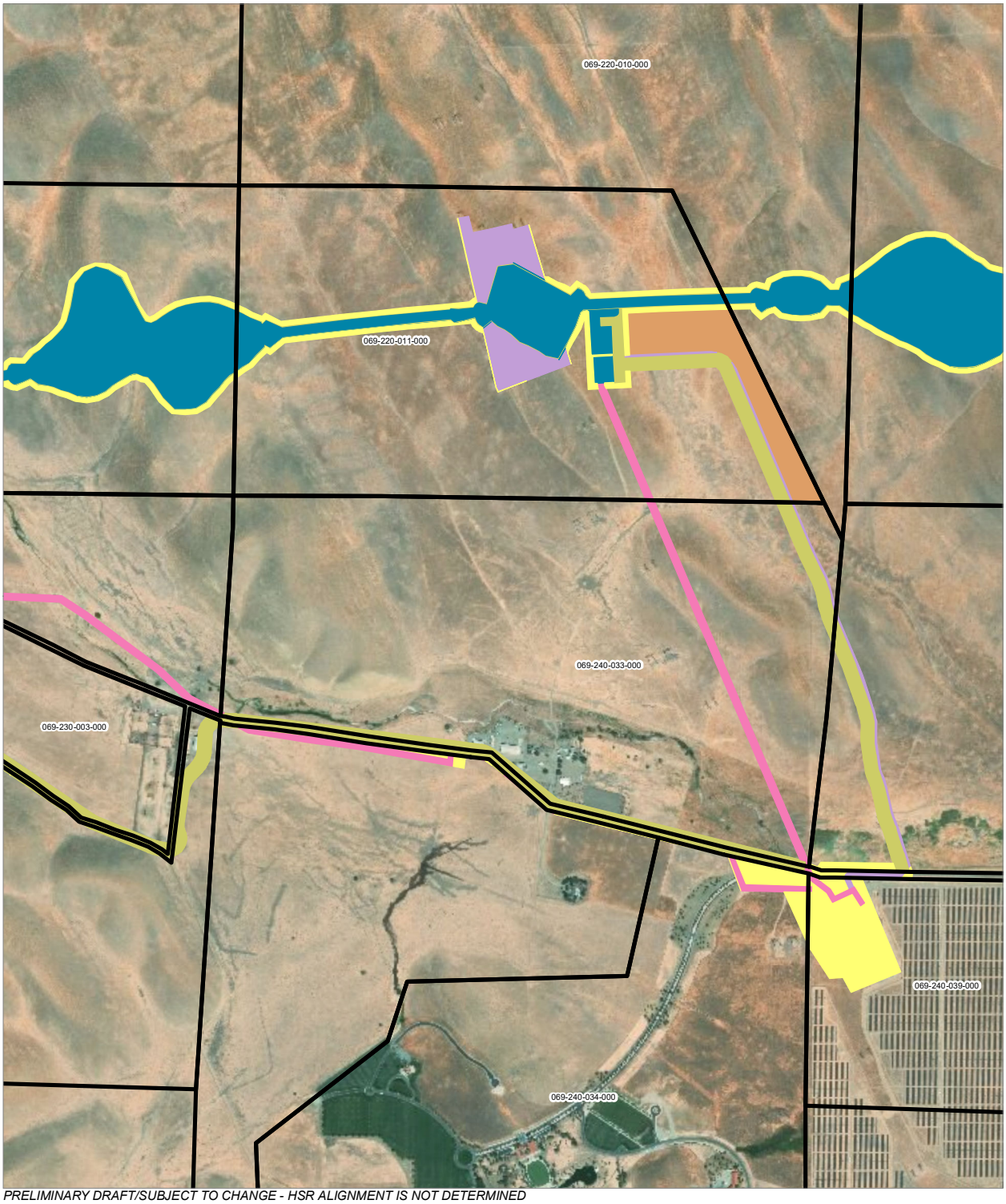


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

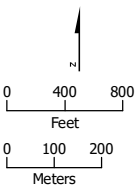
0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

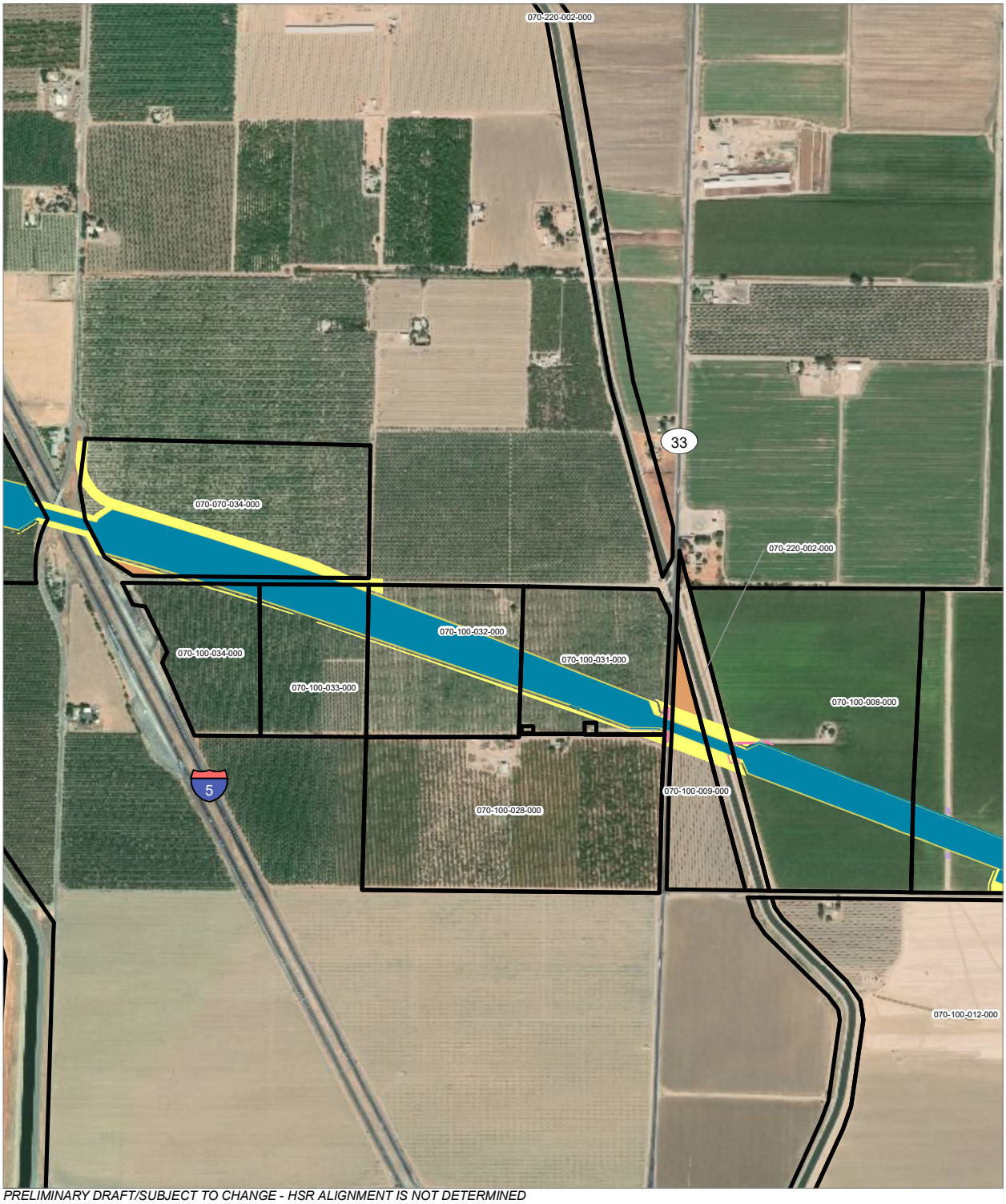
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

N

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



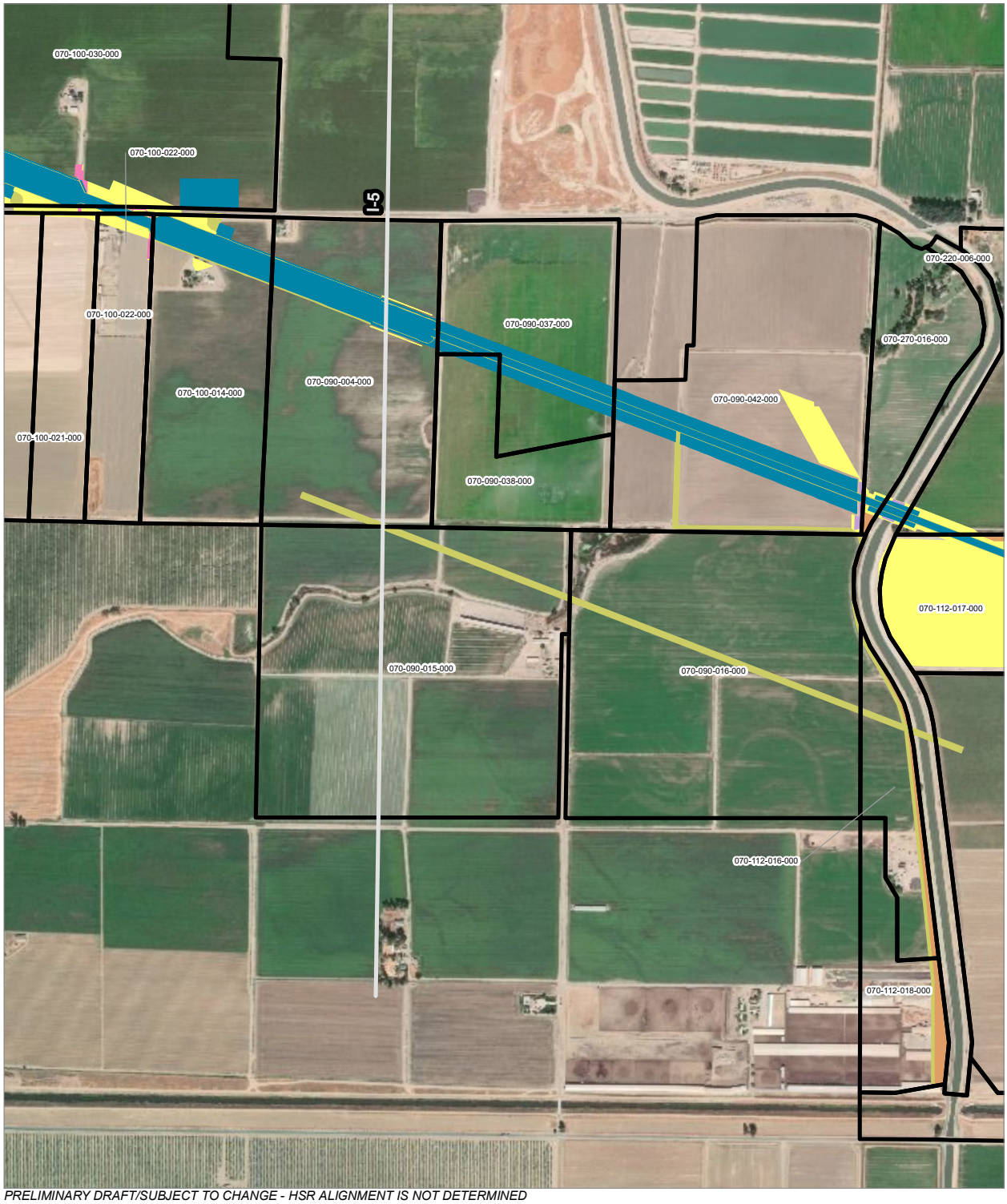
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

N

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



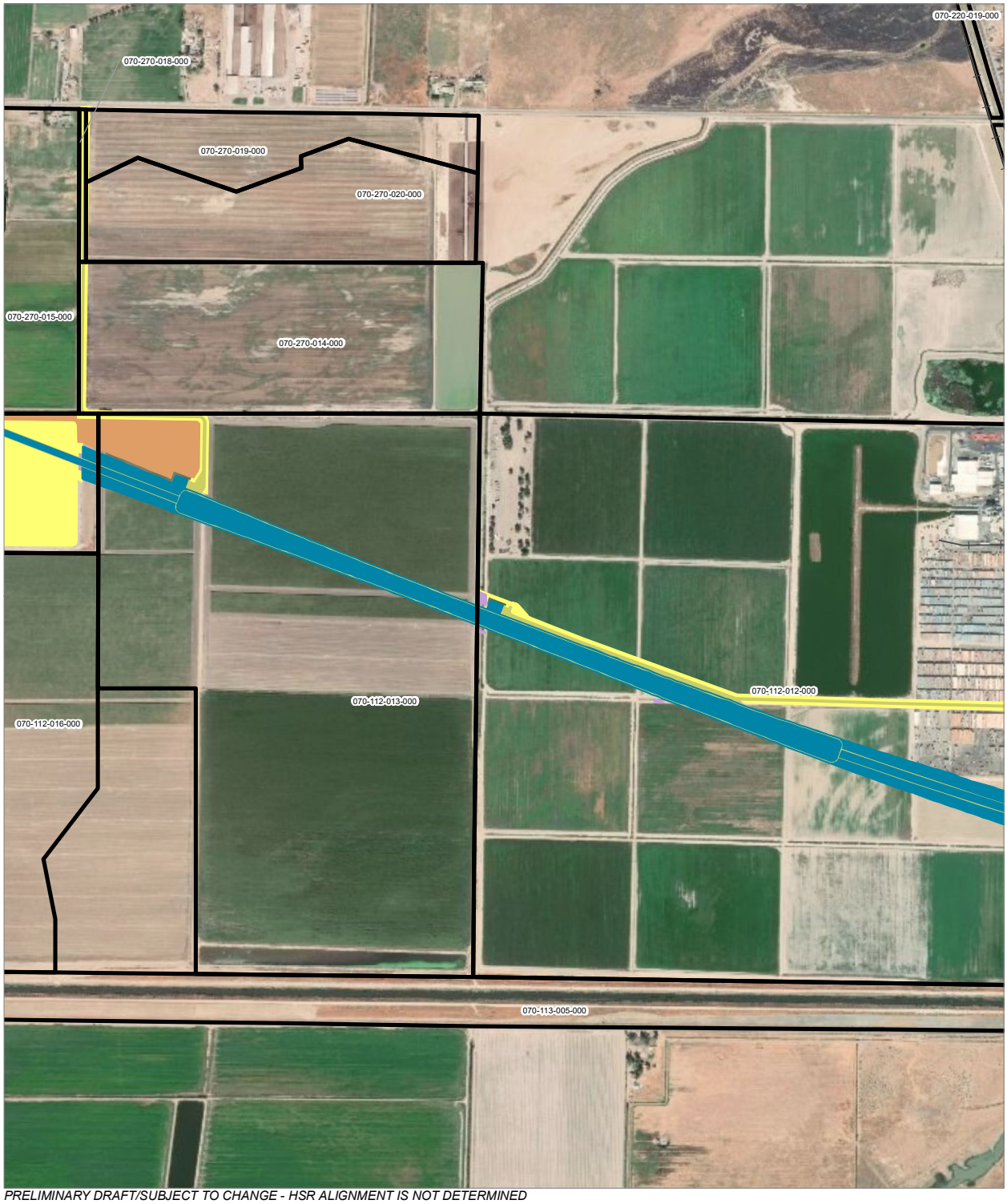
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

N

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

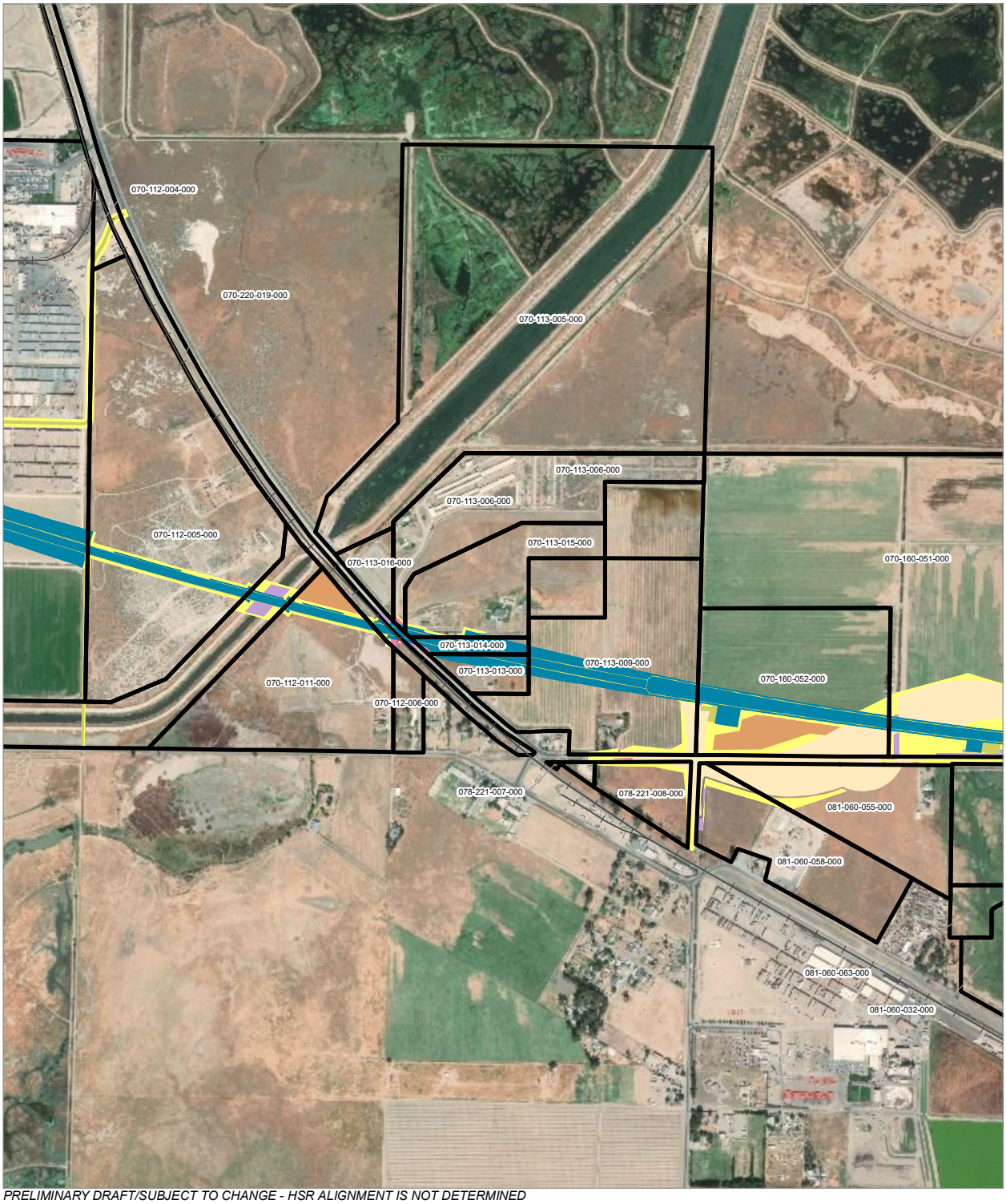


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

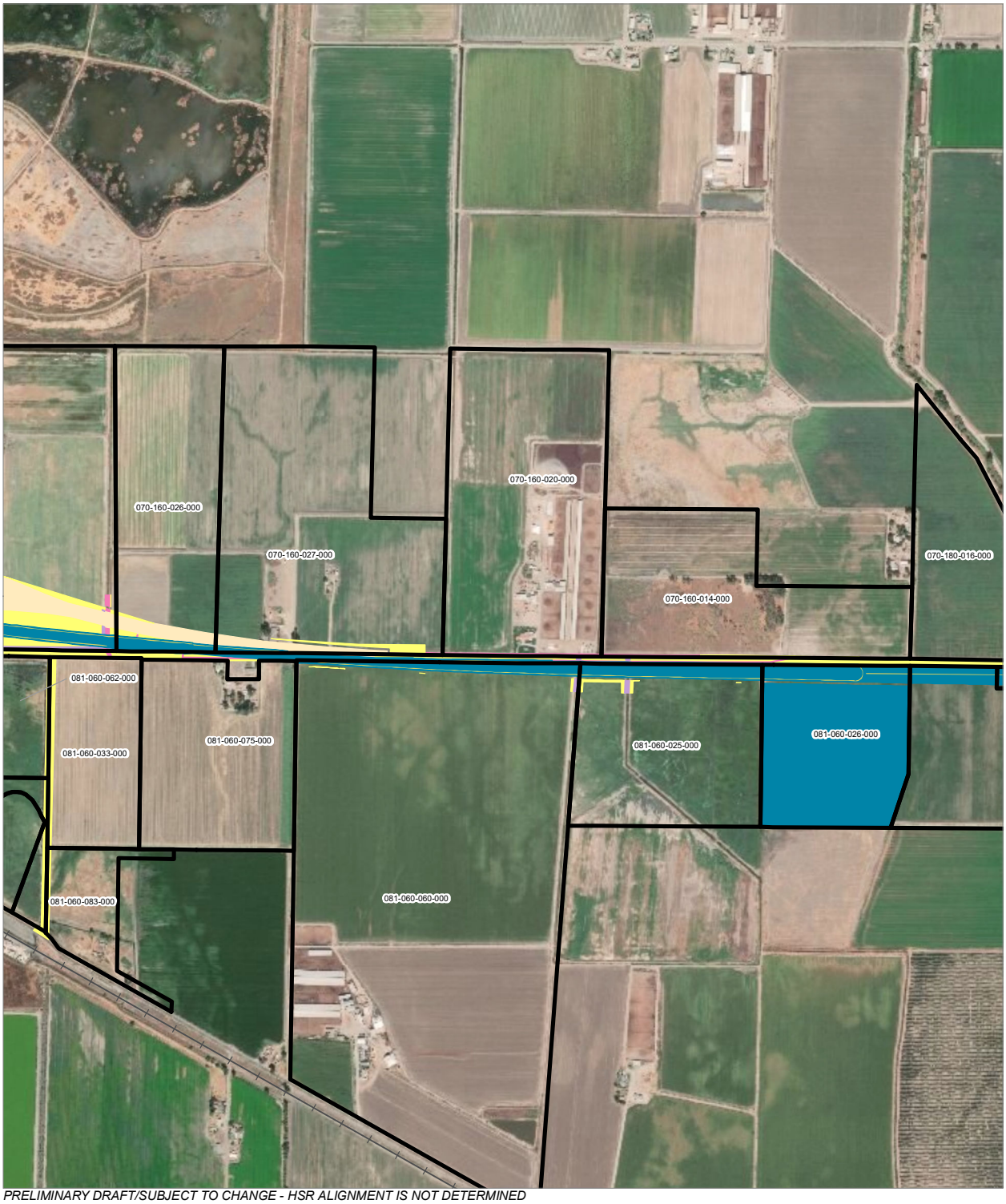
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



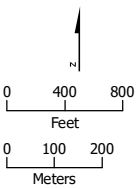
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

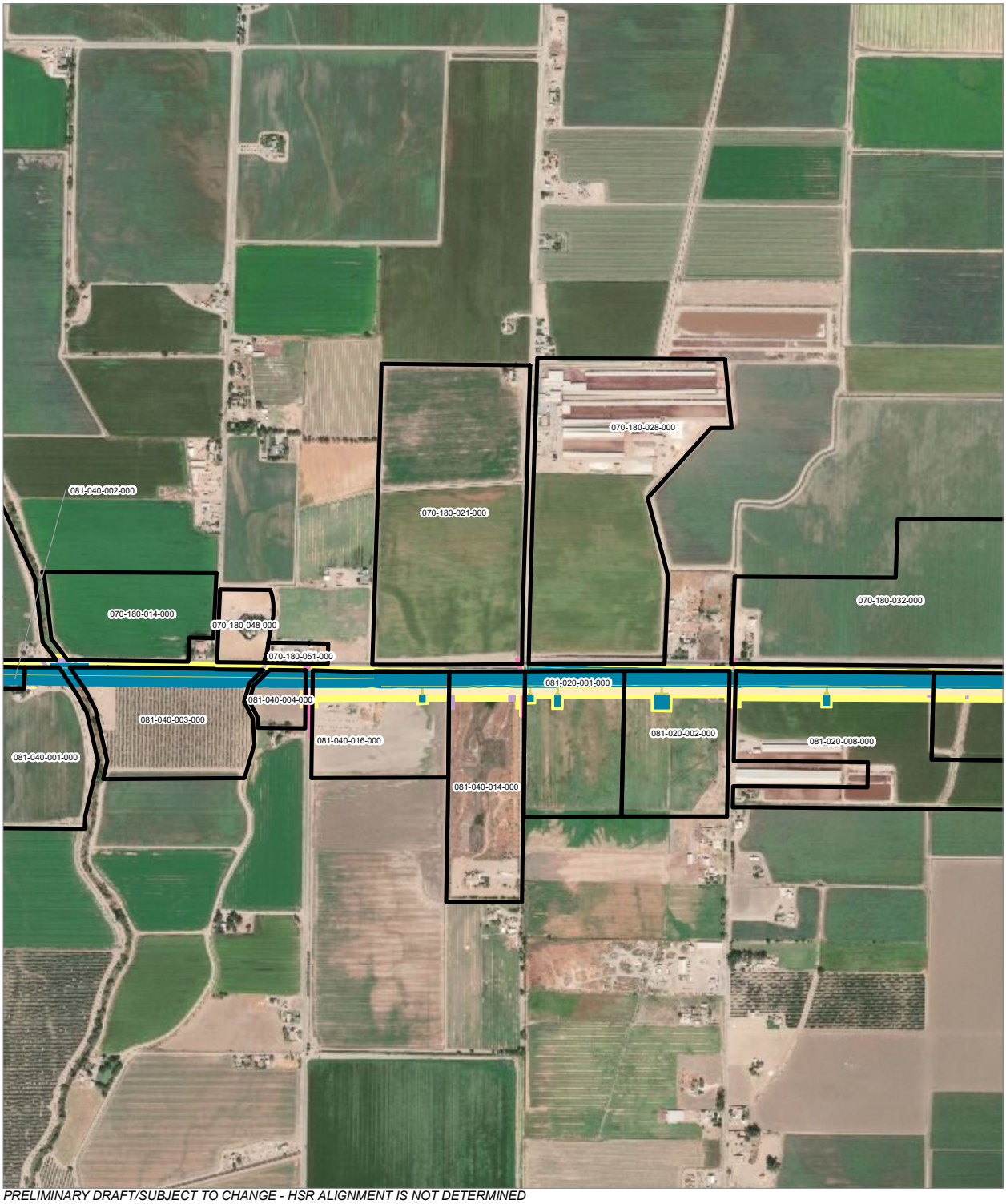


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

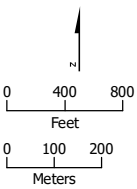


HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

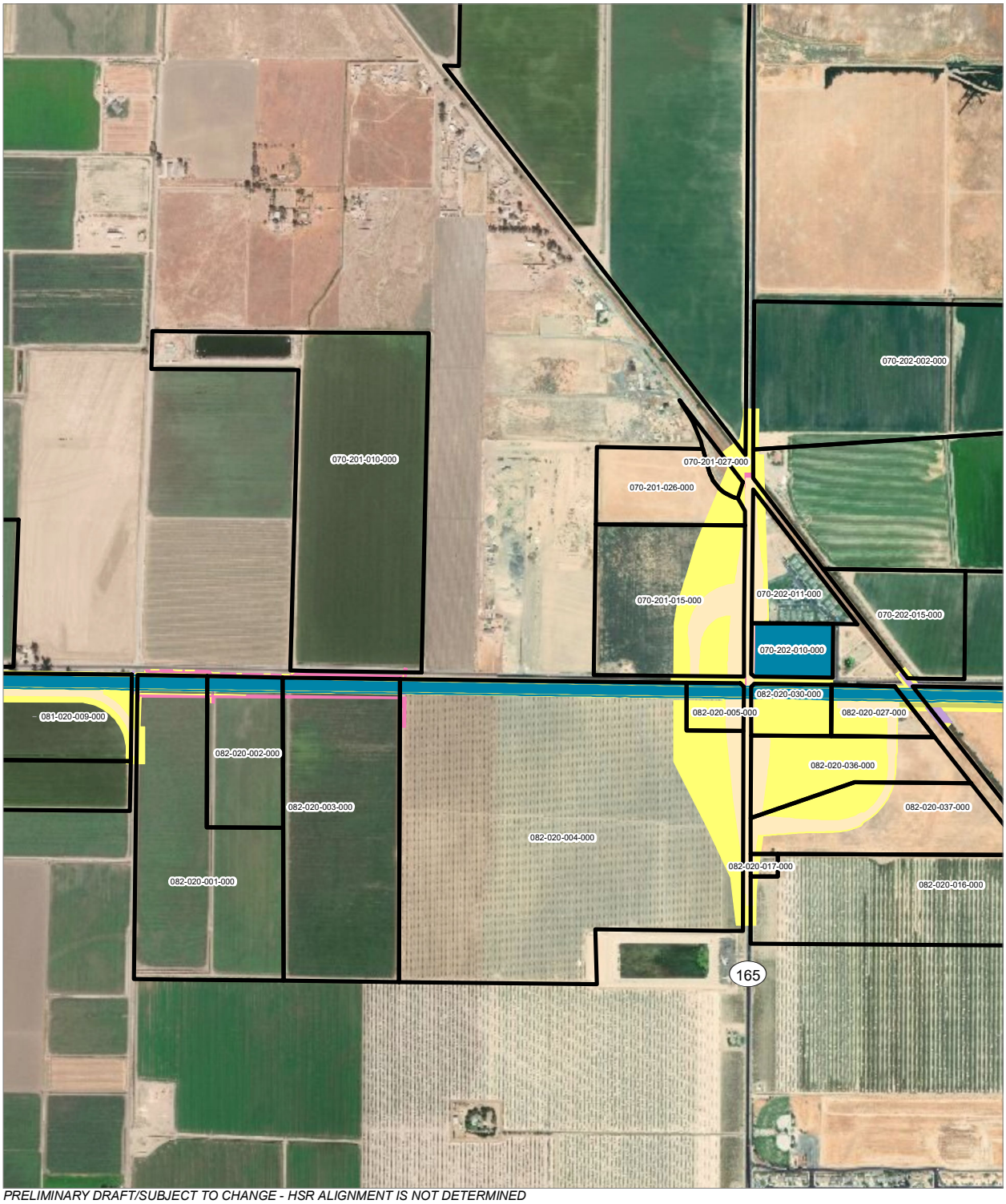


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

N

0 400 800
Feet
0 100 200
Meters

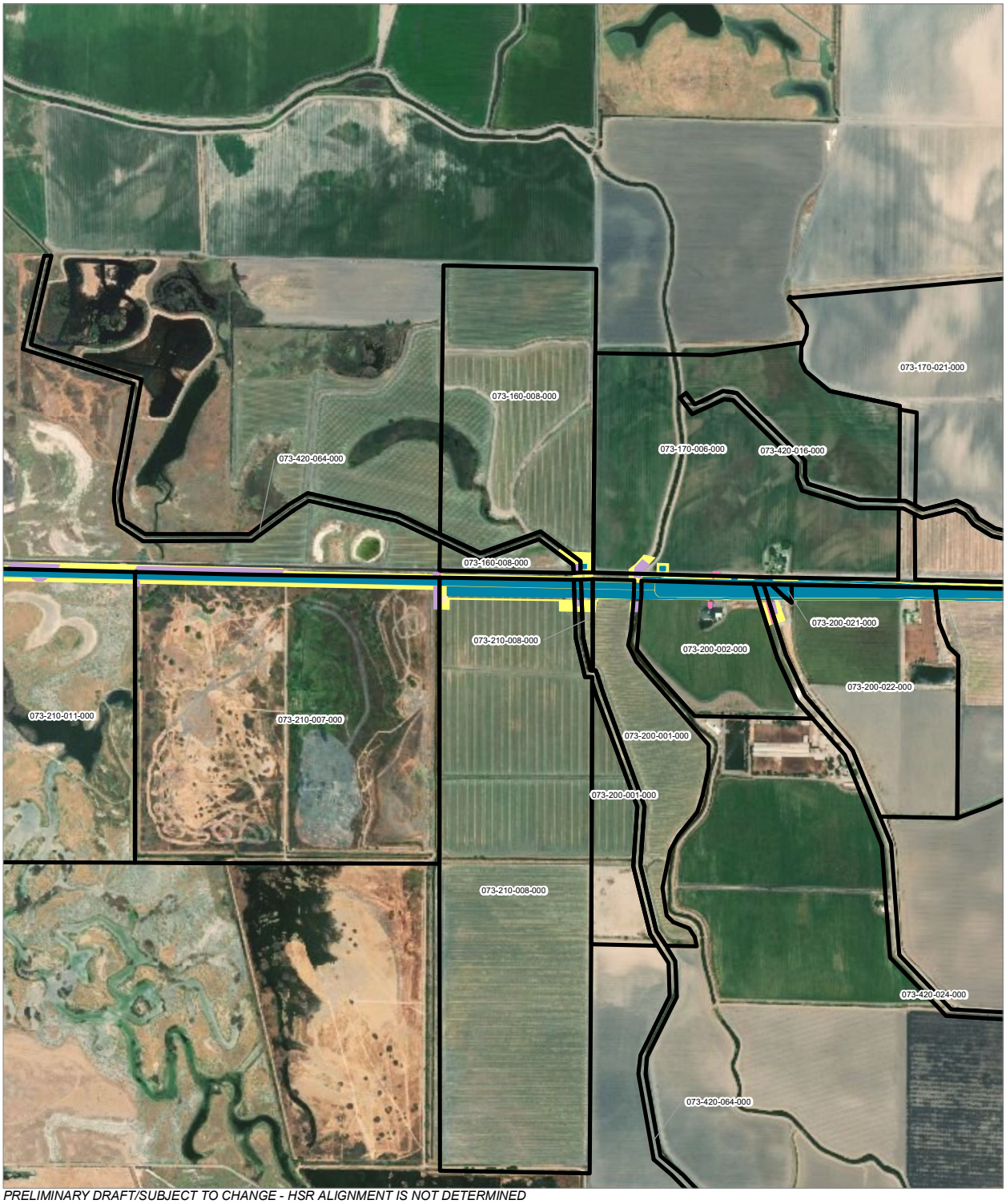
- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

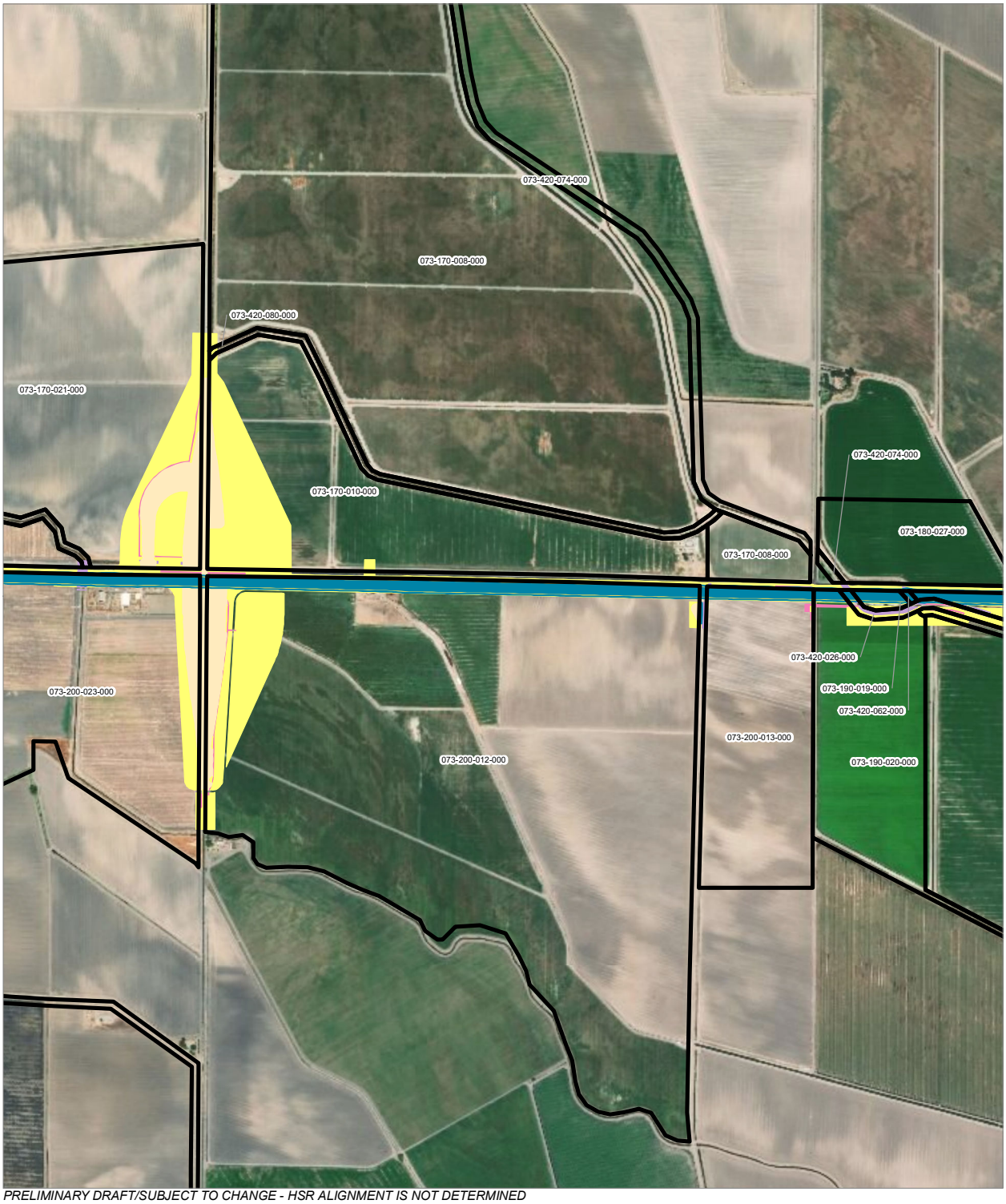


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

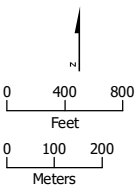
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

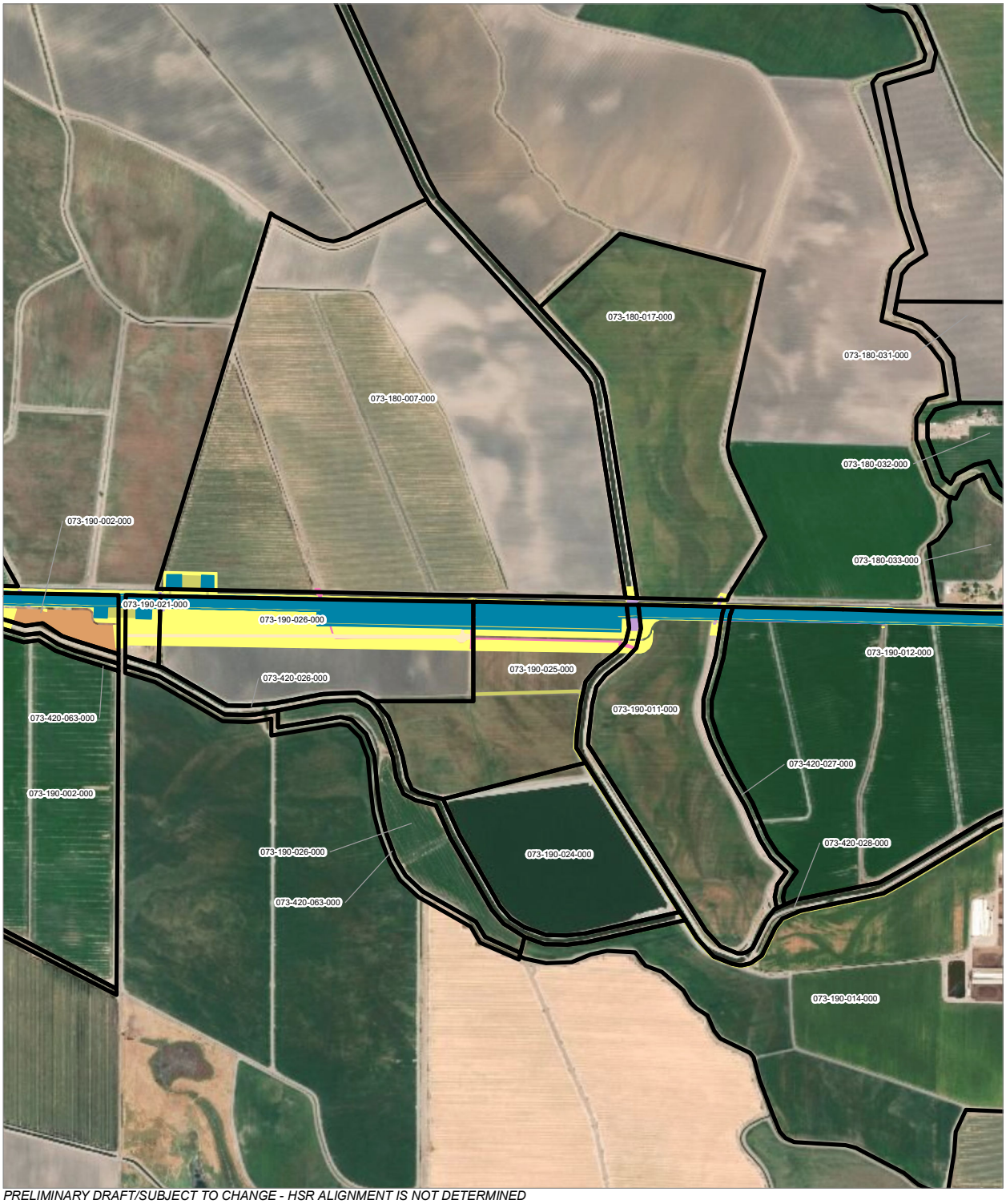


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

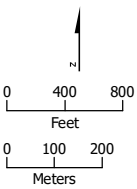
Alternative 1

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 1

0 400 800
Feet
0 100 200
Meters

Roadway Right-of-Way
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

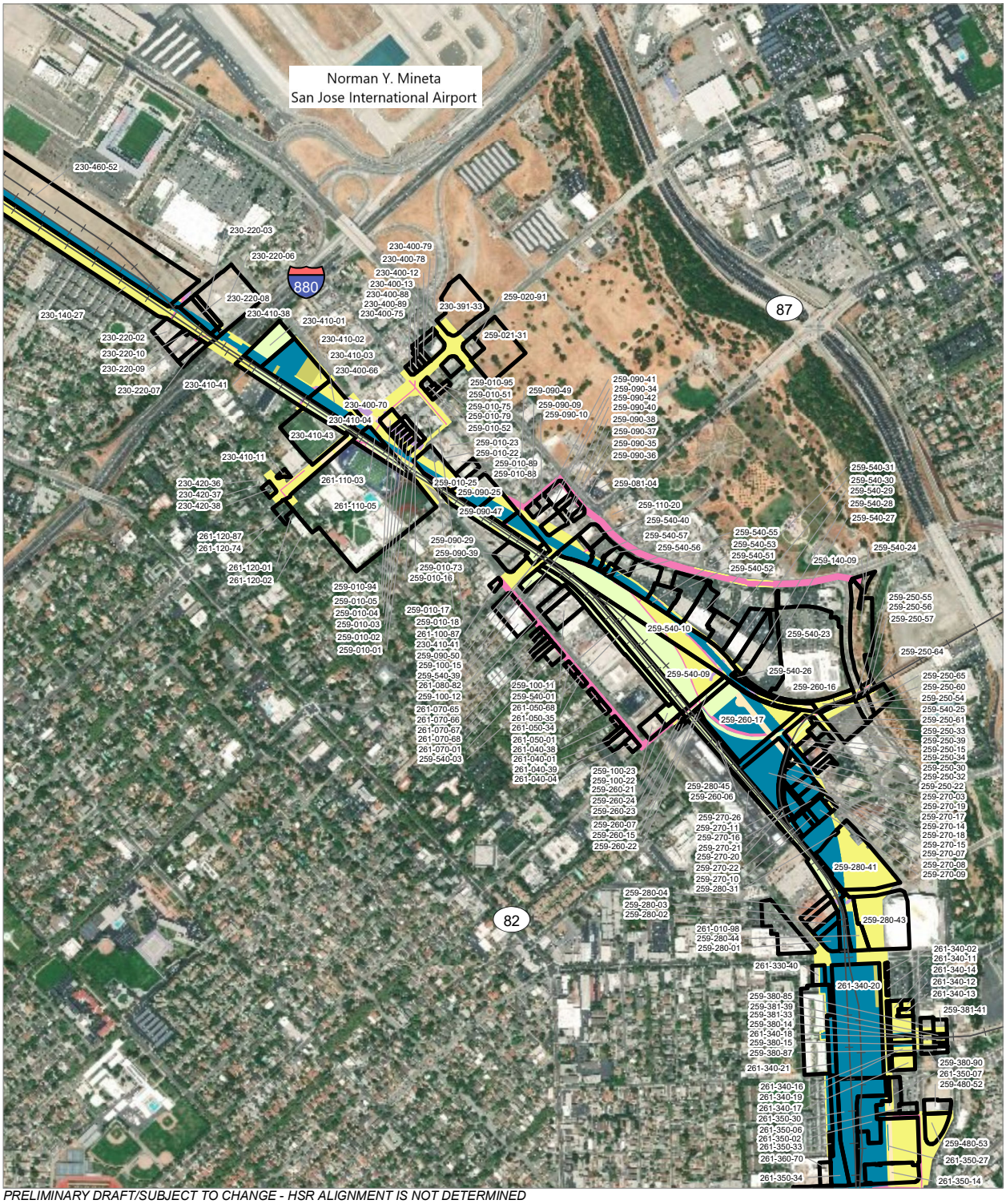
APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 2, Part 1)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

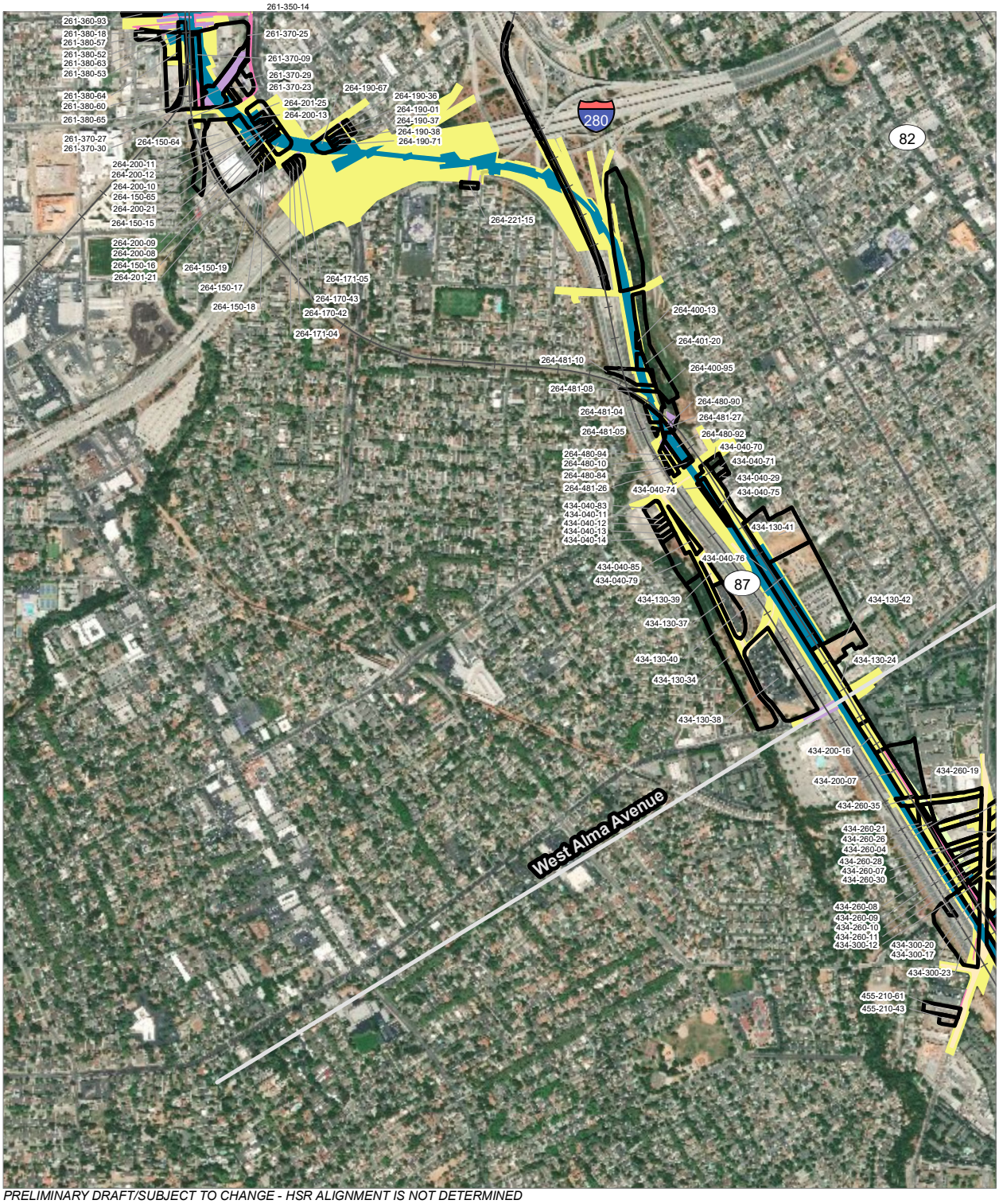


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

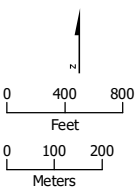
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

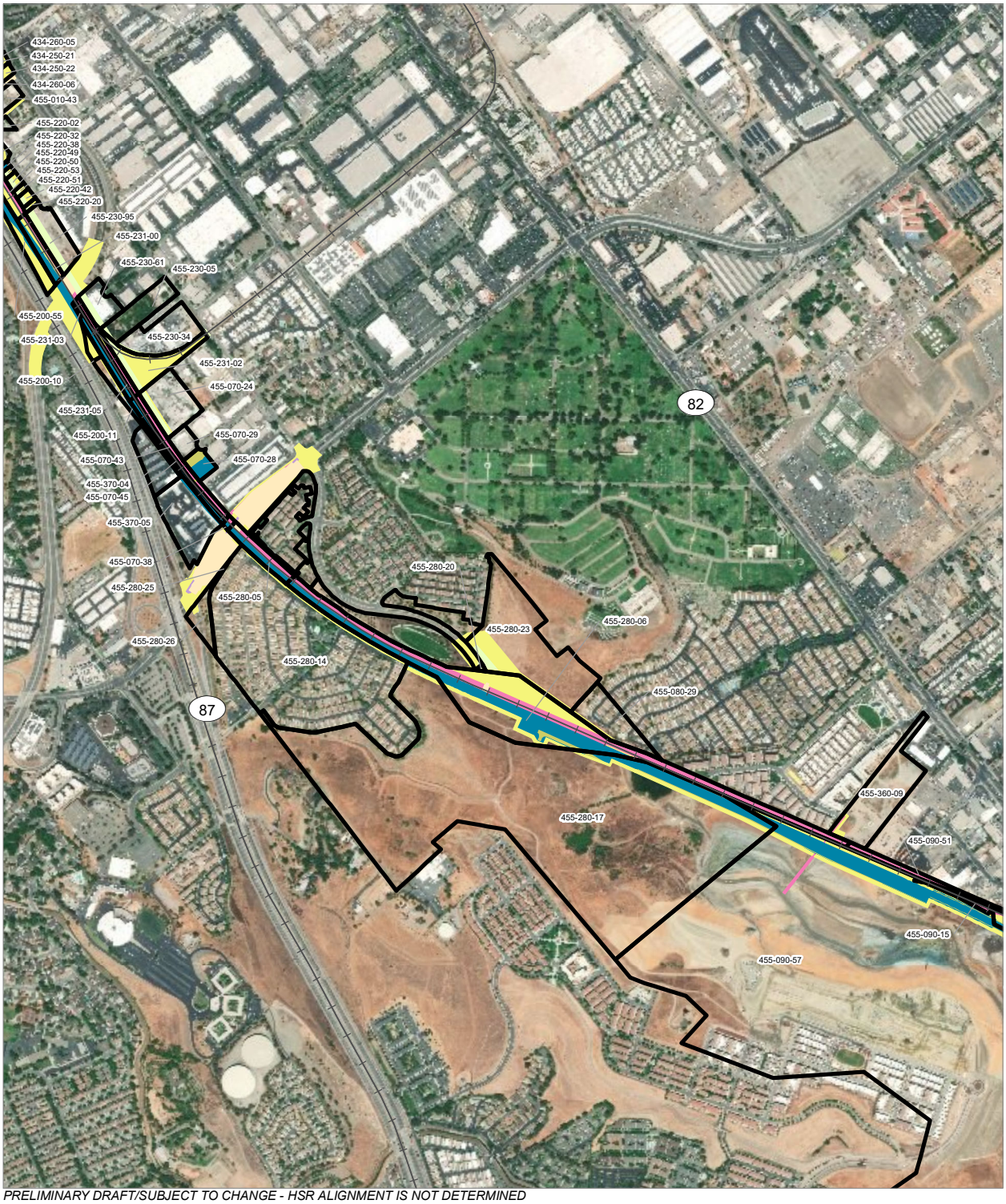


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

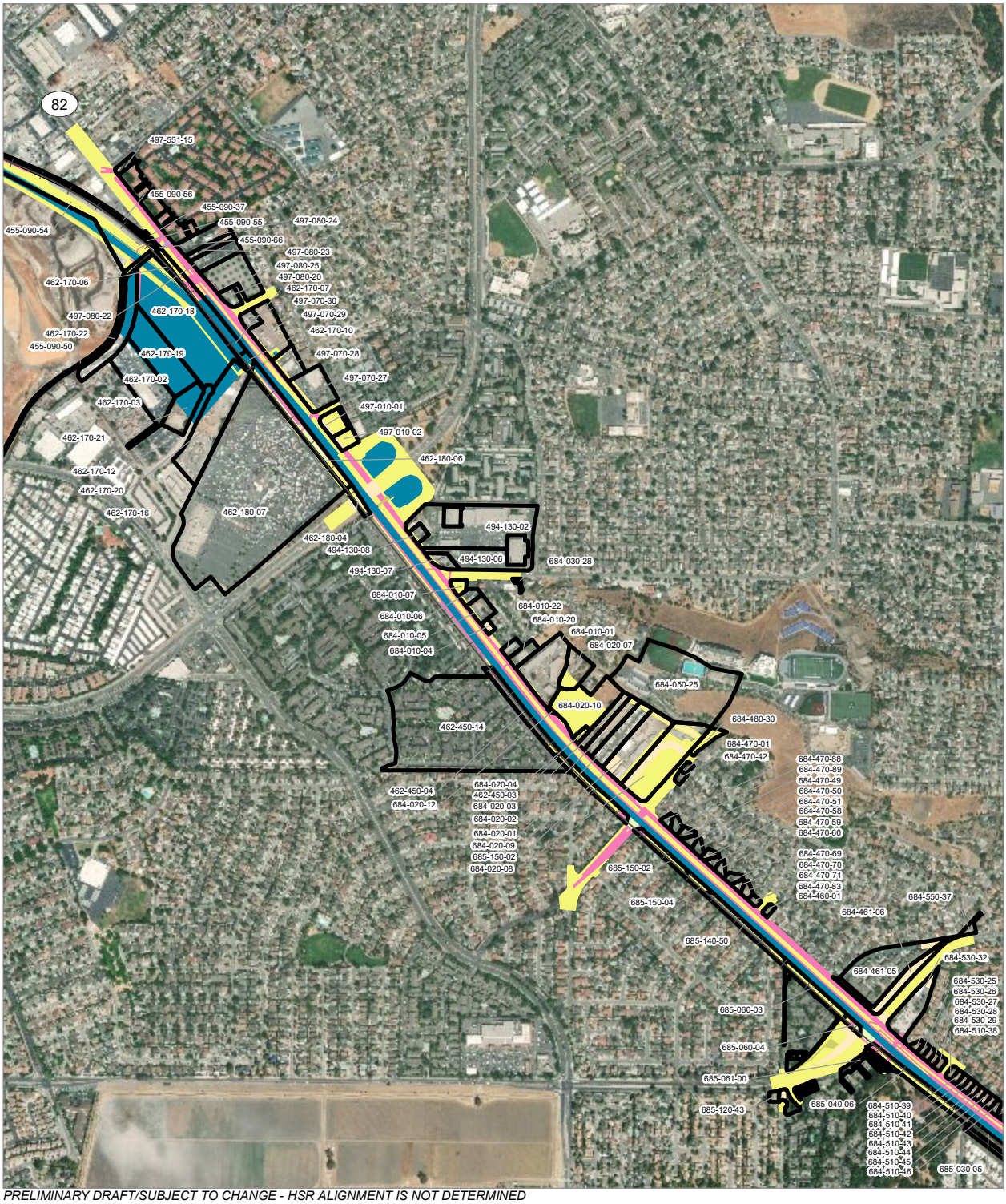


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

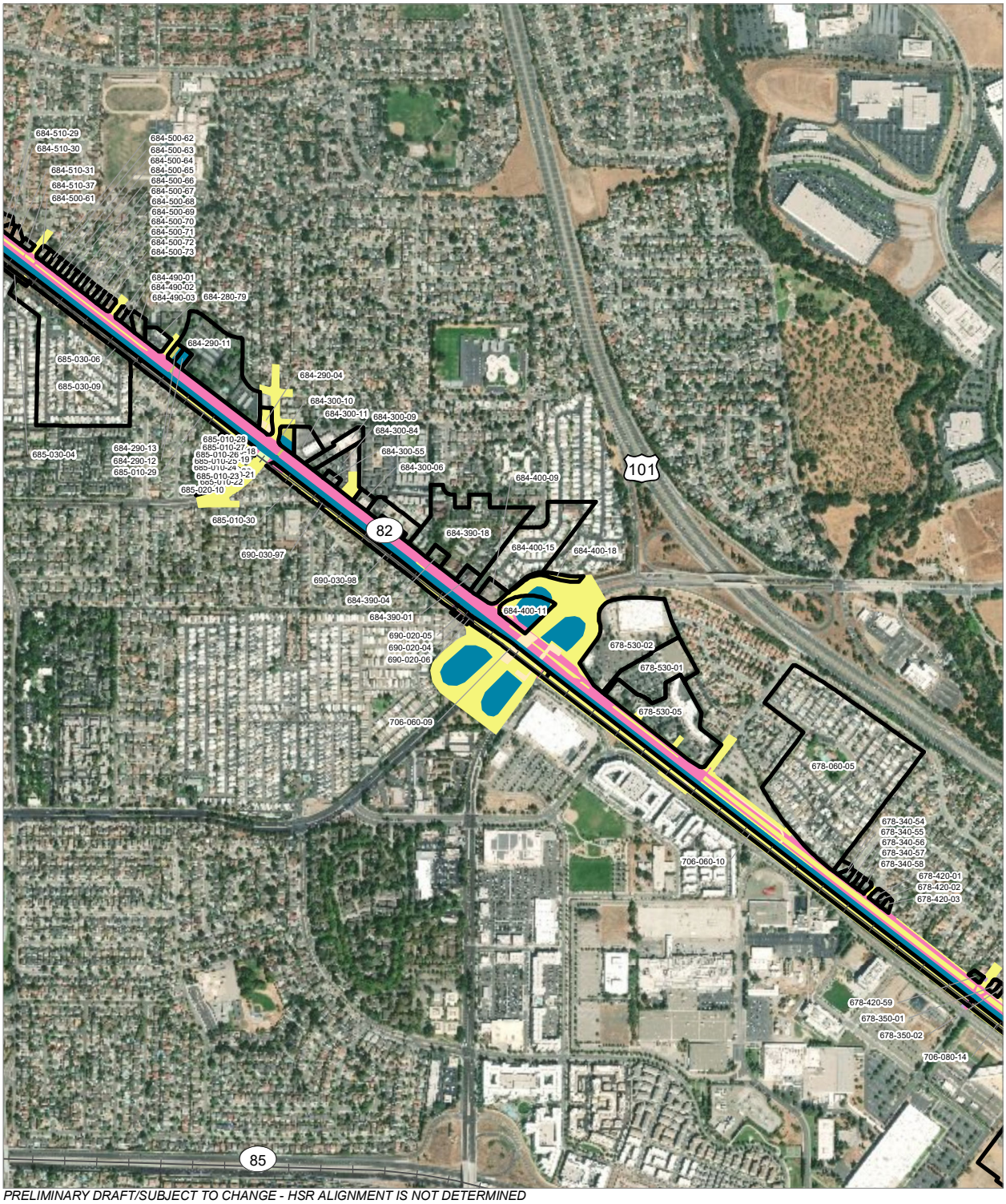


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

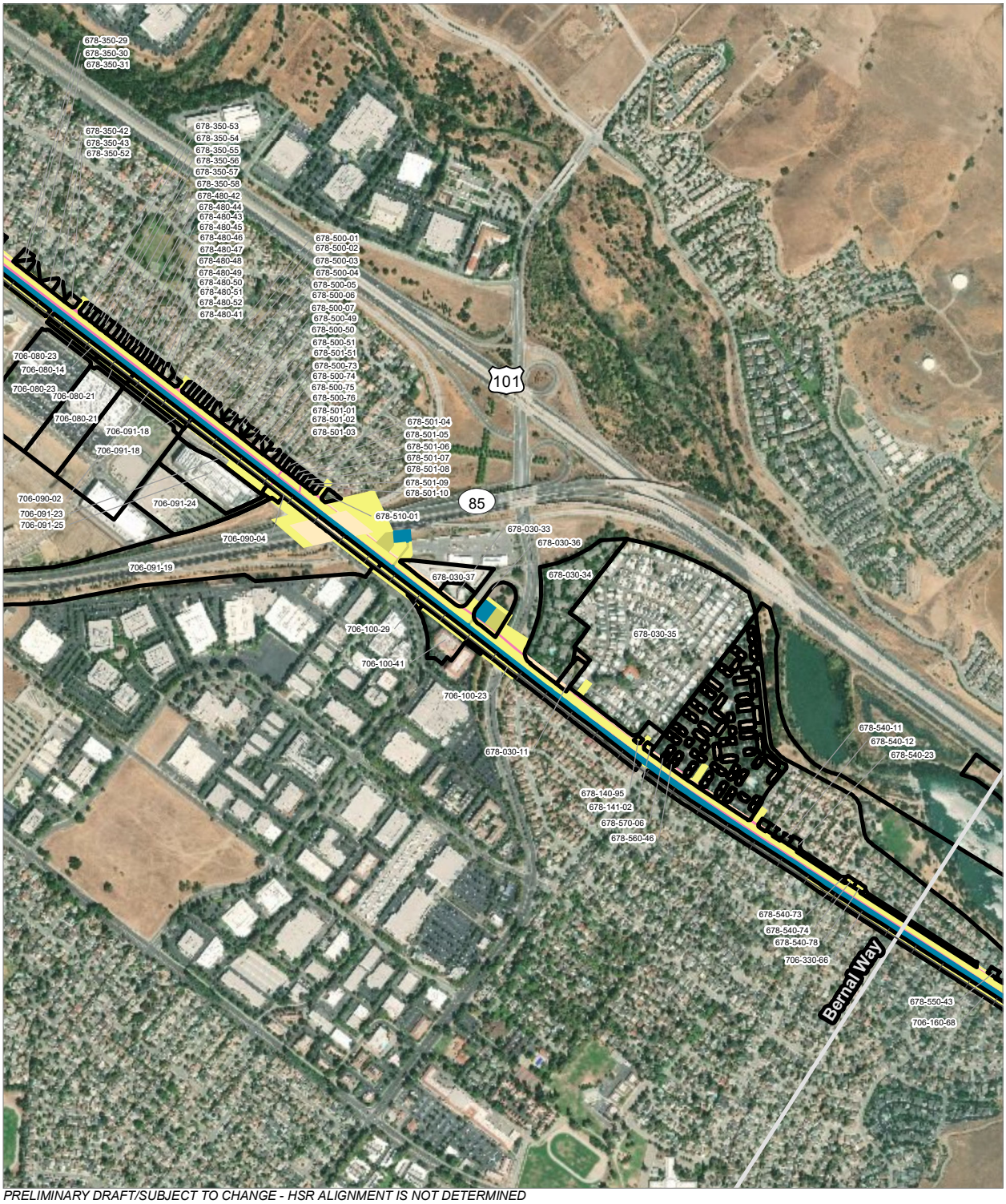


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

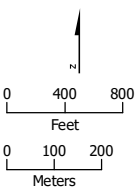
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

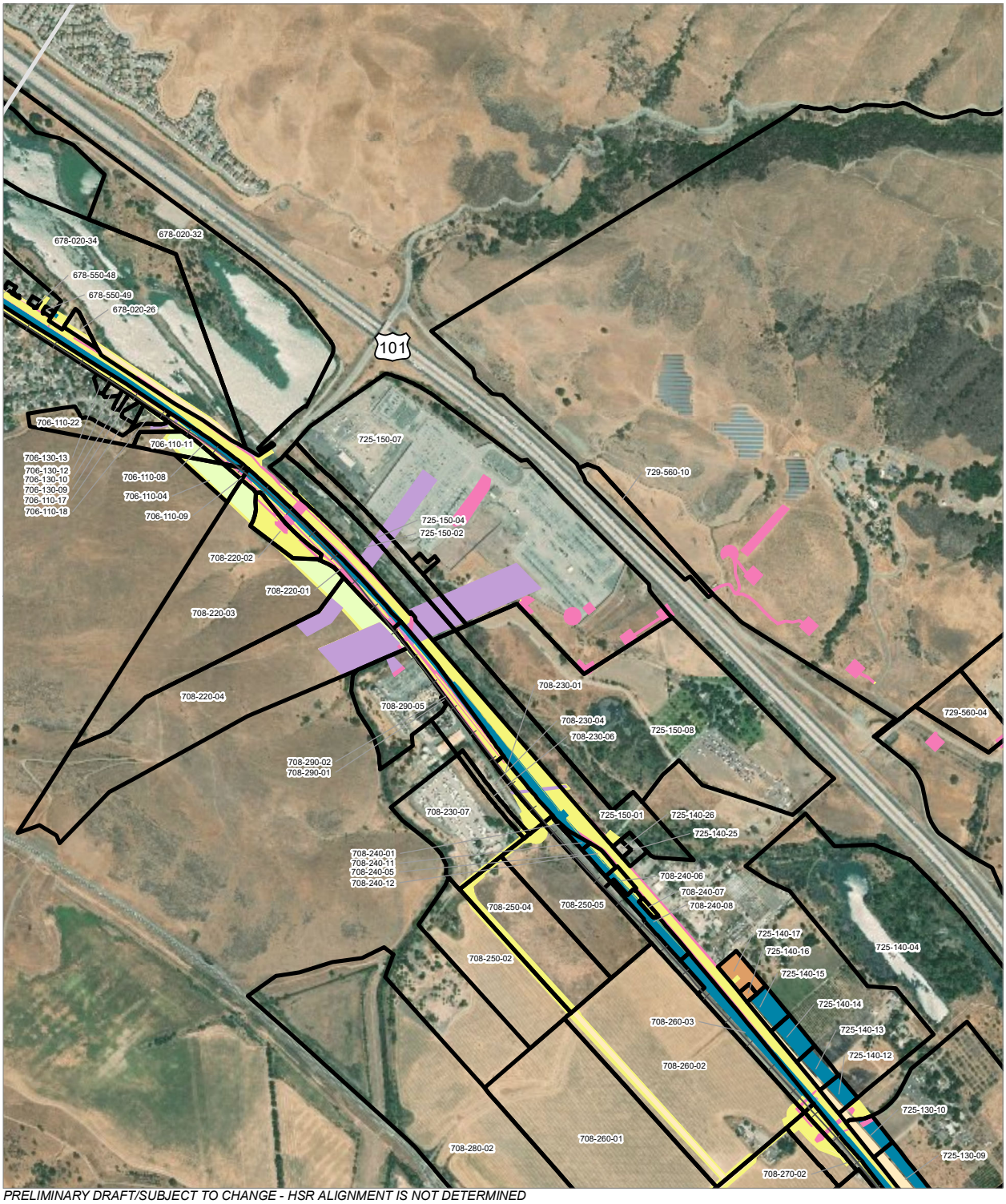


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

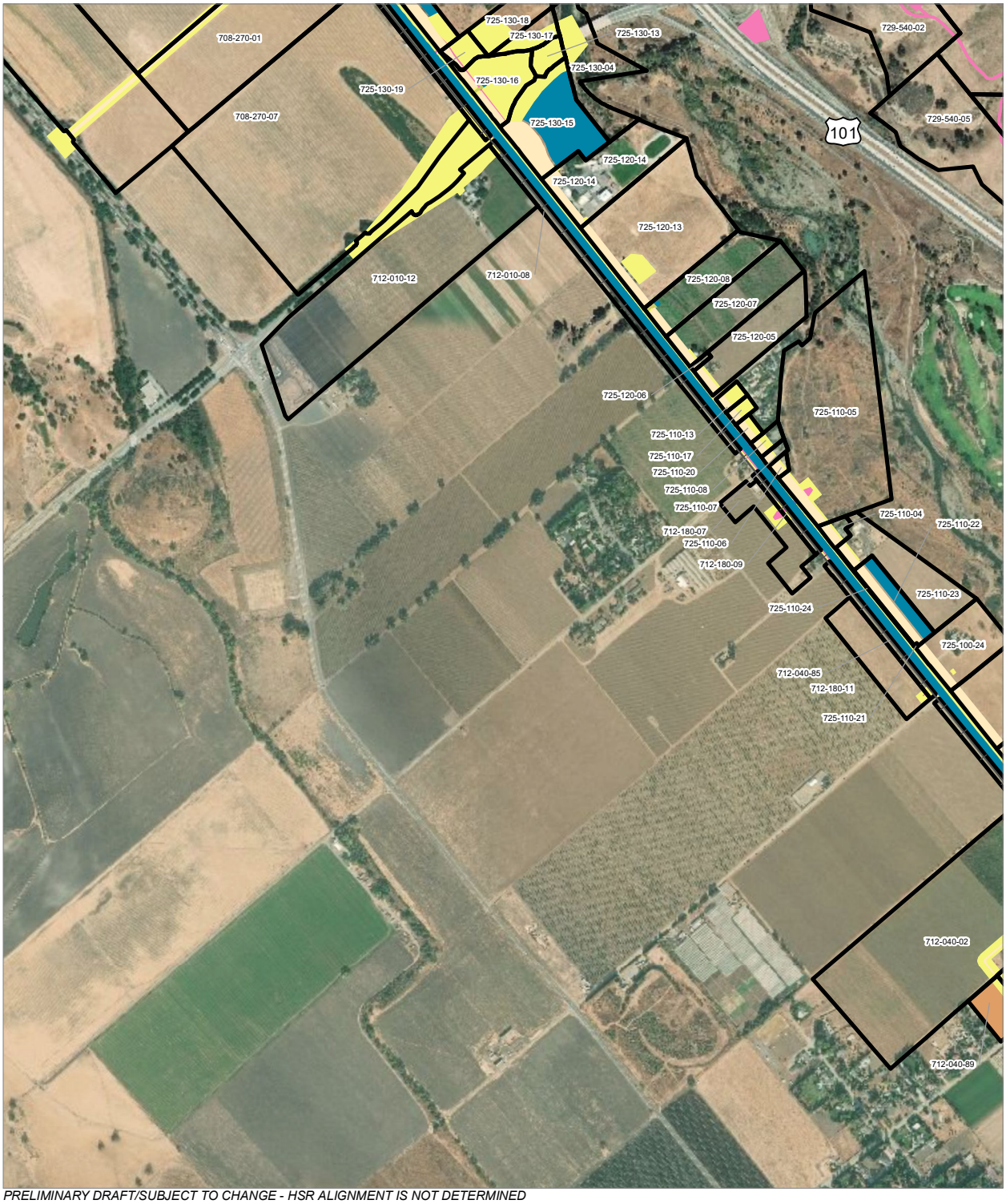


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

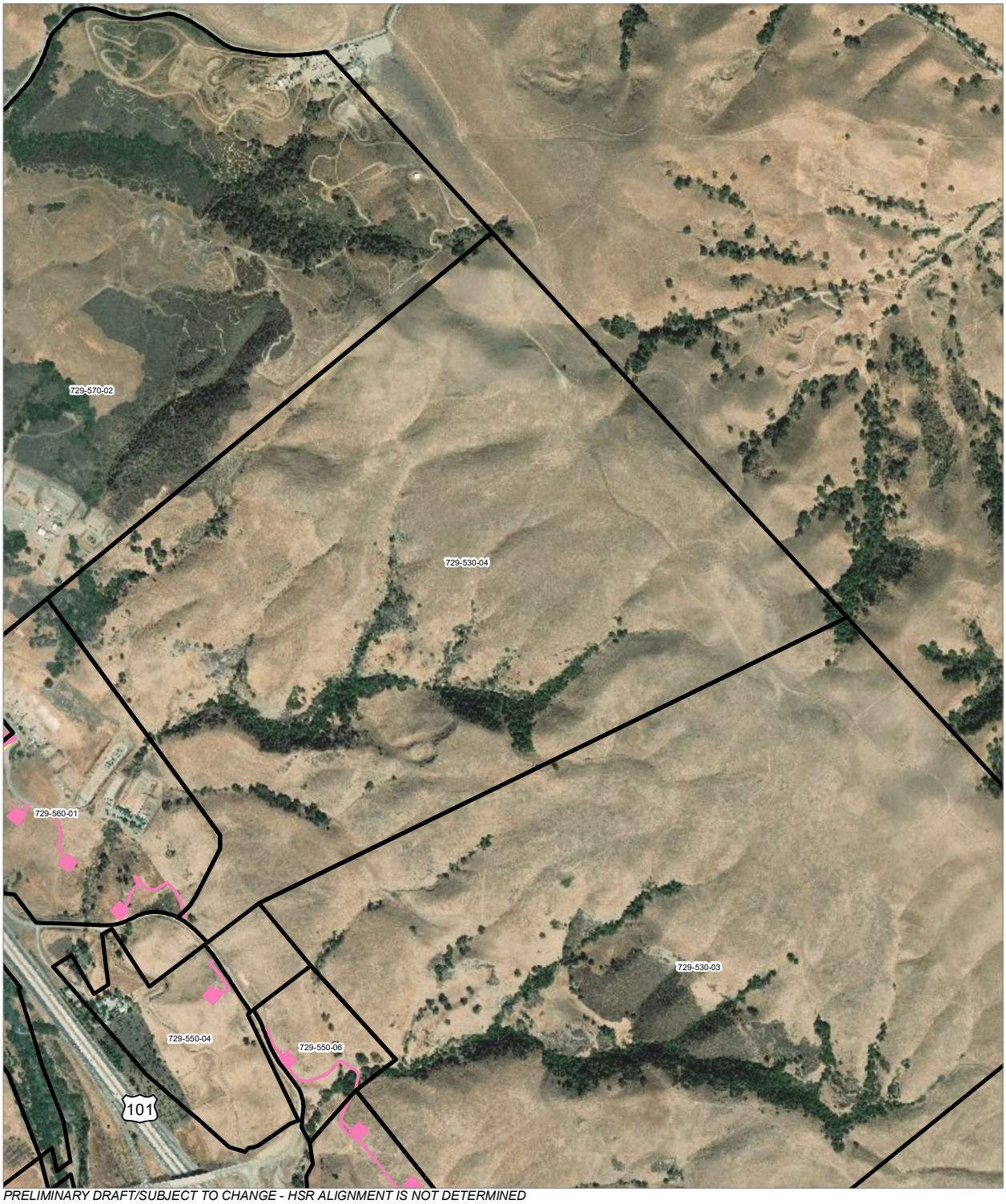
0 400 800
Feet
0 100 200
Meters

Alternative 2



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

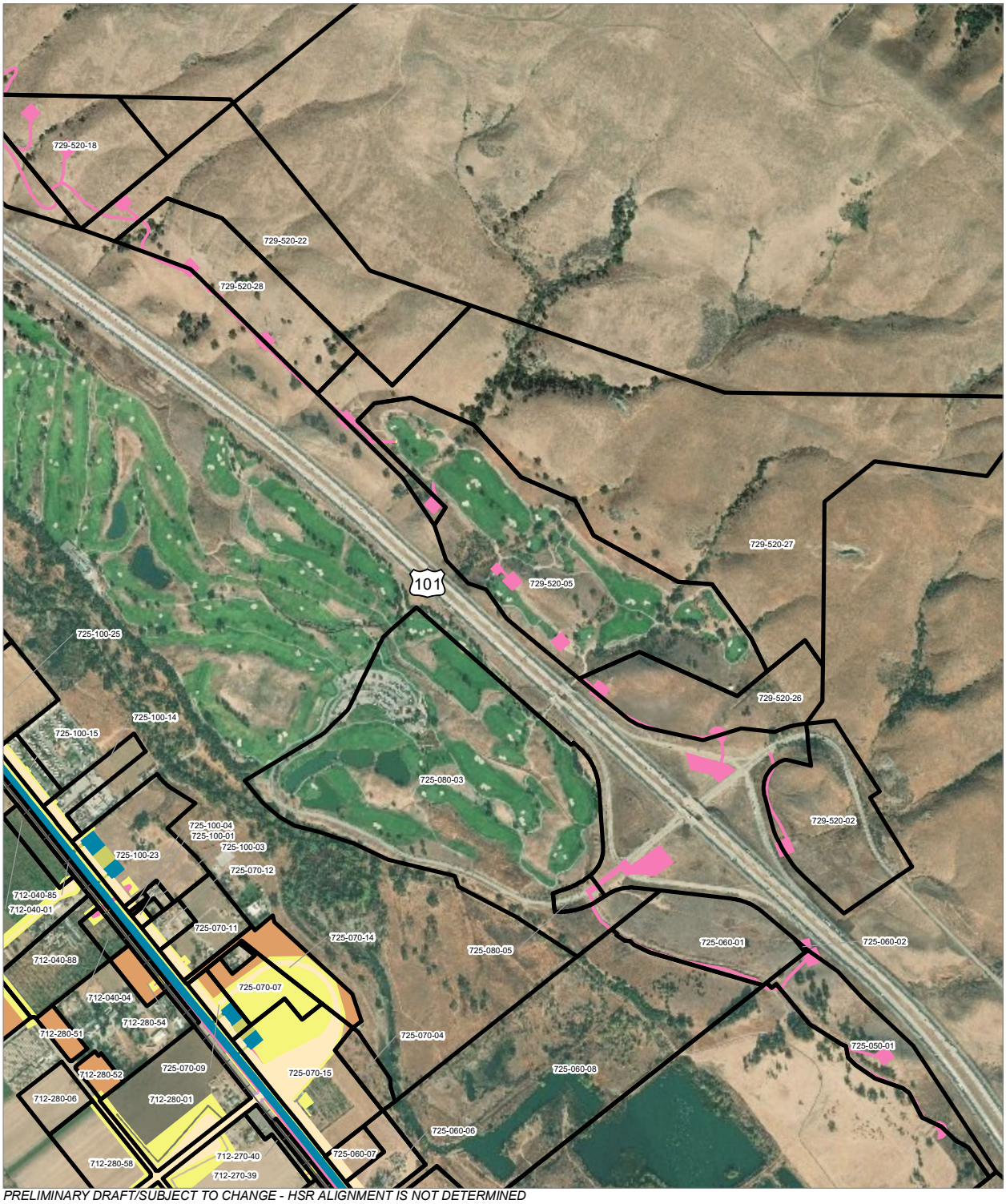


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

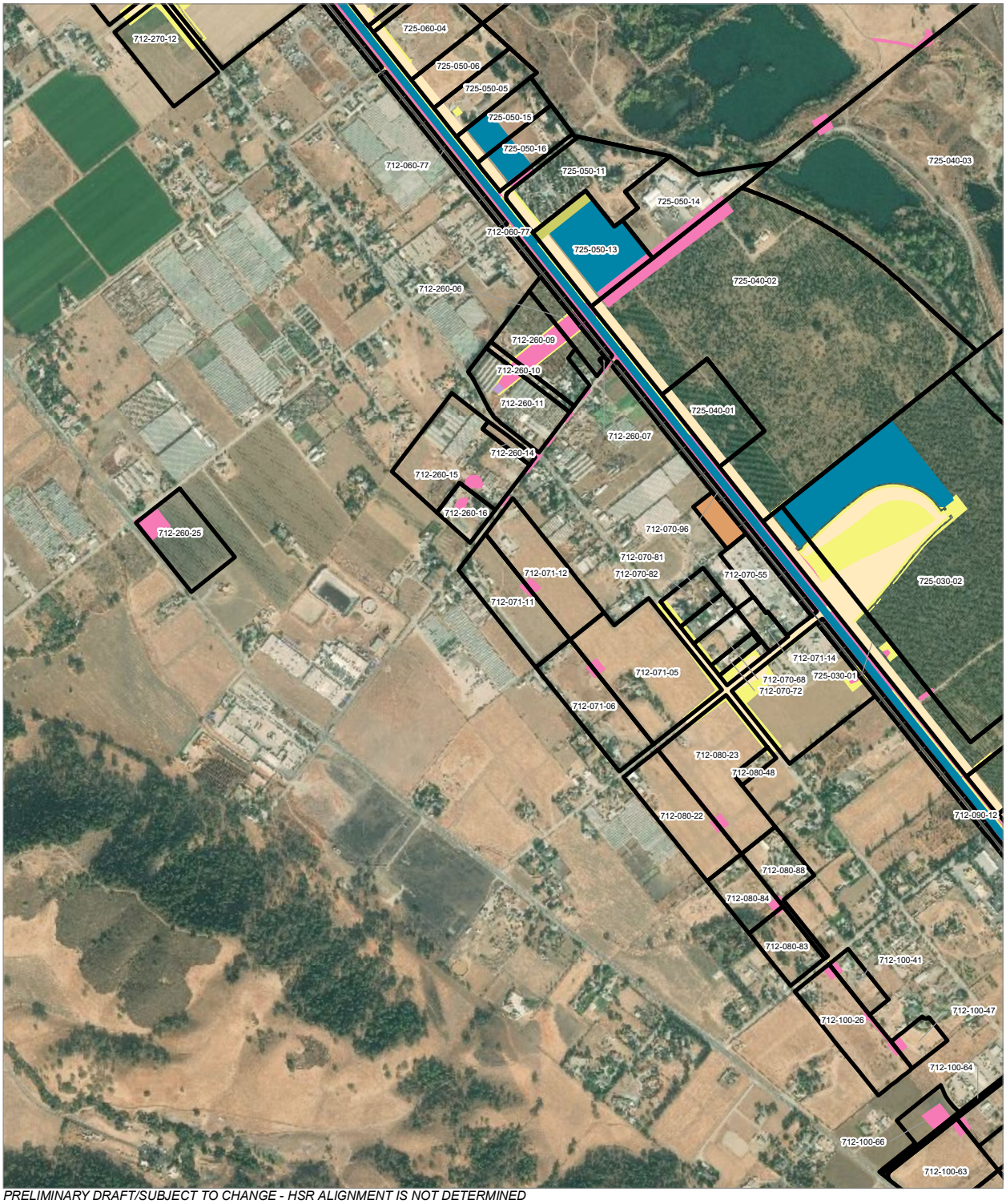


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

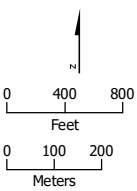
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

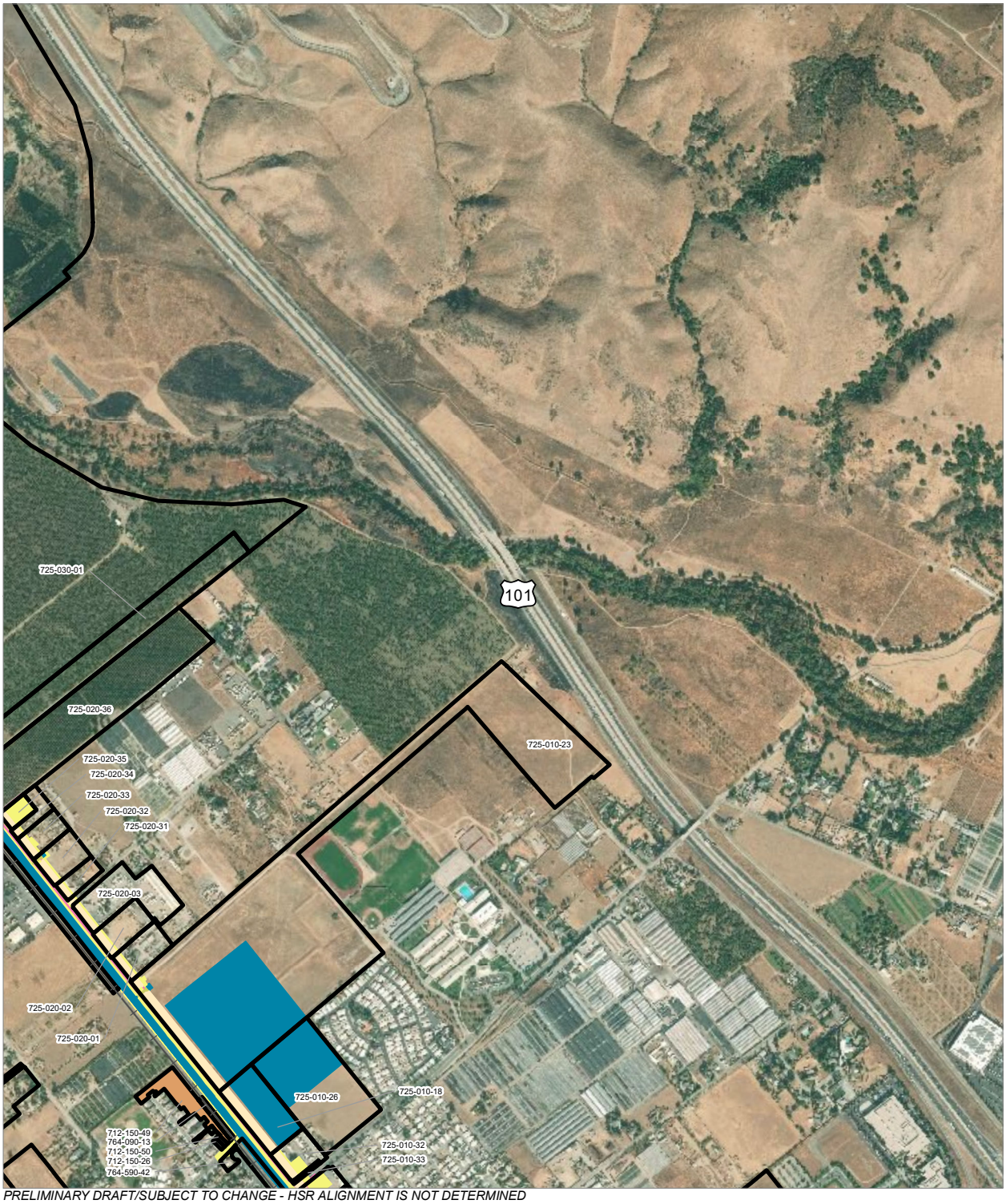


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

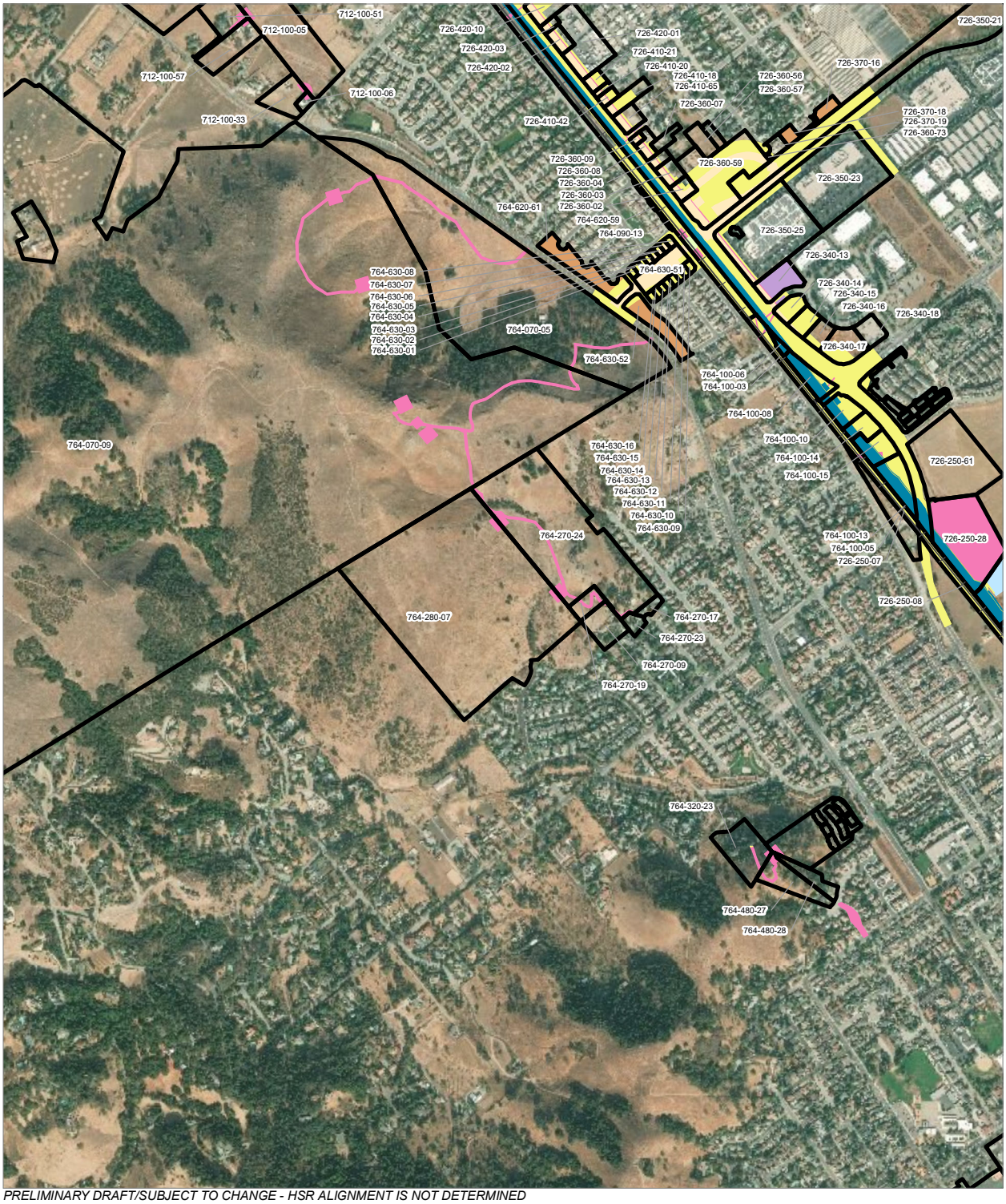


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

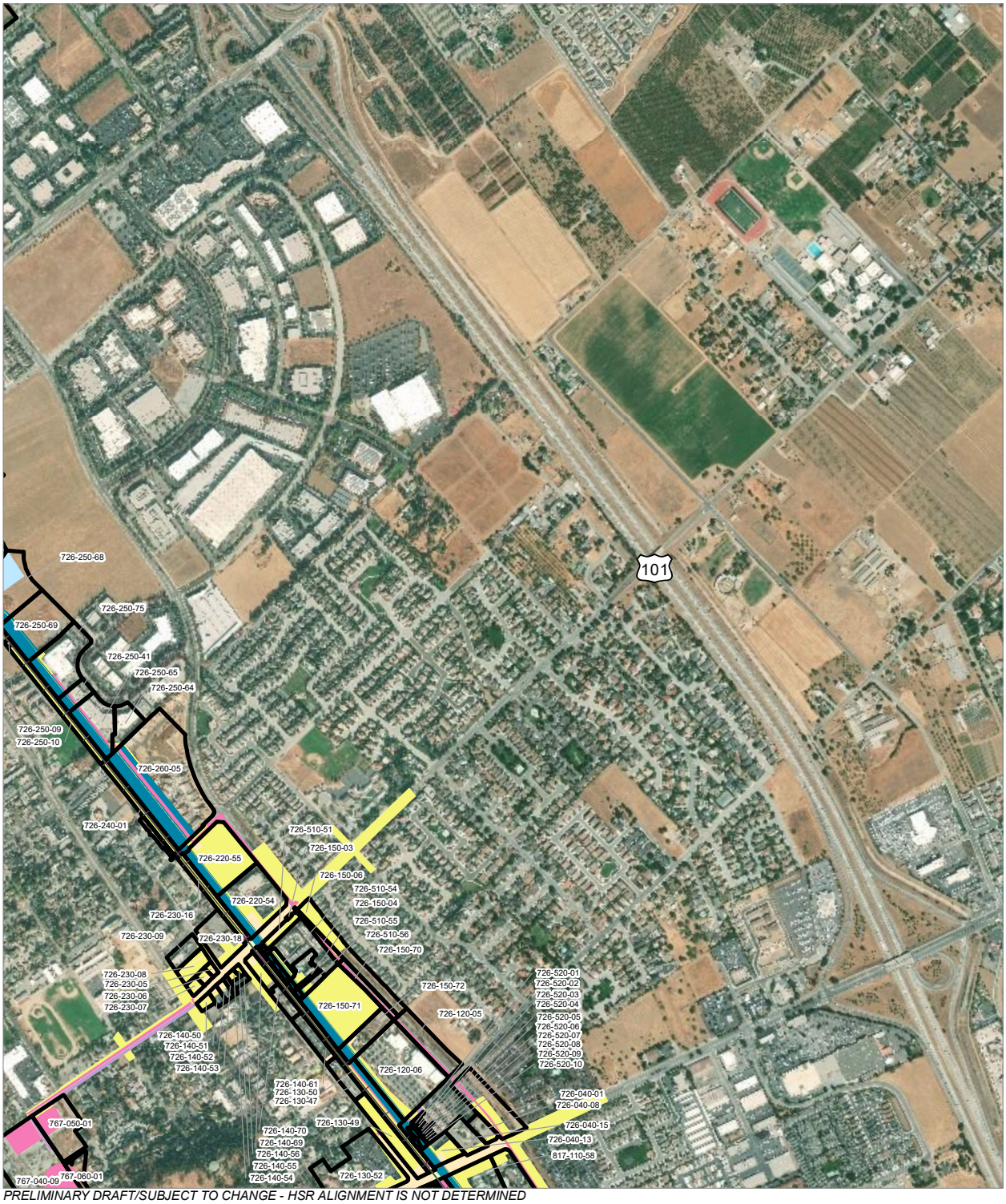


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

HSR Right-of-Way
Other Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

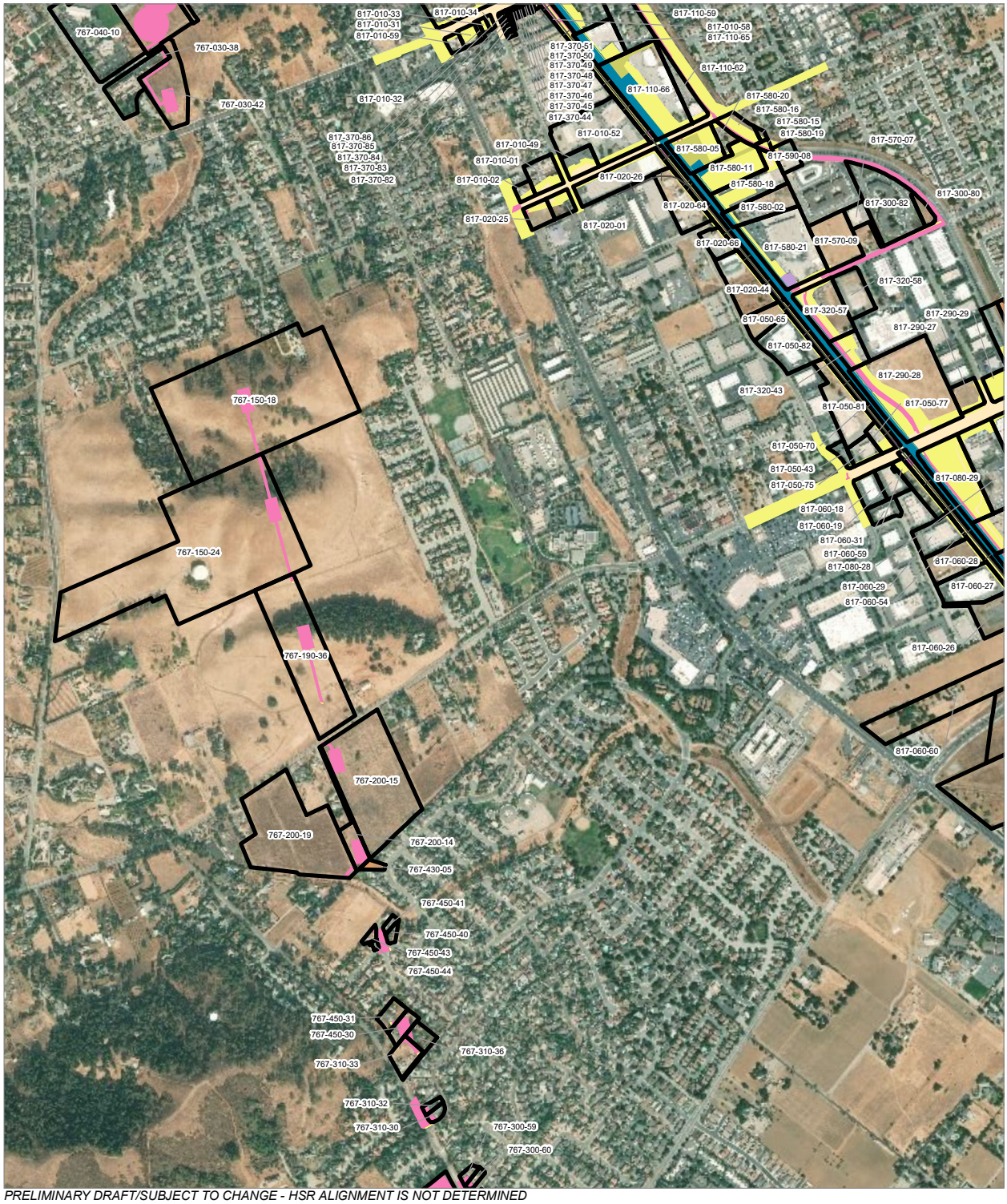


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

HSR Right-of-Way
Other Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

Alternative 2

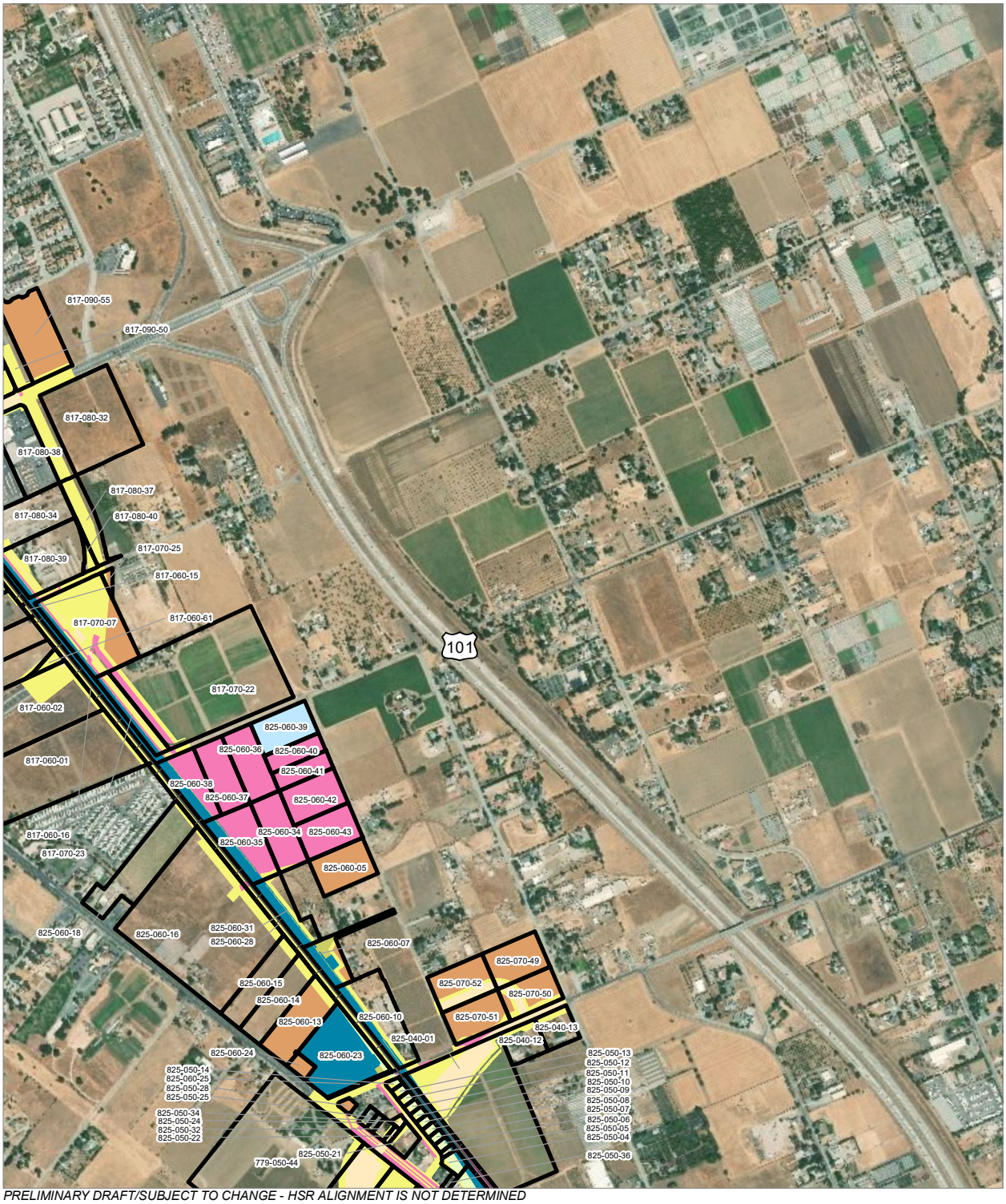


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

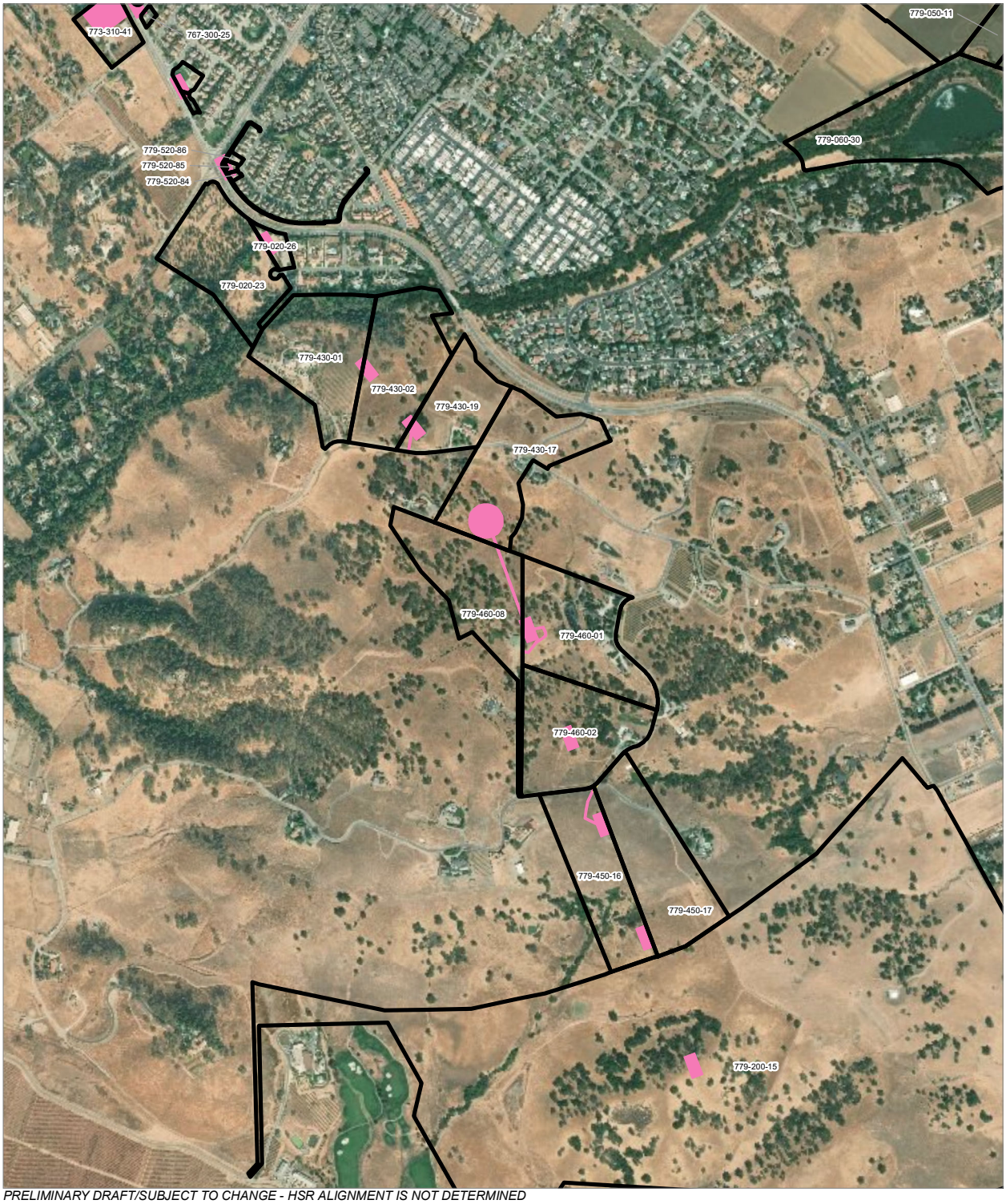


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

HSR Right-of-Way
Other Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

Alternative 2

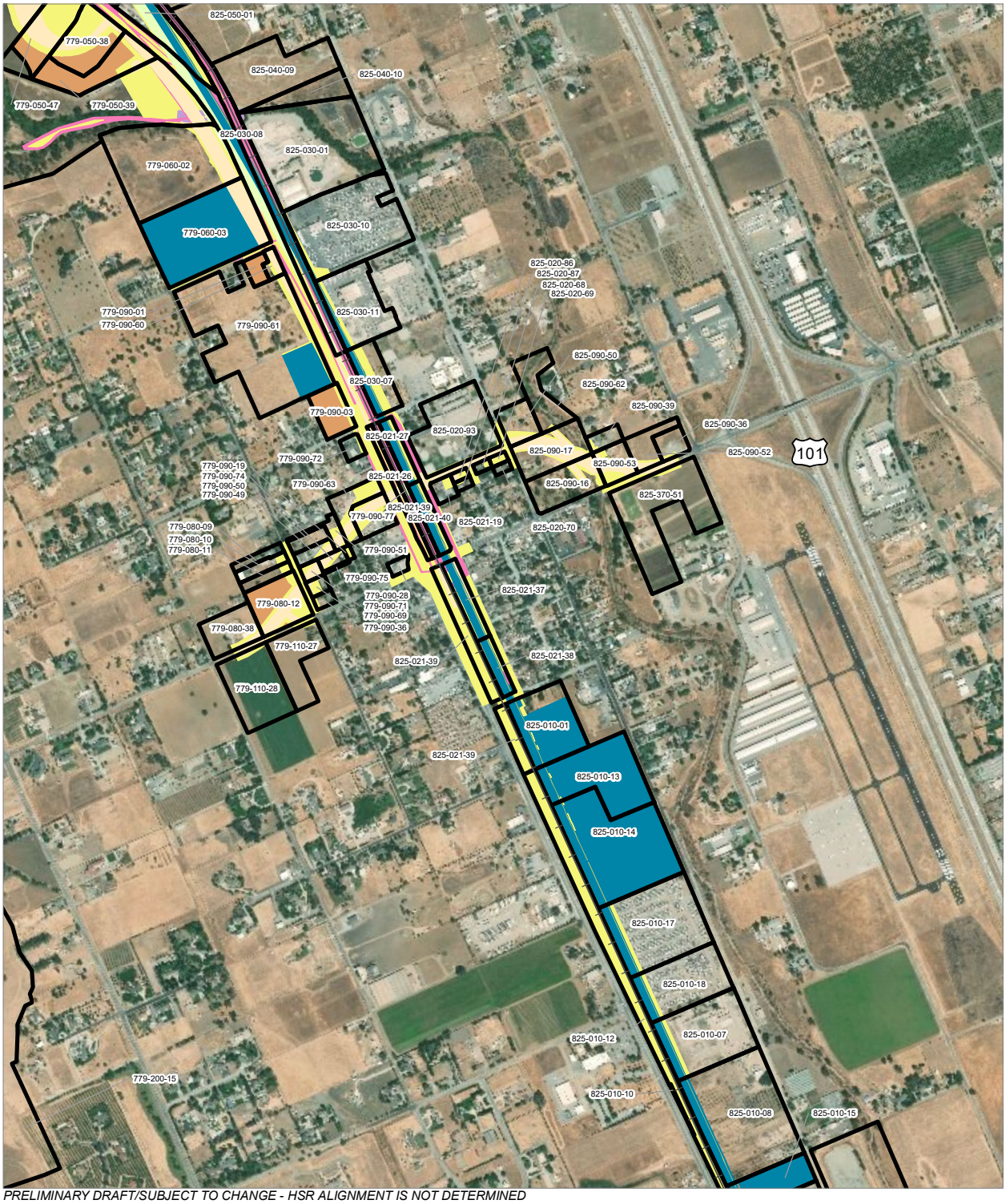


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

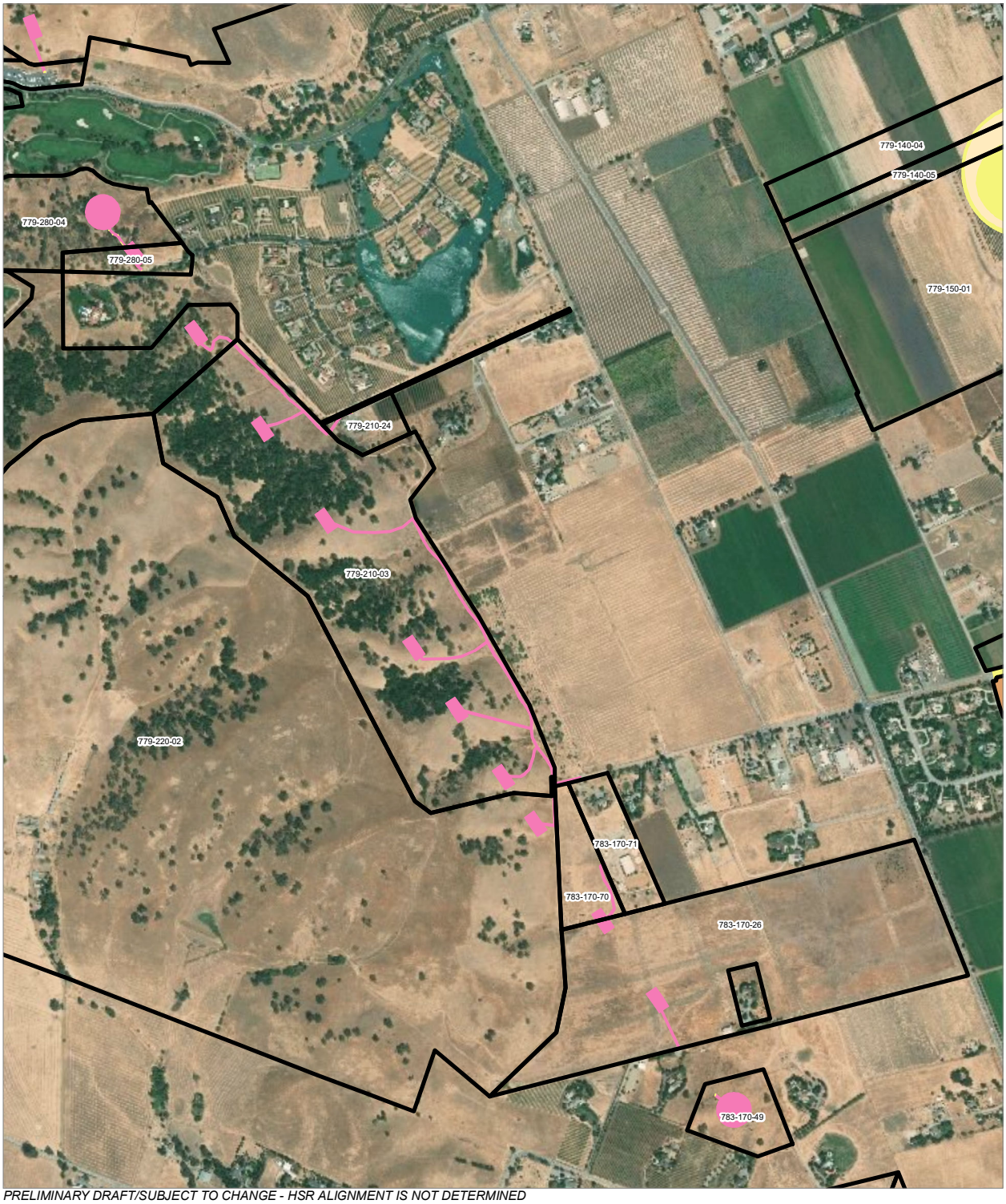


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

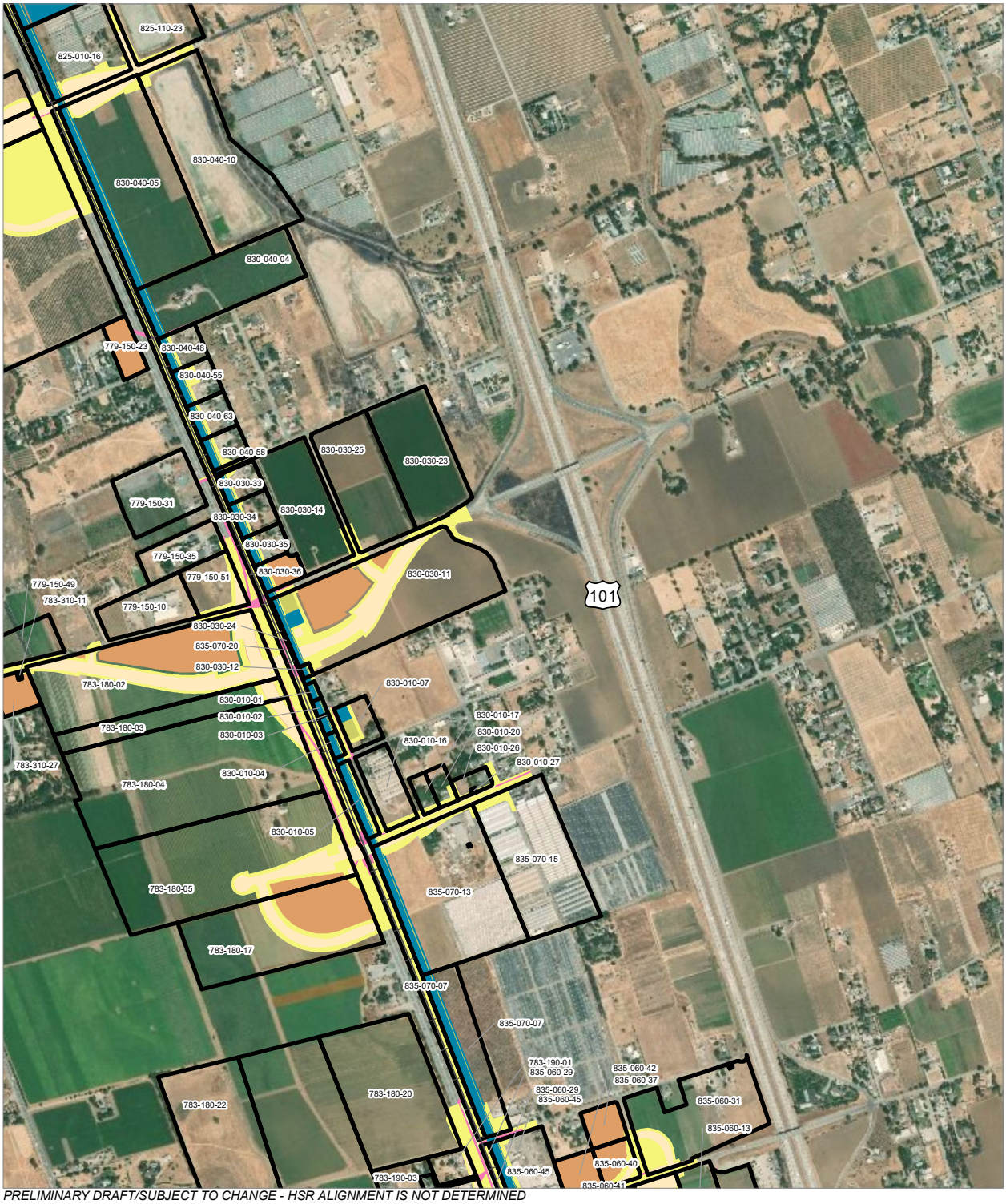


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

Roadway Right-of-Way
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

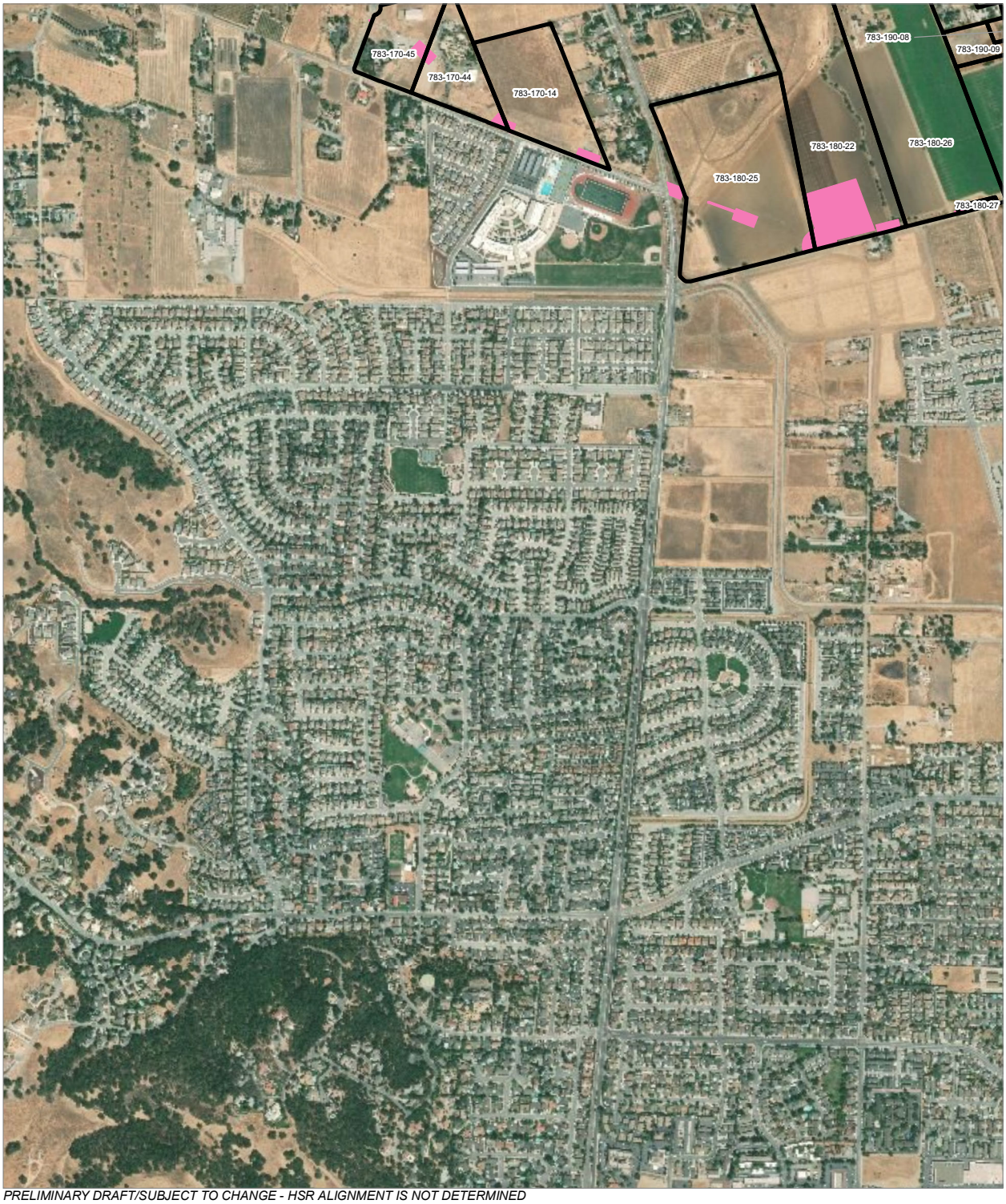


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

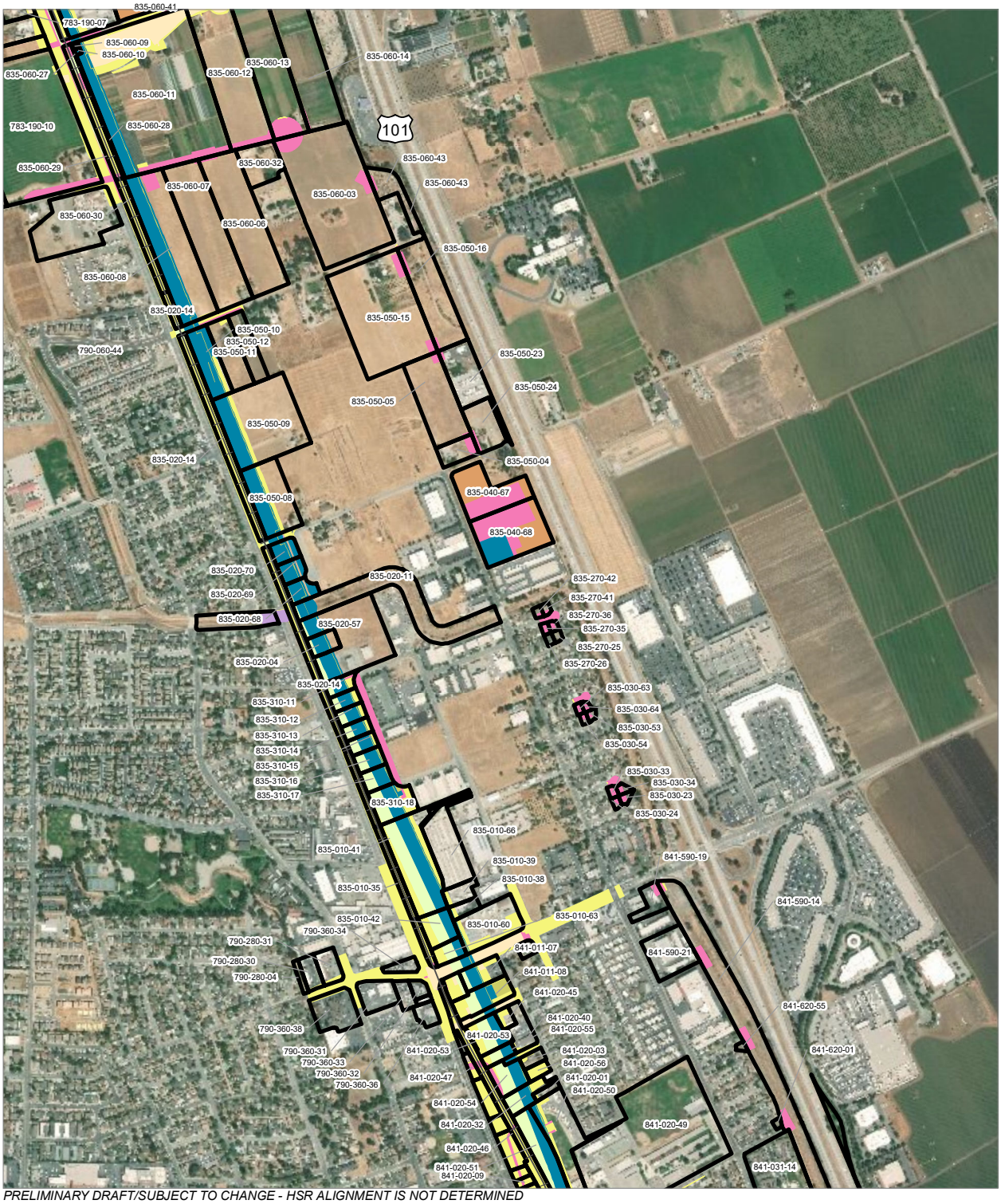


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

Permanent Utility Easement
Parcel (APN Displayed)

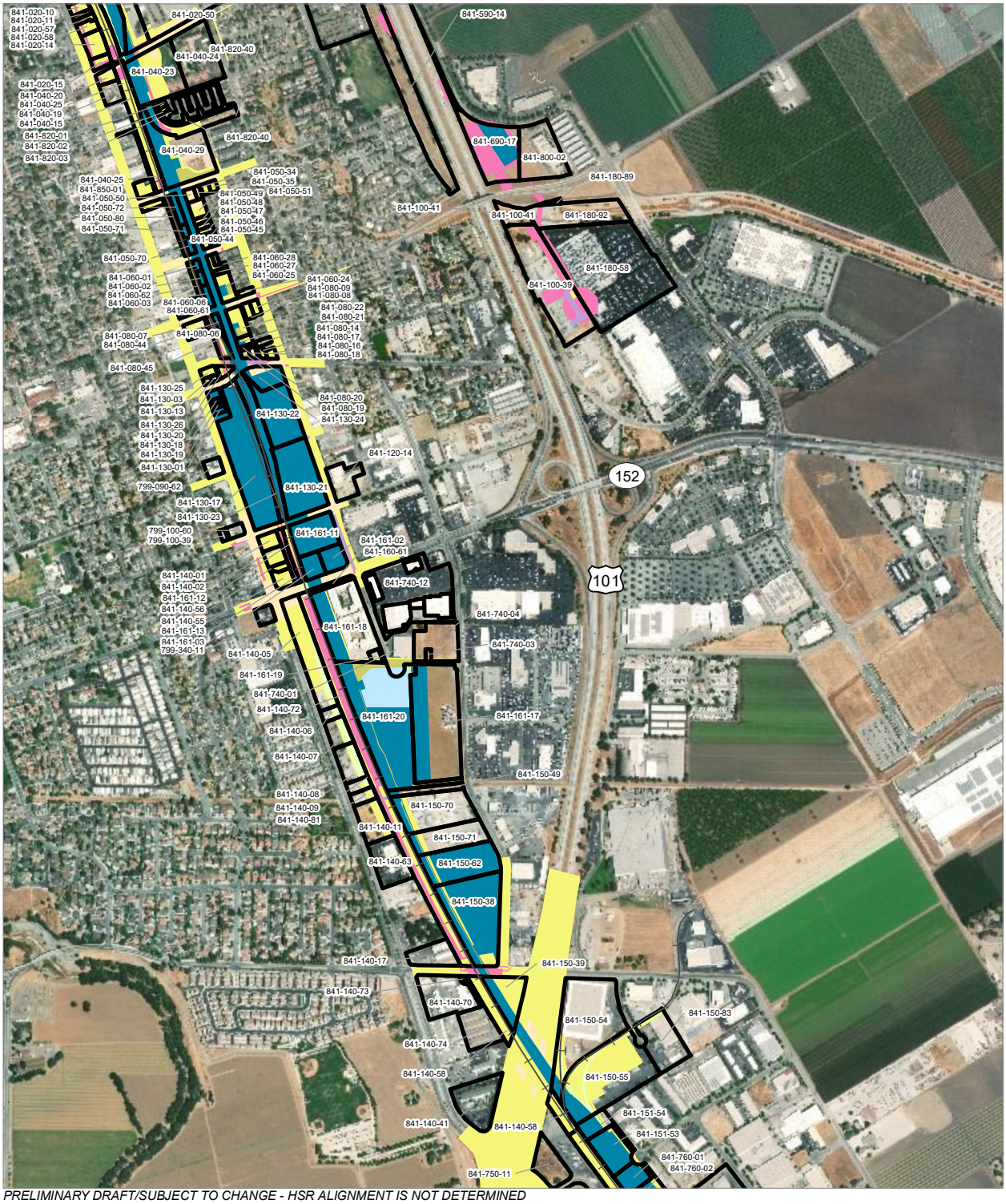


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

Alternative 2



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

HSR Right-of-Way
Other Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

Alternative 2

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

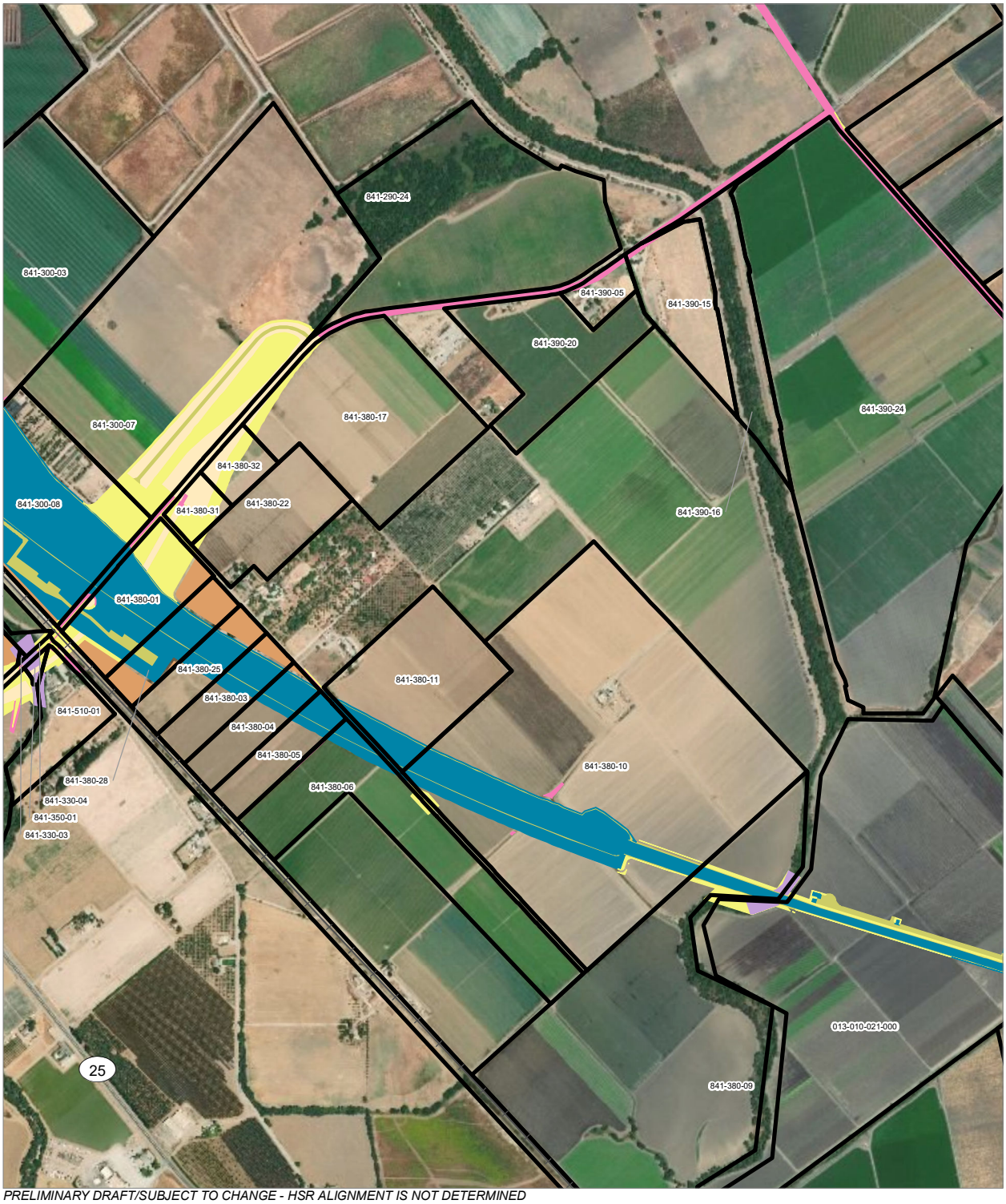
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

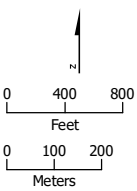
0 400 800
Feet
0 100 200
Meters

Alternative 2

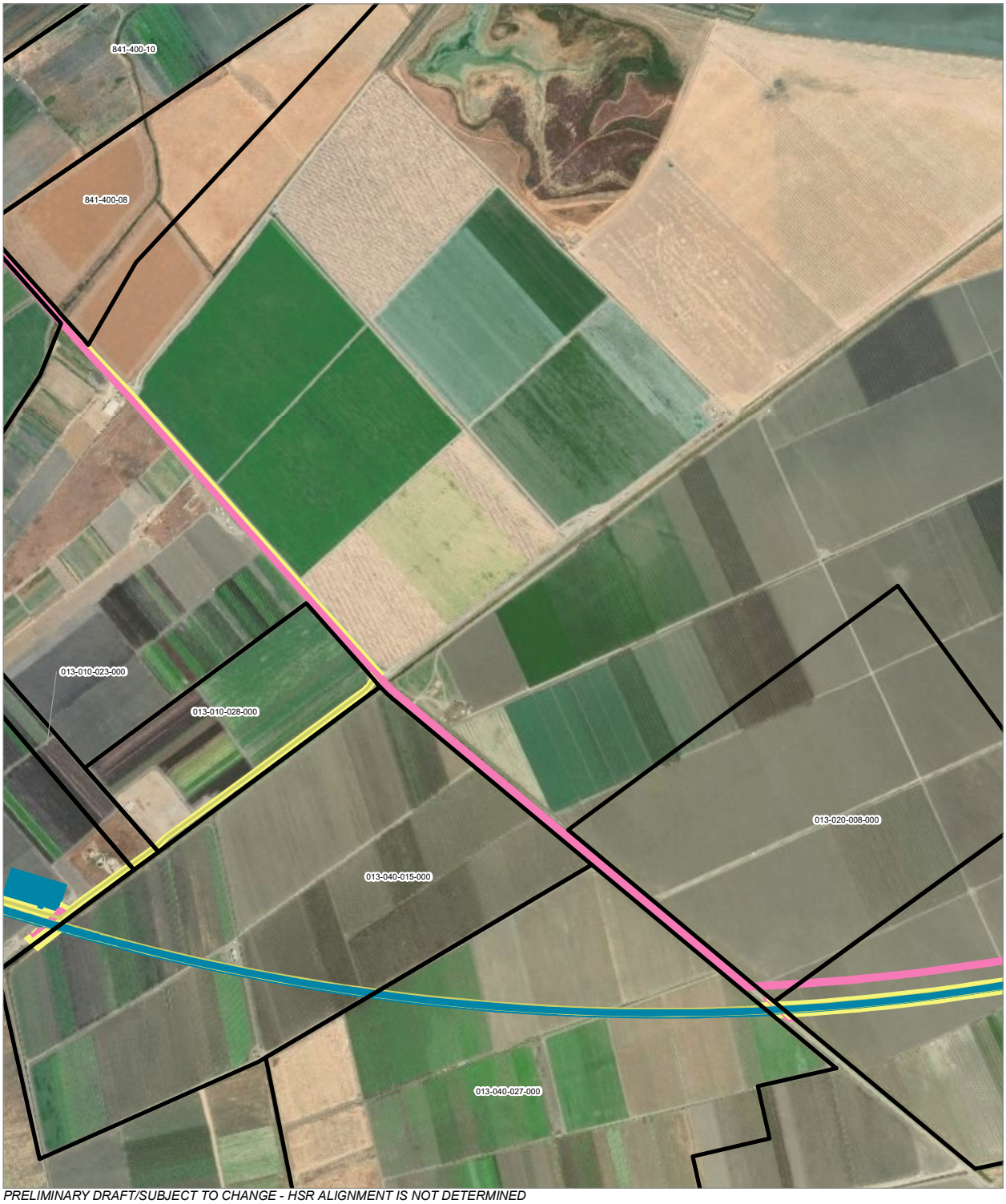


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

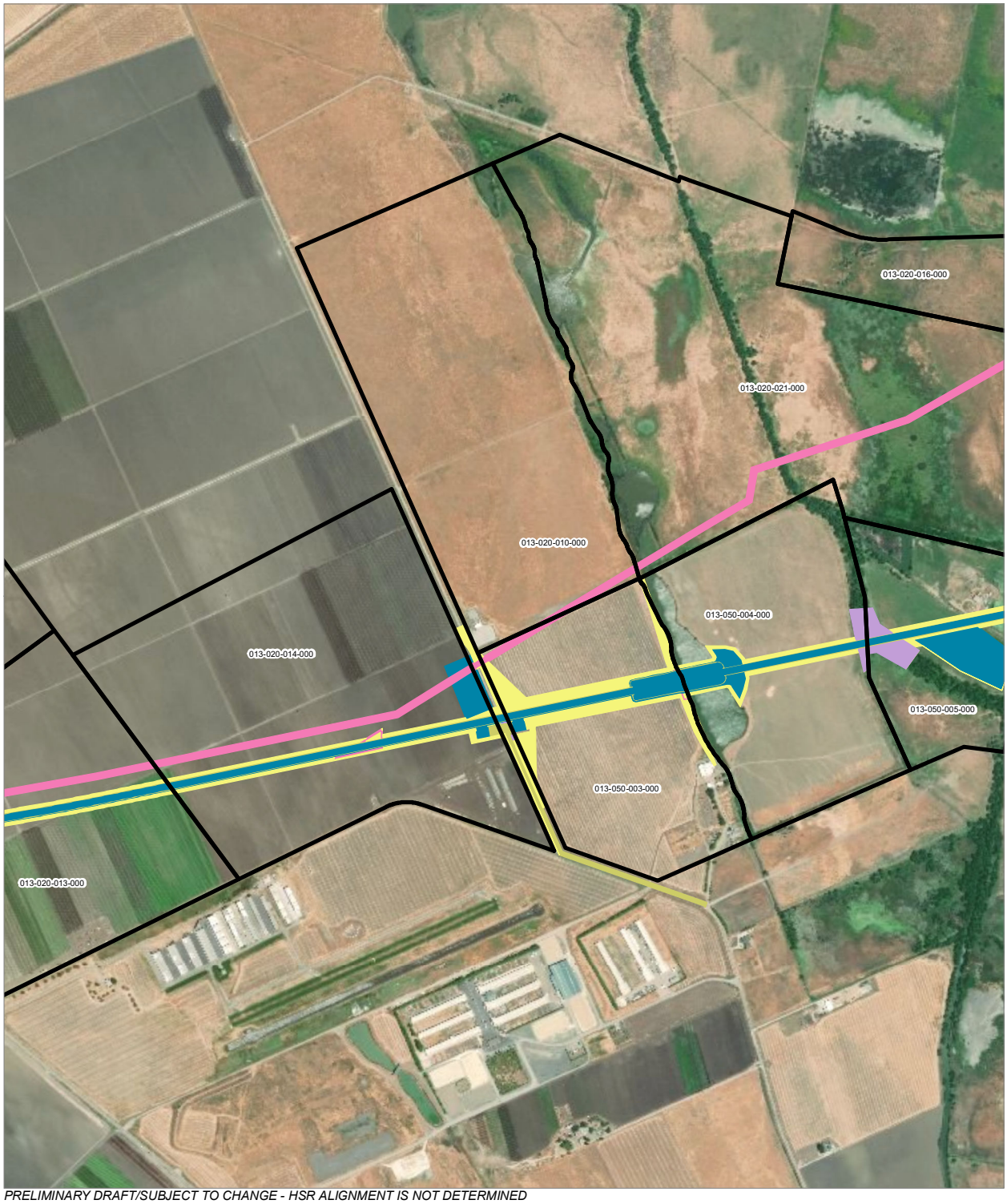


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

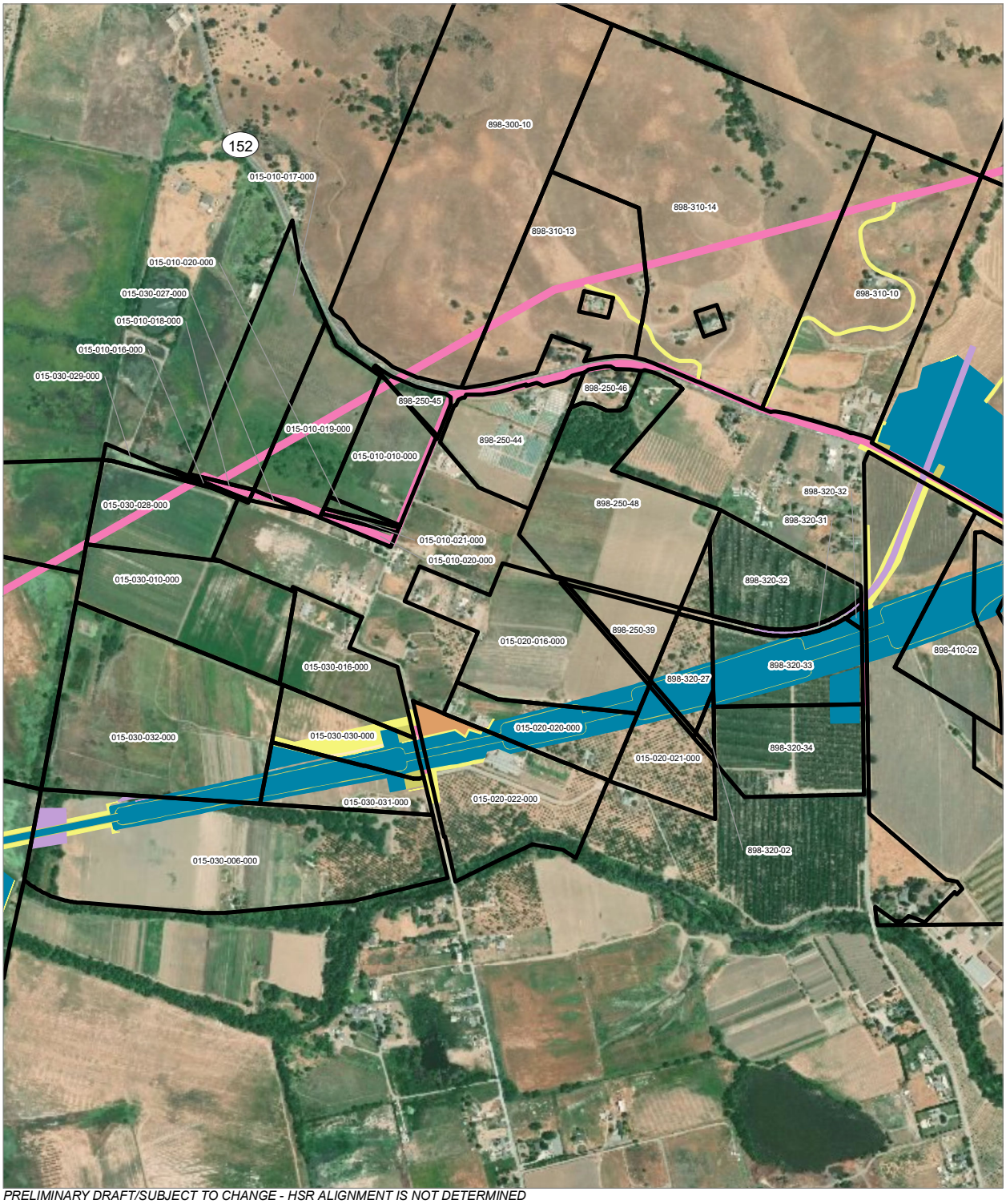


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



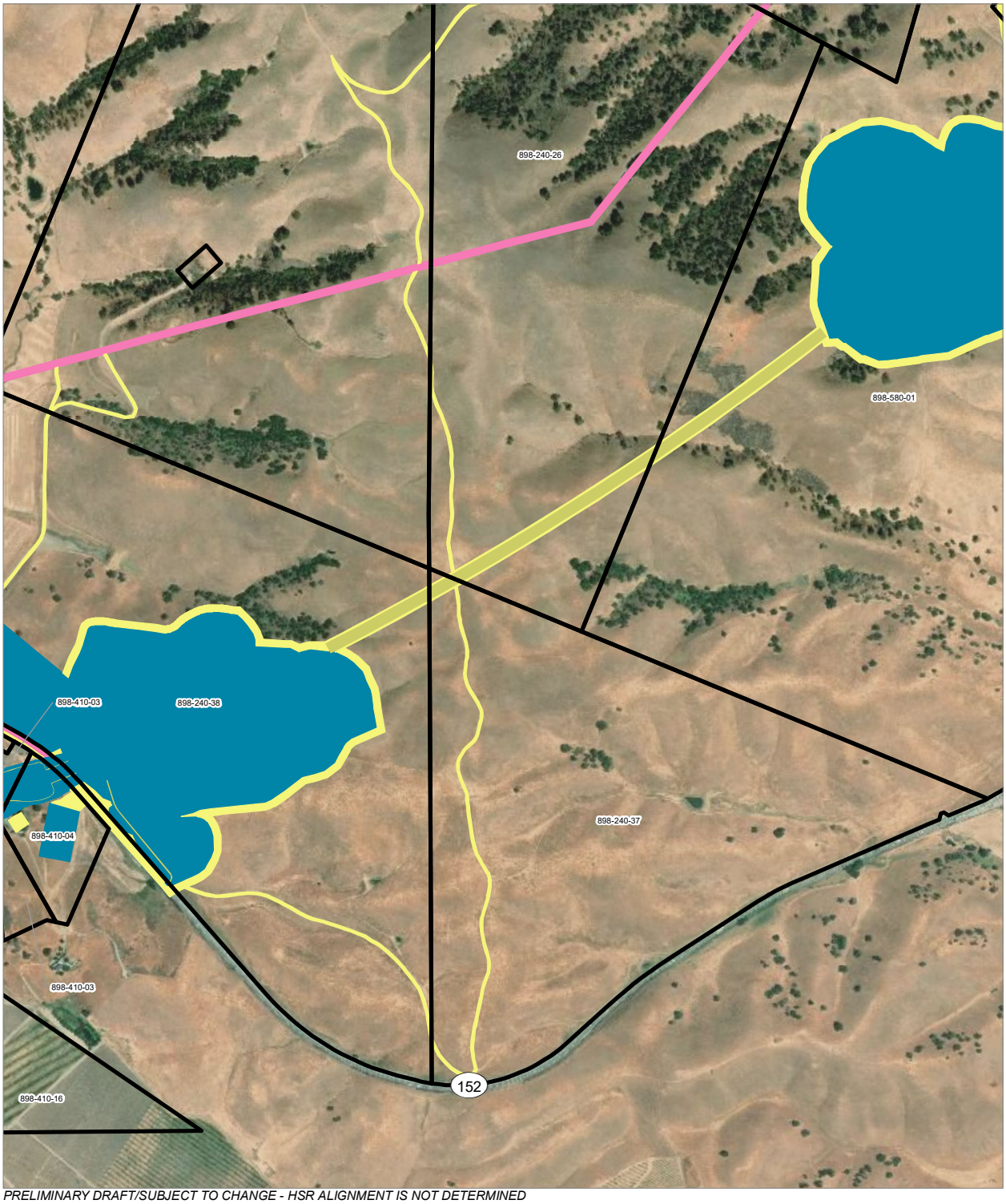
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 2, Part 1)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

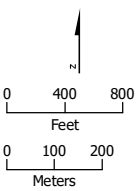
Alternative 2

0 400 800
Feet
0 100 200
Meters

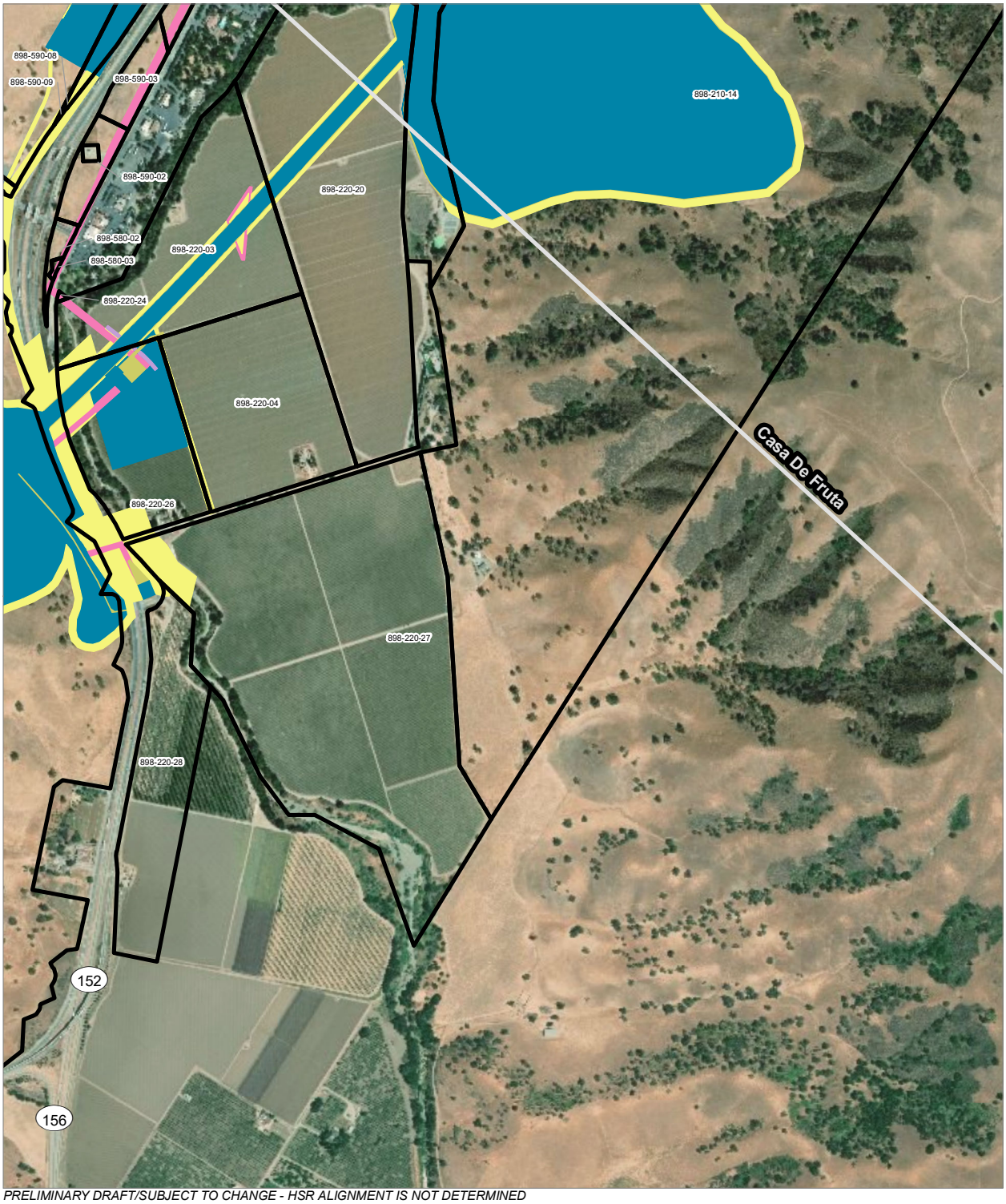
HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

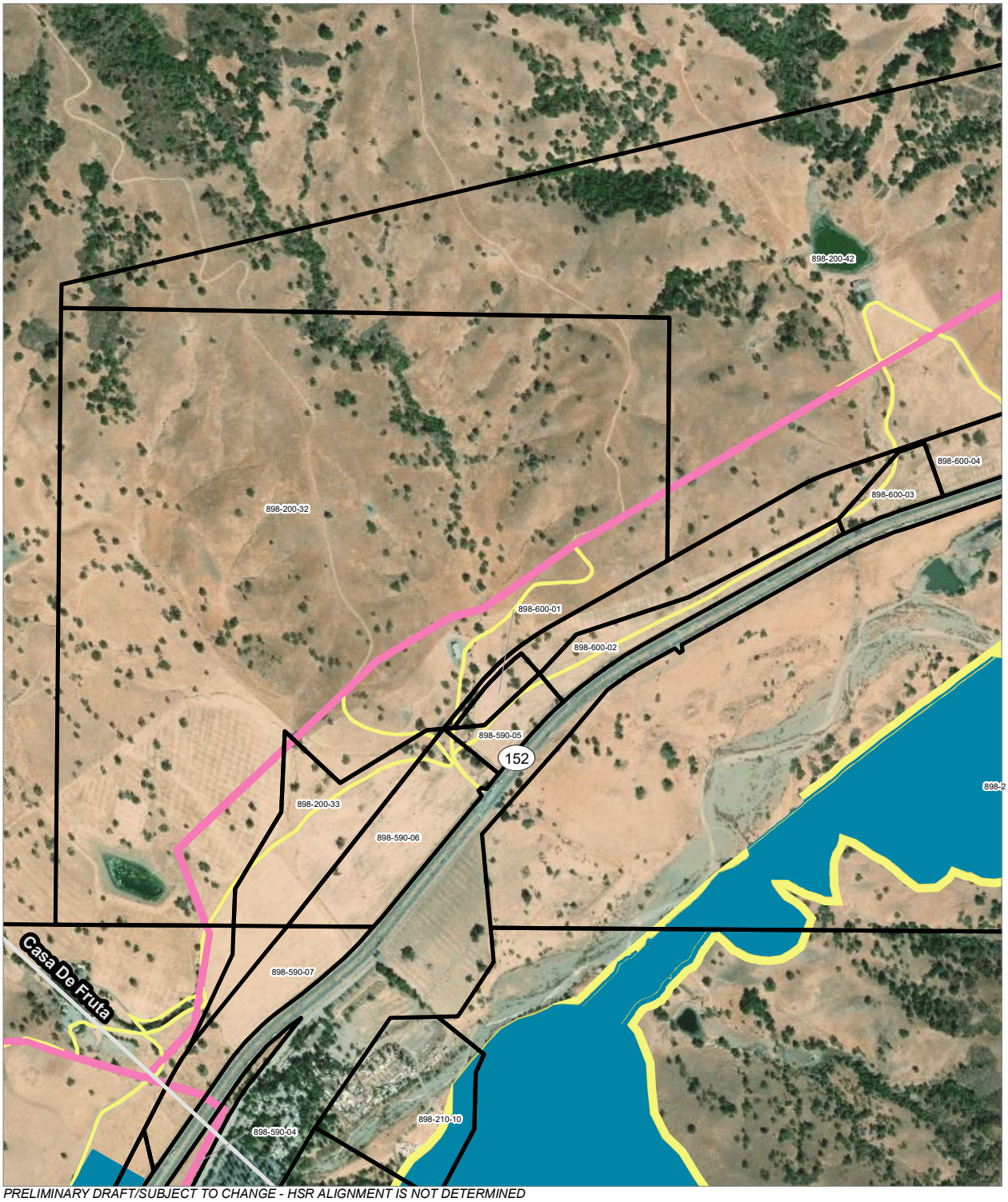


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

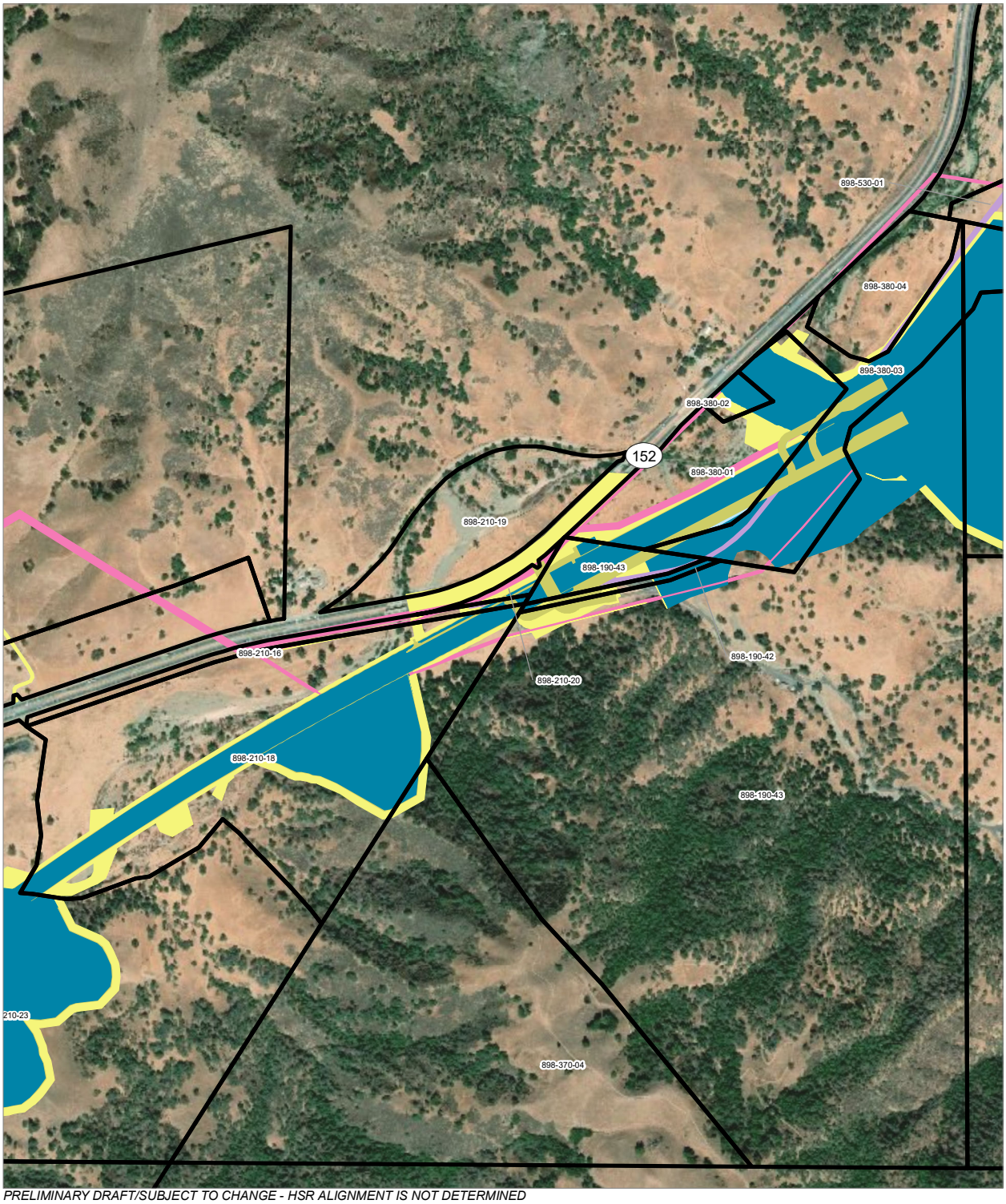


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

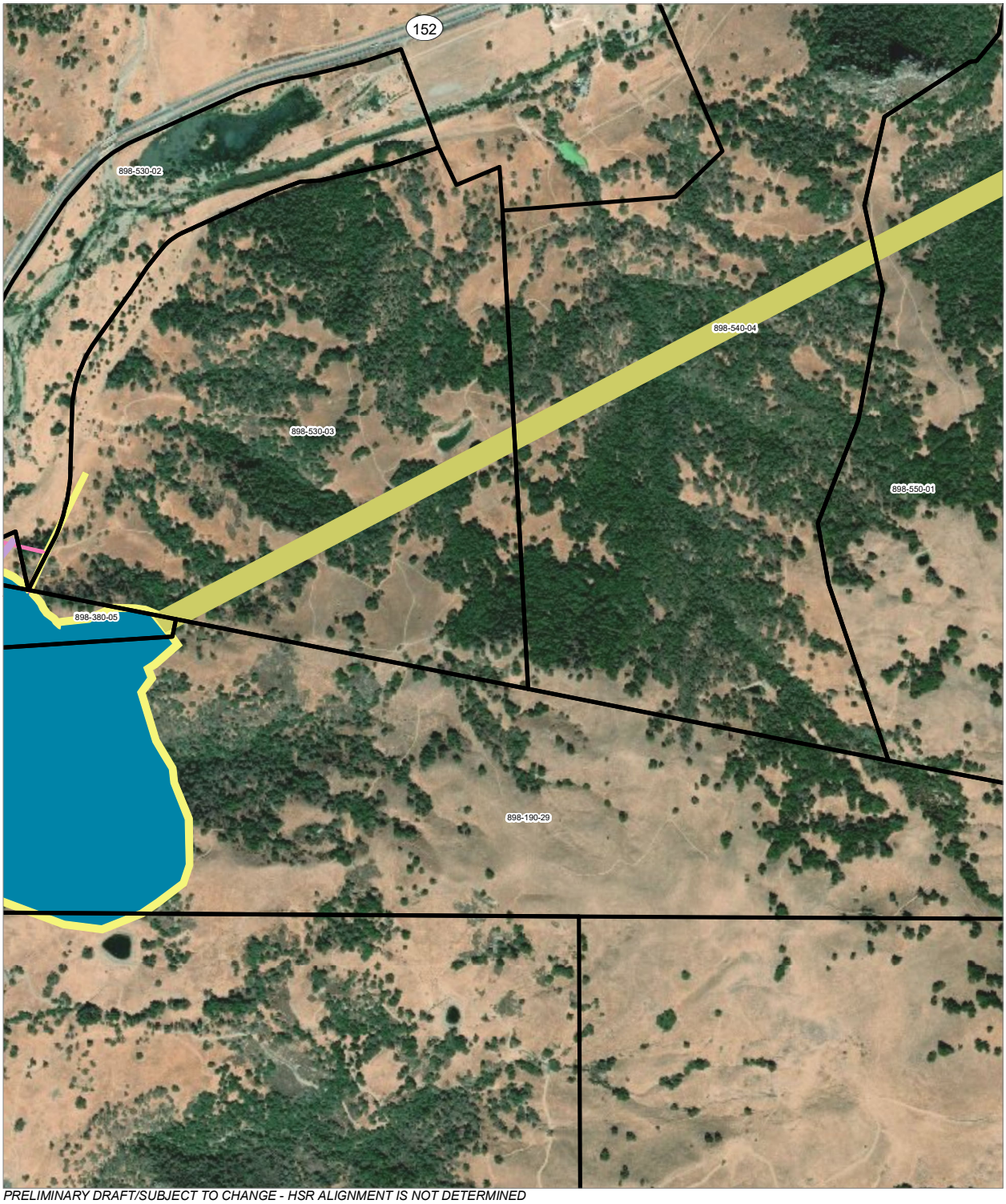


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

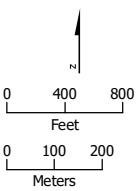
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Other Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

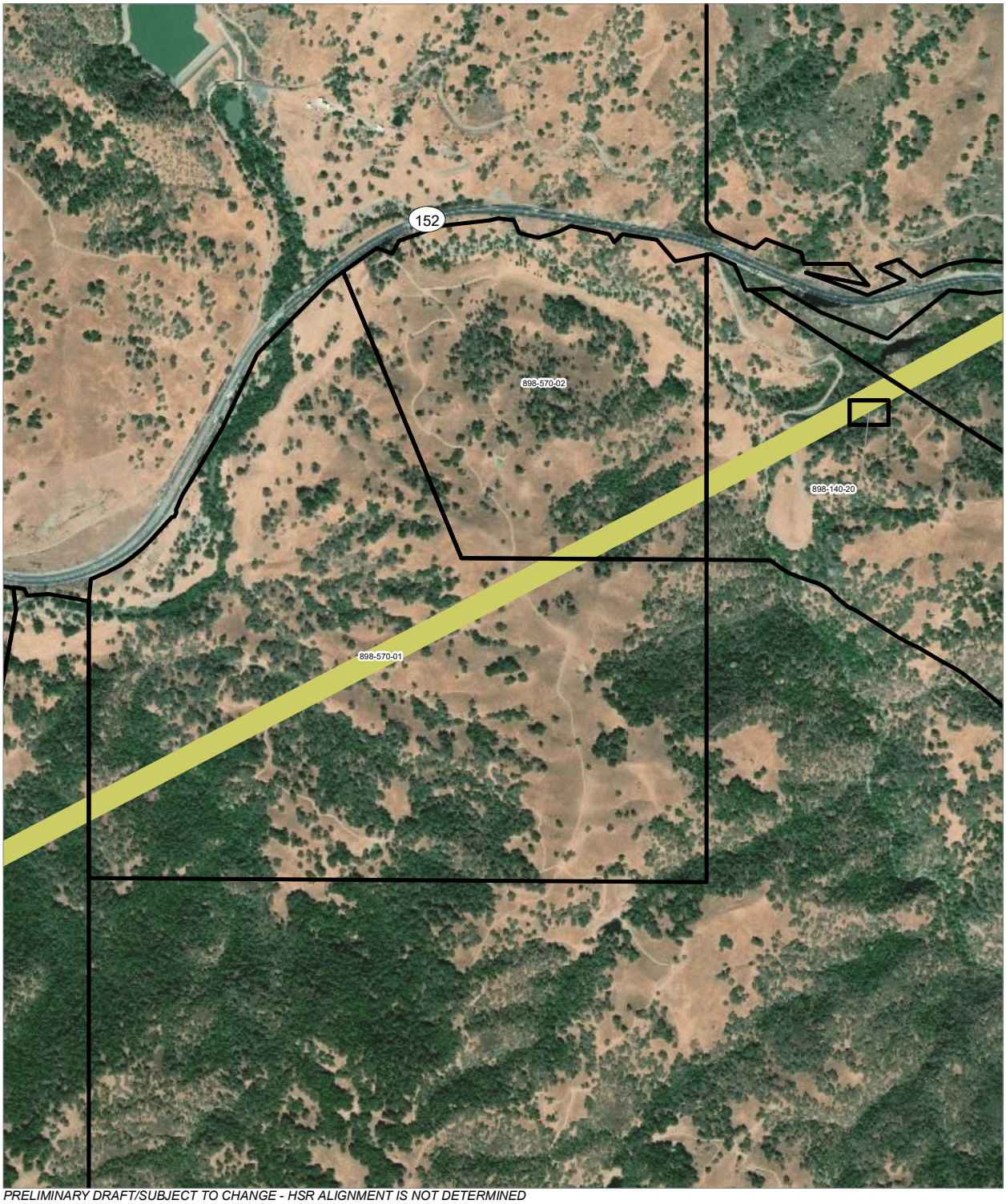


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

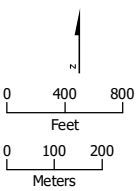


HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

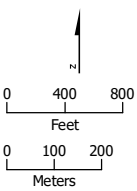


HSR Permanent Easement

Parcel (APN Displayed)

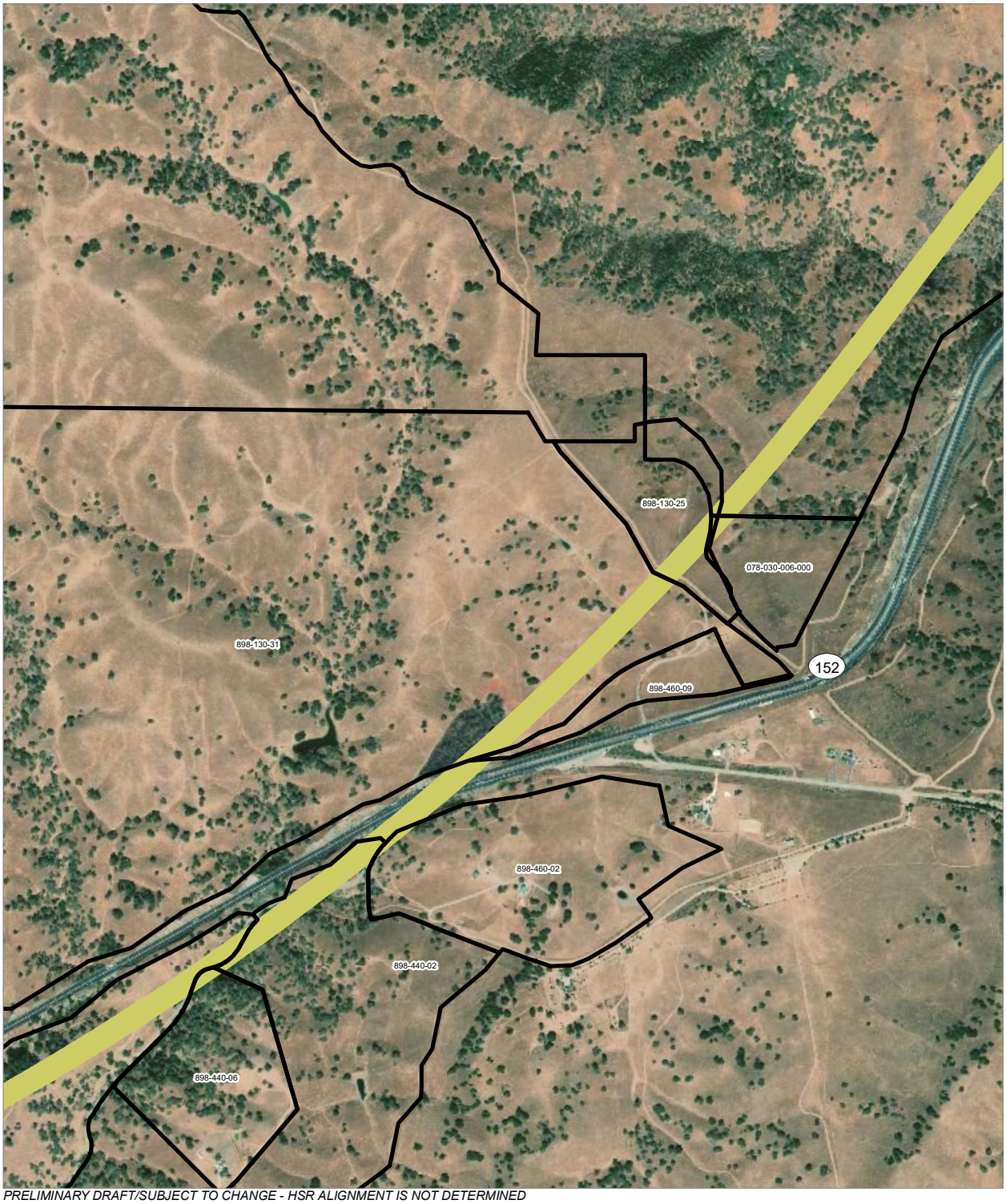
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Permanent Easement

Parcel (APN Displayed)

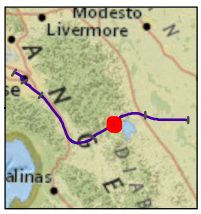


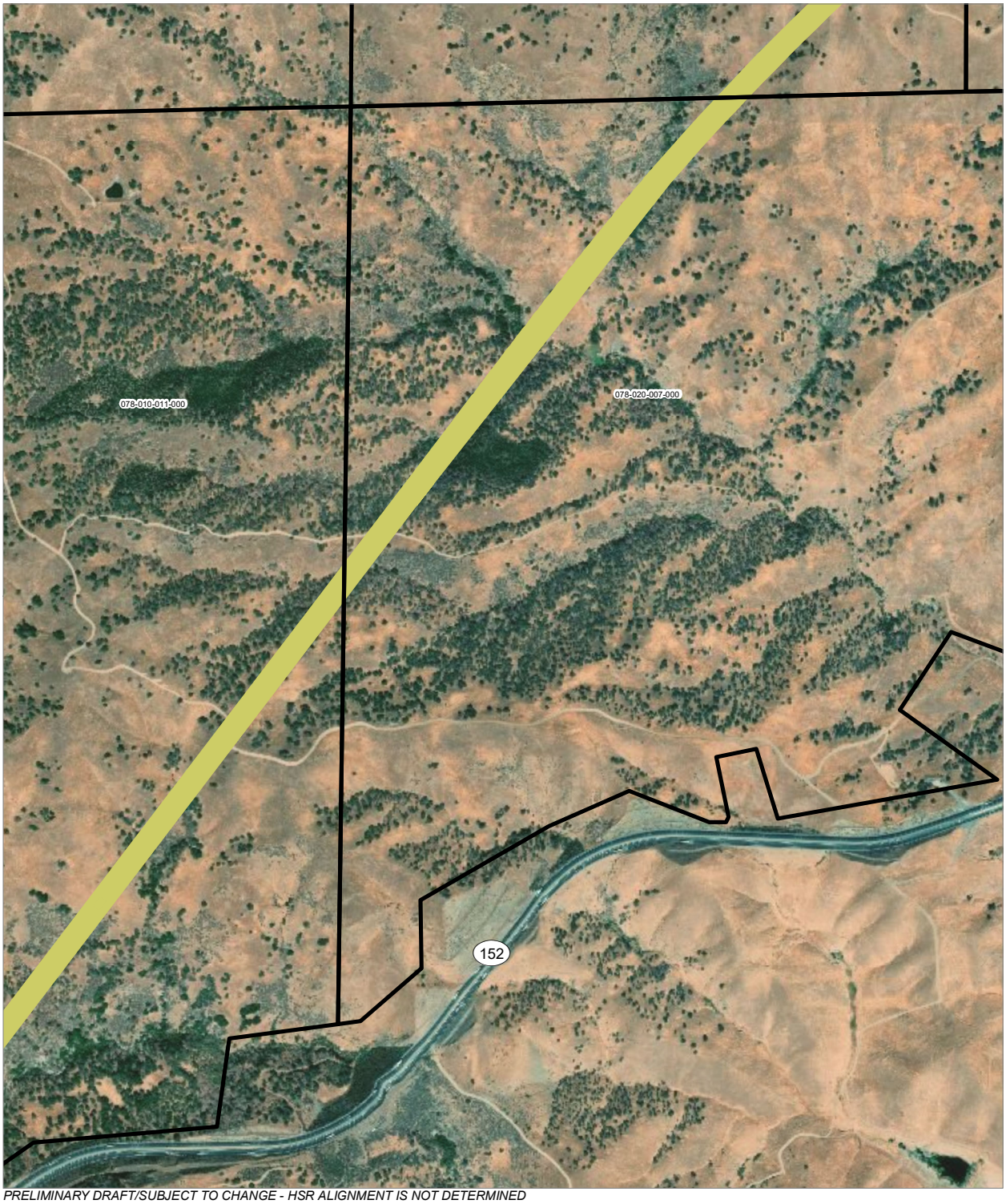
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

HSR Permanent Easement
Parcel (APN Displayed)





PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

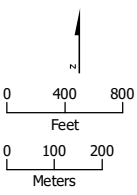
Alternative 2

0 400 800
Feet
0 100 200
Meters

HSR Permanent Easement
Parcel (APN Displayed)

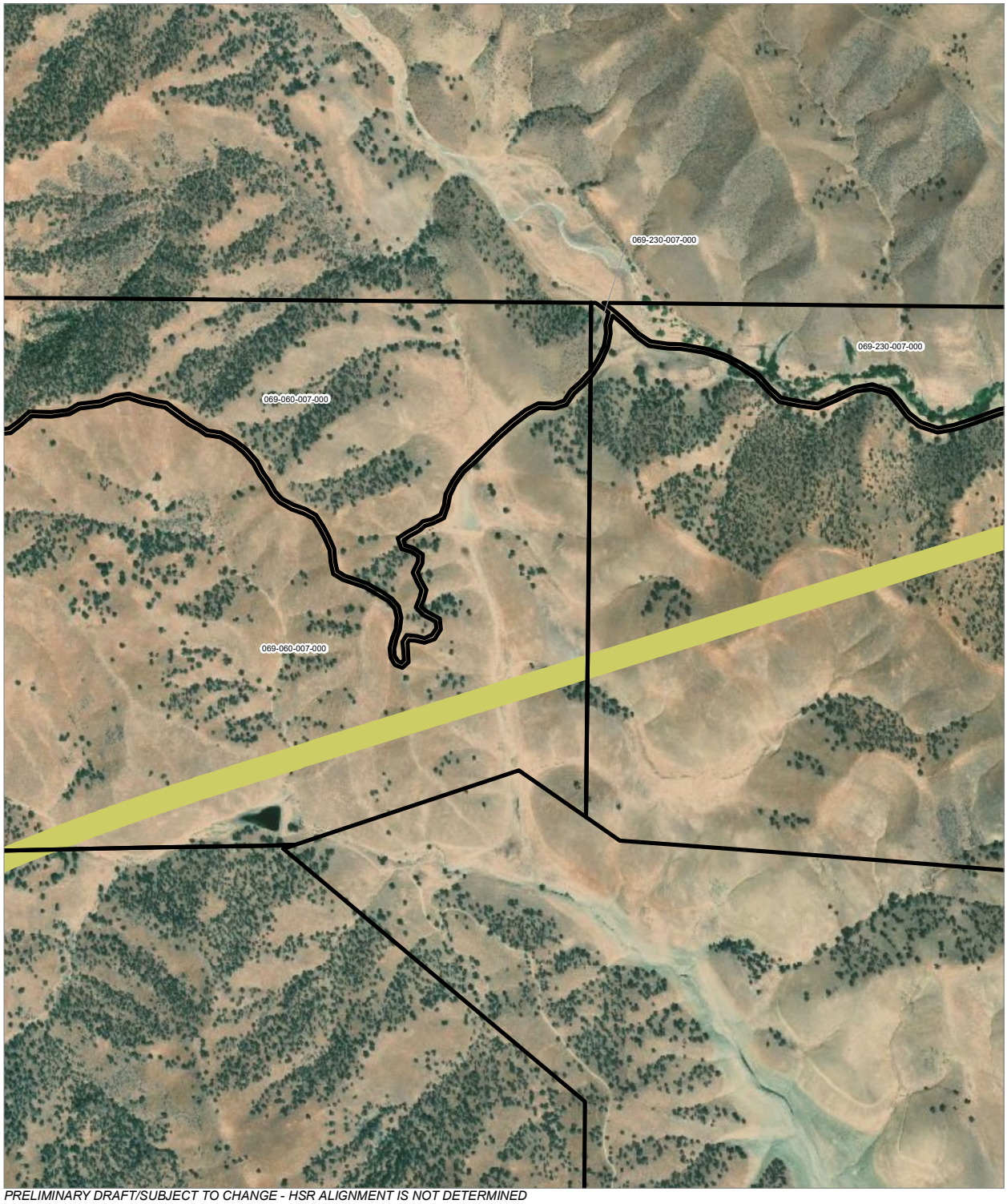
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



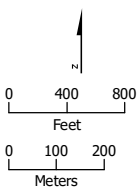
HSR Permanent Easement

Parcel (APN Displayed)



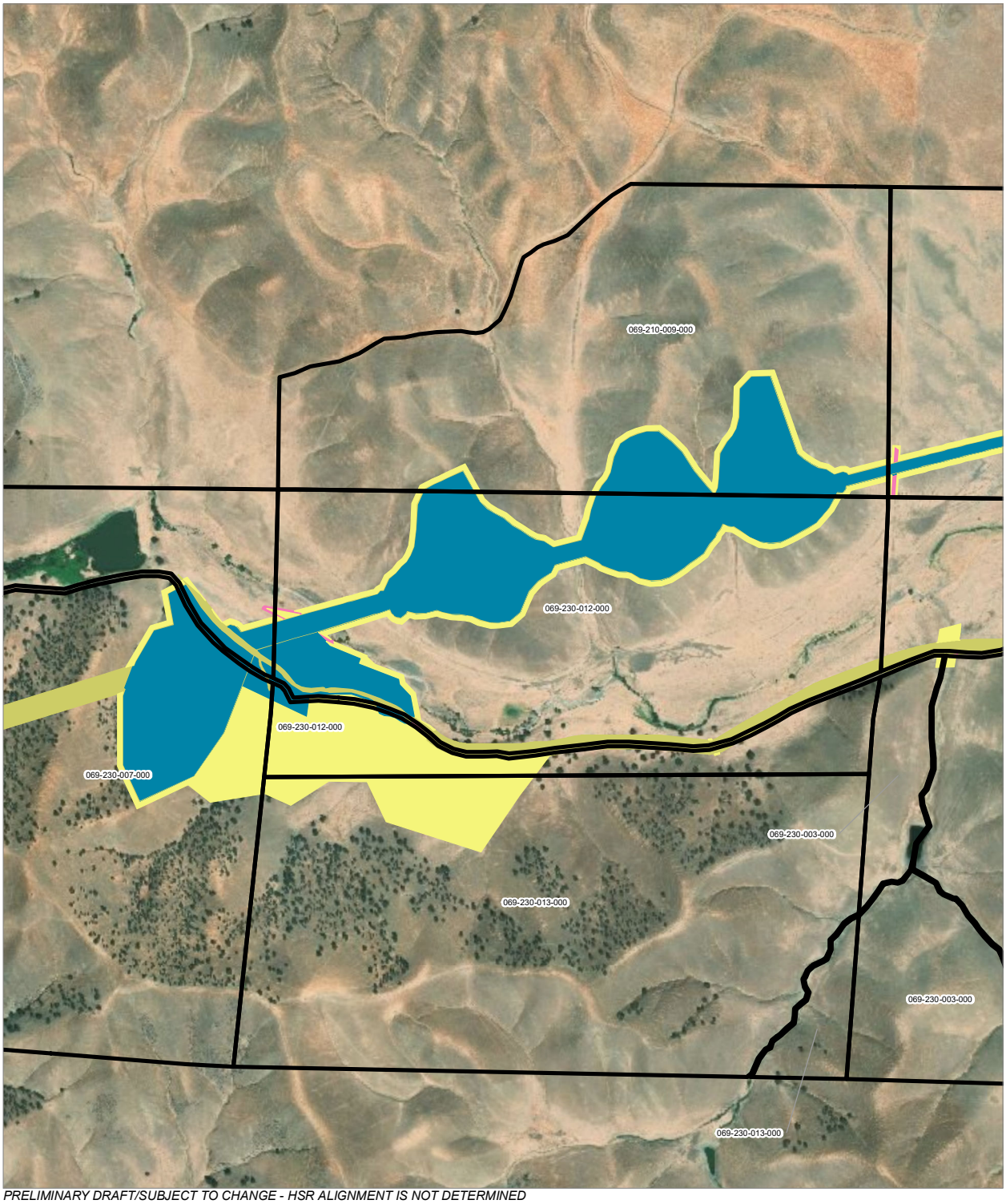
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Permanent Easement

Parcel (APN Displayed)

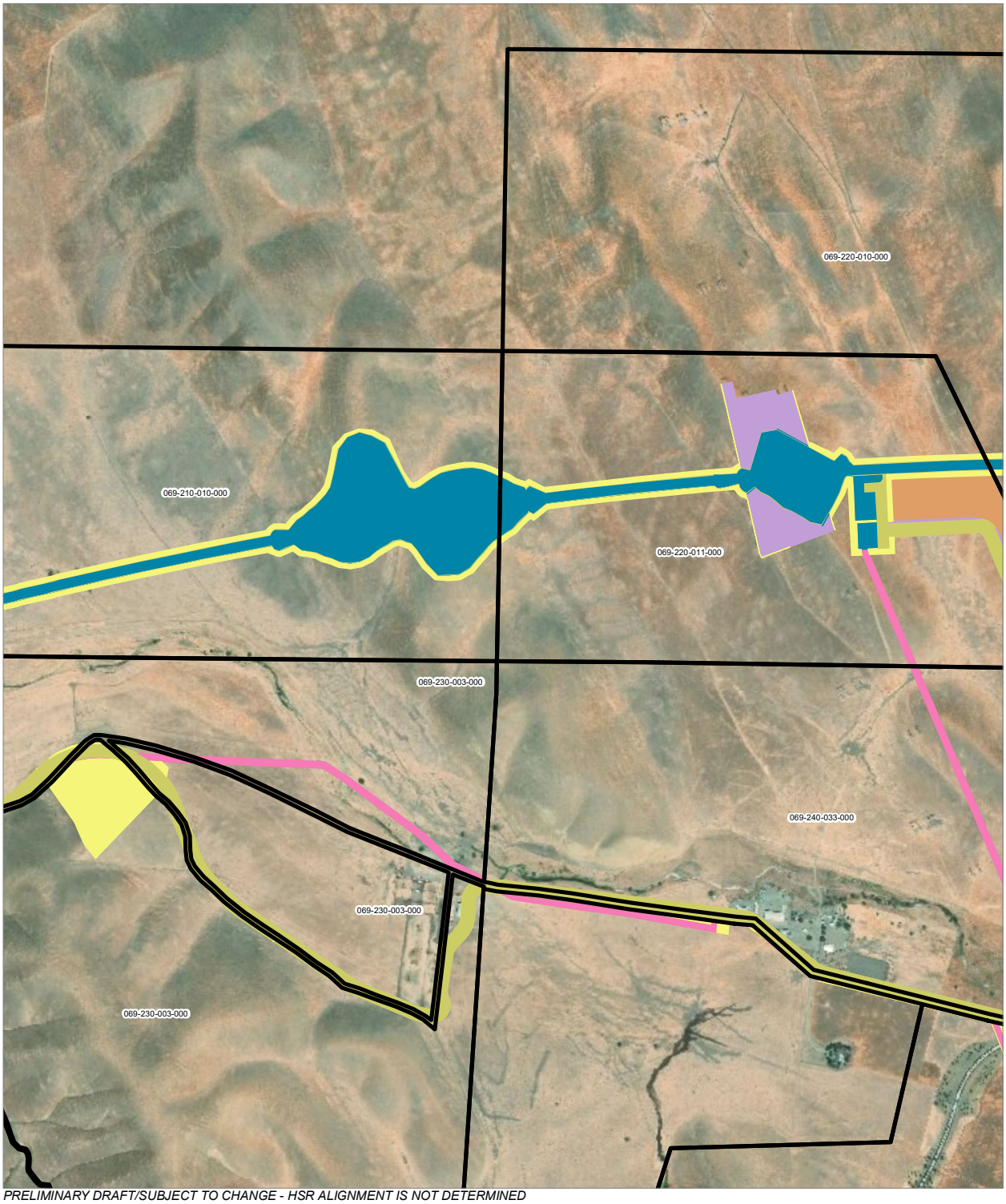


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

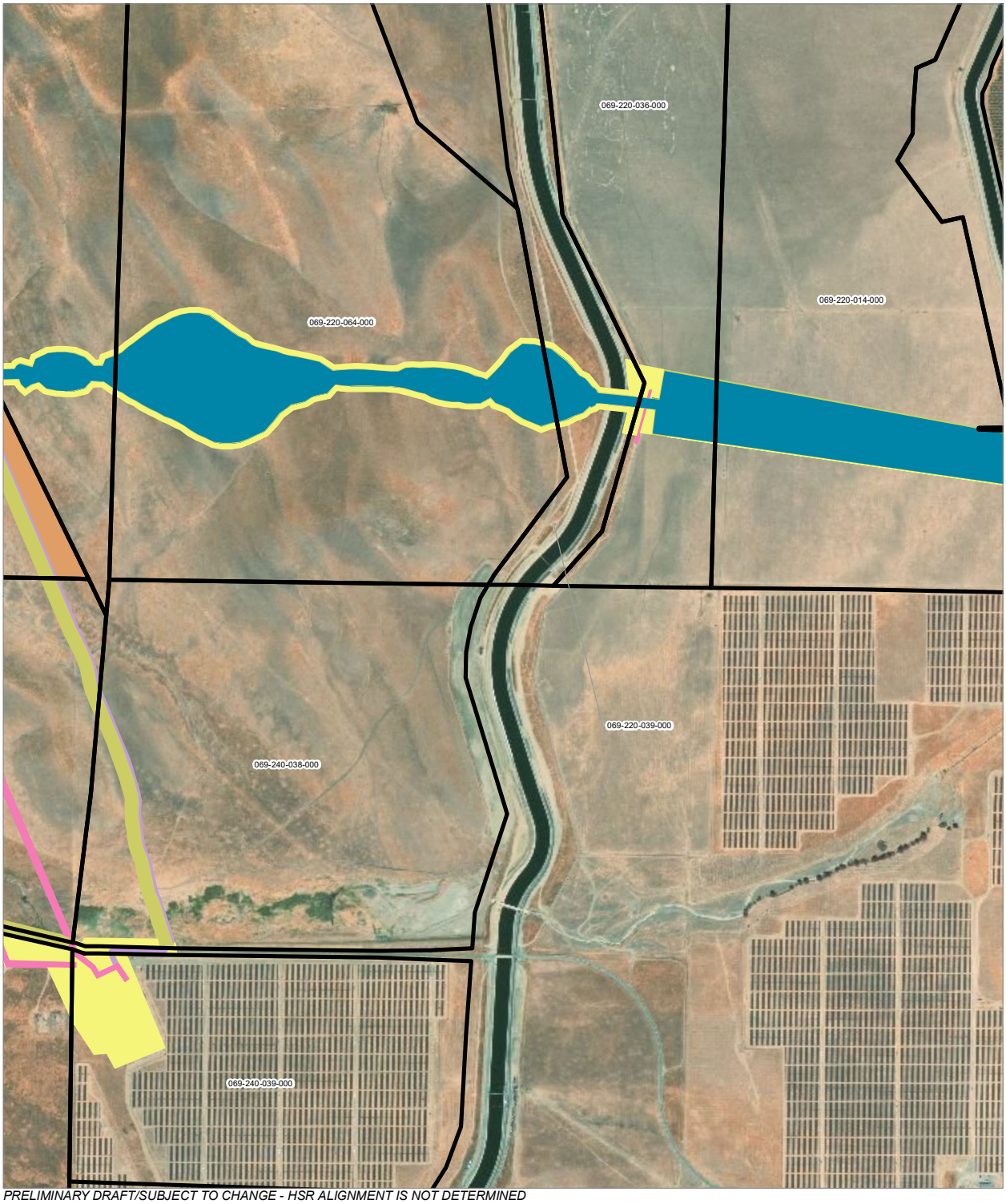


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

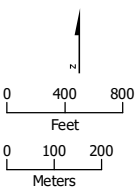
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

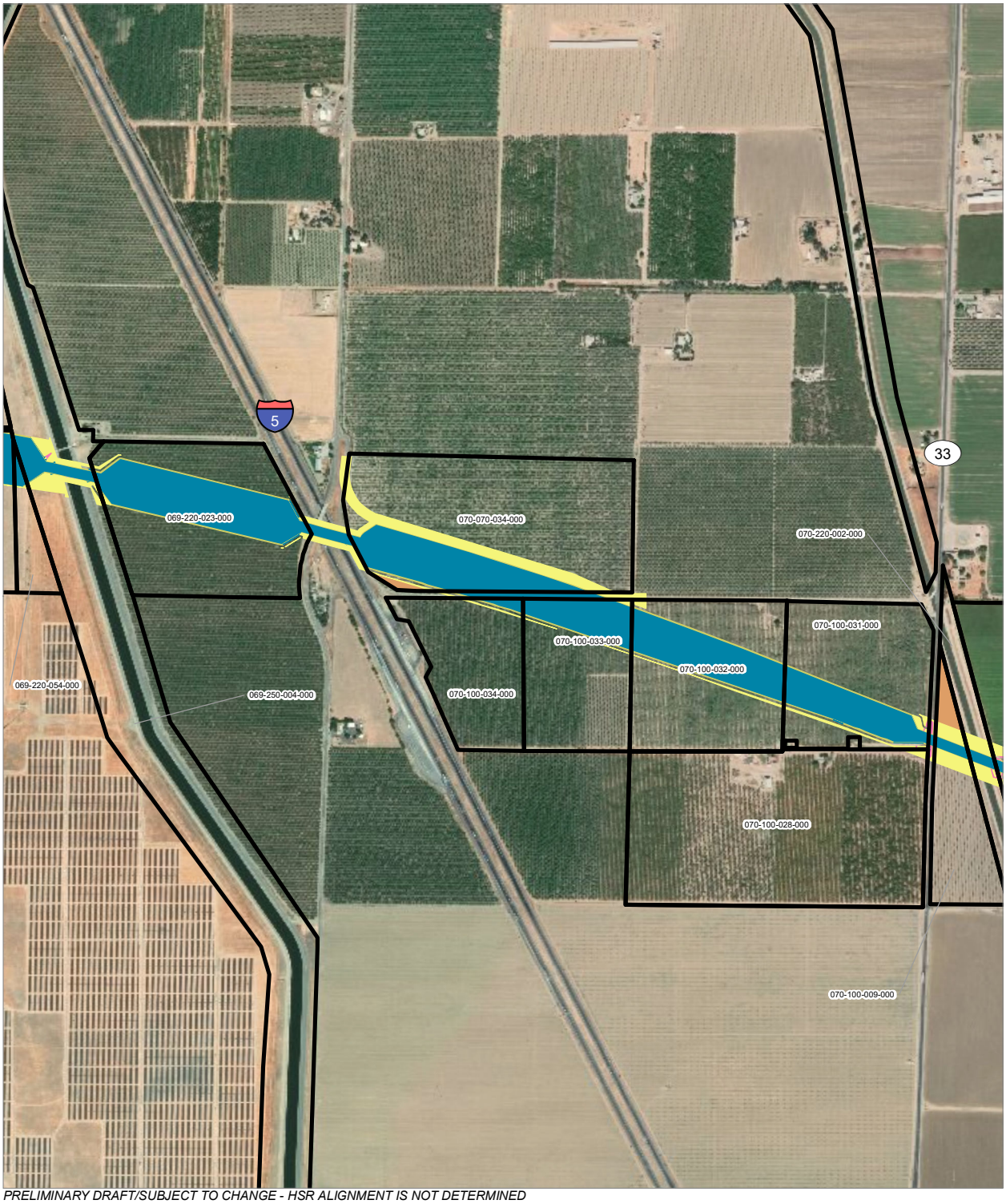


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

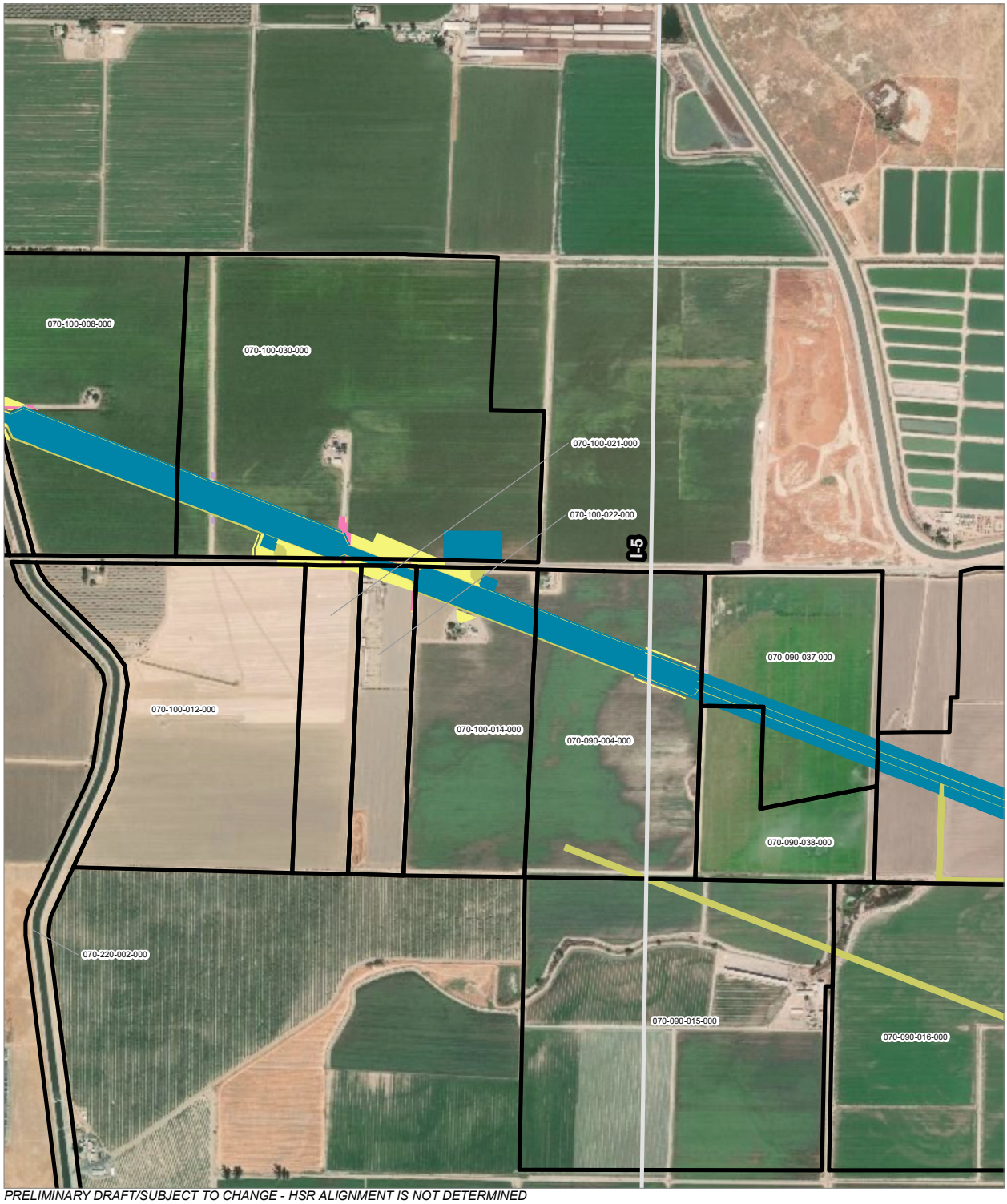


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

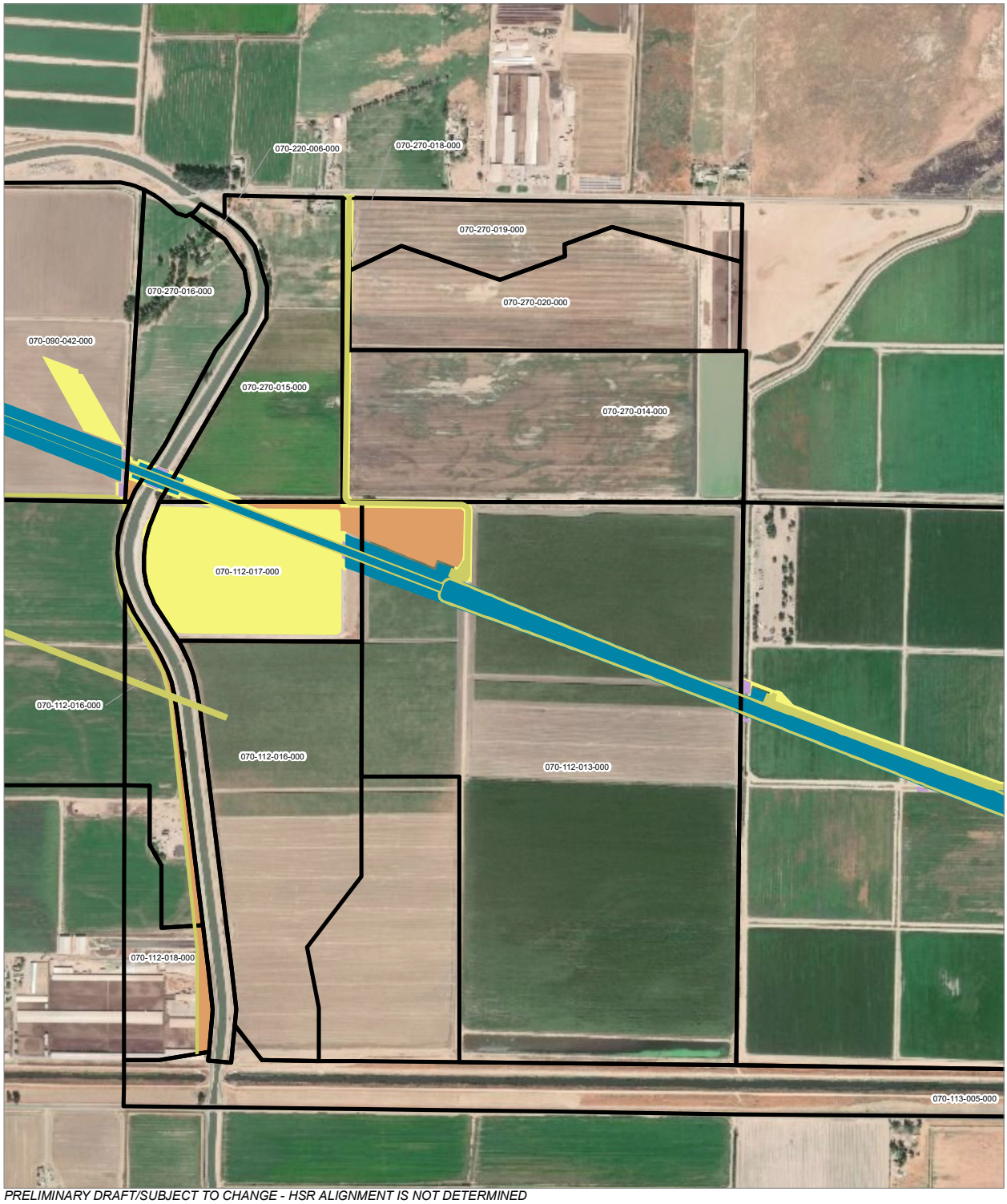


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

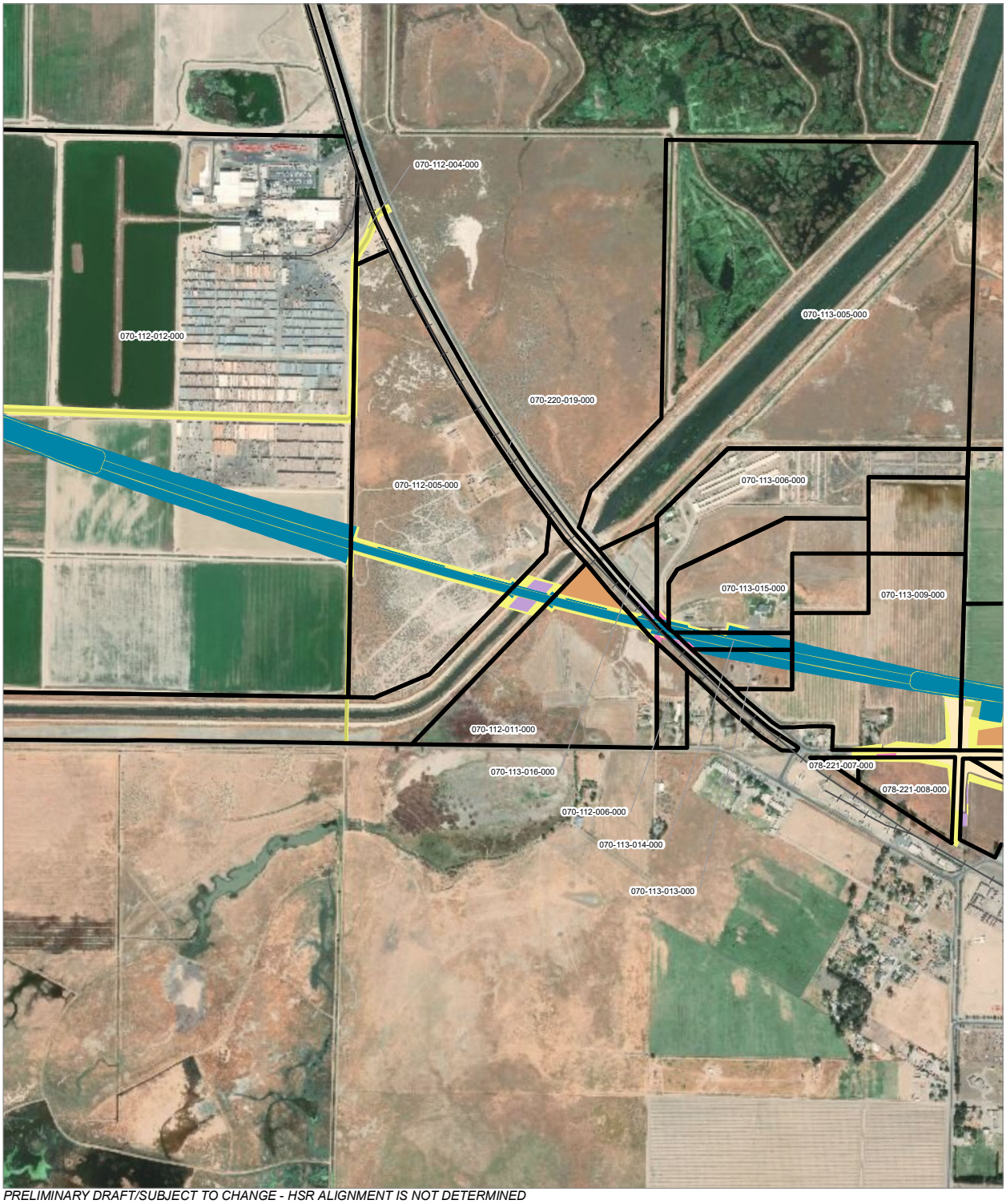


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

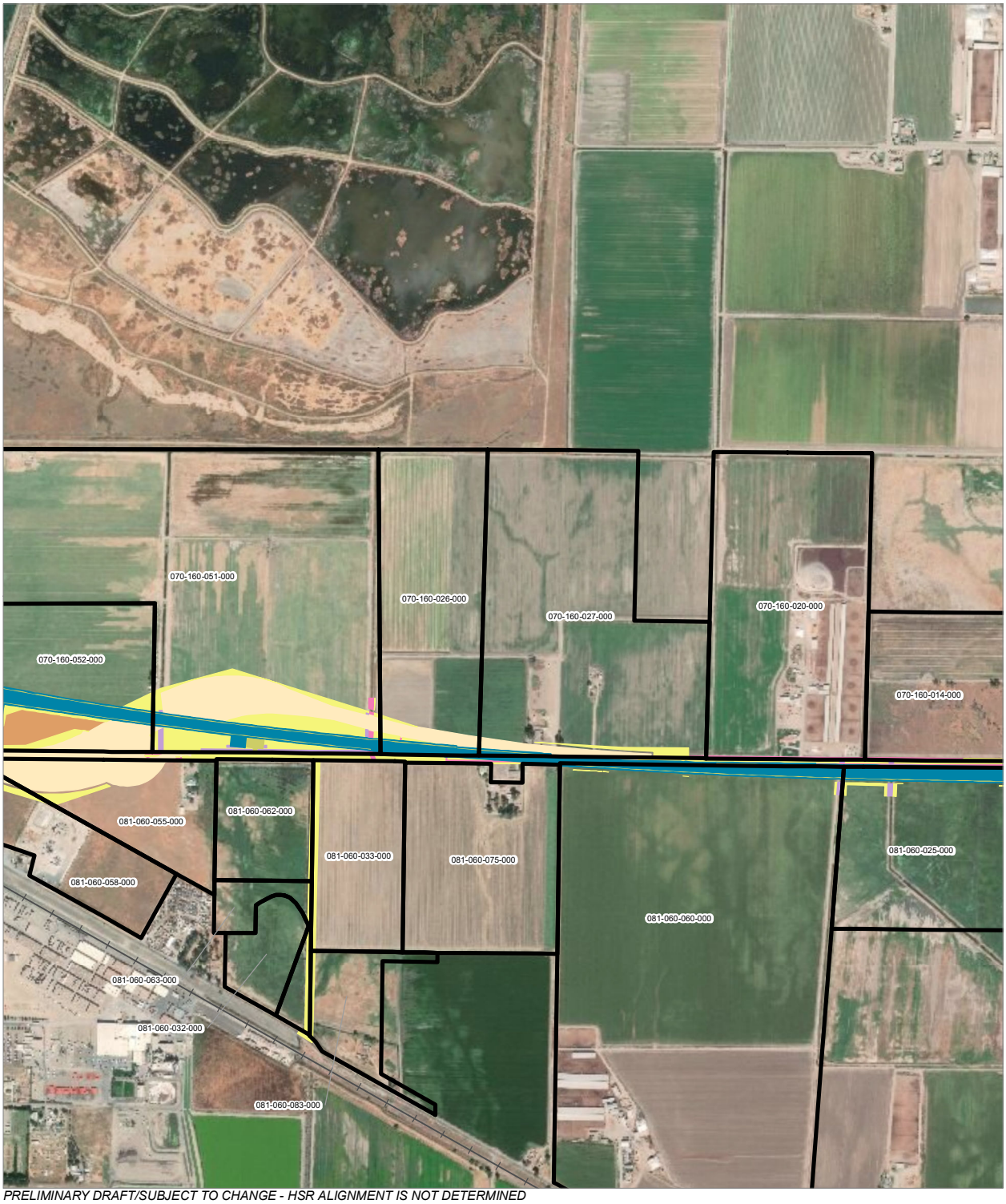
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

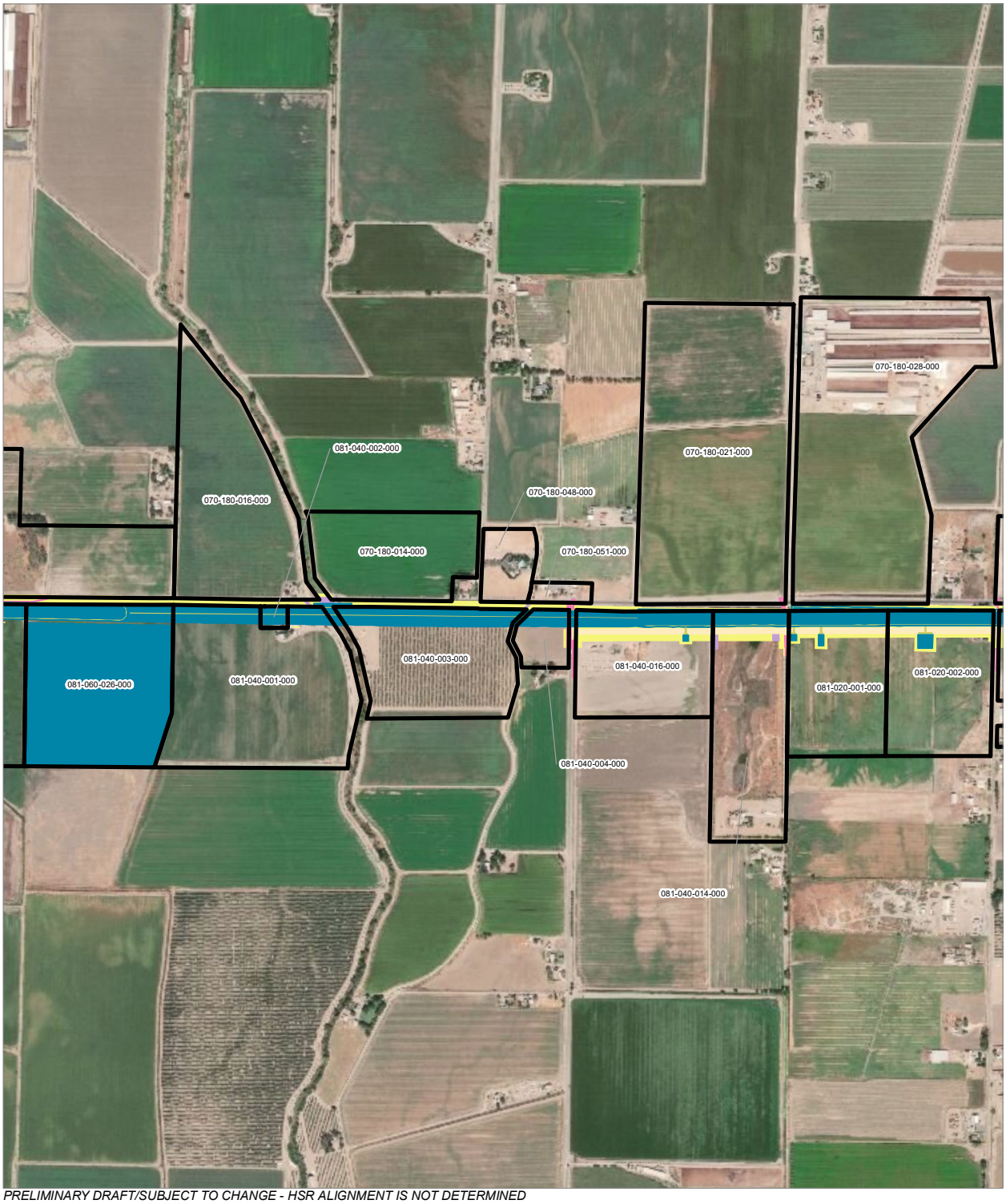


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

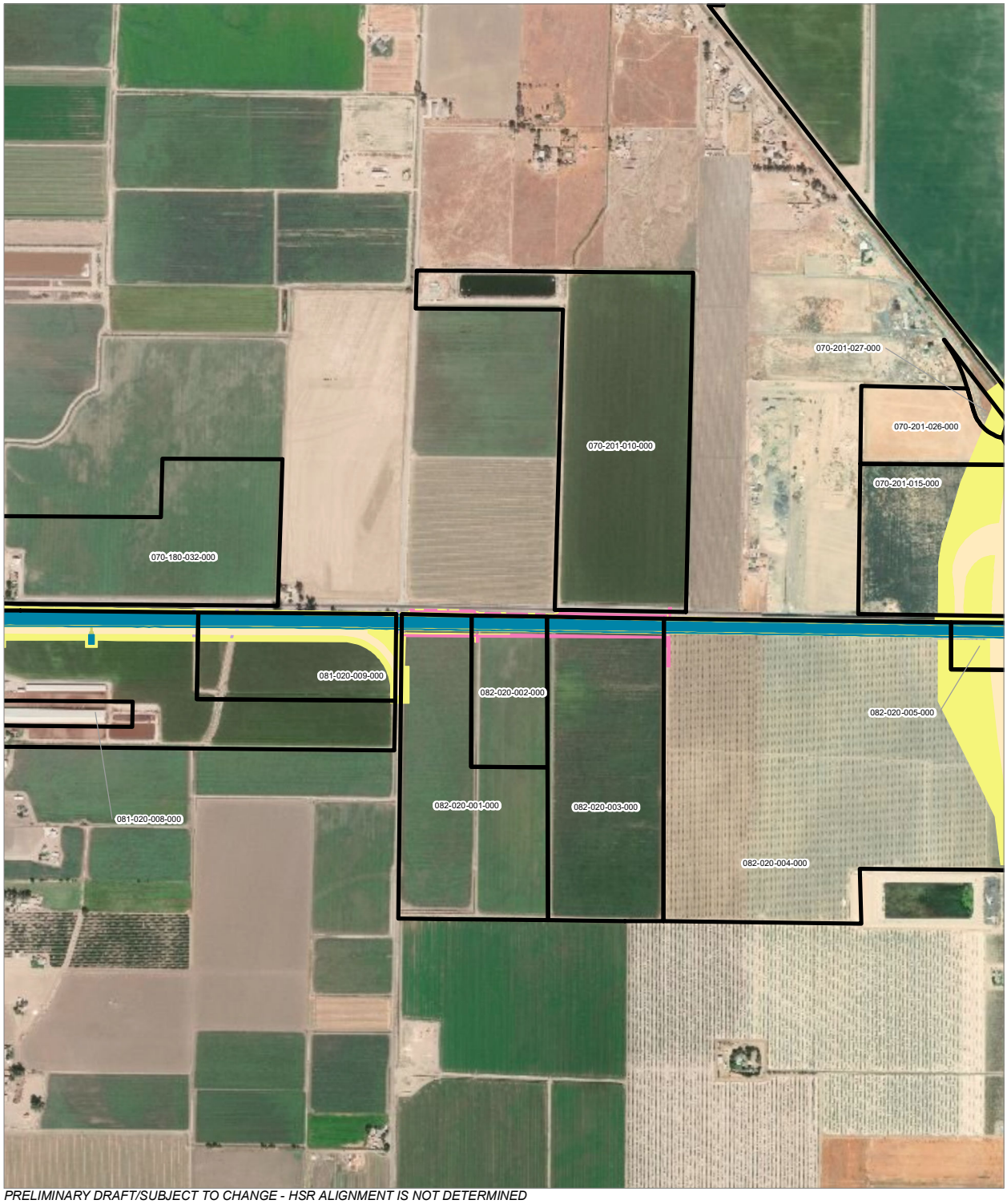


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

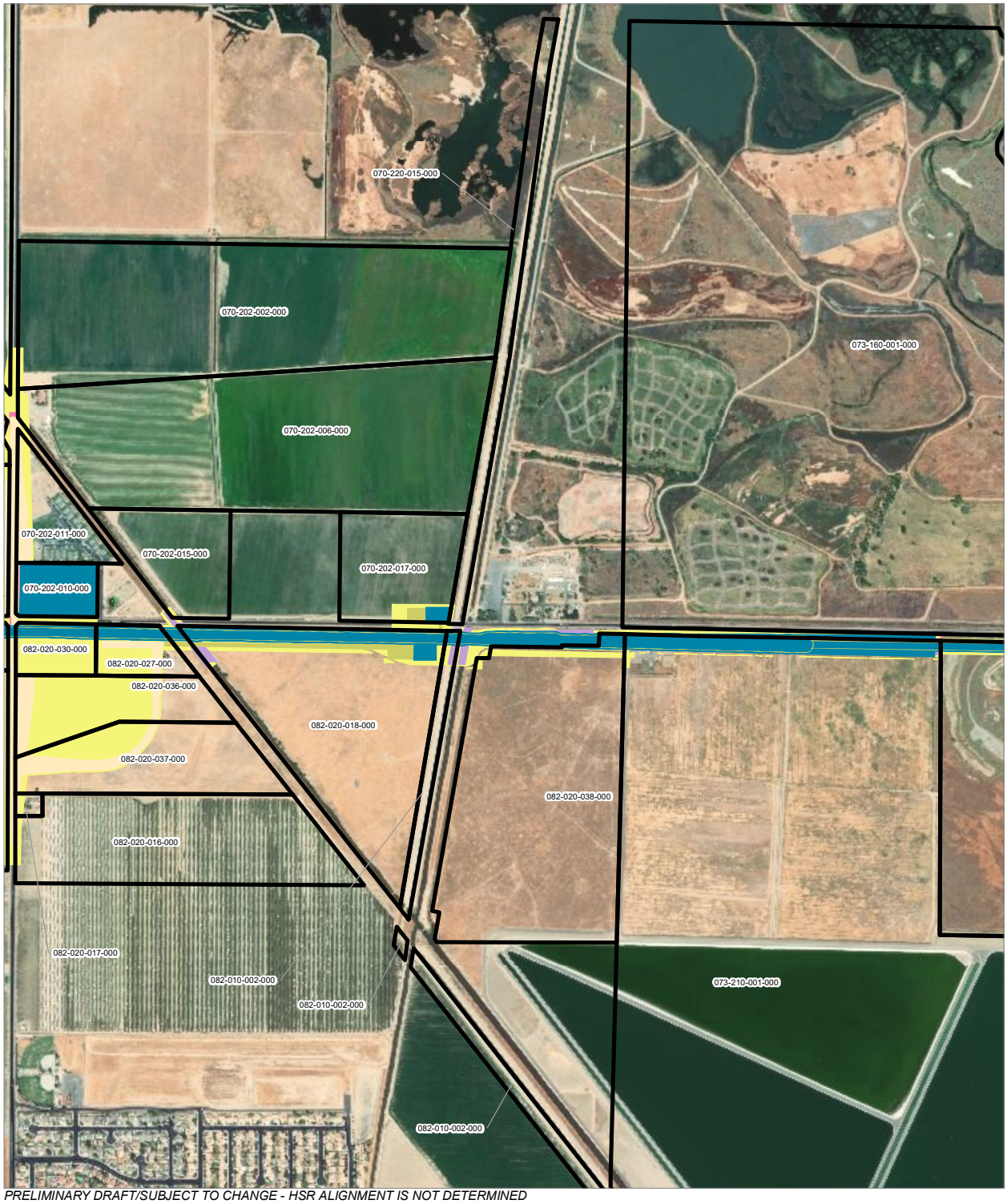


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

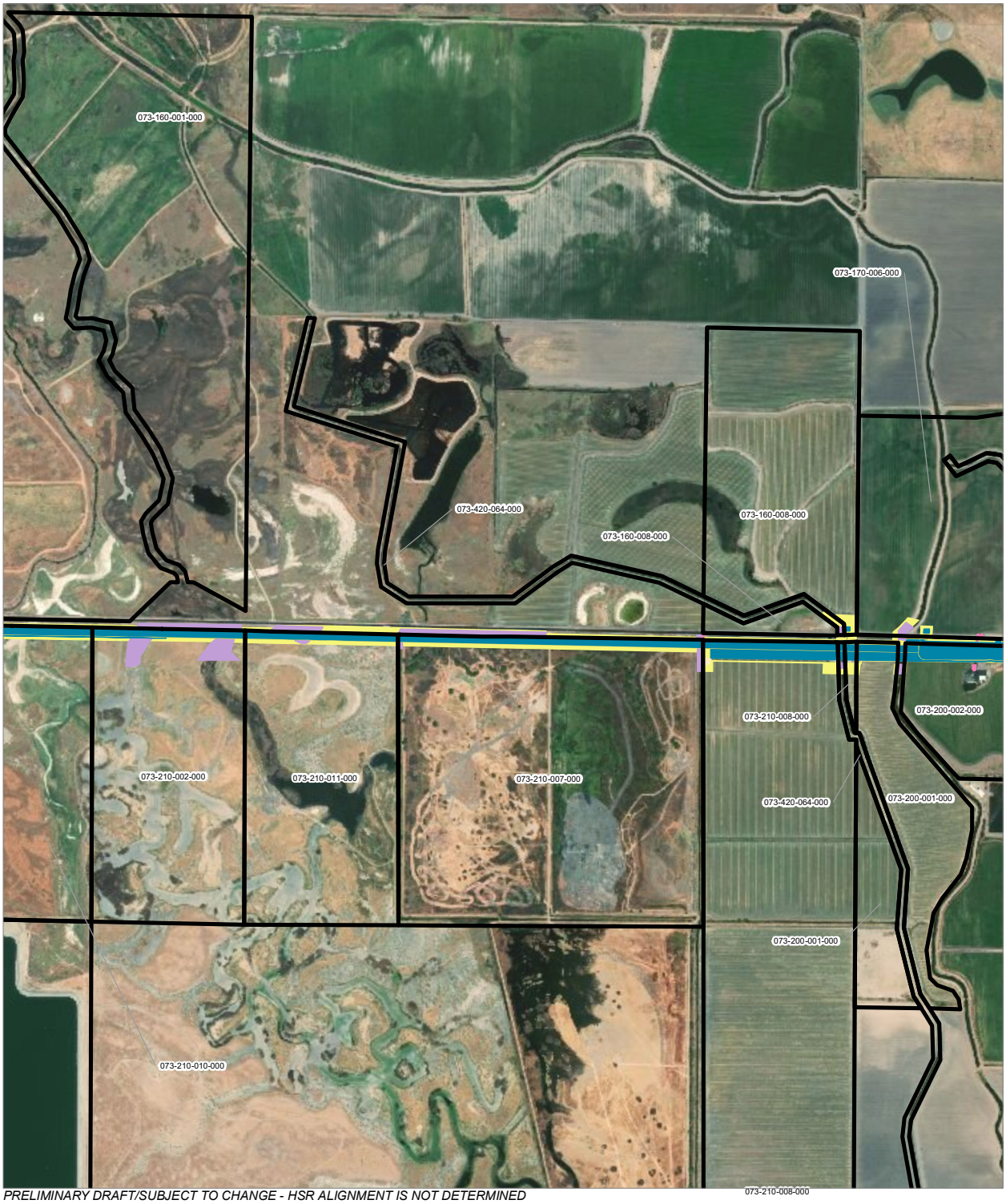


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

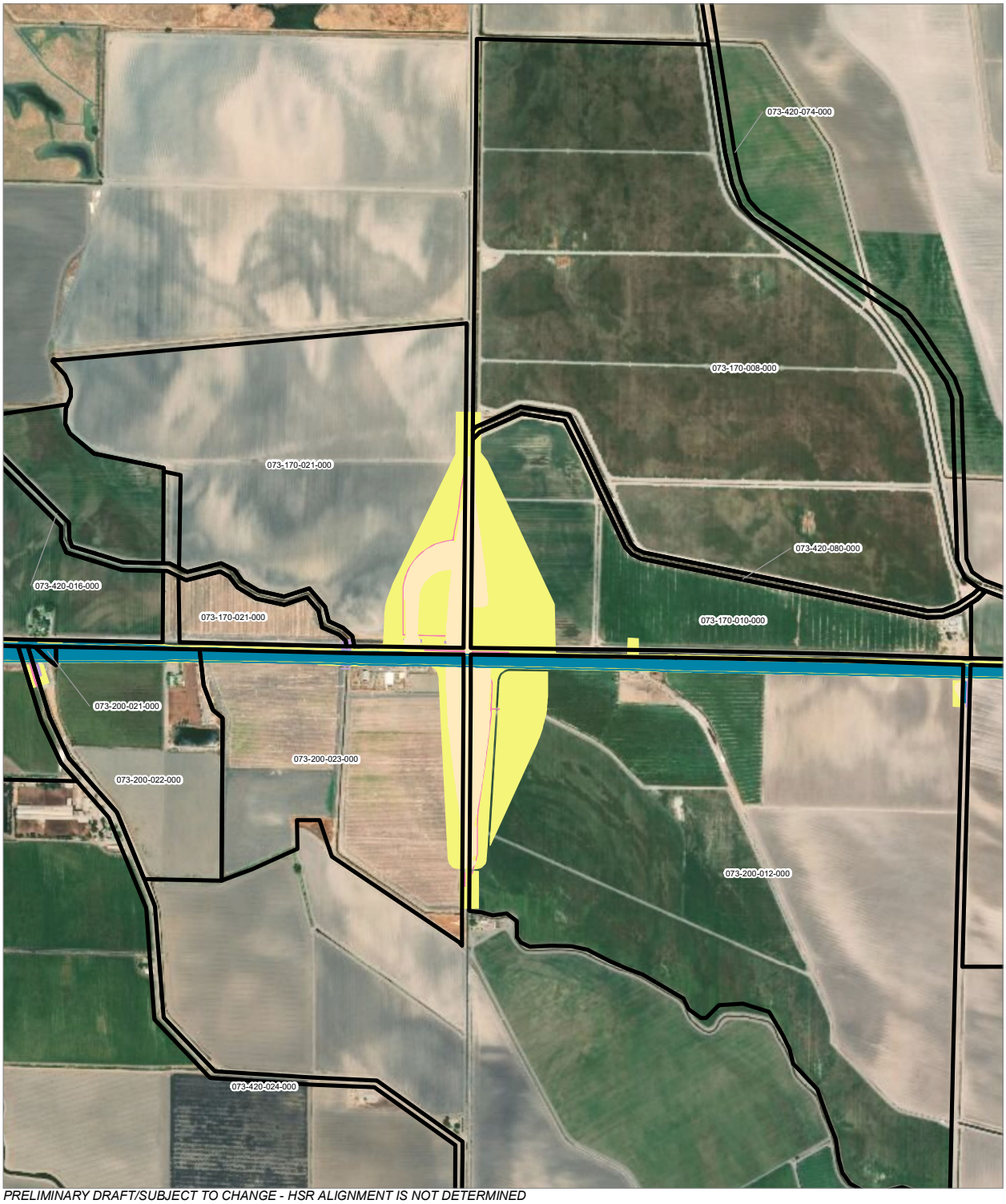


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

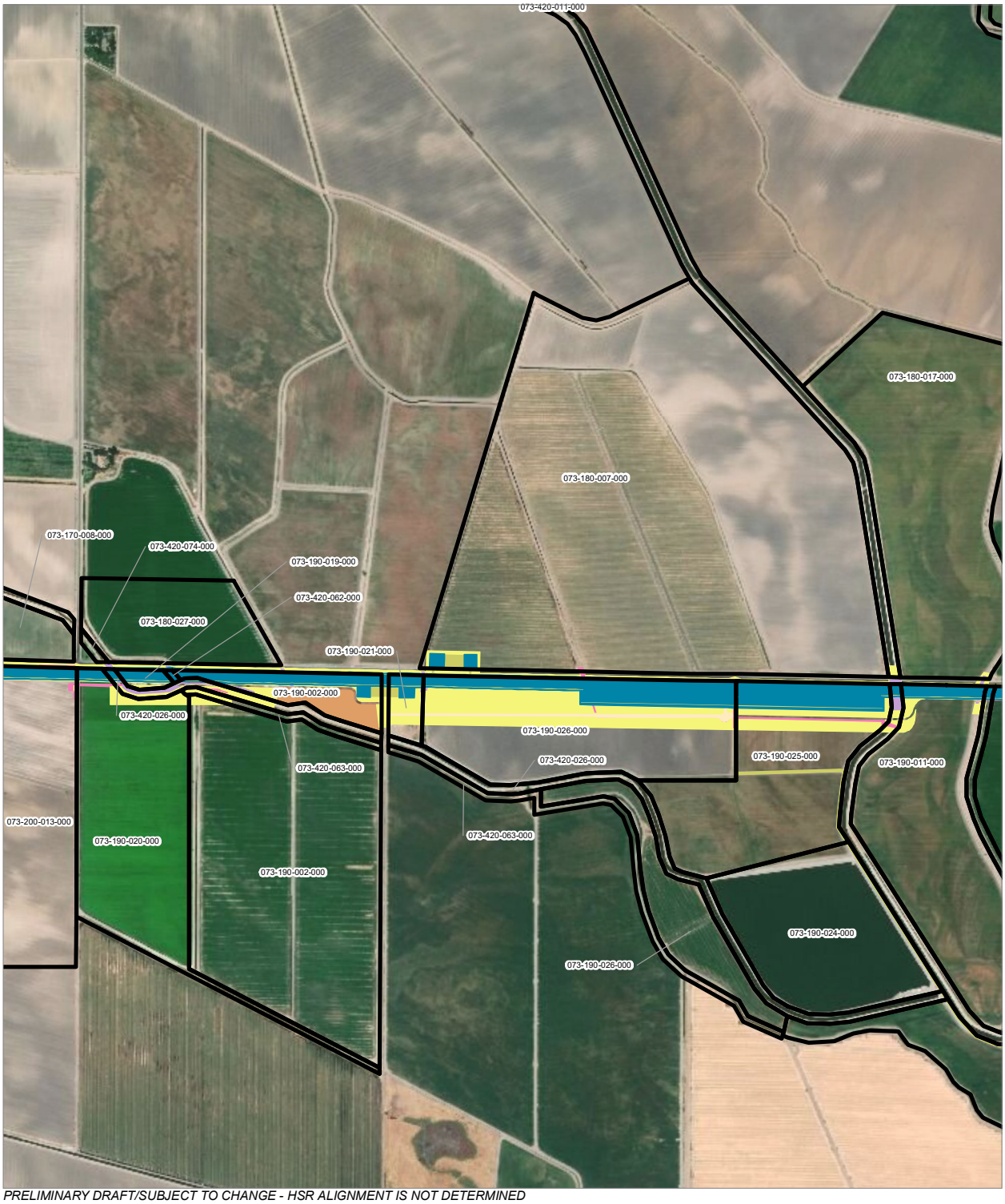


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

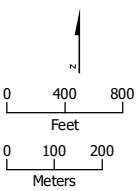
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

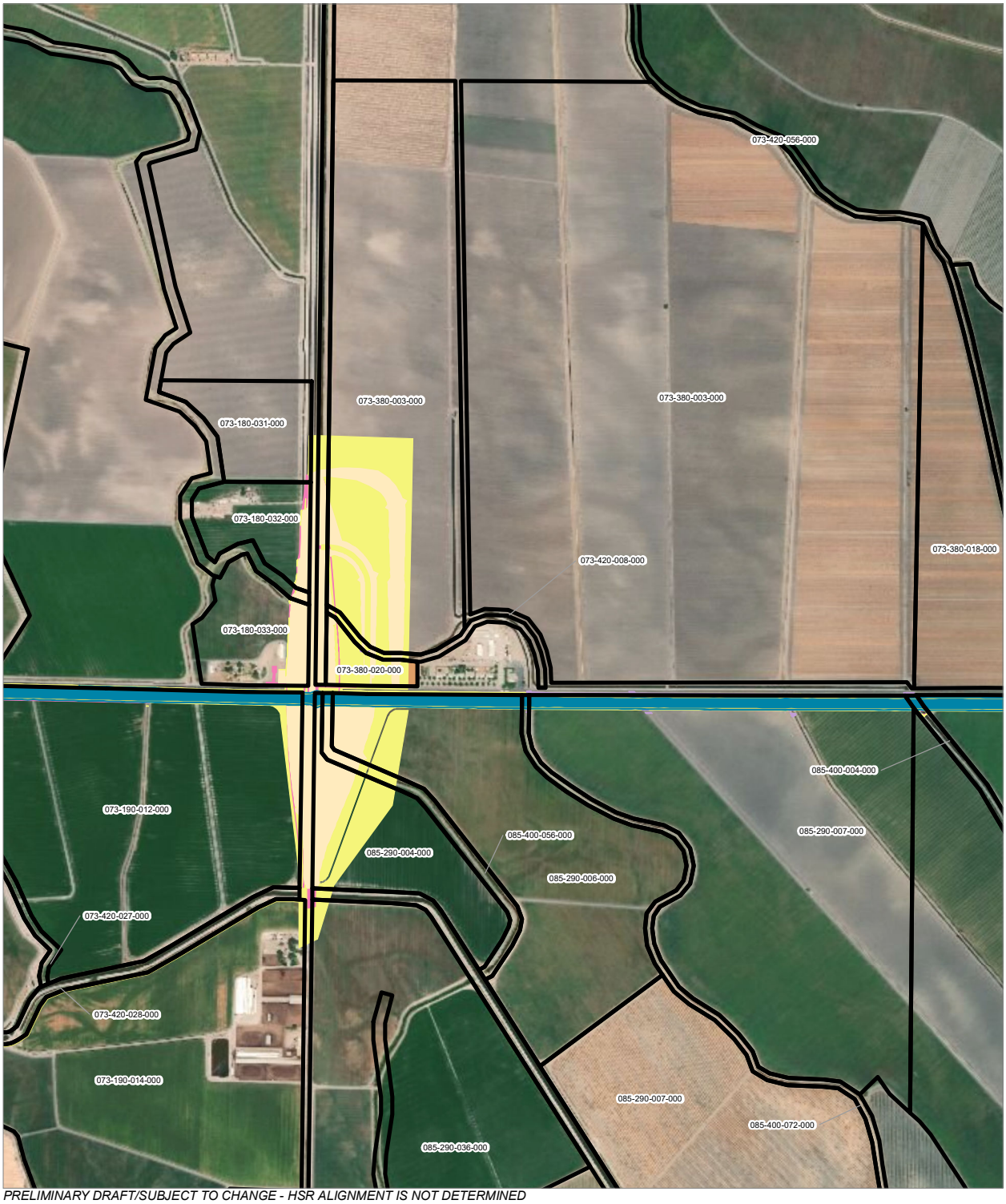


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

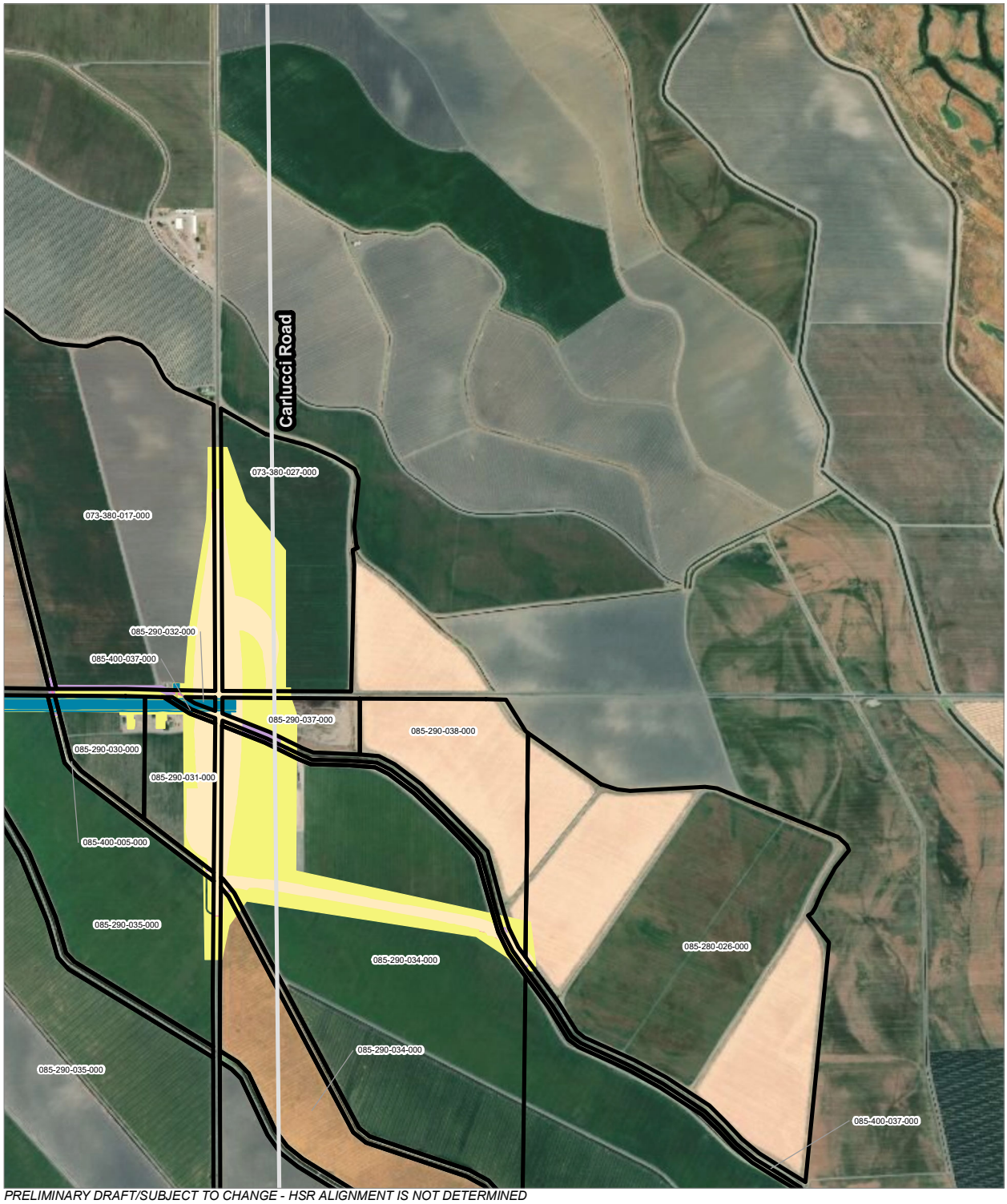


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; San Jose County, 2016; San Benito County, 2016; Merced Counties, 2016.

Alternative 2

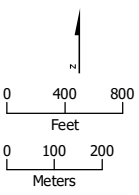
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

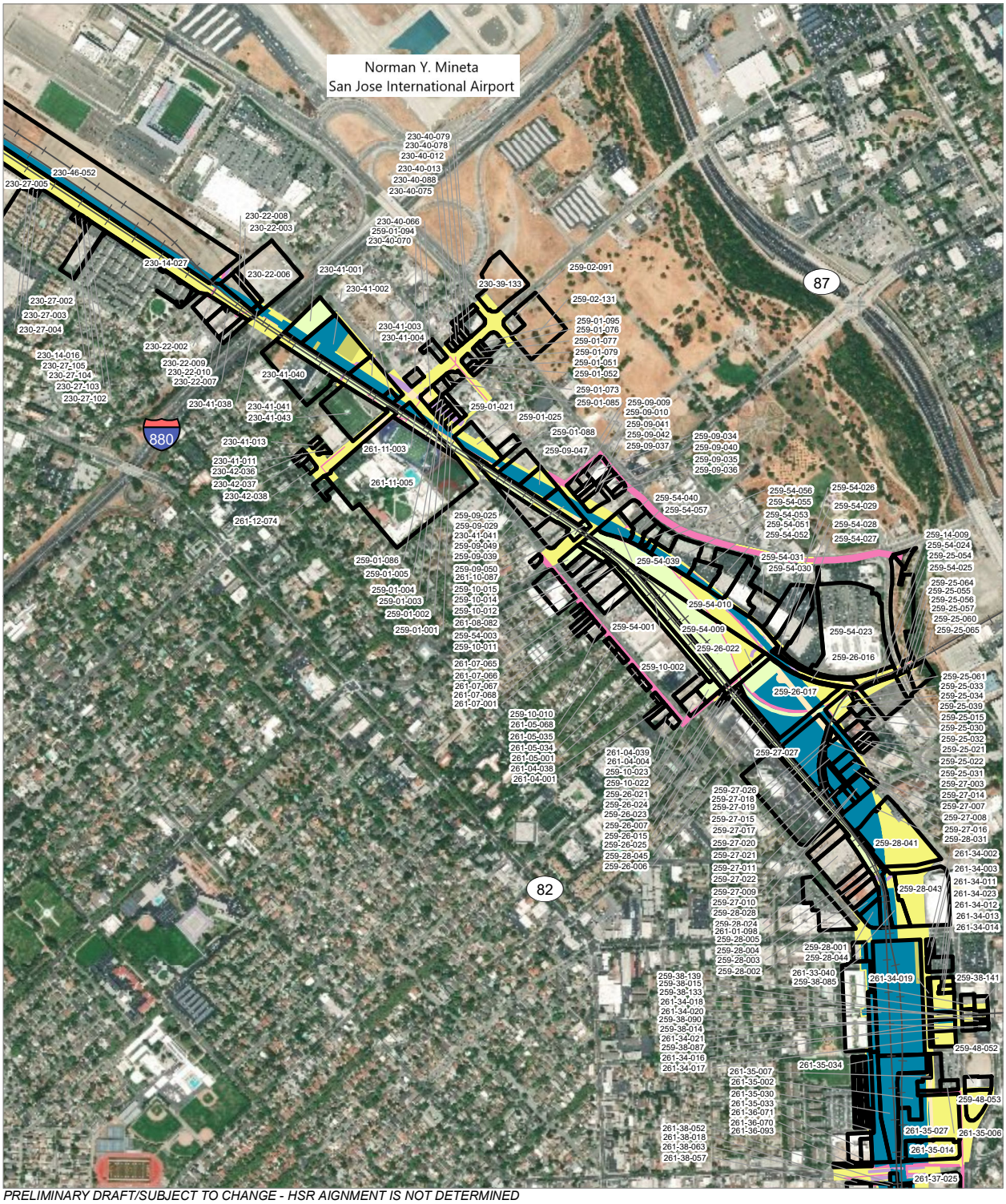
APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 3, Part 1)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

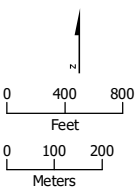


HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

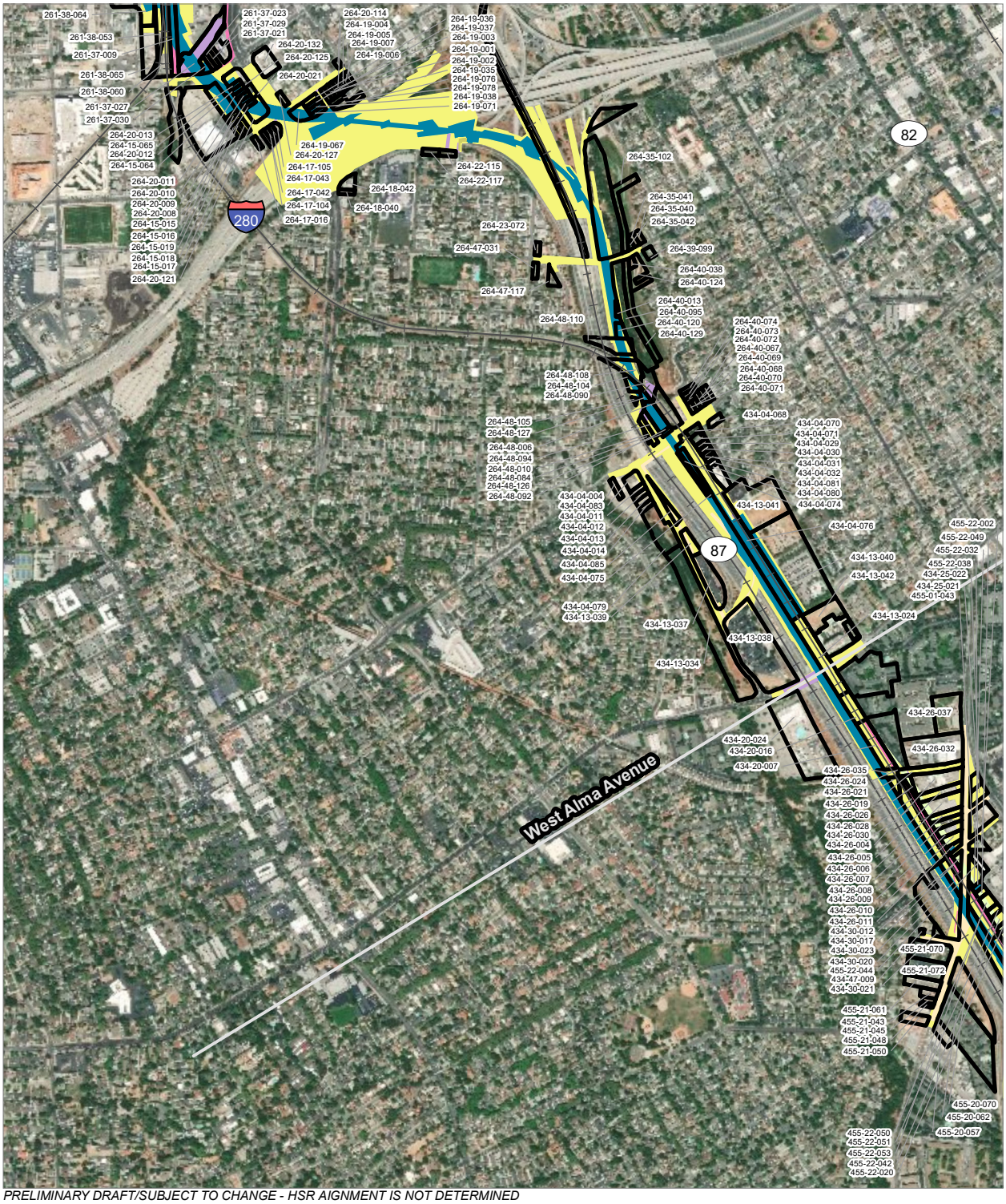


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

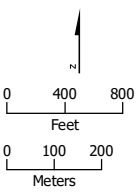


HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

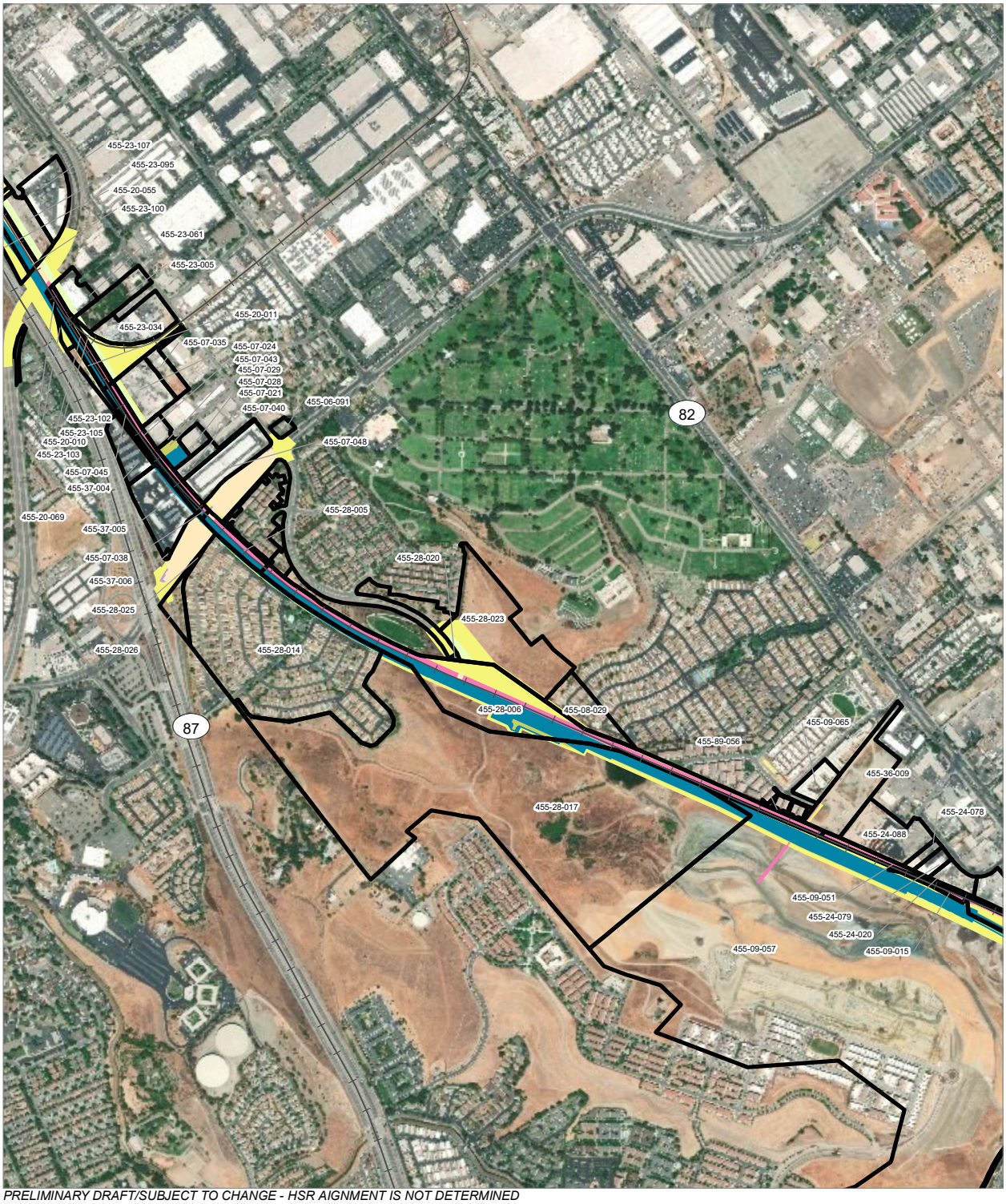


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3



- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

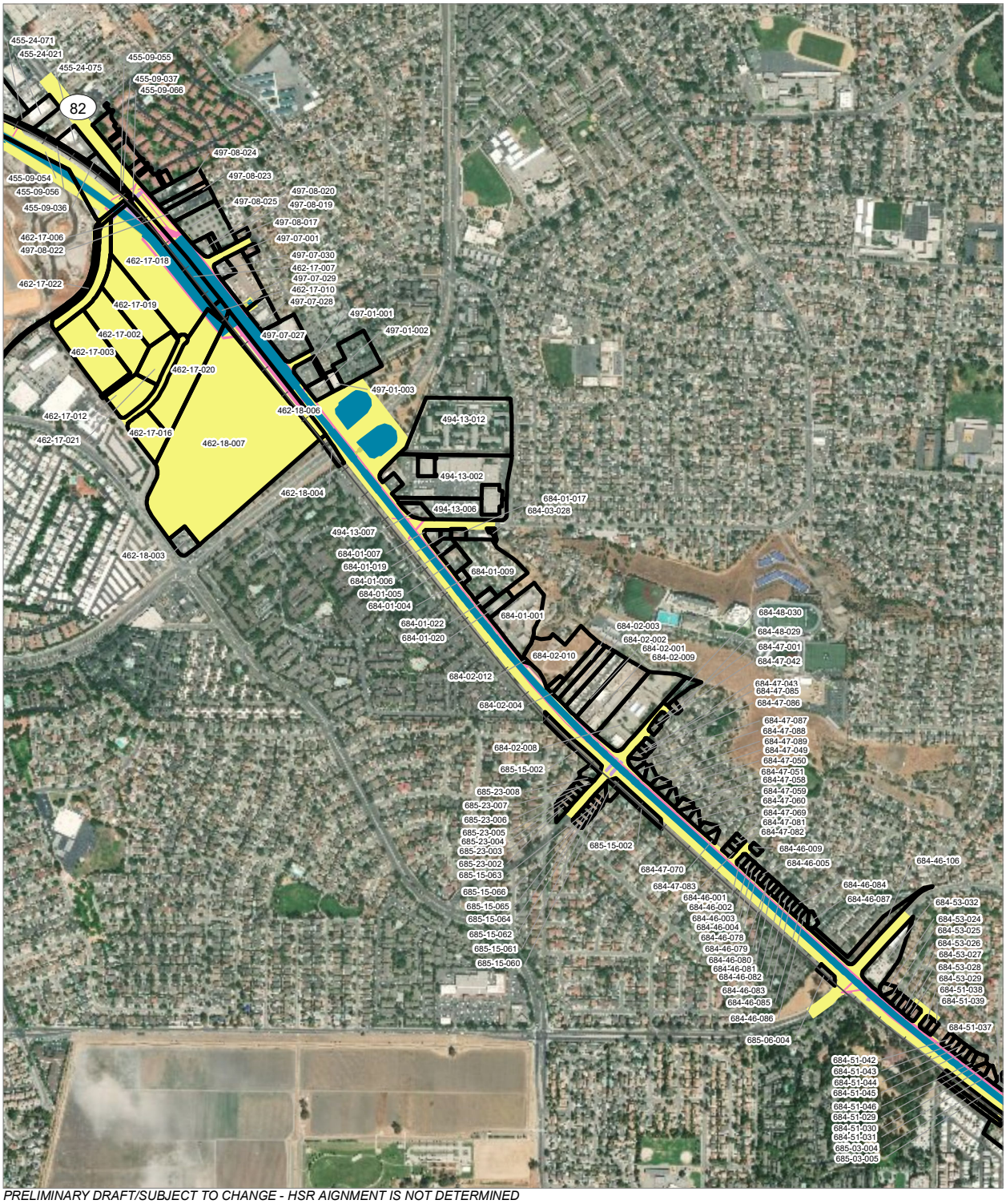


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

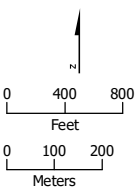
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

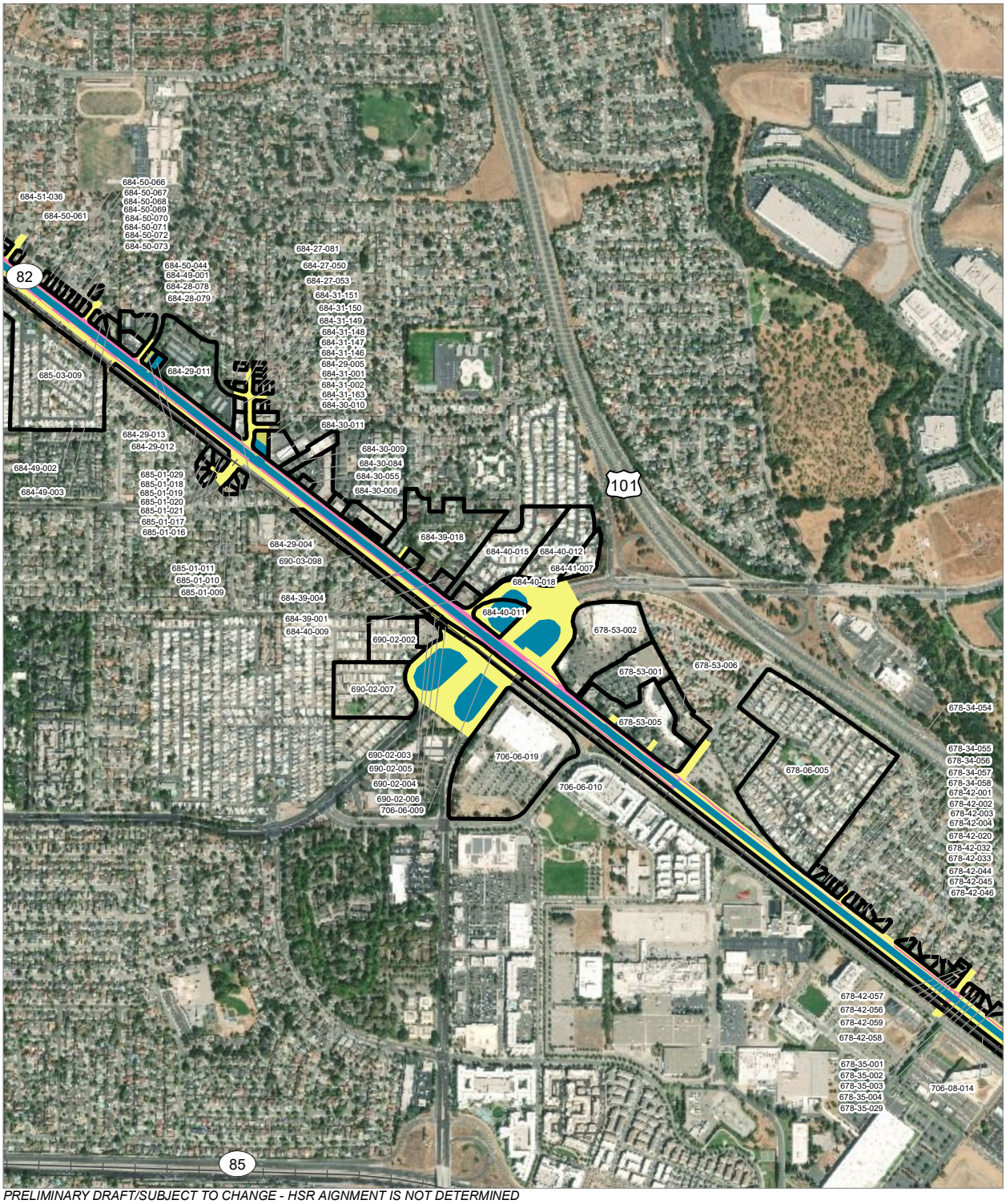


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3



HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

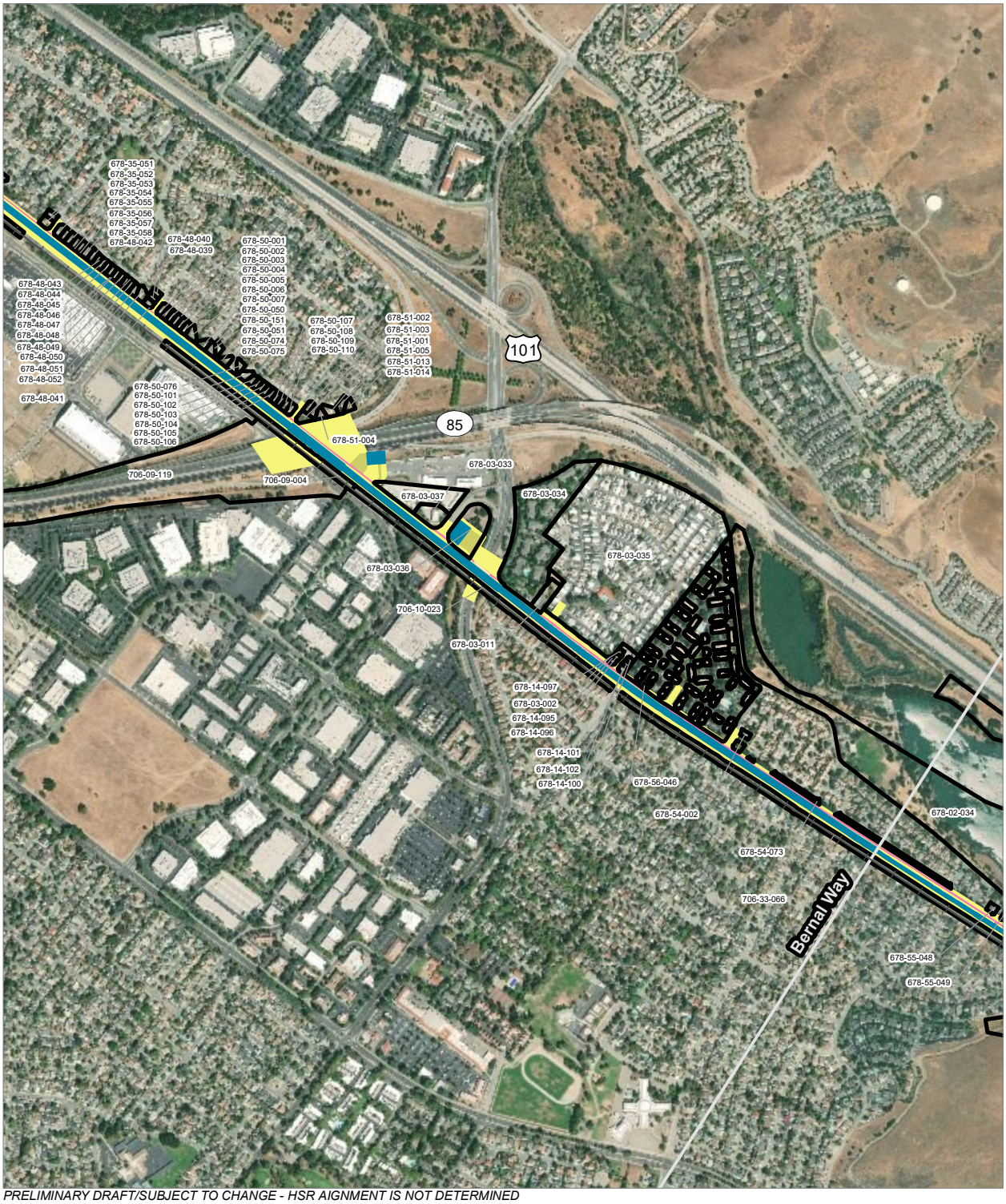


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

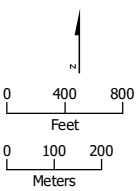
0 400 800 Feet
0 100 200 Meters

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

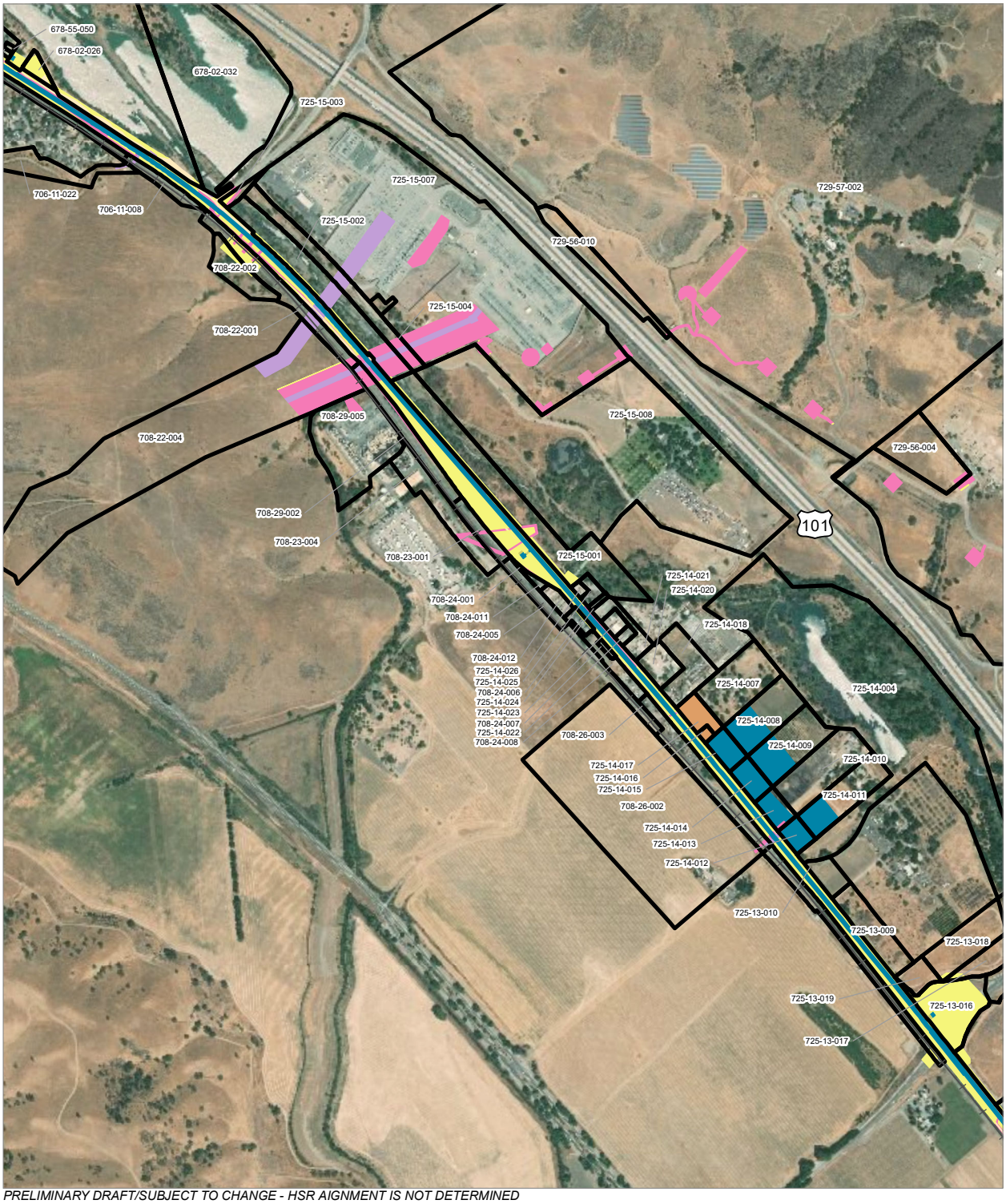


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

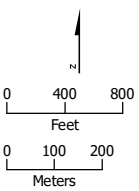


HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

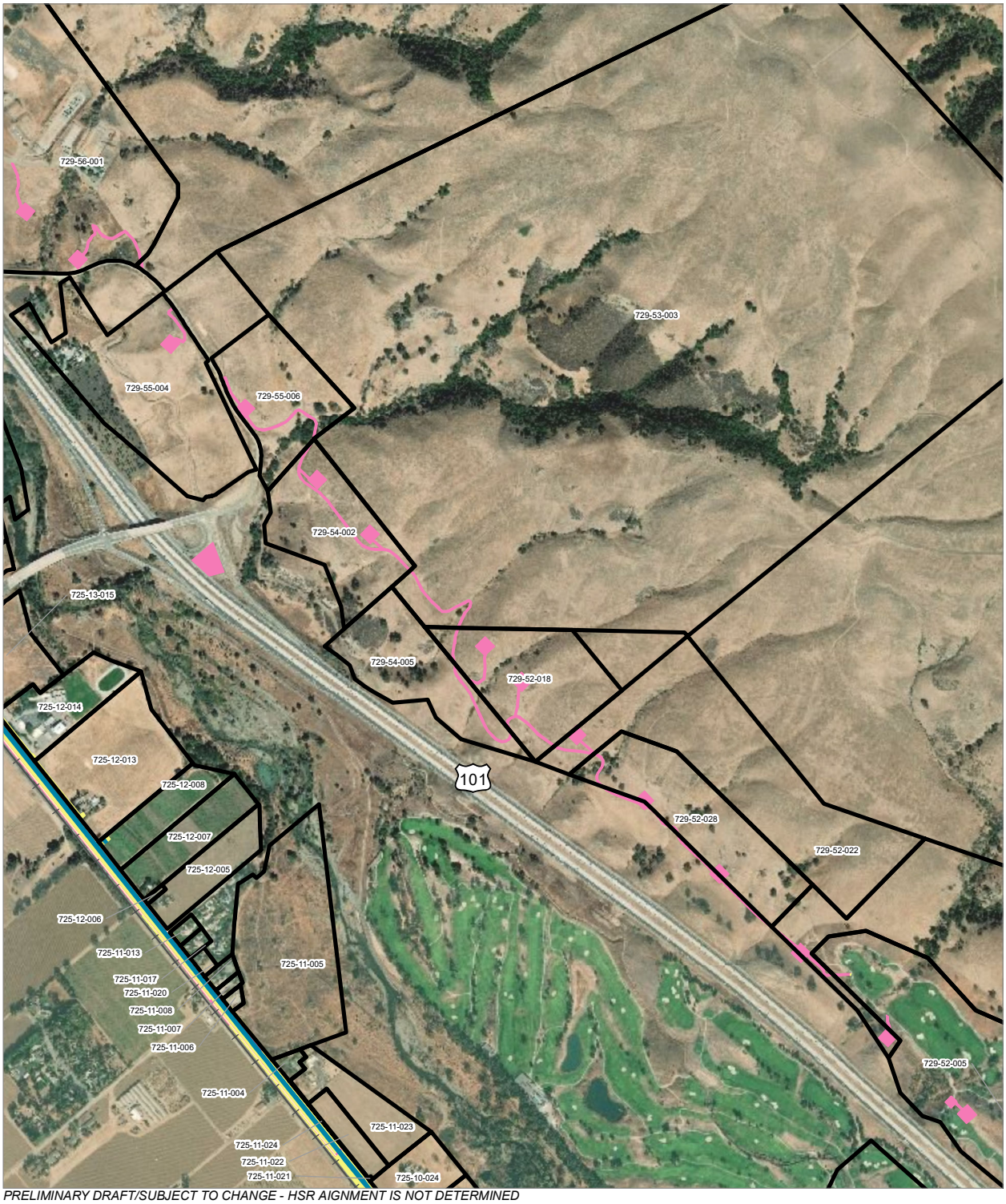


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

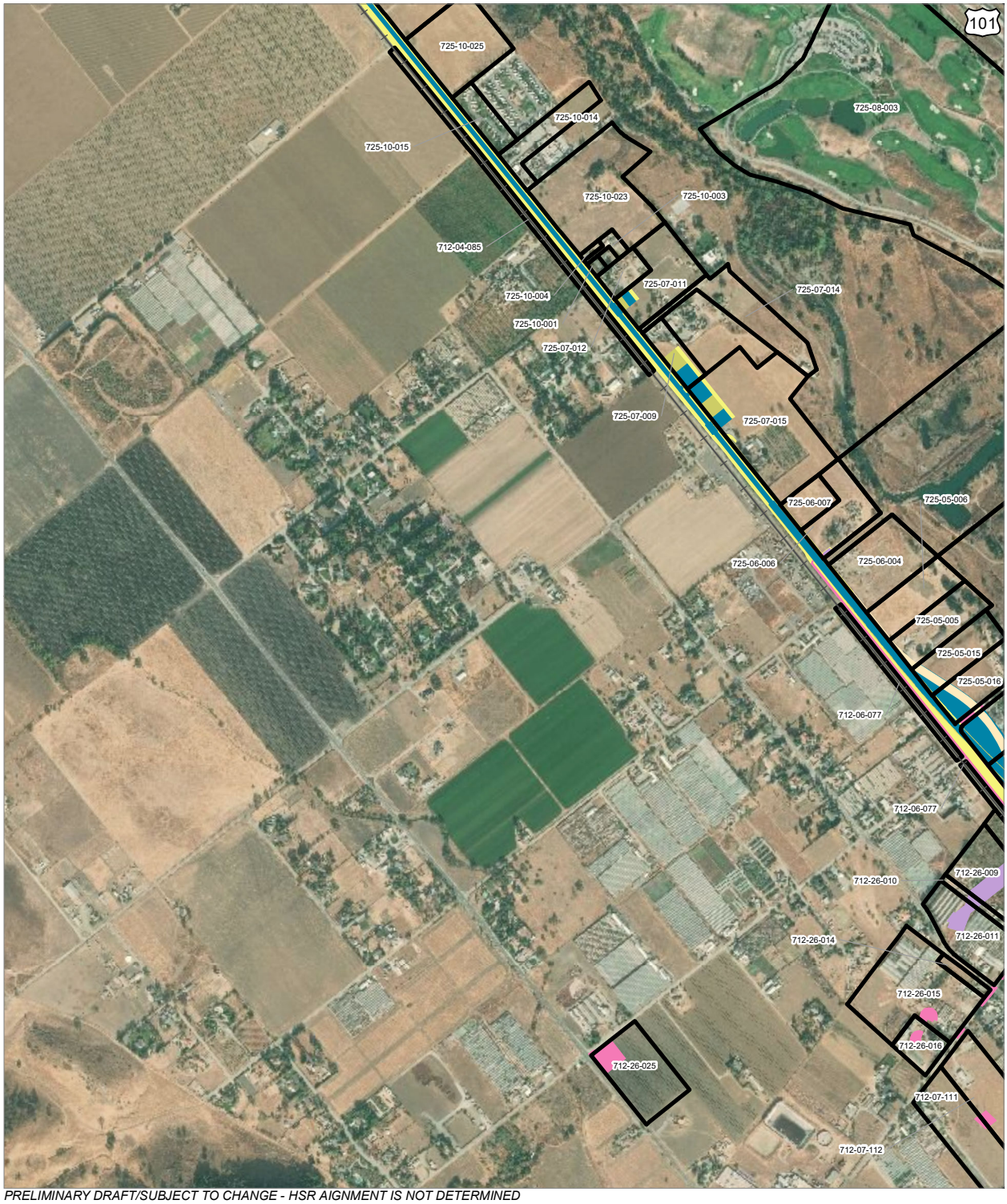


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

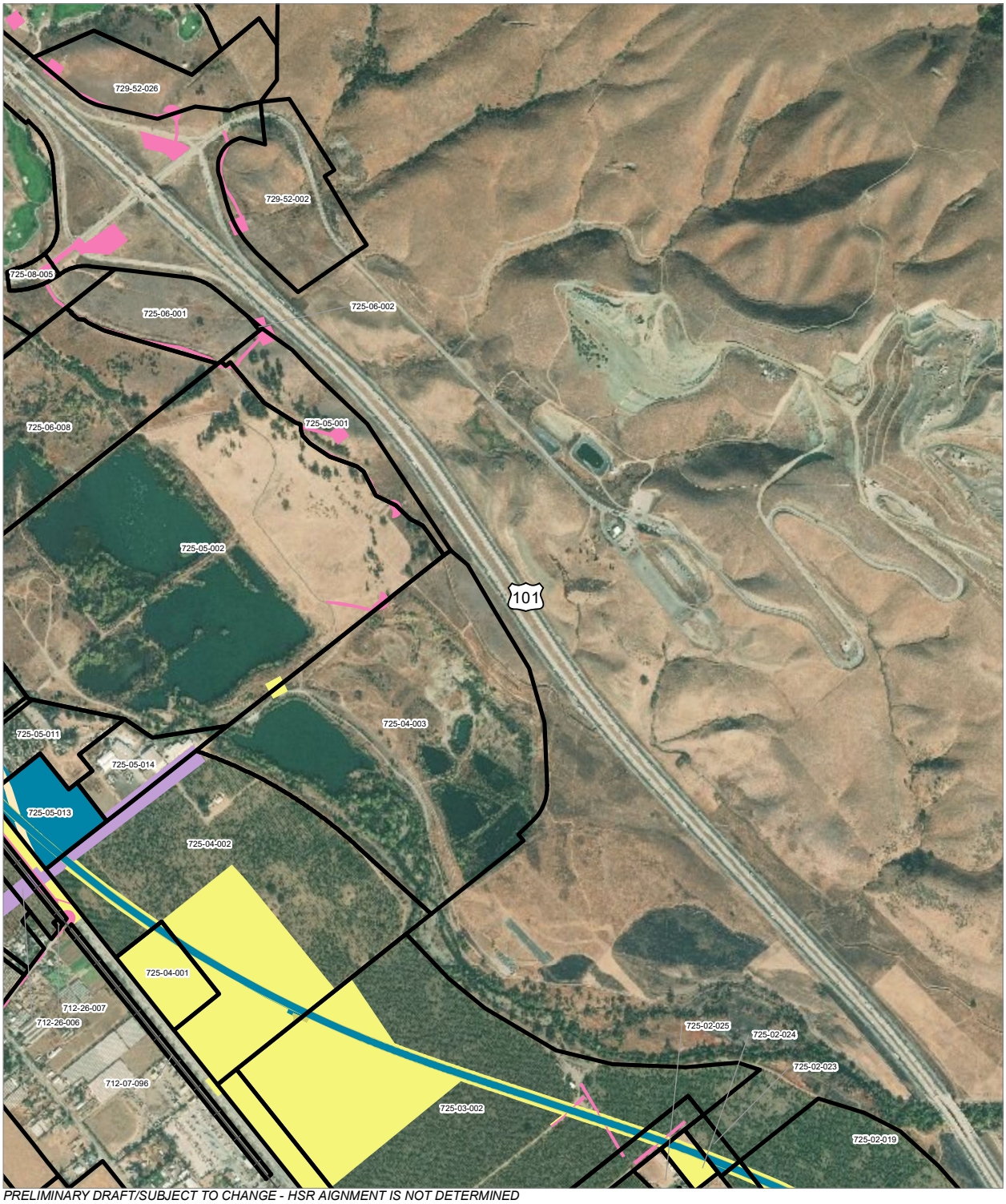


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

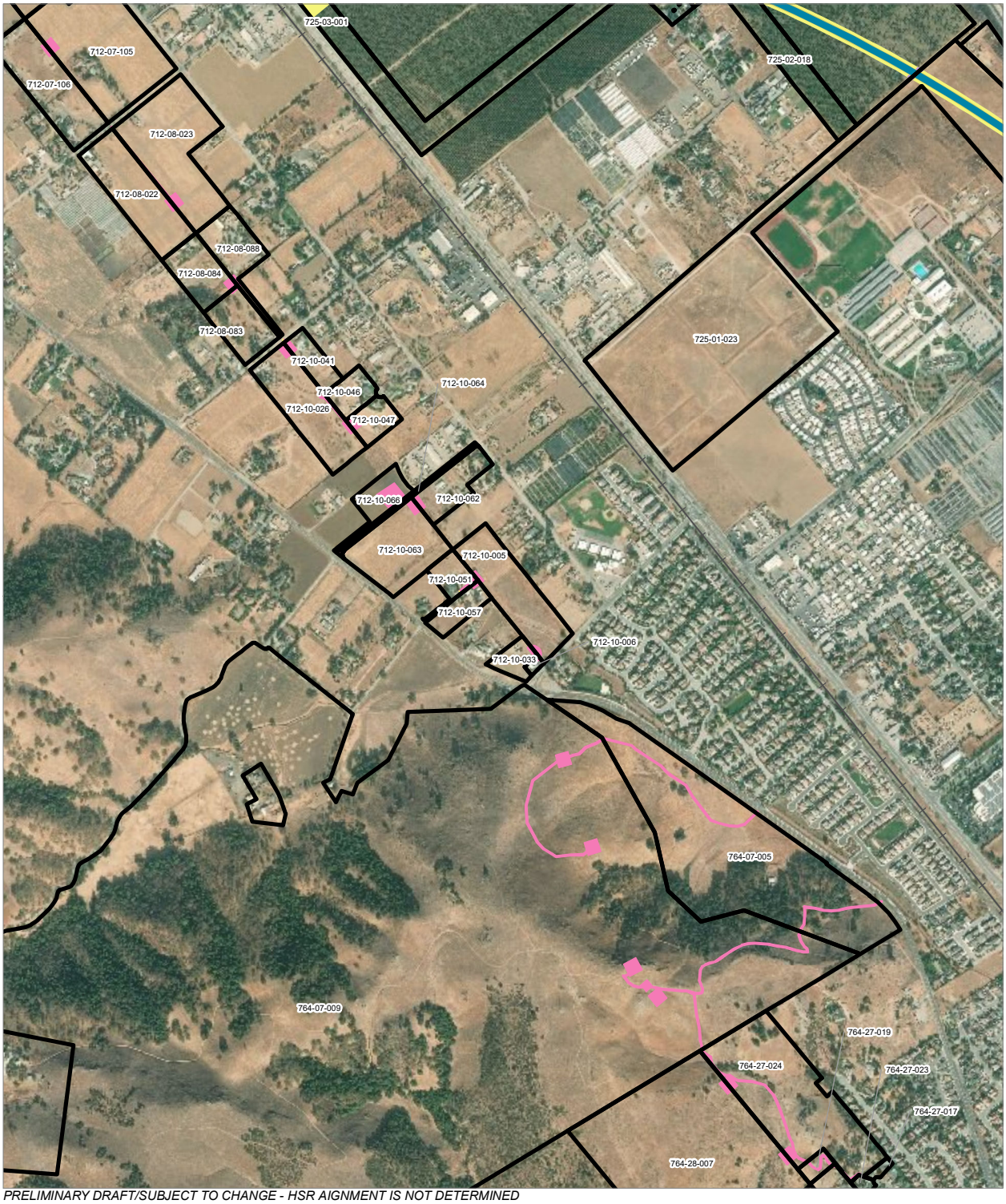
Alternative 3

N

0 400 800
Feet

0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

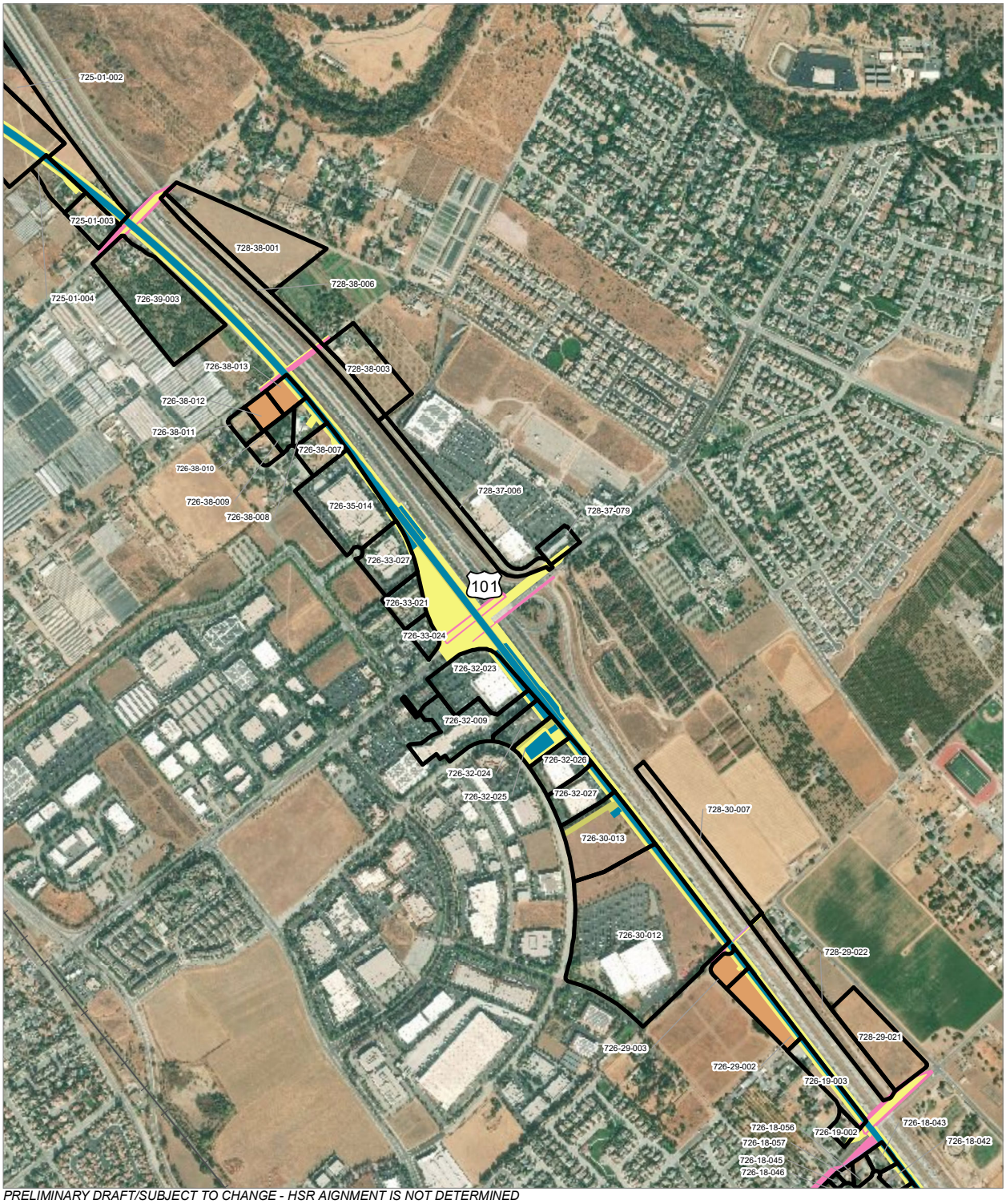


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

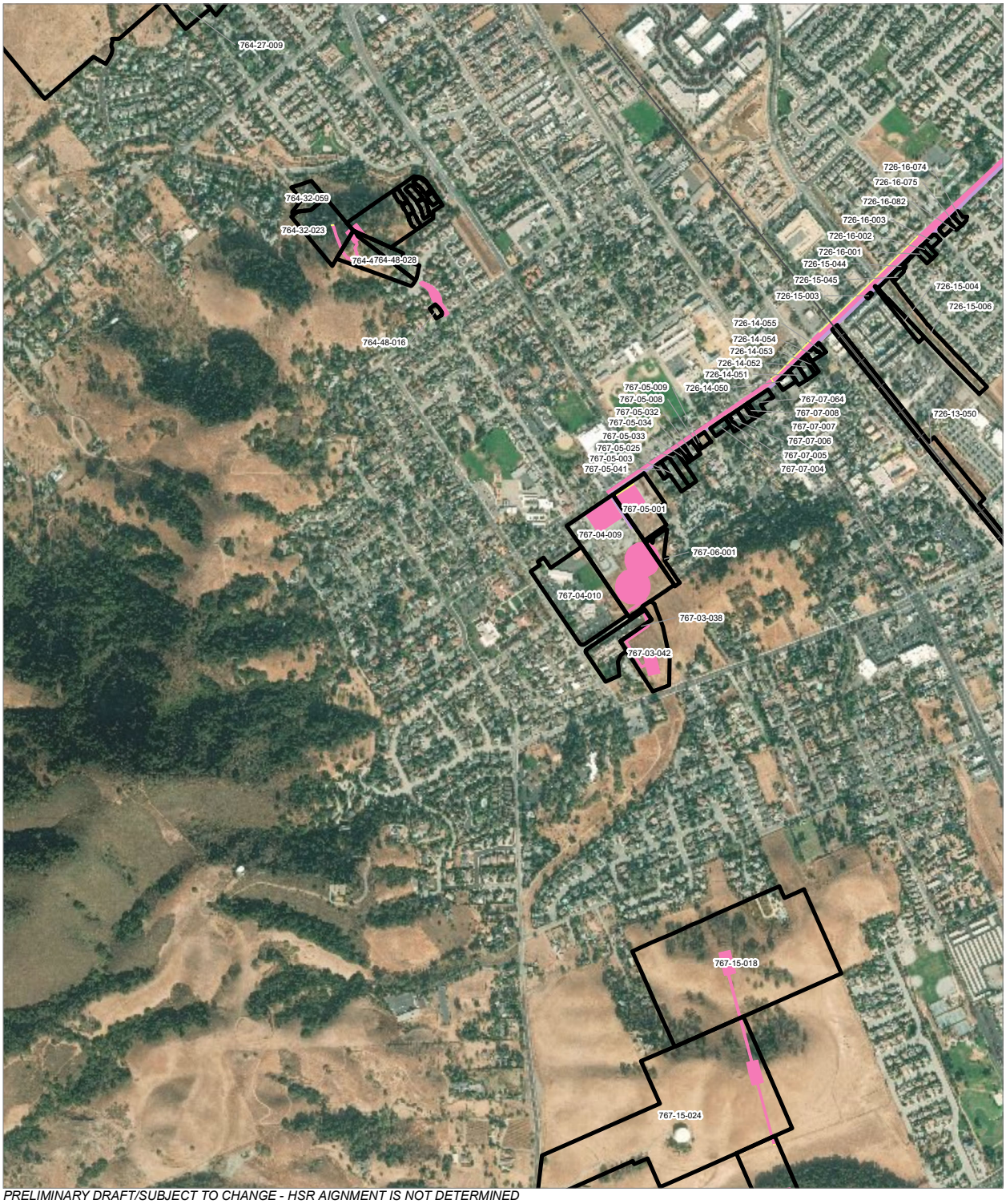


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

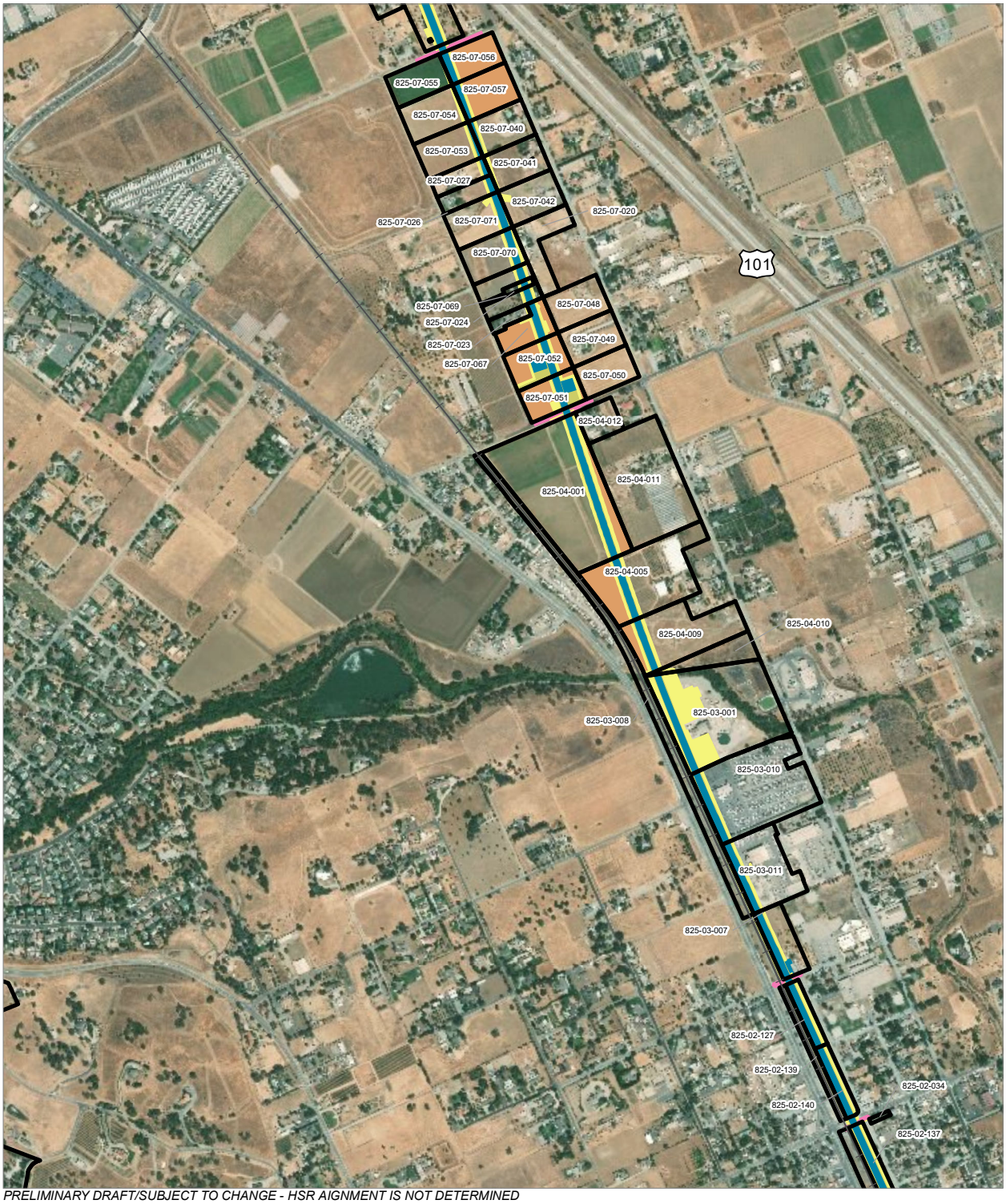


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

Permanent Utility Easement
Temporary Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

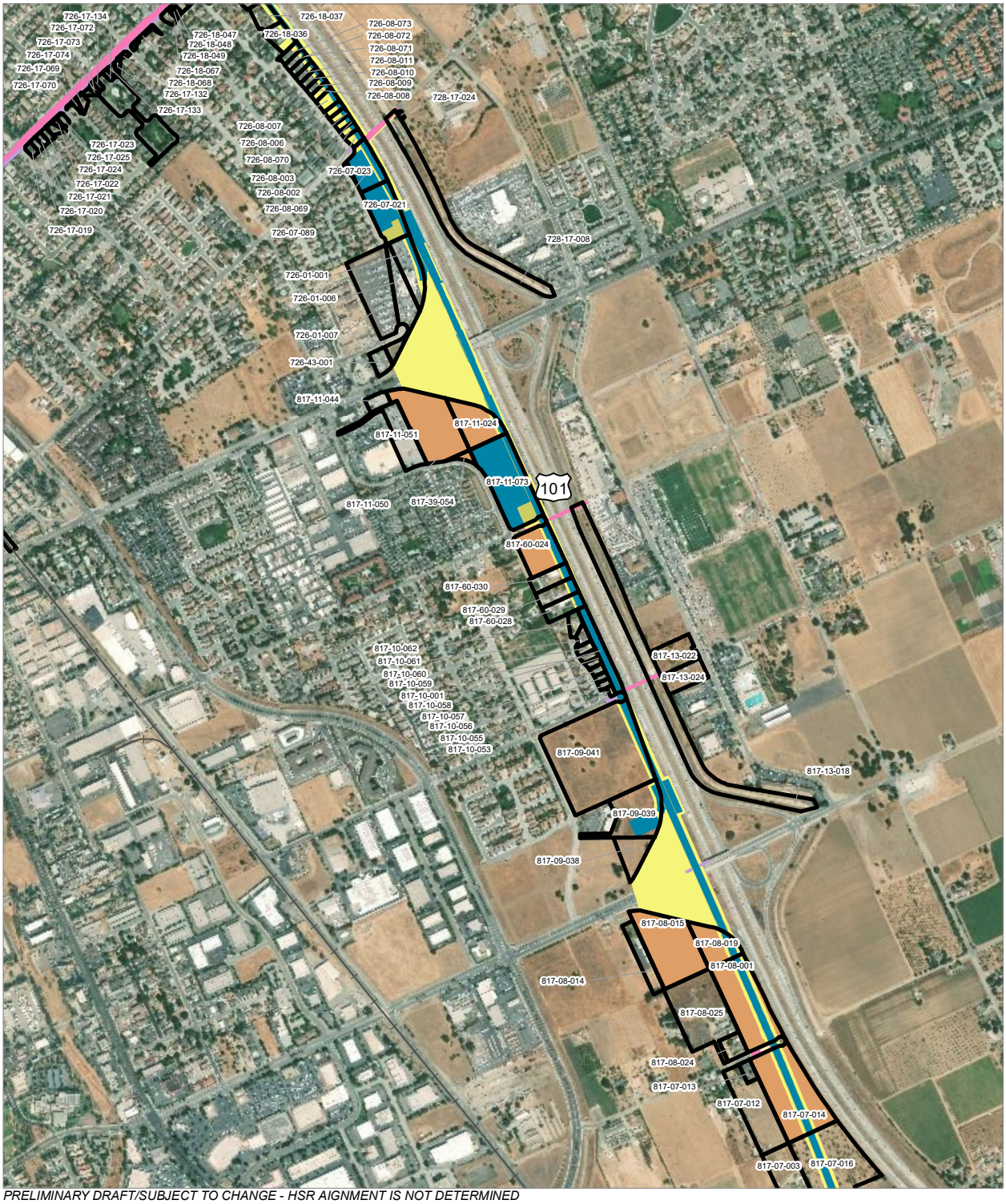


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

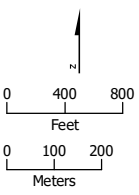
HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

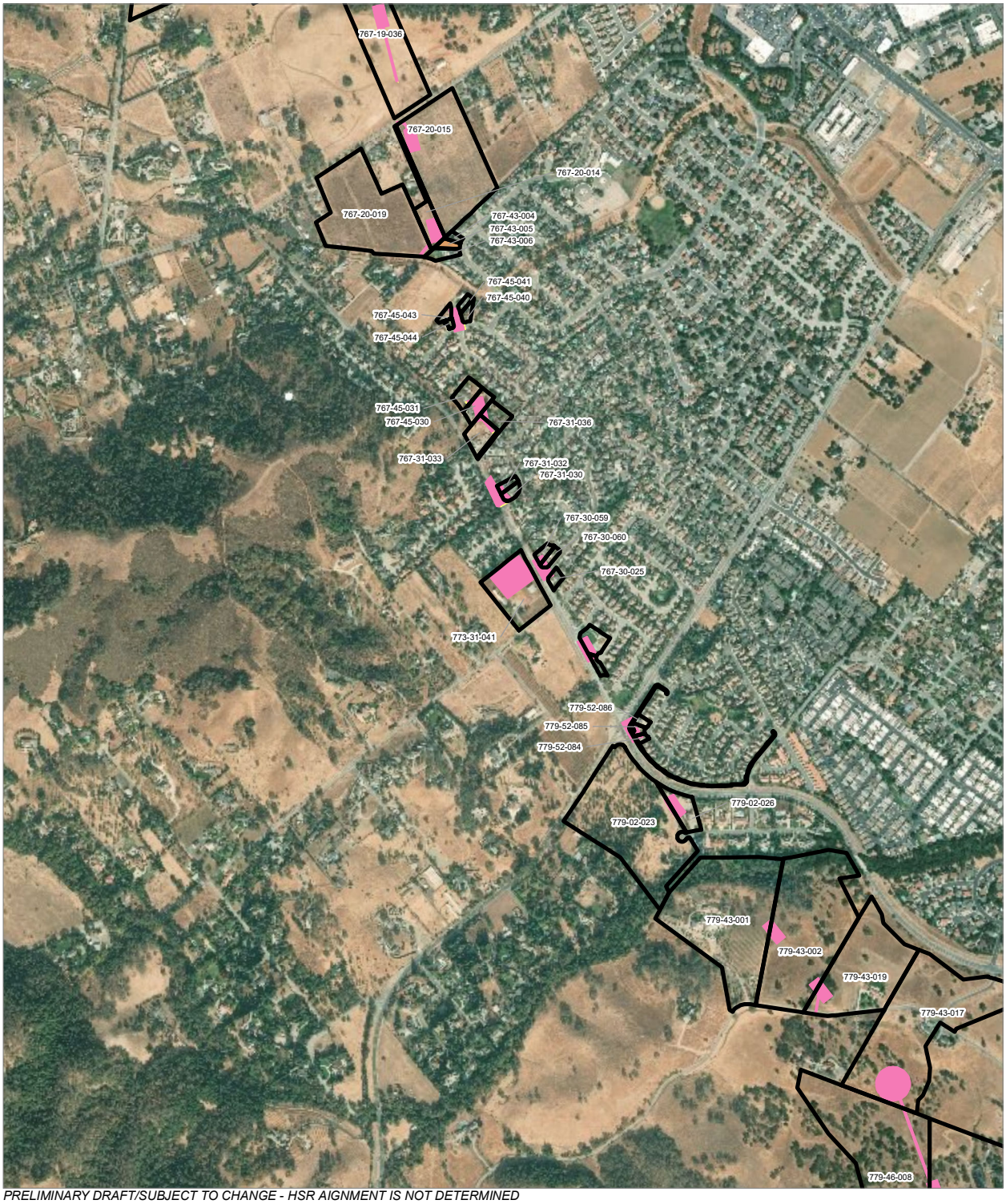


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3



- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

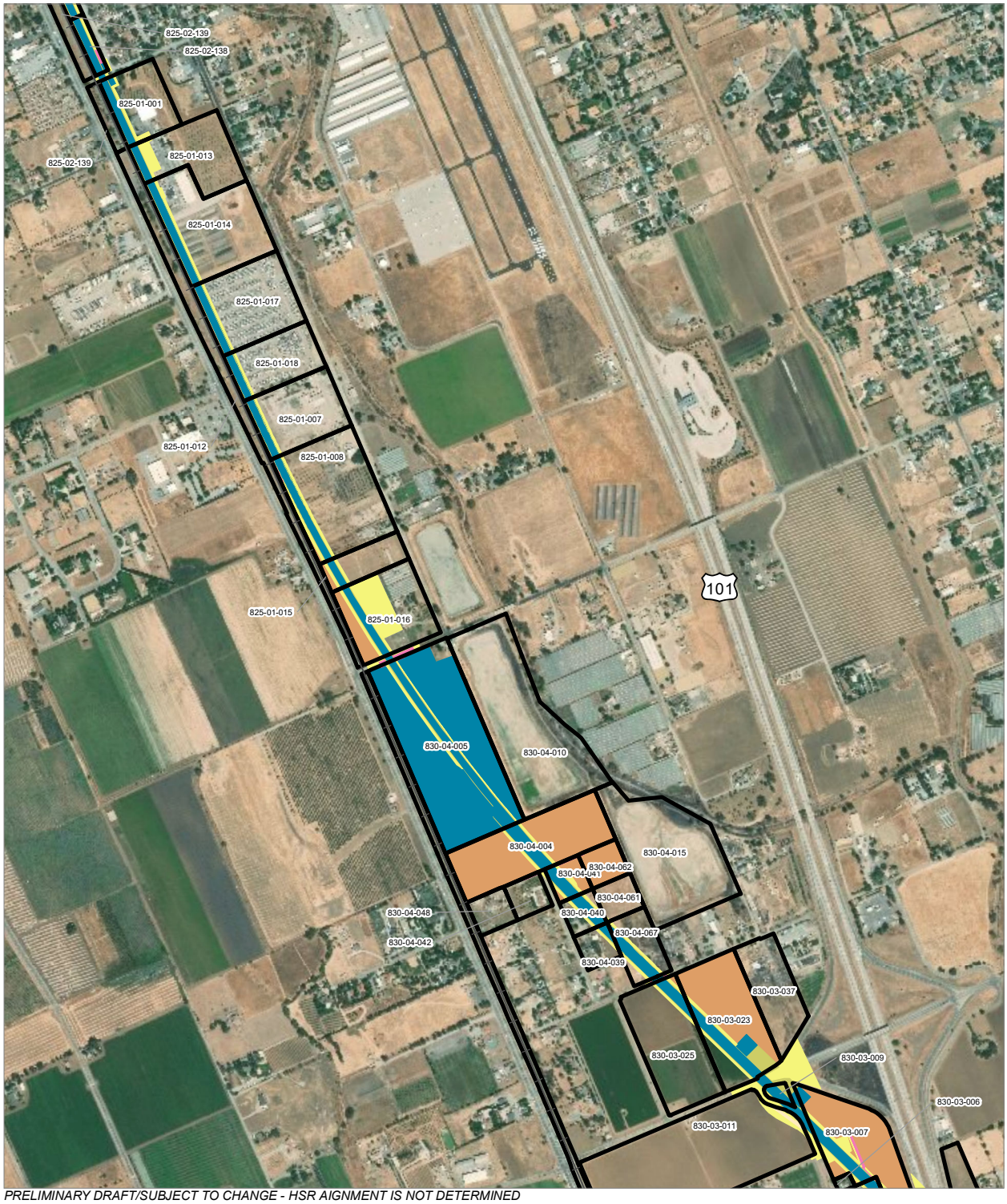


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

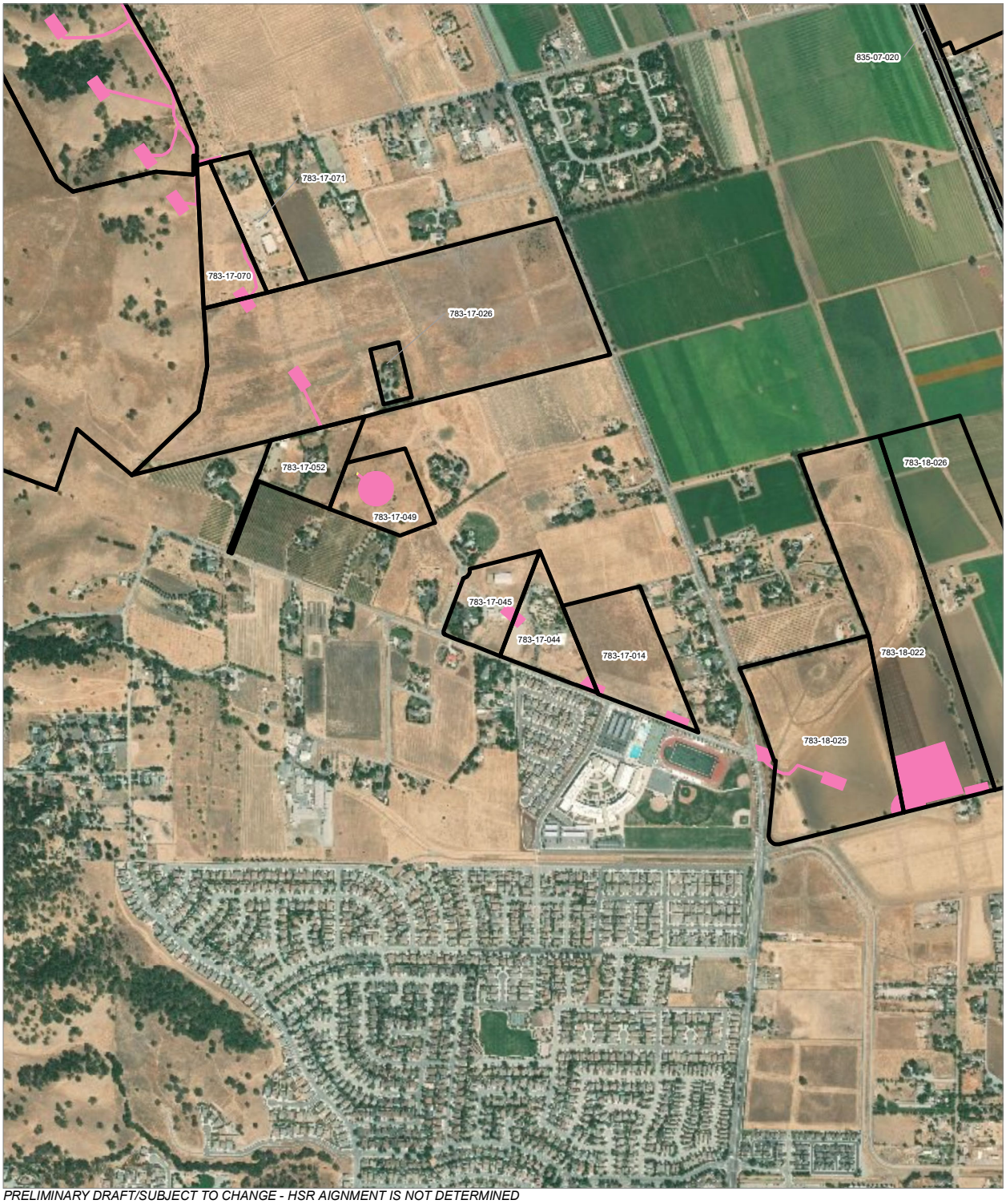


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

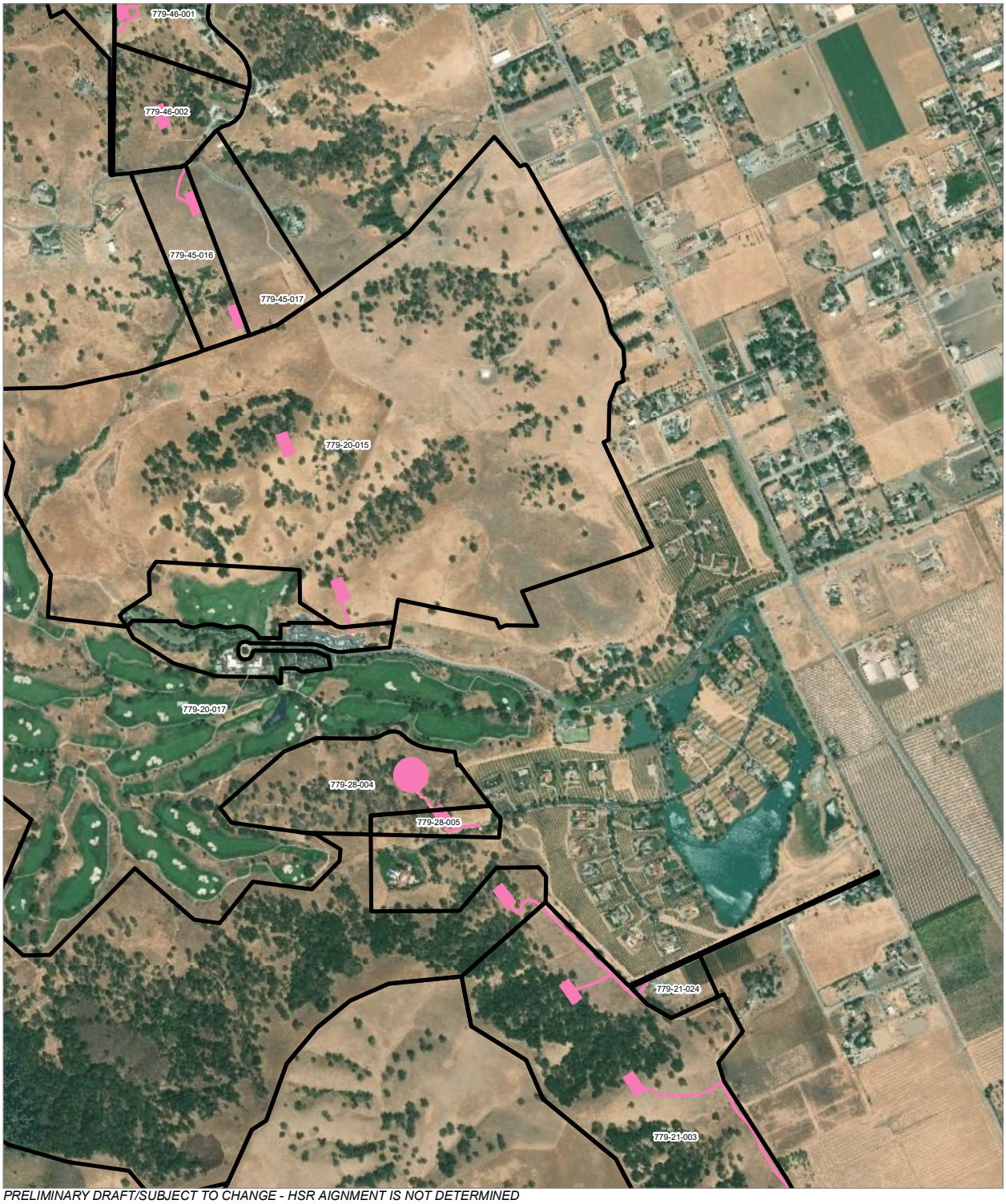


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

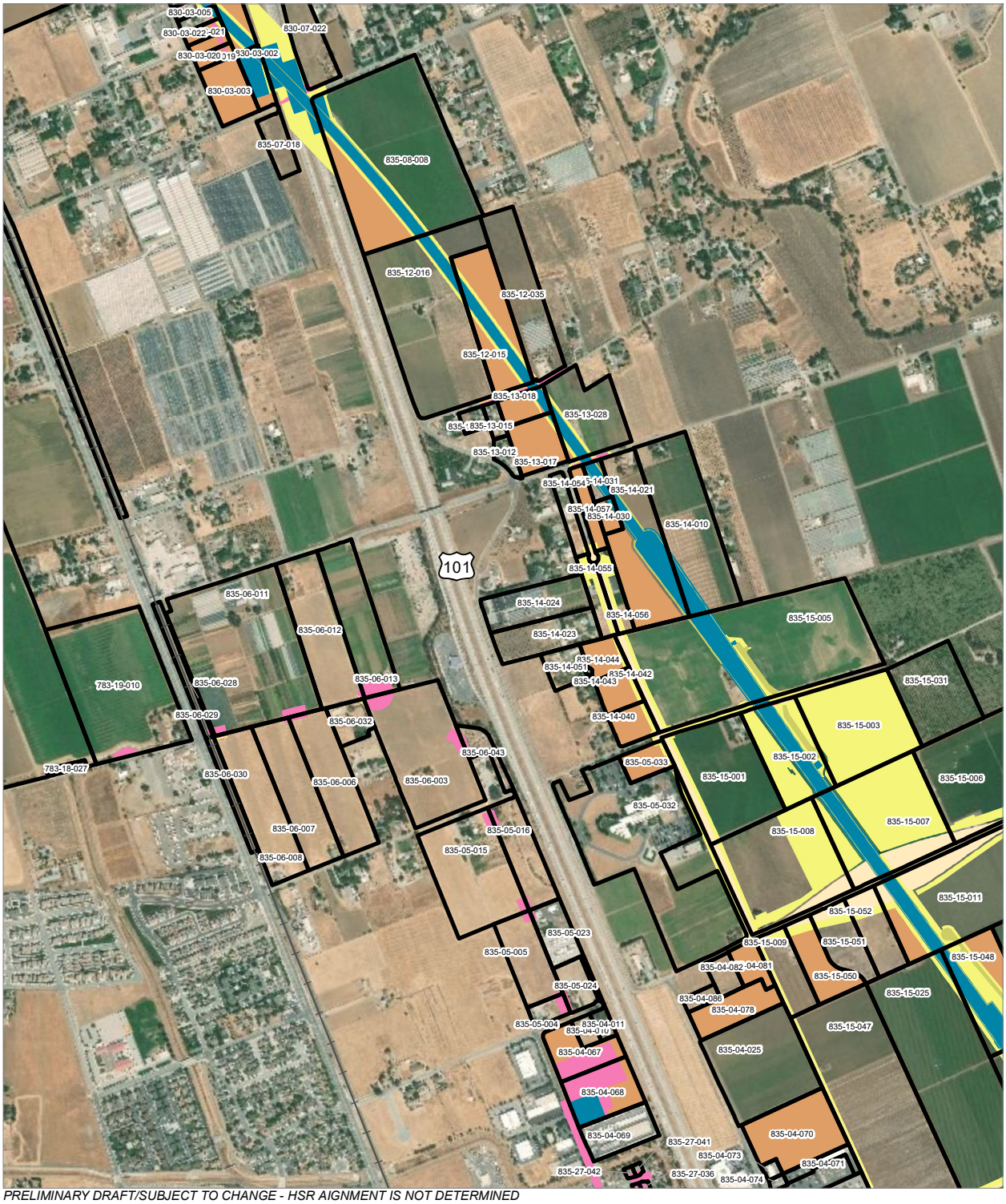


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

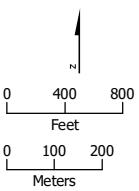
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3



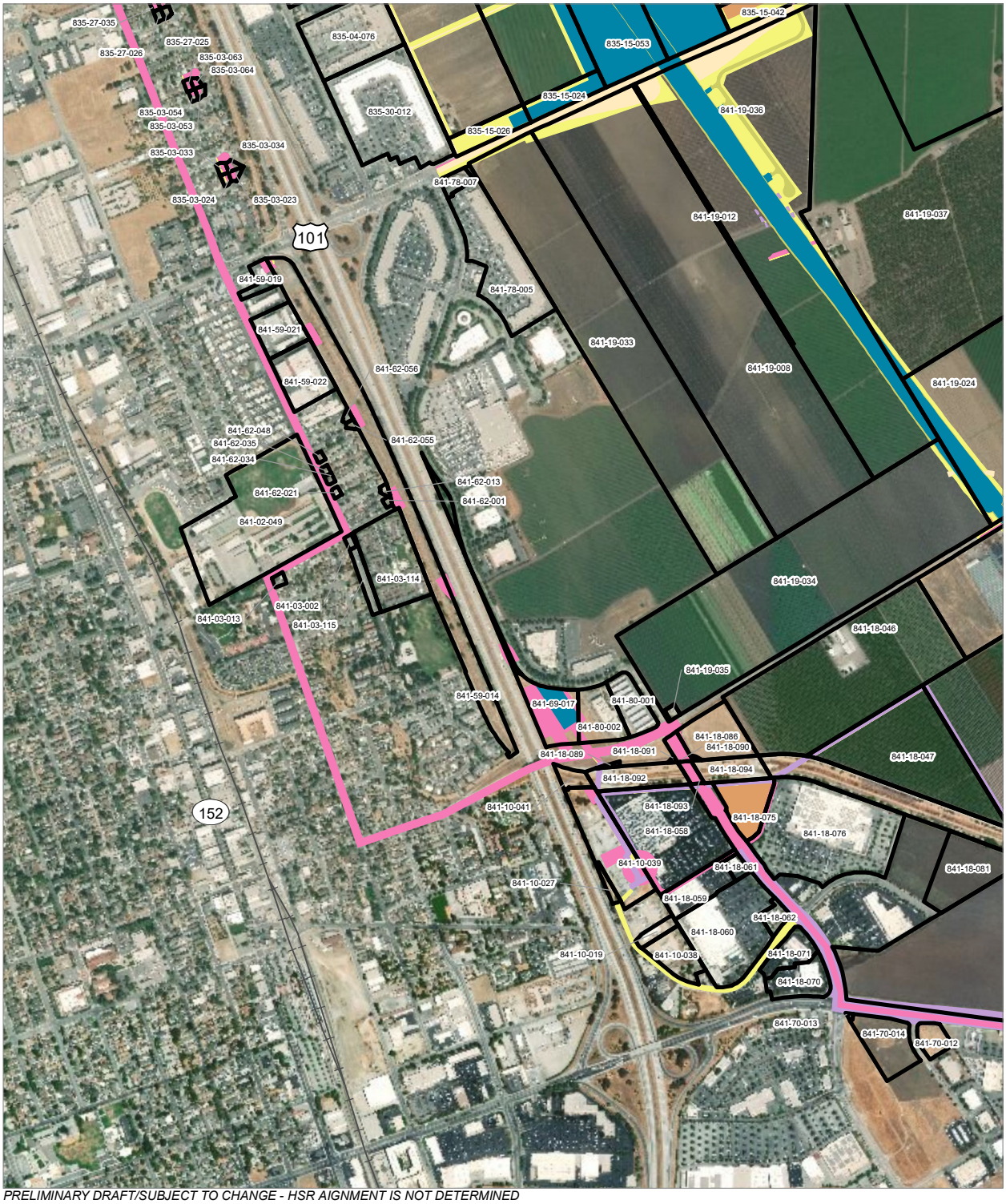
HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

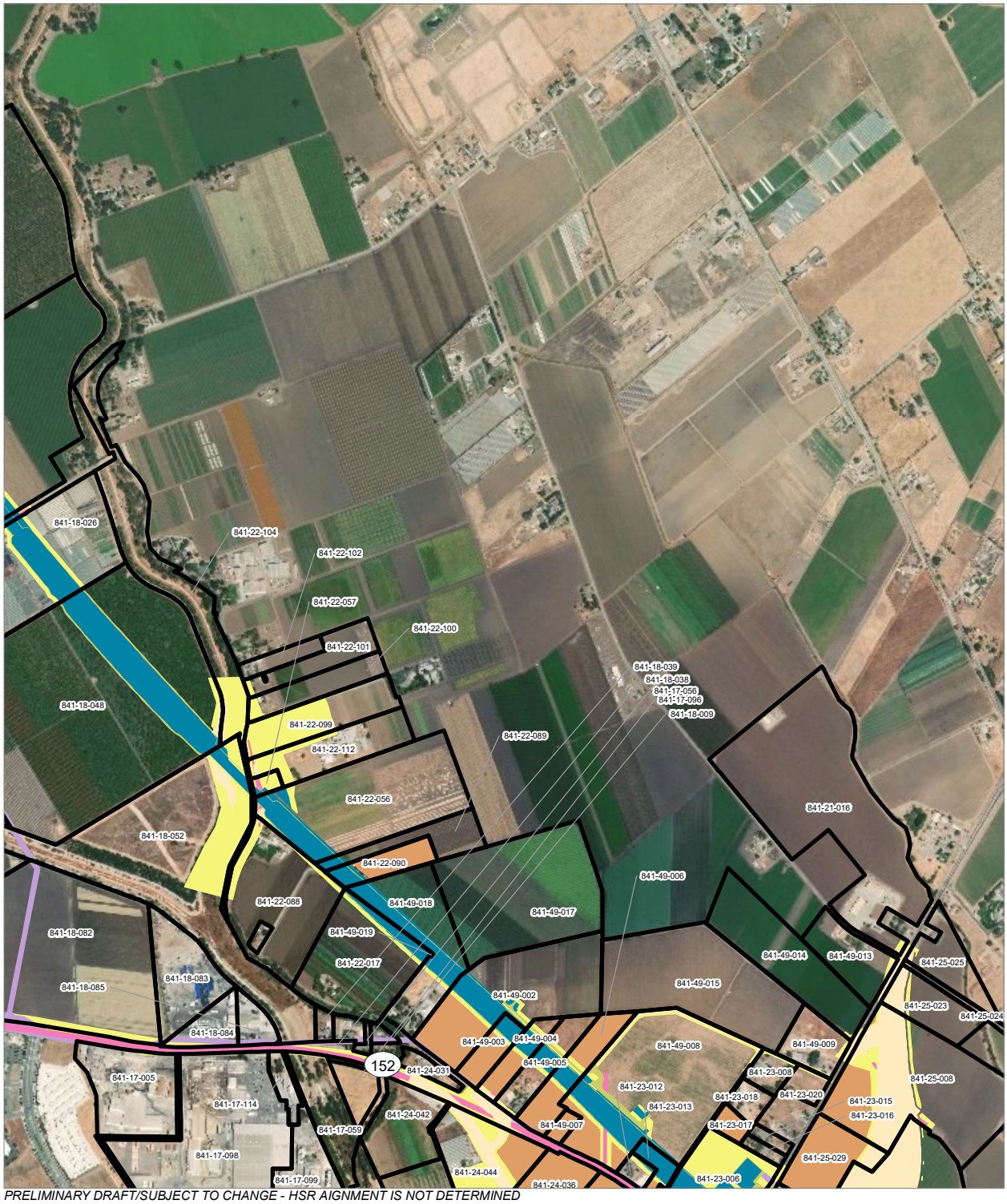


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

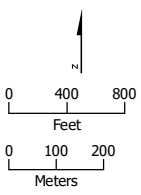
HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

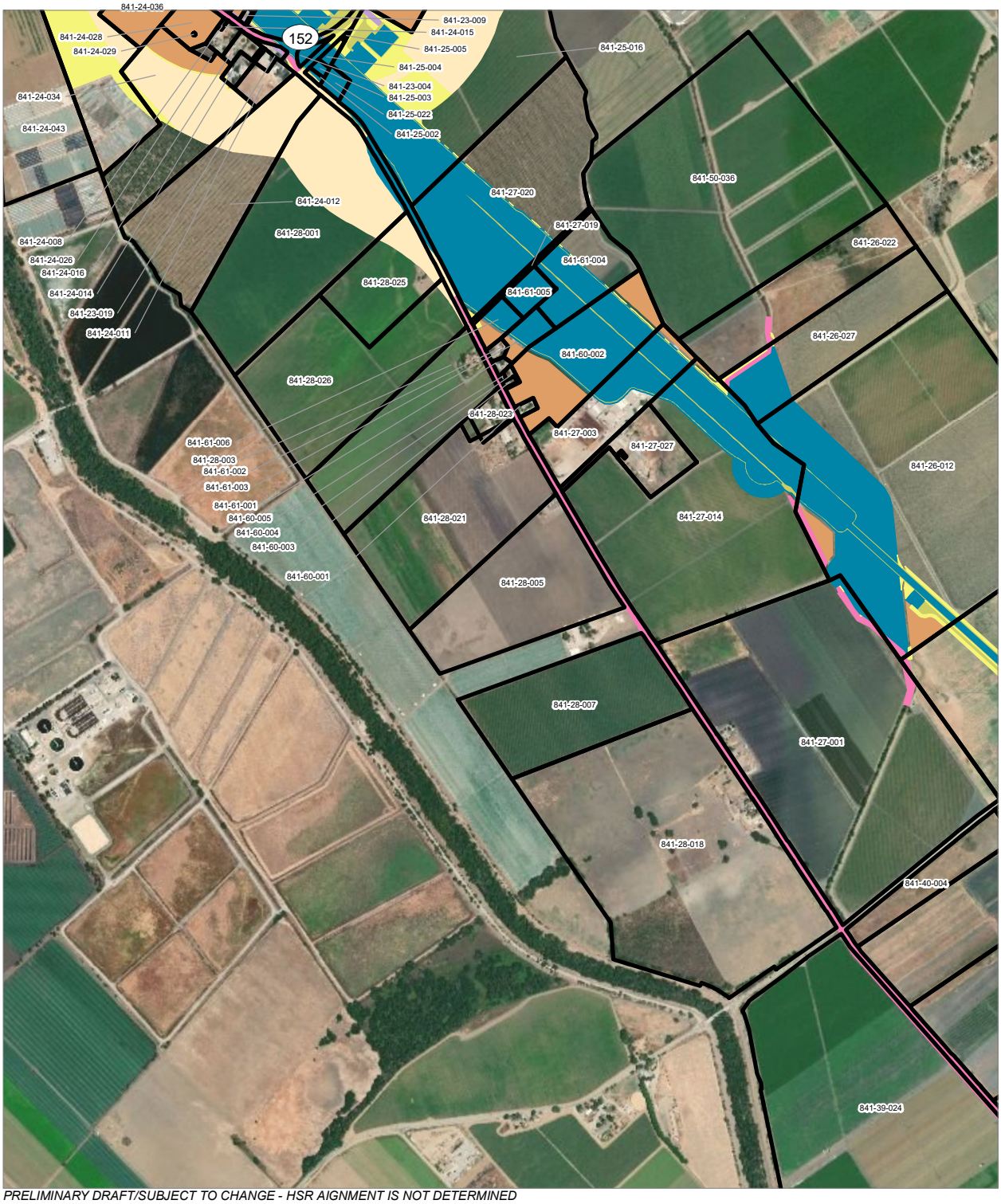


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

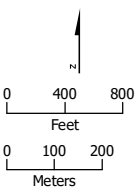


- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3



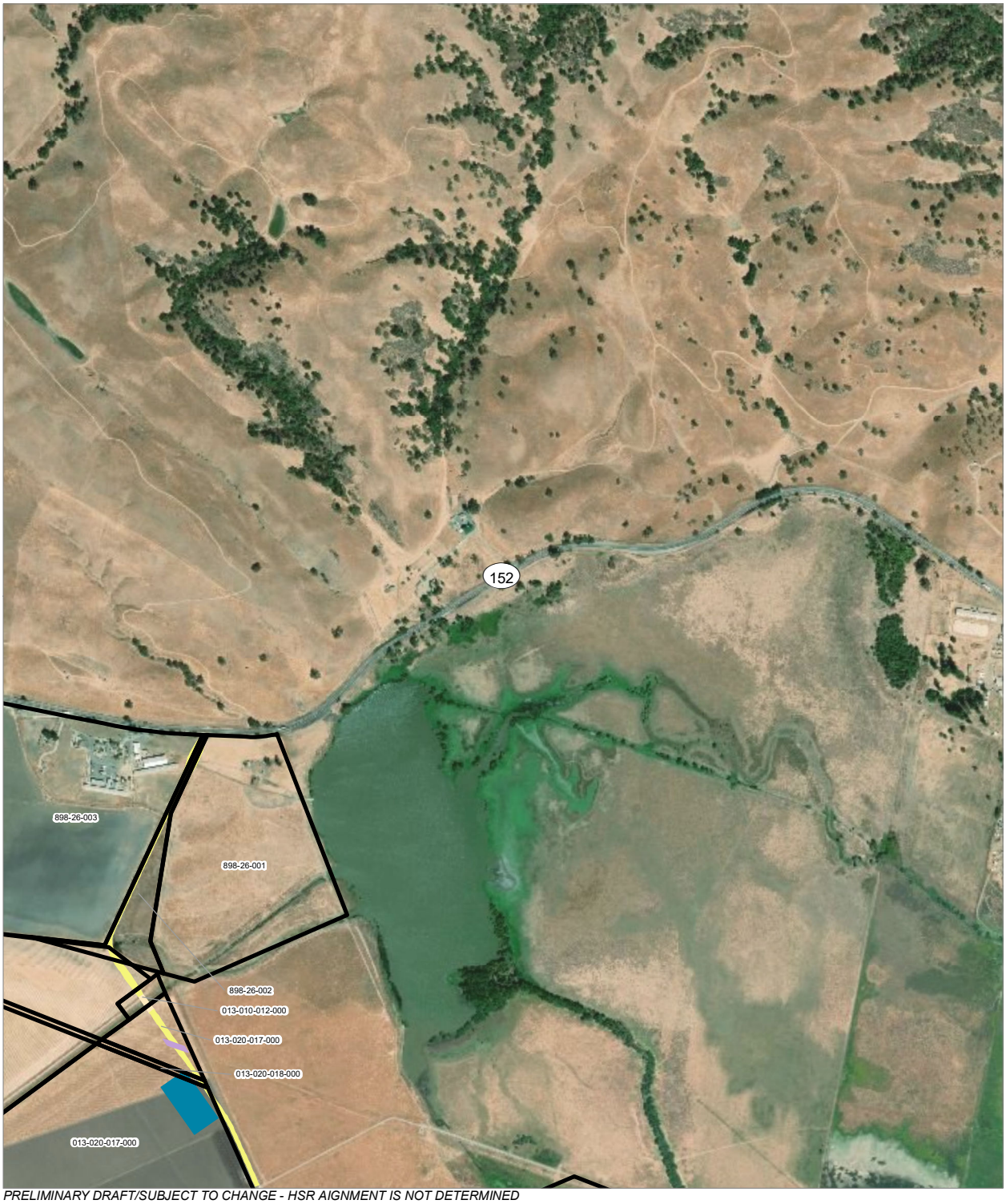
HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

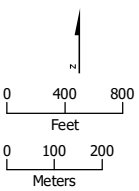
Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

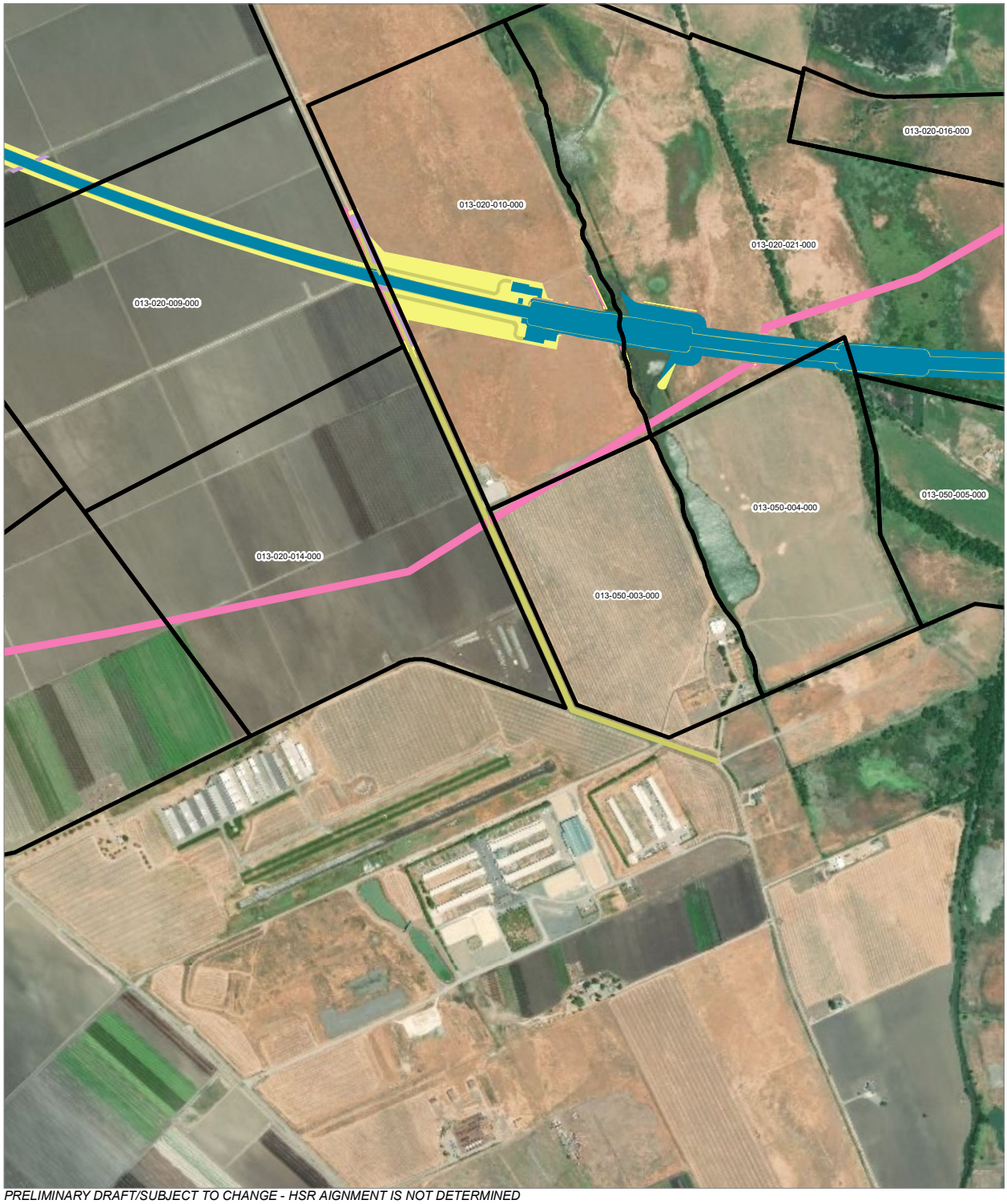
0 400 800
Feet
0 100 200
Meters

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3



HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

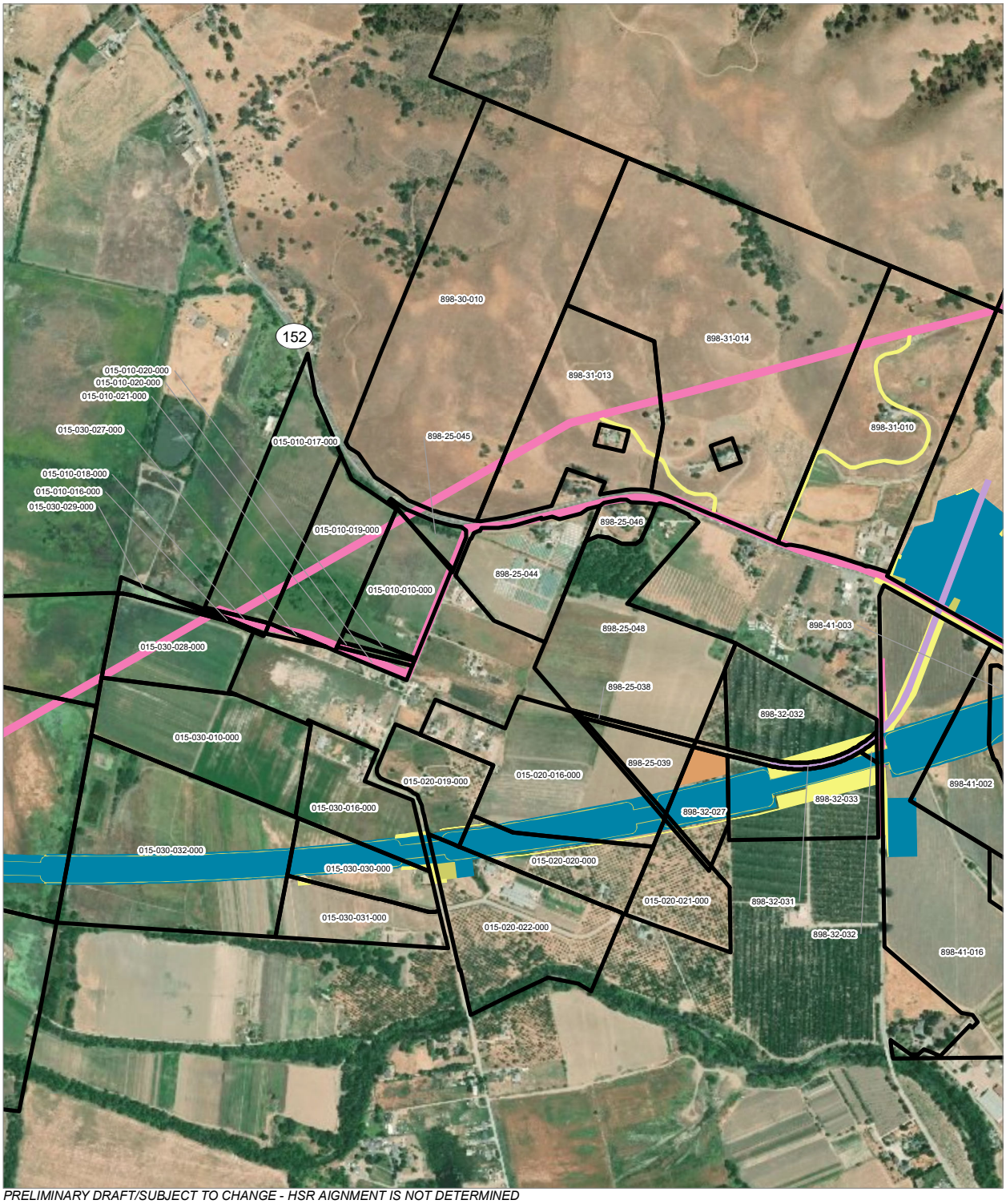


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters



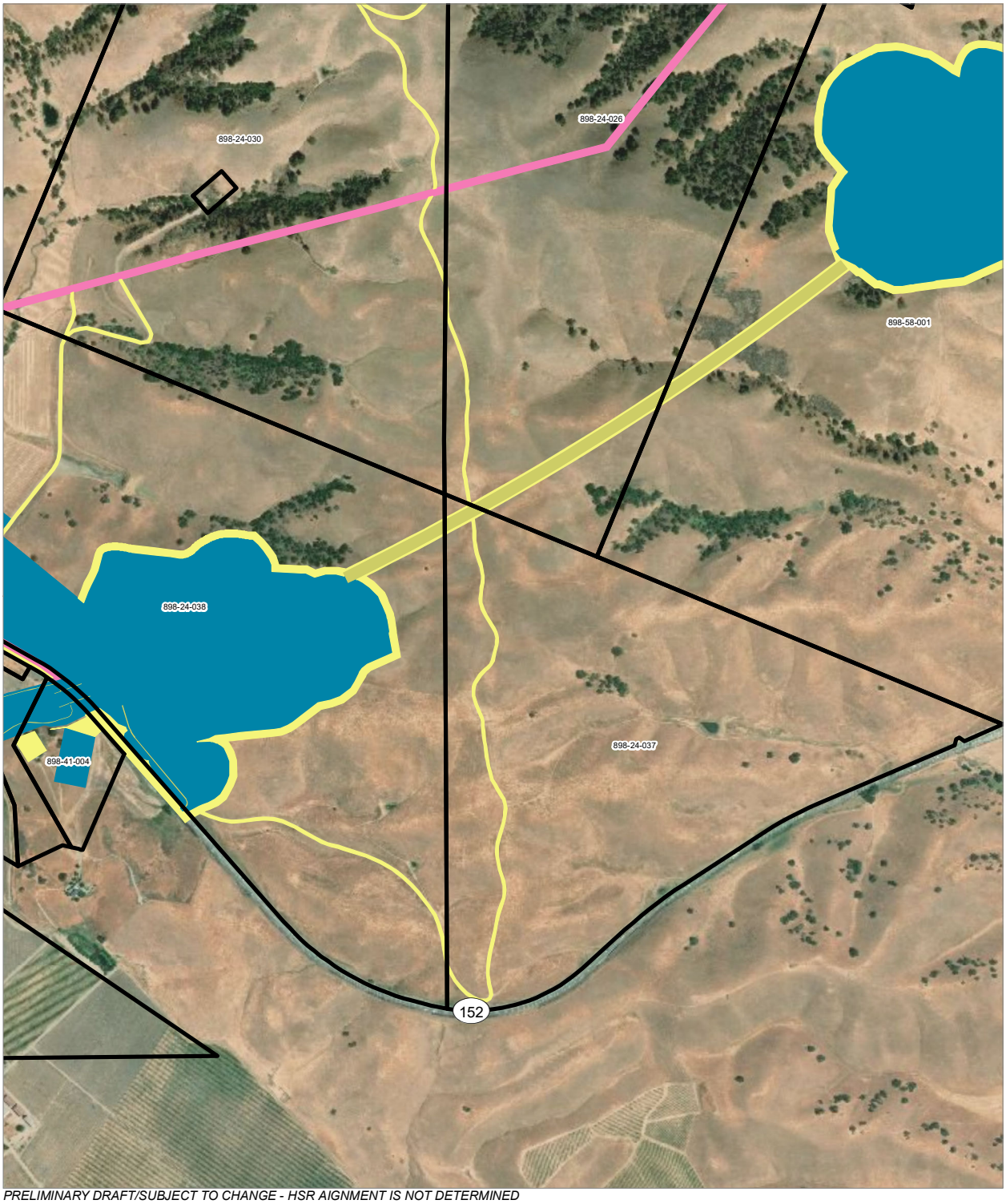
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 3, Part 2)

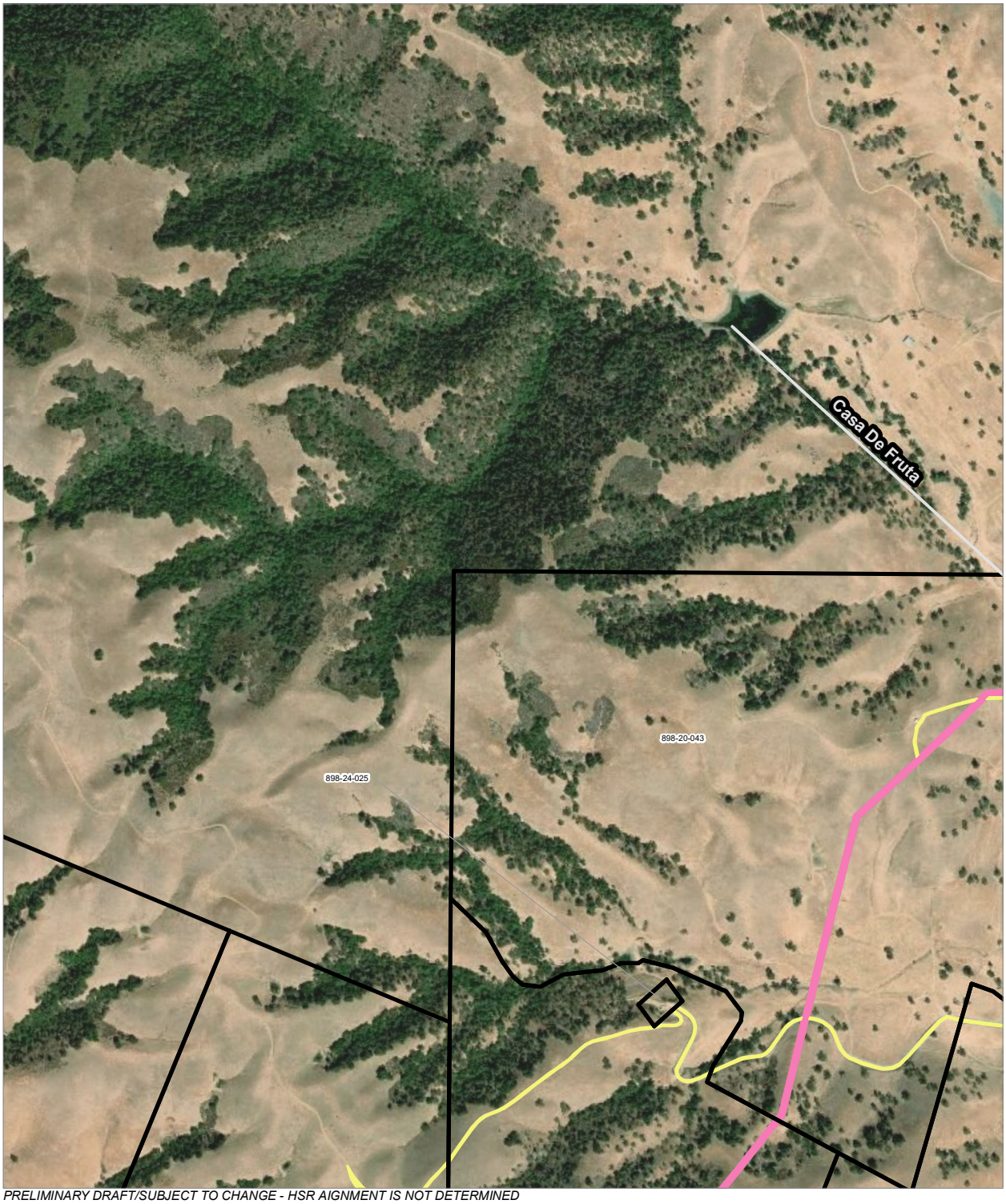


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

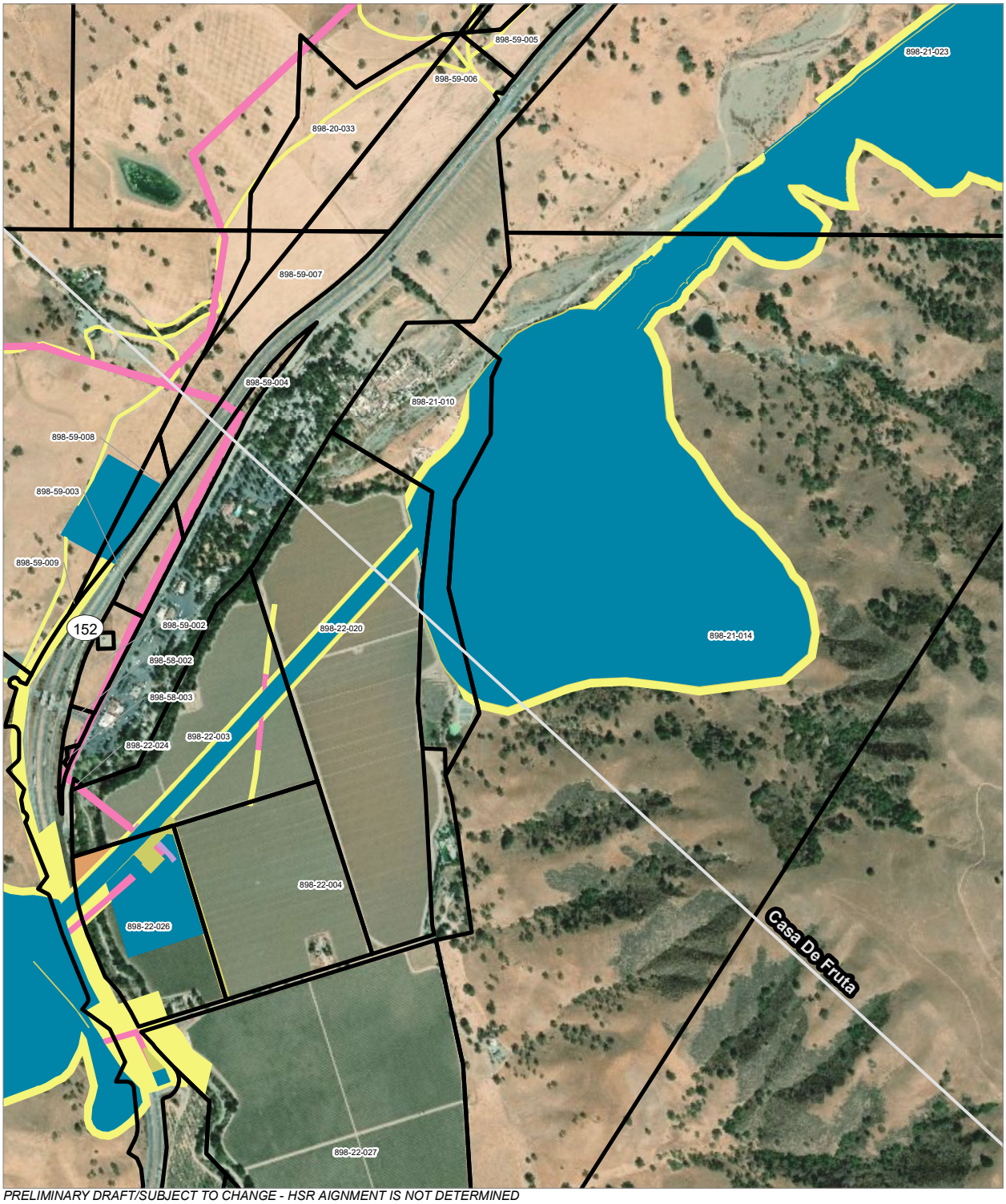


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

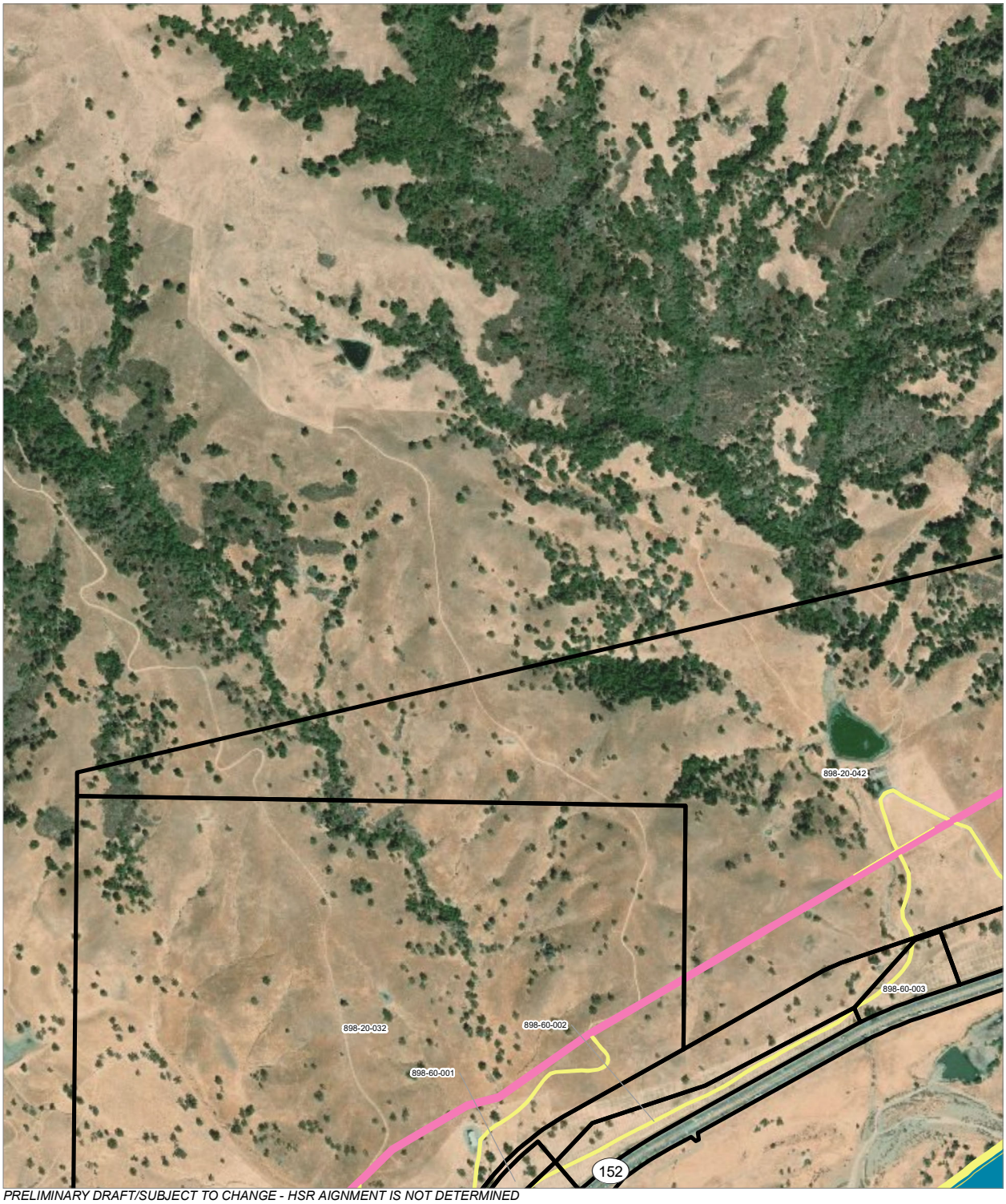


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

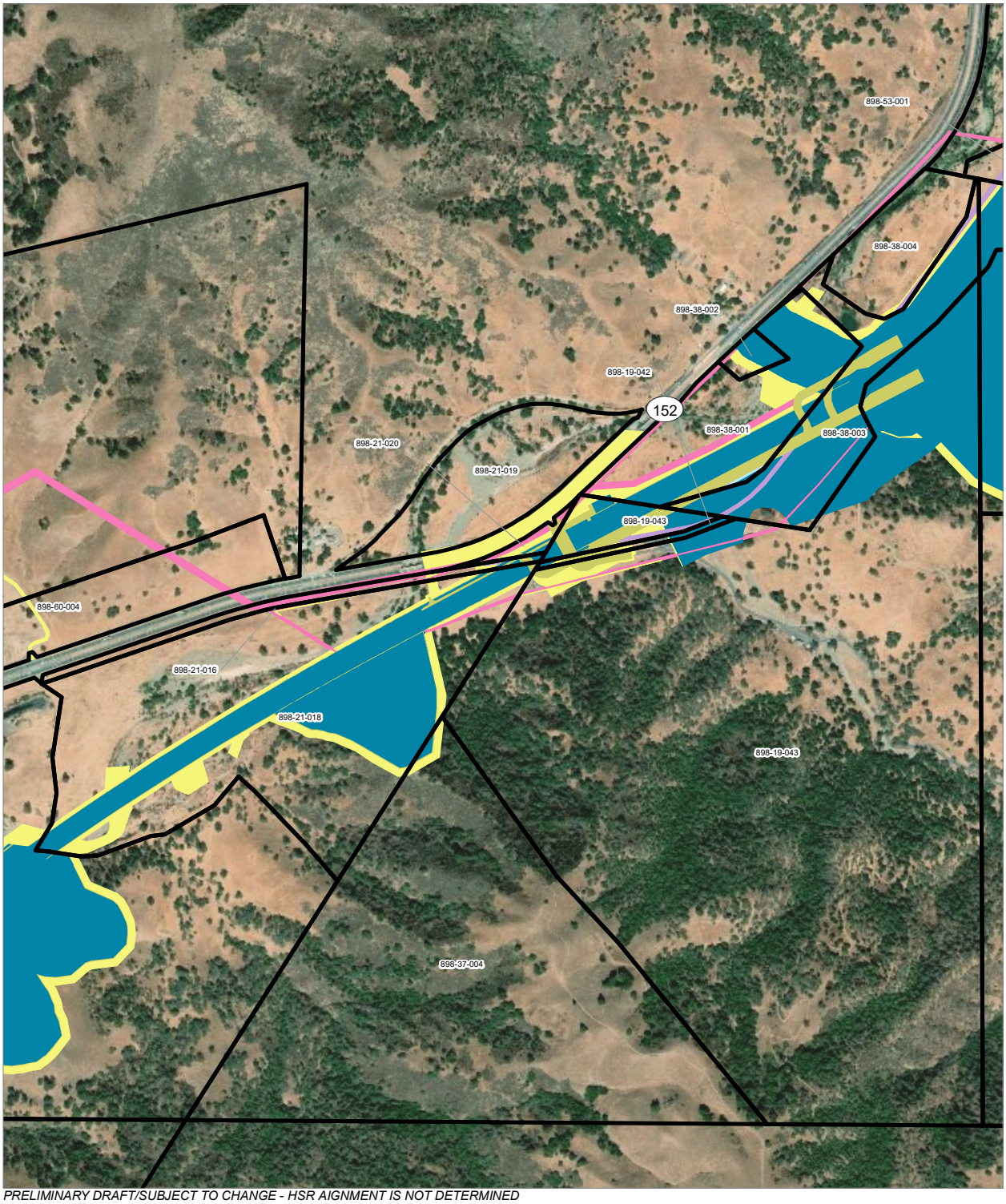


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

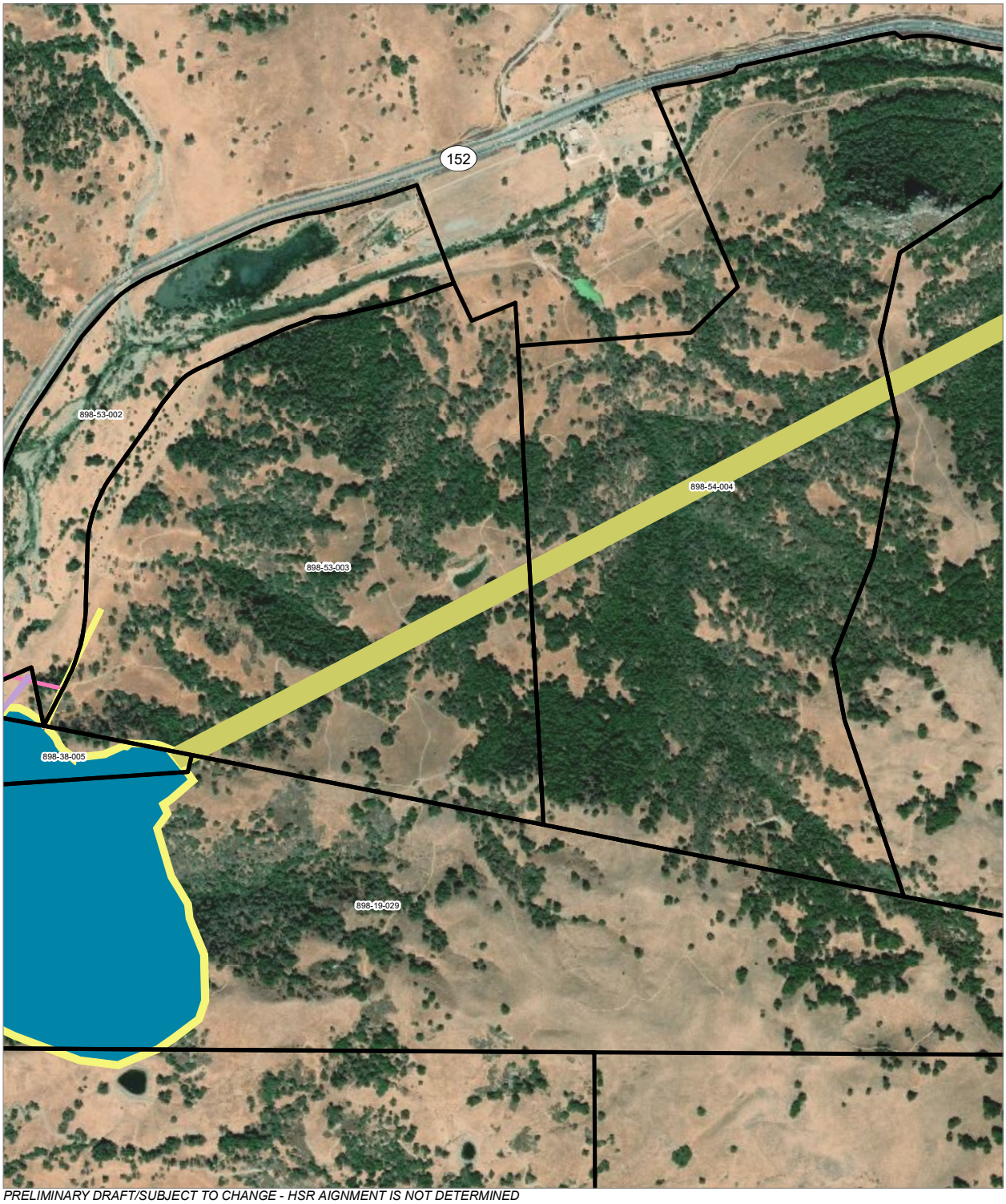


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Other Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Permanent Easement
Parcel (APN Displayed)

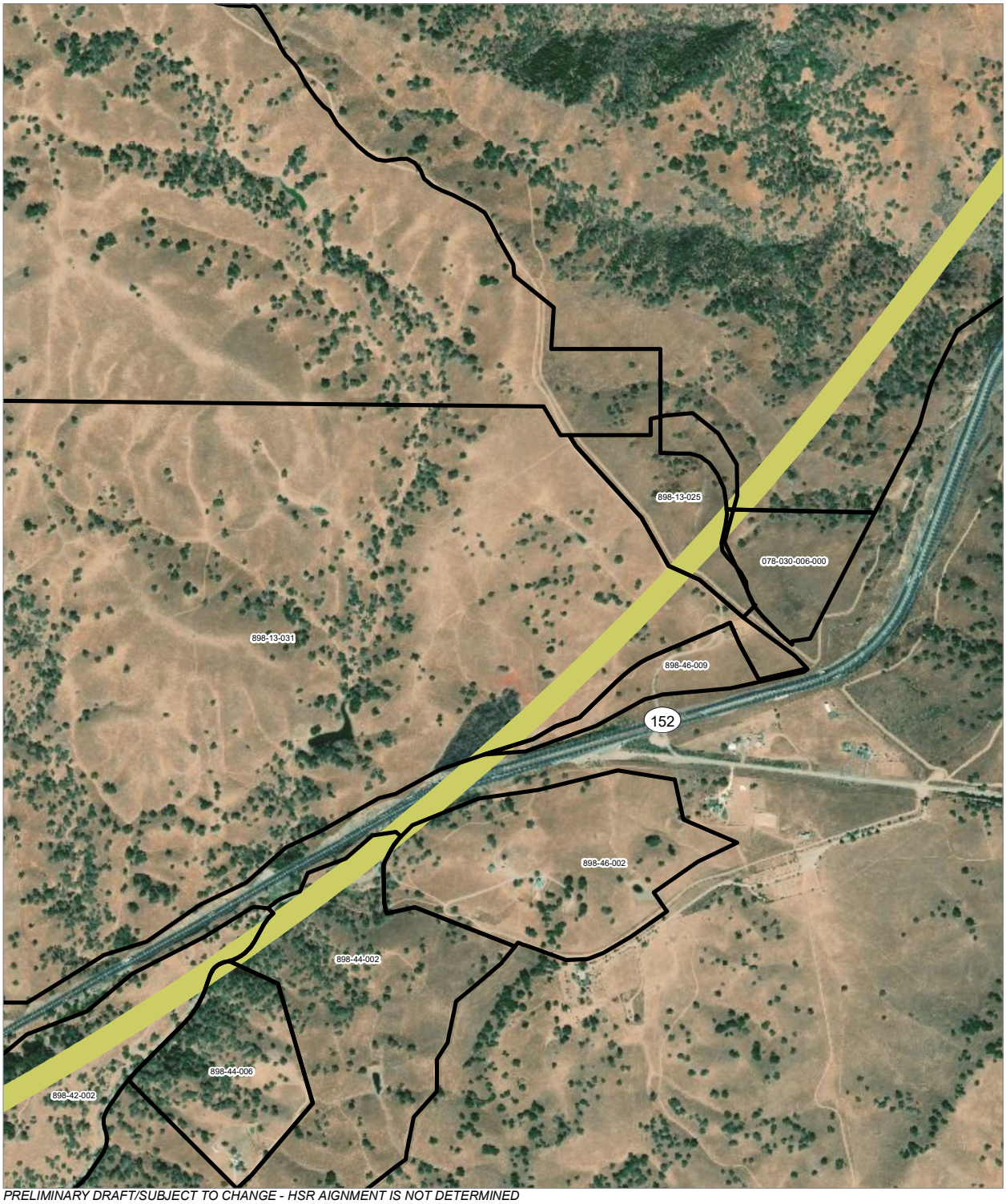
0 400 800
Feet
0 100 200
Meters

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Permanent Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

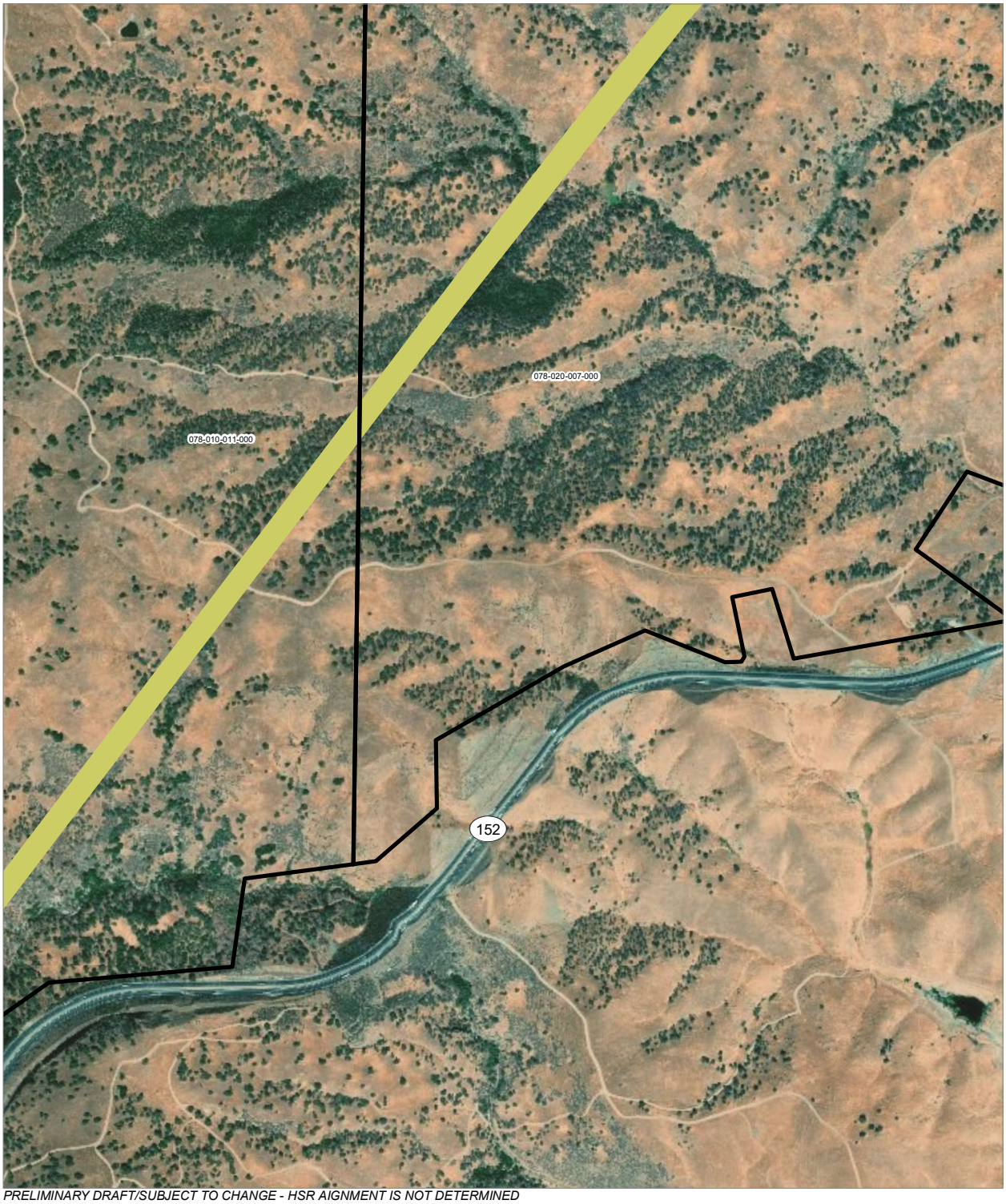


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Permanent Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

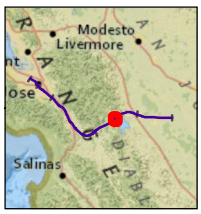


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Permanent Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

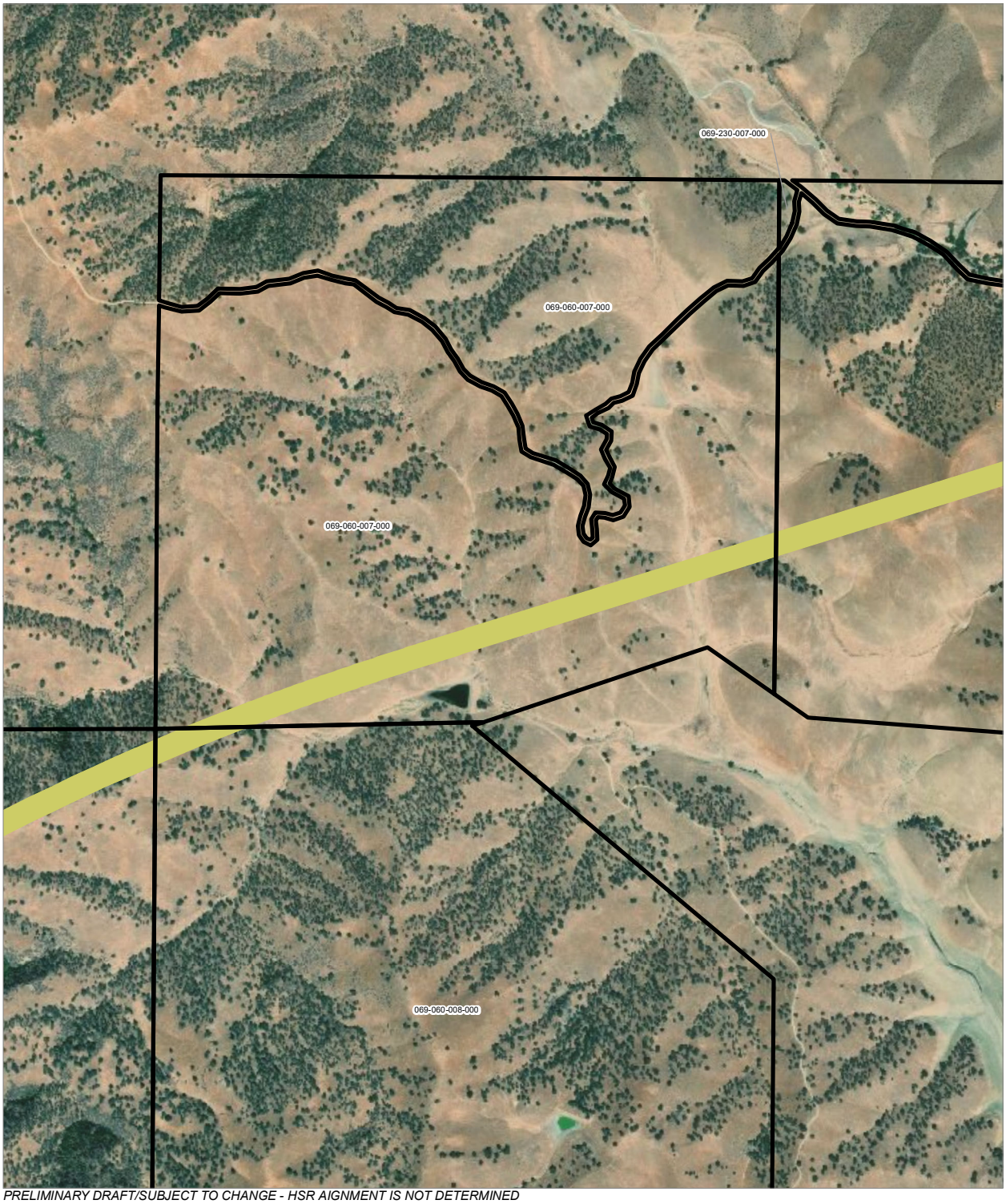


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Permanent Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

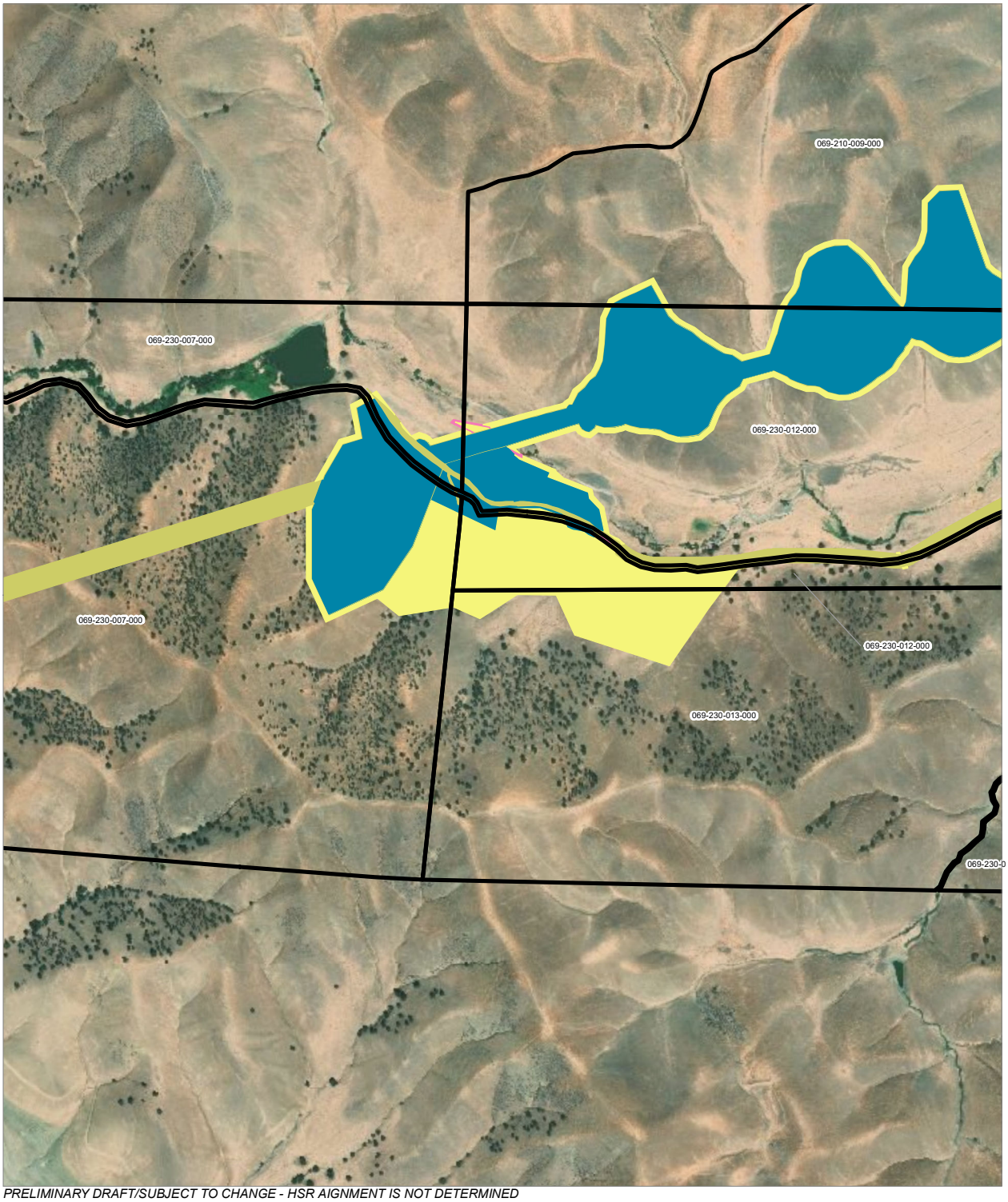


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Permanent Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

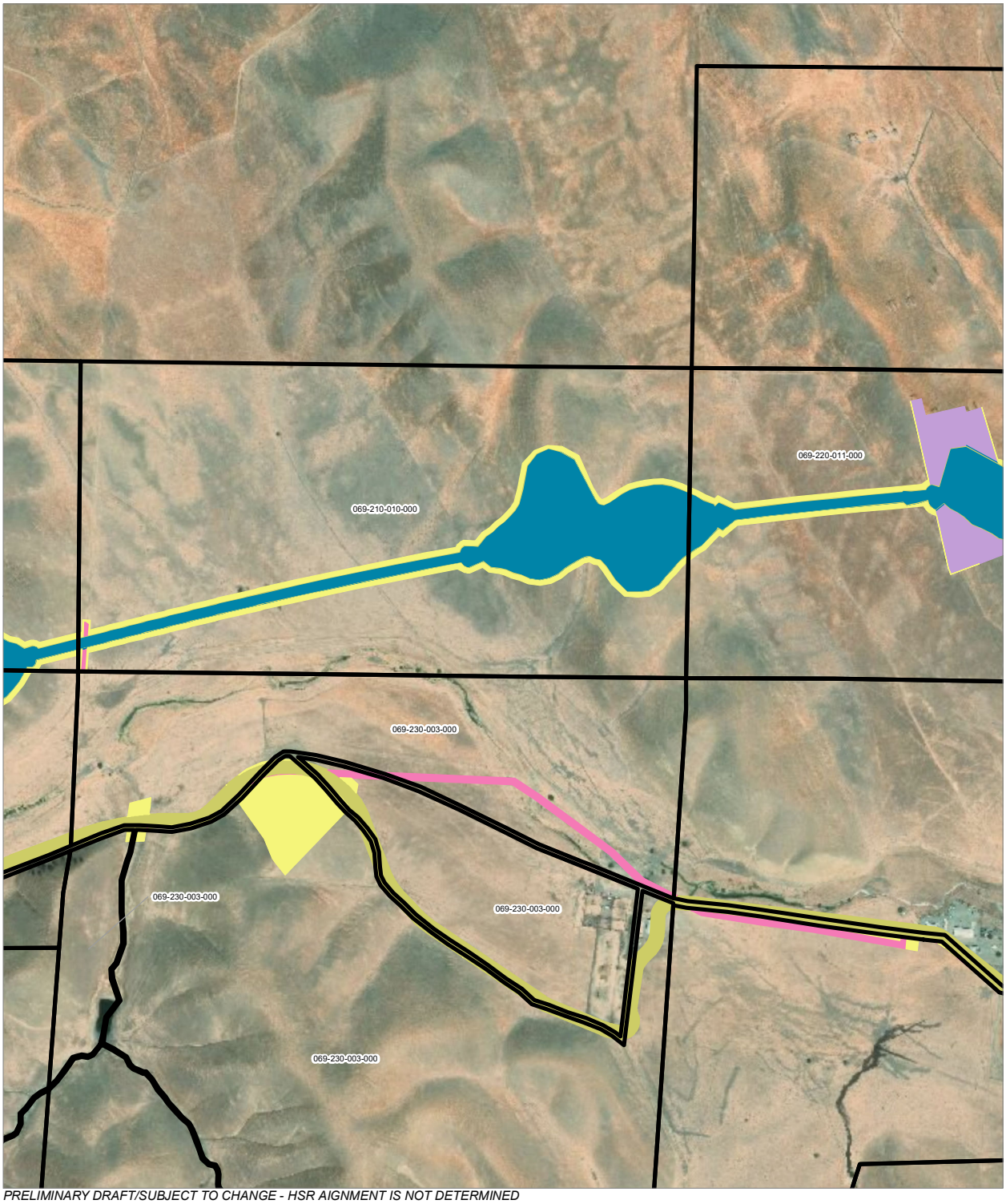


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

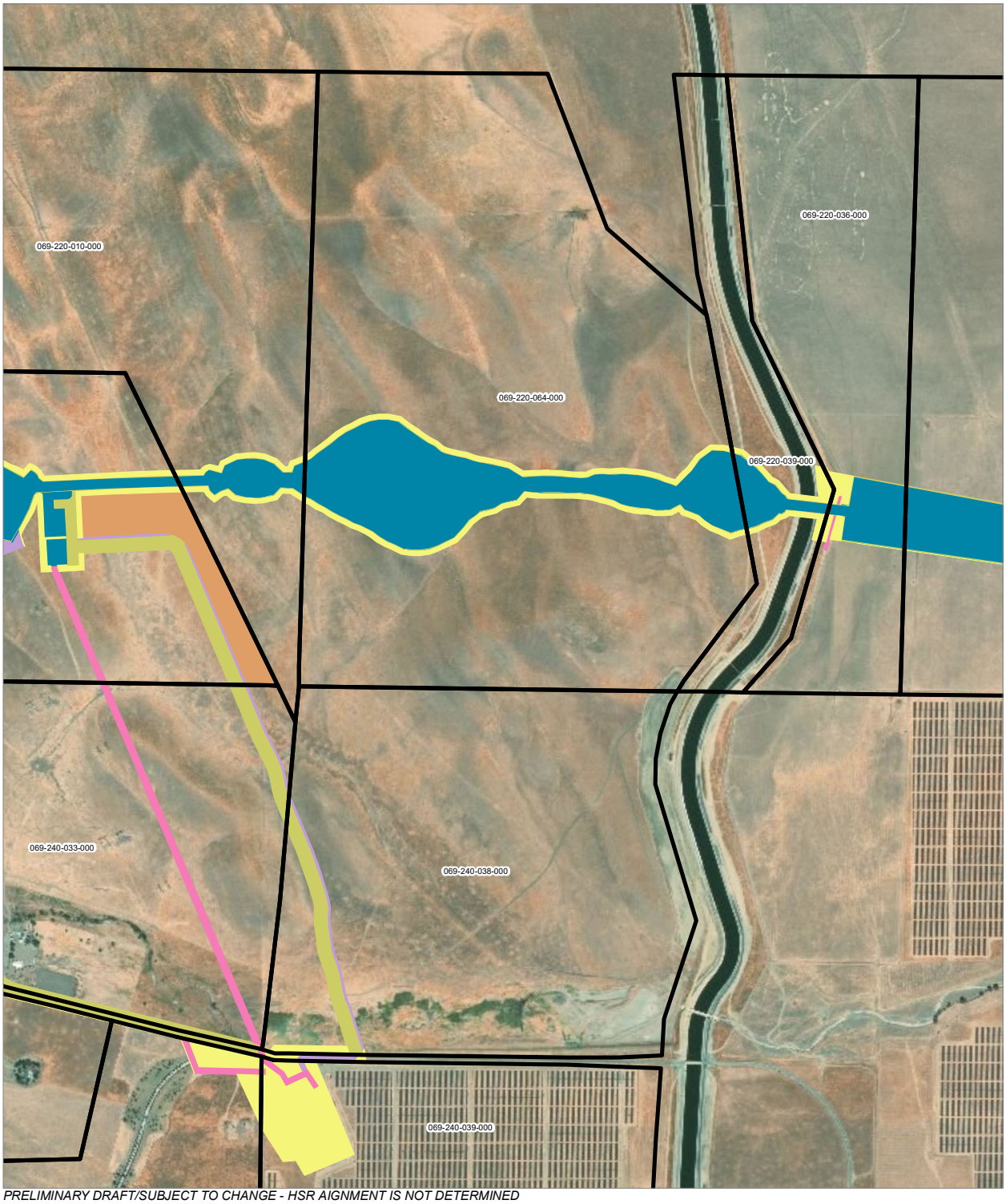


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

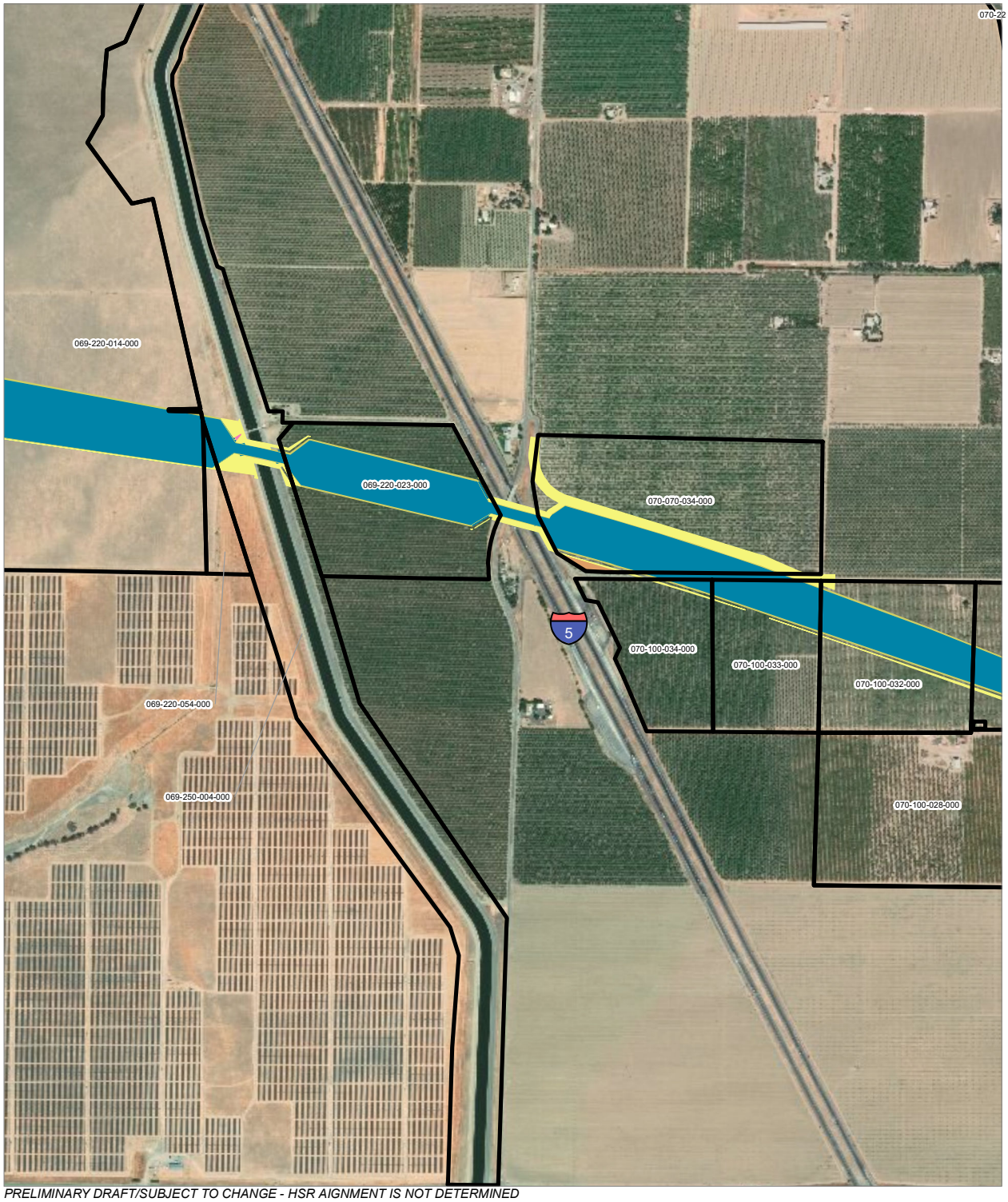


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

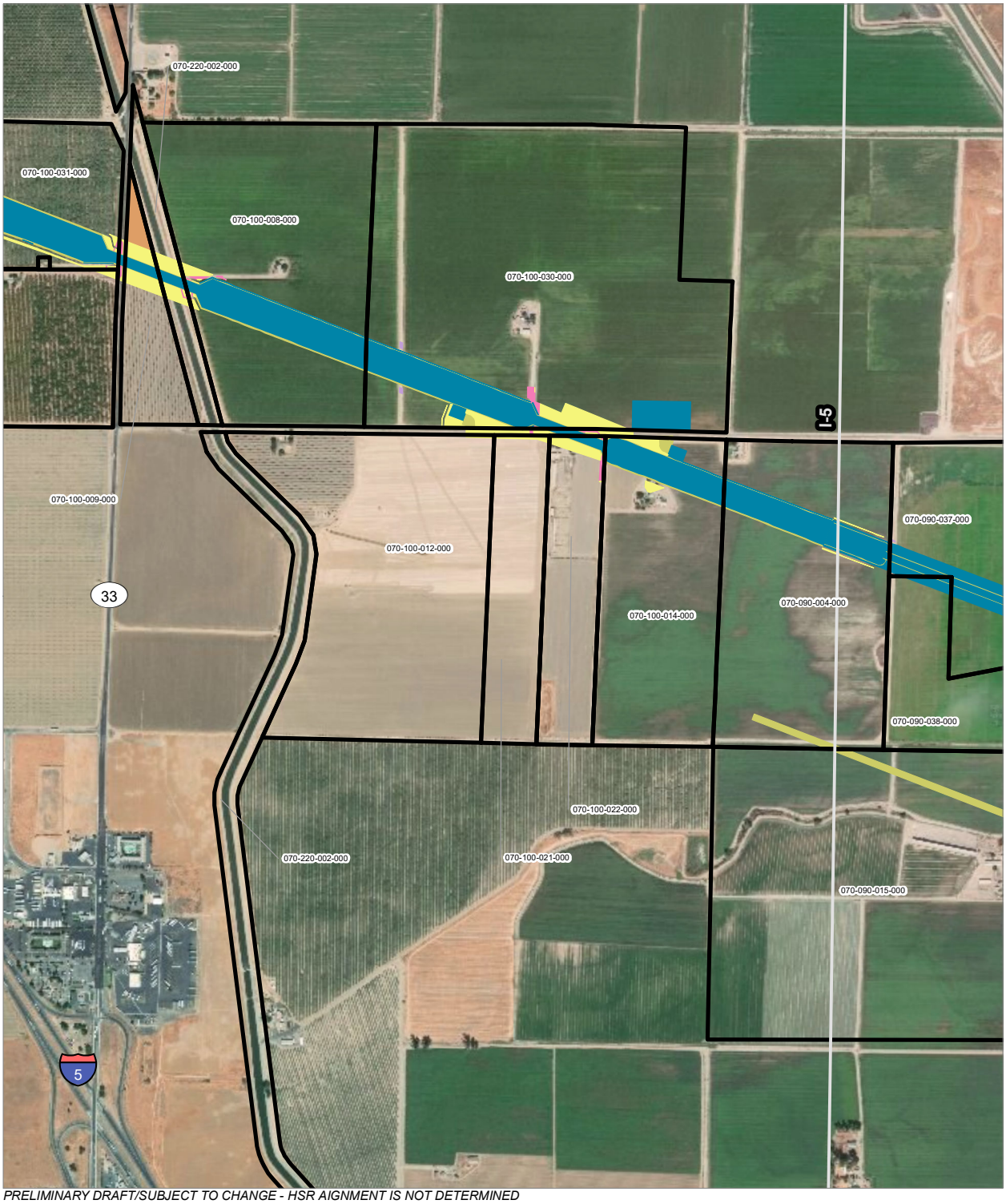


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

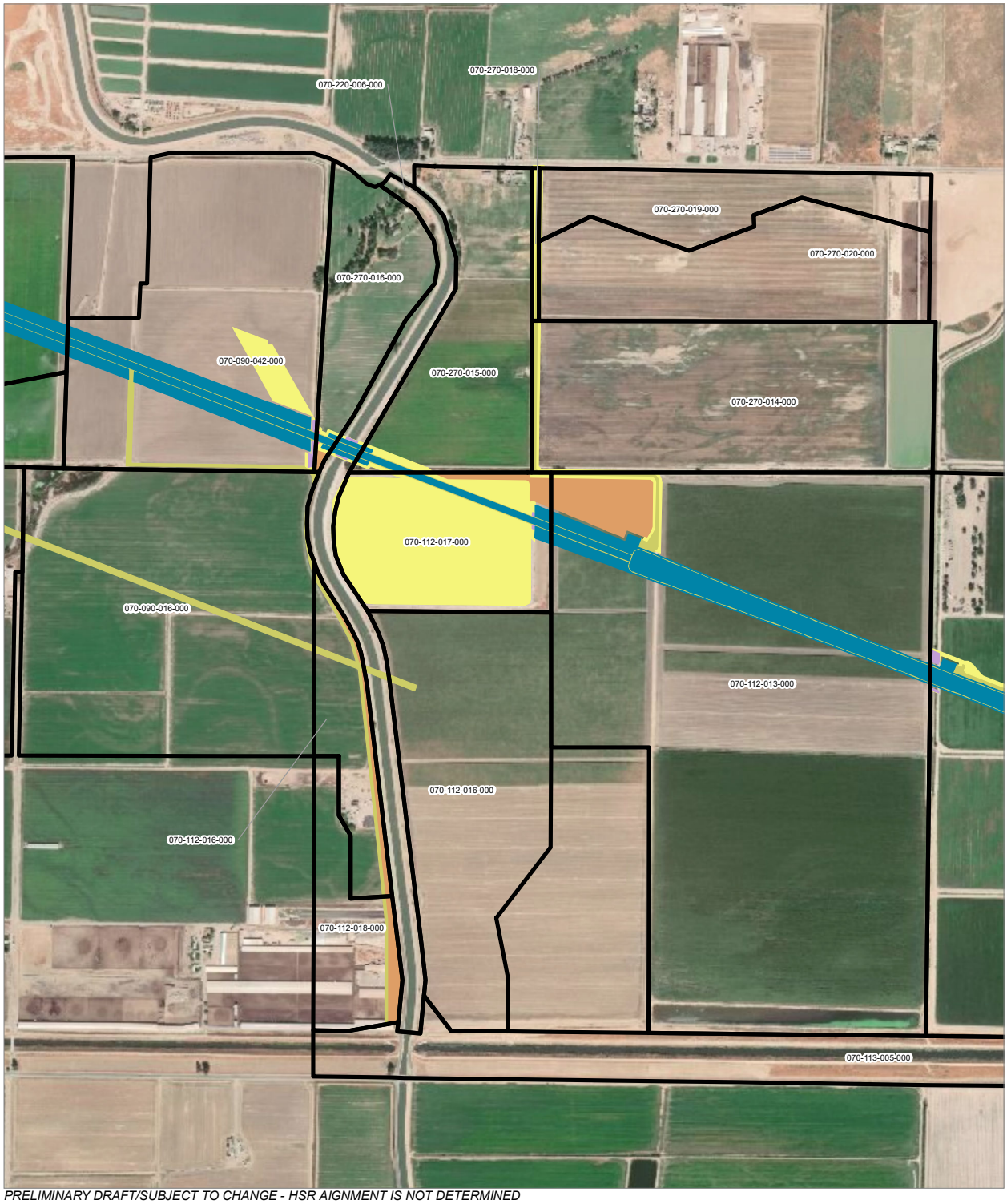


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

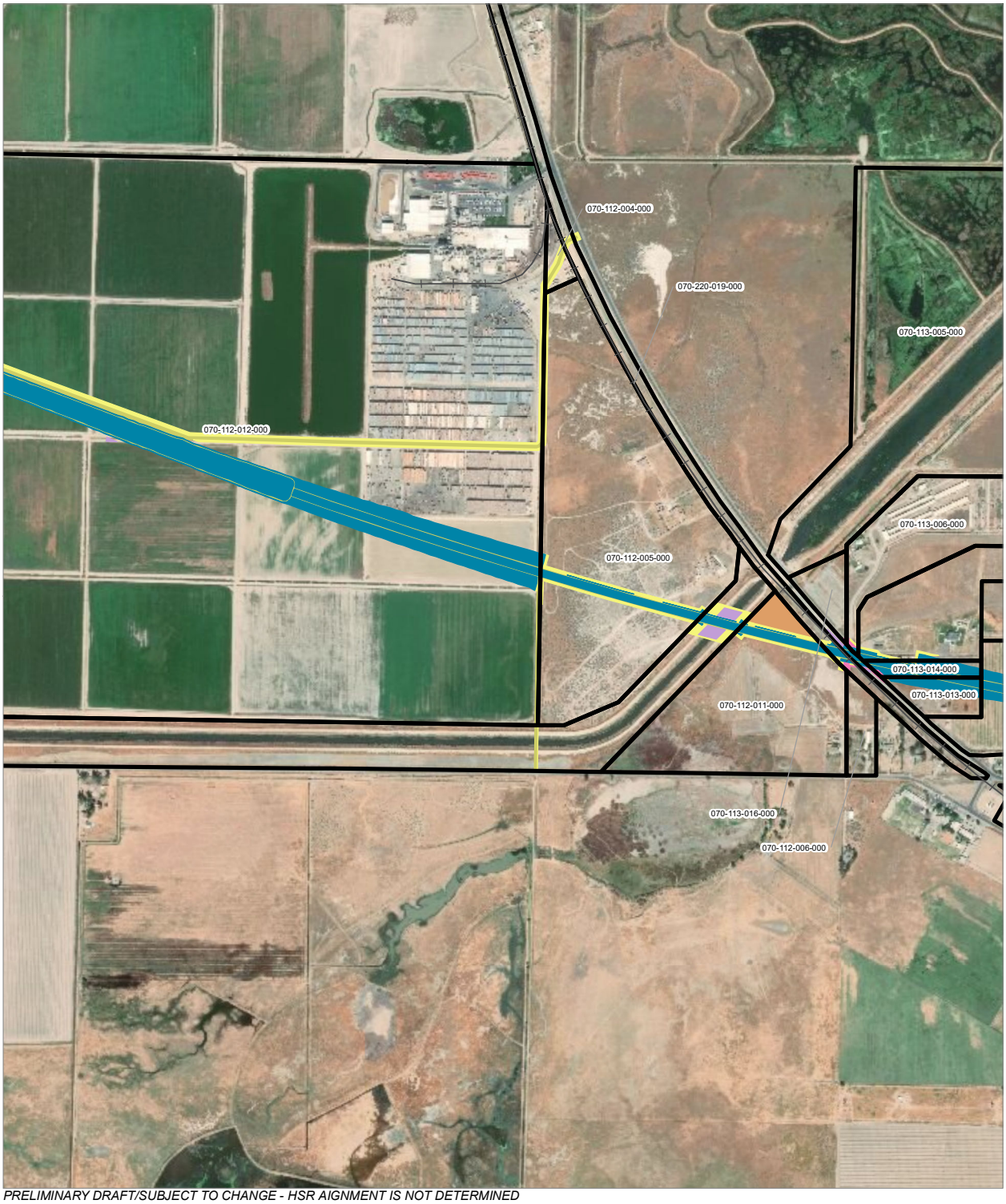


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

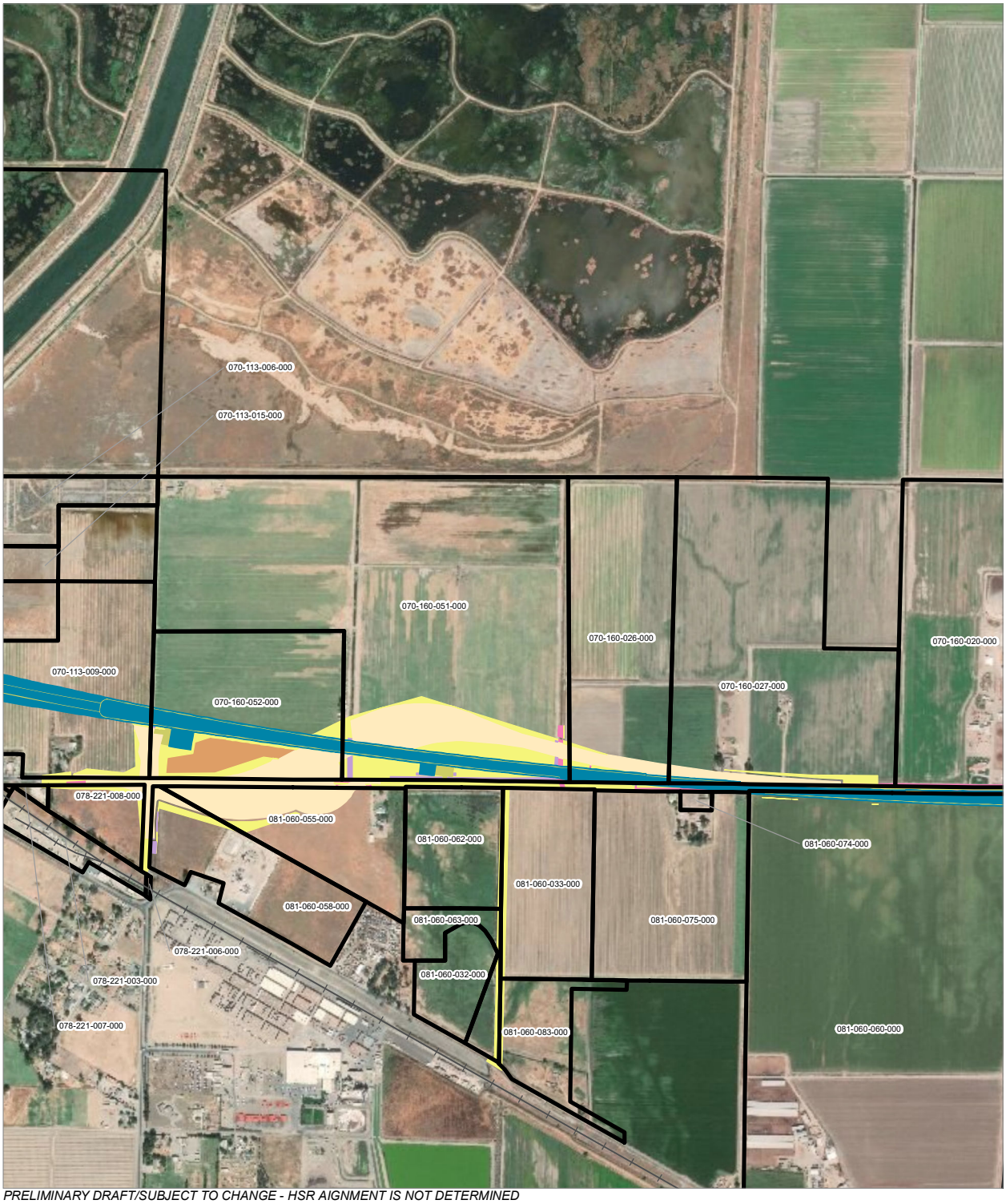


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

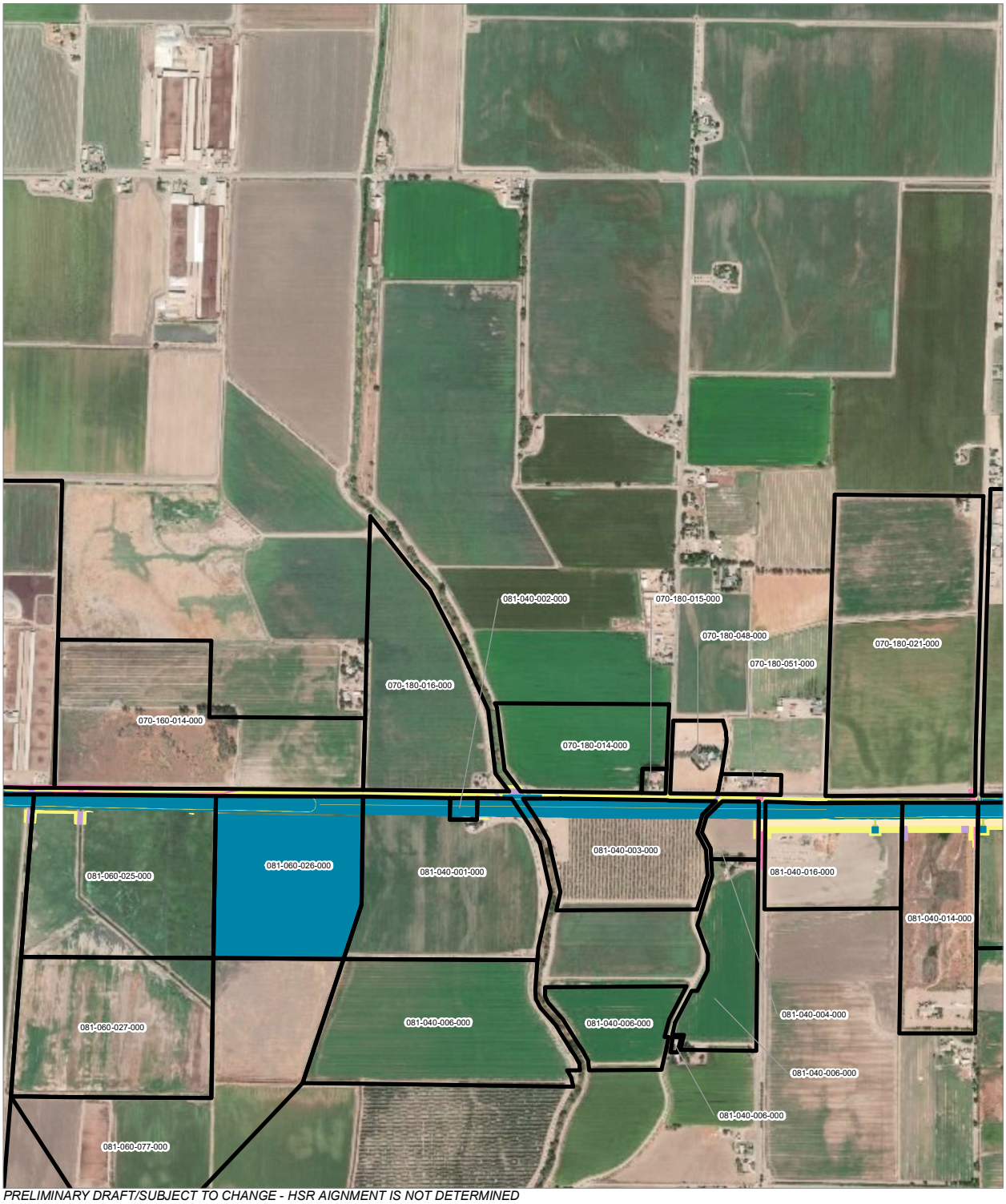


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

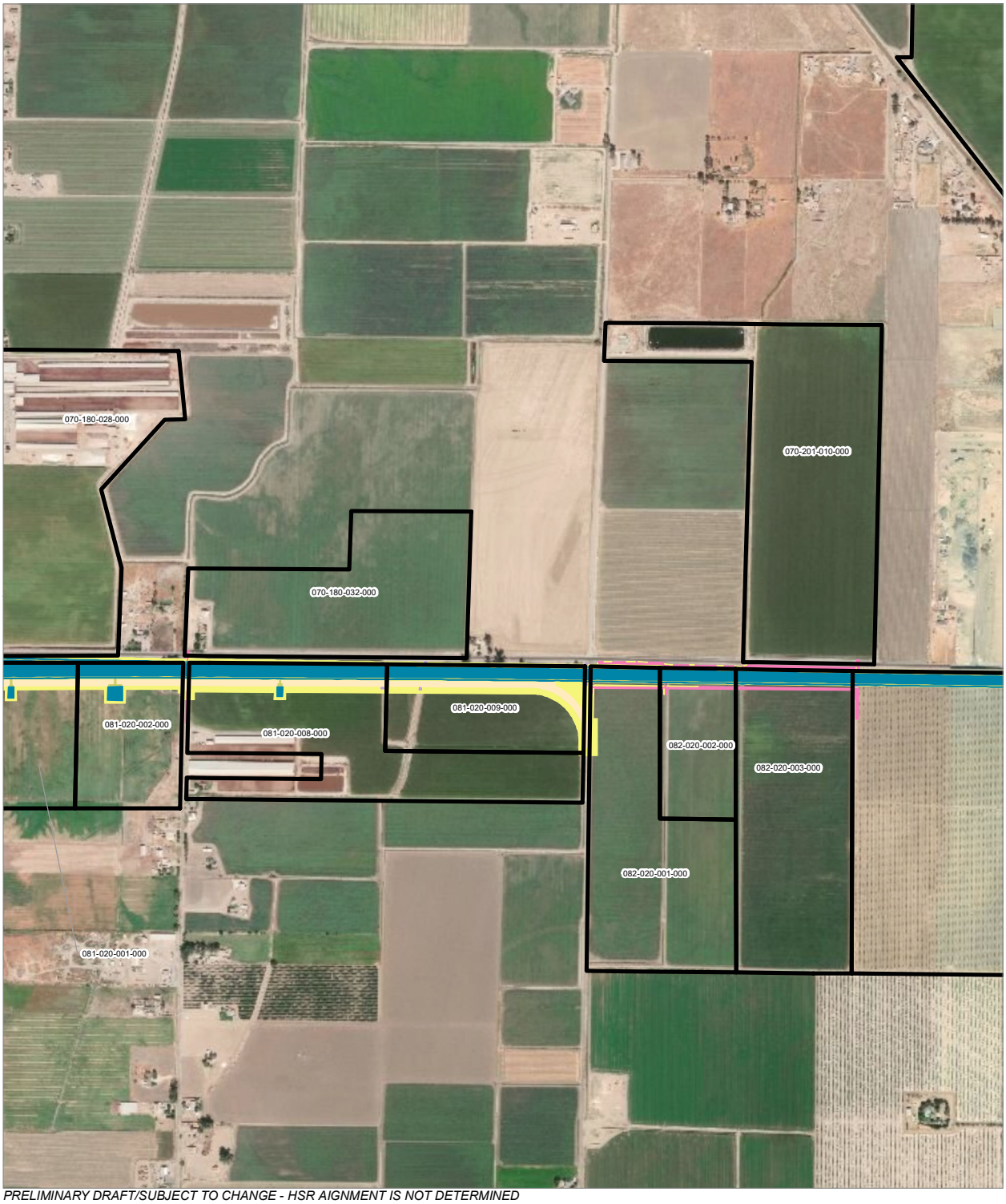


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

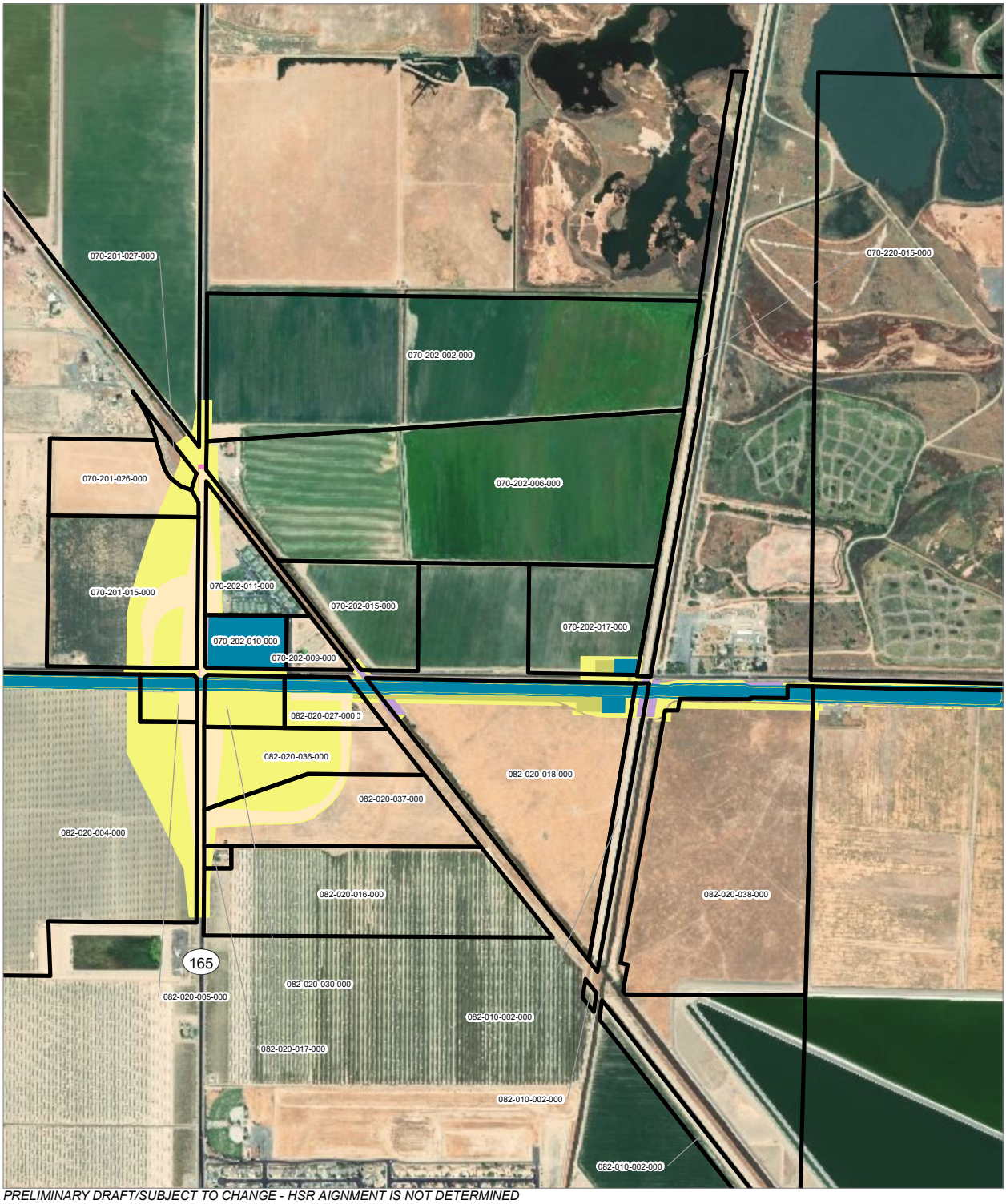


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

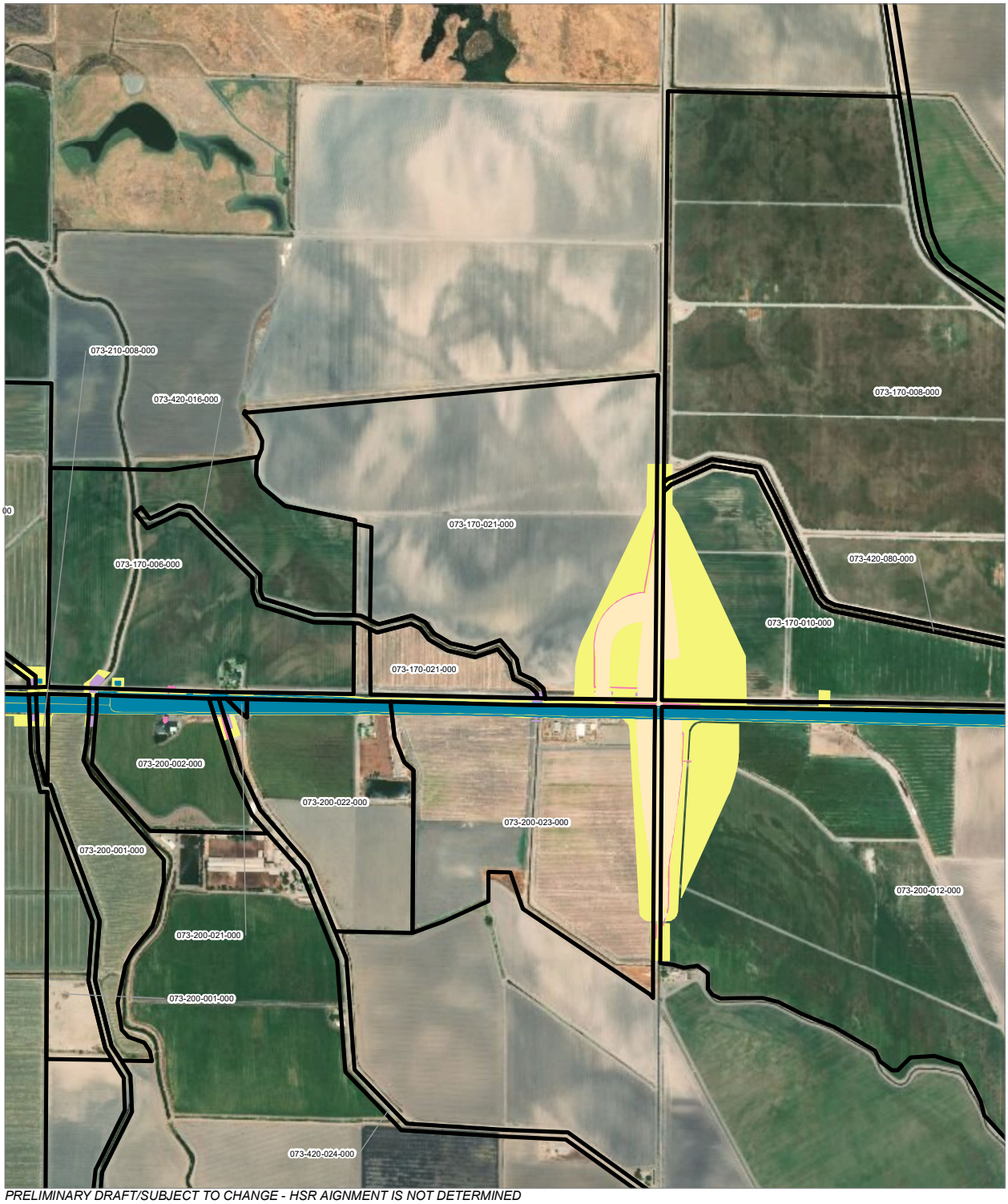
0 400 800
Feet
0 100 200
Meters

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

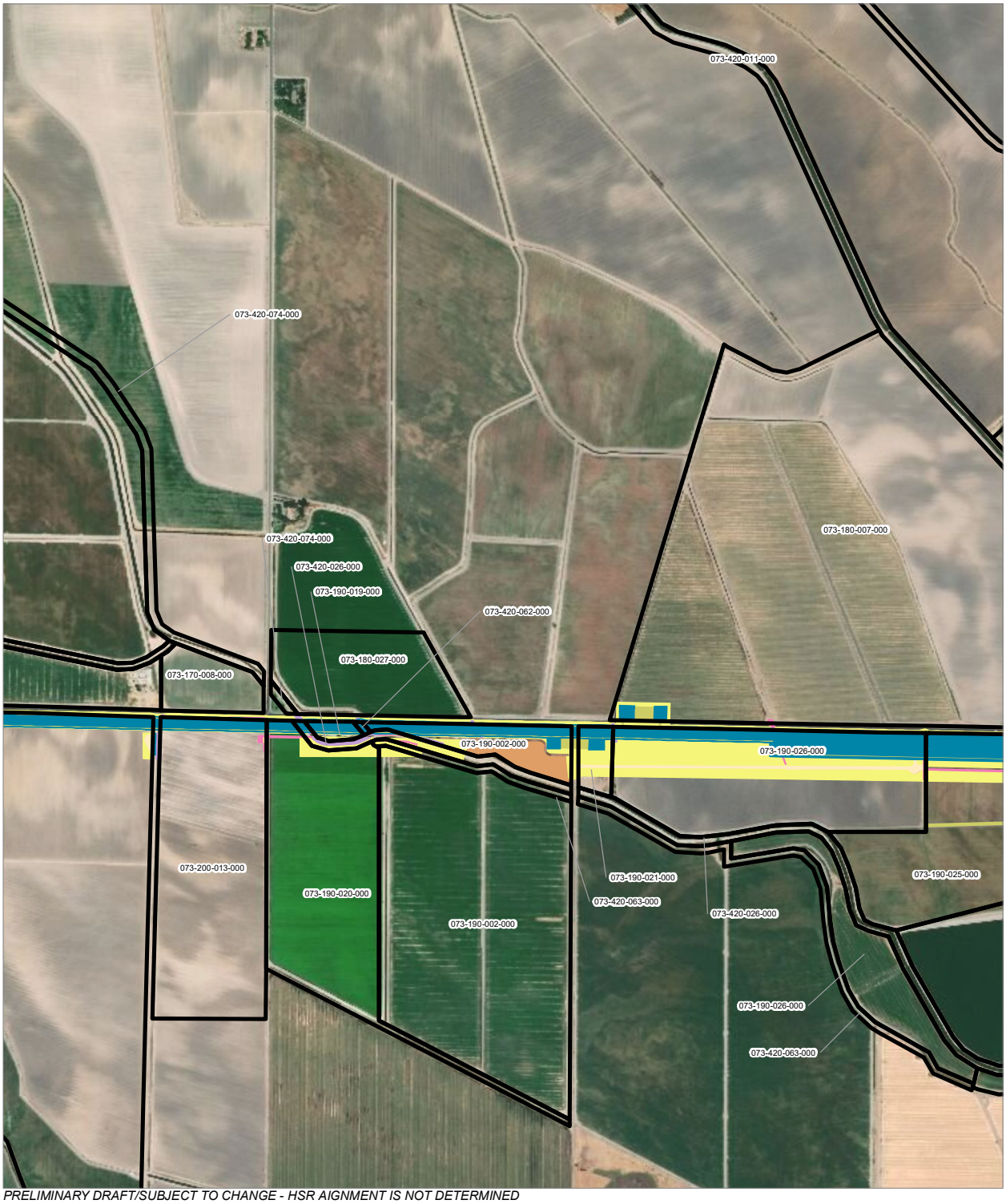


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



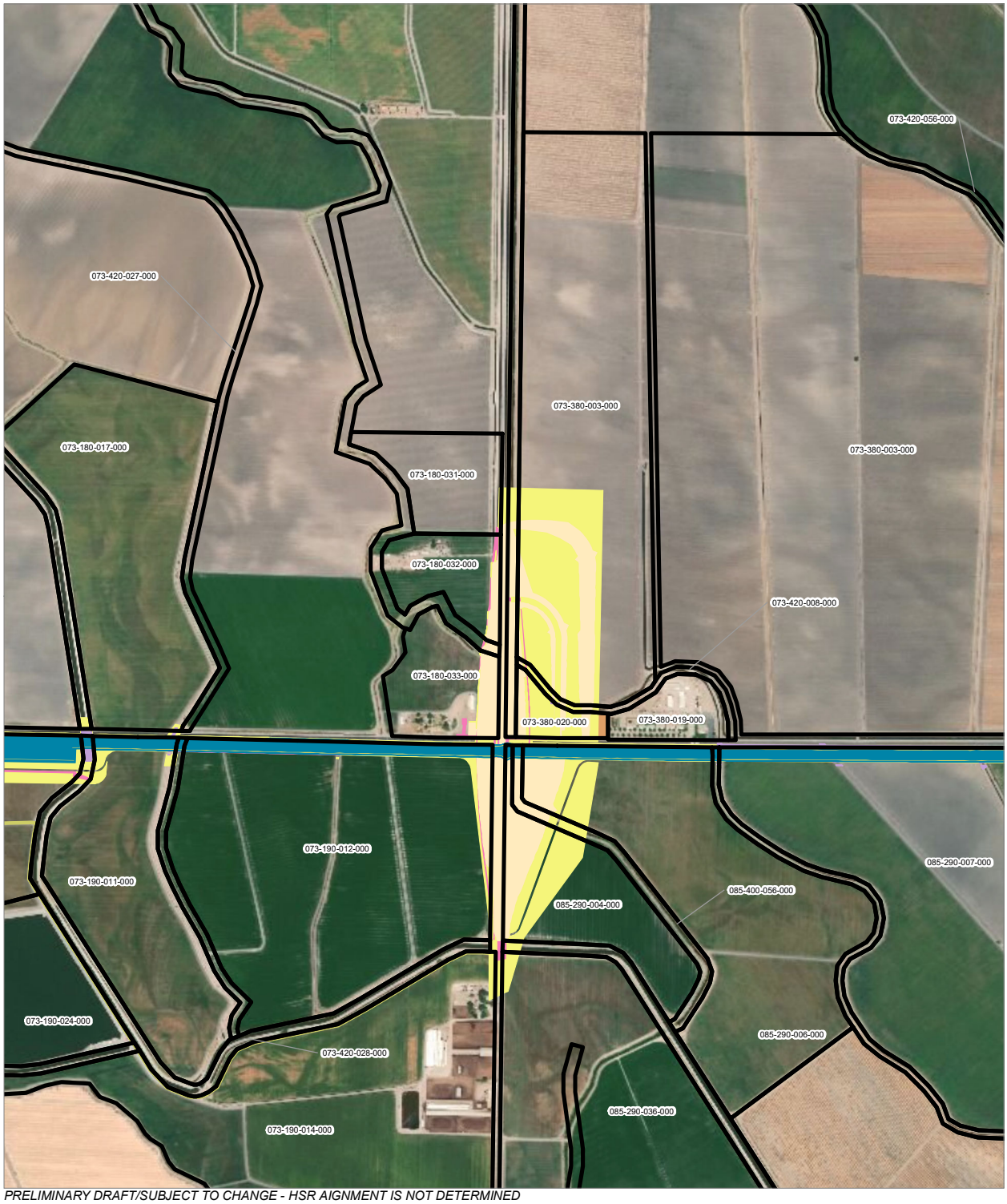
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

N

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

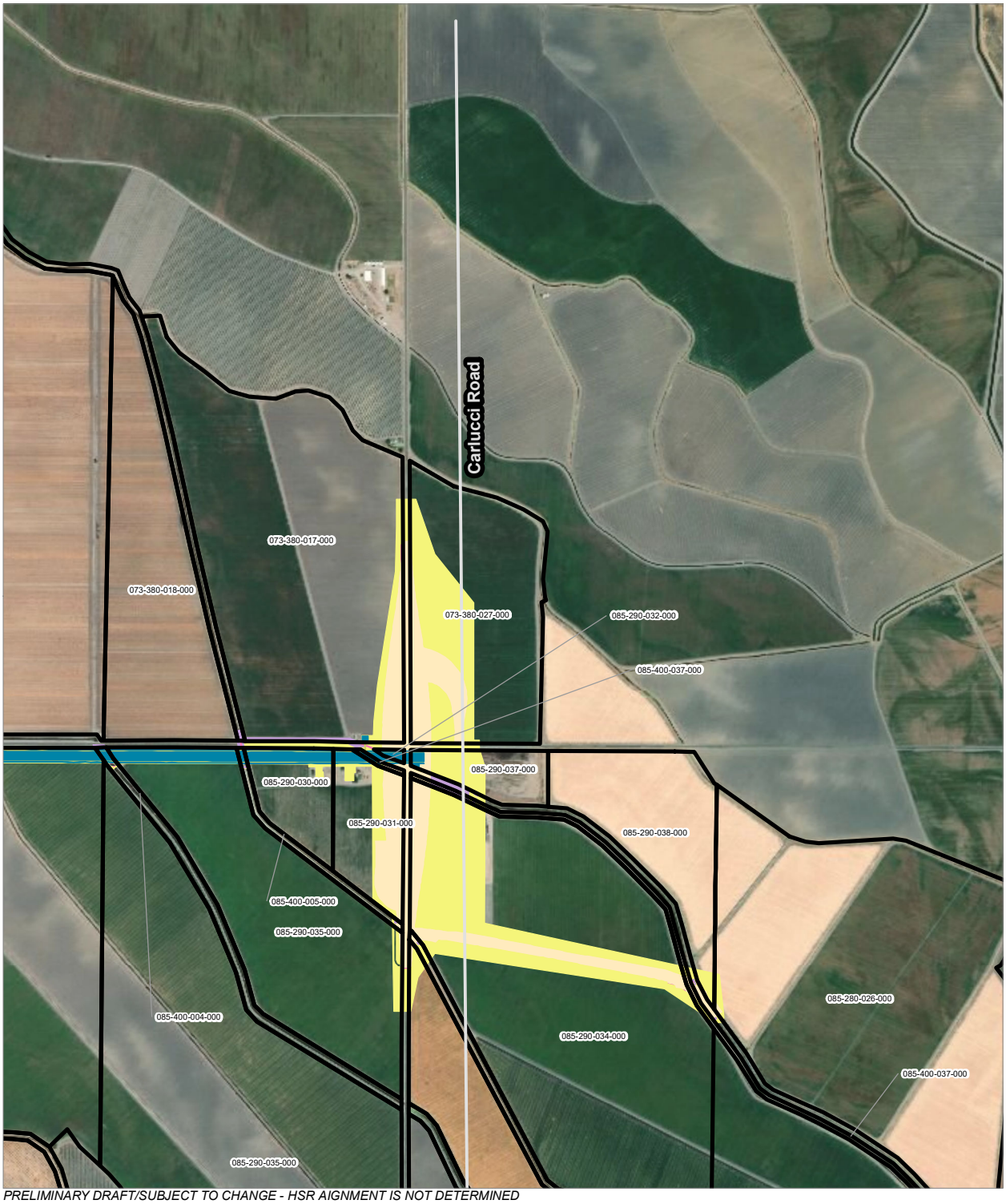


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters



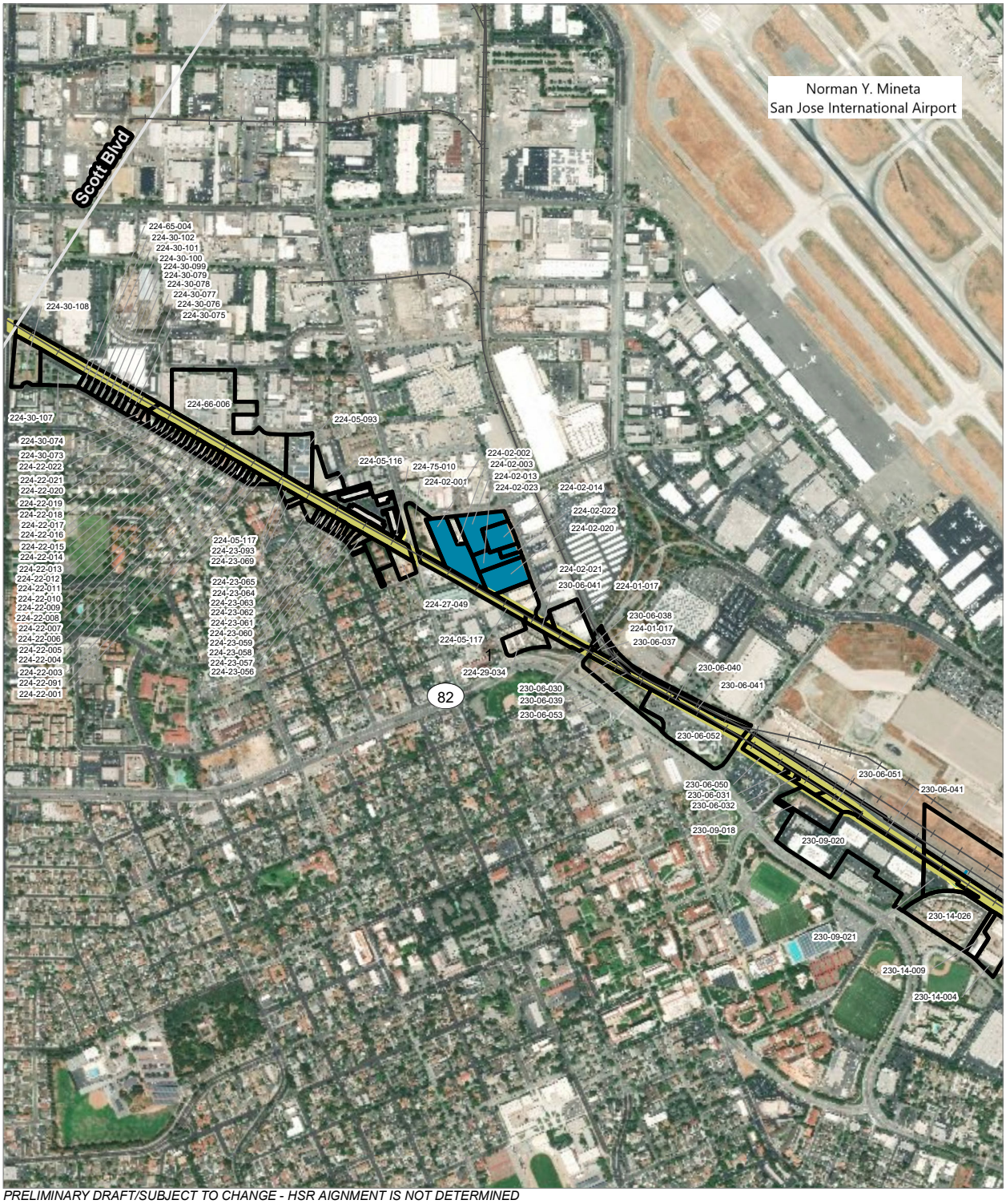
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 3

0 400 800
Feet
0 100 200
Meters

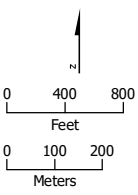
- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 4, Part 1)

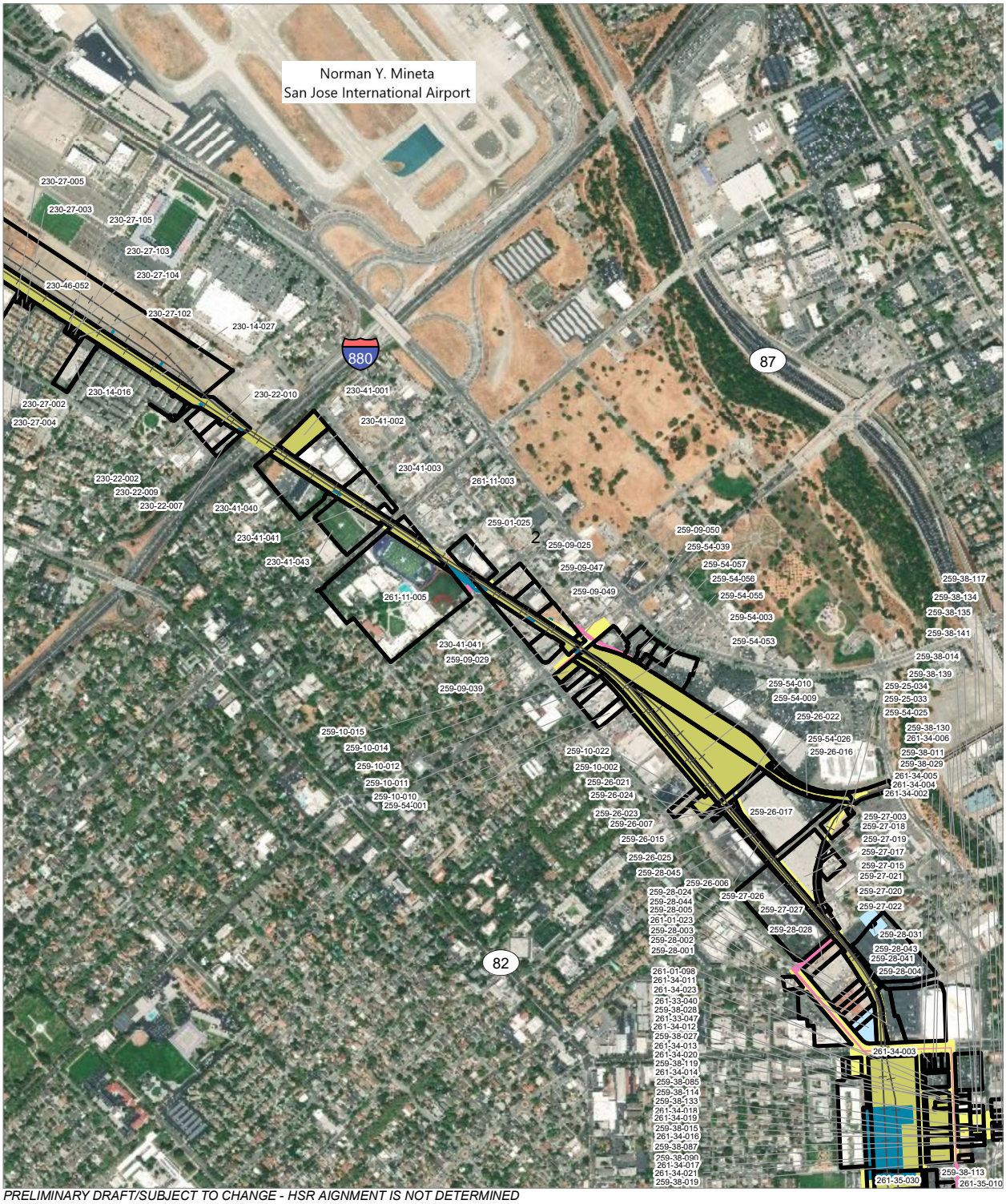


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



HSR Right-of-Way
HSR Permanent Easement
Temporary Construction Easement
Parcel (APN Displayed)

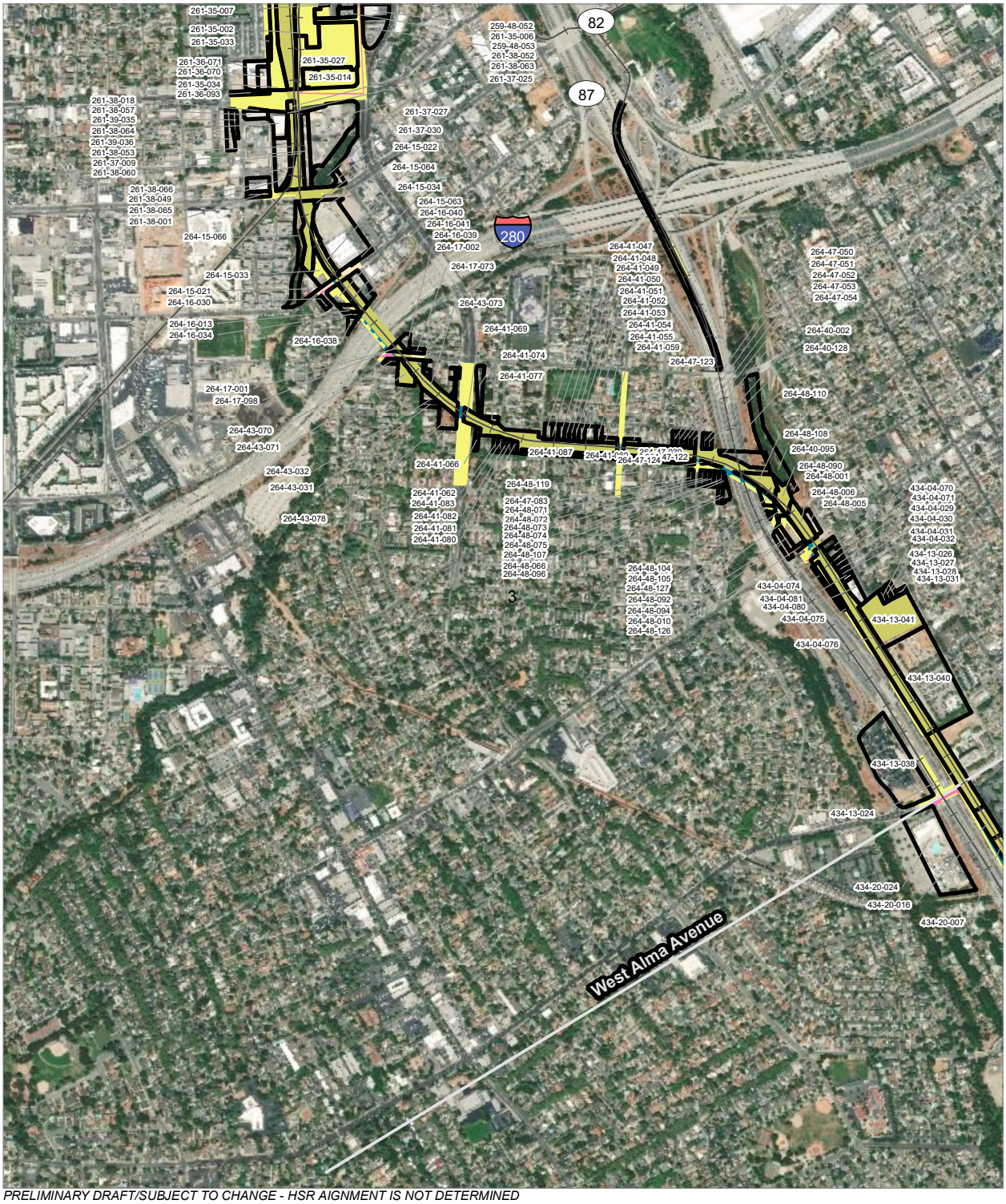


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

HSR Right-of-Way
Other Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

Alternative 4

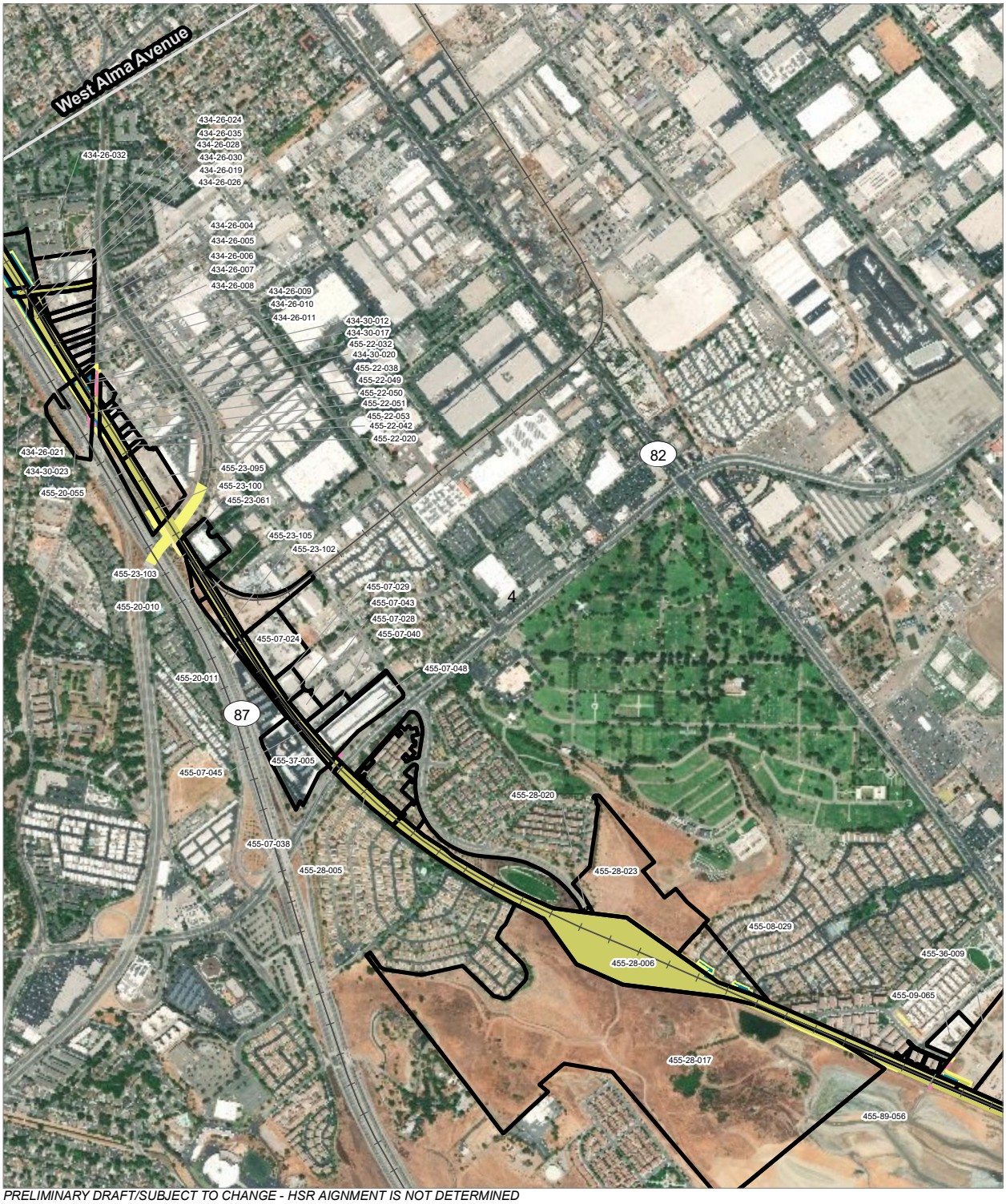


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

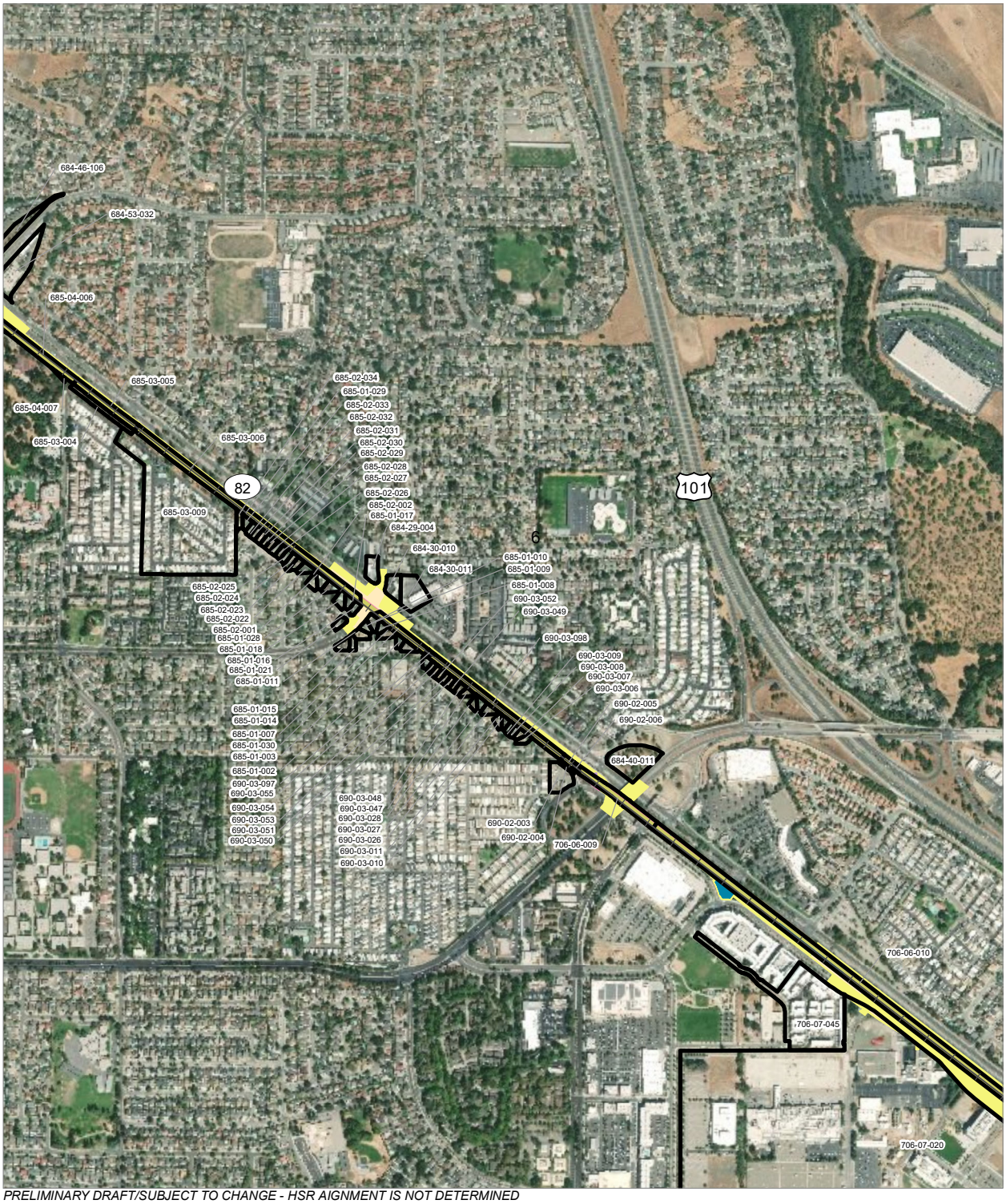
- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

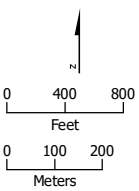
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

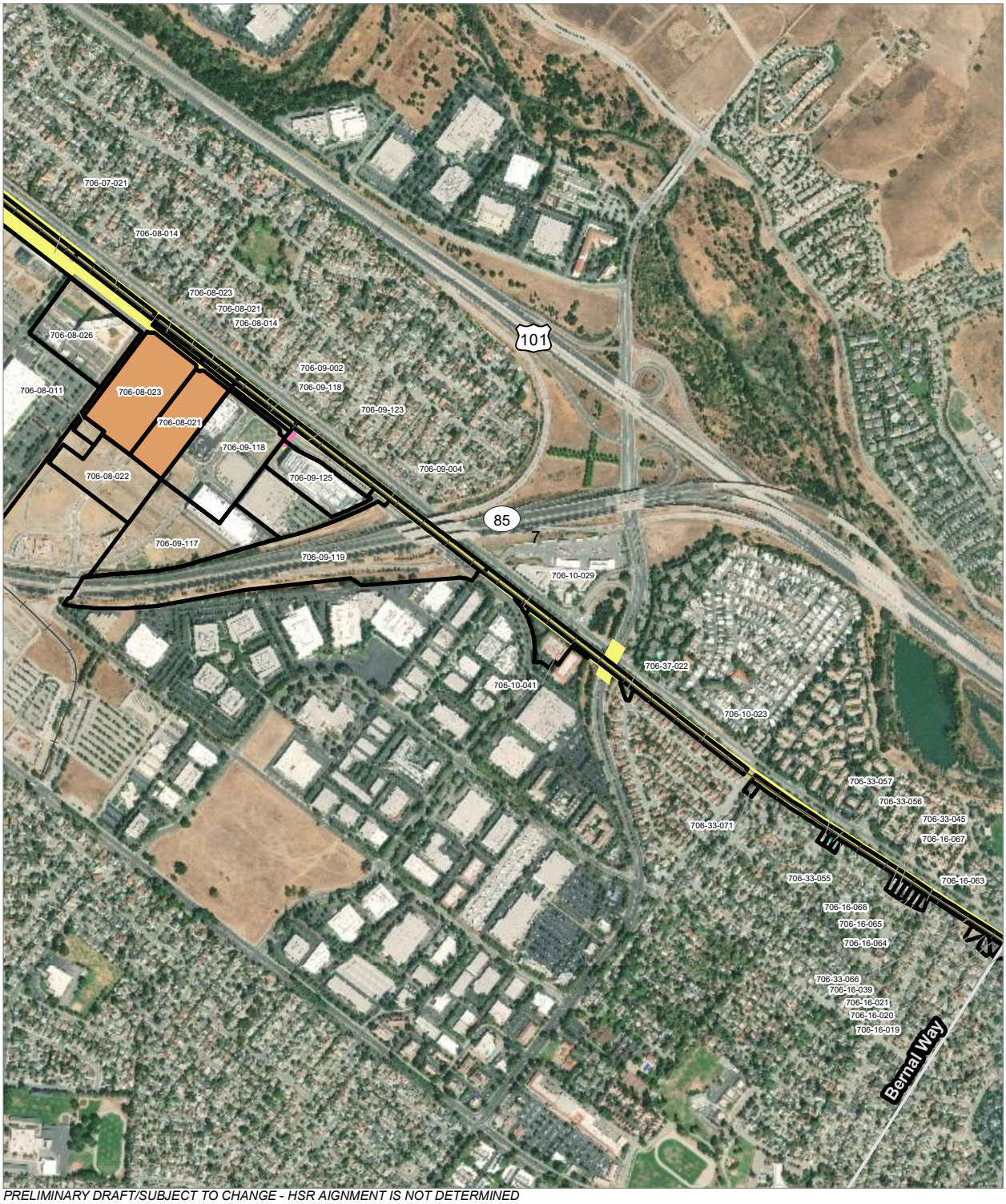


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

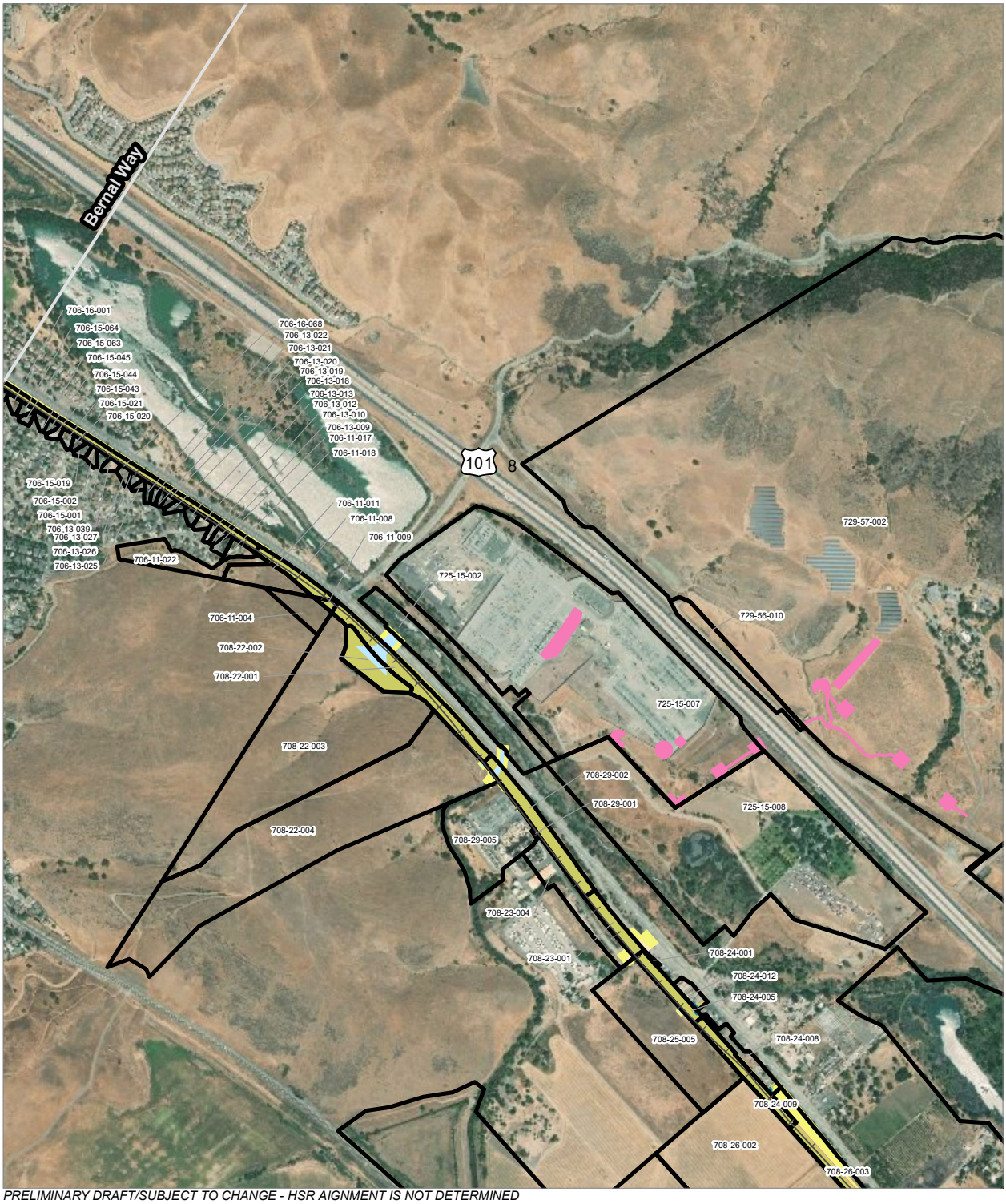


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

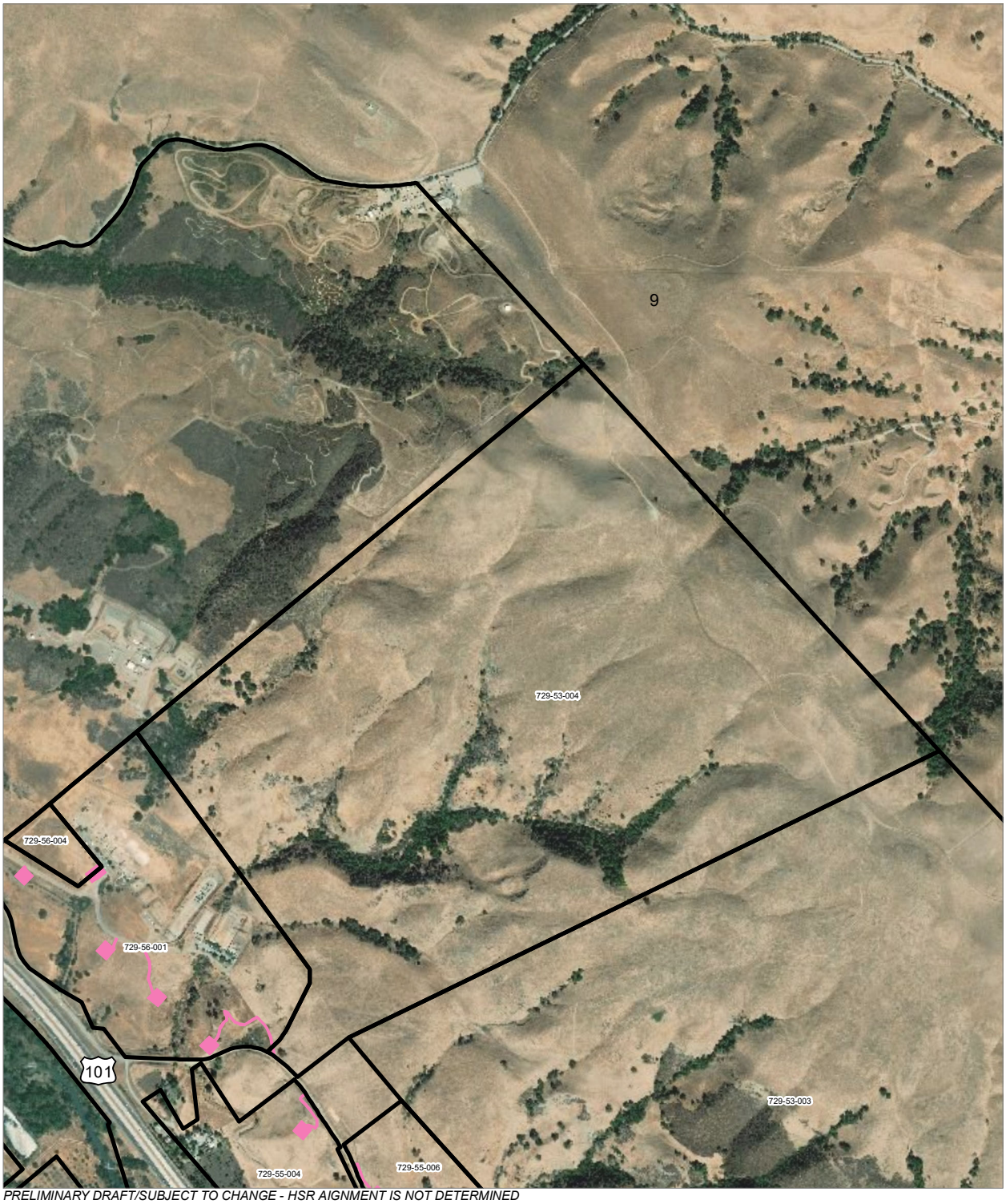


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

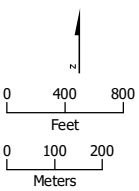
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Other Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

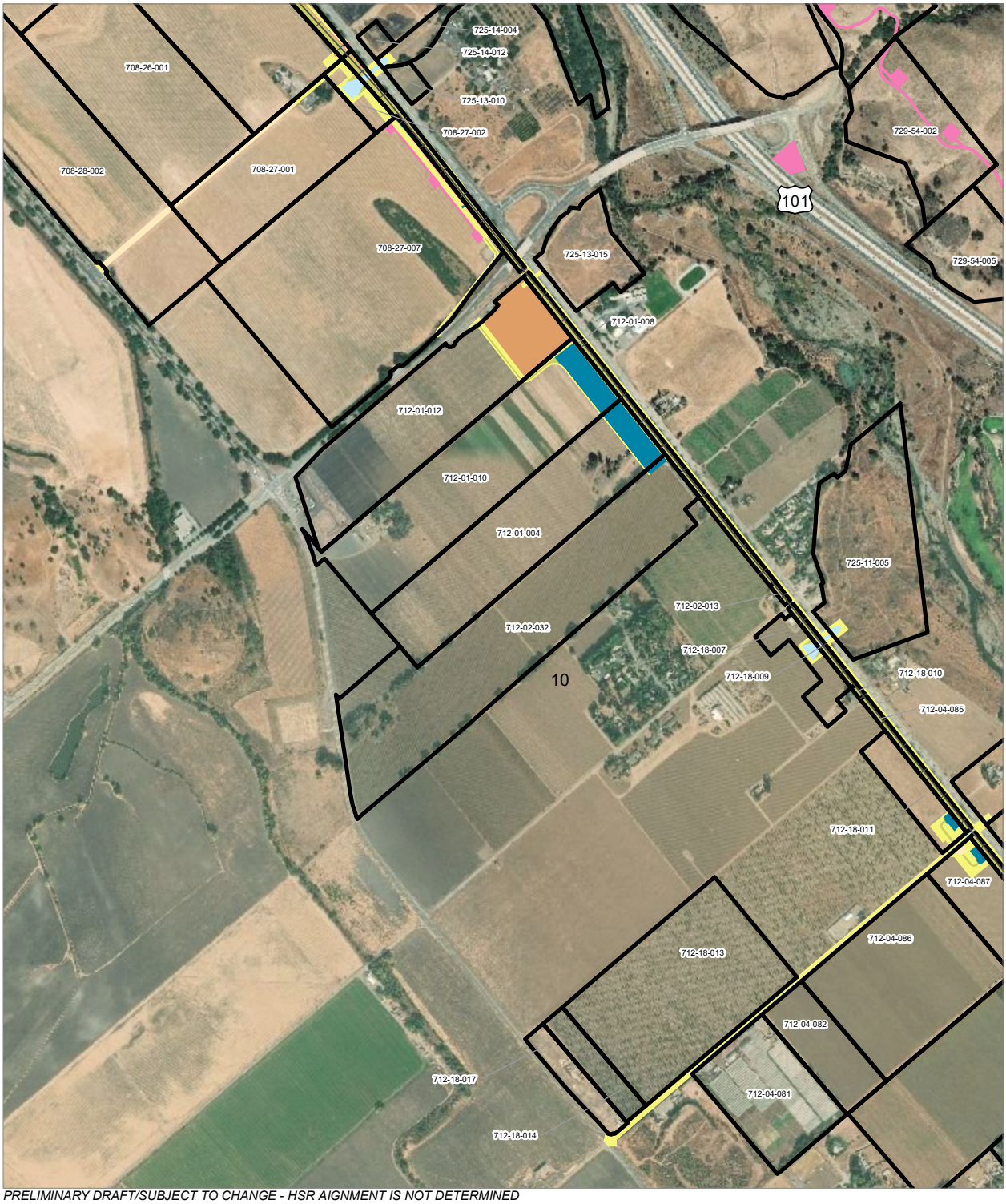


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



Permanent Utility Easement
Parcel (APN Displayed)

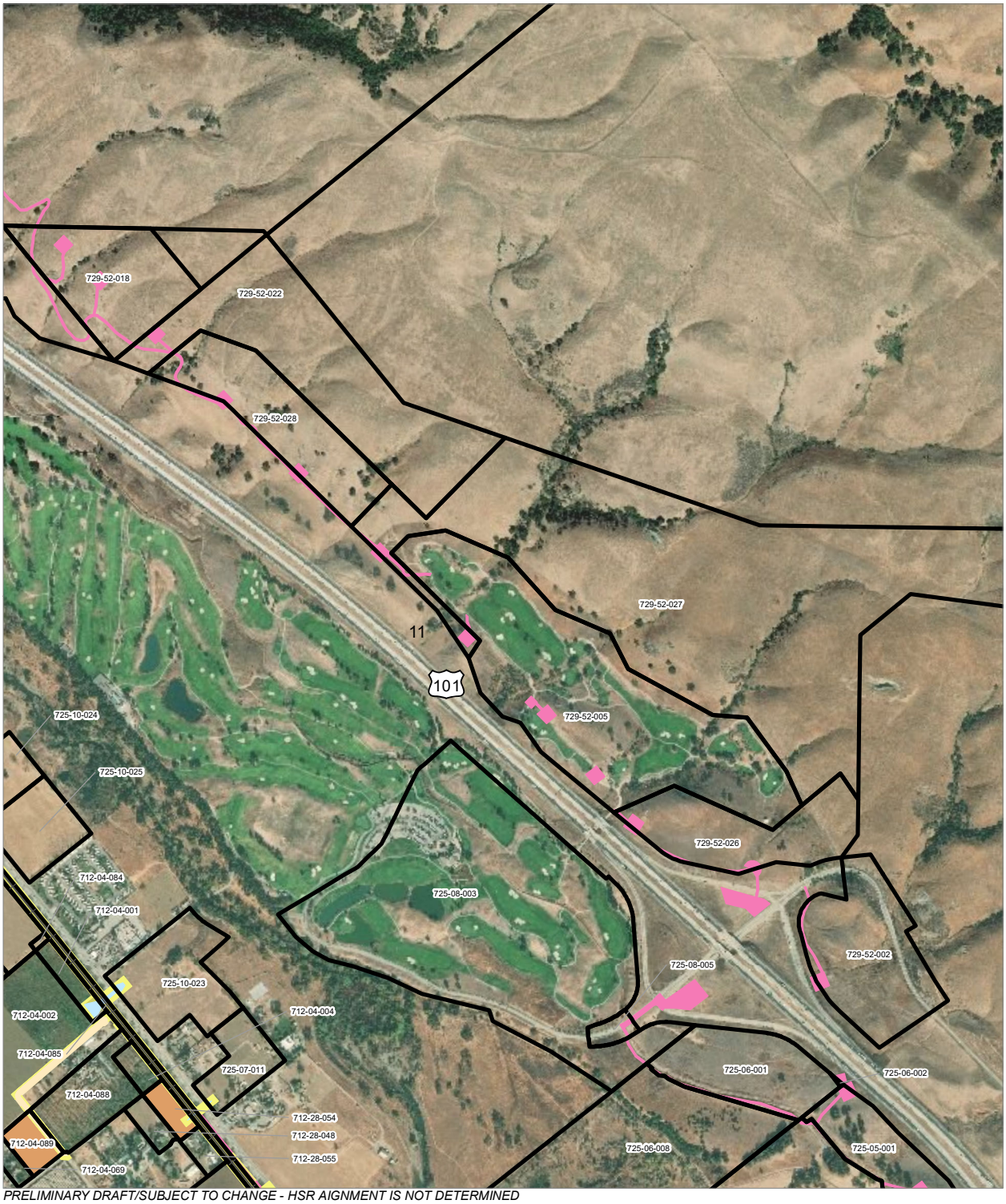


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

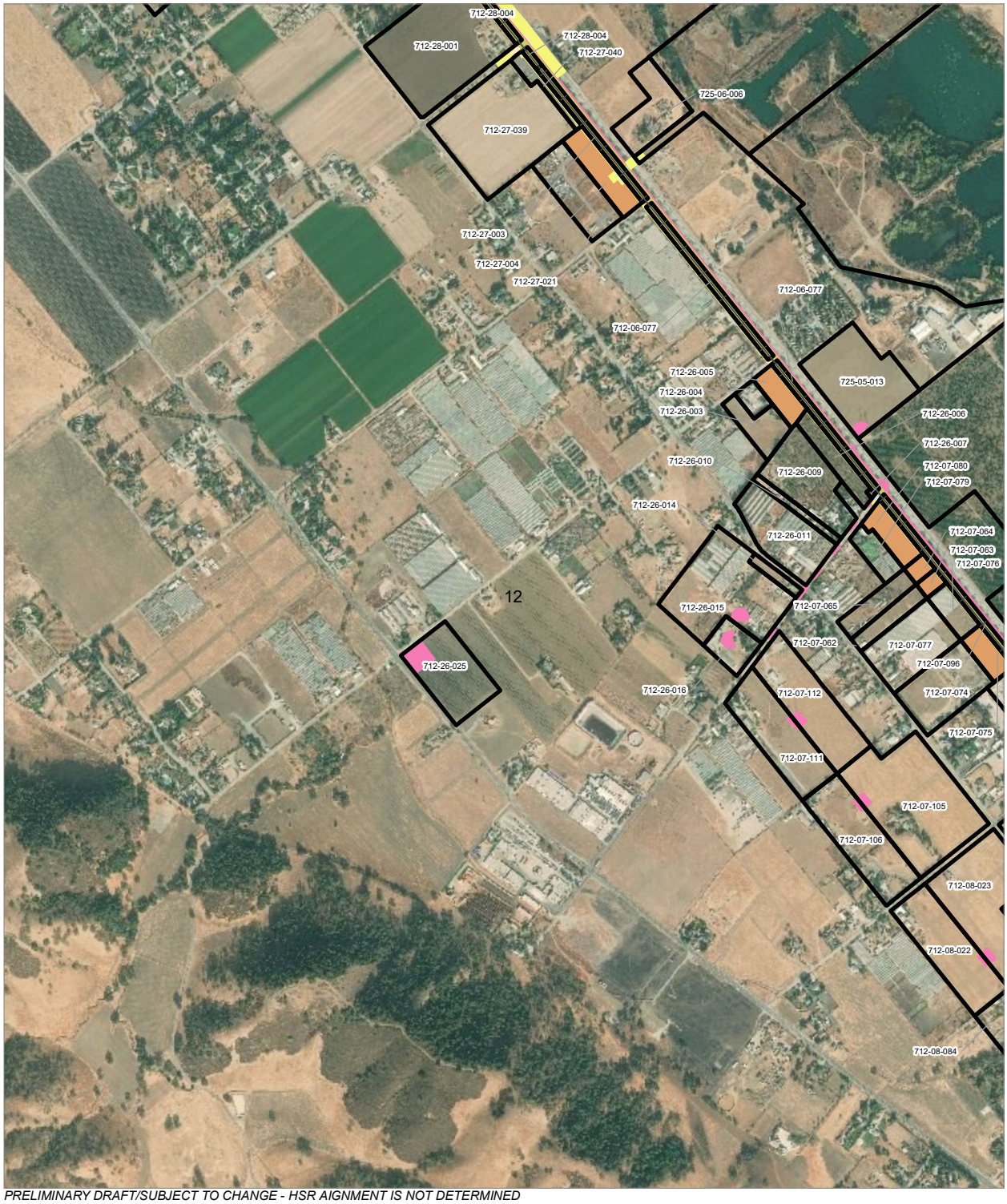
HSR Right-of-Way
Other Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

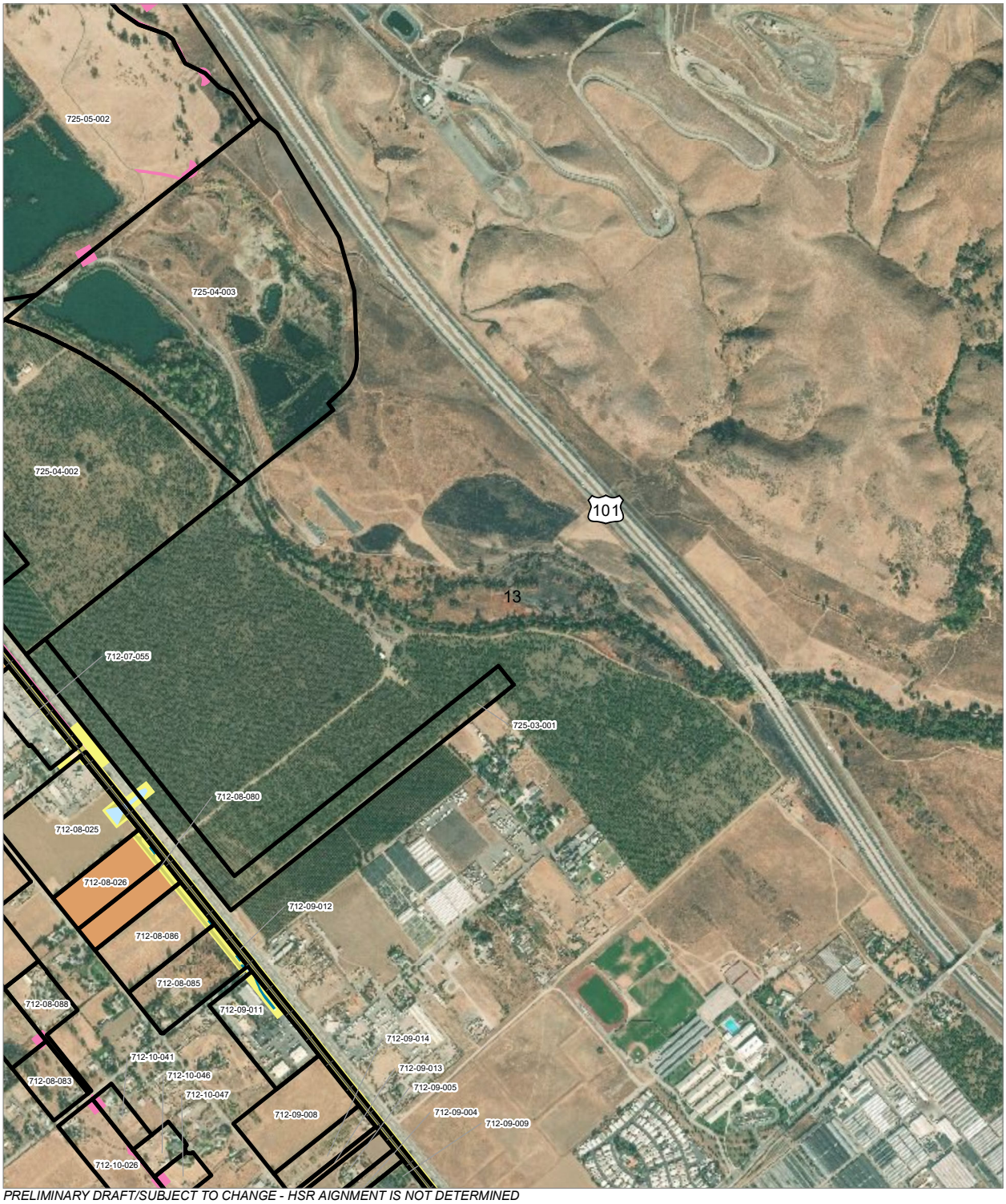


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Other Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

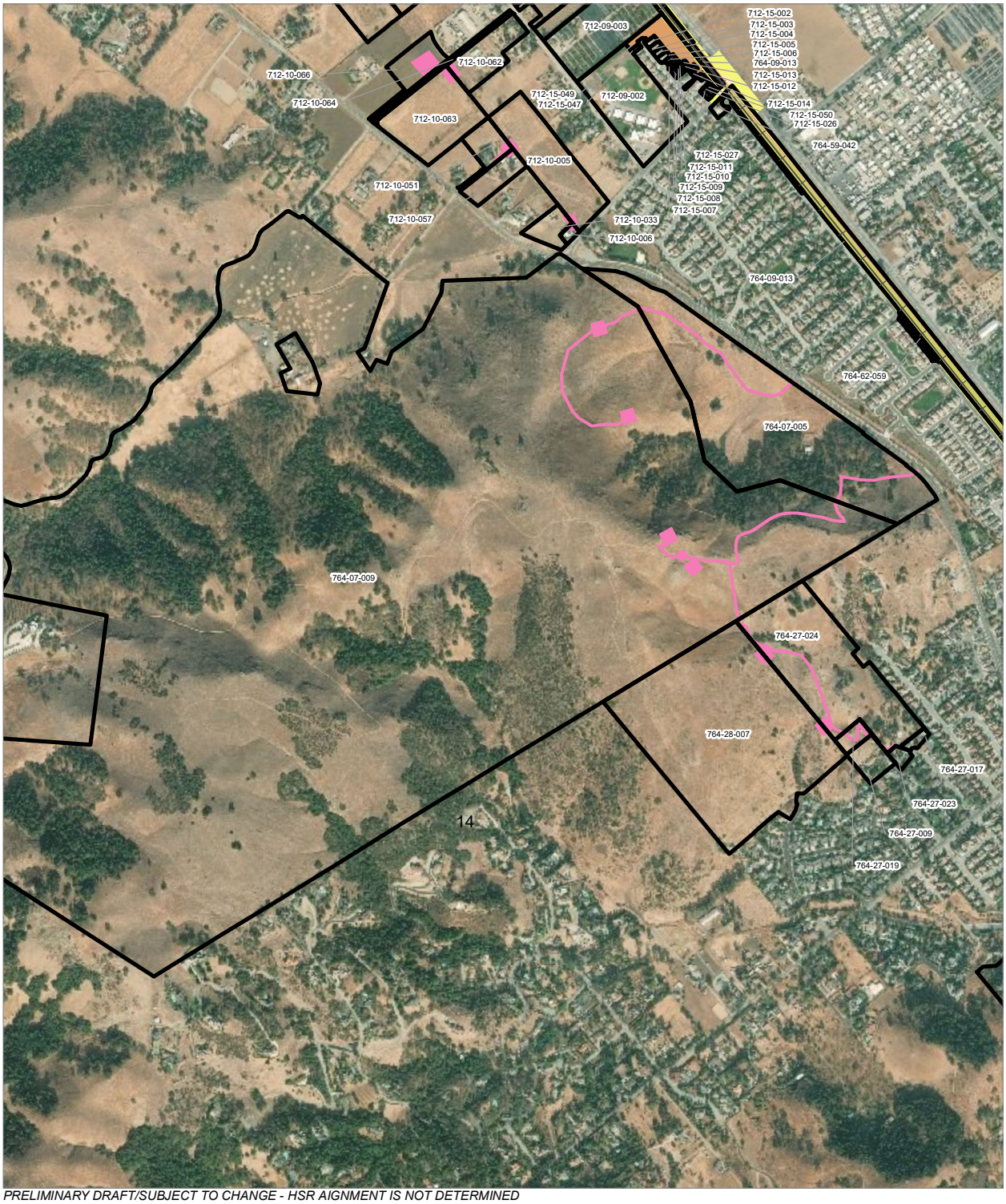


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Other Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

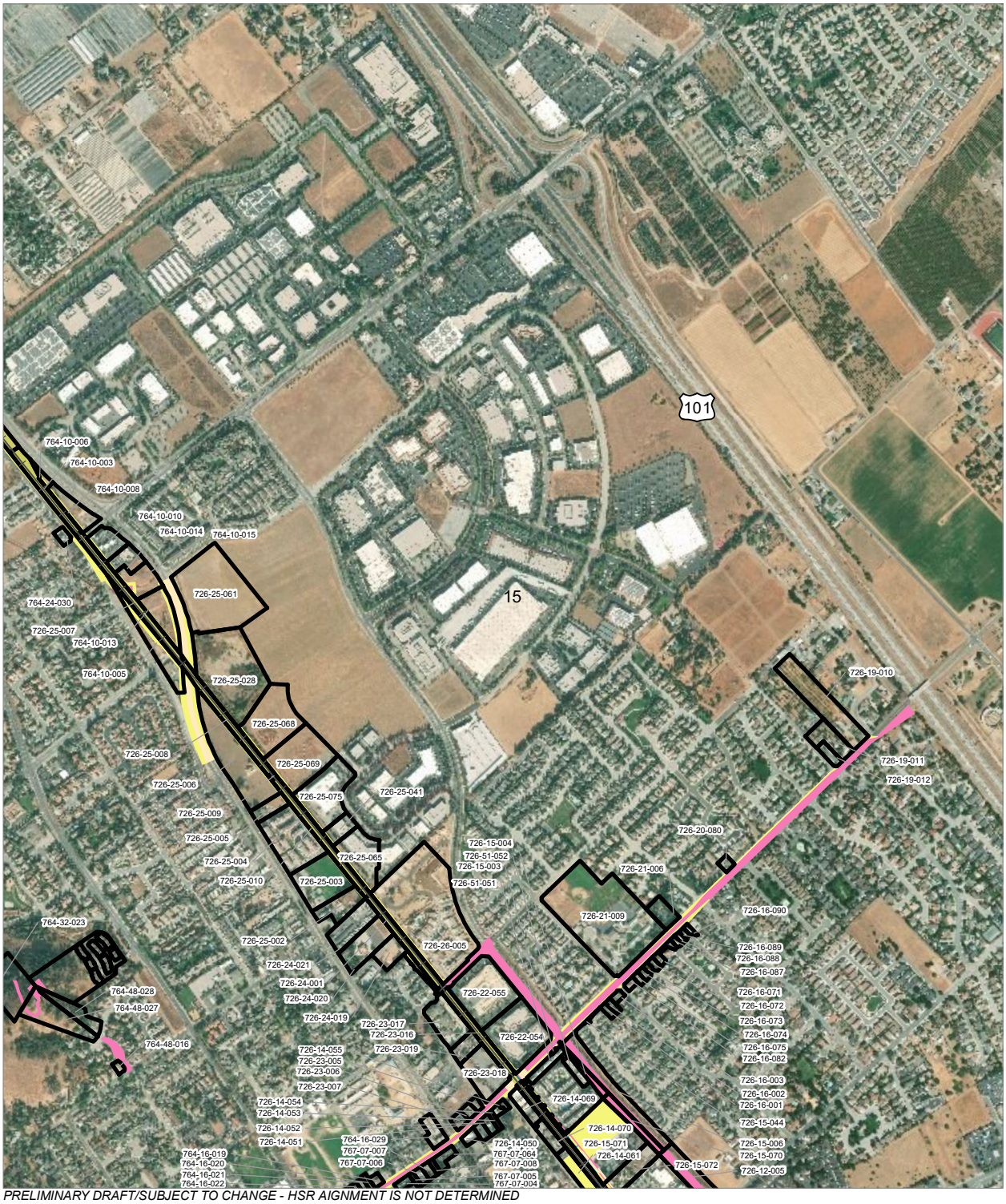


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

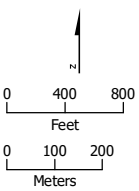
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

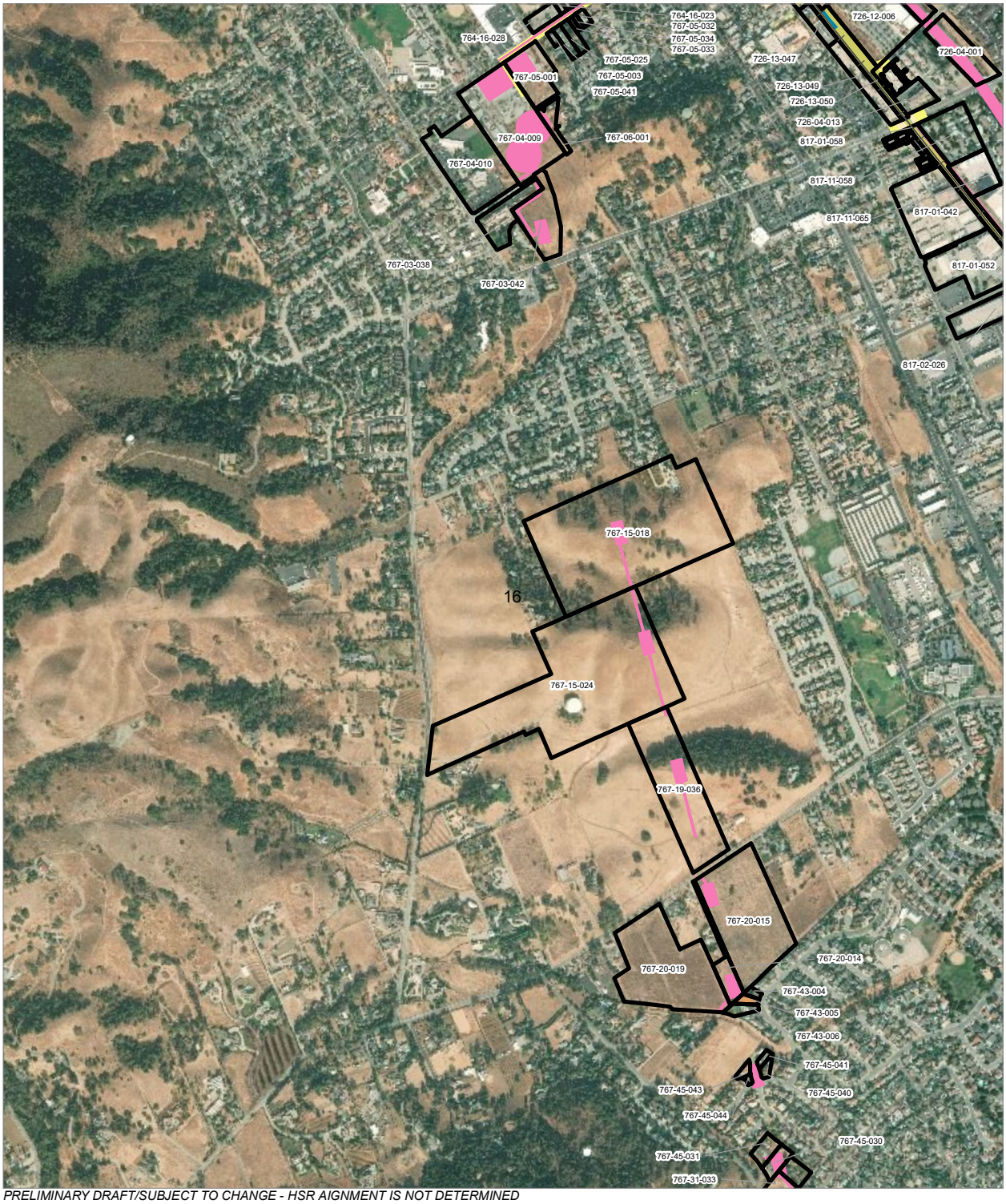


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

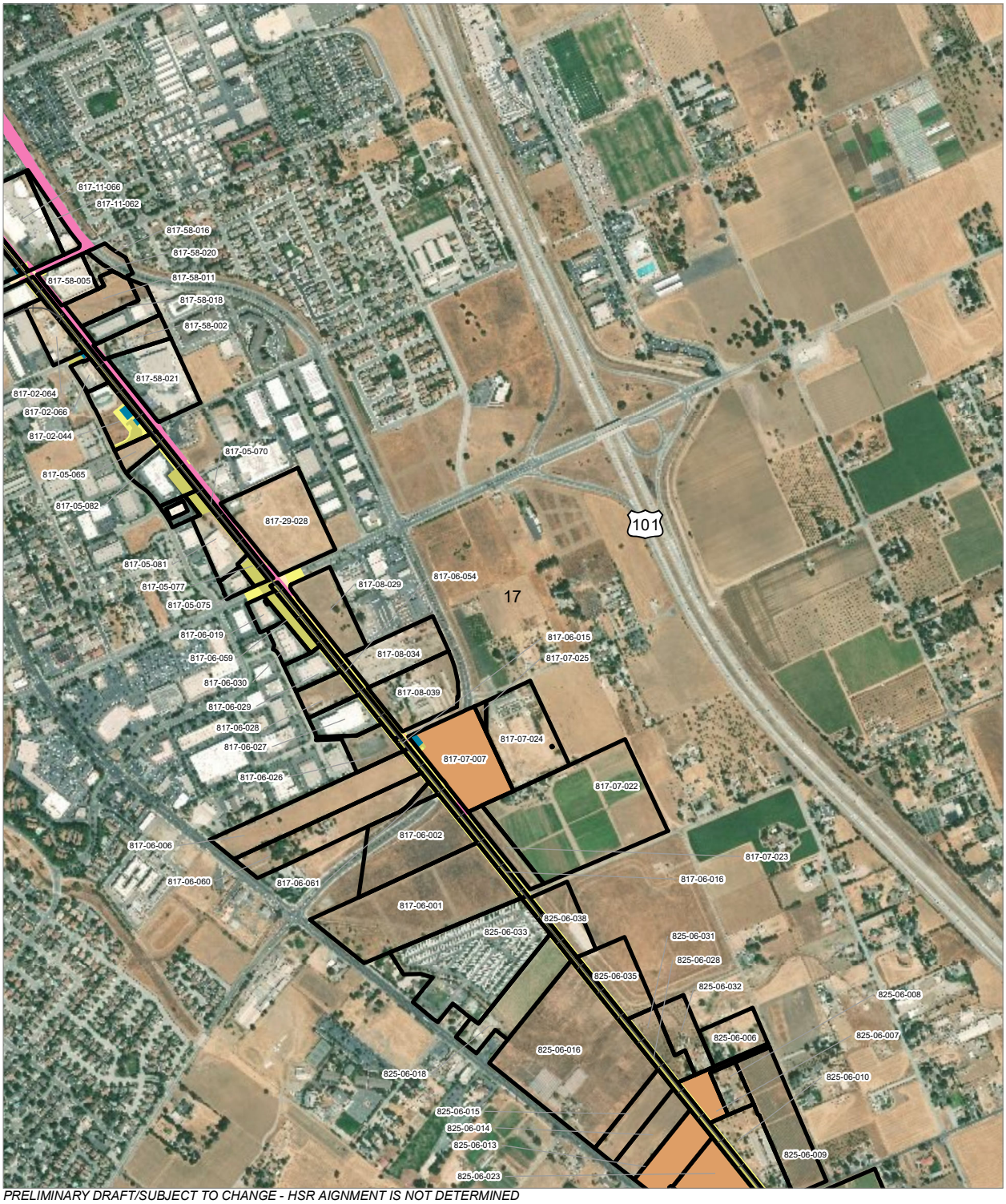


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

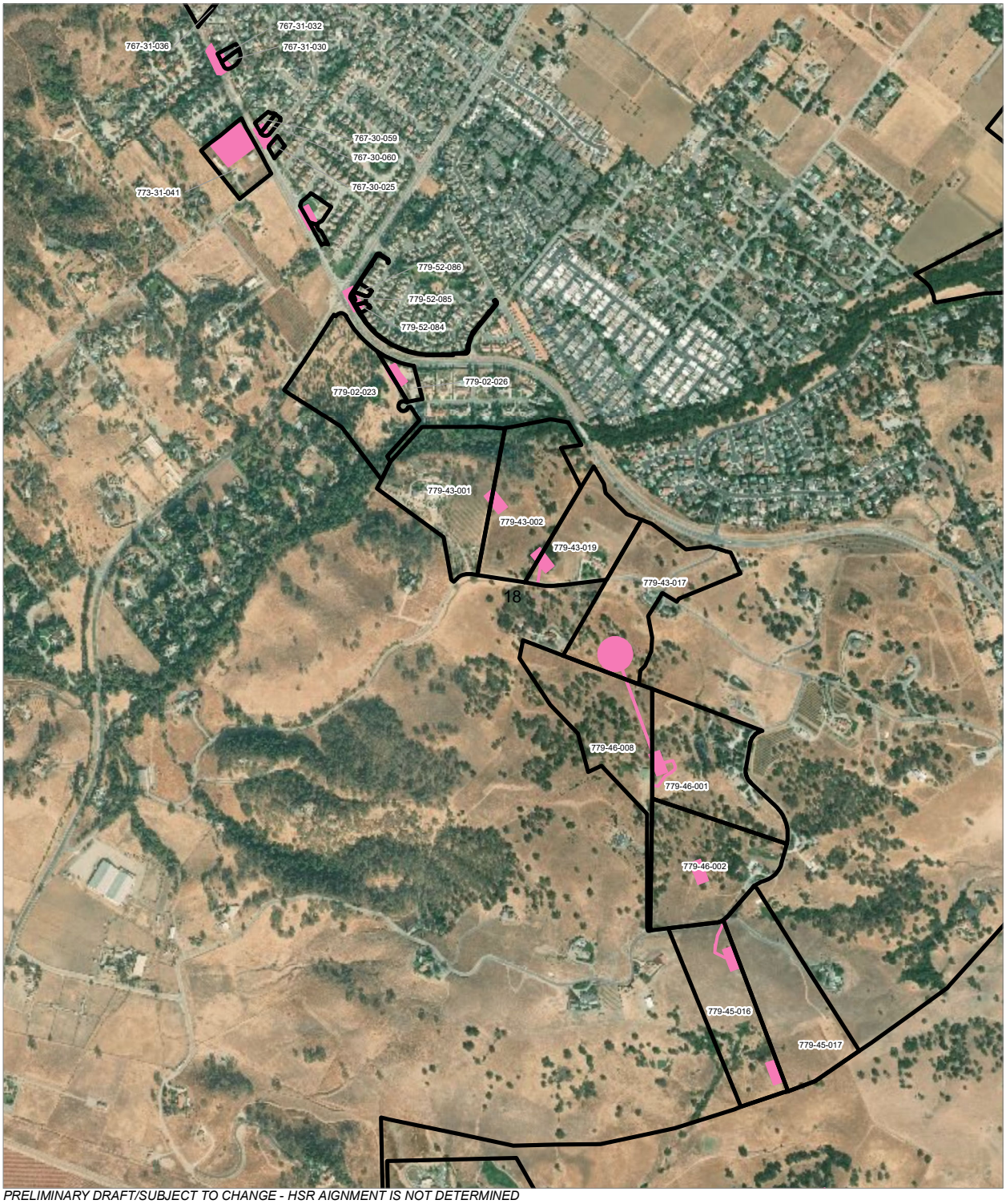


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

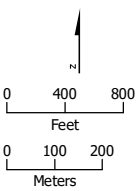
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

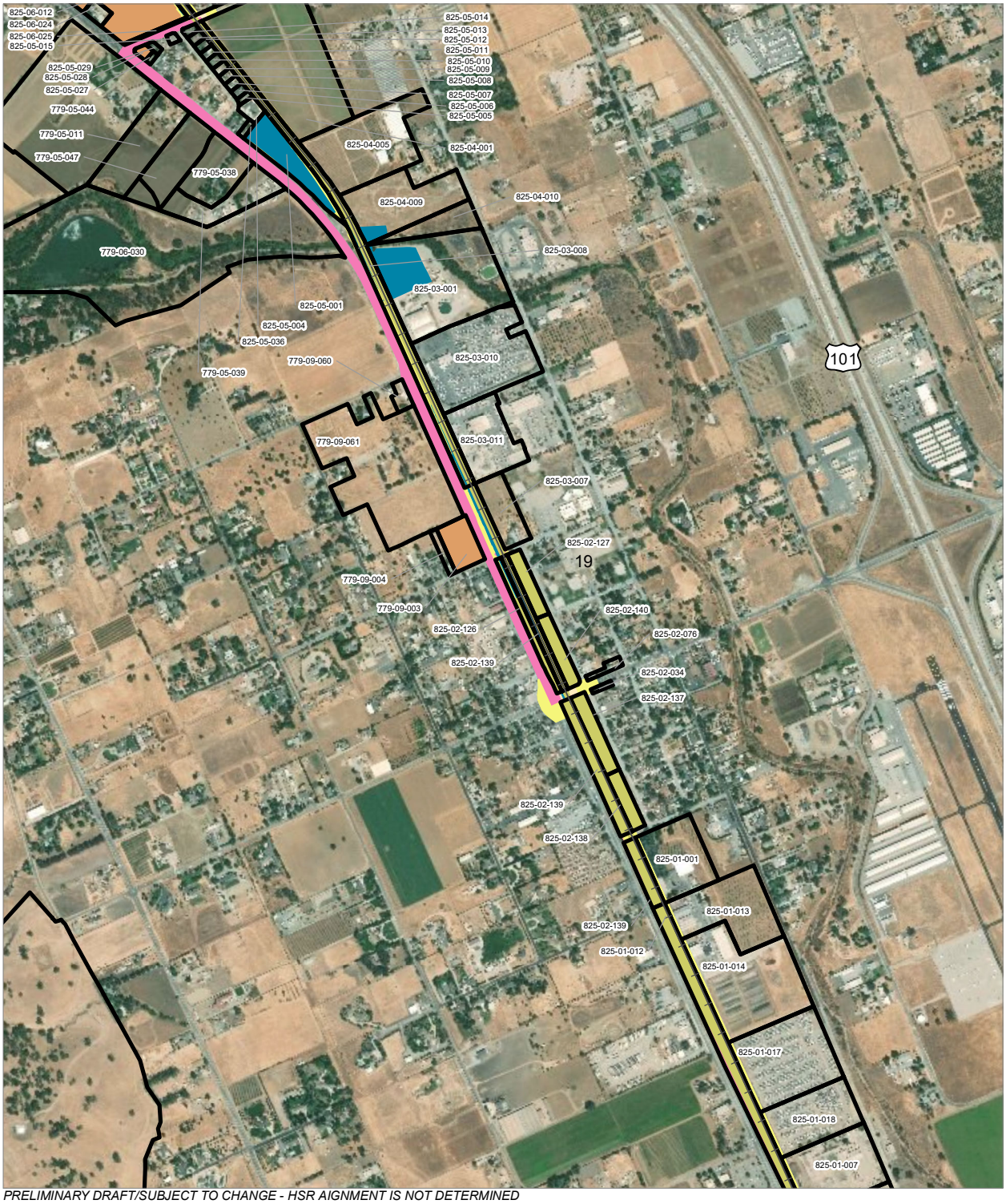


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



Permanent Utility Easement
Parcel (APN Displayed)

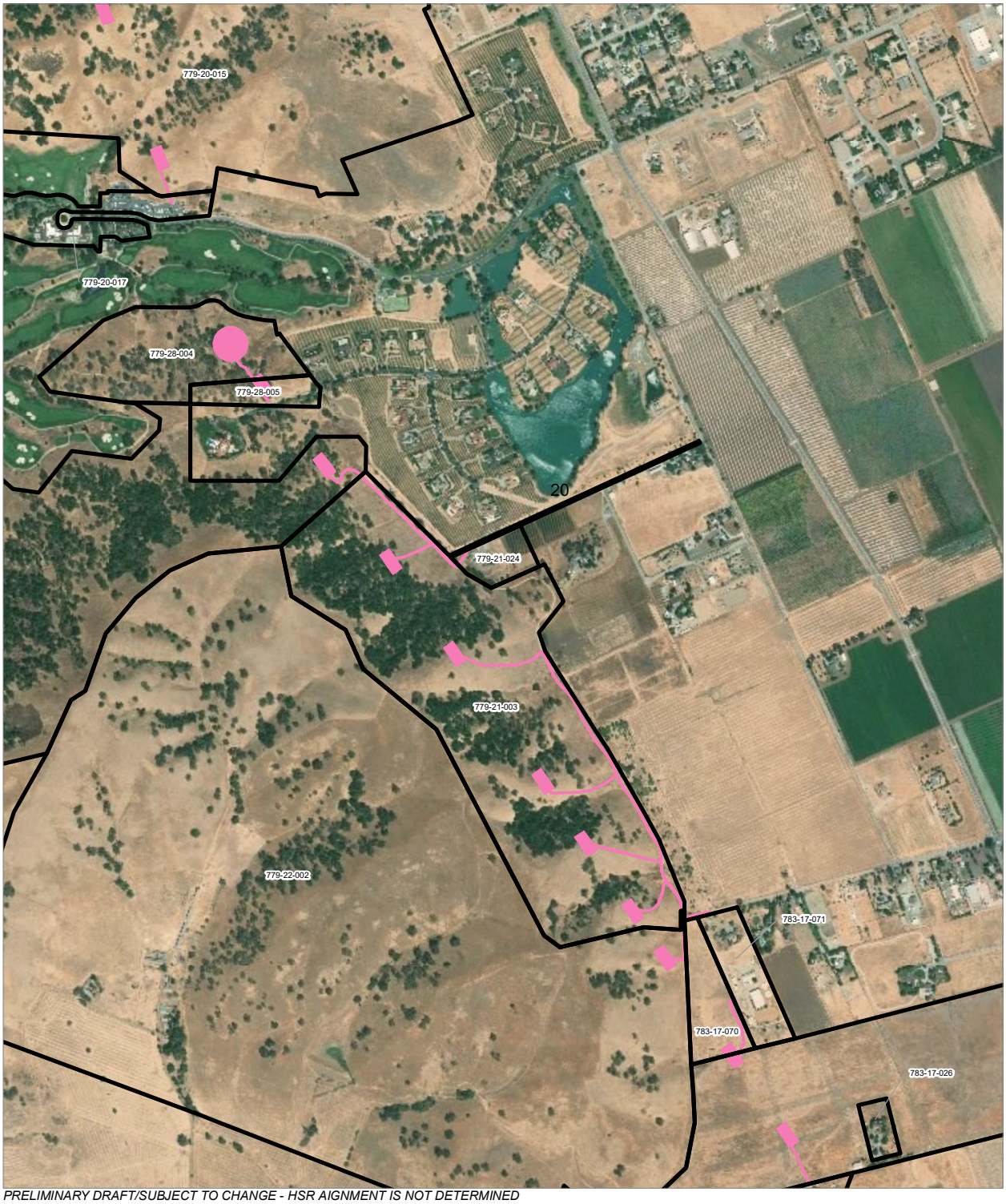


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

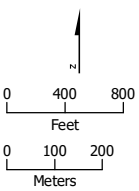
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



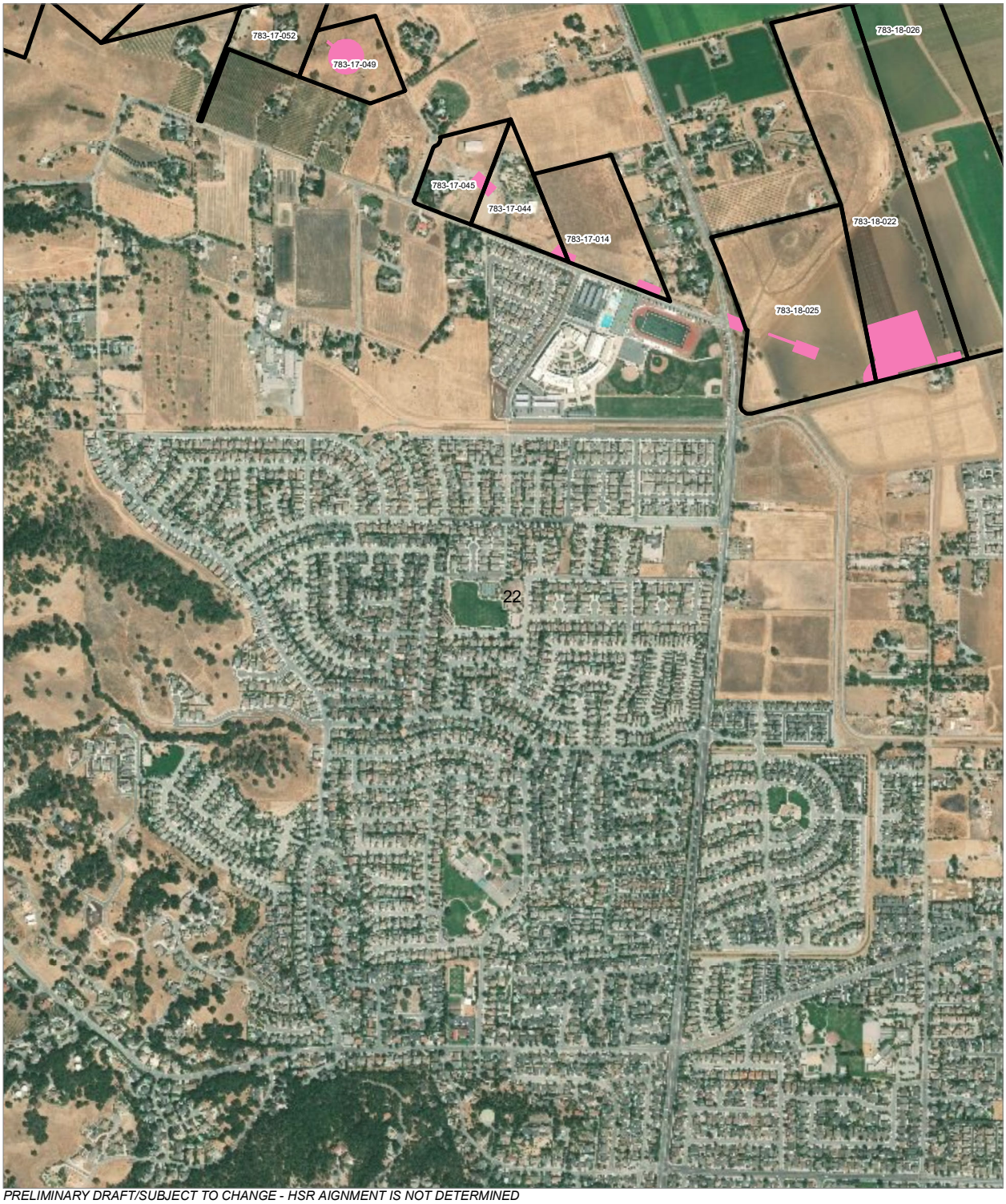
Permanent Utility Easement
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

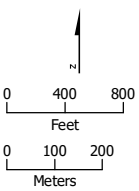
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

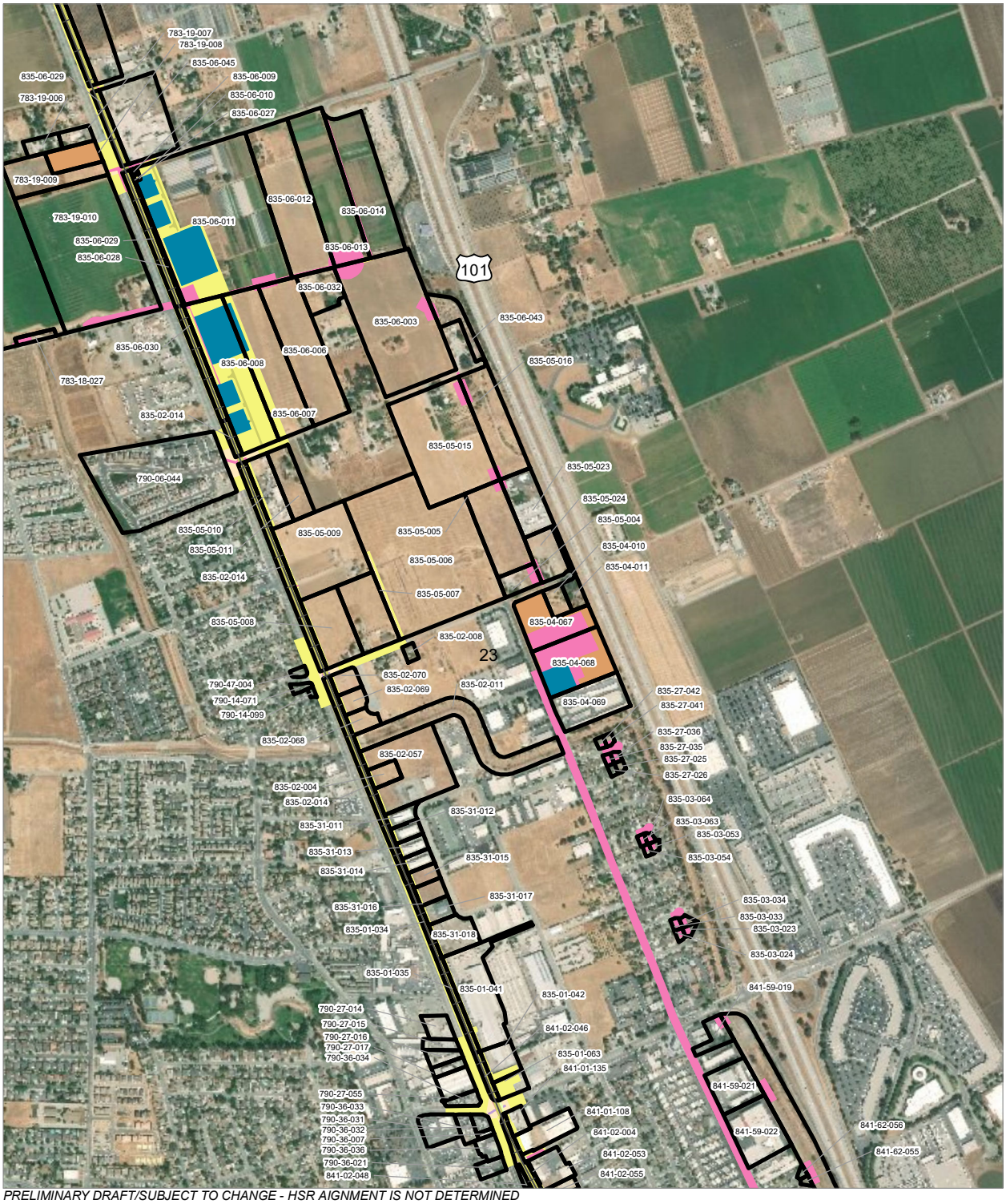


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



Permanent Utility Easement
Parcel (APN Displayed)

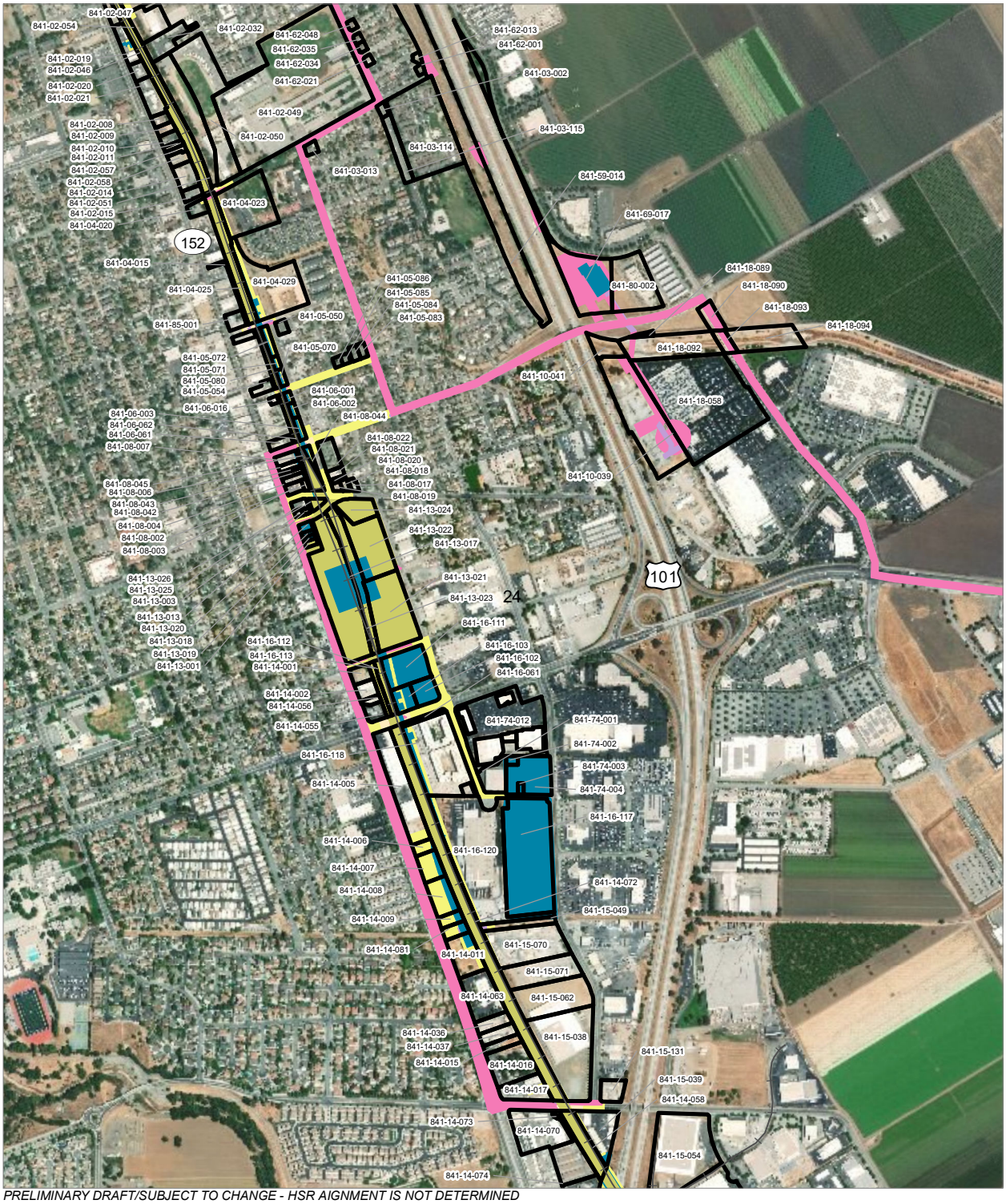


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

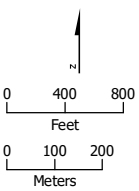
HSR Right-of-Way
Roadway Right-of-Way
Rail Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)

0 400 800
Feet
0 100 200
Meters

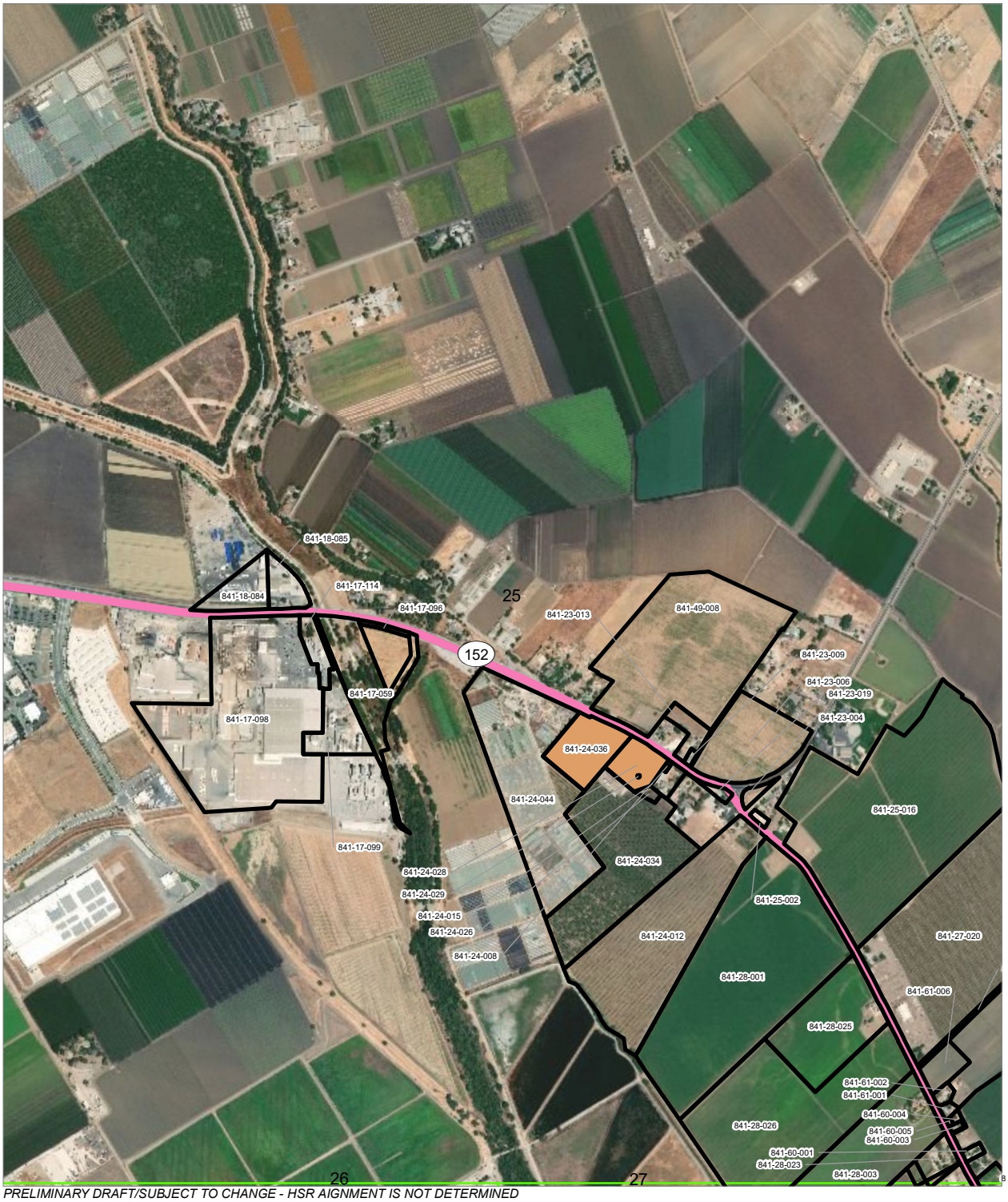


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



HSR Right-of-Way
Roadway Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Temporary Utility Easement
Parcel (APN Displayed)

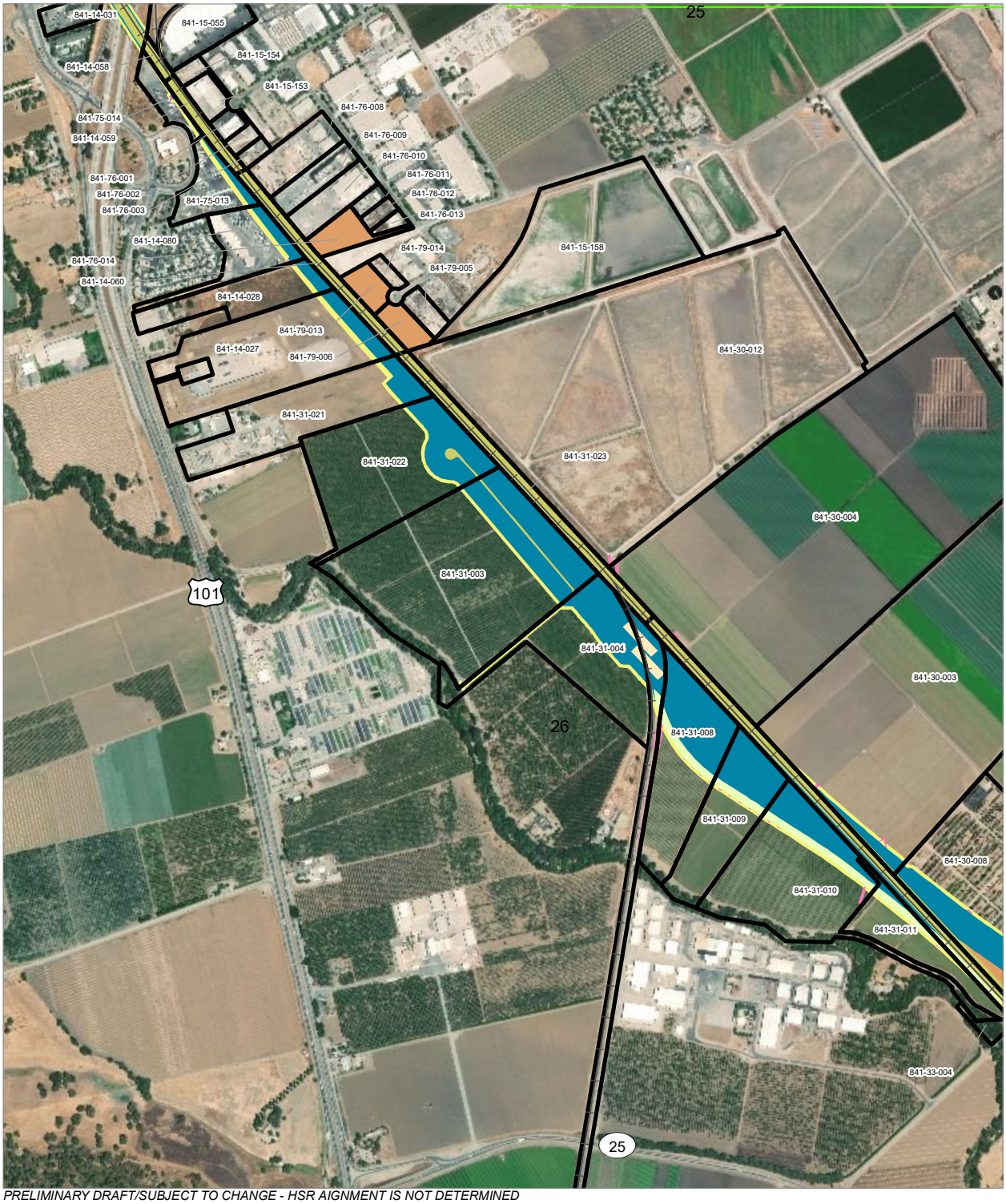


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

Permanent Utility Easement
Non-Viable Remnant Parcel
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- Rail Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

N

0 400 800
Feet
0 100 200
Meters

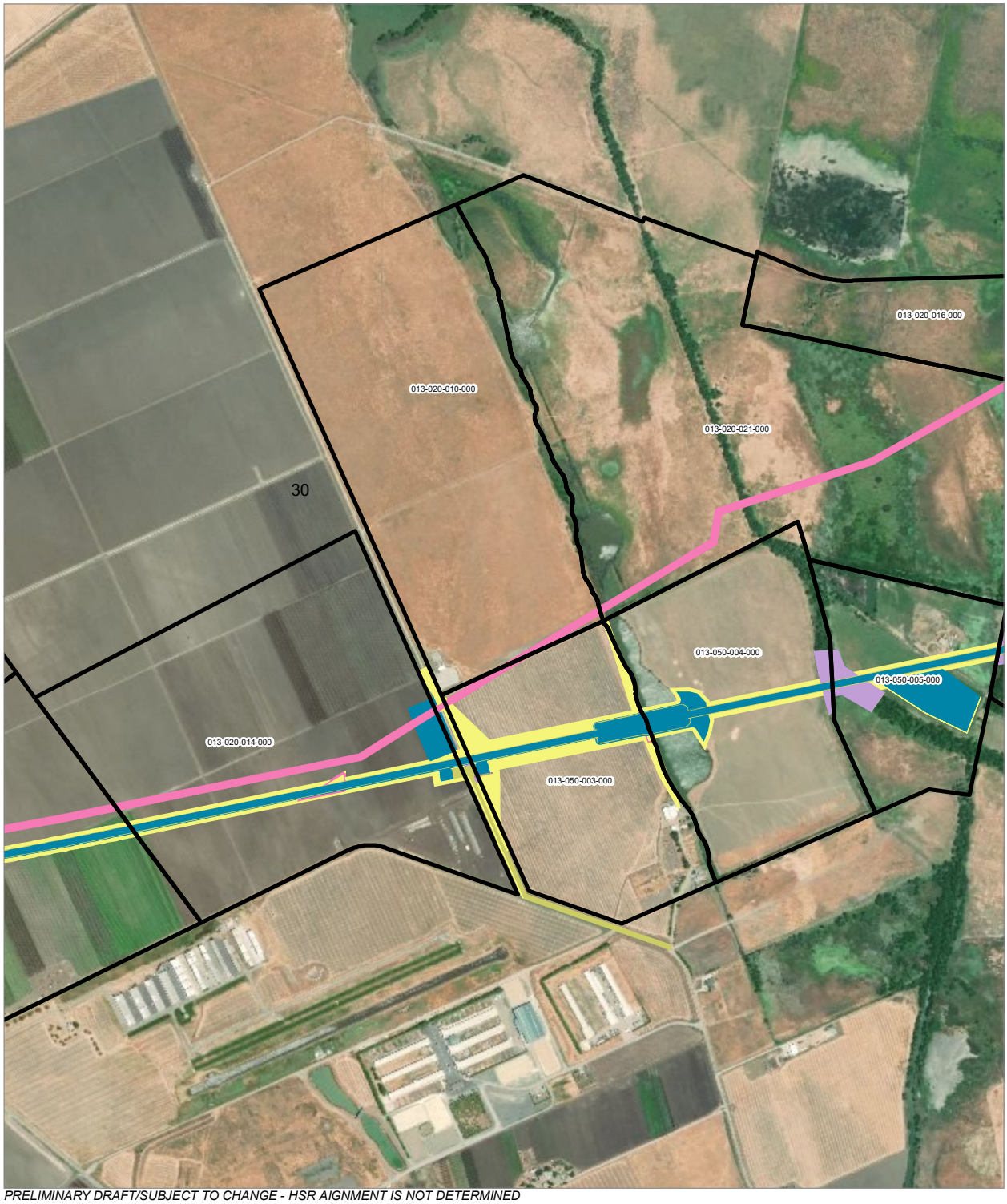
- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)



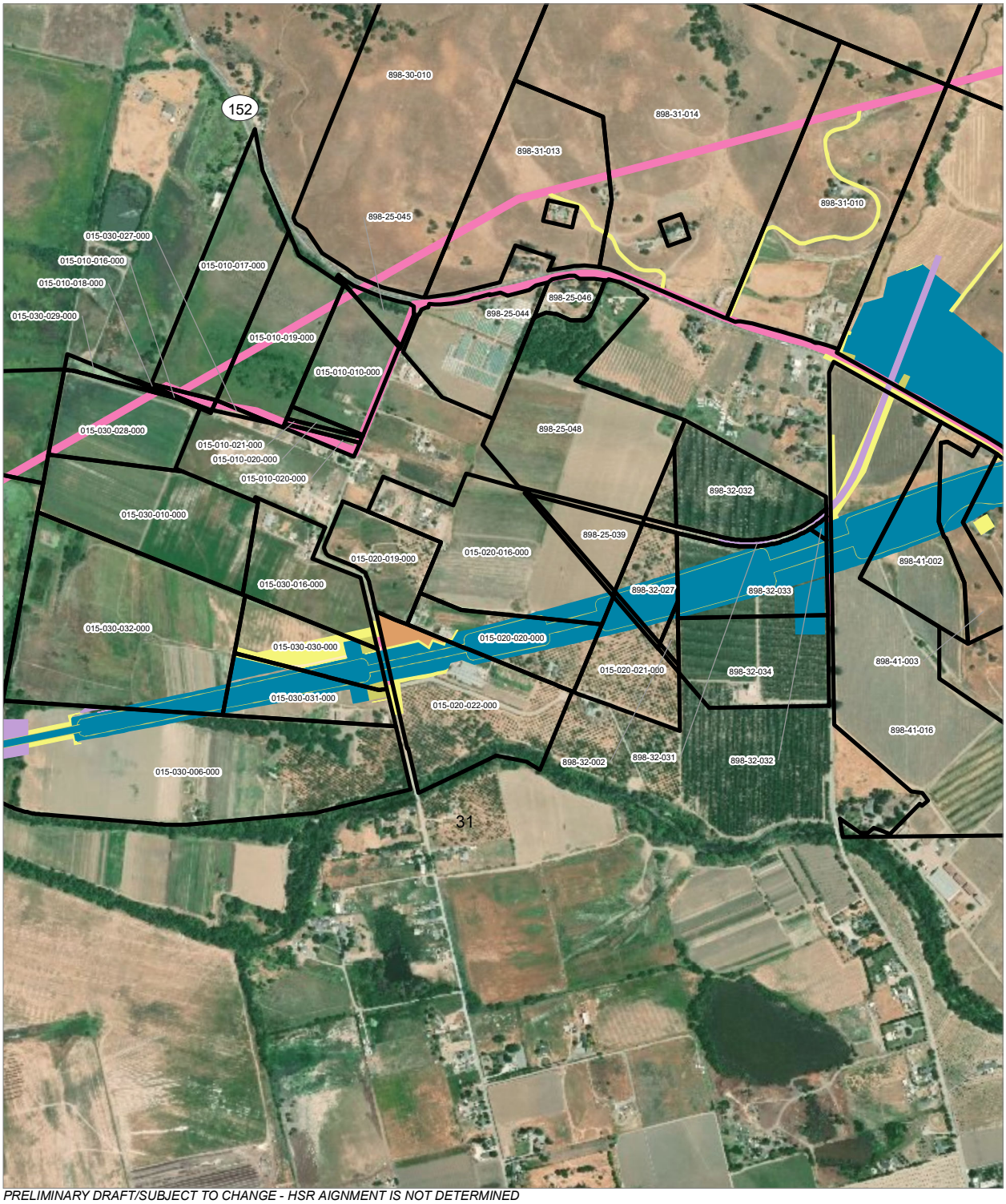
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

APPENDIX 3.1-A: PARCELS WITHIN THE HSR PROJECT FOOTPRINT (Alternative 4, Part 2)

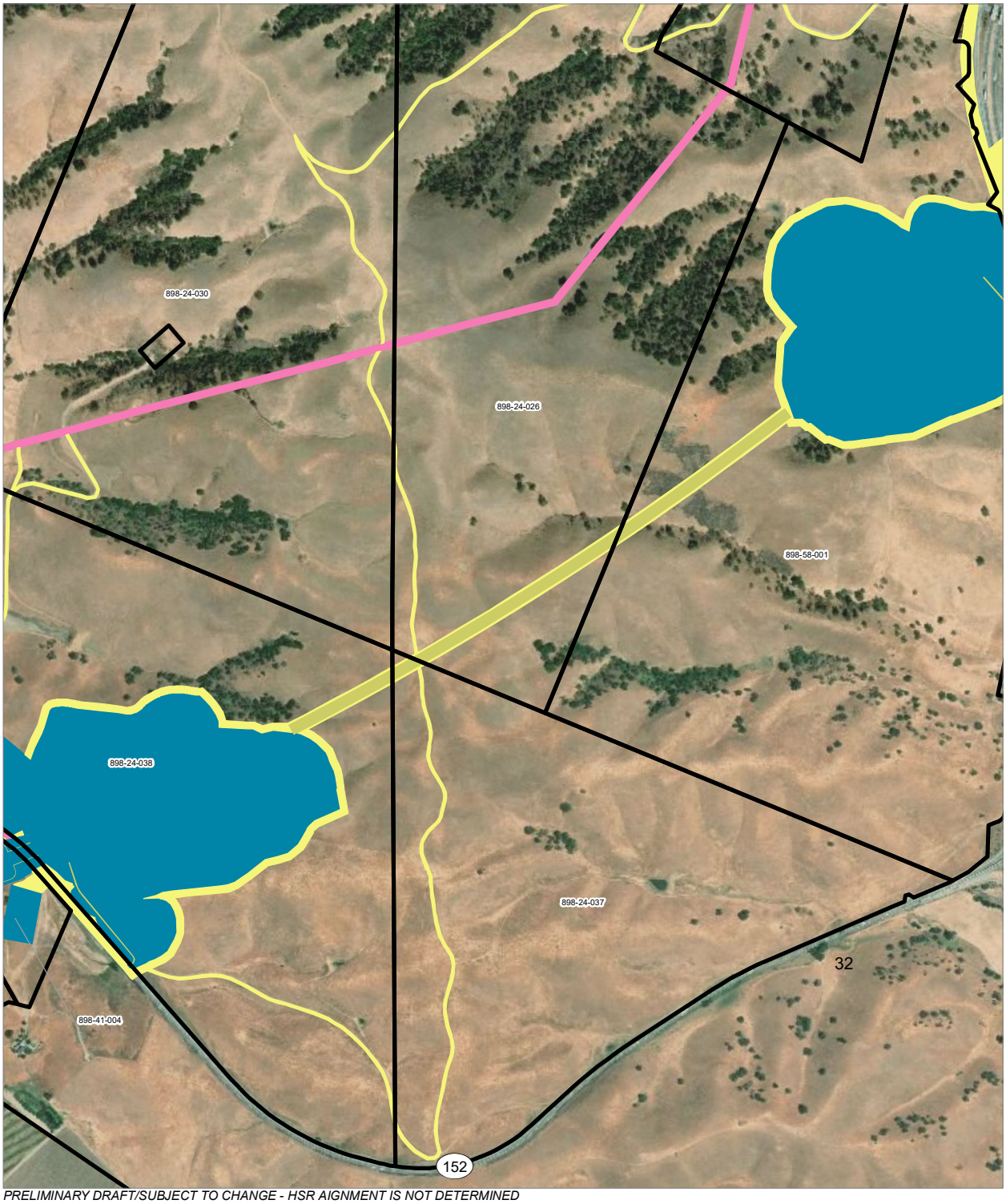


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Roadway Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

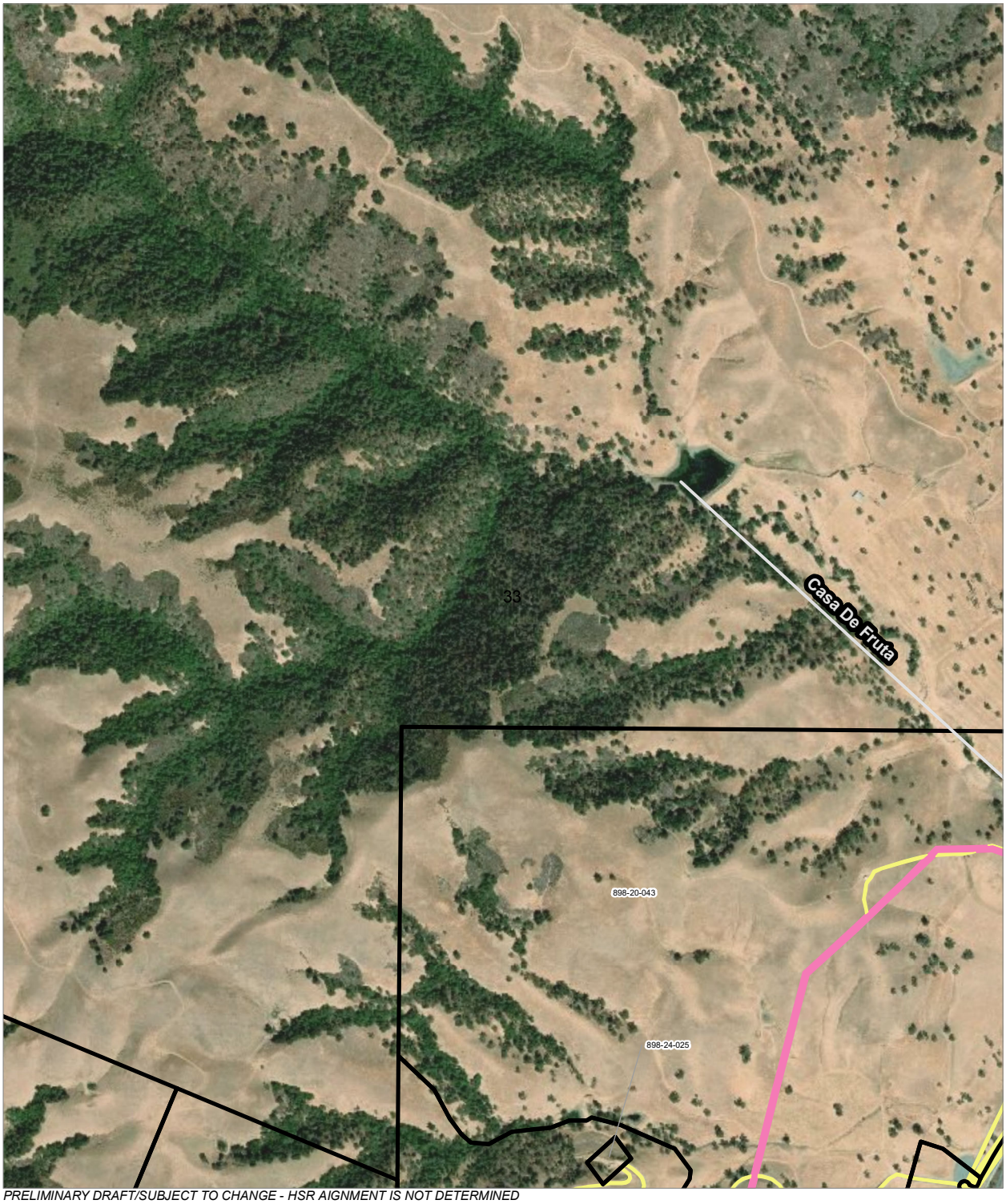


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

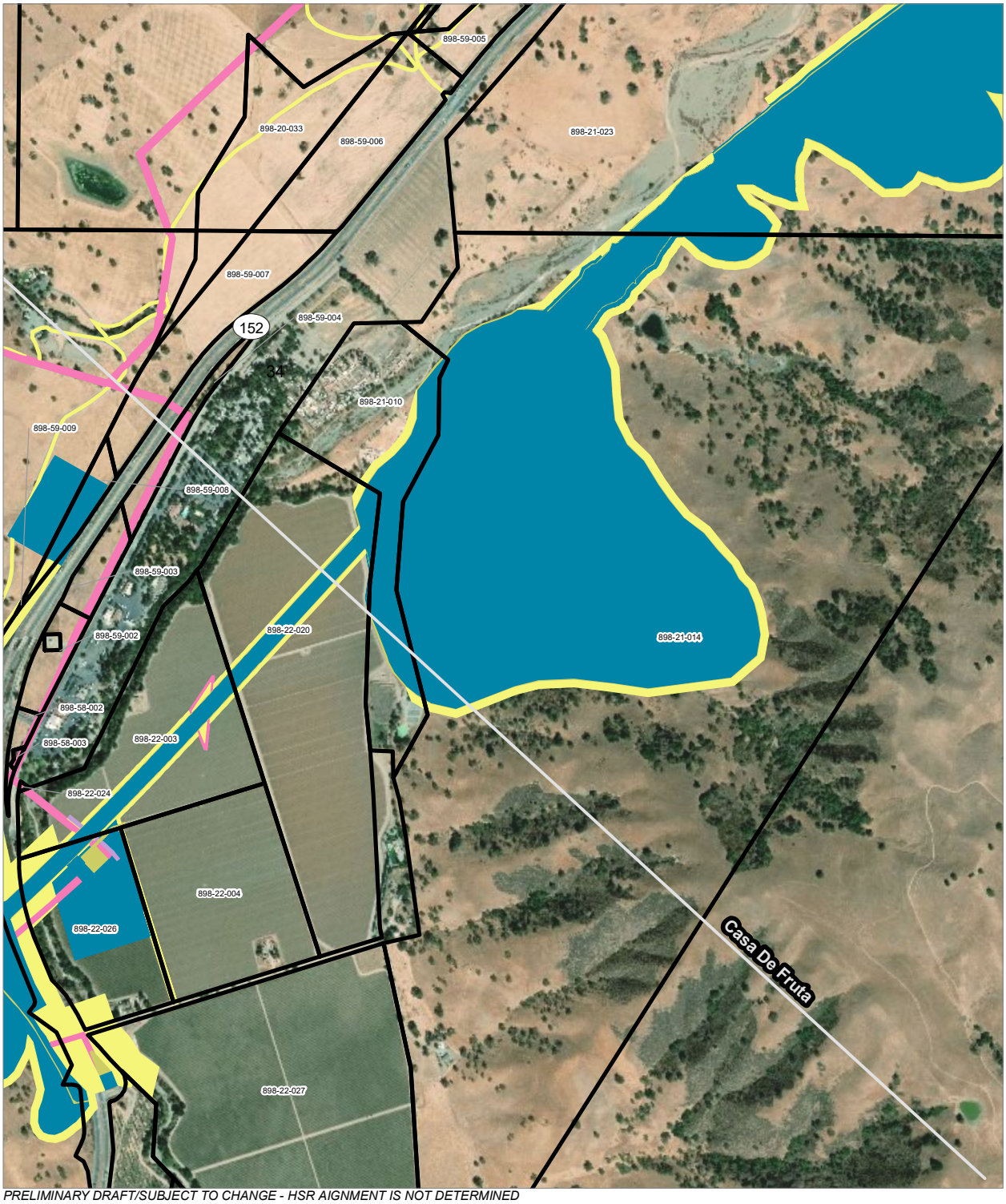


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

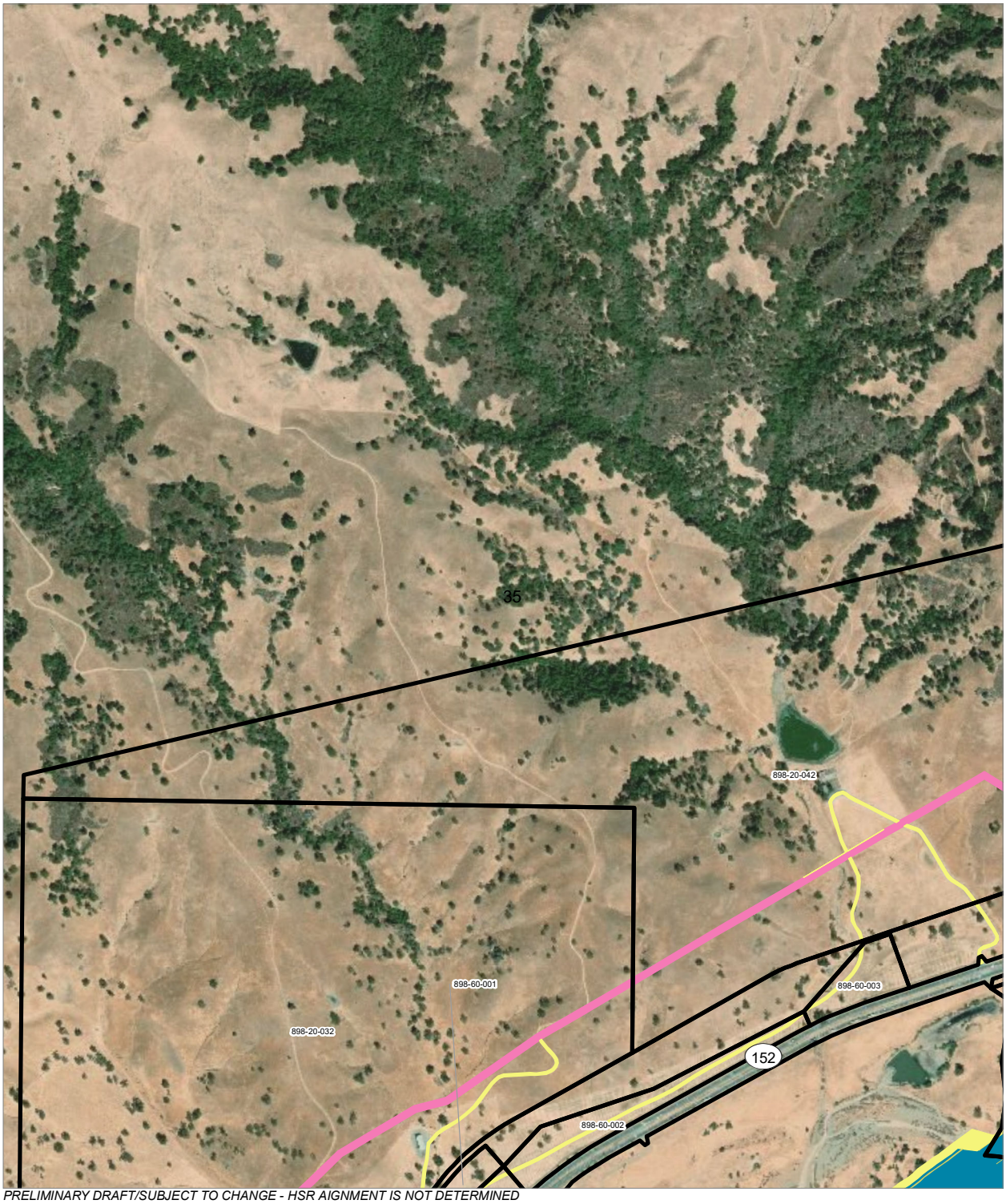


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Non-Viable Remnant Parcel
- Parcel (APN Displayed)

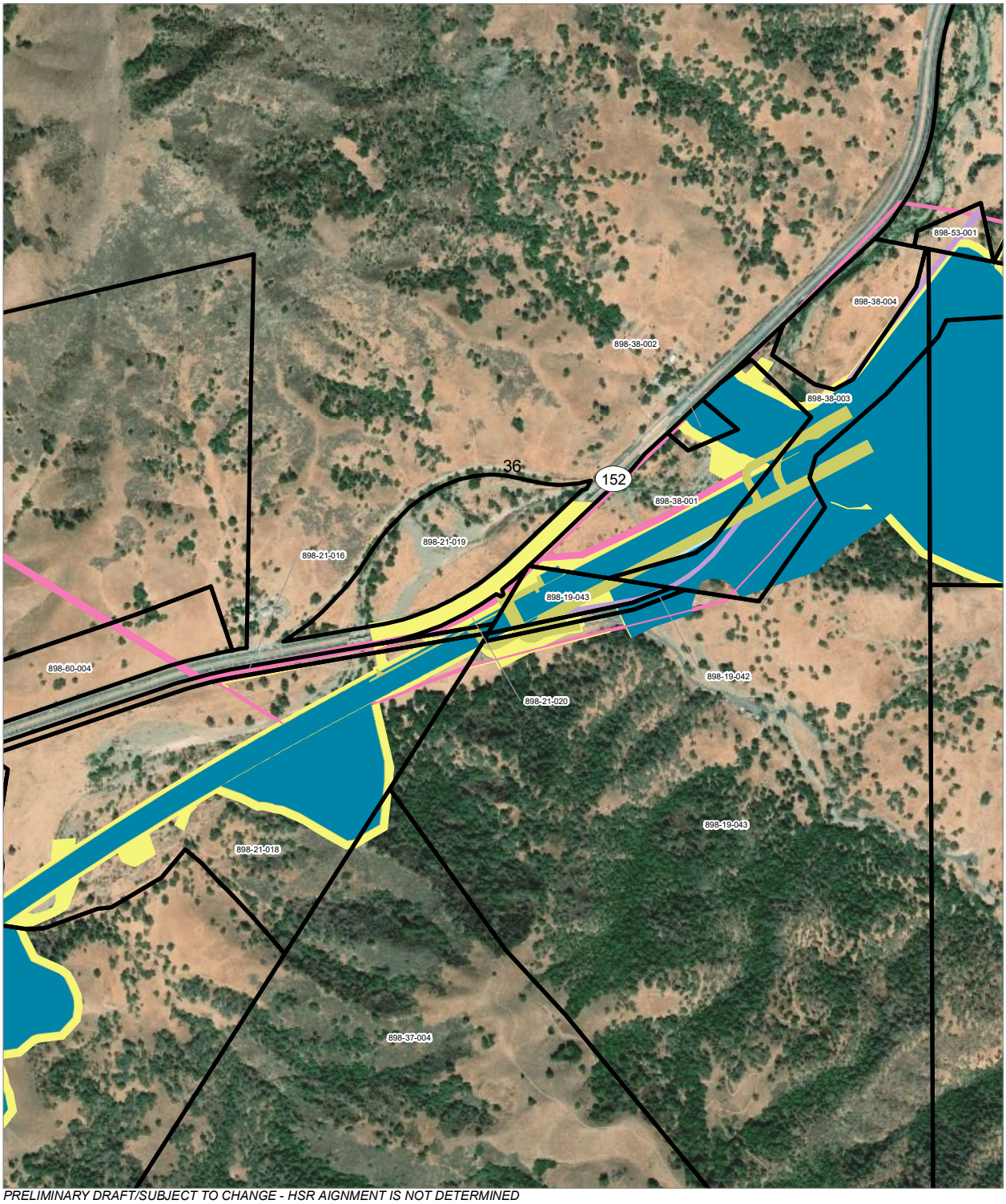


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

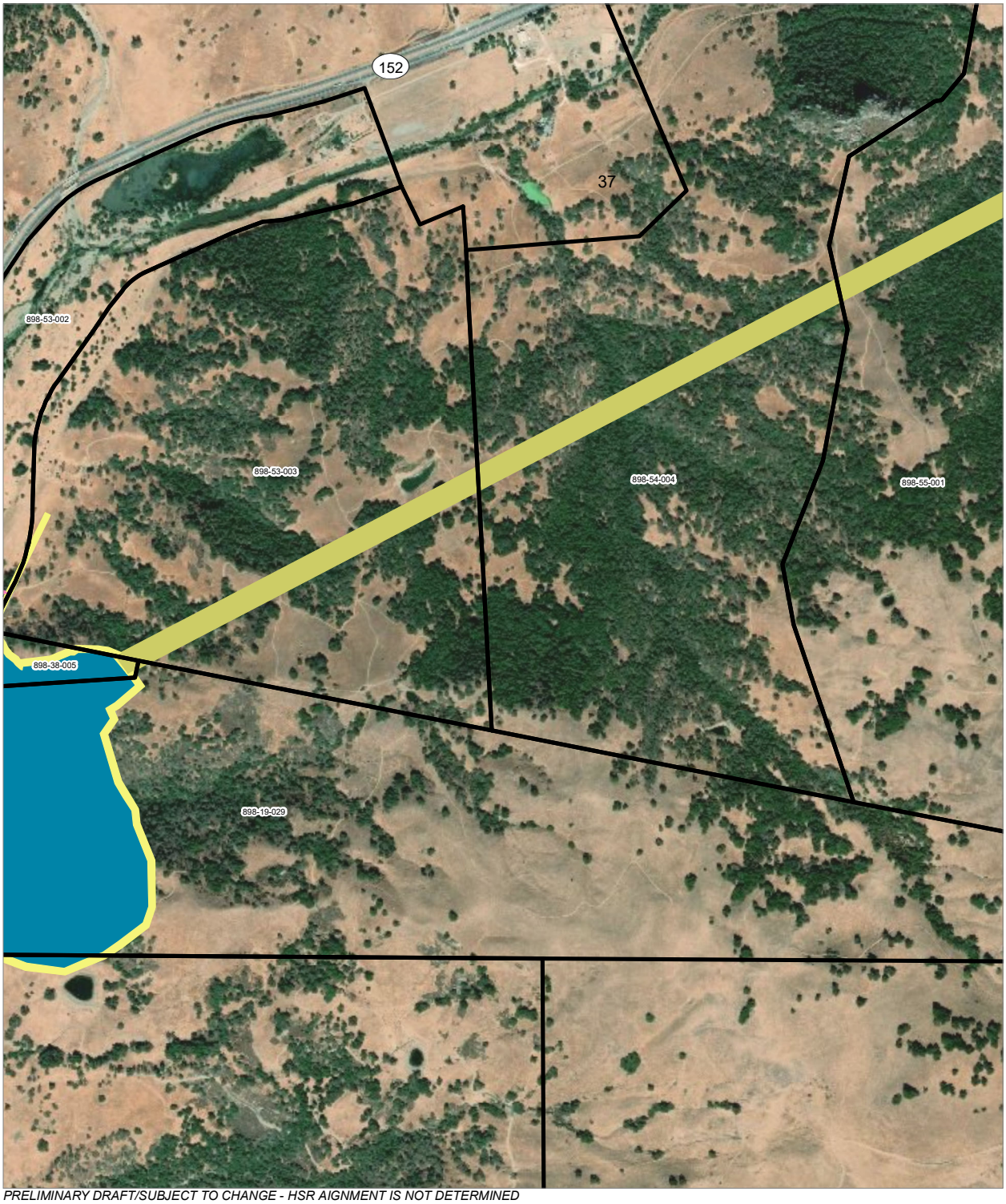


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

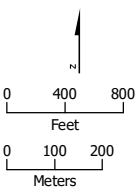
0 400 800
Feet
0 100 200
Meters

- HSR Right-of-Way
- Other Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
- Temporary Construction Easement
- Temporary Utility Easement
- Parcel (APN Displayed)

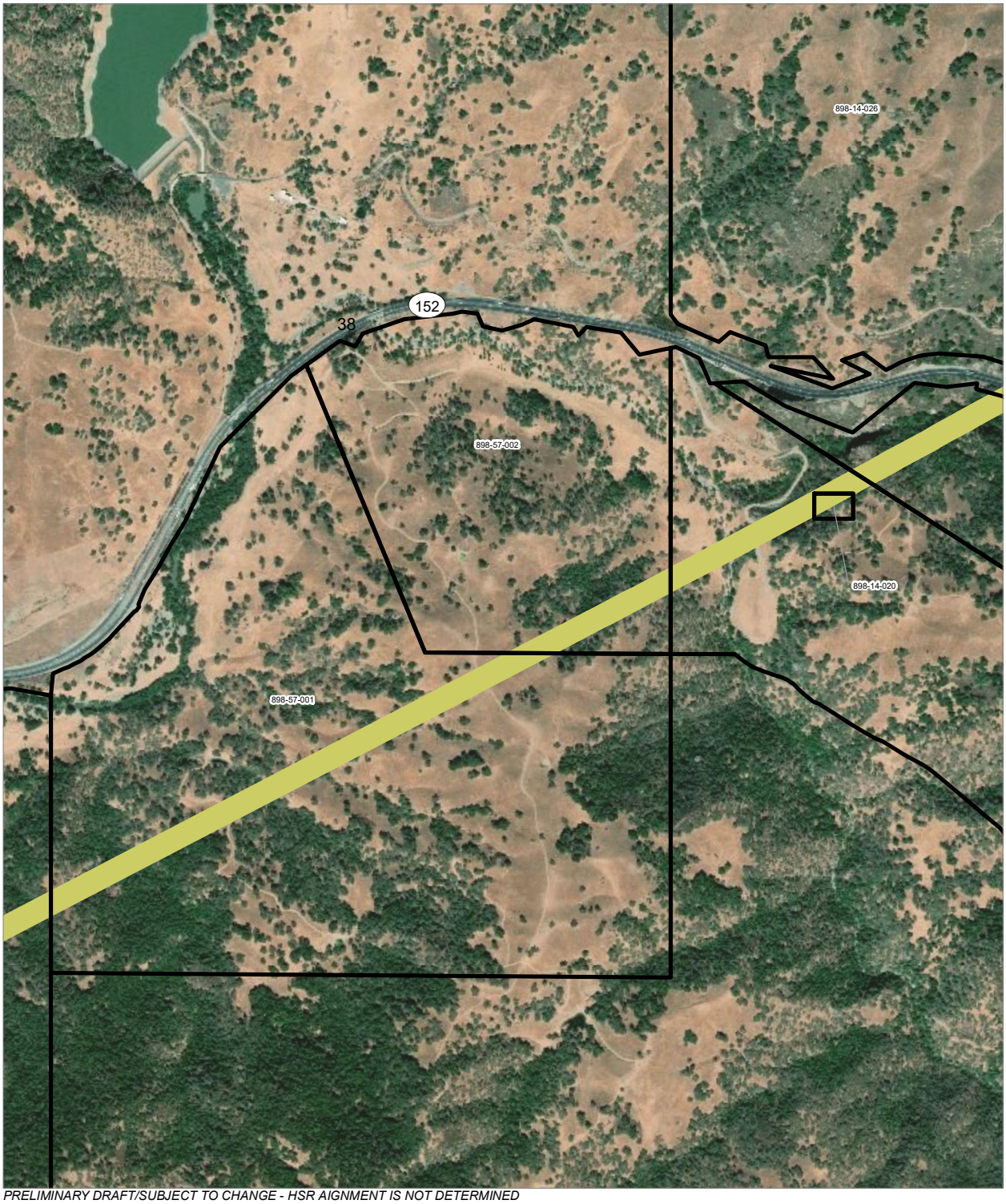


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

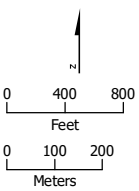


HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)

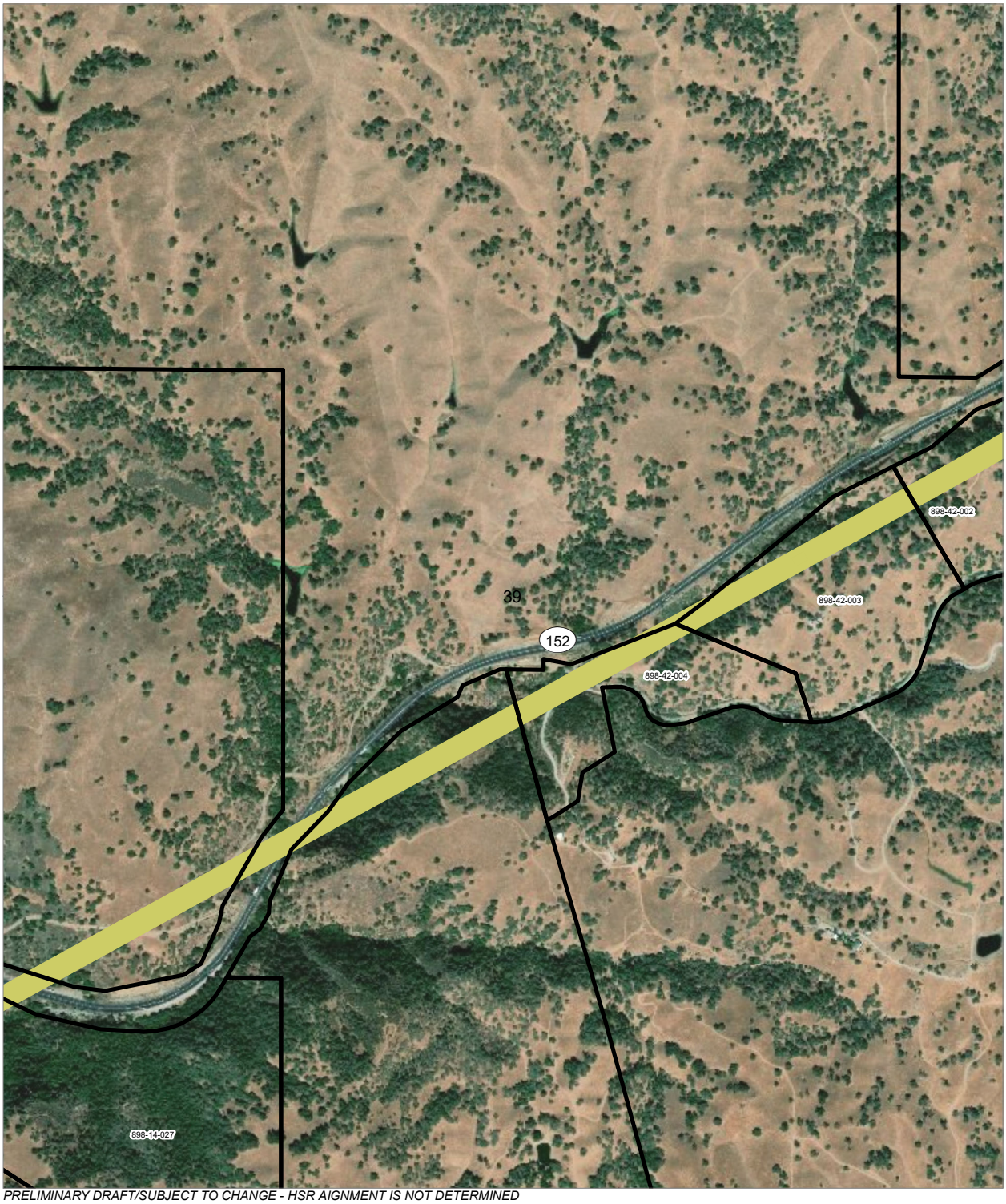


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

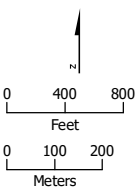


HSR Permanent Easement
Parcel (APN Displayed)

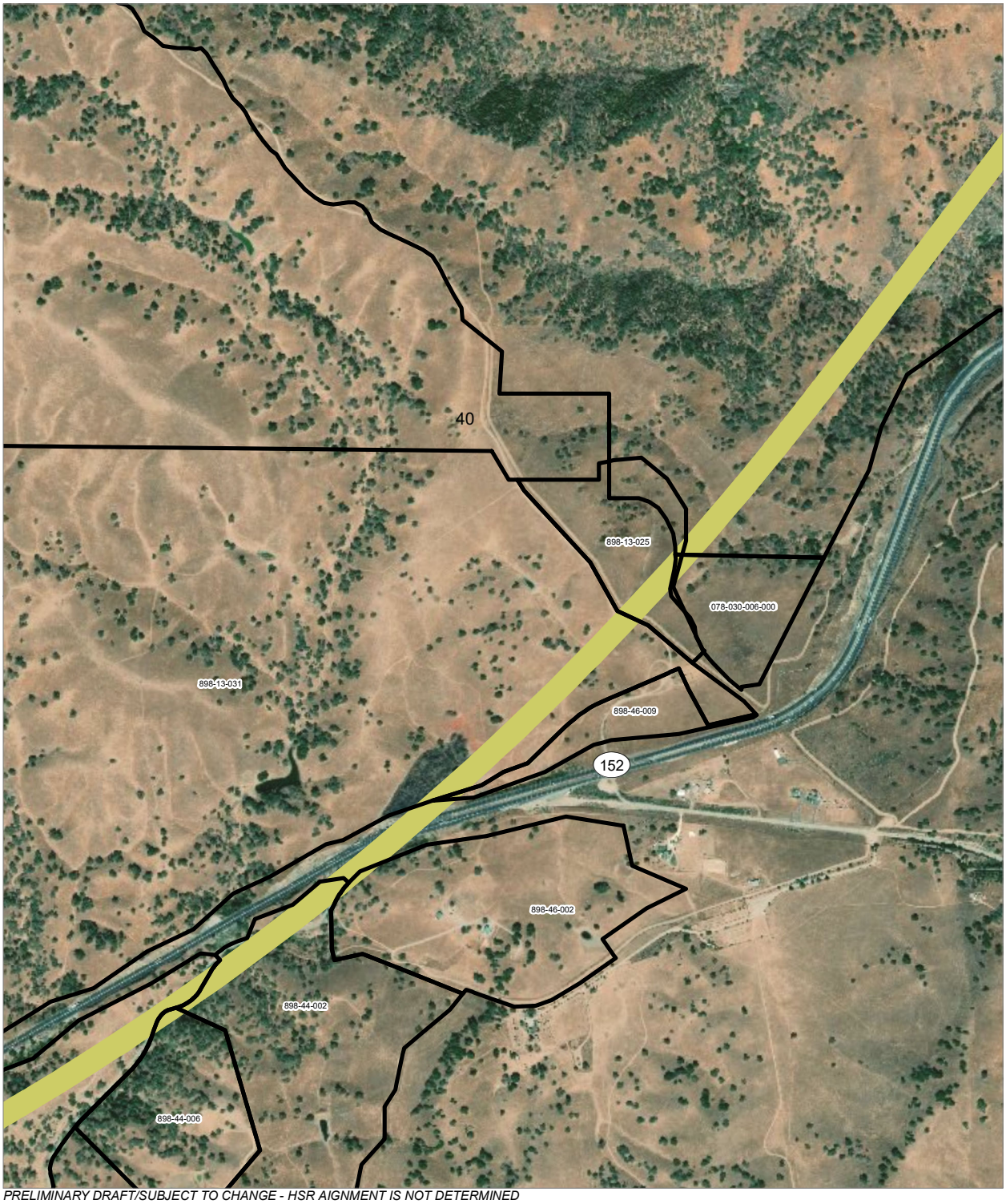


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

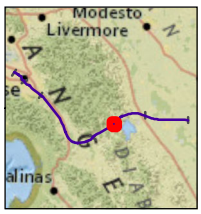


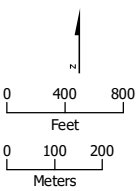
HSR Permanent Easement
Parcel (APN Displayed)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

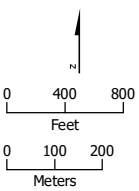




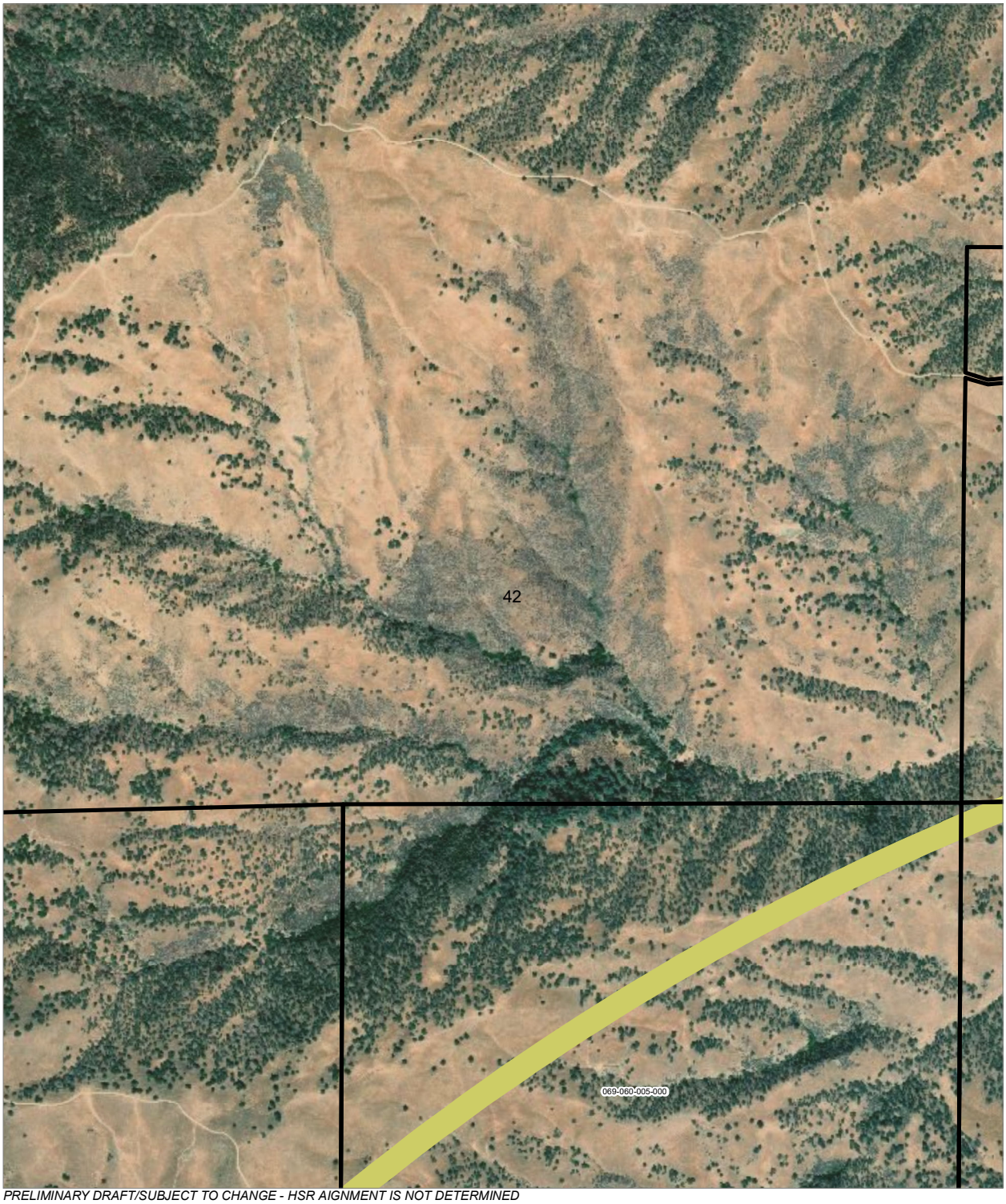
HSR Permanent Easement
Parcel (APN Displayed)

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



HSR Permanent Easement
Parcel (APN Displayed)

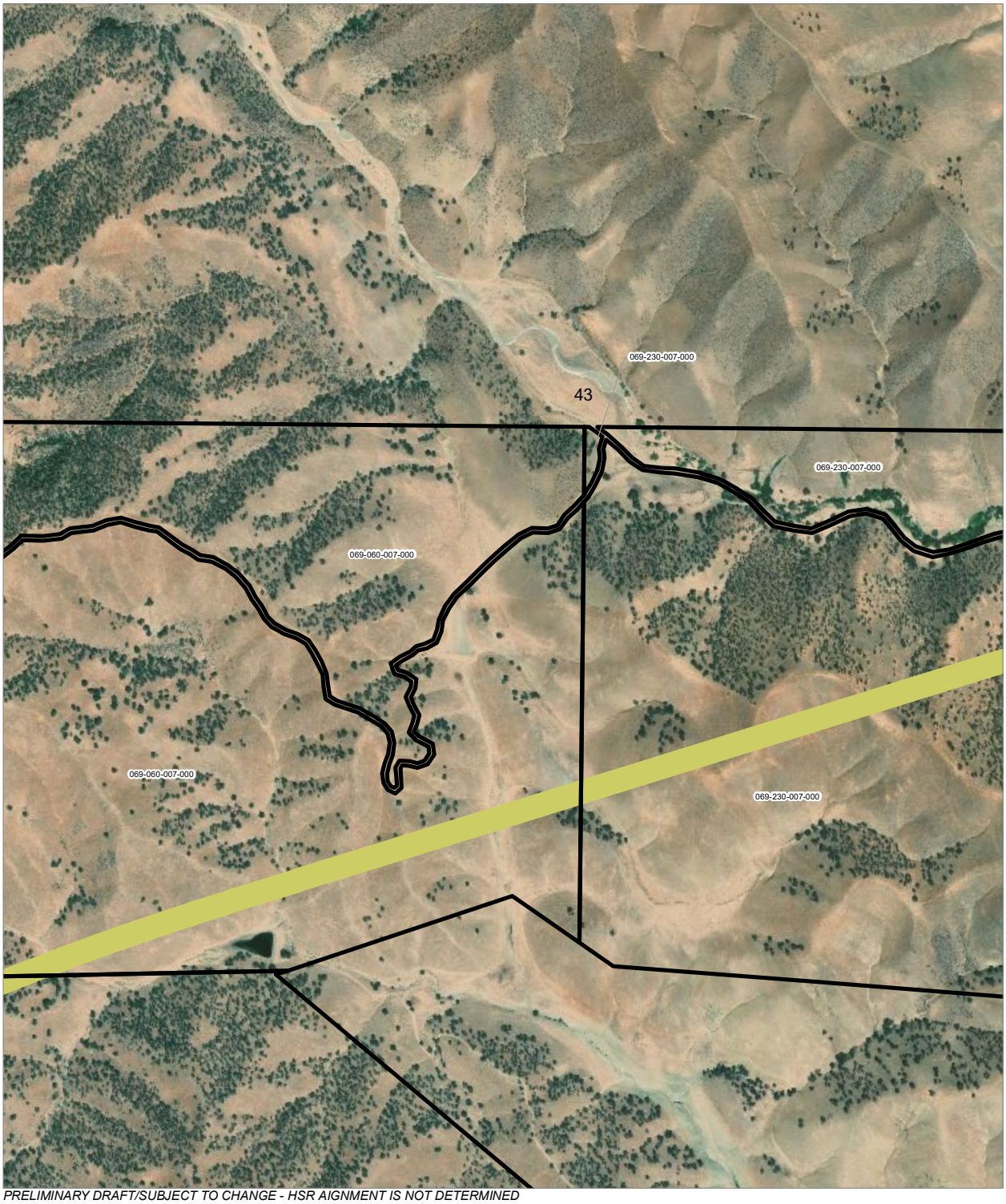


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

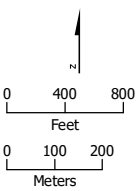
0 400 800
Feet
0 100 200
Meters

HSR Permanent Easement
Parcel (APN Displayed)



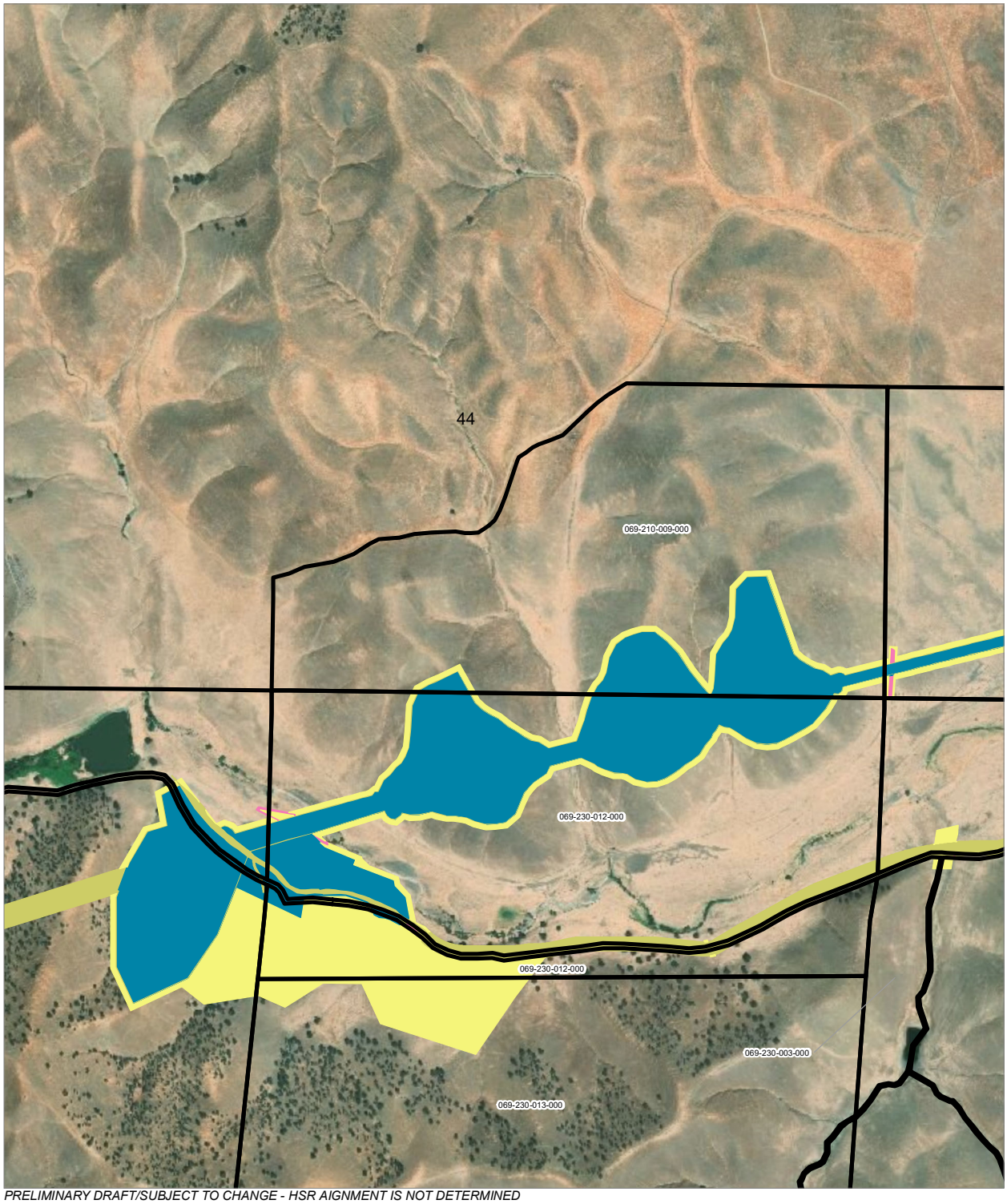
PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4



HSR Permanent Easement

Parcel (APN Displayed)

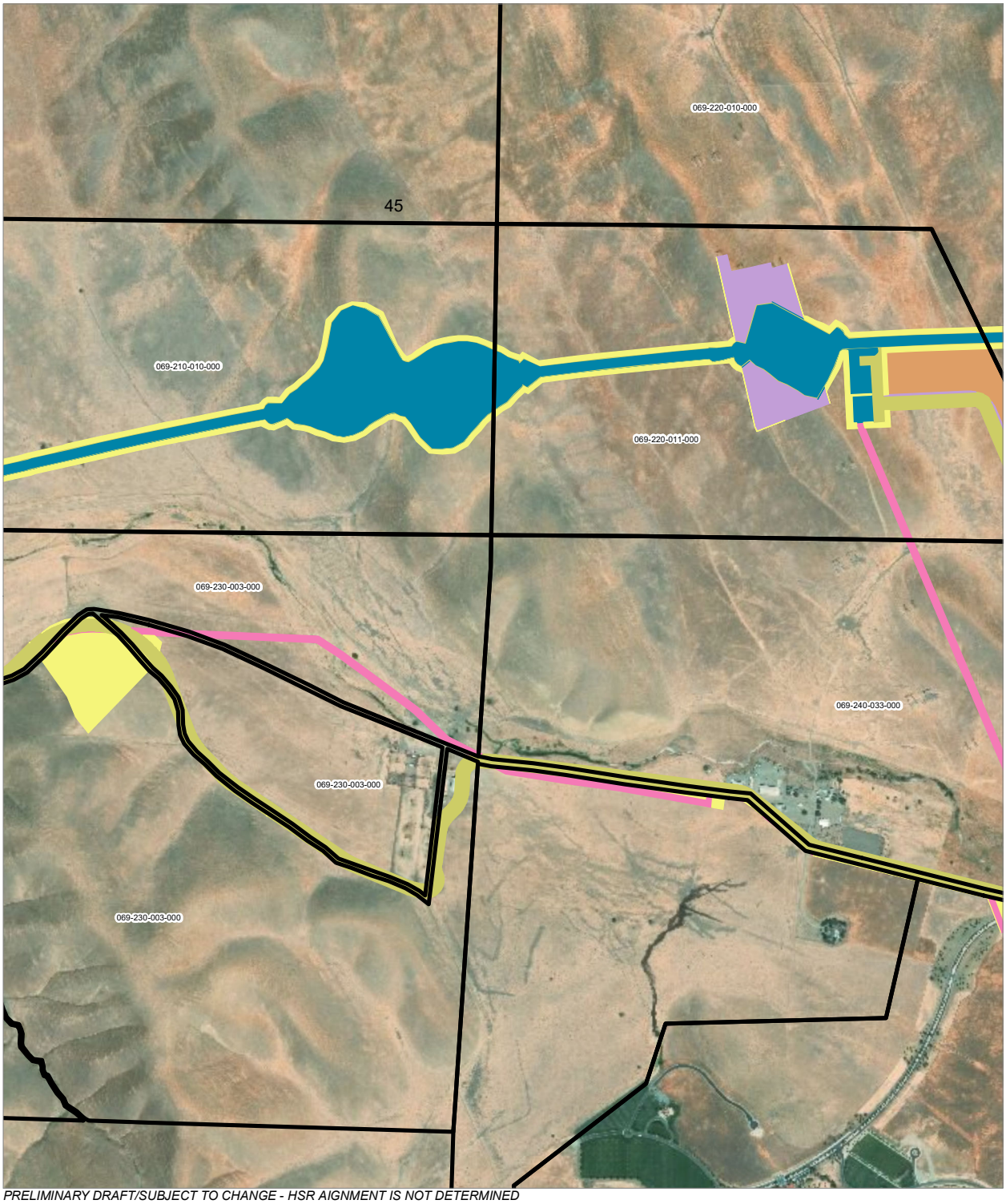


PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR AIGNMENT IS NOT DETERMINED
SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

0 400 800
Feet
0 100 200
Meters

HSR Right-of-Way
HSR Permanent Easement
Permanent Utility Easement
Temporary Construction Easement
Parcel (APN Displayed)



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SOURCE: ESRI, 2019; Santa Clara County, 2016; San Mateo County, 2016, San Franciso County, 2016

Alternative 4

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- HSR Right-of-Way
- HSR Permanent Easement
- Permanent Utility Easement
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- Temporary Utility Easement
- Non-Viable Remnant Parcel
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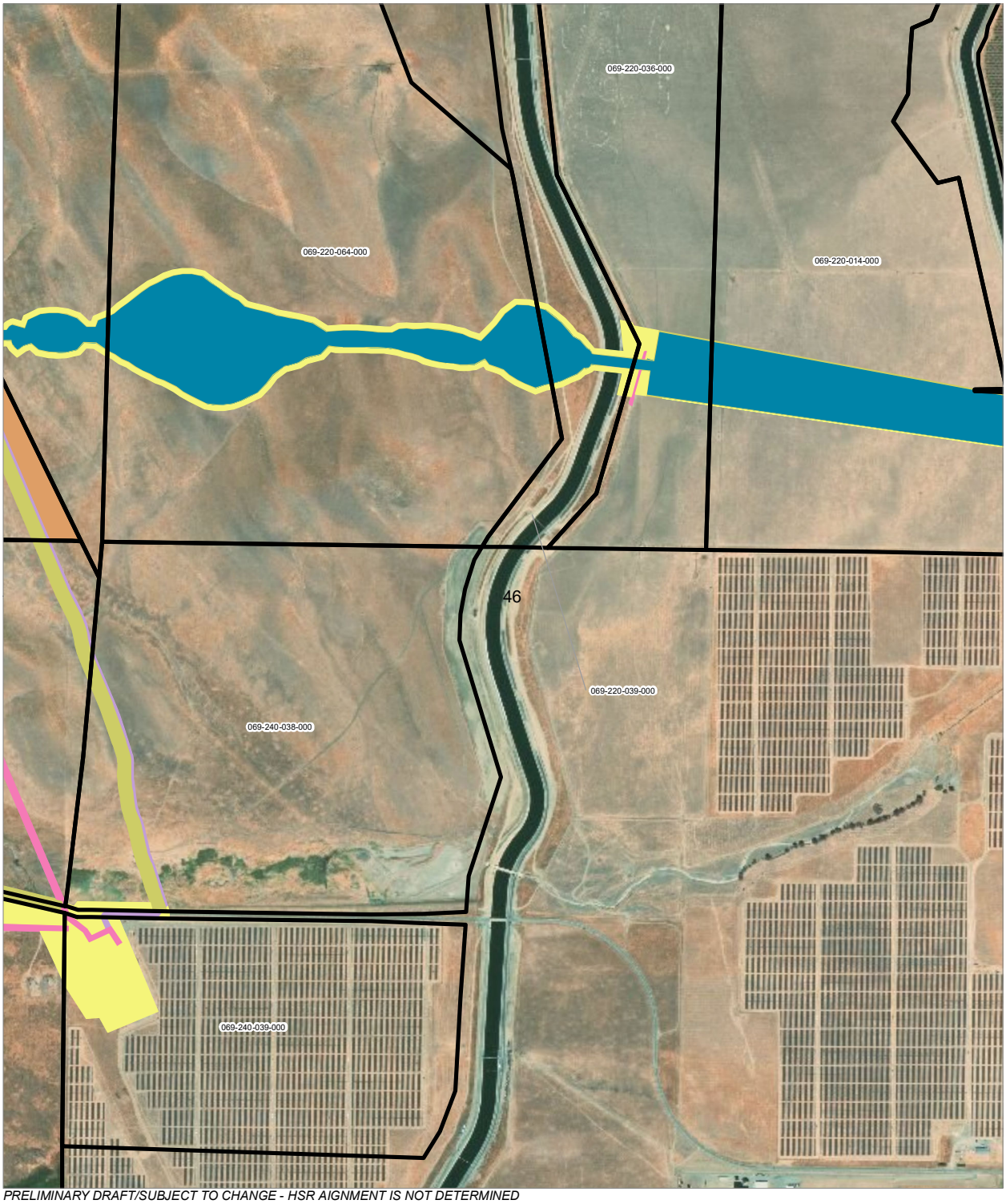

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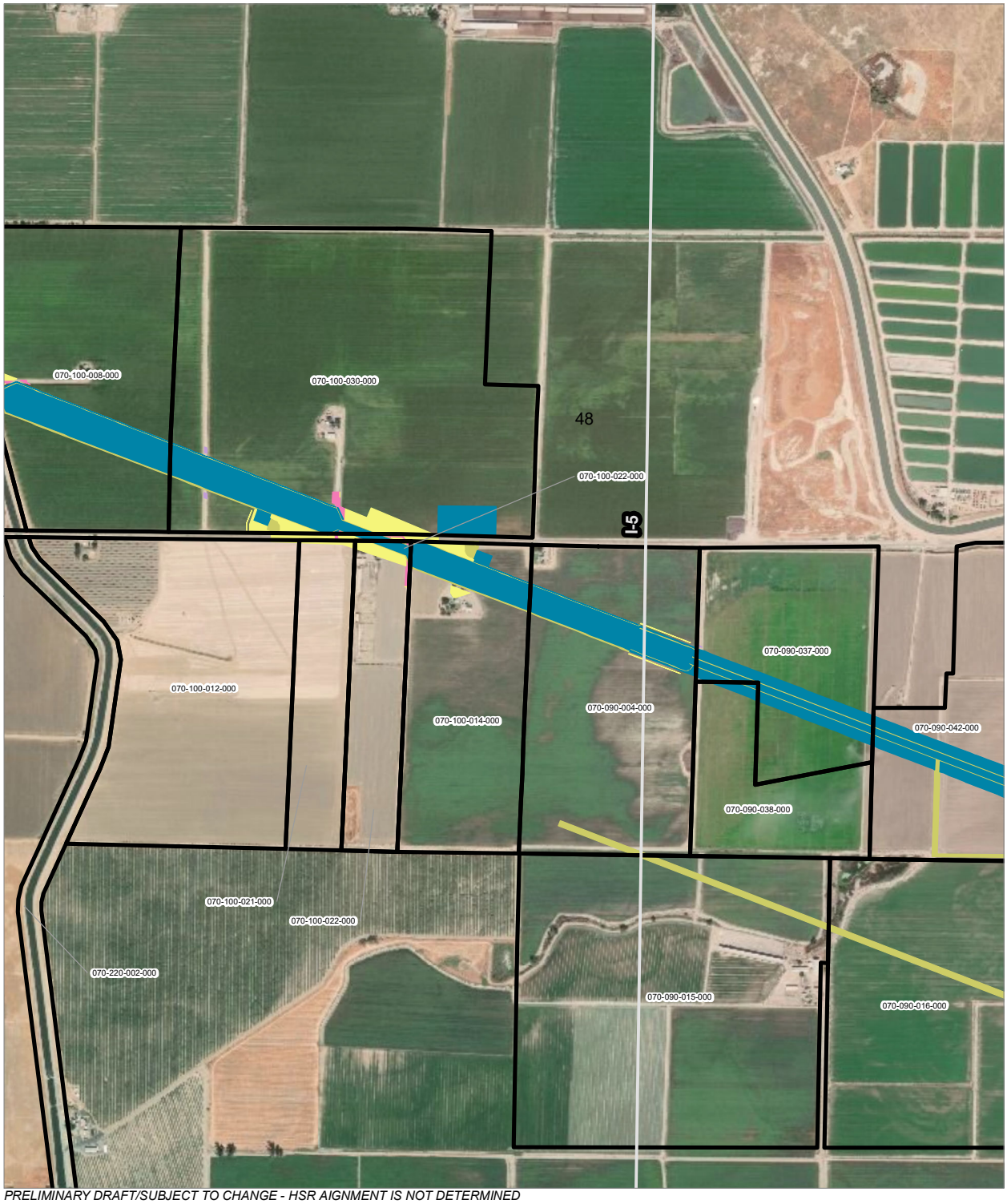

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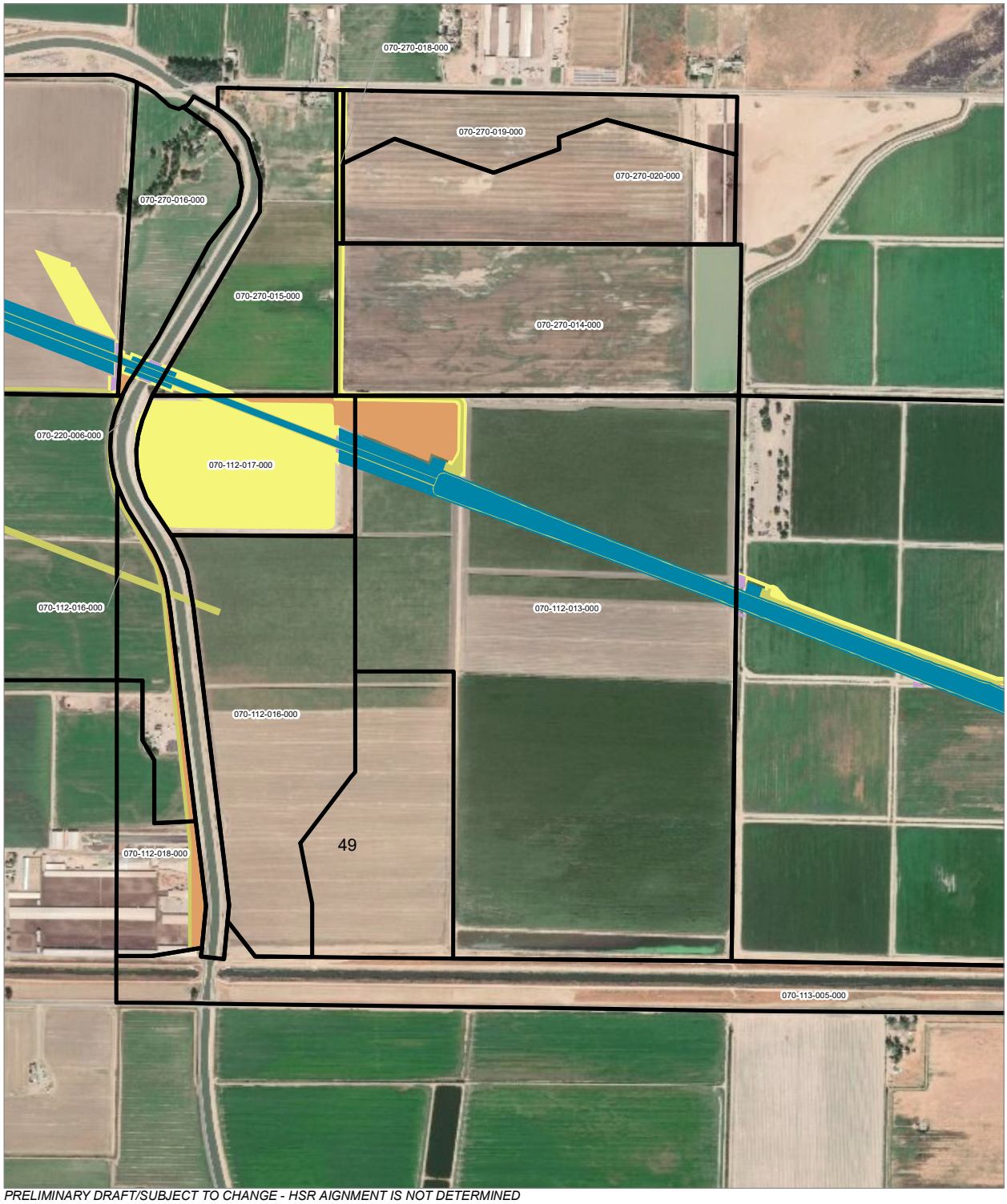

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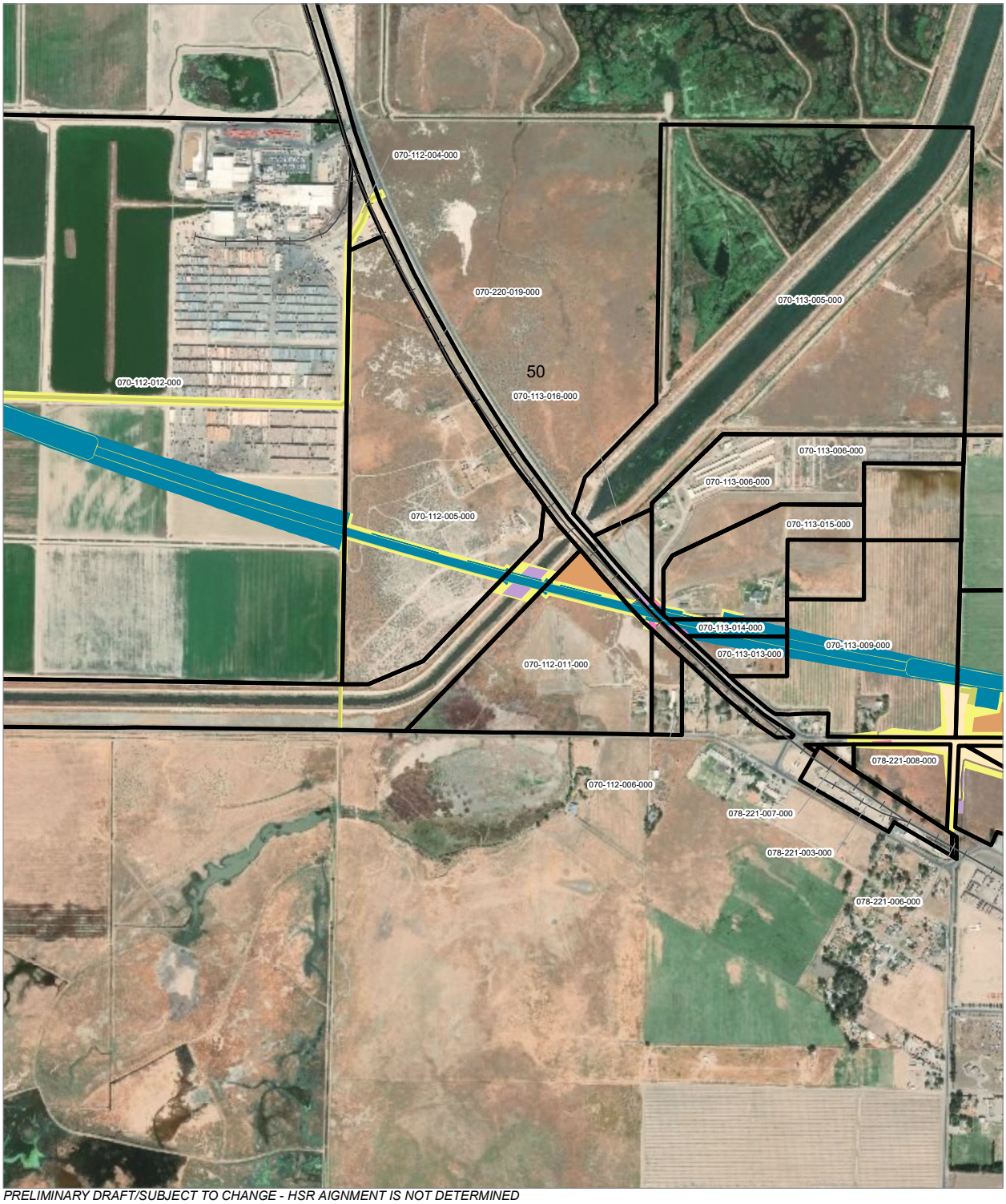

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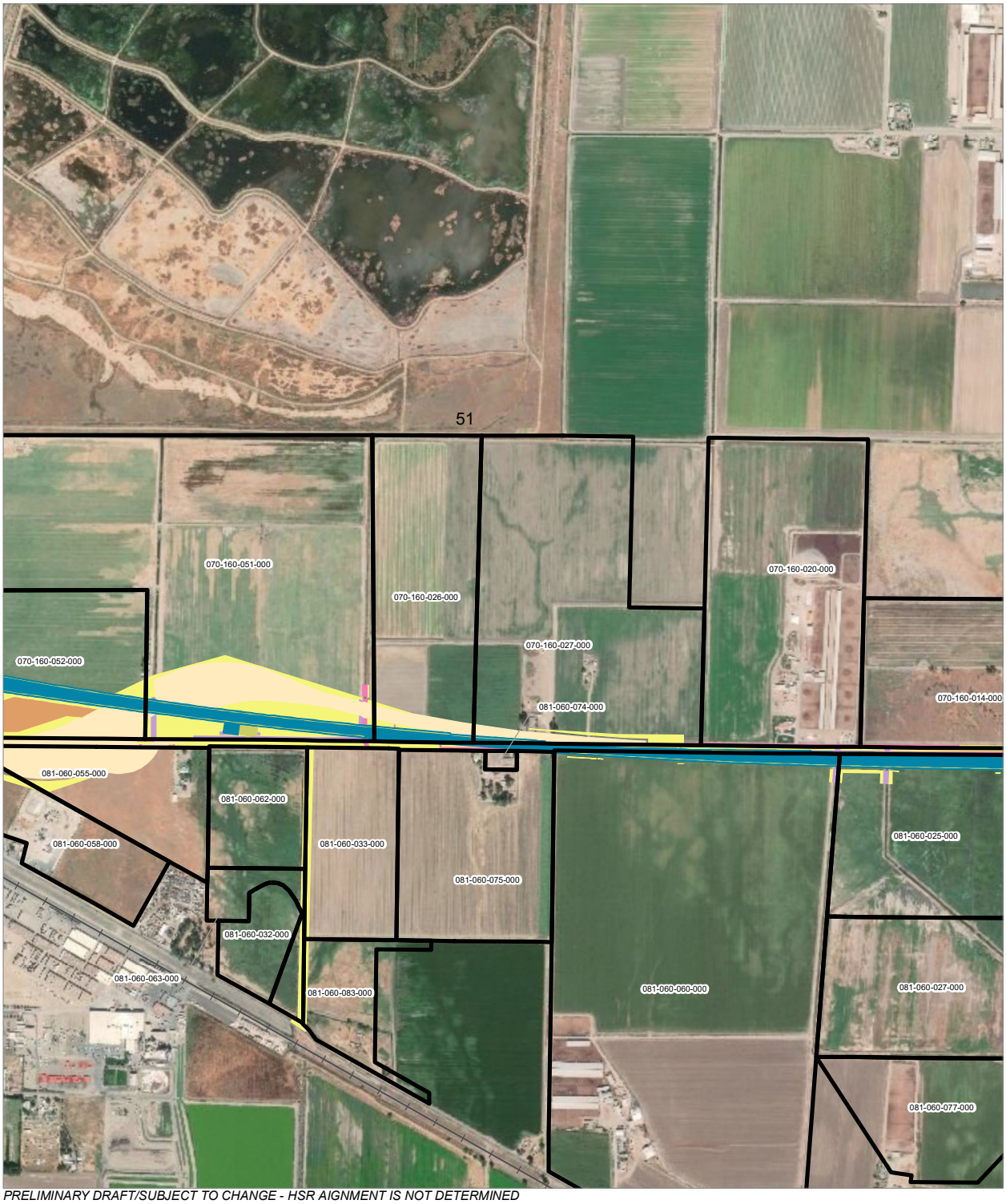

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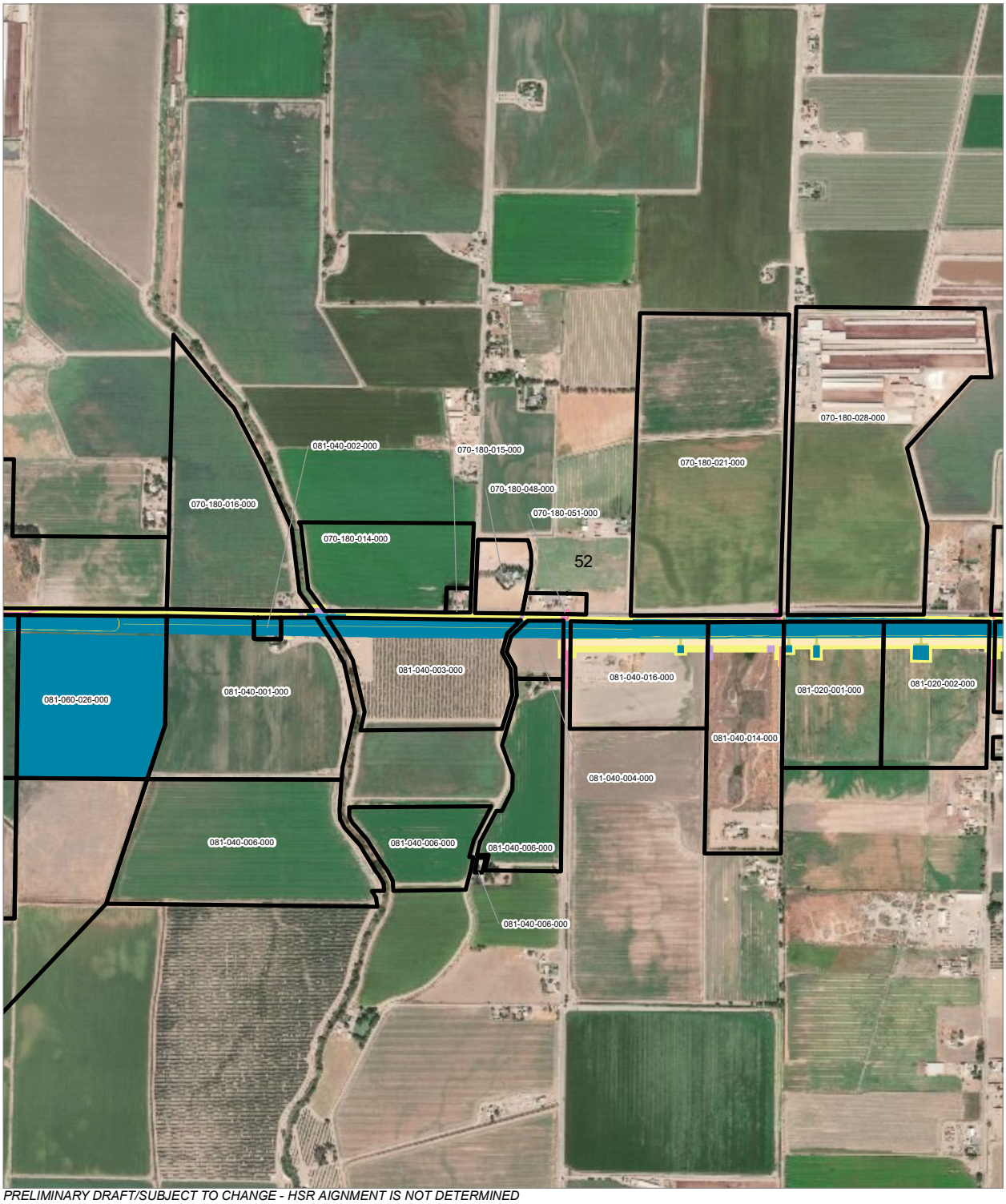

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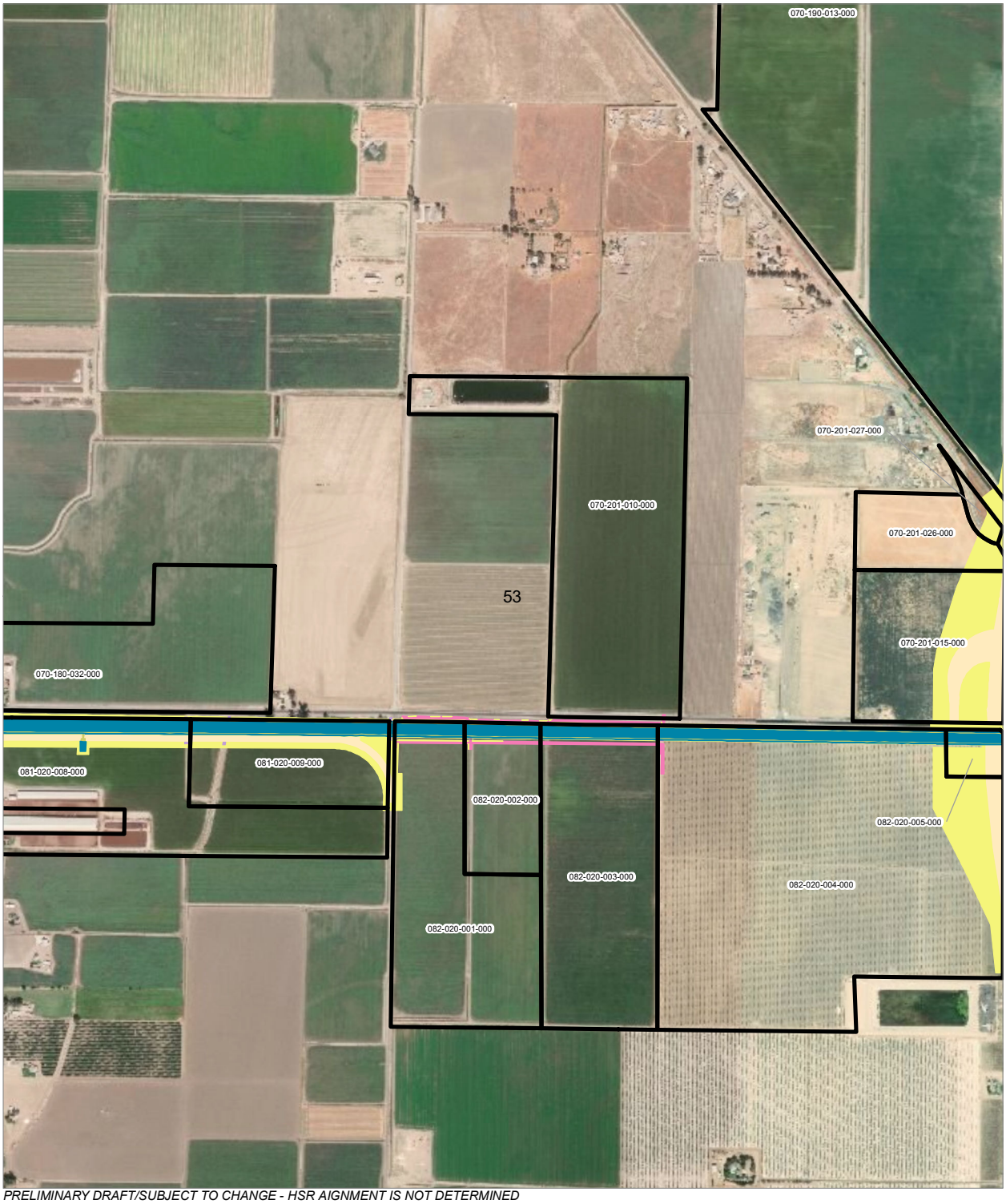

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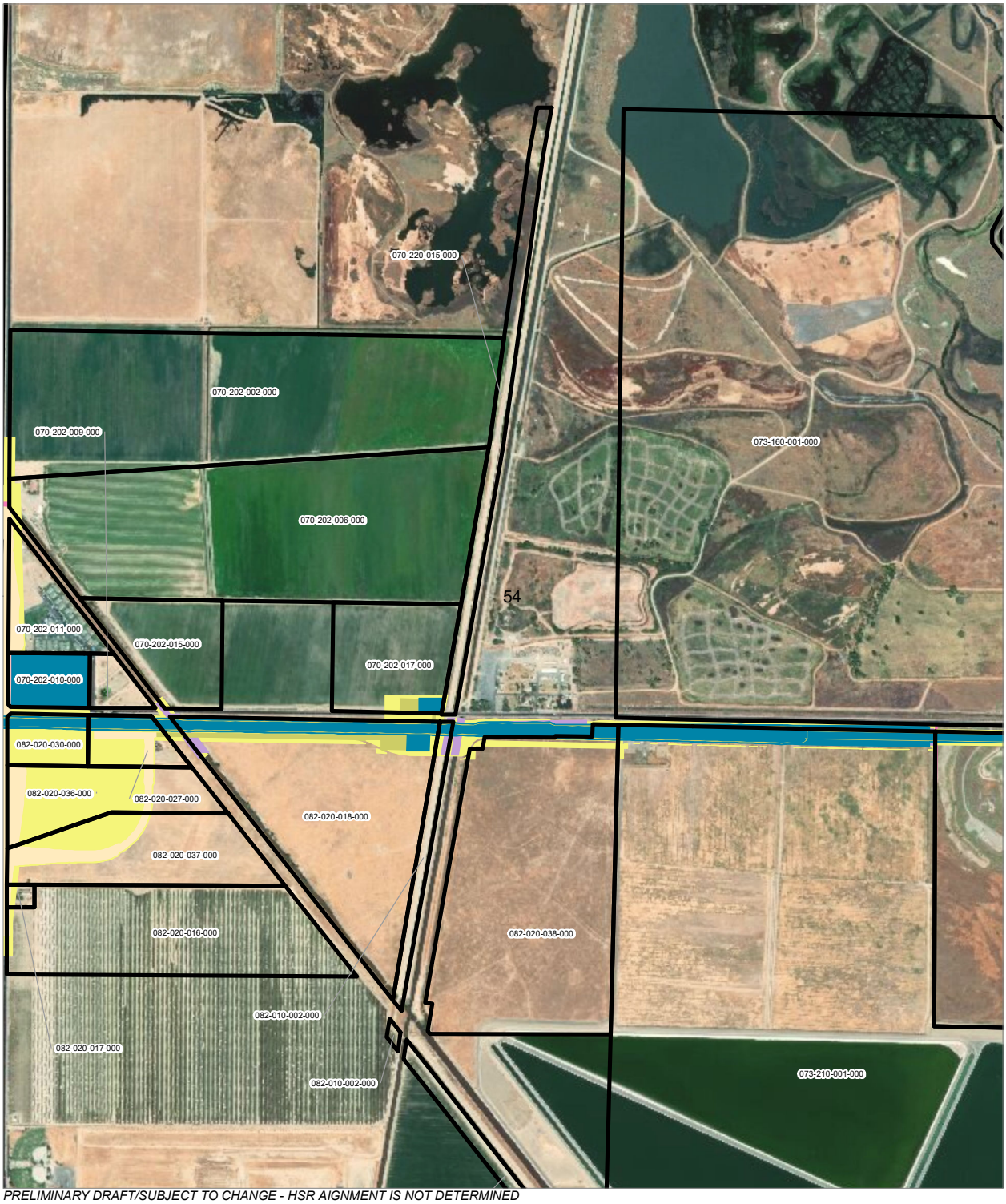

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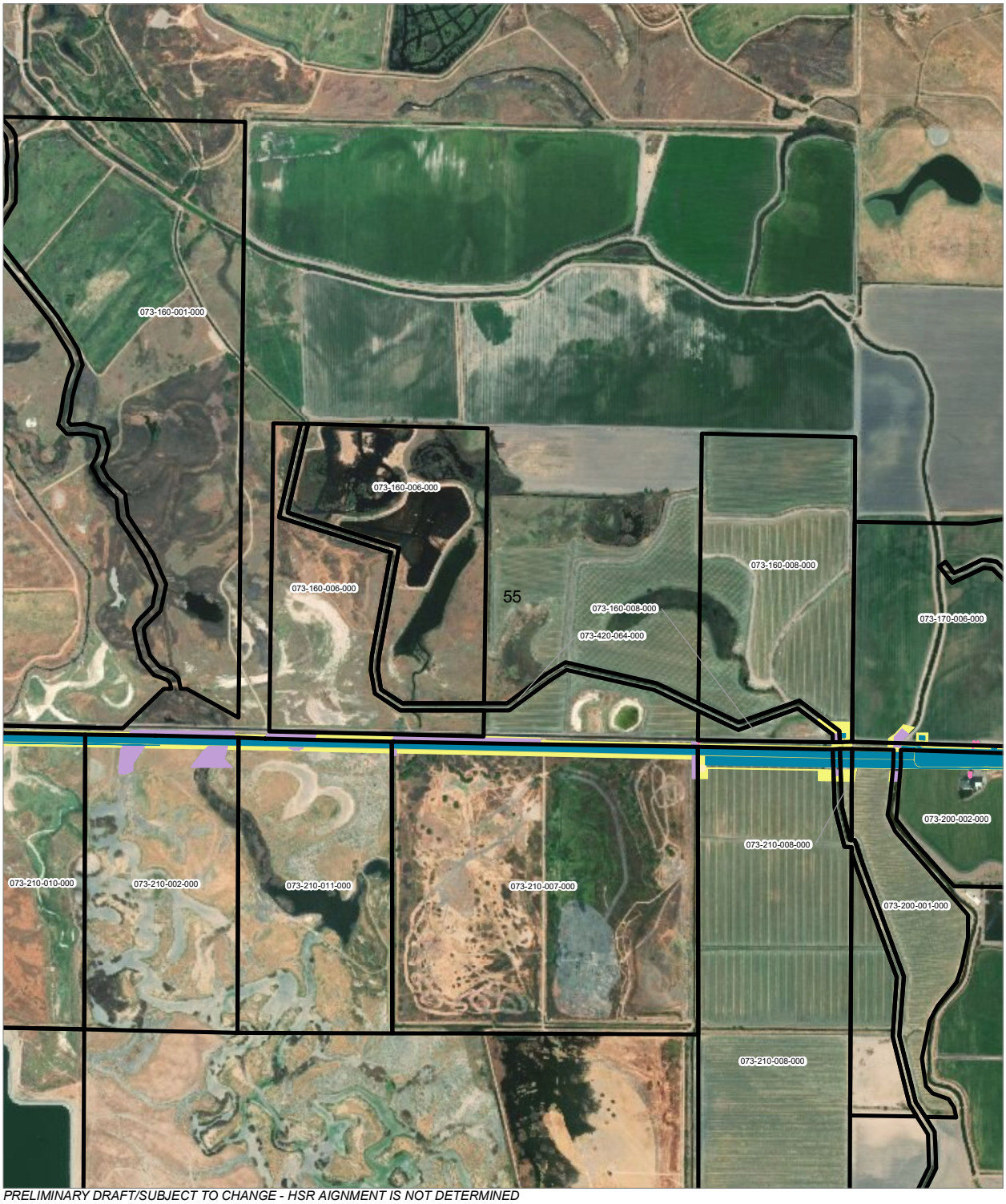

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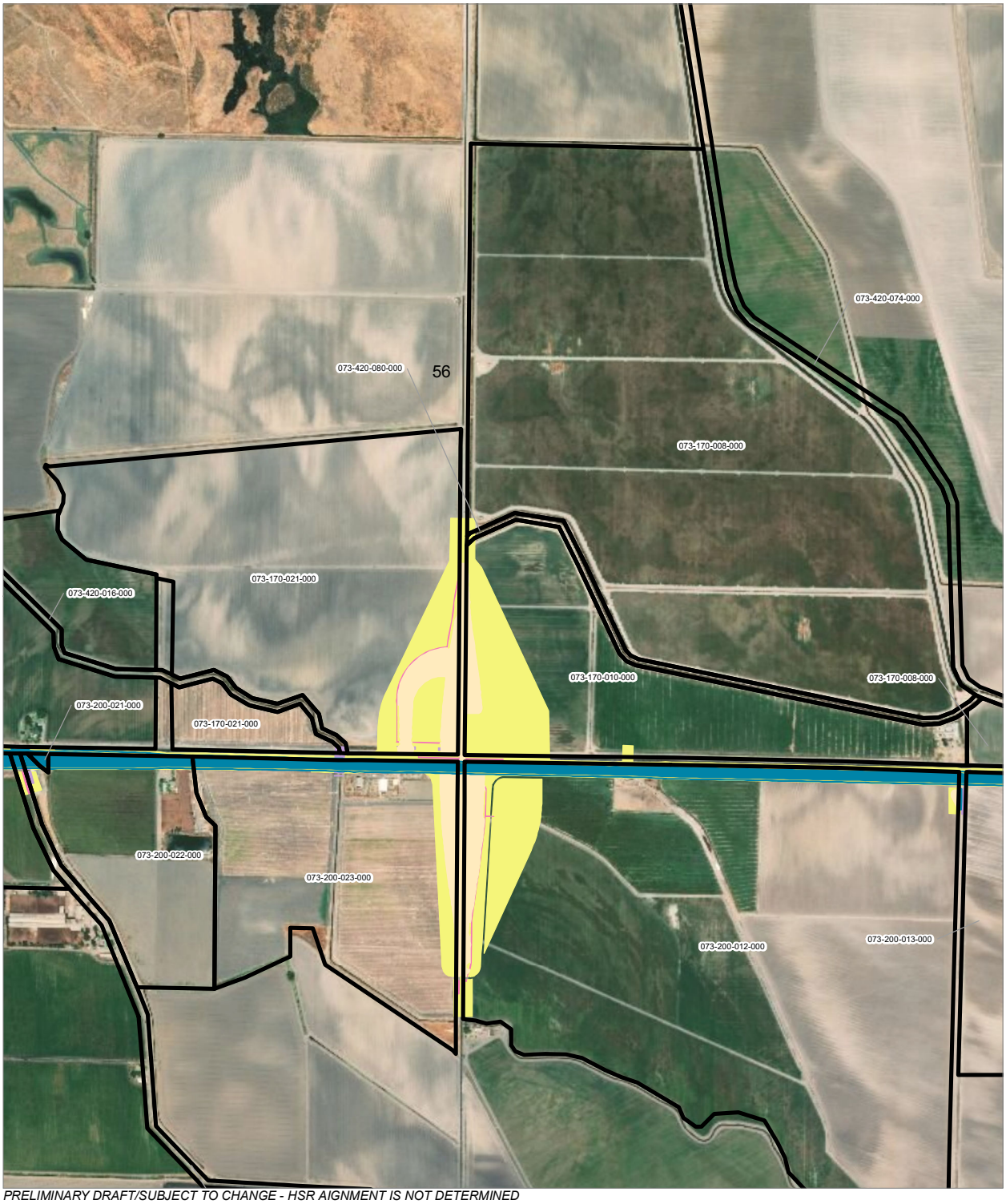

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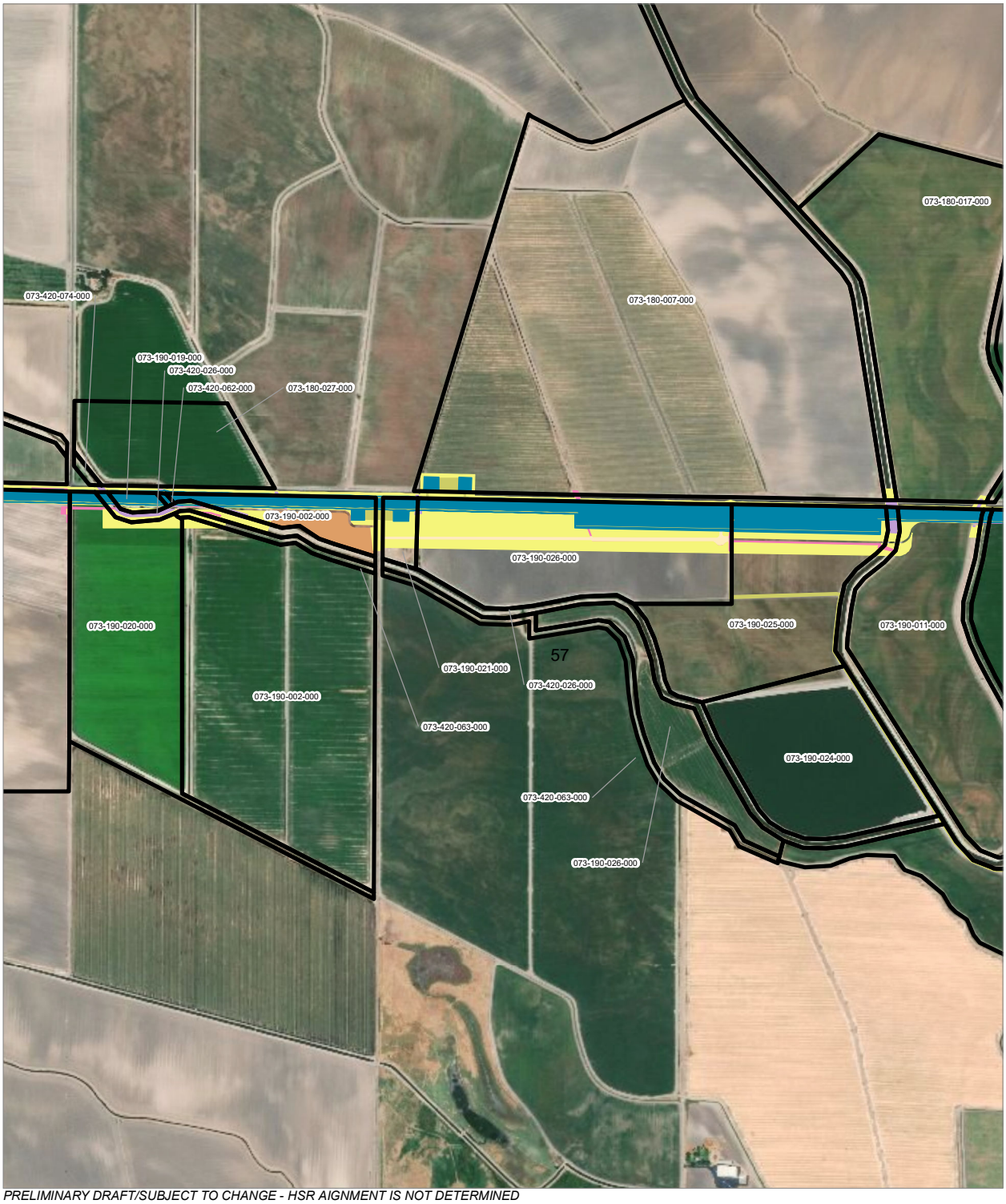

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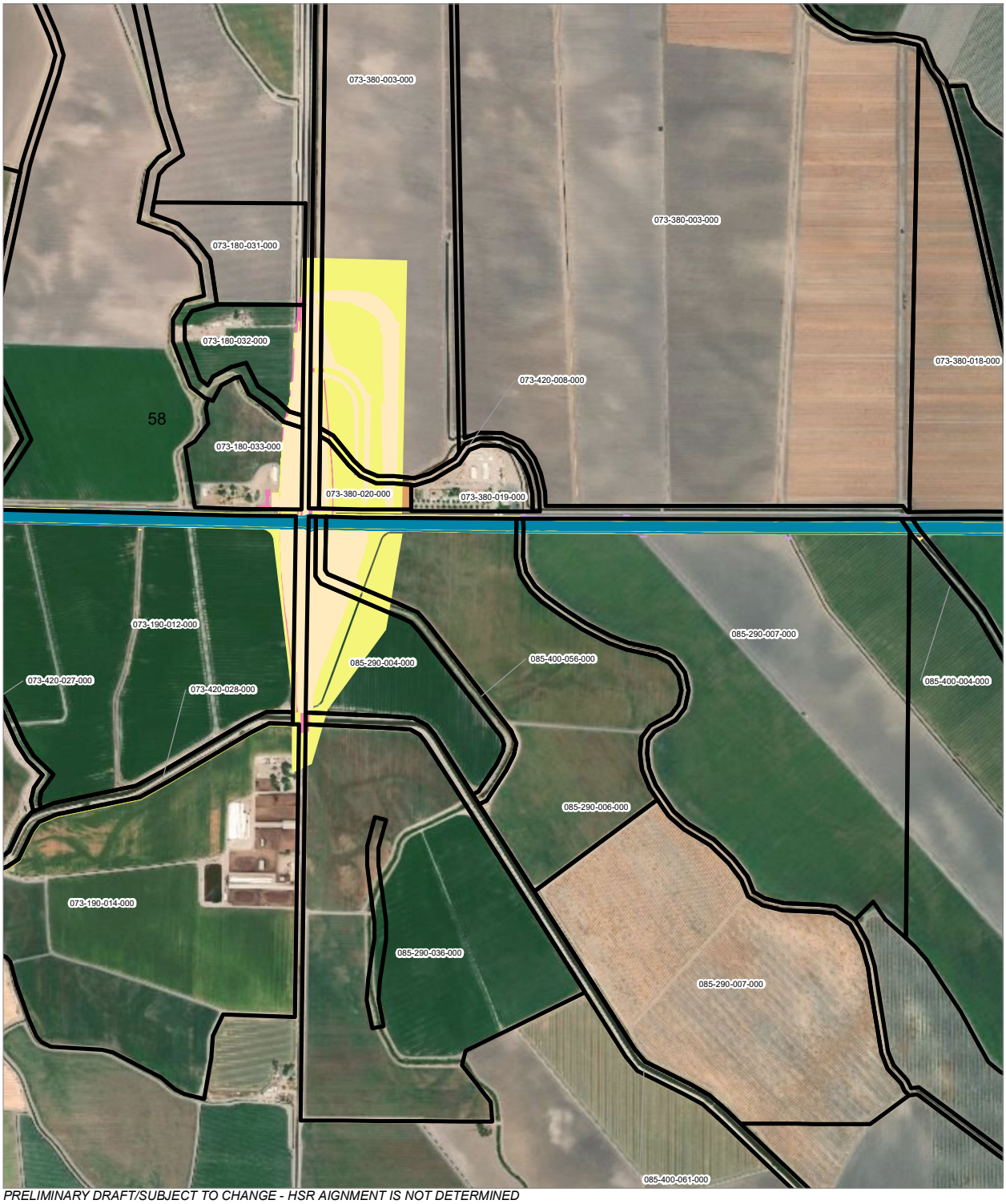

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APPENDIX 3.2-A: TRANSPORTATION DATA ON ROADWAYS, FREEWAYS, AND INTERSECTIONS

Tables

Table 1 Existing Freeway Level of Service 2-3
Table 2 Existing Plus Project Freeway Level of Service 2-4
Table 3 2029 No Project Freeway Level of Service 2-6
Table 4 2029 Plus Project Affected Freeway Segments 2-8
Table 5 2040 No Project Freeway Level of Service 2-10
Table 6 2040 Plus Project Affected Freeway Segments 2-12
Table 7 Existing Level of Service at Intersections in San Jose Diridon Station Approach Subsection 3-2
Table 8 Existing Level of Service at Intersections in Monterey Corridor Subsection 3-5
Table 9 Existing Level of Service at Intersections in Morgan Hill and Gilroy Subsection 3-8
Table 10 Existing Level of Service at Intersection in San Joaquin Valley Subsection 3-13
Table 11 Construction Level of Service under Temporary Roadway Narrowing at Intersections in Monterey Corridor Subsection 3-15
Table 12 Existing Plus Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections 3-18
Table 13 2029 No Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections 3-29
Table 14 2029 No Project and Plus Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections 3-41
Table 15 2040 No Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections 3-53
Table 16 2040 No Project and Plus Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections 3-65
Table 17 2040 No Project and Plus Project Mitigated Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections 3-76

Figures

Figure 1 Monterey Corridor Affected Freeway Segments 2-14
Figure 2 San Jose Diridon Station 2029 Plus Project AM Intersection LOS – Part 1 of 13 3-81
Figure 3 San Jose Diridon Station 2029 Plus Project PM Intersection LOS – Part 1 of 13 3-82
Figure 4 San Jose Diridon Station 2040 Plus Project AM Intersection LOS – Part 1 of 13 3-83

Figure 5 Jose Diridon Station 2040 Plus Project PM Intersection LOS – Part 1 of 13 3-84
Figure 6 San Jose Diridon Station 2029 Plus Project AM Intersection LOS – Part 2 of 13 3-85
Figure 7 San Jose Diridon Station 2029 Plus Project PM Intersection LOS – Part 2 of 13 3-86
Figure 8 San Jose Diridon Station 2040 Plus Project AM Intersection LOS – Part 2 of 13 3-87
Figure 9 San Jose Diridon Station 2040 Plus Project PM Intersection LOS – Part 2 of 13 3-88
Figure 10 Monterey Corridor 2029 Plus Project AM Intersection LOS – Part 3 of 13 3-89
Figure 11 Monterey Corridor 2029 Plus Project PM Intersection LOS – Part 3 of 13 3-90
Figure 12 Monterey Corridor 2040 Plus Project AM Intersection LOS – Part 3 of 13 3-91
Figure 13 Monterey Corridor 2040 Plus Project PM Intersection LOS – Part 3 of 13 3-92
Figure 14 Monterey Corridor 2029 Plus Project AM Intersection LOS – Part 4 of 13 3-93
Figure 15 Monterey Corridor 2029 Plus Project PM Intersection LOS – Part 4 of 13 3-94
Figure 16 Monterey Corridor 2040 Plus Project AM Intersection LOS – Part 4 of 13 3-95
Figure 17 Monterey Corridor 2040 Plus Project PM Intersection LOS – Part 4 of 13 3-96
Figure 18 Monterey Corridor 2029 Plus Project AM Intersection LOS – Part 5 of 13 3-97
Figure 19 Monterey Corridor 2029 Plus Project PM Intersection LOS – Part 5 of 13 3-98
Figure 20 Monterey Corridor 2040 Plus Project AM Intersection LOS – Part 5 of 13 3-99
Figure 21 Monterey Corridor 2040 Plus Project PM Intersection LOS – Part 5 of 13 3-100
Figure 22 Morgan Hill 2029 Plus Project AM Intersection LOS – Part 6 of 13 3-101
Figure 23 Morgan Hill 2029 Plus Project PM Intersection LOS – Part 6 of 13 3-102
Figure 24 Morgan Hill 2040 Plus Project AM Intersection LOS – Part 6 of 13 3-103
Figure 25 Morgan Hill 2040 Plus Project PM Intersection LOS – Part 6 of 13 3-104
Figure 26 San Martin 2029 Plus Project AM Intersection LOS – Part 7 of 13 3-105
Figure 27 San Martin 2029 Plus Project PM Intersection LOS – Part 7 of 13 3-106
Figure 28 San Martin 2040 Plus Project AM Intersection LOS – Part 7 of 13 3-107
Figure 29 San Martin 2040 Plus Project PM Intersection LOS – Part 7 of 13 3-108
Figure 30 Gilroy 2029 Plus Project AM Intersection LOS – Part 8 of 13 3-109
Figure 31 Gilroy 2029 Plus Project PM Intersection LOS – Part 8 of 13 3-110

Figure 32 Gilroy 2040 Plus Project AM Intersection LOS – Part 8 of 13.....3-111
Figure 33 Gilroy 2040 Plus Project PM Intersection LOS – Part 8 of 13.....3-112
Figure 34 Gilroy 2029 Plus Project AM Intersection LOS – Part 9 of 13.....3-113
Figure 35 Gilroy 2029 Plus Project PM Intersection LOS – Part 9 of 13.....3-114
Figure 36 Gilroy 2040 Plus Project AM Intersection LOS – Part 9 of 13.....3-115
Figure 37 Gilroy 2040 Plus Project PM Intersection LOS – Part 9 of 13.....3-116
Figure 38 Gilroy 2029 Plus Project AM Intersection LOS – Part 10 of 13.....3-117
Figure 39 Gilroy 2029 Plus Project PM Intersection LOS – Part 10 of 13.....3-118
Figure 40 Gilroy 2040 Plus Project AM Intersection LOS – Part 10 of 13.....3-119
Figure 41 Gilroy 2040 Plus Project PM Intersection LOS – Part 10 of 13.....3-120
Figure 42 Downtown Gilroy Station 2029 Plus Project AM Intersection LOS – Part 11 of 13.....3-121
Figure 43 Downtown Gilroy Station 2029 Plus Project PM Intersection LOS – Part 11 of 13.....3-122
Figure 44 Downtown Gilroy Station 2040 Plus Project AM Intersection LOS – Part 11 of 13.....3-123
Figure 45 Downtown Gilroy Station 2040 Plus Project PM Intersection LOS – Part 11 of 13.....3-124
Figure 46 Gilroy MOWF 2029 Plus Project AM Intersection LOS – Part 12 of 13.....3-125
Figure 47 Gilroy MOWF 2029 Plus Project PM Intersection LOS – Part 12 of 13.....3-126
Figure 48 Gilroy MOWF 2040 Plus Project AM Intersection LOS – Part 12 of 13.....3-127
Figure 49 Gilroy MOWF 2040 Plus Project PM Intersection LOS – Part 12 of 13.....3-128
Figure 50 San Joaquin Valley 2029 Plus Project AM Intersection LOS – Part 13 of 13.....3-129
Figure 51 San Joaquin Valley 2029 Plus Project PM Intersection LOS – Part 13 of 13.....3-130
Figure 52 San Joaquin Valley 2040 Plus Project AM Intersection LOS – Part 13 of 13.....3-131
Figure 53 San Joaquin Valley 2040 Plus Project PM Intersection LOS – Part 13 of 13.....3-132

1 INTRODUCTION

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- This appendix was updated to correct two typographical errors in Table 6.
- The results of additional analysis with the planned intersection at Dunne Avenue and Depot Street/Church Street per the City of Morgan Hill General Plan were added to Table 16.
- Table 17, 2040 No Project and Plus Project Mitigated Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections, was added.

This appendix provides technical data and figures related to the assessment of intersection and freeway delays for the San Jose to Merced Project Section.

It should be noted that Senate Bill (SB) 743 was signed into law on September 27, 2013, the transportation impact analysis under the California Environmental Quality Act (CEQA) shifted away from auto delay toward consideration of greenhouse gas reductions, with a focus on multimodal transportation networks and land use mixes. Vehicle Miles Traveled (VMT) was chosen as the new metric for evaluating transportation impacts under CEQA. SB 743 does not prevent counties or cities from continuing existing transportation impact analyses, including use of vehicular LOS in their general plans, but for CEQA analysis, lead agencies are required to shift to a VMT metric by July 1, 2020. Therefore, intersection and freeway LOS was not considered for CEQA impacts.

However, since the environmental document is a combined document for the purposes of both CEQA as well as the federal National Environmental Policy Act (NEPA), intersection and freeway delays were evaluated to determine project effects under NEPA and this appendix provides the technical data supporting that analysis.

2 FREEWAY MAINLINE SEGMENT OPERATIONS

Freeway levels-of-service (LOS) operations were evaluated. Freeway segments that would serve 100 or more project-generated trips in either the AM or PM peak hour were analyzed. Analysts assessed both freeway mainline segments using the methodologies described in the *Highway Capacity Manual* (Transportation Research Board 2010). Analysts evaluated freeway mainline segments using the method described in Chapter 11 of the *Highway Capacity Manual* (Transportation Research Board 2010). The detailed methodology is presented in Section 3.2.4.3 of the San Jose to Merced Project Section Environmental Impact Report/Environmental Impact Statement.

Analysts identified effects on the freeway system through a two-step process. First, the LOS was determined using the volume to capacity (V/C) ratio, as shown in Table 3.2-7 in Section 3.2.4.3 of the San Jose to Merced Project Section. Then, for freeway segments with LOS E or F (only), the difference in the V/C ratio between the No Project and Plus Project conditions was calculated. An effect was deemed to occur if the project caused the V/C ratio to increase by 0.04 (4 percent) or more.

Freeway operations were studied under the following conditions:

- Existing Conditions
- Existing Plus Project Conditions (effects from permanent road closures and relocations)
- 2029 No Project Conditions
- 2029 Plus Project conditions (effects from permanent road closures and relocations, and Project operations)
- 2040 No Project Conditions
- 2040 Plus Project conditions (effects from permanent road closures and relocations, and Project operations)

Table 1 Existing Freeway Level of Service

Freeway	Segment	Peak Hour	Volume	V/C Ratio	LOS
Northbound					
US 101	SR 25 to Monterey Road	AM PM	**3,900*** 2,910	**0.90*** 0.67	**E*** C
US 101	Monterey Road to SR 152	AM PM	3,000 2,400	0.46 0.37	B B
US 101	SR 152 to Leavesley Road	AM PM	4,950 2,600	0.76 0.40	D B
US 101	Leavesley Road to Buena Vista Avenue	AM PM	4,560 3,960	0.70 0.61	C C
US 101	Buena Vista Avenue to Masten Avenue	AM PM	4,360 3,600	0.67 0.55	C C
US 101	Lane drop (SB) to SR 85	AM PM	7,180 4,680	0.87 0.58	D C
US 101	SR 85 to Bernal Road	AM PM	**8,380*** 2,920	**0.99*** 0.34	**F*** B
US 101	Bernal Road to Silver Creek Valley Road	AM PM	6,740 4,030	0.79 0.52	D C
US 101	Silver Creek Valley Road to Hellyer Avenue	AM PM	7,120 5,990	0.85 0.79	D D
US 101	Hellyer Avenue to Yerba Buena Road	AM PM	6,430 **7,110***	0.75 **0.90***	D **E***
Southbound					
US 101	SR 25 to Monterey Road	AM PM	2,000 **4,060***	0.46 **0.94***	B **E***
US 101	Monterey Road to SR 152	AM PM	2,220 2,000	0.34 0.31	B B
US 101	SR 152 to Leavesley Road	AM PM	2,400 3,960	0.37 0.61	B C
US 101	Leavesley Road to Buena Vista Avenue	AM PM	3,200 5,150	0.49 0.79	B D
US 101	Buena Vista Avenue to Masten Avenue	AM PM	2,600 4,560	0.40 0.70	B C
US 101	Lane drop (SB) to SR 85	AM PM	5,070 6,860	0.52 0.67	C C
US 101	SR 85 to Bernal Road	AM PM	4,780 5,710	0.58 0.66	C C
US 101	Bernal Road to Silver Creek Valley Road	AM PM	3,010 4,960	0.43 0.58	B C
US 101	Silver Creek Valley Road to Hellyer Avenue	AM PM	4,370 6,200	0.61 0.79	C D
US 101	Hellyer Avenue To Yerba Buena Road	AM PM	4,900 **7,880***	0.63 **1.02***	C **F***

*Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.*
V/C = volume-to-capacity ratio; *LOS = level of service;* SR = state route; SB = southbound*; US = U. S. Highway*

Table 2 Existing Plus Project Freeway Level of Service

Freeway	Segment	Peak Hour	No Project			Plus Project: Alternatives 1, 2, and 3				Plus Project: Alternative 4			
			Volume	V/C Ratio	LOS	Volume	V/C Ratio	LOS	Effect?	Volume	V/C Ratio	LOS	Effect?
Northbound													
US 101	**SR 25 to Monterey Road**	**AM***	**3,900***	**0.90***	**E***	**3,935***	**0.90***	**E***	No	**3,900***	**0.90***	**E***	No
		PM	2,910	0.67	C	2,949	0.67	C	No	2,910	0.67	C	No
US 101	Monterey Road to SR 152	AM	3,000	0.46	B	3,078	0.46	B	No	3,000	0.46	B	No
		PM	2,400	0.37	B	2,400	0.37	B	No	2,400	0.37	B	No
US 101	SR 152 to Leavesley Road	AM	4,950	0.76	D	5,034	0.76	D	No	4,950	0.76	D	No
		PM	2,600	0.40	B	2,878	0.40	B	No	2,600	0.40	B	No
US 101	Leavesley Road to Buena Vista Avenue	AM	4,560	0.70	C	4,631	0.70	C	No	4,560	0.70	C	No
		PM	3,960	0.61	C	4,208	0.61	C	No	3,960	0.61	C	No
US 101	Buena Vista Avenue to Masten Avenue	AM	4,360	0.67	C	4,431	0.67	C	No	4,360	0.67	C	No
		PM	3,600	0.55	C	3,848	0.55	C	No	3,600	0.55	C	No
US 101	**Lane drop (SB) to SR 85**	**AM***	7,180	0.87	D	**7,608***	**0.92***	**E***	**Yes***	7,180	0.87	D	No
		PM	4,680	0.58	C	4,741	0.59	C	No	4,680	0.58	C	No
US 101	**SR 85 to Bernal Road**	**AM***	**8,380***	**0.99***	**F***	**8,747***	**1.04***	**F***	**Yes***	**8,380***	**0.99***	**F***	No
		PM	2,920	0.34	B	2,960	0.35	B	No	2,920	0.34	B	No
US 101	Bernal Road to Silver Creek Valley Road	AM	6,740	0.79	D	6,946	0.82	D	No	6,740	0.79	D	No
		PM	4,030	0.52	C	4,043	0.52	C	No	4,030	0.52	C	No
US 101	Silver Creek Valley Road to Hellyer Avenue	AM	7,120	0.85	D	7,283	0.87	D	No	7,120	0.85	D	No
		PM	5,990	0.79	D	6,025	0.79	D	No	5,990	0.79	D	No
US 101	**Hellyer Avenue to Yerba Buena Road**	AM	6,430	0.75	D	6,526	0.80	D	No	6,430	0.75	D	No
		PM*	**7,110***	**0.90***	**E***	**7,139***	**0.90***	**E***	No	**7,110***	**0.90***	**E***	No

Freeway	Segment	Peak Hour	No Project			Plus Project: Alternatives 1, 2, and 3				Plus Project: Alternative 4			
			Volume	V/C Ratio	LOS	Volume	V/C Ratio	LOS	Effect?	Volume	V/C Ratio	LOS	Effect?
Southbound													
US 101	**SR 25 to Monterey Road**	AM **PM***	2,000 **4,060***	0.46 **0.94***	B **E***	2,064 **4,060***	0.46 **0.94***	B **E***	No No	2,000 **4,060***	0.46 **0.94***	B **E***	No No
US 101	Monterey Road to SR 152	AM PM	2,220 2,000	0.34 0.31	B B	2,303 2,022	0.34 0.31	B B	No No	2,220 2,000	0.34 0.31	B B	No No
US 101	SR 152 to Leavesley Road	AM PM	2,400 3,960	0.37 0.61	B C	2,681 4,044	0.37 0.61	B C	No No	2,400 3,960	0.37 0.61	B C	No No
US 101	Leavesley Road to Buena Vista Avenue	AM PM	3,200 5,150	0.49 0.79	B D	3,470 5,214	0.49 0.79	B D	No No	3,200 5,150	0.49 0.79	B D	No No
US 101	Buena Vista Avenue to Masten Avenue	AM PM	2,600 4,560	0.40 0.70	B C	2,870 4,624	0.40 0.70	B C	No No	2,600 4,560	0.40 0.70	B C	No No
US 101	Lane drop (SB) to SR 85	AM PM	5,070 6,860	0.52 0.67	C C	5,096 7,353	0.52 0.72	C D	No No	5,070 6,860	0.52 0.67	C C	No No
US 101	SR 85 to Bernal Road	AM PM	4,780 5,710	0.58 0.66	C C	4,796 5,912	0.58 0.68	C C	No No	4,780 5,710	0.58 0.66	C C	No No
US 101	Bernal Road to Silver Creek Valley Road	AM PM	3,010 4,960	0.43 0.58	B C	3,022 5,080	0.43 0.59	B C	No No	3,010 4,960	0.43 0.58	B C	No No
US 101	Silver Creek Valley Road to Hellyer Avenue	AM PM	4,370 6,200	0.61 0.79	C D	4,377 6,327	0.61 0.81	C D	No No	4,370 6,200	0.61 0.79	C D	No No
US 101	**Hellyer Avenue to Yerba Buena Road**	AM **PM***	4,900 **7,880***	0.63 **1.02***	C **F***	4,904 **7,980***	0.70 **1.03***	C **F***	No No	4,900 **7,880***	0.63 **1.02***	C **F***	No No

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
LOS = level of service
US = U.S. Highway
SR = State Route
SB = southbound
V/C = volume-to-capacity ratio

Table 3 2029 No Project Freeway Level of Service

Freeway	Segment	Peak Hour	Volume	V/C Ratio	LOS
Northbound					
US 101	SR 25 to Monterey Road	AM PM	6,000 4,320	0.78 0.56	D C
US 101	Monterey Road to SR 152	AM PM	4,570 3,700	0.60 0.48	C B
US 101	SR 152 to Leavesley Road	AM PM	6,410 3,590	0.84 0.47	D B
US 101	Leavesley Road to Buena Vista Avenue	AM PM	5,580 4,820	0.73 0.63	D C
US 101	Buena Vista Avenue to Masten Avenue	AM PM	5,380 4,460	0.70 0.58	C C
US 101	**Lane drop (SB) to SR 85**	**AM*** PM	**7,530*** 4,860	**0.98*** 0.64	**E*** C
US 101	**SR 85 to Bernal Road**	**AM*** PM	**9,080*** 3,210	**1.19*** 0.42	**F*** B
US 101	**Bernal Road to Silver Creek Valley Road**	**AM*** PM	**7,030*** 4,730	**0.92*** 0.62	**E*** C
US 101	**Silver Creek Valley Road to Hellyer Avenue**	**AM*** PM	**7,430*** 6,540	**0.97*** 0.85	**E*** D
US 101	**Hellyer Avenue to Yerba Buena Road**	**AM*** **PM***	**6,780*** **7,800***	**0.89*** **1.02***	**E*** **F***
Southbound					
US 101	SR 25 to Monterey Road	AM PM	3,550 5,470	0.46 0.72	B D
US 101	Monterey Road to SR 152	AM PM	3,650 3,300	0.48 0.43	B B
US 101	SR 152 to Leavesley Road	AM PM	3,550 4,950	0.46 0.65	B C
US 101	Leavesley Road to Buena Vista Avenue	AM PM	4,240 6,010	0.55 0.79	C D
US 101	Buena Vista Avenue to Masten Avenue	AM PM	3,640 5,420	0.48 0.71	B D
US 101	Lane drop (SB) to SR 85	AM PM	5,740 7,040	0.56 0.69	C C
US 101	SR 85 to Bernal Road	AM PM	5,530 6,000	0.72 0.78	D D
US 101	Bernal Road to Silver Creek Valley Road	AM PM	3,870 5,660	0.51 0.74	C D
US 101	**Silver Creek Valley Road to Hellyer Avenue**	AM **PM***	4,920 **6,750***	0.64 **0.88***	C **E***

Freeway	Segment	Peak Hour	Volume	V/C Ratio	LOS
US 101	**Hellyer Avenue to Yerba Buena Road**	AM **PM***	5,470 **8,570***	0.76 **1.12***	D **F***

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
LOS = level of service
US = U. S. Highway
SR = State Route
SB = southbound
V/C = volume-to-capacity ratio

Table 4 2029 Plus Project Affected Freeway Segments

Freeway	Segment	Peak Hour	No Project			Alternatives 1, 2 & 3				Alternative 4			
			Volume	V/C Ratio	LOS	Volume	V/C Ratio	LOS	Effect?	Volume	V/C Ratio	LOS	Effect?
Northbound													
US 101	SR 25 to Monterey Road	AM PM	6,000 4,320	0.78 0.56	D C	6,035 4,359	0.79 0.57	D C	No No	6,007 4,328	0.79 0.57	D C	No No
US 101	Monterey Road to SR 152	AM PM	4,570 3,700	0.60 0.48	C B	4,648 3,700	0.61 0.48	C B	No No	4,586 3,700	0.60 0.48	C C	No No
US 101	SR 152 to Leavesley Road	AM PM	6,410 3,590	0.84 0.47	D B	6,494 3,868	0.85 0.51	D C	No No	6,427 3,646	0.84 0.48	D C	No No
US 101	Leavesley Road to Buena Vista Avenue	AM PM	5,580 4,820	0.73 0.63	D C	5,651 5,068	0.73 0.66	D C	No No	5,594 4,870	0.73 0.64	D C	No No
US 101	Buena Vista Avenue to Masten Avenue	AM PM	5,380 4,460	0.70 0.58	C C	5,451 4,708	0.71 0.62	D C	No No	5,394 4,510	0.71 0.59	D C	No No
US 101	**Lane drop (SB) to SR 85**	**AM*** PM	**7,530*** 4,860	**0.98*** 0.64	**E*** C	**7,958*** 4,921	**1.04*** 0.64	**F*** C	**Yes*** No	**7,616*** 4,872	**1.00*** 0.64	F C	No No
US 101	**SR 85 to Bernal Road**	**AM*** PM	**9,080*** 3,210	**1.19*** 0.42	**F*** B	**9,447*** 3,250	**1.23*** 0.42	**F*** B	**Yes*** No	**9,153*** 3,218	**1.20*** 0.42	F B	No No
US 101	**Bernal Road to Silver Creek Valley Road**	**AM*** PM	**7,030*** 4,730	**0.92*** 0.62	**E*** C	**7,236*** 4,743	**0.95*** 0.62	**E*** C	No No	**7,071*** 4,733	**0.92*** 0.62	E C	No No
US 101	**Silver Creek Valley Road to Hellyer Avenue**	**AM*** PM	**7,430*** 6,540	**0.97*** 0.85	**E*** D	**7,593*** 6,575	**0.99*** 0.86	**E*** D	No No	**7,463*** 6,547	**0.98*** 0.86	E D	No No
US 101	**Hellyer Avenue to Yerba Buena Road**	**AM*** **PM***	**6,780*** **7,800***	**0.89*** **1.02***	**E*** **F***	**6,876*** **7,829***	**0.90*** **1.02***	**E*** **F***	No No	**6,799** **7,806***	**0.89*** **1.02***	E F	No No

Freeway	Segment	Peak Hour	No Project			Alternatives 1, 2 & 3				Alternative 4			
			Volume	V/C Ratio	LOS	Volume	V/C Ratio	LOS	Effect?	Volume	V/C Ratio	LOS	Effect?
Southbound													
US 101	SR 25 to Monterey Road	AM PM	3,550 5,470	0.46 0.72	B D	3,614 5,470	0.47 0.72	B D	No No	3,594 5,470	0.47 0.72	C D	No No
US 101	Monterey Road to SR 152	AM PM	3,650 3,300	0.48 0.43	B B	3,733 3,322	0.49 0.43	B B	No No	3,708 3,315	0.48 0.43	C B	No No
US 101	SR 152 to Leavesley Road	AM PM	3,550 4,950	0.46 0.65	B C	3,831 5,034	0.50 0.66	C C	No No	3,747 5,009	0.49 0.65	C C	No No
US 101	Leavesley Road to Buena Vista Avenue	AM PM	4,240 6,010	0.55 0.79	C D	4,510 6,074	0.59 0.79	C D	No No	4,429 6,055	0.58 0.79	C D	No No
US 101	Buena Vista Avenue to Masten Avenue	AM PM	3,640 5,420	0.48 0.71	B D	3,910 5,484	0.51 0.72	C D	No No	3,829 5,465	0.50 0.71	C D	No No
US 101	Lane drop (SB) to SR 85	AM PM	5,740 7,040	0.56 0.69	C C	5,766 7,533	0.56 0.74	C D	No No	5,758 7,385	0.56 0.72	C D	No No
US 101	SR 85 to Bernal Road	AM PM	5,530 6,000	0.72 0.78	D D	5,546 6,202	0.72 0.81	D D	No No	5,541 6,141	0.72 0.80	D D	No No
US 101	Bernal Road to Silver Creek Valley Road	AM PM	3,870 5,660	0.51 0.74	C D	3,882 5,780	0.51 0.76	C D	No No	3,878 5,744	0.51 0.75	C D	No No
US 101	**Silver Creek Valley Road to Hellyer Avenue**	AM **PM***	4,920 **6,750***	0.64 **0.88***	C **E***	4,927 **6,877***	0.64 **0.90***	C **E***	No No	4,925 **6,839***	0.64 **0.89***	C **E***	No No
US 101	**Hellyer Avenue To Yerba Buena Road**	AM **PM***	5,470 **8,570***	0.76 **1.12***	D **F***	5,474 **8,670***	0.72 **1.13***	D **F***	No No	5,473 **8,640***	0.72 **1.13***	D **F***	No No

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
[1] The criteria for determination of an effect is provided in Section 4.2.3.3, Intersections.
US = U. S. Highway
SR = State Route
SB = southbound
LOS = level of service
V/C = *volume-to-capacity ratio*
Bolded entries identify location *experience LOS E or F in one or both peak hours.*

Table 5 2040 No Project Freeway Level of Service

Freeway	Segment	Peak Hour	Volume	V/C Ratio	LOS
Northbound					
US 101	**SR 25 to Monterey Road**	**AM*** PM	**7,230*** 5,140	**0.95*** 0.67	**E*** C
US 101	Monterey Road to SR 152	AM PM	5,490 4,450	0.72 0.58	D C
US 101	**SR 152 to Leavesley Road**	**AM*** PM	**7,260*** 4,170	**0.95*** 0.55	**E*** C
US 101	Leavesley Road to Buena Vista Avenue	AM PM	6,170 5,320	0.81 0.70	D C
US 101	Buena Vista Avenue to Masten Avenue	AM PM	5,970 4,960	0.78 0.65	D C
US 101	**Lane drop (SB) to SR 85**	**AM*** PM	**7,730*** 4,960	**1.01*** 0.65	**F*** C
US 101	**SR 85 to Bernal Road**	**AM*** PM	**9,480*** 3,380	**1.24*** 0.44	**F*** B
US 101	**Bernal Road to Silver Creek Valley Road**	**AM*** PM	**7,190*** 5,130	**0.94*** 0.67	**E*** C
US 101	**Silver Creek Valley Road to Hellyer Avenue**	**AM*** **PM***	**7,610*** **6,860***	**0.99*** **0.90***	**E*** **E***
US 101	**Hellyer Avenue to Yerba Buena Road**	**AM*** **PM***	**6,970*** **8,190***	**0.91*** **1.07***	**E*** **F***
Southbound					
US 101	SR 25 to Monterey Road	AM PM	4,450 6,290	0.58 0.82	C D
US 101	Monterey Road to SR 152	AM PM	4,480 4,050	0.59 0.53	C C
US 101	SR 152 to Leavesley Road	AM PM	4,220 5,530	0.55 0.73	C D
US 101	Leavesley Road to Buena Vista Avenue	AM PM	4,850 6,510	0.63 0.85	C D
US 101	Buena Vista Avenue to Masten Avenue	AM PM	4,250 5,920	0.56 0.77	C D
US 101	Lane drop (SB) to SR 85	AM PM	6,120 7,140	0.60 0.70	C C
US 101	SR 85 to Bernal Road	AM PM	5,960 6,170	0.78 0.81	D D
US 101	Bernal Road to Silver Creek Valley Road	AM PM	4,370 6,060	0.57 0.79	C D
US 101	**Silver Creek Valley Road to Hellyer Avenue**	AM **PM***	5,240 **7,070***	0.68 **0.92***	C **E***

Freeway	Segment	Peak Hour	Volume	V/C Ratio	LOS
US 101	**Hellyer Avenue to Yerba Buena Road**	AM **PM***	5,800 **8,960***	0.76 **1.17***	D **F***

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
LOS = level of service
US = U. S. Highway
SR = State Route
SB = southbound
V/C = *volume-to-capacity* ratio

Table 6 2040 Plus Project Affected Freeway Segments

Freeway	Segment	Peak Hour	No Project			Alternatives 1, 2 & 3				Alternative 4			
			Volume	Volume	V/C Ratio	Volume	V/C Ratio	LOS	Effect?	Volume	V/C Ratio	LOS	Effect?
Northbound													
US 101	**SR 25 to Monterey Road**	**AM***	**7,230***	**0.95***	**E***	**7,265***	**0.95***	**E***	No	**7,231***	**0.95***	**E ***	No
		PM	5,140	0.67	C	5,179	0.68	C	No	5,150	0.67	C	No
US 101	Monterey Road to SR 152	AM	5,490	0.72	D	5,568	0.73	D	No	5,492	0.72	D	No
		PM	4,450	0.58	C	4,490	0.59	C	No	4,490	0.59	C	No
US 101	**SR 152 to Leavesley Road**	**AM***	**7,260***	**0.95***	**E***	**7,344***	**0.96***	**E***	No	**7,262***	**0.95***	**E ***	No
		PM	4,170	0.55	C	4,448	0.58	C	No	4,240	0.55	C	No
US 101	Leavesley Road to Buena Vista Avenue	AM	6,170	0.81	D	6,241	0.82	D	No	6,171	0.81	D	No
		PM	5,320	0.70	C	5,568	0.73	D	No	5,382	0.70	D	No
US 101	Buena Vista Avenue to Masten Avenue	AM	5,970	0.78	D	6,041	0.79	D	No	5,971	0.78	D	No
		PM	4,960	0.65	C	5,208	0.68	C	No	5,022	0.66	C	No
US 101	**Lane drop (SB) to SR 85**	**AM***	**7,730***	**1.01***	**F***	**8,158***	**1.07***	**F***	**Yes***	**7,739***	**1.01***	**F***	No
		PM	4,960	0.65	C	5,021	0.65	C	No	4,975	**0.65***	C	No
US 101	**SR 85 to Bernal Road**	**AM***	9,480	**1.24***	**F***	**9,847***	**1.29***	**F***	**Yes***	**9,487***	**1.24***	**F ***	No
		PM	3,380	0.44	B	3,420	0.45	B	No	3,390	0.44	B	No
US 101	**Bernal Road to Silver Creek Valley Road**	**AM***	**7,190***	**0.94***	**E***	**7,396***	**0.97***	**E***	No	**7,194***	**0.94***	**E ***	No
		PM	5,130	0.67	C	5,143	0.67	C	No	5,133	0.67	C	No
US 101	**Silver Creek Valley Road to Hellyer Avenue**	**AM***	**7,610***	**0.99***	**E***	**7,773***	**1.02***	**F***	No	**7,613**	**1.00***	**F ***	No
		PM*	**6,860***	**0.90***	**E***	**6,895***	**0.90***	**E***	No	**6,869***	**0.90***	**E***	No
US 101	**Hellyer Avenue to Yerba Buena Road**	**AM***	**6,970***	**0.91***	**E***	**7,066***	**0.92***	**E***	No	**6,972**	**0.91***	**E ***	No
		PM*	**8,190***	**1.07***	**F***	**8,219***	**1.07***	**F***	No	**8,197***	**1.07***	**F***	No

Freeway	Segment	Peak Hour	No Project			Alternatives 1, 2 & 3				Alternative 4			
			Volume	Volume	V/C Ratio	Volume	V/C Ratio	LOS	Effect?	Volume	V/C Ratio	LOS	Effect?
Southbound													
US 101	SR 25 to Monterey Road	AM PM	4,450 6,290	0.58 0.82	C D	4,514 6,310	0.59 0.83	C D	No No	4,475 6,310	0.59 0.83	C D	No No
US 101	Monterey Road to SR 152	AM PM	4,480 4,050	0.59 0.53	C C	4,563 4,072	0.60 0.53	C C	No No	4,513 4,059	0.59 0.53	C C	No No
US 101	SR 152 to Leavesley Road	AM PM	4,220 5,530	0.55 0.73	C D	4,501 5,614	0.59 0.73	C D	No No	4,332 5,564	0.57 0.73	C D	No No
US 101	Leavesley Road to Buena Vista Avenue	AM PM	4,850 6,510	0.63 0.85	C D	5,120 6,574	0.67 0.86	C D	No No	4,958 6,536	0.65 0.85	C D	No No
US 101	Buena Vista Avenue to Masten Avenue	AM PM	4,250 5,920	0.56 0.77	C D	4,520 5,984	0.59 0.78	C D	No No	4,358 5,946	0.57 0.78	C D	No No
US 101	Lane drop (SB) to SR 85	AM PM	6,120 7,140	0.60 0.70	C C	6,146 7,633	0.60 0.75	C D	No No	6,130 7,337	0.60 0.72	C D	No No
US 101	SR 85 to Bernal Road	AM PM	5,960 6,170	0.78 0.81	D D	5,976 6,372	0.78 0.83	D D	No No	5,966 6,251	0.78 0.82	D D	No No
US 101	Bernal Road to Silver Creek Valley Road	AM PM	4,370 6,060	0.57 0.79	C D	4,382 6,180	0.57 0.81	C D	No No	4,375 6,108	0.57 0.80	C D	No No
US 101	**Silver Creek Valley Road to Hellyer Avenue**	AM **PM***	5,240 **7,070***	0.68 **0.92***	C **E***	5,247 **7,197***	0.68 **0.94***	C **E***	No No	5,243 **7,121***	0.69 **0.93***	C **E***	No No
US 101	**Hellyer Avenue to Yerba Buena Road**	AM **PM***	5,800 **8,960***	0.76 **1.17***	D **F***	5,804 **9,060***	0.76 **1.18***	D **F***	No No	5,802 **9,000***	0.76 **1.18***	D **F***	No No

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
US = U. S. Highway
SR = State Route
SB = southbound
OS = level of service
V/C = *volume-to-capacity ratio*
Bolded entries identify location *experience LOS E or F in one or both peak hours.*

FEBRUARY 2018

Figure 1 Monterey Corridor Affected Freeway Segments

3 INTERSECTION OPERATIONS

The operation of intersections is based on various intersection characteristics such as traffic volumes, lane geometry, and signal phasing, which are used to estimate the average control delay experienced by motorists traveling through an intersection. Intersection levels-of-service (LOS) operations were evaluated. Intersections of roadways classified as a collector or above that would be physically modified by the project or would serve 50 or more project trips in either the AM or PM peak hour were analyzed. Analysts evaluated traffic conditions at intersections using the method from Chapter 19 of the *Highway Capacity Manual* (Transportation Research Board 2010). The detailed methodology is presented in Section 3.2.4.3 of the San Jose to Merced Project Section Environmental Impact Report/Environmental Impact Statement.

An effect on signalized intersections was deemed to occur if the Plus Project condition would result in a LOS E or F and an increase in average traffic delay of 4 seconds or more over the No Project condition. An effect on unsignalized intersections was deemed to occur if the Plus Project condition would have a LOS E or F and the project would result in an increase in traffic delay of 5 seconds or more (measured as average delay for all-way stop or worst-movement delay for side-street stop intersection), and if the intersection satisfies one or more traffic signal warrants[1] for at least 1 hour of the day. Five seconds of delay is the increase for unsignalized intersections (rather than the 4 seconds used for signalized intersections) because it only applies to a single movement rather than for the entire intersection, as is the case for signalized intersections.

Intersection operations were studied under the following conditions:

- Existing Conditions
- During construction on Monterey Road (effects due to construction of the narrowing of Monterey Road)
- Existing Plus Project Conditions (effects from permanent road closures and relocations)
- 2029 No Project Conditions
- 2029 Plus Project conditions (effects from permanent road closures and relocations, and Project operations)
- 2040 No Project Conditions
- 2040 Plus Project conditions (effects from permanent road closures and relocations, and Project operations)

[1] Traffic signal warrants define minimum conditions under which signal installation may be justified.

Table 7 Existing Level of Service at Intersections in San Jose Diridon Station Approach Subsection

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
D1	The Alameda (SR 82)/I-880 NB Ramps	SJ/CT/CMP	Signal	AM PM	22.0 19.1	C B
D2	The Alameda (SR 82)/I-880 SB Ramps	SJ/CT/CMP	Signal	AM PM	18.4 13.9	B B
D3	The Alameda (SR 82)/Hedding Street	SJ/CT/CMP	Signal	AM PM	41.1 42.0	D D
D4	The Alameda (SR 82)/Taylor Street-Naglee Avenue	SJ/CT/CMP	Signal	AM PM	44.4 46.0	D D
D5	The Alameda (SR 82)/Martin Avenue Race Street	SJ/CT/CMP	Signal	AM PM	41.1 31.6	D C
D6	Stockton Avenue/Julian Street	SJ	Signal	AM PM	38.4 37.0	D D
D7	Montgomery Street/Julian Street	SJ	Signal	AM PM	13.5 12.7	B B
D8	Autumn Street/Julian Street	SJ	Signal	AM PM	13.1 13.5	B B
D9	SR 87 SB Ramps-Almaden Boulevard/Julian Street	SJ/CT/CMP	Signal	AM PM	23.6 18.4	C B
D10	SR 87 NB Ramps/Julian Street	SJ/CT/CMP	Signal	AM PM	50.9 51.4	D D
D11	Sunol Avenue/The Alameda (SR 82)	SJ/CT	Signal	AM PM	21.7 23.7	C C
D12	Stockton Avenue/The Alameda-West Santa Clara Street (SR 82)	SJ/CT	Signal	AM PM	19.6 21.0	B C
D13	Cahill Street/West Santa Clara Street (SR 82)	SJ/CT	Signal	AM PM	12.7 17.1	B B
D14	Montgomery Street (SR 82)/West Santa Clara Street (SR 82)	SJ/CT/CMP	Signal	AM PM	4.2 8.3	A A
D15	Autumn Street (SR 82)/West Santa Clara Street (SR 82)	SJ/CT/CMP	Signal	AM PM	27 20.2	C C
D16	SR 87 NB off-ramp/West Santa Clara Street	SJ/CT/CMP	Signal	AM PM	21.5 11.8	C B
D17	Almaden Boulevard/West Santa Clara Street	SJ	Signal	AM PM	18.0 16.1	B B
D18	Notre Dame Avenue-Almaden Boulevard/West Santa Clara Street	SJ	Signal	AM PM	21.2 16.7	C B
D19	Sunol Avenue/Park Avenue	SJ	Signal	AM PM	9.3 11.9	A B
D20	Sunol Avenue/West San Carlos Street	SJ	Signal	AM PM	13.4 14	B B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
D21	Cahill Street/Stover Street-Crandall Street	SJ	AWSC	AM PM	14.5 15.8	B C
D22	Montgomery Street (SR 82)/Stover Street-Crandall Street	SJ/CT	SSSC	AM PM	5.7 (EB) 6.7 (EB)	A A
D23	Cahill Street/West San Fernando Street	SJ	AWSC	AM PM	11.9 11.9	B B
D24	Montgomery Street (SR 82)/West San Fernando Street	SJ/CT	Signal	AM PM	12.3 11.0	B B
D25	Autumn Street (SR 82)/West San Fernando Street	SJ/CT	Signal	AM PM	11.4 14.0	B B
D26	Almaden Boulevard/West San Fernando Street	SJ	Signal	AM PM	37.9 44.5	D D
D27	Montgomery Street (SR 82)/Park Avenue	SJ/CT	Signal	AM PM	20.2 33.6	C C
D28	Delmas Avenue/Park Avenue	SJ	Signal	AM PM	21.7 34.3	C C
D29	Woz Way-SR 87 NB on-ramp/Park Avenue	SJ/CT	Signal	AM PM	10.6 16.0	B B
D30	Almaden Boulevard/Park Avenue	SJ	Signal	AM PM	29.1 35.4	C D
D31	Montgomery Street-Bird Avenue (SR 82)/West San Carlos Street (SR 82)	SJ/CT/CMP	Signal	AM PM	27.8 49.8	C D
D32	Delmas Avenue/West San Carlos Street (SR 82)	SJ/CT	Signal	AM PM	14.6 19.4	B B
D33	Bird Avenue/Auzerais Avenue	SJ	Signal	AM PM	18.8 39.4	B D
D34	Delmas Avenue/Auzerais Avenue	SJ	Signal	AM PM	18.7 22.4	B C
D35	Bird Avenue/I-280 NB ramps	SJ/CT/CMP	Signal	AM PM	53.8 38.3	D D
D36	Bird Avenue/I-280 SB ramps	SJ/CT/CMP	Signal	AM PM	33.5 27.5	C C
D37	Bird Avenue/West Virginia Street	SJ	Signal	AM PM	27.6 26.9	C C
D38	The Alameda (SR 82)/Julian Street	SJ/CT	Signal	AM PM	20.9 25.0	C C
D39	Coleman Avenue/I-880 SB ramps	SJ/CT/CMP	Signal	AM PM	22.9 10.6	C B
D40	Coleman Avenue/I-880 NB ramps	SJ/CT/CMP	Signal	AM PM	37.5 25.5	D C
D41	Coleman Avenue/Hedding Street	SJ	Signal	AM PM	40.9 39.9	D D

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
D42	Coleman Avenue/Taylor Street	SJ	Signal	AM PM	46.8 47.0	D D
D43	Delmas Avenue/West Santa Clara Street	SJ	Future Signal	AM PM	18.7 (NB) 21.6 (NB)	C C
D44	Delmas Avenue/West San Fernando Street	SJ	Signal	AM PM	15.9 26.6	B C
D45	Cahill Street/Park Avenue	SJ	Future Signal	AM PM	--- ---	--- ---
D46	Sunol Avenue/West San Fernando Street	SJ	AWSC	AM PM	8.5 8.7	A A
D47	87 ramps/Taylor Street	SJ/CT/CMP	Signal	AM PM	29.7 35.8	C D
D48	Sunol Street/Auzerais Avenue	SJ	Signal	AM PM	13.1 26.1	B C
D49	Harrison Street/West Virginia Street	SJ	SSSC	AM PM	5.3 (EB) 6.5 (SB)	A A
D50	Bird Avenue/Fuller Avenue	SJ	SSSC	AM PM	7.9 (WB) 8.4 (EB)	A A

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
I- = Interstate
NB = northbound
SB = southbound
EB = eastbound
SJ = City of San Jose
CT= California Department of Transportation
CMP = Congestion Management Plan
SSSC = side street stop controlled
AWSC = all-way stop controlled
--- = Intersection does not exist

Table 8 Existing Level of Service at Intersections in Monterey Corridor Subsection

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
M1	Monterey Road/Capitol Expressway WB Ramps	SJ/CT/SCCo/CMP	Signal	AM PM	15.1 18.0	B B
M2	Monterey Road/Capitol Expressway EB Ramps	SJ/CT/SCCo/CMP	Signal	AM PM	20.5 14.6	C B
M3	Monterey Road/Senter Road	SJ/CT/CMP	Signal	AM PM	48.5 39.0	D D
M4*	**Monterey Road /Skyway Drive***	**SJ/CT/CMP***	**Signal***	**AM*** PM	**80.4*** 40.1	**F*** D
M5	Houndshaven Way/Skyway Drive	SJ	SSSC	AM PM	14.8 (WB) 7.6 (SB)	B A
M6*	**Monterey Road/Branham Lane***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**59.5*** **58.7***	**E*** **E***
M7	Houndshaven Way/Branham Lane	SJ	SSSC	AM PM	17.6 (WB) 7.6 (SB)	B A
M8*	**Monterey Road/Bougainvillea Drive***	**SJ/CT***	**SSSC***	**AM*** **PM***	**>180 (WB)*** **44 (WB)***	**F*** **E***
M9*	**Monterey Road/Chynoweth Avenue-Roeder Road***	**SJ/CT***	**Signal***	AM **PM***	54.2 **95.7***	D **F***
M10	Roeder Road/Azucar Avenue-Vera Lane	SJ	AWSC	AM PM	25.4 11.6	D B
M11	Monterey Road/Blossom Hill Road WB Ramps	SJ/CT/CMP	Signal	AM PM	37.9 23.8	D C
M12*	**Monterey Road/Blossom Hill Road EB Ramps ***	**SJ/CT/CMP***	**Signal***	**AM*** PM	**69.6*** 33.9	**E*** C
M13	Monterey Road/Ford Road	SJ	Signal	AM PM	26.2 20.8	C C
M14	Monterey Road/Flintwell Way	SJ	Signal	AM PM	11.4 8.8	B A
M15	Monterey Road/Bernal Road SB ramps	SJ/CMP	Signal	AM PM	12.6 17.0	B B
M16	Monterey Road/Bernal Road NB ramps	SJ/CMP	Signal	AM PM	6.6 4.5	A A
M17	Santa Teresa Boulevard/Bernal Road	SJ/CMP	Signal	AM PM	34.6 53.0	C D
M18	Santa Teresa Boulevard/Bailey Avenue	SJ/SCCo	Signal	AM PM	24.2 49.4	C D
M22	Monterey Road/Edenview Drive	SJ	Signal	AM PM	25.2 23.9	C C
M23	US 101 SB Ramps/Blossom Hill Road	SJ/CT/CMP	Signal	AM PM	15.5 22.5	B C

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
M24*	**US 101 NB Ramps/Blossom Hill Road***	**SJ/CT/CMP***	**Signal***	AM **PM***	19.2 **113.3***	B **F***
M25	Bernal Road Overpass/Monterey Road ramp	SJ/CMP	Signal	AM PM	9.9 7.6	A A
M26*	**Snell Avenue/Capitol Expressway***	**SJ/SCCo***	**Signal***	**AM*** PM	**58.7*** 39.7	**E*** D
M27*	**Vistapark Drive/Capitol Expressway***	**SJ/SCCo***	**Signal***	**AM*** **PM***	**79.2*** **97.2***	**E*** **F***
M28*	**Senter Road/Capitol Expressway***	**SJ/SCCo***	**Signal***	**AM*** **PM***	**74.8*** **61.5***	**E*** **E***
M29	Senter Road/Sylvandale Avenue	SJ	Signal	AM PM	18.9 14.0	B B
M30	Senter Road/Hellyer Avenue	SJ	Signal	AM PM	24.6 22.7	C C
M31*	**Silver Creek Valley Road/Yerba Buena Road***	**SJ***	**Signal***	**AM*** PM	**58.5*** 35.2	**E*** D
M32	Vistapark Drive/Branham Lane	SJ	Signal	AM PM	30.0 33.1	C C
M33	Snell Avenue/Branham Lane	SJ	Signal	AM PM	40.3 46.7	D D
M34	Snell Avenue/Chynoweth Avenue	SJ	Signal	AM PM	33.3 41.9	C D
M35	Lean Avenue/Chynoweth Avenue	SJ	Signal	AM PM	18.9 20.6	B C
M36	Snell Avenue/Blossom Hill Road	SJ	Signal	AM PM	48.0 53.9	D D
M37	Lean Avenue/Blossom Hill Road	SJ	Signal	AM PM	45.1 45.3	D D
M38	Benswick Drive/Blossom Hill Road	SJ	Signal	AM PM	38.1 20.8	D C
M39	Poughkeepsie Road/Blossom Hill Road	SJ	Signal	AM PM	21.5 24.8	C C
M40	Cottle Road/Poughkeepsie Road	SJ	Signal	AM PM	28.0 47.1	C D
M41	Cottle Road/Santa Teresa Boulevard	SJ	Signal	AM PM	41.5 41.8	D D
M42	Lean Avenue/Santa Teresa Boulevard	SJ	Signal	AM PM	25.9 21.6	C C
M43	Silver Creek Valley Road/Hellyer Avenue	SJ	Signal	AM PM	31.1 30.5	C C
M44	Silicon Valley Boulevard/Hellyer Avenue	SJ	Signal	AM PM	19.1 19.2	B B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
M45	Monterey Road/Fehren Drive	SJ	Signal	AM PM	11.2 12.8	B B
M46	Monterey Road/Tilton Avenue	SCCo	Signal	AM PM	12.9 37.4	B D
M47	Monterey Road/Madrone Parkway	SCCo	Signal	AM PM	10.8 8.9	B A
M48	Park Sommers Way/Skyway Drive	SJ	SSSC	AM PM	9.2 (SB) 7.9 (SB)	A A
M49	Park Paxton Place/Skyway Drive	SJ	SSSC	AM PM	9.9 (NB) 9.7 (NB)	A A
M50*	**Saddlebrook Drive/Branham Lane***	**SJ***	**SSSC***	AM **PM***	12.9 (SB) **147.3 (NB)***	B **F***
M51	Shenado Place/Chynoweth Avenue	SJ	SSSC	AM PM	8.7 (SB) 8.6 (SB)	A A

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
LOS = level of service
SR = State Route
I- = Interstate
NB = northbound
SB = southbound
EB = eastbound
WB = westbound
SCCo = Santa Clara County
SJ = City of San Jose
CT= California Department of Transportation
CMP = Congestion Management Plan

Table 9 Existing Level of Service at Intersections in Morgan Hill and Gilroy Subsection

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
M19	**Hale Avenue/Tilton Avenue**	**MH/SCCo**	**AWSC**	AM **PM**	15.0 **51.5**	B **F**
M20	Hale Avenue/Llagas Road	MH/SCCo	Signal	AM PM	13.7 14.8	B B
M21	Monterey Road/Old Monterey Road	MH	Signal	AM PM	9.5 19.2	A B
M46	Monterey Road/Tilton Avenue	SCCo	Signal	AM PM	12.9 37.4	B D
M47	Monterey Road/Madrone Parkway	SCCo	Signal	AM PM	10.8 8.9	B A
M52	Monterey Road/Blanchard Road	SCCo	Signal	AM PM	2.5 2.5	A A
M53	Monterey Road/Palm Avenue	SCCo	Signal	AM PM	4.5 2.8	A A
M54	Dougherty Avenue /Tilton Avenue	SCCo	AWSC	AM PM	3.1 16.0	A C
M55	Monterey Road/Burnett Avenue	SCCo	Signal	AM PM	21.5 10.8	C B
MH1	Monterey Road/East Dunne Avenue	MH/CT	Signal	AM PM	33.1 30.3	C C
MH2	Railroad Avenue/Tennant Avenue	MH	SSSC	AM PM	12.4 (SB) 12.5 (NB)	B B
MH3	Farmers Market Driveway 1/Tennant Avenue	MH	SSSC	AM PM	11.0 (NB) 12.5 (NB)	B B
MH4	Farmers Market Driveway 2/Tennant Avenue	MH	SSSC	AM PM	11.1 (NB) 13.1 (NB)	B B
MH5	Farmers Market Driveway 3/Tennant Avenue	MH	SSSC	AM PM	11.3 (NB) 12.9 (NB)	B B
MH6	Monterey Road/San Martin Avenue	SCCo/CT	Signal	AM PM	18.3 16.9	B B
MH7	Depot Road/San Martin Avenue	SCCo/CT	SSSC	AM PM	18.0 (NB) 15.5 (NB)	C C
MH8	Llagas Road/San Martin Avenue	SCCo/CT	AWSC	AM PM	13.4 13.1	B B
MH9	Colony Avenue/San Martin Avenue	SCCo/CT	SSSC	AM PM	9.9 (SB) 10.0 (SB)	A B
MH10	Monterey Road/E Main Avenue	MH	Signal	AM PM	40.6 42.3	D D
MH11	Depot Street/E Main Avenue	MH	SSSC	AM PM	32.4 (SB) 25.8 (NB)	D D

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
MH12	Butterfield Boulevard/E Main Avenue	MH	Signal	AM PM	33.9 37.3	C D
MH13	Church Street/East Dunne Avenue	MH	SSSC	AM PM	8.3 11.2	A B
MH14	Depot Street/East Dunne Avenue	MH	Signal	AM PM	10.4 (SB) (SB)	B B
MH15	Butterfield Boulevard/East Dunne Avenue	MH	SSSC	AM PM	39.5 36.3	D D
MH16	Monterey Road/San Pedro Avenue	MH	AWSC	AM PM	14.4 (WB) 13.5 (WB)	B B
MH17	Church Street/San Pedro Avenue	MH	SSSC	AM PM	12.7 12.6	B B
MH18	Railroad Avenue /San Pedro Avenue	MH	Signal	AM PM	12.9 (NB) 11.2 (NB)	B B
MH19	Butterfield Boulevard/San Pedro Avenue	MH	Signal	AM PM	22.3 19.2	C B
MH20	Vineyard Boulevard/Tennant Avenue	MH	SSSC	AM PM	11.0 18.7	B B
MH21	Butterfield Boulevard/Tennant Avenue	MH	Signal	AM PM	32.9 36.3	C D
MH22	Monterey Road/E Middle Avenue	SCCo	SSSC	AM PM	10.8 (WB) 8.3 (WB)	B A
MH23	Crowner Avenue/E Middle Avenue	SCCo	SSSC	AM PM	7.7 (NB) 7.7 (NB)	A A
MH24	Seymour Avenue/E Middle Avenue	SCCo	SSSC	AM PM	10.6 (SB) 5.8 (SB)	A A
MH25	Sewell Avenue/W San Martin Avenue	SCCo	SSSC	AM PM	7.0 (NB) 6.6 (NB)	A A
MH26	**Monterey Road/Masten Avenue**	**SCCo**	**Signal**	AM PM	46.8 **55.8**	D **E**
MH27	Manna Way/Masten Avenue	SCCo	SSSC	AM PM	10.2 (SB) 13.6 (SB)	B B
G1	Monterey Road/Buena Vista Avenue	SCCo	Signal	AM PM	3.4 1.3	A A
G2	US 101 SB ramps/Buena Vista Avenue	G/SCCo/CT	Signal	AM PM	--- ---	--- ---
G3	No Name Uno/Buena Vista Avenue	SCCo	Signal	AM PM	8.1 8.6	A A
G4	Camino Arroyo (Ext.)/Buena Vista Avenue	G/SCCo	SSSC	AM PM	--- ---	--- ---
G5	Marcella Avenue/Buena Vista Avenue	SCCo	SSSC	AM PM	1.7 2.3	A A

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
G6	No Name Uno/Cohansey Avenue	SCCo	SSSC	AM PM	0.3 0.2	A A
G7	Camino Arroyo (Ext.)/Cohansey Avenue	G/SCCo	SSSC	AM PM	--- ---	--- ---
G8	San Ysidro Avenue/No Name Uno-Las Animas Avenue	SCCo	SSSC	AM PM	6.5 4.5	A A
G9	Camino Arroyo (Ext.)/Las Animas Avenue	G/SCCo	SSSC	AM PM	--- ---	--- ---
G10	Santa Teresa Boulevard/First Street (SR 152)	G/CT/SCCo	Signal	AM PM	31.1 28.0	C C
G11	Wren Avenue/First Street (SR 152)	G/CT	Signal	AM PM	31.9 30.0	C C
G12	Church Street/First Street (SR 152)	G/CT	Signal	AM PM	20.6 20.2	C C
G13	Monterey Road (SR 152)/First Street (SR 152)	G/CT	Signal	AM PM	23.6 23.9	C C
G14	Church Street/Welburn Avenue	G/SCCo/CT	Signal	AM PM	19.4 18.9	B B
G15	Monterey Road (SR 152)/Welburn Avenue-Leavesley Road (SR 152)	G	Signal	AM PM	26.8 25.7	C C
G16	Forest Street/Leavesley Road (SR 152)	G/CT/CMP	Signal	AM PM	10.4 15.4	B B
G17	Murray Avenue/Leavesley Road (SR 152)	G/CT	Signal	AM PM	26.2 43.7	C D
G18	US 101 SB ramps/Leavesley Road (SR 152)	G/CT	Signal	AM PM	12.2 25.2	B C
G19	US 101 NB ramps-San Ysidro Avenue/Leavesley Road (SR 152)	G/CT	Signal	AM PM	13.0 19.7	B B
G20	Arroyo Circle/Leavesley Road	G/CT	Signal	AM PM	7.9 17.9	A B
G21	Camino Arroyo (Ext.)/Leavesley Road	G/SCCo	SSSC	AM PM	--- ---	--- ---
G22	Cameron Boulevard (Ext.)/Leavesley Road	G/SCCo	SSSC	AM PM	--- ---	--- ---
G23	Marcella Avenue/Leavesley Road	G/SCCo	SSSC	AM PM	12.5 (SB) 10.6 (SB)	B B
G24	New Avenue/Leavesley Road	G/SCCo	SSSC	AM PM	14.7 (SB) 19.9 (SB)	B B
G25*	**Monterey Road/IOOF Avenue***	**G/SCCo***	**SSSC***	**AM*** PM	**>180.0 (WB)*** 23.3 (WB)	**F*** C
G26	Cameron Boulevard (Ext.)/IOOF Avenue (Ext.)	G	SSSC/ Signal	AM PM	--- ---	--- ---
G27	Monterey Road/Third Street	G/SCCo	Signal	AM PM	9.8 11.2	A B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
G28	Monterey Road/Fifth Street	G	Signal	AM PM	7.4 8.1	A A
G29	Monterey Road/Sixth Street	G	Signal	AM PM	13.6 14.6	B B
G30	Railroad Street/Sixth Street	G	SSSC	AM PM	17.4 (NB) 15.3 (SB)	C C
G31	Camino Arroyo/Sixth Street-Gilman Road	G	Signal	AM PM	15.7 22.6	B C
G32	Cameron Boulevard (Ext.)/Gilman Road	G/SCCo	TBD	AM PM	--- ---	--- ---
G33	Monterey Road/Seventh Street	G/SCCo	Signal	AM PM	10.0 11.3	B B
G34	Alexander Street/Old Gilroy Street	G	AWSC	AM PM	9.1 8.6	A A
G35	Monterey Road/Eighth Street	G	Signal	AM PM	7.9 8.8	A A
G36	Monterey Road/10th Street	G	Signal	AM PM	19.4 24.5	B C
G37	Alexander Street/10th Street	G	Signal	AM PM	8.5 14.9	A B
G38	Chestnut Street/10th Street	G	Signal	AM PM	28.7 46.5	C D
G39	US 101 SB ramps/10th Street (SR 152)	G	Signal	AM PM	9.2 24.5	A C
G40	US 101 NB Ramps/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	7.9 12.9	A B
G41	Camino Arroyo/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	19.1 40.6	B D
G42	Cameron Boulevard/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	2.6 4.1	A A
G43	Monterey Road/Luchessa Avenue	G/CT	Signal	AM PM	40.1 48.8	D D
G44	Monterey Road/US 101 SB ramps	G/CT	Signal	AM PM	7.3 10.1	A B
G45	Monterey Road-Bolsa Road/US 101 NB ramps-Travel Park Circle	G/CT	Signal	AM PM	30.1 17.3	C B
G46	Monterey Road/Las Animas Avenue	G/CT	Signal	AM PM	15.2 12.3	B B
G47	Monterey Road/Cohansey Avenue	G/CT	SSSC	AM PM	23.8 (WB) 17.4 (WB)	C C
G48	Monterey Road/Farrell Road	G/CT	Signal	AM PM	13.0 9.1	B A
G49	Monterey Road/Lewis Street	G/CT	Signal	AM PM	11.5 9.7	B A

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
G50	Monterey Road/Ninth Street	G/CT	SSSC/ Signal (Alts 1, 2 & 4)	AM PM	5.3 (WB) 3.8 (WB)	A A
G51	Alexander Street/Ninth Street	G	SSSC	AM PM	4.7 (WB) 5.1 (WB)	A A
G52	Radtke Avenue/Buena Vista Avenue	G	SSSC	AM PM	5.7 (SB) 4.9 (SB)	A A
G53	School Access/IOOF Avenue	G	AWSC	AM PM	14.1 9.4	B A
G54	Frontage Road/Lewis Street	G	SSSC	AM PM	6.7 (SB) 12.2 (SB)	A B
G55	Railroad Street/Lewis Street	G	SSSC	AM PM	6.5 (NB) 7.2 (NB)	A A
G56	Frontage Road/Martin Avenue	G	SSSC	AM PM	8.8 (SB) 9.9 (SB)	A A
G57	Railroad Street/Martin Avenue	G	SSSC	AM PM	7.0 (SB) 7.3 (SB)	A A
G58	Alexander Street/Sixth Street	G	AWSC	AM PM	15.5 14.0	B B
G59	Railroad Street/Seventh Street	G	SSSC	AM PM	7.5 (SB) 7.5 (SB)	A A
G60	Chestnut Street/Luchessa Street	G	SSSC	AM PM	9.5 (SB) 9.9 (SB)	A A
GM1*	**Frazier Lake Road/Pacheco Pass Highway (SR 152)***	**G/SCCo/CT***	**SSSC***	**AM* PM***	**81.5* 122.1***	**F* F***
GM2	Frazier Lake Road/East Gilroy MOWF Driveway	G/SCCo/CT	TBD	AM PM	--- ---	--- ---
GM3	Bloomfield Road/South Gilroy MOWF Driveway	G/SCCo/CT	TBD	AM PM	--- ---	--- ---
GM4	SR 25/Bloomfield Avenue	G/SCCo/CT	SSSC	AM PM	31.9 31.0	D D
GM5	Bolsa Road/Bloomfield Avenue	G/SCCo/CT	SSSC	AM PM	6.5 (11.5) 5.2 (15.8)	A(B) A(C)

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.

LOS = level of service
SR = State Route
I- = Interstate
NB = northbound
SB = southbound
WB = westbound
CT= California Department of Transportation
CMP = Congestion Management Plan
MH = City of Morgan Hill
G = Gilroy
SCCo = Santa Clara County
Ext. = Extension
SSSC = side street stop controlled
AWSC = all-way stop controlled
Alts = alternatives
TBD = to be determined
MOWF = maintenance of way facility
facility
--- = Intersection does not exist

Table 10 Existing Level of Service at Intersection in San Joaquin Valley Subsection

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
S1	Mercey Springs Road (SR 165)/Henry Miller Avenue	LB/MCo/CT	AWSC	AM PM	10.8 12.4	B B

Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
LOS = level of service
SR = State Route
CT= California Department of Transportation
LB = City of Los Banos
MCo = Merced County
AWSC = all-way stop controlled

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Table 11 Construction Level of Service under Temporary Roadway Narrowing at Intersections in Monterey Corridor Subsection

Intersection		Peak Hour	Existing		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
Monterey Corridor Subsection												
M1	**Monterey Road/Capitol Expressway WB ramps***	**AM***	15.1	B	**80.5****	**F****	**80.5****	**F****	**80.5****	**F****	15.1	B
		PM*	18.0	B	**133.8****	**F****	**133.8****	**F****	**133.8****	**F****	18.0	B
M2	Monterey Road/Capitol Expressway EB ramps	AM	20.5	C	48.6	D	48.6	D	48.6	D	20.5	C
		PM	14.6	B	43.1	D	43.1	D	43.1	D	14.6	B
M3*	**Monterey Road/Senter Road***	**AM***	48.5	D	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	48.5	D
		PM*	39.0	D	**57.8****	**E****	**57.8****	**E****	**57.8****	**E****	39.0	D
M4*	**Monterey Road/Skyway Drive***	**AM***	**80.4***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**80.4***	**F***
		PM*	40.1	D	**154.5****	**F****	**154.5****	**F****	**154.5****	**F****	40.1	D
M5*	**Houndshaven Way/Skyway Drive***	**AM***	14.8 (WB)	B	**45.7 (WB)***	**E***	**45.7 (WB)***	**E***	**45.7 (WB)***	**E***	14.8 (WB)	B
		PM	7.6 (SB)	A	8.3 (SB)	A	8.3 (SB)	A	8.3 (SB)	A	7.6 (SB)	A
M6*	**Monterey Road/Branham Lane***	**AM***	**59.5***	**E***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**59.5***	**E***
		PM	**58.7***	**E***	53.4	D	53.4	D	53.4	D	**58.7***	**E***
M7*	**Houndshaven Way/Branham Lane***	**AM***	17.6 (WB)	B	**>180.0 (WB)****	**F****	**>180.0 (WB)****	**F****	**>180.0 (WB)****	**F****	17.6 (WB)	B
		PM	7.6 (SB)	A	11.7 (SB)	B	11.7 (SB)	B	11.7 (SB)	B	7.6 (SB)	A
M8	**Monterey Road/Bougainvillea Drive***	**AM***	**>180.0 (WB)***	**F***	**37.7 (WB)***	**E***	**37.7 (WB)***	**E***	**37.7 (WB)***	**E***	**>180.0 (WB)***	**F***
		PM*	**44.0 (WB)***	**E***	22.9 (WB)	C	22.9 (WB)	C	22.9 (WB)	C	**44.0 (WB)***	**E***
M9*	**Monterey Road/Chynoweth Avenue-Roeder Road***	**AM***	54.2	D	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	54.2	D
		PM*	**95.7***	**F***	**108.5****	**F****	**108.5****	**F****	**108.5****	**F****	**95.7***	**F***
M10*	**Roeder Road/Azucar Avenue-Vera Lane***	**AM***	25.4	D	**45.8****	**E****	**45.8****	**E****	**45.8****	**E****	25.4	D
		PM	11.6	B	32.9	D	32.9	D	32.9	D	11.6	B
M11*	**Monterey Road/Blossom Hill Road WB Ramps (SR 82/CR G10)***	**AM***	37.9	D	**162.6****	**F****	**162.6****	**F****	**162.6****	**F****	37.9	D
		PM	23.8	C	36.4	D	36.4	D	36.4	D	23.8	C
M12*	**Monterey Road/Blossom Hill Road EB Ramps (SR 82/CR G10)***	**AM***	**69.6***	**E***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**69.6***	**E***
		PM*	33.9	C	**60.7****	**E****	**60.7****	**E****	**60.7****	**E****	33.9	C
M13*	**Monterey Road/Ford Road***	**AM***	26.2	C	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	26.2	C
		PM	20.8	C	23.5	C	23.5	C	23.5	C	20.8	C
M14*	**Monterey Road/Flintwell Way***	**AM***	11.4	B	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	11.4	B
		PM	8.8	A	18.2	B	18.2	B	18.2	B	8.8	A
M15	Monterey Road/Bernal Road SB ramps	AM	12.6	B	11.6	B	11.6	B	11.6	B	12.6	B
		PM	17.0	B	16.6	B	16.6	B	16.6	B	17.0	B
M16	Monterey Road/Bernal Road NB ramps	AM	6.6	A	6.5	A	6.5	A	6.5	A	6.6	A
		PM	4.5	A	4.6	A	4.6	A	4.6	A	4.5	A
M17*	**Santa Teresa Boulevard/Bernal Road***	AM	34.6	C	32.8	C	32.8	C	32.8	C	34.6	C
		PM*	53.0	D	**86.9****	**F****	**86.9****	**F****	**86.9****	**F****	53.0	D

Intersection		Peak Hour	Existing		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M18*	**Santa Teresa Boulevard/Bailey Avenue***	AM	24.2	C	26.9	C	26.9	C	26.9	C	24.2	C
		PM*	49.4	D	**155.9****	**F****	**155.9****	**F****	**155.9****	**F****	49.4	D
M22*	**Monterey Road/Edenview Drive***	AM	25.2	C	25.9	C	25.9	C	25.9	C	25.2	C
		PM*	23.9	C	**79.2****	**E****	**79.2****	**E****	**79.2****	**E****	23.9	C
M23*	**US 101 SB ramps/Blossom Hill Road***	**AM***	15.5	B	**116.5****	**F****	**116.5****	**F****	**116.5****	**F****	15.5	B
		PM*	22.5	C	**83.3****	**F****	**83.3****	**F****	**83.3****	**F****	22.5	C
M24*	**US 101 NB ramps/Blossom Hill Road***	AM	19.2	B	42.5	D	42.5	D	42.5	D	19.2	B
		PM*	**113.3***	**F***	**151.3****	**F****	**151.3****	**F****	**151.3****	**F****	**113.3***	**F***
M25	Bernal Road overpass/Monterey Road ramp	AM	9.9	A	5.4	A	5.4	A	5.4	A	9.9	A
		PM	7.6	A	4.8	A	4.8	A	4.8	A	7.6	A
M26*	**Snell Avenue/Capitol Expressway***	**AM***	**58.7***	**E***	**56.0***	**E***	**56.0***	**E***	**56.0***	**E***	**58.7***	**E***
		PM	39.7	D	33.1	C	33.1	C	33.1	C	39.7	D
M27*	**Vistapark Drive/Capitol Expressway***	**AM***	**79.2***	**E***	**78.3***	**E***	**78.3***	**E***	**78.3***	**E***	**79.2***	**E***
		PM*	**97.2***	**F***	**119.8****	**F****	**119.8****	**F****	**119.8****	**F****	**97.2***	**F***
M28*	**Senter Road/Capitol Expressway***	**AM***	**74.8***	**E***	**85.7***	**F****	**85.7****	**F****	**85.7****	**F****	**74.8***	**E***
		PM*	**61.5***	**E***	**61.0***	**E***	**61.0***	**E***	**61.0***	**E***	**61.5***	**E***
M29	Senter Road/Sylvandale Avenue	AM	18.9	B	20.3	C	20.3	C	20.3	C	18.9	B
		PM	14.0	B	15.1	B	15.1	B	15.1	B	14.0	B
M30	Senter Road/Hellyer Avenue	AM	24.6	C	38.2	D	38.2	D	38.2	D	24.6	C
		PM	22.7	C	31.8	B	31.8	B	31.8	B	22.7	C
M31*	**Silver Creek Valley Road/Yerba Buena Road***	**AM***	**58.5***	**E***	**63.1****	**E****	**63.1****	**E****	**63.1****	**E****	**58.5***	**E***
		PM	35.2	D	34.4	C	34.4	C	34.4	C	35.2	D
M32	Vistapark Drive/Branham Lane	AM	30.0	C	31.8	C	31.8	C	31.8	C	30.0	C
		PM	33.1	C	31.0	C	31.0	C	31.0	C	33.1	C
M33	Snell Avenue/Branham Lane	AM	40.3	D	43.1	D	43.1	D	43.1	D	40.3	D
		PM	46.7	D	50.6	D	50.6	D	50.6	D	46.7	D
M34*	**Snell Avenue/Chynoweth Avenue***	**AM***	33.3	C	**70.2****	**E****	**70.2****	**E****	**70.2****	**E****	33.3	C
		PM*	41.9	D	**64.6****	**E****	**64.6****	**E****	**64.6****	**E****	41.9	D
M35	Lean Avenue/Chynoweth Avenue	AM	18.9	B	31.6	C	31.6	C	31.6	C	18.9	B
		PM	20.6	C	21.1	C	21.1	C	21.1	C	20.6	C
M36*	**Snell Avenue/Blossom Hill Road***	AM	48.0	D	47.9	D	47.9	D	47.9	D	48.0	D
		PM*	53.9	D	55.3	**E***	55.3	**E***	55.3	E	53.9	D
M37*	**Lean Avenue/Blossom Hill Road***	AM	45.1	D	47.4	D	47.4	D	47.4	D	45.1	D
		PM*	45.3	D	**59.4****	**E****	**59.4****	**E****	**59.4****	**E****	45.3	D
M38	Benswick Drive/Blossom Hill Road	AM	38.1	D	34.0	C	34.0	C	34.0	C	38.1	D
		PM	20.8	C	19.3	B	19.3	B	19.3	B	20.8	C

Intersection		Peak Hour	Existing		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M39	Poughkeepsie Road/Blossom Hill Road	AM	21.5	C	20.3	C	20.3	C	20.3	C	21.5	C
		PM	24.8	C	26.5	C	26.5	C	26.5	C	24.8	C
M40*	**Cottle Road/Poughkeepsie Road***	AM	28.0	C	32.3	C	32.3	C	32.3	C	28.0	C
		PM*	47.1	D	**63.7****	**E****	**63.7****	**E****	**63.7****	**E****	47.1	D
M41	Cottle Road/Santa Teresa Boulevard	AM	41.5	D	42.4	D	42.4	D	42.4	D	41.5	D
		PM	41.8	D	42.5	D	42.5	D	42.5	D	41.8	D
M42	Lean Avenue/Santa Teresa Boulevard	AM	25.9	C	29.9	C	29.9	C	29.9	C	25.9	C
		PM	21.6	C	24.4	C	24.4	C	24.4	C	21.6	C
M43	Silver Creek Valley Road/Hellyer Avenue	AM	31.1	C	35.9	D	35.9	D	35.9	D	31.1	C
		PM	30.5	C	33.2	C	33.2	C	33.2	C	30.5	C
M44	Silicon Valley Boulevard/Hellyer Avenue	AM	19.1	B	21.2	C	21.2	C	21.2	C	19.1	B
		PM	19.2	B	18.3	B	18.3	B	18.3	B	19.2	B
M45*	**Monterey Road/Fehren Drive***	AM	11.2	B	21.5	C	21.5	C	21.5	C	11.2	B
		PM*	12.8	B	**137.0****	**F****	**137.0****	**F****	**137.0****	**F****	12.8	B
M48	Park Sommers Way/Skyway Drive	AM	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A
		PM	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A
M49	Park Paxton Place/Skyway Drive	AM	9.9 (NB)	A	9.9 (NB)	A	9.9 (NB)	A	9.9 (NB)	A	9.9 (NB)	A
		PM	9.7 (NB)	A	9.7 (NB)	A	9.7 (NB)	A	9.7 (NB)	A	9.7 (NB)	A
M50*	**Saddlebrook Drive/Branham Lane***	AM	12.9 (SB)	B	12.9 (SB)	B	12.9 (SB)	B	12.9 (SB)	B	12.9 (SB)	B
		PM*	**147.3 (NB)***	**F***	**147.3 (NB)***	**F***	**147.3 (NB)***	**F***	**147.3 (NB)***	**F***	**147.3 (NB)***	**F***
M51	Shenado Place/Chynoweth Avenue	AM	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A
		PM	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A

LOS = level of service
SB = southbound
NB = northbound
EB = eastbound
WB = westbound
[1] Affected intersections are shaded in grey.
[2] LOS and delay results are based on changes in roadway capacity and the shifting of traffic from temporary lane closures and relocations during construction.
Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
Shaded entries bolded with double asterisks (**) identify locations with project effects per the criteria.

Table 12 Existing Plus Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
San Jose Diridon Station Approach Subsection												
D1	The Alameda (SR 82)/I-880 NB ramps	AM	22.0	C	22.0	C	22.0	C	22.0	C	22.0	C
		PM	19.1	B	19.1	B	19.1	B	19.1	B	19.1	B
D2	The Alameda (SR 82)/I-880 SB ramps	AM	18.4	B	18.4	B	18.4	B	18.4	B	18.4	B
		PM	13.9	B	13.9	B	13.9	B	13.9	B	13.9	B
D3	The Alameda (SR 82)/Hedding Street	AM	41.1	D	41.1	D	41.1	D	41.1	D	41.1	D
		PM	42.0	D	42.0	D	42.0	D	42.0	D	42.0	D
D4	The Alameda (SR 82)/Taylor Street-Naglee Avenue	AM	44.4	D	44.4	D	44.4	D	44.4	D	44.4	D
		PM	46.0	D	46.0	D	46.0	D	46.0	D	46.0	D
D5	The Alameda (SR 82)/Martin Avenue-Race Street	AM	41.1	D	41.1	D	41.1	D	41.1	D	41.1	D
		PM	31.6	C	31.6	C	31.6	C	31.6	C	31.6	C
D6	Stockton Avenue/Julian Street	AM	38.4	D	38.4	D	38.4	D	38.4	D	38.4	D
		PM	37.0	D	37.0	D	37.0	D	37.0	D	37.0	D
D7	Montgomery Street/Julian Street	AM	13.5	B	13.5	B	13.5	B	13.5	B	13.5	B
		PM	12.7	B	12.7	B	12.7	B	12.7	B	12.7	B
D8	Autumn Street/Julian Street	AM	13.1	B	13.1	B	13.1	B	13.1	B	13.1	B
		PM	13.5	B	13.5	B	13.5	B	13.5	B	13.5	B
D9	SR 87 SB ramps-Almaden Boulevard/Julian Street	AM	23.6	C	23.6	C	23.6	C	23.6	C	23.6	C
		PM	18.4	B	18.4	B	18.4	B	18.4	B	18.4	B
D10	SR 87 NB ramps/Julian Street	AM	50.9	D	50.9	D	50.9	D	50.9	D	50.9	D
		PM	51.4	D	51.4	D	51.4	D	51.4	D	51.4	D
D11	Sunol Avenue/The Alameda (SR 82)	AM	21.7	C	21.7	C	21.7	C	21.7	C	21.7	C
		PM	23.7	C	23.7	C	23.7	C	23.7	C	23.7	C
D12	Stockton Avenue/The Alameda-West Santa Clara Street (SR 82)	AM	19.6	B	19.4	B	19.4	B	19.4	B	19.6	B
		PM	21.0	C	19.7	B	19.7	B	19.7	B	21.0	C
D13	Cahill Street/West Santa Clara Street (SR 82)	AM	12.7	B	10.2	B	10.2	B	10.2	B	12.7	B
		PM	17.1	B	15.0	B	15.0	B	15.0	B	17.1	B
D14	Montgomery Street (SR 82)/West Santa Clara Street (SR 82)	AM	4.2	A	4.2	A	4.2	A	4.2	A	4.2	A
		PM	8.3	A	8.2	A	8.2	A	8.2	A	8.3	A
D15	Autumn Street (SR 82)/West Santa Clara Street (SR 82)	AM	27.0	C	34.1	C	34.1	C	34.1	C	27.0	C
		PM	20.2	C	27.6	C	27.6	C	27.6	C	20.2	C
D16	SR 87 NB off-ramp/West Santa Clara Street	AM	21.5	C	21.5	C	21.5	C	21.5	C	21.5	C
		PM	11.8	B	11.8	B	11.8	B	11.8	B	11.8	B
D17	Almaden Boulevard/West Santa Clara Street	AM	18.0	B	18.0	B	18.0	B	18.0	B	18.0	B
		PM	16.1	B	16.1	B	16.1	B	16.1	B	16.1	B
D18	Notre Dame Avenue-Almaden Boulevard/West Santa Clara Street	AM	21.2	C	21.2	C	21.2	C	21.2	C	21.2	C
		PM	16.7	B	16.7	B	16.7	B	16.7	B	16.7	B

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
D19	Sunol Avenue/Park Avenue	AM	9.3	A	9.3	A	9.3	A	9.3	A	9.3	A
		PM	11.9	B	11.9	B	11.9	B	11.9	B	11.9	B
D20	Sunol Avenue/West San Carlos Street	AM	13.4	B	13.4	B	13.4	B	13.4	B	13.4	B
		PM	14.0	B	14.0	B	14.0	B	14.0	B	14.0	B
D21	Cahill Street/Stover Street-Crandall Street	AM	14.5	B	23.8	C	23.8	C	23.8	C	14.5	B
		PM	15.8	C	20.6	C	20.6	C	20.6	C	15.8	C
D22	Montgomery Street (SR 82)/Stover Street-Crandall Street	AM	5.7 (EB)	A	6.4 (WB)	A	6.4 (WB)	A	6.4 (WB)	A	5.7 (EB)	A
		PM	6.7 (EB)	A	9.0 (WB)	A	9.0 (WB)	A	9.0 (WB)	A	6.7 (EB)	A
D23	Cahill Street/West San Fernando Street	AM	11.9	B	14.5	B	14.5	B	14.5	B	11.9	B
		PM	11.9	B	6.4	A	6.4	A	6.4	A	11.9	B
D24	Montgomery Street (SR 82)/West San Fernando Street	AM	12.3	B	13.2	B	13.2	B	13.2	B	12.3	B
		PM	11.0	B	11.9	B	11.9	B	11.9	B	11.0	B
D25	Autumn Street (SR 82)/West San Fernando Street	AM	11.4	B	11.7	B	11.7	B	11.7	B	11.4	B
		PM	14.0	B	15.7	B	15.7	B	15.7	B	14.0	B
D26	Almaden Boulevard/West San Fernando Street	AM	37.9	D	37.9	D	37.9	D	37.9	D	37.9	D
		PM	44.5	D	44.5	D	44.5	D	44.5	D	44.5	D
D27	Montgomery Street (SR 82)/Park Avenue	AM	20.2	C	20.2	C	20.2	C	20.2	C	20.2	C
		PM	33.6	C	33.6	C	33.6	C	33.6	C	33.6	C
D28	Delmas Avenue/Park Avenue	AM	21.7	C	21.7	C	21.7	C	21.7	C	21.7	C
		PM	34.3	C	34.3	C	34.3	C	34.3	C	34.3	C
D29	Woz Way-SR 87 NB on-ramp/Park Avenue	AM	10.6	B	10.6	B	10.6	B	10.6	B	10.6	B
		PM	16.0	B	16.0	B	16.0	B	16.0	B	16.0	B
D30	Almaden Boulevard/Park Avenue	AM	29.1	C	29.1	C	29.1	C	29.1	C	29.1	C
		PM	35.4	D	35.4	D	35.4	D	35.4	D	35.4	D
D31	Montgomery Street-Bird Avenue (SR 82)/West San Carlos Street (SR 82)	AM	27.8	C	27.8	C	27.8	C	27.8	C	27.8	C
		PM	49.8	D	49.8	D	49.8	D	49.8	D	49.8	D
D32	Delmas Avenue/West San Carlos Street (SR 82)	AM	14.6	B	14.6	B	14.6	B	14.6	B	14.6	B
		PM	19.4	B	19.4	B	19.4	B	19.4	B	19.4	B
D33	Bird Avenue/Auzerais Avenue	AM	18.8	B	18.8	B	18.8	B	18.8	B	18.8	B
		PM	39.4	D	39.4	D	39.4	D	39.4	D	39.4	D
D34	Delmas Avenue/Auzerais Avenue	AM	18.7	B	18.7	B	18.7	B	18.7	B	18.7	B
		PM	22.4	C	22.4	C	22.4	C	22.4	C	22.4	C
D35	Bird Avenue/I-280 NB ramps	AM	53.8	D	53.8	D	53.8	D	53.8	D	53.8	D
		PM	38.3	D	38.3	D	38.3	D	38.3	D	38.3	D
D36	Bird Avenue/I-280 SB ramps	AM	33.5	C	33.5	C	33.5	C	33.5	C	33.5	C
		PM	27.5	C	27.5	C	27.5	C	27.5	C	27.5	C
D37	Bird Avenue/West Virginia Street	AM	27.6	C	27.6	C	27.6	C	27.6	C	27.6	C
		PM	26.9	C	26.9	C	26.9	C	26.9	C	26.9	C

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
D38	The Alameda (SR 82)/Julian Street	AM	20.9	C	20.9	C	20.9	C	20.9	C	20.9	C
		PM	25.0	C	25.0	C	25.0	C	25.0	C	25.0	C
D39	Coleman Avenue/I-880 SB ramps	AM	22.9	C	22.9	C	22.9	C	22.9	C	22.9	C
		PM	10.6	B	10.6	B	10.6	B	10.6	B	10.6	B
D40	Coleman Avenue/I-880 NB ramps	AM	37.5	D	37.5	D	37.5	D	37.5	D	37.5	D
		PM	25.5	C	25.5	C	25.5	C	25.5	C	25.5	C
D41	Coleman Avenue/Hedding Street	AM	40.9	D	40.9	D	40.9	D	40.9	D	40.9	D
		PM	39.9	D	39.9	D	39.9	D	39.9	D	39.9	D
D42	Coleman Avenue/Taylor Street	AM	46.8	D	46.8	D	46.8	D	46.8	D	46.8	D
		PM	47.0	D	47.0	D	47.0	D	47.0	D	47.0	D
D43	Delmas Avenue/West Santa Clara Street	AM	18.7 (NB)	C	25.1 (NB)	D	25.1 (NB)	D	25.1 (NB)	D	18.7 (NB)	C
		PM	21.6 (NB)	C	28.1 (NB)	D	28.1 (NB)	D	28.1 (NB)	D	21.6 (NB)	C
D44	Delmas Avenue/West San Fernando Street	AM	15.9	B	19.9	B	19.9	B	19.9	B	15.9	B
		PM	26.6	C	28.8	C	28.8	C	28.8	C	26.6	C
D45	Cahill Street/Park Avenue	AM	---	---	7.0	A	7.0	A	7.0	A	---	---
		PM	---	---	6.5	A	6.5	A	6.5	A	---	---
D46	Sunol Avenue/West San Fernando Street	AM	8.5	A	8.5	A	8.5	A	8.5	A	8.5	A
		PM	8.7	A	8.7	A	8.7	A	8.7	A	8.7	A
D47	87 ramps/Taylor Street	AM	29.7	C	29.7	C	29.7	C	29.7	C	29.7	C
		PM	35.8	D	35.8	D	35.8	D	35.8	D	35.8	D
D48	Sunol St/Auzerais Avenue	D48	13.1	B	13.1	B	13.1	B	13.1	B	13.1	B
			26.1	C	26.1	C	26.1	C	26.1	C	26.1	C
D49	Harrison Street/West Virginia Street	D49	5.3 (EB)	A	5.3 (EB)	A	5.3 (EB)	A	5.3 (EB)	A	5.3 (EB)	A
			6.5 (SB)	A	6.5 (SB)	A	6.5 (SB)	A	6.5 (SB)	A	6.5 (SB)	A
D50	Bird Avenue/Fuller Avenue	D50	7.9 (WB)	A	7.9 (WB)	A	7.9 (WB)	A	7.9 (WB)	A	7.9 (WB)	A
			8.4 (EB)	A	8.4 (EB)	A	8.4 (EB)	A	8.4 (EB)	A	8.4 (EB)	A
Monterey Corridor Subsection												
M1	Monterey Road/Capitol Expressway WB ramps	AM	15.1	B	16.6	B	19.0	B	16.6	B	15.1	B
		PM	18.0	B	19.0	B	29.8	C	19.0	B	18.0	B
M2	Capitol Expressway EB ramps	AM	20.5	C	15.5	B	16.4	B	15.5	B	20.5	C
		PM	14.6	B	16.9	B	37.0	D	16.9	B	14.6	B
M3 *	**Monterey Road/Senter Road***	**AM***	48.5	D	**89.0****	**F****	42.4	D	**89.0****	**F****	48.5	D
		PM*	39.0	D	47.3	D	**73.3****	**E****	47.3	D	39.0	D
M4 *	**Monterey Road/Skyway Drive***	**AM***	**80.4***	**F***	**168.6****	**F****	**Variant A: >180.0****	**Variant A: F****	**168.6****	**F****	**80.4***	**F***
		PM*	40.1	D	**90.7****	**F****	**154.0****	**F****	**90.7****	**F****	40.1	D
							Variant B: 168.6**	**Variant B: F****				
							90.7**	**F****				

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M5 *	**Houndshaven Way/Skyway Drive***	**AM***	14.8 (WB)	B	**46.2 (WB)****	**E****	**>180.0 (EB)****	**F****	**46.2 (WB)****	**E****	14.8 (WB)	B
		PM*	7.6 (SB)	A	7.6 (WB)	A	11.7 (SB)	A	7.6 (WB)	A	7.6 (SB)	A
M6 *	**Monterey Road/Branham Lane***	**AM***	**59.5***	**E***	**>180.0****	**F****	**179.2****	**F****	**>180.0****	**F****	**59.5***	**E***
		PM*	**58.7***	**E***	**89.6****	**F****	**161.3****	**F****	**89.6****	**F****	**58.7***	**E***
M7 *	**Houndshaven Way/Branham Lane***	**AM***	17.6 (WB)	B	**104.6 (WB)***	**F****	12.6 (SB)	B	**104.6 (WB)***	**F***	**17.6 (WB)***	**B***
		PM*	5.2 (SB)	A	6.4 (SB)	A	6.0 (SB)	A	6.4 (SB)	A	**5.2 (SB)***	**A***
M8*	**Monterey Road/Bougainvillea Drive***	**AM***	**>180.0 (WB)***	**F***	**66.9 (WB)***	**F***	**66.9 (WB)***	**F***	**66.9 (WB)***	**F***	**>180.0 (WB)***	**F***
		PM*	**44.0 (WB)***	**E***	**36.5 (WB)***	**E***	**51.0 (WB)***	**F***	**36.5 (WB)***	**E***	**44.0 (WB)***	**E***
M9*	**Monterey Road/Chynoweth Avenue-Roeder Road***	**AM***	54.2	D	**138.6****	**F****	**154.8****	**F****	**138.6****	**F****	54.2	D
		PM*	**95.7***	**F***	**>180.0****	**F****	**114.0****	**F****	**>180.0****	**F****	**95.7***	**F***
M10	Roeder Road/Azucar Avenue-Vera Lane	AM	25.4	D	26.5	D	9.4	A	26.5	D	25.4	D
		PM	11.6	B	14.0	B	8.8	A	14.0	B	11.6	B
M11*	**Monterey Road/Blossom Hill Road WB ramps (SR 82)***	**AM***	37.9	D	**68.1****	**E****	**69.4****	**E****	**68.1****	**E****	37.9	D
		PM*	23.8	C	43.6	D	**93.2****	**F****	43.6	D	23.8	C
M12*	**Monterey Road/Blossom Hill Road EB ramps (SR 82)***	**AM***	**69.6***	**E***	52.9	D	28.9	C	52.9	D	**69.6***	**E***
		PM	33.9	C	20.4	C	23.5	C	20.4	C	33.9	C
M13	Monterey Road/Ford Road	AM	26.2	C	27.0	C	24.0	C	27.0	C	26.2	C
		PM	20.8	C	21.3	C	23.9	C	21.3	C	20.8	C
M14	Monterey Road/Flintwell Way	AM	11.4	B	14.2	B	13.2	B	14.2	B	11.4	B
		PM	8.8	A	16.1	B	16.5	B	16.1	B	8.8	A
M15	Monterey Road/Bernal Road SB ramps	AM	12.6	B	15.3	B	12.2	A	15.3	B	12.6	B
		PM	17.0	B	15.4	B	19.6	B	15.4	B	17.0	B
M16	Monterey Road/Bernal Road NB ramps	AM	6.6	A	5.6	A	7.7	A	5.6	A	6.6	A
		PM	4.5	A	4.0	A	4.1	A	4.0	A	4.5	A
M17*	**Santa Teresa Boulevard/Bernal Road***	AM	34.6	C	31.6	C	31.6	C	31.6	C	34.6	C
		PM*	53.0	D	**66.3****	**E****	**66.3****	**E****	**66.3****	**E****	53.0	D
M18*	**Santa Teresa Boulevard/Bailey Avenue***	**AM***	24.2	C	25.5	C	25.5	C	25.5	C	24.2	C
		PM*	49.4	D	**86.7****	**F****	**86.7****	**F****	**86.7****	**F****	49.4	D
M22*	**Monterey Road/Edenview Drive***	AM	25.2	C	24.4	C	36.9	D	24.4	C	25.2	C
		PM*	23.9	C	**100.0****	**F****	**108.3****	**F****	**100.0****	**F****	23.9	C
M23	US 101 SB ramps/Blossom Hill Road	AM	15.5	B	16.4	B	8.0	A	16.4	B	15.5	B
		PM	22.5	C	23.6	C	21.0	C	23.6	C	22.5	C
M24	US 101 NB ramps/Blossom Hill Road	AM	19.2	B	22.9	C	18.2	B	22.9	C	19.2	B
		PM*	**113.3***	**F***	**59.0***	**E***	46.6	D	**59.0***	**E***	**113.3***	**F***
M25	Bernal Road Overpass/Monterey Road ramp	AM	9.9	A	7.6	A	7.0	A	7.6	A	9.9	A
		PM	7.6	A	8.4	A	7.9	A	8.4	A	7.6	A
M26*	**Snell Avenue/Capitol Expressway***	**AM***	**58.7***	**E***	**59.8***	**E***	**59.8***	**E***	**59.8***	**E***	**58.7***	**E***
		PM	39.7	D	39.7	D	39.7	D	39.7	D	39.7	D

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M27*	**Vistapark Drive/Capitol Expressway***	**AM***	**79.2***	**E***	**75.2***	**E***	**75.2***	**E***	**75.2***	**E***	**79.2***	**E***
		PM*	**97.2***	**F***	**97.2***	**F***	**97.2***	**F***	**97.2***	**F***	**97.2***	**F***
M28*	**Senter Road/Capitol Expressway***	**AM***	**74.8***	**E***	**85.8****	**F****	**85.8****	**F****	**85.8****	**F****	**74.8***	**E***
		PM*	**61.5***	**E***	**61.5***	**E***	**61.5***	**E***	**61.5***	**E***	**61.5***	**E***
M29	Senter Road/Sylvandale Avenue	AM	18.9	B	24.5	C	24.5	C	24.5	C	18.9	B
		PM	14.0	B	14.0	B	14.0	B	14.0	B	14.0	B
M30	Senter Road/Hellyer Avenue	AM	24.6	C	30.6	C	30.6	C	30.6	C	24.6	C
		PM	22.7	C	22.7	C	22.7	C	22.7	C	22.7	C
M31*	**Silver Creek Valley Road/Yerba Buena Road***	**AM***	**58.5***	**E***	**63.1****	**E****	**63.1****	**E****	**63.1****	**E****	**58.5***	**E***
		PM	35.2	D	35.2	D	35.2	D	35.2	D	35.2	D
M32	Vistapark Drive/Branham Lane	AM	30.0	C	30.8	C	30.8	C	30.8	C	30.0	C
		PM	33.1	C	33.1	C	33.1	C	33.1	C	33.1	C
M33	Snell Avenue/Branham Lane	AM	40.3	D	40.8	D	40.8	D	40.8	D	40.3	D
		PM	46.7	D	46.7	D	46.7	D	46.7	D	46.7	D
M34	Snell Avenue/Chynoweth Avenue	AM	33.3	C	34.6	C	34.6	C	34.6	C	33.3	C
		PM	41.9	D	41.9	D	41.9	D	41.9	D	41.9	D
M35	Lean Avenue/Chynoweth Avenue	AM	18.9	B	19.5	B	19.5	B	19.5	B	18.9	B
		PM	20.6	C	20.6	C	20.6	C	20.6	C	20.6	C
M36*	**Snell Avenue/Blossom Hill Road***	AM	48.0	D	46.6	D	46.6	D	46.6	D	48.0	D
		PM*	53.9	D	**55.2****	**E****	**55.2****	**E****	**55.2****	**E****	53.9	D
M37	Lean Avenue/Blossom Hill Road	AM	45.1	D	47.7	D	47.7	D	47.7	D	45.1	D
		PM	45.3	D	45.3	D	45.3	D	45.3	D	45.3	D
M38	Benswick Drive/Blossom Hill Road	AM	38.1	D	34.2	C	34.2	C	34.2	C	38.1	D
		PM	20.8	C	20.7	C	20.7	C	20.7	C	20.8	C
M39	Poughkeepsie Road/Blossom Hill Road	AM	21.5	C	23.8	C	23.8	C	23.8	C	21.5	C
		PM	24.8	C	23.3	C	23.3	C	23.3	C	24.8	C
M40	Cottle Road/Poughkeepsie Road	AM	28.0	C	34.6	C	34.6	C	34.6	C	28.0	C
		PM	47.1	D	51.5	D	51.5	D	51.5	D	47.1	D
M41	Cottle Road/Santa Teresa Boulevard	AM	41.5	D	41.8	D	41.8	D	41.8	D	41.5	D
		PM	41.8	D	42.0	D	42.0	D	42.0	D	41.8	D
M42	Lean Avenue/Santa Teresa Boulevard	AM	25.9	C	25.8	C	25.8	C	25.8	C	25.9	C
		PM	21.6	C	21.0	C	21.0	C	21.0	C	21.6	C
M43	Silver Creek Valley Road/Hellyer Avenue	AM	31.1	C	30.2	C	30.2	C	30.2	C	31.1	C
		PM	30.5	C	27.1	C	27.1	C	27.1	C	30.5	C
M44	Silicon Valley Boulevard/Hellyer Avenue	AM	19.1	B	19.4	B	19.4	B	19.4	B	19.1	B
		PM	19.2	B	17.2	C	17.2	C	17.2	C	19.2	B
M45	Monterey Road/Fehren Drive	AM	11.2	B	12.2	B	7.3	A	12.2	B	11.2	B
		PM	12.8	B	15.7	B	17.1	B	15.7	B	12.8	B

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M48	Park Sommers Way/Skyway Drive	AM	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A
		PM	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A
M49	Park Paxton Place/Skyway Drive	AM	9.9 (NB)	A	9.9 (NB)	A	9.9 (NB)	A	9.9 (NB)	A	9.9 (NB)	A
		PM	9.7 (NB)	A	9.7 (NB)	A	9.7 (NB)	A	9.7 (NB)	A	9.7 (NB)	A
M50*	**Saddlebrook Drive/Branham Lane***	AM	12.9 (SB)	B	12.9 (SB)	B	12.9 (SB)	B	12.9 (SB)	B	12.9 (SB)	B
		PM	**147.3** *(NB)	**F***	**147.3** *(NB)	**F***	**147.3** *(NB)	**F***	**147.3** *(NB)	**F***	**147.3** *(NB)	**F***
M51	Shenado Place/Chynoweth Avenue	AM	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A
		PM	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A
Morgan Hill and Gilroy Subsection												
M19*	**Hale Avenue/Tilton Avenue***	AM	15.0	B	16.7	C	16.7	C	16.7	C	15.0	B
		PM*	**51.5***	**F***	**62.0****	**F****	**62.0****	**F****	**62.0****	**F****	**51.5***	**F***
M20	Hale Avenue/Llagas Road	AM	13.7	B	14.2	B	14.2	B	14.2	B	13.7	B
		PM	14.8	B	15.3	B	15.3	B	15.3	B	14.8	B
M21	Monterey Road/Old Monterey Road	AM	9.5	A	9.6	A	9.6	A	9.6	A	9.5	A
		PM	19.2	B	16.7	B	16.7	B	16.7	B	19.2	B
M46*	**Monterey Road/Tilton Avenue***	**AM***	12.9	B	13.4	B	**54.4****	**F****	13.4	B	12.9	B
		PM*	37.4	D	45.4	D	**85.4****	**F****	45.4	D	37.4	D
M47*	**Monterey Road/Madrone Parkway***	**AM***	10.8	B	46.2	D	**124.3****	**F****	46.2	D	10.8	B
		PM	8.9	A	12.2	B	50.4	D	12.2	B	8.9	A
M52	Monterey Road/Blanchard Road	AM	2.5	A	2.5	A	2.5	A	2.5	A	2.5	A
		PM	2.5	A	2.5	A	2.5	A	2.5	A	2.5	A
M53	Monterey Road/Palm Ave	AM	4.5	A	4.5	A	4.5	A	4.5	A	4.5	A
		PM	2.8	A	2.8	A	2.8	A	2.8	A	2.8	A
M54	Dougherty Ave/Tilton Ave	AM	3.1	A	3.1	A	3.1	A	3.1	A	3.1	A
		PM	16.0	B	16.0	B	16.0	B	16.0	B	16.0	B
M55	Monterey Road/Burnett Ave	AM	21.5	C	21.5	C	21.5	C	21.5	C	21.5	C
		PM	10.8	B	10.8	B	10.8	B	10.8	B	10.8	B
MH1	Monterey Road/East Dunne Avenue	AM	33.1	C	33.1	C	33.1	C	33.1	C	33.1	C
		PM	30.3	C	30.3	C	30.3	C	30.3	C	30.3	C
MH2*	**Railroad Avenue/Tennant Avenue***	**AM***	12.4 (SB)	B	12.4 (SB)	B	**44.9 (SB)****	**E****	12.4 (SB)	B	12.4 (SB)	B
		PM*	12.5 (NB)	B	12.5 (NB)	B	**62.9 (NB)****	**F****	12.5 (NB)	B	12.5 (NB)	B
MH3	Farmers Market Driveway 1/Tennant Avenue	AM	11.0 (NB)	B	11.0 (NB)	B	8.9 (WB)	A	11.0 (NB)	B	11.0 (NB)	B
		PM	12.5 (NB)	B	12.5 (NB)	B	8.8 (WB)	A	12.5 (NB)	B	12.5 (NB)	B
MH4	Farmers Market Driveway 2/Tennant Avenue	AM	11.1 (NB)	B	11.1 (NB)	B	---	---	11.1 (NB)	B	11.1 (NB)	B
		PM	13.1 (NB)	B	13.1 (NB)	B	---	---	13.1 (NB)	B	13.1 (NB)	B
MH5	Farmers Market Driveway 3/Tennant Avenue	AM	11.3 (NB)	B	11.3 (NB)	B	---	---	11.3 (NB)	B	11.3 (NB)	B
		PM	12.9 (NB)	B	12.9 (NB)	B	---	---	12.9 (NB)	B	12.9 (NB)	B
MH6	Monterey Road/San Martin Avenue	AM	18.3	B	18.3	B	12.2	B	18.3	B	18.3	B
		PM	16.9	B	16.9	B	12.2	B	16.9	B	16.9	B

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
MH7	Depot Road/San Martin Avenue	AM	18.0 (NB)	C	18.0 (NB)	C	7.6	A	18.0 (NB)	C	18.0 (NB)	C
		PM	15.5 (NB)	C	15.5 (NB)	C	7.2	A	15.5 (NB)	C	15.5 (NB)	C
MH8	Llagas Road/San Martin Avenue	AM	13.4	B	13.4	B	18.8 (SB)	C	13.4	B	13.4	B
		PM	13.1	B	13.1	B	17.0 (SB)	C	13.1	B	13.1	B
MH9	Colony Avenue/San Martin Avenue	AM	9.9 (SB)	A	9.9 (SB)	A	16.4 (NB)	C	9.9 (SB)	A	9.9 (SB)	A
		PM	10.0 (SB)	B	10.0 (SB)	B	17.1 (NB)	C	10.0 (SB)	B	10.0 (SB)	B
MH10	Monterey Road/E Main Ave	AM	40.6	D	40.6	D	40.6	D	40.6	D	40.6	D
		PM	42.3	D	42.3	D	42.3	D	42.3	D	42.3	D
MH11	Depot St/E Main Ave	AM	32.4 (SB)	D	32.4 (SB)	D	32.4 (SB)	D	32.4 (SB)	D	32.4 (SB)	D
		PM	25.8 (NB)	D	25.8 (NB)	D	25.8 (NB)	D	25.8 (NB)	D	25.8 (NB)	D
MH12	Butterfield Blvd/E Main Ave	AM	33.9	C	33.9	C	33.9	C	33.9	C	33.9	C
		PM	37.3	D	37.3	D	37.3	D	37.3	D	37.3	D
MH13	Church St/East Dunne Avenue	AM	8.3	A	8.3	A	8.3	A	8.3	A	8.3	A
		PM	11.2	B	11.2	B	11.2	B	11.2	B	11.2	B
MH14	Depot St/East Dunne Avenue	AM	10.4 (SB)	A (B)	10.4 (SB)	A (B)	10.4 (SB)	A (B)	10.4 (SB)	A (B)	10.4 (SB)	A (B)
		PM	12.2 (SB)	A (B)	12.2 (SB)	A (B)	12.2 (SB)	A (B)	12.2 (SB)	A (B)	12.2 (SB)	A (B)
MH15	Butterfield Blvd/East Dunne Avenue	AM	39.5	B	39.5	B	39.5	B	39.5	B	39.5	B
		PM	36.3	B	36.3	B	36.3	B	36.3	B	36.3	B
MH16	Monterey Road/San Pedro Avenue	AM	14.4 (WB)	B	14.4 (WB)	B	14.4 (WB)	B	14.4 (WB)	B	14.4 (WB)	B
		PM	13.5 (WB)	B	13.5 (WB)	B	13.5 (WB)	B	13.5 (WB)	B	13.5 (WB)	B
MH17	Church St/San Pedro Avenue	AM	12.7	B	12.7	B	12.7	B	12.7	B	12.7	B
		PM	12.6	B	12.6	B	12.6	B	12.6	B	12.6	B
MH18	Railroad Ave/San Pedro Avenue	AM	12.9 (NB)	B	12.9 (NB)	B	12.9 (NB)	B	12.9 (NB)	B	12.9 (NB)	B
		PM	11.2 (NB)	B	11.2 (NB)	B	11.2 (NB)	B	11.2 (NB)	B	11.2 (NB)	B
MH19	Butterfield Blvd/San Pedro Avenue	AM	22.3	C	22.3	C	22.3	C	22.3	C	22.3	C
		PM	19.2	B	19.2	B	19.2	B	19.2	B	19.2	B
MH20	Vineyard Blvd/Tennant Avenue	AM	11.0	B	11.0	B	11.0	B	11.0	B	11.0	B
		PM	18.7	B	18.7	B	18.7	B	18.7	B	18.7	B
MH21	Butterfield Blvd/Tennant Avenue	AM	32.9	C	32.9	C	32.9	C	32.9	C	32.9	C
		PM	36.3	C	36.3	C	36.3	C	36.3	C	36.3	C
MH22	Monterey Road/E Middle Avenue	AM	10.8 (WB)	B	10.8 (WB)	B	10.8 (WB)	B	10.8 (WB)	B	10.8 (WB)	B
		PM	8.3 (WB)	A	8.3 (WB)	A	8.3 (WB)	A	8.3 (WB)	A	8.3 (WB)	A
MH23	Crowner Avenue/E Middle Avenue	AM	7.7 (NB)	A	7.7 (NB)	A	7.7 (NB)	A	7.7 (NB)	A	7.7 (NB)	A
		PM	7.7 (NB)	A	7.7 (NB)	A	7.7 (NB)	A	7.7 (NB)	A	7.7 (NB)	A
MH24	Seymour Avenue/E Middle Avenue	AM	10.6 (SB)	A	10.6 (SB)	A	10.6 (SB)	A	10.6 (SB)	A	10.6 (SB)	A
		PM	5.8 (SB)	A	5.8 (SB)	A	5.8 (SB)	A	5.8 (SB)	A	5.8 (SB)	A
MH25	Sewell Avenue/W San Martin Avenue	AM	7.0 (NB)	A	7.0 (NB)	A	7.0 (NB)	A	7.0 (NB)	A	7.0 (NB)	A
		PM	6.6 (NB)	A	6.6 (NB)	A	6.6 (NB)	A	6.6 (NB)	A	6.6 (NB)	A

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
MH26*	**Monterey Road/Masten Avenue***	AM	46.8	D	46.8	D	46.8	D	46.8	D	46.8	D
		PM*	**55.8***	**E***	**55.8***	**E***	**55.8***	**E***	**55.8***	**E***	**55.8***	**E***
MH27	Manna Way/Masten Avenue	AM	10.2 (SB)	B	10.2 (SB)	B	10.2 (SB)	B	10.2 (SB)	B	10.2 (SB)	B
		PM	13.6 (SB)	B	13.6 (SB)	B	13.6 (SB)	B	13.6 (SB)	B	13.6 (SB)	B
G1	Monterey Road/Buena Vista Avenue	AM	3.4	A	3.4	A	5.6	A	3.4	A	3.4	A
		PM	1.3	A	1.3	A	4.3	A	1.3	A	1.3	A
G2	US 101 SB ramps/Buena Vista Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G3	No Name Uno/Buena Vista Avenue	AM	8.1	A	8.1	A	8.3 (SB)	A	8.1	A	8.1	A
		PM	8.6	A	8.6	A	8.8 (NB)	A	8.6	A	8.6	A
G4	Camino Arroyo (Ext.)/Buena Vista Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G5	Marcella Avenue/Buena Vista Avenue	AM	1.7	A	1.7	A	8.9 (NB)	A	1.7	A	1.7	A
		PM	2.3	A	2.3	A	9.0 (NB)	A	2.3	A	2.3	A
G6	No Name Uno/Cohansey Avenue	AM	0.3	A	0.3	A	9.8 (WB)	A	0.3	A	0.3	A
		PM	0.2	A	0.2	A	10.6 (WB)	B	0.2	A	0.2	A
G7	Camino Arroyo (Ext.)/Cohansey Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G8	San Ysidro Avenue/No Name Uno-Las Animas Avenue	AM	6.5	A	6.5	A	10.2 (NB)	B	6.5	A	6.5	A
		PM	4.5	A	4.5	A	10.7 (NB)	B	4.5	A	4.5	A
G9	Camino Arroyo (Ext.)/Las Animas Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G10	Santa Teresa Boulevard/First Street (SR 152)	AM	31.1	C	31.1	C	32.1	C	31.1	C	31.1	C
		PM	28.0	C	28.0	C	23.3	C	28.0	C	28.0	C
G11	Wren Avenue/First Street (SR 152)	AM	31.9	C	31.9	C	27.3	C	31.9	C	31.9	C
		PM	30.0	C	30.0	C	27.5	C	30.0	C	30.0	C
G12	Church Street/First Street (SR 152)	AM	20.6	C	20.6	C	18.5	B	20.6	C	20.6	C
		PM	20.2	C	20.2	C	15.7	B	20.2	C	20.2	C
G13	Monterey Road (SR 152)/First Street (SR 152)	AM	23.6	C	23.6	C	21.4	C	23.6	C	23.6	C
		PM	23.9	C	23.9	C	20.1	C	23.9	C	23.9	C
G14	Church Street/Welburn Avenue	AM	19.4	B	19.4	B	19.4	B	19.4	B	19.4	B
		PM	18.9	B	18.9	B	18.9	B	18.9	B	18.9	B
G15	Monterey Road (SR 152)/Welburn Avenue-Leavesley Road (SR 152)	AM	26.8	C	26.8	C	26.8	C	26.8	C	26.8	C
		PM	25.7	C	25.7	C	25.7	C	25.7	C	25.7	C
G16	Forest Street/Leavesley Road (SR 152)	AM	10.4	B	10.4	B	10.4	B	10.4	B	10.4	B
		PM	15.4	B	15.4	B	15.4	B	15.4	B	15.4	B
G17	Murray Avenue/Leavesley Road (SR 152)	AM	26.2	C	26.2	C	26.2	C	26.2	C	26.2	C
		PM	43.7	D	43.7	D	43.7	D	43.7	D	43.7	D

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G18	US 101 SB ramps/Leavesley Road (SR 152)	AM	12.2	B	12.2	B	12.2	B	12.2	B	12.2	B
		PM	25.2	C	25.2	C	25.2	C	25.2	C	25.2	C
G19	US 101 NB ramps-San Ysidro Avenue/Leavesley Road (SR 152)	AM	13.0	B	13.0	B	13.0	B	13.0	B	13.0	B
		PM	19.7	B	19.7	B	19.7	B	19.7	B	19.7	B
G20	Arroyo Circle/Leavesley Road	AM	7.9	A	7.9	A	7.9	A	7.9	A	7.9	A
		PM	17.9	B	17.9	B	17.9	B	17.9	B	17.9	B
G21	Camino Arroyo (Ext.)/Leavesley Road	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G22	Cameron Boulevard (Ext.)/Leavesley Road	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G23	Marcella Avenue/Leavesley Road	AM	12.5 (SB)	B	12.5 (SB)	B	12.5 (SB)	B	10.9 (SB)	B	12.5 (SB)	B
		PM	10.6 (SB)	B	10.6 ( )	B	10.6 (SB)	B	9.7 (SB)	B	10.6 (SB)	B
G24	New Avenue/Leavesley Road	AM	14.7 (SB)	B	14.7 (SB)	B	14.7 (SB)	B	14.7 (SB)	B	14.7 (SB)	B
		PM	19.9 (SB)	C	19.9 (SB)	C	19.9 (SB)	C	19.9 (SB)	C	19.9 (SB)	C
G25*	**Monterey Road/IOOF Avenue***	**AM***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***	**154.4 (WB)***	**F***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***
		PM*	23.3 (WB)	C	23.3 (WB)	C	**45.2 (WB)***	**E***	23.3 (WB)	C	23.3 (WB)	C
G26	Cameron Boulevard (Ext.)/IOOF Avenue (Ext.)	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G27	Monterey Road/Third Street	AM	9.8	A	9.8	A	9.8	A	9.8	A	9.8	A
		PM	11.2	B	11.2	B	11.2	B	11.2	B	11.2	B
G28	Monterey Road/Fifth Street	AM	7.4	A	7.4	A	7.4	A	7.4	A	6.8	A
		PM	8.1	A	8.1	A	8.1	A	8.1	A	9.5	A
G29*	**Monterey Road/Sixth Street***	AM	13.6	B	13.6	B	13.6	B	13.6	B	31.4	C
		PM*	14.6	B	14.6	B	14.6	B	14.6	B	**89.3****	**F****
G30*	**Railroad Street/Sixth Street***	**AM***	17.4 (NB)	C	17.4 (NB)	C	17.4 (NB)	C	17.4 (NB)	C	**38.4 (NB)****	**E****
		PM*	15.3 (SB)	C	15.3 (SB)	C	15.3 (SB)	C	15.3 (SB)	C	**74.8 (SB)****	**F****
G31	Camino Arroyo/Sixth Street-Gilman Road	AM	15.7	B	15.7	B	15.7	B	15.7	B	15.7	B
		PM	22.6	C	22.6	C	22.6	C	22.6	C	22.6	C
G32	Cameron Boulevard (Ext.)/Gilman Road	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G33	Monterey Road/Seventh Street	AM	10.0	B	10.0	B	13.4	B	10.0	B	---	---
		PM	11.3	B	11.3	B	15.2	B	11.3	B	---	---
G34	Alexander Street/Old Gilroy Street	AM	9.1 (EB)	A	9.5 (EB)	A	9.8 (EB)	A	9.1 (EB)	A	9.2 (EB)	A
		PM	8.6 (EB)	A	9.1 (EB)	A	9.2 (EB)	A	8.6 (EB)	A	10.8 (EB)	B
G35	Monterey Road/Eighth Street	AM	7.9	A	8.1	A	8.1	A	7.9	A	2.7	A
		PM	8.8	A	8.8	A	8.8	A	8.8	A	5.1	A
G36	Monterey Road/10th Street	AM	19.4	B	19.2	B	19.5	B	19.8	B	20.0	C
		PM	24.5	C	25.3	C	24.2	C	23.4	C	27.5	C

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G37	Alexander Street/10th Street	AM	8.5	A	9.0	A	9.6	A	9.7	A	8.9	A
		PM	14.9	B	17.6	B	17.9	B	17.3	B	13.4	B
G38	Chestnut Street/10th Street	AM	28.7	C	29.2	C	27.7	C	28.8	C	23.5	C
		PM	46.5	D	47.6	D	47.6	D	46.8	D	38.0	D
G39	US 101 SB ramps/10th Street (SR 152)	AM	9.2	A	7.5	A	7.6	A	7.8	A	8.0	A
		PM	24.5	C	20.6	C	20.6	C	20.1	C	20.8	C
G40	US 101 NB ramps/Pacheco Pass Highway (SR 152)	AM	7.9	A	8.1	A	8.2	A	7.9	A	5.8	A
		PM	12.9	B	12.2	B	11.8	B	13.0	B	8.5	A
G41	Camino Arroyo/Pacheco Pass Highway (SR 152)	AM	19.1	B	19.2	B	19.4	B	19.0	B	19.1	B
		PM	40.6	D	40.5	D	41.1	D	42.5	D	40.6	D
G42	Cameron Boulevard/Pacheco Pass Highway (SR 152)	AM	2.6	A	2.6	A	2.6	A	2.6	A	2.6	A
		PM	4.1	A	4.1	A	4.1	A	4.1	A	4.1	A
G43	Monterey Road/Luchessa Avenue	AM	40.1	D	40.1	D	40.1	D	40.1	D	40.1	D
		PM	48.8	D	48.8	D	48.8	D	48.8	D	48.8	D
G44	Monterey Road/US 101 SB ramps	AM	7.3	A	7.4	A	7.4	A	7.3	A	7.3	A
		PM	10.1	B	10.3	B	10.3	B	10.1	B	10.1	B
G45	Monterey Road-Bolsa Road/US 101 NB ramps-Travel Park Circle	AM	30.1	C	14.9	B	14.9	B	30.1	C	30.1	C
		PM	17.3	B	13.9	B	13.9	B	17.3	B	17.3	B
G46	Monterey Road/Las Animas Avenue	AM	15.2	B	15.2	B	31.2	C	15.2	B	15.2	B
		PM	12.3	B	12.3	B	33.9	C	12.3	B	12.3	B
G47	Monterey Road/Cohanesey Avenue	AM	23.8 (WB)	C	23.8 (WB)	C	---	---	23.8 (WB)	C	23.8 (WB)	C
		PM	17.4 (WB)	C	17.4 (WB)	C	---	---	17.4 (WB)	C	17.4 (WB)	C
G48	Monterey Road/Farrell Road	AM	13.0	B	13.0	B	6.1	A	13.0	B	13.0	B
		PM	9.1	A	9.1	A	6.5	A	9.1	A	9.1	A
G49	Monterey Road/Lewis Street	AM	11.5	B	11.7	B	11.7	B	11.5	B	9.9	A
		PM	9.7	A	9.7	A	9.7	A	9.7	A	11.1	B
G50	Monterey Road/Ninth Street	AM	5.3 (WB)	A	1.1	A	1.1	A	5.5 (EB)	A	9.2 (EB)	A
		PM	3.8 (WB)	A	1.1	A	1.2	A	4.3 (EB)	A	10.8 (EB)	B
G51	Alexander Street/Ninth Street	AM	4.7 (WB)	A	5.9	A	6.1	A	4.8 (WB)	A	2.7	A
		PM	5.1 (WB)	A	1.0	A	6.5	A	6.3 (WB)	A	5.1	A
G52	Radtke Avenue/Buena Vista Avenue	AM	5.7 (SB)	A	5.7 (SB)	A	5.7 (SB)	A	5.7 (SB)	A	5.7 (SB)	A
		PM	4.9 (SB)	A	4.9 (SB)	A	4.9 (SB)	A	4.9 (SB)	A	4.9 (SB)	A
G53	School Access/IOOF Avenue	AM	14.1	B	14.1	B	14.1	B	14.1	B	14.1	B
		PM	9.4	A	9.4	A	9.4	A	9.4	A	9.4	A
G54	Frontage Road/Lewis Street	AM	6.7 (SB)	A	6.7 (SB)	A	6.7 (SB)	A	6.7 (SB)	A	6.7 (SB)	A
		PM	12.2 (SB)	B	12.2 (SB)	B	12.2 (SB)	B	12.2 (SB)	B	12.2 (SB)	B
G55	Railroad Street/Lewis Street	AM	6.5 (NB)	A	6.5 (NB)	A	6.5 (NB)	A	6.5 (NB)	A	6.5 (NB)	A
		PM	7.2 (NB)	A	7.2 (NB)	A	7.2 (NB)	A	7.2 (NB)	A	7.2 (NB)	A

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G56	Frontage Road/Martin Avenue	AM	8.8 (SB)	A	8.8 (SB)	A	8.8 (SB)	A	8.8 (SB)	A	8.8 (SB)	A
		PM	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A
G57	Railroad Street/Martin Avenue	AM	7.0 (SB)	A	7.0 (SB)	A	7.0 (SB)	A	7.0 (SB)	A	7.0 (SB)	A
		PM	7.3 (SB)	A	7.3 (SB)	A	7.3 (SB)	A	7.3 (SB)	A	7.3 (SB)	A
G58	Alexander Street/Sixth Street	AM	15.5	C	15.5	C	15.5	C	15.5	C	15.5	C
		PM	14.0	B	14.0	B	14.0	B	14.0	B	14.0	B
G59	Railroad Street/Seventh Street	AM	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A
		PM	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A
G60	Chestnut Street/Luchessa Street	AM	9.5 (SB)	A	9.5 (SB)	A	9.5 (SB)	A	9.5 (SB)	A	9.5 (SB)	A
		PM	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A
GM1*	**Frazier Lake Road/Pacheco Pass Highway (SR 152)***	**AM***	**81.5***	**F***	**81.5***	**F***	**81.5***	**F***	33.4	D	**81.5***	**F***
		PM*	**122.1***	**F***	**122.1***	**F***	**122.1***	**F***	**76.6***	**F***	**122.1***	**F***
GM2	Frazier Lake Road/East Gilroy MOWF Driveway	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
GM3	Bloomfield Road/South Gilroy MOWF Driveway	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
GM4	SR 25/Bloomfield Avenue	AM	31.9	D	31.9	D	31.9	D	31.9	D	31.9	D
		PM	31.0	D	31.0	D	31.0	D	31.0	D	31.0	D
GM5	Bolsa Road/Bloomfield Avenue	AM	11.5 (EB)	B	11.5 (EB)	B	11.5 (EB)	B	11.5 (EB)	B	11.5 (EB)	B
		PM	15.8 (EB)	B	15.8 (EB)	B	15.8 (EB)	B	15.8 (EB)	B	15.8 (EB)	B
San Joaquin Valley Subsection												
S1	Mercey Springs Road (SR 165)/Henry Miller Avenue	AM	10.8	B	13.5 (EB)	B	13.5 (EB)	B	13.5 (EB)	B	13.5 (EB)	B
		PM	12.4	B	13.5 (EB)	B	13.5 (EB)	B	13.5 (EB)	B	13.5 (EB)	B
S2	Loop Road/Henry Miller Avenue	AM	---	---	10.1 (SB)	B	10.1 (SB)	B	10.1 (SB)	B	10.1 (SB)	B
		PM	---	---	11.4 (SB)	B	11.4 (SB)	B	11.4 (SB)	B	11.4 (SB)	B

LOS = level of service;
EB = eastbound; SB = southbound; WB = westbound; NB = northbound
SR = State Route
US = U.S. Highway
I = Interstate
Whole intersection average delay reported for signalized intersections. Whole intersection average delay and worst approach delay (in parentheses) reported for unsignalized intersections.
Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
Shaded entries bolded with double asterisks (**) identify locations with project effects per the criteria

Table 13 2029 No Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
San Jose Diridon Station Approach Subsection						
D1	The Alameda (SR 82)/I-880 NB ramps	SJ/CT/CMP	Signal	AM PM	21.7 21.1	C C
D2	The Alameda (SR 82)/I-880 SB ramps	SJ/CT/CMP	Signal	AM PM	22.3 17.1	C B
D3	The Alameda (SR 82)/Hedding Street	SJ/CT/CMP	Signal	AM PM	44.7 48.4	D D
D4 *	**The Alameda (SR 82)/Taylor Street-Naglee Avenue***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**59.3*** **71.6***	**E*** **E***
D5	The Alameda (SR 82)/Martin Avenue-Race Street	SJ/CT/CMP	Signal	AM PM	42.6 34.6	D C
D6 *	**Stockton Avenue/Julian Street***	**SJ***	**Signal***	**AM*** PM	**87.1*** 43.4	**F*** D
D7	Montgomery Street/Julian Street	SJ	Signal	AM PM	13.5 13.6	B B
D8	Autumn Street/Julian Street	SJ	Signal	AM PM	16.8 17.5	B B
D9	SR 87 SB ramps-Almaden Boulevard/Julian Street	SJ/CT/CMP	Signal	AM PM	22.2 21.7	C C
D10	SR 87 NB ramps/Julian Street	SJ/CT/CMP	Signal	AM PM	52.2 53.4	D D
D11	Sunol Avenue/The Alameda (SR 82)	SJ/CT	Signal	AM PM	21.2 22.6	C C
D12*	**Stockton Avenue/The Alameda-West Santa Clara Street (SR 82)***	**SJ/CT***	**Signal***	AM **PM***	20.2 **>180.0***	C **F***
D13	Cahill Street/West Santa Clara Street (SR 82)	SJ/CT	Signal	AM PM	21.7 44.3	C D
D14	Montgomery Street (SR 82)/West Santa Clara Street (SR 82)	SJ/CT/CMP	Signal	AM PM	21.5 14.8	C B
D15*	**Autumn Street (SR 82)/West Santa Clara Street (SR 82)***	**SJ/CT/CMP***	**Signal***	AM **PM***	40.1 **87.9***	D **F***
D16	SR 87 NB Off-ramp/West Santa Clara Street	SJ/CT/CMP	Signal	AM PM	31.6 26.6	C C
D17	Almaden Boulevard/West Santa Clara Street	SJ	Signal	AM PM	20.5 23.8	C C
D18	Notre Dame Avenue-Almaden Boulevard/West Santa Clara Street	SJ	Signal	AM PM	23.2 28.7	C C

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
D19	Sunol Avenue/Park Avenue	SJ	Signal	AM PM	9.9 12.6	A B
D20	Sunol Avenue/West San Carlos Street	SJ	Signal	AM PM	14.1 15.0	B B
D21	Cahill Street/Stover Street-Crandall Street	SJ	AWSC	AM PM	15.8 18.2	C C
D22	Montgomery Street (SR 82)/Stover Street-Crandall Street	SJ/CT	SSSC	AM PM	6.4 (EB) 11.8 (EB)	A B
D23	Cahill Street/West San Fernando Street	SJ	AWSC	AM PM	18.2 21.5	C C
D24	Montgomery Street (SR 82)/West San Fernando Street	SJ/CT	Signal	AM PM	16.0 34.5	B C
D25*	**Autumn Street (SR 82)/West San Fernando Street***	**SJ/CT***	**Signal***	AM **PM***	40.6 **59.2***	D **E***
D26	Almaden Boulevard/West San Fernando Street	SJ	Signal	AM PM	39.5 46.6	D D
D27*	**Montgomery Street (SR 82)/Park Avenue***	**SJ/CT***	**Signal***	AM **PM***	38.1 **149.3***	D **F***
D28	Delmas Avenue/Park Avenue	SJ	Signal	AM PM	20.7 44.3	C D
D29	Woz Way-SR 87 NB on-ramp/Park Avenue	SJ/CT	Signal	AM PM	10.7 30.5	B C
D30	Almaden Boulevard/Park Avenue	SJ	Signal	AM PM	30.4 38.1	C D
D31*	**Montgomery Street-Bird Avenue (SR 82)/West San Carlos Street (SR 82)***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**98*** **137.5***	**F*** **F***
D32	Delmas Avenue/West San Carlos Street (SR 82)	SJ/CT	Signal	AM PM	15.4 20.4	B C
D33*	**Bird Avenue/Auzerais Avenue***	**SJ***	**Signal***	AM **PM***	54.3 **85.8***	D **F***
D34	Delmas Avenue/Auzerais Avenue	SJ	Signal	AM PM	21.7 22.6	C C
D35*	**Bird Avenue/I-280 NB ramps***	**SJ/CT/CMP***	**Signal***	**AM*** PM	**117.1*** 35.0	**F*** D
D36	Bird Avenue/I-280 SB ramps	SJ/CT/CMP	Signal	AM PM	48.7 13.6	D B
D37*	**Bird Avenue/West Virginia Street***	**SJ***	**Signal***	**AM*** PM	**139.3*** 25.7	**F*** C

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
D38	The Alameda (SR 82)/Julian Street	SJ/CT	Signal	AM PM	36.3 36.0	D D
D39	Coleman Avenue/I-880 SB ramps	SJ/CT/CMP	Signal	AM PM	28.7 13.8	C B
D40*	**Coleman Avenue/I-880 NB ramps***	**SJ/CT/CMP***	**Signal***	**AM*** PM	**59.2*** 32.3	**E*** C
D41*	**Coleman Avenue/Hedding Street***	**SJ***	**Signal***	**AM*** PM	**117.7*** 49.1	**F*** D
D42	Coleman Avenue/Taylor Street	SJ	Signal	AM PM	48.4 54.6	D D
D43*	**Delmas Avenue/West Santa Clara Street***	**SJ***	**Future Signal***	**AM*** PM	**92.8*** 20.1	**F*** C
D44*	**Delmas Avenue/West San Fernando Street***	**SJ***	**Signal***	AM **PM***	43.1 **166.5***	D **F***
D45	Cahill Street/Park Avenue	SJ	Future Signal	AM PM	--- ---	--- ---
D46	Sunol Avenue/West San Fernando Street	SJ	AWSC	AM PM	8.4 8.6	A A
D47	87 Ramps/Taylor Street	SJ/CT/CMP	Signal	AM PM	35.3 41.2	D D
D48*	**Sunol St/Auzerais Avenue***	**SJ***	**Signal***	AM **PM***	45.4 **>180***	D **F***
D49	Harrison Street/West Virginia Street	SJ	SSSC	AM PM	6.0 (EB) 6.1 (SB)	A A
D50*	**Bird Avenue/Fuller Avenue***	**SJ***	**SSSC***	AM **PM***	**107.8 (WB)*** 10.1 (EB)	**F*** B
Monterey Corridor Subsection						
M1*	**Monterey Road /Capitol Expressway WB ramps***	**SJ/CT/SCCo/CMP***	**Signal***	AM **PM***	19.8 **60.1***	B **E***
M2	Monterey Road)/Capitol Expressway EB ramps	SJ/CT/SCCo/CMP	Signal	AM PM	24.7 53.1	C D
M3 *	**Monterey Road/Senter Road***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**110.3*** **77.8***	**F*** **E***
M4 *	**Monterey Road/Skyway Drive***	**SJ/CT/CMP***	**Signal***	**AM*** PM	**101.1*** 40.3	**F*** D
M5 *	**Houndshaven Way/Skyway Drive***	**SJ***	**SSSC***	**AM*** PM	**69.3 (WB)*** 8.3 (WB)	**F*** A
M6 *	**Monterey Road/Branham Lane***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**>180.0*** **68.2***	**F*** **E***

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
M7	Houndshaven Way/Branham Lane	SJ	SSSC	AM PM	30.3 (SB) 11.0 (SB)	D B
M8*	**Monterey Road/Bougainvillea Drive***	**SJ/CT***	**SSSC***	**AM*** **PM***	**>180.0 (WB)*** **68.4 (WB)***	**F*** **F***
M9*	**Monterey Road/Chynoweth Avenue-Roeder Road***	**SJ/CT***	**Signal***	**AM*** **PM***	**143.7*** **156.1***	**F*** **F***
M10*	**Roeder Road/Azucar Avenue-Vera Lane***	**SJ***	**AWSC***	**AM*** **PM***	**150.6*** **110.1***	**F*** **F***
M11	Monterey Road/Blossom Hill Road WB ramps	SJ/CT/CMP	Signal	AM PM	54.5 44.5	D D
M12*	**Monterey Road/Blossom Hill Road EB ramps***	**SJ/CT/CMP***	**Signal***	AM **PM***	33.7 **59.9***	C **E***
M13*	**Monterey Road/Ford Road***	**SJ***	**Signal***	**AM*** PM	**140.7*** 31.3	**F*** C
M14	Monterey Road/Flintwell Way	SJ	Signal	AM PM	22.3 19.6	C B
M15	Monterey Road/Bernal Road SB ramps	SJ/CMP	Signal	AM PM	21.0 20.6	C C
M16	Monterey Road/Bernal Road NB ramps	SJ/CMP	Signal	AM PM	15.7 5.2	B A
M17*	**Santa Teresa Boulevard/Bernal Road***	**SJ/CMP***	**Signal***	AM **PM***	32.1 **56.4***	C **E***
M18*	**Santa Teresa Boulevard/Bailey Avenue***	**SJ/SCCo***	**Signal***	AM **PM***	36.4 **>180.0***	D **F***
M22*	**Monterey Road/Edenview Drive***	**SJ/CMP***	**Signal***	AM **PM***	21.8 **>180.0***	C **F***
M23	US 101 SB Ramps/Blossom Hill Road	SJ/SCCo	Signal	AM PM	17.1 36.4	B D
M24	US 101 NB Ramps/Blossom Hill Road	SJ/SCCo	Signal	AM PM	21.7 43.9	C D
M25	Bernal Road Overpass/Monterey Road ramp	SJ/SCCo	Signal	AM PM	7.8 8.0	A A
M26*	**Snell Avenue/Capitol Expressway***	**SJ***	**Signal***	**AM*** PM	**68.7*** 48.2	**E*** D
M27*	**Vistapark Drive/Capitol Expressway***	**SJ***	**Signal***	**AM*** **PM***	**71.6*** **115.6***	**E*** **F***
M28*	**Senter Road/Capitol Expressway***	**SJ***	**Signal***	**AM*** **PM***	**107.1*** **88.2***	**F*** **F***
M29	Senter Road/Sylvandale Avenue	SJ	Signal	AM PM	20.7 14.3	C B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
M30	Senter Road/Hellyer Avenue	SJ	Signal	AM PM	29.8 24.6	C C
M31*	**Silver Creek Valley Road/Yerba Buena Road***	**SJ***	**Signal***	**AM*** PM	**58.3*** 42.0	**E*** D
M32	Vistapark Drive/Branham Lane	SJ	Signal	AM PM	43.4 39.6	D D
M33	Snell Avenue/Branham Lane	SJ	Signal	AM PM	53.8 49.9	D D
M34	Snell Avenue/Chynoweth Avenue	SJ	Signal	AM PM	37.9 35.3	D D
M35	Lean Avenue/Chynoweth Avenue	SJ	Signal	AM PM	21.4 18.3	C B
M36*	**Snell Avenue/Blossom Hill Road***	**SJ***	**Signal***	**AM*** **PM***	**59.3*** **67.4***	**E*** **E***
M37*	**Lean Avenue/Blossom Hill Road***	**SJ***	**Signal***	AM **PM***	48.9 **61.7***	D **E***
M38	Benswick Drive/Blossom Hill Road	SJ	Signal	AM PM	22.2 18.2	C B
M39	Poughkeepsie Road/Blossom Hill Road	SJ	Signal	AM PM	19.5 18.2	B B
M40	Cottle Road/Poughkeepsie Road	SJ	Signal	AM PM	31.5 51.8	C D
M41	Cottle Road/Santa Teresa Boulevard	SJ	Signal	AM PM	54.7 44.4	D D
M42	Lean Avenue/Santa Teresa Boulevard	SJ	Signal	AM PM	30.1 24.5	C C
M43	Silver Creek Valley Road/Hellyer Avenue	SJ/CT/SCCo/ CMP	Signal	AM PM	31.9 30.9	C C
M44	Silicon Valley Boulevard/Hellyer Avenue	SJ/CT/SCCo/ CMP	Signal	AM PM	20.2 17.9	C B
M45	Monterey Road/Fehren Drive	SJ/CT/CMP	Signal	AM PM	11.3 13.1	B B
M48	Park Sommers Way/Skyway Drive	SJ	SSSC	AM PM	11.4 (SB) 12.7 (SB)	B B
M49	Park Paxton Place/Skyway Drive	SJ	SSSC	AM PM	10.6 (NB) 10.0 (NB)	B B
M50*	**Saddlebrook Drive/Branham Lane***	**SJ***	**SSSC***	**AM*** **PM***	**>180 (SB)*** **>180 (NB)***	**F*** **F***
M51	Shenado Place/Chynoweth Avenue	SJ	SSSC	AM PM	20.3 (SB) 13.8 (SB)	C B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
Morgan Hill and Gilroy Subsection						
M19*	**Hale Avenue/Tilton Avenue***	**MH/SCCo***	**AWSC***	AM **PM***	20.4 **175.7***	C **F***
M20	Hale Avenue/Llagas Road	MH/SCCo	Signal	AM PM	14.5 19.6	B B
M21	Monterey Road/Old Monterey Road	MH	Signal	AM PM	8.6 18.9	A B
M46	Monterey Road/Tilton Avenue	SCCo	Signal	AM PM	13.6 27.0	B C
M47	Monterey Road/Madrone Parkway	SCCo	Signal	AM PM	9.4 10.6	A B
M52	Monterey Road/Blanchard Road	SCCo	Signal	AM PM	3.1 6.4	A A
M53	Monterey Road/Palm Avenue	SCCo	Signal	AM PM	5.2 3.4	A A
M54	Dougherty Ave/Tilton Avenue	SCCo	AWSC	AM PM	3.6 30.4	A D
M55	Monterey Road/Burnett Avenue	SCCo	Signal	AM PM	25.0 14.3	C B
MH1	Monterey Road/East Dunne Avenue	MH/CT	Signal	AM PM	41.7 35.9	D D
MH2	Railroad Avenue/Tennant Avenue	MH	SSSC	AM PM	13.0 (SB) 13.8 (SB)	B B
MH3	Farmers Market Driveway 1/Tennant Avenue	MH	SSSC	AM PM	11.3 (NB) 13.8 (NB)	B B
MH4	Farmers Market Driveway 2/Tennant Avenue	MH	SSSC	AM PM	11.5 (NB) 14.5 (NB)	B B
MH5	Farmers Market Driveway 3/Tennant Avenue	MH	SSSC	AM PM	11.8 (NB) 14.1 (NB)	B B
MH6	Monterey Road/San Martin Avenue	SCCo/CT	Signal	AM PM	28.8 22.7	C C
MH7	Depot Road/San Martin Avenue	SCCo/CT	TWSC	AM PM	23.6 (NB) 26.5 (NB)	C D
MH8	Llagas Road/San Martin Avenue	SCCo/CT	AWSC	AM PM	25.2 16.9	D C
MH9	Colony Avenue/San Martin Avenue	SCCo/CT	SSSC	AM PM	12.1 (NB) 11.1 (NB)	B B
MH10*	**Monterey Road/E Main Avenue***	**MH***	**Signal***	**AM*** **PM***	**83.6*** **77.3***	**F*** **E***

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
MH11	Depot Street/E Main Ave	MH	SSSC	AM PM	**>180.0 (SB)*** **>180.0 (NB ***	**F *** **F***
MH12	Butterfield Boulevard/E Main Avenue	MH	Signal	AM PM	**71.2*** 43.2	**E*** D
MH13	Church Street/East Dunne Avenue	MH	Signal	AM PM	11.3 14.5	B B
MH14	Depot Street/East Dunne Avenue	MH	SSSC	AM PM	11.6 (SB) 16.3 (SB)	B B
MH15*	**Butterfield Boulevard/East Dunne Avenue***	**MH***	**Signal***	AM **PM***	51.9 **62.0***	D **E***
MH16	Monterey Road/San Pedro Avenue	MH	SSSC	AM PM	14.2 (WB) 18.2 (WB)	B C
MH17	Church Street/San Pedro Avenue	MH	AWSC	AM PM	12.6 15.8	B C
MH18	Railroad Avenue/San Pedro Avenue	MH	SSSC	AM PM	10.9 (NB) 11.5 (NB)	B B
MH19	Butterfield Boulevard/San Pedro Avenue	MH	Signal	AM PM	24.6 20.5	C C
MH20	Vineyard Boulevard/Tennant Avenue	MH	Signal	AM PM	12.1 21.9	B C
MH21*	**Butterfield Boulevard/Tennant Avenue***	**MH***	**Signal***	**AM*** **PM***	**119.9*** **92.9***	**F*** **F***
MH22	Monterey Road/E Middle Avenue	SCCo	SSSC	AM PM	10.3 (WB) 7.2 (WB)	B A
MH23	Crowner Avenue/E Middle Avenue	SCCo	SSSC	AM PM	7.2 (NB) 6.5 (NB)	A A
MH24	Seymour Avenue/E Middle Avenue	SCCo	SSSC	AM PM	5.5 (SB) 5.5 (SB)	A A
MH25	Sewell Avenue/W San Martin Avenue	SCCo	SSSC	AM PM	11.4 (NB) 10.0 (NB)	B B
MH26*	**Monterey Road/Masten Avenue***	**SCCo***	**Signal***	**AM*** **PM***	**72.1*** **122.3***	**E*** **F***
MH27*	**Manna Way/Masten Avenue***	**SCCo***	**SSSC***	AM **PM***	11.2 (SB) **44.1*** (SB)	B **E***
G1*	**Monterey Road/Buena Vista Avenue***	**SCCo***	**Signal***	**AM*** PM	**36.1 (WB)*** 23.2 (WB)	**E*** C
G2	US 101 SB ramps/Buena Vista Avenue	G/SCCo/CT	Signal	AM PM	--- ---	--- ---
G3	No Name Uno/Buena Vista Avenue	SCCo	Signal	AM PM	8.2 8.5	A A

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
G4	Camino Arroyo (Ext.)/Buena Vista Avenue	G/SCCo	SSSC	AM	---	---
				PM	---	---
G5	Marcella Avenue/Buena Vista Avenue	SCCo	SSSC	AM	9.0 (NB)	A
				PM	9.1 (NB)	A
G6	No Name Uno/Cohansey Avenue	SCCo	SSSC	AM	9.4 (WB)	A
				PM	10.8 (WB)	B
G7	Camino Arroyo (Ext.)/Cohansey Avenue	G/SCCo	SSSC	AM	---	---
				PM	---	---
G8	San Ysidro Avenue/No Name Uno-Las Animas Avenue	SCCo	SSSC	AM	10.0 (NB)	B
				PM	10.8 (NB)	B
G9	Camino Arroyo (Ext.)/Las Animas Avenue	G/SCCo	SSSC	AM	---	---
				PM	---	---
G10	Santa Teresa Boulevard/First Street (SR 152)	G/CT/SCCo	Signal	AM	27.1	C
				PM	23.8	C
G11	Wren Avenue/First Street (SR 152)	G/CT	Signal	AM	25.8	C
				PM	29.8	C
G12	Church Street/First Street (SR 152)	G/CT	Signal	AM	22.0	C
				PM	21.1	C
G13	Monterey Road (SR 152)/First Street (SR 152)	G/CT	Signal	AM	20.9	C
				PM	21.4	C
G14	Church Street/Welburn Avenue	G/SCCo/CT	Signal	AM	25.4	C
				PM	23.8	C
G15	Monterey Road (SR 152)/Welburn Avenue-Leavesley Road (SR 152)	G	Signal	AM	24.8	C
				PM	27.7	C
G16	Forest Street/Leavesley Road (SR 152)	G/CT/CMP	Signal	AM	11.2	B
				PM	10.0	B
G17	Murray Avenue/Leavesley Road (SR 152)	G/CT	Signal	AM	29.5	C
				PM	32.9	C
G18	US 101 SB ramps/Leavesley Road (SR 152)	G/CT	Signal	AM	13.3	B
				PM	17.5	B
G19	US 101 NB ramps-San Ysidro Avenue/Leavesley Road (SR 152)	G/CT	Signal	AM	16.5	B
				PM	17.1	B
G20	Arroyo Circle/Leavesley Road	G/CT	Signal	AM	14.1	B
				PM	24.3	C
G21	Camino Arroyo (Ext.)/Leavesley Road	G/SCCo	SSSC	AM	---	---
				PM	---	---
G22	Cameron Boulevard (Ext.)/Leavesley Road	G/SCCo	SSSC	AM	---	---
				PM	---	---
G23	Marcella Avenue/Leavesley Road	G/SCCo	SSSC	AM	12.7 (SB)	B
				PM	11.2 (SB)	B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
G24	New Avenue/Leavesley Road	G/SCCo	SSSC	AM PM	15.2 (SB) 18.1 (SB)	C C
G25	Monterey Road/IOOF Avenue	G/SCCo	SSSC	AM PM	15.6 5.5	B A
G26	Cameron Boulevard (Ext.)/IOOF Avenue (Ext.)	G	SSSC/Signal	AM PM	--- ---	--- ---
G27	Monterey Road/Third Street	G/SCCo	Signal	AM PM	13.1 12.8	B B
G28	Monterey Road/Fifth Street	G	Signal	AM PM	7.6 8.0	A A
G29	Monterey Road/Sixth Street	G	Signal	AM PM	12.9 14.8	B B
G30	Railroad Street/Sixth Street	G	SSSC	AM PM	14.6 (NB) 15.2 (NB)	B C
G31	Camino Arroyo/Sixth Street-Gilman Road	G	Signal	AM PM	15.5 21.2	B C
G32	Cameron Boulevard (Ext.)/Gilman Road	G/SCCo	TBD	AM PM	--- ---	--- ---
G33	Monterey Road/Seventh Street	G/SCCo	Signal	AM PM	9.6 11.2	A B
G34	Alexander Street/Old Gilroy Street	G	AWSC	AM PM	8.5 8.5	A A
G35	Monterey Road/Eighth Street	G	Signal	AM PM	8.1 8.6	A A
G36	Monterey Road/10th Street	G	Signal	AM PM	18.3 19.8	B B
G37	Alexander Street/10th Street	G	Signal	AM PM	10.1 18.0	B B
G38	Chestnut Street/10th Street	G	Signal	AM PM	26.0 38.9	C D
G39	US 101 SB ramps/10th Street (SR 152)	G	Signal	AM PM	7.1 11.0	A B
G40	US 101 NB ramps/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	5.4 7.0	A A
G41	Camino Arroyo/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	16.0 31.6	B C
G42	Cameron Boulevard/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	2.8 3.9	A A
G43	Monterey Road/Luchessa Avenue	G/CT	Signal	AM PM	32.7 48.2	C D

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
G44	Monterey Road/US 101 SB Ramps	G/CT	Signal	AM PM	7.0 10.1	A B
G45	Monterey Road-Bolsa Road/US 101 NB ramps-Travel Park Circle	G/CT	Signal	AM PM	14.3 13.8	B B
G46	Monterey Road/Las Animas Avenue	G/CT	Signal	AM PM	13.7 13.0	B B
G47	Monterey Road/Cohanesey Avenue	G/CT	SSSC	AM PM	33.2 (WB) 17.6 (WB)	D C
G48	Monterey Road/Farrell Road	G/CT	Signal	AM PM	13.8 11.2	B B
G49	Monterey Road/Lewis Street	G/CT	Signal	AM PM	13.5 9.5	B A
G50	Monterey Road/Ninth Street	G/CT	SSSC/Signal (Alts 1 & 2)	AM PM	8.1 (WB) 5.4 (WB)	A A
G51	Alexander Street/Ninth Street	G	SSSC	AM PM	5.3 (WB) 6.1 (WB)	A A
G52	Radtke Avenue/Buena Vista Avenue	G	SSSC	AM PM	5.9 (SB) 7.2 (SB)	A A
G53	School Access/IOOF Avenue	G	AWSC	AM PM	22.3 10.7	C B
G54	Frontage Road/Lewis Street	G	SSSC	AM PM	10.6 (SB) 9.2 (SB)	B A
G55	Railroad Street/Lewis Street	G	SSSC	AM PM	6.5 (NB) 6.9 (NB)	A A
G56	Frontage Road/Martin Avenue	G	SSSC	AM PM	9.5 (SB) 12.0 (SB)	A B
G57	Railroad Street/Martin Avenue	G	SSSC	AM PM	7.9 (SB) 7.4 (SB)	A A
G58	Alexander Street/Sixth Street	G	AWSC	AM PM	16.0 14.2	C B
G59	Railroad Street/Seventh Street	G	SSSC	AM PM	9.2 (SB) 8.4 (SB)	A A
G60	Chestnut Street/Luchessa Street	G	SSSC	AM PM	8.7 (SB) 9.4 (SB)	A A
GM1*	**Frazier Lake Road/Pacheco Pass Highway (SR 152)***	**G/SCCo/CT***	**SSSC***	**AM*** **PM***	**>180.0 (NB)*** **>180.0 (NB)***	**F*** **F***
GM2	Frazier Lake Road/East Gilroy MOWF Driveway	G/SCCo/CT	TBD	AM PM	--- ---	--- ---

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay	LOS
GM3	Bloomfield Road/South Gilroy MOWF Driveway	G/SCCo/CT	TBD	AM PM	--- ---	--- ---
GM4*	**SR 25/Bloomfield Avenue***	**G/SCCo/CT***	**SSC***	**AM*** **PM***	**44.9 (WB)*** **51.9 (WB)***	**E*** **F***
GM5	Bolsa Road/Bloomfield Avenue	G/SCCo/CT	SSSC	AM PM	13.8 (EB) 17.7 (EB)	B C
San Joaquin Valley Subsection						
S1	Mercey Springs Road (SR 165)/Henry Miller Avenue	LB/MCo/CT	AWSC	AM PM	14.5 (EB) 18.2 (EB)	B C

Whole intersection average delay reported for signalized intersections. Whole intersection average delay and worst approach delay (in parentheses) reported for unsignalized intersections.
Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours. LOS = level of service; SR = State Route; I- = Interstate
NB = northbound; SB = southbound; EB = eastbound; WB = westbound
SJ = City of San Jose
CT= California Department of Transportation
CMP = Congestion Management Plan
MH = City of Morgan Hill
G = Gilroy; SCCo = Santa Clara County; LB = City of Los Banos
MCo = Merced County
SSSC = side street stop controlled
AWSC = all-way stop controlled
Alts = alternatives
TBD = to be determined
MOWF = maintenance of way facility
Ext. = Extension
--- = Intersection does not exist

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Table 14 2029 No Project and Plus Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
San Jose Diridon Station Approach Subsection												
D1	The Alameda (SR 82)/I-880 NB ramps	AM	21.7	C	23.9	C	23.9	C	23.9	C	21.7	C
		PM	21.1	C	23.3	C	23.3	C	23.3	C	21.1	C
D2	The Alameda (SR 82)/I-880 SB ramps	AM	22.3	C	22.2	C	22.2	C	22.2	C	22.3	C
		PM	17.1	B	17.0	B	17.0	B	17.0	B	17.1	B
D3	The Alameda (SR 82)/Hedding Street	AM	44.7	D	44.8	D	44.8	D	44.8	D	44.7	D
		PM	48.4	D	49.2	D	49.2	D	49.2	D	48.4	D
D4	The Alameda (SR 82)/Taylor Street-Naglee Avenue	AM	**59.3***	**E***	**61.6***	**E***	**61.6***	**E***	**61.6***	**E***	**59.3***	**E***
		PM	**71.6***	**E***	**77.6****	**E****	**77.6****	**E****	**77.6****	**E****	**71.6***	**E***
D5	The Alameda (SR 82)/Martin Avenue-Race Street	AM	42.6	D	54.0	D	54.0	D	54.0	D	42.6	D
		PM	34.6	C	39.8	D	39.8	D	39.8	D	34.6	C
D6	Stockton Avenue/Julian Street	AM	**87.1***	**F***	**90.8***	**F***	**90.8***	**F***	**90.8***	**F***	**87.1***	**F***
		PM	43.4	D	43.7	D	43.7	D	43.7	D	43.4	D
D7	Montgomery Street/Julian Street	AM	13.5	B	13.5	B	13.5	B	13.5	B	13.5	B
		PM	13.6	B	13.6	B	13.6	B	13.6	B	13.6	B
D8	Autumn Street/Julian Street	AM	16.8	B	19.9	B	19.9	B	19.9	B	16.8	B
		PM	17.5	B	20.7	C	20.7	C	20.7	C	17.5	B
D9	SR 87 SB ramps-Almaden Boulevard/Julian Street	AM	22.2	C	28.5	C	28.5	C	28.5	C	22.2	C
		PM	21.7	C	28.7	C	28.7	C	28.7	C	21.7	C
D10	SR 87 NB ramps/Julian Street	AM	52.2	D	52.1	D	52.1	D	52.1	D	52.2	D
		PM	53.4	D	53.3	D	53.3	D	53.3	D	53.4	D
D11	Sunol Avenue/The Alameda (SR 82)	AM	21.2	C	23.4	C	23.4	C	23.4	C	21.2	C
		PM	22.6	C	24.5	C	24.5	C	24.5	C	22.6	C
D12	Stockton Avenue/The Alameda-West Santa Clara Street (SR 82)	AM	20.2	C	**166.3****	**F****	**166.3****	**F****	**166.3****	**F****	24.8	C
		PM	**>180.0***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
D13	Cahill Street/West Santa Clara Street (SR 82)	AM	21.7	C	52.0	D	52.0	D	52.0	D	16.8	B
		PM	44.3	D	54.9	D	54.9	D	54.9	D	**59.4****	**E****
D14	Montgomery Street (SR 82)/West Santa Clara Street (SR 82)	AM	21.5	C	35.2	D	35.2	D	35.2	D	26.2	C
		PM	14.8	B	21.9	C	21.9	C	21.9	C	23.5	C
D15	Autumn Street (SR 82)/West Santa Clara Street (SR 82)	AM	40.1	D	**69.0****	**E****	**69.0****	**E****	**69.0****	**E****	**62.5****	**E****
		PM	**87.9***	**F***	52.7	D	52.7	D	52.7	D	48.0	D
D16	SR 87 NB off-ramp/West Santa Clara Street	AM	31.6	C	32.4	C	32.4	C	32.4	C	31.6	C
		PM	26.6	C	33.3	C	33.3	C	33.3	C	26.6	C
D17	Almaden Boulevard/West Santa Clara Street	AM	20.5	C	19.9	B	19.9	B	19.9	B	20.5	C
		PM	23.8	C	25.8	C	25.8	C	25.8	C	23.8	C
D18	Notre Dame Avenue-Almaden Boulevard/West Santa Clara Street	AM	23.2	C	23.4	C	23.4	C	23.4	C	23.2	C
		PM	28.7	C	29.7	C	29.7	C	29.7	C	28.7	C

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
D19	Sunol Avenue/Park Avenue	AM	9.9	A	10.0	A	10.0	A	10.0	A	9.9	A
		PM	12.6	B	12.7	B	12.7	B	12.7	B	12.6	B
D20	Sunol Avenue/West San Carlos Street	AM	14.1	B	14.1	B	14.1	B	14.1	B	14.1	B
		PM	15.0	B	15.0	B	15.0	B	15.0	B	15.0	B
D21	Cahill Street/Stover Street-Crandall Street	AM	15.8	C	**63.3****	**F****	**63.3****	**F****	**63.3****	**F****	19.1	C
		PM	18.2	C	**95.4****	**F****	**95.4****	**F****	**95.4****	**F****	17.5	C
D22	Montgomery Street (SR 82)/Stover Street-Crandall Street	AM	6.4 (EB)	A	5.2 (EB)	A	5.2 (EB)	A	5.2 (EB)	A	17.0 (EB)	C
		PM	11.8 (EB)	B	13.4 (EB)	B	13.4 (EB)	B	13.4 (EB)	B	26.1 (EB)	D
D23	Cahill Street/West San Fernando Street	AM	18.2	C	30.6	D	30.6	D	30.6	D	**44.6****	**E****
		PM	21.5	C	33.1	D	33.1	D	33.1	D	20.3	C
D24	Montgomery Street (SR 82)/West San Fernando Street	AM	16.0	B	17.3	B	17.3	B	17.3	B	37.5	D
		PM	34.5	C	19.4	B	19.4	B	19.4	B	28.9	C
D25	Autumn Street (SR 82)/West San Fernando Street	AM	40.6	D	**139.7****	**F****	**139.7****	**F****	**139.7****	**F****	**92.7****	**F****
		PM	**59.2***	**E***	49.3	D	49.3	D	49.3	D	43.4	D
D26	Almaden Boulevard/West San Fernando Street	AM	39.5	D	40.5	D	40.5	D	40.5	D	39.5	D
		PM	46.6	D	46.4	D	46.4	D	46.4	D	46.6	D
D27	Montgomery Street (SR 82)/Park Avenue	AM	38.1	D	**55.5****	**E****	**55.5****	**E****	**55.5****	**E****	38.1	D
		PM	**149.3***	**F***	**149.2***	**F***	**149.2***	**F***	**149.2***	**F***	**149.3***	**F***
D28	Delmas Avenue/Park Avenue	AM	20.7	C	28.3	C	28.3	C	28.3	C	20.7	C
		PM	44.3	D	47.2	D	47.2	D	47.2	D	44.3	D
D29	Woz Way-SR 87 NB On-ramp/Park Avenue	AM	10.7	B	11.3	B	11.3	B	11.3	B	10.7	B
		PM	30.5	C	34.9	C	34.9	C	34.9	C	30.5	C
D30	Almaden Boulevard/Park Avenue	AM	30.4	C	30.6	C	30.6	C	30.6	C	30.4	C
		PM	38.1	D	38.2	D	38.2	D	38.2	D	38.1	D
D31	Montgomery Street-Bird Avenue (SR 82)/West San Carlos Street (SR 82)	AM	**98.0***	**F***	**111.5****	**F****	**111.5****	**F****	**111.5****	**F****	**98.0***	**F***
		PM	**137.5***	**F***	**138.6***	**F***	**138.6***	**F***	**138.6***	**F***	**137.5***	**F***
D32	Delmas Avenue/West San Carlos Street (SR 82)	AM	15.4	B	17.0	B	17.0	B	17.0	B	15.4	B
		PM	20.4	C	21.2	C	21.2	C	21.2	C	20.4	C
D33	Bird Avenue/Auzerais Avenue	AM	54.3	D	54.8	D	54.8	D	54.8	D	**81.8****	**F****
		PM	**85.8***	**F***	**82.6***	**F***	**82.6***	**F***	**82.6***	**F***	**128.7****	**F****
D34	Delmas Avenue/Auzerais Avenue	AM	21.7	C	22.2	C	22.2	C	22.2	C	21.7	C
		PM	22.6	C	22.6	C	22.6	C	22.6	C	22.6	C
D35	Bird Avenue/I-280 NB ramps	AM	**117.1***	**F***	**122.5****	**F****	**122.5****	**F****	**122.5****	**F****	**106.6***	**F***
		PM	35.0	D	36.2	D	36.2	D	36.2	D	19.2	B
D36	Bird Avenue/I-280 SB ramps	AM	48.7	D	**72.8****	**E****	**72.8****	**E****	**72.8****	**E****	**77.0****	**E****
		PM	13.6	B	12.9	B	12.9	B	12.9	B	11.0	B
D37	Bird Avenue/West Virginia Street	AM	**139.3***	**F***	**151.9****	**F****	**151.9****	**F****	**151.9****	**F****	**>180****	**F****
		PM	25.7	C	24.5	C	24.5	C	24.5	C	27.1	C

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
D38	The Alameda (SR 82)/Julian Street	AM	36.3	D	35.7	D	35.7	D	35.7	D	36.3	D
		PM	36.0	D	35.9	D	35.9	D	35.9	D	36.0	D
D39	Coleman Avenue/I-880 SB ramps	AM	28.7	C	29.1	C	29.1	C	29.1	C	28.7	C
		PM	13.8	B	13.6	B	13.6	B	13.6	B	13.8	B
D40	Coleman Avenue/I-880 NB ramps	AM	**59.2***	**E***	**62.1***	**E***	**62.1***	**E***	**62.1***	**E***	**59.2***	**E***
		PM	32.3	C	33.3	C	33.3	C	33.3	C	32.3	C
D41	Coleman Avenue/Hedding Street	AM	**117.7***	**F***	**115.9***	**F***	**115.9***	**F***	**115.9***	**F***	**117.7***	**F***
		PM	49.1	D	51.1	D	51.1	D	51.1	D	49.1	D
D42	Coleman Avenue/Taylor Street	AM	48.4	D	49.7	D	49.7	D	49.7	D	48.4	D
		PM	54.6	D	**57.0****	**E****	**57.0****	**E****	**57.0****	**E****	54.6	D
D43	Delmas Avenue/West Santa Clara Street	AM	**92.8***	**F***	**145.9****	**F****	**145.9****	**F****	**145.9****	**F****	**92.8***	**F***
		PM	20.1	C	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	20.1	C
D44	Delmas Avenue/West San Fernando Street	AM	43.1	D	40.0	D	40.0	D	40.0	D	43.1	D
		PM	**166.5***	**F***	**171.9****	**F****	**171.9****	**F****	**171.9****	**F****	**166.5***	**F***
D45	Cahill Street/Park Avenue	AM	---	---	7.2	A	7.2	A	7.2	A	---	---
		PM	---	---	8.2	A	8.2	A	8.2	A	---	---
D46	Sunol Avenue/West San Fernando Street	AM	8.4	A	8.8	A	8.8	A	8.8	A	8.4	A
		PM	8.6	A	8.8	A	8.8	A	8.8	A	8.6	A
D47	87 ramps/Taylor Street	AM	35.3	D	35.3	D	35.3	D	35.3	D	35.3	D
		PM	41.2	D	41.2	D	41.2	D	41.2	D	41.2	D
D48	Sunol St/Auzerais Avenue	D48	45.4	D	45.4	D	45.4	D	45.4	D	**68.7****	**E****
			>180*	**F***	**>180****	**F****	**>180****	**F****	**>180****	**F****	**>180****	**F****
D49	Harrison Street/West Virginia Street	D49	6.0 (EB)	A	6.0 (EB)	A	6.0 (EB)	A	6.0 (EB)	A	5.9	A
			6.1 (SB)	A	6.1 (SB)	A	6.1 (SB)	A	6.1 (SB)	A	6.1	A
D50*	**Bird Avenue/Fuller Avenue***	**D50***	**107.8 (WB)***	**F***	**107.8 (WB)***	**F***	**107.8 (WB)***	**F***	**107.8 (WB)***	**F***	**>180.0 (WB)***	**F***
			10.1 (EB)	B	10.1 (EB)	B	10.1 (EB)	B	10.1 (EB)	B	9.7 (EB)	A
Monterey Corridor Subsection												
M1	Monterey Road/Capitol Expressway WB ramps	AM	19.8	B	20.9	C	**72.0****	**E****	20.9	C	19.8	B
		PM	**60.1***	**E***	**130.5****	**F****	**160.8****	**F****	**130.5****	**F****	**60.1***	**E***
M2	Capitol Expressway EB ramps	AM	24.7	C	41.7	D	**97.7****	**F****	41.7	D	24.7	C
		PM	53.1	D	**67.0****	**E****	**85.6****	**F****	**67.0****	**E****	53.1	D
M3 *	**Monterey Road/Senter Road***	**AM***	**110.3***	**F***	**>180.0****	**F****	**131.4****	**F****	**>180.0****	**F****	**110.3***	**F***
		PM*	**77.8***	**E***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**77.8***	**E***
M4 *	**Monterey Road/Skyway Drive***	**AM***	**101.1***	**F***	**>180.0****	**F****	**Variant A:**	**Variant A:**	**>180.0****	**F****	**133.6****	**F****
		PM*	40.3	D	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
							>180.0**	**F****				
							Variant B:	**Variant B:**				
							>180.0**	**F****				
							>180.0**	**F****				

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M5 *	**Houndshaven Way/Skyway Drive***	**AM***	**69.3 (WB)***	**F***	**154.4 (WB)****	**F****	**>180.0 (EB)****	**F****	**154.4 (WB)****	**F****	**69.3 (WB)***	**F***
		PM*	8.3 (WB)	A	**62.6 (WB)****	**F****	**>180.0 (EB)****	**F****	**62.6 (WB)****	**F****	8.3 (WB)	A
M6 *	**Monterey Road/Branham Lane***	**AM***	**>180.0***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
		PM*	**68.2***	**E***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
M7 *	**Houndshaven Way/Branham Lane***	**AM***	30.3 (SB)	D	**>180.0 (SB)****	**F****	**>180.0 (WB)****	**F****	**>180.0 (SB)****	**F****	**43.7 (WB)***	**E***
		PM*	11.0 (SB)	B	10.7 (SB)	B	10.1 (WB)	B	10.7 (SB)	B	9.4 (WB)	A
M8*	**Monterey Road/Bougainvillea Drive***	**AM***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***
		PM*	**68.4 (WB)***	**F***	**43.3 (WB)***	**E***	**99.7 (WB)****	**F****	**43.3 (WB)***	**E***	**68.4 (WB)***	**F***
M9*	**Monterey Road/Chynoweth Avenue-Roeder Road***	**AM***	**143.7***	**F***	**141.9***	**F***	**>180.0***	**F***	**141.9***	**F***	**>180.0****	**F****
		PM*	**156.1***	**F***	**>180.0****	**F****	**175.9***	**F***	**>180.0****	**F***	**>180.0****	**F****
M10	Roeder Road/Azucar Avenue-Vera Lane	AM	**150.6***	**F***	**>180.0****	**F****	19.9	C	**>180.0****	**F****	**>180.0****	**F****
		PM	**110.1***	**F***	**145.7****	**F****	12	B	**145.7****	**F****	**>180.0****	**F****
M11*	**Monterey Road/Blossom Hill Road WB ramps (SR 82)***	**AM***	54.5	D	**81.3****	**F****	**132.2****	**F****	**81.3****	**F****	54.5	D
		PM*	44.5	D	**86.0****	**F****	**93.9****	**F****	**86.0****	**F****	44.5	D
M12*	**Monterey Road/Blossom Hill Road EB ramps (SR 82)***	**AM***	33.7	C	**94.2****	**F****	**119.8****	**F****	**94.2****	**F****	33.7	C
		PM	**59.9***	**E***	**153.4****	**F****	**118.5****	**F****	**153.4****	**F****	**59.9***	**E***
M13	Monterey Road/Ford Road	AM	**140.7***	**F***	**123.0***	**F***	**>180.0****	**F****	**123.0***	**F***	**140.7***	**F***
		PM	31.3	C	38.3	D	**57.8****	**E****	38.3	D	31.3	C
M14	Monterey Road/Flintwell Way	AM	22.3	C	20.9	C	**70.6***	**E***	20.9	C	22.3	C
		PM	19.6	B	13.8	B	15.8	B	13.8	B	19.6	B
M15	Monterey Road/Bernal Road SB ramps	AM	21.0	C	15.2	B	17.1	B	15.2	B	21.0	C
		PM	20.6	C	17.4	B	40.4	D	17.4	B	20.6	C
M16	Monterey Road/Bernal Road NB ramps	AM	15.7	B	5.6	A	8.4	A	5.6	A	15.7	B
		PM	5.2	A	4.0	A	4.3	A	4.0	A	5.2	A
M17*	**Santa Teresa Boulevard/Bernal Road***	AM	32.1	C	30.8	C	30.8	C	30.8	C	32.1	C
		PM*	**56.4***	**E***	**66.7****	**E****	**66.7****	**E****	**66.7****	**E****	**56.4***	**E***
M18*	**Santa Teresa Boulevard/Bailey Avenue***	**AM***	**36.4***	**D***	**55.1****	**E****	**55.1****	**E****	**55.1****	**E****	**36.4***	**D***
		PM*	**>180.0***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0***	**F***
M22*	**Monterey Road/Edenview Drive***	AM	21.8	C	22.9	C	**107.2****	**F****	22.9	C	21.8	C
		PM*	**191.5***	**F***	**178.3***	**F***	**177.3***	**F***	**178.3***	**F***	**191.5***	**F***
M23	US 101 SB ramps/Blossom Hill Road	AM	17.1	B	**63.4****	**E****	24.1	C	**63.4****	**E****	17.1	B
		PM	36.4	D	**107.7****	**F****	**57.3****	**E****	**107.7****	**F****	36.4	D
M24	US 101 NB ramps/Blossom Hill Road	AM	21.7	C	50.6	D	23.2	C	50.6	D	21.7	C
		PM*	43.9	D	**100.5****	**F****	51.5	D	**100.5****	**F****	43.9	D
M25	Bernal Road Overpass/Monterey Road ramp	AM	7.8	A	8.4	A	5.4	A	8.4	A	7.8	A
		PM	8.0	A	8.3	A	51.7	D	8.3	A	8.0	A
M26*	**Snell Avenue/Capitol Expressway***	**AM***	**68.7***	**E***	**72.6***	**E***	**72.6***	**E***	**72.6***	**E***	**68.7***	**E***
		PM	48.2	D	53.3	D	53.3	D	53.3	D	48.2	D

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M27*	**Vistapark Drive/Capitol Expressway***	**AM***	**71.6***	**E***	**72.9***	**E***	**72.9***	**E***	**72.9***	**E***	**71.6***	**E***
		PM*	**115.6***	**F***	**89.1***	**F***	**89.1***	**F***	**89.1***	**F***	**115.6***	**F***
M28*	**Senter Road/Capitol Expressway***	**AM***	**107.1***	**F***	**126.5****	**F****	**126.5****	**F****	**126.5****	**F****	**107.1***	**F***
		PM*	**88.2***	**F***	**78.1***	**E***	**78.1***	**E***	**78.1***	**E***	**88.2***	**F***
M29	Senter Road/Sylvandale Avenue	AM	20.7	C	27.9	C	27.9	C	27.9	C	20.7	C
		PM	14.3	B	14.7	B	14.7	B	14.7	B	14.3	B
M30	Senter Road/Hellyer Avenue	AM	29.8	C	43.0	D	43.0	D	43.0	D	29.8	C
		PM	24.6	C	32.3	C	32.3	C	32.3	C	24.6	C
M31*	**Silver Creek Valley Road/Yerba Buena Road***	**AM***	**58.3***	**E***	**62.2****	**E****	**62.2****	**E****	**62.2****	**E****	**58.3***	**E***
		PM	42.0	D	46.2	D	46.2	D	46.2	D	42.0	D
M32	Vistapark Drive/Branham Lane	AM	43.4	D	46.2	D	46.2	D	46.2	D	43.4	D
		PM	39.6	D	49.9	D	49.9	D	49.9	D	39.6	D
M33	Snell Avenue/Branham Lane	AM	53.8	D	**58.4****	**E****	**58.4****	**E****	**58.4****	**E****	53.8	D
		PM	49.9	D	50.9	D	50.9	D	50.9	D	49.9	D
M34	Snell Avenue/Chynoweth Avenue	AM	37.9	D	40.0	D	40.0	D	40.0	D	37.9	D
		PM	35.3	D	34.6	C	34.6	C	34.6	C	35.3	D
M35	Lean Avenue/Chynoweth Avenue	AM	21.4	C	22.5	C	22.5	C	22.5	C	21.4	C
		PM	18.3	B	18.9	B	18.9	B	18.9	B	18.3	B
M36*	**Snell Avenue/Blossom Hill Road***	AM	**59.3***	**E***	**56.1***	**E***	**56.1***	**E***	**56.1***	**E***	**59.3***	**E***
		PM*	**67.4***	**E***	**77.5****	**E****	**77.5****	**E****	**77.5****	**E****	**67.4***	**E***
M37	Lean Avenue/Blossom Hill Road	AM	48.9	D	**55.6****	**E****	**55.6****	**E****	**55.6****	**E****	48.9	D
		PM	**61.7***	**E***	**56.9***	**E***	**56.9***	**E***	**56.9***	**E***	**61.7***	**E***
M38	Benswick Drive/Blossom Hill Road	AM	22.2	C	20.1	C	20.1	C	20.1	C	22.2	C
		PM	18.2	B	18.8	B	18.8	B	18.8	B	18.2	B
M39	Poughkeepsie Road/Blossom Hill Road	AM	19.5	B	26.1	C	26.1	C	26.1	C	19.5	B
		PM	18.2	B	22.7	C	22.7	C	22.7	C	18.2	B
M40	Cottle Road/Poughkeepsie Road	AM	31.5	C	37.6	D	37.6	D	37.6	D	31.5	C
		PM	51.8	D	**62.6****	**E****	**62.6****	**E****	**62.6****	**E****	51.8	D
M41	Cottle Road/Santa Teresa Boulevard	AM	54.7	D	**55.9****	**E****	**55.9****	**E****	**55.9****	**E****	54.7	D
		PM	44.4	D	50.0	D	50.0	D	50.0	D	44.4	D
M42	Lean Avenue/Santa Teresa Boulevard	AM	30.1	C	25.7	C	25.7	C	25.7	C	30.1	C
		PM	24.5	C	24.8	C	24.8	C	24.8	C	24.5	C
M43	Silver Creek Valley Road/Hellyer Avenue	AM	31.9	C	31.5	C	31.5	C	31.5	C	31.9	C
		PM	30.9	C	28.2	C	28.2	C	28.2	C	30.9	C
M44	Silicon Valley Boulevard/Hellyer Avenue	AM	20.2	C	20.5	C	20.5	C	20.5	C	20.2	C
		PM	17.9	B	18.2	B	18.2	B	18.2	B	17.9	B
M45	Monterey Road/Fehren Drive	AM	11.3	B	13.4	B	7.9	A	13.4	B	11.3	B
		PM	13.1	B	**70.1****	**E****	**101.5****	**F****	**70.1****	**E****	13.1	B

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M48	Park Sommers Way/Skyway Drive	AM	11.4 (SB)	B	11.4 (SB)	B	11.4 (SB)	B	11.4 (SB)	B	**109.9 (SB)***	**F***
		PM	12.7 (SB)	B	12.7 (SB)	B	12.7 (SB)	B	12.7 (SB)	B	21.3 (SB)	C
M49	Park Paxton Place/Skyway Drive	AM	10.6 (NB)	B	10.6 (NB)	B	10.6 (NB)	B	10.6 (NB)	B	**110.0 (NB)***	**F***
		PM	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B	29.5 (NB)	D
M50*	**Saddlebrook Drive/Branham Lane***	AM	**>180 (SB)***	**F***	**>180 (SB)***	**F***	**>180 (SB)***	**F***	**>180 (SB)***	**F***	**>180 (SB)****	**F****
		PM	**>180 (NB)***	**F***	**>180 (NB)***	**F***	**>180 (NB)***	**F***	**>180 (NB)***	**F***	**>180 (NB)****	**F****
M51	Shenado Place/Chynoweth Avenue	AM	20.3 (SB)	C	20.3 (SB)	C	20.3 (SB)	C	20.3 (SB)	C	**66.3 (SB)***	**F***
		PM	13.8 (SB)	B	13.8 (SB)	B	13.8 (SB)	B	13.8 (SB)	B	29.4 (SB)	D
Morgan Hill and Gilroy Subsection												
M19*	**Hale Avenue/Tilton Avenue***	AM	20.4	C	25.5	D	**48.7****	**E****	25.5	D	24.4	C
		PM*	**175.7***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
M20	Hale Avenue/Llagas Road	AM	14.5	B	16.0	B	16.1	B	16.0	B	14.5	B
		PM	19.6	B	21.2	C	21.2	C	21.2	C	19.6	B
M21	Monterey Road/Old Monterey Road	AM	8.6	A	10.3	B	10.2	B	10.3	B	8.6	A
		PM	18.9	B	17.5	B	17.5	B	17.5	B	18.9	B
M46*	**Monterey Road/Tilton Avenue***	**AM***	13.6	B	16.9	B	**47.9****	**E****	16.9	B	20.2	C
		PM*	27.0	C	**88.0****	**F****	**>180.0****	**F****	**88.0****	**F****	44.7	D
M47*	**Monterey Road/Madrone Parkway***	**AM***	9.4	A	34.0	C	**106.7****	**F****	34.0	C	9.4	A
		PM	10.6	B	17.1	B	**91.2****	**F****	17.1	B	10.6	B
M52	Monterey Road/Blanchard Road	AM	3.1	A	3.1	A	3.1	A	3.1	A	8.6	A
		PM	6.4	A	6.4	A	6.4	A	6.4	A	34.3	C
M53	Monterey Road/Palm Avenue	AM	5.2	A	5.2	A	5.2	A	5.2	A	6.0	A
		PM	3.4	A	3.4	A	3.4	A	3.4	A	4.7	A
M54	Dougherty Ave/Tilton Avenue	AM	3.6	A	3.6	A	3.6	A	3.6	A	3.4	A
		PM	30.4	D	30.4	D	30.4	D	30.4	D	29.7	B
M55	Monterey Road/Burnett Avenue	AM	25.0	C	25.0	C	25.0	C	25.0	C	24.4	C
		PM	14.3	B	14.3	B	14.3	B	14.3	B	15.4	B
MH1	Monterey Road/East Dunne Avenue	AM	41.7	D	42.1	D	41.7	D	42.1	D	34.2	D
		PM	35.9	D	34.4	C	36.3	D	34.4	C	40.5	D
MH2*	**Railroad Avenue/Tennant Avenue***	**AM***	13.0 (SB)	B	11.8 (SB)	B	**59.2 (SB)****	**F****	13.0	B	13.0 (SB)	B
		PM*	13.8 (SB)	B	13.8 (SB)	B	**>180.0 (SB)****	**F****	13.8	B	13.8 (SB)	B
MH3	Farmers Market Driveway 1/Tennant Avenue	AM	11.3 (NB)	B	11.3 (NB)	B	9.1 (NB)	A	11.3	B	13.5 (NB)	B
		PM	13.8 (NB)	B	13.8 (NB)	B	9.0 (NB)	A	13.8	B	22.8(NB)	C
MH4	Farmers Market Driveway 2/Tennant Avenue	AM	11.5 (NB)	B	11.5 (NB)	B	---	---	11.5 (NB)	B	15.7(NB)	C
		PM	14.5 (NB)	B	14.5 (NB)	B	---	---	14.5 (NB)	B	30.0 (NB)	D
MH5	Farmers Market Driveway 3/Tennant Avenue	AM	11.8 (NB)	B	11.8 (NB)	B	---	---	11.8 (NB)	B	**36.8 *(NB)**	**E ***
		PM	14.1 (NB)	B	14.1 (NB)	B	---	---	14.1 (NB)	B	**43.9 *(NB)**	**E***
MH6	Monterey Road/San Martin Avenue	AM	28.8	C	28.9	C	13.9	B	29.9	C	44.7	D
		PM	22.7	C	22.6	C	15.8	B	22.2	C	**110.0****	**F****

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
MH7	Depot Road/San Martin Avenue	AM	23.6 (NB)	C	23.6 (NB)	C	7.5	A	28.9	C	**37.2 (NB)***	**E***
		PM	26.5 (NB)	D	26.5 (NB)	D	8.1	A	22.6	C	**64.6 (NB)****	**F****
MH8	Llagas Road/San Martin Avenue	AM	25.2	D	25.2	D	**39.7 (SB)****	**E****	23.6 (NB)	C	33.7	D
		PM	16.9	C	16.9	C	26.6 (SB)	D	26.5 (NB)	D	15.3	C
MH9	Colony Avenue/San Martin Avenue	AM	12.1 (NB)	B	12.1 (NB)	B	19.8 (NB)	C	12.1 (NB)	B	12.1 (NB)	B
		PM	11.1 (NB)	B	12.4 (NB)	B	18.1 (NB)	C	11.1 (NB)	B	11.1 (NB)	B
MH10	Monterey Road/E Main Avenue	AM	**83.6***	**F***	**83.6***	**F***	**83.6***	**F***	**83.6***	**F***	**96.5****	**F****
		PM	**77.3***	**E***	**77.3***	**E***	**77.3***	**E***	**77.3***	**E***	**81.0***	**F***
MH11	Depot St/E Main Avenue	AM	**>180.0 (SB)***	**F ***	**>180.0 (SB)***	**F ***	**>180.0 (SB)***	**F ***	**>180.0 (SB)***	**F ***	**>180.0 (SB)****	**F ****
		PM	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)****	**F****
MH12	Butterfield Blvd/E Main Avenue	AM	**71.2***	**E***	**71.2***	**E***	**71.2***	**E***	**71.2***	**E***	**112.3***	**F***
		PM	43.2	D	43.2	D	43.2	D	43.2	D	48.3	D
MH13	Church Street/East Dunne Avenue	AM	11.3	B	11.3	B	11.3	B	11.3	B	10.1	B
		PM	14.5	B	14.5	B	14.5	B	14.5	B	14.7	B
MH14	Depot Street/East Dunne Avenue	AM	11.6 (SB)	B	11.6 (SB)	B	11.6 (SB)	B	11.6 (SB)	B	13.9 (SB)	B
		PM	16.3 (SB)	B	16.3 (SB)	B	16.3 (SB)	B	16.3 (SB)	B	19.0 (SB)	C
MH15	Butterfield Boulevard/East Dunne Avenue	AM	51.9	D	51.9	D	51.9	D	51.9	D	54.9	D
		PM	**62.0***	**E***	**62.0***	**E***	**62.0***	**E***	**62.0***	**E***	**64.3***	**E***
MH16	Monterey Road/San Pedro Avenue	AM	14.2 (WB)	B	14.2 (WB)	B	14.2 (WB)	B	14.2 (WB)	B	14.8 (WB)	B
		PM	18.2 (WB)	C	18.2 (WB)	C	18.2 (WB)	C	18.2 (WB)	C	15.6 (WB)	B
MH17	Church Street/San Pedro Avenue	AM	12.6	B	12.6	B	12.6	B	12.6	B	14.5	B
		PM	15.8	C	15.8	C	15.8	C	15.8	C	18.4	B
MH18	Railroad Avenue/San Pedro Avenue	AM	10.9 (NB)	B	10.9 (NB)	B	10.9 (NB)	B	10.9 (NB)	B	30.7 (NB)	D
		PM	11.5 (NB)	B	11.5 (NB)	B	11.5 (NB)	B	11.5 (NB)	B	24.3 (NB)	C
MH19	Butterfield Boulevard /San Pedro Avenue	AM	24.6	C	24.6	C	24.6	C	24.6	C	24.9	C
		PM	20.5	C	20.5	C	20.5	C	20.5	C	20.9	C
MH20	Vineyard Boulevard /Tennant Avenue	AM	12.1	B	12.1	B	12.1	B	12.1	B	12.3	B
		PM	21.9	C	21.9	C	21.9	C	21.9	C	23.3	C
MH21	Butterfield Boulevard /Tennant Avenue	AM	**119.9***	**F***	**119.9***	**F***	**119.9***	**F***	**119.9***	**F***	**116.8***	**F***
		PM	**92.9***	**F***	**92.9***	**F***	**92.9***	**F***	**92.9***	**F***	**89.5***	**F***
MH22	Monterey Road/E Middle Avenue	AM	10.3 (WB)	B	10.3 (WB)	B	10.3 (WB)	B	10.3 (WB)	B	14.5 (WB)	B
		PM	7.2 (WB)	A	7.2 (WB)	A	7.2 (WB)	A	7.2 (WB)	A	9.1 (WB)	A
MH23	Crowner Avenue/E Middle Avenue	AM	7.2 (NB)	A	7.2 (NB)	A	7.2 (NB)	A	7.2 (NB)	A	19.4 (NB)	C
		PM	6.5 (NB)	A	6.5 (NB)	A	6.5 (NB)	A	6.5 (NB)	A	14.8 (NB)	B
MH24	Seymour Avenue/E Middle Avenue	AM	5.5 (SB)	A	5.5 (SB)	A	5.5 (SB)	A	5.5 (SB)	A	11.4 (SB)	B
		PM	5.5 (SB)	A	5.5 (SB)	A	5.5 (SB)	A	5.5 (SB)	A	5.7 (SB)	B
MH25	Sewell Avenue/W San Martin Avenue	AM	11.4 (NB)	B	11.4 (NB)	B	11.4 (NB)	B	11.4 (NB)	B	11.8 (NB)	B
		PM	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B	11.1 (NB)	B

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
MH26*	**Monterey Road/Masten Avenue***	AM	**72.1***	**E***	**72.1***	**E***	**72.1***	**E***	**72.1***	**E***	**>180.0****	**F****
		PM*	**122.3***	**F***	**122.3***	**F***	**122.3***	**F***	**122.3***	**F***	**>180.0****	**F****
MH27	Manna Way/Masten Avenue	AM	11.2 (SB)	B	11.2 (SB)	B	11.2 (SB)	B	11.2 (SB)	B	**73.2 (SB)***	**F ***
		PM	**44.1 (SB)***	**E***	**44.1 (SB)***	**E***	**44.1 (SB)***	**E***	**44.1 (SB)***	**E***	**76.2 (SB)***	**F***
G1	Monterey Road/Buena Vista Avenue	AM	**36.1 (WB)***	**E***	**41.7 (WB)****	**E****	**41.7 (WB)****	**E****	**41.0 (WB)****	**E****	**100.1 (WB)****	**F****
		PM	23.2 (WB)	C	26.2 (WB)	D	26.2 (WB)	D	25.3 (WB)	D	**35.6 (WB)****	**E****
G2	US 101 SB ramps/Buena Vista Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G3	No Name Uno/Buena Vista Avenue	AM	8.2	A	8.2	A	8.2	A	8.3	A	8.2	A
		PM	8.5	A	8.5	A	8.5	A	8.5	A	8.5	A
G4	Camino Arroyo (Ext.)/Buena Vista Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G5	Marcella Avenue/Buena Vista Avenue	AM	9.0 (NB)	A	9.0 (NB)	A	9.0 (NB)	A	9.2 (NB)	A	9.0 (NB)	A
		PM	9.1 (NB)	A	9.1 (NB)	A	9.1 (NB)	A	9.3 (NB)	A	9.1 (NB)	A
G6	No Name Uno/Cohansey Avenue	AM	9.4 (WB)	A	9.5 (NB)	A	9.5 (NB)	A	9.5 (NB)	A	9.4 (WB)	A
		PM	10.8 (WB)	B	10.9 (NB)	B	10.9 (NB)	B	10.8 (NB)	B	10.8 (WB)	B
G7	Camino Arroyo (Ext.)/Cohansey Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G8	San Ysidro Avenue/No Name Uno-Las Animas Avenue	AM	10.0 (NB)	B	10 (NB)	B	10 (NB)	B	10.1 (NB)	B	10.0 (NB)	B
		PM	10.8 (NB)	B	10.9 (NB)	B	10.9 (NB)	B	10.8 (NB)	B	10.8 (NB)	B
G9	Camino Arroyo (Ext.)/Las Animas Avenue	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G10	Santa Teresa Boulevard/First Street (SR 152)	AM	27.1	C	28.4	C	---	---	28.2	C	27.1	C
		PM	23.8	C	24.3	C	---	---	24.2	C	23.8	C
G11	Wren Avenue/First Street (SR 152)	AM	25.8	C	26.2	C	26.2	C	26.2	C	25.8	C
		PM	29.8	C	30.2	C	30.2	C	30.2	C	29.8	C
G12	Church Street/First Street (SR 152)	AM	22.0	C	22.5	C	22.5	C	22.6	C	22.0	C
		PM	21.1	C	21.7	C	21.7	C	21.7	C	21.1	C
G13	Monterey Road (SR 152)/First Street (SR 152)	AM	20.9	C	24.1	C	24.1	C	23.2	C	20.9	C
		PM	21.4	C	24.8	C	24.8	C	23.9	C	21.4	C
G14	Church Street/Welburn Avenue	AM	25.4	C	17.4	B	17.5	B	17.0	B	21.1	C
		PM	23.8	C	17.9	B	19.1	B	18.4	B	21.6	C
G15	Monterey Road (SR 152)/Welburn Avenue-Leavesley Road (SR 152)	AM	24.8	C	28.4	C	29.1	C	29.7	C	**64.4****	**E****
		PM	27.7	C	27.5	C	28.6	C	28.3	C	51.6	D
G16	Forest Street/Leavesley Road (SR 152)	AM	11.2	B	11.3	B	12.4	B	11.6	B	10.3	B
		PM	10.0	B	12.6	B	12.4	B	12.3	B	9.2	A
G17	Murray Avenue/Leavesley Road (SR 152)	AM	29.5	C	27.4	C	29.4	C	28.7	C	22.9	C
		PM	32.9	C	31.2	C	30.7	C	31.5	C	24.3	C

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G18	US 101 SB ramps/Leavesley Road (SR 152)	AM	13.3	B	12.5	B	13.0	B	13.6	B	12.2	B
		PM	17.5	B	18.2	B	18.2	B	19.0	B	16.8	B
G19	US 101 NB ramps-San Ysidro Avenue/Leavesley Road (SR 152)	AM	16.5	B	12.8	B	12.6	B	13.5	B	12.3	B
		PM	17.1	B	18.6	B	19.3	B	19.4	B	17.5	B
G20	Arroyo Circle/Leavesley Road	AM	14.1	B	8.2	A	8.3	A	9.7	A	14.1	B
		PM	24.3	C	19.5	B	18.7	B	21.9	C	24.3	C
G21	Camino Arroyo (Ext.)/Leavesley Road	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G22	Cameron Boulevard (Ext.)/Leavesley Road	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G23	Marcella Avenue/Leavesley Road	AM	12.7 (SB)	B	13.1 (SB)	B	12.7 (SB)	B	12.4 (SB)	B	12.7 (SB)	B
		PM	11.2 (SB)	B	11.2 (SB)	B	11.2 (SB)	B	12.4 (SB)	B	11.2 (SB)	B
G24	New Avenue/Leavesley Road	AM	15.2 (SB)	C	15.2 (SB)	C	15.2 (SB)	C	16.0 (SB)	C	15.2 (SB)	C
		PM	18.1 (SB)	C	18.1 (SB)	C	18.1 (SB)	C	18.3 (SB)	C	18.1 (SB)	C
G25*	**Monterey Road/IOOF Avenue***	**AM***	15.6	B	17.4	B	18.3	B	15.9	B	48.7	D
		PM*	5.5	A	5.6	A	5.6	A	5.6	A	12.7	B
G26	Cameron Boulevard (Ext.)/IOOF Avenue (Ext.)	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G27	Monterey Road/Third Street	AM	13.1	B	14.3	B	14.3	B	13.1	B	13.1	B
		PM	12.8	B	13.7	B	13.7	B	12.9	B	12.8	B
G28	Monterey Road/Fifth Street	AM	7.6	A	7.8	A	7.8	A	7.6	A	17.9	C
		PM	8.0	A	8.5	A	8.5	A	8.0	A	23.4	C
G29*	**Monterey Road/Sixth Street***	AM	12.9	B	15.1	B	15.2	B	12.9	B	**90.5****	**F****
		PM*	14.8	B	17.5	B	17.5	B	14.8	B	**179.3****	**F****
G30*	**Railroad Street/Sixth Street***	**AM***	14.6 (NB)	B	15.4 (NB)	C	15.4 (NB)	C	14.6 (NB)	B	**100.0****	**F****
		PM*	15.2 (NB)	C	16.6 (NB)	C	16.6 (NB)	C	15.2 (NB)	C	**123.6****	**F****
G31	Camino Arroyo/Sixth Street-Gilman Road	AM	15.5	B	15.5	B	15.5	B	15.5	B	15.5	B
		PM	21.2	C	21.2	C	21.2	C	21.2	C	21.2	C
G32	Cameron Boulevard (Ext.)/Gilman Road	AM	---	---	---	---	---	---	---	---	---	---
		PM	---	---	---	---	---	---	---	---	---	---
G33	Monterey Road/Seventh Street	AM	9.6	A	10.8	B	14.3	B	9.7	A	8.2	A
		PM	11.2	B	11.9	B	16.0	B	11.2	B	21.5	C
G34	Alexander Street/Old Gilroy Street	AM	8.5	A	9.4	A	9.6	A	8.5	A	7.0	A
		PM	8.5	A	9.2	A	9.2	A	8.5	A	6.4	A
G35	Monterey Road/Eighth Street	AM	8.1	A	8.8	A	8.8	A	8.1	A	5.2	A
		PM	8.6	A	9.7	A	9.7	A	8.6	A	6.1	A
G36	Monterey Road/10th Street	AM	18.3	B	20.8	C	22.7	C	18.2	B	43.8	D
		PM	19.8	B	**94.4****	**F****	**94.4****	**F****	21.6	C	51.0	D

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G37	Alexander Street/10th Street	AM	10.1	B	17.4	B	15.7	B	9.0	A	17.4	B
		PM	18.0	B	**98.7****	**F****	**98.7****	**F****	18.5	B	20.4	C
G38	Chestnut Street/10th Street	AM	26.0	C	34.3	C	33.8	C	26.2	C	22.1	C
		PM	38.9	D	**101.8****	**F****	**101.8****	**F****	46.0	D	31.7	C
G39	US 101 SB ramps/10th Street (SR 152)	AM	7.1	A	7.6	A	7.2	A	6.9	A	7.3	A
		PM	11.0	B	**76.6****	**E****	**76.6****	**E****	11.6	B	12.0	B
G40	US 101 NB ramps/Pacheco Pass Highway (SR 152)	AM	5.4	A	6.0	A	6.0	A	5.4	A	5.5	A
		PM	7.0	A	8.0	A	7.4	A	7.1	A	6.4	A
G41	Camino Arroyo/Pacheco Pass Highway (SR 152)	AM	16.0	B	17.0	B	16.6	B	16.4	B	16.0	B
		PM	31.6	C	42.9	D	32.5	C	42.2	D	31.6	C
G42	Cameron Boulevard/Pacheco Pass Highway (SR 152)	AM	2.8	A	2.8	A	2.8	A	2.8	A	2.8	A
		PM	3.9	A	3.9	A	3.9	A	3.9	A	3.9	A
G43	Monterey Road/Luchessa Avenue	AM	32.7	C	34.1	C	34.0	C	32.7	C	24.4	C
		PM	48.2	D	49.9	D	49.9	D	48.2	D	36.3	D
G44	Monterey Road/US 101 SB ramps	AM	7.0	A	6.8	A	6.8	A	7.0	A	7.0	A
		PM	10.1	B	10.1	B	10.1	B	10.1	B	10.1	B
G45	Monterey Road-Bolsa Road/US 101 NB ramps-Travel Park Circle	AM	14.3	B	14.6	B	14.6	B	14.3	B	14.3	B
		PM	13.8	B	14.0	B	14.0	B	13.8	B	13.8	B
G46	Monterey Road/Las Animas Avenue	AM	13.7	B	14	B	47.1	D	14.5	B	31.4	C
		PM	13.0	B	12.3	B	**60.5****	**E****	12.4	B	23.6	C
G47	Monterey Road/Cohanesey Avenue	AM	33.2 (WB)	D	**35.6 (WB)***	**E***	---	---	34.6 (WB)	D	40.4 (WB)	D
		PM	17.6 (WB)	C	19.0 (WB)	C	---	---	18.7 (WB)	C	32.8 (WB)	C
G48	Monterey Road/Farrell Road	AM	13.8	B	15.0	B	5.2	A	16.8	B	13.8	B
		PM	11.2	B	11.3	B	7.3	A	11.5	B	11.2	B
G49	Monterey Road/Lewis Street	AM	13.5	B	14.5	B	14.0	B	13.5	B	14.8	B
		PM	9.5	A	9.8	A	10.1	B	9.5	A	23.3	C
G50	Monterey Road/Ninth Street	AM	8.1 (WB)	A	10.2 (WB)	B	8.2 (EB)	A	6.1 (EB)	A	9.7	A
		PM	5.4 (WB)	A	**>180.0 (EB)****	**F****	9.6 (EB)	A	14.1 (EB)	B	29.2	D
G51	Alexander Street/Ninth Street	AM	5.3 (WB)	A	8.5	A	8.1	A	5.8 (WB)	A	3.2	A
		PM	6.1 (WB)	A	17.3	B	9.1	A	7.1 (WB)	A	5.7	A
G52	Radtke Avenue/Buena Vista Avenue	AM	5.9 (SB)	A	5.9 (SB)	A	5.9 (SB)	A	5.9 (SB)	A	6.8 (SB)	A
		PM	7.2 (SB)	A	7.2 (SB)	A	7.2 (SB)	A	7.2 (SB)	A	7.5 (SB)	A
G53	School Access/IOOF Avenue	AM	22.3	C	22.3	C	22.3	C	22.3	C	28.8	D
		PM	10.7	B	10.7	B	10.7	B	10.7	B	20.6	C
G54	Frontage Road/Lewis Street	AM	10.6 (SB)	B	10.6 (SB)	B	10.6 (SB)	B	10.6 (SB)	B	25.3 (SB)	D
		PM	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A	9.2 (SB)	A	19.8 (SB)	C
G55	Railroad Street/Lewis Street	AM	6.5 (NB)	A	6.5 (NB)	A	6.5 (NB)	A	6.5 (NB)	A	10.4 (NB)	B
		PM	6.9 (NB)	A	6.9 (NB)	A	6.9 (NB)	A	6.9 (NB)	A	7.0 (NB)	A

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G56	Frontage Road/Martin Avenue	AM	9.5 (SB)	A	9.5 (SB)	A	9.5 (SB)	A	9.5 (SB)	A	33.0 (SB)	D
		PM	12.0 (SB)	B	12.0 (SB)	B	12.0 (SB)	B	12.0 (SB)	B	22.6 (SB)	C
G57	Railroad Street/Martin Avenue	AM	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A	7.9 (SB)	A	7.2 (SB)	A
		PM	7.4 (SB)	A	7.4 (SB)	A	7.4 (SB)	A	7.4 (SB)	A	9.4 (SB)	A
G58	Alexander Street/Sixth Street	AM	16.0	C	16.0	C	16.0	C	16.0	C	**81.0***	**F***
		PM	14.2	B	14.2	B	14.2	B	14.2	B	**113.5****	**F****
G59	Railroad Street/Seventh Street	AM	9.2 (SB)	A	9.2 (SB)	A	---	---	9.2 (SB)	A	---	---
		PM	8.4 (SB)	A	8.4 (SB)	A			8.4 (SB)	A		
G60	Chestnut Street/Luchessa Street	AM	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A	8.7 (SB)	A	21.3 (SB)	C
		PM	9.4 (SB)	A	9.4 (SB)	A	9.4 (SB)	A	9.4 (SB)	A	37.5 (SB)	D
GM1*	**Frazier Lake Road/Pacheco Pass Highway (SR 152)***	**AM***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**90.6 (NB)***	**F***	**>180.0 (NB)***	**F***
		PM*	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***
GM2	Frazier Lake Road/East Gilroy MOWF Driveway	AM	---	---	---	---	---	---	8.5 (NB)	A	---	---
		PM	---	---	---	---	---	---	8.6 (NB)	A	---	---
GM3	Bloomfield Road/South Gilroy MOWF Driveway	AM	---	---	8.6 (SB)	A	8.6 (SB)	A	---	---	8.6 (SB)	A
		PM	---	---	9.5 (SB)	A	9.5 (SB)	A	---	---	9.5 (SB)	A
GM4	SR 25/Bloomfield Avenue	AM	**44.9 (WB)***	**E***	**54.8 (WB)****	**F****	**54.8 (WB)****	**F****	**47.9 (WB)****	**E****	**75.5 (WB)***	**F***
		PM	**51.9 (WB)***	**F***	**144.8 (WB)****	**F****	**144.8 (WB)****	**F****	**107.8 (WB)****	**F****	**96.4 (WB)****	**F***
GM5	Bolsa Road/Bloomfield Avenue	AM	13.8 (EB)	B	13.8 (EB)	B	13.8 (EB)	B	13.8 (EB)	B	28.7 (EB)	D
		PM	17.7 (EB)	C	17.7 (EB)	C	17.7 (EB)	C	17.7 (EB)	C	31.7 (EB)	D
San Joaquin Valley Subsection												
S1	Mercey Springs Road (SR 165)/Henry Miller Avenue	AM	14.5 (EB)	B	16.3 (EB)	C	16.3 (EB)	C	16.3 (EB)	C	16.3 (EB)	C
		PM	18.2 (EB)	C	23.0 (EB)	C	23.0 (EB)	C	23.0 (EB)	C	23.0 (EB)	C
S2	Loop Road/Henry Miller Avenue	AM	---	---	14.3 (SB)	B	14.3 (SB)	B	14.3 (SB)	B	14.3 (SB)	B
		PM	---	---	12.2 (SB)	B	12.2 (SB)	B	12.2 (SB)	B	12.2 (SB)	B

Whole intersection average delay reported for signalized intersections. Whole intersection average delay and worst approach delay (in parentheses) reported for unsignalized intersections.
*Entries **bolded with an asterisk (*)** identify locations with LOS E or F in one or both peak hours. **Shaded** entries bolded with double asterisks (**) identify locations of effects under NEPA as defined by the criteria.*
SR = State Route
I- = Interstate
NB = northbound
SB = southbound
EB = eastbound
WB = westbound
LOS = level of service
MOWF = maintenance of way facility
Ext. = Extension
US = U.S. Highway
--- = Intersection does not exist.

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Table 15 2040 No Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
San Jose Diridon Station Approach Subsection						
D1	The Alameda (SR 82)/I-880 NB ramps	SJ/CT/CMP	Signal	AM PM	21.9 22.7	C C
D2	The Alameda (SR 82)/I-880 SB ramps	SJ/CT/CMP	Signal	AM PM	25.3 19.0	C B
D3	The Alameda (SR 82)/Hedding Street	SJ/CT/CMP	Signal	AM PM	48.9 53.9	D D
D4*	**The Alameda (SR 82)/Taylor Street-Naglee Avenue***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**88.0*** **123.8***	**F*** **F***
D5	The Alameda (SR 82)/Martin Avenue-Race Street	SJ/CT/CMP	Signal	AM PM	42.3 35.7	D D
D6*	**Stockton Avenue/Julian Street***	**SJ***	**Signal***	**AM*** PM	**>180.0*** 52.7	**F*** D
D7	Montgomery Street/Julian Street	SJ	Signal	AM PM	14.1 14.9	B B
D8	Autumn Street/Julian Street	SJ	Signal	AM PM	17.0 17.8	B B
D9	SR 87 SB ramps-Almaden Boulevard/Julian Street	SJ/CT/CMP	Signal	AM PM	21.3 23.1	C C
D10	SR 87 NB ramps/Julian Street	SJ/CT/CMP	Signal	AM PM	53.1 54.8	D D
D11	Sunol Avenue/The Alameda (SR 82)	SJ/CT	Signal	AM PM	21.3 22.4	C C
D12*	**Stockton Avenue/The Alameda-West Santa Clara Street (SR 82)***	**SJ/CT***	**Signal***	**AM*** **PM***	**>180.0*** **>180.0***	**F*** **F***
D13*	**Cahill Street/West Santa Clara Street (SR 82)***	**SJ/CT***	**Signal***	**AM*** **PM***	**55.4*** **75.7***	**E*** **E***
D14	Montgomery Street (SR 82)/West Santa Clara Street (SR 82)	SJ/CT/CMP	Signal	AM PM	29.0 19.7	C B
D15*	**Autumn Street (SR 82)/West Santa Clara Street (SR 82)***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**60.5*** **>180.0***	**E*** **F***
D16*	**SR 87 NB off-ramp/West Santa Clara Street***	**SJ/CT/CMP***	**Signal***	AM **PM***	37.9 **73.2***	D **E***
D17	Almaden Boulevard/West Santa Clara Street	SJ	Signal	AM PM	21.0 29.7	C C
D18	Notre Dame Avenue-Almaden Boulevard/West Santa Clara Street	SJ	Signal	AM PM	31.6 47.6	C D

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
D19	Sunol Avenue/Park Avenue	SJ	Signal	AM PM	10.3 13.0	B B
D20	Sunol Avenue/West San Carlos Street	SJ	Signal	AM PM	14.7 15.9	B B
D21*	**Cahill Street/Stover Street-Crandall Street***	**SJ***	**AWSC***	AM **PM***	16.2 **37.0***	C **E***
D22*	**Montgomery Street (SR 82)/Stover Street-Crandall Street***	**SJ/CT***	**SSSC***	**AM*** **PM***	**76.1 (SB)*** **>180.0 (SB)***	**F*** **F***
D23*	**Cahill Street/West San Fernando Street***	**SJ***	**AWSC***	AM **PM***	19.4 **36.7***	C **E***
D24*	**Montgomery Street (SR 82)/West San Fernando Street***	**SJ/CT***	**Signal***	AM **PM***	28.5 **55.4***	C **E***
D25*	**Autumn Street (SR 82)/West San Fernando Street***	**SJ/CT***	**Signal***	**AM*** **PM***	**>180.0*** **166.5***	**F*** **F***
D26	Almaden Boulevard/West San Fernando Street	SJ	Signal	AM PM	40.2 47.5	D D
D27*	**Montgomery Street (SR 82)/Park Avenue***	**SJ/CT***	**Signal***	AM **PM***	47.1 **174.7***	D **F***
D28*	**Delmas Avenue/Park Avenue***	**SJ***	**Signal***	AM **PM***	25.4 **97.0***	C **F***
D29*	**Woz Way-SR 87 NB on-ramp/Park Avenue***	**SJ/CT***	**Signal***	AM **PM***	11.7 **87.1***	B **F***
D30	Almaden Boulevard/Park Avenue	SJ	Signal	AM PM	30.4 39.1	C D
D31*	**Montgomery Street-Bird Avenue (SR 82)/West San Carlos Street (SR 82)***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**128.9*** **168.0***	**F*** **F***
D32	Delmas Avenue/West San Carlos Street (SR 82)	SJ/CT	Signal	AM PM	15.7 21.2	B C
D33*	**Bird Avenue/Auzerais Avenue***	**SJ***	**Signal***	**AM*** **PM***	**63.7*** **81.9***	**E*** **F***
D34	Delmas Avenue/Auzerais Avenue	SJ	Signal	AM PM	22.5 23.7	C C
D35*	**Bird Avenue/I-280 NB ramps***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**132.2*** **130.7***	**F*** **F***
D36*	**Bird Avenue/I-280 SB ramps***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**72.6*** **56.4***	**E*** **E***
D37*	**Bird Avenue/West Virginia Street***	**SJ***	**Signal***	**AM*** **PM***	**151.8*** **81.2***	**F*** **F***

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
D38	The Alameda (SR 82)/Julian Street	SJ/CT	Signal	AM PM	46.3 46.1	D D
D39	Coleman Avenue/I-880 SB ramps	SJ/CT/CMP	Signal	AM PM	32.1 15.2	C B
D40*	**Coleman Avenue/I-880 NB ramps***	**SJ/CT/CMP***	**Signal***	**AM*** PM	**55.4*** 34.3	**E*** C
D41*	**Coleman Avenue/Hedding Street***	**SJ***	**Signal***	**AM*** **PM***	**138.7*** **76.1***	**F*** **E***
D42*	**Coleman Avenue/Taylor Street***	**SJ***	**Signal***	AM **PM***	54.7 **82.4***	D **F***
D43*	**Delmas Avenue/West Santa Clara Street***	**SJ***	**Future Signal***	**AM*** PM	**160.2*** 52.8	**F*** D
D44*	**Delmas Avenue/West San Fernando Street***	**SJ***	**Signal***	**AM*** **PM***	**55.4*** **264.0***	**E*** **F***
D45	Cahill Street/Park Avenue	SJ	Future Signal	AM PM	--- ---	--- ---
D46	Sunol Avenue/West San Fernando Street	SJ	AWSC	AM PM	8.5 8.7	A A
D47	87 ramps/Taylor Street	SJ/CT/CMP	Signal	AM PM	42.6 48.0	D D
D48*	**Sunol St/Auzerais Avenue***	**SJ***	**Signal***	**AM*** **PM***	**>180.0*** **>180.0***	**F*** **F***
D49	Harrison Street/West Virginia Street	SJ	SSSC	AM PM	9.4 (EB) 6.9 (SB)	A A
D50*	**Bird Avenue/Fuller Avenue***	**SJ***	**SSSC***	**AM*** PM	**161.3 (WB)*** 22.2 (EB)	**F*** C
Monterey Corridor Subsection						
M1*	**Monterey Road/Capitol Expressway WB Ramps***	**SJ/CT/SCCo/CMP***	**Signal***	AM **PM***	54.7 **70.8***	D **E***
M2*	**Monterey Road/Capitol Expressway EB Ramps***	**SJ/CT/SCCo/CMP***	**Signal***	**AM*** **PM***	**59.6*** **55.7***	**E*** **E***
M3*	**Monterey Road/Senter Road***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**137.7*** **155.7***	**F*** **F***
M4*	**Monterey Road/Skyway Drive***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**119.3*** **171.4***	**F*** **F***
M5*	**Houndshaven Way/Skyway Drive***	**SJ***	**SSSC***	**AM*** **PM***	**109.6 (WB)*** **35.2 (WB)***	**F*** **E***
M6*	**Monterey Road/Branham Lane***	**SJ/CT/CMP***	**Signal***	**AM*** **PM***	**>180.0*** **93.9***	**F*** **F***

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
M7*	**Houndshaven Way/Branham Lane***	**SJ***	**SSSC***	**AM***	**51.0 (SB)***	**F***
				PM	9.8 (SB)	A
M8*	**Monterey Road/Bougainvillea Drive***	**SJ/CT***	**SSSC***	**AM***	**>180.0 (WB)***	**F***
				PM*	**106.7 (WB)***	**F***
M9*	**Monterey Road/Chynoweth Avenue-Roeder Road***	**SJ/CT***	**Signal***	**AM***	**147.6***	**F***
				PM*	**175.9***	**F***
M10*	**Roeder Road/Azucar Avenue-Vera Lane***	**SJ***	**AWSC***	**AM***	**178.2***	**F***
				PM*	**137.3***	**F***
M11*	**Monterey Road/Blossom Hill Road WB ramps***	**SJ/CT/CMP***	**Signal***	**AM***	**85.8***	**F***
				PM*	**55.8***	**E***
M12*	**Monterey Road/Blossom Hill Road EB ramps***	**SJ/CT/CMP***	**Signal***	**AM***	**68.5***	**E***
				PM*	**73.3***	**E***
M13*	**Monterey Road/Ford Road***	**SJ***	**Signal***	**AM***	**>180.0***	**F***
				PM	36.2	D
M14*	**Monterey Road/Flintwell Way***	**SJ***	**Signal***	**AM***	**116.7***	**F***
				PM	20.0	B
M15	Monterey Road/Bernal Road SB ramps	SJ/CMP	Signal	AM	23.3	C
				PM	23.2	C
M16	Monterey Road/Bernal Road NB ramps	SJ/CMP	Signal	AM	37.2	D
				PM	5.7	A
M17*	**Santa Teresa Boulevard/Bernal Road***	**SJ/CMP***	**Signal***	AM	33.4	C
				PM*	**68.8***	**E***
M18*	**Santa Teresa Boulevard/Bailey Avenue***	**SJ/SCCo***	**Signal***	**AM***	**80.1***	**F***
				PM*	**>180.0***	**F***
M22*	**Monterey Road/Edenview Drive***	**SJ***	**Signal***	AM	25.0	C
				PM*	**>180.0***	**F***
M23*	**US 101 SB ramps/Blossom Hill Road***	**SJ/CT/CMP***	**Signal***	AM	29.4	C
				PM*	**57.7***	**E***
M24*	**US 101 NB ramps/Blossom Hill Road***	**SJ/CT/CMP***	**Signal***	AM	22.8	C
				PM*	**61.1***	**E***
M25	Bernal Road Overpass/Monterey Road ramp	SJ/CMP	Signal	AM	8.3	A
				PM	8.5	A
M26*	**Snell Avenue/Capitol Expressway***	**SJ/SCCo***	**Signal***	**AM***	**80.2***	**F***
				PM*	**67.7***	**E***
M27*	**Vistapark Drive/Capitol Expressway***	**SJ/SCCo***	**Signal***	**AM***	**95.2***	**F***
				PM*	**129.7***	**F***
M28*	**Senter Road/Capitol Expressway***	**SJ/SCCo***	**Signal***	**AM***	**156.3***	**F***
				PM*	**128.6***	**F***

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
M29	Senter Road/Sylvandale Avenue	SJ	Signal	AM PM	23.9 14.8	C B
M30	Senter Road/Hellyer Avenue	SJ	Signal	AM PM	41.5 31.2	D C
M31*	**Silver Creek Valley Road/Yerba Buena Road***	**SJ***	**Signal***	**AM*** PM	**75.9*** 50.8	**E*** D
M32*	**Vistapark Drive/Branham Lane***	**SJ***	**Signal***	**AM*** **PM***	**69.6*** **70.7***	**E*** **E***
M33*	**Snell Avenue/Branham Lane***	**SJ***	**Signal***	**AM*** **PM***	**65.1*** **55.3***	**E*** **E***
M34	Snell Avenue/Chynoweth Avenue	SJ	Signal	AM PM	40.9 36.2	D D
M35	Lean Avenue/Chynoweth Avenue	SJ	Signal	AM PM	24.9 19.4	C B
M36*	**Snell Avenue/Blossom Hill Road***	**SJ***	**Signal***	**AM*** **PM***	**81.0*** **86.2***	**F*** **F***
M37*	**Lean Avenue/Blossom Hill Road***	**SJ***	**Signal***	**AM*** **PM***	**57.9*** **98.6***	**E*** **F***
M38	Benswick Drive/Blossom Hill Road	SJ	Signal	AM PM	23.7 19.4	C B
M39	Poughkeepsie Road/Blossom Hill Road	SJ	Signal	AM PM	20.7 20.0	C B
M40*	**Cottle Road/Poughkeepsie Road***	**SJ***	**Signal***	AM **PM***	32.5 **59.7***	C **E***
M41*	**Cottle Road/Santa Teresa Boulevard***	**SJ***	**Signal***	**AM*** PM	**81.5*** 50.0	**F*** D
M42	Lean Avenue/Santa Teresa Boulevard	SJ	Signal	AM PM	28.4 27.5	C C
M43	Silver Creek Valley Road/Hellyer Avenue	SJ	Signal	AM PM	32.9 31.6	C C
M44	Silicon Valley Boulevard/Hellyer Avenue	SJ	Signal	AM PM	20.8 18.3	C B
M45	Monterey Road/Fehren Drive	SJ	Signal	AM PM	11.4 28.6	B C
M48	Park Sommers Way/Skyway Drive	SJ	SSSC	AM PM	11.8 (NB) 9.5 (NB)	B A
M49	Park Paxton Place/Skyway Drive	SJ	SSSC	AM PM	11.4 (NB) 10.3 (NB)	B B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
M50*	**Saddlebrook Drive/Branham Lane***	**SJ***	**SSSC***	**AM* PM***	**>180.0 (SB)* >180.0 (NB)***	**F* F***
M51	Shenado Place/Chynoweth Avenue	SJ	SSSC	AM PM	25.0 (SB) 18.4 (SB)	C C
Morgan Hill and Gilroy Subsection						
M19*	**Hale Avenue/Tilton Avenue***	**MH/SCCo***	**AWSC***	AM **PM***	32.7 **>180.0***	D **F***
M20	Hale Avenue/Llagas Road	MH/SCCo	Signal	AM PM	17.1 28.5	B C
M21	Monterey Road/Old Monterey Road	MH	Signal	AM PM	11.4 28.2	B C
M46*	**Monterey Road/Tilton Avenue***	**SCCo***	**Signal***	AM **PM***	17.9 **65.5***	B **E***
M47	Monterey Road/Madrone Parkway	SCCo	Signal	AM PM	18.8 14.4	B B
M52	Monterey Road/Blanchard Road	SCCo	Signal	AM PM	3.4 9.3	A A
M53	Monterey Road/Palm Avenue	SCCo	Signal	AM PM	6.0 3.7	A A
M54	Dougherty Avenue /Tilton Avenue	SCCo	AWSC	AM PM	4.5 **46.7***	A **E***
M55	Monterey Road/Burnett Avenue	SCCo	Signal	AM PM	44.1 17.8	D B
MH1	Monterey Road/East Dunne Avenue	MH	Signal	AM PM	36.0 38.8	D D
MH2	Railroad Avenue/Tennant Avenue	MH	SSSC	AM PM	13.4 (SB) 14.2 (NB)	B B
MH3	Farmers Market Driveway 1/Tennant Avenue	MH	SSSC	AM PM	11.6 (NB) 14.3 (NB)	B B
MH4	Farmers Market Driveway 2/Tennant Avenue	MH	SSSC	AM PM	11.7 (NB) 15.1 (NB)	B B
MH5	Farmers Market Driveway 3/Tennant Avenue	MH	SSSC	AM PM	12.1 (NB) 14.7 (NB)	B B
MH6*	**Monterey Road/San Martin Avenue***	**SM***	**Signal***	**AM* PM**	**58.2*** 37.6	**E*** D
MH7	Depot Road/San Martin Avenue	SM	TWSC	AM PM	26.5 (NB) 33.2 (NB)	D D

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
MH8*	**Llagas Road/San Martin Avenue***	**SM***	**AWSC***	**AM***	**35.1***	**E***
				PM	22.7	C
MH9	Colony Avenue/San Martin Avenue	SM	SSSC	AM	13.1 (NB)	B
				PM	11.7 (SB)	B
MH10	Monterey Road/E Main Avenue	MH	Signal	AM	**136.0***	**F***
				PM	**151.1***	**F***
MH11	Depot Street/E Main Avenue	MH	SSSC	AM	**>180.0 (SB)***	**F***
				PM	**>180.0 (NB)***	**F***
MH12	Butterfield Boulevard/E Main Avenue	MH	Signal	AM	**173.0***	**F***
				PM	**103.9***	**F***
MH13	Church Street/East Dunne Avenue	MH	SSSC	AM	10.6	B
				PM	18.1	B
MH14	Depot St/East Dunne Avenue	MH	Signal	AM	12.8 (SB)	B
				PM	21.1 (SB)	C
MH15	Butterfield Boulevard/East Dunne Avenue	MH	SSSC	AM	**163.5***	**F***
				PM	**66.5***	**E***
MH16	Monterey Road/San Pedro Avenue	MH	AWSC	AM	14.0 (WB)	B
				PM	17.3 (WB)	C
MH17	Church Street/San Pedro Avenue	MH	SSSC	AM	13.7	B
				PM	19.5	C
MH18	Railroad Avenue/San Pedro Avenue	MH	Signal	AM	11.8 (NB)	B
				PM	11.7 (NB)	B
MH19	Butterfield Boulevard/San Pedro Avenue	MH	Signal	AM	26.9	C
				PM	21.8	C
MH20	Vineyard Boulevard/Tennant Avenue	MH	SSSC	AM	12.0	B
				PM	23.5	C
MH21	Butterfield Boulevard/Tennant Avenue	MH	Signal	AM	**149.4***	**F***
				PM	**109.1***	**F***
MH22	Monterey Road/E Middle Avenue	SCCo	SSSC	AM	14.2 (WB)	B
				PM	7.8 (WB)	A
MH23	Crowner Avenue/E Middle Avenue	SCCo	SSSC	AM	7.6 (NB)	A
				PM	7.3 (NB)	A
MH24	Seymour Avenue/E Middle Avenue	SCCo	SSSC	AM	5.4 (SB)	A
				PM	5.5 (SB)	A
MH25	Sewell Avenue/W San Martin Avenue	SCCo	SSSC	AM	13.4 (NB)	B
				PM	10.8 (NB)	B
MH26	Monterey Road/Masten Avenue	SCCo	Signal	AM	37.0	D
				PM	45.7	D

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
MH27	Manna Way/Masten Avenue	SCCo		AM	9.0 (SB)	A
			SSSC	PM	11.4 (SB)	B
G1	Monterey Road/Buena Vista Avenue	SCCo	Signal	AM	19.6	B
				PM	7.8	A
G2	US 101 SB ramps/Buena Vista Avenue	G/SCCo/CT	Signal	AM	6.1	A
				PM	8.4	A
G3	No Name Uno/Buena Vista Avenue	SCCo	Signal	AM	16.1	B
				PM	11.4	B
G4	Camino Arroyo (Ext.)/Buena Vista Avenue	G/SCCo	SSSC	AM	12.9 (NB)	B
				PM	14.4 (NB)	B
G5	Marcella Avenue/Buena Vista Avenue	SCCo	SSSC	AM	11.0 (NB)	B
				PM	13.8 (NB)	B
G6	No Name Uno/Cohansey Avenue	SCCo	SSSC	AM	10.0 (WB)	B
				PM	10.1 (WB)	B
G7	Camino Arroyo (Ext.)/Cohansey Avenue	G/SCCo	SSSC	AM	9.9 (WB)	A
				PM	10.2 (WB)	B
G8	San Ysidro Avenue/No Name Uno-Las Animas Avenue	SCCo	SSSC	AM	12.4 (EB)	B
				PM	14.1 (WB)	B
G9	Camino Arroyo (Ext.)/Las Animas Avenue	G/SCCo	SSSC	AM	10.6 (NB)	B
				PM	10 (NB)	B
G10	Santa Teresa Boulevard/First Street (SR 152)	G/CT/SCCo	Signal	AM	50.8	D
				PM	52.2	D
G11	Wren Avenue/First Street (SR 152)	G/CT	Signal	AM	35.5	D
				PM	37.6	D
G12	Church Street/First Street (SR 152)	G/CT	Signal	AM	36.4	D
				PM	29.2	C
G13	Monterey Road (SR 152)/First Street (SR 152)	G/CT	Signal	AM	36.8	D
				PM	33.5	C
G14	Church Street/Welburn Avenue	G/SCCo/CT	Signal	AM	28.4	C
				PM	21.5	C
G15	Monterey Road (SR 152)/Welburn Avenue-Leavesley Road (SR 152)	G	Signal	AM	39.3	D
				PM	36.6	D
G16	Forest Street/Leavesley Road (SR 152)	G/CT/CMP	Signal	AM	13.7	B
				PM	13.4	B
G17	Murray Avenue/Leavesley Road (SR 152)	G/CT	Signal	AM	30.4	C
				PM	36.1	D
G18	US 101 SB ramps/Leavesley Road (SR 152)	G/CT	Signal	AM	12.1	B
				PM	17.2	B
G19	US 101 NB ramps-San Ysidro Avenue/Leavesley Road (SR 152)	G/CT	Signal	AM	12.2	B
				PM	19.3	B

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
G20	Arroyo Circle/Leavesley Road	G/CT	Signal	AM PM	8.5 17.2	A B
G21	Camino Arroyo (Ext.)/Leavesley Road	G/SCCo	SSSC	AM PM	10.7 (SB) 11.4 (NB)	B B
G22	Cameron Boulevard (Ext.)/Leavesley Road	G/SCCo	SSSC	AM PM	10.0 (NB) 10.8 (NB)	B B
G23	Marcella Avenue/Leavesley Road	G/SCCo	SSSC	AM PM	9.7 (SB) 9.7 (SB)	A A
G24*	**New Avenue/Leavesley Road***	**G/SCCo***	**SSSC***	AM **PM***	10.4 (SB) **44.1 (SB)***	B **E***
G25	Monterey Road/IOOF Avenue	G/SCCo	SSSC	AM PM	40.5 9.1	D A
G26	Cameron Boulevard (Ext.)/IOOF Avenue (Ext.)	G	SSSC/ Signal	AM PM	8.7 (EB) 8.7 (EB)	A A
G27	Monterey Road/Third Street	G/SCCo	Signal	AM PM	14.3 16.7	B B
G28	Monterey Road/Fifth Street	G	Signal	AM PM	9.1 11.5	A B
G29	Monterey Road/Sixth Street	G	Signal	AM PM	17.2 38.8	B D
G30	Railroad Street/Sixth Street	G	SSSC	AM PM	14.8 (NB) 17.2 (SB)	B C
G31	Camino Arroyo/Sixth Street-Gilman Road	G	Signal	AM PM	16.0 23.8	B C
G32	Cameron Boulevard (Ext.)/Gilman Road	G/SCCo	TBD	AM PM	9.9 (SB) 9.8 (SB)	A A
G33	Monterey Road/Seventh Street	G/SCCo	Signal	AM PM	11.1 13.7	B B
G34	Alexander Street/Old Gilroy Street	G	AWSC	AM PM	10.4 (EB) 10.0 (WB)	B A
G35	Monterey Road/Eighth Street	G	Signal	AM PM	9.7 11.0	A B
G36	Monterey Road/10th Street	G	Signal	AM PM	19.6 27.1	B C
G37	Alexander Street/10th Street	G	Signal	AM PM	11.8 31.9	B C
G38*	**Chestnut Street/10th Street***	**G***	**Signal***	AM PM	26.0 **71.6***	C **E***
G39	US 101 SB ramps/10th Street (SR 152)	G	Signal	AM PM	5.9 9.4	A A

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
G40	US 101 NB ramps/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	5.5 6.7	A A
G41	Camino Arroyo/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	18.5 27.5	B C
G42	Cameron Boulevard/Pacheco Pass Highway (SR 152)	G/CT	Signal	AM PM	7.7 8.8	A A
G43*	**Monterey Road/Luchessa Avenue***	**G/CT***	**Signal***	AM **PM***	40.1 **55.6***	D **E***
G44	Monterey Road/US 101 SB ramps	G/CT	Signal	AM PM	8.4 10.1	A B
G45	Monterey Road-Bolsa Road/US 101 NB Ramps-Travel Park Circle	G/CT	Signal	AM PM	19.0 14.8	B B
G46	Monterey Road/Las Animas Avenue	G/CT	Signal	AM PM	20.6 16.6	C B
G47*	**Monterey Road/Cohanesey Avenue***	**G***	**SSSC***	**AM*** PM	**46.1 (WB)*** 20.2 (WB)	**E*** C
G48	Monterey Road/Farrell Road	G	Signal	AM PM	18.8 14.5	B B
G49	Monterey Road/Lewis Street	G	Signal	AM PM	14.2 10.6	B B
G50	Monterey Road/Ninth Street	G	SSSC/ Signal (Alts 1, 2 & 4)	AM PM	6.1 (EB) 5.3 (EB)	A A
G51	Alexander Street/Ninth Street	G	SSSC	AM PM	5.4 (WB) 5.8 (WB)	A A
G52	Radtke Avenue/Buena Vista Avenue	G	SSSC	AM PM	8.0 (SB) 7.5 (SB)	A A
G53	School Access/IOOF Avenue	G	AWSC	AM PM	**39.1*** 11.8	**E*** B
G54	Frontage Road/Lewis Street	G	SSSC	AM PM	9.4 (SB) 17.2 (SB)	A C
G55	Railroad Street/Lewis Street	G	SSSC	AM PM	6.7 (NB) 7.6 (NB)	A A
G56	Frontage Road/Martin Avenue	G	SSSC	AM PM	11.8 (SB) 7.6 (SB)	B A
G57	Railroad Street/Martin Avenue	G	SSSC	AM PM	6.9(SB) 8.6 (SB)	A A
G58	Alexander Street/Sixth Street	G	AWSC	AM PM	13.3 17.3	B C

Intersection		Jurisdiction(s)	Control	Peak Hour	Delay (seconds)	LOS
G59	Railroad Street/Seventh Street	G	SSSC	AM PM	12.9 (SB) 8.3 (SB)	B A
G60	Chestnut Street/Luchessa Street	G	SSSC	AM PM	9.3 (SB) 10.2 (SB)	A B
GM1	**Frazier Lake Road/Pacheco Pass Highway (SR 152)***	G/SCCo/CT	SSSC	AM PM	**>180.0* (NB)*** **>180.0 (NB)***	**F*** **F***
GM2	Frazier Lake Road/East Gilroy MOWF Driveway	G/SCCo/CT	TBD	AM PM	--- ---	--- ---
GM3	Bloomfield Road/South Gilroy MOWF Driveway	G/SCCo/CT	TBD	AM PM	--- ---	--- ---
GM4	**SR 25/Bloomfield Avenue***	G/SCCo/CT	SSC	AM PM	**53.9 (WB)*** **63.8 (WB)***	**F*** **F***
GM5	Bolsa Road/Bloomfield Avenue	G/SCCo/CT	SSSC	AM PM	13.7 (EB) 18.4 (EB)	B C
San Joaquin Valley Subsection						
S1*	**Mercey Springs Road (SR 165)/Henry Miller Avenue***	**LB/MCo/CT***	**AWSC***	**AM*** **PM***	14.5 **58.2***	B **F***

Whole intersection average delay reported for signalized intersections. Whole intersection average delay and worst approach delay (in parentheses) reported for unsignalized intersections.
Entries **bolded with an asterisk (*)** identify location experience LOS E or F in one or both peak hours.
LOS = level of service
SR = State Route
I- = Interstate
NB = northbound
SB = southbound
EB = eastbound
WB = westbound
SJ = City of San Jose
CT= California Department of Transportation
CMP = Congestion Management Plan
MH = City of Morgan Hill
G = City of Gilroy
SCCo = Santa Clara County
LB = City of Los Banos
MCo = Merced County
SSSC = side street stop controlled
AWSC = all-way stop controlled
Alts = alternatives
TBD = to be determined
MOWF = maintenance of way facility
Ext. = Extension
--- = Intersection does not exist

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Table 16 2040 No Project and Plus Project Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
San Jose Diridon Station Approach Subsection												
D1	The Alameda (SR 82)/I-880 NB ramps	AM	21.9	C	24.2	C	24.2	C	24.2	C	21.9	C
		PM	22.7	C	25.1	C	25.1	C	25.1	C	22.7	C
D2	The Alameda (SR 82)/I-880 SB ramps	AM	25.3	C	25.3	C	25.3	C	25.3	C	25.3	C
		PM	19.0	B	19.0	B	19.0	B	19.0	B	19.0	B
D3	The Alameda (SR 82)/Hedding Street	AM	48.9	D	49.8	D	49.8	D	49.8	D	48.9	D
		PM	53.9	D	54.6	D	54.6	D	54.6	D	53.9	D
D4	The Alameda (SR 82)/Taylor Street-Naglee Avenue	AM	**88.0***	**F***	**94.4****	**F****	**94.4****	**F****	**94.4****	**F****	**88.0***	**F***
		PM	**123.8***	**F***	**133.4****	**F****	**133.4****	**F****	**133.4****	**F****	**123.8***	**F***
D5	The Alameda (SR 82)/Martin Avenue-Race Street	AM	42.3	D	54.8	D	54.8	D	54.8	D	42.3	D
		PM	35.7	D	41.0	D	41.0	D	41.0	D	35.7	D
D6	Stockton Avenue/Julian Street	AM	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180*.0***	**F***	**>180.0***	**F***
		PM	52.7	D	53.4	D	53.4	D	53.4	D	52.7	D
D7	Montgomery Street/Julian Street	AM	14.1	B	14.2	B	14.2	B	14.2	B	14.1	B
		PM	14.9	B	14.9	B	14.9	B	14.9	B	14.9	B
D8	Autumn Street/Julian Street	AM	17.0	B	19.8	B	19.8	B	19.8	B	17.0	B
		PM	17.8	B	20.8	C	20.8	C	20.8	C	17.8	B
D9	SR 87 SB ramps-Almaden Boulevard/Julian Street	AM	21.3	C	29.0	C	29.0	C	29.0	C	21.3	C
		PM	23.1	C	29.9	C	29.9	C	29.9	C	23.1	C
D10	SR 87 NB ramps/Julian Street	AM	53.1	D	53.1	D	53.1	D	53.1	D	53.1	D
		PM	54.8	D	54.8	D	54.8	D	54.8	D	54.8	D
D11	Sunol Avenue/The Alameda (SR 82)	AM	21.3	C	24.3	C	24.3	C	24.3	C	21.3	C
		PM	22.4	C	24.5	C	24.5	C	24.5	C	22.4	C
D12	Stockton Avenue/The Alameda-West Santa Clara Street (SR 82)	AM	**>180.0***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
		PM	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0****	**F****
D13	Cahill Street/West Santa Clara Street (SR 82)	AM	**55.4***	**E***	54.6	D	54.6	D	54.6	D	**60.7****	**E****
		PM	**75.7***	**E***	**80.0****	**F****	**80.0****	**F****	**80.0****	**F****	**71.2***	**E***
D14	Montgomery Street (SR 82)/West Santa Clara Street (SR 82)	AM	29.0	C	44.5	D	44.5	D	44.5	D	26.9	
		PM	19.7	B	41.6	D	41.6	D	41.6	D	36.3	
D15	Autumn Street (SR 82)/West Santa Clara Street (SR 82)	AM	**60.5***	**E***	**72.4****	**E****	**72.4****	**E****	**72.4****	**E****	**84.0***	**F***
		PM	**>180.0***	**F***	**174.2***	**F***	**174.2***	**F***	**174.2***	**F***	**>180.0***	**F***
D16	SR 87 NB Off-ramp/West Santa Clara Street	AM	37.9	D	43.3	D	43.3	D	43.3	D	37.9	D
		PM	**73.2***	**E***	**73.6***	**E***	**73.6***	**E***	**73.6***	**E***	**73.2***	**E***
D17	Almaden Boulevard/West Santa Clara Street	AM	21.0	C	20.7	C	20.7	C	20.7	C	21.0	C
		PM	29.7	C	30.7	C	30.7	C	30.7	C	29.7	C
D18	Notre Dame Avenue-Almaden Boulevard/West Santa Clara Street	AM	31.6	C	33.9	C	33.9	C	33.9	C	31.6	C
		PM	47.6	D	44.0	D	44.0	D	44.0	D	47.6	D

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
D19	Sunol Avenue/Park Avenue	AM	10.3	B	10.4	B	10.4	B	10.4	B	10.3	B
		PM	13.0	B	13.2	B	13.2	B	13.2	B	13.0	B
D20	Sunol Avenue/West San Carlos Street	AM	14.7	B	14.6	B	14.6	B	14.6	B	14.7	B
		PM	15.9	B	15.9	B	15.9	B	15.9	B	15.9	B
D21	Cahill Street/Stover Street-Crandall Street	AM	16.2	C	**130.9****	**F****	**130.9****	**F****	**130.9****	**F****	**105.6****	**F****
		PM	**37.0***	**E***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**61.6***	**F***
D22	Montgomery Street (SR 82)/Stover Street-Crandall Street	AM	**76.1 (SB)***	**F***	**63.9 (SB)***	**F***	**63.9 (SB)***	**F***	**63.9 (SB)***	**F***	**>180.0 (SB)****	**F****
		PM	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**98.4 (SB)****	**F****
D23	Cahill Street/West San Fernando Street	AM	19.4	C	**45.3****	**E****	**45.3****	**E****	**45.3****	**E****	**79.9****	**F****
		PM	**36.7***	**E***	**56.5****	**F****	**56.5****	**F****	**56.5****	**F****	**42.3****	**E****
D24	Montgomery Street (SR 82)/West San Fernando Street	AM	28.5	C	42.6	D	42.6	D	42.6	D	**67.6****	**E****
		PM	**55.4***	**E***	**59.2***	**E***	**59.2***	**E***	**59.2***	**E***	29.2	C
D25	Autumn Street (SR 82)/West San Fernando Street	AM	**>180.0***	**F***	**162.5***	**F***	**162.5***	**F***	**162.5***	**F***	**80.6***	**F***
		PM	**166.5***	**F***	**175.0****	**F****	**175.0****	**F****	**175.0****	**F****	**92.8***	**F***
D26	Almaden Boulevard/West San Fernando Street	AM	40.2	D	41.1	D	41.1	D	41.1	D	40.2	D
		PM	47.5	D	47.4	D	47.4	D	47.4	D	47.5	D
D27	Montgomery Street (SR 82)/Park Avenue	AM	**47.1***	**D***	**75.7****	**E****	**75.7****	**E****	**75.7****	**E****	**47.1***	**D***
		PM	**174.7***	**F***	**150.4***	**F***	**150.4***	**F***	**150.4***	**F***	**174.7***	**F***
D28	Delmas Avenue/Park Avenue	AM	25.4	C	31.5	C	31.5	C	31.5	C	25.4	C
		PM	**97.0***	**F***	**70.1***	**E***	**70.1***	**E***	**70.1***	**E***	**97.0***	**F***
D29	Woz Way-SR 87 NB On-ramp/Park Avenue	AM	11.7	B	11.8	B	11.8	B	11.8	B	11.7	B
		PM	**87.1***	**F***	54.9	D	54.9	D	54.9	D	**87.1***	**F***
D30	Almaden Boulevard/Park Avenue	AM	30.4	C	30.6	C	30.6	C	30.6	C	30.4	C
		PM	39.1	D	39.2	D	39.2	D	39.2	D	39.1	D
D31	Montgomery Street-Bird Avenue (SR 82)/West San Carlos Street (SR 82)	AM	**128.9***	**F***	**139.3****	**F****	**139.3****	**F****	**139.3****	**F****	**128.9***	**F***
		PM	**168.0***	**F***	**143.2***	**F***	**143.2***	**F***	**143.2***	**F***	**168.0***	**F***
D32	Delmas Avenue/West San Carlos Street (SR 82)	AM	15.7	B	17.2	B	17.2	B	17.2	B	15.7	B
		PM	21.2	C	21.9	C	21.9	C	21.9	C	21.2	C
D33	Bird Avenue/Auzerais Avenue	AM	**63.7***	**E***	**66.3***	**E***	**66.3***	**E***	**66.3***	**E***	**88.4****	**F****
		PM	**81.9***	**F***	**72.6***	**E***	**72.6***	**E***	**72.6***	**E***	**128.5****	**F****
D34	Delmas Avenue/Auzerais Avenue	AM	22.5	C	23.1	C	23.1	C	23.1	C	22.5	C
		PM	23.7	C	24.0	C	24.0	C	24.0	C	23.7	C
D35	Bird Avenue/I-280 NB ramps	AM	**132.2***	**F***	**137.2****	**F****	**137.2****	**F****	**137.2****	**F****	**135.2***	**F***
		PM	**130.7***	**F***	**95.5***	**F***	**95.5***	**F***	**95.5***	**F***	**77.3***	**E***
D36	Bird Avenue/I-280 SB ramps	AM	**72.6***	**E***	**80.2****	**F****	**80.2****	**F****	**80.2****	**F****	**97.2****	**F****
		PM	**56.4***	**E***	40.8	D	40.8	D	40.8	D	37.1	D
D37	Bird Avenue/West Virginia Street	AM	**151.8***	**F***	**157.3****	**F****	**157.3****	**F****	**157.3****	**F****	**>180.0****	**F****
		PM	**81.2***	**F***	**66.8***	**E***	**66.8***	**E***	**66.8***	**E***	**70.8***	**E***

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
D38	The Alameda (SR 82)/Julian Street	AM	46.3	D	46.7	D	46.7	D	46.7	D	46.3	D
		PM	46.1	D	47.1	D	47.1	D	47.1	D	46.1	D
D39	Coleman Avenue/I-880 SB ramps	AM	32.1	C	33.0	C	33.0	C	33.0	C	32.1	C
		PM	15.2	B	15.2	B	15.2	B	15.2	B	15.2	B
D40	Coleman Avenue/I-880 NB ramps	AM	**55.4***	**E***	**59.2***	**E***	**59.2***	**E***	**59.2***	**E***	**55.4***	**E***
		PM	34.3	C	35.4	D	35.4	D	35.4	D	34.3	C
D41	Coleman Avenue/Hedding Street	AM	**138.7***	**F***	**145.5****	**F****	**145.5****	**F****	**145.5****	**F****	**138.7***	**F***
		PM	**76.1***	**E***	**81.6****	**F****	**81.6****	**F****	**81.6****	**F****	**76.1***	**E***
D42	Coleman Avenue/Taylor Street	AM	54.7	D	**58.2****	**E****	**58.2****	**E****	**58.2****	**E****	54.7	D
		PM	**82.4***	**F***	**87.7****	**F****	**87.7****	**F****	**87.7****	**F****	**82.4***	**F***
D43	Delmas Avenue/West Santa Clara Street	AM	**160.2***	**F***	**128.4***	**F***	**128.4***	**F***	**128.4***	**F***	**160.2***	**F***
		PM	52.8	D	**178.4****	**F****	**178.4****	**F****	**178.4****	**F****	52.8	D
D44	Delmas Avenue/West San Fernando Street	AM	**55.4***	**E***	**69.1****	**E****	**69.1****	**E****	**69.1****	**E****	**55.4***	**E***
		PM	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***
D45	Cahill Street/Park Avenue	AM	---	---	7.1	A	7.1	A	7.1	A	---	---
		PM	---	---	7.5	A	7.5	A	7.5	A	---	---
D46	Sunol Avenue/West San Fernando Street	AM	8.5	A	8.9	A	8.9	A	8.9	A	8.5	A
		PM	8.7	A	8.9	A	8.9	A	8.9	A	8.7	A
D47	87 ramps/Taylor Street	AM	42.6	D	42.6	D	42.6	D	42.6	D	42.6	D
		PM	48.0	D	48.0	D	48.0	D	48.0	D	48.0	D
D48	Sunol St/Auzerais Avenue	D48	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0****	**F****
			>180.0*	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0***	**F***	**>180.0****	**F****
D49	Harrison Street/West Virginia Street	D49	9.4 (EB)	A	9.4 (EB)	A	9.4 (EB)	A	9.4 (EB)	A	6.1 (EB)	A
			6.9 (SB)	A	6.9 (SB)	A	6.9 (SB)	A	6.9 (SB)	A	7.8 (SB)	A
D50*	**Bird Avenue/Fuller Avenue***	**D50***	**161.3 (WB)***	**F***	**161.3 (WB)***	**F***	**161.3 (WB)***	**F***	**161.3 (WB)***	**F***	**>180.0 (WB)***	**F***
			22.2 (EB)	C	22.2 (EB)	C	22.2 (EB)	C	22.2 (EB)	C	**40.6 (EB)***	**E***
Monterey Corridor Subsection*												
M1	Monterey Road/Capitol Expressway WB ramps	AM	54.7	D	**81.7****	**F****	**97.0****	**F****	**81.7****	**F****	54.7	D
		PM	**70.8***	**E***	**142.8****	**F****	**174.7****	**F****	**142.8****	**F****	**70.8***	**E***
M2	Capitol Expressway EB ramps	AM	**59.6***	**E***	**104.3****	**F****	**116.0****	**F****	**104.3****	**F****	**59.6***	**E***
		PM	**55.7***	**E***	**83.9****	**F****	**97.2****	**F****	**83.9****	**F****	**55.7***	**E***
M3*	**Monterey Road/Senter Road***	**AM***	**137.7***	**F***	**178.0****	**F****	**127.7***	**F***	**178.0****	**F****	**137.7***	**F***
		PM*	**155.7***	**F***	**>180.0****	**F****	**179.5***	**F***	**>180.0****	**F****	**155.7***	**F***
M4*	**Monterey Road/Skyway Drive***	**AM***	**119.3***	**F***	**>180.0****	**F****	**Variant A:**	**Variant A:**	**>180.0****	**F****	**139.9****	**F****
		PM*	**171.4***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
							>180.0**	**F****				
							Variant B:	**Variant B:**				
							>180.0**	**F****				
							>180.0**	**F****				

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M5*	**Houndshaven Way/Skyway Drive***	**AM***	**109.6 (WB)***	**F***	**>180.0 (WB)****	**F****	**>180.0 (WB)****	**F****	**>180.0 (WB)****	**F****	**109.6 (WB)***	**F***
		PM*	**35.2 (WB)***	**E***	**>180.0 (WB)****	**F****	**>180.0 (WB)****	**F****	**>180.0 (WB)****	**F****	**35.2 (WB)***	**E***
M6*	**Monterey Road/Branham Lane***	**AM***	**>180.0***	**F***	**>180.0***	**F***	**>180.0****	**F****	**>180.0***	**F***	**>180.0****	**F****
		PM*	**93.9***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****
M7*	**Houndshaven Way/Branham Lane***	**AM***	**51.0 (SB)***	**F***	**171.6 (SB)****	**F****	**43.8 (SB)****	**E****	**171.6 (SB)****	**F****	**109.3 (SB)***	**F***
		PM*	9.8 (SB)	A	8.5 (SB)	A	12.6 (SB)	B	8.5 (SB)	A	10.0 (SB)	B
M8*	**Monterey Road/Bougainvillea Drive***	**AM***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***	**>180.0 (WB)***	**F***
		PM*	**106.7 (WB)***	**F***	**175.2 (WB)***	**F***	**175.2 (WB)***	**F***	**175.2 (WB)***	**F***	**106.7 (WB)***	**F***
M9*	**Monterey Road/Chynoweth Avenue-Roeder Road***	**AM***	**147.6***	**F***	**165.6***	**F***	**>180.0***	**F***	**165.6***	**F***	**>180.0****	**F****
		PM*	**175.9***	**F***	**177.9****	**F****	**178.0****	**F****	**177.9****	**F****	**>180.0****	**F****
M10	Roeder Road/Azucar Avenue-Vera Lane	AM	**178.2***	**F***	**>180.0****	**F****	30.8	D	**>180.0****	**F****	**>180.0****	**F****
		PM	**137.3***	**F***	**150.9****	**F****	15.7	C	**150.9****	**F****	**>180.0****	**F****
M11*	**Monterey Road/Blossom Hill Road WB ramps (SR 82)***	**AM***	**85.8***	**F***	**87.2***	**F***	**104.2***	**F***	**87.2***	**F***	**85.8***	**F***
		PM*	**55.8***	**E***	47.1	D	**98.9***	**F***	47.1	D	**55.8***	**E***
M12*	**Monterey Road/Blossom Hill Road EB ramps (SR 82)***	**AM***	**68.5***	**E***	**108.0****	**F****	**123.0****	**F****	**108.0****	**F****	**68.5***	**E***
		PM	**73.3***	**E***	**176.7****	**F****	**151.1****	**F****	**176.7****	**F****	**73.3***	**E***
M13	Monterey Road/Ford Road	AM	**>180.0***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0***	**F***
		PM	36.2	D	**156.0****	**F****	53.2	D	**156.0****	**F****	36.2	D
M14	Monterey Road/Flintwell Way	AM	**116.7***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**116.7***	**F***
		PM	20.0	B	20.9	C	17.9	B	20.9	C	20.0	B
M15	Monterey Road/Bernal Road SB ramps	AM	23.3	C	18.3	B	41.8	D	18.3	B	23.3	C
		PM	23.2	C	21.2	C	44.0	D	21.2	C	23.2	C
M16	Monterey Road/Bernal Road NB ramps	AM	37.2	D	6.6	A	21.5	C	6.6	A	37.2	D
		PM	5.7	A	4.4	A	4.7	A	4.4	A	5.7	A
M17*	**Santa Teresa Boulevard/Bernal Road***	AM	33.4	C	33.0	C	33.0	C	33.0	C	33.4	C
		PM*	**68.8***	**E***	**85.5****	**F****	**85.5****	**F****	**85.5****	**F****	**68.8***	**E***
M18*	**Santa Teresa Boulevard/Bailey Avenue***	**AM***	**80.1***	**F***	**133.6****	**F****	**133.6****	**F****	**133.6****	**F****	**80.1***	**F***
		PM*	**>180.0***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0***	**F***
M22*	**Monterey Road/Edenview Drive***	AM	25.0	C	**75.5****	**E****	**171.2****	**F****	**75.5****	**E****	25.0	C
		PM*	**>180.0***	**F***	**173.7***	**F***	**173.8***	**F***	**173.7***	**F***	**>180.0***	**F***
M23	US 101 SB ramps/Blossom Hill Road	AM	29.4	C	**86.9****	**E****	49.3	D	**86.9****	**E****	29.4	C
		PM	**57.7***	**E***	**116.9****	**F****	**100.3****	**F****	**116.9****	**F****	**57.7***	**E***
M24	US 101 NB ramps/Blossom Hill Road	AM	22.8	C	**59.0****	**E****	26.7	C	**59.0****	**E****	22.8	C
		PM*	**61.1***	**E***	**137.7****	**F****	**90.3****	**F****	**137.7****	**F****	**61.1***	**E***
M25	Bernal Road Overpass/Monterey Road ramp	AM	8.3	A	8.7	A	8.6	A	8.7	A	8.3	A
		PM	8.5	A	8.9	A	**110.2****	**F****	8.9	A	8.5	A
M26*	**Snell Avenue/Capitol Expressway***	**AM***	**80.2***	**F***	**81.6***	**F***	**81.6***	**F***	**81.6***	**F***	**80.2***	**F***
		PM	**67.7***	**E***	**60.6***	**E***	**60.6***	**E***	**60.6***	**E***	**67.7***	**E***

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M27*	**Vistapark Drive/Capitol Expressway***	**AM***	**95.2***	**F***	**82.7***	**F***	**82.7***	**F***	**82.7***	**F***	**95.2***	**F***
		PM*	**129.7***	**F***	**128.6***	**F***	**128.6***	**F***	**128.6***	**F***	**129.7***	**F***
M28*	**Senter Road/Capitol Expressway***	**AM***	**156.3***	**F***	**172.6****	**F****	**172.6****	**F****	**172.6****	**F****	**156.3***	**F***
		PM*	**128.6***	**F***	**113.1***	**F***	**113.1***	**F***	**113.1***	**F***	**128.6***	**F***
M29	Senter Road/Sylvandale Avenue	AM	23.9	C	34.9	C	34.9	C	34.9	C	23.9	C
		PM	14.8	B	15.3	B	15.3	B	15.3	B	14.8	B
M30	Senter Road/Hellyer Avenue	AM	41.5	D	**58.8****	**E****	**58.8****	**E****	**58.8****	**E****	41.5	D
		PM	31.2	C	42.5	D	42.5	D	42.5	D	31.2	C
M31*	**Silver Creek Valley Road/Yerba Buena Road***	**AM***	**75.9***	**E***	**79.6***	**E***	**79.6***	**E***	**79.6***	**E***	**75.9***	**E***
		PM	50.8	D	53.9	D	53.9	D	53.9	D	50.8	D
M32	Vistapark Drive/Branham Lane	AM	**69.6***	**E***	**80.4****	**F****	**80.4****	**F****	**80.4****	**F****	**69.6***	**E***
		PM	**70.7***	**E***	**84.3****	**F****	**84.3****	**F****	**84.3****	**F****	**70.7***	**E***
M33	Snell Avenue/Branham Lane	AM	**65.1***	**E***	**80.1****	**F****	**80.1****	**F****	**80.1****	**F****	**65.1***	**E***
		PM	**55.3***	**E***	**60.8****	**E****	**60.8****	**E****	**60.8****	**E****	**55.3***	**E***
M34	Snell Avenue/Chynoweth Avenue	AM	40.9	D	44.0	D	44.0	D	44.0	D	40.9	D
		PM	6.2	D	40.4	D	40.4	D	40.4	D	6.2	D
M35	Lean Avenue/Chynoweth Avenue	AM	24.9	C	27.3	C	27.3	C	27.3	C	24.9	C
		PM	19.4	B	20.2	C	20.2	C	20.2	C	19.4	B
M36*	**Snell Avenue/Blossom Hill Road***	AM	**81.0***	**F***	**72.4***	**E***	**72.4***	**E***	**72.4***	**E***	**81.0***	**F***
		PM*	**86.2***	**F***	**109.4****	**F****	**109.4****	**F****	**109.4****	**F****	**86.2***	**F***
M37	Lean Avenue/Blossom Hill Road	AM	**57.9***	**E***	**84.2****	**F****	**84.2****	**F****	**84.2****	**F****	**57.9***	**E***
		PM	**98.6***	**F***	**99.7***	**F***	**99.7***	**F***	**99.7***	**F***	**98.6***	**F***
M38	Benswick Drive/Blossom Hill Road	AM	23.7	C	21.8	C	21.8	C	21.8	C	23.7	C
		PM	19.4	B	20.5	C	20.5	C	20.5	C	19.4	B
M39	Poughkeepsie Road/Blossom Hill Road	AM	20.7	C	24.9	C	24.9	C	24.9	C	20.7	C
		PM	20.0	B	19.5	B	19.5	B	19.5	B	20.0	B
M40	Cottle Road/Poughkeepsie Road	AM	32.5	C	39.3	D	39.3	D	39.3	D	32.5	C
		PM	**59.7***	**E***	**90.9***	**F***	**90.9***	**F***	**90.9***	**F***	**59.7***	**E***
M41	Cottle Road/Santa Teresa Boulevard	AM	**81.5***	**F***	**84.0***	**F***	**84.0***	**F***	**84.0***	**F***	**81.5***	**F***
		PM	50.0	D	51.2	D	51.2	D	51.2	D	50.0	D
M42	Lean Avenue/Santa Teresa Boulevard	AM	28.4	C	28.5	C	28.5	C	28.5	C	28.4	C
		PM	27.5	C	27.8	C	27.8	C	27.8	C	27.5	C
M43	Silver Creek Valley Road/Hellyer Avenue	AM	32.9	C	33.1	C	33.1	C	33.1	C	32.9	C
		PM	31.6	C	28.8	C	28.8	C	28.8	C	31.6	C
M44	Silicon Valley Boulevard/Hellyer Avenue	AM	20.8	C	21.1	C	21.1	C	21.1	C	20.8	C
		PM	18.3	B	18.6	B	18.6	B	18.6	B	18.3	B
M45	Monterey Road/Fehren Drive	AM	11.4	B	14.7	B	13.7	B	14.7	B	11.4	B
		PM	28.6	C	**98.3****	**F****	**118.9****	**F****	**98.3****	**F****	28.6	C

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M48	Park Sommers Way/Skyway Drive	AM	11.8 (SB)	B	11.8 (SB)	B	11.8 (SB)	B	11.8 (SB)	B	**>180.0 (SB)***	**F***
		PM	9.5 (SB)	A	9.5 (SB)	A	9.5 (SB)	A	9.5 (SB)	A	**45.0 (SB)***	**E***
M49	Park Paxton Place/Skyway Drive	AM	11.4 (NB)	B	11.4 (NB)	B	11.4 (NB)	B	11.4 (NB)	B	**172.2 (NB)***	**F***
		PM	10.3 (NB)	B	10.3 (NB)	B	10.3 (NB)	B	10.3 (NB)	B	**48.1 (NB)***	**E***
M50*	**Saddlebrook Drive/Branham Lane***	AM	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)****	**F****
		PM	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)****	**F****
M51	Shenado Place/Chynoweth Avenue	AM	25.0 (SB)	C	25.0 (SB)	C	25.0 (SB)	C	25.0 (SB)	C	**70.4 (SB)***	**F***
		PM	18.4 (SB)	C	18.4 (SB)	C	18.4 (SB)	C	18.4 (SB)	C	**76.2 (SB)***	**F***
Morgan Hill and Gilroy Subsection*												
M19*	**Hale Avenue/Tilton Avenue***	AM	32.7	D	**43.8****	**E****	**87.0****	**F****	**43.8****	**E****	25.2	D
		PM*	**>180.0***	**F***	**>180.0****	**F****	**>180.0****	**F****	**>180.0****	**F****	**>180.0***	**F***
M20	Hale Avenue/Llagas Road	AM	17.1	B	17.9	B	17.9	B	17.9	B	17.1	B
		PM	28.5	C	30.7	C	30.7	C	30.7	C	28.5	C
M21	Monterey Road/Old Monterey Road	AM	11.4	B	11.6	B	11.6	B	11.6	B	11.4	B
		PM	28.2	C	22.4	C	22.4	C	22.4	C	28.2	C
M46*	**Monterey Road/Tilton Avenue***	**AM***	17.9	B	21.0	C	**77.3****	**F****	21.0	C	21.5	C
		PM*	**65.5***	**E***	**118.0****	**F****	**>180.0****	**F****	**118.0****	**F****	**84.7****	**F***
M47*	**Monterey Road/Madrone Parkway***	**AM***	18.8	B	35.0	C	**148.9****	**F****	35.0	C	18.8	B
		PM	14.4	B	42.2	D	**138.1****	**F****	42.2	D	14.4	B
M52	Monterey Road/Blanchard Road	AM	3.4	A	3.4	A	3.4	A	3.4	A	11.7	B
		PM	9.3	A	9.3	A	9.3	A	9.3	A	52.5	D
M53	Monterey Road/Palm Avenue	AM	6.0	A	6.0	A	6.0	A	6.0	A	7.3	A
		PM	3.7	A	3.7	A	3.7	A	3.7	A	5.1	A
M54	Dougherty Ave/Tilton Avenue	AM	4.5	A	4.5	A	4.5	A	4.5	A	4.4	A
		PM	**46.7***	**E***	**46.7***	**E***	**46.7***	**E***	**46.7***	**E***	**48.1***	**E***
M55	Monterey Road/Burnett Avenue	AM	44.1	D	44.1	D	44.1	D	44.1	D	45.1	D
		PM	17.8	B	17.8	B	17.8	B	17.8	B	18.7	B
MH1	Monterey Road/East Dunne Avenue	AM	36.0	D	37.5	D	35.9	D	37.5	D	39.4	D
		PM	38.8	D	40.3	D	40.2	D	40.3	D	51.8	D
MH2*	**Railroad Avenue/Tennant Avenue***	**AM***	13.4 (SB)	B	13.4 (SB)	B	**78.3 (SB)****	**F****	13.4 (SB)	B	13.4 (SB)	B
		PM*	14.2 (NB)	B	14.2 (NB)	B	**>180.0 (NB)****	**F****	14.2 (NB)	B	14.2 (NB)	B
MH3	Farmers Market Driveway 1/Tennant Avenue	AM	11.6 (NB)	B	11.6 (NB)	B	9.0 (WB)	A	11.6 (NB)	B	11.4 (NB)	B
		PM	14.3 (NB)	B	14.3 (NB)	B	9.0 (WB)	A	14.3 (NB)	B	24.3 (NB)	C
MH4	Farmers Market Driveway 2/Tennant Avenue	AM	11.7 (NB)	B	11.7 (NB)	B	---	---	11.7 (NB)	B	18.5 (NB)	C
		PM	15.1 (NB)	B	15.1 (NB)	B	---	---	15.1 (NB)	B	34.9 (NB)	D
MH5	Farmers Market Driveway 3/Tennant Avenue	AM	12.1 (NB)	B	12.1 (NB)	B	---	---	12.1 (NB)	B	31.3 (NB)	D
		PM	14.7 (NB)	B	14.7 (NB)	B	---	---	14.7 (NB)	B	**47.8 (NB)***	**E***
MH6	Monterey Road/San Martin Avenue	AM	**58.2***	**E***	50.8	D	15.3	B	45.5	D	**70.3****	**E****
		PM	37.6	D	42.8	D	22.8	C	40.7	D	**91.5****	**F****

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
MH7	Depot Road/San Martin Avenue	AM	26.5 (NB)	D	26.7 (NB)	D	7.5	A	26.7 (NB)	D	27.4 (NB)	D
		PM	33.2 (NB)	D	27.7 (NB)	D	8.0	A	27.7 (NB)	D	**91.8 (NB)****	**F***
MH8	Llagas Road/San Martin Avenue	AM	**35.1***	**E***	**35.1***	**E***	**67.1 (SB)***	**F***	**35.1***	**E***	**35.5***	**E***
		PM	22.7	C	22.7	C	34.2 (SB)	D	22.7	C	19.7	C
MH9	Colony Avenue/San Martin Avenue	AM	13.1 (NB)	B	13.1 (NB)	B	22.2 (NB)	C	13.1 (NB)	B	13.1 (NB)	B
		PM	11.7 (SB)	B	11.7 (SB)	B	20.4 (SB)	C	11.7 (SB)	B	11.7 (SB)	B
MH10	Monterey Road/E Main Avenue	AM	**136.0***	**F***	**136.0***	**F***	**136.0***	**F***	**136.0***	**F***	**150.2****	**F****
		PM	**151.1***	**F***	**151.1***	**F***	**151.1***	**F***	**151.1***	**F***	**147.7***	**F***
MH11	Depot Street/E Main Avenue[1]	AM	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)***	**F***	**>180.0 (SB)****	**F****
		PM	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)****	**F****
MH12	Butterfield Boulevard/E Main Avenue	AM	**173.0***	**F***	**173.0***	**F***	**173.0***	**F***	**173.0***	**F***	**>180.0****	**F****
		PM	**103.9***	**F***	**103.9***	**F***	**103.9***	**F***	**103.9***	**F***	**129.7****	**F****
MH13	Church Street/East Dunne Avenue[1]	AM	10.6	B	10.6	B	10.6	B	10.6	B	11.3	B
		PM	18.1	B	18.1	B	18.1	B	18.1	B	19.0	B
MH14	Depot Street/East Dunne Avenue	AM	12.8 (SB)	B	12.8 (SB)	B	12.8 (SB)	B	12.8 (SB)	B	15.9 (SB)	B
		PM	21.1 (SB)	C	21.1 (SB)	C	21.1 (SB)	C	21.1 (SB)	C	20.9 (SB)	C
MH15	Butterfield Boulevard /East Dunne Avenue	AM	**163.5***	**F***	**163.5***	**F***	**163.5***	**F***	**163.5***	**F***	**165.3***	**F***
		PM	**66.5***	**E***	**66.5***	**E***	**66.5***	**E***	**66.5***	**E***	**68.0***	**E***
MH16	Monterey Road/San Pedro Avenue	AM	14.0 (WB)	B	14.0 (WB)	B	14.0 (WB)	B	14.0 (WB)	B	15.2 (WB)	C
		PM	17.3 (WB)	C	17.3 (WB)	C	17.3 (WB)	C	17.3 (WB)	C	18.8 (WB)	C
MH17	Church Street/San Pedro Avenue	AM	13.7	B	13.7	B	13.7	B	13.7	B	14.6	B
		PM	19.5	C	19.5	C	19.5	C	19.5	C	22.8	C
MH18	Railroad Avenue/San Pedro Avenue	AM	11.8 (NB)	B	11.8 (NB)	B	11.8 (NB)	B	11.8 (NB)	B	23.9 (NB)	C
		PM	11.7 (NB)	B	11.7 (NB)	B	11.7 (NB)	B	11.7 (NB)	B	26.5 (NB)	D
MH19	Butterfield Boulevard /San Pedro Avenue	AM	26.9	C	26.9	C	26.9	C	26.9	C	28.0	C
		PM	21.8	C	21.8	C	21.8	C	21.8	C	22.6	C
MH20	Vineyard Boulevard /Tennant Avenue	AM	12.0	B	12.0	B	12.0	B	12.0	B	12.3	B
		PM	23.5	C	23.5	C	23.5	C	23.5	C	24.6	C
MH21	Butterfield Boulevard /Tennant Avenue	AM	**149.4***	**F***	**149.4***	**F***	**149.4***	**F***	**149.4***	**F***	**148.6***	**F***
		PM	**109.1***	**F***	**109.1***	**F***	**109.1***	**F***	**109.1***	**F***	**111.8***	**F***
MH22	Monterey Road/E Middle Avenue	AM	14.2 (WB)	B	14.2 (WB)	B	14.2 (WB)	B	14.2 (WB)	B	17.9 (WB)	C
		PM	7.8 (WB)	A	7.8 (WB)	A	7.8 (WB)	A	7.8 (WB)	A	9.5 (WB)	A
MH23	Crowner Avenue/E Middle Avenue	AM	7.6 (NB)	A	7.6 (NB)	A	7.6 (NB)	A	7.6 (NB)	A	18.9 (NB)	C
		PM	7.3 (NB)	A	7.3 (NB)	A	7.3 (NB)	A	7.3 (NB)	A	14.3 (NB)	B
MH24	Seymour Avenue/E Middle Avenue	AM	5.4 (SB)	A	5.4 (SB)	A	5.4 (SB)	A	5.4 (SB)	A	11.9 (SB)	B
		PM	5.5 (SB)	A	5.5 (SB)	A	5.5 (SB)	A	5.5 (SB)	A	11.0 (SB)	B
MH25	Sewell Avenue/W San Martin Avenue	AM	13.4 (NB)	B	13.4 (NB)	B	13.4 (NB)	B	13.4 (NB)	B	11.9 (NB)	B
		PM	10.8 (NB)	B	10.8 (NB)	B	10.8 (NB)	B	10.8 (NB)	B	11.0 (NB)	B

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
MH26*	**Monterey Road/Masten Avenue***	AM	37.0	D	37.0	D	37.0	D	37.0	D	55.0	D
		PM*	45.7	D	45.7	D	45.7	D	45.7	D	**99.3****	**F****
MH27	Manna Way/Masten Avenue	AM	9.0 (SB)	A	9.0 (SB)	A	9.0 (SB)	A	9.0 (SB)	A	10.6 (SB)	B
		PM	11.4 (SB)	B	11.4 (SB)	B	11.4 (SB)	B	11.4 (SB)	B	10.5 (SB)	B
G1	Monterey Road/Buena Vista Avenue	AM	19.6	B	20.3	C	20.5	C	20.4	C	23.5	C
		PM	7.8	A	7.8	A	**94.7****	**F****	8	A	14.6	B
G2	US 101 SB ramps/Buena Vista Avenue	AM	6.1	A	6.1	A	6.1	A	6.3	A	6.1	A
		PM	8.4	A	8.5	A	8.5	A	8.5	A	8.4	A
G3	No Name Uno/Buena Vista Avenue	AM	16.1	B	16.1	B	16.1	B	16.1	B	16.1	B
		PM	11.4	B	11.4	B	11.4	B	11.4	B	11.4	B
G4	Camino Arroyo (Ext.)/Buena Vista Avenue	AM	12.9 (NB)	B	12.9 (NB)	B	12.9 (NB)	B	13.4 (NB)	B	12.9 (NB)	B
		PM	14.4 (NB)	B	14.4 (NB)	B	14.4 (NB)	B	14.8 (NB)	B	14.4 (NB)	B
G5	Marcella Avenue/Buena Vista Avenue	AM	11.0 (NB)	B	11.0 (NB)	B	11.0 (NB)	B	11.6 (NB)	B	11.0 (NB)	B
		PM	13.8 (NB)	B	13.8 (NB)	B	13.8 (NB)	B	14.6 (NB)	B	13.8 (NB)	B
G6	No Name Uno/Cohansey Avenue	AM	10.0 (WB)	B	10.0 .0 (WB)	B	10.0 (WB)	B	10.0 (WB)	B	10.0 (WB)	B
		PM	10.1 (WB)	B	10.2 (WB)	B	10.1 (WB)	B	10.1 (WB)	B	10.1 (WB)	B
G7	Camino Arroyo (Ext.)/Cohansey Avenue	AM	9.9 (WB)	A	9.9 (WB)	A	9.9 (WB)	A	10.1 (WB)	B	9.9 (WB)	A
		PM	10.2 (WB)	B	10.2 (WB)	B	10.2 (WB)	B	10.5 (WB)	B	10.2 (WB)	B
G8	San Ysidro Avenue/No Name Uno-Las Animas Avenue	AM	12.4 (EB)	B	12.4 (EB)	B	12.4 (EB)	B	12.5 (EB)	B	12.4 (EB)	B
		PM	14.1 (WB)	B	14.2 (WB)	B	14.2 (WB)	B	14.2 (WB)	B	14.1 (WB)	B
G9	Camino Arroyo (Ext.)/Las Animas Avenue	AM	10.6 (NB)	B	10.6 (NB)	B	10.6 (NB)	B	10.6 (NB)	B	10.6 (NB)	B
		PM	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B
G10	Santa Teresa Boulevard/First Street (SR 152)	AM	50.8	D	51.3	D	51.3	D	52.0	D	50.8	D
		PM	52.2	D	52.2	D	52.2	D	52.9	D	52.2	D
G11	Wren Avenue/First Street (SR 152)	AM	35.5	D	36.1	D	36.1	D	36.4	D	35.5	D
		PM	37.6	D	38.3	D	38.3	D	38.3	D	37.6	D
G12	Church Street/First Street (SR 152)	AM	36.4	D	37.4	D	37.4	D	37.4	D	36.4	D
		PM	29.2	C	30.3	C	30.3	C	30.2	C	29.2	C
G13	Monterey Road (SR 152)/First Street (SR 152)	AM	36.8	D	51.8	D	51.8	D	43.0	D	36.8	D
		PM	33.5	C	46	D	46.0	D	39.9	D	33.5	C
G14	Church Street/Welburn Avenue	AM	28.4	C	33.9	C	28.6	C	37.7	D	27.1	C
		PM	21.5	C	21.9	C	22.2	C	21.9	C	25.1	C
G15	Monterey Road (SR 152)/Welburn Avenue-Leavesley Road (SR 152)	AM	39.3	D	44.3	D	40.8	D	42.5	D	**65.4****	**E****
		PM	36.6	D	51.2	D	38.7	D	40.1	D	51.0	D
G16	Forest Street/Leavesley Road (SR 152)	AM	13.7	B	14.5	B	14.0	B	13.7	B	11.6	B
		PM	13.4	B	13.6	B	14.3	B	16.0	B	10.9	B
G17	Murray Avenue/Leavesley Road (SR 152)	AM	30.4	C	32.8	C	31.8	C	32.5	C	23.6	C
		PM	36.1	D	38.4	D	37.3	D	45.9	D	26.1	C

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G18	US 101 SB ramps/Leavesley Road (SR 152)	AM	12.1	B	13.4	B	12.9	B	13.8	B	13.2	B
		PM	17.2	B	17.9	B	17.9	B	19.9	B	16.6	B
G19	US 101 NB ramps-San Ysidro Avenue/Leavesley Road (SR 152)	AM	12.2	B	12.4	B	12.3	B	13.2	B	12.9	B
		PM	19.3	B	18.8	B	19.5	B	21.0	C	18.5	B
G20	Arroyo Circle/Leavesley Road	AM	8.5	A	8.6	A	8.2	A	8.8	A	8.5	A
		PM	17.2	B	17.3	B	17.4	B	18.3	B	17.2	B
G21	Camino Arroyo (Ext.)/Leavesley Road	AM	10.7 (SB)	B	10.9 (NB)	B	10.9 (NB)	B	17.8 (SB)	C	10.7 (SB)	B
		PM	11.4 (NB)	B	11.9 (NB)	B	11.9 (NB)	B	19.9 (SB)	C	11.4 (NB)	B
G22	Cameron Boulevard (Ext.)/Leavesley Road	AM	10.0 (NB)	B	10.0 (NB)	B	10.0 (NB)	B	0.5 (EB)	A	10.0 (NB)	B
		PM	10.8 (NB)	B	10.8 (NB)	B	10.8 (NB)	B	0.3 (EB)	A	10.8 (NB)	B
G23	Marcella Avenue/Leavesley Road	AM	9.7 (SB)	A	9.7 (SB)	A	9.7 (SB)	A	9.6 (SB)	A	9.7 (SB)	A
		PM	9.7 (SB)	A	9.7 (SB)	A	9.7 (SB)	A	9.5 (SB)	A	9.7 (SB)	A
G24	New Avenue/Leavesley Road	AM	10.4 (SB)	B	10.4 (SB)	B	10.4 (SB)	B	10.4 (SB)	B	10.4 (SB)	B
		PM	**44.1 (SB)***	**E***	**44.1 (SB)***	**E***	**44.1 (SB)***	**E***	**46.3 (SB)***	**E***	**44.1 (SB)***	**E***
G25*	**Monterey Road/IOOF Avenue***	**AM***	40.5	D	49.2	D	48.0	D	42.9	D	**167.2***	**F***
		PM*	9.1	A	10.5	B	10.3	B	9.3	A	13.3	B
G26	Cameron Boulevard (Ext.)/IOOF Avenue (Ext.)	AM	8.7 (EB)	A	8.7 (EB)	A	8.7 (EB)	A	8.7 (EB)	A	8.7 (EB)	A
		PM	8.7 (EB)	A	8.7 (EB)	A	8.7 (EB)	A	8.7 (EB)	A	8.7 (EB)	A
G27	Monterey Road/Third Street	AM	14.3	B	15.9	B	15.9	B	14.3	B	14.3	B
		PM	16.7	B	19.1	B	19.1	B	16.8	B	16.7	B
G28	Monterey Road/Fifth Street	AM	9.1	A	9.7	A	9.7	A	9.2	A	32.1	D
		PM	11.5	B	16.5	B	16.5	B	11.6	B	29.2	D
G29*	**Monterey Road/Sixth Street***	AM	17.2	B	25.0	C	23.0	C	17.2	B	**>180.0****	**F****
		PM*	38.8	D	54.2	D	54.2	D	38.9	D	**179.3****	**F****
G30*	**Railroad Street/Sixth Street***	**AM***	14.8 (NB)	B	---	---	---	---	14.8 (NB)	B	**157.0 (NB)***	**F***
		PM*	17.2 (SB)	C	---	---	---	---	17.2 (SB)	C	**152.0 (SB)***	**F***
G31	Camino Arroyo/Sixth Street-Gilman Road	AM	16.0	B	16.3	B	16.3	B	16.3	B	16.0	B
		PM	23.8	C	24.0	C	24.0	C	4.3	C	23.8	C
G32	Cameron Boulevard (Ext.)/Gilman Road	AM	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A	9.9 (SB)	A
		PM	9.8 (SB)	A	9.8 (SB)	A	9.8 (SB)	A	9.9 (SB)	A	9.8 (SB)	A
G33	Monterey Road/Seventh Street	AM	11.1	B	13.5	B	17.4	B	11.1	B	**92.5****	**F****
		PM	13.7	B	15.8	B	19.5	B	13.7	B	9.5	A
G34	Alexander Street/Old Gilroy Street	AM	10.4 (EB)	B	11.3	B	11.1	B	10.4 (EB)	B	**46.3 (WB)***	**E***
		PM	10.0 (WB)	A	11.3	B	10.9	B	10.0 (WB)	A	**>180.0 (WB)***	**F***
G35	Monterey Road/Eighth Street	AM	9.7	A	10.6	B	10.6	B	9.7	A	**134.9****	**F****
		PM	11.0	B	13.6	B	13.6	B	11.0	B	6.5	A
G36	Monterey Road/10th Street	AM	19.6	B	24.8	C	22.9	C	20.1	C	44.0	D
		PM	27.1	C	**105.7****	**F****	**112.4****	**F****	27.3	C	52.7	D

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G37	Alexander Street/10th Street	AM	11.8	B	22.4	C	20.7	C	10.7	B	24.1	C
		PM	31.9	C	**113.2****	**F****	**116.3****	**F****	31.0	C	27.0	C
G38	Chestnut Street/10th Street	AM	26.0	C	31.7	C	37.2	D	26.1	C	23.6	C
		PM	**71.6***	**E***	**101.8****	**F****	**100.9****	**F****	**74.7***	**E***	34.2	C
G39	US 101 SB ramps/10th Street (SR 152)	AM	5.9	A	6.8	A	6.7	A	6.0	A	9.1	A
		PM	9.4	A	43.8	D	28.2	C	10.1	B	9.8	A
G40	US 101 NB ramps/Pacheco Pass Highway (SR 152)	AM	5.5	A	6.0	A	5.9	A	5.8	A	5.0	A
		PM	6.7	A	7.4	A	7.6	A	7.3	A	6.5	A
G41	Camino Arroyo/Pacheco Pass Highway (SR 152)	AM	18.5	B	17.0	B	18.8	B	20.0	B	31.2	C
		PM	27.5	C	28.9	C	27.6	C	30.3	C	39.0	D
G42	Cameron Boulevard/Pacheco Pass Highway (SR 152)	AM	7.7	A	7.6	A	7.6	A	7.7	A	7.7	A
		PM	8.8	A	8.8	A	8.8	A	8.8	A	8.8	A
G43	Monterey Road/Luchessa Avenue	AM	40.1	D	43.5	D	43.5	D	40.1	D	40.1	D
		PM	**55.6***	**E***	**58.6***	**E***	**58.6***	**E***	**55.6***	**E***	**55.6***	**E***
G44	Monterey Road/US 101 SB ramps	AM	8.4	A	8.6	A	8.6	A	8.4	A	8.4	A
		PM	10.1	B	10.2	B	10.2	B	10.1	B	10.1	B
G45	Monterey Road-Bolsa Road/US 101 NB ramps-Travel Park Circle	AM	19.0	B	20.6	C	20.6	C	19.0	B	19.0	B
		PM	14.8	B	15.2	B	15.2	B	14.8	B	14.8	B
G46	Monterey Road/Las Animas Avenue	AM	20.6	C	20.6	C	**>180.0****	**F****	21.4	C	54.3	D
		PM	16.6	B	16.6	B	**159.3****	**F****	17.3	B	41.5	D
G47	Monterey Road/Cohanesey Avenue	AM	**46.1 (WB)***	**E***	**46.1 (WB)***	**E***	---	---	**50.7 (WB)***	**F***	43.9 (WB)	D
		PM	20.2 (WB)	C	20.2 (WB)	C	---	---	21.4 (WB)	C	29.4 (WB)	C
G48	Monterey Road/Farrell Road	AM	18.8	B	18.8	B	9.8	A	19.2	B	18.8	B
		PM	14.5	B	14.5	B	13.8	B	15.8	B	14.5	B
G49	Monterey Road/Lewis Street	AM	14.2	B	15.2	B	15.2	B	14.2	B	38.1	D
		PM	10.6	B	12.4	B	12.4	B	10.6	B	46.3	D
G50	Monterey Road/Ninth Street	AM	6.1 (EB)	A	7.5 (EB)	A	8.4 (EB)	A	6.9 (EB)	A	14.5 (EB)	B
		PM	5.3 (EB)	A	**>180.0 (SB)****	**F****	**139.8 (SB)****	**F****	7.2 (EB)	A	22.9 (EB)	C
G51	Alexander Street/Ninth Street	AM	5.4 (WB)	A	8.8	A	8.4	A	5.3 (WB)	A	6.9 (WB)	A
		PM	5.8 (WB)	A	**75.8****	**E****	**73.9****	**E****	6.9 (WB)	A	8.7 (WB)	A
G52	Radtke Avenue/Buena Vista Avenue	AM	8.0 (SB)	A	8.0 (SB)	A	8.0 (SB)	A	8.0 (SB)	A	8.4 (SB)	A
		PM	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A	7.5 (SB)	A	7.1 (SB)	A
G53	School Access/IOOF Avenue	AM	**39.1***	**E***	**39.1***	**E***	**39.1***	**E***	**39.1***	**E***	**79.7****	**F****
		PM	11.8	B	11.8	B	11.8	B	11.8	B	23.2	C
G54	Frontage Road/Lewis Street	AM	9.4 (SB)	A	9.4 (SB)	A	9.4 (SB)	A	9.4 (SB)	A	**51.3 (SB)***	**F***
		PM	17.2 (SB)	C	17.2 (SB)	C	17.2 (SB)	C	17.2 (SB)	C	**40.3 (SB)***	**E***
G55	Railroad Street/Lewis Street	AM	6.7 (NB)	A	6.7 (NB)	A	6.7 (NB)	A	6.7 (NB)	A	33.0 (NB)	D
		PM	7.6 (NB)	A	7.6 (NB)	A	7.6 (NB)	A	7.6 (NB)	A	**50.2 (NB)***	**F***

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G56	Frontage Road/Martin Avenue	AM	11.8 (SB)	B	11.8 (SB)	B	11.8 (SB)	B	11.8 (SB)	B	25.4 (SB)	D
		PM	7.6 (SB)	A	7.6 (SB)	A	7.6 (SB)	A	7.6 (SB)	A	22.9(SB)	C
G57	Railroad Street/Martin Avenue	AM	6.9(SB)	A	6.9(SB)	A	6.9(SB)	A	6.9(SB)	A	11.1 (SB)	B
		PM	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A	8.6 (SB)	A	9.9 (SB)	A
G58	Alexander Street/Sixth Street	AM	13.3	B	13.3	B	13.3	B	13.3	B	**159.9****	**F****
		PM	17.3	C	17.3	C	17.3	C	17.3	C	**172.3****	**F****
G59	Railroad Street/Seventh Street	AM	12.9 (SB)	B	12.9 (SB)	B	---	---	12.9 (SB)	B	---	---
		PM	8.3 (SB)	A	8.3 (SB)	A	---	---	8.3 (SB)	A	---	---
G60	Chestnut Street/Luchessa Street	AM	9.3 (SB)	A	9.3 (SB)	A	9.3 (SB)	A	9.3 (SB)	A	21.2 (SB)	C
		PM	10.2 (SB)	B	10.2 (SB)	B	10.2 (SB)	B	10.2 (SB)	B	**37.5 (SB)****	**E****
GM1*	**Frazier Lake Road/Pacheco Pass Highway (SR 152)***	**AM***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**132.7 (NB)***	**F***	**>180.0 (NB)***	**F***
		PM*	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***	**>180.0 (NB)***	**F***
GM2	Frazier Lake Road/East Gilroy MOWF Driveway	AM	---	---	---	---	---	---	8.5 (NB)	A	---	---
		PM	---	---	---	---	---	---	8.6 (NB)	A	---	---
GM3	Bloomfield Road/South Gilroy MOWF Driveway	AM	---	---	8.6 (SB)	A	8.6 (SB)	A	---	---	8.6 (SB)	A
		PM	---	---	9.1 (SB)	A	9.1 (SB)	A	---	---	9.1 (SB)	A
GM4	SR 25/Bloomfield Avenue	AM	**53.9 (WB)***	**F***	**64.8 (WB)****	**F****	**64.8 (WB)****	**F****	**53.9 (WB)****	**F****	**173.3 (WB)***	**F***
		PM	**63.8 (WB)***	**F***	**90.8 (WB)****	**F****	**90.8 (WB)****	**F****	**63.8 (WB)****	**F****	**146.3 (WB)****	**F***
GM5	Bolsa Road/Bloomfield Avenue	AM	13.7 (EB)	B	13.7 (EB)	B	13.7 (EB)	B	13.7 (EB)	B	25.4 (EB)	D
		PM	18.4 (EB)	C	18.4 (EB)	C	18.4 (EB)	C	18.4 (EB)	C	34.3 (EB)	D
San Joaquin Valley Subsection*												
S1	Mercey Springs Road (SR 165)/Henry Miller Avenue	AM	14.5	B	29.0 (EB)	D	29.0 (EB)	D	29.0 (EB)	D	29.0 (EB)	D
		PM	**58.2***	**F***	22.5 (EB)	C	22.5 (EB)	C	22.5 (EB)	C	22.5 (EB)	C
S2	Loop Road/Henry Miller Avenue	AM	---	---	12.0 (SB)	B	12.0 (SB)	B	12.0 (SB)	B	12.0 (SB)	B
		PM	---	---	16.3 (SB)	C	16.3 (SB)	C	16.3 (SB)	C	16.3 (SB)	C

Whole intersection average delay reported for signalized intersections. Whole intersection average delay and worst approach delay (in parentheses) reported for unsignalized intersections.
*Entries **bolded with an asterisk (*)** identify locations with LOS E or F in one or both peak hours.* **Shaded** *entries bolded with double asterisks (**) identify locations of effects under NEPA as defined by the criteria.*
[1] The City of Morgan Hill's 2030 General Plan includes an infrastructure project that would combine the existing off-set intersections of Dunne/Church and Dunne/Depot to one four-legged intersection of Dunne/Church/Depot. With this change, the new intersection would function at LOS C/21.4 and LOS C/29.9 during the AM and PM peak hours respectively during the 2040 No Project Condition. Under the 2040 Plus Project Alternative 4 Condition the new intersection would function at LOS C/22.5 and LOS C/31.1 during the AM and PM peak hours respectively.
I- = Interstate
NB = northbound
SB = southbound
EB = eastbound
WB = westbound
LOS = level of service
MOWF = maintenance of way facility
Ext. = Extension
US = U.S. Highway
--- = Intersection does not exist

Table 17 2040 No Project and Plus Project Mitigated Level of Service at Intersections in San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
San Jose Diridon Station Approach Subsection												
D4	The Alameda (SR 82)/Taylor Street-Naglee Avenue	AM	**88.0**	**F**	**91.0**	**F**	**91.0**	**F**	**91.0**	**F**		
		PM	**123.8**	**F**	**126.8**	**F**	**126.8**	**F**	**126.8**	**F**		
D12	Stockton Avenue/The Alameda-West Santa Clara Street (SR 82)	AM	**>180.0**	**F**	**>180.0**	**F**	**>180.0**	**F**	**>180.0**	**F**	Adverse	Adverse
		PM	**>180.0**	**F**							Adverse	Adverse
D13	Cahill Street/West Santa Clara Street (SR 82)	AM	**55.4**	**E**							Adverse	Adverse
		PM	**75.7**	**E**	**67.5**	**E**	**67.5**	**E**	**67.5**	**E**		
D15	Autumn Street (SR 82)/West Santa Clara Street (SR 82)	AM	**60.5**	**E**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse
		PM	**>180.0**	**F**							Adverse	Adverse
D21	Cahill Street/Stover Street-Crandall Street	AM	16.2	C	12.6	B	12.6	B	12.6	B	13.0	B
		PM	**37.0**	**E**	13.0	B	13.0	B	13.0	B		
D22	Montgomery Street (SR 82)/Stover Street-Crandall Street	AM	**76.1 (SB)**	**F**							12.9	B
		PM	**>180.0 (SB)**	**F**							13.0	B
D23	Cahill Street/West San Fernando Street	AM	19.4	C	18.9	B	18.9	B	18.9	B	18.8	B
		PM	**36.7**	**E**	18.3	B	18.3	B	18.3	B	18.5	B
D24	Montgomery Street (SR 82)/West San Fernando Street	AM	28.5	C							Adverse	Adverse
		PM	**55.4**	**E**								
D25	Autumn Street (SR 82)/West San Fernando Street	AM	**>180.0**	**F**								
		PM	**166.5**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
D27	Montgomery Street (SR 82)/Park Avenue	AM	**47.1**	**D**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**174.7**	**F**								
D31	Montgomery Street-Bird Avenue (SR 82)/West San Carlos Street (SR 82)	AM	**128.9**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**168.0**	**F**								
D33	Bird Avenue/Auzerais Avenue	AM	**63.7**	**E**							Adverse	Adverse
		PM	**81.9**	**F**							Adverse	Adverse
D35	Bird Avenue/I-280 NB ramps	AM	**132.2**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**130.7**	**F**								
D36	Bird Avenue/I-280 SB ramps	AM	**72.6**	**E**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse
		PM	**56.4**	**E**								
D37	Bird Avenue/West Virginia Street	AM	**151.8**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse
		PM	**81.2**	**F**								
D41	Coleman Avenue/Hedding Street	AM	**138.7**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**76.1**	**E**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
D42	Coleman Avenue/Taylor Street	AM	54.7	D	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**82.4**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
D43	Delmas Avenue/West Santa Clara Street	AM	**160.2**	**F**								
		PM	52.8	D	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		

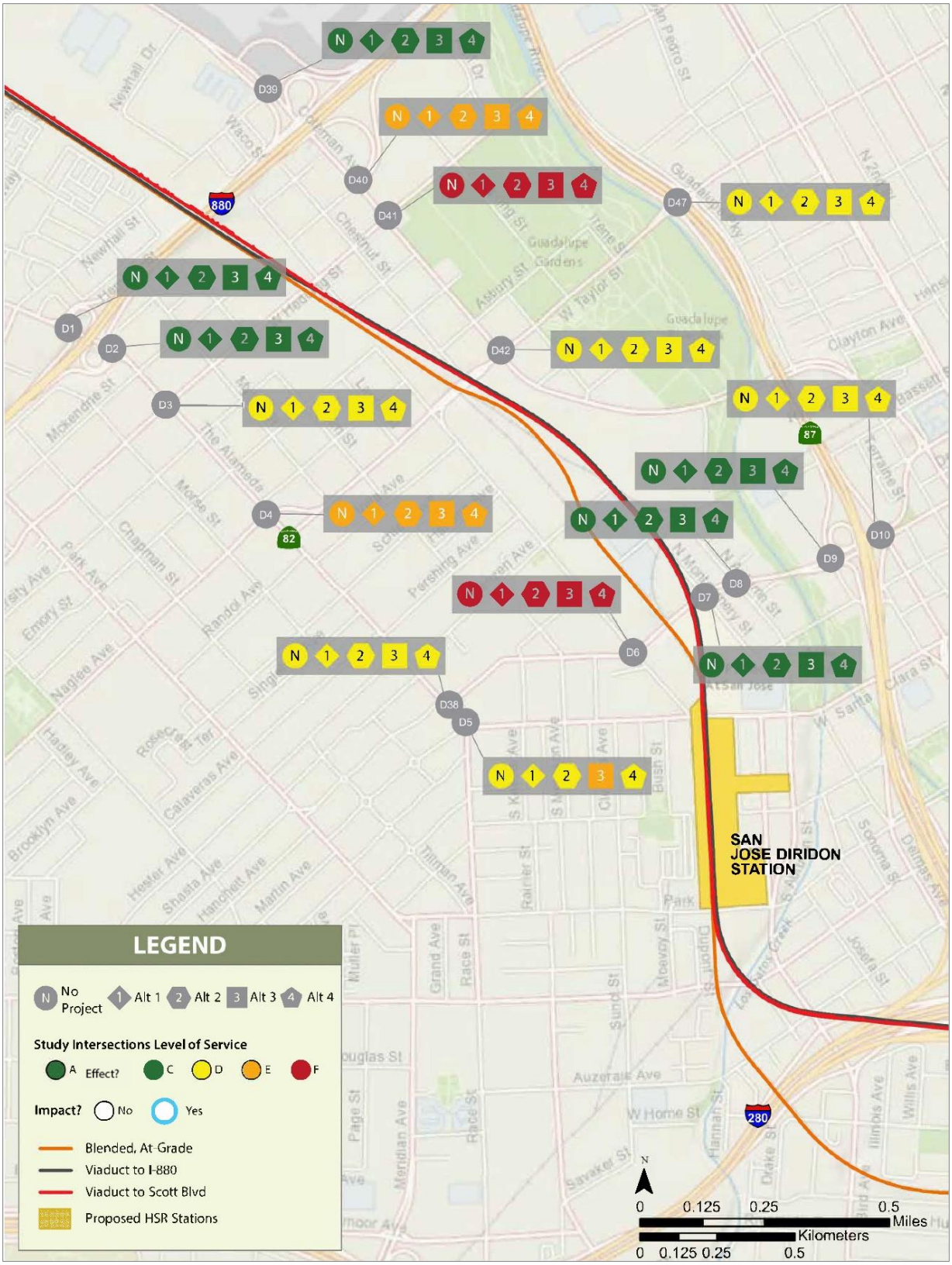
Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
D44	Delmas Avenue/West San Fernando Street	AM	**55.4**	**E**	45.7	D	45.7	D	45.7	D		
		PM	**>180.0**	**F**								
D48	Sunol St/Auzerais Avenue	AM	**>180.0**	**F**							Adverse	Adverse
		PM	**>180.0**	**F**							Adverse	Adverse
Monterey Corridor Subsection												
M1	Monterey Road/Capitol Expressway WB ramps	AM	54.7	D	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**70.8**	**E**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
M2	Capitol Expressway EB ramps	AM	**59.6**	**E**	36.4	D	27.4	C	36.4	D		
		PM	**55.7**	**E**	24.9	C	34.2	C	24.9	C		
M3	Monterey Road/Senter Road	AM	**137.7**	**F**	**60.4**	**E**			**60.4**	**E**		
		PM	**155.7**	**F**	**69.7**	**E**	45.1	D	**69.7**	**E**		
M4	Monterey Road/Skyway Drive	AM	**119.3**	**F**	Adverse	Adverse	Variant A:	Variant A:	Adverse	Adverse	Adverse	Adverse
		PM	**171.4**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse
							Adverse	Adverse				
							Variant B:	Variant B:				
							Adverse	Adverse				
							Adverse	Adverse				
M5	Houndshaven Way/Skyway Drive	AM	**109.6 (WB)**	**F**	Adverse	Adverse	42.5	D	Adverse	Adverse		
		PM	**35.2 (WB)**	**E**	Adverse	Adverse	37.6	D	Adverse	Adverse		
M6	Monterey Road/Branham Lane	AM	**>180.0**	**F**			Adverse	Adverse			Adverse	Adverse
		PM	**93.9**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse
M7	Houndshaven Way/Branham Lane	AM	**51.0 (SB)**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	9.8 (SB)	A								
M9	Monterey Road/Chynoweth Avenue-Roeder Road	AM	**147.6**	**F**							Adverse	Adverse
		PM	**175.9**	**F**	**89.4**	**F**	**89.9**	**F**	**89.4**	**F**	Adverse	Adverse
M10	Roeder Road/Azucar Avenue-Vera Lane	AM	**178.2**	**F**	Adverse	Adverse			Adverse	Adverse	Adverse	Adverse
		PM	**137.3**	**F**	Adverse	Adverse			Adverse	Adverse	Adverse	Adverse
M11	Monterey Road/Blossom Hill Road WB ramps (SR 82)	AM	**85.8**	**F**			Adverse	Adverse				
		PM	**55.8**	**E**			Adverse	Adverse				
M12	Monterey Road/Blossom Hill Road EB ramps (SR 82)	AM	**68.5**	**E**	37.9	D	**62.2**	**E**	37.9	D		
		PM	**73.3**	**E**	42.7	D	42.5	D	42.7	D		
M13	Monterey Road/Ford Road	AM	**>180.0**	**F**	**172.7**	**F**	**>180.0**	**F**	**172.7**	**F**		
		PM	36.2	D	34.7	C			34.7	C		
M14	Monterey Road/Flintwell Way	AM	**116.7**	**F**	43.4	D	**93.5**	**F**	43.4	D		
		PM	20.0	B								
M17	Santa Teresa Boulevard/Bernal Road	AM	33.4	C								
		PM	**68.8**	**E**	50.1	D	50.1	D	50.1	D		
M18	Santa Teresa Boulevard/Bailey Avenue	AM	**80.1**	**F**	**71.7**	**E**	**71.7**	**E**	**71.7**	**E**		
		PM	**>180.0**	**F**	**>180.0**	**F**	**>180.0**	**F**	**>180.0**	**F**		

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
M22	Monterey Road/Edenview Drive	AM	25.0	C	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**>180.0**	**F**								
M23	US 101 SB ramps/Blossom Hill Road	AM	29.4	C	Adverse	Adverse			Adverse	Adverse		
		PM	**57.7**	**E**	48.5	D	35.8	D	48.5	D		
M24	US 101 NB ramps/Blossom Hill Road	AM	22.8	C	24.0	C			24.0	C		
		PM	**61.1**	**E**	**58.9**	**E**	**63.3**	**E**	**58.9**	**E**		
M25	Bernal Road Overpass/Monterey Road ramp	AM	8.3	A								
		PM	8.5	A			Adverse	Adverse				
M28	Senter Road/Capitol Expressway	AM	**156.3**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**128.6**	**F**								
M30	Senter Road/Hellyer Avenue	AM	41.5	D	37.2	D	37.2	D	37.2	D		
		PM	31.2	C								
M32	Vistapark Drive/Branham Lane	AM	**69.6**	**E**	**72.5**	**E**	**72.5**	**E**	**72.5**	**E**		
		PM	**70.7**	**E**	52.8	D	52.8	D	52.8	D		
M33	Snell Avenue/Branham Lane	AM	**65.1**	**E**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
		PM	**55.3**	**E**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
M36	Snell Avenue/Blossom Hill Road	AM	**81.0**	**F**								
		PM	**86.2**	**F**	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
M37	Lean Avenue/Blossom Hill Road	AM	**57.9**	**E**	54.3	D	54.3	D	54.3	D		
		PM	**98.6**	**F**								
M40	Cottle Road/Poughkeepsie Road	AM	32.5	C								
		PM	**59.7**	**E**	**59.8**	**E**	**59.8**	**E**	**59.8**	**E**		
M45	Monterey Road/Fehren Drive	AM	11.4	B								
		PM	28.6	C	Adverse	Adverse	Adverse	Adverse	Adverse	Adverse		
M50	Saddlebrook Drive/Branham Lane	AM	**>180.0 (SB)**	**F**							Adverse	Adverse
		PM	**>180.0 (NB)**	**F**							Adverse	Adverse
Morgan Hill and Gilroy Subsection												
M19	Hale Avenue/Tilton Avenue	AM	32.7	D	14.9	B	14.9	B	14.9	B		
		PM	**>180.0**	**F**	**74.6**	**E**	**74.6**	**E**	**74.6**	**E**		
M46	Monterey Road/Tilton Avenue	AM	17.9	B			20.1	C				
		PM	**65.5**	**E**	48.9	D	11.2	B	48.9	D	**61.5**	**E**
M47	Monterey Road/Madrone Parkway	AM	18.8	B			47.5	D				
		PM	14.4	B			45.1	D				
MH2	Railroad Avenue/Tennant Avenue	AM	13.4 (SB)	B			6.9	A				
		PM	14.2 (NB)	B			4.6	A				
MH6	Monterey Road/San Martin Avenue	AM	**58.2**	**E**							Adverse	Adverse
		PM	37.6	D							Adverse	Adverse
MH7	Depot Road/San Martin Avenue	AM	26.5 (NB)	D								
		PM	33.2 (NB)	D							Adverse	Adverse

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
MH8	Llagas Road/San Martin Avenue	AM	**35.1**	**E**			11.5	B				
		PM	22.7	C			9.2	A				
MH10	Monterey Road/E Main Avenue	AM	**136.0**	**F**							Adverse	Adverse
		PM	**151.1**	**F**								
MH11	Depot Street/E Main Avenue	AM	**>180.0 (SB)**	**F**							46.6	D
		PM	**>180.0 (NB)**	**F**							21.7	C
MH12	Butterfield Boulevard/E Main Avenue	AM	**173.0**	**F**							121.9	F
		PM	**103.9**	**F**							**78.3**	**E**
MH26	Monterey Road/Masten Avenue	AM	37.0	D								
		PM	45.7	D							Adverse	Adverse
G1	Monterey Road/Buena Vista Avenue	AM	19.6	B				Adverse				
		PM	7.8	A			Adverse					
G15	Monterey Road (SR 152)/Welburn Avenue-Leavesley Road (SR 152)	AM	39.3	D							Adverse	Adverse
		PM	36.6	D								
G25	Monterey Road/IOOF Avenue	AM	40.5	D							44.1	D
		PM	9.1	A								
G29	Monterey Road/Sixth Street	AM	17.2	B							Adverse	Adverse
		PM	38.8	D							Adverse	Adverse
G33	Monterey Road/Seventh Street	AM	11.1	B							Adverse	Adverse
		PM	13.7	B								
G35	Monterey Road/Eighth Street	AM	9.7	A							Adverse	Adverse
		PM	11.0	B								
G36	Monterey Road/10th Street	AM	19.6	B								
		PM	27.1	C	33.1	C	36.5	D				
G37	Alexander Street/10th Street	AM	11.8	B								
		PM	31.9	C	33.1	C	28.2	C				
G38	Chestnut Street/10th Street	AM	26.0	C								
		PM	**71.6**	**E**	39.0	D	43.8	D				
G46	Monterey Road/Las Animas Avenue	AM	20.6	C			Adverse	Adverse				
		PM	16.6	B			Adverse	Adverse				
G50	Monterey Road/Ninth Street	AM	6.1 (EB)	A								
		PM	5.3 (EB)	A	10.0 (EB)	A	9.3 (SB)	A				
G51	Alexander Street/Ninth Street	AM	5.4 (WB)	A								
		PM	5.8 (WB)	A	9.7	A	9.2	A				
G53	School Access/IOOF Avenue	AM	**39.1**	**E**							29.6	C
		PM	11.8	B								
G58	Alexander Street/Sixth Street	AM	13.3	B							Adverse	Adverse
		PM	17.3	C							Adverse	Adverse

Intersection		Peak Hour	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
G60	Chestnut Street/Luchessa Street	AM	9.3 (SB)	A								
		PM	10.2 (SB)	B							21.2 (SB)	C
GM4	SR 25/Bloomfield Avenue	AM	**53.9 (WB)**	**F**								
		PM	**63.8 (WB)**	**F**	38.0	D	38.0	D	38.0	D	16.1	B

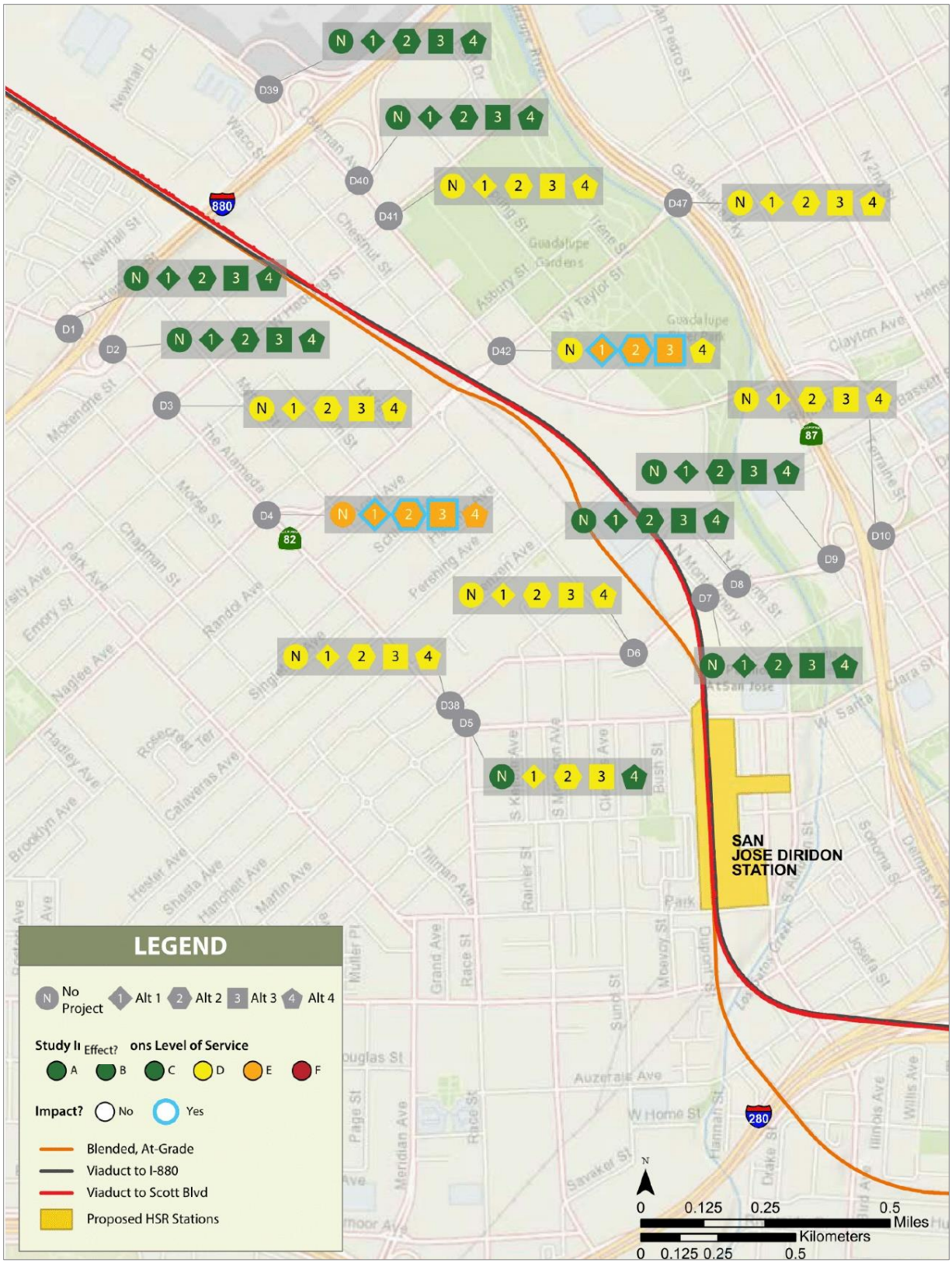
Whole intersection average delay reported for signalized intersections. Whole intersection average delay and worst approach delay (in parentheses) reported for unsignalized intersections.
Entries **bolded** identify locations with LOS E or F in one or both peak hours. **Shaded bolded** entries identify locations of adverse effects under NEPA as defined by the criteria.
I- = Interstate
NB = northbound
SB = southbound
EB = eastbound
WB = westbound
LOS = level of service
MOWF = maintenance of way facility
Ext. = Extension
US = U.S. Highway



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

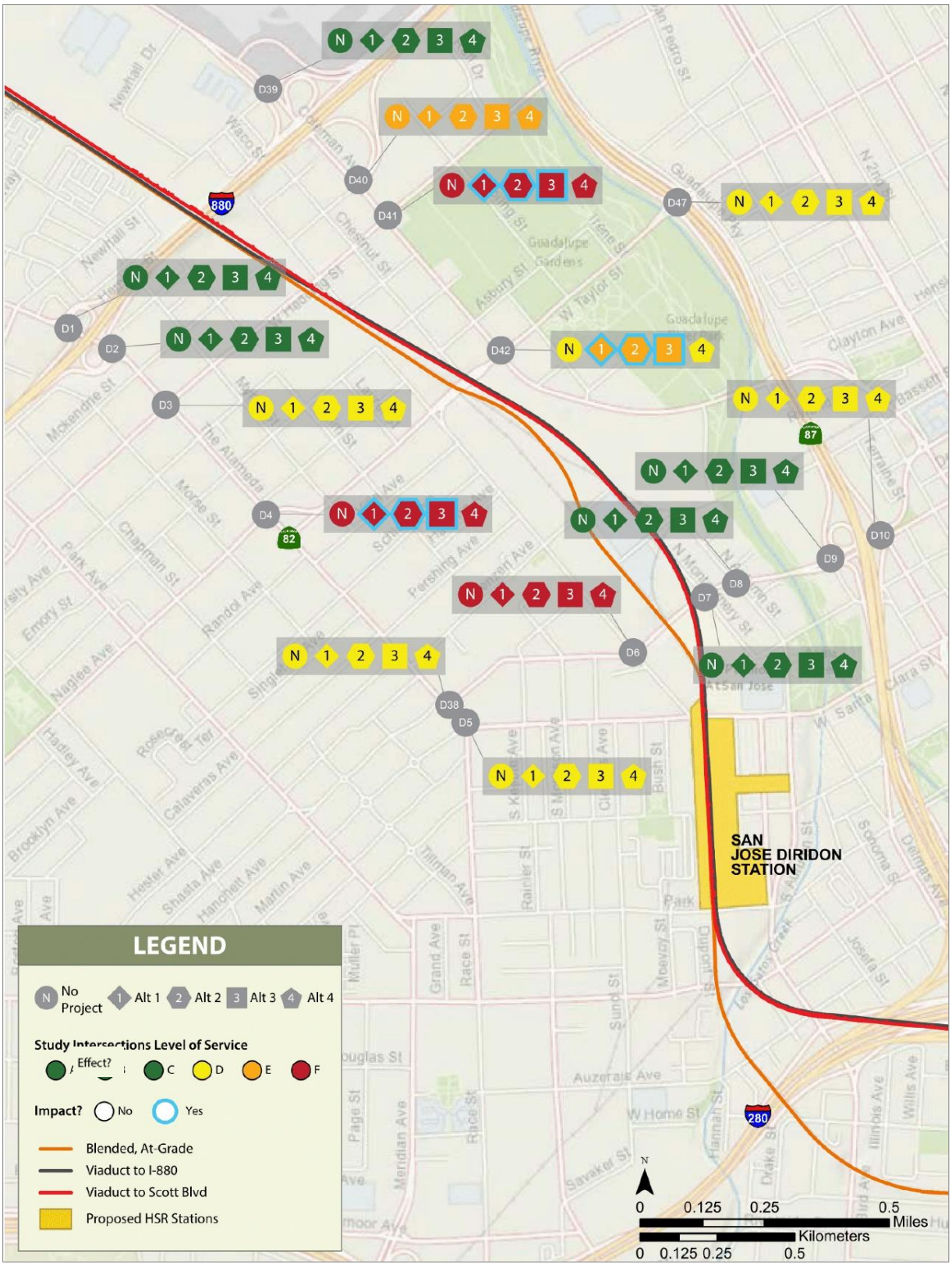
MARCH 2019

Figure 2 San Jose Diridon Station 2029 Plus Project AM Intersection LOS – Part 1 of 13



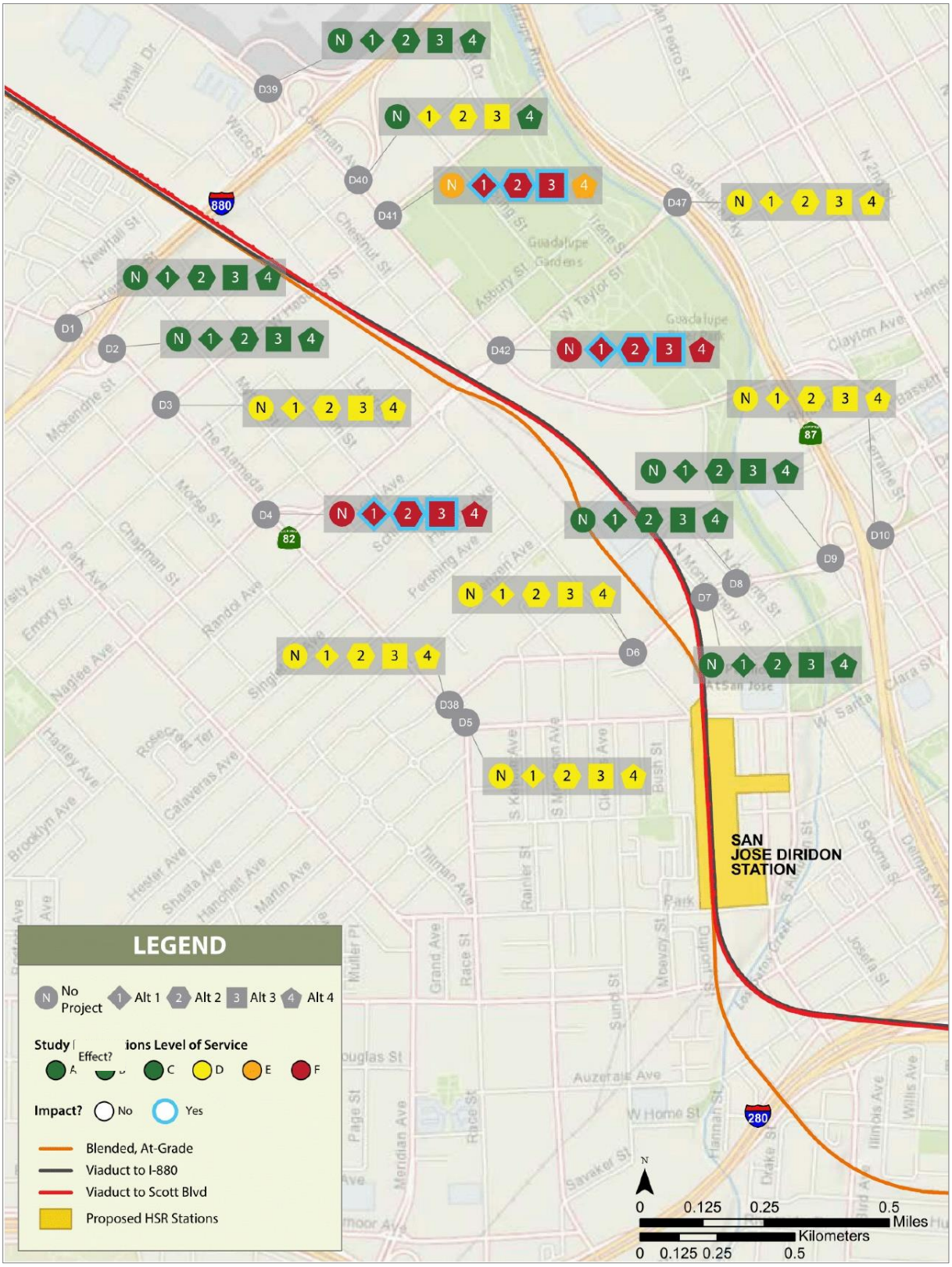
LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

Figure 3 San Jose Diridon Station 2029 Plus Project PM Intersection LOS – Part 1 of 13



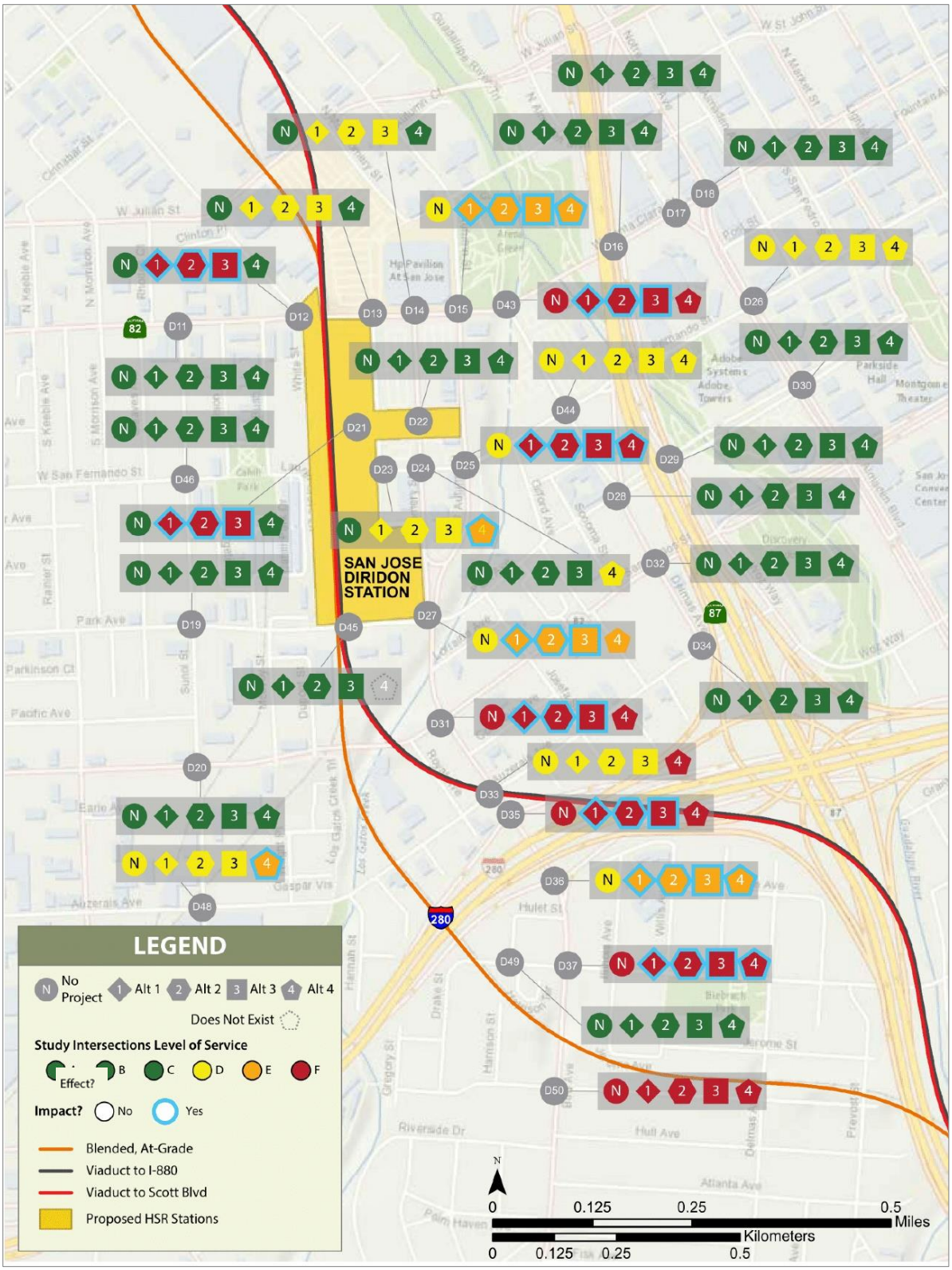
LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

Figure 4 San Jose Diridon Station 2040 Plus Project AM Intersection LOS – Part 1 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

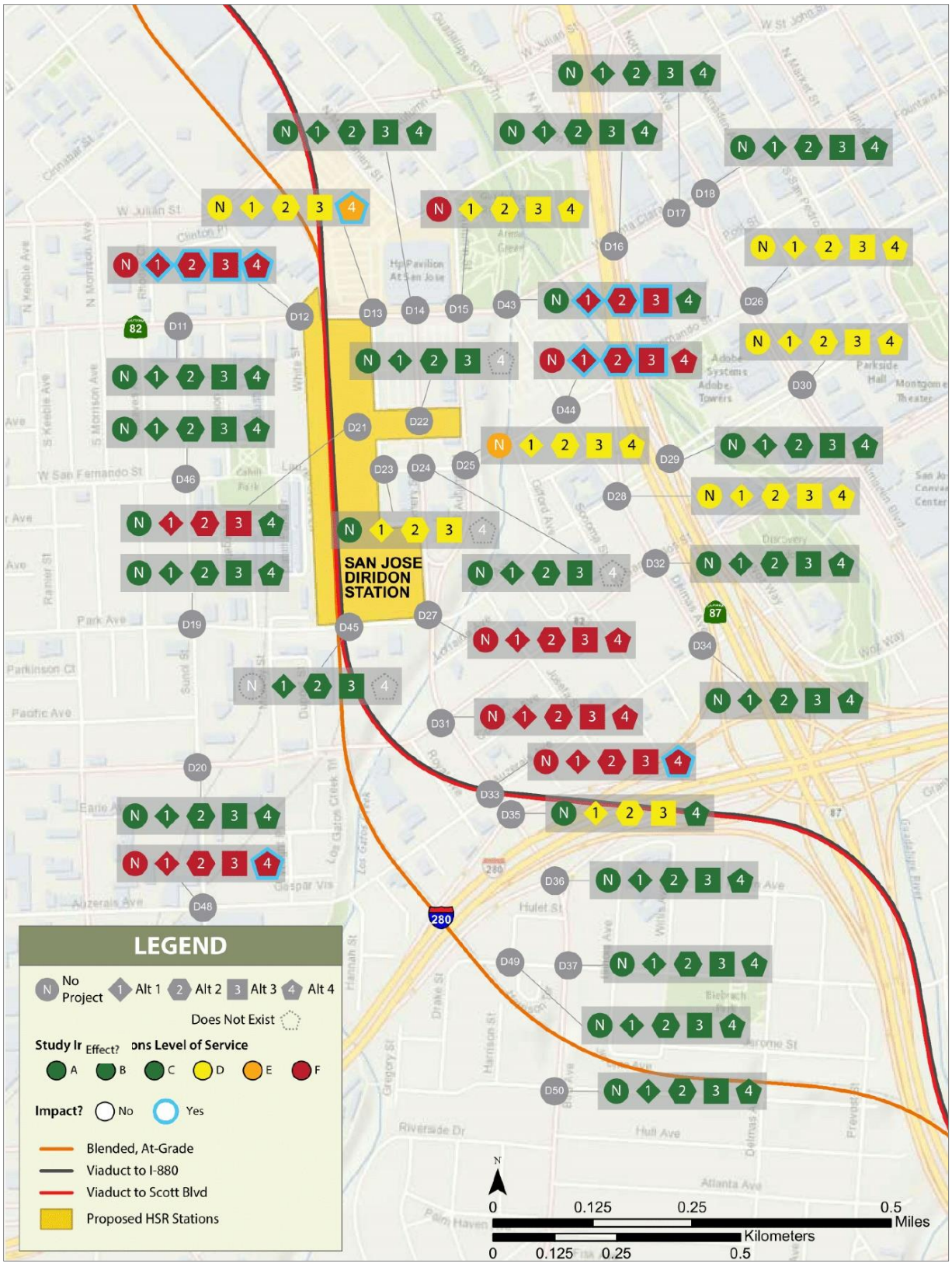
Figure 5 Jose Diridon Station 2040 Plus Project PM Intersection LOS – Part 1 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

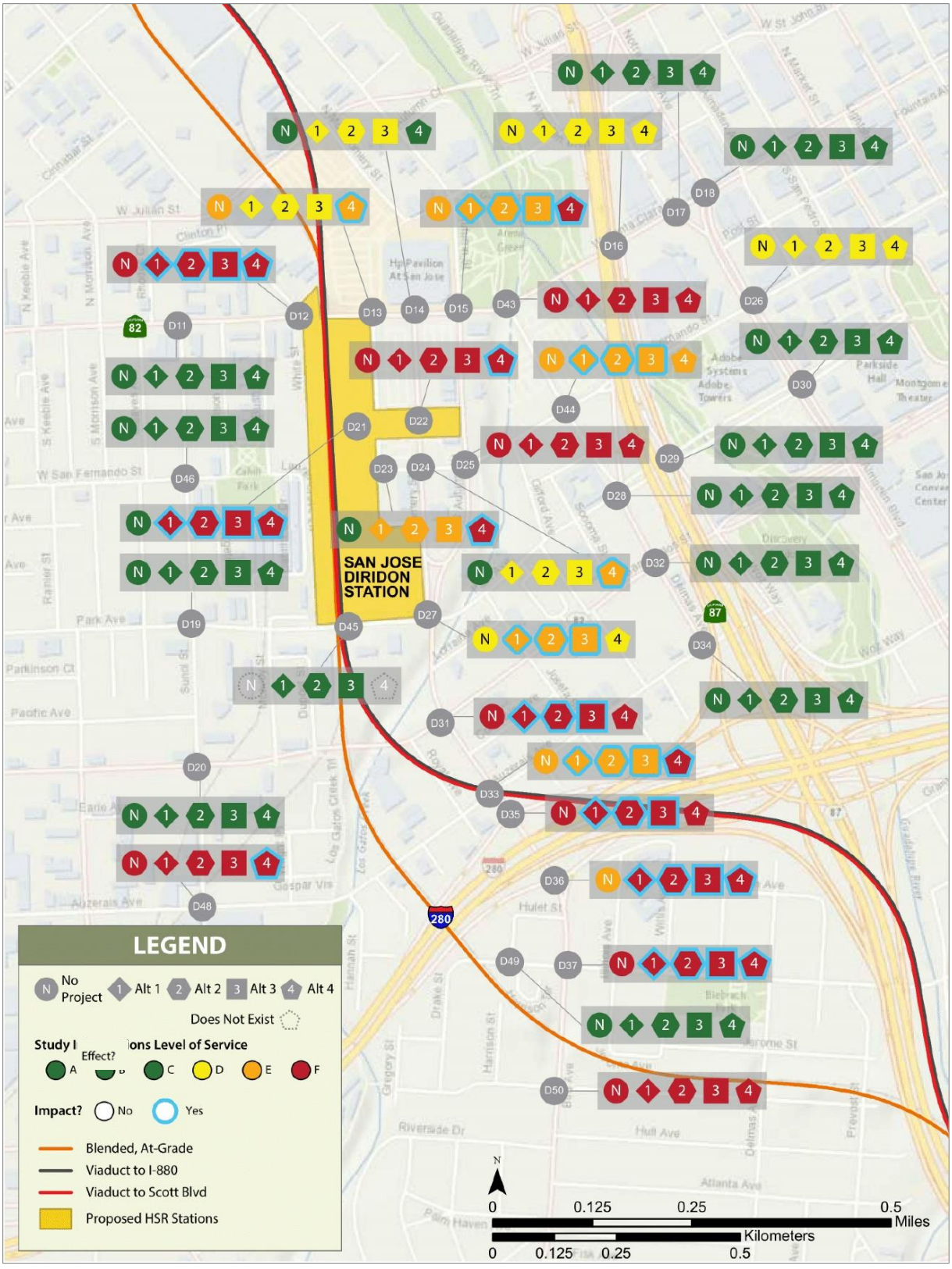
MARCH 2019

Figure 6 San Jose Diridon Station 2029 Plus Project AM Intersection LOS – Part 2 of 13



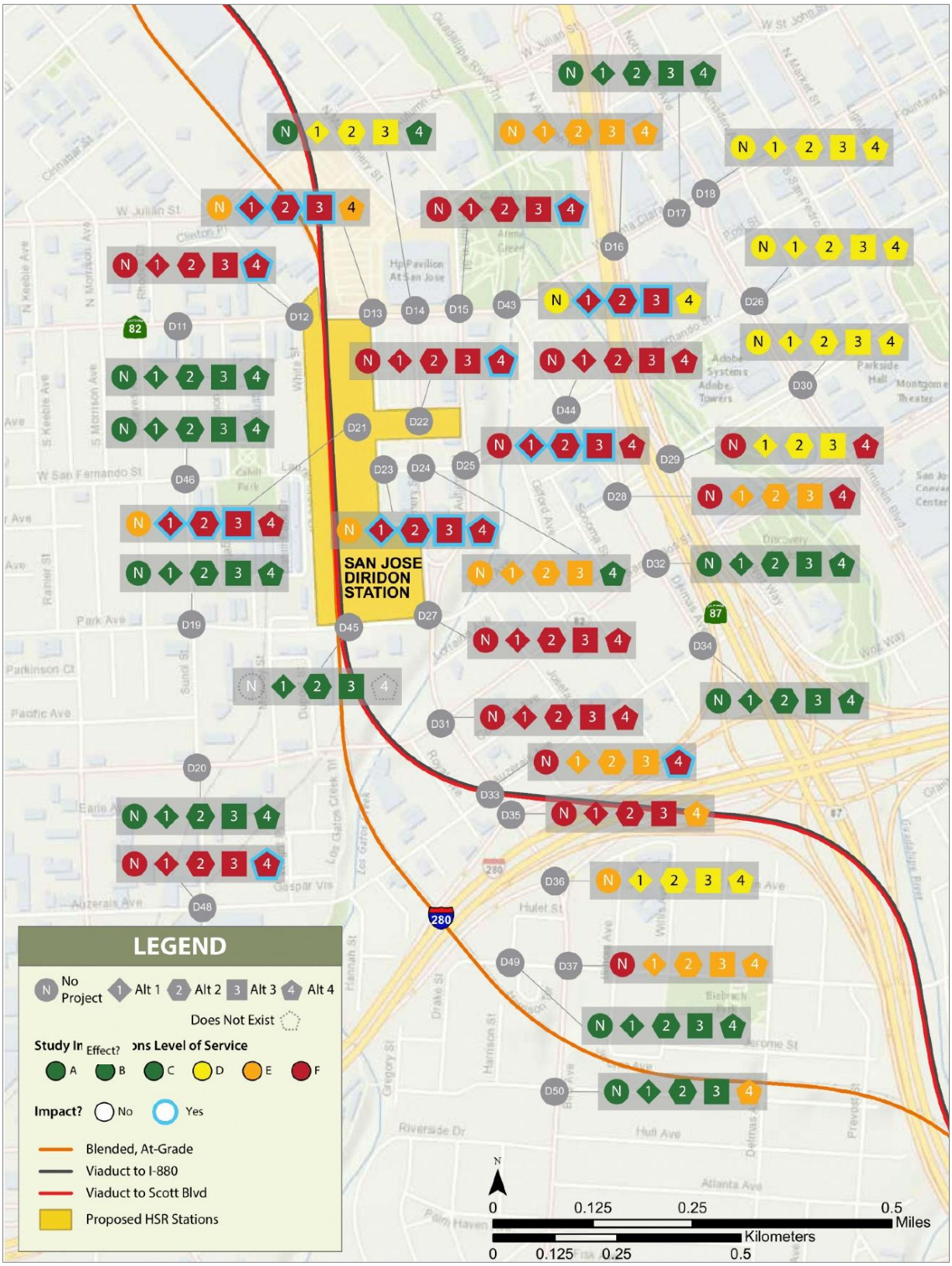
LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

Figure 7 San Jose Diridon Station 2029 Plus Project PM Intersection LOS – Part 2 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

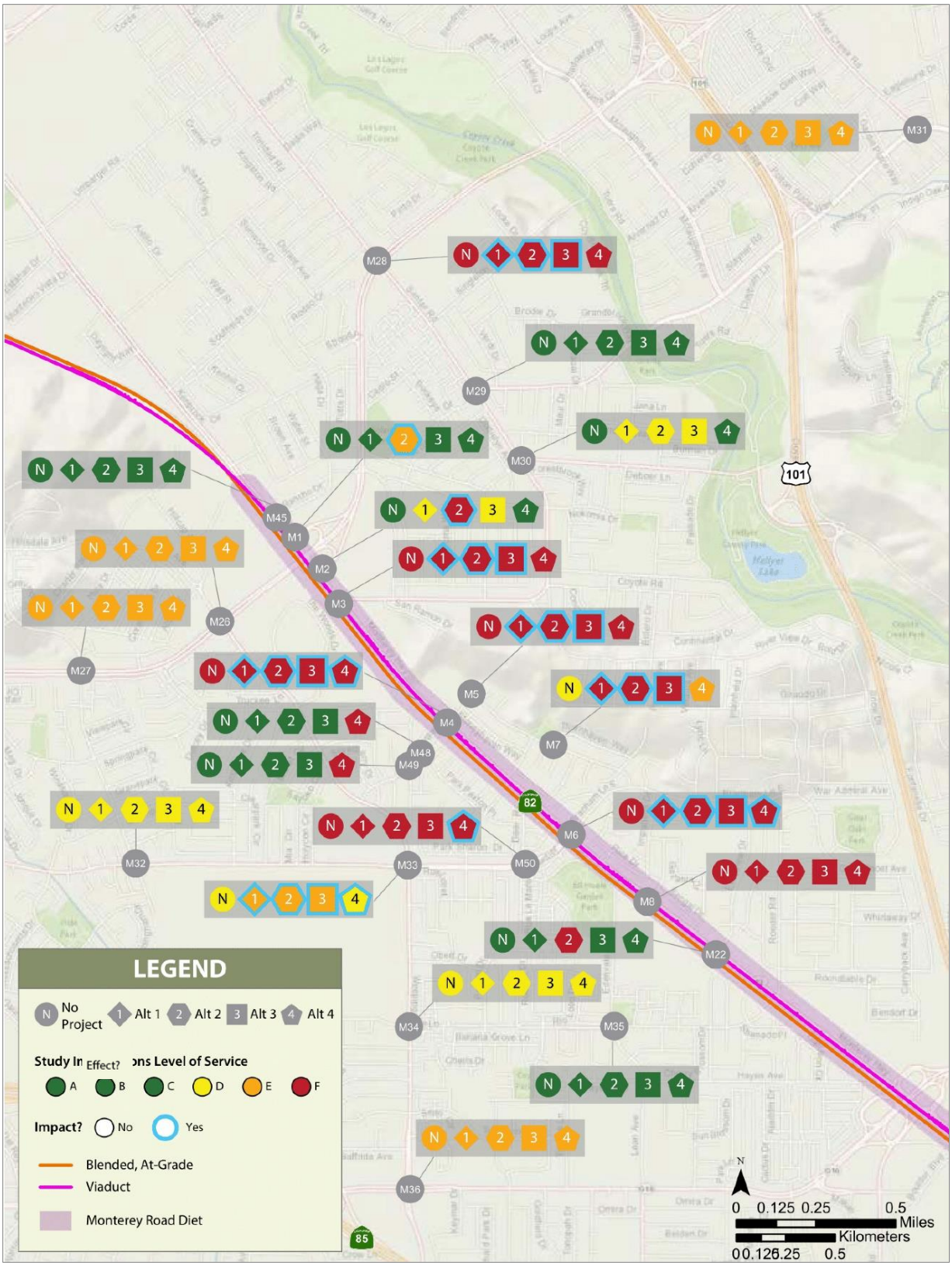
Figure 8 San Jose Diridon Station 2040 Plus Project AM Intersection LOS – Part 2 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

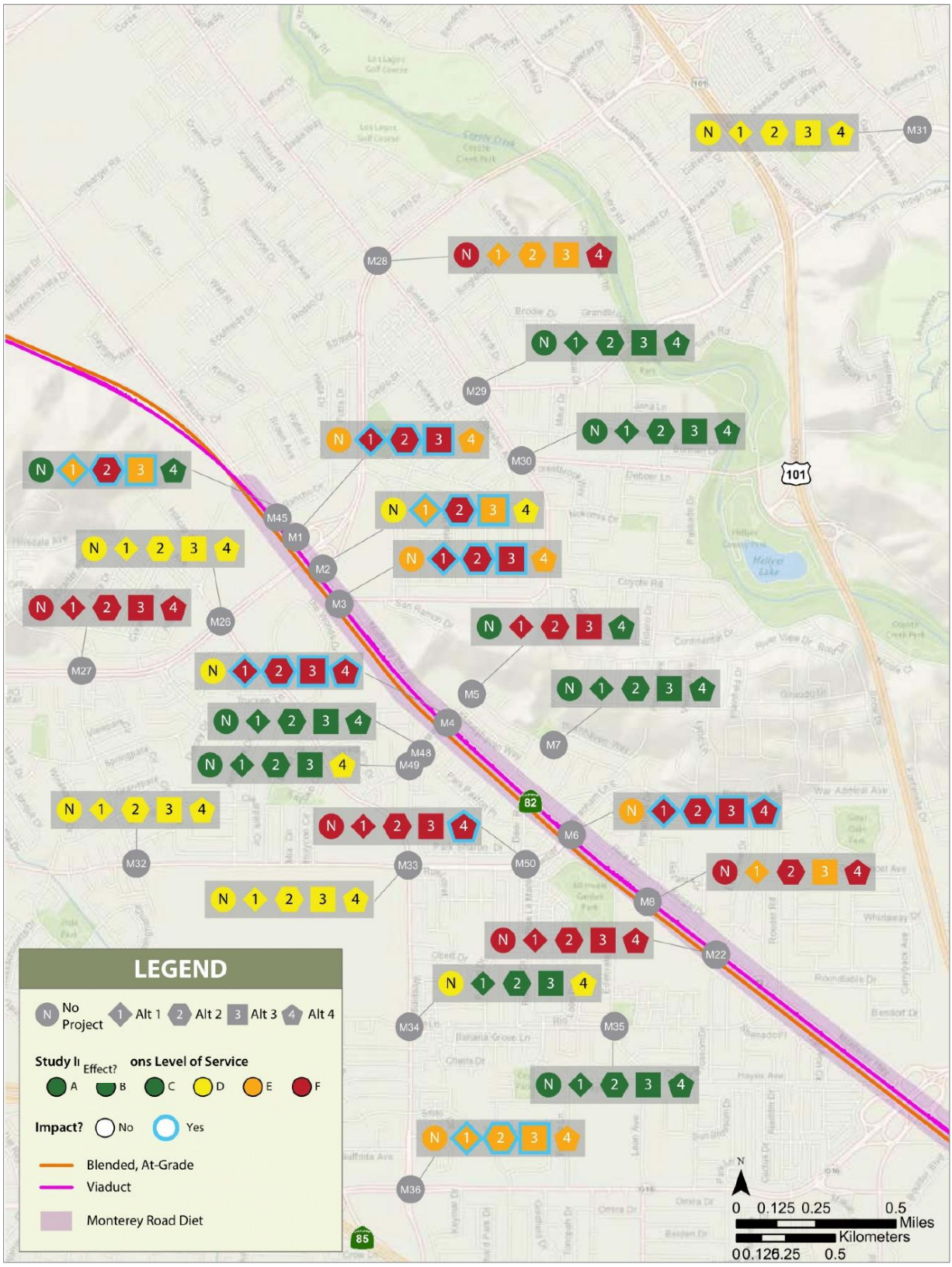
Figure 9 San Jose Diridon Station 2040 Plus Project PM Intersection LOS – Part 2 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

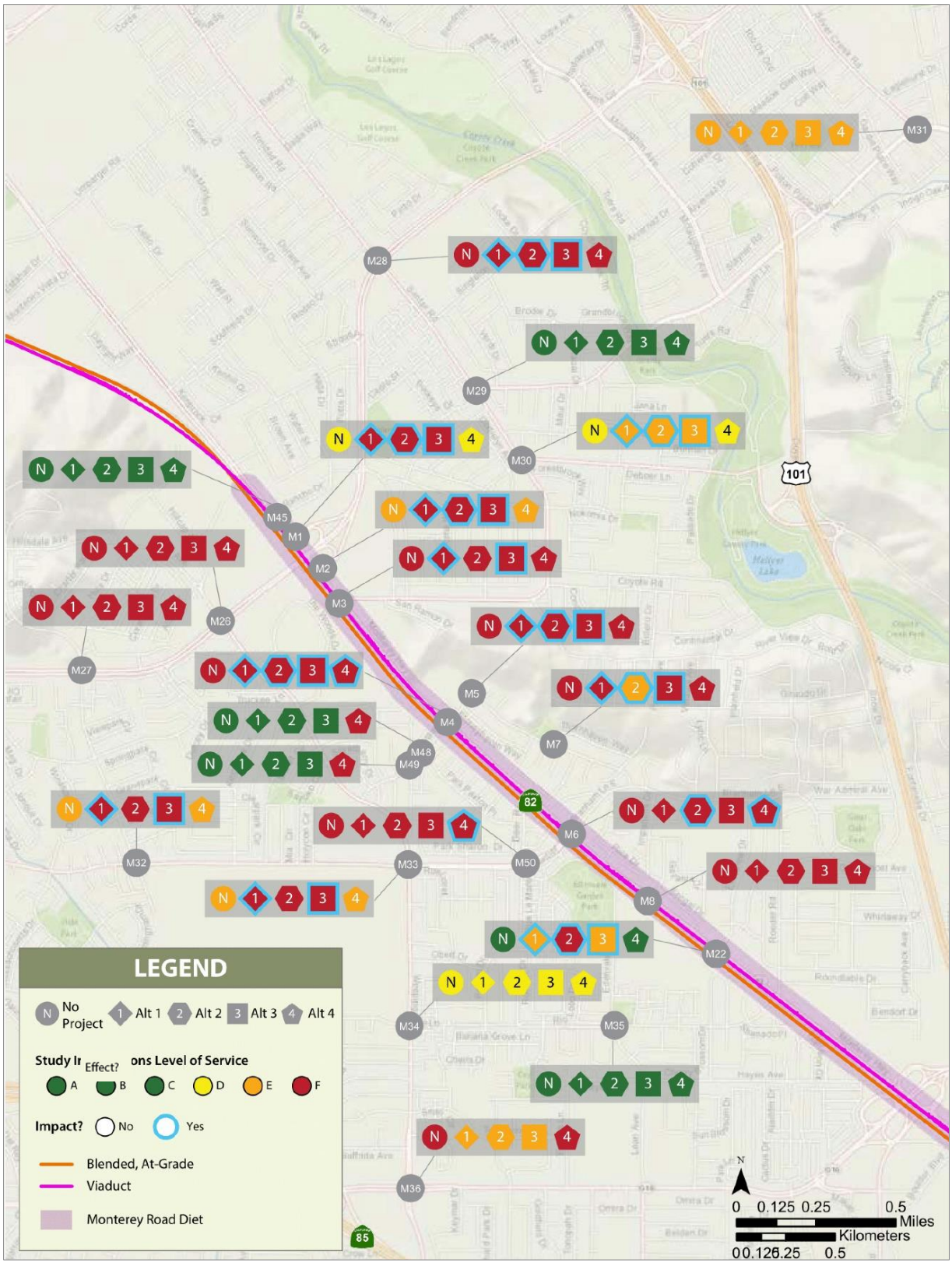
Figure 10 Monterey Corridor 2029 Plus Project AM Intersection LOS – Part 3 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

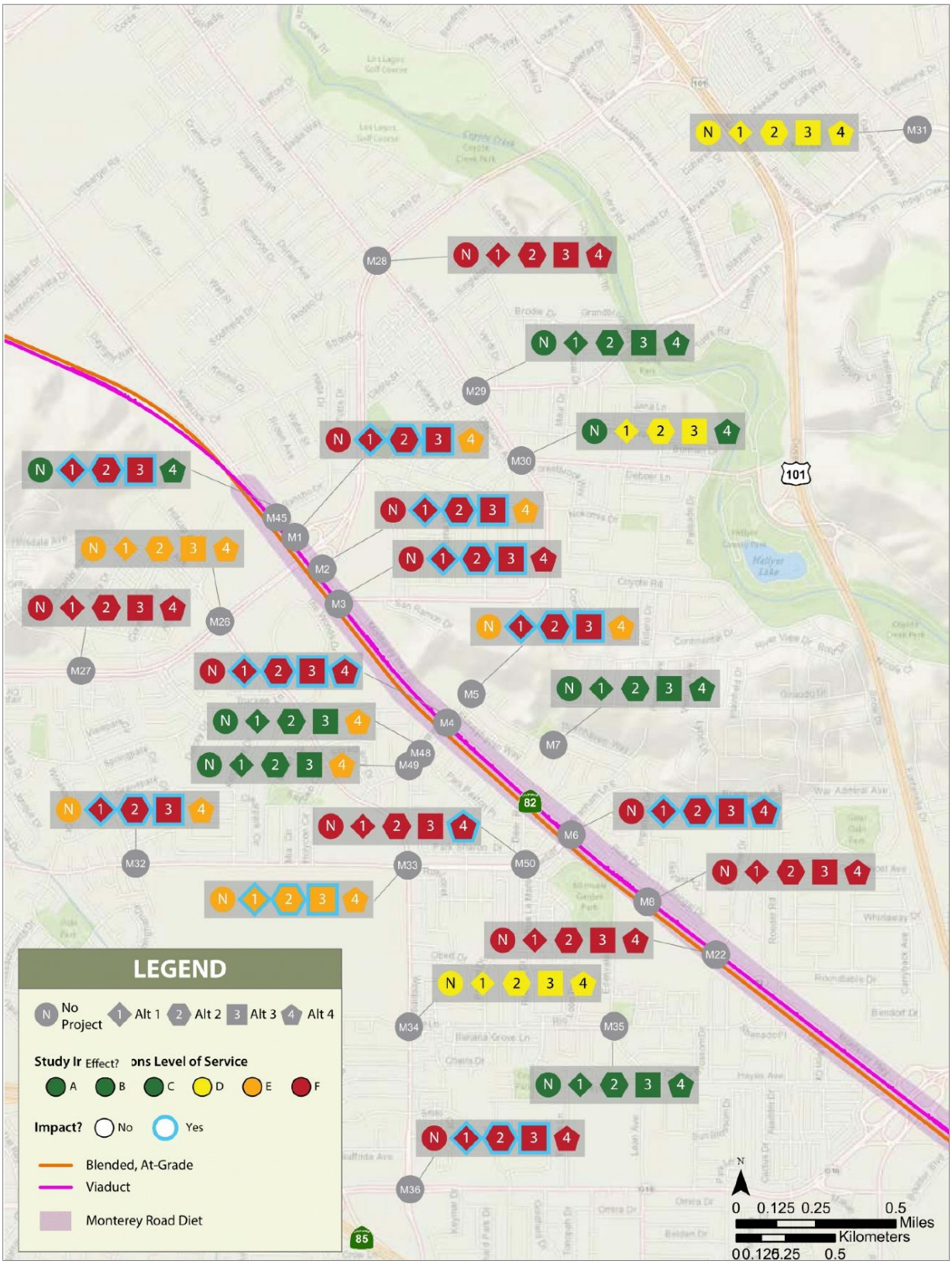
Figure 11 Monterey Corridor 2029 Plus Project PM Intersection LOS – Part 3 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

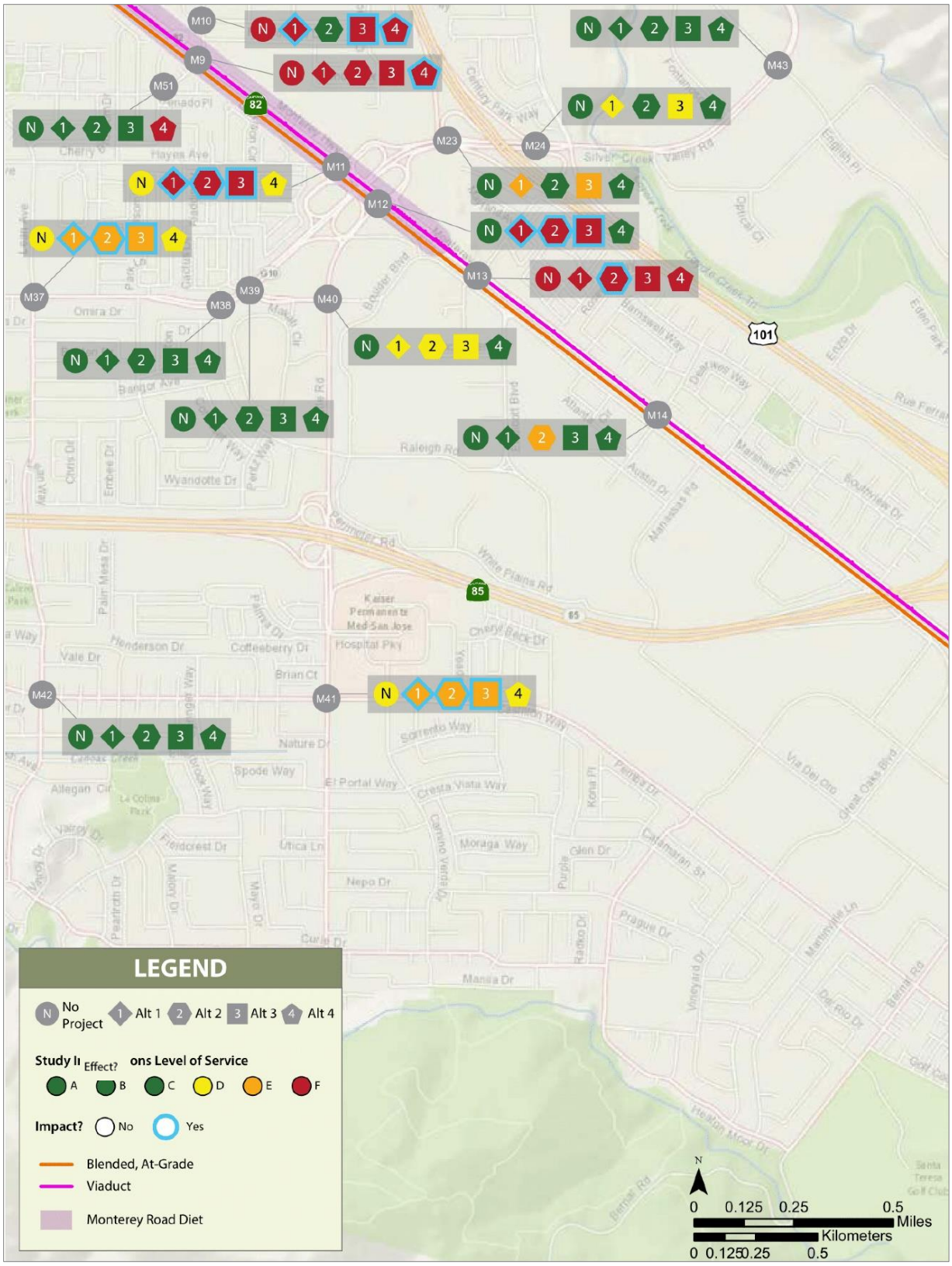
Figure 12 Monterey Corridor 2040 Plus Project AM Intersection LOS – Part 3 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

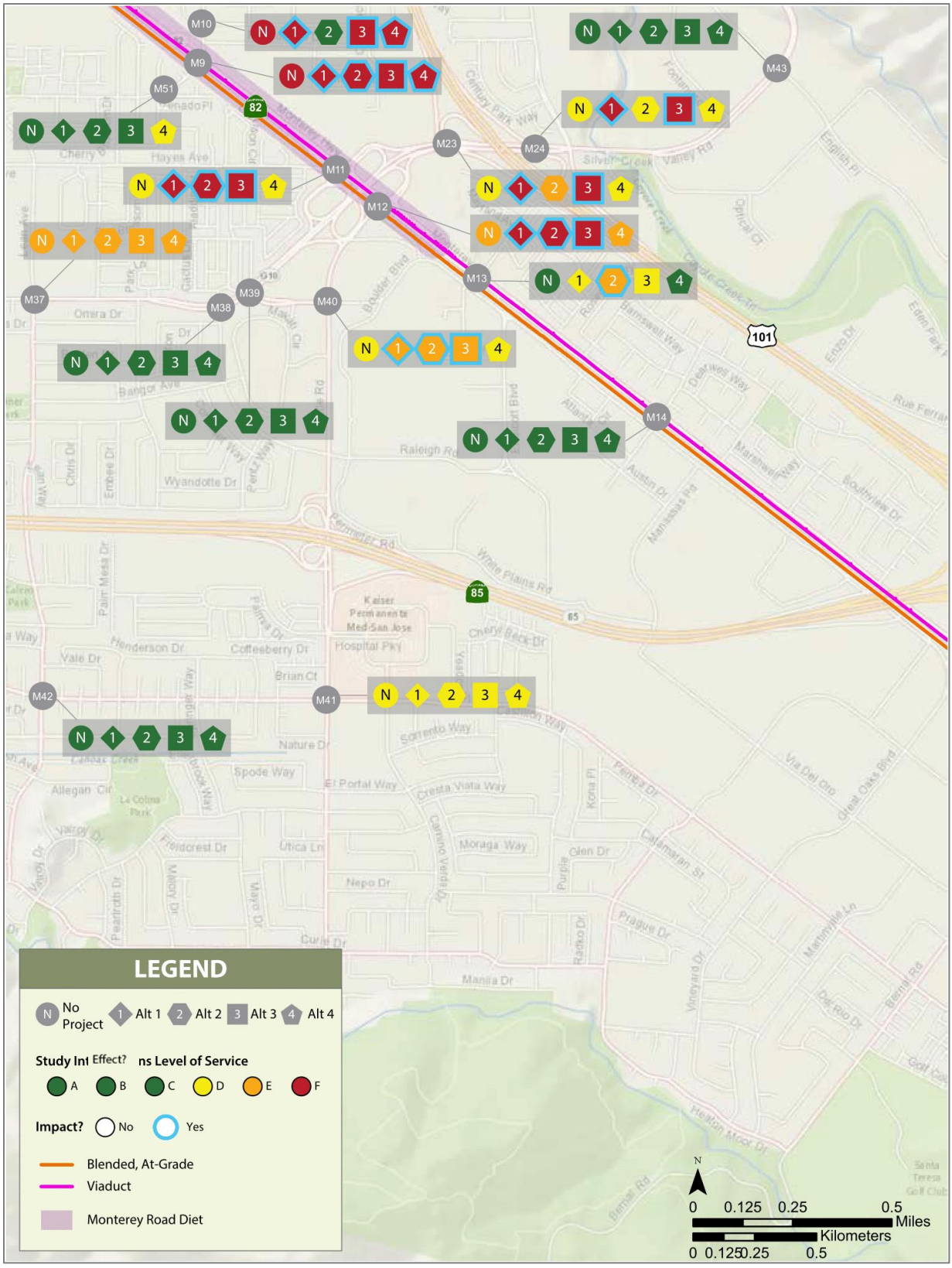
Figure 13 Monterey Corridor 2040 Plus Project PM Intersection LOS – Part 3 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

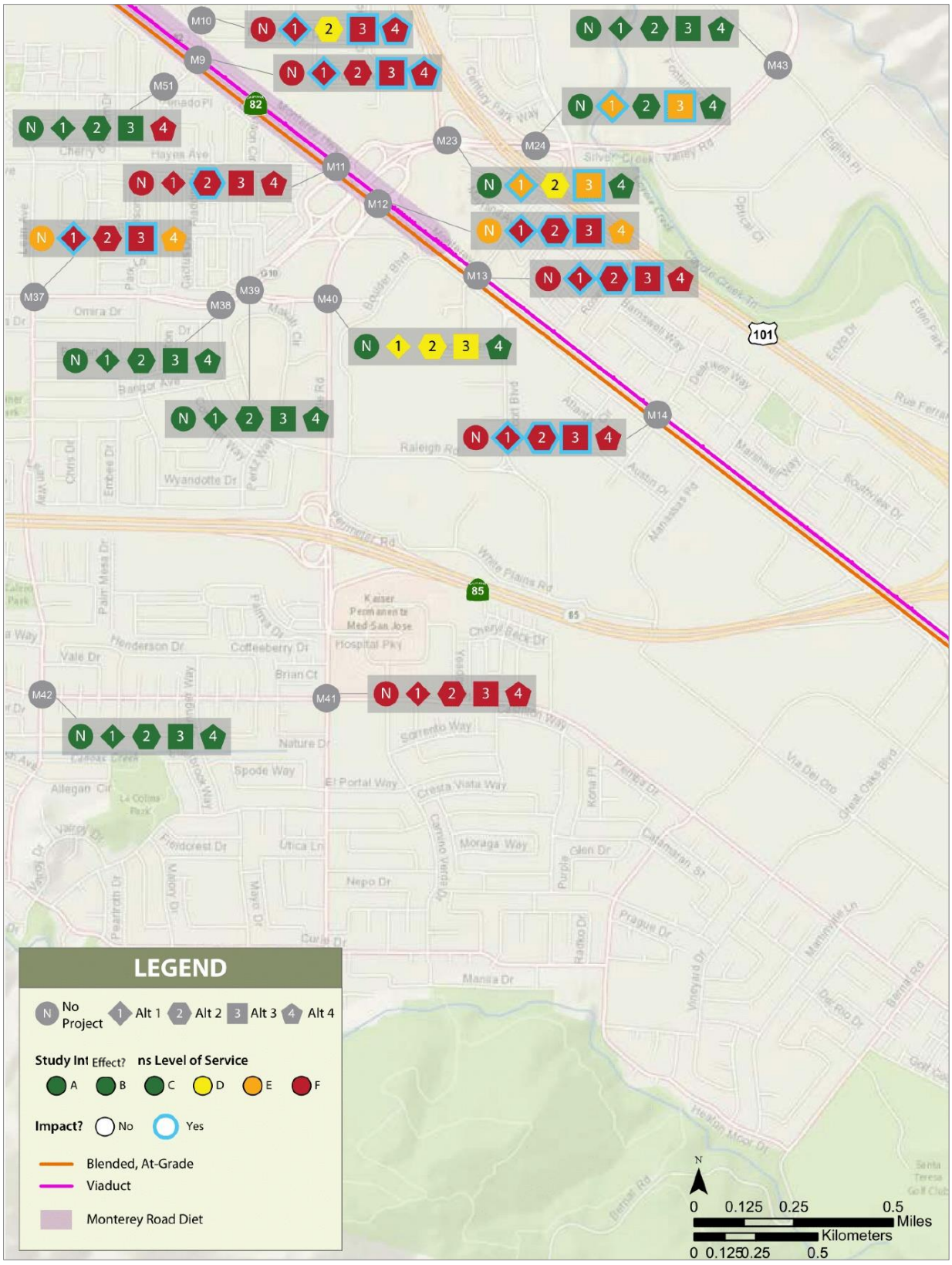
Figure 14 Monterey Corridor 2029 Plus Project AM Intersection LOS – Part 4 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

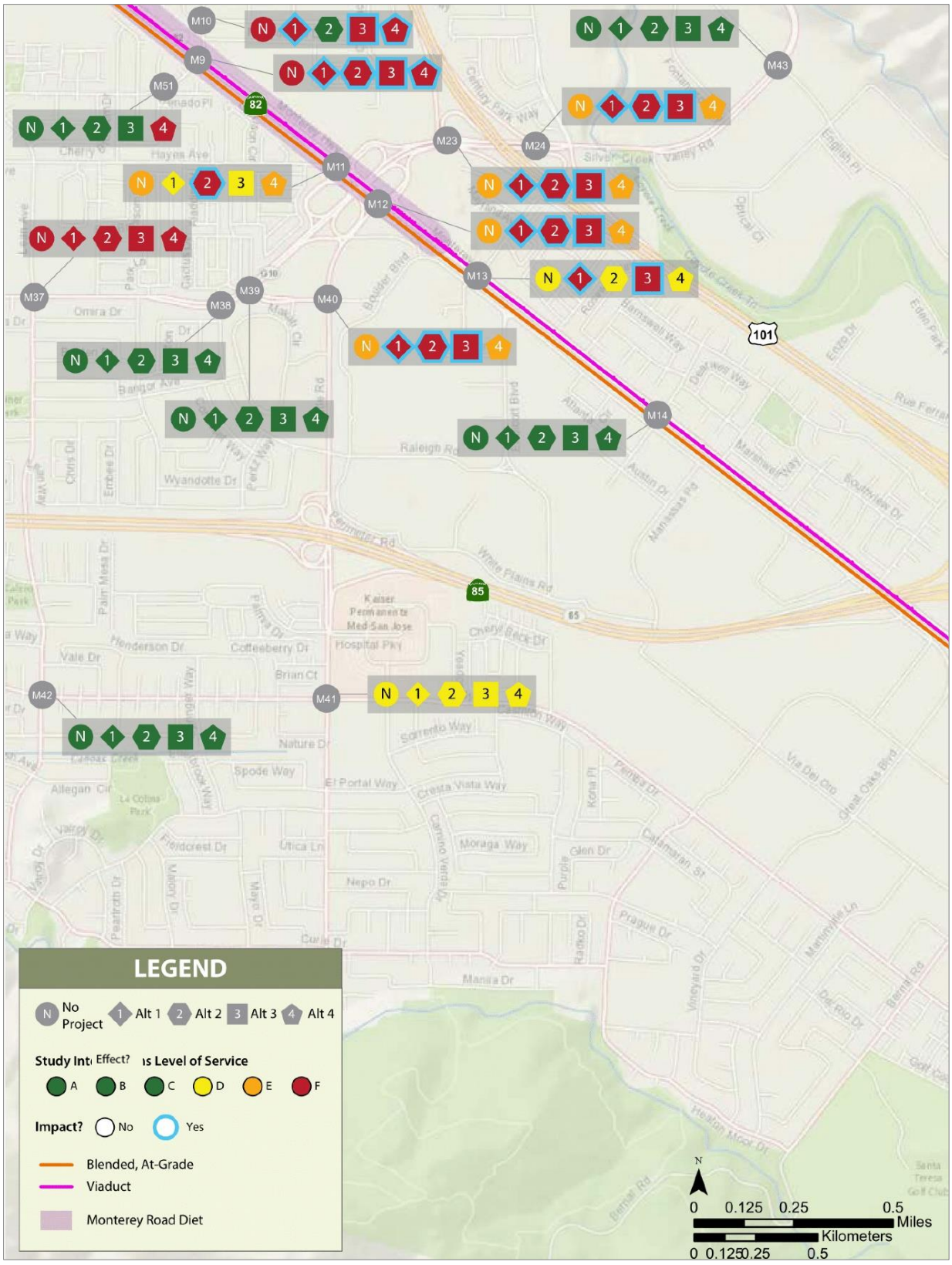
Figure 15 Monterey Corridor 2029 Plus Project PM Intersection LOS – Part 4 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

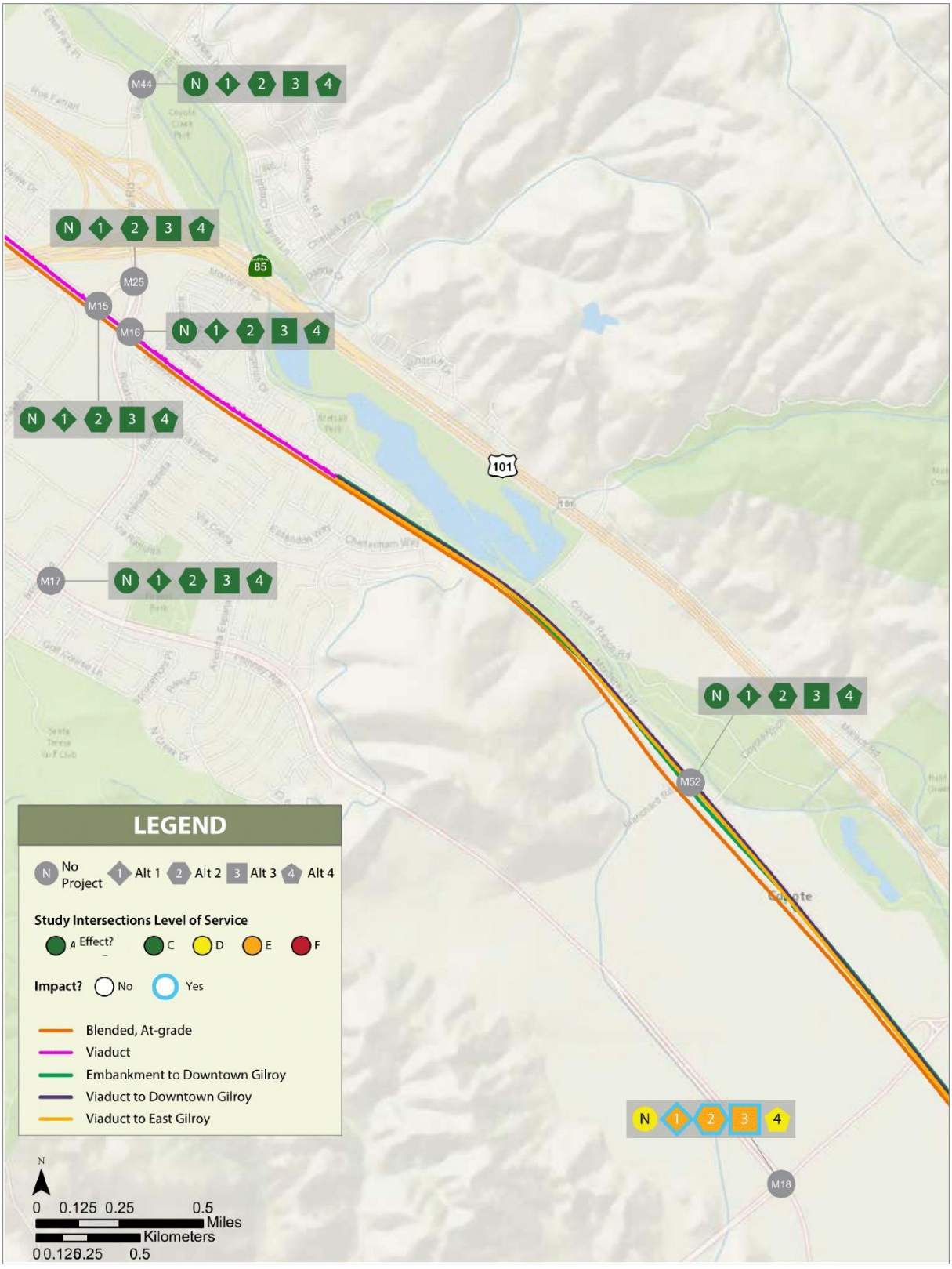
Figure 16 Monterey Corridor 2040 Plus Project AM Intersection LOS – Part 4 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

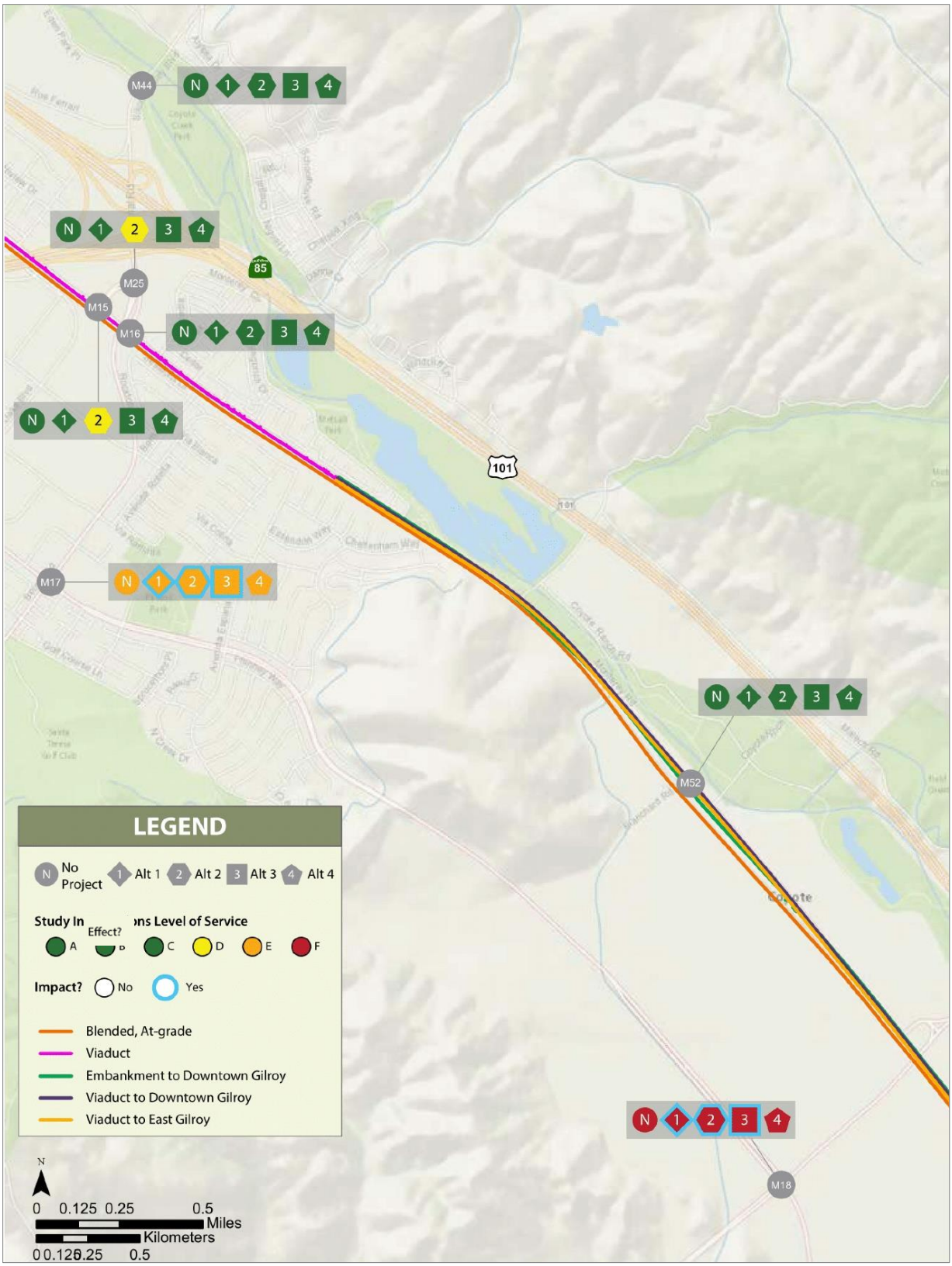
Figure 17 Monterey Corridor 2040 Plus Project PM Intersection LOS – Part 4 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

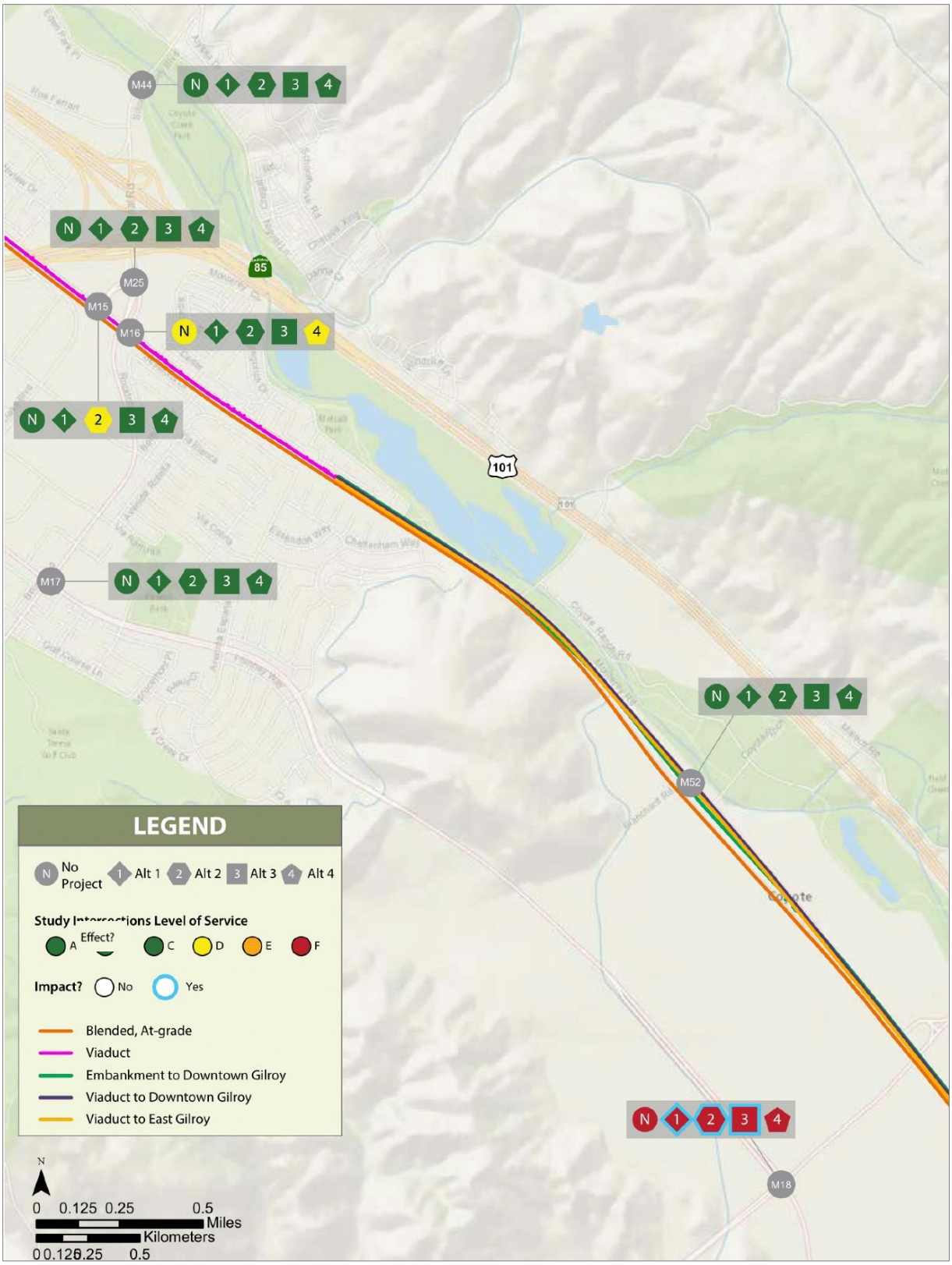
MARCH 2019

Figure 18 Monterey Corridor 2029 Plus Project AM Intersection LOS – Part 5 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

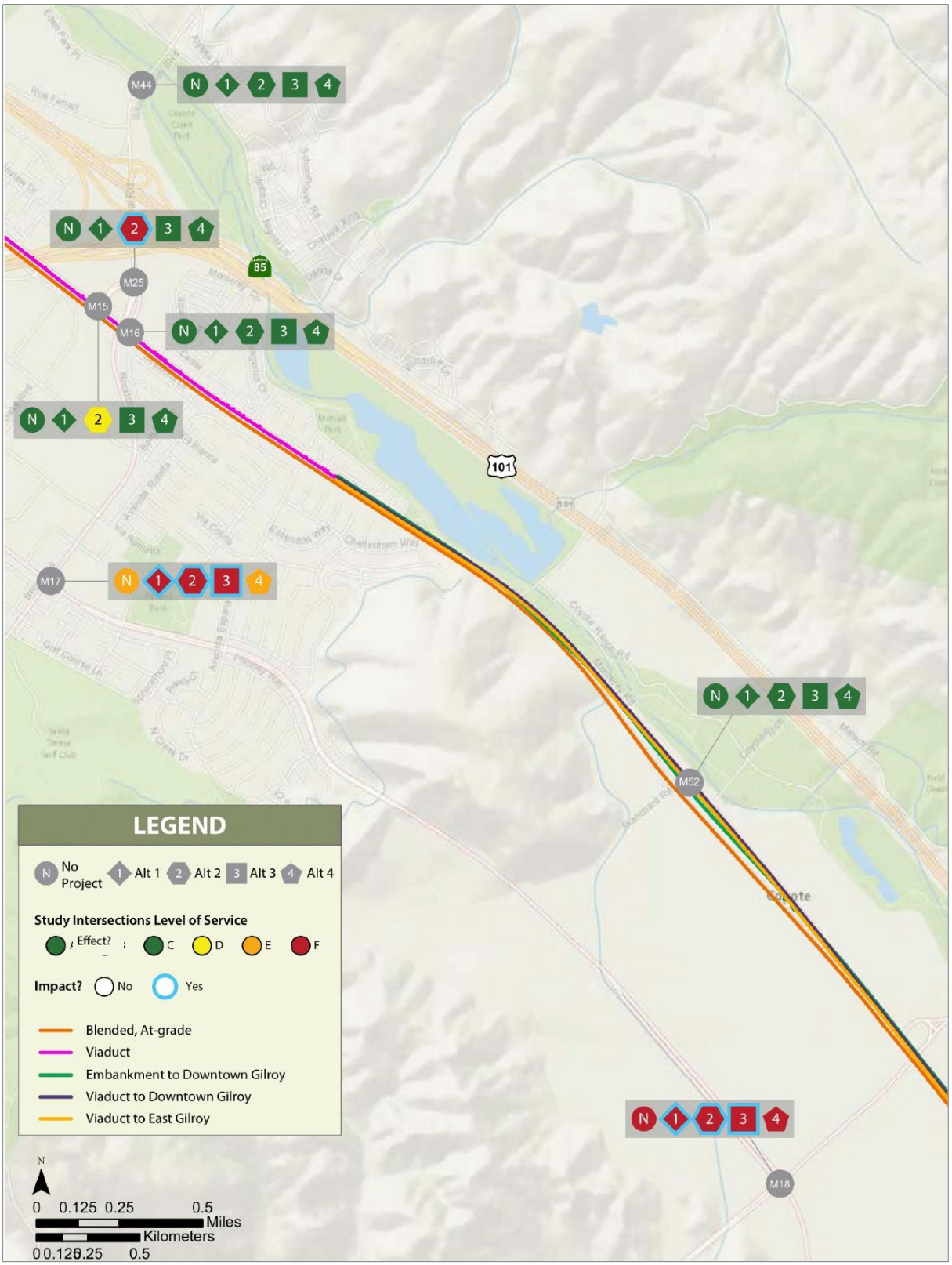
Figure 19 Monterey Corridor 2029 Plus Project PM Intersection LOS – Part 5 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

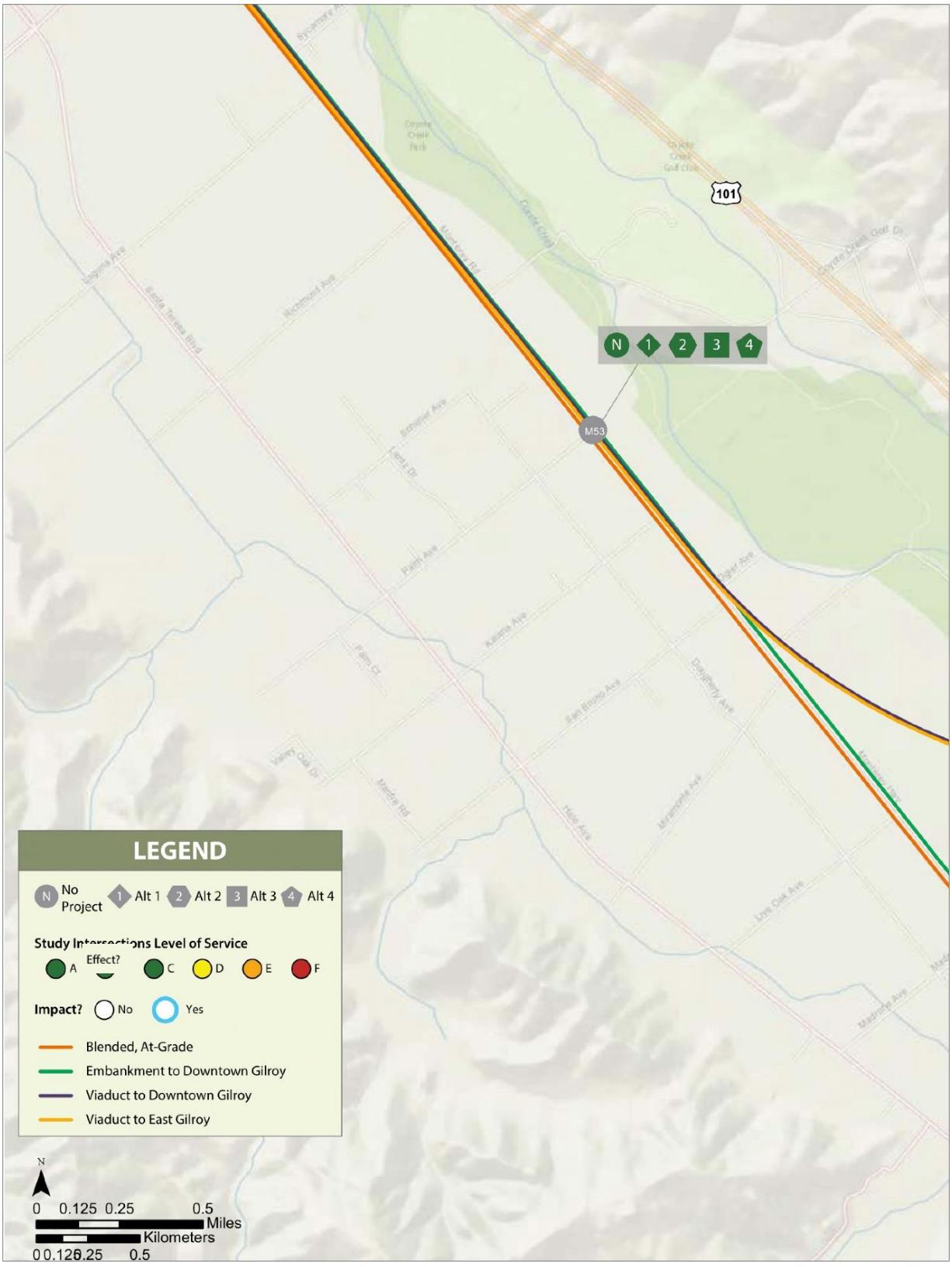
Figure 20 Monterey Corridor 2040 Plus Project AM Intersection LOS – Part 5 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

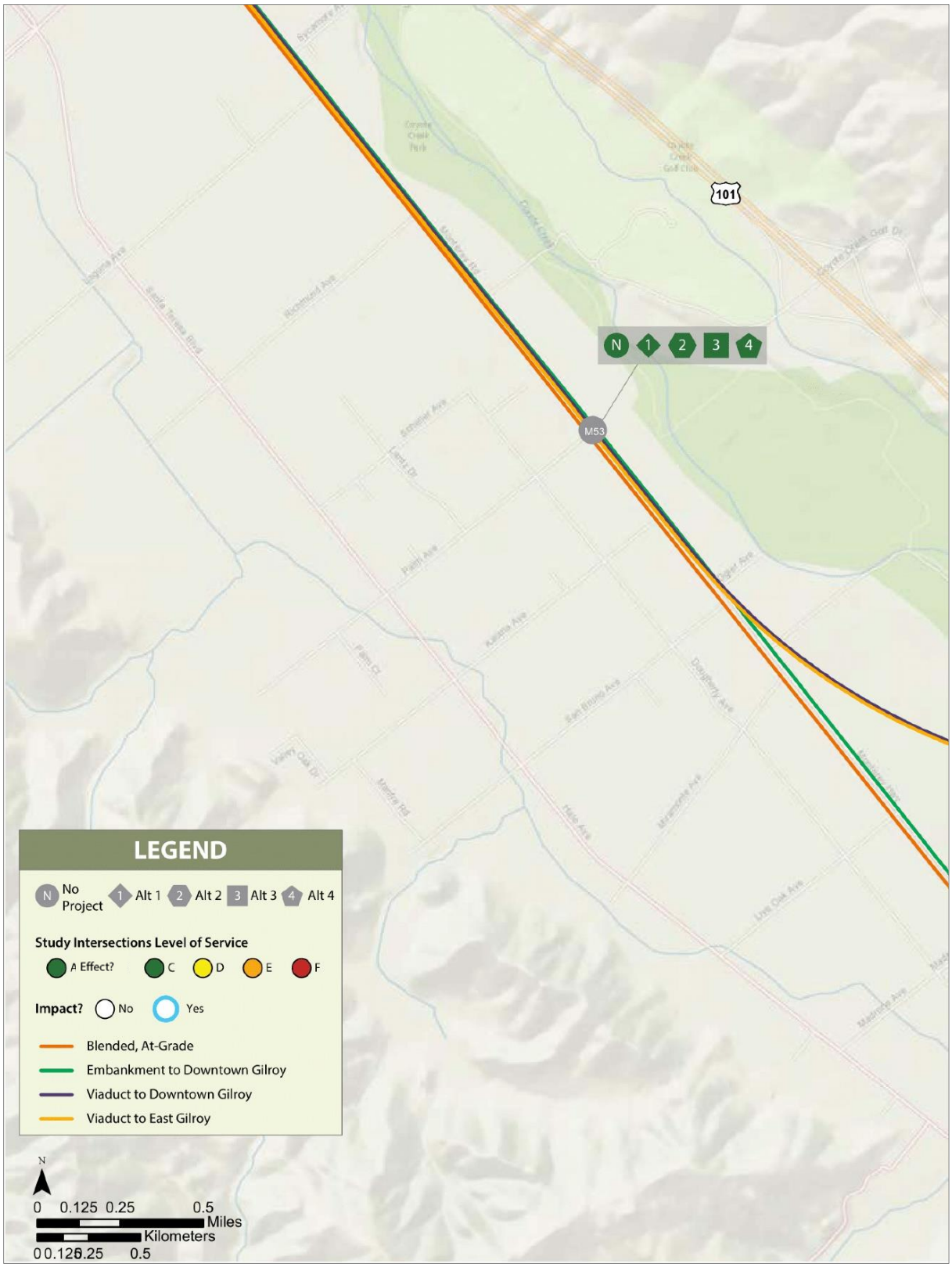
MARCH 2019

Figure 21 Monterey Corridor 2040 Plus Project PM Intersection LOS – Part 5 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

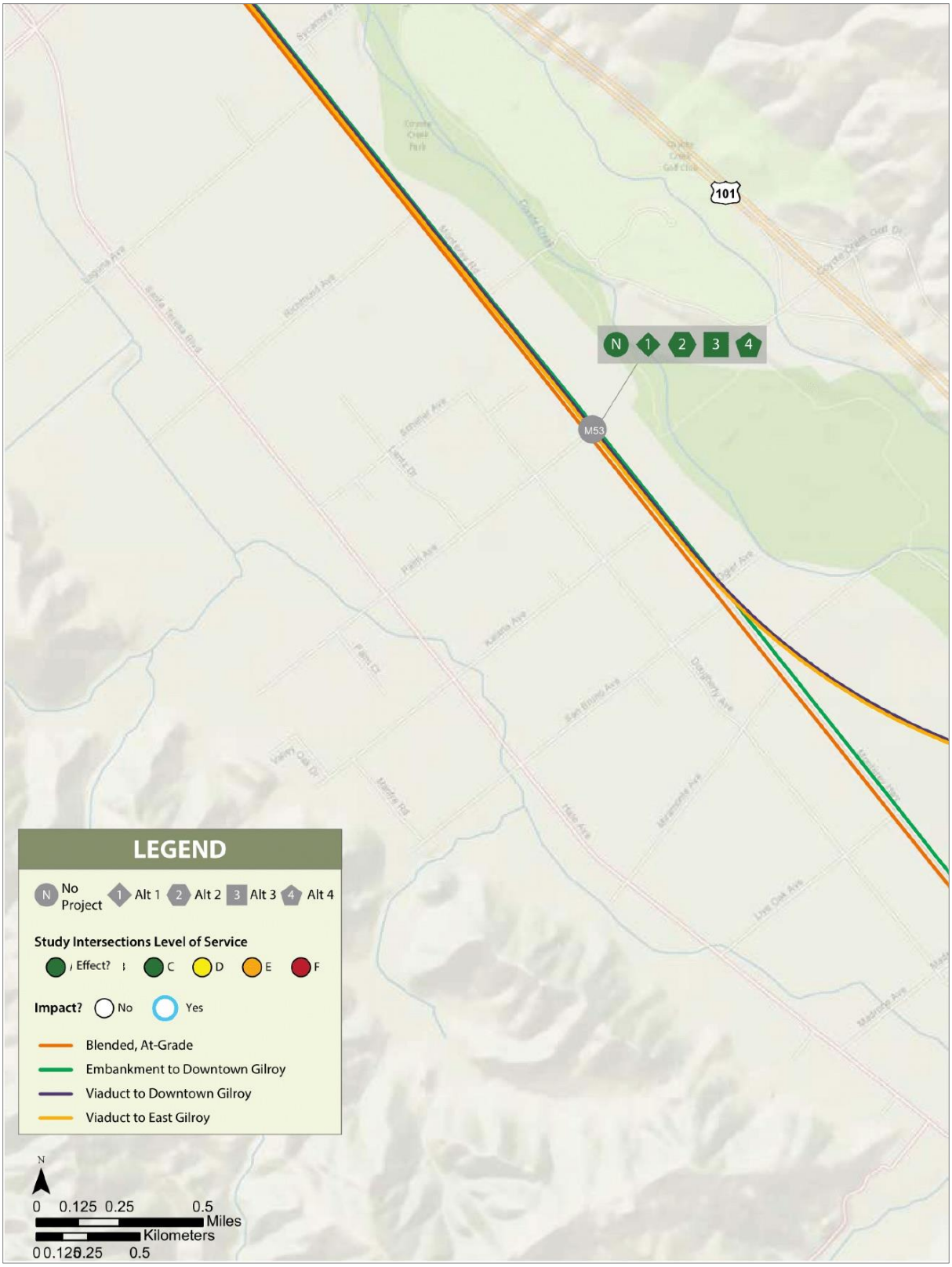
Figure 22 Morgan Hill 2029 Plus Project AM Intersection LOS – Part 6 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

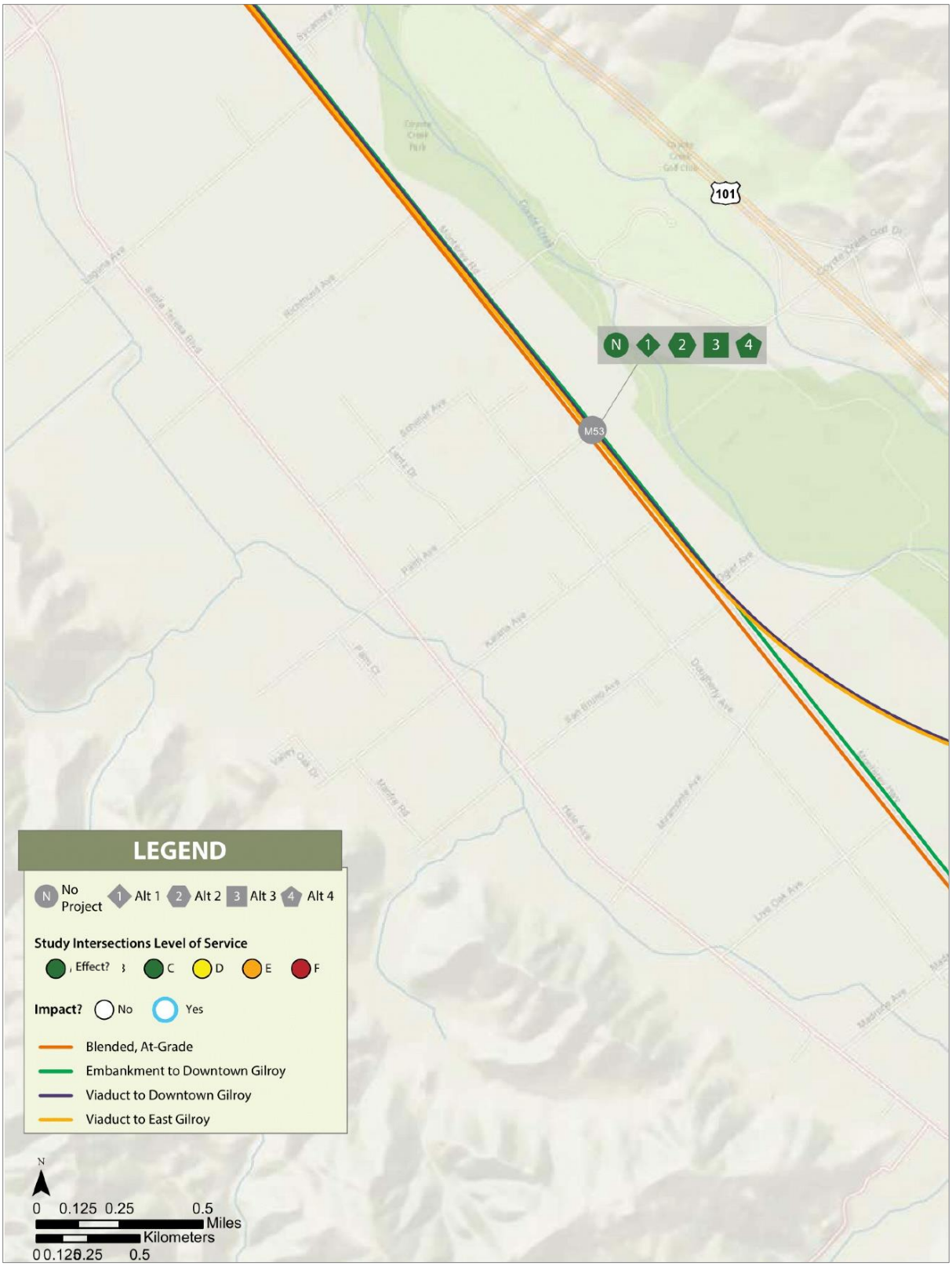
Figure 23 Morgan Hill 2029 Plus Project PM Intersection LOS – Part 6 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

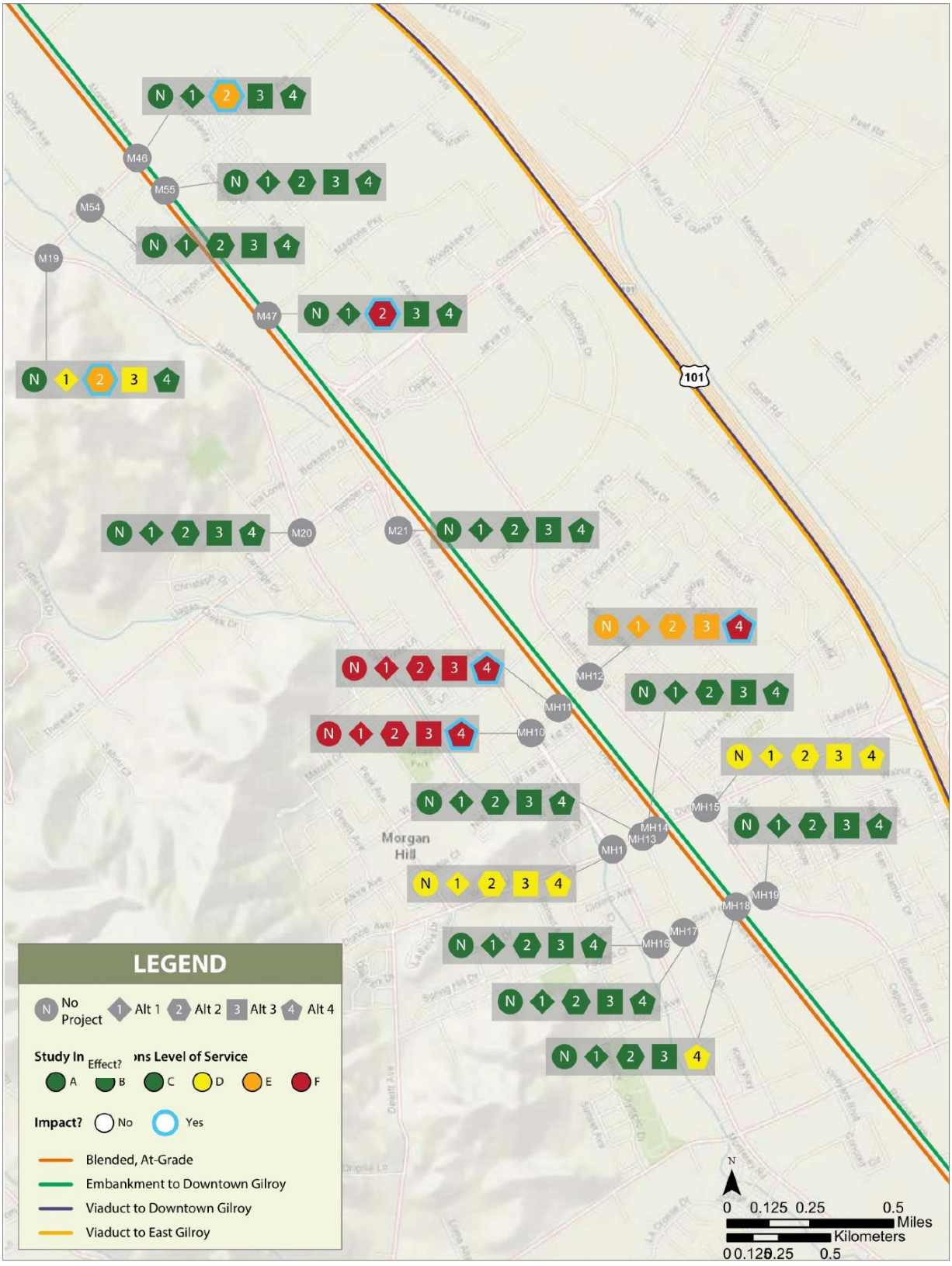
Figure 24 Morgan Hill 2040 Plus Project AM Intersection LOS – Part 6 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

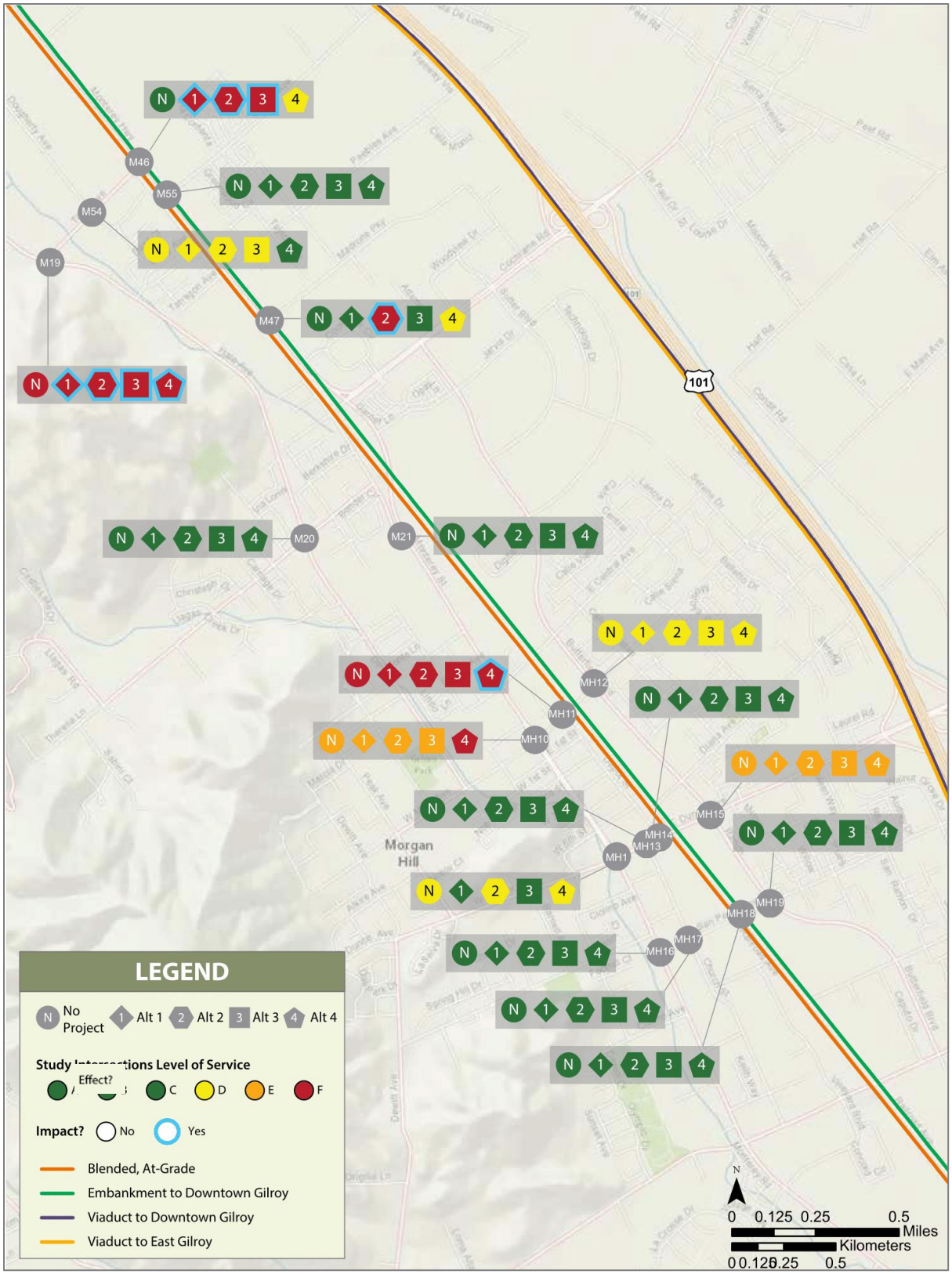
Figure 25 Morgan Hill 2040 Plus Project PM Intersection LOS – Part 6 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

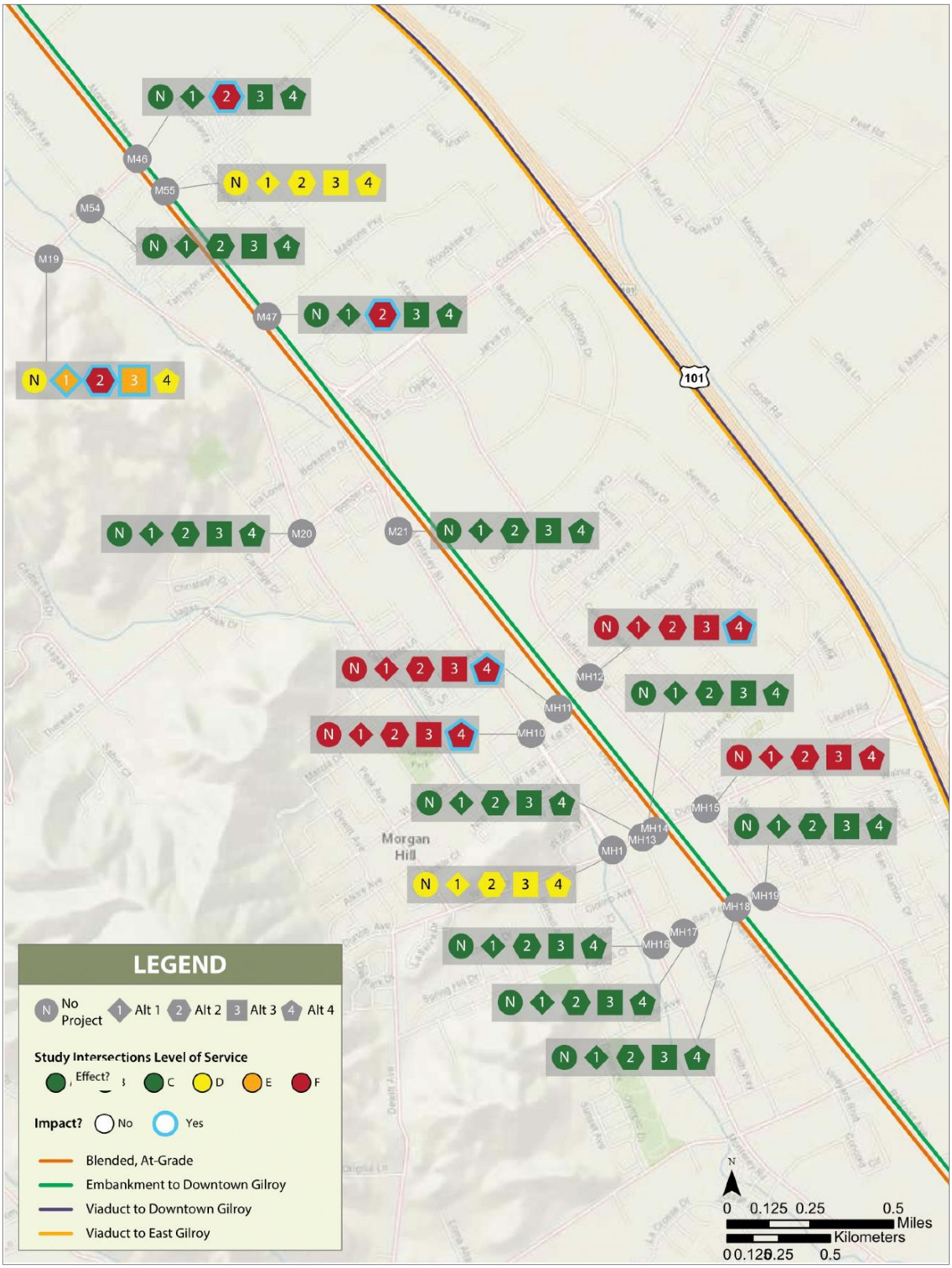
Figure 26 San Martin 2029 Plus Project AM Intersection LOS – Part 7 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

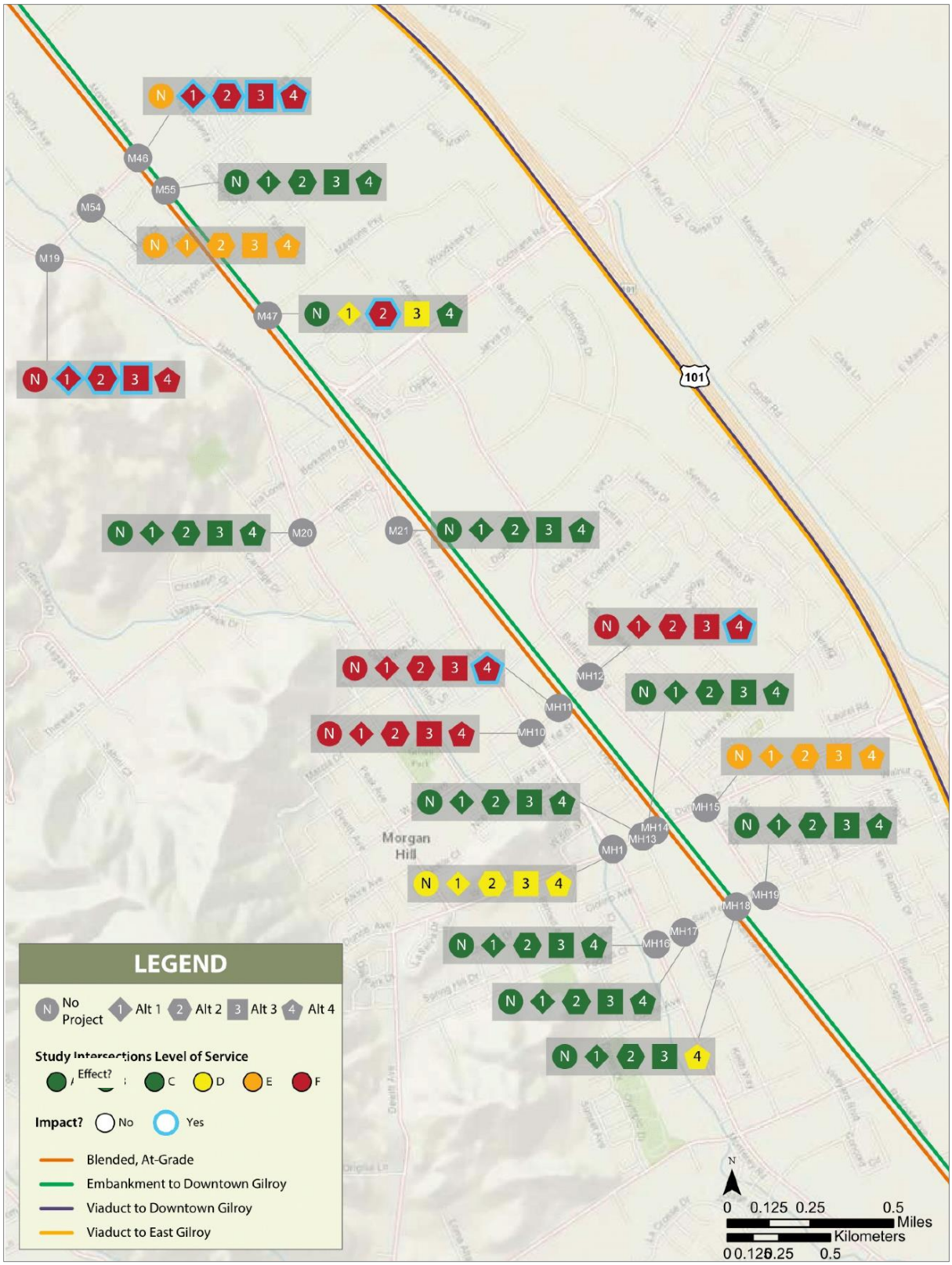
Figure 27 San Martin 2029 Plus Project PM Intersection LOS – Part 7 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

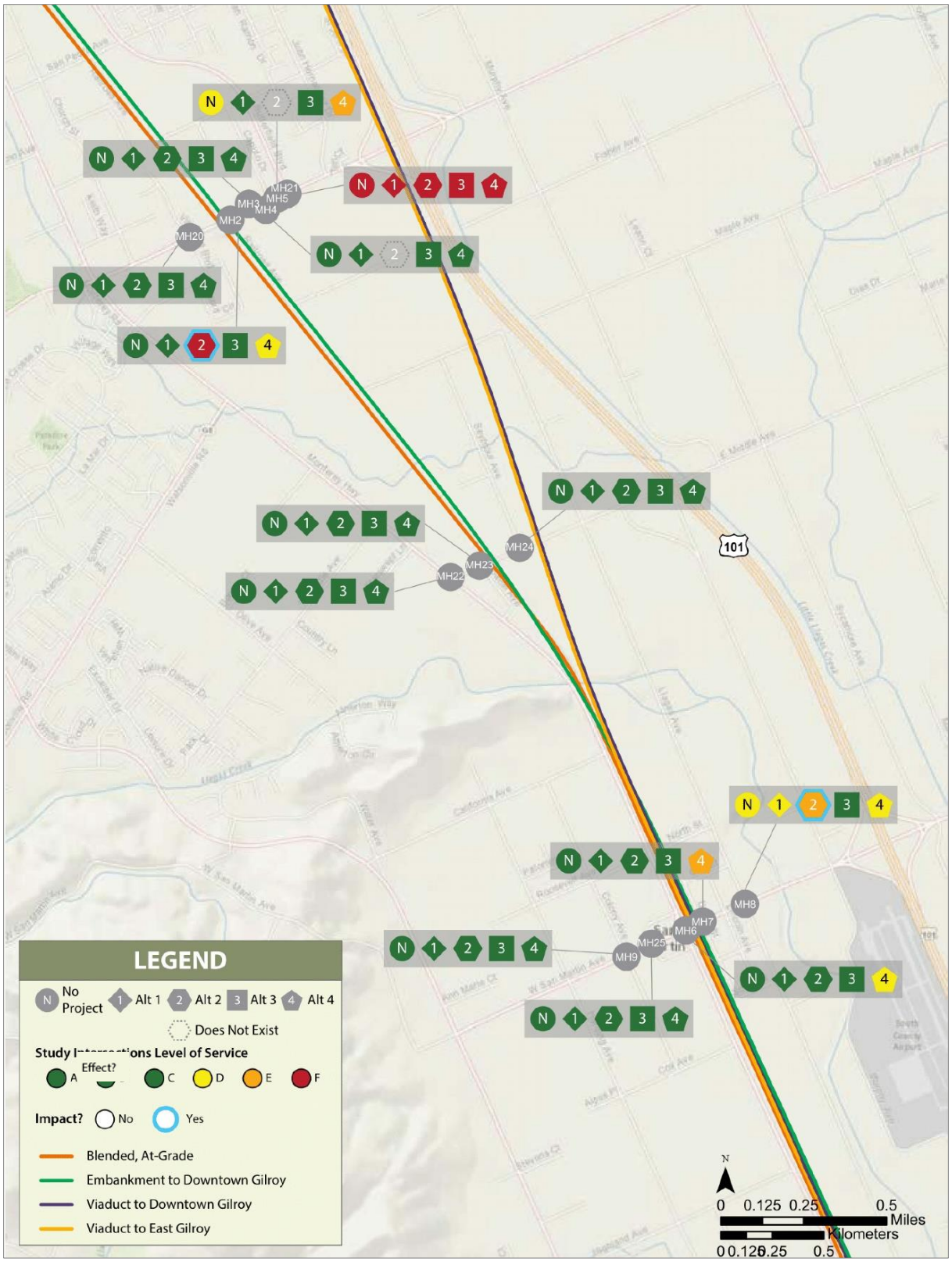
Figure 28 San Martin 2040 Plus Project AM Intersection LOS – Part 7 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

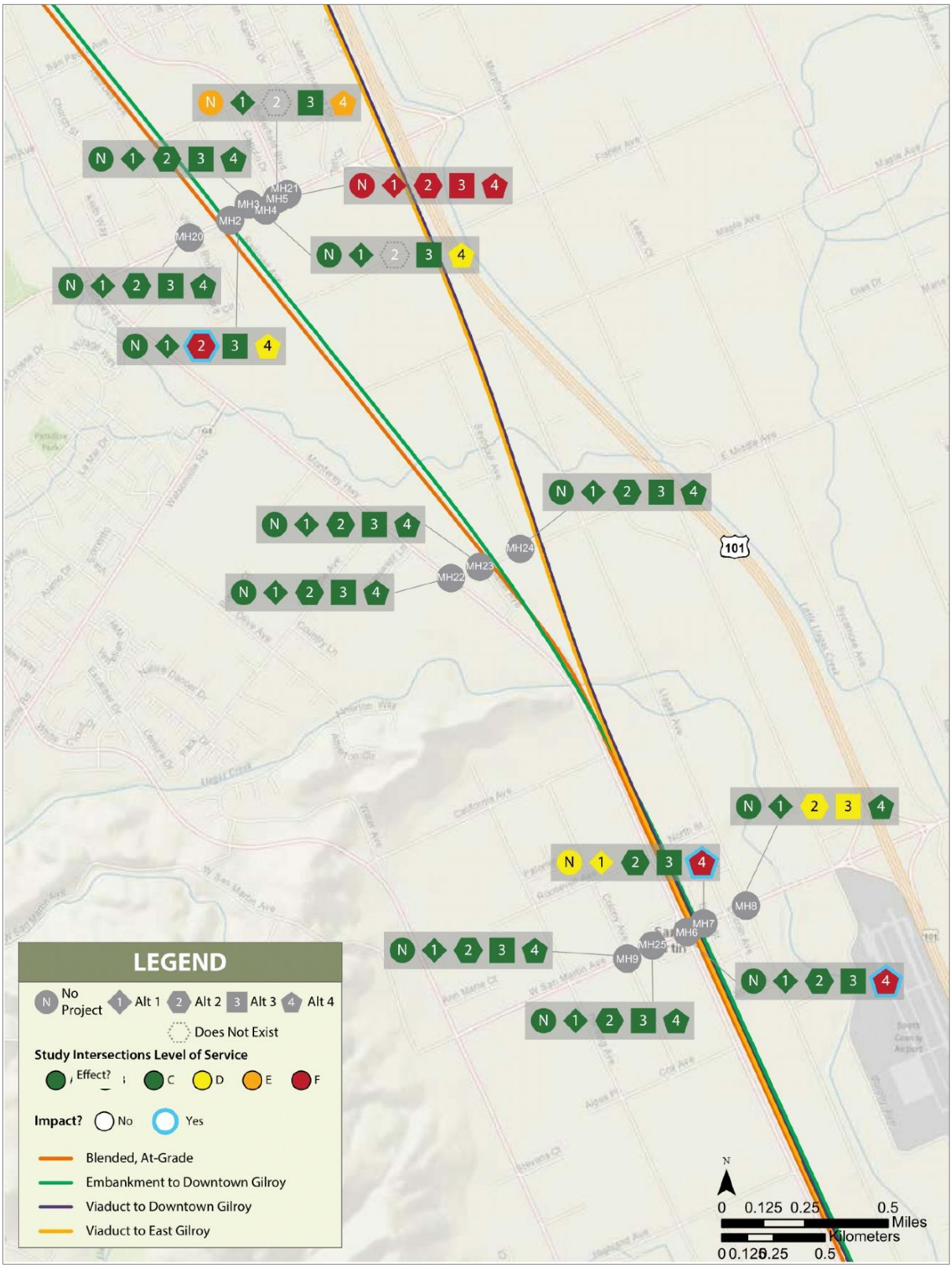
Figure 29 San Martin 2040 Plus Project PM Intersection LOS – Part 7 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

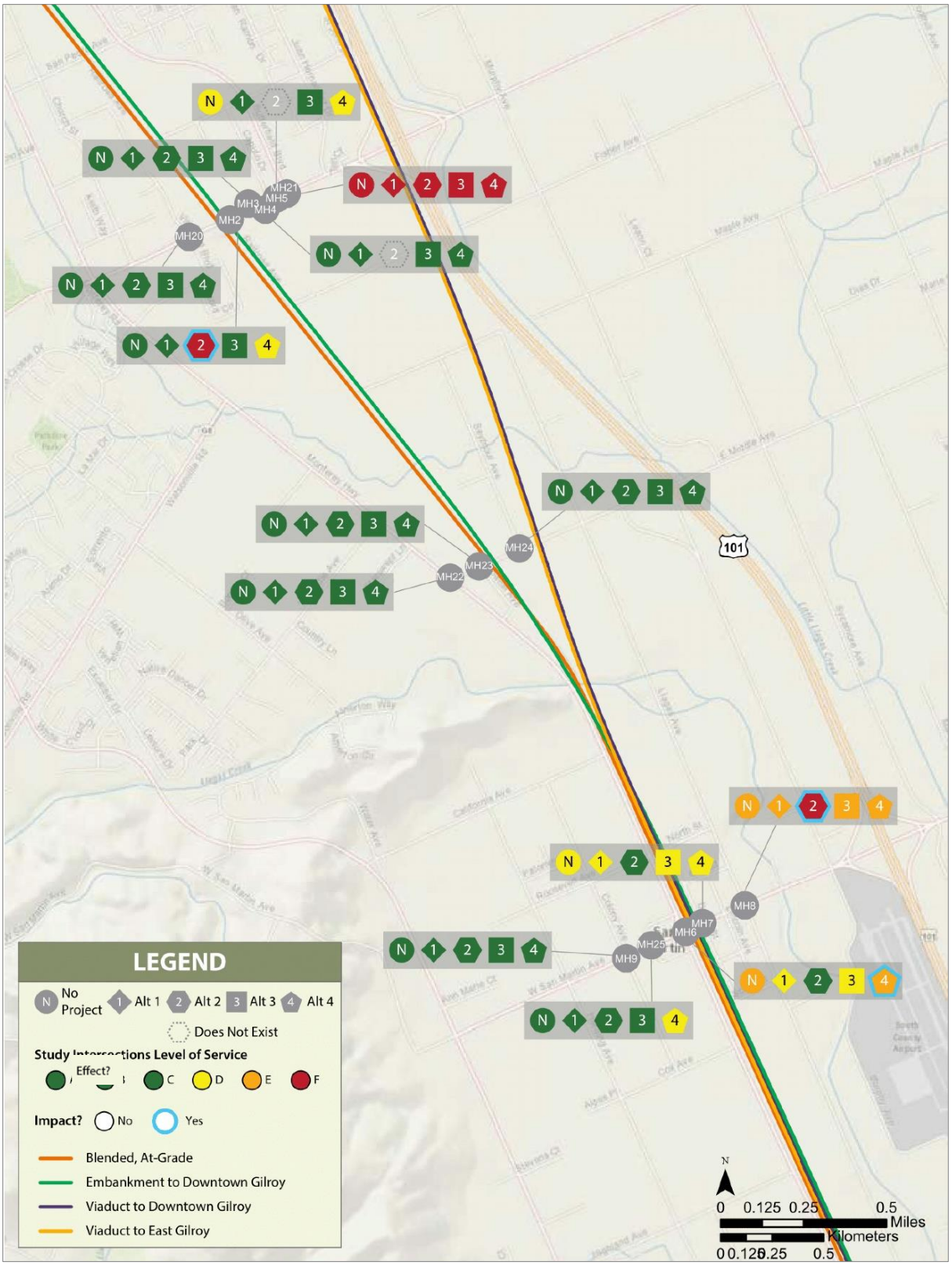
Figure 30 Gilroy 2029 Plus Project AM Intersection LOS – Part 8 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

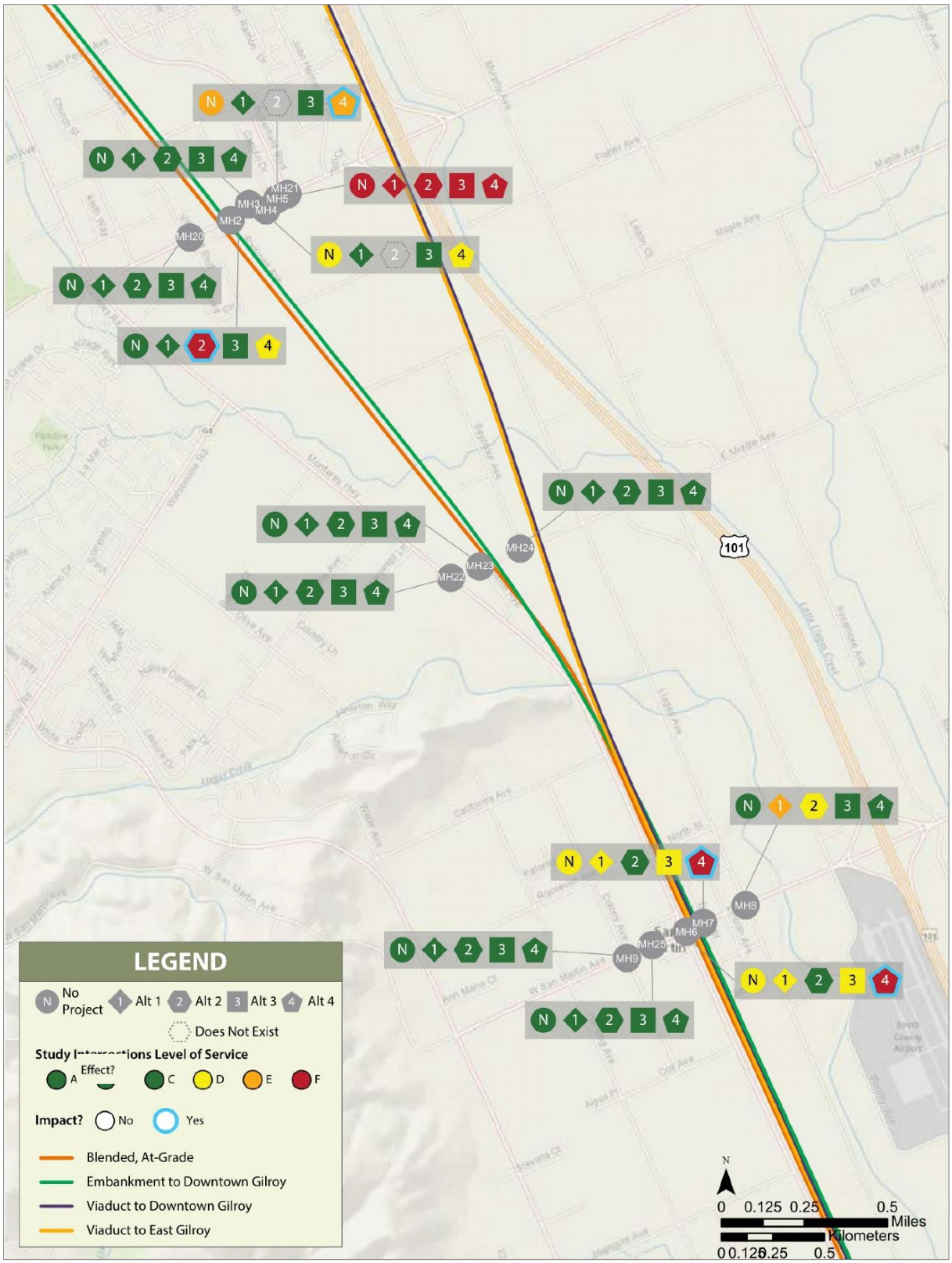
Figure 31 Gilroy 2029 Plus Project PM Intersection LOS – Part 8 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

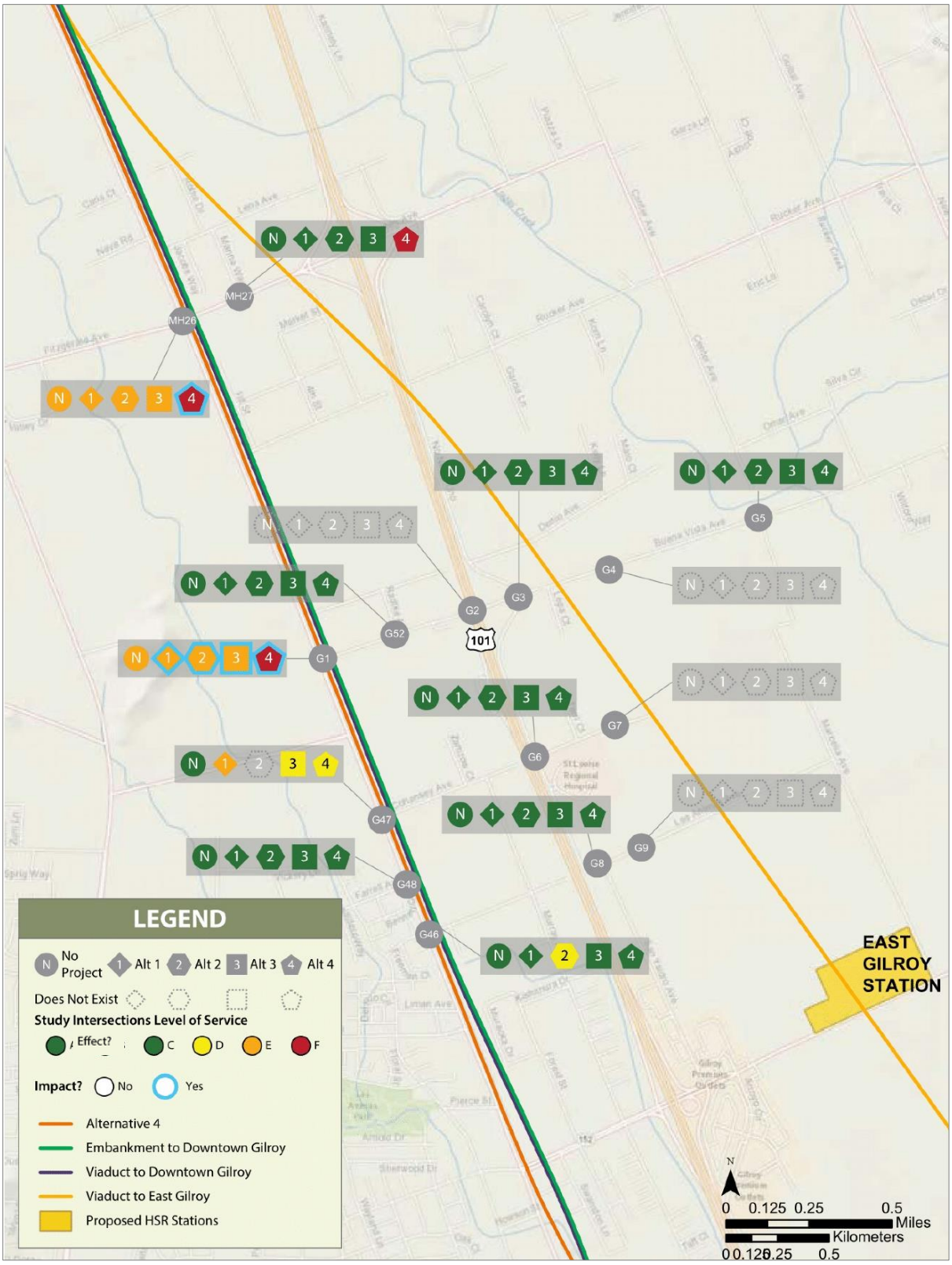
Figure 32 Gilroy 2040 Plus Project AM Intersection LOS – Part 8 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

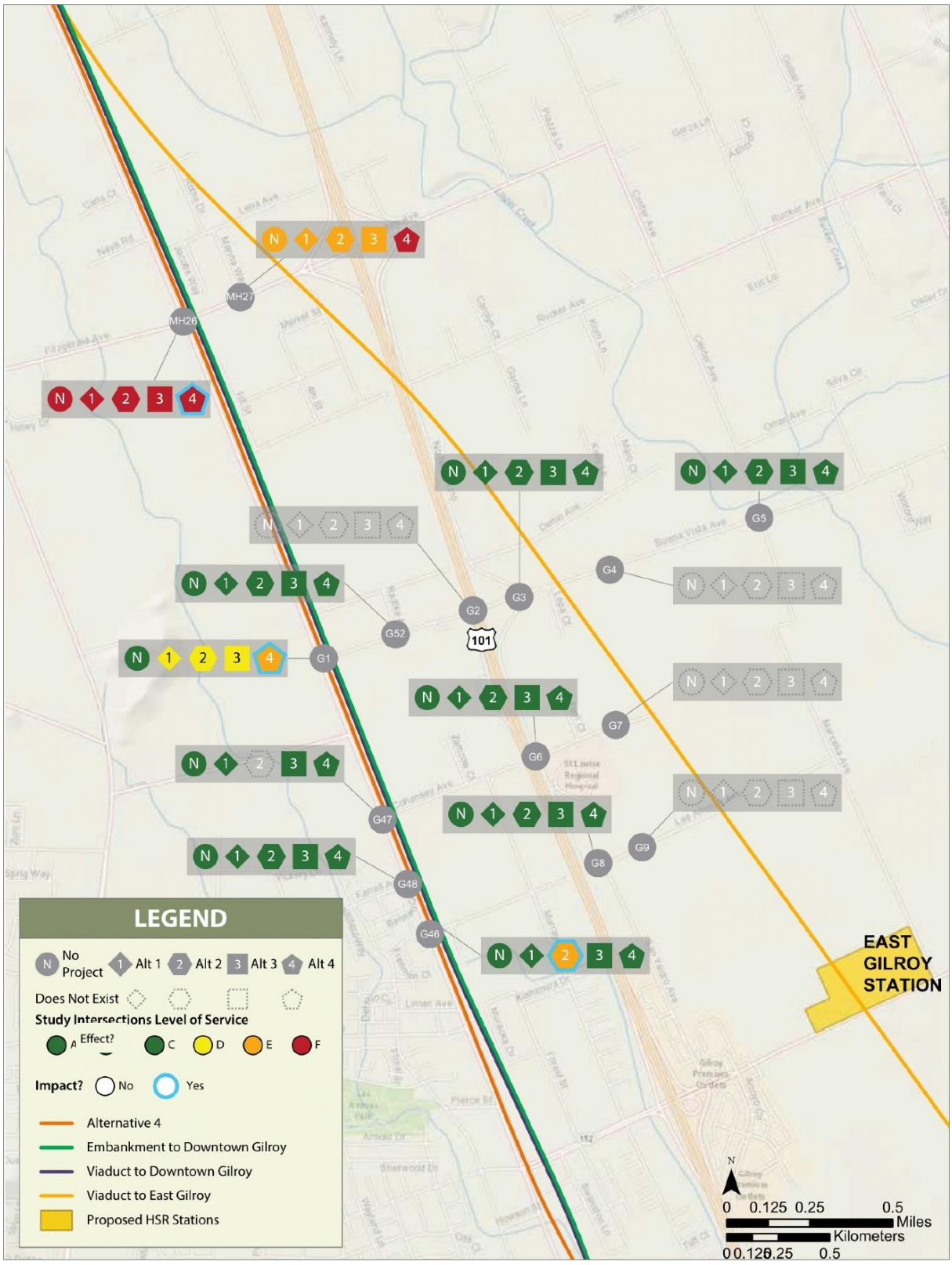
Figure 33 Gilroy 2040 Plus Project PM Intersection LOS – Part 8 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

Figure 34 Gilroy 2029 Plus Project AM Intersection LOS – Part 9 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

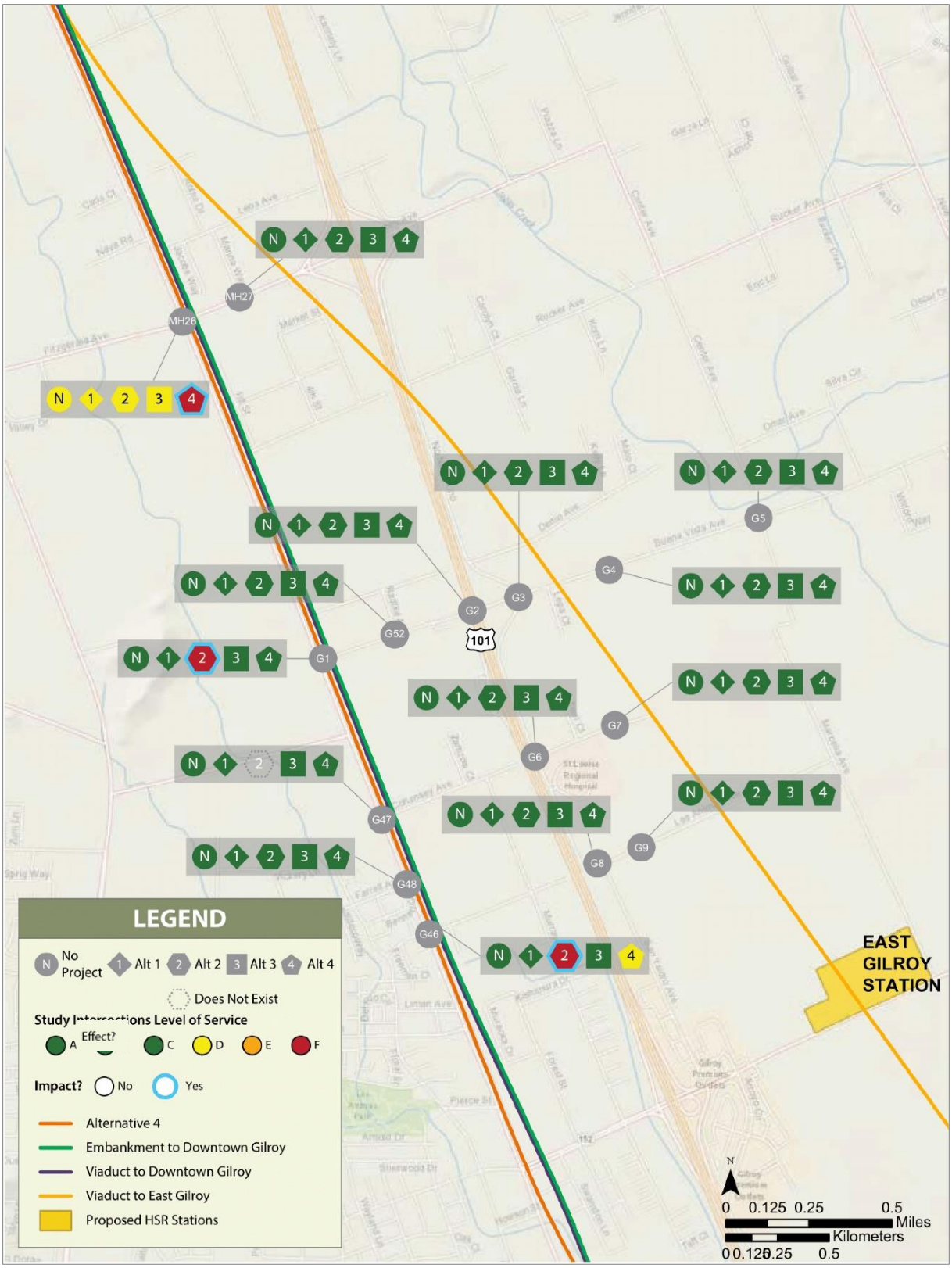
MARCH 2019

Figure 35 Gilroy 2029 Plus Project PM Intersection LOS – Part 9 of 13

LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

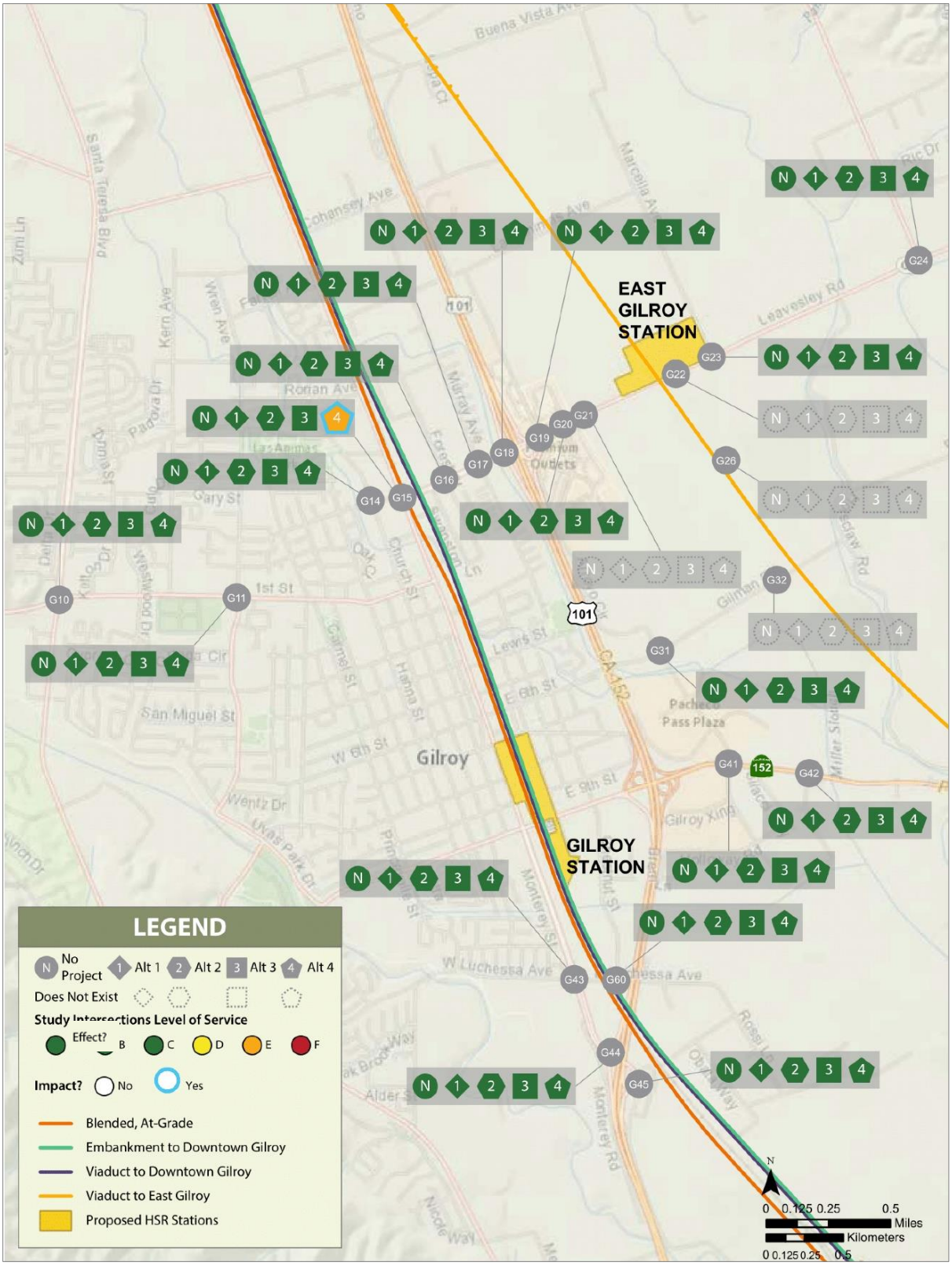
MARCH 2019

Figure 36 Gilroy 2040 Plus Project AM Intersection LOS – Part 9 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

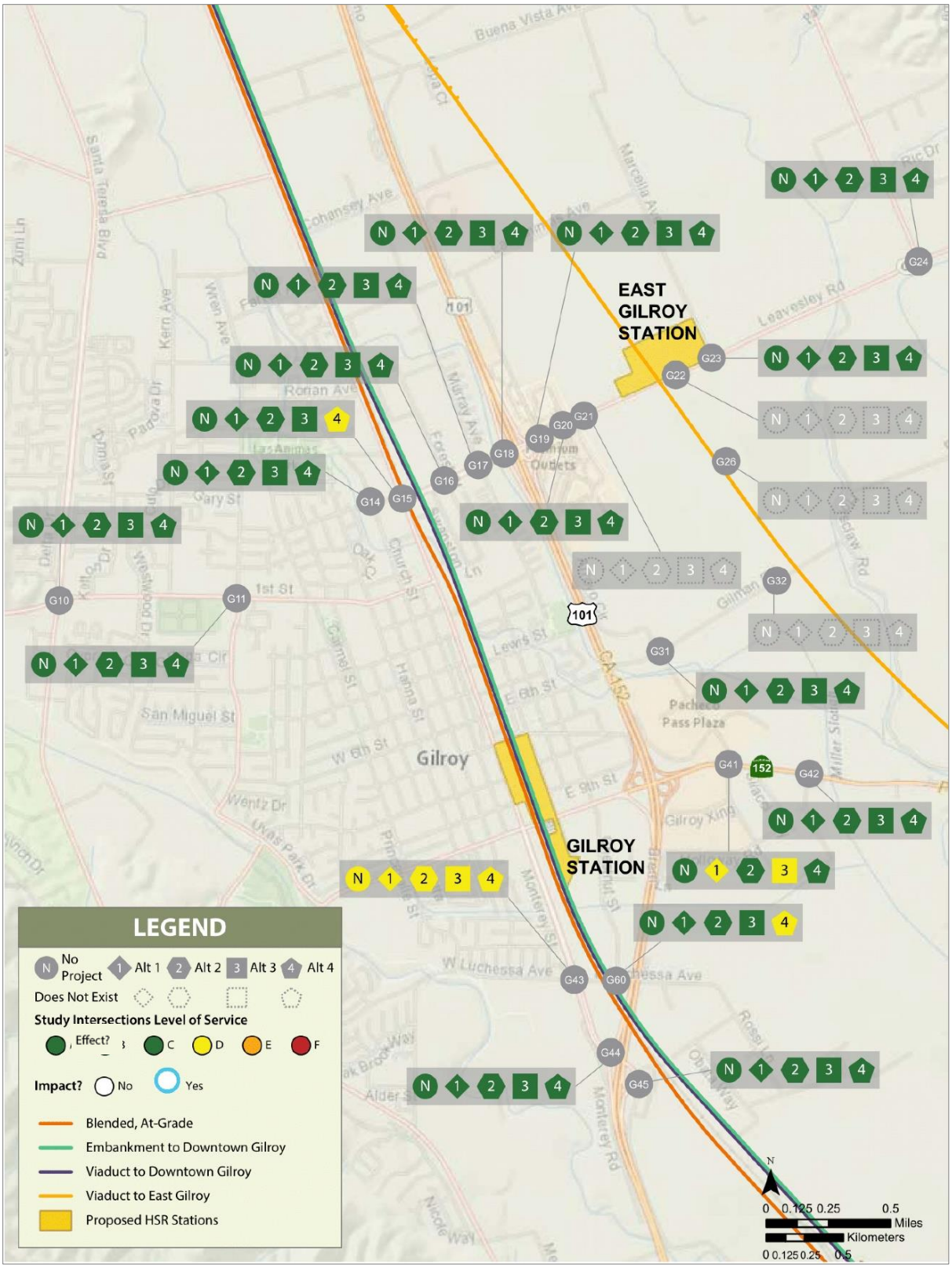
Figure 37 Gilroy 2040 Plus Project PM Intersection LOS – Part 9 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

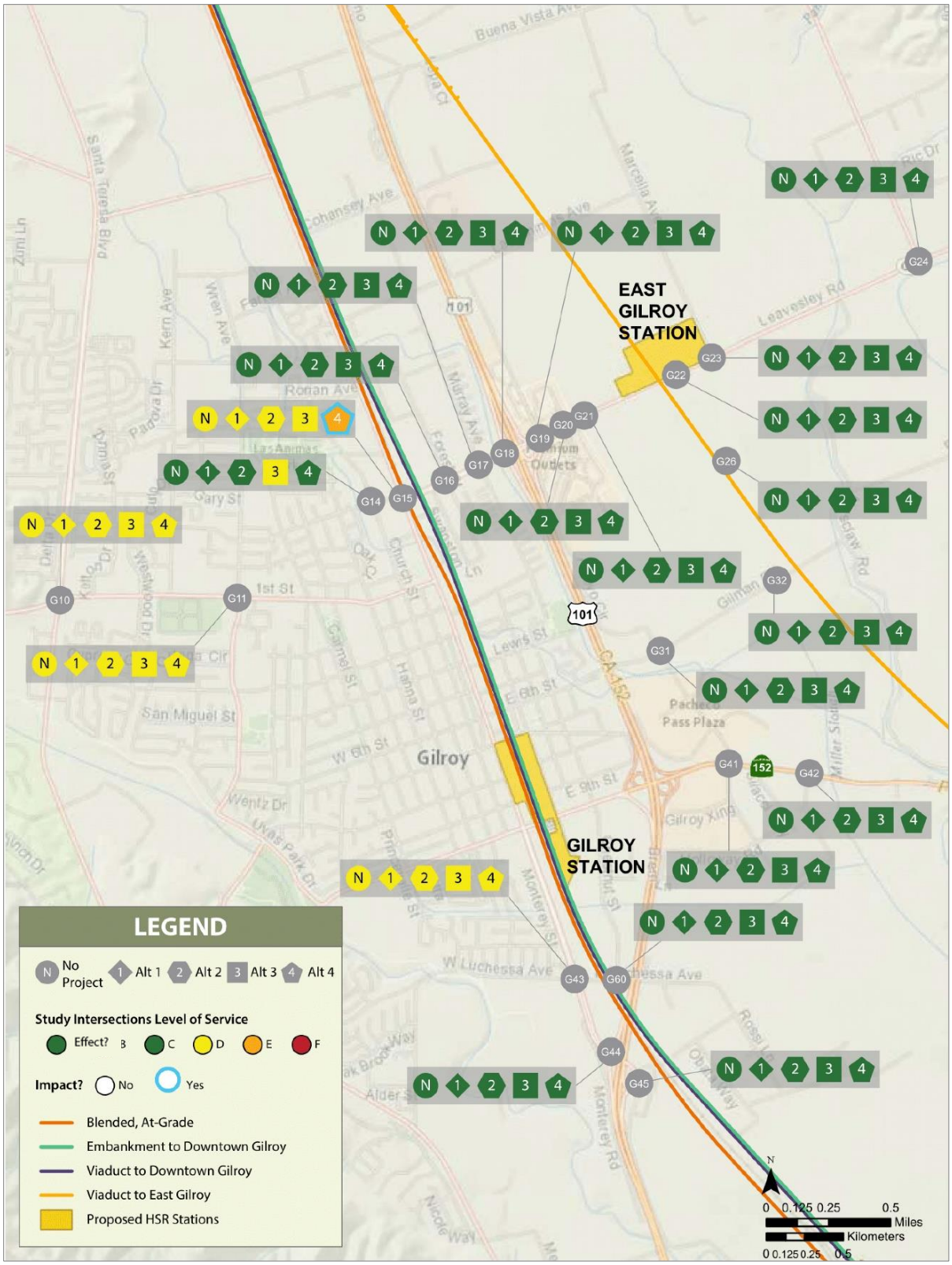
Figure 38 Gilroy 2029 Plus Project AM Intersection LOS – Part 10 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

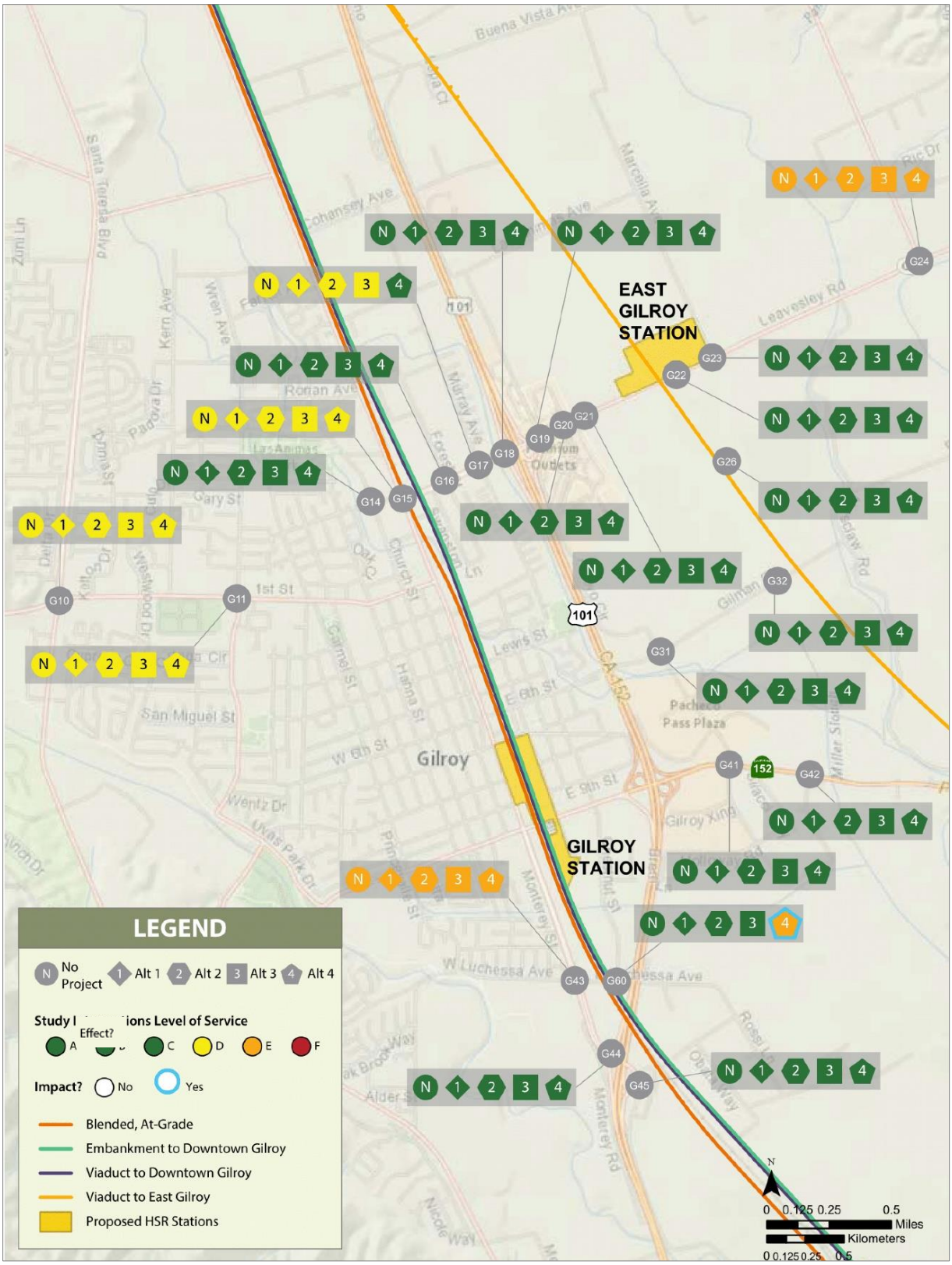
Figure 39 Gilroy 2029 Plus Project PM Intersection LOS – Part 10 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

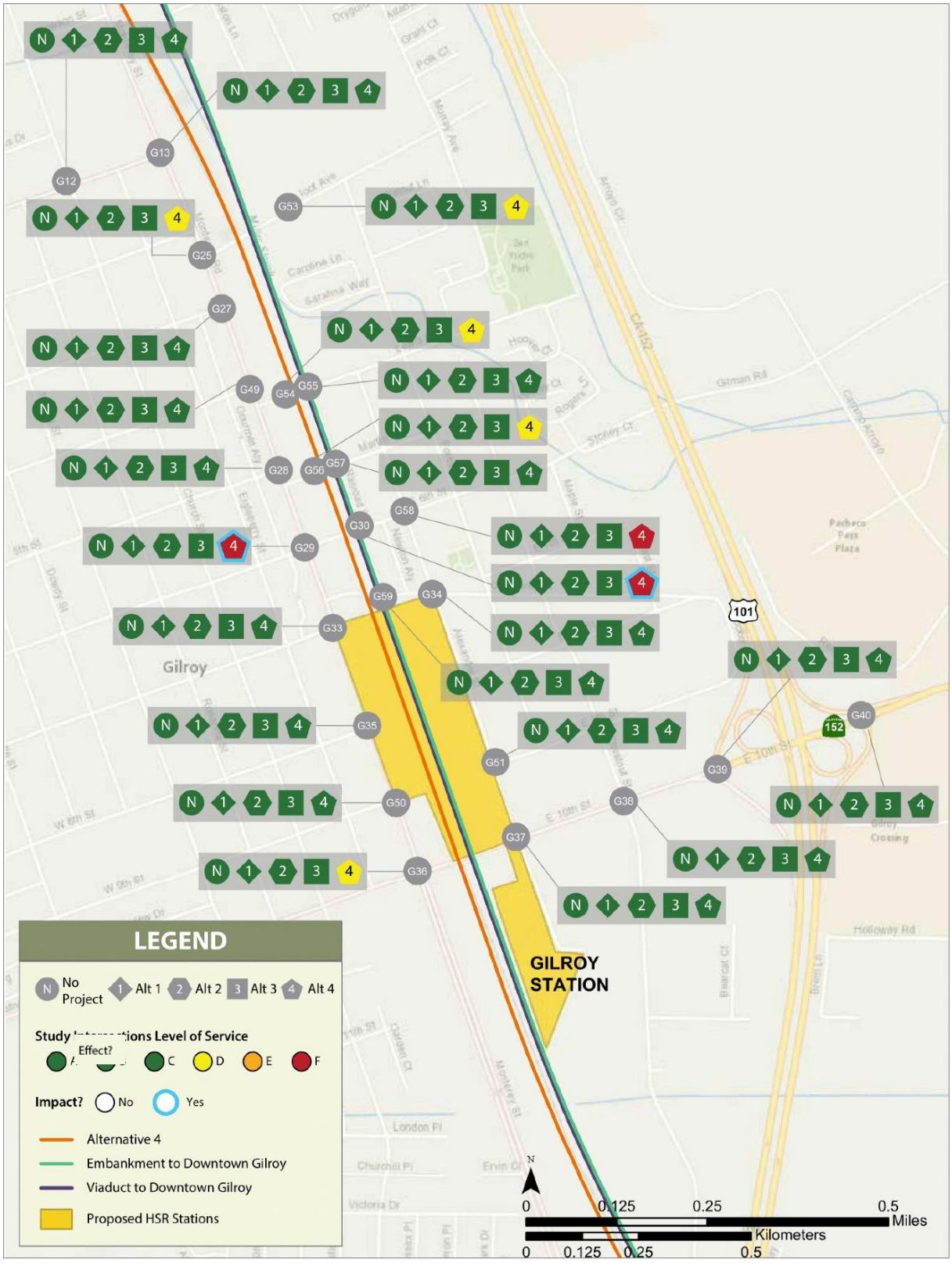
Figure 40 Gilroy 2040 Plus Project AM Intersection LOS – Part 10 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

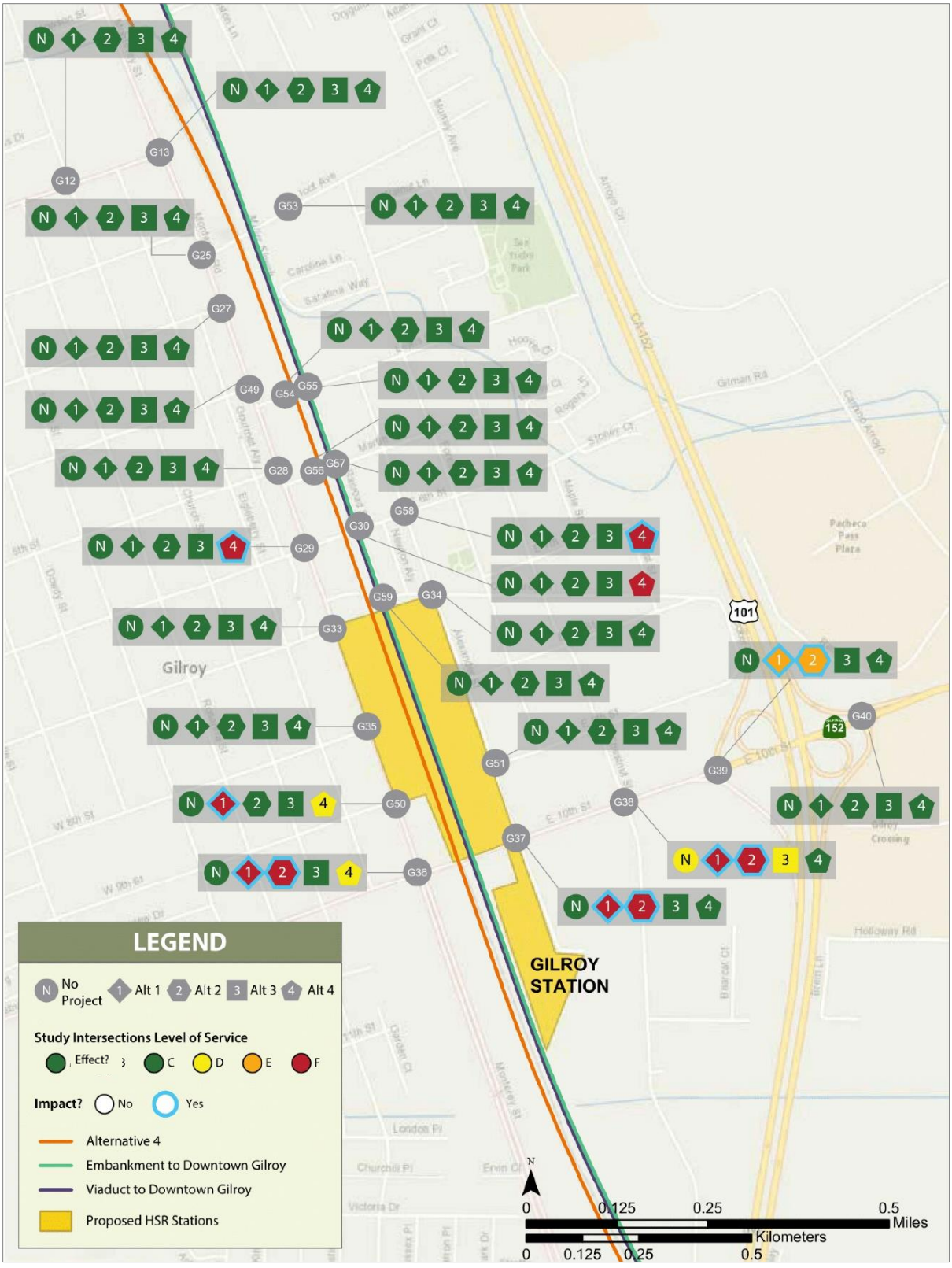
Figure 41 Gilroy 2040 Plus Project PM Intersection LOS – Part 10 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

Figure 42 Downtown Gilroy Station 2029 Plus Project AM Intersection LOS – Part 11 of 13



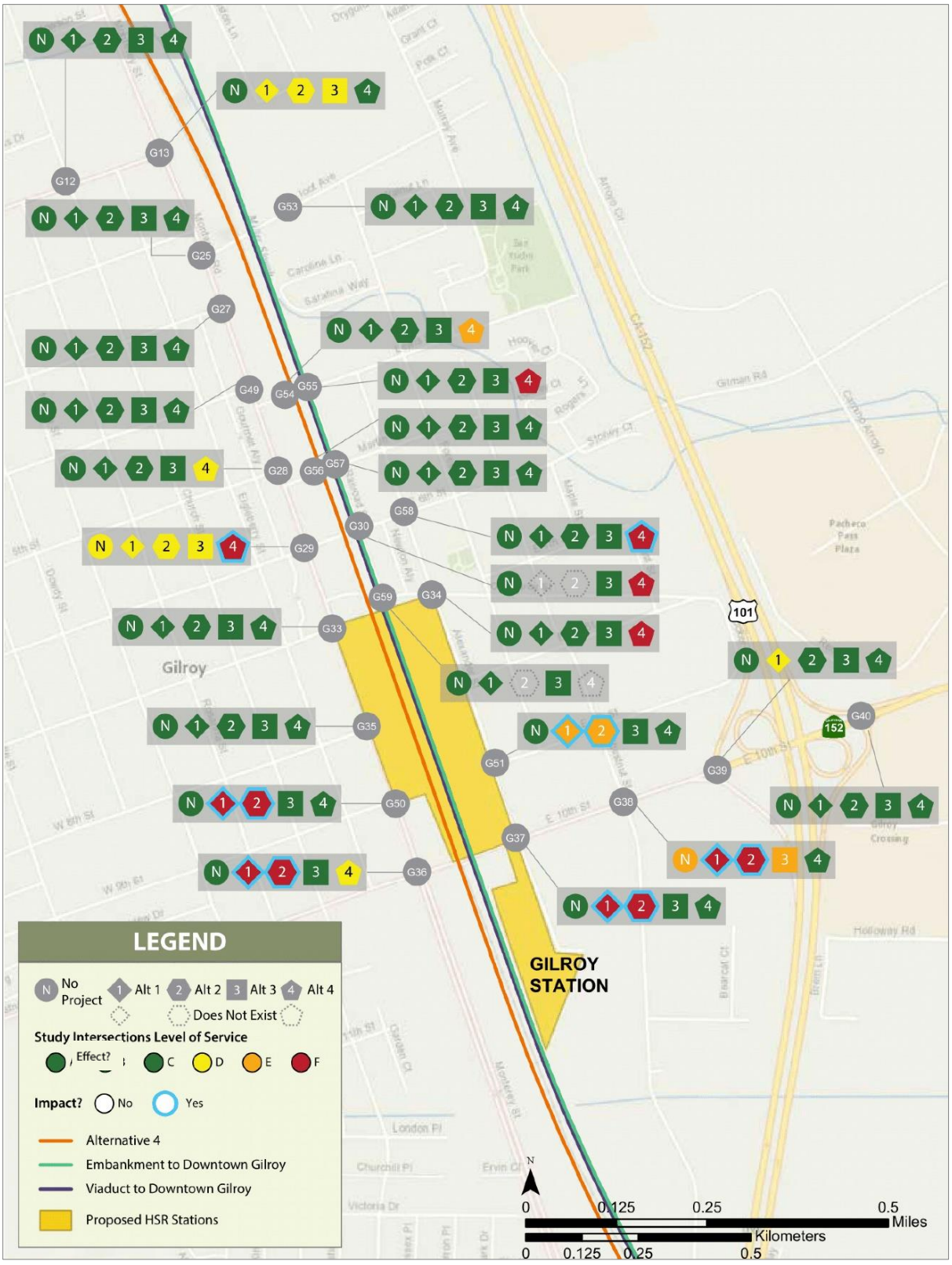
LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

Figure 43 Downtown Gilroy Station 2029 Plus Project PM Intersection LOS – Part 11 of 13

LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

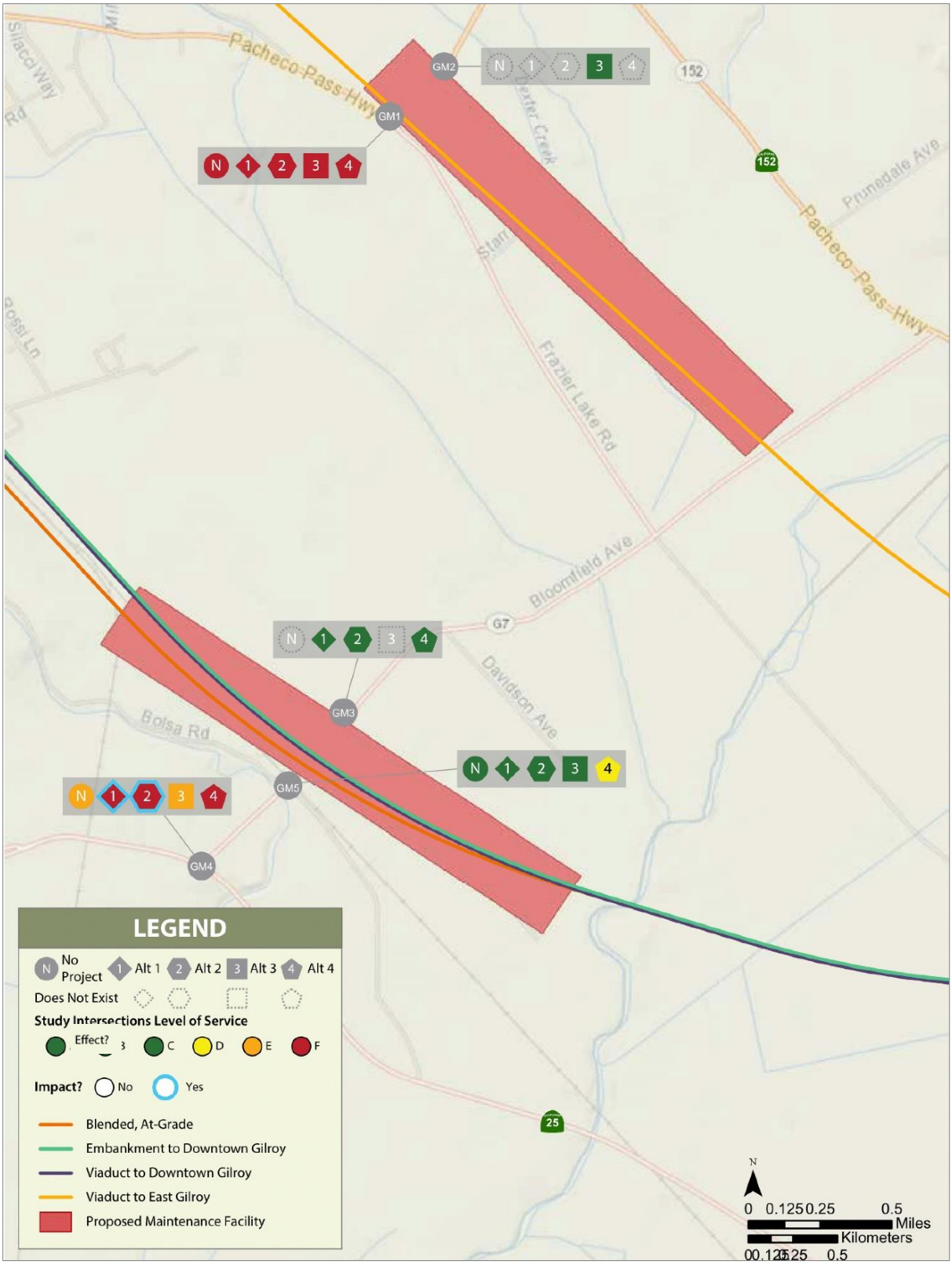
MARCH 2019

Figure 44 Downtown Gilroy Station 2040 Plus Project AM Intersection LOS – Part 11 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay. MARCH 2019

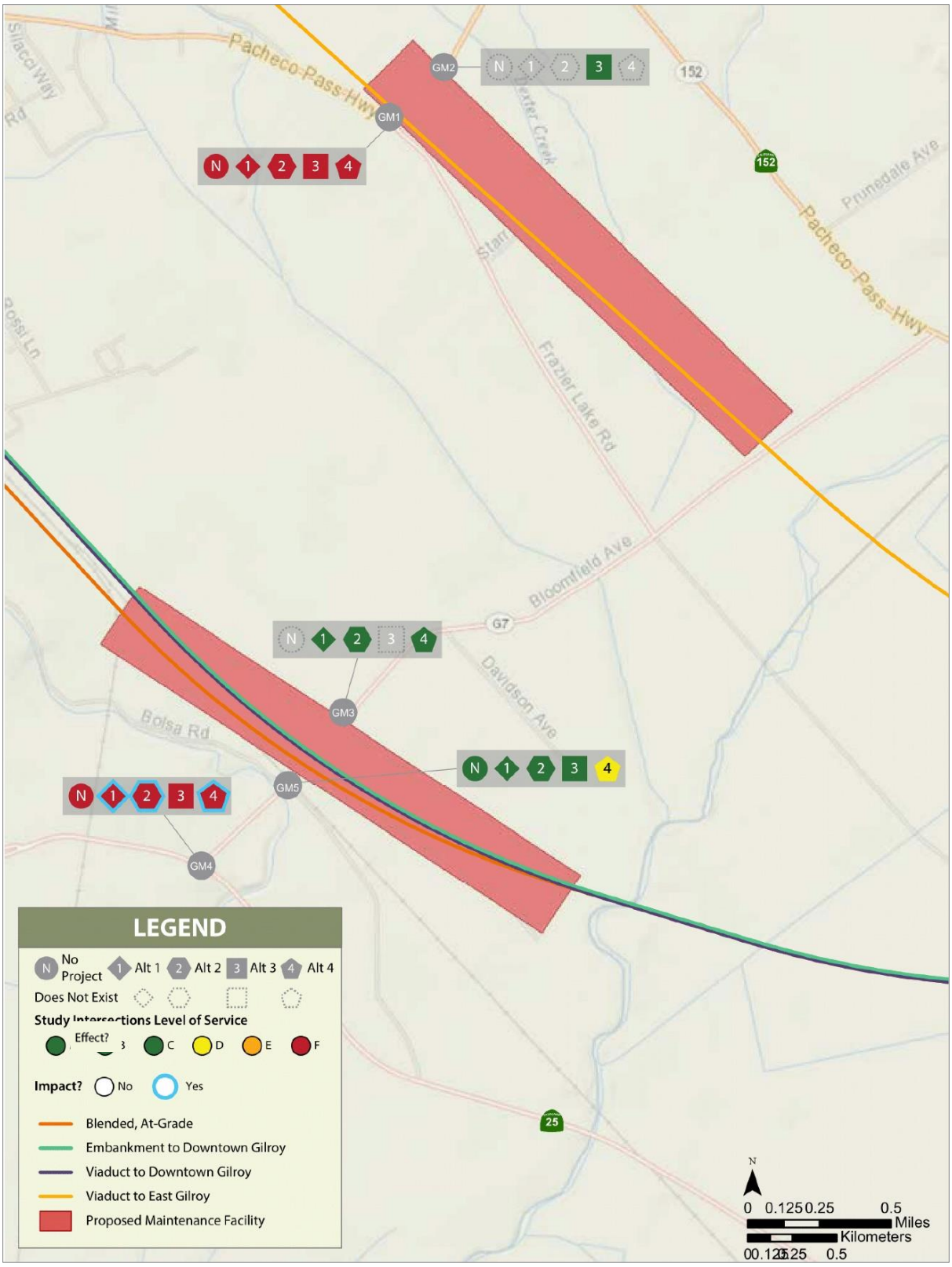
Figure 45 Downtown Gilroy Station 2040 Plus Project PM Intersection LOS – Part 11 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

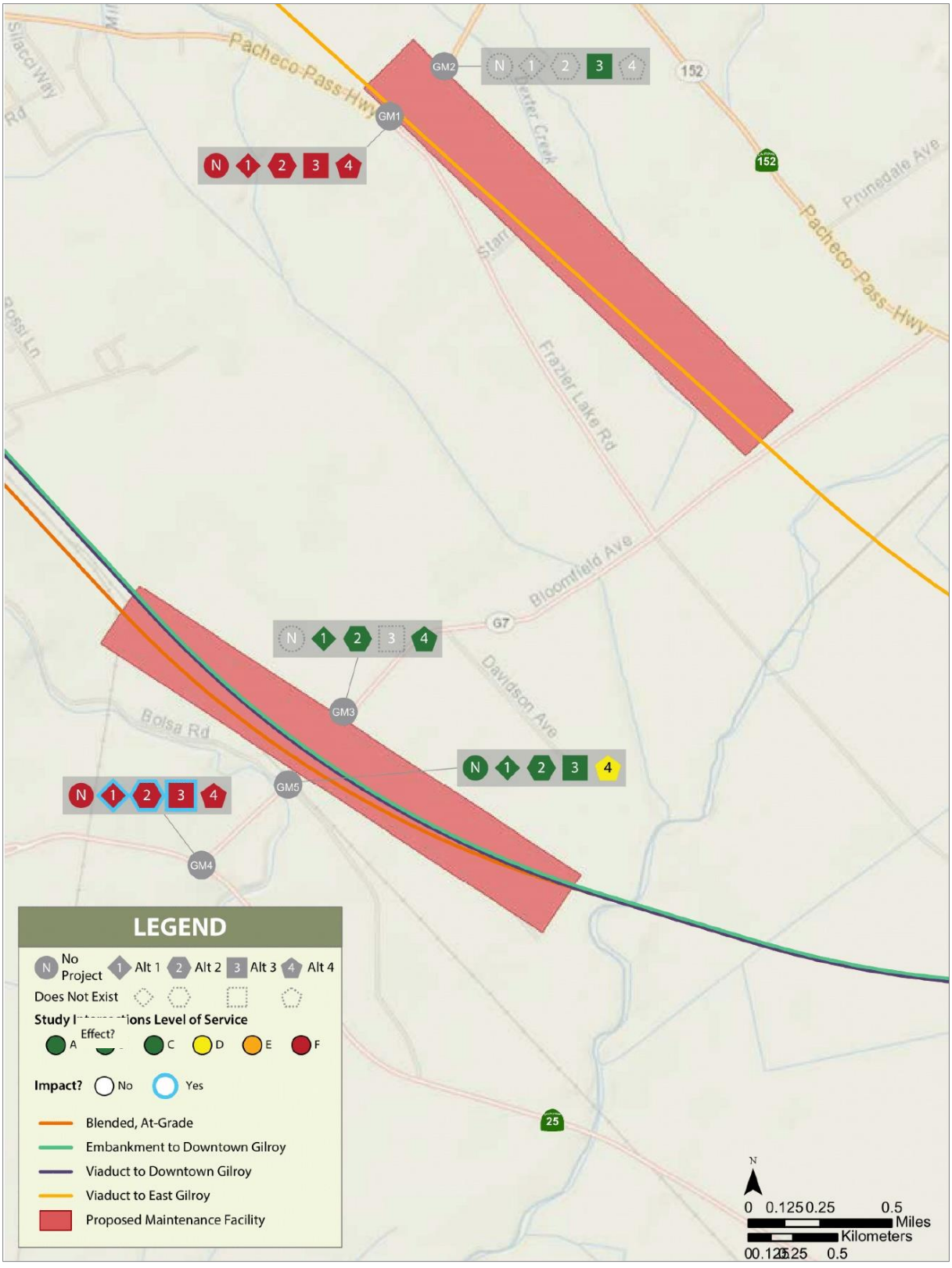
Figure 46 Gilroy MOWF 2029 Plus Project AM Intersection LOS – Part 12 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

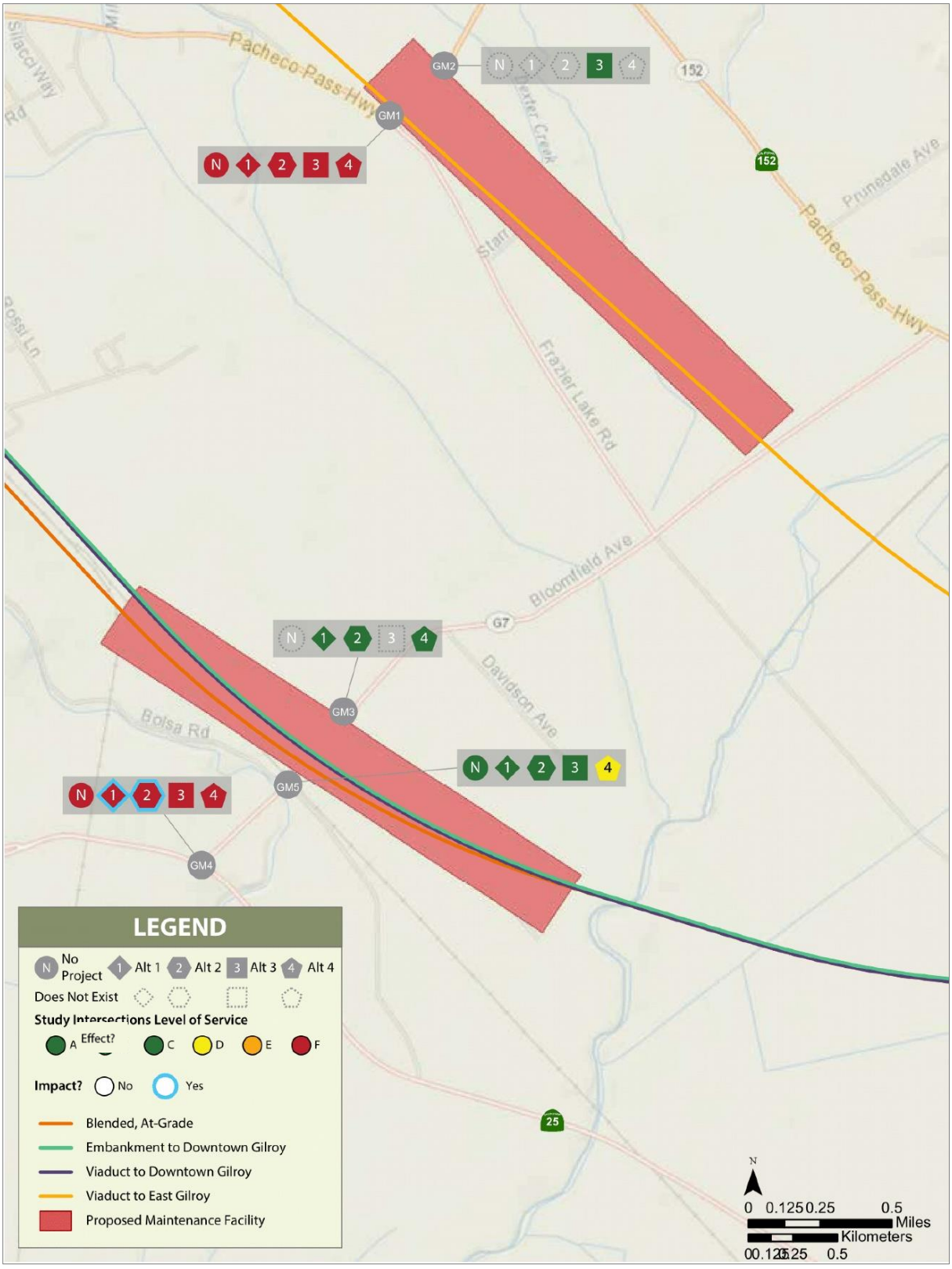
Figure 47 Gilroy MOWF 2029 Plus Project PM Intersection LOS – Part 12 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

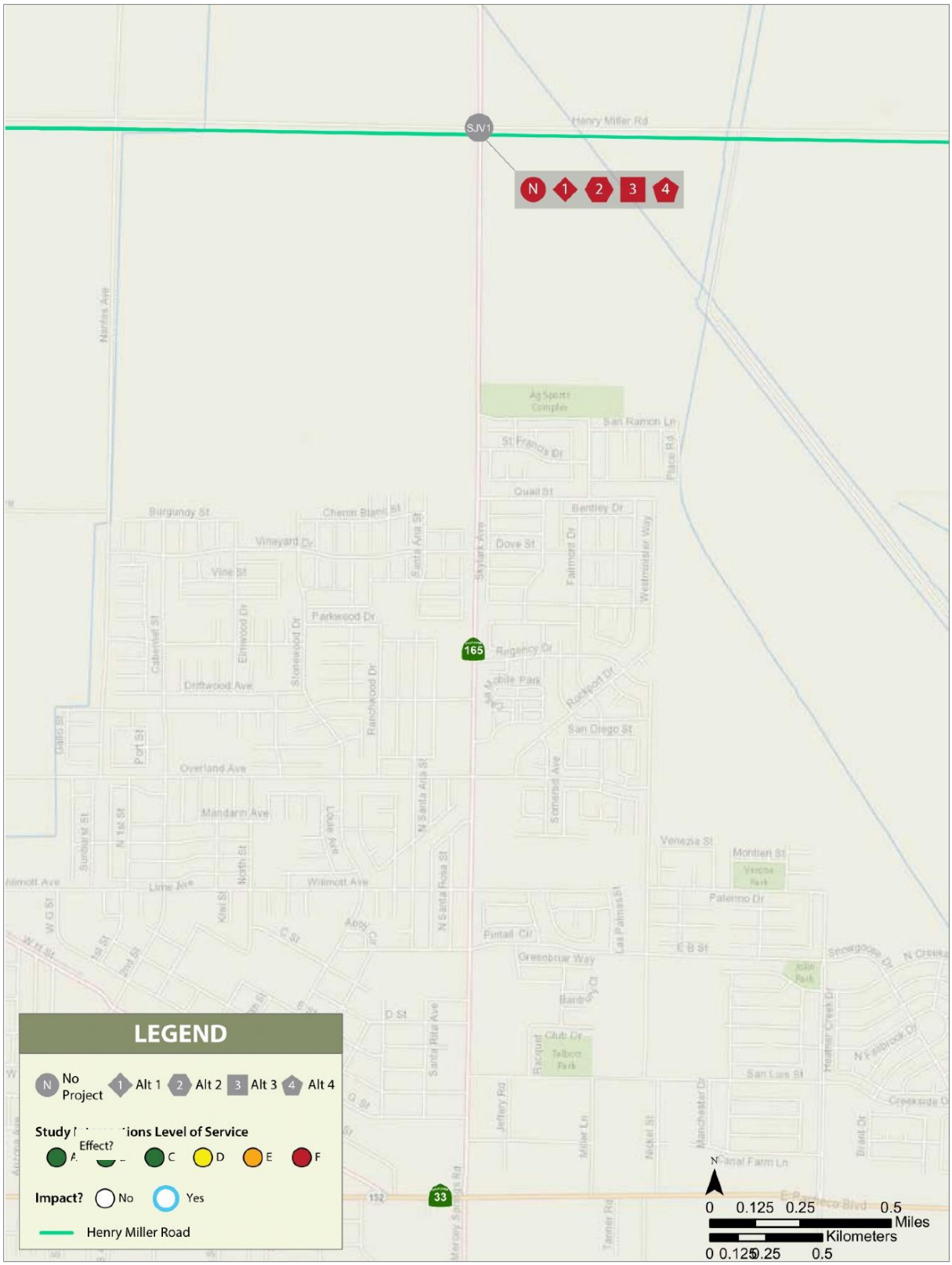
Figure 48 Gilroy MOWF 2040 Plus Project AM Intersection LOS – Part 12 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

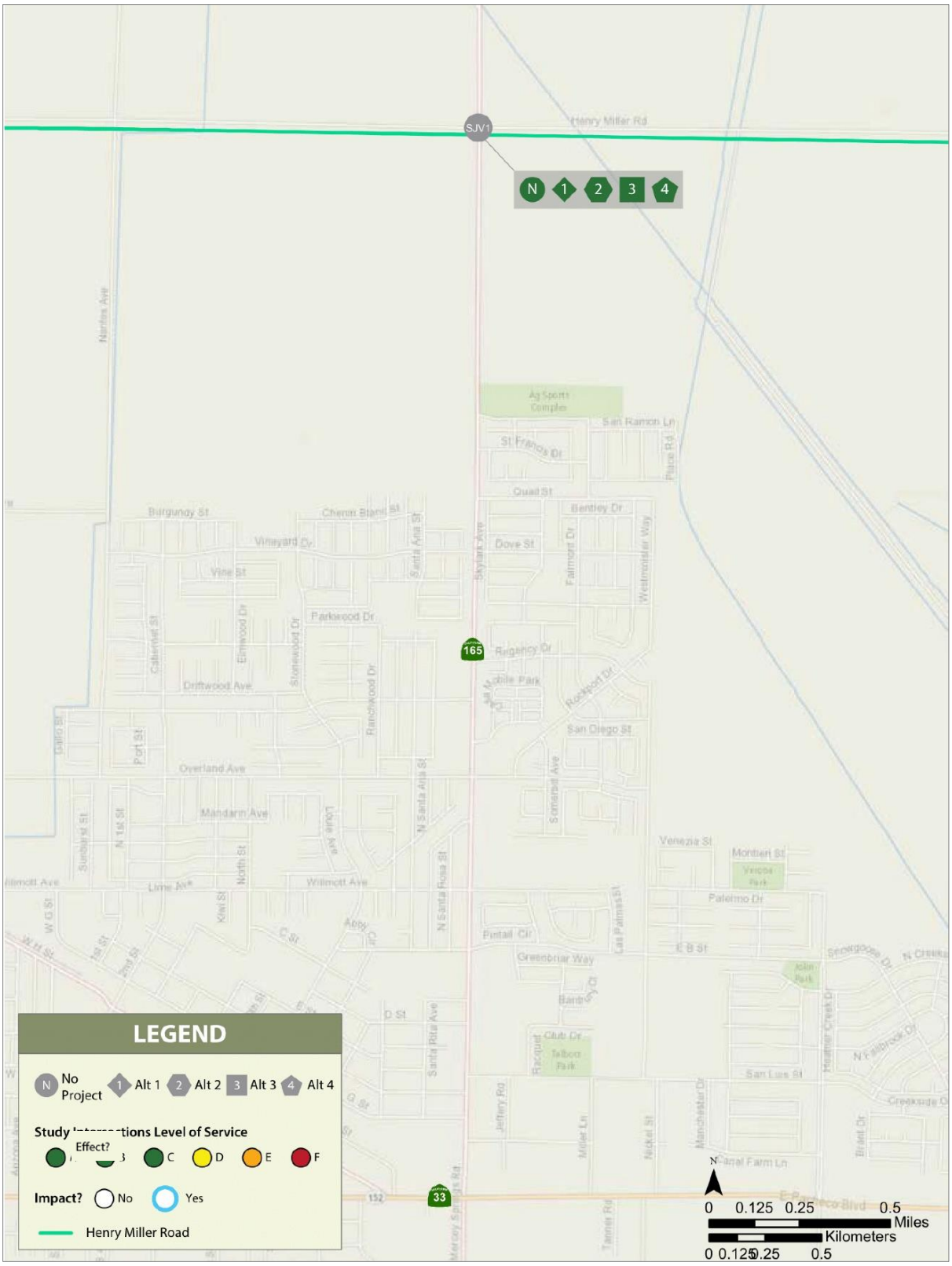
Figure 49 Gilroy MOWF 2040 Plus Project PM Intersection LOS – Part 12 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

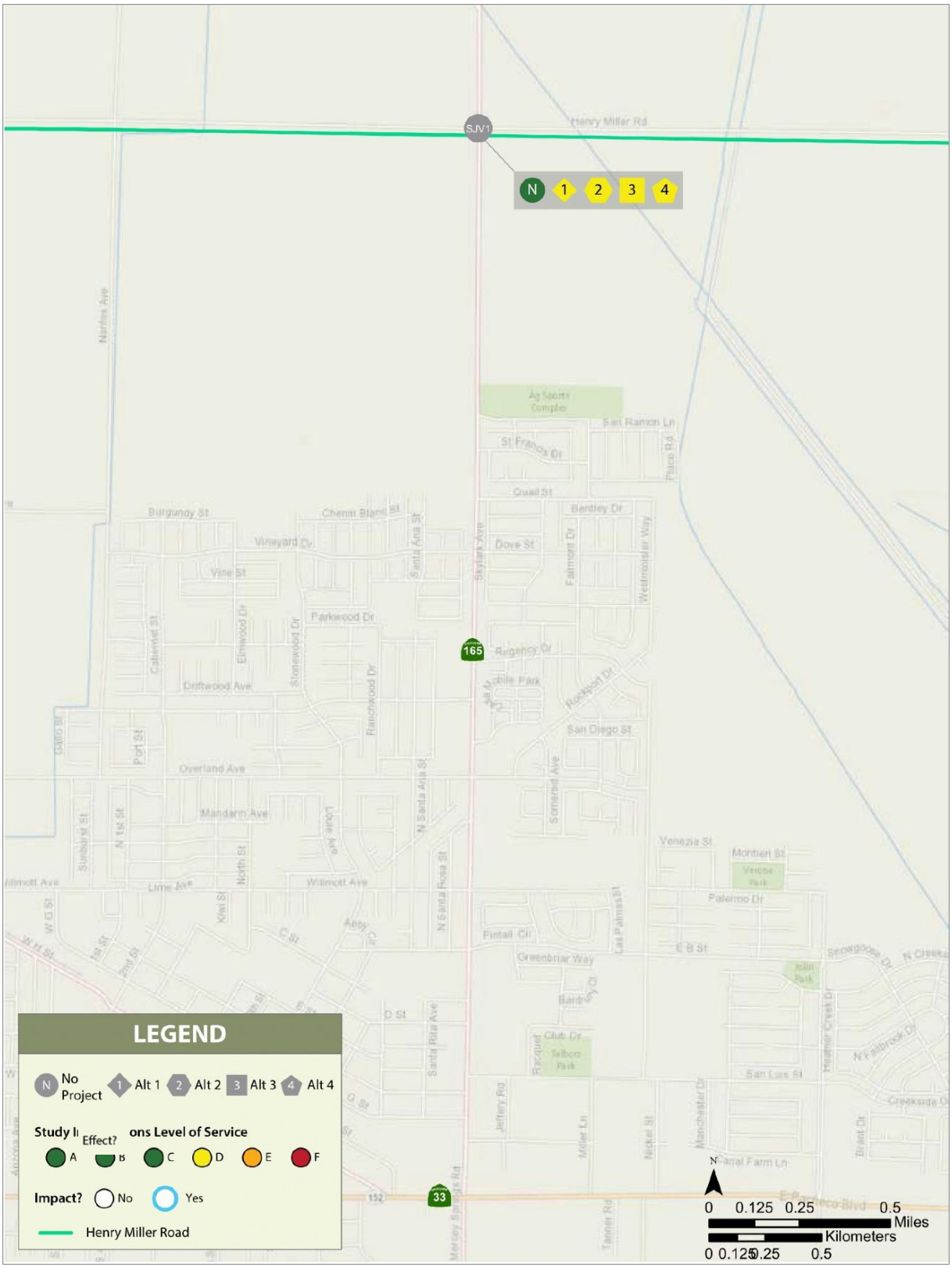
Figure 50 San Joaquin Valley 2029 Plus Project AM Intersection LOS – Part 13 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

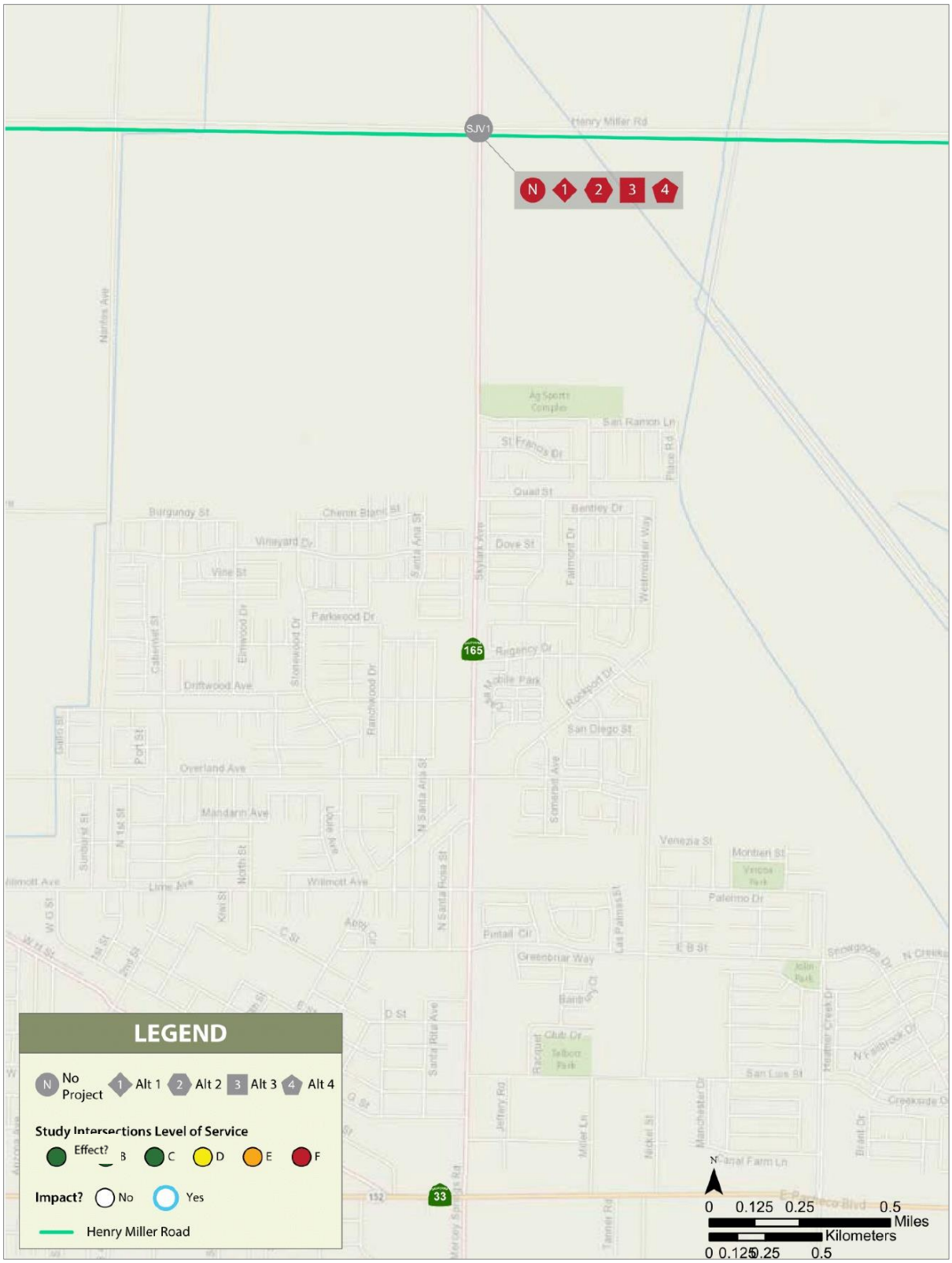
Figure 51 San Joaquin Valley 2029 Plus Project PM Intersection LOS – Part 13 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

MARCH 2019

Figure 52 San Joaquin Valley 2040 Plus Project AM Intersection LOS – Part 13 of 13



LOS A, B & C are all displayed as green because intersections experience little to average traffic delay.

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Figure 53 San Joaquin Valley 2040 Plus Project PM Intersection LOS – Part 13 of 13

APPENDIX 3.2-B: VEHICLE MILES TRAVELED FORECASTING

CALIFORNIA High-Speed Rail Authority

Memorandum

DATE: January 22, 2020

TO: Memo to File

FROM: John Helsel, Travel Demand Forecasting for the RDP 2017-2019

SUBJECT: Further Background on Cambridge Systematics Explanation of Ridership Forecasts

Cambridge Systematics, Inc. (CS) developed the ridership and revenue forecasting model used to support the 2016 Business Plan. This model was named the Business Plan Model – Version 3 (BPM-V3) and is documented separately. The BPM-V3 was also used to estimate changes in vehicle miles traveled (VMT) for the California High-Speed Rail Authority (the Authority) to support various environmental planning efforts. CS documented its efforts in the main document which this memo accompanies.[1]

The CS ridership, revenue, and VMT forecasts were used as the core input to produce year-by-year estimates by the Rail Delivery Partner (RDP) for use by the Authority. This memo documents the reason and methodology for the process by which the CS inputs were used to create the year-by-year estimates.

Application of CS Forecasts

The CS forecasts for the 2016 Business Plan formed the basis for the forecasts of ridership, revenue, and VMT used by the Authority but had to be aligned with the required application in business plan and environmental analysis as follows:

- The Business Plan cash flow analysis and environmental planning groups required annual forecasts for every year between the start of operations and 2060 (while CS forecasts were developed only for three individual years and not for every year between the start of operations and 2060); and,

- The Business Plan cash flow analysis and environmental planning groups required a set of reasonable ramp-up assumptions to account for the introduction of new services (the BPM-V3 model assumes a steady-state system). These ramp-up assumptions reflect the reality that transit systems experience a transition over their initial operation as new riders begin to incorporate the system into their travel planning. This is especially likely to be true with HSR because it will be a new mode for most travelers and not merely an extension of an existing system.

The BPM-V3, like most travel demand models, delivers forecasts for a single typical day, which are then annualized to estimate annual travel behavior. Each forecast requires socioeconomic, land use, and transportation network data for the year of the forecast. Each forecast also requires processing time of about a week on a high performance computer. It is unreasonable to produce individual year forecasts when the only input changes are the baseline socioeconomic, land use, and transportation network data. Instead, the RDP directed CS to provide forecasts for three model years and then interpolated forecasts for the years not explicitly modeled.

[1] Cambridge Systematics. October 4, 2019. *California High Speed Rail Environmental Analysis: Method for Forecasting Vehicle-Miles of Travel Reductions.*

Methodology for Transition from CS Single-Year Forecasts to Multi-Year Forecasts

The methodology to estimate vehicle miles traveled (VMT) from the ridership model was driven by the methodology to estimate overall ridership. These two efforts were tied together in order to make the year-by-year estimates as consistent and theoretically coherent as possible. Thus, this section will discuss both the original estimates for ridership and then highlight to additional effort to derive forecasts for VMT.

In 2016, CS provided forecasts for three years (2025, 2029, and 2040).[2] Since the 2016 Business Plan forecasts were developed, the Authority has adopted its 2018 Business Plan, which was accompanied by updated forecasts. The 2016 and 2018 Business Plan ridership forecasts were developed using the same travel forecasting model; the forecasts differ due to changes in the model's inputs, including the high-speed rail service plan, demographic forecasts, estimates of automobile operating costs and travel times, and airfares.

Forecasts of the Valley-to-Valley line (San Francisco to Bakersfield) were provided for its first and last years of operation (when Phase 1 would come online): 2025 and 2029. Forecasts for the Phase 1 line (San Francisco to Anaheim) were provided for its first year of operation and a reasonable out year for forecasts: 2029 and 2040.

To develop the ridership and revenues series shown in the Business Plan[3], the RDP took the forecasts for Valley-to-Valley and Phase 1 and developed a compound annual growth rate (CAGR) for the two systems between the modeled years. These were calculated to be 0.10% for Valley-to-Valley and 1.33% for Phase 1. Ridership growth after 2040 was assumed to be 1% annually through 2060. This series represented the steady state for ridership on the system without accounting for the ramp-up of introducing new services.

However, it is well documented that it takes time for riders to reach these steady state behaviors and so ramp-up factors were applied to ensure that the Authority would report reasonably conservative forecasts during initial operation. The full set of assumptions for the ridership ramp-up are reported in the 2016 Business Plan, but are repeated here for completeness. The RDP used a 5-year ramp-up cycle (40%, 55%, 70%, 85%, and 100%). From 2025-2028, this series was applied in a straightforward manner. From 2029 to 2034, when Phase 1 was introduced, the ramp-up applied only to the difference in ridership between Valley-to-Valley and Phase 1. In other words, the ridership that used the system during Valley-to-Valley operation was assumed to continue to use the system without alteration, but the additional ridership from the larger system was incremental.

Importantly, the RDP did not estimate any differentials in which markets would be affected during the ramp-up periods. The ramp-up cuts were applied to the headline system-wide ridership and revenue values and assumed to apply evenly.[4]

The forecasted VMT and vehicle hours traveled (VHT) *reductions* (relative to the No Build scenario without high-speed rail service) were adjusted to be consistent with this methodology. First, CS provided Build and No Build VMT and VHT totals and by county for each scenario as well as the reduction in VMT

[2] A full description of the assumptions and modeling efforts for the 2016 Business Plan can be found in the Technical Memo attached to that plan on the Authority's website: https://hsr.ca.gov/docs/about/business_plans/2016_Business_Plan_Ridersihp_Revenue_Forecast.pdf.

[3] See Exhibit 7.1 to Exhibit 7.10 in the Business Plan: https://hsr.ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf.

[4] The BPM-V3 was developed to estimate steady-state travel conditions. Ramp-up periods vary depending on ridership markets, competitive situation and existing ridership experience. While it was reasonable to use the steady-state condition as an upper bound of ridership, it was not well suited to the task of determining how particular sectors might react during the ramp up period. For instance, it may be that people living in San Jose will immediately begin using the system to travel to San Francisco because it is very similar to existing Caltrain service. And it may come to pass that people living in Bakersfield will be slightly slower to adopt HSR because it would be a much newer mode. The model did not have any data to support such differentiated approaches and the magnitude of ramp-up and so the decision was made to just apply the ramp up percentage evenly across all ridership markets and geographies.

and VHT (i.e., the difference between the Build and No Build scenarios).[5,6] Second, the reduction in VMT and VHT was modeled using the CAGR developed for overall ridership and the No Build VMT and VHT were increased using a CAGR between the No Build scenarios (and assumed to grow at 1% post 2040). Again, no attempt was made to identify any differences in trip-making patterns during the ramp-up period so all VMT/VHT estimates were factored at the same rate. Finally, the Build VMT was then re-derived as the difference between the No Build and the reduction. Because the reductions were streamed using the ridership CAGR rather than developing a VMT reduction specific CAGR, it is not surprising that the estimate slightly differed from the CS forecast, especially by 2040.[7]

Conclusion

The RDP has produced numerous forecasts of ridership, revenue, and environmental impacts in support of the Authority's mission to deliver high speed rail to California. These forecasts begin with the Authority's service plans for trip times and frequency, are evaluated in the BPM-V3 to find a steady state forecast for several future years, and then interpolated according to the methodology outlined in this memo to meet the needs of the Authority's stakeholders. These interpolations are conservative adjustments to the raw model outputs and represent a reasonable compromise between the BPM-V3's technical limitations and the Authority's business planning needs.

[5] It should be noted that the structure of the travel model provides a forecast for the *change* in VMT/VHT, but does not explicitly provide a forecast for total statewide no build or build VMT/VHT. The BPM-V3 is a long-distance trip model that forecasts all trips longer than 50 miles and shorter trips only in Los Angeles and the San Francisco Bay Area. This has caused some confusion when reporting county wide VMT/VHT where some counties are modeled in the short distance trip model and others are only modeled in the long-distance trip model. The full details of the BPM-V3 short and long distance models can be found in the model documentation: https://hsr.ca.gov/docs/about/ridership/CHSR_Ridership_and_Revenue_Model_BP_Model_V3_Model_Doc.pdf

[6] The raw CS data is found in tables 2.7 and 2.8 in the memo cited in Footnote 1.

[7] The medium case 2040 annual statewide total estimated VMT reductions produced as a result of using the same CAGR used for the ridership series resulted in a reported savings of 4.767 billion VMT reduced. The medium 2040 annual statewide VMT reductions estimated as a direct output of the BPM-V3 were 4.785 billion VMT reduced. Thus, the methodology adopted by the RDP understated the project's impact by 0.35% compared to the VMT seen in the raw model output.

CAMBRIDGE SYSTEMATICS

California High-Speed Rail Environmental Analysis

Method for Forecasting Vehicle-Miles of Travel Reductions

prepared for

DB Engineering & Consulting USA Inc. for the California High-Speed Rail Authority

prepared by

Cambridge Systematics, Inc.

January 20, 2020

www.camsys.com

California High-Speed Rail Environmental Analysis

Method for Forecasting Vehicle-Miles of Travel Reductions

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date

January 20, 2020

Table of Contents

1.0 Travel Modeling Approach 1-1
1.1 Approach for VMT and GHG Calculation 1-2
1.1.1 2016 Business Plan Ridership Modeling 1-2
1.1.2 Risk Analysis 1-4
1.1.3 Modeling Process for Ridership and Differences in VMT 1-5
Detailed Procedures for Producing Differences in VMT 1-6
1.1.4 Process to Estimate Differences in Air Travel and Air Service Needs 1-7
1.1.5 Greenhouse Gas Emissions Modeling 1-7
1.2 Growth Forecasts 1-8
1.2.1 Population, Household, and Employment Forecasts 1-8
1.2.2 Growth in Trips Forecast by the Trip Frequency Model 1-9
1.2.3 Growth in Corridor-Level Trips Forecast by the Destination Choice Model 1-9
1.3 Transportation Network 1-9
1.3.1 HSR Network Assumptions for the Different Horizon Years 1-9
Silicon Valley to Central Valley Line–Open in 2025 1-9
Phase 1 1-10
High-Speed Rail Service Plan Assumptions 1-11
1.3.2 Assumed roadway improvements 1-13
Automobile Operating Cost 1-13
1.3.3 Aviation Network Assumptions 1-13
1.3.4 Conventional Passenger Rail Service Assumptions 1-14

2.0 Summary of Estimates 2-17
2.1 75th Percentile Travel Forecasts 2-17
2.1.1 Trips by Mode 2-17
2025 Results 2-17
2029 Results 2-17
2040 Results 2-17
2.2 Changes in VMT 2-24
2.3 Avoided Air Trips 2-25
2.4 Input to GHG analysis (Meg) 2-26

3.0 Model Calibration/Quality Control 3-27
3.1 BPM-V3 Calibration 3-27
3.2 Quality Control Measures 3-27
3.3 Peer Review Process 3-28

4.0 Uncertainty/Limitation 4-29
4.1 Focus on Differences in VMT Balances 4-29
4.2 Model Limitations 4-29
4.3 Relevance for GHG estimation (Meg) 4-29

List of Tables

Table 1.1 Risk Factors Considered by Forecast Year 1-5
Table 1.2 High-Speed Rail Service Plan Assumptions by Scenario 1-12
Table 1.3 Auto Operating Costs in 2015 Dollars 1-13
Table 1.4 Air Service Assumptions 1-14
Table 1.5 Source of CVR Operating Plan Forecasts 1-15
Table 1.6 CVR Operating Plan Service Frequencies 1-16
Table 2.1 2025 Annual Trips (in Millions) – No-Build and Silicon Valley to Central Valley Alternatives 2-18
Table 2.2 2025 Annual Trips (in Millions) and Shares of Trips Diverted from Each Mode to HSR 2-19
Table 2.3 2029 Annual Trips (in Millions) – No-Build and Phase 1 Alternatives 2-20
Table 2.4 2029 Annual Trips (in Millions) and Shares of Trips Diverted from Each Mode to HSR 2-21
Table 2.5 2040 Annual Trips (in Millions) – No-Build and Phase 1 Alternatives 2-22
Table 2.6 2040 Annual Trips (in Millions) and Shares of Trips Diverted from Each Mode to HSR 2-23
Table 2.7 Annual Auto VMT in Billions of Miles 2-24
Table 2.8 Daily Auto VMT in Thousands of Miles 2-24
Table 2.9 Potential Annual Flight Reductions Due to Diversion of Air Trips to HSR 2-25

List of Figures

Figure 1.1 Nesting Structure for Joint Main Mode – Access/Egress Mode Model 1-3
Figure 1.2 Risk Analysis Approach 1-5
Figure 1.3 Silicon Valley to Central Valley Line 1-10
Figure 1.4 Phase 1–Open in 2029 1-11
Figure 3-1 Calibration Process 3-27

1.0 Travel Modeling Approach

Since 2007, Cambridge Systematics (CS) has been supporting the California High-Speed Rail Authority (Authority) by producing ridership and revenue forecasts for different high-speed rail (HSR) service options. CS developed the "Version 1" model, which was estimated and calibrated using data from the 2000-2001 California Household Travel Survey (CSHTS) and stated-preference (SP) survey data from a revealed preference/stated preference (RP/SP) survey conducted in 2005 for the express purpose of HSR ridership and revenue forecasting.[1] The Version 1 model was used to support alternatives analyses and project-level environmental work.

In preparation for the 2012 Business Plan, CS updated the Version 1 model based on a new trip frequency survey of long-distance travel made by California residents and recalibrated it to 2008 conditions. The enhancements culminated in ridership and revenue model runs used to support the California High-Speed Rail 2012 Business Plan.[2]

In 2012 and 2013, CS made additional enhancements to the ridership and revenue model to accommodate the evolving forecasting needs of the Authority, including the 2014 Business Plan. The enhanced model, known as the Version 2 ridership and revenue model, represented a major overhaul of all model components and incorporated new and reanalyzed data from the 2012-2013 CSHTS and the 2005 SP and revealed preference (RP) data. The enhancements to the Version 2 model incorporated the recommendations of the Authority's Ridership Technical Advisory Panel (RTAP) and considered comments from the Authority's Peer Review Group (PRG) and the Government Accountability Office's report. In addition to the ridership and revenue model enhancements, CS developed a risk analysis approach to estimate uncertainty in the forecasts and prepare and present ridership and revenue forecasts.

Since application of the Version 2 model in the 2014 Business Plan, CS updated the model to the current Business Plan Model-Version 3 (BPM-V3)[3]. During the development of the 2014 Business Plan, CS completed a new 2013-2014 RP/SP survey that was incorporated into the BPM-V3 model.[4] The BPM-V3 was estimated using data from the 2013-2014 RP/SP survey in addition to the 2005 RP/SP survey and the 2012-2013 CSHTS data. Additionally, the model includes an adjustment to explicitly divide auto costs by an assumed average auto occupancy of 2.5 for those who travel in groups.

Finally, based on model applications using the Version 2 model, CS identified a tendency of the model to forecast trips with long access and/or egress times, coupled with relatively short trips on the main mode. This tendency did not show up in the model calibration or validation since most observed trips on conventional rail (CVR) were relatively short and, conversely, most trips by air were relatively long. Since

[1] Cambridge Systematics, Inc., *Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study: Interregional Model System Development*, prepared for Metropolitan Transportation Commission and the California High-Speed Rail Authority, August 2006.

[2] Cambridge Systematics, Inc., *California High-Speed Rail 2012 Business Plan, Ridership, and Revenue Forecasting, Final Technical Memorandum*, prepared for Parsons Brinckerhoff for the California High-Speed Rail Authority, April 12, 2012.

[3] Cambridge Systematics, Inc., *California High-Speed Rail Ridership and Revenue Model, Business Plan Model-Version 3 Model Documentation, Final Report*, prepared for the California High-Speed Rail Authority, February 17, 2016.

[4] Cambridge Systematics, Inc., Corey, Canapary and Galanis Research, and Kevin F. Tierney, *California High-Speed Rail 2013-2014 Traveler Survey – Survey Documentation*, prepared for the California High-Speed Rail Authority, February 2015.

HSR provided competitive service for the full range of distances, trips by HSR were more likely affected by the long access-egress/short main mode issue and, thus, the issue was not identified until model application.

In response, CS made enhancements to the BPM-V3 by including four new variables in the mode choice utility functions: auto access time, non-auto access time, auto egress time, and non-auto egress time with each being divided by total auto distance. These variables appear in the access and egress utility components of the mode choice model. The BPM-V3 model was used to produce forecasts of total ridership and revenue primarily for 2016 business planning purposes.

1.1 Approach for VMT and GHG Calculation

1.1.1 2016 Business Plan Ridership Modeling

CS used the BPM-V3 to develop ridership and revenue forecasts[5] for two main phases of the project as specified by the Authority:

1. Silicon Valley to Central Valley (VtoV) – San Jose to a station north of Bakersfield opening in year 2025.
2. Phase 1: San Francisco and Merced to Los Angeles and Anaheim opening in 2029 and an out-year of 2040.

Ridership and revenue forecasts were prepared for the opening year for each implementation step and a Phase 1 out year. The 2016 Business Plan lays out an implementation strategy that starts with the Silicon Valley to Central Valley line. The 2040 forecast reflects ridership on a mature system that would at the time have more than 10 years of operating history.

As noted, the BPM-V3 was used to forecast ridership and revenue for the 2016 Business Plan. The BPM-V3 is a detailed travel model for long distance trips greater than or equal to 50 miles in length made within California on an average day. Four model components are used to estimate the travel:

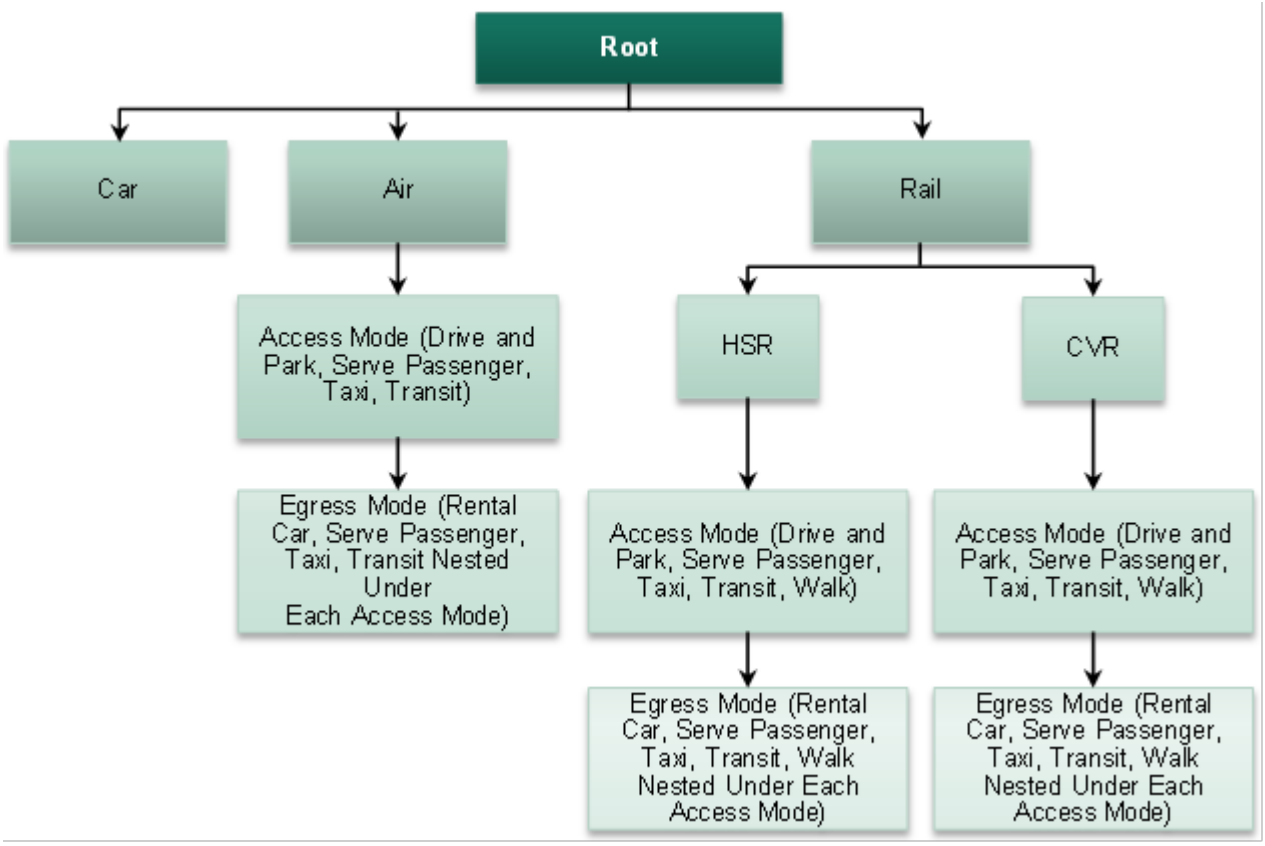
- Trip frequency choice – the choice of making either zero or one long distance trip (e.g., home to work) by residents of California
- Trip destination choice – given that a long-distance trip is being made, what is the destination of that trip from the trip-makers' home locations
- Main mode choice – given a long-distance trip from a trip-makers' home to a specified destination, what mode is used for the travel: auto, air, conventional rail, or high-speed rail
- Access/egress mode choice – given a long distance trip by air, conventional rail, or high-speed rail, what are the access and egress modes used to get to and from the airports or rail stations used for the travel: drive and park (from home to departure airport/station), rental car (from arrival airport/station to destination), dropped off/picked up by auto, or transit.

[5] Detailed ridership and revenue forecast assumptions and results for the 2016 Business Plan are documented in: https://www.hsr.ca.gov/docs/about/business_plans/2016_Business_Plan_Ridersihp_Revenue_Forecast.pdf.

The final model component steps are crucial in understanding forecasts performed using the BPM-V3. Figure 1.1 shows the model structure for the joint mode choice and access/egress choice model. In the figure, "Root" represents trips made by individuals with common household characteristics for (see Section 1.2.2) for a specific TAZ to TAZ interchange. Information regarding the travel options for the interchange, including egress from the best destination station or airport and access to the best origin station or airport for each of the main public transportation modes (air, CVR, and HSR) feeds up through the modeling process and is considered along with the travel characteristics for the main modes. Based on the information, the joint model is used to estimate the probabilities of auto, air, and rail travel for the long-distance trips, then under rail, the probabilities of using CVR or HSR, and then under each of the main modes the probabilities of using each of the available access and egress modes. The number of long distance trips for the individuals making the trips are multiplied by the probabilities to estimate trips by each of the main modes and access/egress modes.

The key is that improvements to travel characteristics for access to or egress from a main mode or changes to the travel characteristics for a main mode proportionally affects the competing modes. Thus, the introduction of HSR for an interchange will proportionally divert travel from both auto and air to rail (the rail travel characteristics are based on both the HSR and CVR characteristics). Further, the rail trips will split between HSR and CVR based on the quality of service and other characteristics afforded by those modes.

Figure 1.1 Nesting Structure for Joint Main Mode – Access/Egress Mode Model



Source: Cambridge Systematics

The long-distance person-trips are modeled for each of four trip purposes:

- Business – trips made from home to another location on an infrequent basis for work-related purposes
- Commute – trips made from home to another location on a regular basis for work
- Recreation – trips made from home to another location for recreational purposes
- Other – trips made from home to another location for personal business purposes (e.g. doctor, visit, etc.)

Note that all trips are modeled from home to non-home locations. This standard modeling practice is designated as modeling trips in "production-attraction" format. Trips from the non-home location to the home location are modeled as being made in the home to non-home direction. This convention allows for the consideration of household characteristics of trip-makers at their home (production) zone.

The BPM-V3 also includes intraregional models for the San Francisco Metropolitan Transportation Commission (MTC) and Southern California Association of Governments (SCAG) regions since high-speed rail may be an option for trips within those regions. Short-distance trips (less than 50 miles in length) that take place within the SCAG or MTC regions are modeled with separate intraregional mode choice models. Although these trips are not a major market for HSR, they are evaluated to get a more complete picture of travel within the state that may be attracted to and served by the HSR system. Both the SCAG and MTC intraregional mode choice models are based on a refined version of the MTC BAYCAST model. The models use static trip tables adopted from the SCAG and MTC regional models.[6] In addition, the models use transportation level of service (LOS) characteristics and household characteristics developed specifically for the HSR model system. During application, the models are run for all trips (both less than and greater than 50 miles in length), and then the long-distance trips (greater than or equal to 50 miles in length) are removed from the results (since they are modeled using the BPM-V3 long distance travel model). Thus, the model results presented in this section encompass all trip lengths without duplication.

1.1.2 Risk Analysis

A detailed, eight-step risk analysis approach was employed to forecast a range of revenue and ridership forecasts for the 2016 Business Plan as shown in Figure 1.2 below.[7] The process was used to forecast the probabilities of achieving different levels of ridership and revenue for the system based on the variation of specified risk factors that would affect future travel. The risk factors included calibrated model parameters as well as variation in input assumptions as shown in Table 1.1.

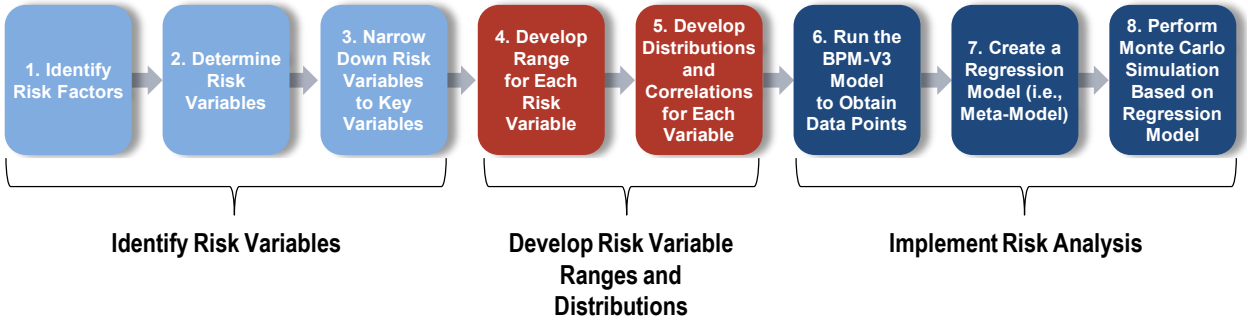
The key to the risk analysis approach was the development of simplified meta-models based on the specified risk factors that reasonably reproduced the results of the BPM-V3. The BPM-V3, which takes hours of computer time for each forecast, was run 59 times for each forecast year varying the risk factors. The resulting forecasts formed the inputs necessary for the development of linear regression-based models of the BPM-V3 forecasts that could be run in fractions of a second on a computer. This approach made it possible

[6] Southern California Association of Governments, *SCAG Regional Travel Demand Model and 2008 Model Validation*, June 2012; and Metropolitan Transportation Commission, *Travel Model Development: Calibration and Validation*, May 2012.

[7] See the 2016 Business Plan documentation for additional details regarding the risk analysis.

to produce 50,000 forecasts of ridership and revenue for each forecast year using Monte Carlo simulation procedures varying the input risk variables.

Figure 1.2 Risk Analysis Approach



Source: Cambridge Systematics.

Table 1.1 Risk Factors Considered by Forecast Year

Risk Variable	2025	2029	2040
HSR mode choice constant	x	x	x
Business/Commute and Recreation/Other trip frequency constants	x	x	x
Auto operating cost	x	x	x
HSR fares	x	x	x
HSR frequency of service	x	x	x
Availability and frequency of service of CVR and HSR bus connections to HSR termini	x		
Coefficient on transit access and egress TIME/AUTO DISTANCE variable	x	x	
Airfares		x	
Number and distribution of households throughout the state			x
Auto travel time			x

Source: Cambridge Systematics.

For business planning purposes, the 25th percentile forecast of HSR revenue was used; and for environmental analyses, the 75th percentile of HSR ridership was used. Since the risk analysis procedures produced only the HSR ridership or revenue forecasts, a separate, full, BPM-V3 forecast was performed with input values and assumptions set to reproduce the 75th percentile HSR ridership forecast. Estimation of 75th percentile VMT and VHT were based on this special forecast.

1.1.3 Modeling Process for Ridership and Differences in VMT

Two travel forecasts are produced for each forecast year in order to estimate differences in travel by each mode:

- a no-build forecast without the HSR system, and
- a build forecast with the HSR system.

The transportation systems and levels of service for auto, air, and CVR are assumed to be the same for the no-build and build forecasts.

Each of the model runs produces person trip tables for auto, air, CVR, and HSR for each of the four trip purposes. The BPM-V3 does not include a traffic assignment process since its primary focus was the forecast of HSR ridership and revenue. The California Statewide Travel Demand Model (CSTDM) does include a roadway network and traffic assignment process.[8] The BPM-V3 forecasts of person trips made by auto were, thus, processed using CSTDM forecast results to convert the auto person trips in the 50 or more mile range to auto vehicle trips. These were combined with CSTDM forecasts of auto vehicle trips less than 50 miles in length, commercial vehicle trips, and auto trips to, from, or through California and assigned to the CSTDM roadway network to produce VMT and VHT forecasts. Finally, since the BPM-V3 intraregional modeling procedures for the MTC and SCAG regions produced auto vehicle trips that can be assigned to the more detailed roadway networks in those regions, the intraregional VMT and VHT for those regions were used to replace the results of the CSTDM forecasts.

Detailed Procedures for Producing Differences in VMT

The BPM-V3 outputs auto person trips by four purposes – business, commute, recreation, and other. The CSTDM assignment process requires auto vehicle trips for the four different time periods – AM, midday, PM and off-peak for each of three different modes – single occupant vehicles (SOV), two occupant vehicles (HOV2), and three or more occupant vehicles (HOV3+). The following process was used to convert the BPM-V3 forecasts of auto person trips by purpose to vehicle trips by occupancy:

- BPM-V3 forecasts of auto person trips for business, commute, recreation, and other trip purposes were aggregated at the TAZ to TAZ level and then converted from production-attraction format to origin-destination format;
- The BPM-V3 auto person trips were split into short-distance (SD) trips greater than or equal to 50 miles and less than 100 miles and long-distance (LD) trips greater than or equal to 100 miles. The 100-mile cutoff distance was based on the CSTDM criterion of using straight line distance. The two trip tables were then converted from BPM-V3 zone system to CSTDM zone system based on proportion of area overlap;
- The total auto person trips were then split into person trips for the three different occupancy levels by the four time periods based on forecast CSTDM county to county proportions for each of the 12 combinations of person trips by vehicle occupancy by time of day. This step was performed for both for SD and LD trips.
- The person trips were then converted to vehicle trips by dividing the person trips by the occupancy level and summing the resulting vehicle trips. The CSTDM uses an HOV3+ occupancy rate of 3.6 persons per vehicle.
- CSTDM SD trips less than 50 miles (straight line distance) were added to the BPM-V3 SD trip table produce a full set of SD trips between 0-100 miles in length.

[8] Auto travel times used for the BPM-V3 are obtained from CSTDM forecasts.

- The resulting SD and LD vehicle trips were combined with commercial and external vehicle trips obtained from the CSTDM forecast for the appropriate year.

The resulting trip tables were then assigned for each of the four different time periods, and the resulting VMT on each link for each time of day was aggregated to produce statewide VMT estimate.

The above process was performed for both the no-build and 75th percentile BPM-V3 forecasts and the differences between the forecasts were calculated.

1.1.4 Process to Estimate Differences in Air Travel and Air Service Needs

As noted in Section 1.1.1, the introduction of HSR will divert trips from auto, air, and CVR. Those diverted trips can be consistently and deterministically forecast by comparing the differences in forecast trips by mode between the build and no-build alternatives.

The determination of changes in air service needs are more difficult to estimate since the amount of air service provided by carriers is based on their individual responses to HSR and other factors. Based on the structure of the BPM-V3, air trip interchanges can be assigned to origin and destination airports.[9] The average daily air passenger trips were multiplied by 365 to estimate annual intra-California air passenger trips. Each airport was assigned to one of six regions: San Francisco Bay Area, Sacramento Valley, San Diego, San Joaquin Valley, Southern California, and the Remainder of the state. The forecast no-build and modeled annual air trips were aggregated into tables of trips from airport region to airport region.

Annual passenger and flight data between California airports updated in May 2015 by the US Bureau of Transportation Statistics (BTS) were used to determine load factors for flights from each of the six regions. The detail of the BTS data allowed for the calculation of different load factors for flights internal to California and flights destined to locations outside of California.

The forecast airport region to airport region trips were then divided by the BTS derived load factor for the departure airport region to determine the number of annual flights required to serve the passenger loads based on load factors estimated from 2015 passenger and flight data. The reduction was then the estimated flights for the no-build forecast minus the estimated flights for the build forecast.

Flight reductions computed using the above approach represent what might be expected in the future. However, airline response to changes in air passengers due to the introduction of HSR might be different.

1.1.5 Greenhouse Gas Emissions Modeling

Authority analysts evaluated on-road vehicle emissions using average daily VMT estimates and associated average daily speed estimates for each affected county. Analysts estimated emission factors using the emission factors using the California Air Resources Board (CARB) emission factor program, EMission FACtors 2014 (EMFAC2014), which accounts for existing regulations that would reduce emissions, such as the Pavley Clean Car Standards. Parameters were set in the program for each individual county to reflect conditions within each county and statewide parameters to reflect travel through each county. The analysis was conducted for the following modeling years:

[9] Air passenger trips are in production-attraction format. Thus, the trips from airport A to airport B actually represent both the outbound and return trips to locations served by airport A.

- Existing (Year 2015)
- Opening Year (Year 2029)
- Horizon Year (Year 2040)

To determine overall pollutant burdens generated by on-road vehicles, analysts multiplied the estimated VMT by the applicable pollutant's emission factors, which are based on speed, vehicle mix, and analysis year.

Air-passenger trip reductions are the number of passengers that shift from air travel to the HSR system. Air-passenger trips are used to estimate the number of airplane flights reduced which results in airline fuel use reductions. Airplane flights removed are based on a full airplane cycle, including taxi/idle, take-off, climbing, cruise, decent, and landing. Emission factors are provided by airplane type and for each component of the full airplane cycle. The source of emissions factors for airplane flights include the Federal Aviation Administration's Aviation Environmental Design Tool (AEDT) and the California Air Resources Board (California 2000-2014 GHG Emission Inventory: Technical Support Document, 2016 Edition. September 2016).

1.2 Growth Forecasts

As documented in Section 1.1, the BPM-V3 is a choice model with four distinct steps: trip frequency choice, trip destination choice, main mode choice, and access/egress mode choice. The primary keys to growth in travel are the growth in the number of households and the amount of employment within California coupled with changes in accessibility afforded by the HSR system. This information directly impacts the total numbers of trips forecast through the trip frequency model and the distribution of those trips within the state.

1.2.1 Population, Household, and Employment Forecasts

Forecasts of future population, households, and employment in California used as input to the BPM-V3 were based on county-level socioeconomic estimates and forecasts from many sources, including:

- **Federal agencies:** U.S. Census Bureau;
- **State agencies:** California Department of Finance (DOF) and the California Employment Development Department (EDD);
- **MPOs:** Metropolitan Transportation Commission (MTC), Sacramento Area Council of Governments (SACOG), San Diego Association of Governments (SANDAG), Southern California Association of Governments (SCAG), and the San Joaquin Valley MPOs;
- **Third Parties within California:** input data for the CSTDM, California Economic Forecast Project (CEF), Center for Continuing Study of the California Economy, University of California Los Angeles (UCLA – Anderson School), and University of Southern California (Price School).
- **Third Parties outside California:** Moody Analytics and Woods & Poole, Inc.

The data and forecasts from the various agencies were critically evaluated and processed to produce county-level forecasts of population, households, and employment throughout the state. Information from the MPOs was used to disaggregate the forecasts to TAZs.

1.2.2 Growth in Trips Forecast by the Trip Frequency Model

The trip frequency choice model forecasts the choice of making either zero or one long distance trip greater than 50 miles by residents of California. The models produce the probabilities of a single person in each household type in a TAZ making one travel-alone long-distance trip and one travel-in-group long-distance trip on a given day. Household types are stratified by four household size groups (1, 2, 3, or 4+), three income groups (low, medium, or high income), three auto ownership groups (0, 1, or 2+ autos), and three number of workers groups (0, 1, or 2+ workers) to produce the numbers of households by each of 99 different household types for each TAZ.[10] The forecasts produce the probabilities of making either a production-attraction trip or the return attraction-production trip. The resulting probabilities represent the trips per person for each household type. The trips per person were multiplied by the household size and, then, by the number of households in the specific household size group to estimate the total person trips "generated." Thus, the growth in total forecast trips for any forecast year is directly related to the growth in the numbers of households by household type.

The forecast of future trips is also directly related to change in accessibility in the state. As roadways become more congested and travel times increase, accessibility decreases and, thus, long distance trips also decrease. Likewise, if the aggregate accessibility from a TAZ to all other TAZs increases due to good HSR connections, long distance trips from that TAZ will increase. When comparing a build alternative to a no-build alternative, an increase in total trip making for the build alternative can be considered one component of induced travel.

1.2.3 Growth in Corridor-Level Trips Forecast by the Destination Choice Model

The total numbers of trips produced by household in each TAZ are determined using the Trip Frequency model. However, based on changes in the accessibility for each TAZ to TAZ interchange, trips from a TAZ may be diverted from less accessible destination TAZs to more accessible destination TAZs. Thus, in comparison to a no-build alternative, trips between TAZs in well-served corridors may increase, compensating for decreases in trips in less well-served corridors. This change in trips due to accessibility constitutes as second component of induced travel.

1.3 Transportation Network

1.3.1 HSR Network Assumptions for the Different Horizon Years

The business case evaluation assumes that the high-speed rail project will open in phases, from 2025 through 2029, as described below.

Silicon Valley to Central Valley Line–Open in 2025

The Silicon Valley to Central Valley line is planned to begin service in 2025, characterized by:

- A north terminal at San Jose and a south terminal at a station north of Bakersfield (Figure 1.3);

[10] 4×3×3×3=108 household strata. However, nine illogical strata where number of workers per household are greater than the household size are removed.

- Dedicated coach services will be provided between the Fresno station and the Sacramento region, as well as between the line's southern terminus and locations in the Los Angeles Basin (LA Basin);
- Connections with Amtrak at Fresno to the Bay Area and Sacramento would be coordinated; and
- Potential extensions to the Silicon Valley to Central Valley phase would extend high-speed rail service from San Jose to San Francisco in the north and from the assumed southern terminus to Bakersfield.

Figure 1.3 Silicon Valley to Central Valley Line

Phase 1

Scheduled to start operations in 2029, Phase 1 completes the high-speed rail system from a north terminal at San Francisco to the south terminal at Anaheim (Figure 1.4), with these characteristics:

- High-speed rail service will operate on Caltrain tracks from San Jose to San Francisco, meaning that congestion on the corridor is taken into account for assumed travel time;
- Dedicated coach services would be provided from Merced to Sacramento;
- Connections with Amtrak at Merced to the Bay Area and Sacramento would be coordinated; and
- Connections with Metrolink feeder service at Los Angeles Union Station (LAUS) to LA Basin destinations would be coordinated.

Figure 1.4 Phase 1–Open in 2029

High-Speed Rail Service Plan Assumptions

High-speed rail fares for all 2016 Business Plan scenarios were identical to those in the 2014 Business Plan escalated from 2013 dollars to 2015 dollars. The fares are based on the formula below, with an $89 maximum in 2015 dollars:

- $32.26 + $0.1994 per mile (in 2015 dollars) for interregional fares;
- $23.94 + $0.1662 per mile (in 2015 dollars) for intraregional fares for the SCAG region; and
- $15.51 + $0.1330 per mile (in 2015 dollars) for intraregional fares for MTC and SANDAG regions.

Service assumptions varied by scenario. The details of the service frequencies are described in Table 1.2.

Table 1.2 High-Speed Rail Service Plan Assumptions by Scenario

Business Plan Scenario	North Terminus	South Terminus	High-Speed Rail Service Summary[a]	Dedicated Peak Bus Coach Connections[b]		Conventional Rail Connections
				North Terminus	South Terminus	
Silicon Valley to Central Valley Line	San Jose	North of Bakersfield	• 2 peak TPH from San Jose and North of Bakersfield (1 in off-peak)	• 2 peak BPH from Fresno and Sacramento (1 in off-peak)	• 2 BPH from North of Bakersfield and LAUS (1 in off-peak) • 2 BPH from North of Bakersfield and West LA (1 in off-peak) • 2 BPH from North of Bakersfield and Santa Anita (1 in off-peak)	• Coordinated service with Amtrak at Fresno
Silicon Valley to Central Valley Line Extension	San Francisco	Bakersfield	• 2 peak TPH from San Francisco and Bakersfield (1 in off-peak)	• 2 peak BPH from Fresno and Sacramento (1 in off-peak)	• 2 BPH from Bakersfield and LAUS (1 in off-peak) • 2 BPH from Bakersfield and West LA (1 in off-peak) • 2 BPH from Bakersfield and Santa Anita (1 in off-peak)	• Coordinated service with Amtrak at Fresno
Phase 1	San Francisco and Merced	Los Angeles and Anaheim	• 2 peak TPH from San Francisco and Los Angeles (3 in off-peak) • 2 peak TPH from San Francisco and Anaheim (1 in off-peak) • 2 peak TPH from San Jose and Los Angeles (0 in off-peak) • 1 peak TPH from Merced and Los Angeles (0 in off-peak) • 1 peak TPH from Merced and Anaheim (same in off-peak)	• 2 BPH from Sacramento and Merced (1 in off-peak)	None	• Coordinated service with Amtrak at Merced • Metrolink connections at LAUS

[a] TPH – Trains per Hour

[b] BPH - Buses per Hour

1.3.2 Assumed roadway improvements

The highway network assumptions were the same as those used for the CSTDM for each respective forecast year.[11] CS averaged AM and PM peak congested travel times derived from the CSTDM for use when peak travel times were needed in the mode choice model. Similarly, CS averaged midday and off-peak congested speeds for when off-peak travel times were needed. Auto terminal times representing the average time to access one's vehicle at each end of the trip were added to the congested travel time to get the total congested travel time skim. Terminal times were based on the area type and assessed at both the origin and destination of the trip. When the CSTDM forecast years did not match the 2016 Business Plan forecast years, the travel times for the modeled forecast years were determined by interpolating between the closest CSTDM forecast years.

Auto costs (besides operating costs) comprise tolls and parking costs. Toll costs were imported from networks developed for the CSTDM. Tolls corresponding to single-occupancy vehicles were assumed in the auto skims. Peak and off-peak tolls were averaged where costs differed. The parking costs developed for the 2010 base year scenario were used for all future year scenarios.

Automobile Operating Cost

Auto operating costs for the 2016 Business Plan were developed based on information regarding gasoline prices from the U.S. Energy Information Administration's (EIA) 2011 Annual Energy Outlook (AEO) coupled with projected motor gasoline prices in California based on the 2013 AEO, which extends through 2040. This procedure was consistent with the methodology used for the 2014 Business Plan. The forecasts for fuel efficiency were based on the adopted Corporate Average Fuel Economy (CAFE) standards for light-duty vehicles for model year 2012 to 2016, as well as fuel economy projections based on the 2013 AEO forecasts, which included the adopted fuel efficiency standards for model year 2017 through model year 2025. The auto operating costs used for the different forecast years are summarized in Table 1.3.

Table 1.3 Auto Operating Costs in 2015 Dollars

Forecast Year	Range (Cents per Mile)
2025	26
2029	26
2040	24

Source: Cambridge Systematics, Inc.

1.3.3 Aviation Network Assumptions

Air service assumptions for forecast years were based on the latest air service patterns in the California Corridor markets.[12] The past decade of U.S. Department of Transportation (DOT) data on airline service and fare levels were used to provide information on the economic factors affecting airline responses to changes

[11] For more information regarding the CSTDM model development and assumptions, see the documentation provided on the California DOT (Caltrans) web site: http://www.dot.ca.gov/hq/tsip/otfa/cstdm/cstdm_documentation.html.

[12] Forecasts were produced by Aviation System Consulting, LLC (ASC), a California-based expert firm.

in competition and capacity, and helped determine scenarios of potential airline competitive response to the introduction of high-speed rail service.

The baseline assumption for air fares and assumed headways for all forecast years was that air fares would remain consistent with average fares and frequency of service that were used in the 2014 Business Plan. Table 1.4 provides base airfares and headways between select major airports.

Table 1.4 Air Service Assumptions

Origin Airport	Destination Airport	Assumed Airfare (2015 Dollars)	Assumed Headway (Minutes)
Burbank	San Francisco	$115	480.0
Burbank	Sacramento	$112	150.0
Los Angeles	San Diego	$237	32.0
Los Angeles	San Francisco	$100	23.0
Oakland	San Diego	$111	46.0
Oakland	Los Angeles	$111	44.0
Sacramento	Burbank	$112	150.0
Sacramento	San Francisco	$299	141.0
San Francisco	San Diego	$96	28.0
San Francisco	Burbank	$115	480.0

Source: Aviation System Consulting.

1.3.4 Conventional Passenger Rail Service Assumptions

CVR service, including travel times, frequency of service, and stations served, were updated to reflect the latest conditions and forecasts from the 2013 California State Rail Plan (CSRP),[13] MPO forecasts, and the CSTDM. The largest service changes from 2016 conditions include increased conventional rail service on the Altamont Corridor Express and the San Joaquins to connect with HSR, and increased service between San Diego and Los Angeles via connected Coaster and Metrolink service. In the Silicon Valley to Central Valley scenarios, the enhanced San Joaquin trains were assumed to connect from Sacramento and Oakland to HSR at Fresno. In Phase 1, that connection was assumed to be at Merced. The sources for CVR service are summarized in Table 4.2 and operating frequencies are summarized in Table 4.3. Fare assumptions for all CVR lines were consistent with on-line published fares from 2011. Consistent with previous assumptions, the peak period was assumed to be three hours during each of the AM and PM peak periods, and 10 hours for the off-peak period.

[13] 2013 California State Rail Plan, May 2013. Available at: http://californiastaterailplan.dot.ca.gov/.

Table 1.5 Source of CVR Operating Plan Forecasts

Source of Forecast	CVR Operators
California State Rail Plan	Amtrak San Joaquin
	Capitol Corridor
	Pacific Surfliner
	Altamont Corridor Express
	Caltrain
	Coaster
	MetroRail
MPO Plans	BART
	SMART
	Metrolink
California Statewide Transportation Demand Model	Muni LRT
	VTA LRT
	Sacramento LRT
	SANDAG LRT
	Sprinter

Table 1.6 CVR Operating Plan Service Frequencies

	2025 / 2029-2040[a]
Caltrain	
Gilroy – San Jose	11 / 11
Tamien/San Jose – San Francisco (4th and King/SF Transbay)	68 / 68
Capitol Corridor Route	
Auburn – Oakland	2 / 2
Sacramento – Oakland	3 / 3
Sacramento – San Jose	11 / 11
San Joaquin Route	
Sacramento – Merced connection to high-speed rail via San Joaquin Route	10 / 10
Sacramento – Bakersfield via San Joaquin Route	- / -
Oakland – Bakersfield via San Joaquin Route	- / -
Oakland – Merced connection to high-speed rail via San Joaquin Route	10 / 10
Stockton – Merced connection to high-speed rail via San Joaquin Route	1 / 1
Merced – Bakersfield via San Joaquin Route	6 / 6
Ace Route	
San Jose – Stockton via ACE Route	4 / 4
San Jose – Merced connection to high-speed rail via ACE and Union Pacific Railroad (UPRR) Route	2 / 2
San Jose – Merced connection to high-speed rail via ACE and BNSF Railway (BNSF) Route	4 / 4
Pacific Surfliner	
San Luis Obispo – Los Angeles	2 / 2
Goleta – Los Angeles	3 / 3
Los Angeles – San Diego	18 / 18
Metrolink (Ventura and Orange County Lines) and COASTER	
East Ventura[p] – Los Angeles	20 / 20
Los Angeles – Irvine/Laguna Niguel	5 / 5
Los Angeles – Oceanside	2 / 2
Los Angeles – San Diego (Metrolink COASTER “through” commuter service)	5 / 5
Riverside – San Diego (Metrolink-COASTER “through” commuter service)	0 / 2
Oceanside – San Diego	17 / 17
Metrolink – Other Lines	
Antelope Valley Line (LAUS – Palmdale)	19 / 19
San Bernardino Line (LAUS – San Bernardino)	23 / 23
Riverside Line (LAUS – Riverside)	6 / 6
91/Perris Valley Line (LAUS – Riverside-Perris)	7 / 7
Burbank Airport Line (LAUS – Burbank Airport)	7 / 7
IEOC (San Bernardino-Riverside-Irvine-Laguna Niguel/Mission Viejo)	10 / 10
OC Intracounty Line (Fullerton – Laguna Niguel/Mission Viejo)	5 / 5

Source: Cambridge Systematics, Inc.

[a] This column denotes the number of conventional passenger rail trains per day in each direction for the Silicon Valley to Central Valley lines in 2025 and for Phase 1 between 2029 and 2040.

2.0 Summary of Estimates

2.1 75th Percentile Travel Forecasts

2.1.1 Trips by Mode

2025 Results

Table 2.1 summarizes the annual trips by mode for the no-build and build alternatives for major markets in California in 2025. The results are raw model output and do not account for ramp-up. Table 2.2 summarizes the diversion of trips to HSR from other modes along with the induced long-distance travel. There are no forecast short distance changes in ridership in the MTC and SCAG regions for 2025 since the Silicon Valley to Central Valley HSR system does not serve those regions.

2029 Results

Table 2.3 summarizes the annual trips by mode for the no-build and build alternatives for major markets in California in 2025. The results are raw model output and do not account for ramp-up.

Table 2.4 summarizes the diversion of trips to HSR from other modes along with the induced long-distance travel. The short distance trip model for the MTC and SCAG regions was not rerun for the 2029 75th percentile no-build scenario. No-build trips by mode for 2029 were estimated by prorating the short distance HSR trips to the auto and CVR modes.

2040 Results

Table 2.5 summarizes the annual trips by mode for the no-build and build alternatives for major markets in California in 2025. The results are raw model output and do not account for ramp-up.

Table 2.6 summarizes the diversion of trips to HSR from other modes along with the induced long-distance travel. The short distance trip model for the MTC and SCAG regions was not rerun for the 2040 75th percentile no-build scenario. No-build trips by mode for 2040 were estimated by prorating the short distance HSR trips to the auto and CVR modes.

Table 2.1 2025 Annual Trips (in Millions) – No-Build and Silicon Valley to Central Valley Alternatives *75th Percentile Forecast*

Market		Ridership – No Build Alternative					Ridership – Silicon Valley to Central Valley Alternative				
		Auto	Air	HSR	CVR	Total	Auto	Air	HSR	CVR	Total
SACOG	SACOG	3.5	-	-	0.0	3.5	3.5	-	-	0.0	3.5
SACOG	SANDAG	0.6	0.4	-	0.0	1.0	0.6	0.4	0.0	0.0	1.0
SACOG	MTC	54.7	0.0	-	1.6	56.3	54.7	0.0	0.0	1.6	56.3
SACOG	SCAG	5.2	1.7	-	0.0	6.9	5.0	1.6	0.3	0.0	7.0
SACOG	San Joaquin Valley	13.3	0.0	-	0.1	13.4	13.1	0.0	0.2	0.1	13.4
SACOG	Other Regions	16.7	0.0	-	0.0	16.8	16.6	0.0	0.1	0.0	16.8
SANDAG	SANDAG	1.0	-	-	0.0	1.0	1.0	-	-	0.0	1.0
SANDAG	MTC	2.0	1.4	-	0.0	3.4	1.9	1.3	0.2	0.0	3.4
SANDAG	SCAG	110.6	0.3	-	3.2	114.1	110.5	0.3	-	3.2	114.0
SANDAG	San Joaquin Valley	3.0	0.2	-	0.0	3.2	2.9	0.2	0.1	0.0	3.2
SANDAG	Other Regions	2.4	0.3	-	0.0	2.7	2.4	0.2	0.0	0.0	2.7
MTC	MTC	34.9	0.0	-	1.0	35.9	34.6	0.0	0.3	0.9	35.9
MTC	SCAG	14.3	5.6	-	0.1	19.9	13.1	4.7	2.2	0.1	20.1
MTC	San Joaquin Valley	39.8	0.3	-	0.5	40.6	37.4	0.2	2.7	0.5	40.8
MTC	Other Regions	44.9	0.0	-	0.5	45.4	43.8	0.0	1.2	0.4	45.4
SCAG	SCAG	153.0	0.0	-	1.9	154.9	153.0	0.0	-	1.9	154.9
SCAG	San Joaquin Valley	31.3	0.4	-	0.9	32.6	30.5	0.4	0.8	0.9	32.6
SCAG	Other Regions	28.5	0.8	-	0.3	29.6	28.1	0.7	0.5	0.3	29.6
San Joaquin Valley	San Joaquin Valley	21.1	0.0	-	0.3	21.4	20.1	0.0	1.1	0.2	21.5
San Joaquin Valley	Other Regions	24.1	0.0	-	0.1	24.3	23.4	0.0	0.7	0.1	24.3
Other Regions	Other Regions	20.1	0.0	-	0.0	20.1	19.9	0.0	0.2	0.0	20.1
Long-Distance Total		624.8	11.6	-	10.6	646.9	616.2	10.2	10.6	10.3	647.4
MTC (< 50 miles)	MTC (< 50 miles)	8,406.6	-	-	15.4	8,422.0	8,406.6	-	-	15.4	8,422.0
SCAG (< 50 miles)	SCAG (< 50 miles)	18,655.0	-	-	13.9	18,668.9	18,655.0	-	-	13.9	18,668.9
Short-Distance Total[1]		**27,061.7**	-	-	**29.2**	**27,090.9**	**27,061.7**	**-**	**-**	**29.2**	**27,090.9**
Total		**27,686.5**	**11.6**	-	**39.8**	**27,737.8**	**27,677.9**	**10.2**	**10.6**	**39.6**	**27,738.3**

[1] With the exception of the SCAG and MTC regions, only long distance trips (trips made to locations 50 or more miles from a traveler's home) are shown in the table. In the SCAG and MTC regions, separate summaries of intraregional trips made to locations less than 50 miles from the travelers' homes are also shown. Only short-distance auto, HSR, and CVR modes are shown in this table.

Source: Cambridge Systematics

Table 2.2 2025 Annual Trips (in Millions) and Shares of Trips Diverted from Each Mode to HSR
75th Percentile Forecast

Market		HSR Ridership Diverted from Each Mode				Percentage of HSR Ridership Diverted from Each Mode			
		Auto	Air	CVR	Induced	Auto	Air	CVR	Induced
SACOG	SACOG	-	-	-	-	0%	0%	0%	0%
SACOG	SANDAG	0.0	0.0	-	0.0	39%	52%	0%	9%
SACOG	MTC	0.0	-	0.0	-	96%	0%	4%	0%
SACOG	SCAG	0.2	0.1	0.0	0.0	54%	40%	1%	5%
SACOG	San Joaquin Valley	0.2	0.0	0.0	0.0	93%	2%	3%	1%
SACOG	Other Regions	0.1	0.0	0.0	0.0	94%	1%	2%	3%
SANDAG	SANDAG	-	-	-	-	0%	0%	0%	0%
SANDAG	MTC	0.1	0.1	-	0.0	39%	55%	0%	6%
SANDAG	SCAG	-	-	-	-	0%	0%	0%	0%
SANDAG	San Joaquin Valley	0.1	0.0	0.0	0.0	81%	14%	2%	4%
SANDAG	Other Regions	0.0	0.0	-	0.0	62%	36%	0%	3%
MTC	MTC	0.3	-	0.0	0.0	88%	0%	11%	1%
MTC	SCAG	1.1	0.9	0.0	0.1	51%	42%	1%	7%
MTC	San Joaquin Valley	2.4	0.0	0.1	0.2	90%	1%	3%	7%
MTC	Other Regions	1.1	0.0	0.0	0.0	92%	0%	3%	4%
SCAG	SCAG	-	-	-	-	0%	0%	0%	0%
SCAG	San Joaquin Valley	0.7	0.1	0.0	0.0	88%	7%	2%	3%
SCAG	Other Regions	0.4	0.1	0.0	0.0	78%	17%	0%	5%
San Joaquin Valley	San Joaquin Valley	1.0	-	0.0	0.0	93%	0%	4%	4%
San Joaquin Valley	Other Regions	0.7	0.0	0.0	0.0	96%	0%	1%	3%
Other Regions	Other Regions	0.1	-	-	0.0	97%	0%	0%	3%
Long-Distance Total		8.6	1.4	0.2	0.5	80%	13%	2%	5%
MTC (< 50 miles)	MTC (< 50 miles)	-	-	-	-	-	-	-	-
SCAG (< 50 miles)	SCAG (< 50 miles)	-	-	-	-	-	-	-	-
Short-Distance Total		-	-	-	-	-	-	-	-
Total		8.6	1.4	0.2	0.5	80%	13%	2%	5%

Source: Cambridge Systematics

Table 2.3 2029 Annual Trips (in Millions) – No-Build and Phase 1 Alternatives
75th Percentile Forecast

Market		Ridership – No Build Alternative					Ridership – Silicon Valley to Central Valley Alternative				
		Auto	Air	HSR	CVR	Total	Auto	Air	HSR	CVR	Total
SACOG	SACOG	4.1	-	-	0.0	4.2	4.1	-	-	0.0	4.1
SACOG	SANDAG	0.8	0.5	-	0.0	1.3	0.8	0.4	0.2	0.0	1.3
SACOG	MTC	66.6	0.0	-	2.0	68.6	65.7	0.0	0.9	2.0	68.6
SACOG	SCAG	6.8	1.7	-	0.0	8.5	5.9	1.3	1.4	0.0	8.6
SACOG	San Joaquin Valley	15.8	0.0	-	0.1	16.0	15.5	0.0	0.3	0.1	16.0
SACOG	Other Regions	20.3	0.0	-	0.0	20.3	20.1	0.0	0.2	0.0	20.3
SANDAG	SANDAG	1.3	-	-	0.0	1.3	1.3	-	-	0.0	1.3
SANDAG	MTC	2.6	1.5	-	0.0	4.1	2.1	1.0	1.1	0.0	4.2
SANDAG	SCAG	131.8	0.2	-	4.0	136.0	128.7	0.2	3.5	3.7	136.1
SANDAG	San Joaquin Valley	3.6	0.2	-	0.0	3.8	3.1	0.1	0.6	0.0	3.9
SANDAG	Other Regions	2.9	0.3	-	0.0	3.2	2.7	0.2	0.3	0.0	3.2
MTC	MTC	41.1	-	-	1.1	42.2	38.7	-	2.7	0.9	42.3
MTC	SCAG	17.8	5.5	-	0.1	23.4	13.1	3.1	7.8	0.0	24.0
MTC	San Joaquin Valley	46.5	0.2	-	0.5	47.3	41.7	0.2	5.2	0.5	47.6
MTC	Other Regions	51.7	0.0	-	0.6	52.4	48.9	0.0	3.0	0.5	52.5
SCAG	SCAG	182.3	0.0	-	2.3	184.7	174.5	0.0	8.2	2.1	184.9
SCAG	San Joaquin Valley	36.8	0.4	-	1.0	38.2	30.5	0.2	7.2	0.6	38.5
SCAG	Other Regions	32.9	0.7	-	0.3	33.9	31.2	0.5	2.1	0.3	34.0
San Joaquin Valley	San Joaquin Valley	25.1	0.0	-	0.2	25.3	22.7	0.0	2.5	0.2	25.4
San Joaquin Valley	Other Regions	27.4	0.0	-	0.1	27.5	26.3	0.0	1.0	0.1	27.5
Other Regions	Other Regions	23.1	0.0	-	0.0	23.1	22.9	0.0	0.2	0.0	23.1
Long-Distance Total		741.5	11.2	-	12.6	765.3	700.5	7.4	48.3	11.1	767.3
MTC (< 50 miles)	MTC (< 50 miles)	8,675.9	-	-	17.2	8,693.1	8,675.5	-	0.4	17.2	8,693.1
SCAG (< 50 miles)	SCAG (< 50 miles)	19,060.0	-	-	13.7	19,073.7	19,059.9	-	0.1	13.7	19,073.7
Short-Distance Total[1,2]		27,735.9	-	-	30.9	27,766.8	27,735.4	-	0.5	30.9	27,766.8
Total		28,477.4	11.2	0.0	43.5	28,532.2	28,435.9	7.4	48.9	42.0	28,534.2

1 With the exception of the SCAG and MTC regions, only long distance trips (trips made to locations 50 or more miles from a traveler's home) are shown in the table. In the SCAG and MTC regions, separate summaries of intraregional trips made to locations less than 50 miles from the travelers' homes are also shown. Only short-distance auto, HSR, and CVR modes are shown in this table.

2 The short distance trip model for the MTC and SCAG regions was not rerun for the 2029 75th percentile no-build scenario. No-build trips by mode for 2029 were estimated by prorating the short distance HSR trips to the auto and CVR modes.

Source: Cambridge Systematics

Table 2.4 2029 Annual Trips (in Millions) and Shares of Trips Diverted from Each Mode to HSR
75th Percentile Forecast

Market		HSR Ridership Diverted from Each Mode				Percentage of HSR Ridership Diverted from Each Mode			
		Auto	Air	CVR	Induced	Auto	Air	CVR	Induced
SACOG	SACOG	-	-	-	-	0%	0%	0%	0%
SACOG	SANDAG	0.1	0.1	0.0	0.0	51%	42%	1%	6%
SACOG	MTC	0.9	0.0	0.0	-	96%	0%	4%	0%
SACOG	SCAG	0.9	0.4	0.0	0.1	64%	29%	0%	6%
SACOG	San Joaquin Valley	0.3	0.0	0.0	-	97%	1%	2%	0%
SACOG	Other Regions	0.2	0.0	0.0	-	98%	1%	2%	0%
SANDAG	SANDAG	-	-	-	-	0%	0%	0%	0%
SANDAG	MTC	0.5	0.4	0.0	0.1	50%	42%	0%	7%
SANDAG	SCAG	3.2	0.0	0.3	0.0	89%	1%	9%	1%
SANDAG	San Joaquin Valley	0.5	0.0	0.0	0.0	86%	7%	2%	5%
SANDAG	Other Regions	0.2	0.1	0.0	0.0	74%	19%	1%	6%
MTC	MTC	2.4	-	0.2	0.1	90%	0%	6%	4%
MTC	SCAG	4.7	2.4	0.0	0.6	61%	30%	1%	8%
MTC	San Joaquin Valley	4.8	0.1	0.1	0.3	92%	1%	2%	5%
MTC	Other Regions	2.8	0.0	0.1	0.1	93%	0%	4%	3%
SCAG	SCAG	7.8	0.0	0.2	0.2	95%	0%	3%	2%
SCAG	San Joaquin Valley	6.3	0.1	0.4	0.4	88%	2%	5%	5%
SCAG	Other Regions	1.8	0.2	0.0	0.1	86%	9%	1%	4%
San Joaquin Valley	San Joaquin Valley	2.3	0.0	0.1	0.1	94%	0%	3%	3%
San Joaquin Valley	Other Regions	1.1	0.0	0.0	-	99%	0%	1%	0%
Other Regions	Other Regions	0.2	0.0	0.0	-	99%	1%	1%	0%
Long-Distance Total		41.0	3.8	1.5	2.0	85%	8%	3%	4%
MTC (< 50 miles)	MTC (< 50 miles)	0.4	-	-	-	100%	-	-	-
SCAG (< 50 miles)	SCAG (< 50 miles)	0.1	-	-	-	100%	-	-	-
Short-Distance Total		0.5	-	-	-	100%	-	-	-
Total		41.5	3.8	1.5	2.0	85%	8%	3%	4%

Source: Cambridge Systematics

Table 2.5 2040 Annual Trips (in Millions) – No-Build and Phase 1 Alternatives
75th Percentile Forecast

Market		Ridership – No Build Alternative					Ridership – Silicon Valley to Central Valley Alternative				
		Auto	Air	HSR	CVR	Total	Auto	Air	HSR	CVR	Total
SACOG	SACOG	4.5	-	-	0.0	4.5	4.5	-	-	0.0	4.5
SACOG	SANDAG	0.8	0.7	-	0.0	1.5	0.8	0.6	0.1	0.0	1.5
SACOG	MTC	76.1	0.0	-	2.4	78.6	74.9	0.0	1.3	2.4	78.5
SACOG	SCAG	7.0	2.6	-	0.0	9.6	6.3	2.1	1.3	0.0	9.7
SACOG	San Joaquin Valley	23.9	0.1	-	0.2	24.2	23.5	0.0	0.4	0.2	24.2
SACOG	Other Regions	25.5	0.0	-	0.1	25.6	25.3	0.0	0.2	0.0	25.6
SANDAG	SANDAG	1.5	-	-	0.0	1.5	1.5	-	-	0.0	1.5
SANDAG	MTC	2.5	2.0	-	0.0	4.6	2.1	1.6	0.9	0.0	4.6
SANDAG	SCAG	146.0	0.5	-	4.5	151.0	140.2	0.4	4.1	4.0	148.7
SANDAG	San Joaquin Valley	5.0	0.3	-	0.1	5.4	4.3	0.2	0.8	0.1	5.4
SANDAG	Other Regions	3.1	0.4	-	0.0	3.6	2.9	0.3	0.2	0.0	3.5
MTC	MTC	44.6	0.0	-	0.9	45.5	41.8	0.0	3.1	0.8	45.6
MTC	SCAG	17.6	7.6	-	0.1	25.3	13.8	4.9	7.1	0.1	25.9
MTC	San Joaquin Valley	67.2	0.5	-	0.9	68.6	61.3	0.3	6.5	0.8	68.9
MTC	Other Regions	58.8	0.1	-	0.7	59.6	55.6	0.1	3.4	0.5	59.6
SCAG	SCAG	206.6	0.0	-	2.7	209.4	198.7	0.0	9.0	2.4	210.1
SCAG	San Joaquin Valley	50.5	0.8	-	1.3	52.6	43.4	0.5	8.2	0.9	53.0
SCAG	Other Regions	33.9	1.2	-	0.3	35.4	32.4	1.0	1.9	0.3	35.5
San Joaquin Valley	San Joaquin Valley	43.5	0.0	-	0.4	43.9	40.2	0.0	3.5	0.3	44.0
San Joaquin Valley	Other Regions	39.0	0.0	-	0.1	39.2	37.8	0.0	1.2	0.1	39.1
Other Regions	Other Regions	31.3	0.0	-	0.0	31.3	31.0	0.0	0.2	0.0	31.3
Long-Distance Total		889.0	16.9	-	14.8	920.7	842.3	12.2	53.5	12.8	920.8
MTC (< 50 miles)	MTC (< 50 miles)	9,217.8	-	-	19.3	9,237.1	9,217.3	-	0.5	19.3	9,237.1
SCAG (< 50 miles)	SCAG (< 50 miles)	20,028.5	-	-	13.3	20,041.9	20,028.4	-	0.1	13.3	20,041.9
Short-Distance Total[1,2]		29,246.3	-	-	32.7	29,279.0	29,245.7	-	0.6	32.7	29,279.0
Total		30,135.3	16.9	-	47.5	30,199.7	30,088.0	12.2	54.1	45.5	30,199.8

[1] With the exception of the SCAG and MTC regions, only long distance trips (trips made to locations 50 or more miles from a traveler's home) are shown in the table. In the SCAG and MTC regions, separate summaries of intraregional trips made to locations less than 50 miles from the travelers' homes are also shown. Only short-distance auto, HSR, and CVR modes are shown in this table.

[2] The short distance trip model for the MTC and SCAG regions was not rerun for the 2040 75th percentile no-build scenario. No-build trips by mode for 2040 were estimated by prorating the short distance HSR trips to the auto and CVR modes.

Source: Cambridge Systematics

Table 2.6 2040 Annual Trips (in Millions) and Shares of Trips Diverted from Each Mode to HSR
75th Percentile Forecast

Market		HSR Ridership Diverted from Each Mode				Percentage of HSR Ridership Diverted from Each Mode			
		Auto	Air	CVR	Induced	Auto	Air	CVR	Induced
SACOG	SACOG	-	-	-	-	0%	0%	0%	0%
SACOG	SANDAG	0.1	0.1	0.0	-	48%	51%	1%	0%
SACOG	MTC	1.2	0.0	0.1	-	93%	0%	7%	0%
SACOG	SCAG	0.7	0.5	0.0	0.1	54%	38%	0%	7%
SACOG	San Joaquin Valley	0.4	0.0	0.0	-	95%	2%	3%	0%
SACOG	Other Regions	0.2	0.0	0.0	-	97%	1%	2%	0%
SANDAG	SANDAG	-	-	-	-	0%	0%	0%	0%
SANDAG	MTC	0.4	0.5	0.0	-	45%	54%	0%	0%
SANDAG	SCAG	5.8	0.1	0.5	-	91%	1%	8%	0%
SANDAG	San Joaquin Valley	0.7	0.1	0.0	-	88%	9%	3%	0%
SANDAG	Other Regions	0.2	0.1	0.0	-	74%	25%	2%	0%
MTC	MTC	2.8	-	0.1	0.1	91%	0%	5%	4%
MTC	SCAG	3.7	2.7	0.0	0.6	52%	39%	1%	9%
MTC	San Joaquin Valley	5.9	0.1	0.1	0.3	91%	2%	2%	5%
MTC	Other Regions	3.2	0.0	0.1	0.1	93%	0%	4%	3%
SCAG	SCAG	8.0	0.0	0.3	0.7	89%	0%	3%	8%
SCAG	San Joaquin Valley	7.0	0.2	0.4	0.5	86%	3%	5%	6%
SCAG	Other Regions	1.5	0.3	0.0	0.1	78%	13%	1%	7%
San Joaquin Valley	San Joaquin Valley	3.3	0.0	0.1	0.1	94%	0%	3%	3%
San Joaquin Valley	Other Regions	1.2	0.0	0.0	-	99%	0%	1%	0%
Other Regions	Other Regions	0.2	0.0	0.0	-	99%	0%	1%	0%
Long-Distance Total		46.7	4.7	2.0	0.1	87%	9%	4%	0%
MTC (< 50 miles)	MTC (< 50 miles)	0.5	-	-	-	100%	-	-	-
SCAG (< 50 miles)	SCAG (< 50 miles)	0.1	-	-	-	100%	-	-	-
Short-Distance Total		0.6	-	-	-	100%	-	-	-
Total		47.3	4.7	2.0	0.1	87%	9%	4%	0%

Source: Cambridge Systematics

2.2 Changes in VMT

Table 2.7 and Table 2.8 summarize the assigned annual VMT in billions of miles and daily VMT in thousands of miles, respectively, for the three forecast years using the procedures outlined in Section 1.1.3. The modeling procedures used to forecast the assigned VMT are based on the underlying assumptions that the HSR system is operating in a steady state situation for the entire year.

Table 2.7 Annual Auto VMT in Billions of Miles

Summary	2025	2029	2040
Modeled Intraregional Assignment Results			
No-Build VMT	159.458	162.234	171.921
Build Alternative VMT	159.458	162.229	171.916
Change in VMT Due to HSR	0.000	-0.005	-0.005
Modeled Interregional Raw Assignment Results			
No-Build VMT	60.368	67.501	73.727
Build Alternative VMT	58.978	61.795	66.461
Change in VMT Due to HSR	-1.390	-5.706	-7.266
Modeled Total Raw Assignment Results			
No-Build VMT	219.826	229.735	245.648
Build Alternative VMT	218.436	224.024	238.377
Change in VMT Due to HSR	-1.390	-5.711	-7.271

Source: Cambridge Systematics

Table 2.8 Daily Auto VMT in Thousands of Miles

Summary	2025	2029	2040
Modeled Intraregional Assignment Results			
No-Build VMT	476,179	484,506	513,406
Build Alternative VMT	476,179	484,491	513,390
Change in VMT Due to HSR	0	-15	-15
Modeled Interregional Raw Assignment Results			
No-Build VMT	157,612	188,871	739,135
Build Alternative VMT	153,661	173,346	722,884
Change in VMT Due to HSR	-3,951	-15,525	-16,250
Modeled Total Raw Assignment Results			
No-Build VMT	633,791	673,377	1,252,541
Build Alternative VMT	629,840	657,837	1,236,275
Change in VMT Due to HSR	-3,951	-15,540	-16,266

Source: Cambridge Systematics

2.3 Avoided Air Trips

Section 2.1.1 summarized the diversion of air passenger trips to HSR for the three forecast years. The procedures outlined in Section 1.1.4 were used to estimate the changes in required annual flights assuming airlines maintain the same passenger load factors achieved in 2015. Table 2.9 summarizes the results.

Table 2.9 Potential Annual Flight Reductions Due to Diversion of Air Trips to HSR

Scenario and Interchange	2025	2029	2040
No-Build			
Bay Area	97,058	93,895	137,732
Sacramento Valley	33,845	33,917	54,461
San Diego	31,976	31,714	48,483
San Joaquin Valley	3,544	2,553	6,097
Southern California	112,316	107,443	162,667
Rest of State	4,532	3,720	7,219
Total	283,270	273,240	416,659
Build			
Bay Area	91,700	71,250	95,616
Sacramento Valley	32,930	29,623	46,034
San Diego	31,299	27,574	39,468
San Joaquin Valley	3,106	1,409	4,698
Southern California	106,284	82,707	117,437
Rest of State	4,300	3,036	6,252
Total	269,620	215,599	309,505
Flight Reductions			
Bay Area	(5,358)	(22,644)	(42,116)
Sacramento Valley	(915)	(4,294)	(8,428)
San Diego	(677)	(4,140)	(9,015)
San Joaquin Valley	(438)	(1,143)	(1,399)
Southern California	(6,031)	(24,736)	(45,230)
Rest of State	(232)	(684)	(967)
Total	(13,651)	(57,641)	(107,154)

2.4 Input to GHG analysis

Statewide VMT and Air-passenger trip reductions, calculated by the methodology discussed in 1.1.5 and expressed as metric tons of carbon dioxide equivalent, are combined and presented as the total GHG emissions avoided due to mode shift to high-speed rail service.

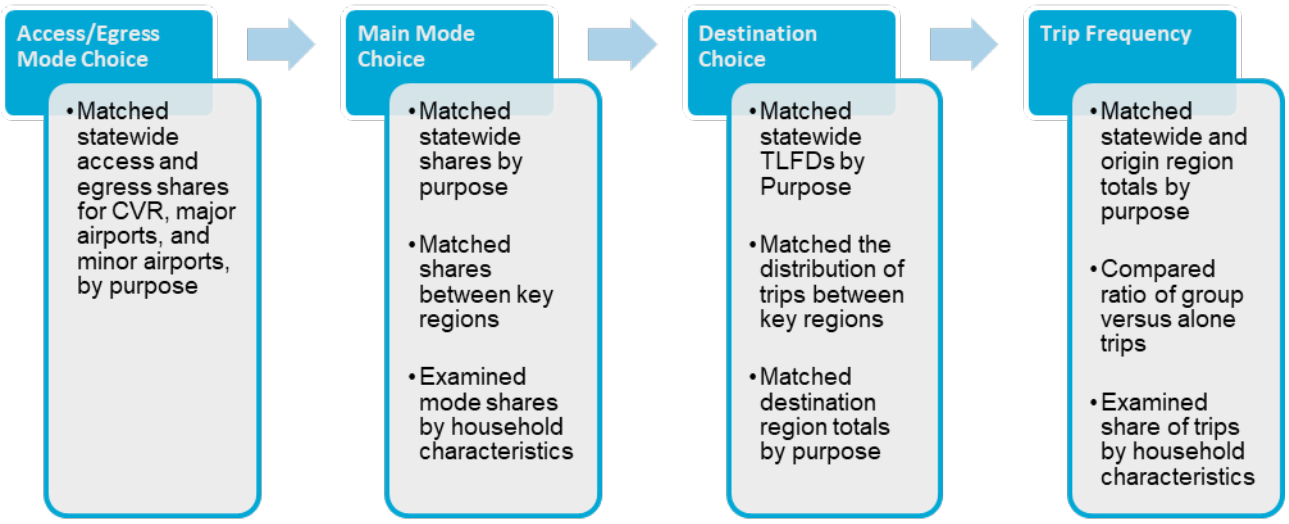
3.0 Model Calibration/Quality Control

3.1 BPM-V3 Calibration

The BPM-V3, including trip frequency, destination choice, main mode choice, and access/egress mode choice, was calibrated to reproduce estimates of long-distance travel patterns of California travelers.[14] The observed data were based on an expansion of the 2012-2013 CSHTS Daily Diary and Long-Distance survey data to match the socioeconomic characteristics of the 2010 California population.

Since the model components pass logsum information "up" through the modeling process and trip information "down" through the process, the individual model components had to be calibrated in an iterative fashion. The initial step was calibration of the access/egress portion of the mode choice model followed by, and sometimes simultaneously with, the main mode portion of the mode choice model. Once calibration targets were reached for access/egress and main mode choice models, destination choice was calibrated, followed by trip frequency. The process was repeated, since individual adjustments to one model could affect others. Figure 3-1 illustrates this iterative process used for calibration and targets for each model.

Figure 3-1 Calibration Process



Source: Cambridge Systematics.

3.2 Quality Control Measures

Ridership and revenue forecasts were based on information regarding the HSR service provided by the Rail Delivery Partners (RDP) and the Authority. Other input data were developed by CS such as auto, air, and CVR services and socioeconomic forecasts were reviewed with the RDP and Authority for reasonableness prior to being used in the BPM-V3. An internal quality control process was used to ensure that the correct data files were used for each run of the BPM-V3 and that the resulting forecasts were reasonable in comparison to other forecasts produced using the BPM-V3.

[14] Full details of the model calibration and validation process can be found in the BPM-V3 model documentation: https://www.hsr.ca.gov/docs/about/ridership/CHSR_Ridership_and_Revenue_Model_BP_Model_V3_Model_Doc.pdf

3.3 Peer Review Process

A formal Peer Review Panel (PRP) provided advice on the development, calibration, and validation of the BPM-V3. The following panelists comprised the PRP:

- Frank S. Koppelman, PhD, Professor Emeritus of Civil Engineering, Northwestern University (chair)
- Kay W. Axhausen, Dr.Ing., Professor, Institute for Transport Planning and Systems, ETH Zurich (Swiss Federal Institute of Technology Zurich)
- Eric Miller, PhD, Professor, Department of Civil Engineering, University of Toronto
- David Ory, PhD, Principal Planner/Analyst, Metropolitan Transportation Commission
- Kenneth A. Small, PhD, Professor Emeritus, Department of Economics, University of California-Irvine

The PRP was re-designated the Ridership Technical Advisory Panel (RTAP) in 2014 with the new designation stemming from the Authority's reliance on the PRP for advice rather than just reviews of completed work.

As stated in the 2016 Business Plan:[15]

> In their review of the forecasts and methodologies for this 2016 Business Plan, the Ridership Technical Advisory Panel (RTAP), a group of international experts in travel demand forecasting, stated that:
>
> > *"The review confirmed the Panel's previously expressed belief that the [Business Plan Model – Version 3] BPM-V3 model is suitable for use in business planning"*
> >
> > *"The Panel reviewed the Authority's design for a risk analysis for the 2016 Business Plan, as well as preliminary results on the likely range of ridership and revenue. This risk assessment is of high quality, more advanced than usual practice based on the Panel's experience, and highlights those uncertain factors that have a strong bearing on the results."*

The 2016 Business Plan ridership and revenue forecasts were also reviewed by Project Finance Advisory Limited (PFAL). In their memorandum to the Authority, PFAL stated:[16]

> *"We consider the CS forecasting model to be of good quality and can provide it with a clean bill of health in terms of its design and functionality. We have identified a number of areas where we consider the produced forecasts to be optimistic and also a number where we consider the forecasts to be pessimistic."*

[15] California High-Speed Rail Authority, *Connecting and Transforming California, 2016 Business Plan*, May 1, 2016, page 84.

[16] Memorandum from PFAL to Boris Lipkin, Deputy Director of Business, Analytics and Commercial Implementation, California High Speed Rail Authority, Re: HSR14-65 Draft Memo on Ridership and Revenue for Valley to Valley Line of the California High-Speed Rail System, dated December 5, 2016.

4.0 Uncertainty/Limitation

4.1 Focus on Differences in VMT Balances

"It's hard to make predictions, especially about the future."
Yogi Berra and others

The ridership and revenue forecasts are based on myriad predictions regarding the future including population, households and structure of those households, employment, the transportation system, travel costs, and traveler behavior. The potential for variation of some of the input variables has been rigorously taken into account through the formal risk analysis procedures documented in Section 1.1.2.

While there can be variation in the absolute magnitude of the ridership and revenue forecasts, some of the variation is reduced when alternatives are compared. The BPM-V3 is a deterministic model: If the same input assumptions are used for two different model runs, the same ridership and revenue forecasts will result. When two forecasts are compared, many of the inputs are the same. For the no-build and build forecasts, the only difference in the BPM-V3 inputs was the representation of the HSR system. As a result, there can be increased confidence in the veracity of the forecast differences.

4.2 Model Limitations

The BPM-V3, like any travel model, is based on a limited number of variables. While the BPM-V3 has been calibrated to reasonably reproduce travel for a base year, much of the "unexplained" variation in travel is "explained" through calibrated model constants. The constants account for unknown input variables that affect travel. In effect, the constants assume that the impacts of those unknown variables do not change over time.

The information and results presented in this technical memorandum are estimates and projections that involve subjective judgments, and may differ materially from the actual future ridership and revenue. This technical memorandum is not intended, nor shall it be construed, to constitute a guarantee, promise, or representation of any particular outcome(s) or result(s). Further, the material presented in this technical memorandum is provided solely for the Authority's planning purposes and should not be used for any other purpose.

4.3 Relevance for GHG estimation

The GHG analysis, as described earlier, was based on the calculation of VMT multiplied by an applicable pollutant's emission factor. Although the emission factors also consider vehicle speed, vehicle mix, and analysis year, the resultant GHG emission burdens are directly related to the VMT estimates. Since these VMT estimates are derived from the ridership and revenue forecasts, any limitations with regards to the certainty of the future ridership and revenue estimates also apply to the resultant GHG estimates. As such, the GHG estimates may differ from the actual future GHG emissions of the roadway network.

APPENDIX 3.2-C: TRAFFIC MITIGATION MEASURES SCREENING

1 INTRODUCTION

On February 5, 2021, the California High Speed Rail Authority (Authority) finalized "Decision-making Guidance for the Adoption of Traffic Mitigation Measures" (Authority 2021). This memorandum describes Senate Bill (SB) 743 and its effect on California Environmental Quality Act (CEQA) transportation analysis, describes National Environmental Policy Act (NEPA) requirements concerning the analysis of traffic effects and consideration of mitigation, and provides criteria for screening and selection of traffic mitigation. Five screening criteria were identified:

- The mitigation measure does not cause an increase in vehicle miles traveled (VMT).
- The measure would not contradict the objectives of SB 743.
- The measure is not more disruptive to the community than the traffic effect itself.
- The measure does not result in unmitigable secondary environmental effects.
- The California High-Speed Rail Authority (Authority) has determined the measure is practicable.

This appendix describes screening of traffic mitigation measures under consideration by the Authority as mitigation for traffic delays/congestion. A total of 44 potential site-specific traffic mitigation measures were reviewed in this screening analysis. Some of these measures would apply to all four project alternatives; some would only apply to one of the four alternatives. Eleven of the measures under consideration would not meet one or more of the screening criteria above, leaving 33 remaining measures which are included in Section 3.2, Transportation. The number of remaining measures varies by alternative, as discussed below.

2 SCREENING METHODOLOGY

The application and interpretation of the screening criteria are described below.

Increase in VMT

The Office of Planning and Research (OPR) (OPR 2018) has issued guidance in the evaluation of VMT, given its role in SB 743 implementation. The following is a description of project types that OPR indicates would generally lead to a measurable and substantial increase in vehicle travel/VMT.

- Addition of through lanes on existing or new highways, including general purpose lanes, high-occupancy vehicle (HOV) lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

OPR identifies a list of road projects, the most potentially relevant of which are listed below, that would not likely lead to a substantial or measurable increase in vehicle travel and therefore generally would not require an induced travel analysis.

- Addition of an auxiliary lane of less than 1 mile in length designed to improve roadway safety
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Grade separation to separate vehicles from rail, transit, pedestrians, or bicycles or to replace a lane to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way

- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel
- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets

The National Center for Sustainable Transportation (NCST no date) provides an induced travel calculator that estimates the VMT induced annually because of adding vehicle travel lanes in any of California's urbanized counties. The annual induced VMT is calculated based on the facility type (freeway vs arterial), county location, and number of lane miles added.

In summary, the current mainstream view, articulated by OPR, is that mitigation measures that include signal timing modifications, installation of new traffic control devices, and/or turn lanes at intersections would not likely lead to a measurable increase in vehicle travel and VMT. Mitigation measures that add through lanes, either on freeway or arterial facilities, are likely to result in induced travel effects, particularly if the added travel lanes are through lanes of a mile or more in length.

While there are some differing opinions on this matter, the Authority has decided to rely on the written OPR guidance and follow the guidance of the state agency at the forefront of the consideration of VMT at this time.

Contradict the objectives of SB 743

The objectives of SB 743 are as follows:

- To promote the state's goals of reducing greenhouse gas (GHG) emissions and traffic-related air pollution,
- To promote the development of a multimodal transportation system,
- To provide clean, efficient access to destinations,
- To address the environmental impacts of traffic, such as noise, air pollution, and safety
- To balance congestion management with statewide goals related to infill development (diversity of land uses), promotion of public health through active transportation.

This screening evaluation considered a mitigation measure to not pass screening for the SB 743 criterion if it contradicted a SB 743 objective, as in it would make it more difficult to achieve the objectives due to some physical or operational hindrance.

- *GHG emissions and air pollution*: SB 743 identifies that reducing VMT will result in reducing GHG emissions and air pollution. Thus, a mitigation measure will be considered to contradict SB 743 if it substantially increases VMT. Since all the traffic mitigation measures will reduce traffic delay at intersections, if they do not substantially increase VMT, they would lower localized emissions (such as carbon monoxide) at congested intersections.
- *Multimodal transportation system*: Traffic mitigation measures, by definition, are addressing onroad vehicle congestion/delay, and onroad travel is dominated by private passenger vehicles. Thus, the primary beneficiary of traffic mitigation measures are private passenger vehicles, but bus transit will also benefit where transit crosses an intersection addressed by mitigation. None of the traffic mitigation measures under consideration would block or impede bus, rail, pedestrian, or bicycle modes of travel; they can all be designed to accommodate existing bike lanes, sidewalks, or bus stops. As such, they will not hinder the operation of a multi-modal system or block the completion of future multi-modal investments. As such, none of the measures currently under consideration are considered to contradict this objective.
- *Clean, efficient access to destinations*: Passenger cars are the dominant mode of travel in the project corridor. While there are plans to expand some transit systems (including the BART system and the potential increase of Caltrain service to Gilroy), the corridor between San Jose and Gilroy does not have efficient transit systems today, as reflected by the low mode share of transit in general. As a result, passenger vehicles are the most efficient mode of travel at present and likely for some time. As

to the "clean" criterion, transit modes are much cleaner on a passenger mile basis than personal vehicles, on average. However, none of the traffic mitigation measures under consideration would block or impede bus, rail, pedestrian, or bicycle modes of travel; as such, they will not hinder the operation of clean, efficient transit at present or block the development of such modes in the future. As such, none of the measures currently under consideration are considered to contradict this objective.

- *Noise, air pollution, and safety*: Air pollution was addressed in the first subcriteria above. SB 743 does not state that one of its purposes is to reduce noise or improve safety. Instead, it states that switching from level of service (LOS) to VMT does not relieve a lead agency from still addressing noise or safety associated with increases in traffic. As such, noise and safety have not been used as a SB 743 consistency criteria for this evaluation.
- *Infill development*: Traffic mitigation supports all development but is not targeted at infill especially. It is possible that traffic mitigation measures may help residents infill areas in downtown Gilroy and downtown San Jose, when they drive, to get in and out of their infill developments better. None of the traffic mitigation measures under consideration would block or otherwise impede infill development. As such, none of the measures currently under consideration are considered to contradict this objective.
- *Promotion of public health through active transportation:* Traffic mitigation measures do not promote active transportation such as biking or walking. However, all the traffic mitigation measures under consideration can be designed to accommodate existing bike lanes and sidewalks. As such, none of the measures currently under consideration are considered to contradict this objective.

More disruptive than the traffic effect itself

Evaluation under this criterion requires comparison of the effects of implementing a mitigation measure, which may include residential or business displacement, conversion of prime farmland or other effects, against the benefits of reducing traffic congestion/delay. This requires a comparison of different types of effects, which is not readily reduced to an objective quantitative comparison. As a result, there is inevitably some level of subjective judgement in completing screening against this criterion. Nevertheless, the evaluation of the mitigation measures regarding this criterion was conducted as follows:

- The traffic benefits of the measures were identified by identifying the highest traffic delay reduction during a peak period provided by the measure. The number of people exposed to the delay were identified by the PM peak total intersection volume.
- The secondary effects were identified by identifying first whether the measure could be completed in the existing road right-of-way or not. If it could not, then the effects of acquisition of right-of-way were evaluated by reviewing whether biological habitat, built environment historic sites, residences, business structures, important farmland, or publicly owned parks, recreational areas, or wildlife refuges were present. Operational effects considered included generation of VMT (which is also used as a proxy for operational air pollution, GHG emissions, and energy) and noise.
- Temporary effects during construction were not considered to be more disruptive than permanent traffic delays that are more than the adverse criteria used in the EIR/EIS.
- Permanent effects that could be resolved by mitigation were not considered to be more disruptive than permanent traffic delays that are more than the adverse criteria used in the EIR/EIS.
- Permanent effects that cannot be resolved by mitigation were considered to be more disruptive than permanent traffic delay effects that are less than 30 seconds.
- If the traffic delay reduction benefits are more than 30 seconds of intersection delay, this was considered to outweigh the identified permanent secondary effects identified in this evaluation.

Unmitigable secondary environmental effects

"Unmitigable" effects are defined in three different ways for this evaluation: (1) if the measure would result in a significant unavoidable impact under CEQA (such as conversion of prime farmland); (2) if the

measure would result in adverse effects that cannot be avoided under NEPA (such as operational noise) that would be considered adverse even after the adoption of other measures to reduce the secondary effects, and/or (3) if the measure would contribute to previously identified disproportionately high and adverse effects on minority populations or low-income populations.

The focus in this evaluation is on permanent effects, not temporary effects that may occur during the construction of site-specific traffic measures.

Payment for property acquisition and relocation assistance will be provided per state and federal requirements. Where there is adequate local availability for residential and/or commercial relocation within the same community, displacement is considered a “mitigable” effect. Where there is not adequate availability, displacement is considered an “unmitigable” effect.

Practicable

Practicability was defined in terms of technical, logistical, and financial feasibility. Logistical feasibility includes whether the measure is within the defined responsibilities and mission of the Authority.

3 SCREENING RESULTS BY CRITERION

The site-specific traffic mitigation measures under consideration are shown in Table 3.2-1, including identification of the location of impacts addressed, whether they are in an environmental justice community, a description of the measure, identification of which alternatives the mitigation applies to, the PM peak intersection traffic volumes, the traffic delay effects of the different alternatives, and the traffic benefits of the mitigation in terms of reduced delay.

The screening evaluation and results are summarized below. Table 3.2-2 presents the details of the evaluation including description of the secondary effects, whether additional right-of-way is required, whether the additional right-of-way acquisition would likely result in displacement of residences or businesses, whether the measure has additional effect on top of the project alternatives. Table 3.2-2 also identifies whether the measure would increase VMT, contradict the objectives of SB 743, have an unmitigable secondary effect, be more disruptive than the traffic effect, whether it would pass the four screening criteria. Table 3.2-2 also identifies whether the measure would reduce emergency vehicle response times (based on the analysis in Section 3.11, Safety and Security), but emergency vehicle response time was only considered in this evaluation if the traffic measure would reduce peak hour delays by more than 30 seconds (which is the adverse effect criteria used in Section 3.11).

Increase in VMT

Following OPR guidance, traffic measures improvements that do not include widening of roadways between crossing streets are not considered to result in a substantial increase in VMT. Three measures, one involving widening of U.S. Highway (US) 101 and two that would involve widening of Monterey Road, are considered to result in a substantial increase in VMT and would not meet this criterion.

Contradict the objectives of SB 743

Apart from the three mitigation measures that are considered to result in a substantial increase in VMT, none of the other measures are considered to contradict SB 743 objectives for the reasons discussed above in the discussion of methodology.

More disruptive to the community than the traffic effect itself

No biological habitat, built environment historic sites or publicly owned parks, recreational areas, or wildlife refuges were identified within the likely footprint of any of the traffic mitigation measures for intersection impacts. Some of the measures would include the acquisition of residential or commercial land, and some would likely result in displacement of residences or commercial businesses. Some of the displacements would occur in areas where relocation can occur within the same jurisdictions and some would not. Most of the traffic mitigation measures would occur within census districts where the percentage of minority persons or percentage of low-income persons is greater than the reference community (e.g., environmental justice communities) but a few would not.

Nine mitigation measures were identified as resulting in secondary effects that are more disruptive to the community than the traffic effect itself and thus would not meet this criterion. The secondary effects that outweighed the traffic benefits of the measures were the displacement of residences or businesses in an environmental justice community where there is insufficient availability to relocate them within the same local environmental justice community.

Unmitigable secondary environmental effects

Seven mitigation measures were identified as resulting in unmitigable secondary effects. These unmitigable effects included conversion of prime farmland/farmland of state importance and displacement of residential and/or commercial businesses where there is insufficient availability to relocate the residence or business within the same jurisdiction.

Practicability

Many of the measures are standard local intersection improvements and are considered practicable to implement. However, due to the substantial cost and high level of disruption and right-of-way needs, expanding US 101 and grade separations are not considered financially or institutionally practicable for implementation by the Authority given its defined responsibilities and mission.

4 OVERALL RESULTS AND RECOMMENDATIONS

Eleven out of 44 traffic mitigation measures would fail one or more of the first four of the screening criteria using the methodology described above, which would leave 33 remaining measures. These eleven measures are as follows:

Alternatives 1, 2, and 3:

- TR-MM#X.1: US 101 Corridor Mobility Improvements—Fair Share Contribution
- TR-MM#X.2: Coleman Avenue/Hedding Street—Widen and Reconfigure Eastbound Approach
- TR-MM#X.3: Coleman Avenue/Taylor Street—Widen and Reconfigure Southbound Approach
- TR-MM#X.4: Delmas Avenue/West San Fernando Street—Add Eastbound and Westbound Left Turn Lanes
- TR-MM#X.5: Autumn Street/West Fernando Street—Provide Eastbound and Westbound Left Turn Lanes
- TR-MM#X.6: Montgomery Street/Park Avenue: Reconfigure Northbound and Eastbound Approaches

Alternative 2 only:

- TR-MM#X.10: Monterey Road/Buena Vista Avenue

Alternative 4:

- TR-MM#X.7: Monterey Road/Masten Avenue
- TR-MM#X.8: Monterey Road/East Main Avenue—Widen and Reconfigure Westbound Approach
- TR MM #X.9: Depot Road/San Martin Avenue—Widen and Reconfigure Westbound Approach
- TR MM #X.11: Monterey Road/Leavesley Road —Widen and Reconfigure Eastbound Approach and Southbound Approach

The overall results of the screening are as follows (the remaining measures are shown in Table 3.2-2):

- Alternatives 1:
  - Total of 29 measures considered
  - 6 measures excluded
  - 23 measures remaining

- Alternative 2:
  - Total of 33 measures considered
  - 7 measures excluded
  - 26 measures remaining
- Alternative 3:
  - Total of 28 measures considered
  - 6 measures excluded
  - 22 measures remaining
- Alternative 4
  - Total of 17 measures considered
  - 5 measures excluded
  - 12 measures remaining

5 REFERENCES

California High-Speed Rail Authority (Authority). 2021. *Decision-making Guidance for the Adoption of Traffic Mitigation Measures*. Memorandum from Serge Stanich, Director of Environmental Services, to Mike McCormick, Gary Kennerley, Rick Simon, and Mark Chang, Strategic Delivery. February 5, 2021.

National Center for Sustainable Transportation (NCST). No Date. Induced Travel Calculator. https://ncst.ucdavis.edu/research-product/induced-travel-calculator (accessed April 29, 2021).

Office of Planning and Research, State of California (OPR). 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. December. https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf (accessed April 29, 2021).

Table 3.2-1 Traffic Mitigation Measures Screening Evaluation, Part One

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR-MM#1a: Monterey Road Construction Modifications	Monterey Road intersections in SSJ	South San Jose	Yes	Pre-time and coordinate signals, maintain channelized right turns, maintain right turns, restripe one left turn lane.	X	X	X		6,780	Not quantified	Maintenance of existing LOS	NA				
TR-MM#1b: The Alameda (SR 82)/Taylor Street–Naglee Avenue—Restripe Northbound Approach	D4	San Jose Diridon	Yes	Approach would be reconfigured to provide a left turn lane, two through lanes, and an exclusive right turn lane	X	X	X		6,512	9.6	-6.6	-24				
TR-MM#1c: Optimize Signal Coordination on West Santa Clara Street from Stockton Street to Autumn Street in San Jose	D13, D14, D15	San Jose Diridon	Yes	Modify the signal and optimize the signal timings and coordination for the traffic signals on West Santa Clara Street from Stockton Street to Autumn Street. This improvement includes the intersections of West Santa Clara Street with Stockton Street, Cahill Street Montgomery Street, and Autumn Street	X	X	X	X	3,696/3,673/ 5,468	4.3	-12.5	-26			23.5	NA
TR-MM#1d: Monterey Road/Capitol Expressway EB Ramps—Widen and Reconfigure	M2	South San Jose	Yes	Widen and reconfigure the Monterey Road/Capitol Expressway EB Ramps intersection. The specific improvements include lengthening the southbound left turn pocket on Monterey Road and construction of a second westbound right turn lane.	X	X	X		5,080	44.7	-77.9	-220	56.4	-88.6		
TR-MM#1e: Monterey Road/Chynoweth Avenue-Roeder Road—Widen and Reconfigure	M9	South San Jose	Yes	Widen and reconfigure the Monterey Road/Chynoweth Avenue-Roeder Road intersection. The specific improvements include widening the northbound Monterey Road approach to add an additional left turn pocket and a right turn pocket, modify the eastbound Chynoweth Avenue approach to provide one shared through-right and one left turn only lane and widen the westbound Roeder Road approach to provide for an additional left turn pocket.	X	X	X	X	6,800	18	-112.6	-425	32.4	-95.6		
TR-MM#1f: Monterey Road/Senter Road—Widen and Reconfigure Southbound Approach	M3	South San Jose	Yes	Widen the southbound Monterey Road approach to the Senter Road intersection to add an additional southbound left turn pocket. Modification to the project design in the median of Monterey Road	X	X	X		5,440	40.3	-117.6	-355				
TR-MM#1g: Monterey Road/Senter Road—Widen and Reconfigure Westbound Approach	M3	South San Jose	Yes	Widen the westbound Senter Road approach to the Monterey Road intersection to add an additional westbound right turn pocket	X	X	X		5,440	40.3	-117.6	-355	23.8	-134.4		

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR-MM#1h: Monterey Road/Blossom Hill Westbound Ramps—Reconfigure Northbound Approach	M11, M23, M24	South San Jose	Yes	Modify/widen the northbound Monterey Road approach to the Blossom Hill Road westbound ramps intersection to provide an exclusive right turn lane. Remove northbound right turn lane. Modifications and improvements to the traffic signal at the Monterey Road/Blossom Hill Road westbound ramps intersection.	X	X	X		6,390/6,300/ 3,400	76.6	-78.8	145	42.6	-64.5		
TR-MM#1i: Monterey Road/Blossom Hill Road Eastbound Ramps—Widen and Reconfigure	M12	South San Jose	Yes	Widen and reconfigure the Monterey Road/Blossom Hill Road Eastbound Ramps intersection (mitigation for Alternatives 1 and 3). The specific improvements include prohibiting U-turns on the southbound Monterey Road approach and widening the westbound approach to add a right turn lane. Widen and reconfigure the Monterey Road/Blossom Hill Road eastbound ramps intersection (mitigation for Alternative 2). The specific improvements include widening the westbound approach to add a right turn lane and widening the southbound approach to add a left turn pocket.	X	X	X		5,480	103.4	-134	-408	77.8	-108.5		
TR-MM#1j: Senter Road/Hellyer Avenue—Restripe Westbound Approach	M30	South San Jose	Yes	Stripe the westbound Hellyer Avenue approach to the Senter Road intersection to add an additional westbound left turn pocket and one shared-through right lane and change the intersection's signal phasing.	X	X	X		2,200	NA	NA	NA				
TR-MM#1k: Houndshaven Way/Skyway Drive—Widen and Reconfigure	M5	South San Jose	Yes	Widen and reconfigure the Houndshaven Way/Skyway Drive intersection. The specific improvements include widening the eastbound Skyway Drive approach to provide two left turn pockets and a shared through-right turn lane and widening the westbound approach to provide one right turn pocket, one through lane, and one left turn pocket.	X	X	X		1,710	144.8	N/A	NA	144.8	-142.2		
TR MM #1l: Vistapark/Branham Lane—Reconfigure Southbound Approach	M32	South San Jose	No	Reconfigure the southbound Vistapark Drive approach to the Branham Lane intersection to add an additional southbound left turn pocket. This improvement would require modifications to the existing median, intersection restriping and modifications to the traffic signal.	X	X	X		4,020	13.6	-31.5	-70				

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR MM#1m: Lean Avenue/Blossom Hill Road – Improve Signal Phasing	M37	South San Jose	Yes	Modify the traffic signal phasing on the northbound and southbound approaches to Blossom Hill Road to replace the existing split phasing with protected left turn phasing.	X	X	X		1,970	26.3	-29.9	-33				
TR MM#1n: Cottle Road/Poughkeepsie Road – Restripe Eastbound Approach	M40	South San Jose	Yes	Restripe the intersection's eastbound Poughkeepsie Road approach to the Cottle Road intersection to provide an exclusive right turn lane. This would be accomplished by modifying the existing shared through-right turn lane to be an exclusive right turn lane	X	X	X		3,820	31.2	-31.1	-66				
TR-MM#1o: Santa Teresa Boulevard/Bernal Road—Restripe Westbound Approach	M17	South San Jose	Yes	Restripe the westbound approach at the Santa Teresa Boulevard/Bernal Road intersection, modify the westbound Bernal Road approach to convert a through lane to a left turn lane, and changes to the intersection's signal phasing.	X	X	X		3,930	16.7	-35.4	-77	16.7	-35.4		
TR-MM#1p: Santa Teresa Boulevard/Bailey Avenue—Reconfigure	M18	South San Jose	Yes	Reconfigure the Santa Teresa Boulevard/Bailey Avenue intersection. The specific improvements include the removal of the northbound and southbound channelized right turn pockets and their conversion to shared through-right lanes. Modifications to the existing traffic signal system at the intersection.	X	X	X		4,790	53.5	-61.9	-165	-296501			
TR-MM#1q: Monterey Road/Tilton Avenue—Various Improvements	M46	Morgan Hill	Yes	The mitigation for Alternatives 1 and 3 is the addition of a second eastbound right turn lane. Would require the elimination of on-street parking on the north side of Tilton Avenue approaching the intersection and narrowing of the landscaping on the south side of the roadway. Modifications to the traffic and rail signal systems at the intersection would also be necessary. The mitigation for Alternative 4 is the interconnection of the Monterey Road/Tilton Avenue intersection with the Monterey Road/Burnett Avenue intersection.	X		X	X	4,120 (Alt. 1) / 1,480 (Alt. 4)	52.5	-69.1	-158			19.2	-23.2

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR-MM#1r: Hale Avenue/Madrone Parkway—Signal at New Connection	M46	Morgan Hill	No	Alternative 2 alters the roadways and connections for Monterey Road/Tilton Avenue, and this intersection is replaced by a new connection at Hale Avenue/Madrone Parkway. The specific improvement as mitigation for Alternative 2 is the installation of a traffic signal at the new Hale Avenue/Madrone Parkway intersection.		X			2,370	114.5	-168.8	-222				
TR-MM#1s: Monterey Road/Madrone Parkway—Widen and Reconfigure	M47	Morgan Hill	Yes	Widen and reconfigure the Monterey Road/Madrone Parkway intersection. The specific improvements include reconfiguring the eastbound approach to include two right turn lanes and two left turn lanes and widening of the southbound approach to include a second southbound left turn lane		X			5,200	130.1	-101.4	-293				
TR MM #1t: Monterey Road/San Martin Avenue—Restripe Southbound Approach	MH6	San Martin	No	Restripe the southbound Monterey Road approach to provide additional capacity for the southbound left turn lane. This improvement would require the removal of the adjacent northbound left turn lane on Monterey Road into Burbank Avenue				X	490	12.1	NA	NA				
TR MM #1u: Monterey Road/IOOF Avenue—Widen and Reconfigure Southbound Approach	G25	Gilroy	Yes	Widen the southbound approach of Monterey Road to provide an additional southbound left pocket				X	3,458	126.7	-123.1	-236				
TR-MM#1v: Coordinate Signal Timings on 10th Street from Chestnut Street to Monterey Road in Gilroy	G36, G37, G38	Gilroy	Yes	Furnish and install signal interconnect equipment and coordinate all signals on 10th Street from Monterey Road to Chestnut Street. This improvement includes the intersections of 10th Street with Chestnut Street, Alexander Street, and Monterey Road	X	X			2,849/2,430/ 3,203	174.7	-170	-269	134.5	-130.5		
TR MM #1w: Chestnut Street/Luchessa Ave—Reconfigure Southbound Approach.	G60	Gilroy	Yes	Restripe the southbound approach of Chestnut Street to Luchessa Avenue to provide a southbound right pocket				X	2,804	27.3	-16.3	-25				
TR-MM#1x.1: Cahill Street/Stover-Crandall Street—Install Traffic Signal	D21	San Jose Diridon	Yes	Traffic signals	X	X	X	X	629	143	-167	-58			89.4	-92.6
TR-MM#1x.2: Montgomery Street/Stover-Crandall Street—Install Traffic Signal	D22	San Jose Diridon	Yes	Traffic signals				X	842	103.9	-167.1	-78				

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR-MM#1x.3: Cahill Street/West San Fernando Street—Install Traffic Signal	D23	San Jose Diridon	Yes	Traffic signals	X	X	X	X	916	19.8	-38.2	-19			60.5	-61.1
TR-MM#1x.4: Houndshaven Way/Skyway Drive—Install Traffic Signal	M5	South San Jose	Yes	Traffic signals	X	X	X		770	144.8	NA	NA	144.8	-142.2		
TR-MM#1x.5: Hale Avenue/Tilton Avenue—Install Traffic Signal	M19	Morgan Hill	No	Traffic signals	X	X	X		2,230	74.6	-105.4	-131				
TR-MM#1x.6: East Main Avenue/Depot Street—Install Traffic Signal	MH11	Morgan Hill	Yes	Traffic signals				X	3,650	NA	-158.3	-321				
TR-MM#1x.7: Railroad Avenue/Tennant Avenue—Install Traffic Signal	MH2	Morgan Hill	Yes	Traffic signals		X			2,330	165.8	-161.2	-209				
TR-MM#1x.8: Llagas Road/San Martin Avenue—Install Traffic Signal	MH8	San Martin	No	Traffic signals		X			1,140	32	-55.6	-35				
TR-MM#1x.9: School Access/IOOF Avenue—Install Traffic Signal	G53	Gilroy	Yes	Traffic signals				X	2,198	40.1	-50.1	-61				
TR-MM#1x.10: SR 25/Bloomfield—Install Traffic Signal	GM4	Gilroy	Yes	Traffic signals	X	X	X	X	2,736	27	-52.8	-80			82.5	-130.2
TR-MM#X.1 US 101 Corridor Mobility Improvements—Fair Share Contribution	Freeway interchanges in South San Jose	South San Jose	Yes	Caltrans has identified future freeway widening and the construction of express lanes in the affected segments of US 101. These improvements would reduce the impact on freeway operations resulting from the project. While the improvements are included in the MTC RTP, they are not part of the implementation program funded for 2040. In concept, this measure would require the project to make a fair share contribution towards mobility improvements in the affected section of the highway corridor.	X	X	X		NA	NA	NA	NA				

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR-MM#X.2: Coleman Avenue/Hedding Street—Widen and Reconfigure Eastbound Approach	D41	San Jose Diridon	Yes	Widen the eastbound Hedding Street approach to provide an additional left turn lane and an exclusive right turn lane, with the elimination of the existing channelized right turn. Modification to the traffic signal and removal of on-street parking on the south side of Hedding Street between Coleman Avenue and Chestnut Street.	X	X	X		8,720	6.8	-19.9	-96				
TR-MM#X.3: Coleman Avenue/Taylor Street—Widen and Reconfigure Southbound Approach	D42	San Jose Diridon	Yes	Widen the southbound Coleman Avenue approach to the Taylor Street intersection to include an exclusive right turn pocket and convert the existing shared through right to through-only lane. Modification to the traffic signal	X	X	X		8,218	5.3	-17.2	-79				
TR-MM#X.4: Delmas Avenue/West San Fernando Street—Add Eastbound and Westbound Left Turn Lanes	D44	San Jose Diridon	Yes	Modify the Delmas Avenue/West San Fernando Street intersection to provide exclusive eastbound and westbound (West San Fernando Street) left turn lanes. Modifications to the traffic signal at Delmas Avenue/West San Fernando Street intersection to accommodate the new movements and new protected phasing in the eastbound and westbound directions would also be necessary. Modifications to the adjacent VTA light rail crossing and signal system would be required.	X	X	X		1,543	13.7	-23.4	-20				
TR-MM#X.5: Autumn Street/West Fernando Street —Provide Eastbound and Westbound Left Turn Lanes	D25	San Jose Diridon	Yes	Modify the Autumn Street/West San Fernando Street intersection to provide exclusive eastbound and westbound (West San Fernando Street) left turn lanes and would apply to all project alternatives. This improvement would require the widening of West San Fernando Street and the acquisition of right-of-way from adjacent properties. Modifications to the traffic signal at Autumn Street/West San Fernando Street intersection to accommodate the new movements and new protected phasing in the eastbound and westbound directions would also be necessary.	X	X	X		3,246	8.5	NA	NA				

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR-MM#X.6: Montgomery Street/Park Avenue: Reconfigure Northbound and Eastbound Approaches	D27	San Jose Diridon	Yes	Reconfigure the northbound and eastbound approaches to the intersection. This measure would reconfigure the northbound Montgomery Street approach to the Park Avenue intersection, removing the channelized right turn lane and restriping the northbound approach to provide two left turn pockets, one through lane and one shared through-right lane. This modification would also involve signal phasing changes, from the current north-south lead left phasing to a lead-lag phasing. This measure would also modify/restripe the eastbound lanes of Park Avenue at the Montgomery Street/Park Avenue intersection to provide two eastbound lanes on Park Avenue entering and departing the intersection. This measure would require the widening by restriping of the roadway to four lanes for 300 feet on either side of Montgomery Street, with standard transitions.	X	X	X		3,513	28.6	NA	NA				
TR-MM#X.7: Monterey Road/East Main Avenue—Widen and Reconfigure Westbound Approach	MH10	Morgan Hill	Yes	Widen the westbound East Main Avenue approach to provide an exclusive right turn lane and convert the shared through/right lane into a dedicated through lane. This improvement would require modification to the traffic signal, and the acquisition of right-of-way on the north side of East Main Street.				X	3,620	14.2	-78.3	-157				
TR MM #X.8: Depot Road/San Martin Avenue—Widen and Reconfigure Westbound Approach	MH7	San Martin	No	Widen the westbound San Martin Avenue approach to provide an additional westbound through lane. Removal of parking on the north side of San Martin Avenue				X	3,440	58.6	-73	-140				
TR-MM#X.9: Monterey Road/Masten Avenue	MH26	San Martin	No	Widen and reconfigure the Monterey Road/Masten Avenue intersection. The specific improvements include widening Masten Avenue to four lanes and widening Monterey Road to six lanes between Masten Avenue and Rucker Avenue.				X	1,170	53.6	NA	NA				
TR-MM#1l.10: Monterey Road/Buena Vista Avenue	G1	Gilroy	Yes	Widen and reconfigure the Monterey Road/Buena Vista Avenue intersection. The specific improvements include widening Monterey Road to six lanes between Buena Vista Avenue and Las Animas Avenue.		X			3,652	75.1	-75.5	-153				

Mitigation Measure	Intersection(s)	Community	EJ Community?	Detail	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Traffic Volume (PM peak)	Traffic Delay all Alts. (if same) or Alt. 1.	MM Benefit All Alts. (if same) or Alt. 1	Delay (person-hours/day)	Traffic Delay Alt. 2 (if diff)	MM Benefit Alt. 2 (if Diff)	Traffic Delay Alt. 4 (if diff)	MM Benefit Alt. 4 (if Diff)
TR MM #X.11: Monterey Road/Leavesley Road — Widen and Reconfigure Eastbound Approach and Southbound Approach	G15	Gilroy	Yes	Widen the eastbound approach of Leavesley Avenue to provide a dedicated right turn pocket, and the southbound approach of Monterey Road to provide an additional southbound left pocket.				X	2,334	26.1	-14.9	-19				
TR-MM#X.12: Grade Separations	Multiple	San Jose, Morgan Hill, San Martin Gilroy	Yes	While grade separations are a technically feasible way to reduce traffic impacts at at-grade crossing locations, it is a highly expensive mitigation strategy and requires a collaborative approach of state, regional, and local agencies to fund and implement. The Authority would support future regional efforts for grade separation where acceptable to local communities and where federal, state, regional, and local funding can be obtained to fund these improvements.				X	NA	NA				NA	NA
					6	**7**	**6**	**5**								

Alt. = alternative
EB = eastbound
EJ = environmental justice
LOS = level of service
MM = mitigation measure
MTC = Metropolitan Transportation Commission
NA = not applicable
RTP = regional transportation plan
SR = State Route
SSJ = South San Jose
US = U.S. Highway
VTA = Santa Clara Valley Transportation Authority

Table 3.2-2 Traffic Mitigation Measures Screening Evaluation, Part Two

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#1a: Monterey Road Construction Modifications	Monterey Road intersections in SSJ	South San Jose	X	X	X		The improvements would occur entirely in the existing rights-of-way and the project footprint of the project alternatives	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1b: The Alameda (SR 82)/Taylor Street–Naglee Avenue—Restripe Northbound Approach	D4	San Jose Diridon	X	X	X		Removing curb on-street parking for the block between West Taylor Street and Naglee Avenue on the east side of The Alameda.	No	No	Yes	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1c: Optimize Signal Coordination on West Santa Clara Street from Stockton Street to Autumn Street in San Jose	D13, D14, D15	San Jose Diridon	X	X	X	X	All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1d: Monterey Road/Capitol Expressway EB Ramps—Widen and Reconfigure	M2	South San Jose	X	X	X		This improvement would be accommodated within the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1e: Monterey Road/Chynoweth Avenue-Roeder Road—Widen and Reconfigure	M9	South San Jose	X	X	X	X	Right-of-way would need be acquired in the northeast and southeast corners of intersection, which are occupied by commercial establishments (reconfigure two gas stations pumps)	Yes	Yes (gas pumps)	Yes	No	No. See text discussion.	No	No Gas pumps can be relocated.	Yes	Yes
TR-MM#1f: Monterey Road/Senter Road—Widen and Reconfigure Southbound Approach	M3	South San Jose	X	X	X		Acquisition of right-of-way from the northeast corner of the intersection, which is occupied by commercial establishments Acquisition on gas station property; possibly reconfiguration of pumps and building and parking lot	Yes	Yes (gas pumps)	Yes	No	No. See text discussion.	No	No Gas pumps can be relocated.	Yes	Yes
TR-MM#1g: Monterey Road/Senter Road—Widen and Reconfigure Westbound Approach	M3	South San Jose	X	X	X		Acquisition of additional right-of-way in the northeast corner of the intersection, Acquisition on gas station property; possibly reconfiguration of pumps and building	Yes	Yes (gas pumps)	Yes	No	No. See text discussion.	No	No Gas pumps can be relocated.	Yes	Yes
TR-MM#1h: Monterey Road/Blossom Hill Westbound Ramps—Reconfigure Northbound Approach	M11, M23, M24	South San Jose	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#1i: Monterey Road/Blossom Hill Road Eastbound Ramps—Widen and Reconfigure	M12	South San Jose	X	X	X		Acquisition of additional right-of-way from the northeast corner of the intersection would be necessary. This parcel is currently unoccupied (middle of the SE interchange loop is ornamental woodland). No additional to Alt. 2 (because the IC is rebuilt with Alt. 2).	Yes	No	Yes	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1j: Senter Road/Hellyer Avenue—Restripe Westbound Approach	M30	South San Jose	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1k: Houndshaven Way/Skyway Drive—Widen and Reconfigure	M5	South San Jose	X	X	X		This would require acquisition of additional right-of-way from the parcel east of Monterey Road that is north of Skyway Drive, which is being procured as part of the project, so no additional displacement beyond the project	Yes	No additional beyond that included in the project.	Yes	No	No. See text discussion.	No	No	Yes	Yes
TR MM #1l: Vistapark/Branham Lane—Reconfigure Southbound Approach	M32	South San Jose	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR MM#1m: Lean Avenue/Blossom Hill Road – Improve Signal Phasing	M37	South San Jose	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR MM#1n: Cottle Road/Poughkeepsie Road – Restripe Eastbound Approach	M40	South San Jose	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1o: Santa Teresa Boulevard/Bernal Road—Restripe Westbound Approach	M17	South San Jose	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1p: Santa Teresa Boulevard/Bailey Avenue—Reconfigure	M18	South San Jose	X	X	X		This improvement could be accomplished entirely in the existing right-of-way.	No	No	Yes	No	No. See text discussion.	No	No	Yes	Yes

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#1q: Monterey Road/Tilton Avenue—Various Improvements	M46	Morgan Hill	X		X	X	Alternatives 1/3: Elimination of on-street parking on the north side of Tilton Avenue approaching the intersection and narrowing of the landscaping on the south side of the roadway (residential) Modifications to the traffic and rail signal systems at the intersection. Alternative 4 would be accomplished within the roadway right-of-way.	Yes (Alt. 1, 3)	No	Yes	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1r: Hale Avenue/Madrone Parkway—Signal at New Connection	M46	Morgan Hill		X			Would be accomplished within the roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1s: Monterey Road/Madrone Parkway—Widen and Reconfigure	M47	Morgan Hill		X			Would require a modification to the Alternative 2 roadway design modifications at this location and would be accommodated within the Alternative 2 footprint and right-of-way	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR MM #1t: Monterey Road/San Martin Avenue—Restripe Southbound Approach	MH6	San Martin				X	All work would be accomplished in the existing roadway right-of-way but would result in the removal of vehicle capacity at an adjacent intersection (Monterey/Burbank)	No	No	Yes	No	No. See text discussion.	No	No	Yes	Yes
TR MM #1u: Monterey Road/IOOF Avenue—Widen and Reconfigure Southbound Approach	G25	Gilroy				X	Removal of parking on the west side of Monterey Road.	No	No	Yes	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1v: Coordinate Signal Timings on 10th Street from Chestnut Street to Monterey Road in Gilroy	G36, G37, G38	Gilroy	X	X			All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR MM #1w: Chestnut Street/Luchessa Ave—Reconfigure Southbound Approach	G60	Gilroy				X	All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.1: Cahill Street/Stover-Crandall Street—Install Traffic Signal	D21	San Jose Diridon	X	X	X	X	All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#1x.2: Montgomery Street/Stover-Crandall Street—Install Traffic Signal	D22	San Jose Diridon				X	All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.3: Cahill Street/West San Fernando Street—Install Traffic Signal	D23	San Jose Diridon	X	X	X	X	All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.4: Houndshaven Way/Skyway Drive—Install Traffic Signal	M5	South San Jose	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.5: Hale Avenue/Tilton Avenue—Install Traffic Signal	M19	Morgan Hill	X	X	X		All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.6: East Main Avenue/Depot Street—Install Traffic Signal	MH11	Morgan Hill				X	All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.7: Railroad Avenue/Tennant Avenue—Install Traffic Signal	MH2	Morgan Hill		X			All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.8: Llagas Road/San Martin Avenue—Install Traffic Signal	MH8	San Martin		X			All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.9: School Access/IOOF Avenue—Install Traffic Signal	G53	Gilroy				X	All work would be accomplished in the existing roadway right-of-way.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#1x.10: SR 25/Bloomfield—Install Traffic Signal	GM4	Gilroy	X	X	X	X	All work would be accomplished in the existing roadway right-of-way but there would be removal of parking on the west side of Monterey Road.	No	No	No	No	No. See text discussion.	No	No	Yes	Yes
TR-MM#X.1 US 101 Corridor Mobility Improvements - Fair Share Contribution	Freeway interchanges in South San Jose	South San Jose	X	X	X		Widening of the freeway and adding new freeway capacity would likely result in a substantial increase in VMT. Widening could also result in acquisition of right-of-way and displacements, construction disruption, traffic noise effects, biological resource effects, and other effects.	Likely	Potentially	Yes	Yes	Yes	Yes Widening of US 101 may be necessary for other regional movement needs but would be disproportionate to the project's traffic effects.	Yes While not analyzed in any detail, large-scale freeway widening usually results in some unmitigable effects.	No It is outside the Authority's mission and authority to fund freeway expansion.	No

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#X.2: Coleman Avenue/Hedding Street—Widen and Reconfigure Eastbound Approach	D41	San Jose Diridon	X	X	X		Removal of on-street parking on the south side of Hedding Street between Coleman Avenue and Chestnut Street, and the acquisition of right-of-way on the south side of Hedding Street. Displace commercial building SE corner of Coleman/Hedding and displacement of 3 residences up to 300' from intersection	Yes	Yes (3 residential and 1 commercial) There is available residential and commercial relocation in San Jose.	Yes	No	No. See text discussion.	Yes Although there is available relocation in San Jose, relocation may not occur within EJ community. Also traffic delay effect (7 to 20 seconds) is limited.	No Primary effect is displacement, but there is available relocation availability in San Jose in general.	Yes	No
TR-MM#X.3: Coleman Avenue/Taylor Street—Widen and Reconfigure Southbound Approach	D42	San Jose Diridon	X	X	X		Widening of Coleman Avenue, which would require the acquisition of adjacent property on the west side of Coleman Avenue occupied by commercial establishments. Acquisition of parking and one displacement of commercial building	Yes	Yes (commercial) There is available commercial relocation in San Jose.	Yes	No	No. See text discussion.	Yes Although there is available relocation in San Jose, relocation may not occur within EJ community. Also traffic delay effect (5 to 17 seconds) is limited.	No Primary effect is displacement, but there is available relocation availability in San Jose in general.	Yes	No
TR-MM#X.4: Delmas Avenue/West San Fernando Street—Add Eastbound and Westbound Left Turn Lanes	D44	San Jose Diridon	X	X	X		Acquisition of adjacent property and changes to the adjacent VTA light rail crossing and signal system. Residential (5-7) and commercial building (1) displacement 300 feet on either side of the intersection.	Yes	Yes (5-7 residential and 1 commercial) There is available residential and commercial relocation in San Jose.	Yes	No	No. See text discussion.	Yes Although there is available relocation in San Jose, relocation may not occur within EJ community. In addition, unavoidable temporary disruption to VTA during construction. Also traffic delay effect (14 to 23 seconds) is limited.	No There is available relocation availability in San Jose in general.	Yes	No
TR-MM#X.5: Autumn Street/West Fernando Street—Provide Eastbound and Westbound Left Turn Lanes	D25	San Jose Diridon	X	X	X		The City of San Jose has recently narrowed Autumn Street by one northbound through lane and bike improvements (including bike lanes) have been made and West San Fernando Street has also been narrowed to include bike lanes. As a result, this measure would require adding back the through lanes and removing the bike lanes (which would be inconsistent with the City's road diet intent for this location) or acquisition of substantial adjacent property, which would result in commercial and/or residential displacements	Yes	Yes	Yes	No	No. See text discussion.	Yes. Although there is available relocation in San Jose, relocation may not occur within EJ community. Inconsistent with current City circulation planning. Also traffic delay effect (8 seconds) is limited.	No There is available relocation availability in San Jose in general.	Yes	No

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#X.6: Montgomery Street/Park Avenue: Reconfigure Northbound and Eastbound Approaches	D27	San Jose Diridon	X	X	X		The City of San Jose has recently made improvements to the Montgomery Street/Park Avenue intersection. Northbound Montgomery was narrowed by one through lane to add in bike improvements. As a result, this measure would require adding back the through lane and removing the bike lanes, which would be inconsistent with the City's road diet intent for this location, or acquisition of substantial adjacent property, which would result in commercial and/or residential displacements.	Yes	Yes	Yes	No	No. See text discussion.	Yes Although there is available relocation in San Jose, relocation may not occur within EJ community. Inconsistent with current City circulation planning Also traffic delay effect (28 seconds) is limited.	No There is available relocation availability in San Jose in general.	Yes	No
TR-MM#X.7: Monterey Road/East Main Avenue—Widen and Reconfigure Westbound Approach	MH10	Morgan Hill				X	Acquisition of right-of-way on the north side of East Main Street. This right-of-way is currently occupied by commercial establishments.	Yes	Yes (commercial) There is insufficient commercial relocation availability in Gilroy with Alt. 4.	Yes	No	No. See text discussion.	Yes Would result in commercial displacement within EJ community and there is insufficient relocation availability in Gilroy. Also traffic delay effect (14 seconds) is limited.	Yes Would result in commercial displacement and there is insufficient commercial relocation availability in Gilroy.	Yes	No
TR MM #X.8: Depot Road/San Martin Avenue—Widen and Reconfigure Westbound Approach	MH7	San Martin				X	Acquisition of right-of-way and removal of parking on the north side of San Martin Avenue. The parcel is currently occupied by a commercial establishment and 2-3 residences	Yes	Yes (commercial and 2-3 residences) There is insufficient commercial relocation availability in San Martin.	Yes	No	No. See text discussion.	No Would result in commercial displacement and there is insufficient commercial relocation availability in San Martin, but the traffic effect is substantial (59 seconds per move and 140 person hours/day) and the MM would completely avoid the delay.	Yes Would result in commercial displacement and there is insufficient commercial relocation availability in San Martin.	Yes	No

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#X.9: Monterey Road/Masten Avenue	MH26	San Martin				X	Would require the procurement of additional right-of-way along the north side or south side of Masten Avenue and on the west side of Monterey Road between Masten and Ricker. Along Masten, the area within 300 feet of the intersection is prime farmland or farmland of state importance on the south and vacant land on the north side. The area west of Monterey Road is prime farmland	Yes	No	Yes	Yes (0.43 mile increase from 4 to 6 lanes)	Yes Probably would not induce VMT on its own, but it would widen 0.43 miles of Monterey Road which could contribute to cumulative VMT inducement.	No	Yes While the amount of generated VMT would be far smaller than the VMT reduction due to HSR, the project would convert prime farmland/ farmland of state importance.	Yes	No
TR-MM#1l.10: Monterey Road/Buena Vista Avenue	G1	Gilroy		X			Right-of-way would need to be acquired on both sides of Monterey Road between Buena Vista Avenue and Las Animas Avenue. These parcels are occupied by agricultural, commercial, or residential uses. Widening to the west would require acquisition of prime farmland and farmland of state importance, commercial land, and residential property and may displace a number of residences.	Yes	Yes (residential) There is insufficient residential relocation in Gilroy with Alt. 2.	Yes	Yes (0.9 mile increase 4 to 6 lanes)	Yes Roadway widening is adjacent to development and could induce VMT	No. Would result in residential displacement without available relocation locally but the traffic effect is substantial (75 seconds per move, and 153 hours delay per day) and the MM would completely avoid the delay.	Yes While the amount of generated VMT would be far smaller than the VMT reduction due to HSR, there is insufficient residential relocation availability in Gilroy with Alt. 2. Would also convert prime farmland/farmland of state importance.	Yes	No
TR MM #X.11: Monterey Road/Leavesley Road —Widen and Reconfigure Eastbound Approach and Southbound Approach	G15	Gilroy				X	Right-of-way acquisition on the northwest and southwest corners of the intersection. These parcels are occupied by commercial establishments.	Yes	Yes (commercial) There is insufficient commercial relocation availability in Gilroy with Alt. 4.	Yes	No	No. See text discussion.	Yes Would result in commercial displacement within EJ community and insufficient local relocation availability in Gilroy.	Yes Would result in commercial displacement and there is insufficient commercial relocation availability in Gilroy.	Yes	No

Mitigation Measure	Intersection(s)	Community	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Secondary Effect	Additional ROW?	Displacement?	More effect?	C1: Increase VMT?	C2: Contradict objectives of SB 743?	C3: More Disruptive than Traffic Effect?	C4: Unmitigable Secondary Effect?	C5: Practicable?	Pass Screening?
TR-MM#X.12: Grade Separations	Multiple	San Jose, Morgan Hill, San Martin Gilroy				X	Grade separations, depending on location and design can have substantial secondary environmental impacts, including construction disruption to roadways and rail operations as well as construction noise and air pollution emissions, visual aesthetic changes, right-of-way acquisition, displacement of residential and commercial development, encroachment on public parks and open space, removal of trees and vegetation, and impacts on groundwater. However, it is speculative to ascribe specific impacts absent detailed location and designs.	Yes	Yes	Yes	No	No. See text discussion.	Yes Would result in residential and commercial displacements within EJ communities and there is insufficient local relocation availability in certain locations. Construction disruption would be extensive.	Yes Would result in residential and commercial displacements within EJ communities and there is insufficient local relocation availability in certain locations. Construction disruption would be extensive.	No. While the Authority supports a regional effort to identify funding and implement crossing improvements, the Authority cannot commit to a comprehensive program of grade separations to address all significantly affected intersections because of funding limitations without jeopardizing the implementation of the project.	No

Alt. = alternative
Authority = California High-Speed Rail Authority
EB = eastbound
EJ = environmental justice
HSR = high-speed rail
IC = interchange
MM = mitigation measure
ROW = right-of-way
SB = southbound
SE = southeast
SR = State Route
SSJ = South San Jose
US = U.S. Highway
VMT = vehicle miles traveled
VTA = Santa Clara Valley Transportation Authority

APPENDIX 3.3-A: AIR QUALITY AND GREENHOUSE GASES TECHNICAL REPORT

California High-Speed Rail Authority

San Jose to Merced Project Section

Air Quality and Greenhouse Gases Technical Report

February 2022

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

TABLE OF CONTENTS

EXECUTIVE SUMMARY XV

1 INTRODUCTION 1-1
1.1 Background of the HSR Program 1-2
1.2 Purpose of this Technical Report 1-2
1.3 Organization of this Technical Report 1-3

2 DESCRIPTION OF THE SAN JOSE TO CENTRAL VALLEY WYE PROJECT 2-1
2.1 Summary of Design Features 2-2
2.2 Description of Alternatives 2-10
2.2.1 Alternative 1 2-10
2.2.2 Alternative 2 2-25
2.2.3 Alternative 3 2-34
2.2.4 Alternative 4 (State's Preferred Alternative, CEQA Proposed Project) 2-42
2.3 Impact Avoidance and Minimization Features 2-53

3 LAWS, REGULATIONS, AND ORDERS 3-1
3.1 Federal 3-1
3.1.1 Clean Air Act (42 U.S.C. § 7401) and National Ambient Air Quality Standards 3-1
3.1.2 Conformity Rule 3-5
3.1.3 Mobile Source Air Toxics/Hazardous Air Pollutants 3-5
3.1.4 Federal Greenhouse Gas Regulations and Guidance 3-6
3.2 State 3-8
3.2.1 California Clean Air Act and California Ambient Air Quality Standards 3-8
3.2.2 Mobile Source Air Toxics/Toxic Air Contaminates 3-8
3.2.3 California Greenhouse Gas Regulations and Guidance 3-9
3.2.4 California Asbestos Control Measures 3-12
3.3 Regional and Local 3-12
3.3.1 Air Quality Management Districts 3-12
3.3.2 Metropolitan Transportation Commission 3-16
3.3.3 Association of Bay Area Governments 3-16
3.3.4 Association of Monterey Bay Area Governments 3-16
3.3.5 Council of San Benito County Governments 3-17
3.3.6 Merced County Association of Governments 3-17
3.3.7 Air Quality Plans 3-17
3.3.8 Climate Action Plans 3-26

4 POLLUTANTS OF CONCERN 4-1
4.1 Criteria Pollutants 4-1
4.1.1 Ozone 4-1
4.1.2 Particulate Matter 4-2
4.1.3 Carbon Monoxide 4-3
4.1.4 Nitrogen Dioxide 4-4
4.1.5 Lead 4-4
4.1.6 Sulfur Dioxide 4-4
4.2 Toxic and Noncriteria Pollutants 4-5
4.2.1 Asbestos 4-5

4.2.2 Mobile Source Air Toxics 4-5
4.3 Valley Fever 4-8
4.4 Greenhouse Gases 4-9

5 AFFECTED ENVIRONMENT 5-1
5.1 Meteorology and Climate 5-1
5.1.1 San Francisco Bay Area Air Basin (Santa Clara Valley Subregion) 5-1
5.1.2 North Central Coast Air Basin 5-1
5.1.3 San Joaquin Valley Air Basin 5-2
5.2 Ambient Air Quality 5-2
5.3 Attainment Status 5-3
5.4 Emissions Inventory 5-10
5.4.1 Criteria Pollutants 5-10
5.4.2 Statewide Greenhouse Gas Emissions 5-12
5.5 Sensitive Receptors 5-12

6 METHODS FOR EVALUATING EFFECTS 6-1
6.1 Definition of Resource Study Area 6-1
6.1.1 Statewide 6-1
6.1.2 Regional 6-1
6.1.3 Local 6-1
6.2 Statewide and Regional Operations Emissions Calculations 6-2
6.2.1 On-Road Vehicles 6-2
6.2.2 Trains 6-2
6.2.3 Aircraft 6-3
6.2.4 Power Plants 6-3
6.3 Local Operations Emissions Calculations 6-3
6.3.1 Stations 6-3
6.3.2 Maintenance Facilities 6-5
6.3.3 Sulfur Hexafluoride Circuit Breakers 6-7
6.3.4 Microscale Carbon Monoxide Hot Spot Analysis 6-7
6.3.5 Particulate Matter (PM_{10} and $PM_{2.5}$) Hot-Spot Analysis 6-10
6.3.6 Mobile Source Air Toxics Analysis 6-11
6.3.7 Operations Health Risk Assessment 6-12
6.4 Construction Emissions Calculations 6-16
6.4.1 Construction Activities 6-16
6.4.2 Construction Approach 6-16
6.4.3 Models and Methods for Mass Emissions Modeling 6-17
6.4.4 Ballast and Subballast Hauling 6-18
6.4.5 Daily and Annual Emissions Estimates 6-18
6.4.6 Emissions by Air District and Basin 6-18
6.4.7 Project Design Features 6-21
6.4.8 Regulatory Control Measures 6-21
6.4.9 Construction Health Risk Assessment 6-21
6.4.10 Other Localized Construction Effects 6-26
6.5 Asbestos, Lead-Based Paint, Valley Fever, and Odors 6-28

7 AIR QUALITY EFFECTS ANALYSIS 7-1
7.1 No Project Alternative 7-1
7.2 Statewide and Regional Operational Emissions Analysis 7-2
7.2.1 On-Road Vehicles 7-2

7.2.2 Trains 7-2
7.2.3 Aircraft 7-9
7.2.4 Power Plants 7-9
7.2.5 Regional Operations Criteria Pollutant Emissions Summary 7-13
7.3 Local Operation Emission Sources 7-19
7.3.1 Station Sites and Maintenance Facilities 7-19
7.4 Total Operations Emissions 7-20
7.5 Microscale Carbon Monoxide Hot-Spot Analysis 7-27
7.6 Particulate Matter (PM_{10} and $PM_{2.5}$) Hot-Spot Analysis 7-31
7.7 Mobile Source Air Toxics 7-32
7.7.1 Regional Mobile Source Air Toxics 7-32
7.7.2 Local Mobile Source Air Toxics 7-33
7.7.3 Mobile Source Air Toxics Research and Incomplete Information 7-33
7.8 Operations Health Risk Assessment 7-33
7.8.1 Freight Relocation 7-33
7.8.2 Stations and Maintenance Facilities 7-39
7.9 Construction Mass Emissions Analysis 7-40
7.9.1 Total Emissions 7-40
7.9.2 Alternative 1 Yearly and Daily Emissions 7-43
7.9.3 Alternative 2 Yearly and Daily Emissions 7-49
7.9.4 Alternative 3 Yearly and Daily Emissions 7-55
7.9.5 Alternative 4 Yearly and Daily Emissions 7-61
7.10 Construction Health Risk Assessment 7-67
7.11 Other Localized Construction Effects 7-71
7.12 Asbestos, Lead-Based Paint, Valley Fever, and Odors 7-101
7.12.1 Asbestos 7-101
7.12.2 Lead-Based Paint 7-101
7.12.3 Valley Fever 7-101
7.12.4 Odors 7-101
7.13 Summary of Effects 7-102

8 GLOBAL CLIMATE CHANGE EFFECTS ANALYSIS 8-1
8.1 Statewide and Regional Operations Emissions Analysis 8-1
8.1.1 On-Road Vehicles 8-2
8.1.2 Trains 8-3
8.1.3 Aircraft 8-3
8.1.4 Power Plants 8-4
8.1.5 Regional Operations Greenhouse Gas Emissions Summary 8-5
8.2 Local Operations Emissions Sources 8-6
8.2.1 Station Sites and Maintenance Facilities 8-6
8.2.2 Sulfur Hexafluoride Circuit Breakers 8-7
8.3 Total Operations Emissions 8-8
8.4 Construction Greenhouse Gas Emissions 8-9
8.5 Summary of Effects 8-14

9 MITIGATION MEASURES 9-1

10 CUMULATIVE EFFECTS 10-1
10.1 Near- and Long-Term Operations 10-1
10.2 Construction 10-6
10.2.1 Criteria Pollutants 10-6

10.2.2 TACs 10-6
10.3 Combined Construction and Operations Cumulative Health Risk Assessment 10-10
11 CONFORMITY ANALYSIS 11-1
11.1 General Conformity 11-1
11.2 Transportation Conformity 11-2
12 REFERENCES 12-1
13 PREPARER QUALIFICATIONS 13-1

Tables

Table 2-1 San Jose to Central Valley Wye Design Options by Subsection 2-4
Table 2-2 Summary of Air Quality and Greenhouse Gas Impact Avoidance and Minimization Features 2-53
Table 3-1 State and Federal Ambient Air Quality Standards 3-2
Table 3-2 Regional and Local Plans and Policies 3-19
Table 5-1 Ambient Criteria Pollutant Concentrations at Air Quality Monitoring Stations in the Project Vicinity 5-5
Table 5-2 Federal and State Attainment Status of the Project 5-8
Table 5-3 Estimated Annual Average Emissions for Santa Clara, San Benito, and Merced Counties (2012 data published in 2017) (tons per day) 5-11
Table 5-4 California Greenhouse Gas Inventory (2016) 5-12
Table 5-5 Sensitive Receptors within 1,000 Feet of the San Jose Diridon and Gilroy Stations and East Gilroy MOWF 5-13
Table 6-1 Daily Passengers at HSR Stations 6-6
Table 6-2 Projects of Air Quality Concerns as Defined by Section 93.123(b)(1) of the Transportation Conformity Rule 6-10
Table 6-3 Relocated Freight Tracks and Distances to Nearest Sensitive Receptors 6-13
Table 6-4 Track Miles and Construction Scaling Factors by Air District 6-20
Table 6-5 Meteorological Datasets by Subsection 6-23
Table 6-6 AERMOD Source Parameters (Bay Area Air Quality Management District and Monterey Bay Air Resources District) 6-23
Table 6-7 AERMOD Source Parameters (San Joaquin Valley Air Pollution Control District) 6-24
Table 6-8 Construction Work Areas by Subsection and Project Alternative 6-24
Table 7-1 Estimated Statewide Emissions without the Project—Medium Ridership Scenario 7-1
Table 7-2 Estimated Statewide Emissions without the Project—High Ridership Scenario 7-2
Table 7-3 Estimated Statewide Emissions with the Project—Medium Ridership Scenario 7-2

Table 7-4 Estimated Statewide Emissions with the Project—High Ridership Scenario 7-3
Table 7-5 Estimated Changes in Statewide Emissions, Project vs. No Project (Medium and High Ridership Scenarios) 7-5
Table 7-6 On-Road Vehicle Miles Traveled, Project vs. No Project (Medium and High Ridership Scenarios) 7-6
Table 7-7 On-Road Vehicle Emission Changes, Project vs. No Project (Medium and High Ridership Scenarios) 7-7
Table 7-8 Aircraft Flights, Project vs. No Project (Medium and High Ridership Scenarios) 7-10
Table 7-9 Aircraft Emission Changes, Project vs. No Project (Medium and High Ridership Scenarios) 7-11
Table 7-10 Power Plant Emission Changes, Project vs. No Project (Medium and High Ridership Scenarios) 7-11
Table 7-11 Regional Criteria Pollutant Emissions Changes, Project Compared to 2015 Existing Conditions (Medium and High Ridership Scenarios) 7-15
Table 7-12 Regional Criteria Pollutant Emissions Changes, Project Compared to 2029 No Project Conditions (Medium and High Ridership Scenarios) 7-16
Table 7-13 Regional Criteria Pollutant Emissions Changes, Project Compared to 2040 No Project Conditions (Medium and High Ridership Scenarios) 7-17
Table 7-14 Station and Maintenance Facility Operations Emissions (tons per year) 7-19
Table 7-15 Total Regional Criteria Pollutant Emissions Changes, Project Compared to 2015 Existing Conditions (Medium and High Ridership Scenarios) 7-23
Table 7-16 Total Regional Criteria Pollutant Emissions Changes, Project Compared to 2029 No Project Conditions (Medium and High Ridership Scenarios) 7-24
Table 7-17 Total Regional Criteria Pollutant Emissions Changes, Project Compared to 2040 No Project Conditions (Medium and High Ridership Scenarios) 7-25
Table 7-18 Carbon Monoxide Modeling Concentration Results (Parts per Million) 7-29
Table 7-19 Cancer and Noncancer Health Risks from Freight Operation under Existing, No Project, and the Freight Relocation (Project) Scenarios 7-35
Table 7-20 Summary of Changes in Cancer and Noncancer Health Risks from Freight Relocation Relative to Existing and No Project Conditions 7-37
Table 7-21 Maximum Health Risks and $PM_{2.5}$ Concentrations from Project Station and MOWF Operation 7-40
Table 7-22 Total Construction-Related Project Criteria Pollutant Emissions[1] 7-41
Table 7-23 Construction-Related Criteria Pollutant Emissions under Alternative 1 in the Bay Area Air Quality Management District 7-45
Table 7-24 Construction-Related Criteria Pollutant Emissions under Alternative 1 in Monterey Bay Air Resources District 7-46
Table 7-25 Construction-Related Criteria Pollutant Emissions under Alternative 1 in San Joaquin Valley Air Pollution Control District 7-47

Table 7-26 Construction-Related Criteria Pollutant Emissions under Alternative 2 in the Bay Area Air Quality Management District 7-51
Table 7-27 Construction-Related Criteria Pollutant Emissions under Alternative 2 in Monterey Bay Air Resources District 7-52
Table 7-28 Construction-Related Criteria Pollutant Emissions under Alternative 2 in San Joaquin Valley Air Pollution Control District 7-53
Table 7-29 Construction-Related Criteria Pollutant Emissions under Alternative 3 in the Bay Area Air Quality Management District 7-57
Table 7-30 Construction-Related Criteria Pollutant Emissions under Alternative 3 in Monterey Bay Air Resources District 7-58
Table 7-31 Construction-Related Criteria Pollutant Emissions under Alternative 3 in San Joaquin Valley Air Pollution Control District 7-59
Table 7-32 Construction-Related Criteria Pollutant Emissions under Alternative 4 in the Bay Area Air Quality Management District 7-63
Table 7-33 Construction-Related Criteria Pollutant Emissions under Alternative 4 in Monterey Bay Air Resources District 7-64
Table 7-34 Construction-Related Criteria Pollutant Emissions under Alternative 4 in San Joaquin Valley Air Pollution Control District 7-65
Table 7-35 Cancer, Noncancer, and $PM_{2.5}$ Concentration Health Risks Associated with Construction of Alternatives 1, 2, 3, and 4 in the Bay Area Air Quality Management District 7-68
Table 7-36 Cancer and Noncancer Health Risks Associated with Construction of Alternatives 1, 2, 3, and 4 in the Monterey Bay Air Resources District 7-69
Table 7-37 Excess Cancer and Noncancer Health Risks Associated with Construction of Alternatives 1, 2, 3, and 4 in the San Joaquin Valley Air Pollution Control District 7-70
Table 7-38 Existing Background Air Quality Concentration in the Resource Study Area ($\mu g/m^3$) 7-72
Table 7-39 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 1 ($\mu g/m^3$) 7-74
Table 7-40 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 1 ($\mu g/m^3$) 7-76
Table 7-41 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 2 ($\mu g/m^3$) 7-78
Table 7-42 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 2 ($\mu g/m^3$) 7-80
Table 7-43 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 3 ($\mu g/m^3$) 7-82
Table 7-44 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 3 ($\mu g/m^3$) 7-84
Table 7-45 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 4 ($\mu g/m^3$) 7-86
Table 7-46 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 4 ($\mu g/m^3$) 7-88

Table 7-47 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 1 (µg/m^3) 7-90
Table 7-48 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 2 (µg/m^3) 7-92
Table 7-49 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 3 (µg/m^3) 7-94
Table 7-50 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 4 (µg/m^3) 7-96
Table 7-51 Incremental PM_{10} and $PM_{2.5}$ Concentrations from Construction of the Alternatives 1, 2, 3, and 4 in Areas with Background Concentrations in Excess of the AAQS (µg/m^3) 7-98
Table 7-52 Summary of Effects 7-102
Table 8-1 Estimated Statewide Greenhouse Gas Emissions Change from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year) 8-1
Table 8-2 Regional On-Road Vehicle Greenhouse Gas Emission Changes from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year) 8-3
Table 8-3 Aircraft Greenhouse Gas Emission Changes from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year) 8-4
Table 8-4 Power Plant Greenhouse Gas Emission Changes from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year) 8-4
Table 8-5 Estimated Regional Greenhouse Gas Emissions Change from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year) 8-5
Table 8-6 Station and Maintenance Facility Operational Greenhouse Gas Emissions (metric tons CO_2e per year) 8-6
Table 8-7 Summary of Total Statewide Greenhouse Gas Emissions Changes from Operation of the Project—2015 Existing and 2029 and 2040 No Project Conditions (Medium and High Ridership Scenarios) (million metric tons CO_2e per year) 8-8
Table 8-8 Alternative 1 Carbon Dioxide Equivalent Construction Emissions (metric tons per year) 8-11
Table 8-9 Alternative 2 Carbon Dioxide Equivalent Construction Emissions (metric tons per year) 8-12
Table 8-10 Alternative 3 Carbon Dioxide Equivalent Construction Emissions (metric tons per year) 8-13
Table 8-11 Alternative 4 Carbon Dioxide Equivalent Construction Emissions (metric tons per year) 8-14
Table 8-12 Summary of Effects 8-15
Table 10-1 Cumulative Cancer and Noncancer Health Risks from Freight Relocation 10-2

Table 10-2 Cumulative Cancer and Noncancer Health Risks from Station and MOWF Operation 10-5
Table 10-3 Cumulative Cancer and Noncancer Health Risks from Alternative 1 Construction in the Bay Area Air Quality Management District 10-7
Table 10-4 Cumulative Cancer and Noncancer Health Risks from Alternative 2 Construction in the Bay Area Air Quality Management District 10-8
Table 10-5 Cumulative Cancer and Noncancer Health Risks from Alternative 3 Construction in the Bay Area Air Quality Management District 10-8
Table 10-6 Cumulative Cancer and Noncancer Health Risks from Alternative 4 Construction in the Bay Area Air Quality Management District 10-9
Table 10-7 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 1 Construction and Operations in the Bay Area Air Quality Management District 10-11
Table 10-8 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 2 Construction and Operations in the Bay Area Air Quality Management District 10-12
Table 10-9 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 3 Construction and Operations in the Bay Area Air Quality Management District 10-13
Table 10-10 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 4 Construction and Operations in the Bay Area Air Quality Management District 10-14

Figures

Figure 2-1 Proposed San Jose to Merced Project Section 2-2
Figure 2-2 Overview of Subsection Design Options 2-3
Figure 2-3 San Jose Diridon Station Approach Subsection 2-5
Figure 2-4 Monterey Corridor Subsection 2-6
Figure 2-5 Morgan Hill and Gilroy Subsection 2-7
Figure 2-6 Pacheco Pass Subsection 2-8
Figure 2-7 San Joaquin Valley Subsection 2-9
Figure 2-8 Conceptual Diridon Aerial Station Plan 2-12
Figure 2-9 Conceptual San Jose Diridon Station Cross Section 2-13
Figure 2-10 Conceptual Downtown Gilroy Aerial Station Plan 2-18
Figure 2-11 Cross Section of Downtown Gilroy Station (Viaduct) 2-19
Figure 2-12 South Gilroy Maintenance of Way Facility 2-22
Figure 2-13 Maintenance of Way Siding near Turner Island Road 2-25
Figure 2-14 Conceptual Downtown Gilroy Embankment Station Plan 2-31
Figure 2-15 Cross Section of Downtown Gilroy Station (Embankment) 2-32
Figure 2-16 Conceptual East Gilroy Station Plan 2-38
Figure 2-17 Cross Section of East Gilroy Station 2-39
Figure 2-18 East Gilroy Maintenance of Way Facility 2-41

Figure 2-19 Conceptual San Jose Diridon At-Grade Station Plan 2-43
Figure 2-20 Conceptual Downtown Gilroy At-Grade Station Plan..... 2-48
Figure 2-21 South Gilroy Maintenance of Way Facility for Alternative 4 2-51
Figure 3-1 Air Basins and Air Districts in the Resource Study Area..... 3-13
Figure 4-1 Ozone in the Atmosphere 4-2
Figure 4-2 Relative Particulate Matter Size..... 4-3
Figure 4-3 Sources of Carbon Monoxide in California (2014) 4-4
Figure 4-4 Projected National Mobile Source Air Toxics Emission Trends (2010–2050) for Vehicles Operating on Roadways, Based on USEPA's MOVES2014a Model Assessment (USEPA 2015d) 4-6
Figure 4-5 The Greenhouse Effect..... 4-9
Figure 5-1 Monitoring Station Locations 5-9
Figure 5-2 Sensitive Receptors within 1,000 Feet of the San Jose Diridon Station 5-14
Figure 5-3 Sensitive Receptors within 1,000 Feet of the Downtown Gilroy Station 5-15
Figure 5-4 Sensitive Receptors within 1,000 Feet of the East Gilroy Station..... 5-16
Figure 5-5 Sensitive Receptors within 1,000 Feet of the East Gilroy Maintenance of Way Facility 5-17

Appendices

Appendix A: CalEEMod Outputs for Station and Maintenance Facility Operation, MOWF Calculations, and East Gilroy Transit Calculations

Appendix B: CALINE4 Outputs for CO Hot-Spot Analysis

Appendix C: Construction Emission and Cumulative HRA Assumptions

Appendix D: Ballast Hauling Memorandum

Appendix E: Localized Impacts from Construction

Appendix F: Potential Impact from Induced Winds

Appendix G: Council on Environmental Quality Provisions Covering Incomplete or Unavailable Information

ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
µm	microns
AAQA	ambient air quality analysis
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACE	Altamont Corridor Express
AMBAG	Association of Monterey Bay Area Governments
APA	applicant-preferred alternative
APCD	air pollution control district
ATC	automatic train control
Authority	California High-Speed Rail Authority
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
Bay Area	San Francisco Bay Area
C.F.R.	Code of Federal Regulations
CAA	Clean Air Act
CAAQS	California ambient air quality standards
CAFE	Corporate Average Fuel Economy
Cal. Health and Safety Code	California Health and Safety Code
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAP	climate action plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEMOF	Centralized Equipment Maintenance and Operations Facility
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
CH_4	methane
CIPH	cast-in-place and hardware
CMP	congestion management program
CO	carbon monoxide

CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CP	Control Point
DPM	diesel particulate matter
EIR	environmental impact report
EIS	environmental impact statement
EMFAC	EMission FACtors
EMMA	Environmental Mitigation Management and Assessment
EMU	electric multiple unit
EO	California Executive Order
Fed. Reg.	*Federal Register*
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
g/L	grams per liter
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GEA	Grasslands Ecological Area
GHG	greenhouse gas
GIS	geographic information system
GWP	Global Warming Potential
HAP	hazardous air pollutants
HRA	health risk assessment
Hot Spots Act	Air Toxics “Hot Spots” Information and Assessment Act of 1987
HSR	high-speed rail
I-	Interstate
IAMF	impact avoidance and minimization features
kV	kilovolt
kWh	kilowatt-hour
LBP	lead-based paint
LOS	level-of-service
MBARD	Monterey Bay Air Resources District
MCAG	Merced County Association of Governments
mg	milligrams
MOU	memorandum of understanding
MOWF	maintenance of way facility
MOWS	maintenance of way siding
mph	miles per hour

MSAT	mobile source air toxics
MT	mainline track
MTC	Metropolitan Transportation Commission
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NCCAB	North Central Coast Air Basin
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NO_X	nitrogen oxides
NZE	near zero emission
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCJPB	Peninsula Corridor Joint Powers Board
PG&E	Pacific Gas and Electric Company
PM	particulate matter
PM_{10}	particulate matter 10 microns in diameter or less
$PM_{2.5}$	particulate matter 2.5 microns in diameter or less
project extent, project	San Jose to Central Valley Wye Project Extent
Project Section	San Jose to Merced Project Section
PTC	positive train control
ROG	reactive organic gases
RSA	resource study area
RTP	regional transportation plan
SAFE	Safer Affordable Fuel-Efficient
San Benito COG	Council of San Benito County Governments
SB	Senate Bill
SCS	sustainable communities strategy
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SIL	significant impact level
SIP	state implementation plan
SJVAB	San Joaquin Valley Air Basin

SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
SR	State Route
Statewide Program EIR/EIS	*Final Program Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System*
t	metric ton
TAC	toxic air contaminant
TAMC	Transportation Agency for Monterey County
Tanner Act	Toxic Air Contaminant Identification and Control Act
TIP	transportation improvement program
TPSS	traction power substation
U.S.C.	United States Code
UPRR	Union Pacific Railroad
USEO	U.S. Presidential Executive Order
USEPA	U.S. Environmental Protection Agency
VERA	Voluntary Emission Reduction Agreement
VMT	vehicle miles traveled
VOC	volatile organic compound
VTA	(Santa Clara) Valley Transportation Authority
ZE	zero emission

EXECUTIVE SUMMARY

The California High-Speed Rail Authority (Authority) has prepared this *San Jose to Merced Project Section Air Quality and Greenhouse Gases Technical Report* to support the *San Jose to Merced Project Section Environmental Impact Report/Environmental Impact Statement*. This technical report characterizes existing conditions and analyzes air quality and greenhouse gas (GHG) effects of four project alternatives.

Air quality and GHG are important considerations because of their effect on human health and global climate change. This technical report addresses effects resulting from construction and operation of the San Jose to Merced Project Section (Project Section), focusing on the portion of the Project Section between San Jose and Carlucci Road (San Jose to Central Valley Wye Project Extent, or simply project). It describes relevant federal, state, regional, and local regulations and requirements; methods used for the analysis of effects; the affected environment; impact avoidance and minimization features (IAMF) that would avoid or minimize effects; and the potential effects on air quality and GHGs in the project resource study area (RSA) that could result from construction and operation of the project alternatives. Emissions and impacts under all four project alternatives are analyzed at an equal level of detail to support the project-level environmental document prepared pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Summary of Effects

Air Quality

Construction of all four project alternatives would result in reactive organic gases (ROG)[1] and nitrogen oxide (NO_X) emissions that would exceed the Bay Area Air Quality Management District's (BAAQMD) CEQA thresholds. Construction emissions of NO_X, carbon monoxide (CO), and particulate matter (PM) less than 10 microns in diameter (PM_{10}) would also exceed the San Joaquin Valley Air Pollution Control District's (SJVAPCD) annual CEQA thresholds. None of the project alternatives would result in construction emissions above the Monterey Bay Air Resources District's (MBARD) PM_{10} CEQA threshold. Construction of all project alternatives would also exceed the general conformity *de minimis* NO_X thresholds in the San Francisco Bay Area Air Basin (SFBAAB) and San Joaquin Valley Air Basin (SJVAB).

The project would be built with feasible on-site control measures to reduce emissions and minimize effects on air quality. Fugitive dust emissions would be reduced through implementation of a dust control plan (AQ-IAMF#1: Fugitive Dust Emissions) and best management practices at new concrete batch plants (AQ-IAMF#6: Reduce the Potential Impact of Concrete Batch Plants). The contractor would utilize low-volatile organic compound (VOC) paints to limit the emissions of VOCs, which contribute to ozone (O_3) formation (AQ-IAMF#2: Selection of Coatings). Exhaust-related pollutants would be reduced through use of renewable diesel, Tier 4 off-road engines, and model year 2010 or newer on-road engines, as required by AQ-IAMF#3: Renewable Diesel, AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment, and AQ-IAMF#5: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment. However, even with application of IAMFs, exceedances of air district and general conformity thresholds would still occur.

The Authority would implement mitigation measures to reduce and offset the remaining construction impact on air quality resources. Specifically, AQ-MM#1: Implement Additional On-Site Emissions Controls to Reduce Fugitive Dust identifies additional best management practices for reducing on-site fugitive dust emissions, consistent with BAAQMD (2017b) guidance. AQ-MM#2 requires that a minimum of 25 percent of all light-duty on-road vehicles use zero emission (ZE) or near-zero emission (NZE) technology. The measure also includes ZE and NZE goals for heavy-duty on-road trucks and off-road equipment. AQ-MM#3: Offset Project Construction

[1] ROG is synonymous with volatile organic compounds (VOC); both terms are used in this document depending on the emissions source.

Emissions in the San Francisco Bay Area Air Basin would offset ROG and NO_X emissions to below BAAQMD thresholds or net zero (as required by the General Conformity regulation). AQ-MM#4: Offset Project Construction Emissions in the San Joaquin Valley Air Basin would fully offset (i.e., to net zero) all emissions of ROG, NOx, and PM within the SJVAPCD, pursuant to the Authority's Memorandum of Understanding (MOU) with the air district for the HSR subsections within the SJVAB. Pursuant to SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts, emissions offsets procured through AQ-MM#4 could not be used to mitigate CO effects. Accordingly, CO emissions would remain above SJVAPCD's CEQA threshold even after implementation of all feasible mitigation.

Within the BAAQMD, Alternatives 2 and 4 would result in comparable levels of total emissions and Alternatives 1 and 3 would result in comparable levels of total emissions. Alternatives 2 and 4 would result in the greatest emissions primarily because of embankment activities in the Morgan Hill and Gilroy Subsection, in contrast to viaduct construction under Alternatives 1 and 3, which requires less earthmoving and equipment and vehicles. Maximum daily ROG and NO_X emissions in excess of BAAQMD thresholds would be generated between 2023 and 2025, with the greatest emissions occurring in 2025 under all project alternatives. Daily ROG and NO_X emissions would be highest in 2025 due to concurrent construction activities in the Morgan Hill and Gilroy Subsection and ballast hauling. Construction and emissions intensity declines after 2025 once earthmoving and other equipment-intensive activities are complete.

Within the MBARD, total annual construction emissions are highest under Alternatives 2 and 4 because of embankment activities in the Morgan Hill and Gilroy Subsection and more movement of ballast through the North Central Coast Air Basin (NCCAB). Embankment construction generally requires more equipment and vehicles than viaduct construction, resulting in greater emissions. In addition, berm and embankment construction requires more ballast, which results in more ballast hauling and associated emissions. In general, emissions under all alternatives would be highest during the first few years of construction when earthmoving and other emissions-intensive activities would occur. Emissions would peak again in 2027 and 2028 due to ballast hauling through the NCCAB.

Within the SJVAPCD, all project alternatives would result in the same amount of emissions because construction activities would be identical. Similar amounts of annual emissions would be generated during each year of construction between 2022 and 2027. Emissions would decline in 2028 once tunneling and other emissions-intensive activities are completed.

Construction activities would not generate emissions in excess of applicable local air district health risk thresholds. Construction of all alternatives would lead to new violations of the PM_{10} and PM less than 2.5 microns in diameter ($PM_{2.5}$) national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), as well as potentially contribute to existing PM_{10} and $PM_{2.5}$ violations through exceedances of the significant impact levels. Alternatives 1, 2, and 4 would also violate the 1-hour nitrogen dioxide NAAQS and CAAQS. Project features would minimize air quality effects (AQ-IAMF#1 through AQ-IAMF#6), although emissions would still violate the ambient air quality standards. These project design features represent all best available on-site controls to reduce construction emissions, and no mitigation is available.

Long-term operation of the project would result in a decrease in all criteria pollutant emissions when compared to 2015 existing and 2029 and 2040 No Project conditions. These patterns apply to all ridership scenarios and alternatives and would be beneficial to the SFBAAB, NCCAB, and SJVAB in meeting their criteria pollutant attainment goals. Regionally and locally, additional vehicle traffic at new and expanded transit stations and maintenance facilities would not result in CO or PM hot spots. Similarly, displaced vehicle miles traveled would reduce regional mobile source air toxics (MSAT) throughout the RSA. While localized MSATs near stations and maintenance facilities may slightly increase as a result of additional passenger traffic, long-term emissions would be substantially reduced because of implementation of state and national vehicle and fuel regulations.

The project would reposition existing Union Pacific Railroad tracks under all four alternatives. Redistributing or moving existing freight traffic would increase long-term toxic air contaminant

(TAC) concentrations at certain receptor locations and would result in corresponding decreases at other locations. Likewise, additional generators at the stations and maintenance facilities proposed under all four project alternatives, new bus service at the East Gilroy Station under Alternative 3, and maintenance operations at the Gilroy maintenance of way facility (MOWF) under all four project alternatives would increase long-term TAC concentrations. Analysis of TAC concentrations from relocated freight service, additional generators, East Gilroy bus service, and MOWF operations indicates that these sources would not result in long-term cancer or noncancer health risks in excess of established thresholds.

The project alignment within the SFBAAB would be in an area that can contain naturally occurring asbestos (NOA). However, the design-build contractor would prepare a congestion management program (CMP) that outlines practices for avoiding and minimizing NOA. Construction contractors would also be required to comply with the BAAQMD's Asbestos Airborne Toxic Control Measure for Construction and Grading Operations, which requires implementation of dust control measures to limit the potential for airborne asbestos. Asbestos-containing materials and lead-based paint may be found during demolition activities, although all four project alternatives would comply with all *National Emission Standards for Hazardous Air Pollutants* regulations. Similarly, implementation of all feasible dust control measures (AQ-IAMF#1) would minimize receptor exposure to Coccidioides immitis fungus spores, if present in the soil during earthmoving activities. While odors may be generated during construction and operation, they would not be substantial and are not expected to result in nuisance complaints.

Greenhouse Gases

Long-term operation of the project would result in a net reduction of regional and statewide GHG emissions when compared to 2015 Existing and 2029 and 2040 No Project conditions. Construction-related emissions would be less than 0.15 percent of the total annual statewide GHG emissions. Total amortized GHG construction emissions for the project are estimated to be between 14,870 and 20,043 metric tons carbon dioxide equivalent per year, with Alternative 4 generating the most emissions, and Alternative 1 generating the least. The increase in GHG emissions generated during construction would be offset in approximately 8 to 14 months by net GHG reductions during operations because of reduced car and aircraft trips in Northern California and statewide. Accordingly, implementation of the project would result in a net decrease in GHG emissions that would be beneficial to the RSA and State of California and would help meet local and statewide GHG reduction goals.

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1 INTRODUCTION

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- Where appropriate, the verb "would," when used specifically to describe impact avoidance and minimization features (IAMF) or mitigation measures, as well as their directly related activities, was changed to "will," indicating their integration into project design.
- Emissions generated by light-duty gasoline-powered vehicles used during construction were remodeled to include the effects of the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule. The adjustment factors were conservatively applied to the entire CalEEMod output for on-road mobile and entire modeled CO concentration, which includes emissions contributions from gasoline and diesel-powered vehicles. The revised emissions results are presented in Tables 7-14 through 7-18, 7-22 through 7-34, 7-52, and 8-6.
- In Section 6.4.9.3, Risk Calculations, text was revised to state that, for risk factors for health risk assessment (HRA) calculations, all receptors were conservatively modeled with residential exposure parameters.
- Section 7, Air Quality Effects Analysis, and Section 8, Global Climate Change Effects Analysis, were updated to state that the emission savings due to reduced vehicle miles traveled (VMT) and mobile source emissions are conservative because they do not consider the recently enacted SAFE Vehicles rule.
- The percentage of future electricity generated by renewable resources required by state law was updated to 100 percent by 2045.
- The analysis now uses a lower *de minimis* threshold (i.e., 70 tons per year rather than 100 tons per year) for particulate matter smaller than or equal to 2.5 microns in diameter ($PM_{2.5}$) and sulfur dioxide (SO_2) in the San Joaquin Valley Air Basin (SJVAB), as shown in Tables 7-25, 7-28, 7-31, and 7-34.
- Refinements were made to the particulate matter mass emissions inventory to more comprehensively capture emissions reductions that would be achieved through implementation of AQ-IAMF#1: Fugitive Dust Emissions. These revisions were made for the final air quality analysis, as reported in Tables 7-22 through 7-34.
- Draft EIR/EIS Mitigation Measure AQ-MM#2 was deleted due to the impact of the SAFE Vehicles Rule. With this Rule, none of the project alternatives would exceed Monterey Bay Air Resources District's (MBARD) coarse particulate matter (PM_{10}) threshold. Text was modified throughout to reflect this change, including in Table 7-52.
- A new air quality mitigation measure, AQ-MM#1: Implement Additional On-Site Emissions Controls to Reduce Fugitive Dust, was added in response to public comments.
- A new air quality mitigation measure, AQ-MM#2: Construction Emissions Reductions – Requirements for use of Zero Emission (ZE) and/or Near Zero Emission (NZE) Vehicles and off-road equipment, was added to reflect the California High-Speed Rail Authority's (Authority) commitment to electric vehicles.
- Statewide operational greenhouse gas (GHG) emissions from electrical generation were revised based on the U.S. Environmental Protection Agency's (USEPA) latest publication of the Emissions and Generation Resource Integrated Database (released January 2020). This resulted in changes to Tables 7-18, 8-1, 8-4, 8-5, and 8-7 through 8-12.
- Text was added to state that, in April 2021, the National Highway Transportation Safety Administration (NHTSA) issued a notice of proposed rulemaking to repeal the SAFE Vehicles Rule. The fate of the SAFE Vehicles Rule remains uncertain in the face of pending litigation by California and others.

- The list of district rules the project may be subject to was updated in Section 3.3.1.1, Bay Area Air Quality Management District, to include Regulation 6, Rule 6 (Prohibition of Trackout).
- Tables 6-3, 7-19, and 10-1 were updated to include the track shift near West Julian Street and North Montgomery Street that would only occur under Alternative 4 with the Diridon design variant.
- Section 6.4.7, Project Design Features, was updated to reflect emissions benefits achieved by AQ-IAMF#1.

This report presents the air quality and GHG technical evaluation for the California High-Speed Rail (HSR) San Jose to Merced Project Section (Project Section), focusing on the portion of the Project Section between San Jose and Carlucci Road (San Jose to Central Valley Wye Project Extent, or project), prepared in support of environmental reviews required under the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA).

1.1 Background of the HSR Program

The Authority proposes to construct, operate, and maintain an electric-powered HSR system in California, connecting the San Francisco Bay Area (Bay Area) and Central Valley to Southern California. When completed, the nearly 800-mile train system would provide new passenger rail service to more than 90 percent of the state's population. More than 200 weekday trains would serve the statewide intercity travel market. The system would be capable of operating speeds up to 220 miles per hour (mph) in certain HSR sections, with state-of-the-art safety, signaling, and automatic train control (ATC) systems. The California HSR System would connect and serve the state's major metropolitan areas, extending from San Francisco to Los Angeles and Anaheim in Phase 1, with extensions to Sacramento and San Diego in Phase 2.

The Authority and Federal Railroad Administration (FRA) commenced their tiered environmental planning process with the 2005 *Final Program Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System* (Statewide Program EIR/EIS) (Authority and FRA 2005). After completion of the first-tier programmatic environmental documents,[2] the Authority and FRA began preparing second-tier project environmental evaluations for sections of the statewide HSR system. Chapter 2, Description of the San Jose to Central Valley Wye Project Extent, of this analysis provides details of the project and the four alternatives under consideration.

1.2 Purpose of this Technical Report

This report supports the San Jose to Merced Project Section EIR/EIS. The resource assessment presented in this analysis is consistent with the Authority and FRA's *California High Speed Rail Project EIR/EIS Environmental Methodology Guidelines Version 5.09,* adopted in April 2017 (Authority and FRA 2017), as well as the following technical guidance manuals:

- Bay Area Air Quality Management District's (BAAQMD) *California Environmental Quality Act Air Quality Guidelines* (BAAQMD 2017a)
- Federal Highway Administration's (FHWA) Memorandum*: Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents* (FHWA 2016)
- Office of Environmental Health Hazard Assessment's (OEHHA) *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015)
- MBARD's *CEQA Air Quality Guidelines* (MBUAPCD 2008)

[2] Two program-level environmental documents were prepared: the Final Program EIR/EIS for the Proposed California High-Speed Train System (Authority and FRA 2005) and the Bay Area to Central Valley High-Speed Train Final Program EIR/EIS (Authority and FRA 2008). These documents evaluated the impacts of proposed HSR corridors and selected the HSR sections constituting the California HSR System.

- San Joaquin Valley Air Pollution Control District's (SJVAPCD) *Guidance for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015a)

1.3 Organization of this Technical Report

This technical report includes the following chapters in addition to this introductory chapter:

- Chapter 2, Description of the San Jose to Central Valley Wye Project, describes the alternatives as currently proposed.
- Chapter 3, Laws, Regulations, and Orders, introduces federal, state, and local laws, regulations, and policies relevant to air quality and GHGs.
- Chapter 4, Pollutants of Concern, describes the key criteria pollutants, toxic air contaminants (TAC), and GHGs of concern for the project.
- Chapter 5, Affected Environment, discusses existing conditions, including air quality and global climate change in the resource study area (RSA).
- Chapter 6, Methods for Evaluating Effects, describes the analytical methods and assumptions used to determine the effects of the project on air quality and GHG.
- Chapter 7, Air Quality Effects Analysis, assesses potential effects of construction and operations of the project alternatives on ambient air quality and human health.
- Chapter 8, Global Climate Change Effects Analysis, assesses the potential effects of construction and operations of the project alternatives on GHGs and climate change.
- Chapter 9, Mitigation Measures, presents mitigation measures to reduce air quality effects.
- Chapter 10, Cumulative Effects, assesses the potential for construction and operations of the project alternatives, in combination with past, present, and reasonably foreseeable projects, to result in cumulative air quality or GHG effects.
- Chapter 11, Conformity Analysis, presents the general conformity determination for the applicant-preferred alternative consistent with Clean Air Act (CAA) 40 Code of Federal Regulations (C.F.R.) Section 93.158(c).
- Chapter 12, References, provides complete reference information for the published, online, agency, institutional, and individual sources consulted in preparation of this report.
- Chapter 13, Preparer Qualifications, presents the credentials of the staff who oversaw the preparation of this report.
- Supporting information is provided in the following appendices:
  - Appendix A, CalEEMod Outputs for Station and Maintenance Facility Operation, MOWF Calculations, and East Gilroy Transit Calculations, provides the California Emissions Estimator Model (CalEEMod) output files for the local analysis of criteria pollutants and GHG emissions from operation of the stations and maintenance facilities. Assumptions and spreadsheets for the maintenance of way facility (MOWF) and East Gilroy transit calculations are also provided.
  - Appendix B, CALINE4 Outputs for CO Hot-Spot Analysis, provides the CALINE4 output files for the localized carbon monoxide (CO) hot-spot analysis.
  - Appendix C, Construction Emission and Cumulative HRA Assumptions, provides the construction inventory and emission factor assumptions for the analysis of criteria pollutants and GHG emissions from construction of the project, as well as the ambient sources assumed in the cumulative HRA.
  - Appendix D, Ballast Hauling Memorandum, describes quarry selection process and scenario analysis performed for the ballast-hauling assessment.
  - Appendix E, Localized Impacts from Construction, describes air dispersion modeling methods for evaluating localized air quality effects.

- Appendix F, Potential Impact from Induced Winds, provides calculations and analysis details for the induced wind analysis.
- Appendix G, Council on Environmental Quality Provisions Covering Incomplete or Unavailable Information, describes incomplete or unavailable information for mobile source air toxics (MSAT).

2 DESCRIPTION OF THE SAN JOSE TO CENTRAL VALLEY WYE PROJECT

The Project Section would provide HSR service between Diridon Station in downtown San Jose and a station in downtown Merced, with a Gilroy station either in downtown Gilroy or east of Gilroy. The Project Section is designed to allow trains to and from the Bay Area to transition smoothly from north-south to east-west travel with a minimum reduction in speed to achieve the Proposition 1A operational service time requirement. Proposition 1A requires that the system be designed to be capable of a nonstop operational service time of 2 hours and 10 minutes between San Jose and Los Angeles Union Station.[3] The Project Section follows existing transportation corridors to the extent feasible, as directed by Proposition 1A.[4]

The Project Section is comprised of three project extents (Figure 2-1):

- From Scott Boulevard in Santa Clara to Carlucci Road in Merced County, at the western terminus of the Central Valley Wye (the project)
- The Central Valley Wye, which connects the east-west portion of HSR from the Bay Area to the Central Valley with the north-south portion from Merced to Fresno
- The northernmost portion of the Merced to Fresno Project Section, from the northern limit of the Central Valley Wye (Ranch Road) to the Merced Station

The project would connect San Jose to the Central Valley portion of the HSR system at the Central Valley Wye in Merced County, which in turn connects to the portion of the system running north to Merced and south to Fresno and Southern California. Because the portion of the Project Section between Carlucci Road and Merced has been analyzed in the *Merced to Fresno Section Final EIR/EIS* (Authority and FRA 2012a) and the *Merced to Fresno Section: Central Valley Wye Supplemental EIR/EIS* (Authority 2019a), the analysis in this document focuses on the project extent between Scott Boulevard and Carlucci Road (the project).

[3] Proposition 1A requires that the HSR system be designed to achieve a nonstop operational service time of 2 hours and 40 minutes between San Francisco and Los Angeles Union Station, including a 30-minute ride between San Francisco and San Jose (Streets & Highways Code § 2704.09(b)(4)).

[4] Proposition 1A directs that the HSR system maximize use of existing transportation and utility corridors to the extent feasible (Streets & Highways Code § 2704.09(g)).

Source: Authority 2019b JUNE 2019

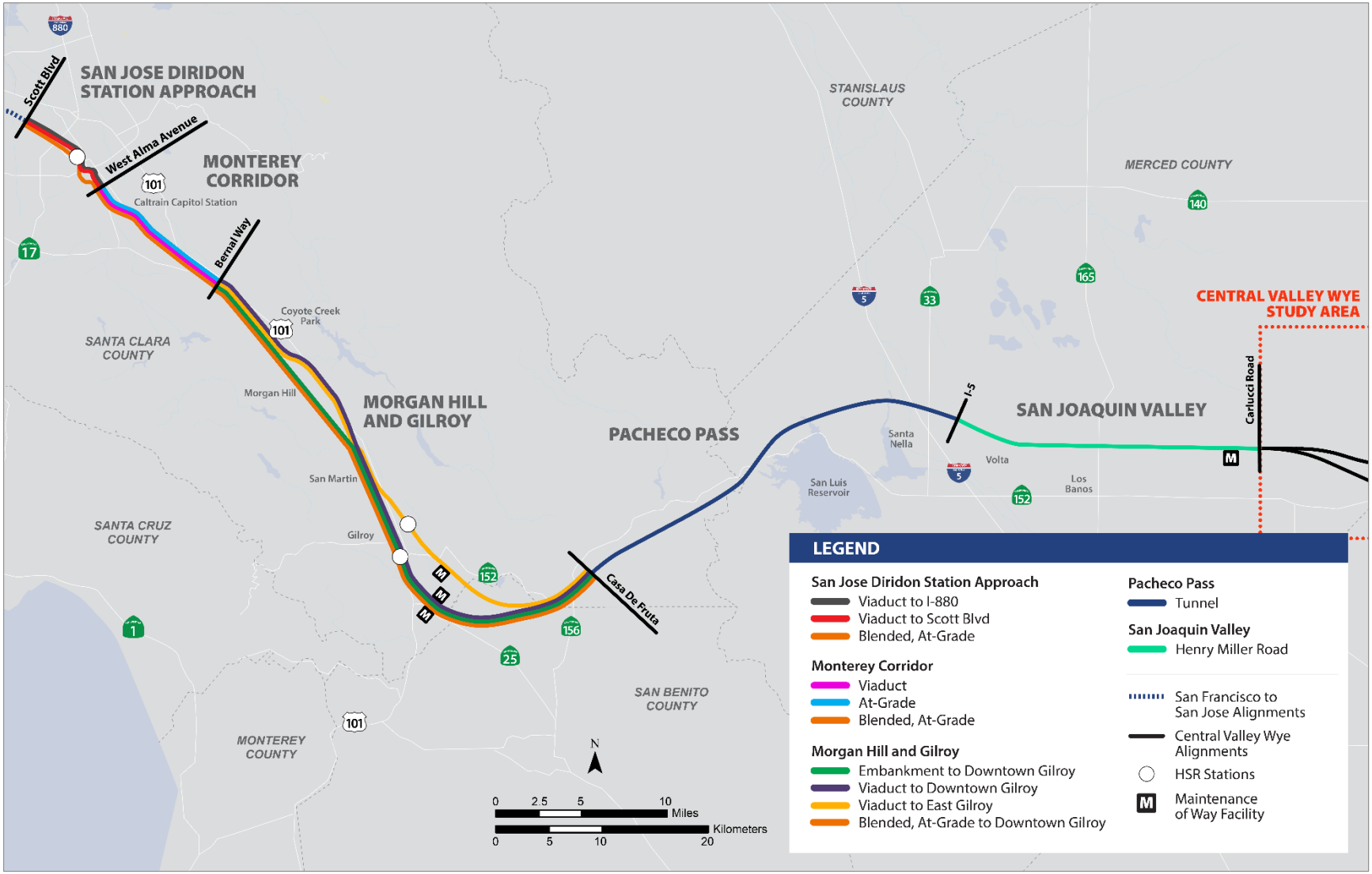
Figure 2-1 Proposed San Jose to Merced Project Section

2.1 Summary of Design Features

While the northern service limit of the project would be the San Jose Diridon Station, the engineering design and evaluation includes infrastructure and train operations north to Scott Boulevard to serve the San Jose Diridon Station; this additional analysis overlaps with the analysis of the San Francisco to San Jose Project Section to the north. The project is an approximately 90-mile portion of the 145-mile-long Project Section, which includes dedicated or blended[5] HSR track and systems; HSR stations located at San Jose Diridon and Gilroy; a maintenance of way facility (MOWF) in the Gilroy area; and a maintenance of way siding (MOWS) near Turner Island Road in the Central Valley (Figure 2-2). HSR stations at San Jose Diridon and Gilroy would support transit-oriented development, provide an interface with regional and local mass transit services, and provide connectivity to the South Bay and Central Valley highway network.[6] While the northern service limit of the project would be the San Jose Diridon Station, the engineering design and evaluation includes train operations north to Scott Boulevard in Santa Clara to support the independent utility of an HSR station at Diridon Station and to describe the proposed interface of HSR alternatives with blended Caltrain railroad infrastructure. This additional analysis between San Jose Diridon Station and Scott Boulevard overlaps with the analysis of the San Francisco to San Jose Project Section to the north. Under three alternatives, the transition of HSR infrastructure and operations from the blended system between San Francisco and Santa Clara to a fully dedicated system south of the San Jose Diridon Station would occur at either Scott Boulevard or near Interstate (I-) 880. A fourth alternative would extend the blended system through San Jose to Gilroy. The project would extend south from San Jose to Gilroy, then east through the Pacheco Pass to the Central Valley to end at Carlucci Road, the western boundary of the Central Valley Wye.

5 *Blended* refers to operating HSR trains with existing intercity, commuter, and regional trains on shared infrastructure.

6 *South Bay* refers to Santa Clara County.



Source: Authority 2019b

JUNE 2019

Figure 2-2 Overview of Subsection Design Options

The project comprises the following five subsections:

- **San Jose Diridon Station Approach**—Extends approximately 6 miles from north of San Jose Diridon Station at Scott Boulevard in Santa Clara to West Alma Avenue in San Jose. This subsection includes San Jose Diridon Station and overlaps the southern portion of the San Francisco to San Jose Project Section.
- **Monterey Corridor**—Extends approximately 9 miles from West Alma Avenue to Bernal Way in the community of South San Jose. This subsection is entirely within the city of San Jose.
- **Morgan Hill and Gilroy**—Extends approximately 30–32 miles from Bernal Way in the community of South San Jose to Casa de Fruta Parkway/State Route (SR) 152 in the community of Casa de Fruta in Santa Clara County.
- **Pacheco Pass**—Extends approximately 25 miles from Casa de Fruta Parkway/SR 152 to I-5 in Merced County.
- **San Joaquin Valley**—Extends approximately 18 miles from I-5 to Carlucci Road in unincorporated Merced County.

The Authority and FRA have developed four end-to-end alternatives for the project (Figure 2-2). Table 2-1 shows the design options that distinguish the alternatives by subsection; Figures 2-3 through 2-7 illustrate the features of the four alternatives by subsection.

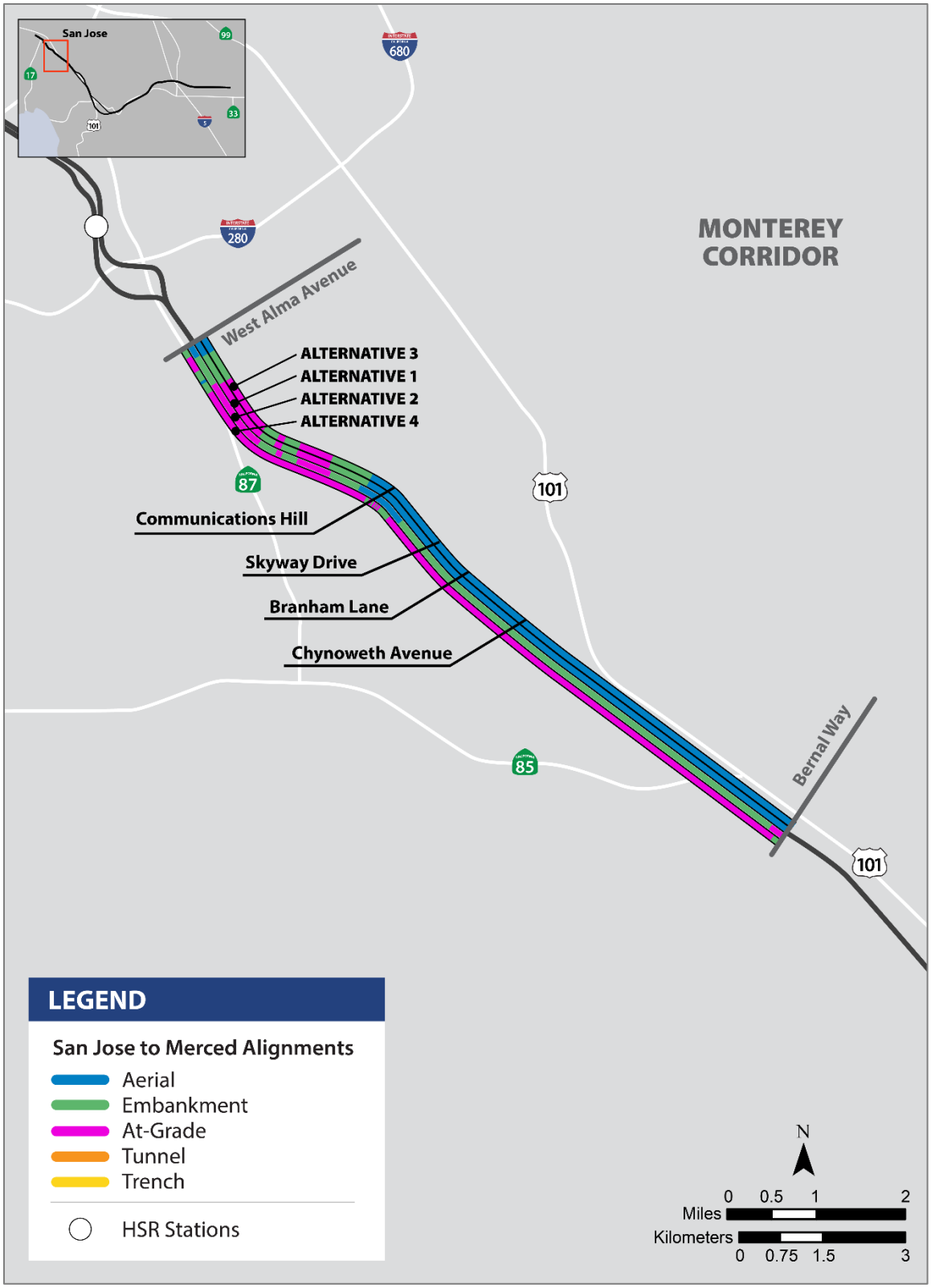
Table 2-1 San Jose to Central Valley Wye Design Options by Subsection

Subsection/Design Options	Alternative 1	Alternative 2	Alternative 3	Alternative 4
San Jose Diridon Station Approach				
Viaduct to Scott Boulevard		X	X	
Viaduct to I-880	X			
Blended, At-Grade				X
Monterey Corridor				
Viaduct	X		X	
At grade		X		
Blended, At-Grade				X
Morgan Hill and Gilroy				
Embankment to downtown Gilroy		X		
Viaduct to downtown Gilroy	X			
Viaduct to east Gilroy			X	
Blended, At-Grade to downtown Gilroy				X
Pacheco Pass				
Tunnel	X	X	X	X
San Joaquin Valley				
Henry Miller Road	X	X	X	X

Source: Authority 2019b

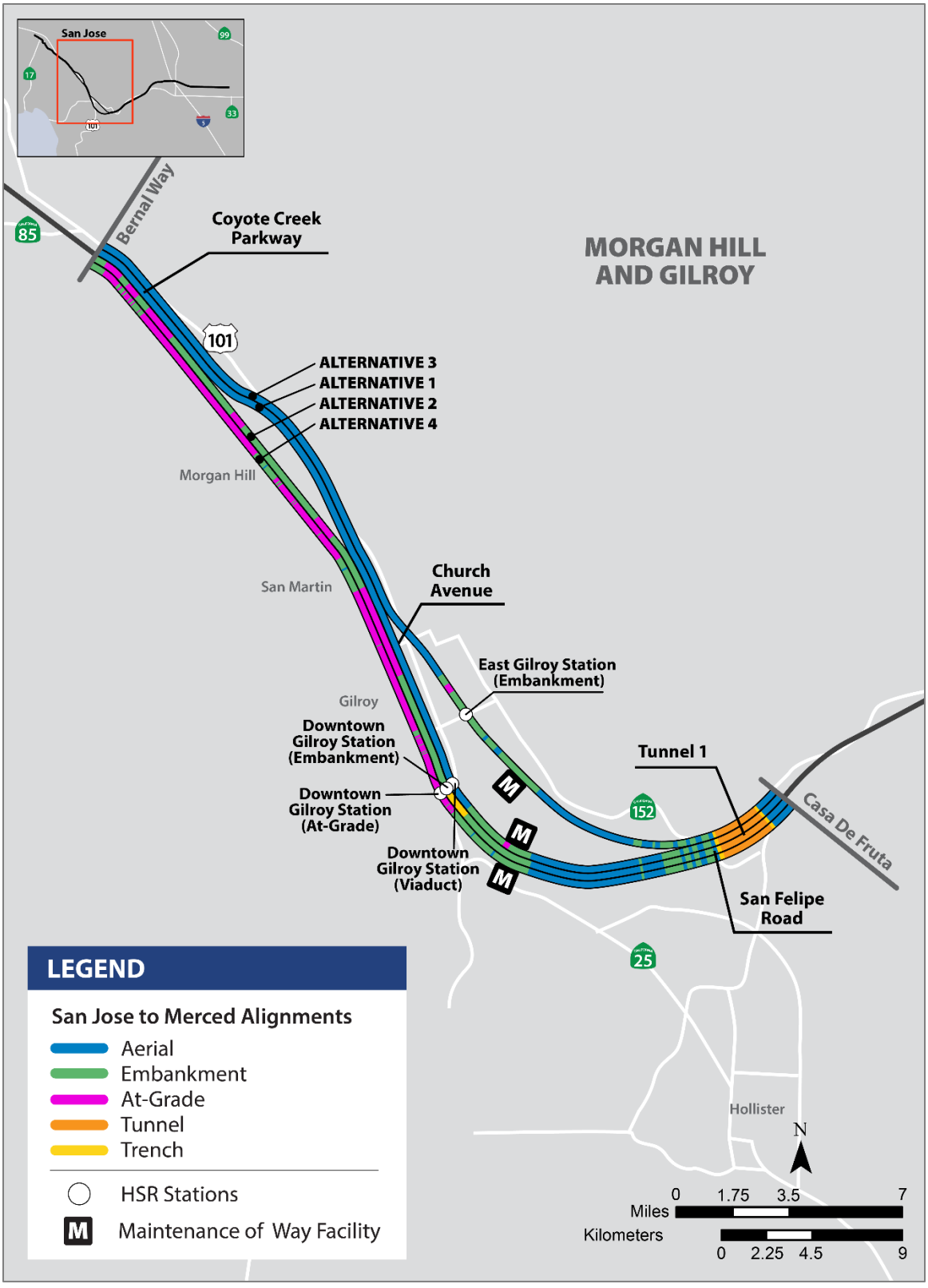
Source: Authority 2019b JUNE 2019
CEMOF = Centralized Equipment Maintenance and Operation Facility

Figure 2-3 San Jose Diridon Station Approach Subsection



Source: Authority 2019b JUNE 2019

Figure 2-4 Monterey Corridor Subsection



Source: Authority 2019b JUNE 2019

Figure 2-5 Morgan Hill and Gilroy Subsection

Source: Authority 2019b JUNE 2019

Figure 2-6 Pacheco Pass Subsection

Source: Authority 2019b JUNE 2019

Figure 2-7 San Joaquin Valley Subsection

2.2 Description of Alternatives

This section describes the proposed design options of the project alternatives in each subsection. The alternatives are similar in length, differing only in the Morgan Hill and Gilroy Subsection, where divergent alignments in Morgan Hill and the alternative alignments through the Downtown Gilroy Station and the East Gilroy Station result in linear variations.

2.2.1 Alternative 1

Development of Alternative 1 was intended to minimize the project footprint, minimize ground disturbance, minimize continuous surface features, and decrease necessary right-of-way acquisition through extensive use of viaduct structures and bypassing downtown Morgan Hill. The HSR alignment for this alternative would consist of 45.4 miles of viaduct, 4.3 miles at grade, 21.9 miles of embankment, two tunnels totaling 15.0 miles, and 2.3 miles in trench.

2.2.1.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

The San Jose Diridon Station Approach Subsection, from Scott Boulevard in Santa Clara to West Alma Avenue in San Jose, would be approximately 6 miles through the cities of Santa Clara and San Jose (Figure 2-3). The existing Caltrain track in this subsection consists of a predominantly two-track and three-track at-grade alignment. South of De La Cruz Boulevard, the Union Pacific Railroad (UPRR) tracks of the Coast Line from the northeast converge with the Caltrain corridor tracks and continue south adjacent to the east side of the railroad corridor to the Santa Clara Caltrain Station. Between the Caltrain College Park Station and San Jose Diridon Station, Caltrain's Central Equipment Maintenance and Operations Facility comprises three mainline tracks, a maintenance building, and nine yard tracks. San Jose Diridon Station includes five passenger platforms served by nine yard tracks along the west side of the station house. HSR diverges from the Caltrain corridor at Park Avenue, just south of San Jose Diridon Station, and returns to the Caltrain corridor at the north end of the Caltrain Tamien Station, which includes a passenger platform served by two tracks and a single through-track.

Alternative 1 would begin at Scott Boulevard in blended service with Caltrain at grade. The blended service would entail several minor realignments of existing Caltrain track between Scott Boulevard and I-880. New UPRR and Caltrain track would be constructed just north of the HSR guideway beginning north of I-880 to just past the Santa Clara Station.

Beginning at I-880 on the southbound approach to West Hedding Street, Caltrain tracks would be realigned to accommodate the HSR tracks. Dedicated HSR tracks would diverge from the Caltrain Mainline Track (MT) 2 and MT3 tracks and continue southeast along the north side of the existing Caltrain corridor, crossing under West Hedding Street. To accommodate the new track configuration, the West Hedding Street roadway overpass would be replaced with a new overpass bridge that would also pass over Stockton Avenue.

Southeast of West Hedding Street, the dedicated HSR tracks would transition from a two-track at-grade configuration to retained fill and finally to a two-track aerial profile. The HSR alignment would begin the short viaduct option by rising on embankment to an approximately 70-foot-high aerial structure. A new bridge structure would be built to carry the realigned UPRR/Caltrain MT2 tracks over the West Taylor Street underpass. University Avenue would become a cul-de-sac. A new pedestrian underpass would be constructed near the alignment of Emory Street to allow Caltrain riders to reach both platforms of the Caltrain College Park Station. The HSR viaduct would also cross over West Taylor Street, then shift horizontally a maximum of 500 feet east of the existing UPRR/Caltrain mainline tracks to maintain high-speed track curvature.

Both legs of the UPRR Warm Springs Subdivision Lenzen Wye would be relocated, and North Montgomery Street would be extended north of the alignment of Lenzen Avenue almost to the former Lenzen Wye to maintain property access beneath the 60-foot-high HSR viaduct. The HSR viaduct would cross over Cinnabar Street, both legs of the relocated Lenzen Wye and North Montgomery Street, West Julian Street, and West Santa Clara Street while curving west toward

the UPRR/Caltrain mainline tracks to enter a new aerial dedicated HSR station at San Jose Diridon Station.

Continuing on an aerial structure, the alignment would diverge from the Caltrain right-of-way south of the San Jose Diridon Station HSR platforms by turning sharply east at the Park Avenue undercrossing of UPRR/Caltrain tracks. The HSR aerial structure would cross over Los Gatos Creek and San Carlos Street, then over Royal Avenue and the intersection of Bird Avenue and Auzerais Avenue, then over the I-280/SR 87 interchange. Continuing south along the east side of SR 87, the HSR aerial structure would cross over West Virginia Street and the Guadalupe River Trail, then over the Caltrain rail bridge, the Guadalupe River, and Willow Street. The HSR aerial structure would continue south over the Caltrain Tamien Station on an alignment between Tamien Station and the SR 87 freeway, transitioning to the Monterey Corridor Subsection at West Alma Avenue.

Wildlife Crossings

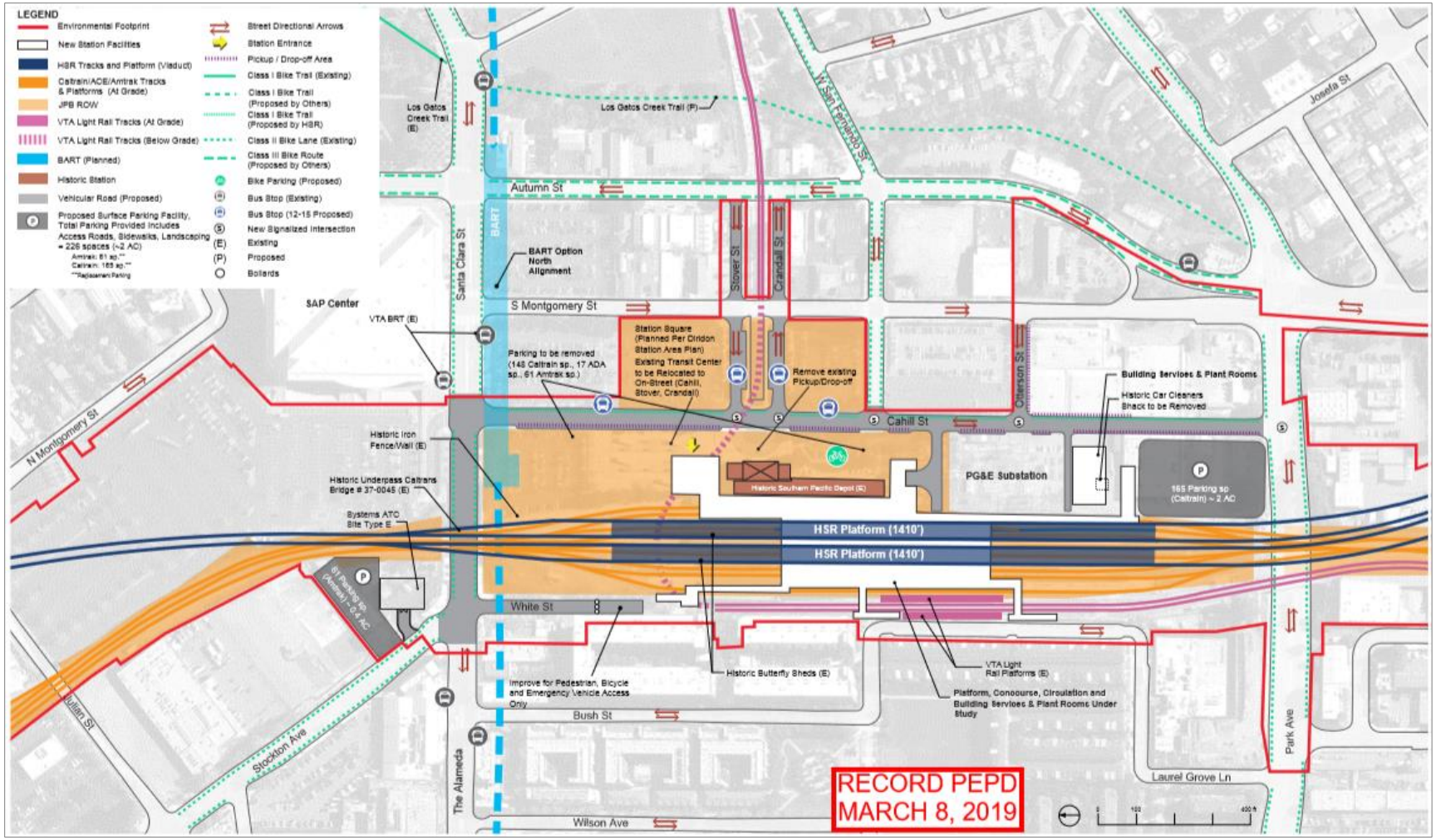
There would be no wildlife crossings in this subsection.

Stations

The HSR San Jose Diridon Station would entail a four-track aerial alignment over the existing Diridon Station at approximately 62 feet to top of rail with 1,410-foot-long platforms above the existing Caltrain rail yard centered between Santa Clara Street and Park Avenue. The existing historic train station would remain in place. As illustrated on Figures 2-8 and 2-9, the primary HSR station building would be constructed north of the existing station building but would continue to the south, wrapping around the existing Caltrain station building. The HSR station building would be accessed from the east at three entrances—the main entrance on the east side of the tracks north of the existing Historic Depot next to the future Bay Area Rapid Transit (BART) alignment; an entrance south of the existing historic Diridon Station building; and an entrance on the east side south of the Pacific Gas and Electric Company (PG&E) power station. There would also be three entrances to the HSR station on the west side of the tracks—a north entrance at the end of White Street and two entrances on Laurel Grove Lane, one north and one south. The aerial station would require viaduct columns within the PG&E substation. The HSR station building would encompass 99,289 square feet with a 4,400-square-foot substation and systems building. The concourse would consist of a mezzanine level above the existing Caltrain tracks and below the HSR platforms, with three east-west connections across the tracks at the north, south, and middle.

Existing parking spaces (226) at Cahill Street would be displaced and replaced 1:1 with new parking areas at Cahill and Park Streets and at Stockton and Alameda Streets. HSR parking demand of 1,050 spaces in 2040 would be met by commercially available parking downtown or at the airport. The Authority has provided a Station Area Planning grant to the City of San Jose to advance the implementation of the Diridon Station Area Plan adopted by the San Jose City Council. Through this effort, the City would address short-term parking needs during HSR and BART Phase II construction and would also address plans for transitioning the parking needed during construction to the highest and best use after construction. Another Station Area Planning grant to the (Santa Clara) Valley Transportation Authority (VTA) would fund a San Jose Diridon Station Facilities Master Plan. This grant would develop a parking program to manage parking demand and supply over time to reflect changes in ridership and park-and-ride mode share. These two studies would provide input into a multimodal access plan for the station that would be developed prior to final station design and construction.

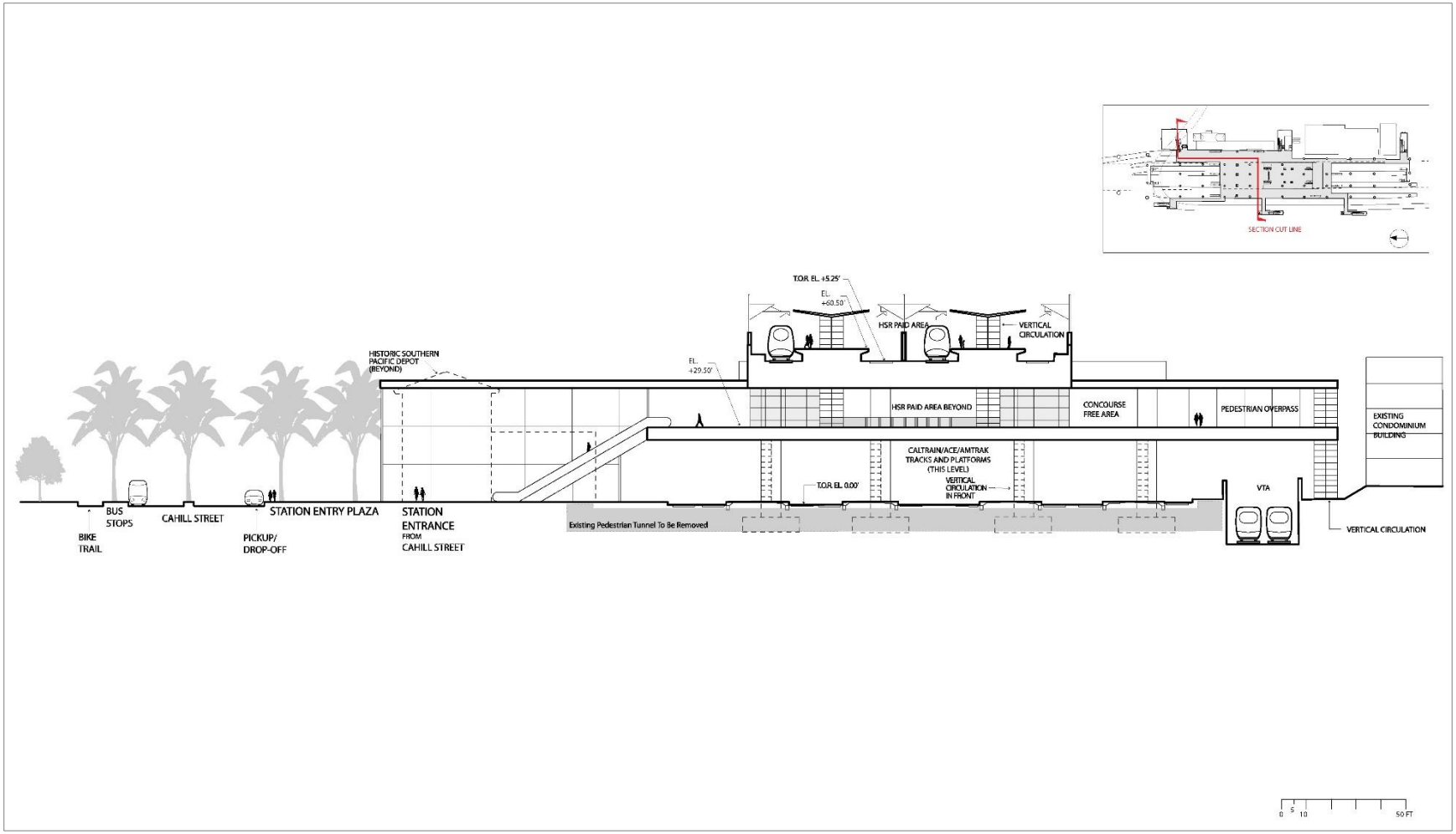
Existing underutilized parking capacity at and around the station would be used to meet the estimated HSR parking demand until a station area parking policy and program are implemented. The Authority would rely on commercially available parking to meet HSR parking demand, provided and priced in accordance with local conditions. HSR riders would be able to walk or take a shuttle, such as the City of San Jose's DASH, from parking located downtown or adjacent to the station.



Source: Authority 2019b

JUNE 2019

Figure 2-8 Conceptual Diridon Aerial Station Plan



Source: Authority 2019b

JUNE 2019

Figure 2-9 Conceptual San Jose Diridon Station Cross Section

The existing off-site bus transit center would be relocated to an on-street facility on Cahill, Stover, and Crandall Streets. Street improvements would include reconfiguring and extending Cahill Street from Santa Clara Street to Park Avenue, and converting Cahill, Stover, and Crandall Streets to a transit street with 12–15 bus stops. Montgomery Street would be reconfigured to provide curb space for a bus layover. A pick-up/drop-off zone of 1,900 square feet would be provided. New two-way cycle tracks would be installed on the east side of Cahill Street. A 4,000-square-foot bicycle facility would be constructed. New signals and pedestrian crossings would be developed at Cahill and Park, Otterson, Stover, West San Fernando, and Crandall Streets.

Other rail operators in the station area are Caltrain, Altamont Corridor Express, Amtrak, VTA light rail, and future BART. VTA has plans to construct new light rail station platforms as a separate project, and BART plans to extend service from the Berryessa Station to Santa Clara with a stop at Diridon by 2026. As a separate project, VTA has plans to construct new light rail station platforms.

Traction Power Sites and Power Connections

One new traction power substation (TPSS) would be constructed in this subsection on the east side of the Caltrain corridor south of I-880 in San Jose (just southeast of the I-880 overcrossing). The TPSS would be interconnected to two new gas-insulated substation breaker-and-a-half bays. The bays would be installed within the fenceline of the PG&E FMC substation, just north of the I-880 overcrossing, via an aerial double-circuit 115-kilovolt (kV) tie-line.

Train Control and Communication Facilities

An enhanced ATC system would control the trains and comply with the FRA-mandated positive train control requirements, including safe separation of trains, over-speed prevention, and work zone protection. This system would include communications towers at intervals of approximately 1.5–3 miles. Signaling and train control elements within the right-of-way would include 10- by 8-foot communications shelters that house signal relay components and microprocessor components, cabling to the field hardware and track, signals, and switch machines on the track. Communications towers in these facilities would use a 6- to 8-foot-diameter 100-foot-tall pole. The communications facilities would be located near track switches and would be grouped with other traction power, maintenance, station, and similar HSR facilities where possible. Where communications towers cannot be co-located with TPSSs or other HSR facilities, the communications facilities would be sited near the HSR corridor in a fenced area approximately 20 by 15 feet.

Under Alternative 1, there would be six ATC sites located between I-880 in San Jose and the I-280 and SR 87 interchange:

- Two sites near the TPSS facility
- One site just north of the San Jose Diridon Station
- Three sites between Park Avenue and the proposed HSR crossing of SR 87

One stand-alone communications radio site would be constructed, at one of two alternative locations, both south of Scott Boulevard along the east side of the Caltrain corridor.

Maintenance Facility

No maintenance facilities are proposed for this subsection.

2.2.1.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The Monterey Corridor Subsection would be approximately 9 miles long and entirely within the San Jose city limits. From the San Jose Diridon Station Approach Subsection at West Alma Avenue, just south of the Caltrain Tamien Station, the alignment would extend primarily southeast to Bernal Way (Figure 2-4). Alternative 1 would be on viaduct in the median of Monterey Road. UPRR MT1, Caltrain MT2, and Caltrain storage tracks would be shifted east between West Alma Avenue and Caltrain/UPRR control point (CP) Lick, at the southeast base of Communications Hill.

Railroad bridges over Almaden Road and Almaden Expressway would be extended to accommodate the track shift. The UPRR Luther spur track south of Almaden Expressway would also be relocated to accommodate the MT shifts.

From West Alma Avenue, the HSR alignment would descend from a viaduct 54 feet above grade to embankment (i.e., 5 feet or higher) north of Almaden Road. The alignment would continue primarily on embankment to cross over Almaden Road on a short aerial structure, then under Almaden Expressway, then continue south on embankment to at grade under Curtner Avenue. The alignment would continue south primarily at grade along the northern base of Communications Hill and ascend to aerial structure before crossing over and entering the Monterey Road median just south of Hillsdale Avenue. Construction of the viaduct over the existing Caltrain Capitol Station would require falsework over the station if constructed by cast-in-place methods or would require relocating the station 500 feet to the south if constructed by precast segments. The alignment would continue south on viaduct in the median of Monterey Road, crossing over Capitol Expressway, Skyway Drive, Branham Lane, Roeder Road/Chynoweth Avenue, Blossom Hill Highway, SR 85/West Valley Freeway, and Bernal Road.

The design assumes a reduction from six to four travel lanes on Monterey Road, beginning south of Southside Drive and continuing to a short distance south of Blossom Hill Road where the existing roadway is already four travel lanes. Three existing mid-block left-turn lanes would be closed because of substandard stopping sight distance. Additionally, the design assumes a combined left-turn and through lane at Palm Avenue.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Two traction power paralleling stations would be constructed in this subsection:

- North of the alignment near Curtner Avenue or south of the alignment at Communications Hill
- South of SR 85 or between Bernal Road and the Bernal Road ramp onto Monterey Road

Train Control and Communication Facilities

One ATC site would be constructed in the Monterey Corridor Subsection at one of two locations east of the guideway in the vicinity of Chynoweth Avenue.

Three stand-alone communications radio sites are proposed:

- Near Almaden Road on the east side of the Caltrain corridor (two site options)
- Near Capitol Expressway (two site options)

Maintenance Facility

No maintenance facilities are proposed for this subsection.

2.2.1.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection would be approximately 30 to 32 miles long and located south of the Monterey Corridor Subsection (Figure 2-5). From Bernal Way in South San Jose, the alignment would extend through Morgan Hill and San Martin to the Downtown Gilroy Station, then curve generally east across the Pajaro River floodplain and through a portion of northern San Benito County before entering a tunnel (Tunnel 1) at the base of the Diablo Range. The alignment would exit the tunnel at Casa de Fruta Parkway/SR 152 in unincorporated eastern Santa Clara County, where it would transition to the Pacheco Pass Subsection. Alternative 1 in this subsection

would construct the Viaduct to downtown Gilroy design option and an aerial Downtown Gilroy Station.

Beginning at the southern limit of the Monterey Corridor Subsection, the alignment would be on viaduct in the median of Monterey Road. In this four-lane section of the road, the design assumes a combined left-turn and through lane to Palm Avenue. The alignment would begin curving east on viaduct (approximately 40 feet above grade) near Ogier Avenue in Santa Clara County. The northbound lanes of Monterey Road would be realigned at this transition to cross beneath the HSR viaduct between columns of the aerial structure.

After crossing the Coyote Valley on viaduct, the alignment would cross over Burnett Avenue in Morgan Hill and parallel US 101 on the west side of the freeway. Continuing south, the alignment would bypass downtown Morgan Hill by crossing over Cochrane Road and associated freeway ramps, East Main Avenue, East Dunne Avenue and associated freeway ramps, and Tennant Avenue and associated freeway ramps.

South of Tennant Avenue and the city limits of Morgan Hill, the alignment would turn west, relocating the cul-de-sac at Fisher Avenue to the west of the HSR facility, then crossing over Maple Avenue, West Little Llagas Creek, East Middle Avenue, and Llagas Creek before rejoining Monterey Road and the UPRR corridor in the community of San Martin. The crossing of Llagas Creek would allow for wildlife movement by clear-spanning both banks and riparian habitat. New storm drainage infrastructure would be constructed on the west side of the alignment along Llagas Creek. The alignment would continue on viaduct along the east side of UPRR and cross over East San Martin Avenue.

South of Las Animas Avenue and the west branch of Llagas Creek, the alignment would curve east over Leavesley Road and Casey Lane. Continuing south, the viaduct would cross the Gilroy Prep School/South Valley Middle School sports field, a portion of the Gilroy Prep School campus, and Upper Miller Slough (with armor added to the channel to strengthen the stormwater conveyance) before crossing over IOOF Avenue, Lewis Street, Martin Street, East 6th Street, and a realigned East 7th Street, to arrive at the downtown Gilroy station on low viaduct (approximately 33 feet high).

South of the Downtown Gilroy Station, the alignment would continue on viaduct over East 10th Street l. Banes Lane would be reconstructed to provide a standard cul-de-sac. South of the Princevale Channel crossing, the alignment would ascend, still on viaduct, over Luchessa Avenue, US 101, and one spur UPRR track. After branching from the main UPRR track and crossing under the HSR viaduct, the new UPRR track for freight access to the MOWF would be provided to travel at grade on the east side of the new HSR track toward the South Gilroy MOWF site. Both the UPRR track and HSR tracks would cross the City of Gilroy wastewater disposal ponds. Continuing south, the alignment would ascend onto embankment. New storm drainage infrastructure would be constructed on the west side of the alignment at Carnadero Avenue, which would be closed where it meets the alignment. Bloomfield Avenue would be realigned to cross over the South Gilroy MOWF site. Sheldon Avenue would become a cul-de-sac south of the HSR alignment and would be abandoned north of the alignment. Before crossing the Pajaro River, the alignment would ascend onto viaduct.

The HSR alignment south and east of Gilroy would cross an agricultural area in Santa Clara and San Benito Counties that is part of the upper Pajaro River floodplain, historically referred to as Soap Lake. HSR guideway on viaduct would be built over the major watercourses to provide a floodplain crossing that is neutral to the hydrology and hydraulics of the floodplain and to accommodate wildlife movement. Because of the Calaveras fault crossing at this location, Tequisquita Slough would be partially filled by approximately 800 feet of HSR embankment. The embankment area would include cross-culverts and 1.3 acres of adjacent floodwater detention basins; in addition, an extended viaduct over Pacheco Creek would serve to maintain floodplain capacity and function. HSR would be on embankment between Pacheco Creek and Lovers Lane. The alignment would return to viaduct at Lovers Lane. After Lovers Lane, the alignment would continue in a combination of embankment and viaduct until reaching the portal for Tunnel 1 on the east side of SR 152.

After exiting the 1.4-mile Tunnel 1 on the west side of SR 152, the alignment would cross over SR 152 and the southern portion of the Pacheco Creek Valley on an aerial structure south of Casa de Fruta. The alignment would move onto embankment just beyond Southside Way at the western transition to the Pacheco Pass Subsection.

Wildlife Crossings

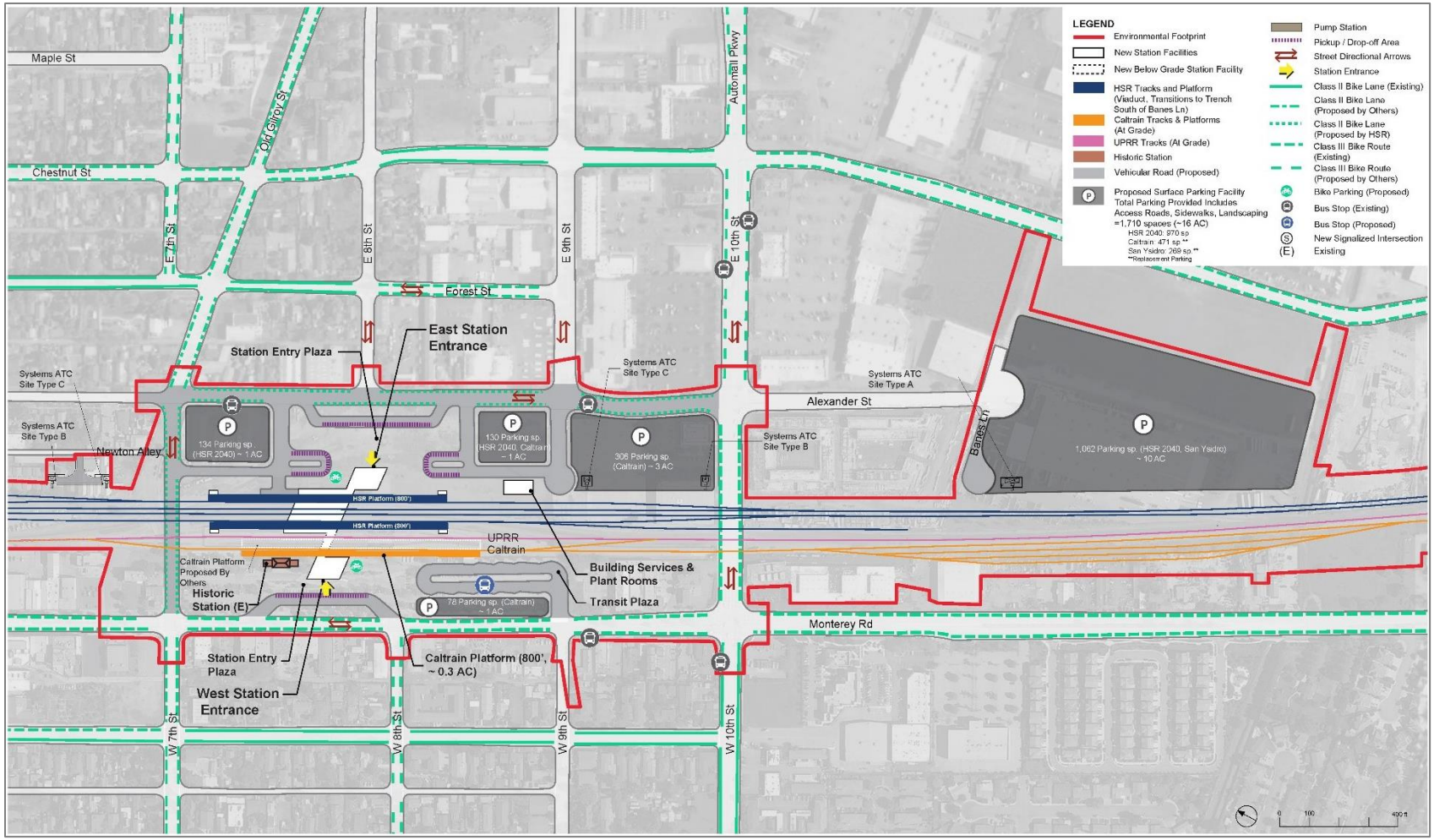
Three wildlife crossings would be provided at the base of Tulare Hill north of the Metcalf Substation connecting to Coyote Creek. The existing culvert under Monterey Road at Fisher Creek would be realigned and replaced with a larger box culvert to improve wildlife movement under Monterey Road and the HSR track. The crossing of Llagas Creek would allow for wildlife movement by clear-spanning both banks and riparian habitat. The alignment would be primarily on viaduct through the Soap Lake area to allow for wildlife movement. Viaducts have heights, widths and depths considered to be very favorable for wildlife movement.

Stations

Alternative 1 would enter the Downtown Gilroy Station on aerial structure (Figures 2-10 and 2-11). The HSR Downtown Gilroy Station would be constructed south of the existing Caltrain station. The station approach would be on a low viaduct—approximately 33 feet to top of rail—with dedicated HSR tracks to the east of UPRR between relocated Old Gilroy/7th Streets and 9th Street. The 800-foot platforms would be on the east and west side of the HSR tracks. The new HSR station building would have both east and west entrances: the main entrance for passengers arriving by auto or bicycle would be on the east side while the main entrance for passengers arriving on foot or by transit would be on the west side. The HSR station building would encompass 60,513 square feet with a 4,400-square-foot substation and systems building. The concourse would be below the new HSR tracks.

The existing 471 Caltrain parking spaces on the west side of the station would be replaced 1:1 by either reconfiguring parking on the west side of the station or relocating it to the east side of the station. The existing 269 San Ysidro housing development parking spaces would be replaced 1:1 with new surface parking at the south end of Alexander Street. HSR parking demand would be 970 spaces in 2040. In addition, the station site plan provides 970 new parking spaces in five areas, for a total of 1,710 parking spaces in 2040. One site would be west of the station along Monterey Road at 9th Street. The other four would be east of the station along Alexander Street at Old Gilroy Street, 9th Street, 10th Street, and Banes Lane. A multimodal access plan would be developed prior to design and construction of the station. The plan would be developed in coordination with local agencies and would include a parking strategy that would confirm the location, amount, and phasing of parking.

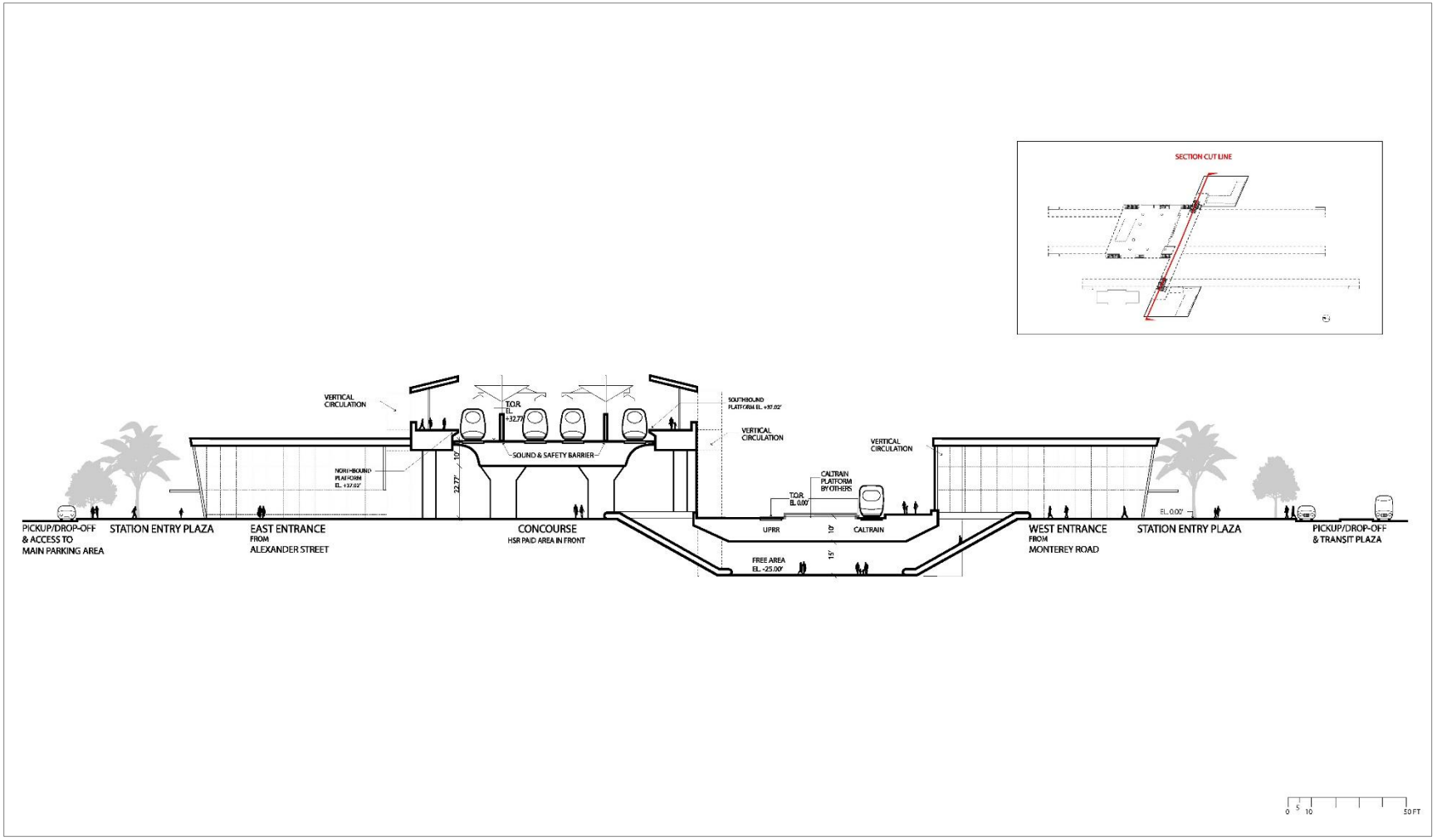
A total of eight bus bays would be provided. Street improvements would include realignment of Old Gilroy Street at East 7th Street; existing grade crossings would remain unchanged. A 4,000-square-foot bicycle facility would be constructed. Class II bike lanes would be provided on 7th and Alexander Streets.



Source: Authority 2019b

JUNE 2019

Figure 2-10 Conceptual Downtown Gilroy Aerial Station Plan



Source: Authority 2019b

JUNE 2019

Figure 2-11 Cross Section of Downtown Gilroy Station (Viaduct)

Traction Power Facilities

One new TPSS, Site 4—Gilroy, would be constructed at one of two alternate locations on the north side of the alignment: either east or west of Bloomfield Avenue. At this site, one new PG&E switching station would be co-located with the TPSS. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnections connecting the TPSS to a new utility switching station, to existing PG&E facilities, or both, typically within tie-line/utility corridors. North of Site 4—Gilroy, a traction power switching station would be constructed east of the HSR alignment at a location north of Palm Avenue.

Four traction power paralleling stations would be constructed adjacent to the guideway at the following locations:

- South of the alignment, either south of Diana Avenue or at the intersection of San Pedro Avenue and Walnut Grove Drive
- North of the alignment, either south of Masten Avenue or south of Rucker Avenue
- In the vicinity of Lovers Lane, either south of the alignment and west of Lovers Lane or north of the alignment and west of Lovers Lane
- At Tunnel 1 east portal

PG&E would reinforce the electric power distribution network to meet HSR traction and distribution power requirements by replacing (reconductoring) the 9.8-mile Metcalf to Morgan Hill and the 10.8-mile Morgan Hill to Llagas 115-kV power lines. The existing power lines to be reconductored, reusing the poles and towers, begin at the Metcalf Energy Center in San Jose and continue southeast parallel to the alignment on the east side before crossing to the west side near Ogier Avenue. Continuing on the west side to the Morgan Hill Substation on West Main Avenue in Morgan Hill, the lines then cross the east side of Peak Avenue and Dewitt Avenue, spanning West Dunne Avenue, Chargin Drive, Spring Avenue, and several residences. The alignment would continue south across an open-space area, then follow Sunnyside Avenue for approximately 0.5 mile. The alignment would continue south for approximately 4 miles, spanning additional open-space areas of wineries and the Corde Valle Golf Course. The alignment would then turn east along the north side of Day Road before heading south for approximately 2.5 miles and terminating at the Llagas Substation in Gilroy. Reconductoring at Metcalf Energy Center in San Jose would be required as well.

A permanent overhead distribution electrical power line from TPSS Site 4 to the Tunnel 1 portal location would provide power to the tunnel boring machine during construction and the tunnel fire-life-safety system during operation.

There are alternative sites for power drops at both portals for Tunnel 1. At each portal, one site is north of the alignment and one is south.

Train Control and Communication Facilities

A total of 17 ATC sites would be constructed in the Morgan Hill and Gilroy Subsection for this alternative:

- One site east of Monterey Road near Palm Avenue (two site options)
- One site at East Middle Avenue (two site options)
- One site between Las Animas Avenue and Leavesley Road
- One site south of Leavesley Road
- One site south of Lewis Street
- One site north of 6th Street in Gilroy
- Two sites south of 6th Street in Gilroy
- Two sites north of 10th Street in Gilroy
- One site south of Banes Lane
- Five sites north of Carnadero Avenue

- Three sites east of the Pajaro River
- One site near Lake Road (two site options)

Six stand-alone communication radio sites would be constructed within this subsection:

- Forsum Road or Blanchard Road (two site options)
- Near Bailey Avenue (two site options)
- Between Barnhart Avenue and Kirby Avenue (two site options)
- South of Cochrane Road along US 101 (two site options)
- North of Cox Avenue and south of West San Martin Avenue (two site options)
- East of the Pajaro River, south of Gilroy

Maintenance Facilities

The MOWF under Alternative 1 would be located in South Gilroy between Carnadero Road and Bloomfield Road (Figure 2-12) to accommodate machinery and inspection and maintenance staff. The MOWF would cover approximately 75 acres. The freight connection would be provided as described above.

2.2.1.4 Pacheco Pass Subsection

Alignment and Ancillary Features

The Pacheco Pass Subsection would be approximately 25 miles long. The alignment would generally follow the existing SR 152 corridor east from Casa de Fruta for approximately 17 miles, then diverge north around the Cottonwood Creek ravine of the San Luis Reservoir for approximately 8 miles before transitioning to the San Joaquin Valley Subsection near I-5 (Figure 2-6). Tunnel is the only design option in this subsection.

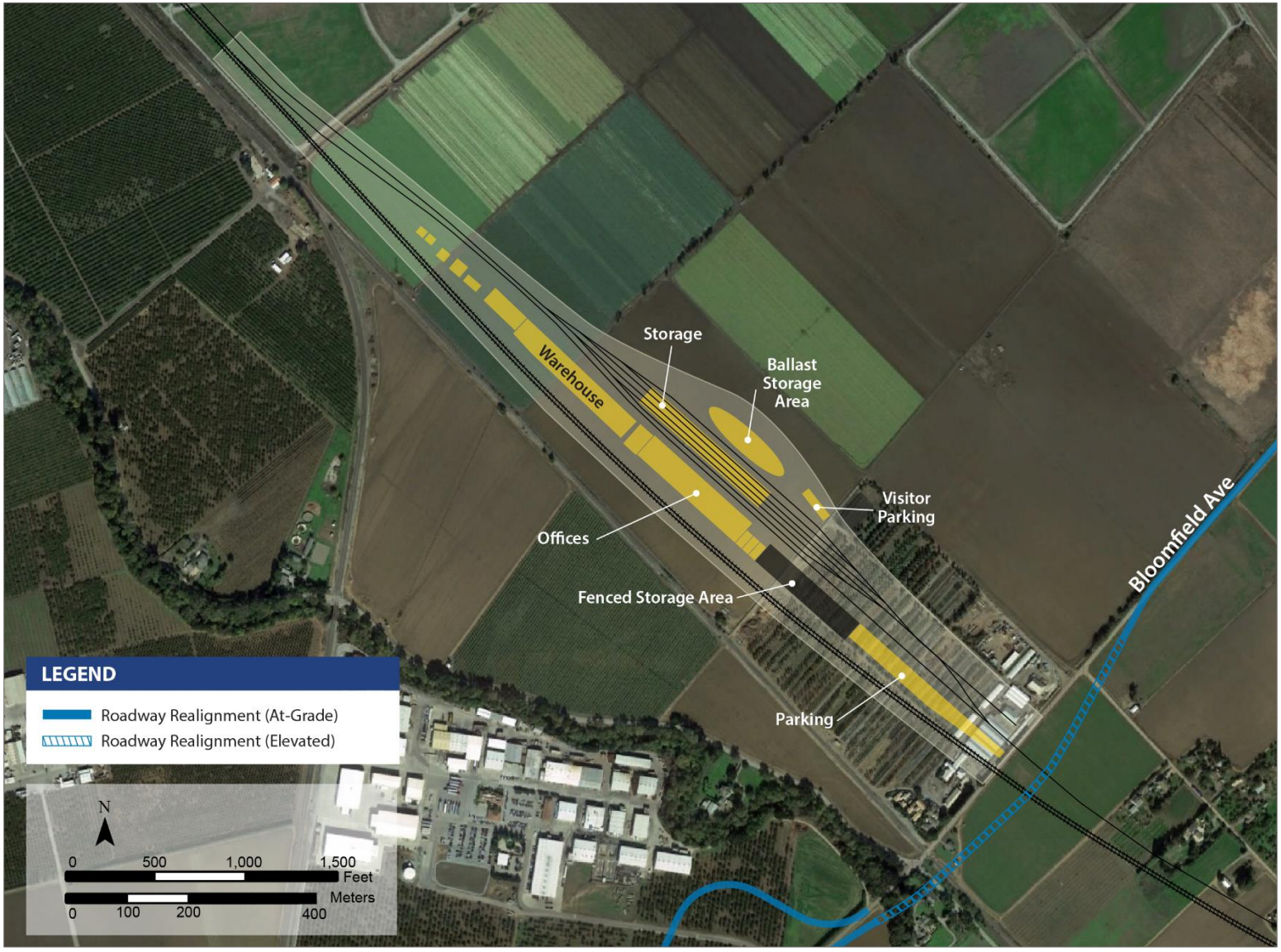
From the eastern limit of the Morgan Hill and Gilroy Subsection, the guideway would transition from aerial structure to embankment along the southern boundary of Casa de Fruta. This stretch of embankment would be on fill or in excavated hillside cuts to accommodate a level HSR guideway profile over varied surface elevations and to control unstable slopes known for vulnerability to landslip (i.e., areas subject to the downward falling or sliding of a mass of soil, detritus, or rock on or from a steep slope). The alignment would ascend to viaduct over Pacheco Creek along the south side of SR 152 and remain on viaduct to the Tunnel 2 portal. This portal would include a staging area for tunnel construction and a permanent area for traction and facility power with access provided by a service road from SR 152. Tunnel 2 would extend northeast approximately 13.5 miles. Access to the Tunnel 2 east portal for HSR construction, operations, and maintenance would be on McCabe Road north of Romero Ranch. Continuing east, the HSR guideway would be predominantly on a combination of embankment and aerial structures, with viaducts over Romero Creek and the California Aqueduct. Romero Road would be realigned at its intersection with I-5. East of I-5, the alignment would cross over SR 33/Santa Nella Road and the CCID Outside Canal before transitioning to the San Joaquin Valley Subsection at Fahey Road.

Wildlife Crossings

Four wildlife crossing culverts would be provided west of the California Aqueduct, with an additional two wildlife crossings between the California Aqueduct and the Delta-Mendota Canal and one between the Delta-Mendota Canal and I-5. Three wildlife crossings would be provided between I-5 and Santa Nella Road, and three more between Santa Nella Road and Fahey Road. Viaducts would also function as wildlife movement areas in this subsection.

Stations

No new HSR stations are proposed for this subsection.



Source: Authority 2019b

JUNE 2019

Figure 2-12 South Gilroy Maintenance of Way Facility

Traction Power Facilities

One new TPSS, Site 5—O'Neill, would be constructed approximately 1.2 miles west of the Calfornia Aqueduct. A new 230-kV double-circuit tie-line would be constructed from the expanded Quinto switching station to the TPSS, paralleling an existing PG&E transmission line for approximately 0.6 mile. The tie-line would be installed either underground in a utility easement or overhead, requiring the existing 500-kV transmission line to be raised. No reinforcements to the PG&E power system would be required for this site. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnection. The interconnection would link the TPSS to a new PG&E switching station, to existing PG&E facilities, or both—typically within tie-line/utility corridors.

A traction power switching station would be constructed at each Tunnel 2 portal. A power drop site would be co-located with the switching stations. A new permanent distribution power line from the Quinto switching station along McCabe Road to the Tunnel 2 east portal location would provide power for tunnel construction and fire and life safety systems during operations. The existing PG&E 230-kV Quinto switching station would be expanded within the fence line to support the HSR system.

Traction power paralleling stations would be constructed at three locations:

- Two stations within Tunnel 2 cross passages, approximately 5 miles apart
- One station located either southeast or northwest of the alignment crossing of Fahey Road

Train Control and Communication Facilities

Three ATC sites would be constructed in the Pacheco Pass Subsection at the following locations:

- West portal of Tunnel 2
- Underground within the limits of Tunnel 2
- Adjacent to TPSS Site 5

One stand-alone communications radio antenna site would be constructed in the Pacheco Pass Subsection:

- Near SR 152 and the Tunnel 2 west portal
- 1 mile west of Tunnel 2
- Delta-Mendota Canal crossing

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.1.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

The San Joaquin Valley Subsection would be approximately 18 miles long, from east of I-5 (at Fahey Road) to the intersection of Henry Miller Road and Carlucci Road in Merced County, where the alignment would connect to the Central Valley Wye (Figure 2-7). The single design option in this subsection is a combination of viaduct and embankment along Henry Miller Road, identified as the Henry Miller Road design option.

South of Fahey Road, the guideway would continue east and cross over three irrigation ditches, Cherokee Road, the CCID Main Canal, two additional irrigation ditches, and adjacent farmland on viaduct. Continuing east, the alignment would be on embankment (including four proposed culvert crossings for irrigation ditches) before ascending on an approximately 1.4-mile-long viaduct over the San Luis (Volta) Wasteway, the UPRR West Side branch line, and Ingomar Grade Road.

The alignment would descend to embankment west of Volta Road while turning southeast before crossing to the south side of Henry Miller Road. Henry Miller Road would be realigned to pass over the HSR alignment on a bridge. The HSR embankment between the Volta Road

overcrossing and Los Banos Creek would cross over two proposed culverts to maintain irrigation canals. The alignment would then ascend to cross over Los Banos Creek and Badger Flat Road on a 0.8-mile-long viaduct before descending onto embankment.

The alignment would continue east for 3.6 miles on embankment, over several combined wildlife crossing/drainage culverts and drainage culverts, including an irrigation ditch at Wilson Road, an irrigation ditch at Johnson Road, two irrigation ditches at Nantes Avenue, the Santa Fe Canal, the San Luis Canal, the San Luis Drain, and the Porter-Blake Bypass. A road would be constructed between Badger Flat Road and Nantes Avenue. SR 165/Mercey Springs Road would be raised to cross over the HSR alignment and Henry Miller Road on a bridge. East of SR 165 and the Santa Fe Grade, the alignment would ascend to an approximately 1.8-mile viaduct south of the Los Banos State Wildlife Area across Mud Slough to maintain wildlife movement within the Grasslands Ecological Area (GEA). Baker Road, Midway Road, and Hereford/Salt Slough would be closed south of Henry Miller Road. Box Car Road would become a cul-de-sac with a new road to the east. Hutchins Road would be abandoned. The alignment would continue on embankment to the eastern limit of the subsection and the project. Culvert crossings would be provided for the San Pedro Canal, Boundary Drain, Lone Tree Canal, Devon Drain, West Delta Drain, West Delta Canal, Dambrosia Ditch, Delta Canal and seepage drain, East Delta Canal, Poso Drain, Belmont Drain, Delta Canal #1, West San Juan Drain, San Juan #1, and several other irrigation ditches and drains in the section of viaduct over the GEA. Several local roadways—Delta Road, Turner Island Road, and Carlucci Road—would be elevated over the HSR guideway, maintaining access to adjacent properties. The alignment would transition to the Central Valley Wye at Carlucci Road.

Wildlife Crossings

The rail alignment would be primarily on viaduct where it overlaps with the GEA boundary and modeled wildlife movement corridors. Three additional wildlife crossing culverts would be added between Fahey Road and Cherokee Road. Regularly spaced wildlife crossing culverts would be provided through the remainder of this subsection. In total, there would be 64 wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

A traction power switching station would be constructed on the north or south side of the alignment at one of two alternate sites east of the intersection of Henry Miller Road and Santa Fe Grade. Traction power paralleling stations would be constructed at the following locations:

- Either east or west of the Henry Miller Road overcrossing of the HSR alignment near Volta Road (two site options)
- Intersection of Henry Miller Road and Box Car Road (two site options either north or south of the alignment)

Train Control and Communication Facilities

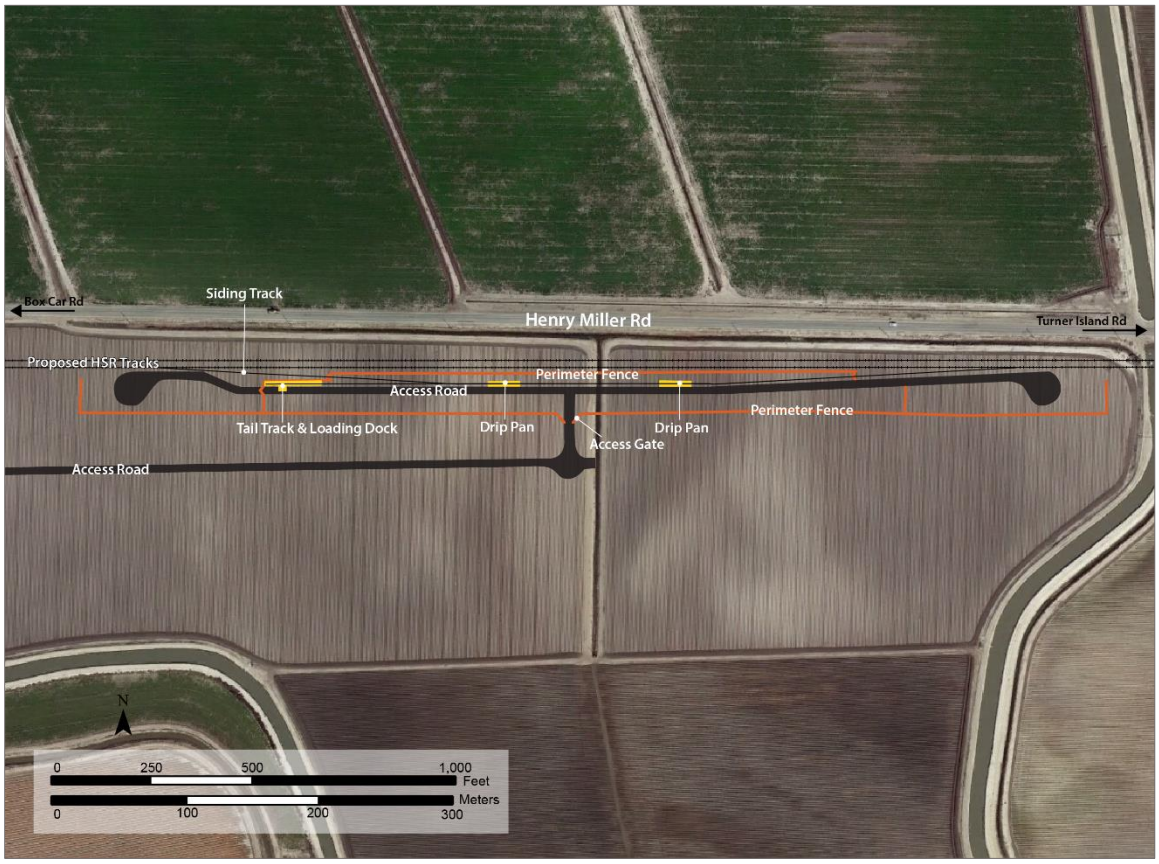
Four ATC sites would be constructed in the San Joaquin Valley Subsection:

- One site east of the CCID Main Canal (two options)
- Three sites near Johnson Road
- One site near Box Car Road (two site options)

One stand-alone communication radio site would be constructed: at Wilson Road (two site options): east of the San Pedro Canal and at Carlucci Road.

Maintenance Facility

An MOWS is proposed near Turner Island Road near the eastern limit of the project (Figure 2-13). The MOWS would be about 0.5 mile long, encompassing about 4 acres. The facility would be constructed near Henry Miller Road to avoid the GEA and other sensitive habitat.



Source: Authority 2019b JUNE 2019

Figure 2-13 Maintenance of Way Siding near Turner Island Road

2.2.2 Alternative 2

Alternative 2 is the alternative that most closely approximates the alignment and structure types identified in the prior program-level documents, implemented by limiting longitudinal encroachment into the UPRR right-of-way to combine railroad grade separations with minimum property displacements. The HSR guideway under this alternative would be comprised of 20.9 miles on viaduct, 8.5 miles at grade, 41.0 miles on embankment, two tunnels totaling 15.0 miles, and 3.2 miles in trench.

2.2.2.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

Alternative 2 would begin at Scott Boulevard at grade in blended service with Caltrain. Approximately 300 feet south of Scott Boulevard, the HSR tracks would separate from the Caltrain tracks and begin ascending to embankment and then to the 50-foot-tall dedicated viaduct at Main Street. The long viaduct under Alternative 2 would have a wider footprint than the short viaduct to I-880 under Alternative 1, requiring more curve straightening of the Caltrain tracks north of I-880. At the Lafayette Street crossing, the project would replace the existing pedestrian

overpass with an underpass. The existing De La Cruz Boulevard overcrossing would be replaced with an undercrossing to enable the HSR aerial structure to cross 43 feet high over De La Cruz Boulevard, the relocated UPRR MT1 and two industry tracks, and the Caltrain Santa Clara Station. The Santa Clara Station northbound platform would be reconstructed to accommodate the supports for the HSR aerial structure. South of Santa Clara Station, the three relocated UPRR tracks would cross under the HSR viaduct so that all Caltrain and UPRR tracks would be west of the HSR viaduct. The HSR viaduct would then ascend to 68 feet to cross over I-880.

Farther south, the existing West Hedding Street roadway overcrossing would be replaced by an undercrossing under the rail corridor. A short section of retained fill would be used to support the tracks over the future BART to San Jose tunnel. The intersection of Stockton Avenue and University Avenue would be replaced by cul-de-sacs; Emory Street would be a new cul-de-sac on the north side of HSR. The curve from westbound West Taylor Street to northbound Chestnut Street would be realigned for the HSR crossing over West Taylor Street; the alignment would then ascend on a viaduct to cross over Cinnabar Street. The UPRR Warm Springs Subdivision Lenzen Wye would be relocated to the southwest. North Montgomery Street would be extended to Cinnabar Street to maintain property access beneath the 68-foot-high HSR viaduct. The alignment would curve west toward the UPRR/Caltrain MTs before crossing over the western part of the SAP Center parking lot, then over West Santa Clara Street to enter the new dedicated HSR aerial platforms at the San Jose Diridon Station.

Between San Jose Diridon Station and West Alma, Alternative 2 would be identical to Alternative 1. Continuing on an aerial structure, the alignment would diverge from the Caltrain right-of-way south of the San Jose Diridon Station HSR platforms by turning sharply east at the Park Avenue undercrossing of UPRR/Caltrain tracks. The HSR aerial structure would cross over Los Gatos Creek and San Carlos Street, then over Royal Avenue and the intersection of Bird Avenue and Auzerais Avenue, then over the I-280/SR 87 interchange. Continuing south along the east side of SR 87, the HSR aerial structure would cross over West Virginia Street and the Guadalupe River Trail, then over the Caltrain rail bridge, the Guadalupe River, and Willow Street. The HSR aerial structure would continue south over the Caltrain Tamien Station on an alignment between Tamien Station and the SR 87 freeway, transitioning to the Monterey Corridor Subsection at West Alma Avenue.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

The San Jose Diridon Station would be the same as described for Alternative 1.

Traction Power Facilities

One new TPSS would be constructed on the east side of the Caltrain corridor south of I-880 as described for Alternative 1.

Train Control and Communication Facilities

Alternative 2 would have six ATC sites within this subsection:

- One site at Scott Boulevard
- One site at Main Street
- One site just north of the San Jose Diridon Station
- Three sites between Park Avenue and the proposed HSR crossing of SR 87 (same as under Alternative 1)

No stand-alone communications radio sites would be built in this subsection under Alternative 2.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.2.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The Monterey Corridor Subsection is approximately 9 miles long and entirely within the San Jose city limits. However, Alternative 2 would begin the viaduct transition to the Monterey Road/UPRR corridor approximately 400 feet north of the transition under Alternatives 1 and 3 but would be primarily at grade or on embankment upon entering the road/rail corridor. Alterations of existing railroad track and systems between West Alma Avenue and CP Lick (near the east base of Communications Hill) would be the same as under Alternatives 1 and 3, except for a new, continuous intrusion barrier between the existing UPRR tracks and HSR tracks.

From West Alma Avenue, the HSR alignment would descend from a viaduct 54 feet above grade to embankment north of Almaden Road. The alignment would continue primarily on embankment on the west side of the Caltrain/UPRR tracks, crossing over Almaden Road on a short aerial structure, then proceeding at grade under West Almaden Expressway and Curtner Avenue. South of Curtner Avenue, the alignment would continue south at grade along the west side of the Caltrain/UPRR tracks around the northern base of Communications Hill, ascending to aerial structure before crossing over and entering the Monterey Road/UPRR corridor just south of Hillsdale Avenue. On the approach to Monterey Road, the aerial structure would cross over the UPRR tracks and the Caltrain Capitol Station while curving southeast to return to grade within the road/rail corridor northwest of the Capitol Expressway. Monterey Road would be realigned to the east, while HSR would run along the east side of UPRR. South of Fehren Drive, Monterey Road would be reduced from six to four lanes. Continuing south, the alignment would descend into trench beneath a widened Capitol Expressway bridge before ascending to grade at Skyway Drive. Under Skyway Drive Variant A, Monterey Road would retain its current at-grade configuration, and a new connector ramp located northwest of the intersection of Skyway Drive and Monterey Road would connect Monterey Road to the depressed Skyway Drive underpass. San Jose Fire Station #18 would have access along the connector ramp. Skyway Drive Variant B would depress Monterey Road to connect to the Skyway Drive underpass. Under this variant, access to the mobile home park northwest of the intersection of Skyway Drive and Monterey Road would be provided by a driveway across the northern portion of the San Jose South Service Yard property. Variant B would not provide access to the fire station.

Continuing south, the HSR alignment would be at grade or on embankment between Monterey Road and UPRR for the remainder of the subsection. Branham Lane and Roeder Road/Chynoweth Avenue would be lowered to be separated from the HSR and existing railroad crossings. Because of the new grade difference between Branham Lane and Roeder Road/Chynoweth, access to Rice Way and four driveways from Monterey Road would be closed. A new Branham Lane pedestrian bridge would span the combined railroad and Monterey Road corridor. The westbound Blossom Hill Road ramp at Monterey Road would be shifted to the east side of Monterey Road. A new pedestrian bridge would be built to maintain connectivity between Ford Road and the Caltrain Blossom Hill Station. The alignment would continue south at grade under SR 85/West Valley Freeway, with modifications to the existing highway bridge to allow HSR to pass underneath. The alignment would then cross under Bernal Road before transitioning to the Morgan Hill and Gilroy Subsection at Bernal Way.

Like the other alternatives, the design assumes a reduction from six to four travel lanes on Monterey Road, beginning north of Capitol Expressway and continuing to just south of Blossom Hill Road, where the existing roadway is already four travel lanes. Under Alternative 2, one left turn lane would be removed south of Senter Street and one left turn lane would be removed south of Roeder where Monterey Road would be depressed and grade separated from adjacent properties. Existing mid-block left-turn lanes would be closed because of substandard stopping sight distance. Alternative 2 (and Alternative 4) differs from Alternatives 1 and 3 by shifting all Monterey Road travel lanes and median to the east of their current locations.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

In the Monterey Corridor Subsection, traction power stations would be in the same area under Alternatives 1, 2 and 3. Traction power paralleling stations would be constructed at the following locations:

- Either the north side of the alignment near Curtner Avenue or the south side of the alignment at Communications Hill (same as Alternative 1)
- Either the south side of SR 85 or between Bernal Road and the Bernal Road ramp onto Monterey Road

Train Control and Communication Facilities

Train control and communication facilities under Alternative 2 would be the same as described for Alternative 1.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.2.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection under Alternative 2 would be approximately 31 miles long and located south of the Monterey Corridor Subsection. From Bernal Way in South San Jose, the alignment would extend through Morgan Hill and San Martin to the Downtown Gilroy Station, then curve generally eastward across the Pajaro River floodplain and through a portion of northern San Benito County before entering a tunnel (Tunnel 1) at the base of the Diablo Range. The alignment would exit the tunnel at Casa de Fruta Parkway/SR 152 in unincorporated eastern Santa Clara County, and then transition to the Pacheco Pass Subsection (Figure 2-8).

Continuing from the southern limit of the Monterey Corridor Subsection, Alternative 2 would be at grade on retained fill between the UPRR right-of-way and Monterey Road in South San Jose. Due to the proximity of the alignment to UPRR, a 3-foot-thick continuous intrusion barrier would be constructed between the proposed HSR and UPRR tracks. In contrast to the other alternatives, Alternative 2 would require the construction of new roadway grade separations to maintain east-west connectivity across the Monterey Corridor. Before turning south near Kittery Court, the two UPRR tracks would be realigned to the west to accommodate the alignment curvature required for HSR operations until returning to the existing alignment adjacent to the south side of the Calpine Metcalf Energy Center. The existing Fisher Creek culvert would be improved with a new culvert installed beneath the new HSR alignment and realigned Monterey Road and UPRR. The creek crossing would be improved to provide a suitable wildlife crossing. The Blanchard Road grade crossing would be closed.

As the UPRR and Monterey Road rights-of-way converge to the south approaching Bailey Avenue, the four-lane Monterey Road would be realigned eastward to accommodate the HSR alignment at grade between the railroad and roadway. The existing Bailey Avenue bridge would remain in place and HSR would cross beneath the road. The alignment would continue south, ascending onto embankment, crossing beneath a new Palm Avenue bridge and a new Live Oak Avenue bridge (which would also cross over UPRR, eliminating both existing at-grade crossings). Tilton Avenue would become a cul-de-sac. Madrone Parkway would be lowered to allow HSR and UPRR to cross over the roadway. At Cochrane Road, the realigned Monterey Road would converge with the existing roadway alignment.

As the alignment proceeds south along the UPRR alignment through Morgan Hill, a new culvert would be placed in the HSR embankment for Fisher Creek. The alignment would then cross over Monterey Road on a clear-span bridge. Continuing south on embankment along the east side of

UPRR, the HSR and UPRR alignments would cross over Main, East/West Dunne, San Pedro, and Tennant Avenues on short bridges over the roadways, which would be lowered 17–30 feet below grade to maintain east-west connections. A new pedestrian underpass would be provided to maintain access from east of the HSR corridor to the Morgan Hill Caltrain Station. Railroad Avenue would be closed between San Pedro Avenue and Barrett Avenue and relocated eastward between Barrett Avenue and Maple Avenue to accommodate the HSR alignment adjacent to UPRR. The existing bridge at Butterfield Boulevard would be extended to cross over the realigned Railroad Avenue and at-grade HSR alignment. The Butterfield Canal would be relocated to the east to accommodate the HSR alignment adjacent to UPRR.

Continuing south, the alignment would ascend onto embankment, and West Little Llagas Creek would flow through a new culvert. The existing East Middle Avenue would become cul-de-sacs on both sides of the alignment. A new alignment of East Middle Avenue would be constructed to the south, where it would cross over the HSR tracks and Monterey Road on a bridge. Monterey Road and UPRR would be realigned westward between East Middle Avenue and Roosevelt Avenue to accommodate the southward alignment curvature required for HSR operations. The realigned roadway and UPRR and the new HSR alignment would cross Llagas Creek on new clear-span bridges. South of Llagas Creek, Monterey Road would return to the existing alignment near Roosevelt Avenue.

San Martin Avenue would be realigned between Murphy and Harding Avenues to connect to Oak Street at Llagas Avenue (north of the HSR alignment) in San Martin. HSR would cross over San Martin Avenue and Oak Street, which would be below grade. A pedestrian path under the HSR embankment would be provided south to San Martin Avenue. Depot Street, UPRR, and Monterey Road, which parallel the HSR tracks at Oak Street, would cross the newly depressed San Martin (formerly Oak) Street on bridges supported by retained fill. HSR would continue south at grade adjacent to the east side of UPRR. Church Avenue would be raised onto a bridge over both HSR and UPRR. Fitzgerald and Masten Avenues would be realigned to the south and would be depressed beneath Monterey Road, UPRR, and HSR. Similarly, Rucker Avenue and Buena Vista Avenue would be depressed beneath Monterey Road, UPRR, and HSR. Both Cohansey Avenue and Las Animas Avenue would remain at grade with bridges for HSR and UPRR to cross over the existing streets.

Continuing south into Gilroy, the alignment would shift east for the approach to the Downtown Gilroy HSR Station. The existing culvert for the West Branch of Llagas Creek would be extended to the east to accommodate the rail alignment shift. HSR and UPRR would be on embankment (approximately 15–25 feet high) and cross over Leavesley Road, Casey Street, IOOF Avenue, Lewis Street, East 6th Street, and the realigned East 7th Street/Old Gilroy on bridges before arriving at the Downtown Gilroy Station embankment (approximately 16 feet high). East 7th Street and Old Gilroy would be realigned (as under Alternative 1). Each of these streets would be lowered approximately 20 feet beneath existing grade, and a pedestrian underpass would replace Martin Street across the rail alignment. Miller Slough would be realigned eastward in a new culvert beneath the railroad alignment. HSR and UPRR would continue on embankment, crossing over East 9th Street and East 10th Street.

The HSR alignment would continue on embankment south from the Downtown Gilroy Station to the Princevale Channel, then descend into a trench under Luchessa Avenue and US 101, where existing bridges would be demolished and reconstructed to accommodate the freeway undercrossing, and two UPRR spur tracks. Just south of the US 101 overcrossing, a freight connection would be made from UPRR on the south side of HSR, crossing over the HSR trench to connect to the South Gilroy MOWF on the north side of HSR. Two UPRR spur tracks would be realigned to connect to the MOWF freight track north of HSR.

The remainder of this subsection—to Casa de Fruta—would be the same as under Alternative 1.

Wildlife Crossings

Three adjacent box culverts would be installed to provide wildlife with a connection between Tulare Hill and Coyote Creek south of Metcalf Road. The box culverts under Monterey Road and

UPRR would be replaced with larger box culverts at Fisher Creek. HSR would also be on a box culvert over Fisher Creek. These three box culverts would have larger openings than existing culverts to improve wildlife movement. There would be seven additional crossings at Emado Avenue, Laguna Avenue, Richmond Avenue, Fox Lane, Paquita Espana Court, south of Palm Avenue, and south of Live Oak Avenue.

Stations

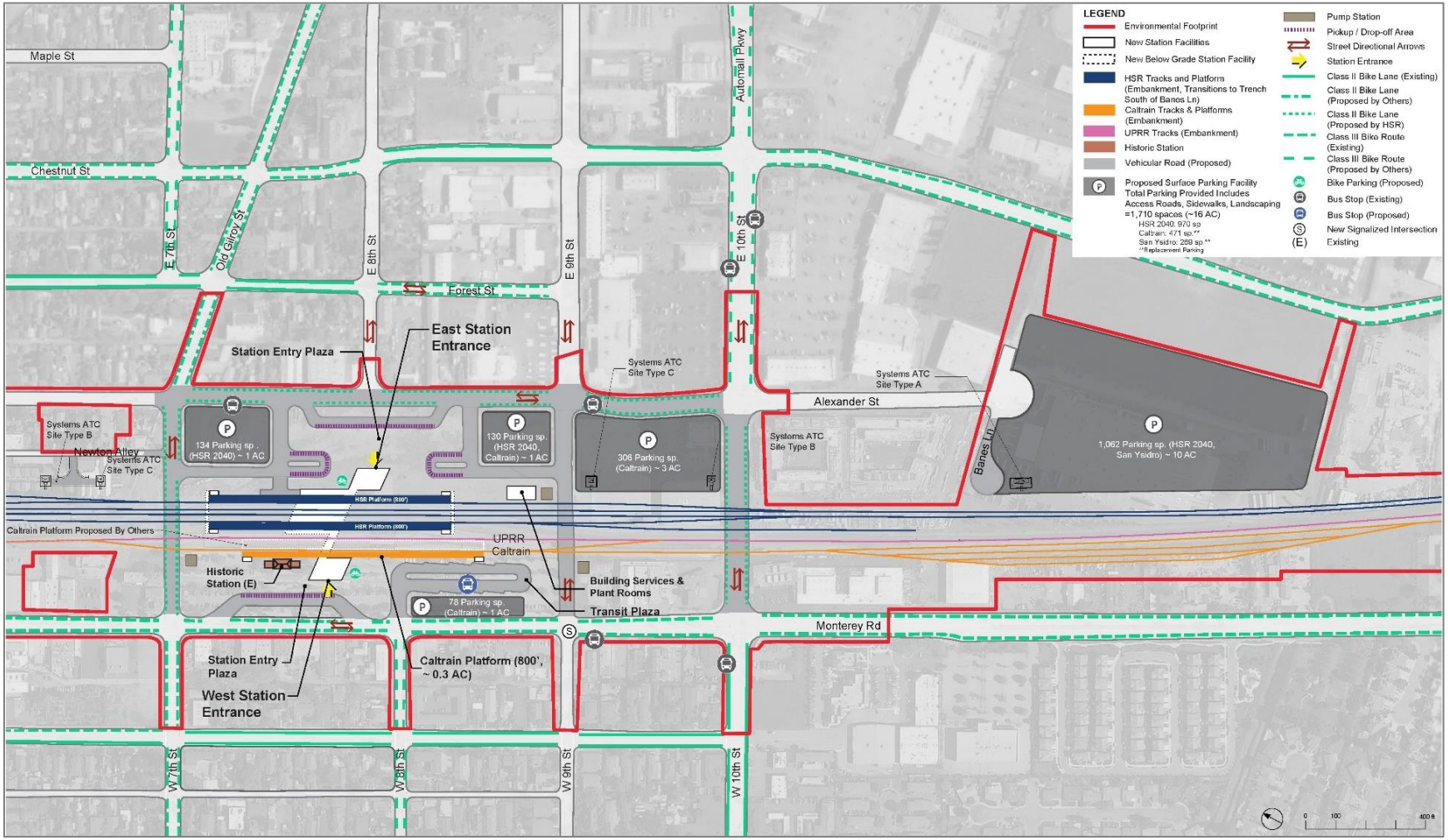
Alternative 2 would enter the Downtown Gilroy Station on embankment (Figures 2-14 and 2-15). The station layout and configuration would be similar to that described for Alternative 1, except that UPRR and Caltrain would be elevated to the same height as HSR on the embankment. The embankment station would also lower East 7th/Old Gilroy Street, East 9th Street, and East 10th Street by approximately 16 feet to maintain street access.

As under Alternative 1, the existing 471 Caltrain parking spaces on the west side of the station would be replaced 1:1 by either reconfiguring parking on the west side of the station or relocating it to the east side of the station. The existing 269 San Ysidro housing development parking spaces would be replaced 1:1 with new surface parking along Automall Parkway with access from the south end of Alexander Street. HSR would provide an additional 970 spaces in 2040, for a total of 1,710 parking spaces in 2040 (including existing demand). The station site plan provides 970 new parking spaces in five areas. One site would be located west of the station along Monterey Road at 9th Street. The other four would be on the east side of the station along Alexander Street at Old Gilroy Street, 9th Street, 10th Street, and Banes Lane. A multimodal access plan that includes a parking strategy would be developed in coordination with local agencies prior to design and construction of the station. A total of eight bus bays would be provided. Street improvements would include realignment of Old Gilroy Street at East 7th Street; existing grade crossings would remain unchanged. A 4,000-square-foot bicycle facility would be constructed. Class II bike lanes would be provided on 7th, Alexander, and 10th Streets.

Traction Power Facilities

As under Alternative 1, one new TPSS, Site 4—Gilroy, would be constructed at one of two alternate sites on the north side of the alignment: either east or west of Bloomfield Avenue. At this location, one new utility switching station would be co-located with the TPSS. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnection of the TPSS to a new utility switching station or to existing PG&E facilities, typically within tie-line/utility corridors. Site 4—Gilroy would connect to the Llagas PG&E substation via existing and proposed transmission or distribution lines along SR 152, Frazier Lake Road, and Bloomfield Avenue. Fiber optic and high-voltage lines would be reconductored overhead on existing towers where available. Where no overhead connections exist, both fiber optic and high-voltage lines would be undergrounded within or adjacent to the public right-of-way.

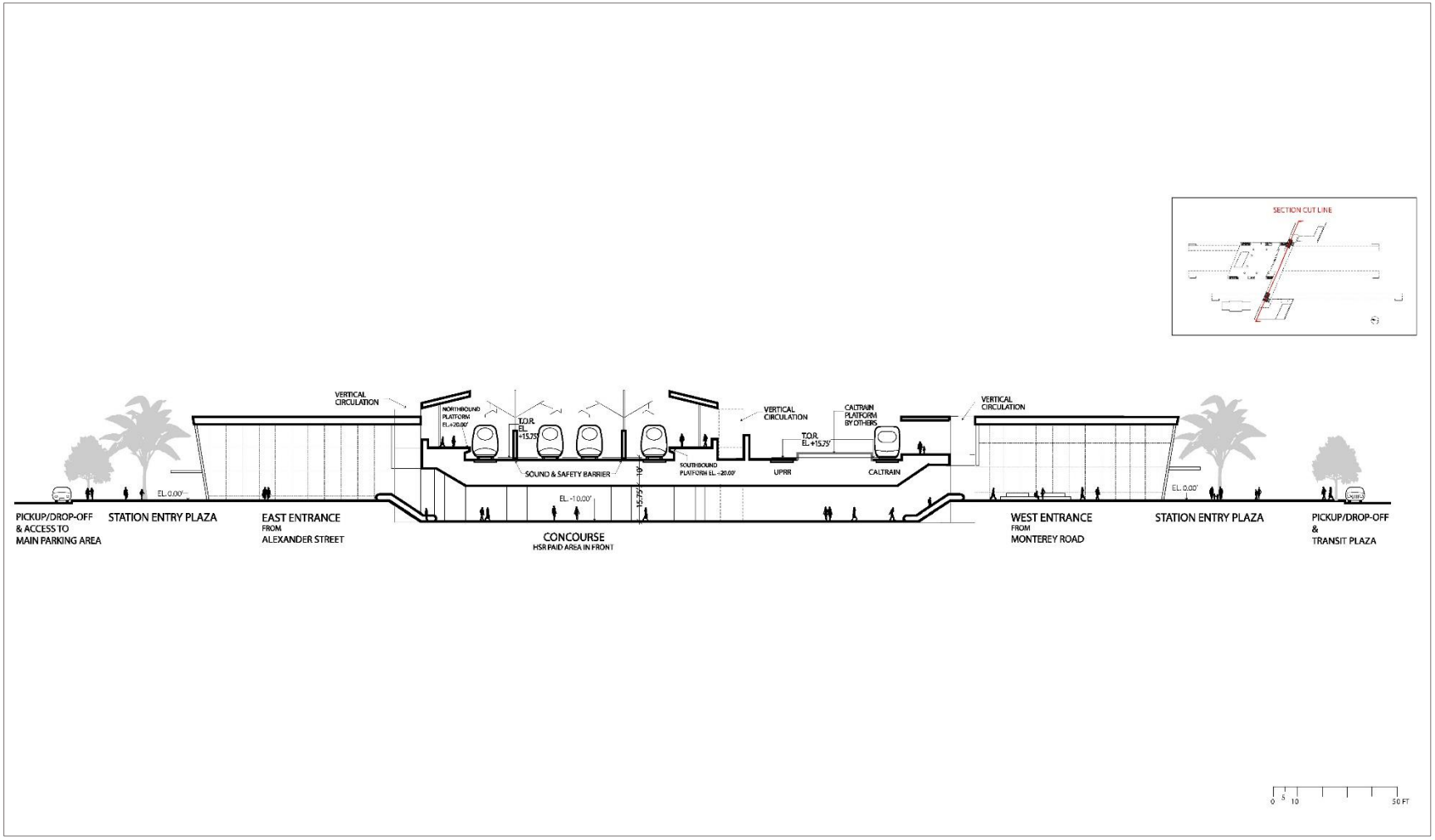
A traction power switching station would be constructed east of the HSR alignment at a location north of Paquita Espana Court or north of Palm Avenue.



Source: Authority 2019b

JUNE 2019

Figure 2-14 Conceptual Downtown Gilroy Embankment Station Plan



Source: Authority 2019b

JUNE 2019

Figure 2-15 Cross Section of Downtown Gilroy Station (Embankment)

Four traction power paralleling stations would be constructed at the following locations:

- Either the east side of the alignment between East Dunne and San Pedro Avenues or south of San Pedro Avenue
- East of the alignment, either north or south of a new Masten Avenue/Fitzgerald Avenue in-trench alignment

South of US 101, Alternative 2 would have the same two switching stations as Alternative 1:

- Either south of the alignment and west of Lovers Lane or north of the alignment and west of Lovers Lane
- In the vicinity of the Tunnel 1 east portal, either at the portal or east of SR 152 in the southern area of Casa de Fruta

PG&E would reinforce the electric power distribution network to meet HSR traction and distribution power requirements by replacing (reconductoring) the approximately 9.8-mile Metcalf to Morgan Hill and 10.6-mile Morgan Hill to Llagas 115-kV power lines. These PG&E transmission network upgrades described under Alternative 1 would also be necessary under Alternative 2.

Train Control and Communication Facilities

A total of 20 ATC sites would be constructed in the Morgan Hill and Gilroy Subsection for this alternative:

- One site east of Monterey Road north of Paquita Espana Court or at Palm Avenue, co-located with the TPSS (two site options)
- One site north of East Middle Avenue (two site options)
- One site between Las Animas Avenue and Leavesley Road
- One site south of Leavesley Road
- One site south of Lewis Street
- One site north of 6th Street in Gilroy
- Two sites south of 6th Street in Gilroy
- Two sites between 9th and 10th Streets in Gilroy
- One site south of Banes Lane

South of US 101, Alternative 2 would have the same ATC sites as Alternative 1:

- Five sites north of Carnadero Avenue
- Three sites east of the Pajaro River
- One site near Lake Road (two site options)

A total of six stand-alone communication radio sites would be constructed in this subsection at the following locations:

- Between Forsum Road and Blanchard Road (two site options)
- Near Bailey Avenue (two site options)
- Near Kirby Avenue (two site options)
- West of the intersection of Cochrane Road and Monterey Road (two site options)
- Near South Street (two site options)

South of US 101, Alternative 2 would have the same radio sites as Alternative 1:

- East of the Pajaro River south of Gilroy.

Maintenance Facilities

The MOWF under Alternative 2 would be constructed along the HSR alignment near Carnadero Avenue as described for Alternative 1 and illustrated on Figure 2-12. The freight connection would be provided as described above.

2.2.2.4 Pacheco Pass Subsection

Alignment and Ancillary Features

The characteristics of the Pacheco Pass Subsection under Alternative 2 would be the same as those described for Alternative 1 in Section 2.2.1.4, Pacheco Pass Subsection.

Wildlife Crossings

The wildlife crossings under Alternative 2 would be the same as described for Alternative 1.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

One new TPSS, Site 5—O'Neill, would be constructed approximately 1.2 miles west of the California Aqueduct as described for Alternative 1.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 2 would be the same as for Alternative 1.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.2.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

The characteristics of the San Joaquin Valley Subsection of Alternative 2 would be the same as those described for Alternative 1 in Section 2.2.1.5, San Joaquin Valley Subsection.

Wildlife Crossings

The wildlife crossings under Alternative 2 would be as described for Alternative 1.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities under Alternative 2 would be as described for Alternative 1.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 2 would be as described for Alternative 1.

Maintenance Facilities

An MOWS would be constructed near Turner Island Road near Carlucci Road as described for Alternative 1 and illustrated on Figure 2-15.

2.2.3 Alternative 3

Alternative 3 was designed to minimize the project footprint through the use of viaduct and by going around downtown Morgan Hill, as is proposed in Alternative 1. Alternative 3 would bypass downtown Gilroy to an East Gilroy Station, further minimizing interface with the UPRR corridor in

comparison to Alternative 1. The HSR guideway under this alternative would comprise 43.2 miles on viaduct, 1.8 miles at grade, 24.9 miles on embankment, 2.4 miles in trench, and two tunnels totaling 15.0 miles.

2.2.3.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

Under Alternative 3, the alignment and characteristics of this subsection would be the same as described for Alternative 2 in Section 2.2.2.1, San Jose Diridon Station Approach Subsection.

Wildlife Crossings

As under Alternative 2, there would be no wildlife crossings in this subsection.

Stations

The San Jose Diridon Station would be as described for Alternatives 1 and 2.

Traction Power Facilities

Traction power facilities under Alternative 3 would be as described for Alternative 2.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 3 would be as described for Alternative 2. No stand-alone communication radio antenna would be constructed in this subsection of Alternative 3.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.3.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The alignment and characteristics of Alternative 3 in this subsection would the same as those described for Alternative 1 in Section 2.2.1.2, Monterey Corridor Subsection.

Wildlife Crossings

As under Alternative 1, there would be no wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities of Alternative 3 would be as described for Alternative 1.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 3 would be as described for Alternative 1 and Alternative 2.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.3.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection under Alternative 3 would be approximately 30 miles long and located south of the Monterey Corridor Subsection. From Bernal Way in South San Jose, the alignment through Morgan Hill and San Martin would be the same as described for Alternative 1 in Section 2.2.1.3, Morgan Hill and Gilroy Subsection. The Alternative 3 alignment would diverge

from Alternative 1 by turning east north of Gilroy to arrive at the East Gilroy Station and an MOWF near SR 152. South of the MOWF, the alignment would curve generally east across the Pajaro River floodplain and through a portion of northern San Benito County before entering a tunnel (Tunnel 1) at the base of the Diablo Range. The Morgan Hill and Gilroy Subsection would end in the Pacheco Pass at Casa de Fruta Parkway/SR 152 (Figure 2-8), where the Alternative 3 alignment would converge with that of Alternatives 1 and 2.

South of the Monterey Corridor Subsection, Alternative 3 would diverge east from Alternative 1 north of Gilroy, near the intersection of Monterey Road and Church Avenue. Beginning at Church Avenue, a new freight track would diverge from the UPRR mainline to provide a freight connection to the MOWF. The freight track would continue parallel to the HSR alignment on the west side to the MOWF. The HSR alignment would cross over Church Avenue, Lena Avenue, Masten Avenue, and US 101 at Rucker Avenue on viaduct approximately 60 feet above grade. The aerial alignment would also cross over Denio Avenue and Buena Vista Avenue on viaduct before descending onto embankment. Cohansey Avenue would be closed. At the north end of the East Gilroy Station site, the alignment would cross beneath Las Animas Avenue; at the south end of the station site, Leavesley Road would be raised on a bridge over the HSR embankment. At the south end of the East Gilroy Station site, the Llagas Creek overbank flow would be directed across the HSR alignment through two culvert crossings. Farther southeast, the alignment would cross over Gilman Avenue on viaduct. The alignment would cross Llagas Creek on a low viaduct, and Holsclaw Road would be closed to vehicular traffic. Levee Road would be realigned south of Llagas Creek.

Continuing south, the alignment would ascend to approximately 25 feet above grade on embankment approaching the MOWF site. SR 152 would be grade separated and realigned, crossing over the MOWF on a bridge. Both Frazier Lake Road and Holsclaw Road would connect to the grade-separated SR 152. The MOWF, on the south side of the alignment, would have the same features as the MOWF under Alternatives 1 and 2 and would similarly be on an embankment. Additional flood detention basins would be installed around the eastern edge of the MOWF to provide sufficient flood capacity in the Soap Lake floodplain. Jones Creek would be realigned around the eastern boundary of the MOWF, crossing beneath the HSR viaduct over Bloomfield Avenue. Continuing on a 40-foot-high embankment and then on viaduct, the alignment would cross the Pajaro River, Millers Canal, Lake Road, Pacheco Creek, Lovers Lane, San Felipe Road, and SR 152 before entering the west portal of Tunnel 1. Tequisquita Slough would be partially filled by the HSR embankment, which would include cross-culverts, 3.1 acres of adjacent floodwater detention basins, and extended viaduct over Pacheco Creek to maintain floodplain capacity and function.

The Alternative 3 alignment would converge at Tunnel 1 with those of the other alternatives.

Wildlife Crossings

Wildlife crossings would be provided between Bernal Way and San Martin as described for Alternative 1 with crossings at Tulare Hill, Fisher Creek, and Llagas Creek. Although Alternative 3 would include more embankment than Alternative 1, it would be similar to Alternative 1 by continuing primarily on viaduct through the Soap Lake area to allow for wildlife movement.

Stations

Alternative 3 would enter the East Gilroy Station on embankment (approximately 17 feet to top of rail) north of Leavesley Road (Figures 2-16 and 2-17). The station platforms would be 800 feet long and the station buildings would be constructed on both the east and west sides of the tracks with a connections concourse under the tracks. The MOWF freight access track would continue through the station on the west side of the west station platform. Access for passengers arriving by auto would be available from either the east or west entrance, while the main entrance on the west side would also provide access for passengers arriving by transit or bicycle. The HSR station buildings would encompass 58,611 square feet with a 4,400-square-foot substation and systems building. The concourse would be below the tracks and embankment. Approximately 1,520 on-site parking spaces would be provided to meet the projected demand in 2040. Spaces would be located on the east and west sides of the building. The west side station parking would

be accessed from Leavesley Road and a new station access road east of the outlet mall. The east side station parking would be accessed from Marcella Avenue. A multimodal access plan would be developed prior to design and construction of the station.

Seven bus bays would be provided on site on the west side of the station. A 4,000-square-foot bicycle parking facility would be constructed; a new Class III bike route would be provided from the outlet mall to the site entrance; then Class II lanes from the station entrance to the parking. Class I bidirectional off-street path would be provided adjacent to parking which connects to the bike station. This would be a new station without any other rail operators in the station area.

Traction Power Facilities

Under Alternative 3, one new TPSS, Site 4—Gilroy, would be constructed at one of two sites: north of HSR either east or west of the former SR 152. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnection of the TPSS to a new utility switching station and/or to existing PG&E facilities, typically within tie-line/utility corridors.

As under Alternative 1, a traction power switching station would be constructed at one of two locations north of Palm Avenue and east of the alignment.

Four traction power paralleling stations would be constructed at the following locations:

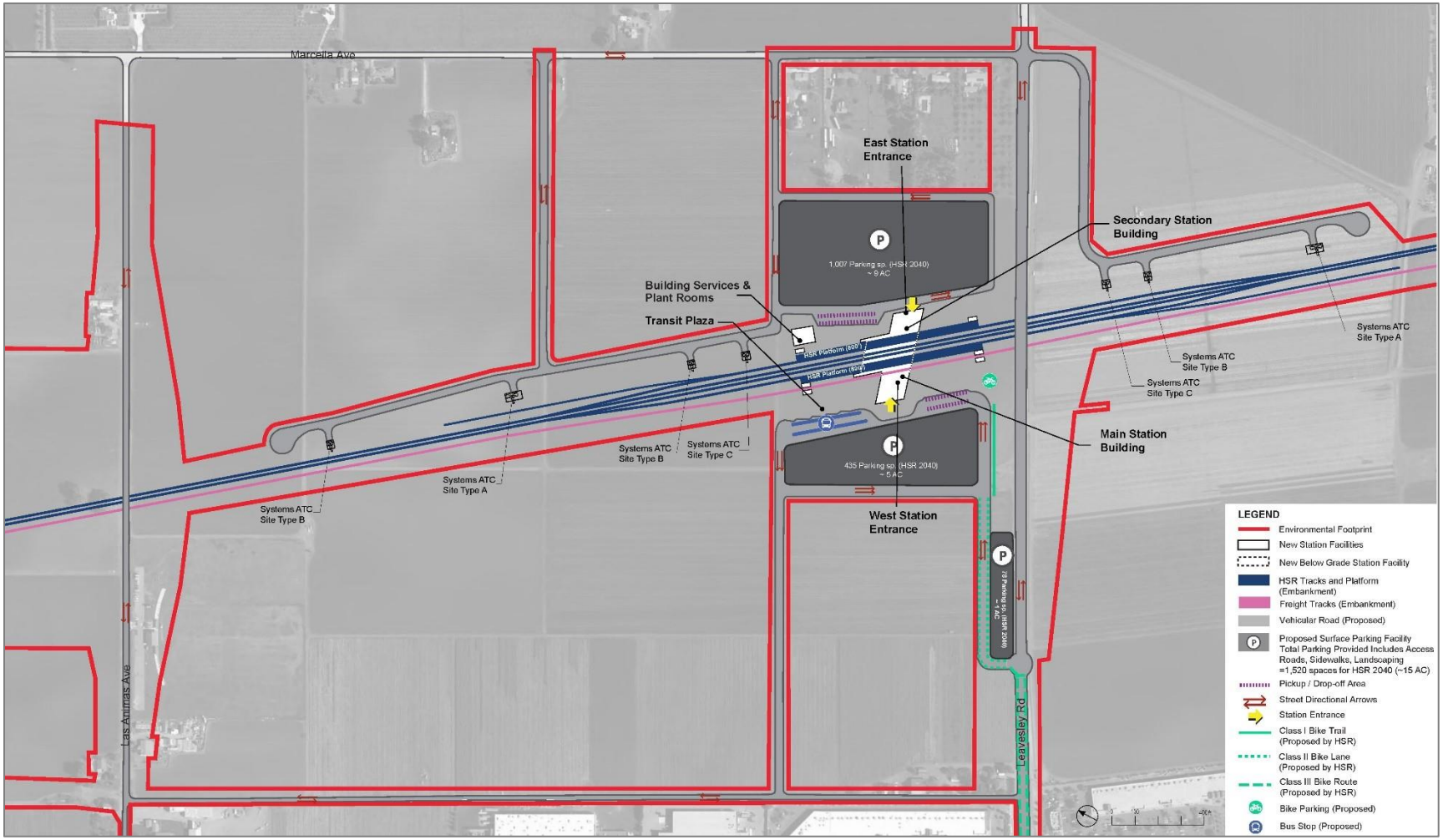
- South of the alignment, located either south of Diana Avenue or at the intersection of San Pedro Avenue and Walnut Grove Drive (like Alternative 1)
- Either at the northwest or southeast corner of the HSR crossing of Masten Avenue
- South of Gilroy at one of three site options: on Lake Road north of the alignment, on Lake Road south of the alignment, or at Lovers Lane south of the alignment
- Near the Tunnel 1 east portal, either at the portal or east of SR 152 in the southern area of Casa de Fruta

The PG&E transmission network upgrades from Metcalf to Morgan Hill and from Morgan Hill to Llagas described for Alternative 1 would also be necessary under Alternative 3. In addition to a new utility switching station co-located with the TPSS, a tie-line route and power distribution to the Tunnel 1 portal under this alternative would be the same, albeit with shorter electrical line routes, as those described for Alternative 1. A distribution power line for the Tunnel 1 portals would be constructed on the south side of the alignment northeast of the intersection of Walnut Lane and SR 152, crossing over and connecting with the TPSS from the north. One power drop site would be provided at the east and west portals (two options for each portal location).

Train Control and Communication Facilities

A total of 19 ATC sites would be constructed in the Morgan Hill and Gilroy Subsection for this alternative:

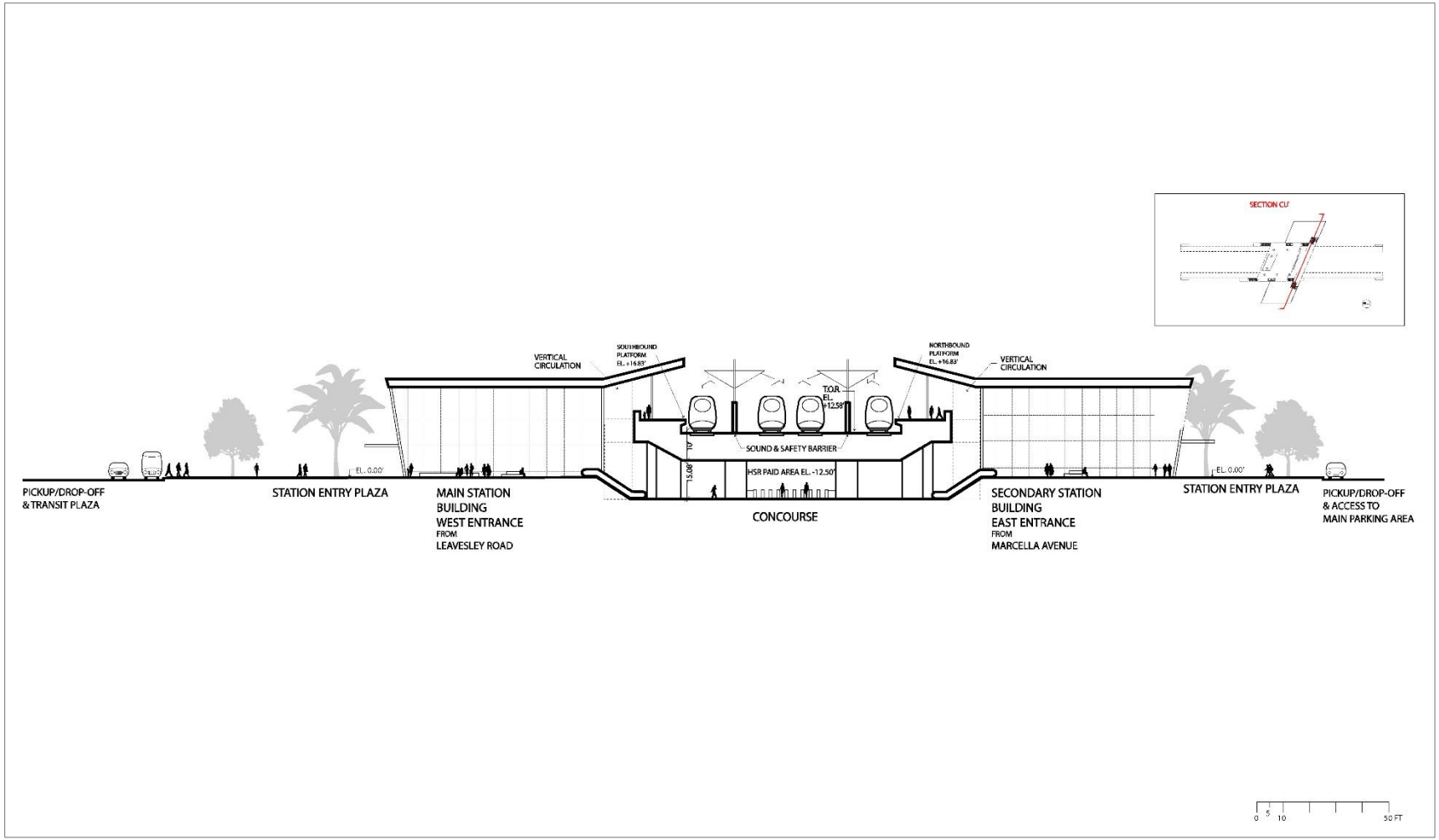
- One site east of Monterey Road near Palm Avenue (two site options)
- One site near East Middle Avenue (two site options)
- Two sites near Cohansey Way
- Four sites between Las Animas Avenue and Leavesley Road
- Three sites south of Leavesley Road
- Four sites north of SR 152, east of Gilroy
- Two sites within the MOWF
- Three sites north of Bloomfield Avenue
- One site near Lake Road (two site options)



Source: Authority 2019b

JUNE 2019

Figure 2-16 Conceptual East Gilroy Station Plan



Source: Authority 2019b

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Figure 2-17 Cross Section of East Gilroy Station

A total of six stand-alone communication radio sites would be constructed in this subsection (five locations are the same as those for Alternative 1):

- Between Barnhart Avenue and Kirby Avenue (two site options)
- South of Cochrane Road along US 101 (two site options)
- North of Cox Avenue and south of West San Martin Avenue (two site options)
- At Bloomfield Avenue

Maintenance Facilities

The East Gilroy MOWF would be located west of the HSR mainline, south of the community of Old Gilroy. The MOWF would encompass approximately 75 acres and extend along the west side of the HSR alignment from the intersection of the SR 152 and Frazer Lake Road south to Jones Creek (Figure 2-18). The freight connection would be provided as described in the discussion of the alignment and ancillary facilities.

2.2.3.4 Pacheco Pass Subsection

Alignment and Ancillary Features

The characteristics of the Pacheco Pass Subsection of Alternative 3 would be the same as Alternatives 1 and 2.

Wildlife Crossings

The wildlife crossings under Alternative 3 would be as described under Alternative 1.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities of Alternative 3 would be as described for Alternatives 1 and 2.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 3 would be as described for Alternatives 1 and 2.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.3.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

The characteristics of the San Joaquin Valley Subsection under Alternative 3 would be the same as under Alternatives 1 and 2.

Wildlife Crossings

The wildlife crossings under Alternative 3 would be as described for Alternatives 1 and 2.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities of Alternative 3 would be as described for Alternatives 1 and 2.

Train Control and Communication Facilities

Train control and communications facilities would be as described for Alternatives 1 and 2.

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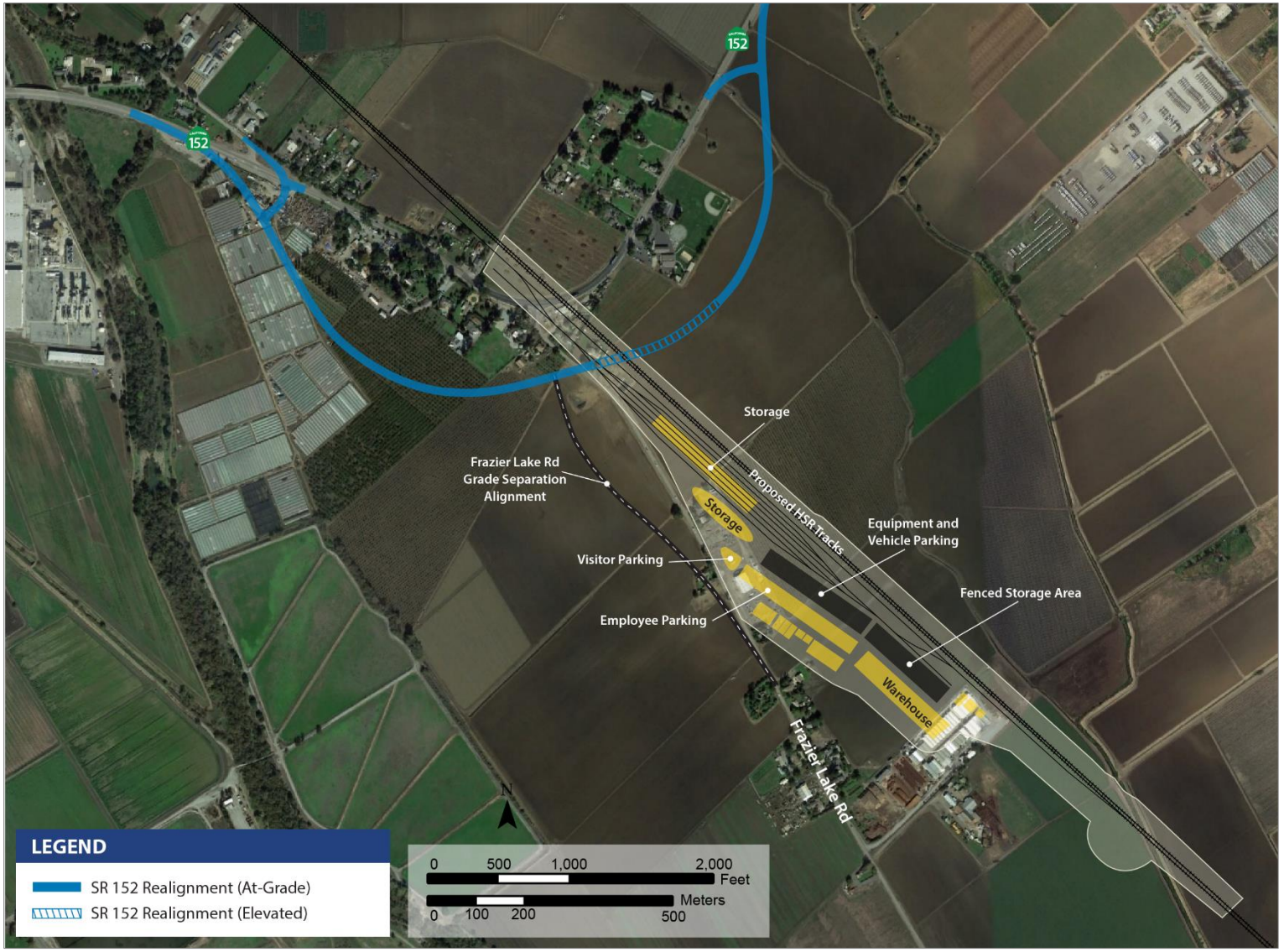


Source: Authority 2019b

JUNE 2019

Figure 2-18 East Gilroy Maintenance of Way Facility

Maintenance Facilities

An MOWS would be constructed near Turner Island Road near Carlucci Road as described for Alternatives 1 and 2 (Figure 2-13)

2.2.4 Alternative 4 (State's Preferred Alternative, CEQA Proposed Project)

On September 17, 2019, the Authority Board of Directors reviewed a staff recommendation on the State's Preferred Alternative and a summary of key identified outreach concerns. The Board confirmed that Alternative 4 is the State's Preferred Alternative for purposes of the Draft EIR/EIS and serves as the CEQA proposed project for purposes of State CEQA Guidelines Section 15124.

The process for considering and the rationale for selecting the State's Preferred Alternative are presented in Chapter 8, Preferred Alternative, of the Final EIR/EIS.

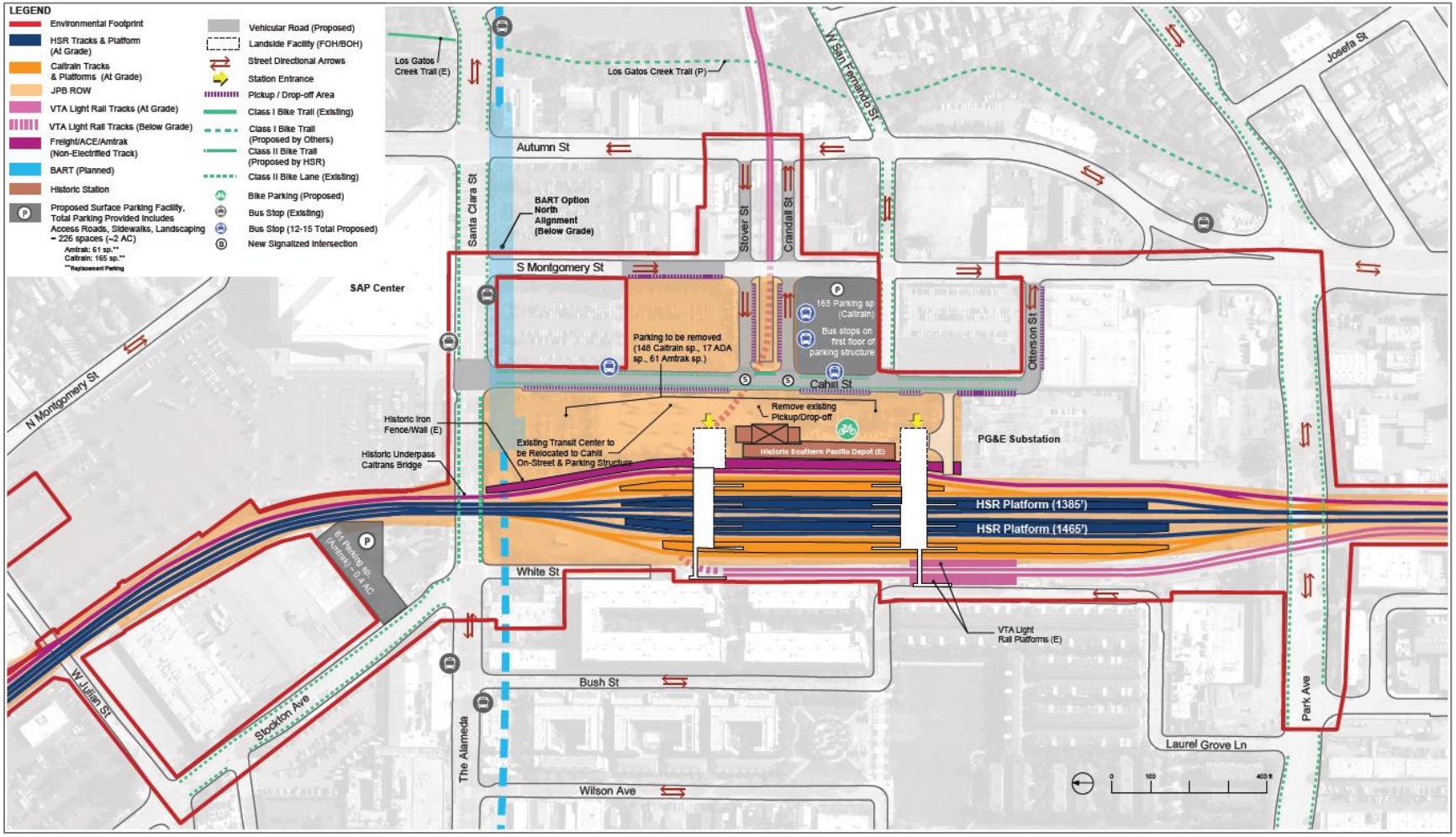
Development of Alternative 4 was intended to extend blended electric-powered passenger railroad infrastructure from the southern limit of the Caltrain Peninsula Corridor Electrification Project through Gilroy. South and east of Gilroy, HSR would operate in a dedicated guideway similar to Alternatives 1, 2, and 3. The objectives of this approach are to minimize property displacements and natural resource impacts, retain local community development patterns, improve the operational efficiency and safety of the existing railroad corridor, and accelerate delivery of electrified passenger rail services in the increasingly congested southern Santa Clara Valley corridor. The alternative is distinguished from the three other project alternatives by a blended, at-grade alignment that would operate on two electrified passenger tracks and one conventional freight track predominantly within the existing Caltrain and UPRR rights-of-way. The maximum train speed of 110 mph in the blended guideway would be enabled by continuous access-restriction fencing; four-quadrant gates, roadway lane channels, and railroad trespass deterrents at all public road grade crossings; and fully integrated communications and controls for train operations, grade crossings, and roadway traffic. Caltrain stations would be reconstructed to enable directional running as part of blended operations. Overall, this alternative would be comprised of 15.2 miles on viaduct, 30.3 miles at grade, 25.9 miles on embankment, 2.3 miles in trench, and two tunnels with a combined length of 15.0 miles.

2.2.4.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

Alternative 4 would begin at Scott Boulevard in blended service with Caltrain on an at-grade profile following Caltrain MT2 and MT3 south along the east side of the existing Caltrain corridor. The existing Lafayette Street pedestrian overpass would remain in place, as would the De La Cruz Boulevard and West Hedding Street roadway overpasses. New UPRR track would start just south of Emory Street to maintain freight movement capacity north of San Jose Diridon Station. The new UPRR track would be east of Caltrain MT1. The existing College Park Caltrain Station would be reconstructed just north of Emory Street on the west side of the Caltrain Corridor on the existing siding track to eliminate the existing holdout rule at the station. A portion of both legs of the UPRR Warm Springs Subdivision Lenzen Wye would undergo minor track adjustments, and a new bridge would be built over Taylor Street for UPRR to tie into the Lenzen Wye.

The blended at-grade alignment would continue along MT2 and MT3 to enter new dedicated HSR platforms at grade at the center of San Jose Diridon Station (Figure 2-19). HSR platforms would be extended south to provide 1,385-foot and 1,465-foot platforms and would be raised to provide level boarding with the HSR trains. The existing Santa Clara Street underpass would remain, but the track in the throat and yard would require modification. There would be no need for modifications to the VTA light rail.



Source: Authority 2019b

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Figure 2-19 Conceptual San Jose Diridon At-Grade Station Plan

Continuing south, the blended at-grade three-track alignment would remain in the Caltrain right-of-way through the Gardner neighborhood. The existing underpass at Park Avenue and the existing overpass at San Carlos Street would remain in place. Four-quadrant gates with channelization would be built at Auzerais Avenue and West Virginia Street. A new bridge for the blended HSR/MT3 track over I-280 would be constructed. The existing underpasses at Bird Avenue and Delmas Avenue would be reconstructed, as would the rail bridge overpasses. New standalone rail bridges over Prevost Street, SR 87, the Guadalupe River, and Willow Street would be built for MT3. MT1 and MT2 would remain on the existing structures. The existing Tamien Caltrain Station would remain in place.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

The San Jose Diridon Station would entail a four-track at-grade alignment through the center of the existing Diridon station, with 1,385- and 1,465-foot platforms centered between Santa Clara Street and Park Avenue (Figure 2-19). The existing historic train station would remain in place. A pedestrian concourse would be built above the yard to provide access to the platforms below. The concourse would consist of a pedestrian walkway above the existing Caltrain tracks and below the HSR platforms, with two entrances on the east side and one on the west.

Construction of San Jose Diridon Station would require displacement of 226 parking spaces. These would be replaced 1:1 in a parking structure at Cahill/Crandall Streets and a second site at Stockton/Alameda Streets. The existing on-site/off-street bus transit center would be relocated to an off-street facility between Cahill, Crandall, South Montgomery, and West San Fernando Streets. Street improvements would include reconfiguring and extending Cahill Street from Santa Clara Street to Otterson Street and extending Stover and Crandall Streets to South Montgomery Street. New bike lanes would be installed on the east side of Cahill Street. New signals and pedestrian crossings would be developed at Cahill and Stover Streets and Cahill and Crandall Streets.

Phasing for interim operations (2027) includes a pedestrian overhead crossing (PED OC) south of the existing historic station and would provide circulation access from the PED OC only to HSR platforms. Caltrain would continue to use the existing tunnel for access. Phasing for Valley-to-Valley (2029) includes access to and from all Caltrain and HSR platforms. At this stage, the existing tunnel would be used only for exiting purposes on HSR platforms. At buildout, there would be an additional PED OC north of the historic station with access to all Caltrain and HSR platforms. From the HSR platforms, the existing tunnel would continue to be used only for exiting.

Train Control and Communication Facilities

Under Alternative 4, HSR would use the existing ATC sites included as part of the Caltrain Positive Control and Electrification Project.

One stand-alone communications radio site would be constructed at one of two locations, both south of Scott Boulevard along the east side of the Caltrain corridor.

Maintenance Facilities

No maintenance facilities are proposed within this subsection.

2.2.4.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The Monterey Corridor Subsection would be approximately 9 miles long and entirely within the San Jose city limits. From the San Jose Diridon Station Approach at West Alma Avenue, just south of the Caltrain Tamien Station, the alignment would extend primarily southeast to Bernal Way (Figure 2-4). Unlike Alternatives 1, 2, and 3, Alternative 4 would be in blended service with Caltrain on an at-grade profile within the Caltrain and UPRR right-of-way. HSR and Caltrain

would operate on the electrified MT2 and MT3 tracks, while UPRR would operate on a nonelectrified MT1. The two existing tracks would be shifted to accommodate the third track. The existing Tamien Caltrain Station would remain in place with two new electrified turnback tracks constructed south of the station to facilitate turning trains outside the station platform areas. The Michael Yard would be reconfigured to a double-ended facility to accommodate storage of Altamont Corridor Express trains and relocated to the east side of the corridor. A new standalone bridge over West Alma Avenue would be constructed for MT3 and a maintenance track, with MT1 and 2 remaining on the existing structure. A new bridge over Almaden Road would be constructed for MT2 and MT3, while MT1 would remain on the existing structures. The existing pedestrian overpass at Communications Hill would remain in place. Capitol Caltrain Station would be reconstructed with a new center platform between MT2 and MT3. The platform would be reached by a new pedestrian overpass built at the north end of the platform. The existing Capitol Expressway overpass would remain in place. Four-quadrant barrier gates with channelization would be built at Skyway Drive, Branhan Lane, and Chynoweth Avenue. The existing Blossom Hill Road overpass and adjacent pedestrian overpass would remain in place. The Blossom Hill Caltrain Station would be reconstructed; the existing pedestrian overpass and platform would be removed and a new center platform constructed between MT2 and MT3. The platform would be reached by a new pedestrian overpass built at the south end of the platform. Great Oaks Parkway would be realigned for approximately 1,350 feet to accommodate the widened rail corridor. SR 85 and Bernal Road overpasses would remain in place.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

There would be no HSR stations within this subsection.

Traction Power Facilities

One traction power paralleling station would be built on the west side of the Caltrain Corridor near the Blossom Hill Caltrain Station.

Train Control and Communication Facilities

Five ATC sites would be built in the subsection:

- Near Communications Hill on the east side of the Caltrain corridor near Chateau La Salle Drive
- Near Communications Hill on the east side of the Caltrain corridor near Montecito Vista Way
- Near Communications Hill on the east side of the Caltrain corridor near Chateau La Salle Drive or Montecito Vista Way (two site options)
- Near Monterey Road on the west side of the Caltrain corridor near Capitol Caltrain Station
- Near Skyway Drive on the west side of the Caltrain corridor (two site options)
- Near Branham Lane on the west side of the Caltrain corridor

Two stand-alone communications radio sites built:

- Near Almaden Road on the east side of the Caltrain corridor
- Near Branham Lane on the west side of the Caltrain corridor

PTC sites would be constructed at the following locations:

- Two sites south of Almaden Road
- One site north of Capitol Caltrain Station
- One site co-located with the ATC site at Branham Lane

2.2.4.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection under Alternative 4 would be approximately 32 miles long, continuing south from the Monterey Corridor Subsection. From Bernal Way in South San Jose, the alignment would extend through Morgan Hill and San Martin to the Downtown Gilroy Station, then curve generally east across the Pajaro River floodplain and through a portion of northern San Benito County before entering Tunnel 1 at the base of the Diablo Range. The alignment would exit the tunnel at Casa de Fruta Parkway/SR 152 in unincorporated eastern Santa Clara County, where it would transition to the Pacheco Pass Subsection. This subsection under Alternative 4 would be blended service with Caltrain on an at-grade profile within the Caltrain and UPRR right-of-way with an at-grade Downtown Gilroy Station. Past the Downtown Gilroy Station and south of the US 101 overpass, HSR would enter the fully grade-separated, dedicated track needed to operate HSR trains at speeds faster than 125 mph.

Beginning at the southern limit of the Monterey Corridor Subsection, the alignment would continue in blended service with Caltrain on an at-grade profile in the existing UPRR right-of-way. HSR and Caltrain would operate on the electrified MT2 and MT3 tracks, while UPRR would operate on MT1. A UPRR siding track would be provided between Blanchard Road and Bailey Avenue. Four-quadrant barrier gates would be installed at all existing public road crossings. Intrusion deterrents would be installed at all at-grade crossings. Three private roads crossing would be eliminated and alternate access provided to those properties. The existing Bailey Avenue overpass would remain in place. Under Alternative 4 the Monterey Road underpass would be reconstructed to accommodate the future widening of Monterey Road to four lanes. The Morgan Hill Caltrain Station would be reconstructed with two new side platforms built outside MT2 and MT3. The platform would be reached by a new pedestrian underpass constructed at the north end of the platform. The existing Butterfield Boulevard overpass would remain in place. Upper Llagas Creek bridge would be reconstructed.

The San Martin Caltrain Station would be reconstructed—the existing platform would be removed and a new center platform would be built between MT2 and MT3. The platform would be reached by a new pedestrian overpass constructed at the south end of the platform. The existing bridge at Miller Slough would be replaced with a triple-cell box. Blended service would end just south of the Downtown Gilroy Station, where Caltrain would have access to turn back and stabling tracks relocated from the station area to south of 10th Street on the west side of the UPRR right-of-way. The Gilroy Caltrain Station would be reconstructed—the existing Caltrain platform would be shifted south and served by a southbound station track. A northbound Caltrain side platform would be provided to the east of a northbound station track. Two side platforms would be provided for HSR on the outside of the MT2 and MT3 tracks. The platforms would be reached by a new pedestrian overpass constructed over the center of the platforms. HSR would continue south under the US 101 overpass, which would remain in place. Past the Industry spur, HSR would ascend onto embankment and then a bridge over the UPRR. Two bridges would be constructed, one for MT2 and MT3 and a separate one for the MOWF lead track. The UPRR Hollister branch line would be realigned to the west to accommodate HSR bridging over the UPRR tracks at a single location. HSR MT2 and MT3 would descend from the embankment before crossing over Bloomfield Road on a new structure. Four-quadrant barrier gates and intrusion deterrents would be installed at Bloomfield Road for the MOWF lead track and UPRR service track. HSR would continue past the MOWF and transition to a new viaduct structure to cross over Pajaro Creek. Continuing on viaduct until just west of Millers Canal, Alternative 4 would join Alternative 1 as described for Alternative 1.

Wildlife Crossings

Twelve wildlife crossings or jump-outs would be built in this subsection:

- Three adjacent wildlife crossings with jump-outs integrated into the wing walls at Tulare Hill

- Fisher Creek culvert under UPRR and Monterey Road replaced with a larger box culvert to improve wildlife crossing potential at this location
- Wildlife crossings and integrated jump-outs south of Emado Avenue, south of Fisher Road, and south of Live Oak
- Wildlife crossings at Richmond Avenue, Paquita Espana Court, and north of Kalana Avenue
- Dedicated jump-outs north of Fisher Creek, south of Blanchard Road, north of Kalana Avenue, and at Miramonte Avenue

Wildlife intrusion deterrents would be constructed for at-grade crossings at Blanchard Road, Palm Avenue, Live Oak Avenue, and Bloomfield Road.

Stations

The Downtown Gilroy Station approach would be at grade with dedicated HSR tracks to the west of UPRR between Old Gilroy Street/7th Street, which would be closed, and 9th Street (Figure 2-20). A new HSR station with 800-foot platforms would be built south of the existing Caltrain station. A pedestrian concourse would be built above the UPRR and Caltrain tracks to provide access to the platforms below.

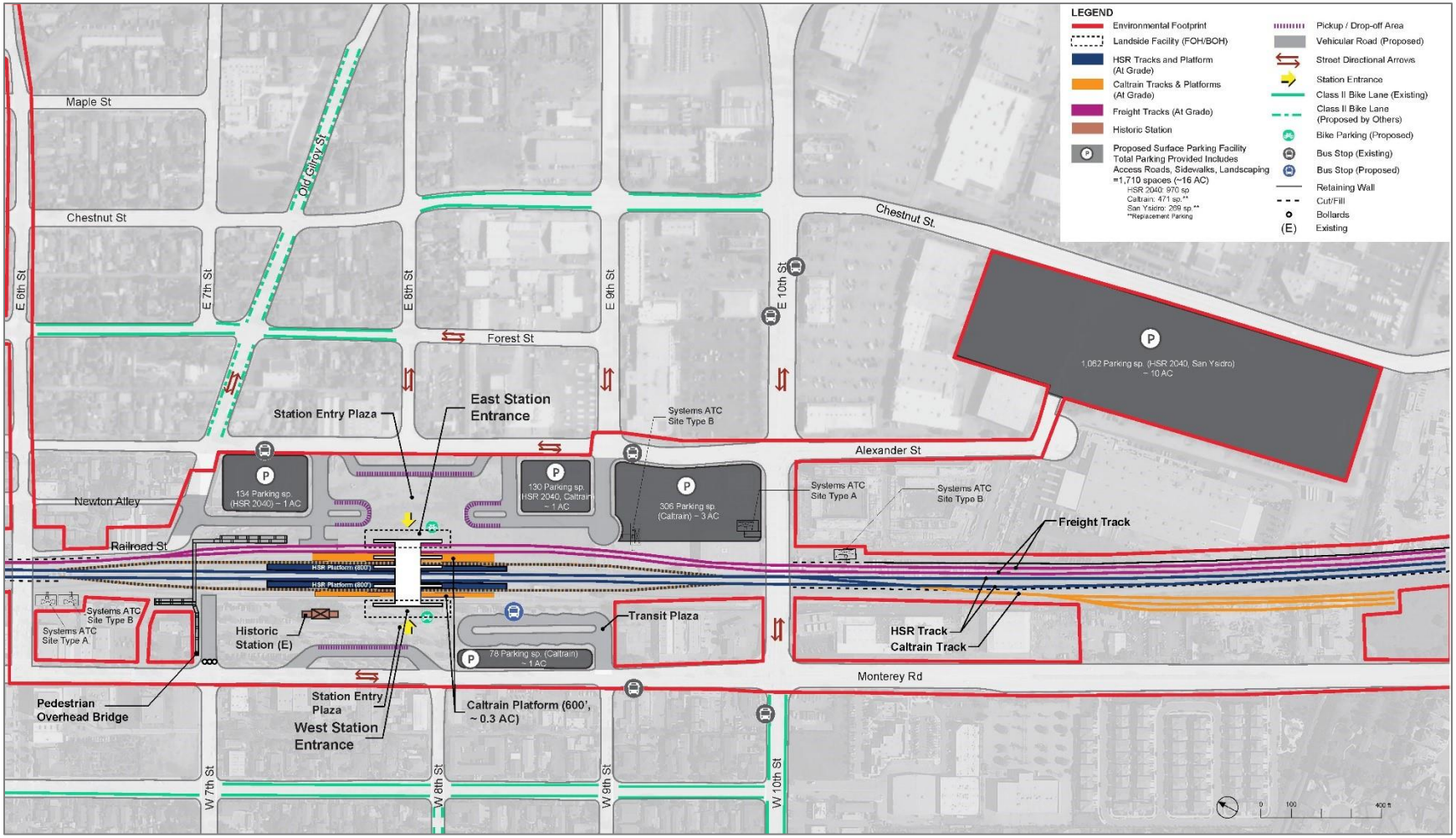
The existing 489 Caltrain parking spaces on the west side of the station would be replaced 1:1 in parking lots on the east and west sides of the alignment. The existing 269 parking spaces at the San Ysidro housing development would be replaced 1:1 with new surface parking at the south end of Alexander Street. HSR parking demand would be 970 spaces in 2040, for a total of 1,728 aggregated parking spaces in 2040. The station site plan provides 970 new parking spaces in five areas. One site would be west of the station along Monterey Road at 9th Street. The other four would be on the east side of the station along Alexander Avenue at 7th Street, 9th Street, 10th Street, and Banes Lane. A multimodal access plan would be developed prior to design and construction of the station. The plan would be developed in coordination with local agencies and would include a parking strategy that would specify the location, amount, and phasing of parking.

A total of eight bus bays would be provided, adding one bay to the existing seven. East 7th Street would be closed and East 10th Street would be modified with quadrant gates and channelization. A pedestrian overcrossing would be installed to provide access between East and West 7th Street. A 4,000-square-foot bicycle facility would be constructed. Figure 2-20 illustrates the conceptual at-grade Downtown Gilroy Station.

The Morgan Hill Caltrain Station would be reconstructed with two new side platforms built outside MT2 and MT3. The platform would be reached by a new pedestrian underpass built at the north end of the platform. The San Martin Caltrain Station would be reconstructed where the existing platform would be removed and a new center platform would be built between MT2 and MT3. The platform would be reached by a new pedestrian overpass constructed at the south end of the platform.

Traction Power Facilities

One new TPSS, Site 4—Gilroy, would be constructed at one of two locations on the east side of the alignment: south of Buena Vista Avenue or north of Cohansey Avenue. At this site, one new utility switching station could be co-located with the TPSS. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnections of the TPSS to a new PG&E switching station and/or to existing PG&E facilities, typically within tie-line/utility corridors.



Source: Authority 2019b

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Figure 2-20 Conceptual Downtown Gilroy At-Grade Station Plan

A traction power switching station would be constructed west of the HSR alignment at Richmond Avenue.

Three traction power paralleling stations would be constructed adjacent to the guideway:

- Either south of San Pedro Avenue on the west side of the alignment or just north of Butterfield Boulevard on the east side of the alignment
- West of Lovers Lane either south of the alignment or north of the alignment (like Alternative 1)
- Near the Tunnel 1 east portal, either at the portal or east of SR 152 in the southern area of Casa de Fruta (like Alternatives 1 and 2)

PG&E would reinforce the electric power distribution network to meet HSR traction and distribution power requirements by replacing (reconductoring) approximately 11.1 miles of existing power line associated with the Spring to Llagas and Green Valley to Llagas 115-kV power lines. The existing power lines to be reconductored, reusing the poles and towers, begin at the Morgan Hill Substation on West Main Avenue in Morgan Hill, then cross the east side of Peak Avenue and Dewitt Avenue, spanning West Dunne Avenue, Chargin Drive, Spring Avenue, and several residences. The alignment would continue south across an open-space area, then follow Sunnyside Avenue for approximately 0.5 mile. The alignment would continue south for approximately 4 miles, spanning additional open-space areas of wineries and the Corde Valley Golf Course. The alignment would then turn east along the north side of Day Road before heading south for approximately 2.5 miles and terminating at the Llagas Substation in Gilroy.

A permanent overhead distribution electrical power line from TPSS Site 4 to the Tunnel 1 portal location would provide power to the tunnel boring machine during construction and the tunnel fire-life-safety system during operations.

Train Control and Communication Facilities

Twenty-two ATC sites would be constructed:

- One site south of Blanchard Road on the east side of the alignment (two site options)
- Three sites south of Live Oak Avenue on the west side of the alignment
- One site north of San Pedro Avenue on the west side of the alignment
- One site north of Barrett Avenue on the west side of the alignment (two site options)
- One site north of East Middle Avenue on the west side of the alignment
- One site in the vicinity of either Church Avenue or Lena Avenue on the east side of the alignment (two site options)
- One site between Leavesley Road and IOOF Avenue
- Two sites south north of Lewis Street on the east side of the alignment
- Two sites south of 6th Street on the west side of the alignment
- Three sites in the vicinity of 10th Street on the east side of the alignment
- Four sites north of Carnadero Avenue on the west side of the alignment
- Two sites east of the Pajaro River
- One site near Lake Road (two site options) (like Alternative 1)

PTC sites would be constructed at the following locations:

- One site south of Blanchard Road
- One site north of Bailey Avenue
- One site co-located with ATC site south of Live Oak Avenue

- One site at Cohansey Avenue
- One site south of Lewis Street
- One site south of East 6th Street

Five stand-alone communications radio sites would be constructed:

- Near Bernal Way on the west side of the alignment (two site options)
- South of Live Oak Avenue on the west side of the alignment (two site options)
- In the vicinity of East Central Avenue (two site options, one on either side of the alignment)
- South of California Avenue on the east side of the alignment
- East of the Pajaro River south of Gilroy

Maintenance Facilities

The South Gilroy MOWF (Figure 2-21) near Bloomfield Road would encompass approximately 50 acres and the program and layout would be as described for Alternatives 1 and 2. In contrast to Alternatives 1 and 2, the MOWF for Alternative 4 would be located on the west side of the tracks between Carnadero Avenue and the Pajaro River. This configuration would require realignment of the UPRR Hollister Subdivision. HSR mainline and MOWF lead track would pass over UPRR Coast Subdivision tracks.

2.2.4.4 Pacheco Pass Subsection

Alignment and Ancillary Features

Alternative 4 would be as described for Alternatives 1–3 for this subsection.

Wildlife Crossings

The wildlife crossings under Alternative 4 would be as described for Alternatives 1–3.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

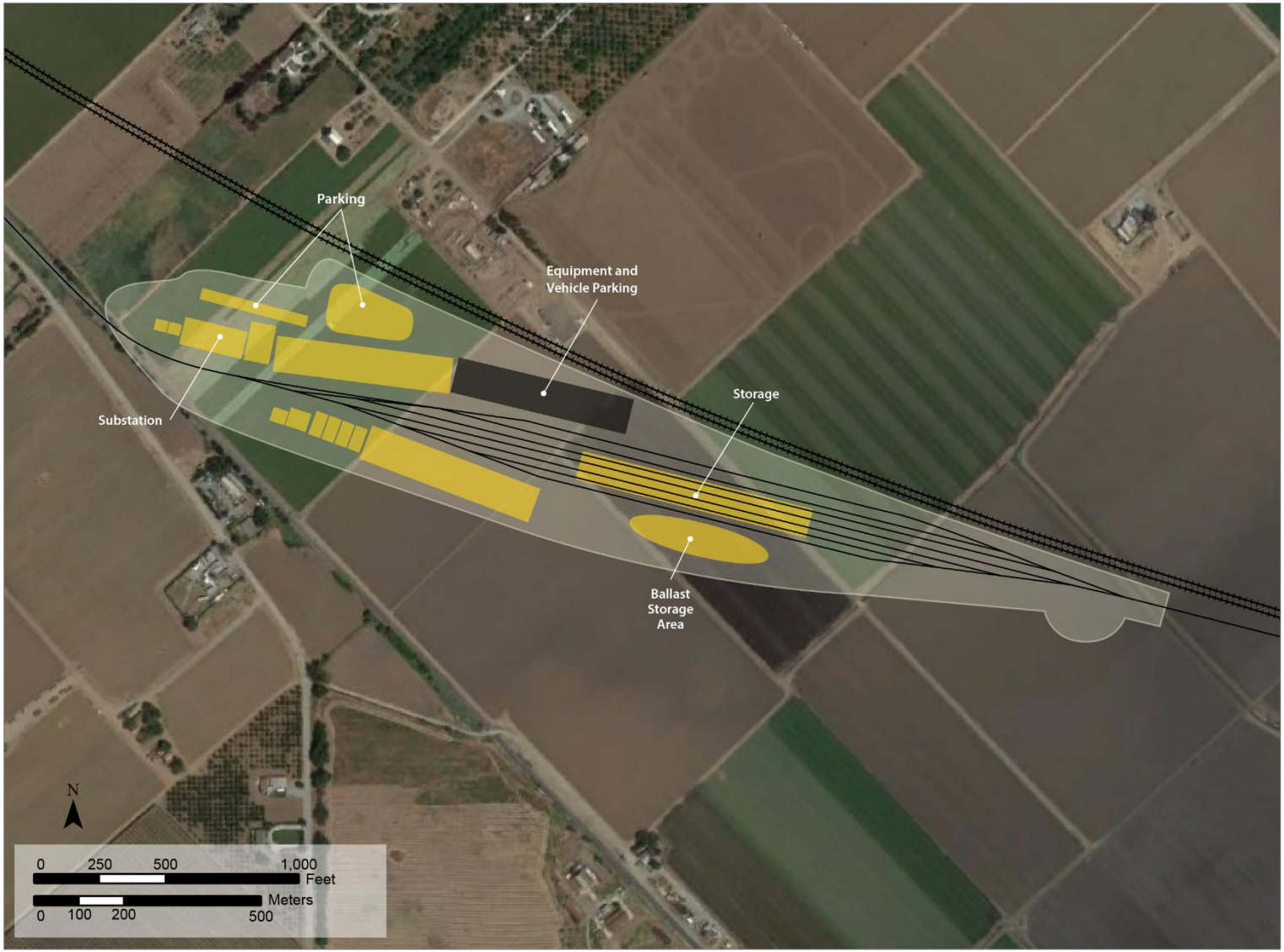
Traction power facilities of Alternative 4 would be as described for Alternatives 1–3.

Train Control and Communication Facilities

Train control and communications facilities would be as described for Alternatives 1–3.

Maintenance Facilities

An MOWS would be built near Turner Island Road near Carlucci Road as described for Alternatives 1–3 (Figure 2-13).



Source: Authority 2019b

JUNE 2019

Figure 2-21 South Gilroy Maintenance of Way Facility for Alternative 4

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2.2.4.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

Alternative 4 would be the same as described for Alternatives 1–3 for this subsection.

Wildlife Crossings

The wildlife crossings under Alternative 4 would be as described for Alternatives 1–3.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities would be as described for Alternatives 1–3.

Train Control and Communication Facilities

Train control and communications facilities would be as described for Alternatives 1–3.

Maintenance Facilities

An MOWS would be built near Turner Island Road near Carlucci Road as described for Alternatives 1–3 (Figure 2-13).

2.3 Impact Avoidance and Minimization Features

The Authority has developed impact avoidance and minimization features (IAMF) that would avoid or minimize potential effects. IAMFs are standard practices, actions, and design features that are incorporated into the project to avoid or minimize environmental or community effects. The description of each IAMF details the means and effectiveness of the feature in avoiding or minimizing effects, as well as the environmental benefits of implementing the measure. Table 2-2 shows complete descriptions of all IAMFs that the Authority and FRA would implement to address potential effects related to air quality and GHGs.

Table 2-2 Summary of Air Quality and Greenhouse Gas Impact Avoidance and Minimization Features

IAMF	Description
AQ-IAMF#1: Fugitive Dust Emissions	This action reduces construction-related air quality emissions by requiring the preparation of a fugitive dust control plan. This plan identifies the minimum features that would be implemented during ground-disturbing activities. Examples of these include covering all materials (truck beds) transported on public roads, watering exposed graded surfaces, limiting vehicle speed on the construction site, suspending operations during high wind events, stabilizing all disturbed graded areas, wetting exterior surfaces of structures during demolition, and removing any accumulation of mud or dirt from adjacent public streets. These types of construction best management practices are proven methods of minimizing fugitive dust generation associated with ground-disturbing and demolition construction activities. Each air district traversed by the HSR has adopted rules and/or regulations requiring dust control plans for construction activities. These dust control plans are a part of each district's overall strategy for compliance with federal and state air quality standards.
AQ-IAMF#2: Selection of Coatings	This commitment reduces overall construction emissions by limiting the type of paint to those containing VOC of less than 10 percent (low) to be used during construction. Using paint that releases fewer organic compounds into the air after application is an air quality management measure effective in reducing construction emissions and achieving federal and state air quality standards.

IAMF	Description
AQ-IAMF#3: Renewable Diesel	This commitment requires the contractor to use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty off-road diesel-fueled construction diesel equipment and on-road diesel trucks. Renewable diesel must meet the most recent ASTM D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50 percent of diesel with the lowest carbon intensity among petroleum diesel fuels sold in California. Using renewable diesel releases less carbon dioxide into the atmosphere, thereby helping reduce greenhouse gas emissions.
AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment	This commitment would be effective in reducing criteria pollutant emissions from off-road equipment. This construction contract requirement would involve utilizing equipment that meets USEPA Tier 4 emission standards, instead of a mix of equipment meeting various engine tiers.
AQ-IAMF#5: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment	This commitment would be effective in reducing criteria pollutant emissions from on-road equipment. This construction contract requirement would involve utilizing model year 2010 or newer on-road engines, instead of a mix of vehicles with various engine model years.
AQ-IAMF#6: Reduce the Potential Impact of Concrete Batch Plants	This measure requires documentation of concrete batch plant location and design requirements. Concrete batch plants would be sited at least 1,000 feet from sensitive receptors. Batch plant technology would include typical control measures to reduce fugitive dust in a manner equivalent to the USEPA AP-42 controlled emissions factors for concrete batch plants. Proper location and utilization of typical control measures would be effective in reducing fugitive dust and health risk during concrete batching.

Source: Authority and FRA 2019
HSR = high-speed rail
VOC = volatile organic compound
USEPA = U.S. Environmental Protection Agency

3 LAWS, REGULATIONS, AND ORDERS

This chapter provides a summary of federal, state, and local laws, regulations, and orders that regulate air quality and GHG and that apply to the project.

Air pollution is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Air pollutants degrade the atmosphere by reducing visibility, damaging property, and combining to form smog. Air pollutants result in effects on humans by reducing the productivity or vigor of crops or natural vegetation, and by reducing human or animal health. *Air quality* describes the amount of air pollution to which the public is exposed.

The USEPA is responsible for establishing the national ambient air quality standards (NAAQS), enforcing the CAA (42 United States Code [U.S.C.] § 7401), and regulating transportation-related emission sources, such as aircraft, ships, and certain types of locomotives, under the exclusive authority of the federal government. The USEPA also establishes vehicular emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by the California Air Resources Board (CARB).

3.1 Federal

3.1.1 Clean Air Act (42 U.S.C. § 7401) and National Ambient Air Quality Standards

The CAA defines nonattainment areas as geographic regions designated as not meeting one or more of the NAAQS, which are standards that the USEPA has established for six major air pollutants, known as criteria pollutants. It requires that a state implementation plan (SIP) be prepared for each nonattainment area and a maintenance plan be prepared for each former nonattainment area that subsequently demonstrates compliance with the standards. A SIP is a compilation of a state's air quality control plans and rules, approved by the USEPA. Section 176(c) of the CAA provides that federal agencies cannot engage, support, or provide financial assistance for licensing, permitting, or approving any project unless the project conforms to the applicable SIP. The state's and USEPA's goals are to eliminate or reduce the severity and number of violations of the NAAQS and to achieve expeditious attainment of these standards.

The six major criteria pollutants subject to the NAAQS are ozone (O_3), particulate matter (PM) (PM_{10} is PM 10 microns in diameter or less, and $PM_{2.5}$ is PM 2.5 microns in diameter or less), CO, nitrogen dioxide (NO_2), SO_2, and lead (Pb) (Table 3-1). The California ambient air quality standards (CAAQS) are statewide standards established by the CARB that are generally more stringent than the NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. California's regulations are discussed in more detail in Section 3.2, State.

Table 3-1 summarizes state and federal standards by pollutant. Chapter 4 also shows the standards for each pollutant by averaging time and the method of measurement. The primary standards are intended to protect public health. The secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

Table 3-1 State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3, 6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM_{10})[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter ($PM_{2.5}$)[9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3, 6]	Method [7]
Lead (Pb)[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility-Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: CARB 2016
°C = degrees Celsius
CAAQS = California ambient air quality standards
CARB = California Air Resources Board
CO = carbon monoxide
NAAQS = national ambient air quality standards
mg/m^3 = milligrams per cubic meter
NO_2 = nitrogen dioxide
O_3 = ozone
Pb = lead
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
ppb = parts per billion
ppm = parts per million
SO_2 = sulfur dioxide
TAC = toxic air contaminants
USEPA = U.S. Environmental Protection Agency
> = greater than
N/A = not applicable or there was insufficient or no data available to determine the value
µg/m^3 = micrograms per cubic meter of air
— = no standard

[1] California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility-reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations

[2] National standards (other than O_3, PM, and those based on annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current national policies.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.
[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated effects of a pollutant.
[7] Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.
[8] On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.
[9] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
[10] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
[11] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of ppb. California standards are in units of ppm. To directly compare the 1-hour national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
[12] The CARB has identified Pb and vinyl chloride as TAC with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
[13] The national standard for Pb was revised on October 15, 2008, to a rolling 3-month average. The 1978 Pb standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
[14] In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

3.1.2 Conformity Rule

Pursuant to CAA Section 176(c) requirements, the USEPA promulgated 40 C.F.R. Part 51, Subpart W and 40 C.F.R. Part 93B, Determining Conformity of General Federal Actions to State or Federal Implementation Plans (§ 63214) (November 30, 1993) as amended; 75 *Federal Register* (Fed. Reg.) 17253 (April 5, 2010). These regulations, commonly referred to as the General Conformity Rule, apply to all federal actions, including FRA actions on the HSR System. Federal actions that are excluded from review (e.g., stationary emission sources that hold permits under the federal New Source Review program) or related to transportation plans, programs, and projects under the Federal Highway Act (Title 23 U.S.C.) or the Federal Transit Act (Title 49 U.S.C.) are not subject to General Conformity. Transportation actions under Title 23 or Title 49 are subject to transportation conformity (40 C.F.R. Part 51T and 40 C.F.R. Part 93A). 40 C.F.R. Part 51, Subpart W, applies in states that have an approved SIP revision adopting the General Conformity Rule.

The General Conformity Rule is used to determine if federal actions meet the requirements of the CAA and the applicable SIP so that air emissions related to the action do not result in the following outcomes:

- Cause or contribute to new violations of an NAAQS
- Increase the frequency or severity of any existing violation of an NAAQS
- Delay timely attainment of an NAAQS or interim emission reduction

A conformity determination under the General Conformity Rule is required if the federal agency determines that all of the following criteria apply:

- The action will occur in a nonattainment or maintenance area
- One or more specific exemptions do not apply to the action
- The action is not included in the federal agency's "presumed to conform" list
- The emissions from the proposed action are not within the approved emissions budget for an applicable facility
- The total direct and indirect emissions of a pollutant (or its precursors) are at or above the *de minimis* levels established in the General Conformity Rule (75 Fed. Reg. 17255)

Conformity regulatory criteria are listed in 40 C.F.R. Section 93.158. An action would be determined to conform to the applicable SIP if, for each pollutant that exceeds the *de minimis* emissions level in 40 C.F.R. Section 93.153(b), or otherwise requires a conformity determination because of the total of direct and indirect emissions from the action, the action meets the requirements of 40 C.F.R. Section 93.158(c).

In addition, federal activities may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions toward attainment. The project is subject to review under the USEPA General Conformity Rule.

3.1.3 Mobile Source Air Toxics/Hazardous Air Pollutants

In addition to the NAAQS criteria pollutants, the USEPA regulates MSATs. MSATs are compounds emitted from highway vehicles and nonroad equipment that are known or suspected to cause cancer or other serious health and environmental effects. In February 2007, the USEPA finalized a rule (Control of Hazardous Air Pollutants from Mobile Sources, February 9, 2007) to reduce hazardous air pollutants (HAP) from mobile sources. The rule limits the benzene content of gasoline and reduces toxic emissions from passenger vehicles and gas cans. The USEPA estimates that in 2030 this rule would reduce total emissions of MSATs by 330,000 tons and volatile organic compound (VOC) emissions (precursors to O_3 and $PM_{2.5}$) by more than 1 million tons. The latest revision to this rule, which added specific benzene control technologies, occurred

in October 2008. No NAAQS or CAAQS exist for MSATs. Specifically, the USEPA has not established NAAQS or provided ambient standards for HAPs.

On October 18, 2016, the FHWA released *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents,* which superseded the February 2006 interim guidelines. The FHWA's guidance advises when and how to analyze MSATs in the NEPA environmental review process for highways and other transportation-related projects. This guidance was followed to define the MSAT analysis for the project.

By 2010, the USEPA's existing programs had reduced MSATs by more than 1 million tons from 1999 levels (USEPA 2015a). In addition to controlling pollutants such as hydrocarbons, PM, and nitrogen oxides (NO_X), recent USEPA regulations controlling emissions from highway vehicles and nonroad equipment will result in large reductions in toxic emissions to the air. The USEPA is developing programs that would provide additional benefits (further controls) for small non-road gasoline engines, diesel locomotives, and marine engines. Several USEPA programs reduce risk in communities. These programs include Clean School Bus USA, the Voluntary Diesel Retrofit Program, Best Workplaces for Commuters, and the National Clean Diesel Campaign.

3.1.4 Federal Greenhouse Gas Regulations and Guidance

Climate change and GHG emission reductions are a concern at the federal level. Laws, regulations, plans, and policies address global climate change issues. This section summarizes key federal regulations relevant to the proposed project.

In *Massachusetts v. U.S. Environmental Protection Agency, et al.*, 549 U.S. 497 (2007), the United States Supreme Court ruled that GHGs fit within the CAA's definition of air pollutants and that the USEPA has the authority to regulate GHGs.

On September 22, 2009, the USEPA published the Final Rule that requires mandatory reporting of GHG emissions from large sources in the U.S. The rule amends CAA Regulations under 40 C.F.R. Parts 86, 87, 89, 90, and 94 and provides a new section, Part 98. The USEPA uses the reports to collect accurate and comprehensive emissions data that can inform future policy decisions. Facilities that emit 25,000 metric tons or more per year of GHG emissions must submit annual reports to the USEPA under Subpart C of the final rule. The final rule covers the GHGs carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride (SF_6), and other fluorinated gases, including nitrogen trifluoride and hydrofluorinated ethers. This is not a transportation-related regulation. However, the methodology developed as part of this regulation is helpful in identifying potential GHG emissions.

On October 5, 2009, President Obama signed U.S. Presidential Executive Order (USEO) 13514; *Federal Leadership in Environmental, Energy, and Economic Performance*. USEO 13514 requires federal agencies to set a 2020 GHG emission-reduction target within 90 days, increase energy efficiency, reduce fleet petroleum consumption, conserve water, reduce waste, support sustainable communities, and leverage federal purchasing power to promote environmentally responsible products and technologies. On December 7, 2009, the *Final Endangerment and Cause or Contribute Findings for Greenhouse Gases* under Section 202(a) of the CAA went into effect. The endangerment finding states that current and projected concentrations of the six key well-mixed GHGs in the atmosphere—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6—threaten the public health and welfare of current and future generations. Furthermore, it states that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare (USEPA 2015b).

Based on the endangerment finding, the USEPA revised vehicle emission standards under the CAA. The USEPA and the NHTSA issued a joint final rulemaking to update the Corporate Average Fuel Economy (CAFE) fuel standards on October 15, 2012 (77 Fed. Reg. 62623), requiring substantial improvements in fuel economy and reductions in GHG emissions for all light-duty vehicles sold in the U.S. The new standards apply to new passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2017–2025. The USEPA GHG standards require that these vehicles meet an estimated combined average emissions level of

163 grams of CO_2 per mile in model year 2025, which would be equivalent to 54.5 miles per gallon if the automotive industry were to meet this CO_2 level entirely through fuel economy improvements.

On September 15, 2011, the USEPA and NHTSA issued a final rule of *Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles* (76 Fed. Reg. 7106). This final rule is tailored to each of three regulatory categories of heavy-duty vehicles—combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles—and applies to model years 2014–2018. The USEPA and NHTSA estimated that the new standards in this rule will reduce CO_2 emissions by approximately 270 million metric tons (MT) and save 530 million barrels of oil over the life of vehicles sold during the 2014–2018 model years. The USEPA and NHTSA signed Phase 2 of these standards on August 16, 2016, which apply to model years 2019–2027 medium- and heavy-duty vehicles. The USEPA and NHTSA have determined that the Phase 2 standards would lower CO_2 emissions by approximately 1.1 billion metric tons and save up to 2 billion barrels of oil over the life of vehicles regulated under the program (USEPA 2016a).

On October 15, 2012, the USEPA and the NHTSA issued CAFE standards for model years 2017 and beyond; these standards will reduce GHG emissions by increasing the fuel economy of light-duty vehicles to 54.5 miles per gallon by model year 2025. To further California's support of the national program to regulate emissions, the CARB submitted a proposal that would allow automobile manufacturer compliance with the USEPA's requirements to show compliance with California's requirements for the same model years. The Final Rulemaking Package was filed on December 6, 2012, and the final rulemaking became effective December 31, 2012. In July 2016, the USEPA, NHTSA, and CARB released a mid-term evaluation of the October 2012 final rule in a draft technical assessment report (USEPA et al. 2016). The draft technical assessment report makes the following conclusions:

- A wider range of technologies exists for manufacturers to meet the model year 2022–2025 standards, and at costs that are similar or lower, than those projected in the 2012 rule.
- Advanced gasoline vehicle technologies will continue to be the predominant technologies, with modest levels of strong hybridization and very low levels of full electrification (plug-in vehicles) needed to meet the standards.
- The car/truck mix reflects updated consumer trends that are informed by a range of factors including economic growth, gasoline prices, and other macro-economic trends. However, as the standards were designed to yield improvements across the light-duty vehicle fleet, irrespective of consumer choice, updated trends are fully accommodated by the footprint-based standards.

On August 2, 2018, NHTSA and USEPA proposed to amend the fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (SAFE Vehicles Rule). On September 19, 2019, USEPA and NHTSA issued a final action on the One National Program Rule, which is consider Part One of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards. Part One of the SAFE Vehicles Rule enables USEPA/NHTSA to provide nationwide uniform fuel economy and GHG vehicle standards, specifically by (1) clarifying that federal law preempts state and local tailpipe GHG standards, (2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and (3) withdrawing California's CAA preemption waiver to set state-specific standards.

USEPA and NHTSA published their decisions to withdraw California's waiver and finalize regulatory text related to the preemption on September 27, 2019 (84 Fed. Reg. 51310). California, 22 other states, the District of Columbia, and two cities filed suit against Part One of the SAFE Vehicles Rule on September 20, 2019 (*California et al. v. United States Department of Transportation et al*., 1:19-cv-02826, U.S. District Court for the District of Columbia). On October 28, 2019, the Union of Concerned Scientists, Environmental Defense Fund, and other groups filed a protective petition for review after the federal government sought to transfer the suit to the

D.C. Circuit (*Union of Concerned Scientists v. National Highway Traffic Safety Administration*). The lawsuit filed by California and others is stayed pending resolution of the petition.

USEPA and NTHSA published final rules to amend and establish national CO_2 and fuel economy standards on April 30, 2020 (Part Two of the SAFE Vehicles Rule) (85 Fed. Reg. 24174). The revised rule changes the national fuel economy standards for light-duty vehicles from 50.4 miles per gallon to 40.5 miles per gallon in future years. California, 22 other states, and the District of Columbia filed a petition for review of the final rule on May 27, 2020.

On January 20, 2021, President Joseph Biden issued an executive order directing the USEPA and NHTSA to review the SAFE Vehicles Rule and propose a new rule suspending, revising, or rescinding it. On April 22, 2021, NTHSA issued a notice of proposed rulemaking to repeal the SAFE Vehicles Rule (49 C.F.R. Parts 531 and 533). The fate of the SAFE Vehicles Rule remains uncertain in the face of pending legal deliberations.

On February 18, 2010, the White House Council on Environmental Quality (CEQ) released draft guidance regarding the consideration of GHG in NEPA documents for federal actions. The CEQ issued revised draft guidance in December 2014 and final guidance in August 2016 (CEQ 2016). On April 25, 2017, CEQ withdrew the guidance pursuant to USEO 13783, but noted "the withdrawal of the guidance does not change any law, regulation, or other legally binding requirement (82 Fed. Reg. 16576)." The CEQ released new draft guidance on June 26, 2019, which if finalized would replace the withdrawn August 2016 guidance. The June 2019 guidance requires federal agencies to analyze the direct, indirect, and cumulative impacts of a proposed action's GHG emissions, as well as consider the impacts of climate change on the project.

3.2 State

3.2.1 California Clean Air Act and California Ambient Air Quality Standards

The California Clean Air Act requires that nonattainment areas achieve and maintain the health-based CAAQS by the earliest practicable date. The act is administered by the CARB at the state level and by local air quality management districts at the regional level. The air districts are required to develop plans and control programs for attaining the state standards.

The CARB is responsible for implementation of the California Clean Air Act, meeting state requirements of the federal CAA, and establishing the CAAQS. The CARB is also responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB also establishes passenger vehicle fuel specifications.

3.2.2 Mobile Source Air Toxics/Toxic Air Contaminates

California regulates TACs (equivalent to the federal HAPs) primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (Hot Spots Act). The Tanner Act created California's program to reduce exposure to air toxics. The Hot Spots Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

In August 1998, the CARB identified diesel particulate matter (DPM) from diesel-fueled engines as a TAC. In September 2000, the CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan was to reduce DPM (respirable particulate matter) emissions and the associated health risk by 75 percent in 2010 and by 85 percent by 2020. The plan identifies 14 measures that target new and existing on-road vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators).

The CARB has adopted regulations to reduce emissions from both on-road and off-road heavy-duty diesel vehicles (e.g., equipment used in construction). These regulations, known as Airborne

Toxic Control Measures, reduce the idling of school buses and other commercial vehicles, control DPM, and limit the emissions of ocean-going vessels in California waters. The regulations also include measures to control emissions of air toxics from stationary sources. The California Toxics Inventory, developed by interpolating from CARB estimates of total organic gases and PM, provides emissions estimates by stationary, area-wide, on-road mobile, off-road mobile, and natural sources (CARB 2015a).

3.2.3 California Greenhouse Gas Regulations and Guidance

California has taken proactive steps, briefly described in this section, to address the issues associated with GHG emissions and climate change.

3.2.3.1 Assembly Bill 1493

With the passage of Assembly Bill (AB) 1493 in 2002, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the CARB to develop and implement regulations to reduce automobile and light-truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the model year 2009. Although litigation challenged these regulations and the USEPA initially denied California's related request for a waiver, the waiver request was granted (CARB 2015b).

3.2.3.2 Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed California Executive Order (EO) S-3-05. The goal of this EO was to reduce California's GHG emissions to (1) 2000 levels by 2010; (2) 1990 levels by 2020; and (3) 80 percent below the 1990 levels by 2050. EO S-3-05 also calls for the California Environmental Protection Agency to prepare biennial science reports on the potential impact of continued global warming on certain sectors of the California economy. As a result of the scientific analysis presented in these biennial reports, a comprehensive Climate Adaptation Strategy was released in December 2009 following extensive interagency coordination and stakeholder input. The latest of these reports, Climate Action Team Biennial Report, was published in December 2010 (Cal-EPA 2010).

3.2.3.3 Assembly Bill 32

One goal of EO S-03-05 was further reinforced by AB 32 (Chapter 488, Statutes of 2006), the Global Warming Solutions Act of 2006, which requires the state to reduce GHG emissions to 1990 levels by 2020. AB 32 mandates that the CARB create a plan that includes market mechanisms and implement rules to achieve "real, quantifiable, cost-effective reductions of GHGs." Separately, Governor Schwarzenegger signed EO S-20-06, which directs state agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

The following are specific requirements of AB 32:

- The CARB will prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions from sources or categories of sources of GHGs by 2020 (Cal. Health and Safety Code § 38561). The scoping plan, approved by the CARB on December 12, 2008, and updated in 2014 and 2017, provides the outline for future actions to reduce GHG emissions in California via regulations, market mechanisms, and other measures. The scoping plan includes the implementation of the HSR system as a GHG reduction measure, estimating a 2020 reduction of 1 million metric tons (t) of CO_2 equivalent (CO_2e).
- The CARB will identify the statewide level of GHG in 1990 to serve as the emissions limit to be achieved by 2020 (Cal. Health and Safety Code § 38550). In December 2007, the CARB approved the 2020 emission limit of 427 million metric tons of CO_2e of GHG.
- The CARB will adopt a regulation requiring the mandatory reporting of GHG emissions (Cal. Health and Safety Code § 38530). In December 2007, the CARB adopted a regulation requiring the largest industrial sources to report and verify their GHG emissions. The

reporting regulation serves as a solid foundation to determine GHG emissions and track future changes in emission levels.

As of July 2016, California is on track to meet or exceed the target of reducing GHG to 1990 levels by 2020, which was previously established in the California Global Warming Solutions Act of 2006 (AB 32).

3.2.3.4 Executive Order S-01-07

With EO S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California in 2007. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

3.2.3.5 California Environmental Quality Act Guidelines Amendments to Address Greenhouse Gas Emissions

The State CEQA Guidelines amendments of December 30, 2009, specifically require lead agencies to address GHG emissions in determining the significance of environmental effects caused by a project, and to consider feasible means to mitigate the significant effects of GHG emissions. The following provisions of the State CEQA Guidelines amendments pertain to addressing GHG emissions (CNRA 2018):

- A lead agency may consider the following when assessing the significance of effects from GHG emissions:
  - The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting
  - Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project
  - The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions
- When an agency makes a statement of overriding considerations, the agency may consider adverse environmental effects in the context of region wide or statewide environmental benefits.
- Lead agencies will consider feasible means of mitigating GHG emissions that may include, but not be limited to, the following:
  - Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision.
  - Reductions in emissions resulting from a project through implementation of project features, project design, or other measures.
  - Off-site measures, including offsets.
  - Measures that sequester GHGs.
- In the case of the adoption of a plan (e.g., general plan, long-range development plan, or GHG reduction plan), mitigation may include specific measures that may be implemented on a project-by-project basis. Mitigation may also incorporate specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

3.2.3.6 Senate Bill 375

SB 375, signed into law by Governor Schwarzenegger on September 30, 2008, became effective January 1, 2009. This law requires the state's 18 metropolitan planning organizations to develop the sustainable communities strategies (SCS) as part of their regional transportation plans (RTP) through integrated land use and transportation planning, and to demonstrate an ability to attain the GHG emissions reduction targets that the CARB established for the region by 2020 and 2035. This would be accomplished through either the financially constrained SCS as part of the RTP or an unconstrained alternative planning strategy. If regions develop integrated land use, housing,

and transportation plans that meet the SB 375 targets, new projects in these regions can be relieved of certain CEQA review requirements.

In accordance with SB 375, the CARB appointed the Regional Targets Advisory Committee on January 23, 2009, to provide recommendations on factors to be considered and methodologies to be used in the CARB's target setting process. The Regional Targets Advisory Committee was required to provide its recommendations in a report to the CARB by September 30, 2009, to include any relevant issues such as data needs, modeling techniques, growth forecasts, jobs-housing balance, interregional travel, various land use/transportation issues affecting GHG emissions, and overall issues relating to setting these targets. The CARB adopted final targets on September 23, 2010. The CARB must update the regional targets every 8 years (or 4 years if it so chooses) consistent with each metropolitan planning organization's update of its RTP. The targets were last revised in March 2018.

3.2.3.7 Executive Order B-30-15

Governor Jerry Brown signed EO B-30-15 on April 29, 2015. EO B-30-15 established a medium-term goal for 2030 of reducing GHG emissions by 40 percent below 1990 levels and requires the CARB to update its current AB 32 Scoping Plan to identify measures to meet the 2030 target. The EO B-30-15 supports EO S-3-05 but is only binding on state agencies.

3.2.3.8 Senate Bill 32 and Assembly Bill 197

Senate Bill (SB) 32 requires the CARB to verify that statewide GHG emissions are reduced to at least 40 percent below the 1990 level by 2030, consistent with the target set forth in EO B-30-15. AB 197 creates requirements to form the Joint Legislative Committee on Climate Change Policies, requires the CARB to prioritize direct emission reductions and consider social costs when adopting regulations to reduce GHG emissions beyond the 2020 statewide limit, requires the CARB to prepare reports on sources of GHGs and other pollutants, establishes 6-year terms for voting members of the CARB, and adds two legislators as nonvoting members of the CARB. Both bills were signed by Governor Brown on September 8, 2016.

3.2.3.9 Senate Bill 100

The state's existing renewables portfolio standard requires all retail sellers to procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 25 percent of retail sales by December 31, 2016 (achieved), 33 percent by December 31, 2020, 40 percent by December 31, 2024, 45 percent by December 31, 2027, and 50 percent by December 31, 2030. SB 100 revises and extends these renewable resource targets to 50 percent by December 31, 2026, 60 percent December 31, 2030, and 100 percent by December 31, 2045.

3.2.3.10 Executive Order B-55-18

EO B-55-18 acknowledges the environmental, community, and public health risks posed by future climate change. It further recognizes the climate stabilization goal adopted by 194 states and the European Union under the Paris Agreement. While the United States was not party to the agreement, California is committed to meeting the Paris Agreement goals and going beyond them wherever possible. Based on the worldwide scientific agreement that carbon neutrality must be achieved by midcentury, EO B-55-18 establishes a new state goal to achieve carbon neutrality as soon as possible, and no later than 2045, and to achieve and maintain net negative emissions thereafter. The EO charges the CARB with developing a framework for implementing and tracking progress towards these goals. This EO extends EO S-3-05, but is only binding on state agencies.

3.2.3.11 Innovative Clean Transit Regulation

The CARB approved the Innovative Clean Transit Regulation on December 14, 2018. The regulation sets a statewide goal for public transit agencies to gradually transition to 100 percent zero-emission bus fleets by 2040. Transiting bus fleets to zero-emissions vehicles is expected to reduce GHG emissions by 19 million metric tons CO_2e between 2020 and 2050 (CARB 2018a).

3.2.4 California Asbestos Control Measures

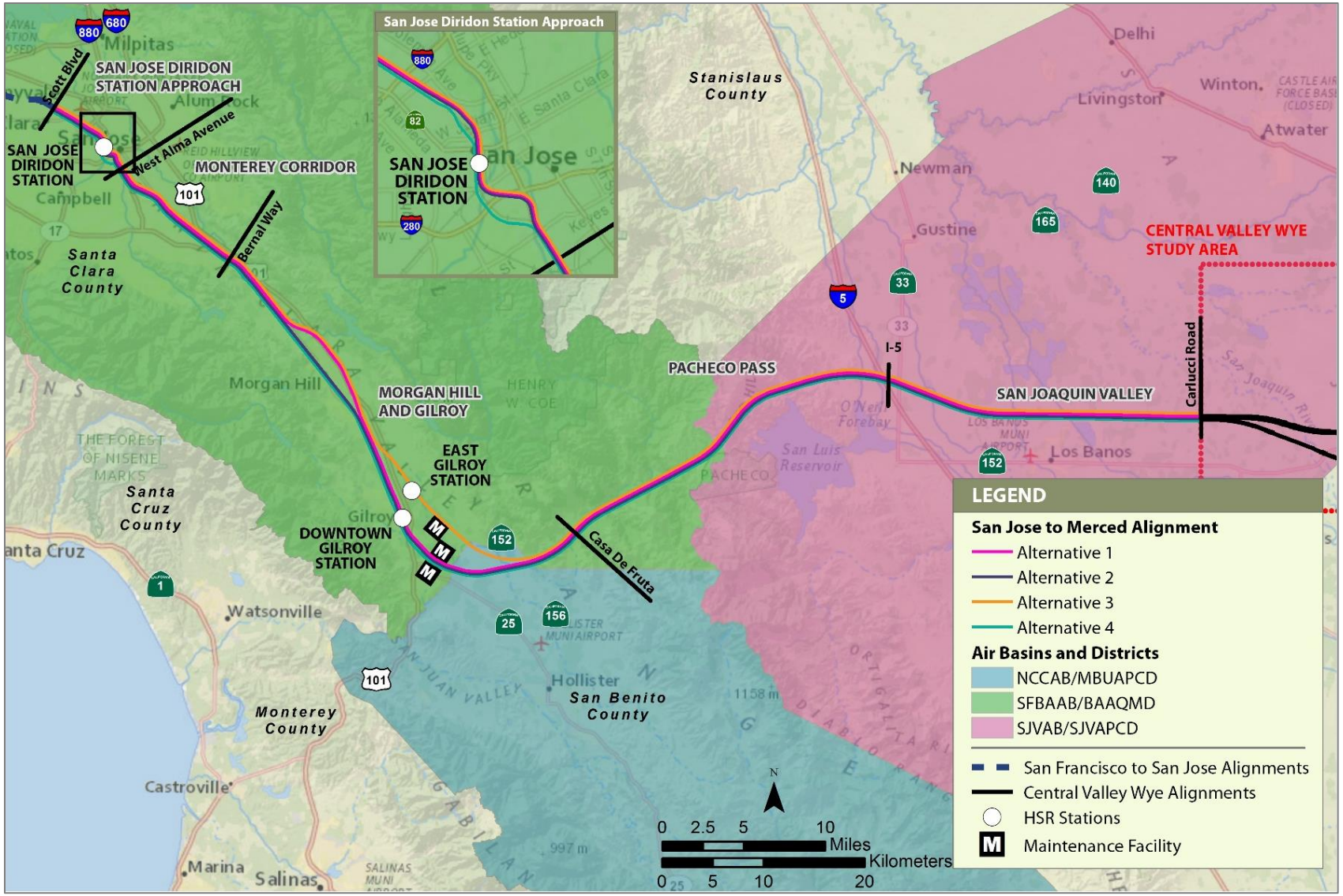
The CARB has adopted two airborne toxic control measures for controlling naturally occurring asbestos (NOA): the *Asbestos Airborne Toxic Control Measure for Surfacing Applications* (BAAQMD 2015) and the *Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations* (BAAQMD 2002). While the USEPA is responsible for enforcing regulations relating to asbestos renovations and demolitions, it can delegate this authority to state and local agencies. The CARB and local air districts have been delegated authority to enforce the Federal National Emission Standards for HAPs regulations for asbestos.

3.3 Regional and Local

3.3.1 Air Quality Management Districts

The project crosses three air basins—San Francisco Bay Area Air Basin (SFBAAB), North Central Coast Air Basin (NCCAB), and SJVAB—and falls under the jurisdiction of three air districts—BAAQMD, MBARD, and SJVAPCD (see Figure 3-1). The BAAQMD, MBARD, and SJVAPCD are responsible for the following actions:

- Implementing air quality regulations, including developing plans and control measures for stationary sources of air pollution to meet the NAAQS and CAAQS.
- Implementing permit programs for the construction, modification, and operation of sources of air pollution.
- Coordinating with local transportation planning agencies on mobile emissions inventory development, transportation control measure development and implementation, and transportation conformity.
- Enforcing air pollution statutes and regulations governing stationary sources. With CARB oversight, the air districts also administer local regulations.



Source: Authority 2019b; CARB 2012

JANUARY 2020

Figure 3-1 Air Basins and Air Districts in the Resource Study Area

3.3.1.1 Bay Area Air Quality Management District

The BAAQMD has local air quality jurisdiction over projects in the SFBAAB including Santa Clara County. BAAQMD has adopted advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's emissions, which are outlined in its *California Environmental Quality Act Air Quality Guidelines* (CEQA Guidelines) (BAAQMD 2017a). The BAAQMD CEQA Guidelines outline advisory thresholds for stationary source and land use development projects. BAAQMD has also adopted air quality plans to improve air quality, protect public health, and protect the climate.

The project may be subject to the following district rules. This list of rules may not be all-encompassing because additional BAAQMD rules may apply to the project as specific components are identified. There are also local city and county policies that pertain to air quality and climate change. The policies of the general plans focus on managing sources of air pollutants through mixed-use and transit- and pedestrian-friendly neighborhoods.[7]

- **Regulation 2, Rule 2 (New Source Review)**—This rule contains requirements for Best Available Control Technology and emission offsets.
- **Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminates)**—This rule outlines guidance for evaluating TAC emissions and their potential health risks.
- **Regulation 6, Rule 1 (Particulate Matter)**—This rule restricts emissions of PM darker than No. 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- **Regulation 6, Rule 6 (Prohibition of Trackout)**—This rule limits the quantity of PM in the atmosphere through control of trackout of solid materials onto paved public roads outside the boundaries of Large Bulk Material Sites, Large Construction Sites, and Large Disturbed Surface sites, including landfills.
- **Regulation 7 (Odorous Substances)**—This regulation establishes general odor limitations on odorous substances and specific emission limitations on certain odorous compounds.
- **Regulation 8, Rule 3 (Architectural Coatings)**—This rule limits the quantity of reactive organic gases (ROG) in architectural coatings.
- **Regulation 9, Rule 6 (Nitrogen Oxides Emission from Natural Gas–Fired Boilers and Water Heaters)**—This rule limits emissions of NO_X generated by natural gas–fired boilers.
- **Regulation 9, Rule 8 (Stationary Internal Combustion Engines)—**This rule limits emissions of NO_X and CO from stationary internal combustion engines of more than 50 horsepower.
- **Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing)**—This rule controls emissions of asbestos to the atmosphere during demolition, renovation, milling, and manufacturing and establishes appropriate waste disposal procedures.

3.3.1.2 Monterey Bay Air Resources District

The MBARD has local air quality jurisdiction over projects in the NCCAB, including San Benito County. The MBARD has adopted CEQA emission thresholds in its *CEQA Air Quality Guidelines* (MBUAPCD 2008) to determine the level of significance of project-related emissions. Emissions that exceed the designated threshold levels are considered potentially significant and should be mitigated.

Through the attainment planning process, the MBARD has developed rules and regulations to regulate sources of air pollution. All projects located in San Benito County are subject to the MBARD regulations in effect at the time of construction. Specific regulations applicable to the

[7] Additional details regarding the applicable rules can be found at the BAAQMD website, http://www.baaqmd.gov/rules-and-compliance/current-rules.

project may involve diesel construction equipment emissions, fugitive dust, on-road haul truck emissions, and general permit requirements. The following list provides descriptions of MBARD rules that would be applicable to the project.[8]

- **Rule 200 (Permits)**—This rule identifies when permits are required and issued. It is anticipated the project would require an Authority to Construct and Permit to Operate, although additional permits may be needed.
- **Rule 207 (Review of New or Modified Sources)**—This rule provides for the review of new and modified stationary air pollution sources to meet provisions of the federal CAA.
- **Rule 400 (Visible Emissions)**—This rule provides limits for the visible emissions from sources within the district.
- **Rule 402 (Nuisances)—**This rule provides an explicit prohibition against sources creating public nuisances while operating within the district.
- **Rule 403 (Particulate Matter)**—This rule provides PM emission limits for sources operating within the district.
- **Rule 404 (Sulfur Compounds and Nitrogen Oxides)**—This rule provides limits for the emissions of sulfur compounds, NO_X, and NO_2 from sources within the district.
- **Rule 424 (National Emission Standards for Hazardous Air Pollutants)—**This rule provides clarity on the district's enforcement authority for the National Emission Standards for Hazardous Air Pollutants by incorporating those provisions of Parts 61 and 63, Chapter I, Title 40 of the C.F.R. into the rule by reference.
- **Rule 425 (Use of Cutback Asphalt)**—This rule limits the emissions of vapors of organic compounds from the use of cutback and emulsified asphalts.
- **Rule 426 (Architectural Coatings)**—This rule limits the emissions of ROGs from the use of architectural coatings.

3.3.1.3 San Joaquin Valley Air Pollution Control District

The SJVAPCD has local air quality jurisdiction over projects in the SJVAB including Merced County. The SJVAPCD prepared the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI) to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SJVAB (SJVAPCD 2015a). The GAMAQI provides SJVAPCD-recommended procedures for evaluating potential air quality impacts during the CEQA environmental review process.

SJVAPCD has specific air quality–related planning documents, rules, and regulations. The following regulations may be applicable to the project in Merced County.[9]

- **Rule 2010 (Permits Required)—**This rule requires any person constructing, altering, replacing or operating any source operation which emits, may emit, or may reduce emissions to obtain an Authority to Construct or a Permit to Operate.
- **Rule 2201 (New and Modified Stationary Source Review)**—This rule requires that sources not increase emissions above the specified thresholds.
- **Rule 2280 (Portable Equipment Registration)**—This rule requires portable equipment used at project sites for less than 6 consecutive months be registered with the SJVAPCD.

[8] Additional details regarding the applicable rules can be found at the MBARD website, http://mbard.org/programs-resources/permitting-engineering/rules-regulations/.

[9] Additional details regarding the applicable rules can be found at the SJVAPCD website, www.valleyair.org/rules/1ruleslist.htm.

- **Rule 4002 (National Emission Standards for Hazardous Air Pollutants)**—This rule incorporates by reference the National Emission Standards for Hazardous Air Pollutants from 40 C.F.R., Part 61, Chapter I, Subchapter C and the National Emission Standards for Hazardous Air Pollutants for Source Categories from 40 C.F.R., Part 63, Chapter I, Subchapter C.
- **Rule 4102 (Nuisance)**—This rule prohibits discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.
- **Rule 4201 and Rule 4202 (Particulate Matter Concentration and Emission Rates)**—These rules provide PM emission limits for sources operating within the district.
- **Rule 4301 (Fuel-Burning Equipment)**—This rule limits the emissions from fuel-burning equipment whose primary purpose is to produce heat or power by indirect heat transfer.
- **Rule 4601 (Architectural Coatings)**—This rule limits VOC emissions from architectural coatings.
- **Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving, and Maintenance Operations)**—This rule limits VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.
- **Rule 8011 (General Requirements—Fugitive Dust Emission Sources)**—This rule outlines requirements for implementation of control measures for fugitive dust emission sources.
- **Rule 9510 (Indirect Source Review)**—This rule outlines mitigation requirements for construction and operations emissions that exceed certain thresholds. The rule applies to any transportation project in which construction emissions equal or exceed 2 tons of NO_X or PM_{10} per year. Projects subject to Rule 9510 must submit an Air Impact Assessment application to the SJVAPCD prior to construction.

3.3.2 Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) serves as both the state-designated regional transportation agency and as the federally designated metropolitan planning organization for the Bay Area. Thus, it is responsible for regularly updating the RTP, a comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle and pedestrian facilities. The MTC also screens requests from local agencies for state and federal grants for transportation projects to determine their compatibility with the plan.

3.3.3 Association of Bay Area Governments

The Association of Bay Area Governments (ABAG) serves as a regional planning body for the Bay Area. ABAG, MTC, and BAAQMD work closely to develop long-range plans that improve the environment and standard of living through a series of measures that link land use, transportation, and air quality. ABAG is responsible for maintaining the state-mandated SCS which links land use, transportation planning, and state funding. ABAG also develops demographic, economic, and project analyses for the region. ABAG also develops earthquake preparedness plans and green business development strategies and leads the San Francisco Bay Trail planning program and the San Francisco Estuary Project.

3.3.4 Association of Monterey Bay Area Governments

The Association of Monterey Bay Area Governments (AMBAG) serves as both a federally designated metropolitan planning organization and regional planning body for the North Central Coast. AMBAG performs metropolitan level transportation planning on behalf of the region. Among its many duties, AMBAG manages the region's transportation demand model and

prepares regional housing, population, and employment forecasts that are utilized in a variety of regional plans.

3.3.5 Council of San Benito County Governments

The Council of San Benito County Governments (San Benito COG) is San Benito County's regional transportation planning agency. San Benito COG plans for the long-term safety and transportation needs of San Benito County residents by improving highways, streets, roads, bicycle paths, bus service, and walkways. San Benito COG works closely with the County, the Cities of Hollister and San Juan Bautista, the California Department of Transportation (Caltrans), AMBAG, and other agencies to help improve travel in the region.

3.3.6 Merced County Association of Governments

The Merced County Association of Governments (MCAG) is the federally designated metropolitan planning organization for Merced County. MCAG comprises representatives from Merced County and the Cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced. As a regional transportation planning agency and metropolitan planning organization, MCAG is the primary transportation facilitator in Merced County.

3.3.7 Air Quality Plans

3.3.7.1 State Implementation Plan

Federal clean air laws require areas with unhealthy levels of O_3, inhalable PM, CO, NO_2, and SO_2 to develop plans, known as SIPs. SIPs are comprehensive plans that describe how an area will attain NAAQS. The 1990 amendments to the federal CAA set deadlines for attainment based on the severity of an area's air pollution problem.

SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, or permitting), district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. State law makes the CARB the lead agency for all purposes related to SIPs. Local air districts and other agencies, such as the Bureau of Automotive Repair and the Department of Pesticide Regulation, prepare SIP elements and submit them to the CARB for review and approval. The CARB forwards SIP revisions to the USEPA for approval and publication in the Fed. Reg. 40 C.F.R. Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items that are included in the California SIP. At any one time, several California submittals are pending USEPA approval.

The following are the relevant regional SIP and air quality plans for the SFBAAB:

- 2001 San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard (BAAQMD 2001)
- 2017 Clean Air Plan: Spare the Air, Cool the Climate (BAAQMD 2017b)

The following are the relevant regional SIP and air quality plans for the NCCAB:

- 2005 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region (MBUAPCD 2005)
- 2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region (MBUAPCD 2007)
- 2012–2015 Air Quality Management Plan (MBUAPCD 2017)

The following are the relevant regional SIP and air quality plans for the SJVAB:

- 2007 PM_{10} Maintenance Plan and Request for Redesignation (SJVAPCD 2007a)
- 2007 Ozone Plan (SJVAPCD 2007b)
- 2013 Plan for the Revoked 1-Hour Ozone Standard (SJVAPCD 2013)

- 2015 Plan for the 1997 $PM_{2.5}$ Standard (SJVAPCD 2015b)
- 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard (SJVAPCD 2016a)
- 2016 Plan for the 2008 8-Hour Ozone Standard (SJVAPCD 2016b)
- 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards (SJVAPCD 2018)

3.3.7.2 Transportation Plans and Programs

An RTP is a long-range plan that includes both long- and short-range strategies and actions that lead to the development of an integrated multimodal transportation system to address future transportation demand. Projects subject to transportation conformity are analyzed for air quality conformity with the SIP as components of RTPs and transportation improvement programs (TIP). RTPs address a region's growth, transportation goals, objectives, and policies for the next 25 years and identify the actions necessary to achieve those goals. TIPs provide a comprehensive listing of all surface transportation projects that are to receive federal funding, are subject to a federally required action, or are considered regionally significant for air quality conformity purposes. RTPs and TIPs relevant to the project are discussed in this section.

San Francisco Bay Area

In the Bay Area, the MTC is responsible for preparing RTPs and TIPs. On July 26, 2017, the MTC adopted the latest RTP for the area, *Plan Bay Area 2040*, which specifies how approximately $303 billion in anticipated federal, state, and local transportation funds will be spent in the nine-county Bay Area during the next 25 years (ABAG and MTC 2017).

The TIP includes improvements for transit; local roadway, state highway, bicycle, and pedestrian facilities; and other regionally significant, locally funded transportation projects in the nine-county Bay Area. The MTC prepares and adopts the TIP every 2 years. The current 2019 TIP covers fiscal years 2018–19 through 2021–22. It contains 500 projects totaling about $13.2 billion over a 4-year period.

The MTC prepares a transportation air quality conformity analysis when it amends or updates its long-range RTP or adds or deletes regionally significant nonexempt projects into the TIP. In 2018, a conformity analysis was finalized for the *Plan Bay Area 2040* and the 2019 TIP in accordance with USEPA transportation conformity regulations and the Bay Area Conformity SIP (Bay Area Air Quality Conformity Protocol).

San Benito County

The San Benito COG prepares a county-wide RTP every 4 years to set forth transportation policy over the next 20 years. The current RTP, *2040 San Benito Regional Transportation Plan*, was adopted June 21, 2018. The plan identifies nearly $1.8 billion in estimated transportation funding for projects and programs.

The San Benito COG also prepares the financially constrained TIP for San Benito County. The current *2016 Regional Transportation Improvement Program* was adopted on February 26, 2016. The conformity analysis for the 2018 RTP and 2016 TIP (revised) in accordance with USEPA transportation conformity regulations and the applicable SIPs was finalized in 2018.

Merced County

MCAG is responsible for preparing the RTP and TIP for transportation projects in Merced County. MCAG adopted the *2018 Regional Transportation Plan* on August 16, 2018, and adopted the *2018 Regional Improvement Program* on November 16, 2017. The final conformity assessment was adopted in August 2018.

3.3.7.3 Regional and Local Air Quality Policies

Table 3-2 outlines the policies related to air quality and GHG from regional and local plans that were considered in the preparation of this analysis. Relevant policies from some of the RTPs are included in this table.

Table 3-2 Regional and Local Plans and Policies

Plans and Policies	Summary
Regional	
Plan Bay Area (ABAG and MTC 2017)	The ABAG and the MTC adopted Plan Bay Area 2040 as the Bay Area's long-term regional transportation and land use blueprint in 2017. The following goals and objectives are relevant to the project: ▪ Target #1: Reduce per-capita CO_2 emissions from cars and light-duty trucks by 15 percent. ▪ Target #3: Reduce adverse health impacts associated with air quality, road safety and physical inactivity by 10%.
San Joaquin Valley Blueprint Planning Process Summary Report (2010)	The *San Joaquin Valley Blueprint Planning Process Summary Report* was prepared in 2010. The following goal is relevant to the project: ▪ Principle 12: Support actions that encourage environmental resource management.
Moving Forward 2035 Monterey Bay (2017)	The Association of Monterey Bay Area Governments adopted *Moving Forward 2035 Monterey Bay* as the region's long-term RTP in 2014 and amended it in 2017. The following policy is relevant to the project: ▪ Policy 3: Environment – Promote environmental sustainability and protect the natural environment.
2018 Regional Transportation Plan (2018)	The Merced County Association of Governments adopted the *2018 Regional Transportation Plan* as the County's long-term RTP in 2018. The following goals and objectives are relevant to the project: ▪ 8.1. Coordinate transportation planning with air quality planning at the technical and policy level.
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994. The following goals and policies are relevant to the project: ▪ Policy C-TR 11 Santa Clara County shall participate in updating and implementing the Congestion Management Plan, the provisions of which as set forth by law: a. establish priority for air quality goals and objectives and development of alternatives to automobile travel; and b. allow additional road capacity to be created only when all feasible automobile travel demand measures have been implemented. ▪ Policy C-RC 80 Sub-regional/countywide planning for Santa Clara County should place major emphasis on the inter-related goals, strategies and policies for improving energy efficiency in transportation, air quality, and reducing traffic congestion.

Plans and Policies	Summary
City of Santa Clara	
City of Santa Clara 2010–2035 General Plan (2010)	The *City of Santa Clara 2010–2035 General Plan* was adopted in November 2010. The following goals and policies are relevant to the project: ▪ 5.10.2-P1 Support alternative transportation modes and efficient parking mechanisms to improve air quality. ▪ 5.10.2-P2 Encourage development patterns that reduce vehicle miles traveled and air pollution. ▪ 5.10.2-P3 Encourage implementation of technological advances that minimize public health hazards and reduce the generation of air pollutants. ▪ 5.10.2-P4 Encourage measures to reduce greenhouse gas emissions to reach 30 percent below 1990 levels by 2020. ▪ 5.10.2-P6 Require "Best Management Practices" for construction dust abatement. ▪ 5.8.1-P4 Expand transportation options and improve alternate modes that reduce greenhouse gas emissions. ▪ 5.10.3-P15 Explore opportunities for alternative energy "fueling stations" and promote participation in shuttle services that use new technology vehicles to reduce greenhouse gas emissions.
City of San Jose	
Envision: San José 2040 General Plan (2011)	The *Envision: San José 2040 General Plan* was adopted in 2011. The following goals and policies are relevant to the project: ▪ MS-1.7 Encourage retrofits for existing buildings throughout San José to use green building principles in order to mitigate the environmental, economic, and social impact of those buildings, to achieve greenhouse gas reductions, and to improve air and water quality. ▪ MS-4.1 Promote the use of building materials that maintain healthful indoor air quality in an effort to reduce irritation and exposure to toxins and allergens for building occupants. ▪ MS-4.2 Encourage construction and pre-occupancy practices to improve indoor air quality upon occupancy of the structure. ▪ MS-10.1 Assess projected air emissions from new development in conformance with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines and relative to state and federal standards. Identify and implement feasible air emission reduction measures. ▪ MS-10.2 Consider the cumulative air quality impacts from proposed developments for proposed land use designation changes and new development, consistent with the region's Clean Air Plan and State law. ▪ MS-10.3 Promote the expansion and improvement of public transportation services and facilities, where appropriate, to both encourage energy conservation and reduce air pollution. ▪ MS-10.4 Encourage effective regulation of mobile and stationary sources of air pollution, both inside and outside of San José. In particular, support Federal and State regulations to improve automobile emission controls. ▪ MS-10.7 Encourage regional and statewide air pollutant emission reduction through energy conservation to improve air quality.

Plans and Policies	Summary
	▪ MS-10.8 Minimize vegetation removal required for fire prevention. Require alternatives to discing, such as mowing, to the extent feasible. Where vegetation removal is required for property maintenance purposes, encourage alternatives that limit the exposure of bare soil. ▪ MS-10.9 Foster educational programs about air pollution problems and solutions. ▪ MS-11.2 For projects that emit toxic air contaminants, require project proponents to prepare health risk assessments in accordance with BAAQMD-recommended procedures as part of environmental review and employ effective mitigation to reduce possible health risks to a less than significant level. Alternatively, require new projects (such as, but not limited to, industrial, manufacturing, and processing facilities) that are sources of TACs to be located an adequate distance from residential areas and other sensitive receptors. ▪ MS-11.3 Review projects generating significant heavy duty truck traffic to designate truck routes that minimize exposure of sensitive receptors to TACs and particulate matter. ▪ MS-11.4 Encourage the installation of appropriate air filtration at existing schools, residences, and other sensitive receptor uses adversely affected by pollution sources. ▪ MS-11.5 Encourage the use of pollution absorbing trees and vegetation in buffer areas between substantial sources of TACs and sensitive land uses. ▪ MS-13.1 Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At minimum, conditions shall conform to construction mitigation measures recommended in the current BAAQMD CEQA Guidelines for the relevant project size and type. ▪ MS-13.2 Construction and/or demolition projects that have the potential to disturb asbestos (from soil or building material) shall comply with all the requirements of the California Air Resources Board's air toxics control measures (ATCMs) for Construction, Grading, Quarrying, and Surface Mining Operations. ▪ MS-13.3 Require subdivision designs and site planning to minimize grading and use landform grading in hillside areas. ▪ EC-7.7 Determine for any development or redevelopment site that is within 1,000 feet of a known, suspected, or likely geographic ultramafic rock unit (as identified in maps developed by the Department of Conservation – Division of Mines and Geology) or any other known or suspected locations of serpentine or naturally occurring asbestos, if naturally occurring asbestos exists and, if so, comply with the Bay Area Air Quality Management District's Asbestos Air Toxic Control Measure requirements. ▪ TR-1.8 Actively coordinate with regional transportation, land use planning, and transit agencies to develop a transportation network with complementary land uses that encourage travel by bicycling, walking and transit, and ensure that regional greenhouse gas emission standards are met.
Midtown Specific Plan (1992)	The *Midtown Specific Plan* was adopted in 1992. The following goals and policies are relevant to the project: ▪ Policy 4.3: Future development should incorporate energy-conserving devices to promote conservation.
Diridon Station Area Plan (2014)	The *Diridon Station Area Plan* was adopted in 2014. No goals and policies are directly relevant to the air quality or greenhouse gas analysis of the project.

Plans and Policies	Summary
Communications Hill Specific Plan (1992)	The *Communications Hill Specific Plan* was adopted in 1992. The following goals and policies are relevant to the project: ▪ Minimize the potential adverse impacts of the Communication Hill area development on the immediate surrounding neighborhood.
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The *Morgan Hill 2035 General Plan* was adopted in 2016. The following goals and policies are relevant to the project: ▪ Policy NRE-10.1 Regional and Subregional Cooperation. Cooperate with regional agencies in developing and implementing air quality management plans. Support subregional coordination with other cities, counties, and agencies in the Santa Clara Valley and adjacent areas to address land use, jobs/housing balance, and transportation planning issues as a means of improving air quality. ▪ Policy NRE-10.2 State and Federal Regulation. Encourage effective regulation of mobile and stationary sources of air pollution and support State and federal regulations to improve automobile emission controls. ▪ Policy NRE-10.3 Automobile Emissions. Encourage the use of and infrastructure for alternative fuel, hybrid, and electric vehicles. Encourage new and existing public and private development to include electric vehicle charging stations. ▪ Policy NRE-10.4 Reduced Automobile Use. To reduce air pollution the frequency and length of automobile trips and the amount of traffic congestion by controlling sprawl, promoting infill development, and encouraging mixed uses and higher density development near transit. Support the expansion and improvement of alternative modes of transportation. Encourage development project designs that protect and improve air quality and minimize direct and indirect air pollutant emissions by including components that reduce vehicle trips. ▪ Policy NRE-11.2 TACs and Existing Sensitive Uses. Encourage the installation of appropriate air filtration mechanisms at existing schools, residences, and other sensitive receptors adversely affected by existing or proposed pollution sources. ▪ Policy NRE-11.3 Health Risk Assessments. For proposed development that emits toxic air contaminants, require project proponents to prepare health risk assessments in accordance with Bay Area Air Quality Management District procedures as part of environmental review and implement effective mitigation measures to reduce potential health risks to less-than-significant levels. Alternatively, require these projects to be located an adequate distance from residences and other sensitive receptors to avoid health risks. Consult with the Bay Area Air Quality Management District to identify stationary and mobile toxic air contaminant sources and determine the need for and requirements of a health risk assessment for proposed developments. ▪ Policy NRE-11.4 Truck Routes. For development projects generating significant heavy duty truck traffic, designate truck routes that minimize exposure of sensitive receptors to toxic air contaminants and particulate matter. ▪ Policy NRE-11.5 Truck Idling. For development projects generating significant truck traffic, require signage to remind drivers that the State truck idling law limits truck idling to five (5) minutes. ▪ Policy NRE-11.5 Truck Idling. For development projects generating significant truck traffic, require signage to remind drivers that the State truck idling law limits truck idling to five (5) minutes. ▪ Policy NRE-11.6 Vegetation Buffers. Encourage the use of pollution-absorbing trees and vegetation in buffer areas between substantial sources of toxic air contaminants and sensitive receptors.

Plans and Policies	Summary
	▪ Policy NRE-12.1 Best Practices. Requirement that development projects implement best management practices to reduce air pollutant emissions associated with construction and operation of the project. ▪ Policy NRE-12.2 Conditions of Approvals. Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At a minimum, conditions shall conform to construction mitigation measures recommended in the current Bay Area Air Quality Management District CEQA Guidelines. ▪ Policy NRE-12.3 Control Measures. Require construction and demolition projects that have the potential to disturb asbestos (from soil or building material) to comply with all the requirements of the California Air Resource Board's air toxics control measures (ATCMs) for Construction, Grading, Quarrying, and Surface Mining Operations. ▪ Policy NRE-12.4 Grading. Require subdivision designs and site planning to minimize grading and use landform grading in hillside areas. ▪ Policy NRE-15.1 Greenhouse Gas Emission Reduction Targets. Maintain a greenhouse gas reduction trajectory that is consistent with the greenhouse gas reduction targets of Executive Orders B-30-15 (40 percent below 1990 levels by 2030) and S-03-05 (80 percent below 1990 levels by 2050) to ensure the City is consistent with statewide efforts to reduce greenhouse gas emissions. ▪ Policy NRE-15.2 Linking Land Use and Transportation. Encourage land use and transportation patterns that reduce dependence on automobiles. ▪ Policy NRE-15.3 Climate Action Plan. Utilize policies in this General Plan denoted with the green leaf symbol as the City's greenhouse gas emissions reduction strategy. ▪ Policy NRE-15.4 Sustainable Land Use. Promote land use patterns that reduce the number and length of motor vehicle trips. ▪ Policy NRE-15.10 VMT Reduction. Continue to work with the Santa Clara Valley Transportation Authority on regional transportation solutions that will reduce vehicle miles traveled and greenhouse gas emissions.
City of Gilroy	
City of Gilroy 2002–2020 General Plan (2002)	The *City of Gilroy 2002–2020 General Plan* was adopted in 2002. The following goals and policies are relevant to the project: ▪ Policy 21.01 "Sensitive Receptors." Use land use planning and project siting to separate air pollution sources (such as freeways, arterials, industrial sites, etc.) from residential areas and other "sensitive receptors" (such as schools, hospital, and nursing homes) that would be adversely affected by close proximity to air pollutants. ▪ Policy 21.02 Landscaping to Reduce Pollutants. Promote the use of trees and plants in landscaping to reduce air pollutant levels. ▪ Policy 21.04 Regional Collaboration. Cooperate with the Bay Area Air Quality Management District and other agencies that deal with issues related to air quality (e.g., the Metropolitan Transportation Commission and the Association of Bay Area Governments) to develop and implement regional air quality strategies. Also, support subregional coordination with other cities, counties and agencies in Santa Clara Valley and adjacent areas to address land use, jobs/housing balance, and transportation planning issues as a means of improving air quality. ▪ Policy 21.05 Air Quality Impacts from Construction Activity. Reduce the air quality impacts associated with construction activity by reducing the exhaust emissions through appropriate mitigation actions.

Plans and Policies	Summary
	▪ Policy 21.06 Traffic Control Measures. Implement the Transportation Control Measures recommended by the Bay Area Air Quality Management District in the 2000 Clean Air Plan to reduce pollutant emissions. ▪ Policy 12.09 LOS and Air Quality. Maintain the City's Standard Level of Service whenever feasible to minimize traffic congestion and thereby minimize exposure to carbon monoxide, since vehicles generate less air pollutant emissions at higher speed. ▪ Policy 14.01 Non-Auto Modes of Travel. Emphasize non-auto travel modes of transportation as a key strategy for achieving air quality goals. For example, encourage bicycle riding to school from an early age by providing safer bikeways between residential areas and schools and encourage the schools to provide secured bike racks and/or lockers.
Downtown Gilroy Specific Plan (2005)	The *Downtown Gilroy Specific Plan* was adopted in 2005. No goals and policies are directly relevant to the air quality or greenhouse gas analysis of the project.
San Benito County	
San Benito County 2035 General Plan (2015)	The *San Benito County 2035 General Plan* was adopted in 2015. The following goals and policies are relevant to the project: ▪ HS-5.1 New Development. The County shall use the CEQA process to ensure development projects incorporate feasible mitigation measures to reduce construction and operational air quality emissions, and consult with the Monterey Bay Unified Air Pollution Control District early in the development review process. ▪ HS-5.2 Sensitive Land Use Locations. The County shall ensure adequate distances between sensitive land uses and facilities or operations that may produce toxic or hazardous air pollutants or substantial odors. ▪ HS-5.3 Early Coordination with the Air Quality Control District. The County shall notify and coordinate with the Monterey Bay Unified Air Pollution Control District when industrial developments are proposed within the county to ensure applicants comply with applicable air quality regulations and incorporate design features and technologies to reduce air emissions. ▪ HS-5.4 PM10 Emissions from Construction. The County shall require developers to reduce particulate matter emissions from construction (e.g., grading, excavation, and demolition) consistent with standards established by the Monterey Bay Unified Air Pollution Control District. ▪ HS-5.6 New Construction Mitigation. The County shall work in coordination with the Monterey Bay Unified Air Pollution Control District to minimize air emissions from construction activities associated with proposed development. ▪ HS-5.7 Greenhouse Gas Emission Reductions. The County shall promote greenhouse gas emission reductions by supporting carbon efficient farming methods (e.g., methane capture systems, no-till farming, crop rotation, cover cropping); supporting the installation of renewable energy technologies; and protecting grasslands, open space, oak woodlands, riparian forest and farmlands from conversion to urban uses. ▪ HS-5.8 GHG Reduction Targets. The County acknowledges that the state endeavors to achieve 1990 greenhouse gas (GHG) emission levels, and establish a long-term goal to reduce GHG emissions by 80 percent below 1990 levels by 2050. The County will encourage projects that support these goals, recognizing that these goals can be met only if the state succeeds in decarbonizing its fuel supply. ▪ AD-2.5 Air Quality Management Coordination. The County shall continue to coordinate with the Monterey Bay Unified Air Pollution Control District (MBUAPCD) and affected agencies and neighboring jurisdictions in the North Central Coast Air

Plans and Policies	Summary
	Basin to ensure regional cooperation on cross-jurisdictional and regional transportation and air quality issues, and to establish parallel air quality programs and implementation measures. ▪ PFS-2.1 Efficient Operations. The County shall maintain facilities and service standards and conduct operations in a manner that meets community needs in an efficient manner, conserves resources, and reduces the County's contribution to greenhouse gas emissions.
Merced County	
2030 Merced County General Plan (2013)	The *2030 Merced County General Plan* was adopted in 2013. The following goals and policies are relevant to the project: ▪ Policy ED-1.7: Improving Merced County's Quality of Life (SO/PI). Economic development efforts shall include consideration of improving air quality, developing an educated workforce, promoting safe/crime-free communities, protecting water quality, and increasing recreational opportunities as a means to improve the quality of life for residents and workers and to attract new industries to the County. ▪ Policy LU-10.9: Air Quality Management Coordination (IGC). Coordinate with the San Joaquin Valley Air Pollution Control District and affected agencies and neighboring jurisdictions in the San Joaquin Valley Air Basin to ensure regional cooperation on cross-jurisdictional and regional transportation and air quality issues, and to establish parallel air quality programs and implementation measures, such as trip reduction ordinances and indirect source programs. ▪ Policy LU-10.10: San Joaquin Valley Air Pollution Control District Consultation (IGC). Consult with the San Joaquin Valley Air Pollution Control District during CEQA review for discretionary projects that have the potential for causing adverse air quality impacts. Ensure that development projects are submitted to the District for CEQA comments and review of air quality analysis. ▪ Policy CIR-1.3: Transportation Efficiency (RDR). Encourage transportation programs that result in more efficient energy use, reduce greenhouse gas emissions and noise levels, and improve air quality. ▪ Policy AQ-1.1: Energy Consumption Reduction (RDR). Encourage new residential, commercial, and industrial development to reduce air quality impacts from energy consumption. ▪ Policy AQ-1.6: Air Quality Improvement (SO). Support and implement programs to improve air quality throughout the County by reducing emissions related to vehicular travel and agricultural practices. ▪ Policy AQ-2.1: Air Quality Plan Compliance (RDR). Require all development projects to comply with applicable regional air quality plans and policies. ▪ Policy AQ-2.3: Cumulative Impacts (RDR). Encourage the reduction of cumulative air quality impacts produced by projects that are not significant by themselves, but result in cumulatively significant impacts in combination with other development. ▪ Policy AQ-2.4: Mitigation (RDR). Require that local and regional air quality impacts identified during CEQA review for projects reviewed and approved by the County are consistently and fairly mitigated. ▪ Policy AQ-2.5: Innovative Mitigation Measures (RDR, IGC, JP). Encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the San Joaquin Valley Air Pollution Control District, project applicants, and other interested parties. ▪ Air Quality Element Goal AQ-3. Improve air quality through improved public facilities and operations and to serve as a model for the private sector.

Plans and Policies	Summary
	▪ Policy AQ-4.6: Non-Motorized Transportation (RDR). Encourage non-motorized transportation corridors within and between communities. ▪ Policy AQ-4.7: Planning Integration (RDR). Require land use, transportation, and air quality planning to be integrated for the most efficient use of resources and a healthier environment. ▪ Policy AQ-5.1: Residential Buffers (RDR). Require effective buffers between residential and other sensitive land uses, and nonresidential land uses that generate hazardous air emissions such as highways (e.g., I-5 and SR-99), trucking centers, gasoline dispensing facilities, and dry cleaners. Effective buffers shall be determined by requiring consultation with the SJVAPCD for any project that may have a health risk impact, including those projects that would otherwise appear to be exempt from CEQA requirements.

Sources: ABAG and MTC 2017; AMBAG 2017; San Joaquin Valley Regional Planning Agencies 2010; City of Gilroy 2002, 2005; City of Morgan Hill 2016; City of San Jose 1992a, 1992b, 2011, 2014; City of Santa Clara 2010; County of Santa Clara 1994; County of San Benito 2015; County of Merced 2013; MCAG 2016
ABAG = Association of Bay Area Governments
MTC = Metropolitan Transportation Commission
RTP = regional transportation plan

3.3.8 Climate Action Plans

A number of cities in the RSA have adopted or are in the process of developing climate action plans (CAP), GHG reduction plans, or equivalent documents aimed at reducing local GHG emissions. Jurisdictions with adopted or in-development CAPs or GHG reduction plans for either municipal operations, community activities, or both include Santa Clara County and the Cities of Santa Clara, San Jose, Gilroy, and Morgan Hill. These plans all call for reductions in GHG emissions below current levels and actions to reduce VMT and associated transportation emissions. All plans include increased transit service as a key strategy in reducing local GHG emissions.

4 POLLUTANTS OF CONCERN

Three general classes of air pollutants are of concern for the project—criteria pollutants, TACs, and GHGs. Criteria pollutants are those pollutants for which the USEPA and the State of California have set ambient air quality standards. (For analysis purposes, these pollutants include chemical precursors of compounds for which ambient standards have been set.) TACs of concern for the project are nine MSATs identified by the USEPA as having significant contributions from mobile sources—acetaldehyde, acrolein, benzene, 1,3-butadiene, DPM and diesel exhaust organic gases, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. GHGs are gaseous compounds that limit the transmission of radiated heat from the Earth's surface to the atmosphere. GHGs include CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, SF_6, and other fluorinated gases, including nitrogen trifluoride and hydrofluoroether.

4.1 Criteria Pollutants

Criteria pollutants are pollutants for which federal and state ambient air quality standards have been established to protect public health and welfare (Chapter 3). The sources of these pollutants, their effects on human health and the nation's welfare, and their final deposition in the atmosphere vary considerably. The following sections provide a brief description of each criteria pollutant.

4.1.1 Ozone

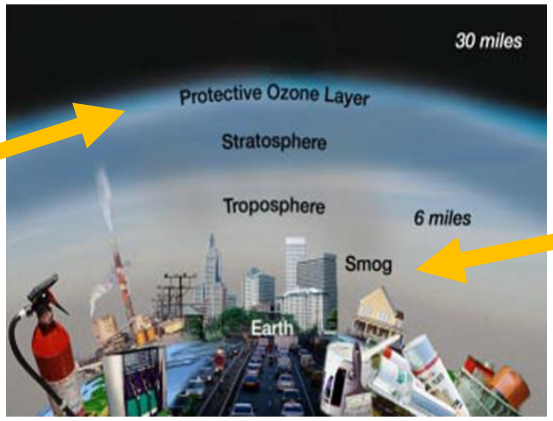
O_3 is a colorless toxic gas. As illustrated on Figure 4-1, O_3 is found in both the Earth's upper and lower atmosphere. In the upper atmosphere, O_3 is a naturally occurring gas that helps to prevent the sun's harmful ultraviolet rays from reaching the Earth. Substantial O_3 formation generally requires a stable atmosphere with strong sunlight; therefore, high levels of O_3 are generally a concern in the summer.

Definition of O_3

O_3 is a colorless toxic gas found in the Earth's upper and lower atmospheric levels. In the upper atmosphere, O_3 is naturally occurring and helps to prevent the sun's harmful ultraviolet rays from reaching the earth. In the lower atmosphere, O_3 is human-made. Although O_3 is not directly emitted, it forms in the lower atmosphere through a chemical reaction between hydrocarbons and oxides of nitrogen, also referred to as VOC and NO_X, which are emitted from industrial sources and from automobiles.

In the lower atmosphere, O_3 is largely human generated. Although O_3 is not directly emitted, it forms in the lower atmosphere through a chemical reaction between certain hydrocarbons, referred to as VOCs and NO_X that are emitted from industrial sources and motor vehicles. Hydrocarbons are compounds composed primarily of hydrogen and carbon atoms. Total organic gas and ROGs are the two classes of hydrocarbons that the CARB inventories. ROGs have relatively high photochemical reactivity. The major source of ROGs is the incomplete combustion of fossil fuel in internal combustion engines. Other sources of ROGs include evaporative emissions associated with paints and solvents, application of asphalt paving, and household consumer products. ROGs do not directly cause effects on human health, but they cause effects by reactions of ROGs to form secondary pollutants. ROGs are also transformed into organic aerosols in the atmosphere, contributing to higher levels of fine PM and lower visibility. The CARB uses the term *ROG* for air quality analysis and defines it the same as the federal term *VOC*. In this analysis, ROG is assumed to be equivalent to VOC.

Too little ozone there… Many popular consumer products like air conditioners and refrigerators involve chlorofluorocarbons or halons during either manufacture or use. Over time, these chemicals damage the earth's protective ozone layer.



Too much ozone here... Cars, trucks, power plants, and factories all emit air pollution that forms ground-level ozone, a primary component of smog.

Source: USEPA 2003

Figure 4-1 Ozone in the Atmosphere

O_3 is the main ingredient of smog. Ground-level O_3 causes health problems because it irritates the mucous membranes, damages lung tissue, reduces lung function, and sensitizes the lungs to other irritants. O_3-related health effects also include respiratory symptoms, aggravation of asthma, increased hospital and emergency room visits, increased asthma medication usage, and a variety of other respiratory-related effects. There is also evidence that short-term exposure to O_3 directly or indirectly contributes to cardiopulmonary-related mortality. In addition, O_3 can damage vegetation by inhibiting its growth. Because O_3 is not directly emitted, potential O_3 effects are assessed by examining the changes in VOC and NO_X emissions for the project on regional and statewide levels.

4.1.2 Particulate Matter

PM pollution is composed of solid particles or liquid droplets that are small enough to remain suspended in the air. In general, PM pollution can include dust, soot, and smoke, which can be irritating, but usually are not toxic. It can also include salts, acids, and metals. However, PM pollution can include substances that are highly toxic. Of particular concern are those particles that have diameters equal to or smaller than 10 microns (µm) (PM_{10})—about 1/7 the thickness of a human hair—or 2.5 µm ($PM_{2.5}$), approximately 1/28 the thickness of a human hair (Figure 4-2). PM can be emitted directly from a source or can form when gases emitted undergo chemical reactions in the atmosphere.

Definition of PM_{10} and $PM_{2.5}$

PM_{10} refers to PM less than 10 microns in diameter, about 1/7th the thickness of a human hair. PM pollution consists of small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals.

PM also forms when gases emitted from motor vehicles undergo chemical reactions in the atmosphere.

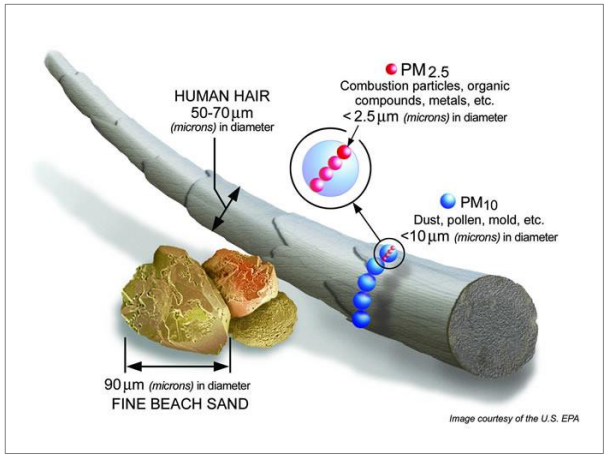
$PM_{2.5}$ is a subset of PM_{10} and refers to particulates that are 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair.

Major sources of PM_{10} include motor vehicles; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. These suspended particulates produce haze and reduce visibility.

A small portion of PM is the product of fuel combustion processes. However, the combustion of fossil fuels (by motor vehicles, power generation, and industrial facilities) accounts for a significant portion of $PM_{2.5}$ pollution. $PM_{2.5}$ also results from fuel combustion in residential

fireplaces and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and VOCs.

The main health effect of airborne PM is on the respiratory system. Both PM_{10} and $PM_{2.5}$ can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Both tend to collect in the upper portion of the respiratory system, but $PM_{2.5}$ or smaller particles can penetrate deeper into the lungs and damage lung tissues. The effects of PM_{10} and $PM_{2.5}$ emissions for the project are examined on a localized (i.e., microscale) basis, on a regional basis, and on a statewide basis.



Source: USEPA 2015c

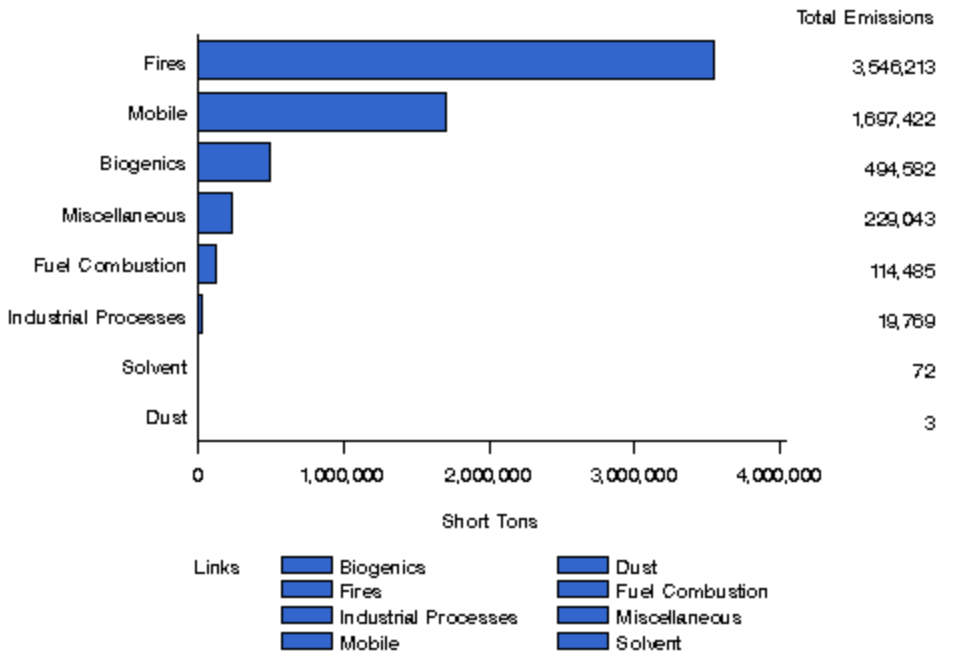
Figure 4-2
Relative Particulate Matter Size

4.1.3 Carbon Monoxide

CO is a colorless gas that interferes with the transfer of oxygen in the bloodstream to the brain. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. As illustrated on Figure 4-3, on-road motor-vehicle exhaust is the primary source of CO in California. In cities, 85 to 95 percent of all CO emissions may come from motor-vehicle exhaust. Prolonged exposure to high levels of CO can cause headaches, drowsiness, loss of equilibrium, and heart disease. CO levels are generally highest in the colder months when inversion conditions (i.e., warmer air traps colder air near the ground) are more frequent. CO concentrations can vary greatly over relatively short distances. Relatively high concentrations of CO are typically found near congested intersections, along heavily used roadways carrying slow-moving traffic, and in areas where atmospheric dispersion is inhibited by urban street canyon conditions. The effects of CO emissions for the project are examined on a localized (i.e., microscale) basis, on a regional basis, and on a statewide basis.

Definition of CO

CO is a colorless gas that interferes with the transfer of oxygen to the brain. CO emits almost exclusively from the incomplete combustion of fossil fuels. On-road motor-vehicle exhaust is the primary source of CO.



Source: USEPA 2017

Figure 4-3 Sources of Carbon Monoxide in California (2014)

4.1.4 Nitrogen Dioxide

NO_2 is a brownish gas that irritates the lungs. It can cause breathing difficulties at high concentrations. NO_2 is one of a group of highly reactive gases known as oxides of nitrogen, or nitrogen oxides. NO_2 can be emitted directly or formed through a reaction between nitric oxide emissions and atmospheric oxygen. NO_2 also contributes to the formation of PM_{10}. At atmospheric concentrations, NO_2 is only potentially irritating. At high concentrations, the result is a brownish-red cast to the atmosphere and reduced visibility. There is some indication of a relationship between NO_2 and chronic (long-term) pulmonary fibrosis. Localized effects of NO_2 are analyzed relevant to the NAAQS and CAAQS.

4.1.5 Lead

Pb is a stable element that persists and accumulates in the environment and in animals. Its principal effects on humans are on the blood-forming, nervous, and renal systems. Pb levels from mobile sources in the urban environment have decreased significantly because of the federally mandated switch to Pb-free gasoline, and they are expected to continue to decrease. An analysis of the effects of Pb emissions from transportation projects is therefore not warranted and has not been conducted for the project.

4.1.6 Sulfur Dioxide

SO_2 is a gas produced by combustion of high-sulfur fuels. The main sources of SO_2 are coal and oil used in power stations, industry, and domestic heating. Industrial chemical manufacturing is another source of SO_2. SO_2 is an irritant that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also cause plant leaves to turn yellow and can corrode iron and steel. Although heavy-duty diesel vehicles emit SO_2, USEPA regulations have greatly decreased the sulfur content of diesel fuel and gasoline in recent years. Transportation sources contribute only a small fraction of total SO_2 emissions, and the USEPA and other regulatory agencies do not consider transportation sources to be significant

sources of this pollutant. Nevertheless, consistent with applicable air district guidance, the effects of changes in SO_2 emissions for the project are examined on regional and statewide levels.

4.2 Toxic and Noncriteria Pollutants

A TAC is defined by California law as an air pollutant that "may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health." The USEPA uses the term HAP in a similar sense. Controlling air toxic emissions became a national priority with the passage of the CAA, in which Congress mandated that the USEPA regulate 188 air toxics, also known as HAPs. TACs can be emitted from stationary and mobile sources. The effects of TACs and other noncriteria pollutants for the project are examined on a local level.

4.2.1 Asbestos

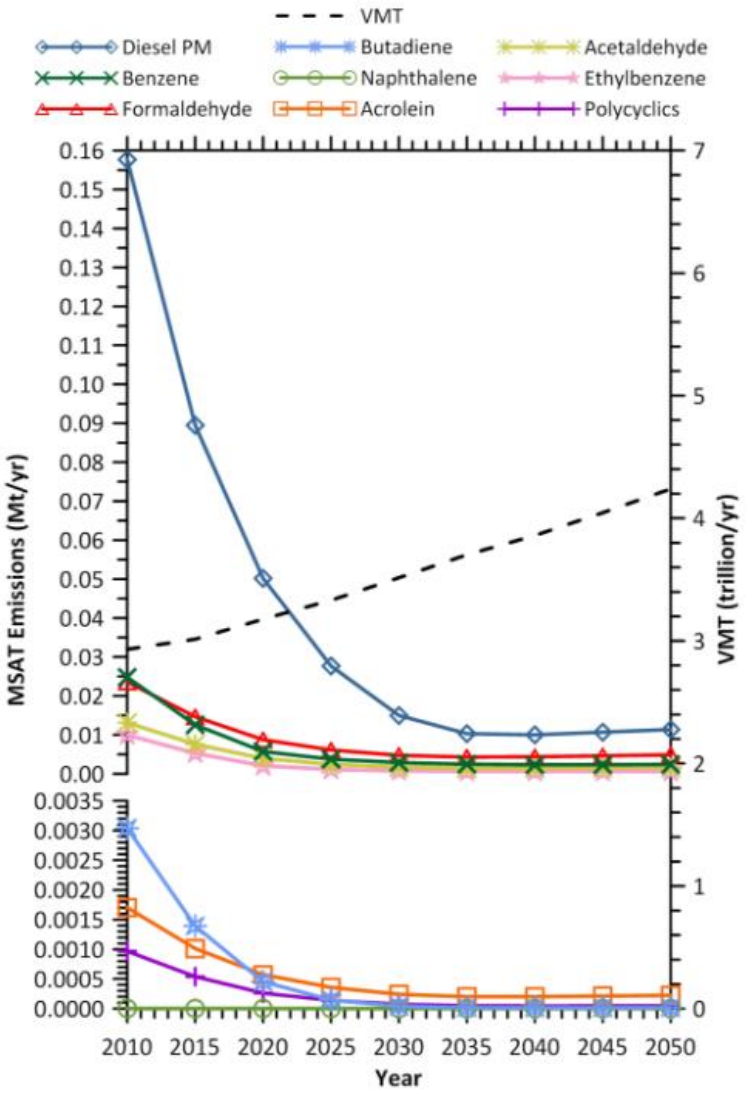
Asbestos deposits from brake wear may be present on surfaces and in the ambient air along the HSR alignment. In addition, asbestos-containing materials may have been used in constructing buildings that would be demolished. Asbestos minerals occur in rocks and soil (known as NOA) as the result of natural geologic processes, often in veins near earthquake faults in the coastal ranges and foothills of the Sierra Nevada and in other areas of California. NOA most commonly occurs in ultramafic rock (i.e., igneous and metamorphic rock with low silica content) that has undergone partial or complete alteration to serpentine rock (or serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, is associated with ultramafic rock, particularly near geologic faults.

Natural weathering or human disturbance can break NOA down to microscopic fibers, easily suspended in air. When inhaled, these thin fibers irritate tissues and resist the body's natural defenses. Chronic inhalation exposure to asbestos in humans can lead to asbestosis, which is a diffuse fibrous scarring of the lungs. Symptoms of asbestosis include shortness of breath, difficulty in breathing, and coughing. Asbestosis is a progressive disease (i.e., the severity of symptoms tends to increase with time, even after the exposure has stopped). In severe cases, this disease can lead to death caused by impairment of respiratory function. A large number of occupational studies have reported that exposure to asbestos by inhalation can cause lung cancer and mesothelioma, which is a rare cancer of the membranes lining the abdominal cavity and surrounding internal organs. The USEPA considers asbestos to be a human carcinogen (i.e., cancer-causing agent) (USEPA 2000). The effects of asbestos for the project are examined on regional and local levels.

4.2.2 Mobile Source Air Toxics

The USEPA has assessed an expansive list of air toxics in its 2007 Rule on the Control of Hazardous Air Pollutants from Mobile Sources and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System.

Under the 2007 rule, the USEPA sets standards on fuel composition, vehicle exhaust emissions, and evaporative losses from portable containers. Using USEPA's MOVES2014a model, as shown on Figure 4-4, the FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same period.



Source: FHWA 2016

Trends for specific locations may be different, depending on locally derived information representing vehicle miles traveled, vehicle speeds, vehicle mix, fuels, emission-control programs, meteorology, and other factors.

Figure 4-4 Projected National Mobile Source Air Toxics Emission Trends (2010–2050) for Vehicles Operating on Roadways, Based on USEPA's MOVES2014a Model Assessment (USEPA 2015d)

The USEPA identified nine compounds with significant contributions from mobile sources that are among the national- and regional-scale cancer risk drivers from its National Air Toxics Assessment (USEPA 2015d). These are acrolein, benzene, 1,3-butadiene, acetaldehyde, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While the FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future USEPA rules. The effects of MSATs for the project are examined on a regional and local level. The following paragraphs describe these MSATs (Authority and FRA 2012b).

Acrolein is a colorless-to-yellow liquid that burns easily, is readily volatilized, and has a disagreeable odor. It is present as a product of incomplete combustion in the exhausts of stationary equipment (e.g., boilers and heaters) and mobile sources. It is also a secondary

pollutant formed through the photochemical reaction of VOCs and NO_X in the atmosphere. Acrolein is considered to have high acute toxicity, and it causes upper respiratory tract irritation and congestion in humans. The major effects from chronic (long-term) inhalation exposure to acrolein in humans consist of general respiratory congestion and eye, nose, and throat irritation. No information is available on the reproductive, developmental, or carcinogenic effects of acrolein in humans. The USEPA considers acrolein data inadequate for an assessment of human carcinogenic potential.

Benzene is a volatile, colorless, highly flammable liquid with a sweet odor. Most of the benzene in ambient air is from incomplete combustion of fossil fuels and evaporation from gasoline service stations. Acute inhalation exposure to benzene causes neurological symptoms, such as drowsiness, dizziness, headaches, and unconsciousness in humans. Chronic inhalation of certain levels of benzene causes disorders in the blood in humans. Benzene specifically affects bone marrow (the tissues that produce blood cells). Aplastic anemia, excessive bleeding, and damage to the immune system (by changes in blood levels of antibodies and loss of white blood cells) may develop. Available human data on the developmental effects of benzene are inconclusive because of concomitant exposure to other chemicals, inadequate sample size, and lack of quantitative exposure data. The USEPA has classified benzene as a known human carcinogen by inhalation.

1,3-Butadiene is a colorless gas with a mild gasoline-like odor. Sources of 1,3-butadiene released into the air include motor vehicle exhaust, manufacturing and processing facilities, forest fires or other combustion, and cigarette smoke. Acute exposure to 1,3-butadiene by inhalation in humans results in irritation of the eyes, nasal passages, throat, and lungs. Neurological effects, such as blurred vision, fatigue, headache, and vertigo, have also been reported at very high exposure levels. One epidemiological study reported that chronic exposure to 1,3-butadiene by inhalation resulted in an increase in cardiovascular diseases, such as rheumatic and arteriosclerotic heart diseases. Other human studies have reported effects on blood (ATSDR 2012). No information is available on reproductive or developmental effects of 1,3-butadiene in humans. The USEPA has classified 1,3-butadiene as a probable human carcinogen by inhalation.

Acetaldehyde is mainly used as an intermediate in the synthesis of other chemicals. It is may be formed in the body from the breakdown of ethanol. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism. Acetaldehyde is considered a probable human carcinogen.

DPM/Diesel Exhaust Organic Gases are a complex mixture of hundreds of constituents in either gaseous or particle form. Gaseous components of diesel exhaust include CO_2, oxygen, nitrogen, water vapor, CO, nitrogen compounds, sulfur compounds, and numerous low-molecular-weight hydrocarbons. Among the gaseous hydrocarbon components of diesel exhaust that are individually known to be of toxicological relevance are several carbonyls (e.g., formaldehyde, acetaldehyde, acrolein), benzene, 1,3-butadiene, and polycyclic aromatic hydrocarbons (PAH) and nitro-PAHs. DPM is composed of a center core of elemental carbon and adsorbed organic compounds, as well as small amounts of sulfate, nitrate, metals, and other trace elements. DPM consists primarily of $PM_{2.5}$, including a subgroup with a large number of particles having a diameter less than 0.1 µm. Collectively, these particles have a large surface area, which makes them an excellent medium for adsorbing organic compounds. Also, their small size makes them highly respirable and able to reach the deep lung. Several potentially toxicologically relevant organic compounds, including PAHs, nitro-PAHs, and oxidized PAH derivatives, are on the particles. Diesel exhaust is emitted from on-road mobile sources such as automobiles and trucks and from off-road mobile sources (e.g., diesel locomotives, marine vessels, and construction equipment). DPM is directly emitted from diesel engines (primary PM) and can be formed from the gaseous compounds emitted by diesel engines (secondary PM).

Acute or short-term (e.g., episodic) exposure to diesel exhaust can cause acute irritation (e.g., eye, throat, and bronchial), neurophysiological symptoms (e.g., lightheadedness and nausea), and respiratory symptoms (e.g., cough and phlegm). Evidence also exists for an exacerbation of

allergenic responses to known allergens and asthma-like symptoms (USEPA 2002). Information from the available human studies is inadequate for a definitive evaluation of possible noncancer health effects from chronic exposure to diesel exhaust. However, on the basis of extensive animal evidence, diesel exhaust is judged to pose a chronic respiratory hazard to humans. The USEPA has determined that diesel exhaust is "likely to be carcinogenic to humans by inhalation" and that this hazard applies to environmental exposures (USEPA 2002).

Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene.

Formaldehyde is a colorless gas with a pungent, suffocating odor at room temperature. The major emission sources of formaldehyde appear to be power plants, manufacturing facilities, incinerators, and automobile exhaust. However, most of the formaldehyde in ambient air is a result of secondary formation through photochemical reactions of VOCs and NO_X. The major toxic effects caused by acute formaldehyde exposure by inhalation are eye, nose, and throat irritation and effects on the nasal cavity. Other effects from exposure to high levels of formaldehyde in humans are coughing, wheezing, chest pains, and bronchitis. Chronic exposure to formaldehyde by inhalation in humans has been associated with respiratory symptoms and eye, nose, and throat irritation. The USEPA considers formaldehyde to be a probable human carcinogen.

Naphthalene is used in mothballs and in the production of phthalic anhydride, a chemical compound used in industrial processes that can cause health effects in humans. Acute (short-term) exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation and ingestion. Chronic (long-term) exposure of workers and rodents to naphthalene reportedly causes cataracts and damage to the retina. Hemolytic anemia has been reported in infants born to mothers who sniffed and ingested naphthalene (as mothballs) during pregnancy. Available data are inadequate to establish a causal relationship between exposure to naphthalene and cancer in humans. The USEPA has classified naphthalene as a possible human carcinogen.

Polycyclic Organic Matter defines a broad class of compounds that includes PAHs, of which benzo[a]pyrene is a member. Polycyclic organic matter compounds are formed primarily by combustion and are present in the atmosphere in particulate form. Sources of air emissions are diverse and include cigarette smoke, vehicle exhaust, home heating, laying tar, and grilling meat. Cancer is the major concern from exposure to polycyclic organic matter. Epidemiologic studies have reported an increase in lung cancer in humans exposed to coke oven emissions, roofing tar emissions, and cigarette smoke; all of these mixtures contain polycyclic organic matter compounds (USEPA 2016b). Animal studies have reported respiratory tract tumors from inhalation exposure to benzo[a]pyrene and forestomach tumors, leukemia, and lung tumors from oral exposure to benzo[a]pyrene. The USEPA has classified seven PAHs (benzo[a]pyrene, benz[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) as probable human carcinogens.

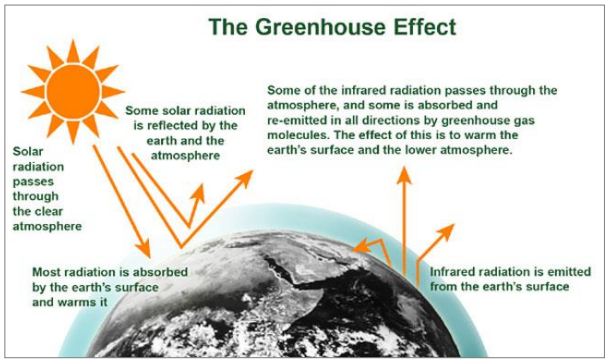
4.3 Valley Fever

Valley fever is not an air pollutant, but is a disease caused by inhaling *Coccidioides immitis* (C. immitis) fungus spores. The spores are found in certain types of soil and become airborne when the soil is disturbed. While C. immitis is not typically found in the Bay Area, the fungus is endemic to the Central Valley (California Department of Public Health 2018). However, the presence of C. immitis in the RSA does not guarantee that construction activities would result in increased incidence of Valley fever. Propagation of C. immitis is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry

spells. C. immitis spores can be released when filaments are disturbed by earthmoving activities, although receptors must be exposed to and inhale the spores to be at increased risk of developing Valley fever. Moreover, exposure to C. immitis does not guarantee that an individual will become ill—approximately 60 percent of people exposed to the fungal spores are asymptomatic and show no signs of an infection (USGS 2000).

4.4 Greenhouse Gases

Gases that trap heat in the atmosphere, or GHGs, are necessary to life, because they keep the planet's surface warmer than it otherwise would be. This is referred to as the *greenhouse effect* (Figure 4-5). As concentrations of GHGs increase, however, the Earth's temperature increases. According to National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration data, the Earth's average surface (land and ocean) temperature has increased by 1.6 degrees Fahrenheit (°F) in the last 100 years (NOAA 2018). According to the USEPA, eight of the top 10 warmest years on record for the United States have occurred since 1998, and 2012 and 2015 were the two warmest years on record. Most of the warming in recent decades is very likely the result of human activities. Other aspects of the climate are also changing, such as rainfall patterns, snow and ice cover, and sea level (USEPA 2016c).



Source: USEPA 2015f *MARCH 2019*

Figure 4-5 The Greenhouse Effect

Some GHGs, such as CO_2, occur naturally and are emitted into the atmosphere through natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. GHGs differ in their ability to trap heat. For example, 1 ton of emissions of CO_2 has a different effect than 1 ton of emissions of CH_4. To compare emissions of different GHGs, a weighting factor called Global Warming Potential (GWP) is used. To use a GWP, the heat-trapping ability of 1 metric ton (1,000 kilograms) of CO_2 is taken as the standard, and emissions are expressed in terms of CO_2e. The GWP of CO_2 is 1, the GWP of CH_4 is 25, the GWP of N_2O is 298, and the GWP for SF_6 is 22,800 (CARB 2018a). The following are the principal GHGs that enter the atmosphere because of human activities.

- **CO_2**—CO_2 enters the atmosphere from the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees, and wood products and also as a result of other chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- **CH_4**—CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal solid waste landfills.
- **N_2O**—N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated gases**—Hydrofluorocarbons, perfluorocarbons, and SF_6 are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for O_3-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in smaller quantities, but, because they are potent GHGs, they are sometimes referred to as high GWP gases.

Because of the global nature of GHG emissions, GHGs are examined for the project on the statewide and regional level. Effects of locally emitted GHGs are felt cumulatively and worldwide.

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5 AFFECTED ENVIRONMENT

This chapter summarizes existing air quality and GHG conditions along the project corridor. Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions that influence movement and dispersal of pollutants. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

5.1 Meteorology and Climate

California is divided into 15 air basins based on geographic features that create distinctive regional climates. The project would cross the SFBAAB, NCCAB, and SJVAB. Accordingly, local meteorological conditions vary greatly along the length of the project because of topography and elevation, as well as proximity to local waterbodies. This section discusses climate and meteorological information associated with the three project air basins.

5.1.1 San Francisco Bay Area Air Basin (Santa Clara Valley Subregion)

Climate within the SFBAAB is divided into 11 climatological subregions. The portion of the project in the SFBAAB crosses the Santa Clara Valley region, which is bounded by San Francisco Bay to the north and by mountains to the east, south, and west. Temperatures are warm on summer days and cool on summer nights, and winter temperatures are mild. At the northern end of the valley, mean maximum temperatures are 79°F to 82°F during the summer and 55°F to 59°F during the winter, and mean minimum temperatures range from 55°F to 59°F in the summer and 39°F to 43°F in the winter. Further inland, where the moderating effect of the bay is not as strong, temperature extremes are greater. For example, in San Martin, located 27 miles south of San Jose International Airport, temperatures can be more than 10°F warmer on summer afternoons and more than 10°F cooler on winter nights.

Winds in the valley are greatly influenced by the terrain, resulting in a prevailing flow that roughly parallels the valley's northwest-southeast axis. A north-northwesterly sea breeze flows through the valley during the afternoon and early evening, and a light south-southeasterly drainage flow occurs during the late evening and early morning. In the summer, the southern end of the valley sometimes becomes a convergence zone, when air flowing from Monterey Bay is channeled northward into the southern end of the valley and meets the prevailing north-northwesterly winds. Wind speeds are greatest in the spring and summer and weakest in the fall and winter. Nighttime and early morning hours frequently have calm winds in all seasons, while summer afternoons and evenings are quite breezy. Strong winds are rare, associated mostly with the occasional winter storm.

The air pollution potential of the Santa Clara Valley is high. High summer temperatures, stable air, and mountains surrounding the valley combine to promote O_3 formation. In addition to the many local sources of pollution, O_3 precursors from San Francisco, San Mateo, and Alameda Counties are carried by prevailing winds to the Santa Clara Valley. The valley tends to channel pollutants to the southeast. On summer days with low-level inversions, O_3 can be recirculated by southerly drainage flows in the late evening and early morning and by prevailing northwesterlies in the afternoon. A similar recirculation pattern occurs in the winter, affecting levels of CO and PM. This movement of the air up and down the valley significantly increases the effects of pollutants (BAAQMD 2017a).

5.1.2 North Central Coast Air Basin

The NCCAB is comprised of Monterey, Santa Cruz, and San Benito Counties. The basin lies along the central coast of California and covers an area of 5,159 square miles. The semi-permanent high-pressure cell in the eastern Pacific, known as the Pacific High, is the basic controlling factor in the climate of the air basin. In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High, forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air above acts as a lid to inhibit vertical air movement.

The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. Surface heating in the interior portion of the Salinas and San Benito Valleys creates a weak low-pressure system that intensifies the onshore air flow during the afternoon and evening.

In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High, which allows pollutants to build up over a period of a few days. It is most often during this season that north or east winds develop and transport pollutants from the Bay Area or Central Valley into the NCCAB.

During the winter, the Pacific High migrates southward and has less influence on the air basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito Valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the basin in winter and early spring.

The northern end of the San Benito Valley experiences west winds nearly one-third of the time. The prevailing air flow during the summer months probably originates in the Monterey Bay area and enters the northern end of the San Benito Valley through the air gap through the Gabilan Range occupied by the Pajaro River. In addition, a northwesterly air flow frequently transports pollutants into the San Benito Valley from the Santa Clara Valley (MBUAPCD 2008).

5.1.3 San Joaquin Valley Air Basin

The SJVAB is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi Mountains to the south. The SJVAB contains all of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties, as well as a portion of Kern County.

The area has an inland Mediterranean climate that is characterized by warm, dry summers and cool winters. Summer high temperatures often exceed 100°F, averaging in the low 90s in the northern valley and high 90s in the southern portion.

Although marine air generally flows into the basin from the Delta, the surrounding mountain ranges restrict air movement through and out of the valley. Wind speed and direction influence the dispersion and transportation of pollutants—the more wind flow, the less accumulation.

The vertical dispersion of air pollutants in the SJVAB is limited by the presence of persistent temperature inversion. Because of differences in air density, the air above and below the inversion do not mix. Air pollutants tend to collect under an inversion, leading to higher concentrations of emitted pollutants.

Precipitation and fog tend to reduce pollutant concentrations. O_3 needs sunlight for its formation, and clouds and fog block the required radiation. Precipitation in the San Joaquin Valley decreases from north to south, with approximately 20 inches in the north, 10 inches in the middle, and less than 6 inches in the south (SJVAPCD 2015a).

5.2 Ambient Air Quality

The existing air quality conditions in the project vicinity can be characterized by regional monitoring data. The CARB and various air districts operate air quality monitoring stations throughout California to monitor pollutant concentrations. For the purposes of this analysis, three stations, one in each air basin, were selected to represent conditions along the corridor: San Jose—Jackson Street (SFBAAB), Hollister—Fairview Road (NCCAB), and Merced—South Coffee Avenue (SJVAB).

Table 5-1 shows the results of ambient monitoring at the three stations, where available, for the most recent 3 years of available data (CARB 2018b; USEPA 2018a). Figure 5-1 shows the locations of the monitoring stations relative to the project footprint. Between 2015 and 2017, monitored CO and NO_2 concentrations did not exceed any federal or state standards at any of the three monitoring locations. However, the state and federal standards for O_3 and $PM_{2.5}$ and the

state standard for PM_{10} were exceeded. Using violations of the ambient air quality standards as a proxy for air quality, conditions tend to be poorest in the eastern portion of the project in Merced County, with improving air quality as the project moves westward to the SFBAAB.

5.3 Attainment Status

Local monitoring data (Table 5-1) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as follows:

- **Nonattainment**—Assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- **Maintenance**—Assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past, but are no longer in violation of that standard.
- **Attainment**—Assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- **Unclassified**—Assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Table 5-2 shows the attainment status of the project in the SFBAAB, NCCAB, and SJVAB with regard to the NAAQS and CAAQS.

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Table 5-1 Ambient Criteria Pollutant Concentrations at Air Quality Monitoring Stations in the Project Vicinity

Pollutant and Standards	San Jose-Jackson Street			Hollister-Fairview Road			Merced-S. Coffee Avenue		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Ozone (O_3)[1]									
Maximum 1-hour concentration (ppm)	0.094	0.087	0.121	0.079	0.073	0.078	0.102	0.097	0.093
Maximum 8-hour concentration (ppm)	0.081	0.066	0.088	0.065	0.060	0.072	0.089	0.086	0.084
Number of days standard exceeded[1]									
CAAQS 1-hour (>0.09 ppm)	0	0	3	0	0	0	2	2	0
NAAQS 8-hour (>0.070 ppm)	2	0	4	0	0	1	29	28	16
CAAQS 8-hour (>0.070 ppm)	2	0	4	0	0	1	34	29	17
Carbon Monoxide (CO)[2]									
Maximum 8-hour concentration (ppm)	1.8	1.4	1.8	N/A	N/A	N/A	N/A	N/A	N/A
Maximum 1-hour concentration (ppm)	2.4	1.9	2.1	N/A	N/A	N/A	N/A	N/A	N/A
Number of days standard exceeded[1]									
NAAQS 8-hour (≥9 ppm)	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
CAAQS 8-hour (≥9.0 ppm)	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
NAAQS 1-hour (≥35 ppm)	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
CAAQS 1-hour (≥20 ppm)	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Nitrogen Dioxide (NO_2)[1]									
National maximum 1-hour concentration (ppm)	49.3	51.1	67.5	N/A	N/A	N/A	35.0	35.4	38.9
State maximum 1-hour concentration (ppm)	49	51	67	N/A	N/A	N/A	35	35	38
State annual average concentration (ppm)	12	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of days standard exceeded									
NAAQS 1-hour (98th Percentile>0.100 ppm)	0	0	0	N/A	N/A	N/A	0	0	0
CAAQS 1-hour (0.18 ppm)	0	0	0	N/A	N/A	N/A	0	0	0

Pollutant and Standards	San Jose-Jackson Street			Hollister-Fairview Road			Merced-S. Coffee Avenue		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Annual standard exceeded?									
NAAQS Annual (>0.053 ppm)	No	No	No	N/A	N/A	N/A	No	No	No
CAAQS Annual (>0.030 ppm)	No	No	No	N/A	N/A	N/A	No	No	No
Particulate Matter (PM_{10})[1, 2]									
National[3] maximum 24-hour concentration (µg/m[3])	58.8	40.0	69.4	65.8	44.3	80.9	N/A	N/A	N/A
National[3] second-highest 24-hour concentration (µg/m[3])	47.2	35.2	67.3	52.5	43.2	74.7	N/A	N/A	N/A
State[4] maximum 24-hour concentration (µg/m[3])	58.0	41.0	69.8	N/A	N/A	N/A	N/A	N/A	N/A
State[4] second-highest 24-hour concentration (µg/m[3])	49.3	37.5	67.6	N/A	N/A	N/A	N/A	N/A	N/A
National annual average concentration (µg/m[3])	21.3	17.5	20.7	17.4	16.5	19.6	NA	NA	NA
State annual average concentration (µg/m[3])[5]	21.9	18.3	21.3	N/A	N/A	N/A	N/A	N/A	N/A
Number of days standard exceeded[1]									
NAAQS 24-hour (>150 µg/m[3])[6]	0	0	0	0	0	0	N/A	N/A	N/A
CAAQS 24-hour (>50 µg/m[3])[6]	3	0	19	N/A	N/A	N/A	N/A	N/A	N/A
Annual standard exceeded?									
CAAQS Annual (>20 µg/m[3])	Yes	No	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Particulate Matter ($PM_{2.5}$)[1]									
National[3] maximum 24-hour concentration (µg/m[3])	49.4	22.6	49.7	18.6	20.4	42.0	61.2	43.0	48.2
National[3] second-highest 24-hour concentration (µg/m[3])	37.0	21.8	46.5	14.6	17.2	34.3	55.7	43.0	47.4
State[4] maximum 24-hour concentration (µg/m[3])	49.4	22.7	49.7	18.6	20.4	42.0	61.2	43.0	48.2
State[4] second-highest 24-hour concentration (µg/m[3])	37.0	21.8	46.5	14.6	17.2	34.3	55.7	43.0	47.4
National annual average concentration (µg/m[3])	9.9	8.3	9.5	4.2	4.3	5.0	12.7	11.9	N/A
State annual average concentration (µg/m[3])[5]	10.6	8.4	N/A	4.3	N/A	5.1	N/A	N/A	11.9
Number of days standard exceeded[1]									
NAAQS 24-hour (>35 µg/m[3])	2	0	6	0	0	1	16	5	N/A

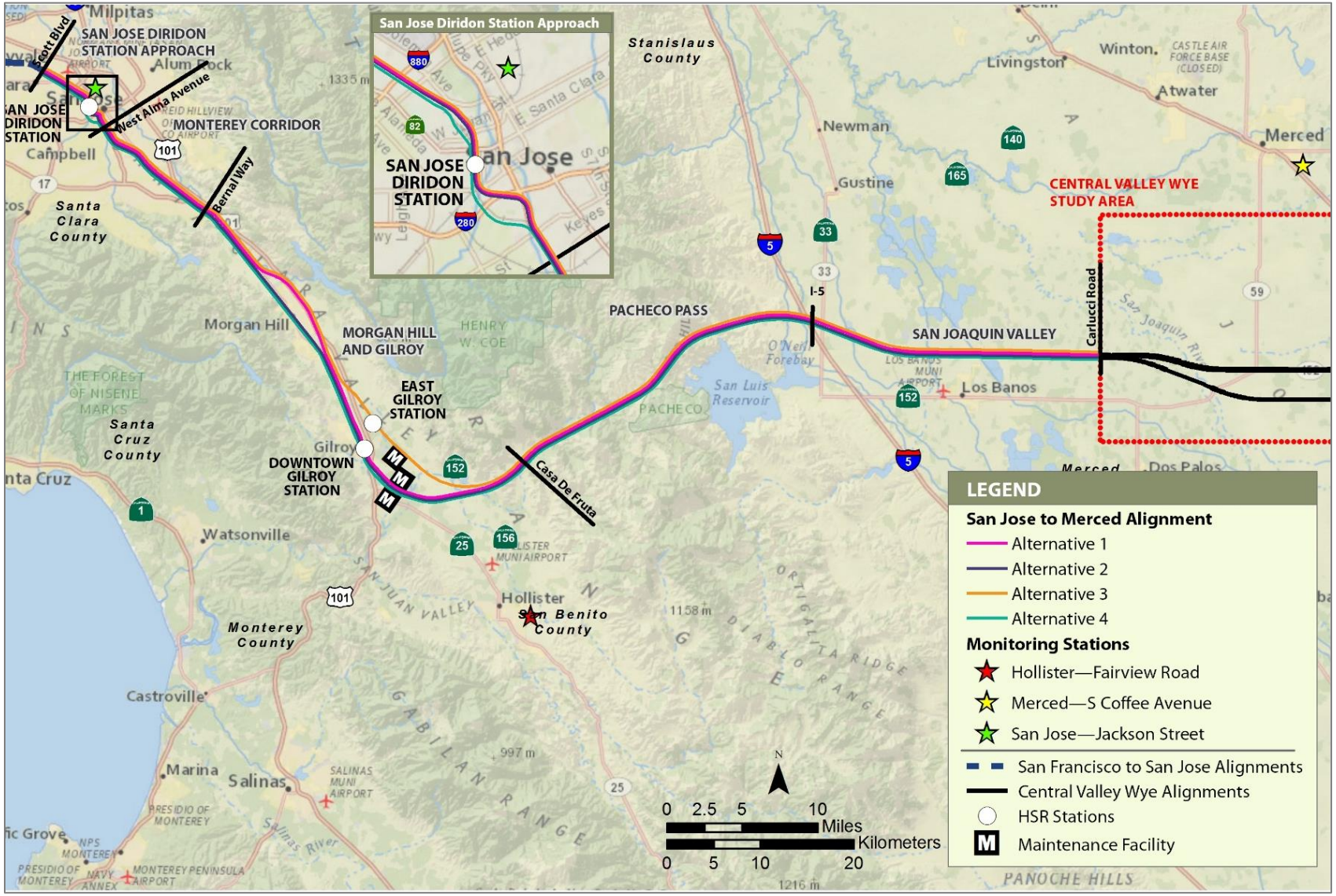
Pollutant and Standards	San Jose-Jackson Street			Hollister-Fairview Road			Merced-S. Coffee Avenue		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Annual standard exceeded?									
NAAQS Annual (>12.0 µg/m^3)	No	No	No	No	No	No	No	No	N/A
CAAQS Annual (>12 µg/m^3)	No	No	No	No	No	No	No	N/A	No
Sulfur Dioxide (SO_2)									
No data available	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Sources: CARB 2018b; USEPA 2018a
CAAQS = California ambient air quality standards
CO = carbon monoxide
NAAQS = national ambient air quality standards
µg/m^3 = micrograms per cubic meter
O_3 = ozone
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
ppm = parts per million
SO_2 = sulfur dioxide
> = greater than
N/A = not applicable or there was insufficient or no data available to determine the value
[1] An exceedance of a standard is not necessarily a violation because of the regulatory definition of a violation.
[2] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.
[3] State statistics are based on local conditions data.
[4] Measurements usually are collected every 6 days.
[5] State criteria for data sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
[6] Mathematical estimate of how many days' concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

Table 5-2 Federal and State Attainment Status of the Project

Pollutant	SFBAAB		NCCAB		SJVAB	
	Federal	State	Federal	State	Federal	State
Ozone (O_3)	Nonattainment (marginal)	Nonattainment	Attainment/ Unclassified	Nonattainment	Nonattainment (extreme)	Nonattainment
Particulate Matter (PM_{10})	Attainment/ Unclassified	Nonattainment	Attainment/ Unclassified	Nonattainment	Maintenance (serious)	Nonattainment
Particulate Matter ($PM_{2.5}$)	Nonattainment (moderate)	Nonattainment	Attainment/ Unclassified	Attainment	Nonattainment (serious/moderate)	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment	Attainment	Attainment/ Unclassified	Attainment	Unclassified
Nitrogen Dioxide (NO_2)	Attainment/ Unclassified	Attainment	Attainment/ Unclassified	Attainment	Attainment/ Unclassified	Attainment
Sulfur Dioxide (SO_2)	Attainment/ Unclassified	Attainment	Attainment/ Unclassified	Attainment	Attainment/ Unclassified	Attainment

Source: CARB 2018c; USEPA 2018b
CO = carbon monoxide
NCCAB = North Central Coast Air Basin
NO_2 = nitrogen dioxide
O_3 = ozone
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SFBAAB = San Francisco Bay Area Air Basin
SJVAB = San Joaquin Valley Air Basin
SO_2 = sulfur dioxide



Source: Authority 2019b; CARB 2018b

JANUARY 2020

Figure 5-1 Monitoring Station Locations

5.4 Emissions Inventory

An emissions inventory is an accounting of the total emissions from all sources in a particular geographic area over a specified period. Emission inventories are used in air quality planning and can provide a general indication of existing air quality in an area.

5.4.1 Criteria Pollutants

The CARB maintains an annual emission inventory for each county and air basin in the state. The inventories for Santa Clara, San Benito, and Merced Counties are composed of data submitted to the CARB by the local air districts, plus estimates for certain source categories, which are provided by CARB staff.

The 2012 air pollutant inventory data for Santa Clara, San Benito, and Merced Counties is shown in Table 5-3. With the exception of San Benito County, mobile source emissions represent the majority of ROG, NO_X, and CO emissions. In San Benito County, area sources represent the majority of ROG emissions, and mobile source emissions represent the majority of NO_X and CO. Area sources represent the majority of PM_{10} and $PM_{2.5}$ emissions in all three counties.

Table 5-3 Estimated Annual Average Emissions for Santa Clara, San Benito, and Merced Counties (2012 data published in 2017) (tons per day)

Source Category	Santa Clara County						San Benito County						Merced County					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources																		
Fuel combustion	1	7	10	3	1	1	<1	<1	1	0	<1	<1	<1	2	2	<1	<1	<1
Waste disposal	1	<1	<1	<1	<1	<1	<1	0	0	0	0	0	2	<1	<1	<1	0	0
Cleaning and surface coatings	7	0	0	0	0	0	<1	0	0	0	<1	<1	1	0	0	0	<1	<1
Petroleum production & marketing	2	0	0	0	0	0	<1	0	0	0	0	0	<1	0	0	0	0	0
Industrial processes	2	<1	1	<1	1	1	<1	<1	<1	0	1	<1	2	<1	<1	<1	1	<1
Area-Wide Sources																		
Solvent evaporation	15	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	0	0
Miscellaneous processes	2	15	3	<1	14	4	1	2	<1	<1	6	1	18	5	1	<1	26	5
Mobile Sources																		
On-road motor vehicles	17	133	34	<1	3	1	1	8	5	0	<1	<1	4	30	18	<1	1	1
Other mobile sources	9	81	12	<1	1	1	<1	3	1	0	<1	<1	2	12	8	<1	<1	<1
Total (all sources)	**55**	**238**	**61**	**3**	**20**	**7**	**4**	**13**	**6**	**0**	**8**	**1**	**32**	**48**	**29**	<1	**29**	**6**

Source: CARB 2017
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
ROG = reactive organic gases
SO_X = sulfur oxide

5.4.2 Statewide Greenhouse Gas Emissions

The CARB maintains a statewide emissions inventory of GHGs. The most recent inventory (2016) is shown in Table 5-4. In 2016, the largest contributor to GHG emissions was the transportation sector (41 percent). This sector includes emissions from on-road vehicles, intrastate aviation, waterborne vessels, and rail operations. The next largest contributor to emissions was the industrial sector (23 percent), followed by electricity generations (in-state and imports) (16 percent).

Table 5-4 California Greenhouse Gas Inventory (2016)

Sector	Emissions (million metric tons CO_2e)	Percent of Inventory
Transportation	174	41%
Industrial	100	23%
Electricity generation (in-state)	43	10%
Electricity generation (imports)	26	6%
Agriculture & forestry	34	8%
Residential	28	7%
Commercial	23	5%
Not specified	1	<1%
Total	429	100%

Source: CARB 2018d
CO_2e = carbon dioxide equivalent
< = less than

5.5 Sensitive Receptors

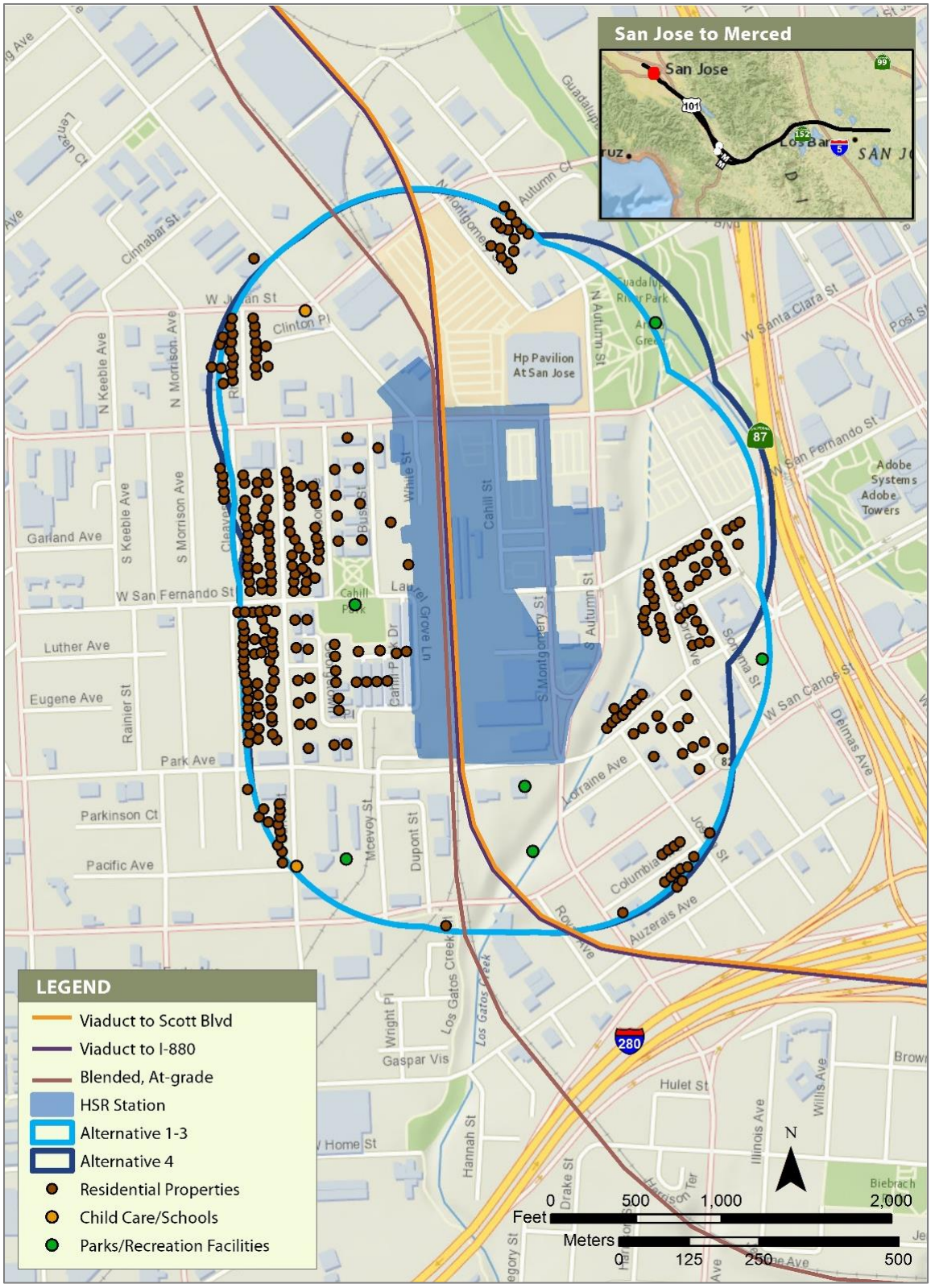
Sensitive receptors are people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, and hospitals. Residential dwellings are also considered sensitive land uses because people can be exposed to pollutants for extended periods. Recreational areas are considered moderately sensitive to poor air quality because vigorous exercise associated with recreation places a high demand on the human respiratory function.

Analyses performed by the CARB indicate that providing a separation of at least 1,000 feet from diesel sources and high-traffic areas would reduce exposure to air contaminants and decrease asthma symptoms in children (CARB 2005). Sensitive receptors located within 1,000 feet of the San Jose Diridon Station, Downtown Gilroy Station, East Gilroy Station, and East Gilroy MOWF are shown in Table 5-5 and on Figures 5-2 through 5-5. There are no receptors within 1,000 feet of the South Gilroy MOWF. In the RSA, residential land uses are the most common. Other sensitive receptors in the RSA include childcare/schools, elder care facilities, and parks/recreational facilities.

Table 5-5 Sensitive Receptors within 1,000 Feet of the San Jose Diridon and Gilroy Stations and East Gilroy MOWF

Station and Receptor	Distance from Station (feet)[1]	
San Jose Diridon Station	**Alternatives 1, 2, and 3**	**Alternative 4**
Nearest residential receptor	33	36
Arena Green Park	-	802
Cahill Park	325	326
Planned community park	144	144
Discovery Dog Park	957	-
Los Gatos Creek Trail	527	527
Sunol Community Day School play area (school is closed but grass and blacktop remain)	745	745
Downtown Gilroy Station	**Alternatives 1 and 2**	**Alternative 4**
Nearest residential receptor	17	41
Elliot Elementary School (play area)	839	939
Forest Street Park	244	362
Wheeler Tot Lot	826	816
Elliot Elementary School	953	-
Miranda's Residential Care Home	934	971
East Gilroy Station	**Alternative 3**	
Nearest residential receptor	21	
East Gilroy Maintenance of Way Facility[2]	**Alternative 3**	
Nearest residential receptor	90	
Anchor Point Christian School play yard	775	
Anchor Point Christian School	883	

Sources: Authority 2019b; CPAD 2016;
[1] Distance measured from the receptor to the closest edge of the temporary construction areas associated with the stations, as shown in Figures 3.3-3 through 3.3-5.
[2] There are no sensitive receptors within 1,000 feet of the South Gilroy MOWF.



Sources: Authority 2019b; CPAD 2016; Google Inc. 2018; JANUARY 2020

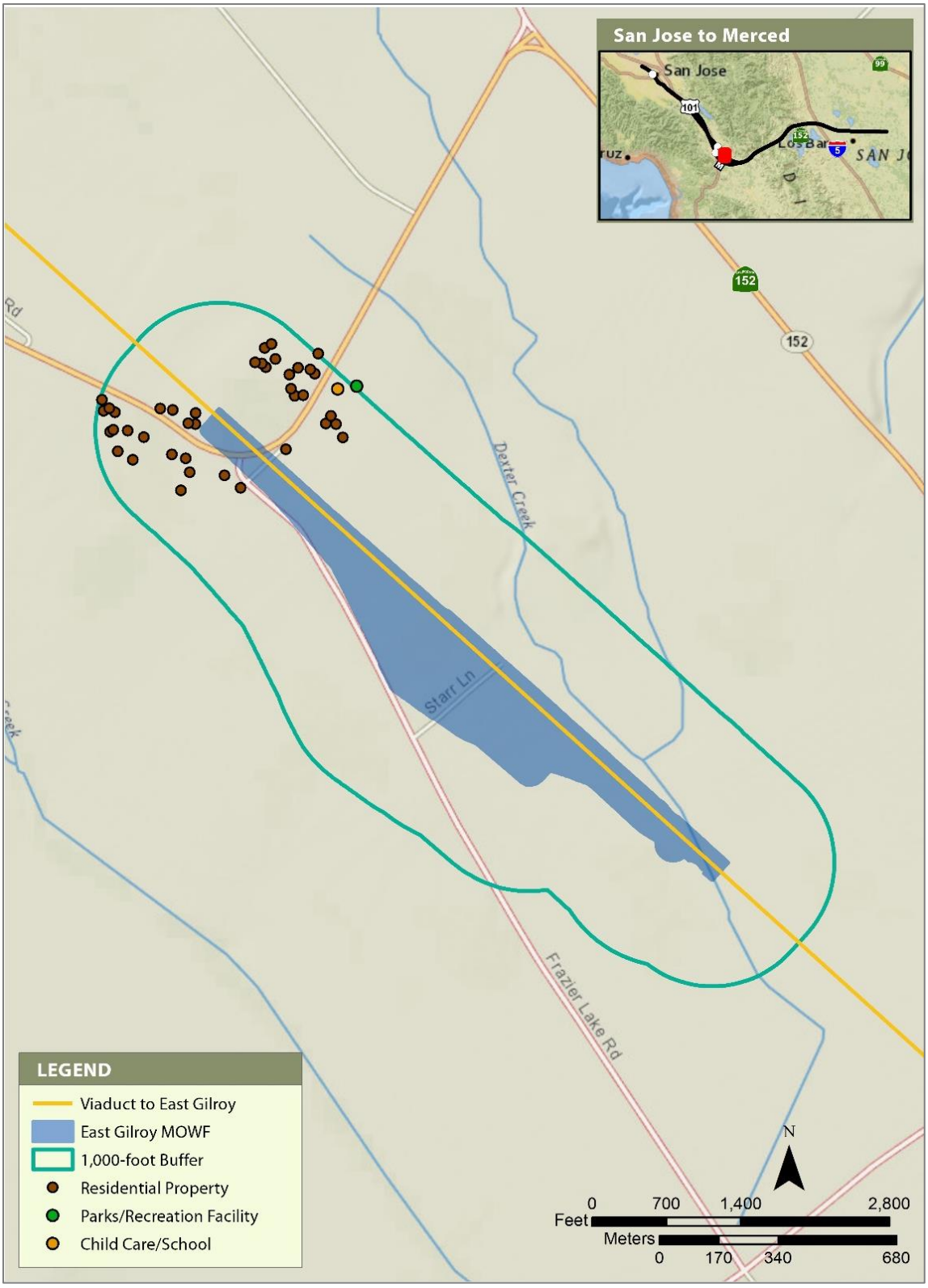
Figure 5-2 Sensitive Receptors within 1,000 Feet of the San Jose Diridon Station

Sources: Authority 2019b; CPAD 2016; Google Inc. 2018; JANUARY 2020

Figure 5-3 Sensitive Receptors within 1,000 Feet of the Downtown Gilroy Station

Sources: Authority 2019b; CPAD 2016; Google Inc. 2018; JANUARY 2020

Figure 5-4 Sensitive Receptors within 1,000 Feet of the East Gilroy Station



Sources: Authority 2019b; CPAD 2016; Google Inc. 2018; JANUARY 2020

Figure 5-5 Sensitive Receptors within 1,000 Feet of the East Gilroy Maintenance of Way Facility

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6 METHODS FOR EVALUATING EFFECTS

This chapter discusses the methods used to determine the air quality and global climate change effects of the construction and operations of the project. The discussion includes the existing physical conditions that were assumed in the analysis.

Air quality analysts used the year 2015 to represent existing conditions for this analysis (2015 Existing Conditions). The project would be constructed and in operation by 2029, and the full Phase 1 of the statewide HSR system would be operational by 2040. The existing background conditions (e.g., background traffic volumes, trip distribution, and vehicle emissions) of 2015 would change over the 25-year span to full operations in 2040. Changes to the transportation network over the next 25 years will result from funded transportation projects programmed to be constructed by 2040. The buildout of local development plans will affect background traffic volumes. Changes in vehicle emissions over the next 25 years will result from application of updated and more stringent vehicle emissions standards, as well as changing background traffic and VMT. Given these anticipated changes in background conditions over the life of the project from 2015 Existing conditions, the project's air quality operations effects are evaluated against both existing (2015) conditions and background (i.e., No Project) conditions as they are expected to be in 2029 and 2040 (when the full Phase 1 of the statewide HSR system is in operation).

Temporary transportation-related effects, such as those from temporary road closures during construction, are evaluated only against existing conditions. Construction of the project alone could reconfigure the existing roadway network, permanently redirecting existing traffic and causing traffic effects at intersections and road segments that receive the redirected traffic. The 2015 Existing Conditions are particularly helpful for evaluating these effects, and mitigation based on these conditions would be appropriate.

6.1 Definition of Resource Study Area

The RSA is the area in which all environmental investigations specific to air quality and global climate change are conducted to determine the resource characteristics and potential effects of the project. The RSA for air quality and global climate change comprises the state, the regional air districts (SFBAAB, NCCAB, and SJVAB), and the local study areas (areas immediately adjacent to construction activities). Each of these components of the RSA is described in the following subsections.

6.1.1 Statewide

Analysts identified a statewide RSA to evaluate potential changes in GHG/global climate change and air quality from large-scale, nonlocalized factors. Such factors include HSR power requirements, changes in air traffic, and project conformance with the SIP.

6.1.2 Regional

The project would potentially affect regional air pollutant concentrations in the Santa Clara County portion of the SFBAAB, the San Benito County portion of the NCCAB, and the Merced County portion of the SJVAB. Figure 3-1 in Chapter 3 highlights the three air basins in the RSA.

6.1.3 Local

Local RSAs are areas of potential major air emission activities, including areas where construction would occur along the project alignment and near construction staging areas. Local RSAs are generally defined as areas within 1,000 feet of the project footprints or construction staging areas. CARB analyses indicate that providing a separation of 1,000 feet from diesel sources and high-traffic areas substantially reduces DPM concentrations, public exposure, and asthma symptoms in children (CARB 2005). Accordingly, 1,000 feet from the project right-of-way is defined as the local RSA.

6.2 Statewide and Regional Operations Emissions Calculations

The emission burden analysis of a project determines a project's overall effect on air quality levels. The project would affect long-distance, city-to-city travel along freeways and highways throughout the state, as well as long-distance, city-to-city aircraft takeoffs and landings. The HSR system would also affect electrical demand throughout the state. Analysts calculated criteria pollutant and GHG operations emissions for two ridership scenarios: a medium ridership scenario of the Silicon Valley to Central Valley line (from San Francisco to north of Bakersfield) and a high ridership scenario of the same distance. Analysts developed these two scenarios for three different years: 2015 Existing Conditions, 2029 Plus Project conditions (opening), and 2040 Plus Project conditions (Phase 1 of the HSR system horizon 2040). Both scenarios are based on the level of ridership as presented in *Connecting and Transforming California, 2016 Business Plan* (2016 Business Plan) (Authority 2016).[10, 11] These scenarios assume different background conditions. For example, forecast trends in demographics and travel costs can influence ridership for any HSR scenario. The medium scenario was developed using the "most likely" values of all inputs to the HSR ridership forecasting model, while the high scenario used inputs that were set at values that result in ridership at the 75th percentile of the range considered in the ridership risk analysis. The 2016 Business Plan provides additional detail on the travel forecasts and risk analysis. The tables in the effects analysis therefore present two values for operational emissions for each pollutant, corresponding to these two scenarios.

6.2.1 On-Road Vehicles

Analysts evaluated on-road vehicle emissions using average daily VMT estimates and associated average daily speed estimates for each affected county. Analysts estimated emission factors using the CARB emission factor program, EMission FACtors (EMFAC) 2017, which accounts for existing regulations that would reduce emissions, such as the Pavley Clean Car Standards. Parameters were set in the program for each county to reflect conditions within each county and statewide parameters to reflect travel through each county. The analysis was conducted for the following modeling years:

- Existing Year (2015)
- Opening Year (2029)
- Horizon Year (2040)

To determine overall pollutant burdens generated by on-road vehicles, analysts multiplied the estimated VMT by the applicable pollutant's emission factors, which are based on speed, vehicle mix, and analysis year. The difference between emissions with the project and without the project represents the effects of the project.

6.2.2 Trains

The entire HSR system, including the project, would use electric multiple-unit (EMU) trains, with the power distributed through the overhead contact system. Accordingly, the HSR system would not produce direct emissions from combustion of fossil fuels and associated emissions. However, trains traveling at high velocities, such as those associated with the HSR system, create sideways turbulence and rear wake, which resuspend particulates from the surface surrounding

[10] As described in Appendix 3.3-C, Changes to Project Benefits Based on 2018 Business Plan, to the EIR/EIS, the Authority Board adopted the 2018 Business Plan on May 15, 2018. The 2018 Business Plan assumes an opening year of 2033 for Phase 1 and presents different ridership forecasts for 2029 and 2040 than were assumed in this technical report. Under the 2018 Business Plan ridership forecasts, the HSR project would achieve the same benefits described in this section, but they would occur at different times and may be less than presented in Chapter 7, Air Quality Effects Analysis, and Chapter 8, Global Climate Change Effects Analysis. Nonetheless, HSR ultimately affords a more energy-efficient choice for personal travel that would help alleviate highway congestion, provide greater capacity for goods movement, and reduce criteria pollutant and GHG emissions.

[11] As described in the *San Jose to Merced Project Section Transportation Technical Report*, the project would result in a 6.5 percent increase in Caltrain ridership (Authority 2019c). VMT reductions and corresponding emissions benefits from this additional ridership have not been accounted for in this analysis. Accordingly, the long-term benefits reported in this study are likely conservative.

the track, resulting in fugitive dust. Analysts used the USEPA (2006a) method for estimating emissions from wind erosion. They assumed a friction velocity of 0.62 foot per second to resuspend soils and that a HSR train passing at 220 mph could resuspend soil particles out to approximately 10 feet from the train (Watson 1996).

6.2.3 Aircraft

Analysts used the Federal Aviation Administration's Aviation Environmental Design Tool to estimate aircraft emissions. This tool estimates the emissions generated from specified numbers of landing and take-off cycles. Along with emissions from the aircraft, emissions generated from associated ground-maintenance requirements are included. Analysts calculated aircraft emissions by using the fuel consumption factors and emission factors from the CARB's 2000–2018 *Documentation of California's Greenhouse Gas Inventory (13th Edition)* and the accompanying support documentation. The emission factor includes both landing and take-off and cruise operations (formula: aircraft emissions per flight = fuel consumption × emission factor; aircraft emissions = flights removed × aircraft emissions per flight). Analysts calculated average aircraft emissions based on the profile of intrastate aircraft currently servicing the San Francisco to Los Angeles corridor. Analysts estimated the number of air trips removed attributable to the project through the travel demand modeling analysis conducted for the project, based on the ridership estimates presented in the 2016 Business Plan (Authority 2016).

6.2.4 Power Plants

Analysts conservatively estimated the electrical demands caused by propulsion of the trains and the trains at terminal stations and in storage depots and maintenance facilities as part of the project design. Analysts derived average emission factors for each kilowatt-hour (kWh) required from CARB statewide emission inventories of electrical and cogeneration facilities data along with USEPA eGRID2018 (released January 2020) electrical generation data. The energy estimates used in this analysis for the propulsion of the HSR include the use of regenerative brake power.

The HSR system is currently analyzed as if it would be powered by the state's current electric grid. This is a conservative assumption because of the state requirement that an increasing fraction of electricity (100 percent by 2045) generated for the state's power portfolio come from renewable energy sources. As such, the emissions generated for the HSR system are expected to be lower in the future than the emissions estimated for this analysis. Furthermore, under the 2013 Policy Directive POLI-PLAN-03, the Authority has adopted a goal to purchase 100 percent of the HSR system's power from renewable energy sources.

6.3 Local Operations Emissions Calculations

Operation of the project traction power, switching, and paralleling stations would not result in appreciable air pollutants because site visits would be infrequent, and power usage would be limited. Therefore, emissions from these stations were not quantified.

The following sections discuss the methods used to estimate operational emissions from the train stations, maintenance facilities, and additional SF_6 circuit breakers installed during reconductoring activities and evaluate the project's effect on ambient air quality conditions and human health. The HRA focuses on the key localized pollutants of concern, which are CO, PM, and MSATs.

6.3.1 Stations

The project includes an expanded San Jose Diridon Station and either an expanded Downtown Gilroy Station or a new East Gilroy Station.[12] The stations would provide drop-off facilities, an entry plaza, a station house area for ticketing and support services, an indoor station room where passengers wait to access the HSR, and parking facilities. Emissions associated with the operation of the stations would primarily result from area and stationary sources, electricity and

[12] The project section terminates at the Merced Station, which is discussed in the Merced to Fresno Final EIR/EIS and is not included in this analysis.

water consumption, waste generation, emergency generator testing, and vehicle traffic. The methods used to evaluate each of these sources is described in the following subsections.

Since the San Jose Diridon and Downtown Gilroy Stations are existing facilities, emissions were analyzed under both existing and project conditions. The difference between existing and project conditions represents the net effect of the project analyzed. Since the East Gilroy Station would be constructed as part of the project, existing emissions were assumed to be zero.

6.3.1.1 Area Sources

Analysts calculated the criteria pollutant and GHG emissions from area sources using CalEEMod. Emissions were based on the land use data, entered as the size of the station buildings (square feet). The CalEEMod output files and the activity data details used to perform the estimations are summarized in Appendix A.

6.3.1.2 Natural Gas

Analysts calculated criteria pollutant and GHG emissions from natural gas consumption for water and space heating based on the building square footage, existing gas consumption rates, and CalEEMod. The San Jose Diridon Station consumed 1,022 therms of gas in 2016, resulting in a consumption rate of 0.05 therms/square foot/year (McGuire 2017–2018). The Downtown Gilroy Station is currently a platform and does not consume gas. Accordingly, the existing gas rate (0.05 therms/square foot/year) for the San Jose Diridon Station was assumed representative of the future stations at San Jose Diridon and in Gilroy. This assumption is conservative, since the stations would be LEED Platinum certified, which would reduce gas consumption per square foot relative to the existing rate.

6.3.1.3 Indirect Electricity

The San Jose Diridon and Gilroy stations would generate indirect emissions from purchased electricity consumed for facility lighting. It is expected that the power used by HSR stations would be much less than the power used by train operations; however, the indirect emissions from power consumption have been included in the overall emission estimates.

Analysts calculated indirect GHG emissions from purchased electricity consumed by HSR stations based on the building square footage, existing electricity consumption rates, and CalEEMod. The San Jose Diridon and Downtown Gilroy Stations consumed 623,763 and 5,041 kWh of electricity in 2016, resulting in a consumption rate of 28 kWh/square foot/year and 2 kWh/square foot/year, respectively (McGuire 2017–2018). Since the Downtown Gilroy Station is currently a platform, the existing electricity rate (28 kWh/square foot/year) for the San Jose Diridon Station was assumed representative of future project stations at Diridon and in Gilroy. This assumption is conservative, since the project stations would be LEED Platinum certified, which would reduce electricity consumption per square foot relative to the existing stations.

6.3.1.4 Indirect Water and Wastewater

The San Jose Diridon Station, Downtown Gilroy Station, and East Gilroy Station would generate indirect GHG emissions from purchased water consumed for facility restrooms, drinking fountains, landscaping, and other miscellaneous uses. Analysts calculated indirect GHG emissions from purchased water consumed by the HSR stations based on the building square footage, existing water consumption rates, and CalEEMod. The San Jose Diridon and Downtown Gilroy Stations consumed 1.9 million and 130,000 gallons of water per year, resulting in a consumption rate of 89 gallons/square foot/year and 49 gallons/square foot/year, respectively (McGuire 2017–2018). Since the Downtown Gilroy Station is currently a platform, the existing water rate (89 gallons/square foot/year) for the San Jose Diridon Station was assumed representative of the future project stations at San Jose Diridon and in Gilroy. This assumption is conservative, since the project stations would be LEED Platinum certified, which would reduce water consumption per square foot relative to the existing stations.

6.3.1.5 Indirect Solid Waste

The San Jose Diridon and Gilroy stations would generate indirect GHG emissions from solid waste disposal. Waste generation at the existing San Jose Diridon and Gilroy stations was not available. Accordingly, analysts calculated indirect GHGs from solid waste generation using CalEEMod defaults.

6.3.1.6 Emergency Generators

The San Jose Diridon and Gilroy stations would have emergency generators that would be used in the event of a power outage. Analysts assumed that the emergency generators would be Tier 4, 800-kilowatt generators. Usage of each of the proposed emergency generators would occur for up to 50 hours per year for periodic testing, consistent with CARB's Airborne Toxic Control Measure for Stationary Compression Ignition Engines and Section 330.3 of BAAQMD Regulation 9, Rule 8. Analysts modeled emissions using CalEEMod.

6.3.1.7 Vehicle Traffic

Passengers

Mobile source emissions would occur from passenger commutes. Passengers would be expected to arrive at the San Jose Diridon and Gilroy stations by car, shuttle, and bus/rail.[13] The numbers of daily passengers visiting the San Jose Diridon and Gilroy stations are shown in Table 6-1. As a conservative estimate, passenger traffic was expected to occur 7 days per week.

Analysts estimated vehicular exhaust emissions from passengers arriving by car using CalEEMod assuming a mix of light-duty automobiles and light-duty trucks. Connecting bus/shuttle service would primarily be provided by the Santa Clara Valley Transportation Authority (VTA). Connecting rail service includes Caltrain, Bay Area Rapid Transit, and VTA light rail. Connecting transit service to the passenger rail terminals is not part of the project. The Authority assumes that bus service levels are constant into the future given that no operator has a funding plan to deliver more service. Routing buses to the new East Gilroy Station would be the responsibility of VTA as part of their long-range expansion plans, which would outline anticipated service and vehicle needs commensurate with the expected East Gilroy demand. Accordingly, mass emissions generated by connecting transit are not included in the air quality or GHG assessment for the project.

Employees

Analysts calculated emissions from employee traffic using CalEEMod based on weighted average vehicle emission factors for light-duty automobiles and light-duty trucks. As a conservative estimate, employee traffic was expected to occur 7 days per week. It was assumed that each employee would make one round trip per day. There would be a total of 36 daily employee round trips at the San Jose Diridon Station and 29 daily employee roundtrips at the Downtown Gilroy or East Gilroy Station (Burton 2017c).

6.3.1.8 Adjustment for the Safe Vehicles Rule

Analysts adjusted the predicted passenger and employee vehicle emissions to reflect the impact of the SAFE Vehicles Rule, as per CARB (2019, 2020) guidance. As discussed in Section 3.1.4, Federal Greenhouse Gas Regulations and Guidance, the SAFE Vehicles Rule only impacts fuel economy and associated emissions from light-duty gasoline vehicles. However, the adjustment factors were conservatively applied to the entire CalEEMod output for on-road mobile, which includes emissions contributions from gasoline and diesel-powered vehicles.

6.3.2 Maintenance Facilities

Two maintenance facilities would be required for the project. A MOWF would be constructed either south of Gilroy (Alternatives 1, 2, and 4) or east of Gilroy (Alternative 3), and a MOWS

[13] Biking and walking trips have been excluded from the table and analysis since there would be no emissions.

would be built near Turner Island Road (Alternatives 1, 2, 3, and 4). Activities performed at the MOWF would consist of planning maintenance work, storing and dispatching rail mounted equipment, inspecting and maintaining rail mounted equipment, and transporting right-of-way equipment. The purpose of the MOWS is to support the MOWF activities by providing temporary storage of materials and other resources.

Table 6-1 Daily Passengers at HSR Stations

Mode of Access	San Jose Diridon	Downtown Gilroy	East Gilroy
By car			
Existing			
Without HSR	2,400	190	0
With HSR	3,860	2,470	2,470
Future without HSR			
2029	3,380	270	0
2040	4,280	340	0
Future with HSR			
2029	4,840	3,300	4,080
2040	9,940	7,100	8,000
By shuttle (with and without HSR)[1]			
2029	1,800	940	1,500[2]
2040	4,300	2,000	3,800[2]
By bus/rail (with and without HSR)[1]			
2029	5,800	1,100	260[2]
2040	12,300	2,300	560[2]

Sources: Burton 2017a, 2017b, 2018
HSR = high-speed rail
[1] The with HSR conditions are the same as the No Project condition. The Authority assumes that bus service levels are constant into the future given that no operator has a funding plan to deliver more service.
[2] While bus service levels are assumed to be the same under with and without project conditions, the East Gilroy Station would be an entirely new transit stop with HSR conditions. Localized emissions and potential health risks from exposure to diesel-exhaust under this specific project-induced change are assessed in Section 7.3.1, Station Sites and Maintenance Facilities.

Analysts used CalEEMod to estimate building operation emissions, assuming default conditions for the *general light industrial* land use category (Appendix A). It was assumed that there would be an average of 20 truck deliveries to the MOWF and MOWS per day and that the trucks would travel 120 miles round trip. Truck deliveries would include supplies of materials and chemicals, as well as remove refuse from the site. There would be a total of 450 daily employee trips at the MOWF (Burton 2017c).[14] One emergency generator was assumed to operate 50 hours per year at each facility. The emission outputs are provided in Appendix A.

Emissions from maintenance equipment, vehicle, and rail movement at the MOWF were estimated using a combination of emission factors and methodologies from CalEEMod, EMFAC2017, and the USEPA (2009). Daily and annual equipment, vehicle, and locomotive

[14] Analysts adjusted the predicted employee vehicle emissions to reflect the impact of the SAFE Vehicles Rule, as per CARB (2019, 2020) guidance. The MOWS would require six employees per day, all of whom would arrive by rail (Burton 2017c).

operating activity were obtained from the Authority (Newson 2018). Rail mounted equipment would include track treatment machinery, right-of-way inspection/maintenance machinery, and hi-rail specialist equipment. Vehicles would primarily include hi-rail trucks, SUVs, and section trucks. Locomotives would be used to support maintenance, grinding, milling, inspection, welding, and other activities.

Prior to operation in 2029, new equipment will be purchased for the MOWF that, at a minimum, conforms to Tier 4 emission standards. EPA and CARB phased-in Tier 4 emission standards over the period of 2008 to 2015. Accordingly, all newly purchased or remanufactured off-road equipment and locomotives after 2015 must meet Tier 4 emission standards. It is possible more stringent emission standards will be introduced and effective by the time new equipment is purchased for the MOWF. However, because Tier 4 is the standard currently required for new and remanufactured equipment, this analysis conservatively assumes all off-road equipment and locomotives operating at the MOWF meet Tier 4 emissions standards. If more stringent standards are adopted prior to new equipment purchase, emissions and health risks would be lower than presented in this analysis. The emission calculations are provided in Appendix A.

6.3.3 Sulfur Hexafluoride Circuit Breakers

Operations and maintenance activities required for the reconductored Spring to Llagas and Green Valley to Llagas power lines would not change from those currently required for the existing system; thus, no additional operations-related criteria pollutants would occur. However, the project would require the installation of electrical equipment, including up to 12 power circuit breakers with SF_6-gas-insulated switchgear. Potential SF_6 emissions from the additional breakers were estimated based on the mass of each breaker (230 pounds) and an assumed 0.5 percent by mass annual leak rate, per PG&E standard specifications.

6.3.4 Microscale Carbon Monoxide Hot Spot Analysis

Traffic around the San Jose Diridon and Gilroy stations and affected by grade crossings (Alternative 4 only) may contribute to localized increases in CO, known as CO “hot spots”. The BAAQMD has adopted screening criteria that provide a conservative indication of whether project-generated traffic would cause a potential CO hot spot. The air district establishes that if the screening criteria are not met, a quantitative analysis through site-specific dispersion modeling of project-related CO concentrations would not be necessary, and the project would not cause localized exceedances of CO CAAQS. BAAQMD’s screening criteria were developed based on local modeling and provide a conservative estimate for the maximum number of vehicles that can be added to an intersection without an exceedance of the CO CAAQS. BAAQMD CO screening criteria are as follows:

1. Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
2. Project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).
3. The project is consistent with an applicable CMP established by the county congestion management agency for designated roads or highways, RTP, and local congestion management agency plans.

Traffic data provided by Fehr & Peers (Burton 2017d) indicate that no intersections in the local RSA would exceed 24,000 vehicles per hour. The intersection analysis included all intersections affected by station traffic and near grade crossings. Up to 20 intersections, depending on the alternative, would violate the established LOS standard in the applicable CMP under 2040 Plus Project conditions. Analysts performed a microscale CO hot-spot analysis at five of these locations near stations and one at-grade crossing (Alternative 4) to verify that project traffic would not cause or contribute to a violation of the CO CAAQS. The potential for CO hot spots was evaluated using the Caltrans Institute of Transportation Studies *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol) (Garza et al. 1997). The CO Protocol details a step-by-

step procedure to determine whether project-related CO concentrations have a potential to generate new air quality violations, worsen existing violations, or delay attainment of CAAQS or NAAQS for CO. Additional details of the modeling are described in the following subsections.

6.3.4.1 Intersection Selection

Analysts ranked the 20 intersections that would violate the established CMP LOS standards by their total peak-hour traffic volumes and anticipated delay. The five intersections with the highest station traffic volumes and worst congestion were selected for CO modeling. Analyzing these intersections provides a worst-case assessment of potential CO effects because CO concentrations at all other intersections would be lower than those estimated for the selected intersections. The following intersections were selected for the analysis:

- The Alameda (SR 82)/Taylor Street-Naglee Avenue
- Autumn Street (SR 82)/West Santa Clara Street (SR 82)
- Coleman Avenue/I-880 Northbound Ramps
- Monterey Road (SR 82)/Blossom Hill Road Westbound Ramps (SR 82/County Route G10)
- US 101 Southbound Ramps/Blossom Hill Road

In addition to these locations, the intersection of Monterey Road and Skyway Drive was analyzed under Alternative 4. The traffic analysis indicates that this intersection would have the highest traffic volumes and worst congestion of the locations analyzed with at-grade crossings (Burton 2017d).

6.3.4.2 Receptor Locations

Receptors for the intersection analyses were identified in accordance with CO Protocol (Garza et al. 1997). All receptors were located at a height of 6 feet. Receptors for the intersection analysis were located 10 feet from the roadway so they were not within the mixing zone of the travel lanes and were spaced at 0, 82, and 164 feet from the intersection for both the 1-hour and 8-hour analyses (Garza et al. 1997). Analysts assumed that the public could access these locations whether or not sidewalks exist at the receptor location.

6.3.4.3 Emission Model

Analysts estimated vehicular emissions using EMFAC2017, which is a mobile source emission estimate program that provides current and future estimates of emissions from highway motor vehicles. Consistent with the traffic analysis and the anticipated design year of the project, CO emission factors are based on 2029 and 2040 vehicle mixes for projected conditions in Santa Clara County. The CARB designed EMFAC2017 to address a wide variety of air pollution modeling needs, and the program incorporates fleet-specific emission rates, realistic driving patterns, separation of start and running emissions, correction factors for engine deterioration, and annual fleet compositions.

6.3.4.4 Dispersion Model

Mobile source dispersion models are the basic analytical tools used to estimate CO concentrations expected under given traffic, roadway geometry, and meteorological conditions. The mathematical expressions and formulations that constitute the various models attempt to describe as closely as possible a complex physical phenomenon. Analysts used Caltrans' CALINE4 dispersion model to estimate pollutant concentrations near roadway intersections.

CALINE4 is a Gaussian model recommended in the Caltrans CO Protocol. Gaussian models assume that the dispersion of pollutants downwind of a pollution source follow a normal distribution around the center of the pollution source. The model is described in *CALINE4 – A Dispersion Model for Predicting Air Pollutant Concentration near Roadways, FHWA/CA/TL-84/15*. The analysis of roadway CO effects followed the CO Protocol (Garza et al. 1997). The CALINE4 output files are provided in Appendix B.

6.3.4.5 Meteorological Conditions

The transport and concentration of pollutants emitted from motor vehicles are influenced by three principal meteorological factors: wind direction, wind speed, and the temperature profile of the atmosphere. Analysts chose the values for these parameters to maximize pollutant concentrations at each prediction site (i.e., to establish a conservative worst-case situation).

- **Wind direction**—Maximum CO concentrations are normally found when the wind is assumed to blow approximately parallel to a single roadway adjacent to the receptor location. However, at complex intersections, it is difficult to predict which wind angle would result in maximum concentrations. Therefore, at each receptor location, the approximate wind angle that would result in maximum pollutant concentrations was used in the analysis. All wind angles from 0° to 360° were considered.
- **Wind speed**—CO concentrations are greatest at low wind speeds. A conservative wind speed of 1 mph was used to predict CO concentrations during peak traffic periods.
- **Temperature and profile of the atmosphere**—Analysts chose an ambient temperature based on the CO Protocol (Garza et al. 1997) recommendation for the local RSA, a mixing height (the height in the atmosphere to which pollutants rise) of 1,000 feet. Neutral atmospheric stability (stability class G) conditions was used in estimating microscale CO concentrations. Winter low temperatures of 41°F were assumed based on the average temperature in December over an approximately 30-year period (based on Western Regional Climate Center data accessed in February 2017). The stability class G was chosen, as recommended in Table B.11 of the CO Protocol.

Analysts based the selection of these meteorological parameters on recommendations from the CO Protocol (Garza et al. 1997) and the USEPA (1992) guidelines. These data were found to be the most representative of the conditions in the RSA.

6.3.4.6 Persistence Factor

Analysts obtained peak 8-hour concentrations of CO by multiplying the highest peak-hour CO estimates by a persistence factor. The persistence factor accounts for the following characteristics:

- Over an 8-hour period (as distinct from a single hour), vehicle volumes fluctuate downward from the peak hour.
- Vehicle speeds may vary over an 8-hour period compared to a single hour.
- Meteorological conditions, including wind speed and wind direction, vary compared with the conservative assumptions used for the single hour.
- Analysts used a persistence factor of 0.7 in this analysis, which is recommended in the CO Protocol (Garza et al. 1997).

6.3.4.7 Background Concentrations

Analysts added background CO concentrations based on local air quality monitoring data (2015 to 2017) to project-level results to account for sources of CO not included in the modeling. Background concentrations for 2029 and 2040 No Project conditions were assumed to be the same as those for the current year. Actual 1- and 8-hour background concentrations in future years would likely be lower than concentrations used in the CO modeling analysis because the CO emissions and concentrations are decreasing because of continuing improvements in engine technology and the retirement of older, higher-emitting vehicles.

6.3.4.8 Traffic Information

Analysts derived traffic data for the air quality analysis from traffic counts and other information developed as part of an overall traffic analysis for the project (Burton 2017d). The microscale CO analysis was performed based on data from this analysis for the afternoon-evening (p.m.) peak

traffic period. This is the period when maximum traffic volumes occur on local streets and the greatest traffic and air quality effects of the project are expected.

6.3.4.9 Adjustment for the Safe Vehicles Rule

Analysts adjusted the predicted CO concentrations to reflect the impact of the SAFE Vehicles Rule, as per CARB (2019) guidance. As discussed in Section 3.1.4, Federal Greenhouse Gas Regulations and Guidance, the SAFE Vehicles Rule only impacts fuel economy and associated emissions from light-duty gasoline vehicles. However, the adjustment factors were conservatively applied to the entire modeled CO concentration, which includes emissions contributions from gasoline and diesel-powered vehicles.

6.3.5 Particulate Matter (PM_{10} and $PM_{2.5}$) Hot-Spot Analysis

PM hot spots may be created by localized increases in vehicle or rail traffic, particularly when that traffic consists of a significant number of diesel-powered vehicles. Redistributing or moving vehicle or rail traffic would also increase PM concentrations at certain locations and result in corresponding decreases in other locations. This section discusses methods for evaluating potential PM hot spots from changes in on-road vehicle and freight rail traffic.

6.3.5.1 On-Road Vehicles

Although the project is not subject to transportation conformity, portions of the local RSA are classified as nonattainment or maintenance for the federal PM_{10} or $PM_{2.5}$ standards. Consequently, analysts conducted a hot-spot analysis following the USEPA's 2015 *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (USEPA 2015e). The analysis focused on potential air quality concerns under NEPA from the project's effects on roads and followed the recommended practice in the USEPA's Final Rule regarding the localized or hot-spot analysis of $PM_{2.5}$ and PM_{10} (40 C.F.R. Part 93, issued March 10, 2006)

The USEPA specifies in 40 C.F.R. Section 93.123(b)(1) that only "projects of air quality concern" are required to undergo a $PM_{2.5}$ and PM_{10} hot-spot analysis. The USEPA defines projects of air quality concern as certain highway and transit projects that involve significant levels of diesel traffic, or any other project identified by the $PM_{2.5}$ SIP as a localized air quality concern. Table 6-2 shows project types that require a $PM_{2.5}$ or PM_{10} hot-spot analysis, as defined by Section 93.123(b)(1) of the Conformity Rule.

Table 6-2 Projects of Air Quality Concerns as Defined by Section 93.123(b)(1) of the Transportation Conformity Rule

Section 93.123(b)(1) Subsection	Type of Project
i	New highway projects that have a significant number of diesel vehicles and expanded highway projects that have a significant increase in the number of diesel vehicles.
ii	Projects affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.
iii	New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location.
iv	Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.

Section 93.123(b)(1) Subsection	Type of Project
v	Projects in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Source: 40 C.F.R. Section 93.123(b)(1)
LOS = level-of-service
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter

The following projects are examples of what would be classified as projects of air quality concern, as defined by 40 C.F.R. Section 93.123(b)(1).

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic where 8 percent or more of such annual average daily traffic is diesel truck traffic.
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal.
- Expansion of an existing highway or other facility that affects a congested intersection (operating at LOS D, E, or F) that has a significant increase in the number of diesel trucks.
- Similar highway projects that involve a significant increase in the number of diesel transit buses or diesel trucks.
- A major new bus or intermodal terminal that is considered to be a "regionally significant project" under 40 C.F.R. Section 93.101.[15]
- An existing bus or intermodal terminal that has a large vehicle fleet where the number of diesel buses increases by 50 percent or more, as measured by bus arrivals.

6.3.5.2 Freight Rail

Neither UPRR service nor associated emissions from locomotive operation would be affected by the proposed freight relocation, relative to existing conditions. While the source of PM emissions would shift commensurate with the lateral track shift, the amount of emissions, and therefore the potential for the project to result in new or worsened PM hot spots, would not change. Accordingly, analysts did not conduct a PM hot-spot analysis for the relocated freight service because there would be no effect under the USEPA definition of projects of air quality concern. Potential changes in receptor exposure to DPM and $PM_{2.5}$ are analyzed further, as described in Section 6.3.7.1, Freight Relocation.

6.3.6 Mobile Source Air Toxics Analysis

On February 3, 2006, the FHWA released Interim Guidance on Air Toxic Analysis in NEPA Documents. This guidance was superseded on September 30, 2009, by the FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents (Interim Guidance), and was most recently updated on October 18, 2016 (FHWA 2016). The updated Interim Guidance advises on when and how to analyze MSATs in the NEPA process for highway projects. This guidance is interim because MSAT science is still evolving, but is used in the

[15] 40 C.F.R. Section 93.101 defines a "regionally significant project" as "a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel."

analysis of potential effects based on guidance provided by the Authority. As the science progresses, the FHWA is expected to update the guidance.

A qualitative analysis provides a basis for identifying and comparing the potential differences in MSAT emissions, if any, among the project alternatives. The Interim Guidance groups projects into the following tier categories:

- **Tier 1**—No analysis for projects without any potential for meaningful MSAT effects
- **Tier 2**—Qualitative analysis for projects with low potential MSAT effects
- **Tier 3**—Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

The project would reduce regional VMT, traffic congestion, and aircraft operations, resulting in a reduction in MSAT emissions. The level of effects from regional MSAT emissions therefore corresponds to FHWA's Tier 1. Accordingly, analysts noted changes to regional MSAT emissions but did not perform quantitative or qualitative analyses of the project alternatives, consistent with FHWA's Interim Guidance.

Changes in vehicle activity could result in localized MSAT increases. The potential level of effects from these circumstances corresponds to FHWA's Tier 2. Accordingly, analysts used a qualitative analysis to provide a basis for identifying and comparing the potential differences in local MSAT emissions, if any, among the project alternatives. The qualitative assessment is derived, in part, from *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives* (FHWA 2011).

6.3.7 Operations Health Risk Assessment

6.3.7.1 Freight Relocation

Construction of the project would reposition existing UPRR tracks. Redistributing or moving existing freight traffic would increase TAC concentrations at certain receptor locations and would result in corresponding decreases at other locations. Because diesel-related exhaust, specifically DPM, is considered a carcinogenic TAC by the CARB, a human HRA was conducted to assess the risk (i.e., cancer risks and chronic acute risks) associated with changes in operational freight activity. Table 6-3 shows the relocated track segments included in the analysis and summarizes the distances to the nearest receptor under existing conditions and with the track relocation.

Table 6-3 Relocated Freight Tracks and Distances to Nearest Sensitive Receptors

General Location	Description of Maximum Track Shift Relative to Receptor Locations	Distance to Nearest Receptor			Reduction in Distance
		Receptor #	Existing Alignment	Relocated Alignment	
Repositions under Alternatives 1 through 3					
Near Monterey Road and Blanchard Road	The relocated track would be approximately 14 feet closer to an existing residential receptor near Monterey Road and Blanchard Road. After this point, the tracks would be shifted up to about 80 feet to the south of the existing line, but there are no receptors within 1,000 feet of the track.	1	61 feet	47 feet	14 feet
Between Monterey Road and Crowner Avenue	The relocated track would require demolition of structures between the existing tracks and Crowner Ave. Receptors west of Crowner Ave would be approximately 110 feet closer to the relocated track than the existing track.	2	230 feet	120 feet	110 feet
Near Monterey Road and California Avenue	The relocated track would be approximately 69 feet closer to an existing residential receptor.	3	164 feet	95 feet	69 feet
Near Monterey Road and Ronan Avenue	The relocated track would be approximately 61 feet closer to New Hope Community Church.	4	359 feet	298 feet	61 feet
Near Monterey Road and Leavesley Road	The relocated track would be approximately 213 feet closer to homes along Swanston Lane.	5	621 feet	408 feet	213 feet
Near Monterey Road and 1st Street	The relocated track would be approximately 129 feet closer to a football field.	6	193 feet	64 feet	129 feet
Near Monterey Road and W 10th Street	The VTA yard would be relocated approximately 2,500 feet south of its existing location. The nearest receptor to the relocated yard is approximately 309 feet to the west under Alternatives 1 and 2 (this receptor is approximately 398 feet from the existing track).	7	398 feet	309 feet	89 feet
Repositions under Alternative 3 Only					
Near Pacheco Court and Frazier Lake Road	Under Alternative 3, the track south of Church Avenue would be relocated eastward to join with the MOWF. The receptor furthest from the existing track and closest to the relocated track (i.e., the receptor with the greatest potential change in health risk) is off Pacheco Court.	8	9,749 feet	56 feet	9,693 feet
Repositions under Alternative 4 Only					
Near Chestnut Street and Asbury St	The relocated track would shift eastward between Emory St and Diridon Station. Most of this area is dominated by commercial uses. The greatest shift near existing receptors is approximately 20 feet.	9	290 feet	270 feet	20 feet

General Location	Description of Maximum Track Shift Relative to Receptor Locations	Distance to Nearest Receptor			Reduction in Distance
		Receptor #	Existing Alignment	Relocated Alignment	
Near Harrison Street and Fuller Ave	The relocated track would swing further south between I-280 and SR 87. The greatest shift near existing receptors is approximately 29 feet.	10	83 feet	54 feet	29 feet
Near Cross Way and Northern Road	Additional storage tracks would be added to Michael Yard (between W Alma and Almaden Rd). The new tracks would be approximately 16 feet closer to existing single-family homes.	11	322 feet	306 feet	16 feet
End of Promme Court	The tracks would be shifted east from just south of Almaden Expressway to south of Communications Hill. The greatest shift near existing receptors is approximately 7 feet.	12	81 feet	74 feet	7 feet
Near Prindiville Road and Urshan Way	The tracks would be shifted east between Monterey Road and Tulare Hill. There are residential subdivisions along this alignment. The greatest shift near existing receptors is approximately 10 feet.	13	160 feet	150 feet	10 feet
Near Madrone Ave and Dougherty Ave	South of Blanchard Rd until Bailey Rd, there would be a new UPRR siding track east of the existing tracks. The track would continue south shifted to the east until just south of the Gilroy Station. There are receptors throughout this area; the greatest shift would be approximately 65 feet closer to an apartment complex.	14	1025 feet	960 feet	65 feet
Near Butterfield Blvd and E Dunne Ave	The Redwood lumber industry spur would be realigned on the west side of the alignment. The tracks would move approximately 10 feet closer to existing single-family homes.	15	70 feet	60 feet	10 feet
End of Sister City Way	Additional storage tracks would be added to the west side of the alignment just south of Gilroy Station. The new tracks would be 90 feet closer to existing single-family homes.	16	395 feet	305 feet	90 feet
Near Garlic Farms Dr and Trave Park Cir	The tracks would be shifted southwest just east of US 101 and would be approximately 100 feet closer to an existing mobile home community.	17	475 feet	375 feet	100 feet
Near Bolsa Rd	The UPRR Hollister track would be realigned southwest of Carnadero Ave. to provide freight access to the MOWF. The track would be approximately 545 feet closer to an existing single-family home.	18	1,320 feet	775 feet	545 feet
Near West Julian St and North Montgomery St	The tracks would be shifted northeast and would be approximately 37 feet closer to existing single-family homes off West Julian Street	19	222 feet	185 feet	37 feet

Source: McGuire 2017–2018
VTA = Santa Clara Valley Transportation Authority
MOWF = maintenance of way facility
I- = Interstate
SR = State Route
UPRR = Union Pacific Railroad
US = U.S. Highway

The BAAQMD maintains an inventory of health risks associated with stationary sources, roadway, and rail sources within the SFBAAB (Winkel 2018). The inventory was used to characterize the net effect of health risks associated with moving operations-related diesel engine locomotive emissions closer to existing sensitive receptors located near the new and shifted tracks. BAAQMD's inventory is based on rail volumes and emission factors in 2015. There were approximately four freight trips per day between Gilroy and San Jose Diridon in 2015, and freight volumes are anticipated to grow by 4 percent per annum (PCJPB 2015). Conversely, locomotive emission factors are anticipated to decrease as a function of time because of natural fleet turnover. Emission rates specific to UPRR are not available; however, data from the USEPA (2009) indicate that national average freight emissions of PM_{10} are expected to decline by 41 percent between 2015 and 2022, which is the first year full operation on the relocated lines could occur. Analysts used the annual growth in freight and decrease in PM_{10} emissions to adjust the 2015 risks from BAAQMD's inventory to be representative of conditions in 2022.

6.3.7.2 Diesel Buses

The San Jose Diridon and Gilroy stations would be served by diesel-powered buses, which generate TACs at idle while loading and unloading passengers. Improved bus service to the passenger rail terminals is not part of the project. The Authority assumes that bus service levels are constant into the future given that no operator has a funding plan to deliver more service. Buses operated by VTA are a mix of diesel- and diesel-electric-powered. The agency also has five fully electric buses. Pursuant to the Innovative Clean Transit Regulation, VTA's bus fleet will be comprised of only zero-emission vehicles by 2040. Thus, diesel bus emissions associated with the San Jose Diridon and Gilroy Stations are expected to decline relative to existing emissions levels as electric buses are integrated into the fleets over time.

While bus service levels are assumed to be the same with and without the project, the East Gilroy Station would be an entirely new transit stop with HSR. Analysts evaluated potential health risks from exposure to diesel exhaust under this specific project-induced change based on the anticipated number of daily shuttle and bus trips at the station (Burton 2019). Analysts assumed each bus would idle for a maximum of 5 minutes for passenger loading/unloading.[16] Analysts quantified running exhaust emissions along the 1,000-foot approach and departure route and station idling emissions using EMFAC2017. Analysts conservatively assumed all buses in 2029 would be diesel powered (VTA operates a mix of diesel-, diesel-electric, and fully-electric buses). Analysts quantified health risks using the USEPA's AERMOD dispersion model and EMFAC emissions results.

6.3.7.3 Emergency Generators

The San Jose Diridon and Gilroy stations and the MOWS and MOWF would have emergency generators that would be used in the event of a power outage. Section 2.3.1 from the BAAQMD's Permit Handbook indicates that "typically any stationary diesel engines over 50 horsepower will require a risk screening analysis" (BAAQMD 2016). Explicitly, BAAQMD Regulation 2, Rule 5, Section 302 specifies that an Authority to Construct permit or Permit to Operate from the BAAQMD will be denied if any new and modified sources of TAC (which includes generators) in excess of 50 horsepower would result in health risks in excess of 10.0 in one million or a hazard index of 1.0. BAAQMD Regulation 2, Rule 5, Section 302 is cited as the evidence in support of BAAQMD's health risk thresholds.

The generators associated with the project would be subject to the permitting requirements specified in BAAQMD Regulation 2, Rule 5, Section 302. Based on these permitting requirements, the emergency generators would not receive a permit from the BAAQMD and would not be allowed to operate at the stations or maintenance facilities if they would result in cancer or acute hazard effects in excess of the BAAQMD's health risk thresholds of significance. However, Regulation 2, Rule 5 does not address $PM_{2.5}$ concentrations or permit

[16] Pursuant to California's Commercial Vehicle Idling Regulation, idling for more than 5 minutes at a single location is prohibited for vehicles of 10,000 pounds or heavier.

restrictions for facilities with emissions more than the BAAQMD's threshold of 0.3 micrograms per cubic meter ($\mu g/m^3$). Accordingly, $PM_{2.5}$ exhaust concentrations from emergency generator testing were estimated using the USEPA's AERMOD dispersion model and emission data from CalEEMod.

6.3.7.4 Maintenance of Way Facility Maintenance Activities

The MOWF would use diesel-powered off-road equipment, vehicles, and locomotives to support maintenance and repair activities. Cancer and noncancer health risks, as well as $PM_{2.5}$ concentrations, were modeled using the USEPA's AERMOD dispersion model. The analysis was conducted using the same general method and guidance as the construction HRA. Refer to Section 6.4.9, Construction Health Risk Assessment, for additional detail.

6.4 Construction Emissions Calculations

Analysts assessed and quantified air quality effects associated with construction of the project using industry standard and accepted software tools, techniques, and emission factors. This section provides a summary of the methods. Appendix C provides a full list of assumptions.

6.4.1 Construction Activities

Analysts quantitatively estimated construction emissions for the earthwork and major civil construction activity during construction of the following components of the project:

- Viaduct
- Embankment
- At grade
- Trench
- Tunnel
- Cut and fill

Construction activities associated with each component include demolition, excavation, utilities, roadwork, concrete forming, and other rail work. Each of these activities was taken into account to evaluate the regional and localized air quality effects during the construction phase. Analysts also quantified emissions from reconductoring approximately 11.1 miles of the existing single-circuit Spring to Llagas and Green Valley to Llagas 115-kV power lines.

6.4.2 Construction Approach

Construction would proceed south to north, from Carlucci Road to San Jose Diridon Station, although construction would likely proceed in all subsections concurrently. Construction would occur over multiple phases between 2022 and 2028. Tunneling activities would occur up to 7 days per week with up to 24-hour days. All other construction would occur 5 days per week with 10-hour days (250 days per year) (Scholz 2018).

Major construction activities include earthworks and excavation support; tunnel, bridge, and aerial structure construction; station construction; track work; railway systems construction (including traction electrification, signaling, and communications); and testing and commissioning. During peak construction periods, work is envisioned to be underway at several locations along the route, with overlapping construction of various project elements. Working hours and workers present at any time would vary, depending on the activities being performed. Pursuant to its adopted sustainability policy (Policy Directive POLI-PLAN-03), the Authority intends to build the project using sustainable methods that:

- Minimize the use of nonrenewable resources
- Minimize the effects on the natural environment
- Protect environmental diversity
- Emphasize the use of renewable resources in a sustainable manner

6.4.3 Models and Methods for Mass Emissions Modeling

Construction of the project would generate emissions of ROG, NO_X, CO, SO_X, PM_{10}, $PM_{2.5}$, CO_2, CH_4, and N_2O that could result in short-term air quality and GHG effects. Emissions would originate from off-road equipment exhaust, employee and haul truck vehicle exhaust (on-road vehicles), site grading and earth movement, concrete batching, demolition, paving, architectural coating, electricity consumption, and helicopters (for reconductoring work). These emissions would be temporary (i.e., limited to the construction period) and would cease when construction activities are complete.

Combustion exhaust, fugitive dust (PM_{10} and $PM_{2.5}$), and fugitive off-gassing (ROG) were estimated using a combination of emission factors and methods from CalEEMod, version 2016.3.2; the CARB's EMFAC2017 model; and the USEPA's AP-42 Compilation of Air Pollutant Emission Factors based on project-specific construction data (e.g., schedule, equipment, truck volumes) provided by the project engineering team (Scholz 2018). Appendix C provides a complete list of construction assumptions, including equipment, vehicles, and quantities and the construction schedule.

- **Off-road equipment**—Emission factors for off-road construction equipment (e.g., loaders, graders, bulldozers) were obtained from the CalEEMod (version 2016.3.2) User's Guide appendix, which provides values per unit of activity (in grams per horsepower-hour) by calendar year (Trinity Consultants 2016). Analysts estimated criteria pollutants by multiplying the CalEEMod emission factors by the equipment inventory provided by the project engineering team (Scholz 2018).
- **On-road vehicles**—On-road vehicles (e.g., pickup trucks, flatbed trucks) would be required for material and equipment hauling, on-site crew and material movement, and employee commuting. Analysis estimated exhaust emissions from on-road vehicles using the EMFAC2017 emissions model and activity data (miles traveled per day) provided by the project engineering team (Scholz 2018). Emission factors for haul trucks are based on aggregated-speed emission rates for EMFAC's T7 Single vehicle category. Factors for on-site dump, water, boom, and concrete trucks were based on 5 mph emission rates for the T6 Heavy category. Factors for employee commute vehicles were based on a weighted average for all vehicle speeds for EMFAC's light-duty automobile/light-duty truck vehicle categories. CARB's (2019, 2020) SAFE Vehicles Rule adjustment factors were applied to the emission factors for gasoline-powered vehicles. Fugitive re-entrained road dust emissions were estimated using the USEPA's *Compilation of Air Pollutant Emission Factors* (AP-42), Sections 13.2.1 and 13.2.2 (USEPA 2006b, 2011).
- **Site grading and earth movement**—Fugitive dust emissions from earth movement (e.g., site grading, bulldozing, and truck loading) were quantified using emission factors from CalEEMod and USEPA (1998) AP-42. Data on the total graded acreage and quantity of cut-and-fill material were provided by the project engineering team (Scholz 2018).
- **Onsite concrete batch plants**—Fugitive dust emissions from concrete batching at the three new temporary batch plants were quantified using emission factors from BAAQMD's (2016) Permit Handbook and USEPA's AP-42. Daily and annual batch quantities (cubic yards) were provided by the project engineering team (Scholz 2018). Emissions generated by material transport and operation of yard equipment and electricity consumption at onsite batch plants are accounted for in the on-road vehicles, off-road equipment, and electricity consumption analyses discussed in this section.
- **Demolition**—Fugitive dust emissions from building demolition were based on the anticipated amount of square feet to be demolished and calculation methods from the CalEEMod User's Guide (Trinity Consultants 2016).
- **Paving**—Fugitive ROG emissions associated with paving were calculated using activity data (e.g., square feet paved) provided by the project engineer and the CalEEMod default

emission factor of 2.62 pounds of ROG per acre paved (Scholz 2018; Trinity Consultants 2016).

- **Architectural coating**—Fugitive ROG emissions associated with architectural coatings of the stations were calculated using activity data (e.g., square feet coated) provided by the project engineering team and methods in the CalEEMod User's Guide (Scholz 2018; Trinity Consultants 2016). Emissions calculations assume a ROG content of 150 grams per liter (g/L), consistent with BAAQMD's Regulation 8, Rule 3, Section 301.
- **Electricity consumption—**GHG emissions generated by electricity used to power tunnel-boring equipment and temporary batch plants were quantified using activity data (e.g., megawatt hours) provided by the project engineering team and the statewide grid average emission factors (Scholz 2018; USEPA 2020).
- **Helicopters—**Helicopters would be required for the reconductoring work. Exhaust emissions were calculated using emission factors and assumptions derived from a review of guidance manuals published by USEPA (1978) and The Climate Registry (2018).

6.4.4 Ballast and Subballast Hauling

Ballast and subballast materials could be transported from multiple quarry locations throughout Northern California and the Central Valley. Analysts estimated emissions from ballast and subballast material hauling by trucks and locomotives based on the travel distances and transportation method (by rail or by truck) from the locations where ballast materials would be available. Analysts used heavy-duty truck emission factors (T7 Single) from EMFAC2017 to estimate emissions from haul trucks and rail emission factors from the USEPA (2009) to estimate the locomotive emissions.

Analysts identified up to 11 potential quarries that could provide ballast material. All quarries are within the SFBAAB, MBARD, and SJVAPCD, with the furthest quarry located 37 rail miles and 89 highway miles from the project footprint. Ballast and subballast quantities for the project were provided by the project engineering team and distributed equally among the identified quarries (Scholz 2018). Analysts estimated emissions under two hauling scenarios: Scenario 1 assumed ballast and subballast would be hauled to the project footprint using a combination of trucks and locomotives, and Scenario 2 assumed ballast and subballast would be hauled to the project footprint using only trucks. Appendix D provides details of the emission estimates, quarry selection process, and scenario analyses.

6.4.5 Daily and Annual Emissions Estimates

Up to six components (viaduct, embankment, at grade, trench, tunnel, and cut and fill) would be constructed, depending on the subsection and project alternative. Each component would be constructed over multiple phases between 2022 and 2028. Daily criteria pollutant and GHG emissions generated by construction of each phase were quantified using the methods described above. The daily estimates were converted to annual totals based on the detailed construction schedule for each project alternative, which was developed by the project engineering team (Scholz 2018). Maximum daily emissions, based on concurrent construction activity, were also quantified within the BAAQMD and MBARD, consistent with air district requirements (BAAQMD 2017a; MBUAPCD 2008). The highest daily emissions in each construction year were selected as the peak day for analysis purposes. This approach is meant to convey a worst-case scenario based on available information and, therefore, is not necessarily representative of actual emissions that would be incurred on a daily basis throughout the construction period.

6.4.6 Emissions by Air District and Basin

The project falls under the jurisdiction of three air districts—BAAQMD, MBARD, and SJVAPCD—all of which have adopted their own distinct local thresholds of significance. To compare

emissions to the federal and state thresholds, activities occurring within each air district were quantified and analyzed separately.[17]

Emissions generated by construction of subsections that would occur exclusively within one air district (e.g., the San Jose Diridon Station Approach Subsection in the BAAQMD) were wholly assigned to that air district. Emissions estimates for alternatives that span more than one air district were apportioned based on the location of construction activity. For example, construction of the Pacheco Pass Subsection would occur in both the BAAQMD and SJVAPCD. Accordingly, the emissions estimates were apportioned to the BAAQMD and SJVAPCD based on the number of rail miles constructed within each air district. Table 6-4 summarizes the location of each subsection and the air district scaling factors used in the analysis, as appropriate. All reconductoring work would occur in the BAAQMD.

[17] The CARB acknowledges that air basins, in particular the SJVAB, are both contributors and receptors of pollutant transport throughout the state. While technical documents have been published analyzing the transport relationship among California air basins, quantifying the effects of pollutant transport as a result of the project would require detailed projections of future climatic and meteorological conditions. Air districts in the RSA have adopted thresholds and mitigation requirements that are commensurate with expected criteria air pollutant contributions from upwind air basins (CARB 2011).

Table 6-4 Track Miles and Construction Scaling Factors by Air District

Subsection	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
	BAAQMD	MBARD	SJVAPCD	BAAQMD	MBARD	SJVAPCD	BAAQMD	MBARD	SJVAPCD	BAAQMD	MBARD	SJVAPCD
Constructed Rail Miles												
San Jose Diridon Station Approach	3	0	0	3	0	0	3	0	0	3	0	0
Monterey Corridor	4	0	0	4	0	0	4	0	0	4	0	0
Morgan Hill and Gilroy	14	2	0	14	2	0	13	2	0	14	2	0
Pacheco Pass	5	0	7	5	0	7	5	0	7	5	0	7
San Joaquin Valley	0	0	9	0	0	9	0	0	9	0	0	9
Emission Scaling Factors												
San Jose Diridon Station Approach	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Monterey Corridor	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Morgan Hill and Gilroy	85%	15%	0%	85%	15%	0%	87%	13%	0%	85%	15%	0%
Pacheco Pass	43%	0%	57%	43%	0%	57%	43%	0%	57%	43%	0%	57%
San Joaquin Valley	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%

Source: Authority 2019b; CARB 2012
BAAQMD = Bay Area Air Quality Management District
MBARD = Monterey Bay Air Resources District
SJVAPCD = San Joaquin Valley Air Pollution Control District

6.4.7 Project Design Features

As discussed in Section 2.3, Impact Avoidance and Minimization Features, the Authority has developed IAMFs that would avoid or minimize potential air quality effects. Because IAMFs are included as part of the project design, they are not considered mitigation, and are included as part of the project construction emissions estimate. Specifically, the following emissions benefits achieved by AQ-IAMF#1 through AQ-IAMF#6 were assumed in the modeling.

- Fugitive dust reductions from earthmoving best management practices (AQ-IAMF#1) (Western Governors' Association 2006).
  - PM from ground disturbance (i.e., scraping and grading activities), 75 percent (Bay Area Air Quality Management District 2017a)
  - PM from unpaved vehicle travel (i.e., re-entrained road dust), 75 percent[18]
  - PM from demolition, 36 percent (Western Governors' Association 2006)
- VOC reductions (93 percent) from application of architectural coatings (AQ-IAMF#2).[19]
- Criteria pollutant and GHG reductions from use of renewable diesel (AQ-IAMF#3) in all off-road diesel-powered engines (Lovegrove and Tadross 2017)
  - CO, 10 percent (Tier 2 tunneling equipment)
  - NO_X, 10 percent (Tier 2 tunneling equipment)
  - PM, 30 percent (all engines)
  - CO_2e, 99 percent (all engines)
- Criteria pollutant and GHG reductions from use of Tier 4 off-road engines (AQ-IAMF#4). Emissions reductions vary by pollutant and equipment type. Emissions were modeled using Tier 4 emission rates from CalEEMod.
- Criteria pollutant and GHG reductions from use of model year 2010 or newer on-road engines in heavy-duty, diesel powered trucks (AQ-IAMF#5). Emissions reductions vary by pollutant, analysis year, and air basin. Emissions were modeled using emission rates derived from the CARB's EMFAC2017 model.
- Fugitive dust reductions from implementation of typical control measures at new concrete batch plants, such as water sprays, enclosures, and hoods (AQ-IAMF#6). Emissions were modeled using USEPA AP-42 controlled emission factors for concrete batch plants.

6.4.8 Regulatory Control Measures

Many of the control measures required by BAAQMD, MBARD, and SJVAPCD rules and regulations are the same or similar to AQ-IAMF#1 and AQ-IAMF#2. Accordingly, no additional reductions from compliance with air district rules were assumed in the emissions modeling.

6.4.9 Construction Health Risk Assessment

Analysts conducted the HRA using the guidelines provided by the OEHHA (2015) for the *Air Toxics Hot Spots Program* and the HRA guidelines developed by the California Air Pollution Control Officers Association (CAPCOA) (2009).The HRA consists of three parts: (1) PM emissions inventory (2) air dispersion modeling to evaluate off-site concentrations of DPM emissions, and (3) assessment of risks associated with predicted concentrations. The following subsections provide descriptions of each component. The quantitative HRA was only performed for construction of the HSR facilities (e.g., alignment, stations and batch plants). The PG&E

[18] Among other controls, this IAMF requires watering unpaved roads three times daily and limiting vehicle speeds. The 75 percent efficacy is based on a 55 percent reduction for watering and a 44 percent reduction for vehicle speed limits (1-(.55*.44)) = 0.75% (Western Governors' Association 2006).

[19] Assumes an uncontrolled ROG content of 150 g/L per BAAQMD Regulation 8, Rule 3, Section 301 and a controlled ROG content of 10 g/L per AQ-IAMF#2.

reconductoring work would be spread throughout the 11.1-mile corridor and would only occur at individual pole locations on a short-term (i.e., few weeks) and temporary basis.

6.4.9.1 Particulate Matter Emissions Inventory

The emissions inventory includes PM emissions generated by heavy-duty equipment and vehicle exhaust, as well as fugitive dust from site grading and soil movement. The particulate constituent analyzed depends on the emission location and associated air district guidance. The BAAQMD (2017a) has adopted cancer and noncancer risk thresholds for DPM, as well as a separate threshold for localized $PM_{2.5}$ emissions. While DPM is a complex mixture of gases and fine particles that includes more than 40 substances listed by the USEPA and CARB as HAPs, OEHHA guidance indicates that the cancer potency factor developed to evaluate cancer risks was based on total (gas and PM) diesel exhaust (OEHHA 2001). The BAAQMD considers DPM as the surrogate for total diesel exhaust, with its guidance requiring that diesel $PM_{2.5}$ emissions serve as the basis for the cancer and noncancer risk calculations in the SFBAAB (Kirk 2016). SJVAPCD (2015a) has adopted slightly different guidance, and requires that diesel PM_{10} emissions serve as the basis for the risk calculations in the SJVAB. Accordingly, the HRA uses $PM_{2.5}$ as a surrogate for DPM in the BAAQMD and PM_{10} as a surrogate for DPM in the SJVAPCD, consistent with air district guidance.

BAAQMD guidance indicates that localized $PM_{2.5}$ risks should be evaluated using total $PM_{2.5}$ exhaust emissions (i.e., emissions from both diesel- and gasoline-powered equipment). SJVAPCD has not adopted a localized $PM_{2.5}$ threshold.

6.4.9.2 Air Dispersion Modeling

The USEPA's AERMOD dispersion model was used to quantify annual average DPM concentrations at nearby receptor locations for each subsection. The modeling approach follows, where applicable, the OEHHA and CAPCOA methodology, but is also consistent with SJVAPCD and BAAQMD methods, as provided in their guidance documents and based on staff consultation (SJVAPCD 2015a; BAAQMD 2012a)[20]

Meteorological Data

Analysts used three representative meteorological datasets, which broadly cover the different meteorological conditions found in the RSA, in the analysis. Table 6-5 shows the assignment for the three datasets. Five recent years of data for each station were used to conduct the analysis within the BAAQMD and MBARD (San Jose, 2009–2013 and San Martin, 2010–2014). Within the SJVAPCD the meteorological modeled derived dataset for Los Banos, 2004–2008 was used in the analysis. Locations north of Gilroy used urban modeling options, whereas all other locations used default rural settings. Appendix E provides additional details on how these datasets were developed.

[20] BAAQMD's conservative modeling guidance was followed for the portion of the project that traverses the MBARD.

Table 6-5 Meteorological Datasets by Subsection

Subsection	San Jose	San Martin	Los Banos
San Jose Diridon Station Approach	X		
Monterey Corridor	X		
Morgan Hill and Gilroy		X	
Pacheco Pass[1]		X	X
San Joaquin Valley			X
Stations			
San Jose Diridon	X		
Downtown Gilroy		X	
East Gilroy		X	

Source: SJVAPCD n.d.
AERMOD ready meteorological files for San Jose International Airport (WBAN# 29293) for 2009-2013 were prepared by BAAQMD and are available from the CARB website at: www.arb.ca.gov/toxics/harp/metfiles2.htm
BAAQMD (November, 2016); San Martin meteorological tower data
[1] San Martin station used in Santa Clara County and Los Banos in Merced County

Source Parameters

Analysts assumed eight types of construction work areas characterize construction activities and emissions. Further details on how each type of source was modeled are shown in Tables 6-6 and 6-7. Off-site activity, such as long-distance haul trucks for spoils removal and ballast delivery, were modeled as area sources located on both sides of the on-site segment with a width of 12 feet.

Table 6-6 AERMOD Source Parameters (Bay Area Air Quality Management District and Monterey Bay Air Resources District)

Construction Work Area	Source Type	Size of Modeled Area[1]	Release Height (meters)
At grade/berm (on-site)	Area	Actual length x 171 feet	3 (exhaust), 0 (dust)[2]
At grade/berm (off-site)	Area	Actual length x 12 feet	3 (exhaust), 0 (dust)[2]
Aerial (on-site)	Area	Actual length x 171 feet	3 (exhaust), 0 (dust)[2]
Aerial (off-site)	Area	Actual length x 12 feet	3 (exhaust), 0 (dust)[2]
Trench[3]	Open Pit	Actual length x 46 feet x (varying depths)	3 (exhaust), 0 (dust)[2]
Tunnel[4]	Horizontal & Capped Point	Effective diameter[5]	1 (exhaust)
Cut and fill (on-site)	Area	Actual length x 492 feet	3 (exhaust), 0 (dust)[2]
Concrete batch plant	Area	Tunnel 1 West Portal—27.1 acres, Tunnel 2 West Portal—26.4 acres	10

Source: Kirk 2016
m = meter
[1] Sizes of modeled areas are shown as dimensions of length and width of the work area
[2] Initial vertical dimension 1 meter
[3] Trench construction was conservatively modeled with the 10-foot mid-depth excavation where exhaust plume is nearest to the receptor height.
[4] Portals as horizontal sources and ventilation shafts as capped points
[5] Based on tunnel opening size at portals and 4-foot-diameter ventilation shaft(s) with minimum flow rate of 30 feet per minute

Table 6-7 AERMOD Source Parameters (San Joaquin Valley Air Pollution Control District)

Construction Work Area	Source Type	Size of Modeled Area[1]	Release Height (meters)
At grade/berm (on-site)	Area	Actual length x 171 feet	3 (exhaust), 0 (dust)[2]
At grade/berm (off-site)	Area	Actual length x 12 feet	3 (exhaust), 0 (dust)[2]
Aerial (on-site)	Area	Actual length x 492 feet	3 (exhaust), 0 (dust)[2]
Aerial (off-site)	Area	Actual length x 12 feet	3 (exhaust), 0 (dust)[2]
Tunnel[3]	Horizontal & Capped Point	Effective Diameter[5]	1 (exhaust)
Cut and fill (on-site)	Area	Actual length x 492 feet	3 (exhaust), 0 (dust)[2]
Concrete batch plant	Area	Tunnel 2 East Portal—15.0 acres.	10

Source: SJVAPCD 2014

[1] Sizes of modeled areas are shown as dimensions of length and width where the modeled work area is a rectangular shape.

[2] Initial vertical dimension 1 meter

[3] Trench construction was conservatively modeled with the 10-foot mid-depth excavation where exhaust plume is nearest to the receptor height.

[4] Portals as horizontal sources and ventilation shafts as capped points

[5] Based on tunnel opening size at portals and 4-foot-diameter ventilation shaft(s) with minimum flow rate of 30 feet per minute

Not all subsections would have all types of construction activity, Table 6-8 shows the types of activities within each subsection. In all cases, at least one construction type was modeled for each project alternative.

Table 6-8 Construction Work Areas by Subsection and Project Alternative

Subsection/Element	At Grade /Berm[1]	Aerial	Trench	Tunnel	Cut and Fill
San Jose Diridon Station Approach					
Viaduct to Scott Blvd	X	X			
Viaduct to I-880	X	X			
Blended, at grade	X				
Monterey Corridor					
Viaduct	X	X			
At grade	X	X			
Blended, at grade	X				
Morgan Hill and Gilroy					
Embankment to downtown Gilroy	X	X	X	X[2]	X
Viaduct to downtown Gilroy	X	X		X[2]	X
Viaduct to east Gilroy	X	X		X[2]	X
Blended, at grade to downtown Gilroy	X	X	X	X[2]	X
Pacheco Pass					
Pacheco Pass	X	X		X[3]	X

Subsection/Element	At Grade /Berm[1]	Aerial	Trench	Tunnel	Cut and Fill
San Joaquin Valley					
Henry Miller Road	X	X			X

I- = Interstate
OSHA = Occupational Safety and Health Administration
[1] Air quality modeling for the berm and at-grade sources are modeled with similar emission source characteristics. The maximum model effects are reported in Section 7.11, Other Localized Construction Effects.
[2] The one tunnel in this subsection had a calculated effective diameter of 167 meters based on twin bore tunnel, length between 0.6 and 2.2 miles and a rail design speed of 250 mph and compliance with minimum OSHA ventilation flow rate of 30 feet/minute.
[3] Two tunnels were modeled in this subsection with a calculated effective diameter of 512 and 472 feet based on twin bore tunnel with a length between 3.1 and 4.7 miles (shorter tunnel) and > 6.2 miles for the longer tunnel with a rail design speed of 250 miles per hour and compliance with minimum OSHA ventilation flow rate of 30 feet/minute. The longer tunnel also included the modeling of emissions from two 4-foot-diameter ventilation shafts with a rain cap cover.

Receptors

Analysts spaced receptors along the edge of each subsection within the BAAQMD and MBARD, with two exceptions: (1) for the trench, an additional 20–30-meter setback distance was allowed based on their limited location, and (2) at the tunnel openings where staging would occur, a 500-foot safety setback distance was used. Per SJVAPCD direction for the rural subsections within San Joaquin County, a 25-meter setback distance was used. Receptor heights were all set to 1.2 meters, consistent with OEHHA (2015) guidance.

6.4.9.3 Risk Calculations

Consistent with the USEPA, CARB, and air district regulatory guidance, the HRA examines cancer and noncancer (chronic)[21] exposure to the surrounding community and uses OEHHA's guidance on risk calculations (OEHHA 2015).

Cancer Risk

Cancer risk is defined as the lifetime probability (chance) of developing cancer from exposure to a carcinogen, typically expressed as the increased chance in 1 million. The default cancer risk calculation for residents and workers is based on the 95th percentile breathing rate, as recommended by the OEHHA. It also accounts for varying sensitivities to exposure based on age. This includes a higher age sensitivity factor for the first 16 years of life, 95th percentile as a breathing rate as a function of age, exposure duration, and adjustment for time spent at home.

The cancer risk occurs exclusively through the inhalation pathway and was calculated using the following equation.

$$\text{Risk} = \frac{(C_{air} * DBR * ED * EF * Conv_1)}{AT} * CPF * ASF * Conv_2)$$

Where

Risk = DPM cancer risk (per million)

C_{air} = Concentration in the air ($\mu g/m^3$), annual average from AERMOD

DBR = Daily breathing rate (liters per kilogram [L/kg] body weight-day)

ED = Exposure duration (years)

EF = Exposure frequency (days/year)

$Conv_1$ = Micrograms to milligrams (mg), liters to cubic meters ([mg/µg] * [m^3/L])

[21] Note that the OEHHA, CARB, BAAQMD, and SJVAPCD have not identified acute health effects from diesel exhaust. Therefore, acute health effects are not included in this analysis.

AT = Averaging time (days)

CPF = Cancer potency factor (mg per kilogram per day [mg/kg-day]$^{-1}$)

ASF = Average age sensitivity factor for resident (unitless)

$Conv_2$ = Risk per million people

Note that the cancer potency factor incorporates worst-case, health-protective assumptions. It was established using data from animal and epidemiological exposure studies and represents the increased chance or probability of developing cancer, assuming continuous lifetime exposure. Analysts also modeled all receptors with "residential" exposure parameters, assuming exposure to construction-generated pollution would begin during the third trimester of gestation. Defining all receptors as "residential" is conservative because it combines the longest exposure duration (third trimester through end of construction) with the highest age sensitivity factors and exposure frequencies (as defined by OEHHA guidance), yielding a worst-case assessment of potential cancer burden for all other receptor types (e.g., schools). The HRA presented in this report is therefore conservative in that it utilizes these worst-case, health-protective assumptions.

Chronic Noncancer Risk

Analysts calculated the noncancer chronic inhalation effects by dividing the annual average concentration by the reference exposure level for DPM. The reference exposure level is defined as the concentration at which no noncancer health effects are anticipated. Consistent with OEHHA (2015) guidance, a reference exposure level of 5 µg/m^3 was assumed in the calculation.

6.4.10 Other Localized Construction Effects

Analysts used the same general approach and guidance as for the HRA (Section 6.4.9) to evaluate localized criteria pollutant effects during construction. The analysis considers both acute (less than 24 hours) and annual emissions effects of all criteria pollutants, as applicable based on the established NAAQS and CAAQS. Note that the quantitative ambient air quality analysis (AAQA) was only performed for construction of the HSR facilities (e.g., alignment, batch plants, stations).

6.4.10.1 Annual Air Quality Effects

The pollutants of concern with established annual standards are NO_2,[22] PM_{10}, and $PM_{2.5}$. Analysts modeled off-site concentrations of these pollutants using the annual mass emissions inventory and the AERMOD dispersion model. NO_X emissions were converted to NO_2, using the Tier 2 ARM2 approach—now the USEPA-preferred approach using the default conversions of minimum of 50 percent as NO_2 at high NO_X concentrations and 90 percent as NO_2 at low concentration levels of NO_X.

6.4.10.2 Acute Air Quality Effects

The following pollutants of concern have established standards based on hourly or daily exposure:

- CO (1 hour and 8 hours)
- PM_{10} and $PM_{2.5}$ (24 hours)

[22] NO_X is both a regional and localized pollutant. Regional effects (i.e., O_3 formation) take place over long distances and time scales and are not analyzed through a localized ambient air quality analysis. Likewise, since ROG is a regional pollutant, it is not addressed in the localized analysis. Rather, O_3 effects (through NO_X and ROG emissions) are addressed through a comparison of project emissions to the air district and federal *de minimis* thresholds (Section 7.9, Construction Mass Emissions Analysis). Localized effects can occur from the conversion of NO_X to NO_2, and these effects are assessed through the localized NO_2 analysis to confirm emissions would not exceed the CAAQS or NAAQS.

- NO_2 (1 hour) (atmospheric conversion of NO_X to NO_2 is estimated using USEPA's regulatory default Tier 2 ARM2 approach with minimum of 20 percent as NO_2 at high NO_X concentrations and 90 percent as NO_2 at low concentration levels of NO_X)
- SO_2 (1 hour and 24 hours)

The approach to modeling the hourly and daily emissions is similar to the annual approach, but it requires an emissions inventory that represents at least a peak-hour emission rate and activities that may overlap in location and time.

Analysts developed a representative maximum emission scenario for air quality hourly and daily effects for each subsection based on maximum activity levels that could take place simultaneously. Up to six types of features were modeled (berm, aerial, at grade, trenching, tunnel, and cut and fill) within each subsection to determine the maximum hourly and daily effect. This section describes each of the major features and their concurrent major elements. The same widths for each construction feature as used in the annual modeling were assumed. However, each construction crew was assumed active over a length of 1,000 feet within a single day.

Berm

The following activities could occur concurrently:

- Excavation (including utility relocation)
- Concrete + retaining walls
- Formwork + earthwork
- Ballast

Both the emissions associated with excavation and concrete + retaining walls can take place on the same day in two adjacent 1,000-foot sections. Formwork + earthwork activity cannot start until retaining walls are complete, so this major element is only modeled as concurrently taking place with the ballast in two adjacent 1,000-foot sections.

Aerial

The following activities could occur concurrently:

- Excavation + cast-in-place and hardware (CIPH)
- Concrete + formwork

These two major elements, excavation + CIPH and concrete + formwork, can take place adjacent to each section, but not in the same section. Thus, the aerial feature modeled only a single scenario with two major elements, excavation + CIPH and concrete + formwork, as two adjacent 1,000-foot sections.

At Grade

The following activities could occur concurrently:

- Utility relocation + demolition + removal
- Track subgrade + track ballast

These major elements, utility + demolition + removal and track subgrade + ballast, were modeled as taking place on the same day in two adjacent 1,000-foot sections. Similarly, track subgrade and ballast were modeled as taking place on the same day in two adjacent 1,000-foot sections.

Trenching

The following activities could occur concurrently:

- Utility relocation + demolition + CIPH + removal of contaminated material
- Excavation for slurry wall
- Excavation for trench + gravel base + rat slab
- Formwork + concrete pour

These four major elements could take place in adjacent 1,000-foot sections under three scenarios on the same day: (1) utility relocation + demolition + CIPH + removal of contaminated material and excavation for slurry wall; (2) excavation for slurry wall and excavation for trench + gravel base + rat slab, and (3) excavation for trench + gravel base + rat slab and formwork + concrete pour. All three scenarios were modeled to determine maximum hourly and daily effects.

Cut and Fill

The following activities could occur concurrently:

- Excavation
- Compact fill and slope finish

These two major elements could take place concurrently on the same day: excavation and compact fill and slope finish. Thus, the large cut-and-fill features were modeled with only a single scenario with two major elements, excavation and compact fill + slope finish, taking place in two adjacent 1,000-foot sections.

Tunnel

The following activities could occur concurrently:

- Form interior walls/upper walls/track bed construction
- Pour interior walls/floor/upper walls/track bed construction

These two major elements were modeled as taking place on the same day in two adjacent 1,000-foot sections within the tunnel.

6.5 Asbestos, Lead-Based Paint, Valley Fever, and Odors

Asbestos causes cancers of the lung and the lining of internal organs, as well as asbestosis and pleural disease, which inhibit lung function. The USEPA is addressing concerns about potential effects of NOA in a number of areas in California. Analysts used the *San Jose to Merced Project Section Geology, Soils, and Seismicity Technical Report* to determine if NOA occurs within the local RSA (Authority 2019d).

Lead-based paint (LBP) may have been used during construction of existing structures throughout the RSA. Analysts considered whether demolition would occur and whether the project would comply with applicable standards for appropriate disposal. The Valley fever and odor analyses are likewise qualitative and considered the potential for receptors to be exposed to C. immitis fungus spores and nuisance odors.

7 AIR QUALITY EFFECTS ANALYSIS

Using the methods described in Chapter 6, this chapter evaluates and discusses the effects of the project on emissions of criteria pollutants, TACs, MSATs, odors, and asbestos generated during operations and construction. This analysis does not identify NEPA and CEQA impacts and significance conclusions; that information is provided in the Final EIR/EIS, Section 3.3, Air Quality and Greenhouse Gases.

7.1 No Project Alternative

Tables 7-1 and 7-2 show estimated emissions under No Project conditions in 2015, 2029, and 2040 under the medium and high ridership scenarios, respectively. As shown in the tables, total emissions for some pollutants would decrease from 2015 to 2040 (VOC, CO, and NO_X). For other pollutants (SO_2, PM_{10}, and $PM_{2.5}$), total emissions would increase from 2015 to 2040. The increase in PM is primarily because of higher VMT, aircraft, and electricity demand brought about by population and economic growth. The increase in SO_2 is primarily related to growth in air travel and power plant production. The decrease in other pollutants are from expected improvements in on-road vehicle engine technology, fuel efficiency, and turnover in older, more heavily polluting vehicles, which would offset emissions increases from higher on-road VMT and aircraft and power plant activity.

Table 7-1 Estimated Statewide Emissions without the Project—Medium Ridership Scenario

Emission Source	VOC (tons/yr)	CO (tons/yr)	NO_X (tons/yr)	SO_2 (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)
2015						
On-road vehicles	7,839	324,144	33,370	767	22,981	6,242
Aircraft	338	2,888	2,779	299	84	84
Power plants	1,893	25,767	13,476	1,609	3,189	2,880
Total statewide emissions	10,070	352,800	49,624	2,675	26,254	9,206
2029						
On-road vehicles	1,712	125,365	9,783	577	26,322	6,998
Aircraft	411	3,445	3,391	367	103	102
Power plants	2,310	34,760	14,890	1,936	3,807	3,442
Total statewide emissions	4,434	163,570	28,064	2,880	30,232	10,542
2040						
On-road vehicles	1,059	91,121	6,688	534	28,262	7,383
Aircraft	474	3,968	3,908	423	118	118
Power plants	2,579	39,173	16,080	2,104	4,082	3,686
Total statewide emissions	4,112	134,261	26,676	3,062	32,463	11,187

Source: Authority 2020
Totals may not add up exactly because of rounding.
CO = carbon monoxide
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year

Table 7-2 Estimated Statewide Emissions without the Project—High Ridership Scenario

Emission Source	VOC (tons/yr)	CO (tons/yr)	NO_X (tons/yr)	SO_2 (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)
2015						
On-road vehicles	7,800	322,534	33,204	763	22,867	6,211
Aircraft	315	2,692	2,589	279	78	78
Power plants	1,893	25,767	13,476	1,609	3,189	2,880
Total statewide emissions	10,008	350,993	49,269	2,651	26,134	9,170
2029						
On-road vehicles	1,725	126,531	9,983	590	26,898	7,147
Aircraft	341	2,856	2,811	304	85	85
Power plants	2,310	34,760	14,890	1,936	3,807	3,442
Total statewide emissions	4,377	164,146	27,684	2,830	30,789	10,674
2040						
On-road vehicles	1,093	94,097	6,907	552	29,185	7,625
Aircraft	520	4,348	4,282	464	129	129
Power plants	2,579	39,173	16,080	2,104	4,082	3,686
Total statewide emissions	4,192	137,618	27,269	3,120	33,397	11,440

Source: Authority 2020
Totals may not add up exactly because of rounding.
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year

7.2 Statewide and Regional Operational Emissions Analysis

Tables 7-3 and 7-4 show estimated statewide emissions for the medium ridership scenario and the high ridership scenario, respectively, with the project operating in 2015, 2029, and 2040. As shown in the tables, total emissions for some pollutants (VOC, CO, and NO_X) would decrease from 2015 to 2040. For other pollutants (SO_2, PM_{10}, $PM_{2.5}$), total emissions would increase from 2015 to 2040. The estimated statewide emissions burdens with the project would be the same under all project alternatives because the ridership scenarios do not vary by alternative.

Table 7-3 Estimated Statewide Emissions with the Project—Medium Ridership Scenario

Emission Source	VOC (tons/yr)	CO (tons/yr)	NO_X (tons/yr)	SO_2 (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)
2015						
On-road vehicles	7,708	318,720	32,811	754	22,596	6,138
Aircraft	237	2,027	1,949	210	59	59
Power plants	1,908	25,983	13,584	1,622	3,215	2,904
Total statewide net emissions	9,853	346,729	48,344	2,586	25,870	9,100

Emission Source	VOC (tons/yr)	CO (tons/yr)	NO_X (tons/yr)	SO_2 (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)
2029						
On-road vehicles	1,696	124,183	9,691	571	26,074	6,932
Aircraft	346	2,900	2,855	309	86	86
Power plants	2,323	34,944	14,982	1,947	3,829	3,462
Total statewide net emissions	4,366	162,027	27,527	2,827	29,989	10,480
2040						
On-road vehicles	1,052	90,518	6,573	525	27,749	7,251
Aircraft	335	2,805	2,763	299	84	83
Power plants	2,594	39,388	16,188	2,117	4,108	3,710
Total statewide net emissions	3,981	132,711	25,523	2,941	31,941	11,044

Source: Authority 2020
Totals may not add up exactly because of rounding.
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year

Table 7-4 Estimated Statewide Emissions with the Project—High Ridership Scenario

Emission Source	VOC (tons/yr)	CO (tons/yr)	NO_X (tons/yr)	SO_2 (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)
2015						
On-road vehicles	7,620	315,076	32,436	745	22,338	6,067
Aircraft	218	1,863	1,792	193	54	54
Power plants	1,910	26,004	13,594	1,624	3,218	2,906
Total statewide net emissions	9,747	342,942	47,822	2,562	25,610	9,028
2029						
On-road vehicles	1,728	126,496	9,872	582	26,560	7,061
Aircraft	269	2,253	2,218	240	67	67
Power plants	2,325	34,962	14,991	1,948	3,831	3,464
Total statewide net emissions	4,322	163,711	27,080	2,770	30,458	10,592
2040						
On-road vehicles	1,067	91,810	6,739	538	28,476	7,439
Aircraft	386	3,230	3,181	345	96	96
Power plants	2,596	39,409	16,198	2,118	4,111	3,712
Total statewide net emissions	4,049	134,450	26,118	3,001	32,683	11,247

Source: Authority 2020
Totals may not add up exactly because of rounding.
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year

Comparing Tables 7-1 and 7-2 with Tables 7-3 and 7-4 shows that emissions with the project would follow the same general trends as emissions without the project. Emissions from some pollutant sources would decrease by a small percentage despite population and economic growth in California because of advances in engine technology. Emissions from power plants would increase due to the additional project electrical demand.

Table 7-5 summarizes the net change in emissions between the two ridership scenarios with the project (absolute emissions shown in Tables 7-3 and 7-4) and without the project (absolute emissions shown in Tables 7-1 and 7-2) for the 2015 Existing conditions, as well as the 2029 and 2040 No Project conditions. The net change represents the incremental change in emissions because of the project. As shown in Table 7-5, the project is predicted to have a beneficial effect on (i.e., it would reduce) statewide emissions of all pollutants under both ridership scenarios for the 2015 Existing and 2029 and 2040 No Project conditions. It should be noted that the emission savings due to reduced VMT are conservative because they do not consider the recently enacted SAFE Vehicles Rule. The SAFE Vehicles Rule increases criteria pollutant emission rates for light-duty gasoline-powered vehicles. As such, applying the SAFE Vehicles Rule would increase the benefits of the HSR VMT reductions by as much as 4 percent for certain criteria pollutants in 2040 (CARB 2019).

7.2.1 On-Road Vehicles

As shown in Table 7-6 and Table 7-7, the project is predicted to reduce regional VMT and on-road emissions, respectively, as compared to the 2015 Existing conditions, as well as the 2029 and 2040 No Project conditions, under both ridership scenarios, resulting in a beneficial effect on regional air quality. The change in emissions would be the same under all four project alternatives because the ridership is assumed to be the same. As noted above, the mobile source emissions reductions shown in Tables 7-6 and 7-7 are conservative because they do not account for the SAFE Vehicles Rule, which will increase criteria pollutant emissions (and thus the benefits of the HSR VMT reductions) generated by light-duty gasoline-powered vehicles.

The HSR system is predicted to reduce statewide and regional criteria pollutant emissions associated with roadways because travelers would use HSR rather than drive. The on-road vehicle emission analysis is based on VMT changes and associated average daily speed estimates calculated for Santa Clara, San Benito, and Merced Counties. Analysts obtained emission factors from EMFAC2017, using statewide parameters.

For the project, some vehicles may need to travel additional distances to cross the HSR track on new roadway overheads. On average, roadway overpasses would be provided approximately every 2 miles along the track. It is estimated that vehicles would not have to travel more than 1 mile out of direction to cross the HSR tracks. The width of the roadway overheads would accommodate both farm equipment and school buses traveling in opposite lanes. Because of the number of roadway overheads, it is expected that additional distances vehicles would travel to cross the HSR tracks would be negligible relative to regional VMT reductions; therefore, this is not discussed further in the analysis.

7.2.2 Trains

The project would use EMU trains, with the power distributed through the overhead contact system. The HSR system would not produce direct emissions from combustion of fossil fuels and associated emissions. However, trains traveling at high velocities, such as those associated with the HSR system, create sideways turbulence and rear wake, which resuspend particulates from the surface surrounding the track, resulting in fugitive dust emissions. Assuming a friction velocity of 0.62 foot per second to resuspend soils in the RSA, an HSR train passing at 220 mph could resuspend soil particles out to approximately 10 feet from the train (Watson 1996). Based on the USEPA method for estimating emissions from wind erosion (USEPA 2006a), the project would generate approximately 8 to 18 tons per year of PM_{10} and 1 to 3 tons per year of $PM_{2.5}$, depending on the alternative (Section 7.2.5, Regional Operations Criteria Pollutants). Details of the analysis and calculations are provided in Appendix F.

The SFBAAB, NCCAB, and SJVAB regions have high rates of asthma in adults and children. Because the HSR system is electrically powered, it would not generate direct combustion emissions along its route that would cause substantial health concerns such as asthma or other respiratory diseases. Appendix F provides a detailed analysis of wind-induced fugitive dust emissions from HSR travel. Based on this analysis, fugitive dust emissions from HSR travel are not expected to result in amounts of dust to cause health concerns.

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Table 7-5 Estimated Changes in Statewide Emissions, Project vs. No Project (Medium and High Ridership Scenarios)

Emission Source	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions												
On-road vehicles	-131	-180	-5,425	-7,458	-558	-768	-13	-18	-385	-529	-104	-144
Aircraft	-101	-97	-862	-829	-829	-798	-89	-86	-25	-24	-25	-24
Power plants	15	17	215	237	108	118	13	14	26	29	23	26
Total statewide net emissions	-217	-260	-6,071	-8,051	-1,280	-1,447	-89	-89	-384	-524	-106	-142
2029 Plus Project Emissions Relative to 2029 No Project Conditions												
On-road vehicles	-16	3	-1,182	-35	-92	-111	-5	-8	-248	-338	-66	-86
Aircraft	-65	-72	-545	-602	-536	-593	-58	-64	-16	-18	-16	-18
Power plants	13	14	184	202	92	101	11	12	22	24	20	22
Total statewide net emissions	-68	-55	-1,543	-435	-537	-603	-52	-59	-242	-332	-62	-82
2040 Plus Project Emissions Relative to 2040 No Project Conditions												
On-road vehicles	-7	-27	-603	-2,287	-115	-168	-10	-13	-513	-709	-132	-185
Aircraft	-139	-134	-1,162	-1,118	-1,145	-1,101	-124	-119	-35	-33	-35	-33
Power plants	15	17	215	237	108	118	13	14	26	29	23	26
Total statewide net emissions	-131	-143	-1,550	-3,168	-1,152	-1,151	-121	-118	-522	-714	-143	-193

Source: Authority 2020
Totals may not add up exactly because of rounding.
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year

Table 7-6 On-Road Vehicle Miles Traveled, Project vs. No Project (Medium and High Ridership Scenarios)

Location	No Project VMT		Plus Project VMT	
	Total Annual Traffic		Total Annual Traffic	
	Medium	High	Medium	High
2015				
Santa Clara	10,312,374,118	10,283,778,970	10,146,971,563	10,060,102,631
San Benito	620,032,419	613,186,473	497,463,094	444,285,228
Merced	1,239,904,084	1,217,771,426	1,095,973,335	1,023,513,300
Regional Total	12,172,310,621	12,114,736,869	11,740,407,991	11,527,901,159
2029				
Santa Clara	12,185,576,908	12,342,515,217	12,054,792,646	12,166,524,907
San Benito	732,687,590	832,309,817	644,576,543	712,361,522
Merced	1,506,540,248	1,649,405,517	1,392,147,947	1,495,480,175
Regional Total	14,424,804,746	14,824,230,551	14,091,517,136	14,374,366,604
2040				
Santa Clara	13,201,830,628	13,445,805,858	12,971,953,362	13,134,939,406
San Benito	845,964,786	938,659,865	675,617,348	703,920,103
Merced	1,842,074,869	2,205,535,193	1,642,039,221	1,935,554,314
Regional Total	15,889,870,283	16,590,000,916	15,289,609,930	15,774,413,823

Source: Authority 2020
Totals may not add up exactly because of rounding.
VMT = vehicle miles traveled

Table 7-7 On-Road Vehicle Emission Changes, Project vs. No Project (Medium and High Ridership Scenarios)

Location	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions												
Santa Clara	-7	-9	-272	-367	-27	-37	-1	-1	-19	-25	-5	-7
San Benito	-4	-6	-162	-224	-21	-28	<0	-1	-14	-19	-4	-5
Merced	-5	-7	-197	-266	-25	-33	-1	-1	-16	-22	-4	-6
Total regional net emissions	-17	-23	-632	-858	-72	-98	-2	-2	-48	-66	-13	-18
2029 Plus Project Emissions Relative to 2029 No Project Conditions												
Santa Clara	-1	-1	-73	-98	-5	-7	<0	<0	-14	-19	-4	-5
San Benito	-1	-1	-36	-49	-4	-5	<0	<0	-10	-13	-3	-3
Merced	-1	-1	-49	-65	-5	-6	<0	<0	-12	-17	-3	-4
Total regional net emissions	-2	-3	-157	-212	-14	-18	-1	-1	-36	-49	-10	-13
2040 Plus Project Emissions Relative to 2040 No Project Conditions												
Santa Clara	-1	-2	-89	-121	-6	-8	<0	-1	-25	-34	-7	-9
San Benito	-1	-1	-43	-60	-4	-6	<0	<0	-18	-25	-5	-7
Merced	-1	-1	-59	-66	-5	-6	<0	-1	-22	-23	-6	-6
Total regional net emissions	-3	-3	-191	-247	-15	-20	-1	-2	-66	-83	-17	-21

Source: Authority 2020

Totals may not add up exactly because of rounding.
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year

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7.2.3 Aircraft

The implementation of the project and the HSR system is predicted to reduce the number of aircraft flights at the regional airports in Northern California. Using the methods described in Section 6.2.3, Aircraft, analysts estimated emissions from aircraft takeoff and landing cycles as well as associated ground maintenance requirements. Table 7-8 shows the total number of flights with and without the project in 2015, 2029, and 2040 for both ridership scenarios.

As shown in Table 7-9, the project is predicted to reduce regional and statewide aircraft emissions compared to the 2015 Existing conditions, as well as the 2029 and 2040 No Project conditions, under both ridership scenarios, resulting in a beneficial effect on regional air quality. The effect on emissions would be the same under all four project alternatives because ridership is assumed the same.

7.2.4 Power Plants

The project would increase electrical requirements compared to the 2015 Existing conditions and 2029 and 2040 No Project conditions because the trains would be powered by electricity. Analysts conservatively estimated the statewide electrical demands from propulsion of the trains and the operation of the trains at terminal stations and in storage depots and maintenance facilities. No one-generation source for the electrical power requirements can be identified, because the state's electrical grid would power the HSR system.

Table 7-10 shows the pollutant emissions relative to the 2015 Existing and 2029 and 2040 No Project conditions and indicates the direct effect of the project by comparing the emissions with the project to the emissions that would occur without the project. The effect on emissions would be the same under all four project alternatives because ridership is assumed the same.

As previously noted, the state requires an increasing fraction (60 percent by 2030) of electricity generated for the state's power portfolio to come from renewable energy sources, and the Authority has a policy goal to use 100 percent renewable energy to power the HSR system. However, this analysis conservatively estimates power plant emissions based on the state's existing power portfolio and renewable energy mix. Accordingly, the emissions generated for powering the HSR system are expected to be lower in the future compared to emission estimates used in this analysis.

Table 7-8 Aircraft Flights, Project vs. No Project (Medium and High Ridership Scenarios)

Location	Total No Project Number of Flights (per year)		Total Project Number of Flights (per year)	
	Medium	High	Medium	High
2015				
Regional (Bay Area)	91,124	85,065	59,462	54,762
Statewide total	268,567	250,276	188,430	173,177
2029				
Regional (Bay Area)	110,664	93,895	90,004	71,250
Statewide total	329,614	273,240	277,475	215,599
2040				
Regional (Bay Area)	125,946	137,732	81,942	95,616
Statewide total	380,189	416,659	268,814	309,505

Source: Authority 2020

Table 7-9 Aircraft Emission Changes, Project vs. No Project (Medium and High Ridership Scenarios)

Location	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High
2015 Plus Project Emissions Relative to 2015 Existing Conditions												
Regional (Bay Area)	(40)	(38)	(341)	(326)	(328)	(314)	(35)	(34)	(10)	(9)	(10)	(9)
Total statewide net emissions	(101)	(97)	(862)	(829)	(829)	(798)	(89)	(86)	(25)	(24)	(25)	(24)
2029 Plus Project Emissions Relative to 2029 No Project Conditions												
Regional (Bay Area)	(26)	(28)	(216)	(237)	(213)	(233)	(23)	(25)	(6)	(7)	(6)	(7)
Total statewide net emissions	(65)	(72)	(545)	(602)	(536)	(593)	(58)	(64)	(16)	(18)	(16)	(18)
2040 Plus Project Emissions Relative to the 2040 No Project Conditions												
Regional (Bay Area)	(55)	(53)	(459)	(440)	(452)	(433)	(49)	(47)	(14)	(13)	(14)	(13)
Total statewide net emissions	(139)	(134)	(1,162)	(1,118)	(1,145)	(1,101)	(124)	(119)	(35)	(33)	(35)	(33)

Source: Authority 2020
(Parentheses) indicate negative values
CO = carbon monoxide
NO_X = nitrogen oxide
VOC = volatile organic compound
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
yr = year

Table 7-10 Power Plant Emission Changes, Project vs. No Project (Medium and High Ridership Scenarios)

Location	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High
2015 Project Emissions Relative to 2015 Existing Conditions												
Regional (Bay Area)	2	2	24	26	12	13	1	2	3	3	3	3
Statewide	15	17	215	237	108	118	13	14	26	29	23	26
2029 Plus Project Emissions Relative to 2029 No Project Conditions												
Regional (Bay Area)	1	2	20	22	10	11	1	1	2	3	2	2
Statewide	13	14	184	202	92	101	11	12	22	24	20	22
2040 Plus Project Emissions Relative to 2040 No Project Conditions												
Regional (Bay Area)	2	2	24	26	12	13	1	2	3	3	3	3
Statewide	15	17	215	237	108	118	13	14	26	29	23	26

Source: Authority 2020
CO = carbon monoxide
HSR = high-speed rail
MWh/yr = megawatt hours per year NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year

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7.2.5 Regional Operations Criteria Pollutant Emissions Summary

Table 7-11 through Table 7-13 show the total emission changes from project operations under the medium and high ridership scenarios for the 2015 Existing conditions (Table 7-11) and 2029 and 2040 No Project conditions (Tables 7-12 and 7-13). Results include indirect emissions from regional vehicle travel, aircraft, and power plants and direct operations emissions from HSR train movement.

As shown in the tables, all four project alternatives would result in a net regional decrease in emissions of all criteria pollutants. These decreases would be beneficial to the SFBAAB, NCCAB, and SJVAB and help the basins meet their attainment goals for O_3 and other criteria pollutants. Lower ridership would result in fewer regional benefits, although it would still constitute a net benefit. Direct emissions of fugitive dust (PM_{10} and $PM_{2.5}$) from train movement would only occur within the project footprint; however, as discussed, these emissions would be distributed along the entire track length and are not expected to result in substantial concentrations in any one localized area.

The beneficial effects from a reduction in regional operations criteria pollutant emissions would be approximately the same under all four project alternatives. The decrease in indirect emissions associated with regional vehicle travel, aircraft, and power plants would be equal under all four project alternatives because ridership would not vary by alternative. As noted above, emission savings shown in Table 7-11 through Table 7-13 due to reduced VMT are conservative because they do not consider the recently enacted SAFE Vehicles Rule. The SAFE Vehicles Rule increases criteria pollutant emission rates for light-duty gasoline-powered vehicles. As such, applying the SAFE Vehicles Rule would increase the benefits of the HSR VMT reductions by as much as 4 percent for certain criteria pollutants in 2040 (CARB 2019). Direct emissions, which do not depend on ridership, would vary slightly by alternative associated with $PM_{2.5}$ and PM_{10} emissions from HSR train movement, although the effect on overall emissions is negligible. Emissions of the other criteria pollutants would be the same under all four alternatives.

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Table 7-11 Regional Criteria Pollutant Emissions Changes, Project Compared to 2015 Existing Conditions (Medium and High Ridership Scenarios)

Emission Source	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High
Indirect Emissions												
On-road vehicles	(17)	(23)	(632)	(858)	(72)	(98)	(2)	(2)	(48)	(66)	(13)	(18)
Aircraft	(40)	(38)	(341)	(326)	(328)	(314)	(35)	(34)	(10)	(9)	(10)	(9)
Power plants	2	2	24	26	12	13	1	2	3	3	3	3
Direct Emissions (Fugitive dust from train movement)[1]												
Alternative 1									8		1	
Alternative 2									16		2	
Alternative 3									9		1	
Alternative 4									18		3	
Total Emissions[2]												
Alternative 1	(55)	(59)	(948)	(1,158)	(388)	(398)	(35)	(34)	(47)	(64)	(19)	(23)
Alternative 2	(55)	(59)	(948)	(1,158)	(388)	(398)	(35)	(34)	(40)	(56)	(18)	(22)
Alternative 3	(55)	(59)	(948)	(1,158)	(388)	(398)	(35)	(34)	(47)	(64)	(19)	(23)
Alternative 4	(55)	(59)	(948)	(1,158)	(388)	(398)	(35)	(34)	(38)	(72)	(18)	(25)

Source: Authority 2020; Watson 1996; USEPA 2006a
(Parentheses) indicate negative values
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year
[1] Direct dust emissions from train movement do not depend on ridership; emissions are the same for both scenarios.
[2] Total includes indirect and direct emissions.

Table 7-12 Regional Criteria Pollutant Emissions Changes, Project Compared to 2029 No Project Conditions (Medium and High Ridership Scenarios)

Emission Source	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High
Indirect Emissions												
On-road vehicles	(2)	(3)	(157)	(212)	(14)	(18)	(1)	(1)	(36)	(49)	(10)	(13)
Aircraft	(26)	(28)	(216)	(237)	(213)	(233)	(23)	(25)	(6)	(7)	(6)	(7)
Power plants	1	2	20	22	10	11	1	1	2	3	2	2
Direct Emissions (Fugitive dust from train movement)[1]												
Alternative 1									8		1	
Alternative 2									16		2	
Alternative 3									9		1	
Alternative 4									18		3	
Total Emissions[2]												
Alternative 1	(27)	(30)	(353)	(427)	(216)	(240)	(23)	(25)	(32)	(45)	(13)	(16)
Alternative 2	(27)	(30)	(353)	(427)	(216)	(240)	(23)	(25)	(25)	(38)	(12)	(15)
Alternative 3	(27)	(30)	(353)	(427)	(216)	(240)	(23)	(25)	(32)	(45)	(13)	(16)
Alternative 4	(27)	(30)	(353)	(427)	(216)	(240)	(23)	(25)	(23)	(54)	(11)	(18)

Source: Authority 2020; Watson 1996; USEPA 2006a
(Parentheses) indicate negative values
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year
[1] Direct dust emissions from train movement do not depend on ridership; emissions are the same for both scenarios.
[2] Total includes indirect and direct emissions.

Table 7-13 Regional Criteria Pollutant Emissions Changes, Project Compared to 2040 No Project Conditions (Medium and High Ridership Scenarios)

Emission Source	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High	Medium	High
Indirect Emissions												
On-road vehicles	(3)	(3)	(191)	(247)	(15)	(20)	(1)	(2)	(66)	(83)	(17)	(21)
Aircraft	(55)	(53)	(459)	(440)	(452)	(433)	(49)	(47)	(14)	(13)	(14)	(13)
Power plants	2	2	24	26	12	13	1	2	3	3	3	3
Direct Emissions (Fugitive dust from train movement)[1]												
Alternative 1									8		1	
Alternative 2									16		2	
Alternative 3									9		1	
Alternative 4									18		3	
Total Emissions[2]												
Alternative 1	(56)	(54)	(626)	(660)	(456)	(440)	(49)	(47)	(69)	(84)	(27)	(30)
Alternative 2	(56)	(54)	(626)	(660)	(456)	(440)	(49)	(47)	(61)	(77)	(26)	(29)
Alternative 3	(56)	(54)	(626)	(660)	(456)	(440)	(49)	(47)	(69)	(84)	(27)	(30)
Alternative 4	(56)	(54)	(626)	(660)	(456)	(440)	(49)	(47)	(59)	(93)	(26)	(32)

Source: Authority 2020, Watson 1996, USEPA 2006a
(Parentheses) indicate negative values
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year
[1] Direct dust emissions from train movement do not depend on ridership; emissions are the same for both scenarios.
[2] Total includes indirect and direct emissions.

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7.3 Local Operation Emission Sources

Operation of the San Jose Diridon, Downtown Gilroy, and East Gilroy Stations and the maintenance facilities would produce criteria pollutant emissions. The operation of the power traction, switching, and paralleling stations would not result in appreciable quantities of air pollutants because site visits would be infrequent, and power usage would be limited. Therefore, emissions from the power traction, switching, and paralleling stations were not quantified.

7.3.1 Station Sites and Maintenance Facilities

Emissions associated with operation of the stations and maintenance facilities are expected because of combustion sources used primarily for space heating and facility landscaping, energy consumption for facility lighting, minor solvent and paint usage for periodic application of architectural coatings, and employee and passenger traffic. Analysts used CalEEMod to estimate these emissions from the stations and maintenance facilities, based on the square footage of the buildings and assumptions described in Chapter 6. Mobile source emissions estimates were adjusted to reflect the impact of the SAFE Vehicles Rule (CARB 2019). Operation of the MOWF would also generate emissions from vehicles, equipment, and locomotives used for maintenance activities. Analysts estimated the criteria pollutant emissions for 2015, 2029, and 2040 conditions and they are included in Table 7-14. Station and maintenance facility emissions would be similar among all four alternatives, but slightly higher under Alternative 3, which includes the East Gilroy Station. Since the East Gilroy Station is entirely new, net emissions are greater than the Downtown Gilroy Station since emissions under existing conditions are zero.

Table 7-14 Station and Maintenance Facility Operations Emissions (tons per year)

Project Component	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
2015 Existing[1]						
San Jose Diridon Station	1	15	2	<1	3	1
Downtown Gilroy Station	<1	1	<1	<1	<1	<1
2015 Existing Plus Project						
San Jose Diridon Station[2]	2	24	3	<1	5	1
Downtown Gilroy Station[3]	2	16	2	<1	3	1
East Gilroy Station	1	16	2	<1	3	1
MOWF[4]	1	12	5	<1	1	<1
MOWS	1	1	7	<1	<1	<1
PROJECT CHANGE—Alternatives 1, 2, and 4	**5**	**38**	**15**	**1**	**6**	**2**
PROJECT CHANGE—Alternative 3	**5**	**39**	**15**	**1**	**6**	**2**
2029 No Project[1]						
San Jose Diridon Station	1	7	1	<1	4	1
Downtown Gilroy Station	<1	1	<1	<1	<1	<1
2029 Plus Project						
San Jose Diridon Station[2]	1	11	1	<1	6	2
Downtown Gilroy Station[3]	1	7	1	<1	4	1
East Gilroy Station	1	9	1	<1	5	1
MOWF[4]	1	9	5	<1	1	<1

Project Component	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
MOWS	1	1	2	<1	<1	<1
PROJECT CHANGE—Alternatives 1, 2, and 4	**3**	**21**	**8**	**<1**	**7**	**2**
PROJECT CHANGE—Alternative 3	**4**	**23**	**8**	**<1**	**8**	**2**
2040 No Project[1]						
San Jose Diridon Station	1	7	1	<1	5	1
Downtown Gilroy Station	<1	1	<1	<1	<1	<1
2040 Plus Project						
San Jose Diridon Station[2]	2	15	2	<1	12	3
Downtown Gilroy Station[3]	1	11	1	<1	8	2
East Gilroy Station	1	12	1	<1	9	2
MOWF[4]	1	9	5	<1	1	<1
MOWS	1	1	2	<1	<1	<1
PROJECT CHANGE—Alternatives 1, 2, and 4	**4**	**29**	**8**	**1**	**16**	**4**
PROJECT CHANGE—Alternative 3	**4**	**31**	**8**	**1**	**17**	**5**

Sources: Trinity Consultants 2016; Newson 2018; USEPA 2009; Burton 2017a, 2017b, , 2017c, 2018; McGuire 2017–2018
CO = carbon monoxide
CO_2 = carbon dioxide
MOWF = light maintenance facility
MOWS = maintenance of way siding
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
tons/yr = tons per year
VOC = volatile organic compound
[1] Represents emissions from the existing facilities prior to HSR improvements. The East Gilroy Station, MOWF, and MOWS do not exist under existing conditions, and existing emissions are assumed to be zero.
[2] There would be no difference in operational emissions between the aerial and at-grade options.
[3] There would be no difference in operational emissions between the aerial and embankment options.
[4] There would be no difference in operational emissions between the south and east Gilroy options.

7.4 Total Operations Emissions

Tables 7-15 through 7-17 show a summary of the total emission changes because of HSR operation for the medium and high ridership scenarios, including the indirect emissions from regional vehicle travel, aircraft, and power plants and direct project operational emissions from HSR stations, maintenance facilities, and train movements. The project would result in a net regional decrease in emissions of criteria pollutants. These decreases would be beneficial to the SFBAAB, NCCAB, and SJVAB and help the basins meet their attainment goals for O_3 and particulates (PM_{10} and $PM_{2.5}$). Lower ridership would result in fewer regional benefits, although even with lower ridership, there would be a net benefit.

All four project alternatives would result in a net reduction in operations emissions from the 2015 Existing and 2029 and 2040 No Project conditions, although there would be slight differences in the total emission changes by alternative. Indirect emissions from vehicle travel, aircraft, and power plants are based on ridership, which would not differ by alternative. Direct emissions, including stations, maintenance facilities, and train movement, would vary by alternative although the overall difference is small. As noted above, emission savings shown in Tables 7-15 through 7-17 due to reduced VMT are conservative because they do not consider the recently enacted SAFE Vehicles Rule. The SAFE Vehicles Rule increases criteria pollutant emission rates for light-

duty gasoline-powered vehicles. As such, applying the SAFE Vehicles Rule would increase the benefits of the HSR VMT reductions by as much as 4 percent for certain criteria pollutants in the year 2040 (CARB 2019).

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Table 7-15 Total Regional Criteria Pollutant Emissions Changes, Project Compared to 2015 Existing Conditions (Medium and High Ridership Scenarios)

Emission Source	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	M	H	M	H	M	H	M	H	M	H	M	H
Indirect Emissions												
On-road vehicles	(17)	(23)	(632)	(858)	(72)	(98)	(2)	(2)	(48)	(66)	(13)	(18)
Aircraft	(40)	(38)	(341)	(326)	(328)	(314)	(35)	(34)	(10)	(9)	(10)	(9)
Power plants	2	2	24	26	12	13	1	2	3	3	3	3
Direct Emissions[1]												
Alternative 1												
Stations[2]	2		24		3		<1		4		1	
Maintenance facilities	2		14		12		<1		2		1	
Train movement[3]									8		1	
Alternative 2												
Stations[2]	2		24		3		<1		4		1	
Maintenance facilities	2		14		12		<1		2		1	
Train movement[3]									16		2	
Alternative 3												
Stations[2]	3		25		3		<1		5		1	
Maintenance facilities	2		14		12		<1		2		1	
Train movement[3]									9		1	
Alternative 4												
Stations[2]	2		24		3		<1		4		1	
Maintenance facilities	2		14		12		<1		2		1	
Train movement[3]									18		3	
Total Emissions[4]												
Alternative 1	(50)	(54)	(911)	(1,120)	(372)	(383)	(35)	(34)	(41)	(58)	(17)	(21)
Alternative 2	(50)	(54)	(911)	(1,120)	(372)	(383)	(35)	(34)	(34)	(50)	(16)	(20)
Alternative 3	(50)	(54)	(910)	(1,119)	(372)	(383)	(35)	(34)	(39)	(56)	(17)	(21)
Alternative 4	(50)	(54)	(911)	(1,120)	(372)	(383)	(35)	(34)	(32)	(48)	(16)	(20)

Sources: Authority 2020; Watson 1996; USEPA 2006a; Trinity Consultants 2016; Newson 2018; USEPA 2009; Burton 2017a, 2017b, 2017c, 2018; McGuire 2017–2018
(Parentheses) indicate negative values
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year
[1] Direct emissions do not depend on ridership; emissions are the same for both scenarios.
[2] Represents the net emissions effect of the project (i.e., the difference in station operating emissions between Existing and Existing Plus Project conditions)
[3] Train movement would only generate fugitive dust emissions.
[4] Total includes indirect and direct emissions.

Table 7-16 Total Regional Criteria Pollutant Emissions Changes, Project Compared to 2029 No Project Conditions (Medium and High Ridership Scenarios)

Emission Source	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	M	H	M	H	M	H	M	H	M	H	M	H
Indirect Emissions												
On-road vehicles	(2)	(3)	(157)	(212)	(14)	(18)	(1)	(1)	(36)	(49)	(10)	(13)
Aircraft	(26)	(28)	(216)	(237)	(213)	(233)	(23)	(25)	(6)	(7)	(6)	(7)
Power plants	1	2	20	22	10	11	1	1	2	3	2	2
Direct Emissions[1]												
Alternative 1												
Stations[2]	1		10		1		<1		5		1	
Maintenance facilities	2		11		7		<1		1		<1	
Train movement[3]									8		1	
Alternative 2												
Stations[2]	1		10		1		<1		5		1	
Maintenance facilities	2		11		7		<1		1		<1	
Train movement[3]									16		2	
Alternative 3												
Stations[2]	2		12		1		<1		7		2	
Maintenance facilities	2		11		7		<1		1		<1	
Train movement[3]									9		1	
Alternative 4												
Stations[2]	1		10		1		<1		5		1	
Maintenance facilities	2		11		7		<1		1		<1	
Train movement[3]									18		3	
Total Emissions[4]												
Alternative 1	(23)	(26)	(332)	(406)	(208)	(232)	(22)	(24)	(25)	(38)	(11)	(15)
Alternative 2	(23)	(26)	(332)	(406)	(208)	(232)	(22)	(24)	(18)	(31)	(10)	(13)
Alternative 3	(23)	(26)	(330)	(404)	(208)	(232)	(22)	(24)	(23)	(36)	(10)	(14)
Alternative 4	(23)	(26)	(332)	(406)	(208)	(232)	(22)	(24)	(16)	(29)	(9)	(13)

Sources: Authority 2020; Watson 1996; USEPA 2006a; Trinity Consultants 2016; Newson 2018; USEPA 2009; Burton 2017a, 2017b, 2017c, 2018; McGuire 2017–2018
(Parentheses) indicate negative values
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year
[1] Direct emissions do not depend on ridership; emissions are the same for both scenarios.
[2] Represents the net emissions effect of the project (i.e., the difference in station operating emissions between 2029 No Project and Project conditions)
[3] Train movement would only generate fugitive dust emissions.
[4] Total includes indirect and direct emissions.

Table 7-17 Total Regional Criteria Pollutant Emissions Changes, Project Compared to 2040 No Project Conditions (Medium and High Ridership Scenarios)

Emission Source	VOC (tons/yr)		CO (tons/yr)		NO_X (tons/yr)		SO_2 (tons/yr)		PM_{10} (tons/yr)		$PM_{2.5}$ (tons/yr)	
	M	H	M	H	M	H	M	H	M	H	M	H
Indirect Emissions												
On-road vehicles	(3)	(3)	(191)	(247)	(15)	(20)	(1)	(2)	(66)	(83)	(17)	(21)
Aircraft	(55)	(53)	(459)	(440)	(452)	(433)	(49)	(47)	(14)	(13)	(14)	(13)
Power plants	2	2	24	26	12	13	1	2	3	3	3	3
Direct Emissions[1]												
Alternative 1												
Stations[2]	2		19		2		<1		14		4	
Maintenance facilities	2		10		6		<1		1		<1	
Train movement[3]									8		1	
Alternative 2												
Stations[2]	2		19		2		<1		14		4	
Maintenance facilities	2		10		6		<1		1		<1	
Train movement[3]									16		2	
Alternative 3												
Stations[2]	2		21		2		<1		16		4	
Maintenance facilities	2		10		6		<1		1		<1	
Train movement[3]									9		1	
Alternative 4												
Stations[2]	2		19		2		<1		14		4	
Maintenance facilities	2		10		6		<1		1		<1	
Train movement[3]									18		3	
Total Emissions[4]												
Alternative 1	(52)	(50)	(597)	(631)	(447)	(432)	(48)	(46)	(53)	(69)	(23)	(26)
Alternative 2	(52)	(50)	(597)	(631)	(447)	(432)	(48)	(46)	(45)	(61)	(22)	(25)
Alternative 3	(52)	(50)	(596)	(629)	(447)	(432)	(48)	(46)	(50)	(66)	(23)	(26)
Alternative 4	(52)	(50)	(597)	(631)	(447)	(432)	(48)	(46)	(43)	(59)	(22)	(25)

Sources: Authority 2020; Watson 1996; USEPA 2006a; Trinity Consultants 2016; Newson 2018; Burton 2017a, 2017b, 2017c, 2018; McGuire 2017–2018
(Parentheses) indicate negative values
CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound
yr = year
[1] Direct emissions do not depend on ridership; emissions are the same for both scenarios.
[2] Represents the net emissions effect of the project (i.e., the difference in station operating emissions between 2040 No Project and Project conditions)
[3] Train movement would only generate fugitive dust emissions.
[4] Total includes indirect and direct emissions.

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7.5 Microscale Carbon Monoxide Hot-Spot Analysis

Analysts modeled CO concentrations at five intersections covered by covered by congestion management plans identified in the traffic analysis as having the highest station traffic volumes and the worst levels of congestion/delay. In addition to these locations, the intersection of Monterey Road and Skyway Drive was analyzed under Alternative 4, which would require an at-grade crossing. Alternatives 1 through 3 would not worsen traffic conditions at this or other intersections along the alignment because the alignment and roadways would be grade separated.

The modeled CO concentrations were adjusted to reflect the impact of the SAFE Vehicles Rule (CARB 2019) and were combined with CO background concentrations. The total ambient CO concentrations were then compared with air quality standards. Table 7-18 shows the CO hot-spot analysis results and indicates that CO concentrations are not anticipated to exceed the 1- or 8-hour NAAQS and CAAQS. Traffic volumes would not differ significantly among the project alternatives at the five station intersections; consequently, the results presented in Table 7-18 are representative of all four project alternatives. The results for Monterey Road/Skyway Drive are only applicable to Alternative 4.

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Table 7-18 Carbon Monoxide Modeling Concentration Results (Parts per Million)

Intersection	Rec.1	1-Hour Concentration[2]						8-Hour Concentration[3]					
		Existing (2015)		Future (2029)		Future (2040)		Existing (2015)		Future (2029)		Future (2040)	
		No Project	Plus Project	No Project	Plus Project	No Project	Plus Project	No Project	Plus Project	No Project	Plus Project	No Project	Plus Project
The Alameda (SR 82)/Taylor Street-Naglee Avenue	1	3.7	3.7	3.0	3.0	3.0	3.0	2.8	2.8	2.3	2.3	2.3	2.3
	2	3.7	3.7	2.9	2.9	2.9	3.0	2.8	2.8	2.2	2.2	2.2	2.3
	3	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	2.3	2.3	2.3	2.3
	4	3.6	3.6	2.9	2.9	3.0	3.0	2.7	2.7	2.2	2.2	2.3	2.3
Autumn Street (SR 82)/West Santa Clara Street (SR 82)	5	3.1	3.2	2.8	2.8	2.9	2.9	2.4	2.4	2.1	2.1	2.2	2.2
	6	3.2	3.2	2.8	2.9	2.8	2.9	2.4	2.4	2.1	2.2	2.1	2.2
	7	2.9	3.0	2.7	2.8	2.9	3.0	2.2	2.3	2.0	2.1	2.2	2.3
	8	3.1	3.2	2.8	2.8	2.9	3.0	2.4	2.4	2.1	2.1	2.2	2.3
Coleman Avenue/I-880 Northbound Ramps	9	3.8	3.9	2.9	2.9	2.9	2.9	2.9	2.9	2.2	2.2	2.2	2.2
	10	4.2	4.3	3.0	3.1	3.0	3.1	3.1	3.2	2.3	2.3	2.3	2.4
	11	4.0	4.0	2.9	3.0	3.0	3.0	3.0	3.0	2.2	2.3	2.3	2.3
	12	4.4	4.5	3.1	3.1	3.1	3.1	3.3	3.3	2.3	2.3	2.4	2.4
Monterey Road (SR 82)/Blossom Hill Road Westbound Ramps (SR 82/CR G10)	13	3.6	3.6	2.9	2.8	2.7	3.0	2.7	2.7	2.2	2.1	2.1	2.3
	14	3.7	3.7	3.0	2.9	2.8	3.0	2.8	2.8	2.3	2.2	2.1	2.3
	15	3.7	3.8	3.0	2.8	2.6	3.0	2.8	2.9	2.3	2.1	2.0	2.3
	16	3.8	3.8	3.0	2.9	2.9	3.0	2.9	2.9	2.3	2.2	2.2	2.3
US 101 Southbound Ramps/Blossom Hill Road	17	4.7	4.6	3.1	3.1	3.1	3.1	3.5	3.4	2.3	2.3	2.4	2.4
	18	5.0	5.1	3.3	3.3	3.3	3.3	3.7	3.8	2.5	2.5	2.5	2.5
	19	4.2	4.3	3.0	3.0	3.0	3.0	3.1	3.2	2.3	2.3	2.3	2.3
	20	4.2	4.3	3.0	3.0	3.0	3.0	3.1	3.2	2.3	2.3	2.3	2.3
Monterey Road/Skyway Drive (Alternative 4 only)	21	3.7	3.7	3.0	3.0	3.0	3.0	2.8	2.8	2.3	2.3	2.3	2.3
	22	4.4	4.4	2.9	2.9	2.9	3.0	3.3	3.3	2.2	2.2	2.2	2.3
	23	3.8	3.8	3.0	3.0	3.0	3.0	2.9	2.9	2.3	2.3	2.3	2.3
	24	4.5	4.5	2.9	2.9	3.0	3.0	3.3	3.3	2.2	2.2	2.3	2.3
State Standard (ppm)		20	20	20	20	20	20	9	9	9	9	9	9
Federal Standard (ppm)		35	35	35	35	35	35	9	9	9	9	9	9

Sources: Garza et al. 1997; Burton 2017d
CO = carbon monoxide
CR = county road
ppm = parts per million
SR = State Route
US = U.S. Highway
Caltrans = California Department of Transportation
[1] Consistent with Caltrans CO Protocol, receptors are located at 3 meters from the intersection, at each of the four corners to represent the nearest location in which a receptor could potentially be located adjacent to a traveled roadway. The modeled receptors indicated are not representative of the actual sensitive receptors. Receptor locations are theoretical and are not reflective of actual locations show on Figure 5-2.
[2] Average 1-hour background concentration between 2015 and 2017 was 2.13 ppm (USEPA 2018a).
[3] Average 8-hour background concentration between 2015 and 2017 was 1.67 ppm (USEPA 2020).

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7.6 Particulate Matter (PM_{10} and $PM_{2.5}$) Hot-Spot Analysis

Compared to the No Project Condition, the project would reduce VMT under all analysis years (2015, 2029, and 2040), resulting in PM_{10} and $PM_{2.5}$ reductions (Table 7-5 and Table 7-6). To identify and evaluate potential effects, analysts prepared a hot-spot analysis because the SFBAAB and SJVAPCD portions of the local RSA are designated nonattainment for the $PM_{2.5}$ NAAQS and maintenance for the PM_{10} NAAQS (SJVAPCD only), and the project is subject to a localized PM_{10} and $PM_{2.5}$ hot-spot analysis. The project alternatives would not differ in PM emissions because the regional change in VMT would be the same for all alternatives.

In November 2015, the USEPA updated its *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (USEPA 2015e), which was used for this analysis. Although this analysis is normally associated with the Transportation Conformity Rule, the HSR system is subject to the General Conformity Rule. Notwithstanding the decision to use this analytical structure, additional analysis or associated activities required to comply with transportation conformity would be carried out only if discrete project elements become subject to those requirements. In accordance with this guidance, if a project meets one of the following criteria, it is considered a project of air quality concern, and a quantitative PM_{10}/$PM_{2.5}$ analysis is required.

- **New or expanded highway projects that have a significant number of or significant increase in number of diesel vehicles**—The project is not a new highway project, nor would it expand an existing highway beyond its current capacity. The HSR system would be electrically powered. While the project would affect traffic conditions on roadways near the stations, it would not measurably affect truck volumes on the affected roadways. Most vehicle trips entering and leaving the station location would be passenger vehicles, which are typically not diesel-powered, except for delivery truck trips to support station activities. Furthermore, the project would improve regional traffic conditions by reducing traffic congestion and regional VMT within the RSA and increasing vehicle speeds.
- **Projects affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles or those that will degrade to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project**—The project would not change the existing traffic mix at signalized intersections. Although the maintenance facilities would use diesel vehicles, daily deliveries are not expected to exceed 20 trips. In some cases, the LOS of intersections near the HSR stations or at at-grade crossings (Alternative 4 only) would be degraded to LOS F under the project alternatives. However, the traffic volume increases at the affected intersections would be primarily from passenger cars and transit buses used for transporting people to or from the stations. Passenger cars would be gasoline-powered. Buses operated by VTA are a mix of diesel- and diesel-electric-powered. Pursuant to the Innovative Clean Transit Regulation, VTA's bus fleet will be comprised of only zero-emission vehicles by 2040. While diesel-powered buses would still operate as part of VTA's future vehicle fleet until this time, they would not represent a significant (i.e., less than 5 percent) portion of local traffic.
- **New or expanded bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location**—The trains used for the project would be EMUs, powered by electricity, not diesel fuel. Most vehicle trips entering and leaving the stations would be passenger vehicles, which are not typically diesel-powered.[23]

  Alternatives 1, 2, and 4 would not have new or expanded bus or rail passenger terminals or transfer points that would significantly increase the number of diesel vehicles congregating at a single location. Improved bus service at the Diridon and Downtown Gilroy stations is not part of the HSR system. The Authority assumes that bus service levels at these locations are

[23] While not a bus or rail terminal, the maintenance facilities would also have diesel vehicles, but these would be limited to 20 or fewer haul vehicles per day. Likewise, locomotives used to support maintenance activities at the MOWF would be used between 24 and 210 hours per year, depending on function.

constant into the future given that no operator has a funding plan to deliver more service. VTA will transition to a zero-emissions bus fleet, which will reduce emissions over time.

While bus service levels are assumed to be the same with and without the project, the East Gilroy Station under Alternative 3 would be an entirely new transit stop with HSR. The project would generate approximately 107 shuttle/bus trips per day at the East Gilroy Station in 2029. These trips would be made by a combination of diesel, diesel-electric, and fully electric buses. While the diesel-powered buses would generate DPM along the bus access route (Leavesley Road) and during passenger loading/unloading, the emissions would be minor, totaling less than 0.0012 pounds of PM_{10} per day (refer to Appendix C). The 107 additional bus trips would represent less than 1.5 percent of average daily traffic on Leavesley Road (Burton 2019). Accordingly, the East Gilroy Station would not significantly increase the number of diesel vehicles congregating at a single location in the near term. By 2040, all transit buses at the East Gilroy Station would be zero-emissions vehicles, pursuant to the Innovative Clean Transit Regulation.

- **Projects in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$- or PM_{10}-applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation**—The RSA is not in an area identified as a site of violation or possible violation in the USEPA-approved SIP.

For these reasons, the project would not be considered a project of air quality concern as defined by 40 C.F.R. Section 93.123(b)(1) and would not likely cause violations of the PM_{10}/$PM_{2.5}$ NAAQS during its operation. Therefore, quantitative $PM_{2.5}$ and PM_{10} hot-spot evaluations are not required. CAA 40 C.F.R. Section 93.116 requirements are therefore met without a quantitative hot-spot analysis. The project would not likely cause an effect on air quality for PM_{10}/$PM_{2.5}$ standards because, based on these criteria, it is not a project of air quality concern.

7.7 Mobile Source Air Toxics

In accordance with the FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents,* released September 30, 2009 and updated on October 18, 2016 (FHWA 2016), the qualitative assessment presented in the following subsections is derived, in part, from an FHWA study, *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives* (FHWA 2011). It is provided as a basis for identifying and comparing the potential differences in MSAT emissions, if any, among the project alternatives.

MSAT emissions would not differ among the project alternatives because the regional change in vehicle emissions would be the same for all alternatives. Therefore, this analysis compares the project to the 2015 Existing Conditions and 2029 and 2040 No Project conditions.

7.7.1 Regional Mobile Source Air Toxics

Under the project, the HSR system would use EMUs, with the power distributed to each train car via the overhead contact system. Operation of the EMUs would not generate combustion emissions; therefore, no toxic emissions would be expected from operation of the project.

The project would decrease regional VMT and MSAT emissions relative to the 2029 and 2040 No Project conditions. The availability of the HSR system would reduce the number of individual vehicle trips on a regional basis. Because the project would not substantially change the regional traffic mix, the amount of MSATs emitted from highways and other roadways within the RSA would be proportional to the VMT. Because the regional VMT estimated for the project would be less than the anticipated VMT in 2029 and 2040 without the project, MSAT emissions from regional vehicle traffic would be less for the project.

The project would also result in reduced traffic congestion and increased vehicle speed when compared to the 2029 and 2040 No Project conditions because more people would use the HSR system instead of driving. According to USEPA's Motor Vehicle Emission Simulator (MOVES) 2014a model, emissions of all priority MSATs, except DPM, decrease as speed increases.

Therefore, the project would result in decreases in MSAT emissions as traffic congestion declines.

Even without the project, emissions in 2029 and 2040 would likely be lower than present levels because of the USEPA's national control programs, which are projected to reduce annual MSAT emissions by 90 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth relative to existing conditions) that MSAT emissions in the RSA are likely to be lower in the future in nearly all cases.

7.7.2 Local Mobile Source Air Toxics

The potential MSAT emission sources directly related to project operation would be from vehicles used at maintenance facilities and passenger vehicles traveling to and from the train stations. Localized increases in MSAT emissions could occur near the stations because of passenger commutes. Consistent with FHWA's MSAT guidance, the magnitude and the duration of potential changes in localized MSATs cannot be reliably quantified because of incomplete or unavailable information in forecasting project-specific health effects. Even though there may be differences among the project alternatives with respect to localized MSATs, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will cause substantial MSAT reductions over time, thereby offsetting the increase in localized traffic associated with the project.

7.7.3 Mobile Source Air Toxics Research and Incomplete Information

Air toxics analysis is an ongoing area of research. While much work has been done to assess the overall health risk of TACs, many questions remain unanswered. In particular, considerable uncertainties are associated with the existing estimates of MSAT toxicity, as well as the acceptable risk levels. Because of these and other limitations, technical tools are not available to predict the project-specific health effects of the emission changes associated with each project alternative. Because of these limitations, Appendix G is included in this analysis in accordance with CEQ regulations (40 C.F.R. § 1502.22(b)) regarding incomplete or unavailable information.

7.8 Operations Health Risk Assessment

7.8.1 Freight Relocation

Relocated freight service because of the project has the potential to create increased inhalation health risks and exposure to $PM_{2.5}$, which may exceed local significance thresholds for cancer and noncancer hazards at receptor locations adjacent to the relocated track. Health risks to the closest receptors along the relocated track sections were estimated using the BAAQMD's rail inventory tool and the methods described in Section 6.3.7.1. Table 7-19 shows estimated cancer risk, chronic health hazard, and $PM_{2.5}$ concentrations associated with the freight relocation at the analyzed receptor locations.

Table 7-20 shows the incremental change in health risks between the project and existing and No Project conditions and compares those risks to BAAQMD's thresholds. As discussed in Section 6.3.7.1, the analysis assumes the freight relocation would be complete in 2022. Accordingly, emissions exposure under the relocated freight scenario and No Project conditions was assumed to begin in 2022. Existing conditions reflects the risks that would occur if the freight tracks were not relocated and exposure to emissions began in 2015.

As shown in Table 7-20, relocated freight service would generally result in decreased cancer and noncancer health risks, relative to existing conditions. These decreases are primarily because of advancements in locomotive emissions technology and the retirement of older, higher-emitting engines, which reduce future DPM emission rates. The reduction in future locomotive emission rates is enough to offset the increased risk associated with relocating freight service closer to existing receptors.

The comparison of relocated risks to No Project conditions normalizes locomotive emission rates since both conditions assume exposure begins in 2022. Accordingly, the comparison reflects the

incremental project effect, exclusive of background trends. As shown in Table 7-20, relative to no project conditions, relocated freight service would result in minor increases in cancer and noncancer health risks at modeled receptor locations. These increases would not exceed BAAQMD thresholds.

Table 7-20 only evaluates locations where freight would be moved closer to receptors. In many of these locations, receptors on the other side of the track would observe a corresponding health benefit as freight would be moved further away from these receptors.

Table 7-19 Cancer and Noncancer Health Risks from Freight Operation under Existing, No Project, and the Freight Relocation (Project) Scenarios

General Location	Cancer Risk (per million)			Chronic HI			$PM_{2.5}$ Concentration (µg/m³)		
	Existing[1]	No Project[2]	Project[3]	Existing[1]	No Project[2]	Project[3]	Existing[1]	No Project[2]	Project[3]
Repositions under Alternatives 1 through 3									
Near Monterey Road and Blanchard Rd	14.6	10.6	10.6	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Between Monterey Road and Crowner Ave	7.2	5.3	7.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Monterey Road and California Ave	9.0	6.6	10.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Monterey Road and Ronan Ave	4.0	3.0	3.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Monterey Road and Leavesley Rd	3.0	2.2	3.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Monterey Road and 1st St	5.6	4.1	7.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Monterey Road and W 10th St	4.0	2.9	5.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Repositions under Alternative 3 Only									
Near Pacheco Court and Frazier Lake Rd	0.4	0.3	5.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Repositions under Alternative 4 Only									
Near Chestnut Street and Asbury St	82.9	60.5	65.7	<0.1	<0.1	<0.1	0.1	0.1	0.1
Near Harrison Street and Fuller Ave	35.2	25.7	31.3	<0.1	<0.1	<0.1	0.1	<0.1	0.1
Near Cross Way and Northern Road	9.4	6.8	7.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
End of Promme Court	15.3	11.2	12.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Prindiville Road and Urshan Way	10.9	8.0	10.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Madrone Ave and Dougherty Ave	7.6	5.6	7.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Butterfield Blvd and E Dunne Ave	2.8	2.0	2.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
End of Sister City Way	3.7	2.7	3.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near Garlic Farms Dr and Trave Park Cir	2.4	1.8	2.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

General Location	Cancer Risk (per million)			Chronic HI			$PM_{2.5}$ Concentration ($\mu g/m^3$)		
	Existing[1]	No Project[2]	Project[3]	Existing[1]	No Project[2]	Project[3]	Existing[1]	No Project[2]	Project[3]
Near Bolsa Rd	2.7	2.0	3.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Near West Julian St and North Montgomery St	78.9	57.6	66.1	<0.1	<0.1	<0.1	0.1	0.1	0.1

Sources: McGuire 2017–2018; Winkel 2018; PCJPB 2015; USEPA 2009
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
$\mu g/m^3$ = micrograms per cubic meter
[1] Existing conditions reflects the risks that would occur if the freight tracks were not relocated and exposure to emissions began in 2015.
[2] No Project conditions reflects the risks that would occur if the freight tracks were not relocated and exposure to emissions began in 2022.
[3] Project conditions reflects the risks that would occur if the freight tracks were relocated and exposure to emissions began in 2022.

Table 7-20 Summary of Changes in Cancer and Noncancer Health Risks from Freight Relocation Relative to Existing and No Project Conditions

General Location	Change in Exposure with the Freight Relocation relative to Exposure under Existing Conditions[1]			Change in Exposure with the Freight Relocation relative to Exposure under No Project Conditions[2]		
	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
Repositions under Alternatives 1 through 3						
Near Monterey Road and Blanchard Rd	(3.9)	<0.0	<0.0	<0.1	<0.1	<0.1
Between Monterey Road and Crowner Ave	(0.1)	<0.0	<0.0	1.8	<0.1	<0.1
Near Monterey Road and California Ave	1.2	<0.1	<0.1	3.7	<0.1	<0.1
Near Monterey Road and Ronan Ave	(0.2)	<0.0	<0.0	0.9	<0.1	<0.1
Near Monterey Road and Leavesley Rd	0.0	<0.0	<0.0	0.8	<0.1	<0.1
Near Monterey Road and 1st St	1.8	<0.1	<0.1	3.3	<0.1	<0.1
Near Monterey Road and W 10th St	1.3	<0.1	<0.1	2.3	<0.1	<0.1
Repositions under Alternative 3 Only						
Near Pacheco Court and Frazier Lake Rd	4.9	<0.1	<0.1	5.0	<0.1	<0.1
Repositions under Alternative 4 Only						
Near Chestnut Street and Asbury St	(17.2)	<0.0	<0.0	5.2	<0.1	<0.1
Near Harrison Street and Fuller Ave	(3.9)	<0.0	<0.0	5.6	<0.1	<0.1
Near Cross Way and Northern Road	(1.9)	<0.0	<0.0	0.6	<0.1	<0.1
End of Promme Court	(3.4)	<0.0	<0.0	0.8	<0.1	<0.1
Near Prindiville Road and Urshan Way	(0.6)	<0.0	<0.0	2.4	<0.1	<0.1
Near Madrone Ave and Dougherty Ave	(0.2)	<0.0	<0.0	1.9	<0.1	<0.1
Near Butterfield Blvd and E Dunne Ave	(0.7)	<0.0	<0.0	0.1	<0.1	<0.1
End of Sister City Way	(0.6)	<0.0	<0.0	0.4	<0.1	<0.1
Near Garlic Farms Dr and Trave Park Cir	(0.3)	<0.0	<0.0	0.4	<0.1	<0.1
Near Bolsa Rd	0.4	<0.1	<0.1	1.1	<0.1	<0.1

General Location	Change in Exposure with the Freight Relocation relative to Exposure under Existing Conditions[1]			Change in Exposure with the Freight Relocation relative to Exposure under No Project Conditions[2]		
	Cancer	Chronic HI	$PM_{2.5}$ ($\mu g/m^3$)	Cancer	Chronic HI	$PM_{2.5}$ ($\mu g/m^3$)
Near West Julian St and North Montgomery St	(12.8)	<0.0	<0.0	8.4	<0.1	<0.1
Threshold	**10.0**	**1.0**	**0.3**	**10.0**	**1.0**	**0.3**

Sources: McGuire 2017–2018; Winkel 2018; PCJPB 2015; USEPA 2009
(Parentheses) indicate negative values
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
$\mu g/m^3$ = micrograms per cubic meter
BAAQMD = Bay Area Air Quality Management District
[1] Existing conditions reflects the risks that would occur if the freight tracks were not relocated and exposure to emissions began in 2015.
[2] No Project conditions reflects the risks that would occur if the freight tracks were not relocated and exposure to emissions began in 2022.

7.8.2 Stations and Maintenance Facilities

The Downtown Gilroy and San Jose Diridon Stations would have emergency generators for use in the event of a power outage. The generators would comply with the permitting requirements specified in BAAQMD Regulation 2, Rule 5 and SJVAPCD Rule 2201, which prohibit their operation if cancer or acute hazards exceed air district thresholds. Regulation 2, Rule 5 does not establish any permit restrictions on $PM_{2.5}$ concentrations in the BAAQMD. Accordingly, analysts only estimated $PM_{2.5}$ exhaust concentrations from emergency generator testing because cancer and hazards would be below air district thresholds.

The East Gilroy Station would also operate an emergency generator and would serve diesel-powered buses under 2029 conditions (by 2040, all buses will be net zero emissions per state regulation). Health risks from transit buses are not subject to permit restrictions, and as such, the analysis of health risks at the East Gilroy Station evaluates cancer risk, hazards, and $PM_{2.5}$ concentrations.

The MOWF would operate an emergency generator and use diesel-powered off-road equipment, vehicles, and locomotives to support maintenance and repair activities. The analysis of cancer and noncancer health risks, as well as $PM_{2.5}$ concentrations, at the MOWF includes emissions from all these sources.

Table 7-21 shows the results of health risks analysis at the project stations and the East Gilroy MOWF.[24,25] Health risks and maximum $PM_{2.5}$ concentrations would be less than BAAQMD's health risk thresholds of significance under all alternatives.

[24] The Los Banos MOWS is not analyzed as this facility would be located within the SJVAPCD and the SJVAPCD does not have a $PM_{2.5}$ threshold. SJVAPCD does not issue permits for projects that create a significant cancer or noncancer health risk (SJVAPCD Rule 2201). Accordingly, cancer and noncancer health risks from generator operation at the Los Banos MOWS would be less than SJVAPCD's health risk thresholds.

[25] There are no receptors within 1,000 feet of the South Gilroy MOWF. Accordingly, a health risk assessment is not required, consistent with BAAQMD (2017a) guidance.

Table 7-21 Maximum Health Risks and $PM_{2.5}$ Concentrations from Project Station and MOWF Operation[1]

Location/Condition	Cancer	Chronic HI	Maximum $PM_{2.5}$ Concentration ($\mu g/m^3$)
2015 Existing/2029 and 2040 No Project[2]			
San Jose Diridon Station	<10	<1.0	<0.1
Downtown Gilroy Station	<10	<1.0	<0.1
2029/2040 Plus Project[3]			
San Jose Diridon Station (Alternatives 1, 2, 3, 4)[4]	<10	<1.0	<0.1
Downtown Gilroy Station (Alternatives 1, 2, 4)[5]	<10	<1.0	<0.1
East Gilroy Station (Alternative 3)	<1	<0.1	<0.1
East Gilroy MOWF (Alternative 3)[7]	3	<0.1	<0.1
Project vs. Existing and No Project Conditions[6]			
San Jose Diridon Station (Alternatives 1, 2, 3, 4)[4]	<10	<1.0	<0.1
Downtown Gilroy Station (Alternatives 1, 2, 4)[5]	<10	<1.0	<0.1
East Gilroy Station (Alternative 3)	<1	<0.1	<0.1
East Gilroy MOWF (Alternative 3)[7]	3	<0.1	<0.1
Threshold	**10**	**1.0**	**0.3**

Source: AERMOD version 18081; HARP 2 version 18159; OEHHA 2015; McGuire 2017–2018, Burton 2019 pers. comm.
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
$\mu g/m^3$ = micrograms per cubic meter
MOWF = maintenance of way facility
MOWS = maintenance of way siding
SJVAPCD = San Joaquin Valley Air Pollution Control District
[1] The Los Banos MOWS is not analyzed because this facility would be located within the SJVAPCD and the SJVAPCD does not have a $PM_{2.5}$ threshold. SJVAPCD does not issue permits for projects that create a significant cancer or non-cancer health risk.
[2] The San Jose Diridon and Downtown Gilroy Stations were assumed to operate one emergency generator under existing conditions. The East Gilroy Station does not exist under existing conditions and, as such, existing emissions are assumed to be zero.
[3] The expanded San Jose Diridon Station were assumed to operate three emergency generators with implementation of the project. The Downtown Gilroy Station was assumed to operate two emergency generators under project conditions. The East Gilroy Station and MOWF were assumed to operate one generator under project conditions.
[4] There would be no difference in operational emissions or health risk between the aerial and at-grade options.
[5] There would be no difference in operational emissions or health risk between the aerial and embankment options.
[6] Represents the net concentration effect of the project (i.e., the difference in between the existing/no project and the project condition)
[7] There are no receptors within 1,000 feet of the South Gilroy MOWF. Accordingly, a health risk assessment is not required, consistent with BAAQMD (2017a) guidance.

7.9 Construction Mass Emissions Analysis

7.9.1 Total Emissions

Construction activities associated with the project would result in criteria pollutant emissions. This section quantifies and analyzes mass emissions generated by construction. All tables presented in this and subsequent sections reflect the impact of the SAFE Vehicles Rule (CARB 2019).

Construction activities expected to occur during the same calendar year are summarized based on the construction schedule presented in Appendix C. Analysts compared project emissions to the General Conformity *de minimis* emission thresholds on a calendar-year basis; consequently, emissions can exceed thresholds for any calendar year in which emissions occur. No future natural growth or other non-HSR-related improvements are included in project construction effects. Construction emissions for the project alternatives over the entire construction period are shown in Table 7-22. The following sections present detailed tables of emissions by year for each project alternative.

Table 7-22 Total Construction-Related Project Criteria Pollutant Emissions[1]

Alternative/Location	Total Tons									
					PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[2]	Exhaust	Dust	Total[2]
Alternative 1										
BAAQMD	28	403	965	3	3	220	223	3	47	50
MBARD	2	29	88	<1	<1	17	17	<1	4	4
SJVAPCD	31	313	1,076	3	3	119	122	3	26	29
Total emissions	*62*	*745*	*2,129*	*6*	*6*	*356*	*362*	*6*	*76*	*83*
Alternative 2										
BAAQMD	37	600	1,231	4	4	323	326	4	72	75
MBARD	4	59	131	<1	<1	32	33	<1	7	8
SJVAPCD	31	313	1,076	3	3	119	122	3	26	29
Total emissions	*72*	*972*	*2,438*	*7*	*7*	*473*	*481*	*7*	*105*	*112*
Alternative 3										
BAAQMD	33	432	1,143	3	3	228	232	3	49	52
MBARD	3	30	101	<1	<1	16	16	<1	4	4
SJVAPCD	31	313	1,076	3	3	119	122	3	26	29
Total emissions	*67*	*775*	*2,320*	*6*	*7*	*363*	*370*	*7*	*78*	*85*
Alternative 4										
BAAQMD	34	644	1,120	4	4	364	368	4	83	86
MBARD	4	68	118	<1	<1	41	41	<1	10	10
SJVAPCD	31	313	1,076	3	3	119	122	3	26	29
Total emissions	*69*	*1,025*	*2,313*	*7*	*7*	*524*	*531*	*7*	*118*	*125*

Sources: Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

BAAQMD = Bay Area Air Quality Management District
CO = carbon monoxide
MBARD = Monterey Bay Air Resources District
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_2 = sulfur dioxide
VOC = volatile organic compound

[1] Table presents total emissions in tons over the course of complete construction (2022–2028). Emissions results include implementation of AQ-IAMF#1 through AQ-IAMF#6, as described in Section 2.3.
[2] Total PM_{10} and $PM_{2.5}$ emissions consist of exhaust and fugitive dust emissions.

7.9.2 Alternative 1 Yearly and Daily Emissions

Table 7-23, Table 7-24, and Table 7-25 show emissions from Alternative 1 in the BAAQMD, MBARD, and SJVAPCD regions, respectively, in tons per year and pounds per day. Emissions are shown for each year that construction would occur and include the major construction activities discussed in Section 6.4, Construction Emission Calculations. The tables also show applicable General Conformity and CEQA thresholds within the BAAQMD, MBARD, and SJVAPCD, respectively, and indicate whether project construction emissions would exceed these General Conformity and CEQA thresholds.

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Table 7-23 Construction-Related Criteria Pollutant Emissions under Alternative 1 in the Bay Area Air Quality Management District[1]

	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
Activities	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	100	100	-	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-
BAAQMD CEQA threshold	-	-	-	-	-	-	-	-	-	-	54	54	-	-	82	-	-	54	-	-
2022																				
Emissions	4	50	145	<1	<1	28	28	<1	6	6	42	624	1,396	5	4	308	312	4	66	70
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2023																				
Emissions	6	79	200	1	1	46	46	1	10	10	63	967	2,216	7	6	590	596	6	128	134
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2024																				
Emissions	7	106	245	1	1	65	66	1	14	15	61	961	2,154	7	6	580	586	6	126	131
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2025																				
Emissions	6	85	205	1	1	48	49	1	10	11	64	1,158	2,025	7	10	537	542	10	111	116
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2026																				
Emissions	3	37	89	<1	<1	18	18	<1	4	4	32	369	1,146	3	3	197	200	3	42	45
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2027																				
Emissions	2	35	53	<1	<1	12	12	<1	2	3	41	375	546	8	12	120	123	12	25	33
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2028																				
Emissions	1	11	28	<1	<1	3	3	<1	1	1	33	330	707	7	10	108	112	10	23	27
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

BAAQMD = Bay Area Air Quality Management District
CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NAAQS = national ambient air quality standards
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SFBAAB = San Francisco Bay Area Air Basin
SO_2 = sulfur dioxide
USEPA = U.S. Environmental Protection Agency
VOC = volatile organic compound
O_3 = ozone
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SFBAAB. The project vicinity is considered a marginal nonattainment area for the O_3 NAAQS and a moderate nonattainment area for the $PM_{2.5}$ NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.

Table 7-24 Construction-Related Criteria Pollutant Emissions under Alternative 1 in Monterey Bay Air Resources District[1]

Activities	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBARD CEQA threshold	-	-	-	-	-	-	-	-	-	-	-[5]	-[5]	-	-	-	-	82	-	-	-
2022																				
Emissions	1	7	17	<1	<1	4	4	<1	1	1	5	93	176	1	1	46	46	1	10	10
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2023																				
Emissions	1	6	19	<1	<1	4	4	<1	1	1	4	66	157	<1	<1	39	39	<1	8	8
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2024																				
Emissions	<1	5	18	<1	<1	3	3	<1	1	1	4	43	148	<1	<1	29	29	<1	6	7
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2025																				
Emissions	<1	4	15	<1	<1	3	3	<1	1	1	4	55	136	<1	<1	27	27	<1	6	6
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2026																				
Emissions	<1	2	10	<1	<1	2	2	<1	<1	<1	3	28	105	<1	<1	19	20	<1	4	5
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2027																				
Emissions	<1	3	6	<1	<1	1	1	<1	<1	<1	2	69	67	<1	<1	16	16	<1	4	4
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2028																				
Emissions	<1	1	3	<1	<1	<1	<1	<1	<1	<1	3	48	94	<1	<1	15	16	<1	3	4
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; MBUAPCD 2008; Scholz 2018

CEQA = California Environmental Quality Act
CO = carbon monoxide
MBARD = Monterey Bay Air Resources District
NCCAB = North Central Coast Air Basin
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
NO_X = nitrogen oxide
ROG = reactive organic gases
SO_2 = sulfur dioxide
VOC = volatile organic compound
O_3 = ozone
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The NCCAB is considered attainment for all criteria pollutants. As such, a general conformity analysis is not required, and there are no applicable *de minimis* thresholds.
[5] According to the MBARD CEQA guidelines, construction projects that temporarily emit precursors of ozone (i.e., ROG or NO_X) are accommodated in the emission inventories of state- and federally required air plans and would not have a significant impact on the attainment and maintenance of state or federal O_3 ambient air quality standards (MBUAPCD 2008).

Table 7-25 Construction-Related Criteria Pollutant Emissions under Alternative 1 in San Joaquin Valley Air Pollution Control District[1]

	Tons per year										Average Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
Activities	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	10	10	-	70	-	-	100	-	-	70	-	-	-	-	-	-	-	-	-	-
SJVAPCD CEQA threshold	10	10	100	27	-	-	15	-	-	15	100[5]	100[5]	100[5]	100[5]	-	-	100[5]	-	-	100[5]
2022																				
Emissions	6	42	218	1	1	18	18	1	4	5	51	348	1,789	4	4	145	149	4	35	40
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2023																				
Emissions	6	55	226	1	1	23	24	1	5	6	51	442	1,808	4	5	184	189	5	41	45
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2024																				
Emissions	6	56	220	1	1	23	23	1	5	5	50	450	1,763	4	4	180	185	4	39	44
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2025																				
Emissions	6	54	209	1	1	20	21	1	4	5	47	428	1,674	4	4	160	165	4	35	39
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2026																				
Emissions	4	45	131	<1	<1	17	17	<1	4	4	30	361	1,049	3	3	135	138	3	28	32
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2027																				
Emissions	2	50	49	<1	<1	16	17	<1	3	3	14	400	389	1	3	129	132	3	25	28
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2028																				
Emissions	1	10	22	<1	<1	2	2	<1	1	1	8	114	244	<1	2	25	27	2	6	8
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	No	-	-	No	No	Yes	Yes	-	-	-	No	-	-	No

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; SJVAPCD 2015a; Scholz 2018

AAQA = ambient air quality analysis
CAAQS = California Ambient Air Quality Standards
CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NAAQS = National Ambient Air Quality Standards
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold
O_3 = ozone

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the average emissions estimate during a single day of construction in each year. Average emissions are presented in SJVAPCD (rather than maximum emissions), consistent with (SJVAPCD 2015a) guidance for correct application of its 100-pound-per-day AAQA screening criteria.
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SJVAB. The project vicinity is considered an extreme nonattainment area for the O_3 NAAQS, a serious/moderate nonattainment area for the $PM_{2.5}$ NAAQS, and a serious maintenance area for the PM_{10} NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.
[5] The 100-pound-per-day threshold is a screening-level threshold to help determine whether increased emissions from a project will cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the threshold will not be in violation of CAAQS or NAAQS. Projects with emissions above the threshold would require an AAQA to confirm this conclusion (SJVAPCD 2015a).

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The emissions results demonstrated that construction of Alternative 1 would result in ROG and NO_X emissions that would exceed the BAAQMD's CEQA thresholds, as well as SJVAPCD's annual CEQA thresholds for NO_X, CO, and PM_{10}. Construction of Alternative 1 would also exceed the general conformity *de minimis* NO_X thresholds in the SFBAAB and SJVAB.

Construction emissions would also exceed SJVAPCD's daily AAQA screening trigger for NO_X, CO, and PM_{10}. Localized effects from these pollutants are evaluated based on the air dispersion modeling of ambient air concentrations. Section 7.11 presents the modeled ambient air concentrations relative to the NAAQS and CAAQS.

Project features (AQ-IAMF#1 through AQ-IAMF#6) would minimize air quality effects through application of best available on-site controls to reduce construction emissions. However, even with these measures, exceedances of air district and general conformity *de minimis* thresholds would still occur. AQ-MM#1 identifies additional best management practices for reducing on-site fugitive dust emissions, consistent with BAAQMD (2017a) guidance. AQ-MM#2 requires that a minimum of 25 percent of all light-duty on-road vehicles use ZE or NZE technology. The measure also includes ZE and NZE goals for heavy-duty on-road trucks and off-road equipment. The commercial availability of future ZE and NZE off-road equipment and heavy-duty vehicles in the California market is uncertain but expected to improve given technological advancements and regulations. Therefore, in addition to the minimum light-duty on-road vehicle ZE and NZE requirement of 25 percent, AQ-MM#2 includes ZE and NZE goals for off-road equipment and heavy-duty vehicles. ZE and NZE equipment and vehicles do not directly generate, or generate only minimal criteria pollutants, and thus AQ-MM#2 will reduce the severity of this impact. However, because the penetration of ZE and NZE off-road equipment and heavy-duty vehicles in future construction fleets is unknown, emissions reductions achieved by this measure cannot currently be quantified.

ROG and NO_X emissions would be offset in the BAAQMD through the purchase of offsets (AQ-MM#3: Offset Project Construction Emissions in the San Francisco Bay Area Air Basin) to below BAAQMD thresholds or net zero (as required by the General Conformity regulation). ROG, NO_X, and PM emissions would be fully offset (i.e., to net zero) within the SJVAPCD, pursuant to the Authority's MOU with the air district for the HSR subsections within the SJVAB (AQ-MM#4: Offset Project Construction Emissions in the San Joaquin Valley Air Basin). Pursuant to SJVAPCD's GAMAQI, emissions offsets procured through AQ-MM#4 cannot be used to mitigate CO impacts. Accordingly, CO emissions would remain above SJVAPCD's CEQA threshold even after implementation of all feasible mitigation.

7.9.3 Alternative 2 Yearly and Daily Emissions

Table 7-26, Table 7-27, and Table 7-28 show yearly emissions from Alternative 2 in the BAAQMD, MBARD, and SJVAPCD, respectively, in tons per year and pounds per day. Emissions are shown for each year that construction would occur and include the major construction activities discussed in Section 6.4. The tables also show applicable General Conformity and CEQA thresholds within the BAAQMD, MBARD, and SJVAPCD, respectively, and indicate whether project construction emissions would exceed these General Conformity and CEQA thresholds.

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Table 7-26 Construction-Related Criteria Pollutant Emissions under Alternative 2 in the Bay Area Air Quality Management District[1]

Activities	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	100	100	-	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-
BAAQMD CEQA threshold	-	-	-	-	-	-	-	-	-	-	54	54	-	-	82	-	-	54	-	-
2022																				
Emissions	6	76	192	1	1	41	41	1	9	10	54	773	1,770	5	5	417	422	5	94	98
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2023																				
Emissions	7	118	255	1	1	67	67	1	15	16	77	1,334	2,630	8	7	779	787	7	177	184
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2024																				
Emissions	9	155	304	1	1	92	93	1	21	21	75	1,325	2,558	8	7	768	775	7	174	181
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2025																				
Emissions	7	112	241	1	1	62	63	1	14	15	76	1,334	2,367	8	10	721	727	9	160	166
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2026																				
Emissions	4	56	125	<1	<1	28	29	<1	6	7	42	564	1,496	4	4	294	298	4	66	70
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2027																				
Emissions	3	69	77	<1	<1	28	29	<1	5	6	50	750	807	9	13	282	290	13	54	65
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2028																				
Emissions	1	14	38	<1	<1	4	5	<1	1	1	35	711	1,052	8	10	286	291	10	56	61
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-

Source: Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

NO_X = nitrogen oxide
O_3 = ozone
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
NAAQS = national ambient air quality standards
PM_{10} = particulate matter 10 microns or less in diameter
SFBAAB = San Francisco Bay Area Air Basin
SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold
BAAQMD = Bay Area Air Quality Management District
CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SFBAAB. The project vicinity is considered a marginal nonattainment area for the O_3 NAAQS and a moderate nonattainment area for the $PM_{2.5}$ NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.

Table 7-27 Construction-Related Criteria Pollutant Emissions under Alternative 2 in Monterey Bay Air Resources District[1]

Activities	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBARD CEQA threshold	-	-	-	-	-	-	-	-	-	-	-[5]	-[5]	-	-	-	-	82	-	-	-
2022																				
Emissions	1	12	26	<1	<1	6	6	<1	1	2	8	121	244	1	1	65	66	1	31	32
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2023																				
Emissions	1	11	26	<1	<1	6	7	<1	2	2	7	107	225	1	1	60	61	1	29	29
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2024																				
Emissions	1	10	24	<1	<1	6	6	<1	1	1	6	81	201	1	1	49	49	1	25	25
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2025																				
Emissions	1	9	23	<1	<1	5	5	<1	1	1	5	96	185	1	1	47	47	1	24	24
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2026																				
Emissions	<1	6	16	<1	<1	3	3	<1	1	1	5	64	170	<1	<1	38	38	<1	19	20
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2027																				
Emissions	<1	11	11	<1	<1	4	4	<1	1	1	4	179	112	1	1	51	52	1	24	25
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2028																				
Emissions	<1	1	5	<1	<1	1	1	<1	<1	<1	5	132	158	1	1	49	50	1	22	23
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; MBUAPCD 2008; Scholz 2018

CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
MBARD = Monterey Bay Air Resources District
NCCAB = North Central Coast Air Basin
NO_X = nitrogen oxide
O_3 = ozone
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
ROG = reactive organic gases
SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The NCCAB is considered attainment for all criteria pollutants. As such, a general conformity analysis is not required, and there are no applicable *de minimis* thresholds.
[5] According to the MBARD CEQA guidelines, construction projects that temporarily emit precursors of O_3 (i.e., ROG or NO_X) are accommodated in the emission inventories of state- and federally required air plans and would not have a significant impact on the attainment and maintenance of state or federal O_3 ambient air quality standards (MBUAPCD 2008).

Table 7-28 Construction-Related Criteria Pollutant Emissions under Alternative 2 in San Joaquin Valley Air Pollution Control District[1]

Activities	Tons per year										Average Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	10	10	-	70	-	-	100	-	-	70	-	-	-	-	-	-	-	-	-	-
SJVAPCD CEQA threshold	10	10	100	27	-	-	15	-	-	15	100[5]	100[5]	100[5]	100[5]	-	-	100[5]	-	-	100[5]
2022																				
Emissions	6	42	218	1	1	18	18	1	4	5	51	348	1,789	4	4	145	149	4	35	40
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2023																				
Emissions	6	55	226	1	1	23	24	1	5	6	51	442	1,808	4	5	184	189	5	41	45
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2024																				
Emissions	6	56	220	1	1	23	23	1	5	5	50	450	1,763	4	4	180	185	4	39	44
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2025																				
Emissions	6	54	209	1	1	20	21	1	4	5	47	428	1,674	4	4	160	165	4	35	39
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2026																				
Emissions	4	45	131	<1	<1	17	17	<1	4	4	30	361	1,049	3	3	135	138	3	28	32
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2027																				
Emissions	2	50	49	<1	<1	16	17	<1	3	3	14	400	389	1	3	129	132	3	25	28
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2028																				
Emissions	1	10	22	<1	<1	2	2	<1	1	1	8	114	244	<1	2	25	27	2	6	8
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	No	-	-	No	No	Yes	Yes	-	-	-	No	-	-	No

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; SJVAPCD 2015a; Scholz 2018

AAQA = ambient air quality analysis
CAAQS = California Ambient Air Quality Standards
CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NAAQS = National Ambient Air Quality Standards
NO_X = nitrogen oxide
O_3 = ozone
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.

[2] Presents the average emissions estimate during a single day of construction in each year. Average emissions are presented in SJVAPCD (rather than maximum emissions), consistent with (SJVAPCD 2015a) guidance for correct application of its 100-pound-per-day AAQA screening criteria.

[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.

[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SJVAB. The project vicinity is considered an extreme nonattainment area for the O_3 NAAQS, a serious/moderate nonattainment area for the $PM_{2.5}$ NAAQS, and a serious maintenance area for the PM_{10} NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.

[5] The 100-pound-per-day threshold is a screening-level threshold to help determine whether increased emissions from a project will cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the threshold will not be in violation of CAAQS or NAAQS. Projects with emissions above the threshold would require an AAQA to confirm this conclusion (SJVAPCD 2015a).

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The emissions results demonstrated that construction of Alternative 2 would result in ROG and NO_X emissions that would exceed the BAAQMD's CEQA thresholds, as well as SJVAPCD's annual CEQA thresholds for NO_X, CO, and PM_{10}. Construction of Alternative 2 would also exceed the general conformity *de minimis* NO_X thresholds in the SFBAAB and SJVAB.

Construction emissions would also exceed SJVAPCD's daily AAQA screening trigger for NO_X, CO, and PM_{10}. Localized effects from these pollutants are evaluated based on the air dispersion modeling of ambient air concentrations. Section 7.11 presents the modeled ambient air concentrations relative to the NAAQS and CAAQS.

Project features (AQ-IAMF#1 through AQ-IAMF#6) would minimize air quality effects through application of best available on-site controls to reduce construction emissions. However, even with these measures, exceedances of air district and general conformity *de minimis* thresholds would still occur. AQ-MM#1 identifies additional best management practices for reducing on-site fugitive dust emissions, consistent with BAAQMD (2017a) guidance. AQ-MM#2 requires that a minimum of 25 percent of all light-duty on-road vehicles use ZE or NZE technology. The measure also includes ZE and NZE goals for heavy-duty on-road trucks and off-road equipment. The commercial availability of future ZE and NZE off-road equipment and heavy-duty vehicles in the California market is uncertain but expected to improve given technological advancements and regulations. Therefore, in addition to the minimum light-duty on-road vehicle ZE and NZE requirement of 25 percent, AQ-MM#2 includes ZE and NZE goals for off-road equipment and heavy-duty vehicles. ZE and NZE equipment and vehicles do not directly generate, or generate only minimal criteria pollutants, and thus AQ-MM#2 will reduce the severity of this impact. However, because the penetration of ZE and NZE off-road equipment and heavy-duty vehicles in future construction fleets is unknown, emissions reductions achieved by this measure cannot currently be quantified.

ROG and NO_X emissions would be offset in the BAAQMD through the purchase of offsets (AQ-MM#3) to below BAAQMD thresholds or net zero (as required by the General Conformity regulation). ROG, NO_X, and PM emissions would be fully offset (i.e., to net zero) within the SJVAPCD, pursuant to the Authority's MOU with the air district for the HSR subsections within the SJVAB (AQ-MM#4). Pursuant to SJVAPCD's GAMAQI, emissions offsets procured through AQ-MM#4 cannot be used to mitigate CO effects. Accordingly, CO emissions would remain above SJVAPCD's CEQA threshold even after implementation of all feasible mitigation.

7.9.4 Alternative 3 Yearly and Daily Emissions

Table 7-29, Table 7-30, and Table 7-31 show yearly emissions from Alternative 3 in the BAAQMD, MBARD, and SJVAPCD, respectively, in tons per year and pounds per day. Emissions are shown for each year that construction would occur and include the major construction activities discussed in Section 6.4. The tables also show applicable General Conformity and CEQA thresholds within the BAAQMD, MBARD, and SJVAPCD, respectively, and indicate whether project construction emissions would exceed these General Conformity and CEQA thresholds.

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Table 7-29 Construction-Related Criteria Pollutant Emissions under Alternative 3 in the Bay Area Air Quality Management District[1]

	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
Activities	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	100	100	-	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-
BAAQMD CEQA threshold	-	-	-	-	-	-	-	-	-	-	54	54	-	-	82	-	-	54	-	-
2022																				
Emissions	5	51	173	<1	<1	27	27	<1	6	6	46	514	1,602	4	4	277	281	4	59	63
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2023																				
Emissions	7	89	244	1	1	49	50	1	11	11	73	1,021	2,586	8	7	616	623	7	135	141
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2024																				
Emissions	8	114	293	1	1	68	69	1	15	15	71	1,012	2,511	8	7	602	609	6	131	138
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2025																				
Emissions	7	85	233	1	1	47	47	1	10	11	73	1,064	2,377	7	9	555	561	9	116	122
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2026																				
Emissions	3	41	116	<1	<1	19	19	<1	4	4	39	415	1,406	4	4	205	209	4	44	48
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2027																				
Emissions	2	41	55	<1	<1	15	15	<1	3	3	42	444	573	8	12	138	145	12	28	38
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2028																				
Emissions	1	12	30	<1	<1	3	4	<1	1	1	33	426	777	8	10	150	154	10	31	35
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-

Source: Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

BAAQMD = Bay Area Air Quality Management District
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NAAQS = national ambient air quality standards
NO_X = nitrogen oxide
O_3 = ozone
SFBAAB = San Francisco Bay Area Air Basin
SO_2 = sulfur dioxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
USEPA = U.S. Environmental Protection Agency
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.

[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities

[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.

[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SFBAAB. The project vicinity is considered a marginal nonattainment area for the O_3 NAAQS and a moderate nonattainment area for the $PM_{2.5}$ NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.

Table 7-30 Construction-Related Criteria Pollutant Emissions under Alternative 3 in Monterey Bay Air Resources District[1]

Activities	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBARD CEQA threshold	-	-	-	-	-	-	-	-	-	-	-[5]	-[5]	-	-	-	-	82	-	-	-
2022																				
Emissions	1	6	19	<1	<1	3	3	<1	1	1	5	63	181	1	<1	34	35	<1	7	8
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2023																				
Emissions	1	6	22	<1	<1	4	4	<1	1	1	5	63	177	1	<1	34	34	<1	7	8
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2024																				
Emissions	1	5	21	<1	<1	3	3	<1	1	1	5	46	169	<1	<1	27	27	<1	6	6
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2025																				
Emissions	<1	5	18	<1	<1	3	3	<1	1	1	4	59	161	1	<1	25	26	<1	6	6
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2026																				
Emissions	<1	3	12	<1	<1	2	2	<1	<1	<1	4	32	132	<1	<1	18	19	<1	4	4
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2027																				
Emissions	<1	4	6	<1	<1	2	2	<1	<1	<1	2	101	64	<1	1	23	23	<1	5	6
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2028																				
Emissions	<1	1	3	<1	<1	<1	<1	<1	<1	<1	3	66	92	<1	<1	21	21	<1	4	5
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; MBUAPCD 2008; Scholz 2018

CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NCCAB = North Central Coast Air Basin
MBARD = Monterey Bay Air Resources District
NO_X = nitrogen oxide
O_3 = ozone
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
ROG = SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities.
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The NCCAB is considered attainment for all criteria pollutants. As such, a general conformity analysis is not required. and there are no applicable *de minimis* thresholds.
[5] According to the MBARD CEQA guidelines, construction projects that temporarily emit precursors of O_3 (i.e., ROG or NO_X) are accommodated in the emission inventories of state- and federally required air plans and would not have a significant impact on the attainment and maintenance of state or federal ozone ambient air quality standards (MBUAPCD 2008).

Table 7-31 Construction-Related Criteria Pollutant Emissions under Alternative 3 in San Joaquin Valley Air Pollution Control District[1]

Activities	Tons per year										Average Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	10	10	-	70	-	-	100	-	-	70	-	-	-	-	-	-	-	-	-	-
SJVAPCD CEQA threshold	10	10	100	27	-	-	15	-	-	15	100[5]	100[5]	100[5]	100[5]	-	-	100[5]	-	-	100[5]
2022																				
Emissions	6	42	218	1	1	18	18	1	4	5	51	348	1,789	4	4	145	149	4	35	40
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2023																				
Emissions	6	55	226	1	1	23	24	1	5	6	51	442	1,808	4	5	184	189	5	41	45
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2024																				
Emissions	6	56	220	1	1	23	23	1	5	5	50	450	1,763	4	4	180	185	4	39	44
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2025																				
Emissions	6	54	209	1	1	20	21	1	4	5	47	428	1,674	4	4	160	165	4	35	39
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2026																				
Emissions	4	45	131	<1	<1	17	17	<1	4	4	30	361	1,049	3	3	135	138	3	28	32
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2027																				
Emissions	2	50	49	<1	<1	16	17	<1	3	3	14	400	389	1	3	129	132	3	25	28
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2028																				
Emissions	1	10	22	<1	<1	2	2	<1	1	1	8	114	244	<1	2	25	27	2	6	8
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	No	-	-	No	No	Yes	Yes	-	-	-	No	-	-	No

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; SJVAPCD 2015a; Scholz 2018

AAQA = ambient air quality analysis
CAAQS = California ambient air quality standards
CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NAAQS = national ambient air quality standards
NO_X = nitrogen oxide
O_3 = ozone
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the average emissions estimate during a single day of construction in each year. Average emissions are presented in SJVAPCD (rather than maximum emissions), consistent with (SJVAPCD 2015a) guidance for correct application of its 100-pound-per-AAQA screening criteria.
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SJVAB. The project vicinity is considered an extreme nonattainment area for the O_3 NAAQS, a serious/moderate nonattainment area for the $PM_{2.5}$ NAAQS, and a serious maintenance area for the PM_{10} NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.
[5] The 100-pound-per-day threshold is a screening-level threshold to help determine whether increased emissions from a project will cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the threshold will not be in violation of CAAQS or NAAQS. Projects with emissions above the threshold would require an AAQA to confirm this conclusion (SJVAPCD 2015a).

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The emissions results demonstrated that construction of Alternative 3 would result in ROG and NO_X emissions that would exceed the BAAQMD's CEQA thresholds, and NO_X, CO, and PM_{10} emissions that would exceed SJVAPCD's annual CEQA thresholds. Construction of Alternative 3 would also exceed the general conformity *de minimis* NO_X thresholds in the SFBAAB and SJVAB.

Construction emissions would also exceed SJVAPCD's daily AAQA screening trigger for NO_X, CO, and PM_{10}. Localized effects from these pollutants are evaluated based on the air dispersion modeling of ambient air concentrations. Section 7.11 presents the modeled ambient air concentrations relative to the NAAQS and CAAQS.

Project features (AQ-IAMF#1 through AQ-IAMF#6) would minimize air quality effects through application of all best available on-site controls to reduce construction emissions. However, even with these measures, exceedances of air district and general conformity *de minimis* thresholds would still occur. AQ-MM#1 identifies additional best management practices for reducing on-site fugitive dust emissions, consistent with BAAQMD (2017a) guidance. AQ-MM#2 requires that a minimum of 25 percent of all light-duty on-road vehicles use ZE or NZE technology. The measure also includes ZE and NZE goals for heavy-duty on-road trucks and off-road equipment. The commercial availability of future ZE and NZE off-road equipment and heavy-duty vehicles in the California market is uncertain but expected to improve given technological advancements and regulations. Therefore, in addition to the minimum light-duty on-road vehicle ZE and NZE requirement of 25 percent, AQ-MM#2 includes ZE and NZE goals for off-road equipment and heavy-duty vehicles. ZE and NZE equipment and vehicles do not directly generate, or generate only minimal criteria pollutants, and thus AQ-MM#2 will reduce the severity of this impact. However, because the penetration of ZE and NZE off-road equipment and heavy-duty vehicles in future construction fleets is unknown, emissions reductions achieved by this measure cannot currently be quantified.

ROG and NO_X emissions would be offset in the BAAQMD through the purchase of offsets (AQ-MM#3) to below BAAQMD thresholds or net zero (as required by the General Conformity regulation. ROG, NO_X, and PM emissions would be fully offset (i.e., to net zero) within the SJVAPCD, pursuant to the Authority's MOU with the air district for the HSR subsections within the SJVAB (AQ-MM#4). Pursuant to SJVAPCD's GAMAQI, emissions offsets procured through AQ-MM#4 cannot be used to mitigate CO effects. Accordingly, CO emissions would remain above SJVAPCD's CEQA threshold even after implementation of all feasible mitigation.

7.9.5 Alternative 4 Yearly and Daily Emissions

Table 7-32, Table 7-33, and Table 7-34 show yearly emissions from Alternative 4 in the BAAQMD, MBARD, and SJVAPCD, respectively, in tons per year and pounds per day. Emissions are shown for each year that construction would occur and include the major construction activities discussed in Section 6.4. The tables also show applicable General Conformity and CEQA thresholds within the BAAQMD, MBARD, and SJVAPCD, respectively, and indicate whether project construction emissions would exceed these General Conformity and CEQA thresholds.

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Table 7-32 Construction-Related Criteria Pollutant Emissions under Alternative 4 in the Bay Area Air Quality Management District[1]

Activities	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	100	100	-	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-
BAAQMD CEQA threshold	-	-	-	-	-	-	-	-	-	-	54	54	-	-	82	-	-	54	-	-
2022																				
Emissions	5	77	177	1	<1	47	47	<1	11	11	52	787	1,692	5	4	484	489	4	112	116
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2023																				
Emissions	7	113	222	1	1	69	70	1	16	17	64	1,191	2,137	7	6	727	732v	6	170	176
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2024																				
Emissions	8	156	272	1	1	95	95	1	22	23	74	1,363	2,358	8	7	824	831	7	188	195
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2025																				
Emissions	7	139	241	1	1	79	79	1	18	19	74	1,731	2,220	9	13	798	804	12	181	187
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	No	-	-	No	-	-
2026																				
Emissions	3	62	109	<1	<1	34	34	<1	8	8	42	686	1,442	4	4	392	396	4	90	94
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2027																				
Emissions	3	84	70	<1	<1	37	37	<1	7	7	45	900	997	9	12	378	383	12	72	79
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-
2028																				
Emissions	1	13	29	<1	<1	5	5	<1	1	1	31	754	743	7	10	341	344	10	65	68
Exceeds General Conformity threshold?	No	No	-	No	-	-	-	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	No	Yes	-	-	No	-	-	No	-	-

Source: Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Schotz 2018

BAAQMD = Bay Area Air Quality Management District
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NAAQS = national ambient air quality standards
NO_X = nitrogen oxide
O_3 = ozone
SFBAAB = San Francisco Bay Area Air Basin
SO_2 = sulfur dioxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
USEPA = U.S. Environmental Protection Agency
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.

[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities

[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.

[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SFBAAB. The project vicinity is considered a marginal nonattainment area for the O_3 NAAQS and a moderate nonattainment area for the $PM_{2.5}$ NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.

Table 7-33 Construction-Related Criteria Pollutant Emissions under Alternative 4 in Monterey Bay Air Resources District[1]

Activities	Tons per year										Maximum Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBARD CEQA threshold	-	-	-	-	-	-	-	-	-	-	-[5]	-[5]	-	-	-	-	82	-	-	-
2022																				
Emissions	1	12	23	<1	<1	7	7	<1	2	2	7	123	229	1	1	77	78	1	18	19
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2023																				
Emissions	1	12	25	<1	<1	8	8	<1	2	2	6	118	212	1	1	74	74	1	17	18
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2024																				
Emissions	1	11	23	<1	<1	8	8	<1	2	2	6	96	190	1	1	62	63	1	15	16
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2025																				
Emissions	1	11	21	<1	<1	7	7	<1	2	2	5	111	175	1	1	60	61	1	15	15
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2026																				
Emissions	<1	7	13	<1	<1	4	4	<1	1	1	4	84	153	<1	<1	54	55	<1	13	13
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2027																				
Emissions	<1	14	9	<1	<1	6	6	<1	1	1	5	200	150	1	1	66	67	1	13	14
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-
2028																				
Emissions	<1	1	4	<1	<1	1	1	<1	<1	<1	3	171	102	1	1	62	63	1	13	13
Exceeds General Conformity threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	-	-

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; MBUAPCD 2008; Scholz 2018

CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NCCAB = North Central Coast Air Basin
MBARD = Monterey Bay Air Resources District
NO_X = nitrogen oxide
O_3 = ozone
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
ROG = SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.
[2] Presents the highest emissions estimate during a single day of construction in each year, based on concurrent construction activities.
[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.
[4] The NCCAB is considered attainment for all criteria pollutants. As such, a general conformity analysis is not required. and there are no applicable *de minimis* thresholds.
[5] According to the MBARD CEQA guidelines, construction projects that temporarily emit precursors of O_3 (i.e., ROG or NO_X) are accommodated in the emission inventories of state- and federally required air plans and would not have a significant impact on the attainment and maintenance of state or federal ozone ambient air quality standards (MBUAPCD 2008).

Table 7-34 Construction-Related Criteria Pollutant Emissions under Alternative 4 in San Joaquin Valley Air Pollution Control District[1]

Activities	Tons per year										Average Pounds per day[2]									
					PM_{10}			$PM_{2.5}$							PM_{10}			$PM_{2.5}$		
	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]	VOC	NO_X	CO	SO_2	Exhaust	Dust	Total[3]	Exhaust	Dust	Total[3]
Applicable *de minimis* level[4]	10	10	-	70	-	-	100	-	-	70	-	-	-	-	-	-	-	-	-	-
SJVAPCD CEQA threshold	10	10	100	27	-	-	15	-	-	15	100[5]	100[5]	100[5]	100[5]	-	-	100[5]	-	-	100[5]
2022																				
Emissions	6	42	218	1	1	18	18	1	4	5	51	348	1,789	4	4	145	149	4	35	40
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2023																				
Emissions	6	55	226	1	1	23	24	1	5	6	51	442	1,808	4	5	184	189	5	41	45
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2024																				
Emissions	6	56	220	1	1	23	23	1	5	5	50	450	1,763	4	4	180	185	4	39	44
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2025																				
Emissions	6	54	209	1	1	20	21	1	4	5	47	428	1,674	4	4	160	165	4	35	39
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2026																				
Emissions	4	45	131	<1	<1	17	17	<1	4	4	30	361	1,049	3	3	135	138	3	28	32
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	Yes	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2027																				
Emissions	2	50	49	<1	<1	16	17	<1	3	3	14	400	389	1	3	129	132	3	25	28
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	Yes	-	-	No	No	Yes	Yes	-	-	-	Yes	-	-	No
2028																				
Emissions	1	10	22	<1	<1	2	2	<1	1	1	8	114	244	<1	2	25	27	2	6	8
Exceeds General Conformity threshold?	No	Yes	-	No	-	-	No	-	-	No	-	-	-	-	-	-	-	-	-	-
Exceeds CEQA threshold?	No	Yes	No	No	-	-	No	-	-	No	No	Yes	Yes	-	-	-	No	-	-	No

Sources: Trinity Consultants 2016; USEPA 1998, 2006b, 2009, 2011; SJVAPCD 2015a; Scholz 2018

AAQA = ambient air quality analysis
CAAQS = California ambient air quality standards
CEQA = California Environmental Quality Act
CO = carbon monoxide
IAMF = impact avoidance and minimization feature
NAAQS = national ambient air quality standards
NO_X = nitrogen oxide
O_3 = ozone
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_2 = sulfur dioxide
VOC = volatile organic compound
- = no threshold

[1] Emissions results include implementation of air quality IAMFs, as described in Section 2.3.

[2] Presents the average emissions estimate during a single day of construction in each year. Average emissions are presented in SJVAPCD (rather than maximum emissions), consistent with (SJVAPCD 2015a) guidance for correct application of its 100-pound-per-AAQA screening criteria.

[3] Total PM_{10} and $PM_{2.5}$ emissions consist of the exhaust and fugitive dust emissions. Annual values may not add due to rounding. Daily results may not add because the table presents maximum emissions results for each individual pollutant component. For example, the maximum PM exhaust emissions may not occur on the same day as the maximum total dust emissions.

[4] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the project vicinity in the SJVAB. The project vicinity is considered an extreme nonattainment area for the O_3 NAAQS, a serious/moderate nonattainment area for the $PM_{2.5}$ NAAQS, and a serious maintenance area for the PM_{10} NAAQS. Although the project vicinity is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.

[5] The 100-pound-per-day threshold is a screening-level threshold to help determine whether increased emissions from a project will cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the threshold will not be in violation of CAAQS or NAAQS. Projects with emissions above the threshold would require an AAQA to confirm this conclusion (SJVAPCD 2015a).

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The emissions results demonstrated that construction of Alternative 4 would result in ROG and NO_X emissions that would exceed the BAAQMD's CEQA thresholds, as well as SJVAPCD's annual CEQA thresholds for NO_X, CO, and PM_{10}. Construction of Alternative 4 would also exceed the general conformity *de minimis* NO_X thresholds in the SFBAAB and SJVAB.

Construction emissions would also exceed SJVAPCD's daily AAQA screening trigger for NO_X, CO, and PM_{10}. Localized effects from these pollutants are evaluated based on the air dispersion modeling of ambient air concentrations. Section 7.11 presents the modeled ambient air concentrations relative to the NAAQS and CAAQS.

Project features (AQ-IAMF#1 through AQ-IAMF#6) would minimize air quality effects through application of all best available on-site controls to reduce construction emissions. However, even with these measures, exceedances of air district and general conformity *de minimis* thresholds would still occur. AQ-MM#1 identifies additional best management practices for reducing on-site fugitive dust emissions, consistent with BAAQMD (2017a) guidance. AQ-MM#2 requires that a minimum of 25 percent of all light-duty on-road vehicles use ZE or NZE technology. The measure also includes ZE and NZE goals for heavy-duty on-road trucks and off-road equipment. The commercial availability of future ZE and NZE off-road equipment and heavy-duty vehicles in the California market is uncertain but expected to improve given technological advancements and regulations. Therefore, in addition to the minimum light-duty on-road vehicle ZE and NZE requirement of 25 percent, AQ-MM#2 includes ZE and NZE goals for off-road equipment and heavy-duty vehicles. ZE and NZE equipment and vehicles do not directly generate, or generate only minimal criteria pollutants, and thus AQ-MM#2 will reduce the severity of this impact. However, because the penetration of ZE and NZE off-road equipment and heavy-duty vehicles in future construction fleets is unknown, emissions reductions achieved by this measure cannot currently be quantified.

ROG and NO_X emissions would be offset in the BAAQMD through the purchase of offsets (AQ-MM#3) to below BAAQMD or net zero (as required by the General Conformity regulation). ROG, NO_X, and PM emissions would be fully offset (i.e., to net zero) within the SJVAPCD, pursuant to the Authority's MOU with the air district for the HSR subsections within the SJVAB (AQ-MM#4). Pursuant to SJVAPCD's GAMAQI, emissions offsets procured through AQ-MM#4 cannot be used to mitigate CO effects. Accordingly, CO emissions would remain above SJVAPCD's CEQA threshold even after implementation of all feasible mitigation.

7.10 Construction Health Risk Assessment

During construction, sensitive receptors (e.g., schools, residences, and health care facilities) could be exposed to increased concentrations of TAC, such as DPM, that may present increased cancer risks and other health hazards. This section reports and identifies the health risk from the emissions generated by construction.

The analysis considers both acute and chronic noncancer health hazards and increased cancer risk for each project alternative and subsection. Acute risks are based on the maximum daily emissions that could occur across all calendar years. Chronic health risks are based on the maximum annual emissions from all calendar years. Cancer risk is defined as the predicted risk of cancer (unitless) over a lifetime and is expressed as chances per million persons exposed.

DPM is the primary TAC released from construction activities. The modeled DPM concentrations were used in determining the total exposure dose and associated health effect. Specific details of the air dispersion modeling and HRA are provided in Appendix E.

Tables 7-35 through 7-37 present the results of the HRA within the BAAQMD, MBARD, and SJVAPCD, respectively. Maximum predicted risks for each subsection are compared to the local air district significance criteria and indicate no air district risk criteria would be exceeded for any of the four project alternatives. The results represent the highest modeled risk at a receptor location from combined construction of all features (e.g., at grade, viaduct). Consistent with BAAQMD guidance, Table 7-35 also presents the maximum incremental $PM_{2.5}$ concentration generated by project construction. The tables include implementation of AQ-IAMF#1 through AQ-IAMF#6.

Table 7-35 Cancer, Noncancer, and $PM_{2.5}$ Concentration Health Risks Associated with Construction of Alternatives 1, 2, 3, and 4 in the Bay Area Air Quality Management District[1]

Alternative/Subsection	Cancer (per million)[2]	Chronic HI[3]	Acute HI[3]	$PM_{2.5}$ (µg/m³)
Alternative 1				
San Jose Diridon Station Approach	3.8	<0.1	0.2	<0.1
Monterey Corridor	4.8	<0.1	0.1	<0.1
Morgan Hill and Gilroy	2.7	<0.1	0.4	<0.1
Pacheco Pass	0.6	<0.1	0.4	<0.1
Alternative 2				
San Jose Diridon Station Approach	3.9	<0.1	0.2	<0.1
Monterey Corridor	5.0	<0.1	0.1	<0.1
Morgan Hill and Gilroy	4.6	<0.1	0.3	<0.1
Pacheco Pass	0.6	<0.1	0.4	<0.1
Alternative 3				
San Jose Diridon Station Approach	3.9	<0.1	0.2	<0.1
Monterey Corridor	2.7	<0.1	0.4	<0.1
Morgan Hill and Gilroy	9.4	<0.1	0.1	<0.1
Pacheco Pass	0.6	<0.1	0.4	<0.1
Alternative 4				
San Jose Diridon Station Approach	5.5	<0.1	0.1	<0.1
Monterey Corridor	6.1	<0.1	0.2	<0.1
Morgan Hill and Gilroy	2.6	<0.1	0.4	<0.1
Pacheco Pass	0.6	<0.1	0.4	<0.1
Threshold	**10.0**	**1.0**	**1.0**	**0.3**

Sources: AERMOD version 18081; OEHHA 2015; HARP 2 version 18159

HI = Hazard Indices; µg/m³ = micrograms per cubic meter; NO_X = nitrogen oxide; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter; NO_2 = nitrogen dioxide

[1] Only the highest modeled off-site risk is presented for each subsection. The reported risk includes effects from combined construction of all features (e.g., at grade, viaduct, concrete batch plants) in each subsection. Refer to Appendix E for individual risk contributions.

[2] Cancer risk represents the incremental increase in the number of cancers in a population of one million. Risks are cumulative of inhalation, dermal, soil, mother's milk, and crop pathways.

[3] HI are shown by pollutant contributions to the most affected organ system (respiratory). All NO_2 risks assume an 80% ambient ratio to NO_X concentrations.

Table 7-36 Cancer and Noncancer Health Risks Associated with Construction of Alternatives 1, 2, 3, and 4 in the Monterey Bay Air Resources District[1]

Alternative/Subsection	Cancer (per million)[2]	Chronic HI[3]	Acute HI[3]
Alternative 1			
Morgan Hill and Gilroy	2.7	<0.1	0.4
Alternative 2			
Morgan Hill and Gilroy	4.6	<0.1	0.3
Alternative 3			
Morgan Hill and Gilroy	9.4	<0.1	0.1
Alternative 4			
Morgan Hill and Gilroy	2.6	<0.1	0.4
Threshold	**10.0**	**1.0**	**1.0**

Sources: AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
HI = Hazard Indices
µg/m^3 = micrograms per cubic meter
NO_2 = nitrogen dioxide
NO_X = nitrogen oxide
[1] Only the highest modeled off-site risk is presented for each subsection. The reported risk includes effects from combined construction of all features (e.g., at grade, viaduct, concrete batch plants) in each subsection. Refer to Appendix E for individual risk contributions.
[2] Cancer risk represents the incremental increase in the number of cancers in a population of one million. Risks are cumulative of inhalation, dermal, soil, mother's milk, and crop pathways.
[3] HI are shown by pollutant contributions to the most affected organ system (respiratory). All NO_2 risks assume an 80% ambient ratio to NO_X concentrations.

Table 7-37 Excess Cancer and Noncancer Health Risks Associated with Construction of Alternatives 1, 2, 3, and 4 in the San Joaquin Valley Air Pollution Control District[1]

Alternative/Subsection	Cancer (per million)[2]	Chronic HI[3]	Acute HI[3]
Alternative 1			
Pacheco Pass	0.6	<0.1	0.4
San Joaquin Valley	5.0	<0.1	0.1
Alternative 2			
Pacheco Pass	0.6	<0.1	0.4
San Joaquin Valley	5.0	<0.1	0.1
Alternative 3			
Pacheco Pass	0.6	<0.1	0.4
San Joaquin Valley	5.0	<0.1	0.1
Alternative 4			
Pacheco Pass	0.6	<0.1	0.4
San Joaquin Valley	5.0	<0.1	0.1
Threshold	**20.0**	**1.0**	**1.0**

Sources: AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
HI = Hazard Indices
µg/m^3 = micrograms per cubic meter
NO_2 = nitrogen dioxide
NO_X = nitrogen oxide
[1] Only the highest modeled off-site risk is presented for each subsection. The reported risk includes effects from combined construction of all features (e.g., at grade, viaduct) in each subsection. Refer to Appendix E for individual risk contributions.
[2] Cancer risk represents the incremental increase in the number of cancers in a population of one million. Risks are cumulative of inhalation, dermal, soil, mother's milk, and crop pathways.
[3] HI are shown by pollutant contributions to the most affected organ system (respiratory). All NO_2 risks assume an 80% ambient ratio to NO_X concentrations.

7.11 Other Localized Construction Effects[26]

Construction emissions have the potential to cause elevated criteria pollutant concentrations. These elevated concentrations may cause or contribute to exceedances of the NAAQS and CAAQS. This section reports and identifies the criteria air pollutant concentrations from the emissions generated by construction.

Background pollutant concentrations vary by location along the alignment. Table 7-38 reports the background concentrations by pollutant and applicable averaging period for three locations within the RSA. The ambient air quality standards are provided for reference. Existing violations of the standards are shown in bold.

Tables 7-39 through 7-46 present the estimated maximum hourly (< 24 hours) and daily concentrations relative to the CAAQS and NAAQS for Alternatives 1, 2, 3, and 4. Tables 7-47 through 7-50 present the estimated maximum annual concentrations. The tables present both the incremental project and total pollutant concentration; only the total pollutant concentration, which reflects the incremental project contribution plus the background concentration, is compared with the CAAQS and NAAQS to determine if construction would cause an ambient air quality violation.[27]

As shown in Table 7-38, background concentrations of PM_{10} and $PM_{2.5}$ along most of the project already exceed hourly, daily, and annual $PM_{2.5}$ and PM_{10} ambient air quality standards. Table 7-51 compares the incremental project increase in PM concentrations within these areas with the applicable USEPA significant impact levels (SIL)[28] to analyze the potential for the project to worsen existing $PM_{2.5}$ and PM_{10} violations.

All tables include implementation of AQ-IAMF#1 through AQ-IAMF#6. However, because the penetration of ZE and NZE off-road equipment and heavy-duty vehicles in future construction fleets is unknown, emissions reductions achieved by AQ-MM#2 cannot currently be quantified or included in the analysis.

[26] Refinements were made to the particulate matter mass emissions inventory to more comprehensively capture emissions reductions that will be achieved through implementation of AQ-IAMF#1: Fugitive Dust Emissions. These revisions were made for the final air quality analysis, as reported in Tables 7-22 through 7-34 in Section 7.9, Construction Mass Emissions Analysis. Concentration modeling for localized particulate matter was performed prior to the refinement. Accordingly, the particulate matter results shown in Tables 7-39 through 7-51 in this section are conservative.

[27] Project construction does not include any sources that would generate Pb. Pb would be emitted by the three new temporary batch plants, although concentrations would not exceed 1.96E-08 $\mu g/m^3$ for the quarterly standard, 6.72E-07 $\mu g/m^3$ for the 1-hour standard, 1.09E-07 $\mu g/m^3$ for the 8-hour standard, nor 6.14E-08 $\mu g/m^3$ for the 24-hour standard which are well below the NAAQS and CAAQS. Accordingly, a detailed analysis of Pb-related emissions was not conducted.

[28] While the $PM_{2.5}$ SILs have not been officially approved by the USEPA or the SJVAPCD, the air districts suggest that, for illustrative purposes, the analysis consider the USEPA's proposed SILs.

Table 7-38 Existing Background Air Quality Concentration in the Resource Study Area (µg/m³)

Pollutant	San Jose-Jackson Street		Hollister-Fairview		Merced-S Coffee Avenue	
	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS
$PM_{2.5}$						
24-hour	31.0	N/A	14.7	N/A	**39.3**	N/A
Standard	*35*	N/A	*35*	N/A	*35*	N/A
Annual mean	9.6	10.6	4.6	5.1	12.6	13.3
Standard	*12.0*	*12*	*12.0*	*12*	*12.0*	*12*
PM_{10}						
24-hour	49.7	69.0	56.3	80.0	73.3	146.0[2]
Standard	*150*	*50*	*150*	*50*	*150*	*50*
Annual mean	19.8	21.9	17.8	19.6[1]	31.8	35.8[2]
Standard	*N/A*	*20*	*N/A*	*20*	*N/A*	*20*
NO_2						
1-hour	85.2	127.8	49.5	62.0	61.4	73.3
Standard	*188*	*339*	*188*	*339*	*188*	*339*
Annual mean	22.8	24.1	8.4[3]	8.6[3]	13.1	13.4
Standard	*100*	*57*	*100*	*57*	*100*	*57*
CO						
1-hour	2,329	2,749	2,215[3]	4,812[3]	3,475[4]	6,644[4]
Standard	*23,000*	*23,000*	*23,000*	*23,000*	*23,000*	*23,000*
8-hour	1,757	2,062	992.9	1031	1,222[4]	3,551[4]
Standard	*10,000*	*10,000*	*10,000*	*10,000*	*10,000*	*10,000*

Pollutant	San Jose-Jackson Street		Hollister-Fairview		Merced-S Coffee Avenue	
	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS
SO_2						
1-hour	6.1	9.4	6.1[5]	9.4[5]	15.7[6]	28.3[6]
Standard	*196*	*655*	*196*	*655*	*196*	*655*
24-hour	N/A	2.9	N/A	2.9[5]	N/A	6.3[6]
Standard	*N/A*	*105*	*N/A*	*105*	*N/A*	*105*

Sources: CARB 2018b; USEPA 2018a
NAAQS = national ambient air quality standards
CAAQS = California ambient air quality standards
CO = carbon monoxide
SO_2 = sulfur dioxide
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
N/A = No applicable standard
[1] National mean used as no CAAQS mean available
[2] Data Site: M St, Merced
[3] Data Site: E. Laurel Dr., Salinas
[4] Data Site: Rd 29 ½, Madera
[5] Data Site: Use San Jose – Jackson
[6] Data Site: N First St., Fresno

Table 7-39 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 1 (µg/m³)[1]

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
San Jose Diridon Station Approach												
Aerial	104	2,853	50	2,112	22	150	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
Berm	267	3,016	128	2,190	106	233			1	11	<1	3
At grade	78	2,828	41	2,103	38	166			<1	10	<1	3
Diridon Station	45	2,795	19	2,081	13	141			<1	10	<1	3
Combined[9]	267	3,016	147	2,209	119	246			1	11	<1	3
Monterey Corridor												
Aerial	61	2,810	34	2,096	16	144	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
Berm	69	2,818	39	2,101	32	159			<1	10	<1	3
At grade	80	2,829	45	2,107	56	184			<1	10	<1	3
Combined[9]	80	2,829	45	2,107	56	184			<1	10	<1	3
Morgan Hill and Gilroy												
Aerial	76	4,887	20	2,082	178	306	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
Cut and fill	473	5,285	121	2,183	19	147			1	10	<1	3
At grade	291	5,102	73	2,135	178	306			2	11	<1	3
Tunnel	90	4,902	15	2,077	74	202			<1	10	<1	3
Gilroy Station	57	4,869	15	2,077	12	140			<1	10	<1	3
MOWF	132	4,943	28	2,090	56	184			<1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	605	5,417	149	2,211	234	362			2	12	<1	3

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
Pacheco Pass												
Aerial	202	5,013	33	1,064	69	131	Incremental concentration assessed in Table 7-51.[10]		1	10	<1	3
Tunnel	525	5,337	85	1,116	180	242			<1	10	<1	3
Cut and Fill	466	5,277	76	1,107	36	98			1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	525	5,337	85	1,116	180	242			1	10	<1	3
San Joaquin Valley												
Aerial	132	6,908	24	3,575	17	91	Incremental concentration assessed in Table 7-51.[10]		<1	28	<1	6
Berm	263	6,908	51	3,603	60	133			1	29	<1	6
Cut and fill	501	7,146	107	3,658	23	97			1	29	<1	6
MOWS	401	7,045	83	3,635	110	183			1	29	<1	6
Combined[9]	902	7,546	190	3,741	170	243			1	30	<1	6
CAAQS (µg/m³)	**-**	**23,000**	**-**	**10,000**	**-**	**339**	**-**	**50**	**-**	**655**	**-**	**105**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006a, 2006bb, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air
N/A = Not applicable. Batch plants only have particulate matter emissions

[1] Only the highest modeled concentration is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration from project construction.
[3] A background 1-hour CO concentration of 2,749, 4,812, and 6,644. µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[4] A background 8-hour CO concentration of 2,062, 1,031, and 3,551 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[5] A background 1-hour NO_2 concentration of 127.84, 62.04, and 73.32 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background 24-hour PM_{10} concentration of 69, 80, and 146 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[7] A background 1-hour SO_2 concentration of 9.43 and 28.30 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.
[8] A background 24-hour SO_2 concentration of 2.88 and 6.29 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[9] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[10] Background concentration exceeds the AAQS.

Table 7-40 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 1 (µg/m³)[1]

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
San Jose Diridon Station Approach												
Aerial	93	2,422	43	1,800	15	100	2	33	14	64	<1	6
Berm	241	2,571	117	1,774	75	160	12	43*	69	118	1	7
At grade	76	2,406	37	1,793	33	119	3	34	22	71	<1	6
Diridon Station	44	2,373	17	1,774	6	91	1	32	3	53	<1	6
Combined[9]	286	2,617	134	1,891	81	167	13	44*	72	122	1	7
Monterey Corridor												
Aerial	60	2,390	29	1,785	13	98	1	32	11	60	<1	6
Berm	68	2,398	33	1,789	25	110	2	33	17	67	<1	6
At grade	79	2,408	38	1,794	44	129	2	33	20	70	<1	6
Combined[9]	79	2,408	38	1,794	44	129	2	33	20	70	<1	6
Morgan Hill and Gilroy												
Aerial	62	2,391	18	1,775	7	93	1	32	6	63	<1	6
Cut and fill	355	2,685	112	1,868	12	98	1	32	4	60	1	7
At grade	211	2,540	65	1,822	115	200*	8	39*	38	94	1	7
Tunnel	89	2,418	14	1,771	21	106	1	32	3	59	<1	6
Gilroy Station	46	2,372	13	1,769	5	91	1	32	2	59	<1	6
MOWF	84	2,413	23	1,780	24	109	1	32	9	65	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	1	32	3	59	N/A	N/A
Combined[9]	439	2,769	135	1,892	138	223*	10	41*	47	103	1	7

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
Pacheco Pass												
Aerial	185	2,400	28	1,021	15	64	1	16	7	63	<1	6
Tunnel	401	2,615	79	1,072	96	145	2	16	11	67	<1	6
Cut and fill	421	2,636	64	1,057	8	57	<1	15	2	58	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	<1	15*	3	59	N/A	N/A
Combined[9]	421	2,636	79	1,072	96	145	2	16	11	67	<1	6
San Joaquin Valley												
Aerial	121	3,596	22	1,244	11	72	Incremental concentration assessed in Table 7-51.[10]		5	78	<1	16
Berm	241	3,716	44	1,266	36	97			12	86	<1	16
Cut and fill	430	3,905	105	1,327	15	76			3	76	<1	16
MOWS	373	3,848	77	1,299	46	107			28	101	<1	16
Combined[9]	803	4,278	182	1,404	81	143			40	113	1	16
NAAQS (µg/m³)	**-**	**40,000**	**-**	**10,000**	**-**	**188**	**-**	**35**	**-**	**150**	**-**	**196**

Source(s): AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air

* Not applicable. Batch plants only have particulate matter emissions

[1] Only the highest modeled concentration in the form of the standard is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.

[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction.

[3] A background 1-hour CO concentration of 2,329, 2,215, and 3,475 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.

[4] A background 8-hour CO concentration of 1,757, 992.85, and 1222 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.

[5] A background 1-hour NO_2 concentration of 85.23, 49.51, and 61.41 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.

[6] A background 24-hour $PM_{2.5}$ concentration in the form of the standard of 31.0, 14.67, and 39.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.

[7] A background 24-hour PM_{10} concentration of 49.678, 56.33, and 73.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.

[8] A background 1-hour SO_2 concentration of 6.11 and 15.72 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.

[9] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.

[10] Background concentration exceeds the NAAQS. USEPA Office of Air Quality Planning and Standards, August, 2016.

Table 7-41 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 2 (µg/m³)[1]

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
San Jose Diridon Station Approach												
Aerial	80	2,830	52	2,114	15	142	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
Berm	272	3,031	127	2,189	106	234			1	11	<1	3
At grade	99	2,849	52	2,114	47	175			<1	10	<1	3
Diridon Station	45	2,795	19	2,081	13	141			<1	10	<1	3
Combined[9]	317	3,066	147	2,209	119	247			1	11	<1	3
Monterey Corridor												
Aerial	155	2,905	78	2,140	57	184	Incremental concentration assessed in Table 7-51.[10]		1	10	<1	3
Berm	68	2,818	38	2,100	32	160			<1	10	<1	3
At grade	72	2,821	40	2,102	51	179			<1	10	<1	3
Trench	582	3,331	218	2,280	233	361*			2	11	<1	3
Combined[9]	582	3,331	218	2,280	233	361*			2	11	<1	3
Morgan Hill and Gilroy												
Aerial	440	5,251	115	2,177	50	178	Incremental concentration assessed in Table 7-51.[10]		1	10	<1	3
Berm	123	4,935	32	2,094	28	156			<1	10	<1	3
At grade	226	5,038	58	2,120	50	178			1	10	<1	3
Cut and fill	480	5,291	120	2,183	23	151			1	10	<1	3
Trench	458	5,270	125	2,187	145	273			1	11	<1	3
Tunnel	90	4,902	15	2,077	74	201			<1	11	<1	3
Gilroy Station	57	4,869	15	2,077	12	140			<1	10	<1	3
MOWF	132	4,943	28	2,090	56	183			<1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	611	5,423	152	2,215	201	329			1	11	<1	3

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
Pacheco Pass												
Aerial	202	5,013	33	1,064	69	131	Incremental concentration assessed in Table 7-51.[10]		1	10	<1	3
Tunnel	525	5,337	85	1,116	180	242			<1	10	<1	3
Cut and fill	466	5,277	76	1,107	36	98			1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	525	5,337	85	1,116	180	242			1	10	<1	3
San Joaquin Valley												
Aerial	132	6,908	24	3,575	17	91	Incremental concentration assessed in Table 7-51.[10]		<1	28	<1	6
Berm	263	6,908	51	3,603	60	133			1	29	<1	6
Cut and fill	501	7,146	107	3,658	23	96			1	29	<1	6
MOWS	401	7,045	83	3,635	110	183			1	29	<1	6
Combined[9]	902	7,546	190	3,741	170	243			1	30	<1	6
CAAQS (µg/m³)	**-**	**23,000**	**-**	**10,000**	**-**	**339**	**-**	**50**	**-**	**655**	**-**	**105**

Source: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
N/A = Not Applicable batch plants only have particulate matter emissions
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air

[1] Only the highest modeled concentration is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration from project construction.
[3] A background 1-hour CO concentration of 2,749, 4,812, and 6,644. µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[4] A background 8-hour CO concentration of 2,062, 1,031, and 3,551 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[5] A background 1-hour NO_2 concentration of 127.84, 62.04, and 73.32 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background 24-hour PM_{10} concentration of 69, 80, and 146 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[7] A background 1-hour SO_2 concentration of 9.43 and 28.30 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.
[8] A background 24-hour SO_2 concentration of 2.88 and 6.29 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
"Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[10] Background concentration exceeds the CAAQS.

Table 7-42 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 2 (µg/m³)[1]

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
San Jose Diridon Station Approach												
Aerial	69	2,398	33	1,790	10	96	2	33	13	62	<1	6
Berm	242	2,572	118	1,875	73	158	13	44*	69	118	1	7
At grade	98	2,427	47	1,803	42	127	4	35	29	78	<1	6
Diridon Station	44	2,373	17	1,774	6	91	1	32	3	53	<1	6
Combined[9]	286	2,626	135	1,892	79	164	13	44*	72	122	1	7
Monterey Corridor												
Aerial	144	2,473	71	1,828	44	130	4	35	1	71	<1	7
Berm	68	2,397	32	1,789	25	110	3	34	17	67	<1	6
At grade	71	2,400	34	1,790	40	125	3	34	19	68	<1	6
Trench	527	2,857	201	1,958	129	214*	17	48*	93	142	1	7
Combined[9]	527	2,857	201	1,958	129	214*	17	48*	93	142	1	7
Morgan Hill and Gilroy												
Aerial	349	2,678	102	1,858	57	142	9	40*	45	101	1	7
Berm	95	2,425	28	1,785	19	104	3	34	13	69	<1	6
At grade	172	2,502	52	1,808	34	119	5	36*	24	80	<1	6
Cut and fill	358	2,688	21	1,777	17	102	1	32	4	60	1	7
Trench	372	2,701	108	1,865	87	172	7	37*	39	95	1	7
Tunnel	89	2,418	14	1,771	21	106	1	32	3	59	<1	6
Gilroy Station	46	2,375	13	1,769	5	91	1	32	2	59	<1	6
MOWF	84	2,413	23	1,780	24	109	1	32	9	65	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	1	32	3	59	N/A	N/A
Combined[9]	456	2,785	135	1,891	111	196*	11	42*	54	110	1	7

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
Pacheco Pass												
Aerial	185	2,400	28	1,021	15	64	1	16	7	63	<1	6
Tunnel	401	2,615	79	1,072	96	145	2	16	11	67	<1	6
Cut and fill	421	2,636	64	1,057	8	57	0	15	2	58	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	<1	15*	3	59	N/A	N/A
Combined[9]	421	2,636	79	1,072	96	145	2	16	11	67	<1	6
San Joaquin Valley												
Aerial	121	3,596	22	1,244	11	72	Incremental concentration assessed in Table 7-51.[10]		5	78	<1	16
Berm	251	3,516	44	1,266	36	97			12	86	<1	16
Cut and fill	430	3,905	105	1,327	15	76			3	76	<1	16
MOWS	373	3,848	77	1,299	46	107			28	101	<1	16
Combined[9]	803	4,278	182	1,404	81	143			40	113	1	16
NAAQS (µg/m³)	**-**	**40,000**	**-**	**10,000**	**-**	**188**	**-**	**35**	**-**	**150**	**-**	**196**

Source: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
N/A = Not Applicable. Batch plants only have particulate matter emissions
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air

[1] Only the highest modeled concentration in the form of the standard is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction.
[3] A background 1-hour CO concentration of 2,329, 2,215, and 3,475 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[4] A background 8-hour CO concentration of 1,757, 992.85, and 1222 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[5] A background 1-hour NO_2 concentration of 85.23, 49.51, and 61.41 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background 24-hour $PM_{2.5}$ concentration in the form of the standard of 31.0, 14.67, and 39.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[7] A background 24-hour PM_{10} concentration of 49.678, 56.33, and 73.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[8] A background 1-hour SO_2 concentration of 6.11 and 15.72 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.
[9] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[10] Background concentration exceeds the NAAQS. USEPA Office of Air Quality Planning and Standards, August, 2016.

Table 7-43 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 3 (µg/m³)[1]

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
San Jose Diridon Station Approach												
Aerial	80	2,830	52	2,114	15	142	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
Berm	272	3,031	127	2,189	106	234			1	11	<1	3
At grade	99	2,849	52	2,114	47	175			<1	10	<1	3
Diridon Station	45	2,795	19	2,081	13	141			<1	10	<1	3
Combined[9]	317	3,066	147	2,209	119	247			1	11	<1	3
Monterey Corridor												
Aerial	61	2,810	34	2,096	16	144	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
Berm	69	2,818	39	2,101	32	159			<1	10	<1	3
At grade	80	2,829	45	2,107	56	184			<1	10	<1	3
Combined[9]	80	2,829	45	2,107	56	184			<1	10	<1	3
Morgan Hill and Gilroy												
Aerial	76	4,888	20	2,082	15	143	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
Cut and fill	473	5,285	121	2,183	33	161			1	10	<1	3
At grade	94	4,906	25	2,087	48	176			<1	10	<1	3
Tunnel	90	4,902	15	2,077	74	201			<1	11	<1	3
Gilroy Station	57	4,869	15	2,077	13	141			<1	10	<1	3
MOWF	133	4,945	27	2,089	52	180			<1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	606	5,418	148	2,210	101	229			1	10	<1	3

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
Pacheco Pass												
Aerial	202	5,013	33	1,064	69	131	Incremental concentration assessed in Table 7-51.[10]		1	10	<1	3
Tunnel	525	5,337	85	1,116	180	242			<1	10	<1	3
Cut and fill	466	5,277	76	1,107	36	98			1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	525	5,337	85	1,116	180	242			1	10	<1	3
San Joaquin Valley												
Aerial	132	6,908	24	3,575	17	91	Incremental concentration assessed in Table 7-51.[10]		<1	28	<1	6
Berm	263	6,908	51	3,603	60	133			1	29	<1	6
Cut and fill	501	7,146	107	3,658	23	96			1	29	<1	6
MOWS	401	7,045	83	3,635	110	183			1	29	<1	6
Combined[9]	902	7,546	190	3,741	170	243			1	30	<1	6
CAAQS (µg/m³)	**-**	**23,000**	**-**	**10,000**	**-**	**339**	**-**	**50**	**-**	**655**	**-**	**105**

Source: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air
N/A = Not Applicable. Batch plants only have particulate matter emissions

[1] Only the highest modeled concentration is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration from project construction.
[3] A background 1-hour CO concentration of 2749., 4812. and 6644. µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[4] A background 8-hour CO concentration of 2,062, 1,031, and 3,551 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[5] A background 1-hour NO_2 concentration of 127.84, 62.04, and 73.32 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background 24-hour PM_{10} concentration of 69, 80, and 146 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[7] A background 1-hour SO_2 concentration of 9.43 and 28.30 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.
[8] A background 24-hour SO_2 concentration of 2.88 and 6.29 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[9] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[10] Background concentration exceeds the CAAQS.

Table 7-44 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 3 (µg/m³)[1]

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
San Jose Diridon Station Approach												
Aerial	69	2,398	33	1,790	10	96	2	33	13	62	<1	6
Berm	242	2,572	118	1,875	73	158	13	44*	69	118	1	7
At grade	98	2,427	47	1,803	42	127	4	35	29	78	<1	6
Diridon Station	44	2,373	17	1,774	6	91	1	32	3	53	<1	6
Combined[9]	286	2,626	135	1,892	79	164	13	44*	72	122	1	7
Monterey Corridor												
Aerial	60	2,390	29	1,785	13	98	1	32	11	60	<1	6
Berm	68	2,398	33	1,789	25	110	2	33	17	67	<1	6
At grade	79	2,408	38	1,794	44	129	2	33	20	70	<1	6
Combined[9]	79	2,408	38	1,794	44	129	2	33	20	70	<1	6
Morgan Hill and Gilroy												
Aerial	62	2,391	19	1,775	8	93	1	32	6	63	<1	6
Cut and fill	355	2,685	112	1,869	17	102	1	32	4	60	1	7
At grade	77	2,407	23	1,780	25	110	2	33	10	67	<1	6
Tunnel	89	2,418	14	1,771	21	106	1	32	3	59	<1	6
Gilroy Station	46	2,375	13	1,769	5	91	1	32	2	59	<1	6
MOWF	90	2,420	23	1,780	23	107	1	32	9	65	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	1	32	3	59	N/A	N/A
Combined[9]	445	1,775	135	1,892	47	132	3	34	19	75	1	7

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
Pacheco Pass												
Aerial	185	2,400	28	1,021	15	64	1	16	7	63	<1	6
Tunnel	401	2,615	79	1,072	96	145	2	16	11	67	<1	6
Cut and fill	421	2,636	64	1,057	8	57	<1	15	2	58	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	<1	15*	3	59	N/A	N/A
Combined[9]	421	2,636	79	1,072	96	145	2	16	11	78	<1	6
San Joaquin Valley												
Aerial	121	3,596	22	1,244	11	72	Incremental concentration assessed in Table 7-51.[10]		5	78	<1	16
Berm	241	3,716	44	1,266	36	97			12	86	<1	16
Cut and fill	430	3,905	105	1,327	15	76			3	76	<1	16
MOWS	373	3,848	77	1,299	46	107			28	101	<1	16
Combined[9]	803	4,278	182	1,404	81	143			40	113	1	16
NAAQS (µg/m³)	**-**	**40,000**	**-**	**10,000**	**-**	**188**	**-**	**35**	**-**	**150**	**-**	**196**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air

* Not Applicable. Batch plants only have particulate matter emissions

[1] Only the highest modeled concentration in the form of the standard is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.

[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction.

[3] A background 1-hour CO concentration of 2,329, 2,215, and 3,475 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.

[4] A background 8-hour CO concentration of 1,757, 992.85, and 1222 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.

[5] A background 1-hour NO_2 concentration of 85.23, 49.51, and 61.41 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.

[6] A background 24-hour $PM_{2.5}$ concentration in the form of the standard of 31.0, 14.67, and 39.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.

[7] A background 24-hour PM_{10} concentration of 49.678, 56.33, and 73.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.

[8] A background 1-hour SO_2 concentration of 6.11 and 15.72 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.

[9] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.

[10] Background concentration exceeds the NAAQS.

Table 7-45 Hourly and Daily California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 4 (µg/m³)[1]

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
San Jose Diridon Station Approach												
Berm	173	2,922	92	2,154	68	196	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
At grade	62	2,812	32	2,095	38	166			<1	10	<1	3
Diridon Station	45	2,795	19	2,081	13	141			<1	10	<1	3
Combined[9]	218	2,967	111	2,173	81	209			1	10	<1	3
Monterey Corridor												
Berm	80	2,830	45	2,107	36	164	Incremental concentration assessed in Table 7-51.[10]		<1	10	<1	3
At grade	122	2,871	68	2,130	74	202			<1	10	<1	3
Combined[9]	122	2,871	68	2,130	74	202			<1	10	<1	3
Morgan Hill and Gilroy												
Aerial	1,122	5,934	26	1,188	199	327	Incremental concentration assessed in Table 7-51.[10]		2	12	<1	3
Berm	295	5,007	50	2,112	63	190			<1	10	<1	3
At grade	849	5,661	216	2,278	175	302			2	11	<1	3
Cut and fill	679	5,491	139	2,202	35	163			1	10	<1	3
Tunnel	90	4,902	15	2,077	74	201			<1	11	<1	3
Gilroy Station	57	4,869	15	2,077	13	141			<1	10	<1	3
MOWF	160	4,971	43	2,106	74	202			<1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	1,282	6,094	270	2,332	274	401			2	12	<1	3

Construction Area	CO				NO_2		PM_{10}		SO_2			
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 1-hour[2]	Total 1-hour[7]	Project 24-hour[2]	Total 24-hour[8]
Pacheco Pass												
Aerial	202	5,013	33	1,064	69	131	Incremental concentration assessed in Table 7-51.[10]		1	10	<1	3
Tunnel	525	5,337	85	1,116	180	242			<1	10	<1	3
Cut and fill	466	5,277	76	1,107	36	98			1	10	<1	3
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A
Combined[9]	525	5,337	85	1,116	180	242			1	10	<1	3
San Joaquin Valley												
Aerial	132	6,908	24	3,575	17	91	Incremental concentration assessed in Table 7-51.[10]		<1	28	<1	6
Berm	263	6,908	51	3,603	60	133			1	29	<1	6
Cut and fill	501	7,146	107	3,658	23	96			1	29	<1	6
MOWS	401	7,045	83	3,635	110	183			1	29	<1	6
Combined[9]	902	7,546	190	3,741	170	243			1	30	<1	6
CAAQS (µg/m³)	**-**	**23,000**	**-**	**10,000**	**-**	**339**	**-**	**50**	**-**	**655**	**-**	**105**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air
N/A = Not Applicable. Batch plants only have particulate matter emissions

[1] Only the highest modeled concentration is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration from project construction.
[3] A background 1-hour CO concentration of 2749., 4812. and 6644. µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[4] A background 8-hour CO concentration of 2,062, 1,031, and 3,551 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[5] A background 1-hour NO_2 concentration of 127.84, 62.04, and 73.32 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background 24-hour PM_{10} concentration of 69, 80, and 146 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[7] A background 1-hour SO_2 concentration of 9.43 and 28.30 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.
[8] A background 24-hour SO_2 concentration of 2.88 and 6.29 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[9] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[10] Background concentration exceeds the CAAQS.

Table 7-46 Hourly and Daily National Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 4 (µg/m³)[1]

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
San Jose Diridon Station Approach												
Berm	138	2,467	66	1,822	51	137	19	50*	44	93	<1	6
At grade	62	2,391	28	1,785	26	112	10	41*	14	63	<1	6
Diridon Station	44	2,373	17	1,774	6	91	1	32	3	53	<1	6
Combined[9]	181	2,511	83	1,840	57	143	20	51*	47	97	<1	7
Monterey Corridor												
Berm	80	2,409	38	1,795	29	114	4	35	20	69	<1	6
At grade	120	2,450	58	1,814	60	145	4	35	28	77	<1	6
Combined[9]	120	2,450	58	1,814	60	145	4	35	28	77	<1	6
Morgan Hill and Gilroy												
Aerial	763	3,092	207	1,963	120	205*	20	51*	118	174*	1	7
Berm	149	2,478	44	1,801	35	121	4	35	22	77	<1	6
At grade	646	2,976	193	1,950	95	180	19	50*	92	148	1	7
Cut and fill	475	2,804	40	1,797	18	104	1	32	5	61	1	7
Tunnel	89	2,418	14	1,771	21	106	1	32	3	59	<1	6
Gilroy Station	46	2,375	13	1,769	5	91	1	32	2	59	<1	6
MOWF	134	2,464	33	1,790	33	118	2	33	13	69	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	1	15	3	59	N/A	N/A
Combined[9]	897	3,227	240	1,996	152	238*	22	53*	130	187*	1	8
Pacheco Pass												
Aerial	185	2,400	28	1,021	15	64	1	16	7	63	<1	6
Tunnel	401	2,615	79	1,072	96	145	2	16	11	67	<1	6

Construction Area	CO				NO_2		$PM_{2.5}$		PM_{10}		SO_2	
	Project 1-hour[2]	Total 1-hour[3]	Project 8-hour[2]	Total 8-hour[4]	Project 1-hour[2]	Total 1-hour[5]	Project 24-hour[2]	Total 24-hour[6]	Project 24-hour[2]	Total 24-hour[7]	Project 1-hour[2]	Total 1-hour[8]
Cut and fill	421	2,636	64	1,057	8	57	<1	15	2	58	<1	6
Batch plant	N/A	N/A	N/A	N/A	N/A	N/A	<1	15*	3	59	N/A	N/A
Combined[9]	421	2,636	79	1,072	96	145	2	16	11	67	<1	6
San Joaquin Valley												
Aerial	121	3,596	22	1,244	11	72	Incremental concentration assessed in Table 7-51.[10]		5	78	<1	16
Berm	241	3,716	44	1,266	36	97			12	86	<1	16
Cut and fill	430	3,905	105	1,327	15	76			3	76	<1	16
MOWS	373	3,848	77	1,299	46	107			28	101	<1	16
Combined[9]	803	4,278	182	1,404	81	143			40	113	1	16
NAAQS (µg/m³)	**-**	**40,000**	**-**	**10,000**	**-**	**188**	**-**	**35**	**-**	**150**	**-**	**196**

Source: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
N/A = Not applicable. Batch plants only have particulate matter emissions
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air

[1] Only the highest modeled concentration in the form of the standard is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction.
[3] A background 1-hour CO concentration of 2,329, 2,215, and 3,475 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[4] A background 8-hour CO concentration of 1,757, 992.85, and 1222 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Madera – Rd. 29 1/2, respectively) was added to the maximum increment off-site project contribution.
[5] A background 1-hour NO_2 concentration of 85.23, 49.51, and 61.41 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background 24-hour $PM_{2.5}$ concentration in the form of the standard of 31.0, 14.67, and 39.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[7] A background 24-hour PM_{10} concentration of 49.678, 56.33, and 73.33 µg/m³ (for the locations of San Jose – Jackson St., Hollister – Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[8] A background 1-hour SO_2 concentration of 6.11 and 15.72 µg/m³ (for the locations of San Jose – Jackson St and Fresno – N First St, respectively) was added to the maximum increment off-site project contribution.
[9] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[10] Background concentration exceeds the NAAQS.

Table 7-47 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 1 (µg/m^3)[1]

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
San Jose Diridon Station Approach										
Aerial	2	26	2	24	<1	11	<1	10	Incremental concentration assessed in Table 7-51.[9]	
Berm	2	26	2	25	1	11	1	10		
At grade	5	29	5	28	1	11	1	10		
Diridon Station	0	24	0	23	<1	11	<1	10		
Combined[9]	6	30	5	30	1	12	1	10		
Monterey Corridor										
Aerial	1	25	1	24	<1	11	<1	10	Incremental concentration assessed in Table 7-51.[9]	
Berm	3	27	3	26	1	11	1	10		
At grade	6	30	5	28	1	11	1	10		
Combined[9]	6	30	5	28	1	11	1	10		
Morgan Hill and Gilroy										
Aerial	2	35	2	34	<1	11	<1	10	2	22*
At grade	4	28	4	27	1	12	1	10	5	25*
Tunnel	4	28	3	26	<1	11	<1	10	2	22*
Gilroy Station	<1	24	<1	23	<1	11	<1	10	<1	20*
MOWF	<1	24	<1	23	<1	11	<1	10	<1	20*
Batch plant	N/A	N/A	N/A	N/A	<1	11	<1	10	<1	20*
Combined[9]	5	29	4	27	1	12	1	10	5	25*
Pacheco Pass										
Aerial	4	12	4	12	<1	5	<1	5	Incremental concentration assessed in Table 7-51.[9]	
Tunnel	11	20	10	19	1	6	1	5		

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
Cut and fill	2	11	2	10	<1	5	<1	5		
Batch Plant	N/A	N/A	N/A	N/A	<1	5*	<1	5*		
Combined[9]	11	20	10	19	1	6	1	5		
San Joaquin Valley										
Aerial	<1	14	<1	13	Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]	
Berm	1	14	1	14						
Cut and fill	1	14	1	14						
MOWS	<1	13	<1	13						
Combined[8]	1	14	1	14						
CAAQS/NAAQS (µg/m³)	**-**	**57**	**-**	**100**	**-**	**12**	**-**	**12**	**-**	**20**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018
CAAQS = California ambient air quality standards
CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air
N/A = Not applicable. Batch plants only have particulate matter emissions
[1] Only the highest modeled concentration in the form of the applicable standard is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction.
[3] A background annual NO_2 concentration in the form of the (CAAQS) standard of 24.08, 8.55 and 13.40 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[4] A background annual NO_2 concentration in the form of the (NAAQS) standard of 23.75, 8.39 and 13.12 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[5] A background annual $PM_{2.5}$ concentration in the form of the (CAAQS) standard of 10.60, 5.10 and 13.3 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background annual $PM_{2.5}$ concentration in the form of the (NAAQS) standard of 9.57, 4.57 and 12.63 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[7] A background annual PM_{10} concentration in the form of the (CAAQS) standard off 21.90, 19.6 and 35.8 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[8] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[9] Background concentration exceeds the CAAQS and/or NAAQS.

Table 7-48 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 2 (µg/m^3)[1]

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
San Jose Diridon Station Approach										
Aerial	2	26	2	24	<1	11	<1	10	Incremental concentration assessed in Table 7-51.[9]	
Berm	2	26	2	25	1	11	1	10		
At grade	5	29	5	28	1	11	1	11		
Diridon Station	<1	24	0	23	<1	11	<1	10		
Combined[9]	6	30	5	28	1	11	1	10		
Monterey Corridor										
Aerial	1	25	1	24	<1	11	<1	10	Incremental concentration assessed in Table 7-51.[9]	
Berm	3	27	3	26	1	11	1	10		
At grade	3	27	2	26	1	11	1	10		
Trench	13	37	12	34	2	12*	2	11		
Combined[9]	13	37	12	34	2	12*	2	11		
Morgan Hill and Gilroy										
Aerial	2	26	2	24	<1	11	<1	10	2	22*
Berm	1	26	1	24	<1	11	<1	10	1	21*
At grade	1	26	1	24	<1	11	<1	10	1	21*
Cut and fill	2	26	2	25	<1	11	<1	10	1	21*
Trench	7	31	7	30	1	12	1	11	6	26*
Tunnel	3	27	3	25	<1	11	<1	10	2	22*
Gilroy Station	<1	24	<1	23	<1	11	<1	10	<1	20*
MOWF	<1	24	<1	23	<1	11	<1	11	<1	20*
Batch plant	N/A	N/A	N/A	N/A	<1	5	<1	5	<1	20*
Combined[9]	8	32	7	30	1	12	1	11	7	27*

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
Pacheco Pass										
Aerial	4	12	4	12	<1	5	<1	5	Incremental concentration assessed in Table 7-51.[9]	
Tunnel	11	20	10	19	1	6	1	5		
Cut and fill	2	11	2	10	<1	5	<1	5		
Batch plant	N/A	N/A	N/A	N/A	<1	13*	<1	13*		
Combined[9]	11	20	10	19	1	6	1	5		
San Joaquin Valley										
Aerial	<1	14	<1	13	Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]	
Berm	1	14	1	14						
Cut and fill	1	14	1	14						
MOWS	<1	13	<1	13						
Combined[8]	1	14	1	14						
CAAQS/NAAQS (µg/m³)	**-**	**57**	**-**	**100**	**-**	**12**	**-**	**12**	**-**	**20**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CAAQS = California ambient air quality standards
CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
N/A Not applicable. Batch plants only have particulate matter emissions
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air

[1] Only the highest modeled concentration in the form of the applicable standard is presented for each pollutant.
[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[3] A background annual NO_2 concentration in the form of the (CAAQS) standard of 24.08, 8.55 and 13.40 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[4] A background annual NO_2 concentration in the form of the (NAAQS) standard of 23.75, 8.39 and 13.12 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[5] A background annual $PM_{2.5}$ concentration in the form of the (CAAQS) standard of 10.60, 5.10 and 13.3 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background annual $PM_{2.5}$ concentration in the form of the (NAAQS) standard of 9.57, 4.57 and 12.63 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[7] A background annual PM_{10} concentration in the form of the (CAAQS) standard off 21.90, 19.6 and 35.8 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[8] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[9] Background concentration exceeds the CAAQS and/or NAAQS.

Table 7-49 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 3 (µg/m³)[1]

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
San Jose Diridon Station Approach										
Aerial	2	26	2	24	<1	11	<1	10	Incremental concentration assessed in Table 7-51.[9]	
Berm	2	26	2	25	1	11	1	10		
At grade	5	29	5	28	1	11	1	11		
Diridon Station	<1	24	<1	23	<1	11	<1	10		
Combined[9]	6	30	5	28	1	11	1	10		
Monterey Corridor										
Aerial	1	25	1	24	<1	11	<1	10	Incremental concentration assessed in Table 7-51.[9]	
Berm	3	27	3	26	1	11	1	10		
At grade	6	30	5	28	1	11	1	10		
Combined[9]	6	30	5	28	1	11	1	10		
Morgan Hill and Gilroy										
Aerial	1	25	1	24	<1	11	<1	10	1	22*
Cut and fill	2	26	2	25	<1	11	<1	10	1	21*
At grade	1	26	1	25	<1	11	<1	10	2	22*
Tunnel	3	27	3	25	<1	11	<1	10	2	22*
Gilroy Station	<1	24	0	23	<1	11	<1	10	<1	20*
MOWF	<1	24	0	23	<1	11	<1	10	<1	20*
Batch plant	N/A	N/A	N/A	N/A	<1	11	<1	10	<1	20*
Combined[9]	2	26	2	25	<1	11	<1	11	2	22*

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
Pacheco Pass										
Aerial	4	12	4	12	<1	5	<1	5	Incremental concentration assessed in Table 7-51.[9]	
Tunnel	11	20	10	19	1	6	1	5		
Cut and fill	2	11	2	10	<1	5	<1	5		
Batch plant	N/A	N/A	N/A	N/A	<1	13*	<1	13*		
Combined[9]	11	20	10	19	1	6	1	5		
San Joaquin Valley										
Aerial	<1	14	<1	13	Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]	
Berm	1	14	1	14						
Cut and fill	1	14	1	14						
MOWS	<1	13	<1	13						
Combined[8]	1	14	1	14						
CAAQS/NAAQS (µg/m³)	**-**	**57**	**-**	**100**	**-**	**12**	**-**	**12**	**-**	**20**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air
N/A = Not applicable. Batch plants only have particulate matter emissions

[1] Only the highest modeled concentration in the form of the applicable standard is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction.
[3] A background annual NO_2 concentration in the form of the (CAAQS) standard of 24.08, 8.55 and 13.40 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[4] A background annual NO_2 concentration in the form of the (NAAQS) standard of 23.75, 8.39 and 13.12 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[5] A background annual $PM_{2.5}$ concentration in the form of the (CAAQS) standard of 10.60, 5.10 and 13.3 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background annual $PM_{2.5}$ concentration in the form of the (NAAQS) standard of 9.57, 4.57 and 12.63 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[7] A background annual PM_{10} concentration in the form of the (CAAQS) standard off 21.90, 19.6 and 35.8 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[8] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[9] Background concentration exceeds the CAAQS and/or NAAQS.

Table 7-50 Annual National Ambient Air Quality Standards and California Ambient Air Quality Standards Criteria Pollutant Concentration Effects from Construction of Alternative 4 (µg/m³)[1]

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
San Jose Diridon Station Approach										
Berm	6	31	6	29	2	12*	2	11	Incremental concentration assessed in Table 7-51.[9]	
At grade	3	27	3	26	1	11	1	10		
Diridon Station	<1	24	0	23	<1	11	<1	10		
Combined[9]	7	31	6	29	2	12*	2	11		
Monterey Corridor										
Berm	5	29	4	27	1	12	1	10	Incremental concentration assessed in Table 7-51.[9]	
At grade	6	30	6	29	1	11	1	10		
Combined[9]	6	30	6	29	1	12	1	10		
Morgan Hill and Gilroy										
Aerial	1	25	1	23	<1	11	<1	10	<1	20
Berm	3	27	2	25	1	11	1	10	3	23
At grade	1	26	1	24	<1	11	<1	10	2	22
Cut and fill	1	26	1	24	<1	11	<1	10	1	21
Tunnel	3	27	3	25	<1	11	<1	10	2	22
Gilroy Station	<1	24	<1	23	<1	11	<1	10	<1	20
MOWF	<1	24	<1	23	<1	11	<1	10	<1	20
Batch plant	N/A	N/A	N/A	N/A	<1	11	<1	10	<1	20
Combined[9]	3	27	3	26	1	11	1	10	3	23

Construction Area	NO_2 (CAAQS)		NO_2 (NAAQS)		$PM_{2.5}$ (CAAQS)		$PM_{2.5}$ (NAAQS)		PM_{10} (CAAQS)	
	Project Annual[2]	Total Annual[3]	Project Annual[2]	Total Annual[4]	Project Annual[2]	Total Annual[5]	Project Annual[2]	Total Annual[6]	Project Annual[2]	Total Annual[7]
Pacheco Pass										
Aerial	4	12	4	12	<1	5	<1	5	Incremental concentration assessed in Table 7-51.[9]	
Tunnel	11	20	10	19	1	6	1	5		
Cut and fill	2	11	2	10	<1	5	<1	5		
Batch plant	N/A	N/A	N/A	N/A	<1	13*	<1	13*		
Combined[9]	11	20	10	19	1	6	1	5		
San Joaquin Valley										
Aerial	<1	14	<1	13	Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]		Incremental concentration assessed in Table 7-51.[9]	
Berm	1	14	1	14						
Cut and fill	1	14	1	14						
MOWS	<1	13	<1	13						
Combined[8]	1	14	1	14						
CAAQS/NAAQS (µg/m³)	**-**	**57**	**-**	**100**	**-**	**12**	**-**	**12**	**-**	**20**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018

CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
µg/m³ = micrograms per cubic meter of air
N/A = Not applicable. Batch plants only have particulate matter emissions

[1] Only the highest modeled concentration in the form of the applicable standard is presented for each pollutant. Values have been rounded. In some cases, the rounded value may appear to violate the ambient air quality standard. Only those results shown in underline with an asterisk (*) actually violate the standard.
[2] Represents the maximum incremental off-site concentration in the form of the standard from project construction.
[3] A background annual NO_2 concentration in the form of the (CAAQS) standard of 24.08, 8.55 and 13.40 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[4] A background annual NO_2 concentration in the form of the (NAAQS) standard of 23.75, 8.39 and 13.12 µg/m³ (for the locations of San Jose – Jackson St., Salinas – Laurel Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[5] A background annual $PM_{2.5}$ concentration in the form of the (CAAQS) standard of 10.60, 5.10 and 13.3 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[6] A background annual $PM_{2.5}$ concentration in the form of the (NAAQS) standard of 9.57, 4.57 and 12.63 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – S. Coffee, respectively) was added to the maximum increment off-site project contribution.
[7] A background annual PM_{10} concentration in the form of the (CAAQS) standard off 21.90, 19.6 and 35.8 µg/m³ (for the locations of San Jose – Jackson St., Hollister - Fairview Dr, and Merced – M St, respectively) was added to the maximum increment off-site project contribution.
[8] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.
[9] Background concentration exceeds the CAAQS and/or NAAQS.

Table 7-51 Incremental PM_{10} and $PM_{2.5}$ Concentrations from Construction of the Alternatives 1, 2, 3, and 4 in Areas with Background Concentrations in Excess of the AAQS (µg/m³)[1]

Construction Area	24- hour $PM_{2.5}$ (NAAQS)				24- hour PM_{10} (CAAQS)				Annual PM_{10} (CAAQS)				Annual $PM_{2.5}$ (NAAQS/CAAQS)			
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 1	Alt 2	Alt 3	Alt 4	Alt 1	Alt 2	Alt 3	Alt 4	Alt 1	Alt 2	Alt 3	Alt 4
San Jose Diridon Station Approach																
Aerial	Background concentration does not exceed AAQS. Refer to Tables 7-40, 7-42, 7-44, and 7-46 for analysis of total concentrations relative to the NAAQS.				15.5	14.0	14.0	X	3.30	2.06	2.06	X	0.4	0.3	0.3	X
Berm					76.7	76.7	76.7	49.9	4.60	4.80	4.80	7.00	0.8	0.9	0.9	1.7
At grade					24.4	32.1	32.1	18.1	5.40	5.40	5.40	3.10	0.9	0.9	0.9	0.5
Diridon Station					3.7	3.7	3.7	3.7	0.10	0.10	0.10	0.10	<0.1	<0.1	<0.1	<0.1
Combined[1]					80.4	80.4	80.4	53.7	5.50	5.50	5.50	7.00	0.9	0.9	0.9	1.7
Monterey Corridor																
Aerial	Background concentration does not exceed AAQS. Refer to Tables 7-40, 7-42, 7-44, and 7-46 for analysis of total concentrations relative to the NAAQS.				10.5	22.7	10.5	X	1.30	1.20	1.30	X	0.2	0.2	0.2	X
Berm					16.9	17.7	16.9	20.5	2.90	3.10	2.90	4.60	0.6	0.6	0.6	1.0
At grade					20.5	19.5	20.5	29.1	5.70	5.00	5.70	5.50	0.9	0.8	0.9	0.9
Trench					X	122.2	X	X	X	10.30	X	X	X	X	X	X
Combined[1]					20.5	122.2	20.5	29.1	5.70	10.30	5.70	5.50	0.9	0.8	0.9	1.0
Morgan Hill and Gilroy																
Aerial	Background concentration does not exceed AAQS. Refer to Tables 7-40, 7-42, 7-44, and 7-46 for analysis of total concentrations relative to the NAAQS.				7.0	53.1	7.1	121.8	Background concentration does not exceed AAQS. Refer to Tables 7-47 through 7-50 for analysis of total concentrations relative to the CAAQS.				0.2	0.3	0.1	0.1
Berm					4.2	15.6	X	25.1					0.9	0.3	X	0.5
At grade					39.9	28.5	11.5	108.9					0.2	0.2	0.3	0.3
Cut and fill					4.2	4.2	4.2	5.2					0.2	0.2	0.3	0.2
Trench					X	47.8	X	X					X	1.0	X	X
Tunnel					3.4	3.4	3.4	3.4					0.3	0.3	0.3	0.3
Gilroy Station					2.9	2.9	2.9	2.9					<0.1	<0.1	<0.1	<0.1
MOWF					11.0	11.0	10.2	16.2					<0.1	<0.1	<0.1	<0.1
Batch plant					0.6	0.6	0.6	0.6					0.1	0.1	0.1	0.1
Combined[1]					50.9	64.1	21.7	138.0					1.0	0.3	0.3	0.6

Construction Area	24- hour $PM_{2.5}$ (NAAQS)				24- hour PM_{10} (CAAQS)				Annual PM_{10} (CAAQS)				Annual $PM_{2.5}$ (NAAQS/CAAQS)			
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 1	Alt 2	Alt 3	Alt 4	Alt 1	Alt 2	Alt 3	Alt 4	Alt 1	Alt 2	Alt 3	Alt 4
Pacheco Pass																
Aerial	Background concentration does not exceed AAQS. Refer to Tables 7-40, 7-42, 7-44, and 7-46 for analysis of total concentrations relative to the NAAQS.				8.4	8.4	8.4	8.4	1.70	1.70	1.70	1.70	0.2	0.2	0.2	0.2
Tunnel					10.9	10.9	10.9	10.9	2.40	2.40	2.40	2.40	0.8	0.8	0.8	0.8
Cut and fill					3.3	3.3	3.3	3.3	1.30	1.30	1.30	1.30	0.2	0.2	0.2	0.2
Batch plant					5.2	5.2	5.2	5.2	0.70	0.70	0.70	0.70	0.1	0.1	0.1	0.1
Combined[1]					10.9	10.9	10.9	10.9	2.40	2.40	2.40	2.40	0.9	0.9	0.9	0.9
San Joaquin Valley																
Aerial	0.8	0.8	0.8	0.8	5.2	5.2	5.2	5.2	0.20	0.20	0.20	0.20	<0.1	<0.1	<0.1	<0.1
Berm	2.7	2.7	2.7	2.7	16.5	16.5	16.5	16.5	0.50	0.50	0.50	0.50	0.1	0.1	0.1	0.1
Cut and fill	0.6	0.6	0.6	0.6	3.3	3.3	3.3	3.3	0.30	0.30	0.30	0.30	0.1	0.1	0.1	0.1
MOWS	3.1	3.1	3.1	3.1	32.8	32.8	32.8	32.8	0.03	0.03	0.03	0.03	<0.1	<0.1	<0.1	<0.1
Combined[1]	5.8	5.8	5.8	5.8	49.3	49.3	49.3	49.3	0.55	0.55	0.55	0.55	0.1	0.1	0.1	0.1
SIL	**1.2**	**1.2**	**1.2**	**1.2**	**10.4**	**10.4**	**10.4**	**10.4**	**2.08**	**2.08**	**2.08**	**2.08**	**0.2**	**0.2**	**0.2**	**0.2**

Sources: AERMOD version 18081, Trinity Consultants 2016; USEPA 1978, 1998, 2006b, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz 2018
CO = carbon monoxide
MOWF = maintenance of way facility
MOWS = maintenance of way siding
NAAQS = national ambient air quality standards
NO_2 = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
SIL = significant impact level
$\mu g/m^3$ = micrograms per cubic meter of air
X = Profile would not be constructed under the alternative.
[1] "Combined" conservatively estimates the sum of worst-case concentrations from all features that can occur concurrently at one receptor location.

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7.12 Asbestos, Lead-Based Paint, Valley Fever, and Odors

7.12.1 Asbestos

NOA could become airborne as a result of excavating (including cuts and drilling deep foundations for aerial structures) or tunneling through ultramafic and metavolcanic bedrock. As noted in Section 6.5, Asbestos, Lead-Based Paint, Valley Fever, and Odors, no ultramafic or metavolcanic bedrock is mapped in the San Jose Diridon Station Approach or San Joaquin Valley Subsections. However, more than half of the alignment in the Pacheco Pass Subsection includes tunneling through bedrock that may contain zones of ultramafic or metavolcanic bedrock. Similarly, ultramafic rock is presented within the Monterey Corridor and Morgan Hill and Gilroy Subsections. While excavation and soil movement in these subsections may disturb NOA, the design-build contractor would prepare a CMP that outlines practices for avoiding and minimizing NOA. Construction contractors would also be required to comply with the BAAQMD's Asbestos Airborne Toxic Control Measure for Construction and Grading Operations, which requires implementation of dust control measures to limit the potential for airborne asbestos.

The demolition of asbestos-containing materials is subject to the limitations of the *National Emission Standards for Hazardous Air Pollutants* regulations and would require an asbestos inspection. The Authority would consult with the BAAQMD, MBARD, and SJVAPCD, as applicable, before demolition activities begin.

7.12.2 Lead-Based Paint

Buildings in the RSA might be contaminated with residual Pb, which was used as a pigment and drying agent in oil-based paint until the Lead-Based Paint Poisoning Prevention Act of 1971 prohibited such use. If encountered during demolitions and relocations for any of the project alternatives, LBP and asbestos would be handled and disposed of in accordance with applicable standards. Section 3.10, Hazardous Materials and Wastes, of the Final EIR/EIS discusses potential issues of LBP during construction of the project.

7.12.3 Valley Fever

While there are several factors that influence receptor exposure and development of Valley fever, earthmoving activities during construction could release C. immitis spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increased risk of inhaling C. immitis spores and subsequent development of Valley fever. Dust control measures are the primary defense against infection (USGS 2000). The project includes all best available fugitive dust control measures (see AQ-IAMF#1) that would avoid dusty conditions and reduce the risk of contracting Valley fever through routine watering and other measures.

7.12.4 Odors

Sources of odor during project construction would include diesel exhaust from construction equipment and asphalt paving. All odors would be localized and generally confined to the immediate area surrounding the construction site. The project would use typical construction techniques. The equipment odors would be temporary and localized, and they would cease once construction activities have been completed. The BAAQMD, MBARD, and SJVAPCD have adopted rules that limit the amount of ROG emissions from cutback asphalt (Section 3.3, Regional and Local).

No potentially odorous emissions would be associated with train operation because the trains would be powered from the regional electrical grid. There would be some area source emissions associated with station and maintenance facility operation, such as natural-gas combustion for space and water heating, landscaping equipment emissions, and minor solvent and paint use. The solvent and paint use could be odorous to sensitive receptors. However, the exposure would be less severe than the exposure to odors from other commercial and industrial activities that would occur in these areas under the No Project Alternative.

7.13 Summary of Effects

Project features, including IAMFs, design standards, and compliance with the Authority's project design guideline technical memoranda, would minimize effects of Air Quality. Table 7-52 summarizes the project alternatives' air quality effects.

Construction of all four project alternatives would result in ROG and NO_X emissions that would exceed the BAAQMD's CEQA thresholds, as well as the SJVAPCD's annual CEQA thresholds for NO_X, CO, and PM_{10}. Construction of all project alternatives would exceed the general conformity *de minimis* NO_X thresholds in the SFBAAB and SJVAB.

The project would be constructed with feasible on-site control measures to reduce emissions and minimize effects on air quality. Effects associated with fugitive dust emissions would be minimized through implementation of a dust control plan (AQ-IAMF#1) and best management practices at new concrete batch plants (AQ-IAMF#6). The contractor would use low-VOC paints to limit the emissions of VOCs (AQ-IAMF#2). Exhaust-related pollutants would be reduced through use of renewable diesel, Tier 4 off-road engines, and model year 2010 or newer on-road engines, as required by AQ-IAMF#3 through AQ-IAMF#5. However, even with application of IAMFs, exceedances of air district and general conformity thresholds would still occur.

The Authority would implement mitigation measures to reduce and offset the remaining construction impact on air quality resources. Specifically, AQ-MM#1 and AQ-MM#2 identify additional control strategies for reducing on-site emissions, including ZE or NZE requirements and goals for vehicles and off-road equipment. Remaining ROG and NO_X emissions after implementation of AQ-IAMF#1 through AQ-IAMF#6 and AQ-MM#1 and AQ-MM#2 would be offset in the BAAQMD to below BAAQMD thresholds or net zero (as required by the General Conformity regulation). ROG, NO_X, and PM emissions would be fully offset (i.e., to net zero) within the SJVAPCD, pursuant to the Authority's MOU with the air district for the HSR subsections within the SJVAB. Pursuant to SJVAPCD's GAMAQI, emissions offsets procured through AQ-MM#4 could not be used to mitigate CO effects. Accordingly, CO emissions would remain above SJVAPCD's CEQA threshold even after implementation of all feasible mitigation.

Construction activities would not exceed applicable local air district health risk thresholds or criteria; however, they would exceed state and federal ambient air quality standards. Construction of all alternatives would lead to new violations of the PM_{10} and $PM_{2.5}$ CAAQS and NAAQS, as well as potentially contribute to existing PM violations through exceedances of the SIL. Alternatives 1, 2, and 4 would also violate the 1-hour NO_2 NAAQS and CAAQS.

Table 7-52 Summary of Effects

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Temporary Direct and Indirect Effects on Air Quality within the SFBAAB	Temporary construction activity would generate NO_X emissions in excess of the General Conformity *de minimis* threshold. Emissions would also exceed BAAQMD's ROG and NO_X CEQA thresholds.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Temporary Direct and Indirect Effects on Air Quality within the NCCAB	Temporary construction activity would generate criteria pollutants, but those emissions would not exceed MBARD's PM_{10} threshold.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Temporary Direct and Indirect Effects on Air Quality within the SJVAB	Temporary construction activity would generate NO_X emissions in excess of the General Conformity *de minimis* threshold. Emissions would also exceed SJVAPCD's NO_X, CO, and PM_{10} CEQA thresholds.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Temporary Direct Effects on Implementation of an Applicable Air Quality Plan	Construction-related criteria pollutant emissions would exceed adopted air district thresholds in the BAAQMD and SJVAPCD, and the federal *de minimis* NOx thresholds in the SFBAAB and SJVAB.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Temporary Direct Effects on Localized Air Quality—Criteria Pollutants	Temporary construction activity would violate the 1-hour NO_2 CAAQS and NAAQS, annual PM_{10} CAAQS, annual $PM_{2.5}$ CAAQS and NAAQS, and 24-hour $PM_{2.5}$ NAAQS. Emissions concentrations would also exceed the 24-hour and annual PM_{10} SIL and 24-hour and annual $PM_{2.5}$ SIL.	Same as Alternative 1.	Temporary construction activity would violate the annual PM_{10} CAAQS, annual $PM_{2.5}$ CAAQS and NAAQS, and 24-hour $PM_{2.5}$ NAAQS. Emissions concentrations would also exceed the 24-hour and annual PM_{10} SIL and 24-hour and annual $PM_{2.5}$ SIL.	Temporary construction activity would violate the 1-hour NO_2 CAAQS and NAAQS, annual and 24-hour PM_{10} CAAQS, annual $PM_{2.5}$ CAAQS and NAAQS, and 24-hour $PM_{2.5}$ NAAQS. Emissions concentrations would also exceed the 24-hour and annual PM_{10} SIL and 24-hour and annual $PM_{2.5}$ SIL.

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Temporary Direct Effects on Localized Air Quality—Exposure to Diesel Particulate Matter and $PM_{2.5}$ (Health Risk)	Temporary construction activity would not generate DPM or $PM_{2.5}$ concentrations in excess of established health risk thresholds. The maximum increase in potential cancer risk (5.0 per million) would occur in the San Joaquin Valley Subsection.	Temporary construction activity would not generate DPM or $PM_{2.5}$ concentrations in excess of established health risk thresholds. The maximum increase in potential cancer risk (5.0 per million) would occur in the Monterey Corridor and San Joaquin Valley Subsections.	Temporary construction activity would not generate DPM or $PM_{2.5}$ concentrations in excess of established health risk thresholds. The maximum increase in potential cancer risk (9.4 per million) would occur in the Morgan Hill and Gilroy Subsection.	Temporary construction activity would not generate DPM or $PM_{2.5}$ concentrations in excess of established health risk thresholds. The maximum increase in potential cancer risk (6.1 per million) would occur in the Monterey Corridor Subsection.
Temporary Direct Effects on Localized Air Quality—Exposure to Asbestos, Lead-Based Paint, and Valley Fever	Project design and compliance with existing asbestos and LBP handling and disposal standards, as well as fugitive dust control practices, would prevent exposure of sensitive receptors to substantial pollutant concentrations. There would be limited potential for exposure of sensitive receptors to asbestos or LBP associated with demolition of 4.4 million square feet. There would be limited potential for exposure of sensitive receptors to Valley fever associated with movement of 51.5 million cubic yards of soil and disturbance of 813 acres.	Same as Alternative 1. There would be limited potential for exposure of sensitive receptors to asbestos or LBP associated with demolition of 6.3 million square feet. There would be limited potential for exposure of sensitive receptors to Valley fever associated with movement of 60.4 million cubic yards of soil and disturbance of 1,047 acres.	Same as Alternative 1. There would be limited potential for exposure of sensitive receptors to asbestos or LBP associated with demolition of 3.9 million square feet. There would be limited potential for exposure of sensitive receptors to Valley fever associated with movement of 58.7 million cubic yards of soil and disturbance of 870 acres.	Same as Alternative 1. There would be limited potential for exposure of sensitive receptors to asbestos or LBP associated with demolition of 2.2 million square feet. There would be limited potential for exposure of sensitive receptors to Valley fever associated with movement of 52.2 million cubic yards of soil and disturbance of 1,048 acres.
Temporary Direct Effects on Localized Air Quality—Exposure to Odors	There would be limited potential for odors generated by construction to affect sensitive receptors or result in nuisance complaints.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Continuous Permanent Direct Effects on Air Quality within the SFBAAB, NCCAB, and SJVAB—On-Road Vehicle, Train, Aircraft, Station, and Maintenance Facility Emissions	Long-term operation of the HSR system would reduce criteria pollutant emissions, relative to No Project conditions, resulting in a regional and local air quality benefit. Annual reductions would range from 23 to 54 tons of VOC, 332 to 1,120 tons of CO, 208 to 447 tons of NO_X, 22 to 48 tons of SO_2, 25 to 69 tons of PM_{10}, and 11 to 26 tons of $PM_{2.5}$, depending on the ridership scenario.	Same as Alternative 1. Annual reductions would range from 23 to 54 tons of VOC, 332 to 1,120 tons of CO, 208 to 447 tons of NO_X, 22 to 48 tons of SO_2, 18 to 61 tons of PM_{10}, and 10 to 25 tons of $PM_{2.5}$, depending on the ridership scenario.	Same as Alternative 1. Annual reductions would range from 23 to 54 tons of VOC, 330 to 1,119 tons of CO, 208 to 447 tons of NO_X, 22 to 48 tons of SO_2, 23 to 66 tons of PM_{10}, and 10 to 26 tons of $PM_{2.5}$, depending on the ridership scenario.	Same as Alternative 1. Annual reductions would range from 23 to 54 tons of VOC, 332 to 1,120 tons of CO, 208 to 447 tons of NO_X, 22 to 48 tons of SO_2, 16 to 59 tons of PM_{10}, and 9 to 25 tons of $PM_{2.5}$, depending on the ridership scenario.
Continuous Permanent Direct Effects on Implementation of an Applicable Air Quality Plan	Emissions reductions from project operation would support implementation of air quality plans and attainment of regional air quality goals.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Continuous Permanent Direct Effects on Localized Air Quality—Carbon Monoxide Hot Spots (NAAQS Compliance)	Increased project traffic would not result in localized CO hot spots or exceedances of the CO NAAQS or CAAQS.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Continuous Permanent Direct Effects on Localized Air Quality—Exposure to Mobile Source Air Toxics	Operation of the HSR system would result in a regional MSAT reduction and benefit. Increased station traffic would have a low potential for meaningful localized MSAT impacts.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Continuous Permanent Direct Effects on Localized Air Quality—Particulate Matter Hot Spots (NAAQS Compliance)	The project is not considered to be a project of air quality concern, based on the descriptions as indicated in 40 C.F.R. Section 93.123(b)(1).	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Continuous Permanent Direct Effects on Localized Air Quality—Exposure to Diesel Particulate Matter and $PM_{2.5}$ (Health Risk)	Emissions of DPM and $PM_{2.5}$ from relocated freight service and station and maintenance facility operation would not expose sensitive receptors to pollutant concentrations since health risks would not exceed BAAQMD's thresholds.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Continuous Permanent Direct Effects on Localized Air Quality—Exposure to Odors	Emissions-generated odors would be limited and would not be expected to affect a substantial number of people.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

BAAQMD = Bay Area Air Quality Management District
C.F.R. = Code of Federal Regulations
CAAQS = California ambient air quality standards
CEQA = California Environmental Quality Act
CO = carbon monoxide
DPM = diesel particulate matter
HSR = high-speed rail
LBP = lead-based paint
MBARD = Monterey Bay Air Resources District
MSAT = mobile source air toxics
NAAQS = national ambient air quality standards
NCCAB = North Central Coast Air Basin
NO_2 = nitrogen dioxide
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
PM_{10} = particulate matter 10 microns in diameter or less
ROG = reactive organic gas
SFBAAB = San Francisco Bay Area Air Basin
SIL = significant impact level
SJVAB = San Joaquin Valley Air Basin
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_2 = sulfur dioxide
VOC = volatile organic compound

8 GLOBAL CLIMATE CHANGE EFFECTS ANALYSIS

Using the methods described in Chapter 6, this chapter evaluates and discusses the effects of the project pertaining to global climate change and GHG.

8.1 Statewide and Regional Operations Emissions Analysis

Table 8-1 shows the statewide GHG emission changes (expressed in terms of CO_2e) that would result from the project under the medium and high ridership scenarios for the 2015 Existing and 2029 and 2040 No Project conditions. The analysis estimated the emission changes from reduced on-road VMT, reduced intrastate aircraft travel, and increased electrical demand. As Table 8-1 shows, the project is predicted to have a beneficial effect on statewide GHG emissions relative to both the 2015 Existing and 2029 and 2040 No Project conditions because it would result in a net reduction in GHG emissions. The estimated GHG emissions changes would be the same under all four project alternatives because the ridership scenarios do not vary by alternative. It should be noted that the emission savings due to reduced VMT are conservative because they do not consider the recently enacted SAFE Vehicles Rule. The SAFE Vehicles Rule increases GHG emission rates for light-duty gasoline-powered vehicles. As such, applying the SAFE Vehicles Rule would increase the benefits of the HSR VMT reductions by as much as 10 percent for CO_2 emissions in 2040 (CARB 2020).

This analysis considers the GHG effects associated with the project beyond 2020, consistent with SB 32 (Section 3.2.3.8, Senate Bill 32 and Assembly Bill 197), by assessing operations emissions for two conditions (2029 and 2040). Table 8-1 shows that the project would result in GHG reductions relative to the 2029 and 2040 No Project conditions and would help the state reach the goal established in SB 32 (40 percent below 1990 levels). Based on the 1990 emissions of 431 million metric tons CO_2e, the state would need to reduce emissions by 172 million metric tons CO_2e to achieve the SB 32 goal. The project would reduce statewide GHG emissions by 1.1–1.7 million metric tons CO_2e in the design year (2040), depending on the ridership scenario. These reductions correspond to an annual reduction of 0.6 to 1.0 percent of the 172 million metric tons CO_2e needed to achieve the SB 32 goal.

Table 8-1 Estimated Statewide Greenhouse Gas Emissions Change from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year)

Emission Source	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions		
On-road vehicles	(1.1)	(1.5)
Aircraft	(0.7)	(0.7)
Power plants	0.4	0.4
Total statewide emissions	(1.4)	(1.8)
2029 Plus Project Emissions Relative to 2029 No Project Conditions		
On-road vehicles	(0.4)	(0.3)
Aircraft	(0.5)	(0.5)
Power plants	0.3	0.3
Total statewide emissions	(0.6)	(0.4)

Emission Source	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
2040 Plus Project Emissions Relative to 2040 No Project Conditions		
On-road vehicles	(0.5)	(1.1)
Aircraft	(1.0)	(0.9)
Power plants	0.4	0.4
Total statewide emissions	(1.1)	(1.7)

Source: Authority 2020
(Parentheses) indicate negative values
Totals may not add up exactly because of rounding.
CO_2e = carbon dioxide equivalent
HSR = high-speed rail
t = metric tons

Table 8-1 also shows that the net change in emissions for 2015 Existing conditions would be a decrease in GHG emissions. Despite increases in power plant emissions from the project plus all other statewide activity between 2015 and 2040, total statewide GHG emissions in 2040 would be less than the level of GHG emissions in 2015. As evident in Table 8-1, the primary factor for the net decrease in emissions is decreases in on-road vehicle emissions related to advancements in vehicle emissions technology and the retirement of older, higher-emitting vehicles. Statewide growth would increase background aircraft emissions, but the project would reduce emissions relative to the No Project conditions by diverting passengers from aircraft to HSR. Therefore, the project's effect on GHG emissions would be beneficial with respect to both 2015 Existing conditions and the 2029 and 2040 No Project conditions.

8.1.1 On-Road Vehicles

The project would reduce annual roadway VMT compared to 2015 Existing Conditions and the 2029 and 2040 No Project conditions because travelers would use the HSR rather than drive (see Table 7-6 for VMT under No Project and Plus Project conditions). The on-road vehicle emission analysis is based on projected VMT changes and associated average daily speed estimates, calculated based on the ridership estimates presented in the 2016 Business Plan (Authority 2016). Analysts obtained GHG emission factors from EMFAC2017, using statewide parameters.

As shown in Table 8-2, the project is predicted to decrease statewide on-road GHG emissions relative to both 2015 Existing conditions and 2029 and 2040 No Project conditions. On county and regional levels, Table 8-2 also shows the project is predicted to result in a decrease in on-road GHG emissions relative to both conditions, as well. As discussed previously, on-road vehicle emissions are expected to decrease in the future because of advancements in vehicle emissions technology and the retirement of older, higher-emitting vehicles. Therefore, the reduction in GHG emissions from on-road vehicles because of the project is demonstrated on the county, regional, and statewide levels for both conditions. The change in emissions would be the same under all four project alternatives because the ridership is assumed to be the same. As noted above, the mobile source emissions reductions shown in Table 8-2 are conservative because they do not account for the SAFE Vehicles Rule, which will increase GHG emissions (and thus the benefits of the HSR VMT reductions) generated by light-duty gasoline-powered vehicles.

Table 8-2 Regional On-Road Vehicle Greenhouse Gas Emission Changes from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year)

Location	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions		
Santa Clara	(0.1)	(0.1)
San Benito	<0.0	(0.1)
Merced	<0.0	(0.1)
Total regional net emissions	(0.1)	(0.2)
2029 Plus Project Emissions Relative to 2029 No Project Conditions		
Santa Clara	<0.0	<0.0
San Benito	<0.0	<0.0
Merced	<0.0	<0.0
Total regional net emissions	(0.1)	(0.1)
2040 Plus Project Emissions Relative to 2040 No Project Conditions		
Santa Clara	<0.0	(0.1)
San Benito	<0.0	<0.0
Merced	<0.0	(0.1)
Total regional net emissions	(0.1)	(0.2)

Source: Authority 2020
(Parentheses) indicate negative values
Totals may not add up exactly because of rounding.
CO_2e = carbon dioxide equivalent
t = metric tons
HSR = high-speed rail

8.1.2 Trains

The project would use EMU trains, with the power distributed through the overhead contact system. The HSR system would not produce direct GHG emissions from combustion of fossil fuels and associated emissions. Electricity-related emissions are assessed in Section 8.1.4, Power Plants.

8.1.3 Aircraft

As described in Section 6.2.3, analysts calculated aircraft emissions by using fuel consumption and emission factors, profiles of aircrafts, and number of air trips removed. Refer to Table 7-10 for the number of flights in 2015, 2029, and 2040 with and without the project. As shown in Table 8-3, the project would reduce regional (Bay Area) and statewide emissions relative to 2015 Existing and 2029 and 2040 No Project conditions. The change in emissions would be the same under all four project alternatives because the ridership is assumed to be the same.

Table 8-3 Aircraft Greenhouse Gas Emission Changes from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year)

Location	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions		
Regional (Bay Area)	(0.3)	(0.3)
Total statewide net emissions	(0.7)	(0.7)
2029 Plus Project Emissions Relative to 2029 No Project Conditions		
Regional (Bay Area)	(0.2)	(0.2)
Total statewide net emissions	(0.5)	(0.5)
2040 Plus Project Emissions Relative to 2040 No Project Conditions		
Regional (Bay Area)	(0.4)	(0.4)
Total statewide net emissions	(1.0)	(0.9)

Source: Authority 2020
(Parentheses) indicate negative values
Totals may not add up exactly because of rounding.
CO_2e = carbon dioxide equivalent
HSR = high-speed rail
t = metric tons

8.1.4 Power Plants

The HSR system would increase electrical requirements when compared to both the 2015 Existing and 2029 and 2040 No Project conditions. Analysts conservatively estimated the electrical demands from propulsion of the trains and operation of the trains in storage depots and maintenance facilities. Table 8-4 shows the GHG emissions for both medium and high ridership scenarios relative to the 2015 Existing Conditions and 2029 and 2040 No Project conditions. Emissions would increase under both scenarios.

The state's electrical grid would power the HSR system, and, therefore, no single generation source for the electrical power requirements can be identified. As previously discussed, the state requires an increasing fraction (60 percent by 2030) of electricity generated for the state's power portfolio to come from renewable energy sources, and the Authority has a policy goal to use 100 percent renewable energy to power the HSR system. Accordingly, the GHG emissions generated for powering the HSR system are expected to be lower in the future compared to emission estimates used in this analysis, which assume the current energy mix of California. As shown in Table 8-4, the HSR system's electrical requirements would increase statewide and regional indirect GHG emissions.

Table 8-4 Power Plant Greenhouse Gas Emission Changes from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year)

Location	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions		
Regional	<0.0	<0.0
Statewide	0.4	0.4

Location	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
2029 Plus Project Emissions Relative to 2029 No Project Conditions		
Regional	<0.0	<0.0
Statewide	0.3	0.3
2040 Plus Project Emissions Relative to 2040 No Project Conditions		
Regional	<0.0	<0.0
Statewide	0.4	0.4

Source: Authority 2020
Totals may not add up exactly because of rounding.
CO_2e = carbon dioxide equivalent
HSR = high-speed rail
t = metric tons

8.1.5 Regional Operations Greenhouse Gas Emissions Summary

A summary of the effects of the project on regional GHG emissions, which include the emissions from vehicles, aircraft, and power plants, is shown in Table 8-5. The project would reduce regional GHG emissions relative to 2015 Existing and 2029 and 2040 No Project conditions. However, this regional assessment does not account for the benefit of emissions reductions in roadway and airplane emissions that would occur statewide. Likewise, as noted above, emission savings shown in Table 8-5 due to reduced VMT do not consider the recently enacted SAFE Vehicles Rule. The SAFE Vehicles Rule increases GHG emission rates for light-duty gasoline-powered vehicles. As such, applying the SAFE Vehicles Rule would increase the benefits of the HSR VMT reductions by as much as 10 percent for CO_2 in 2040 (CARB 2020). Therefore, the full benefit of the project is not reflected in the emissions at the regional level. However, as shown in Table 8-5, the project would result in a net reduction in GHG emissions statewide for both conditions. Because GHGs circulate globally, an increase at the regional level would not be adverse, given the net reduction at the state level. There would be no difference in emissions among the alternatives because ridership is assumed to be the same.

Table 8-5 Estimated Regional Greenhouse Gas Emissions Change from the Project—Medium and High Ridership Scenarios (million metric tons CO_2e per year)

Emission Source	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions		
On-road vehicles	(0.1)	(0.2)
Aircraft	(0.3)	(0.3)
Power plants	<0.0	<0.0
Total regional emissions	(0.4)	(0.4)
2029 Plus Project Emissions Relative to 2029 No Project Conditions		
On-road vehicles	(0.1)	(0.1)
Aircraft	(0.2)	(0.2)
Power plants	<0.0	<0.0
Total regional emissions	(0.2)	(0.3)

Emission Source	Change in CO_2e Emissions from HSR (million t/year)	
	Medium	High
2040 Plus Project Emissions Relative to 2040 No Project Conditions		
On-road vehicles	(0.1)	(0.2)
Aircraft	(0.4)	(0.4)
Power plants	<0.0	<0.0
Total regional emissions	(0.5)	(0.5)

Source: Authority 2020
(Parentheses) indicate negative values
Totals may not add up exactly because of rounding.
CO_2e = carbon dioxide equivalent
HSR = high-speed rail
t = metric tons

8.2 Local Operations Emissions Sources

Operation of the San Jose Diridon and Gilroy stations and maintenance facilities would produce GHG emissions. Likewise, additional circuit breakers installed as part of the PG&E reconductoring work may result in fugitive SF_6 emissions. The operation of the power traction, switching, and paralleling stations would not result in appreciable quantities of air pollutants because site visits would be infrequent, and power usage would be limited. Therefore, analysts did not quantify emissions from these stations. This section therefore focuses on emissions generated by the station sites, maintenance facilities, and SF_6 circuit breakers.

8.2.1 Station Sites and Maintenance Facilities

Emissions associated with the operation of stations and maintenance facilities are expected because of combustion sources used primarily for space heating and facility landscaping, energy consumption for facility lighting, water usage, waste generation, and employee and passenger traffic. Analysts used CalEEMod to estimate these emissions from the stations and maintenance facilities, based on the square footage of the buildings. Mobile source emissions estimates were adjusted to reflect the impact of the SAFE Vehicles Rule (CARB 2020). Operation of the MOWF would also generate emissions from vehicles, equipment, and locomotives used for maintenance activities. The GHG emissions (expressed in terms of CO_2e) were estimated for the 2015 Existing and 2029 and 2040 No Project conditions and are included in Table 8-6. The only difference in emissions among the alternatives is associated with the Gilroy stations. Since the East Gilroy Station is entirely new, net emissions are greater than the Downtown Gilroy Station since emissions under existing conditions are zero.

Table 8-6 Station and Maintenance Facility Operational Greenhouse Gas Emissions (metric tons CO_2e per year)

Project Component	CO_2e
2015 Existing[1]	
San Jose Diridon Station	2,780
Downtown Gilroy Station	234
Existing Plus Project	
San Jose Diridon Station[3]	4,934
Downtown Gilroy Station[4]	3,180
East Gilroy Station	3,148

Project Component	CO_2e
MOWF[5]	3,861
MOWS	2,144
PROJECT CHANGE – Alternatives 1, 2, and 4	**11,106**
PROJECT CHANGE – Alternative 3	**11,308**
2029 No Project[1]	
San Jose Diridon Station	2,510
Downtown Gilroy Station	218
2029 Plus Project	
San Jose Diridon Station[3]	3,870
Downtown Gilroy Station[4]	2,636
East Gilroy Station	3,166
MOWF[5]	3,416
MOWS	1,897
PROJECT CHANGE – Alternatives 1, 2, and 4	**9,090**
PROJECT CHANGE – Alternative 3	**9,838**
2040 No Project[1]	
San Jose Diridon Station	2,799
Downtown Gilroy Station	240
2040 Plus Project	
San Jose Diridon Station[3]	6,676
Downtown Gilroy Station[4]	4,752
East Gilroy Station	5,295
MOWF[5]	3,348
MOWS	1,932
PROJECT CHANGE – Alternatives 1, 2, and 4	**13,669**
PROJECT CHANGE – Alternative 3	**14,452**

Sources: Trinity Consultants 2016; Newson 2018; USEPA 2009; Burton 2017a, 2017b, 2017c, 2018 ; McGuire 2017–2018
CO_2e = carbon dioxide equivalent
MOWF = maintenance of way facility
MOWS = maintenance of way siting
[1] Represents emissions from the existing facilities prior to HSR improvements. The East Gilroy Station, MOWF, and MOWS do not exist under existing conditions, and, as such, existing emissions are assumed to be zero.
[2] There would be no difference in operational emissions between the aerial and at-grade options.
[3] There would be no difference in operational emissions between the aerial and embankment options.
[4] There would be no difference in operational emissions between the south and east Gilroy options.

8.2.2 Sulfur Hexafluoride Circuit Breakers

PG&E substations and switching stations would require the installation of electrical equipment, including up to 12 power circuit breakers with SF_6 gas-type insulated switchgear. It is assumed that the annual SF_6 leakage rates associated with the 12 additional circuit breakers (up to 230 pounds each) would not exceed 0.5 percent. Based on the GWP of SF_6 (see Section 4.4,

Greenhouse Gases), the additional equipment would result in approximately 143 metric tons of CO_2e emissions annually for all four project alternatives.

8.3 Total Operations Emissions

Table 8-7 shows the total GHG emission changes because of project operation for the medium and high ridership scenarios, including the indirect emissions from regional vehicle travel, aircraft, and power plants and direct project operations emissions from HSR stations, maintenance facilities, and SF_6 circuit breakers under the project. The project would result in a net decrease in GHG emissions. These decreases would be beneficial to the SFBAAB, NCCAB, SJVAB, and state and would help meet local and statewide GHG reduction goals. Although lower ridership would result, there would still be a net benefit. The overall change in GHG emissions would be approximately the same under all four project alternatives. As noted above, the emission savings due to reduced VMT are conservative because they do not consider the recently enacted SAFE Vehicles Rule. The SAFE Vehicles Rule increases GHG emission rates for light-duty gasoline-powered vehicles. As such, applying the SAFE Vehicles Rule would increase the benefits of the HSR VMT reductions by as much as 10 percent for CO_2 emissions in 2040 (CARB 2020).

Table 8-7 Summary of Total Statewide Greenhouse Gas Emissions Changes from Operation of the Project—2015 Existing and 2029 and 2040 No Project Conditions (Medium and High Ridership Scenarios) (million metric tons CO_2e per year)

Emission Source	Change in CO_2e Emissions from HSR (Million t/year)	
	Medium	High
Existing Plus Project Emissions Relative to 2015 Existing Conditions		
Indirect emissions		
On-road vehicles	(1.1)	(1.5)
Aircraft	(0.7)	(0.7)
Power plants	0.4	0.4
Direct emissions[1]		
Alternative 1	<0.1	
Alternative 2	<0.1	
Alternative 3	<0.1	
Alternative 4	<0.1	
Total emissions[2]	(1.4)	(1.7)
2029 Plus Project Emissions Relative to 2029 No Project Conditions		
Indirect emissions		
On-road vehicles	(0.4)	(0.3)
Aircraft	(0.5)	(0.5)
Power plants	0.3	0.3
Direct emissions[1]		
Alternative 1	<0.1	
Alternative 2	<0.1	
Alternative 3	<0.1	

Emission Source	Change in CO_2e Emissions from HSR (Million t/year)	
	Medium	High
Alternative 4	<0.1	
Total emissions[2]	(0.6)	(0.4)
2040 Plus Project Emissions Relative to 2040 No Project Conditions		
Indirect emissions		
On(road vehicles	(0.5)	(1.1)
Aircraft	(1.0)	(0.9)
Power plants	0.4	0.4
Direct emissions[1]		
Alternative 1	<0.1	
Alternative 2	<0.1	
Alternative 3	<0.1	
Alternative 4	<0.1	
Total emissions[2]	(1.1)	(1.6)

Sources: Authority 2020; Trinity Consultants 2016; Newson 2018 ; USEPA 2009; Burton 2017a, 2017b, 2017c, 2018; McGuire 2017–2018
(Parentheses) indicate negative values
CO_2e = carbon dioxide equivalent
HSR = high-speed rail
t = metric tons
SF_6 = sulfur hexafluoride
[1] Sum of station, maintenance facility, and SF_6 circuit breaker emissions. Represents the net emissions effect of the project (i.e., the difference in operating emissions between existing or No Project condition and the project condition).
[2] The total includes the indirect and direct emissions for the alternative (Alternative 3) with the greatest total emissions. Totals may not add up exactly because of rounding.

8.4 Construction Greenhouse Gas Emissions

GHG emissions generated from construction of the project would be short term. However, since the time that CO_2 remains in the atmosphere cannot be definitively quantified because of the wide range of time scales in which carbon reservoirs exchange CO_2 with the atmosphere, there is no single value for the half-life of CO_2 in the atmosphere (IPCC 2007). Therefore, the duration that CO_2 emissions from a short-term project would remain in the atmosphere is unknown.

Tables 8-8 through 8-11 show construction activity emissions from the project. The analysis reflects the impact of the SAFE Vehicles Rule (CARB 2020) and assumes implementation of AQ-IAMF#1 through AQ-IAMF#6. However, because the penetration of ZE and NZE off-road equipment and heavy-duty vehicles in future construction fleets is unknown, emissions reductions achieved by AQ-MM#2 cannot currently be quantified or included in the analysis. The total GHG construction emissions of the project (Alternative 4) would be less than 0.15 percent of the total annual statewide GHG emissions.[29]

Tables 8-8 through 8-10 also show the amortized GHG emissions during project construction activities. GHG pollutants such as N_2O can remain in the atmosphere for 120 years (IPCC 2007). A 25-year project life is conservatively assumed (although the actual project life would be much longer). Total amortized GHG construction emissions for the project are estimated to be between

[29] A GHG emissions inventory for the regional project vicinity was not available at the time of the release of this document, so the comparison was made to CARB's 2016 emissions inventory, which estimated that the annual CO_2e emissions in California are about 429 million metric tons (CARB 2018d).

14,870 and 20,043 metric tons CO_2e per year, with Alternative 4 generating the most emissions, and Alternative 1 generating the least. Most emissions would occur in the BAAQMD (58 percent to 65 percent), followed by SJVAPCD (28 percent to 37 percent), and MBARD (4 percent to 7 percent). The increase in GHG emissions generated during construction would be offset in 8 to 14 months, depending on the alternative, during operation by the net GHG reductions in operation (because of car and aircraft trips removed in the RSA), relative to No Project conditions.

Table 8-8 Alternative 1 Carbon Dioxide Equivalent Construction Emissions (metric tons per year)[1, 2]

Year	Air District		
	BAAQMD	MBARD	SJVAPCD
2022	30,032	4,662	14,621
2023	47,001	3,274	28,274
2024	59,992	2,647	28,581
2025	45,788	2,118	25,893
2026	20,596	1,201	22,709
2027	11,084	1,217	17,495
2028	2,352	279	1,935
Total by air district	216,845	15,399	139,508
Construction total	371,752		
Amortized GHG Emissions (averaged over 25 years)			
CO_2e per year by air district	8,674	616	5,580
CO_2e per year for total construction	14,870		
Payback of GHG Emissions (months)[2, 3]			
Payback period (project vs. 2029 no project)	8 to 10		

Sources: Trinity Consultants 2016; USEPA 1978; USEPA 2020; The Climate Registry 2018; Scholz 2018
BAAQMD = Bay Area Air Quality Management District
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
MBARD = Monterey Bay Air Resources District
SJVAPCD = San Joaquin Valley Air Pollution Control District
< = less than
[1] Project life assumed to be 25 years.
[2] Payback periods were estimated by dividing the GHG emissions during construction by the annual GHG emission reduction during operation. See Table 8-7 for operational GHG emission-reduction data. The range in payback days represents the range of emissions changes based on the medium and high ridership scenarios.
[3] The payback period accounts for all emissions directly and indirectly generated by construction activities for which the Authority has practical control and program responsibility. Emissions generated upstream (e.g., material manufacturing) and downstream (e.g., recycling) of construction, otherwise known as "lifecycle emissions", are not included in the analysis, consistent with guidance from the California Natural Resources Agency (2018). While the origin of most raw materials is not known, and thus an emissions analysis would be speculative, construction of the project would require concrete from on- and off-site batch plants. Lifecycle emissions for cement and aggregate manufacturing, which is upstream of the concrete batching process, have been studied in various literature. Accordingly, for the purposes of disclosure, analysts quantified upstream CO_2 emissions resulting from cement and aggregate manufacturing using emission factors from Marceau et al. (2007). It was assumed the tunnel segments would require a compression strength of 7,500 pounds per square inch and all other infrastructure would require a compression strength of 5,000 pounds per square inch. The analysis indicates that cement and aggregate manufacturing would generate 1,004,663 metric tons CO_2e. These emissions would be generated upstream of construction and through activities for which the Authority has no practical control. The emissions are therefore disclosed for informational purposes only. Nonetheless, it is worth noting that if the emissions were added to the 371,752 metric tons CO_2e generated by construction of Alternative 1, the combined total emissions would be offset in 2 to 3 years (relative to 2029 No Project conditions).

Table 8-9 Alternative 2 Carbon Dioxide Equivalent Construction Emissions (metric tons per year)[1, 2]

Year	Air District		
	BAAQMD	MBARD	SJVAPCD
2022	41,877	6,823	14,621
2023	64,260	5,463	28,274
2024	80,133	4,409	28,581
2025	55,833	3,945	25,893
2026	27,833	2,505	22,709
2027	25,130	4,284	17,495
2028	3,381	489	1,935
Total by air district	298,447	27,917	139,508
Construction total	465,635		
Amortized GHG Emissions (averaged over 25 years)			
CO_2e per year by air district	11,938	1,117	5,580
CO_2e per year for total construction	18,635		
Payback of GHG Emissions (months)[2, 3]			
Payback period (project vs. 2029 no project)	9 to 13		

Sources: Trinity Consultants 2016; USEPA 1978; USEPA 2020; The Climate Registry 2018; Scholz 2018
BAAQMD = Bay Area Air Quality Management District
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
MBARD = Monterey Bay Air Resources District
SJVAPCD = San Joaquin Valley Air Pollution Control District
< = less than
[1] Project life assumed to be 25 years.
[2] Payback periods were estimated by dividing the GHG emissions during construction by the annual GHG emission reduction during operation. See Table 8-7 for operational GHG emission-reduction data. The range in payback days represents the range of emissions changes based on the medium and high ridership scenarios.
[3] The payback period accounts for all emissions directly and indirectly generated by construction activities for which the Authority has practical control and program responsibility. Emissions generated upstream (e.g., material manufacturing) and downstream (e.g., recycling) of construction, otherwise known as "lifecycle emissions", are not included in the analysis, consistent with guidance from the California Natural Resources Agency (2018). While the origin of most raw materials is not known, and thus an emissions analysis would be speculative, construction of the project would require concrete from on- and off-site batch plants. Lifecycle emissions for cement and aggregate manufacturing, which is upstream of the concrete batching process, have been studied in various literature. Accordingly, for the purposes of disclosure, analysts quantified upstream CO_2 emissions resulting from cement and aggregate manufacturing using emission factors from Marceau et al. (2007). It was assumed the tunnel segments would require a compression strength of 7,500 pounds per square inch and all other infrastructure would require a compression strength of 5,000 pounds per square inch. The analysis indicates that cement and aggregate manufacturing would generate 1,040,538 metric tons CO_2e. These emissions would be generated upstream of construction and through activities for which the Authority has no practical control. The emissions are therefore disclosed for informational purposes only. Nonetheless, it is worth noting that if the emissions were added to the 465,635 metric tons CO_2e generated by construction of Alternative 2, the combined total emissions would be offset in about 3 years (relative to 2029 No Project conditions).

Table 8-10 Alternative 3 Carbon Dioxide Equivalent Construction Emissions (metric tons per year)[1, 2]

Year	Air District		
	BAAQMD	MBARD	SJVAPCD
2022	28,886	3,837	14,621
2023	50,402	3,173	28,274
2024	62,236	2,556	28,581
2025	44,303	2,043	25,893
2026	21,272	1,145	22,709
2027	13,343	1,502	17,495
2028	2,552	283	1,935
Total by air district	222,993	14,538	139,508
Construction total	377,040		
Amortized GHG Emissions (averaged over 25 years)			
CO_2e per year by air district	8,920	582	5,580
CO_2e per year for total construction	15,082		
Payback of GHG Emissions (months)[2, 3]			
Payback period (project vs. 2029 no project)	8 to 10		

Sources: Trinity Consultants 2016; USEPA 1978; USEPA 2020; The Climate Registry 2018; Scholz 2018
BAAQMD = Bay Area Air Quality Management District
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
MBARD = Monterey Bay Air Resources District
SJVAPCD = San Joaquin Valley Air Pollution Control District
< = less than
[1] Project life assumed to be 25 years.
[2] Payback periods were estimated by dividing the GHG emissions during construction by the annual GHG emission reduction during operation. See Table 8-7 for operational GHG emission-reduction data. The range in payback days represents the range of emissions changes based on the medium and high ridership scenarios.
[3] The payback period accounts for all emissions directly and indirectly generated by construction activities for which the Authority has practical control and program responsibility. Emissions generated upstream (e.g., material manufacturing) and downstream (e.g., recycling) of construction, otherwise known as "lifecycle emissions", are not included in the analysis, consistent with guidance from the California Natural Resources Agency (2018). While the origin of most raw materials is not known, and thus an emissions analysis would be speculative, construction of the project would require concrete from on- and off-site batch plants. Lifecycle emissions for cement and aggregate manufacturing, which is upstream of the concrete batching process, have been studied in various literature. Accordingly, for the purposes of disclosure, analysts quantified upstream CO_2 emissions resulting from cement and aggregate manufacturing using emission factors from Marceau et al. (2007). It was assumed the tunnel segments would require a compression strength of 7,500 pounds per square inch and all other infrastructure would require a compression strength of 5,000 pounds per square inch. The analysis indicates that cement and aggregate manufacturing would generate 1,050,040 metric tons CO_2e. These emissions would be generated upstream of construction and through activities for which the Authority has no practical control. The emissions are therefore disclosed for informational purposes only. Nonetheless, it is worth noting that if the emissions were added to the 377,040 metric tons CO_2e generated by construction of Alternative 3, the combined total emissions would be offset in 2 to 3 years (relative to 2029 No Project conditions).

Table 8-11 Alternative 4 Carbon Dioxide Equivalent Construction Emissions (metric tons per year)[1, 2]

Year	Air District		
	BAAQMD	MBARD	SJVAPCD
2022	44,472	7,276	14,621
2023	64,038	6,517	28,274
2024	81,575	5,744	28,581
2025	69,495	5,332	25,893
2026	31,610	3,170	22,709
2027	32,092	5,730	17,495
2028	3,927	584	1,935
Total by air district	327,209	34,352	139,508
Construction total	501,070		
Amortized GHG Emissions (averaged over 25 years)			
CO_2e per year by air district	13,088	1,374	5,580
CO_2e per year for total construction	20,043		
Payback of GHG Emissions (months)[2]			
Payback period (project vs. 2029 no project)	10 to 14		

Sources: Trinity Consultants 2016; USEPA 1978 USEPA 2020; The Climate Registry 2018; Scholz 2018
BAAQMD = Bay Area Air Quality Management District
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
MBARD = Monterey Bay Air Resources District
SJVAPCD = San Joaquin Valley Air Pollution Control District
< = less than
[1] Project life assumed to be 25 years.
[2] Payback periods were estimated by dividing the GHG emissions during construction by the annual GHG emission reduction during operation. See Table 8-7 for operational GHG emission-reduction data. The range in payback days represents the range of emissions changes based on the medium and high ridership scenarios.
[3] The payback period accounts for all emissions directly and indirectly generated by construction activities for which the Authority has practical control and program responsibility. Emissions generated upstream (e.g., material manufacturing) and downstream (e.g., recycling) of construction, otherwise known as "lifecycle emissions", are not included in the analysis, consistent with guidance from the California Natural Resources Agency (2018). While the origin of most raw materials is not known, and thus an emissions analysis would be speculative, construction of the project would require concrete from on- and off-site batch plants. Lifecycle emissions for cement and aggregate manufacturing, which is upstream of the concrete batching process, have been studied in various literature. Accordingly, for the purposes of disclosure, analysts quantified upstream CO_2 emissions resulting from cement and aggregate manufacturing using emission factors from Marceau et al. (2007). It was assumed the tunnel segments would require a compression strength of 7,500 pounds per square inch and all other infrastructure would require a compression strength of 5,000 pounds per square inch. The analysis indicates that cement and aggregate manufacturing would generate 925,308 metric tons CO_2e. These emissions would be generated upstream of construction and through activities for which the Authority has no practical control. The emissions are therefore disclosed for informational purposes only. Nonetheless, it is worth noting that if the emissions were added to the 501,070 metric tons CO_2e generated by construction of Alternative 4, the combined total emissions would be offset in 2 to 3 years (relative to 2029 No Project conditions).

8.5 Summary of Effects

Project features, including IAMFs, design standards, and compliance with the Authority's project design guideline technical memoranda, would avoid or minimize effects of GHGs. Table 8-12 summarizes the project's effects associated with GHG by alternative. The project would lower GHG emissions overall.

Table 8-12 Summary of Effects

Impacts	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Temporary Direct and Indirect Effects on Global Climate Change—Greenhouse Gas Emissions	GHG emissions generated during temporary construction of 14,870 t CO_2e per year would be offset by reductions achieved through project operation in 8 to 10 months (relative to 2029 No Project conditions).	GHG emissions generated during temporary construction of 18,635 t CO_2e per year would be offset by reductions achieved through project operation in 9 to 13 months (relative to 2029 No Project conditions).	GHG emissions generated during temporary construction of 15,082 t CO_2e per year would be offset by reductions achieved through project operation in 8 to 10 months (relative to 2029 No Project conditions).	GHG emissions generated during temporary construction of 20,043 t CO_2e per year would be offset by reductions achieved through project operation in 10 to 14 months (relative to 2029 No Project conditions).
Continuous Permanent Direct and Indirect Effects on Global Climate Change—Greenhouse Gas Emissions	Long-term operation of the HSR system would reduce GHG emissions, relative to No Project conditions, resulting in a statewide and regional GHG benefit. Annual reductions would range from 1.1 million mt CO_2e to 1.6 million mt CO_2e, depending on the ridership scenario.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

GHG = greenhouse gas
t = metric tons
CO_2e = carbon dioxide equivalent
HSR = high-speed rail

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9 MITIGATION MEASURES

This chapter presents mitigation measures the Authority would implement to address effects on air quality.

AQ-MM#1: Implement Additional On-Site Emissions Controls to Reduce Fugitive Dust

During construction, the Contractor shall employ the following measures to minimize and control fugitive dust emissions:

- Where feasible, install wind breaks (e.g., dust curtains, plastic tarps, solid fencing) on the average dominant windward side(s) of construction areas. For purposes of implementation, chain-link fencing with added landscape mesh fabric adequately qualifies as solid fencing.
- Post a publicly visible sign with the telephone number and person to contact at the Authority regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number for the local air district shall also be visible to ensure compliance with applicable regulations.

AQ-MM#2: Construction Emissions Reductions – Requirements for Use of Zero Emission (ZE) and/or Near Zero Emission (NZE) Vehicles and Off-Road Equipment

This mitigation measure will reduce the impact of construction emissions from project related on-road vehicles and off-road equipment.

The Authority and all project construction contractors shall require that a minimum of 25 percent, with a goal of 100 percent, of all light-duty on-road vehicles (e.g., passenger cars, light-duty trucks) associated with the project (e.g., on-site vehicles, contractor vehicles) use ZE or NZE technology.

The Authority and all project construction contractors shall have the goal that a minimum of 25 percent of all heavy-duty on-road vehicles (e.g., for hauling, material delivery and soil import/export) associated with the project use ZE or NZE technology.

The Authority and all project construction contractors shall have the goal that a minimum of 10 percent of off-road construction equipment use ZE or NZE vehicles.

If local or state regulations mandate a faster transition to using ZE and/or NZE vehicles at the time of construction, the more stringent regulations will be applied. For example, EO N-79-20, issued by California Governor Newsom September 23, 2020, currently states the following:

- Light duty and passenger car sales be 100 percent ZE vehicles by 2035
- Full transition to ZE short haul/drayage trucks by 2035
- Full transition to ZE heavy-duty long-haul trucks, where feasible, by 2045
- Full transition to ZE off-road equipment by 2035, where feasible.

The project will have a goal of surpassing the requirements of these or other future regulations as a mitigation measure.

AQ-MM#3: Offset Project Construction Emissions in the San Francisco Bay Area Air Basin

Prior to issuance of construction contracts, the Authority will conduct an air quality analysis that evaluates the conditions that exist at that time. If the analysis determines that there will be exceedances of the VOC or NOx thresholds, even after the application of the mitigation in AQ-MM#2, the Authority will enter into an agreement with BAAQMD to reduce VOC and NO_X to the required levels by acquiring offsets. The required levels in the SFBAAB are as follows:

1. For emissions in excess of the General Conformity *de minimis* thresholds (NO_X): net zero.
2. For emissions not in excess of *de minimis* thresholds but above the BAAQMD's daily emission thresholds (VOC and NO_X): below the appropriate CEQA threshold levels.

The mitigation offset fee amount will be determined at the time of mitigation to fund one or more emissions reduction projects within the SFBAAB. The offset fee will be determined by the Authority and BAAQMD based on the type of projects that present appropriate emission reduction opportunities. These funds may be spent to reduce either VOC or NO_X emissions ("O_3 precursors"). Documentation of payment will be provided to the Authority or its designated representative.

The agreement will include details regarding the annual calculation of required offsets the Authority must achieve, funds to be paid, administrative fee, and the timing of the emissions reductions projects. Acceptance of this fee by BAAQMD will serve as an acknowledgment and commitment by BAAQMD to: (1) implement an emissions reduction project(s) within a timeframe to be determined based on the type of project(s) selected after receipt of the mitigation fee designed to achieve the emission reduction objectives; and (2) provide documentation to the Authority or its designated representative describing the project(s) funded by the mitigation fee, including the amount of emissions reduced (tons per year) in the SFBAAB from the emissions reduction project(s). To qualify under this mitigation measure, the specific emissions reduction project(s) must result in emission reductions in the SFBAAB that are real, surplus, quantifiable, enforceable, and will not otherwise be achieved through compliance with existing regulatory requirements or any other legal requirement. Pursuant to 40 C.F.R. Section 93.163(a), the necessary reductions must be achieved (contracted and delivered) by the applicable year in question. Funding will need to be received by BAAQMD prior to contracting with participants and should allow enough time to receive and process applications to fund and implement off-site reduction projects prior to commencement of project activities being reduced. This will roughly equate to 1 year prior to the required mitigation; additional lead time may be necessary depending on the level of off-site emission reductions required for a specific year.

This mitigation measure will be effective in offsetting emissions generated during project construction through the funding of emission-reduction projects. It is BAAQMD's experience that emissions offsets are feasible mitigation that effectively achieves actual emission reductions (Kirk 2018).

The implementation of this mitigation measure will not be expected to affect air quality in the BAAQMD because purchasing emissions offsets will not result in any physical change to the environment, and therefore will not result in other secondary environmental impacts. In addition to VOC and NO_X, the implementation of emission-reduction projects could result in reductions of other criteria pollutants and/or GHGs. However, this will be a secondary effect of this mitigation measure and is not a required outcome to mitigate any impacts of the project.

AQ-MM#4: Offset Project Construction Emissions in the San Joaquin Valley Air Basin

On June 19, 2014, the SJVAPCD and Authority entered a Memorandum of Understanding (MOU) that establishes the framework for fully mitigating to net zero construction emissions of NOx, VOC, PM_{10}, and $PM_{2.5}$ from the entire High-Speed Rail Project within the SJVAB (Authority and SJVUAPCD 2014). Emissions generated by construction of the portion of the project within the SJVAB are subject to this MOU and therefore must be offset to net zero. Pursuant to the MOU, the Authority and the SJVAPCD will enter into a Voluntary Emissions Reduction Agreement (VERA) to cover the portion of the project approved and funded for construction within the SJVAB. The project-level VERA must be executed prior to commencement of construction and the mitigation fees and offsets delivered and achieved according to the requirements of the VERA and MOU.

This mitigation measure will be effective in offsetting emissions generated during construction of the project through the funding of emission-reduction projects. It is SJVAPCD's experience that implementation of a VERA is feasible mitigation that effectively achieves actual emission reductions. Based on the performance of current incentive programs and reasonably foreseeable future growth, the SJVAPCD has confirmed that enough emissions reduction credits will be available to offset emissions generated by the project for all years in excess of the SJVAPCD's thresholds and the General Conformity *de minimis* threshold (Authority and SJVUAPCD 2014).

The implementation of this mitigation measure will not be expected to affect air quality in the SJVAPCD because purchasing emissions offsets will not result in any physical change to the environment, and therefore will not result in other secondary environmental impacts. In addition to NO_X and PM_{10}, the implementation of emission-reduction projects could result in reductions of other criteria pollutants, GHGs, or both. However, this will be a secondary effect of this mitigation measure and is not a required outcome to mitigate any impacts of the project.

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10 CUMULATIVE EFFECTS

The RSA for cumulative air quality is the SFBAAB, NCCAB, and SJVAB, and the RSA for global climate change is the state and global atmosphere. Air quality and global climate change are inherently cumulative resources because criteria pollutant and GHG emissions, once emitted, mix into the atmosphere and affect a larger area than an individual project site. Thus, this cumulative analysis does not consider individual cumulative projects near the project; rather, it uses the same thresholds of significance as the project-level analysis (except for health risks in BAAQMD) because of the inherently cumulative nature of these resources.

10.1 Near- and Long-Term Operations

State: Even with the more stringent regulations on GHG emissions expected in the future, projected growth in California may result in cumulative increases in GHG emissions. Increased GHG emissions from past, present, and reasonably foreseeable future projects in the state would result in effects on global climate change. The project's statewide demand for electricity could result in indirect GHG emissions from power generation facilities. Although the Authority has adopted a policy to purchase renewable, clean-power energy sources, it cannot guarantee that only renewable energy is used to power the HSR system because the local power distribution network does not distribute energy based on energy sources. Therefore, GHG emissions may be associated with the provisions of energy to the HSR system. However, the project would decrease overall GHG emissions by reducing vehicle and aircraft trips and would also result in a net reduction in CO_2 emissions, as described in Chapter 8. Global Climate Change Effects Analysis. This reduction in GHG emissions would more than offset the increase in GHG emissions associated with project facilities. Therefore, the project would result in a net decrease in GHG emissions from operations.

Regional: Operation of the HSR system would help the region attain air quality standards and plans by reducing the amount of regional vehicular traffic and providing an alternative mode of transportation. Because the project would help to decrease emissions of criteria pollutants and precursors (e.g., ROG, NO_X), it would result in a net benefit to regional air quality.

Local: Cumulative CO effects would not occur because, as discussed in Section 7.5, Microscale Carbon Monoxide Hot-Spot Analysis, additional traffic created by the project would not result in CO concentrations in excess of the NAAQS or CAAQS.

Multiple sources of cumulative (existing sources and future planned) TAC emissions are located within 1,000 feet of the relocated freight sections and HSR stations, including the following:

- **Existing sources**—Multiple stationary, rail, and roadway sources are currently located along the alignment.
- **Planned land use development**—Land use development in the region would increase traffic levels and result in increased vehicle-related emissions along roadways, although, over time, state and federal regulations would reduce the allowed emission rates for new vehicles. Planned development may also generate additional DPM from emergency generators and truck loading bays, as well as DPM during construction of near-term improvements.
- **Future passenger service expansion**—There are proposals to expand passenger train service from the Transportation Agency for Monterey County (TAMC) to extend rail service from Salinas to Gilroy, from the Capitol Corridor Joint Powers Authority to expand existing service between San Jose and Sacramento, and from the San Joaquin Regional Rail Commission to expand existing Altamont Corridor Express (ACE) service from Stockton and Merced to San Jose. In addition, Facebook and San Mateo Transit District are exploring Dumbarton Rail Corridor service, which in the past has included potential service from the East Bay to San Jose and there have been proposals to add Coast Daylight service from Los Angeles to San Francisco. TAMC's Monterey County Rail Extension project has completed environmental review and is funded to start initial service. Environmental compliance for improvements necessary to facilitate expanded Capitol Corridor, ACE, or Dumbarton Rail service to San Jose has not been completed and funding has not yet been obtained, so they

are not included in the cumulative analysis. Plans and funding for the Coast Daylight service are uncertain, so it has not been included in the cumulative analysis.

- **Freight rail service expansion**—Freight rail service may also expand in the future as the economy expands. The exact amount of freight rail transport is difficult to predict. Freight levels depend on not only the overall level of economic activity but also the specific demand for bulk and oversize commodities that dominate freight carried by rail. As a conservative assessment, analysts assumed that freight would increase in the future at a rate of 3.5 percent per annum (PCJPB 2015) rounded up to 4 percent. This rate is an informal rate that freight operators, such as UPRR, often cite.

A quantitative HRA has not been conducted to estimate future DPM-related health risks to nearby sensitive receptors from cumulative land use development because construction and operations details are not available, and those projects would be responsible for analyzing their contributions. The cumulative HRA, therefore, focuses on ambient concentrations from stationary, rail, and roadway sources.

The BAAQMD has developed Google Earth and geographic information system (GIS) raster files that identify source-specific health risks throughout the SFBAAB. Analysts used these files to screen the relocated freight alignment and select one area per section to analyze cumulative health risks. The selected areas were chosen based on their proximity to residential receptors and the freight alignment, as well as overall density of existing sources. Where appropriate, the BAAQMD's (2012b, 2012c) distance multipliers were used to adjust risks from existing generators and gasoline-dispensing facilities. Total cumulative health risks at the representative location in each freight section were calculated by adding the background health risk sources to the health risk and hazard effects for the net change in health risk from the relocated freight service.

Table 10-1 shows cumulative cancer risk, chronic health hazard, and $PM_{2.5}$ concentrations at representative locations along the relocated freight sections.

Table 10-1 Cumulative Cancer and Noncancer Health Risks from Freight Relocation

General Location	Cancer	Chronic HI	$PM_{2.5}$ (µg/m3)
Near Monterey Road and Blanchard Road (Alternatives 1 through 3)			
Ambient risk	34	<1	0.3
Increment project contribution[1]	(4)	<0	<0.0
Total	30	<1	0.3
Between Monterey Road and Crowner Avenue (Alternatives 1 through 3)			
Ambient risk	14	<1	0.1
Increment project contribution[1]	<0	<0	<0.0
Total	14	<1	0.1
Near Monterey Road and California Avenue (Alternatives 1 through 3)			
Ambient risk	25	<1	0.1
Increment project contribution[1]	1	<0	<0.0
Total	26	<1	0.1
Near Monterey Road and Ronan Avenue (Alternatives 1 through 3)			
Ambient risk	17	<1	0.3
Increment project contribution[1]	<0	<0	<0.0
Total	16	<1	0.3

General Location	Cancer	Chronic HI	$PM_{2.5}$ (µg/m3)
Near Monterey Road and Leavesley Road (Alternatives 1 through 3)			
Ambient risk	14	<1	3.3
Increment project contribution[1]	<0	<0	<0.0
Total	15	<1	3.3
Near Monterey Road and 1st Street (Alternatives 1 through 3)			
Ambient risk	15	<1	0.2
Increment project contribution[1]	2	<0	<0.0
Total	16	<1	0.2
Near Monterey Road and W 10th Street (Alternatives 1 through 3)			
Ambient risk	4	<1	<0.1
Increment project contribution[1]	1	<0	<0.0
Total	5	<1	<0.1
Near Pacheco Court and Frazier Lake Road (Alternative 3 only)			
Ambient risk	<1	<1	<0.1
Increment project contribution[1]	5	<0	<0.0
Total	5	<1	<0.1
Near Chestnut Street and Asbury Street (Alternative 4 only)			
Ambient risk	100	<1	51.7
Increment project contribution[1]	(17)	<0	<0.0
Total	83	<1	51.7
Near Harrison Street and Fuller Ave (Alternative 4 only)			
Ambient risk	61	<1	0.8
Increment project contribution[1]	(4)	<0	<0.0
Total	57	<1	0.8
Near Cross Way and Northern Road (Alternative 4 only)			
Ambient risk	94	<1	2.4
Increment project contribution[1]	(2)	<0	<0.0
Total	96	<1	2.4
End of Promme Court (Alternative 4 only)			
Ambient risk	39	<1	0.5
Increment project contribution[1]	(3)	<0	<0.0
Total	35	<1	0.5
Near Prindiville Road and Urshan Way (Alternative 4 only)			
Ambient risk	31	<1	0.3
Increment project contribution[1]	(1)	<0	<0.0
Total	30	<1	0.3

General Location	Cancer	Chronic HI	$PM_{2.5}$ (µg/m3)
Near Madrone Ave and Dougherty Ave (Alternative 4 only)			
Ambient risk	14	<1	0.1
Increment project contribution[1]	<0	<0	<0.0
Total	14	<1	0.1
Near Butterfield Blvd and E Dunne Ave (Alternative 4 only)			
Ambient risk	12	<1	0.2
Increment project contribution[1]	(1)	<0	<0.0
Total	11	<1	0.2
End of Sister City Way (Alternative 4 only)			
Ambient risk	4	<1	1.2
Increment project increment[1]	(1)	<0	<0.0
Total	4	<1	1.2
Near Garlic Farms Dr and Trave Park Cir (Alternative 4 only)			
Ambient risk	22	<1	0.1
Increment project contribution[1]	0	<0	<0.0
Total	22	<1	<0.1
Near Bolsa Rd (Alternative 4 only)			
Ambient risk	3	<1	0.1
Increment project contribution[1]	<0	<0	<0.0
Total	3	<1	<0.1
Near West Julian St and North Montgomery St (Alternative 4 only)			
Ambient risk	100	<1	0.6
Increment project contribution[1]	(13)	<0	<0.0
Total	87	<1	0.6
Threshold[2]	**100**	**10**	**0.8**

Sources: Winkel 2018; PCJPB 2015; Google Inc. 2018; McGuire 2017–2018; USEPA 2009
(Parentheses) indicate negative values
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m^3 = micrograms per cubic meter
< = less than
[1] Presents the maximum incremental contribution from the relocated freight service, relative to existing conditions (see Table 7-20)
[2] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis.

The San Jose Diridon and Gilroy stations and the MOWS and MOWF would have emergency generators that would be used in the event of a power outage. The MOWF would also use diesel-powered off-road equipment, vehicles, and locomotives to support maintenance and repair activities. The new East Gilroy Station would serve diesel-powered buses.[30] Table 10-2 shows the maximum cumulative risks and $PM_{2.5}$ concentrations near HSR stations and the MOWF.[31]

Table 10-2 Cumulative Cancer and Noncancer Health Risks from Station and MOWF Operation

Facility	vs. Existing		
	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station			
Ambient risk	68	<1	0.5
Increment project contribution[1]	<10[3]	<1[3]	<0.1
Total	*<78*	*<1*	*0.5*
Downtown Gilroy Station			
Ambient risk	18	<1	0.2
Increment project contribution[1]	<10[3]	<1[3]	<0.1
Total	*<28*	*<1*	*0.2*
East Gilroy Station			
Ambient risk	5	<1	0.1
Increment project contribution[1]	<1	<1	<0.1
Total	*<15*	*<1*	*0.1*
MOWF (East Gilroy Location)			
Ambient risk	1	<1	<0.1
Increment project contribution[3]	3	<1	<0.1
Total	4	*<1*	*<0.1*
Threshold[4]	**100**	**10**	**0.8**

Sources: Winkel 2018; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
< = less than
[1] Presents the maximum incremental project contribution (see Table 7-21). These risks do not exceed BAAQMD's project-level thresholds.
[2] A project-specific cancer risk and chronic health hazard assessment was not conducted since BAAQMD Regulation 2, Rule 5, Section 302, prohibits generator use if they would result in cancer or acute hazard impacts in excess of BAAQMD's health risk thresholds of significance.
[3] There are no receptors within 1,000 feet of the South Gilroy MOWF. Accordingly, a health risk assessment is not required, consistent with BAAQMD (2017a) guidance.
[4] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis.

[30] Bus service levels at the existing Diridon and Downtown Gilroy Stations are constant into the future given that no operator has a funding plan to deliver more service. Accordingly, there would be no change in risk relative to existing conditions.
[31] There are no receptors within 1,000 feet of the South Gilroy MOWF. Accordingly, a health risk assessment is not required, consistent with BAAQMD (2017a) guidance.

As shown in Table 10-1, total cumulative cancer and noncancer chronic health hazards to sensitive receptors located near the relocated freight service would not exceed the BAAQMD's health risk thresholds. However, cumulative $PM_{2.5}$ exposure at certain locations is above the BAAQMD's threshold of 0.8 µg/m^3. The exceedances are the result of existing sources located within the vicinity of the freight tracks, as the freight relocation would reduce $PM_{2.5}$ concentrations at these locations relative to existing conditions. As shown in Table 10-2, total cumulative health risks to sensitive receptors located near the HSR stations and the MOWF would not exceed the BAAQMD's health risk thresholds.

10.2 Construction

Air quality construction effects associated with the project would be above the BAAQMD's and SJVAPCD's significance thresholds.

State: As described in Section 8.4, Construction Greenhouse Gas Emissions, construction of the project would result in a one-time increase in GHG emissions. These emissions are anticipated to be offset in 8 to 14 months of project operations because of reduced passenger vehicle travel on roadways. Based on this short offset time period, the overall GHG effects (construction plus operations) would be negative and would therefore be consistent with AB 32 and SB 32 goals.

Regional: The BAAQMD, MBARD, and SJVAPCD thresholds of significance may be used to evaluate criteria pollutant effects. Projects in excess of these significance thresholds would have a cumulatively considerable effect on air quality in the SFBAAB, NCCAB, and SJVAB because they would not be consistent with the BAAQMD's, MBARD's, and SJVAPCD's attainment strategies and would prevent the BAAQMD, MBARD, and SJVAPCD from achieving attainment of state and federal standards.

As discussed in Chapter 7, construction of Alternatives 1 through 4 would result in ROG and NO_X that would exceed BAAQMD's CEQA thresholds, and NO_X, CO, and PM_{10} emissions that would exceed SJVAPCD's CEQA thresholds. ROG, NO_X, and PM_{10} emissions would be reduced and offset in the BAAQMD and SJVAPCD, as applicable, through the purchase of offsets (AQ-MM#3 and AQ-MM#4). Because AQ-MM#3 and AQ-MM#4 would offset ROG, NO_X, and PM emissions to below air district thresholds or net zero, construction of the project would not have a cumulatively considerable effect on ROG, NO_X, and PM.

Pursuant to SJVAPCD's GAMAQI, emissions offsets procured through AQ-MM#4 cannot be used to mitigate CO effects. Accordingly, CO emissions would remain above SJVAPCD's CEQA threshold and cumulatively considerable even after implementation of all feasible mitigation.

Local: Emissions analysis at the local level includes the criteria pollutants PM_{10}, $PM_{2.5}$, NO_2, CO, SO_2, and TACs.

10.2.1 Criteria Pollutants

It is anticipated that construction activities would lead to new violations of the PM_{10} and $PM_{2.5}$ CAAQS and NAAQS, as well as potentially contribute to existing PM_{10} and $PM_{2.5}$ violations through exceedances of the SIL. Alternatives 1, 2, and 4 would also violate the 1-hour NO_2 NAAQS and CAAQS. Project features would minimize air quality impacts (AQ-IAMF#1 through AQ-IAMF#6), although emissions concentrations would still violate the ambient air quality standards and exceed the SIL.

10.2.2 TACs

A cumulative HRA was performed for portions of project construction located within the BAAQMD, consistent with air district requirements. Current MBARD and SJVAPCD guidance is to evaluate the potential risks associated from all project emission sources. Within the NCCAB and SJVAB, emission sources outside the project footprint should not be included in the cumulative assessment. If the project assessment demonstrates that potential health impacts are less than significant, one could conclude that the project would have a less than cumulatively significant impact (Siong 2011; Frisbey 2017). As discussed in Section 7.10, Construction Health Risk

Assessment, construction of the project in the NCCAB and SJVAB would not exceed the MBARD's nor SJVAPCD's project-level health risk thresholds.

The construction cumulative HRA in the BAAQMD was performed using the method described in Chapter 6 for near- and long-term operational impacts. The BAAQMD's Google Earth and GIS raster files were used to screen the HSR alignment and select one 1,000-foot area per subsection to analyze cumulative health risks. Note that in some locations, two areas were analyzed to capture the greatest ambient cancer risk and $PM_{2.5}$ concentration, which occur at different locations within the 1,000-foot radius. Total cumulative health risks at the representative location(s) in each subsection were calculated by adding the background health risks sources to the health risk and hazard impacts for project construction. Tables 10-3 through 10-6 summarize the maximum cumulative cancer risk, chronic health hazard, and $PM_{2.5}$ concentrations at the representative locations in the subsections. Appendix C provides further details on the ambient sources included in the cumulative analysis.

Table 10-3 Cumulative Cancer and Noncancer Health Risks from Alternative 1 Construction in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Ambient risk	51	<1	51.6
HSR construction[1]	4	<1	<0.1
Total	*54*	*<1*	*51.6*
Monterey Corridor			
Ambient risk	198	<1	16.8
HSR construction[1]	5	<1	<0.1
Total	*203*	*<1*	*16.8*
Morgan Hill and Gilroy			
Ambient risk	68	<1	0.4
HSR construction[1]	3	<1	<0.1
Total	*71*	*<1*	*0.4*
Pacheco Pass			
Ambient risk	<1	<1	<0.1
HSR construction[1]	1	<1	<0.1
Total	*1*	*<1*	*<0.1*
Threshold[2]	**100**	**10**	**0.8**

Sources: Winkel 2018; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
HSR = high-speed rail
[1] Presents the maximum health risk from HSR construction (see Table 7-32). These risks do not exceed BAAQMD's project-level thresholds.
[2] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis.

Table 10-4 Cumulative Cancer and Noncancer Health Risks from Alternative 2 Construction in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Ambient risk	51	<1	51.6
HSR construction[1]	4	<1	<0.1
Total	*54*	*<1*	*51.6*
Monterey Corridor			
Ambient risk	198	<1	16.8
HSR construction[1]	5	<1	<0.1
Total	*203*	*<1*	*16.8*
Morgan Hill and Gilroy			
Ambient risk	68	<1	29.6
HSR construction[1]	5	<1	<0.1
Total	*73*	*<1*	*29.6*
Pacheco Pass			
Ambient risk	<1	<1	<0.1
HSR construction[1]	1	<1	<0.1
Total	*1*	*<1*	*<0.1*
Threshold[2]	**100**	**10**	**0.8**

Sources: Winkel 2018 ; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
HSR = high-speed rail
[1] Presents the maximum health risk from HSR construction (see Table 7-32). These risks do not exceed BAAQMD's project-level thresholds.
[2] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis.

Table 10-5 Cumulative Cancer and Noncancer Health Risks from Alternative 3 Construction in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Ambient risk	51	<1	51.6
HSR construction[1]	4	<1	<0.1
Total	*54*	*<1*	*51.6*
Monterey Corridor			
Ambient risk	198	<1	16.8
HSR construction[1]	3	<1	<0.1
Total	*201*	*<1*	*16.8*

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
Morgan Hill and Gilroy			
Ambient risk	156	1	0.8
HSR construction[1]	9	<1	<0.1
Total	*166*	*1*	*0.8*
Pacheco Pass			
Ambient risk	<1	<1	<0.1
HSR construction[1]	1	<1	<0.1
Total	*1*	*<1*	*<0.1*
Threshold[2]	**100**	**10**	**0.8**

Sources: Winkel 2018, Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
HSR = high-speed rail
[1] Presents the maximum health risk from HSR construction (see Table 7-32). These risks do not exceed BAAQMD's project-level thresholds.
[2] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis.

Table 10-6 Cumulative Cancer and Noncancer Health Risks from Alternative 4 Construction in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Ambient risk	51	<1	51.6
HSR construction[1]	5	<1	<0.1
Total	*56*	*<1*	*51.6*
Monterey Corridor			
Ambient risk	198	<1	16.8
HSR construction[1]	6	<1	<0.1
Total	*204*	*<1*	*16.8*
Morgan Hill and Gilroy			
Ambient risk	68	<1	29.6
HSR construction[1]	3	<1	<0.1
Total	*71*	*<1*	*29.6*
Pacheco Pass			
Ambient risk	<1	<1	<0.1
HSR construction[1]	1	<1	<0.1
Total	*1*	*<1*	*<0.1*
Threshold[2]	**100**	**10**	**0.8**

Sources: Winkel 2018; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

µg/m^3 = micrograms per cubic meter
HSR = high-speed rail
[1] Presents the maximum health risk from HSR construction (see Table 7-32). These risks do not exceed BAAQMD's project-level thresholds.
[2] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis.

The combined effects of the electrified passenger rail service, displacement of VMT and air travel, and motor vehicle and stationary source turnover represent the new emissions paradigm to which receptors would be exposed. Although there are areas of the RSA with greater existing health risks, the addition of HSR service would achieve health risk reductions in the RSA, which also would constitute a localized air quality benefit. Nevertheless, combined total cumulative cancer risks and noncancer impacts on sensitive receptors located near the project footprint would exceed the BAAQMD's thresholds. The exceedances are primarily the result of existing ambient sources, as the project's relative contribution to the exceedances of the screening threshold is less than the BAAQMD's project-level heath thresholds and is minor compared to health risks from existing sources.

10.3 Combined Construction and Operations Cumulative Health Risk Assessment

Individuals currently residing near the project corridor are exposed to a certain amount of pollution (representative of ambient risks described in Tables 10-1 through 10-6). If that individual remains in the same location during and after construction, they would be exposed to project-generated DPM during construction and then any incremental changes in risk from project-generated DPM during operations. Analysts conservatively estimated the potential lifetime risks to long-term residents that may be present during both construction and operations. Tables 10-7 through 10-10 show the results of the analysis and compare the risks to BAAQMD's cumulative thresholds. There would be no freight relocation or station operations in the Pacheco Pass Subsection. Accordingly, there is no potential for combined risk from construction and operations, and as such, the subsection is not included in the tables.

As shown in Tables 10-7 through 10-9, total cumulative health risks during construction and long-term operations would not exceed BAAQMD's thresholds at locations where a single receptor could be located during both construction and operation. Note that these receptors may be in a different location than those analyzed for the construction-only analysis in Tables 10-3 through 10-6. Accordingly, ambient or background risks differ among the analyses. Table 10-10 shows that cumulative $PM_{2.5}$ exposure would exceed BAAQMD's threshold in all subsections under Alternative 4. The exceedances are primarily the result of existing sources in the vicinity of the freight tracks, because the freight relocation would either result in minimal $PM_{2.5}$ (<0.1 µg/m^3) or reduce $PM_{2.5}$ concentrations at these locations relative to existing conditions.

Table 10-7 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 1 Construction and Operations in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Ambient	68	<1	0.5
HSR construction	4	<1	<0.1
Diridon Station operations	<10[2]	<1[2]	<0.1
Total	*<82*	*<1*	*0.5*
Monterey Corridor			
Ambient	34	<1	0.3
HSR construction	5	<1	<0.1
Freight relocation[3]	(4)	<0	<0.0
Total	*35*	*<1*	*0.3*
Morgan Hill and Gilroy			
Ambient	18	<1	0.2
HSR construction	3	<1	<0.1
Downtown Gilroy Station operations	<10[2]	<1[2]	<0.1
Freight relocation[2]	1	<1	<0.1
Total	*<32*	*<1*	*0.2*
Threshold[1]	**100**	**10**	**0.8**

Sources: Winkel 2018; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
(Parentheses) indicate negative values
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
HSR = high-speed rail
BAAQMD = Bay Area Air Quality Management District
[1] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis. Note that risks from neither construction nor operations exceed BAAQMD's project-level thresholds.
[2] A project-specific cancer risk and chronic health hazard assessment was not conducted since BAAQMD Regulation 2, Rule 5, Section 302, prohibits generator use if they would result in cancer or acute hazard impacts in excess of BAAQMD's health risk thresholds of significance.
[3] Presents the maximum incremental contribution from the relocated freight service, relative to existing conditions.

Table 10-8 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 2 Construction and Operations in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Ambient	68	<1	0.5
HSR construction	4	<1	<0.1
Diridon Station operations	<10[2]	<1[2]	<0.1
Total	*<82*	*<1*	*0.5*
Monterey Corridor			
Ambient	34	<1	0.3
HSR construction	5	<1	<0.1
Freight relocation[3]	(4)	<0	<0.0
Total	*35*	*<1*	*0.3*
Morgan Hill and Gilroy			
Ambient	18	<1	0.2
HSR construction	5	<1	<0.1
Downtown Gilroy Station operations	<10[2]	<1[2]	<0.1
Freight relocation[3]	1	<1	<0.1
Total	*<34*	*<1*	*0.2*
Threshold[1]	**100**	**10**	**0.8**

Sources: Winkel 2018; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
(Parentheses) indicate negative values
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
HSR = high-speed rail
BAAQMD = Bay Area Air Quality Management District
[1] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis. Note that risks from neither construction nor operations exceed BAAQMD's project-level thresholds.
[2] A project-specific cancer risk and chronic health hazard assessment was not conducted since BAAQMD Regulation 2, Rule 5, Section 302, prohibits generator use if they would result in cancer or acute hazard impacts in excess of BAAQMD's health risk thresholds of significance.
[3] Presents the maximum incremental contribution from the relocated freight service, relative to existing conditions.

Table 10-9 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 3 Construction and Operations in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Ambient	68	<1	0.5
HSR construction	4	<1	<0.1
Diridon Station operations	<10[2]	<1[2]	<0.1
Total	*<82*	*<1*	*0.5*
Monterey Corridor			
Ambient	34	<1	0.3
HSR construction	3	<1	<0.1
Freight relocation[3]	(4)	<0	<0.0
Total	*33*	*<1*	*0.3*
Morgan Hill and Gilroy			
Ambient	5	<1	0.1
HSR construction	9	<1	<0.1
East Gilroy Station operations	<1	<1	<0.1
Freight relocation[3]	5	<1	<0.1
Total	*19*	*<1*	*0.1*
Ambient	1	<1	<0.1
HSR construction	9	<1	<0.1
East Gilroy MOWF operations	3	<1	<0.1
Freight relocation[3]	5	<1	<0.1
Total	*13*	*<1*	*<0.1*
Threshold[1]	**100**	**10**	**0.8**

Sources: Winkel 2018; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
(Parentheses) indicate negative values
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
HSR = high-speed rail
MOWF = maintenance of way facility
[1] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis. Note that risks from neither construction nor operations exceed BAAQMD's project-level thresholds.
[2] A project-specific cancer risk and chronic health hazard assessment was not conducted since BAAQMD Regulation 2, Rule 5, Section 302, prohibits generator use if they would result in cancer or acute hazard impacts in excess of BAAQMD's health risk thresholds of significance.
[3] Presents the maximum incremental contribution from the relocated freight service, relative to existing conditions.

Table 10-10 Cumulative Cancer and Noncancer Health Risks from Combined Alternative 4 Construction and Operations in the Bay Area Air Quality Management District

Subsection/Source	Cancer	Chronic HI	$PM_{2.5}$ (µg/m³)
San Jose Diridon Station Approach			
Location 1 (receptor near construction and freight relocation)			
Ambient	100	<1	51.7
HSR construction	5	<1	<0.1
Freight relocation[2]	(17)	<0	<0.0
Total	*88*	*<1*	*51.7*
Location 2 (receptor near construction and Diridon Station)			
Ambient	68	0	0.5
HSR construction	5	<1	<0.1
Diridon Station operations	<10[3]	<1[3]	<0.1
Total	*<83*	*<1*	*0.5*
Monterey Corridor			
Ambient	94	<1	2.4
HSR construction	6	<1	<0.1
Freight relocation[2]	(2)	<0	<0.1
Total	*98*	*<1*	*2.4*
Morgan Hill and Gilroy			
Location 1 (receptor near construction and Downtown Gilroy Station)			
Ambient	18	<1	0.2
HSR construction	3	<1	<0.1
Downtown Gilroy Station operations	<10[3]	<1[3]	<0.1
Total	*<31*	*<1*	*0.2*
Location 2 (receptor near construction and freight relocation)			
Ambient	68	<1	29.6
HSR construction	3	<1	<0.1
Freight relocation[2]	<1	<1	<0.1
Total	*71*	*<1*	*29.7*
Threshold[1]	100	10	0.8

Sources: Winkel 2018; Google Inc. 2018; AERMOD version 18081; OEHHA 2015; HARP 2 version 18159
(Parentheses) indicate negative values
HI = hazard index
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
µg/m³ = micrograms per cubic meter
HSR = high-speed rail
[1] BAAQMD has adopted both project- and cumulative-level thresholds for health risks. BAAQMD's cumulative thresholds are used in this analysis. Note that risks from neither construction nor operations exceed BAAQMD's project-level thresholds.
[2] Presents the maximum incremental contribution from the relocated freight service, relative to existing conditions.
[3] A project-specific cancer risk and chronic health hazard assessment was not conducted since BAAQMD Regulation 2, Rule 5, Section 302, prohibits generator use if they would result in cancer or acute hazard impacts in excess of BAAQMD's health risk thresholds of significance.

11 CONFORMITY ANALYSIS

Projects requiring approval or funding from federal agencies that are in areas designated as nonattainment or maintenance for the NAAQS may be subject to the USEPA's Conformity Rule. The two types of federal conformity are Transportation Conformity and General Conformity.

Conformity refers to conforming to, or being consistent with, SIP for compliance with the CAA. The USEPA's Conformity Rule requires SIP conformity determinations on transportation plans, programs, and projects before they are approved or adopted (i.e., eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards [40 C.F.R. Part 93]). Federal activities, such as federally sponsored projects, may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emission reductions toward attainment.

Transportation conformity applies to those projects that will have FHWA or Federal Transit Administration (FTA) funding or require FHWA/FTA approval. General Conformity applies to those projects that will have funding or require approval from any federal agency other than the FHWA or FTA.

The FRA and USEPA have determined that General Conformity may be applicable to the project. The federal lead agency for the project is the FRA, and FHWA or FTA involvement is not anticipated other than incidental FHWA or FTA funding for joint-benefit components.

If the FHWA or FTA funds a component of the HSR, or if a minor action is required to approve the project, such as the need for an FHWA-approved grade crossing, it is anticipated that this project element would be added to the affected area's Regional Transportation Improvement Program or RTP for transportation conformity purposes. However, conformity of elements of the overall HSR system is addressed through application of the General Conformity Rule and requirements. Both General Conformity and Transportation Conformity, as they relate to the project, are discussed in this chapter.

11.1 General Conformity

The USEPA has established General Conformity *de minimis* thresholds (in tons per calendar year) for each criteria pollutant to determine whether projects are subject to conformity determination requirements. If the emissions generated by construction or operations of a project (on an area-wide basis) are less than these threshold values, the effects of the project are not considered to be significant, and no additional analyses are required to satisfy General Conformity. If the emissions are greater than these values, compliance with the General Conformity Rule must be demonstrated by one or more of several prescribed methods.

Under federal designations, the RSA is currently designated as extreme and marginal nonattainment for 8-hour O_3 in the SJVAB and SFBAAB, respectively; serious/moderate nonattainment for $PM_{2.5}$ in the SFBAAB and SJVAB; and maintenance for PM_{10} in the SJVAB. As such, the FRA is required to demonstrate project-level compliance with the General Conformity Rule for NO_X and VOC (O_3 precursors), $PM_{2.5}$, PM_{10}, and SO_2 ($PM_{2.5}$ precursor) if project-related emissions of these pollutants in the SFBAAB or SJVAB would exceed the General Conformity *de minimis* thresholds.

As shown in Section 7.4, Total Operations Emissions, the total regional emissions for all of the applicable pollutants would be lower during project operations than under No Project conditions (and would therefore not exceed the *de minimis* emission thresholds). Accordingly, only emissions generated during the construction phase need to be compared to the conformity threshold levels to determine conformity compliance. As shown in Section 7.9, Construction Mass Emissions Analysis, construction emissions, compared to the General Conformity applicability rates, are as follows:

- Annual estimated NO_X emissions in the SJVAB are greater than the applicability rate of 10 tons per year for all years of construction between 2022 and 2028 for all project alternatives with implementation of IAMFs.

- Annual estimated NO_X emissions in the SFBAAB are greater than the applicability rate of 100 tons per year in 2024 under Alternatives 1 and 3 and for all years of construction between 2023 and 2025 under Alternatives 2 and 4 with implementation of IAMFs.
- Annual estimated VOC, SO_2, PM_{10}, and $PM_{2.5}$ emissions are less than the applicability rates in the SFBAAB and SJVAB with implementation of IAMFs.

As such, a General Conformity Determination is required for the project for NO_X for the years during construction when the emissions would exceed the *de minimis* thresholds in the SFBAAB and SJVAB. The General Conformity Determination can be achieved using one of the following methods:

- Demonstrating that the direct and indirect emissions are specifically identified in the relevant implementation plan
- Obtaining a written statement from the entity responsible for the implementation plan that the total indirect and direct emissions from the action, along with other emissions in the area, would not exceed the total implementation plan emission budget
- Fully offsetting the total direct and indirect emissions to net zero by reducing emissions of the same pollutant in the same nonattainment or maintenance area

Compliance with the General Conformity Rule for the APA is required before construction of the project, but may be completed concurrent with EIR/EIS certification. Demonstrating compliance with the General Conformity Rule will not change the results of the analysis described in this report.

Appendix 3.3-B in the Draft EIR/EIS contains the draft General Conformity Determination for the project. The FRA demonstrates in the determination that the emissions of NO_X (a precursor to O_3) caused by the construction of the project would not result in an increase in regional NO_X emissions. This would be achieved by offsetting the NO_X emissions generated by construction of the project in a manner consistent with the General Conformity regulations.

The offsets are anticipated to be accomplished through an agreement with the BAAQMD and a VERA between the Authority and the SJVAPCD. The requirement for the agreement and VERA would be implemented as part of the project as described in the mitigation measures identified in Chapter 9.

The FRA is issuing the draft General Conformity Determination for public and agency review as part of the Draft EIR/EIS. Any comments on the draft General Conformity Determination would be addressed in the final General Conformity Determination, which would be included in the Final EIR/EIS for the project.

11.2 Transportation Conformity

Transportation conformity is an analytical process required for all federally funded transportation projects, but it does not apply to the project. Under the 1990 CAA amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the SIP for achieving the goals of the CAA requirements. Conformity with the CAA takes place at both the regional and project levels.

The project is not subject to the Transportation Conformity Rule. However, if the project requires future actions that meet the definition of a project element subject to Transportation Conformity, additional determinations and associated analysis would be completed as required.

12 REFERENCES

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. T*oxicological Profile for 1,3-Butadiene*. U.S. Department of Health and Human Services, Public Health Service. September 2012. Atlanta, GA.

Association of Bay Area Governments (ABAG) and Metropolitan Transit Commission (MTC). 2017. *Plan Bay Area 2040.* Final. Adopted July 26, 2017. http://2040.planbayarea.org/cdn/ff/buje2Q801oUV3Vpib-FoJ6mkOfWC9S9sgrSgJrwFBgo/1510696833/public/2017-11/Final_Plan_Bay_Area_2040.pdf (accessed July 18, 2019).

Association of Monterey Bay Area Governments (AMBAG). 2017. *Moving Forward Monterey Bay 2035*. Metropolitan Transportation Plan/Sustainable Communities Strategy. Amendment No. 1 January 2017. www.ambag.org/programs-services/planning/metro-transport-plan/Moving-Forward-2035-Monterey-Bay (accessed April 18, 2017).

Bay Area Air Quality Management District (BAAQMD). 2001. *San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard.* October 24, 2001. www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2001%20Ozone%20Attainment%20Plan/oap_2001.ashx (accessed August 17, 2016).

———. 2002 *Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations*. www.baaqmd.gov/~/media/files/compliance-and-enforcement/policies-and-procedures/inspection_guidelines_012604.pdf (accessed March 4, 2019).

———. 2012a. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en (accessed March 2017).

———. 2012b. *Gasoline Dispensing Facility (GDF) Distance Multiplier Tool.* www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools (accessed January 2017).

———. 2012c. *Diesel Internal Combustion (IC) Engine Distance Multiplier Tool.* www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools (accessed January 2017).

———. 2015. *Asbestos Airborne Toxic Control Measure (ATCM) for Surfacing Applications.* www.arb.ca.gov/toxics/atcm/asbeatcm.htm (accessed January 2017).

———. 2016. *Bay Area Air Quality Management District Permit Handbook.* www.baaqmd.gov/~/media/files/engineering/permit-handbook/baaqmd-permit-handbook.pdf?la=en (accessed March 2017).

———. 2017a. *California Environmental Quality Act Air Quality Guidelines*. May 2017.

———. 2017b. *Spare the Air, Cool the Climate*. Final 2017 Clean Air Plan. Adopted April 19, 2017. www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en (accessed October 19, 2018).

Burton, Bill. 2017a. Senior Associate. Fehr & Peers, Walnut Creek, CA. Email to ICF regarding HSR JM Station/Maintenance Facility Traffic Summary (no project and existing numbers). January 12, 2017

———. 2017b. Senior Associate. Fehr & Peers, Walnut Creek, CA. Email to ICF regarding 2029 Station Trips (existing plus project numbers). October 6, 2017

———. 2017c. Senior Associate. Fehr & Peers, Walnut Creek, CA. Email to ICF regarding confirmation of station and maintenance facility employee trips. December 13, 2017

———. 2017d. Senior Associate. Fehr & Peers, Walnut Creek, CA. Email exchanges with ICF regarding San Jose to Merced peak hour traffic data and LOS. January 19, 2017; February 15, 2017; March 31, 2017; April 11, 2017; August 14, 2017; and January 16, 2019.

———. 2018. Senior Associate. Fehr & Peers, Walnut Creek, CA. Email to ICF regarding confirmation of station with HSR project trips (with-project numbers). September 18, 2018.

———. 2019. Senior Associate. Fehr & Peers, Walnut Creek, CA. Email to ICF regarding transit at east Gilroy. January 30, 2019.

California Air Pollution Control Officers Association (CAPCOA). 2009. *Health Risk Assessments for Proposed Land Use Projects*. www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf (accessed August 2016).

California Air Resources Board (CARB). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. www.arb.ca.gov/ch/handbook.pdf (accessed August 2016).

———. 2011. *Transport*. March 3, 2011. www.arb.ca.gov/aqd/transport/transport.htm (accessed May 2012).

———. 2012. *ARB's Geographical Information System (GIS) Library*. www.arb.ca.gov/ei/gislib/gislib.htm. (accessed March 2017).

———. 2015a. California Toxics Inventory. www.arb.ca.gov/toxics/cti/cti.htm (accessed August 2016).

———. 2015b. *Climate Change Backgrounder: The Greenhouse Effect and California*. Information sheet supporting Assembly Bill 1493 (Pavley). www.arb.ca.gov/cc/factsheets/ccbackground.pdf (accessed August 2016).

———. 2016. *Ambient Air Quality Standards*. www.arb.ca.gov/research/aaqs/aaqs2.pdf (accessed August 2016).

———. 2017. *2012 Base Year Emissions*. January 26, 2017. www.arb.ca.gov/ei/emissiondata.htm (accessed October 2018).

———. 2018a. *California Transition to All-Electric Public Bus Fleets by 2040*. https://ww2.arb.ca.gov/news/california-transitioning-all-electric-public-bus-fleet-2040 (accessed January 2019).

———. 2018b. iADAM: Air Quality Data Statistics. www.arb.ca.gov/adam/topfour/topfour1.php (accessed August 2018).

———. 2018c. Area Designations Maps / State and National. December 28, 2018. www.arb.ca.gov/desig/adm/adm.htm (accessed January 2019).

———. 2018d. *California Greenhouse Gas Emissions Inventory – 2018 Edition*. www.arb.ca.gov/cc/inventory/data/data.htm (accessed August 2018).

———. 2019. *EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One*. https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf (accessed July 2020).

———. 2020. *EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO2) Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule*. https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery (accessed July 2020).

California Department of Public Health. 2018. *Epidemiological Summary of Coccidioidomycosis in California, 2017*. www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2017.pdf (accessed October 2018).

California Environmental Protection Agency (Cal-EPA). 2010. *Climate Action Team Report to Governor Schwarzenegger and the California Legislature*. December 2010.

California High Speed Rail Authority (Authority). 2016. *Connecting and Transforming California, 2016 Business Plan.* May 1, 2016. http://hsr.ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf (accessed July 28, 2016).

———. 2019a. *Merced to Fresno Section: Central Valley Wye Draft Supplemental Environmental Impact Report/Environmental Impact Statement*. Volume 1: Report. May 2019. Sacramento, CA.

———. 2019b. *San Jose to Merced Project Section, Record Preliminary Engineering for Project Definition*. May 2019. Sacramento, CA.

———. 2019c. *San Jose to Merced Project Section Transportation Technical Report.* Prepared by Fehr & Peers. September 2019. Sacramento, CA.

———. 2019d. *San Jose to Merced Project Section Geology, Soils, and Seismicity Technical Report*. September 2019. Sacramento, CA.

———. 2020. *California High-Speed Rail Statewide Criteria Pollutant and GHG Analysis Emission Spreadsheets*. Provided by Eddie Tadross. October 26, 2020.

California High-Speed Rail Authority (Authority) and Federal Railroad Administration (FRA). 2005. *Final Program Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System*. August 2005. Sacramento, CA and Washington, DC.

———. 2008. *San Francisco Bay Area (Bay Area) to Central Valley High-Speed Train (HST) Program Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS).* May 2008. Sacramento, CA and Washington, DC.

———. 2012a. *Final California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement and Final Section 4(f) Statement and Draft General Conformity Determination—Merced to Fresno Section*. Volume I: Report. April 2012. Sacramento, CA and Washington, DC.

———. 2012b. *Merced to Fresno Section Air Quality Technical Report, California High-Speed Train Final Project EIR/EIS*. Prepared by AECOM and CH2M HILL. April 2012. Sacramento, CA, and Washington, DC.

———. 2017. *California High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines*, Version 5.09. April 2017. Sacramento, CA, and Washington, DC.

———. 2019. *Statewide Impact Avoidance and Minimization Features Library*. Revision 16. March 11, 2019.

California High-Speed Rail Authority (Authority) and San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). 2014. Memorandum of Understanding between the Authority and the SJVUAPCD regarding offset of construction emissions and VERA implementation. June 19, 2014.

California Natural Resources Agency (CNRA). 2018. *Final Statement of Reasons for Regulatory Action—Amendments to the State CEQA Guidelines*. OAL Notice File No. Z-2018-0116-12. November 2018.

California Protected Areas Data Portal (CPAD). 2016. *California Protected Areas Database (CPAD)*. California Protected Areas Data Portal. www.calands.org/about/download/ (accessed March 2017)

City of Gilroy. 2002. *Gilroy 2002–2020 General Plan*. Adopted June 13, 2002. www.cityofgilroy.org/274/2020-General-Plan (accessed June 9, 2016).

———. 2005. *Downtown Gilroy Specific Plan*. Prepared by: RRM Design Group. Adopted November 21, 2005. www.ci.gilroy.ca.us/DocumentCenter/Home/View/1271 (accessed June 9, 2016).

City of Morgan Hill. 2016. *2035 General Plan City of Morgan Hill.* Prepared by: PlaceWorks. Adopted July 27, 2016. http://morganhill2035.org/wp-content/uploads/2016/08/MorganHill2035_GeneralPlan_Adopted1.pdf (accessed March 7, 2017).

City of San Jose. 1992a. *Midtown Specific Plan*. Adopted by the City Council December 8, 1992. www.sanjoseca.gov/DocumentCenter/Home/View/461 (accessed March 6, 2017).

———. 1992b. *Communications Hill Specific Plan.* City of San Jose Planning, Building and Code Enforcement. www.sanjoseca.gov/DocumentCenter/Home/View/456 (accessed March 6, 2017).

———. 2011. *Envision San José 2040 General Plan: Building a City of Great Places.* Adopted November 1, 2011. Revised March 23, 2016. www.sanjoseca.gov/DocumentCenter/Home/View/474 (accessed March 6, 2017).

———. 2014. *Diridon Station Area Plan: Final Plan*. Final. Prepared by: Field Paoli, Dyett and Bhatia, RHAA, Fehr and Peers, ARUP, Perkins and Will, AECOM, WSA, BKF, Sollod and Corson. June 2014. www.sanjoseca.gov/DocumentCenter/View/33057 (accessed March 6, 2017).

City of Santa Clara. 2010. *2010–2035 General Plan.* Adopted November 16, 2010. http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan (accessed March 7, 2017).

Council on Environmental Quality (CEQ). 2016. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. August 1, 2016. www.whitehouse.gov/sites/default/files/docs/nepa_revised_draft_ghg_guidance.pdf. Issued August 1, 2016.

County of Merced. 2013. *Merced County General Plan*. Adopted December 10, 2013. www.co.merced.ca.us/DocumentCenter/View/6766/2030-General-Plan?bidId= (accessed July 17, 2019).

County of San Benito. 2015. *San Benito County 2035 General Plan.* Adopted July 21, 2015. http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf (accessed March 7, 2017).

County of Santa Clara. 1994. *Santa Clara County General Plan: Charting a Course for Santa Clara County's Future 1995–2010.* Adopted December 20, 1994. www.sccgov.org/sites/dpd/PlansOrdinances/GP/Pages/GP.aspx (accessed March 8, 2017).

Federal Highway Administration (FHWA). 2011. *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*. www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm (accessed August 2016).

———. 2016. *Updated Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*. www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm (accessed March 2017).

Frisbey, David. 2017. Air Quality Planner II. Monterey Bay Unified Air Pollution Control District, Monterey, CA. Telephone call with ICF regarding MBARD thresholds. March 30, 2017

Garza, V.J., P. Graney, and D. Sperling (Garza et al.). 1997. *The Transportation Project-Level Carbon Monoxide Protocol.* Revised December 1997. University of California, Davis.

Google Inc. 2018. *Google Earth Pro*, Version 4.2, Mountain View, CA. (accessed 2018).

Intergovernmental Panel on Climate Change (IPCC). 2007. *Fourth Assessment Report: Climate Change 2007: Working Group I: The Physical Science Basis*. Section 2.10.2, Direct Global Warming Potentials. www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html (accessed June 2016).

Kirk, Allison. 2016. Senior Planner. Bay Area Air Quality Management District, San Francisco, CA. Telephone conversation with ICF regarding health risk analyses in BAAQMD. December 14, 2016.

———. 2018. Senior Environmental Planner. Bay Area Air Quality Management District, San Francisco, CA. Email to Laura Yoon, ICF, regarding construction emission offsets. November 7, 2018.

Lovegrove, A., and E. Tadross. 2017. Memo to Bryan Porter of the Authority regarding incorporating the use of Tier 4 engines and renewable diesel fuel in environmental documentation. November 9, 2017.

Marceau, M.L., M.A. Nisbet, M., and M.G. VanGeem. 2007. Life Cycle Inventory of Portland Cement Concrete. PCA R&D Serial No. 3007. Portland Cement Association. Skokie, IL.

McGuire, Rosanna. 2017–2018. Environmental Planner/Biologist. HNTB Cooperation, San Francisco, CA. Email exchanges with ICF regarding station utilities. March 2017 and September 2018.

Merced County Association of Governments (MCAG). 2016. *Regional Transportation Plan/Sustainable Communities Strategy for Merced County: 2014–2040*. Adopted September 25, 2014. Amendment 1 adopted May 19, 2016. www.mcagov.org/DocumentCenter/View/789/RTP-2014-amendment-1---May-2016?bidId= (accessed March 7, 2019).

Monterey Bay Unified Air Pollution Control District (MBUAPCD). 2005. *Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region*. December 1, 2005. http://mbard.org/pdf/358%20(1).pdf (accessed August 17, 2016).

———. 2007. *Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region*. March 21, 2007. http://mbard.org/pdf/451.pdf (accessed August 17, 2016).

———. 2008. *CEQA Air Quality Guidelines.* February 2008.

———. 2017. *2012–2015 Air Quality Management Plan.* Adopted March 15, 2017. Monterey, CA. http://mbard.org/wp-content/uploads/2017/03/2012-2015-AQMP_FINAL.pdf (accessed March 30, 2017).

National Oceanographic and Atmospheric Administration (NOAA). 2018. *Climate at a Glance: Global Mapping*. Centers for Environmental Information. www.ncdc.noaa.gov/cag/ (accessed June 2018).

Newson, Ross. 2018. Lead Maintenance, Standards, and Planning. High-Speed Rail Authority. Sacramento, CA. October 16, 2018—email message to ICF.

Office of Environmental Health Hazard Assessment (OEHHA). 2001. *Health Effects of Diesel Exhaust*. http://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf (accessed August 2016).

———. 2015. *Guidance Manual for Preparation of Health Risk Assessments*. http://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf (accessed August 2016).

Peninsula Corridor Joint Powers Board (PCJPB). 2015. *Peninsula Corridor Electrification Project Final Environmental Impact Report*. January 2015. Prepared by ICF International.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2007a. *PM10 Maintenance Plan and Request for Redesignation*. September 20, 2007. www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed January 22, 2015).

———. 2007b. *2007 Ozone Plan*. April 2007. www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_Ozone2007.htm (accessed January 22, 2015).

———. 2013. *2013 Plan for the Revoked 1-Hour Ozone Standard*. September 2013. www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf (accessed January 22, 2015)

———. 2014. APR 1925. Policy for District Rule 2201 AAQA Modeling. April 14.

———. 2015a. *Guidance for Assessing and Mitigating Air Quality Impacts*. Adopted March 19, 2015.

———. 2015b. *2015 Plan for the 1997 PM2.5 Standard*. April 16, 2015. www.valleyair.org/Air_Quality_Plans/docs/PM25-2015/2015-PM2.5-Plan-Complete.pdf (accessed May 14, 2015).

———. 2016a. *2016 Moderate Area Plan for the 2012 PM2.5 Standard*. September 15, 2016. www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2016/September/final/05.pdf (accessed November 22, 2016).

———. 2016b. *2016 Plan for the 2008 8-Hour Ozone Standard*. June 16, 2016. www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm (accessed January 8, 2018).

———. 2018. *Plan for the 1997, 2006, and 2012 PM2.5 Standards*. November 15. www.valleyair.org/pmplans/documents/2018/pm-plan-adopted/PlanCoverPage.pdf (accessed February 6, 2019).

———. n.d. *Air Quality Modeling: Permitting & CEQA*. www.valleyair.org/busind/pto/tox_resources/airqualitymonitoring.htm#met_data (accessed October 2017).

San Joaquin Valley Regional Planning Agencies. 2010. *San Joaquin Valley Blueprint Planning Process Summary Report.* www.valleyblueprint.org/files/SJVBR_Summary_Final_2010-09-22.pdf (accessed: March 7, 2017).

Scholz, Dan. 2018. Construction Manager. AnchorCM. San Francisco, CA. Email to Laura Yoon of ICF transmitting construction assumptions. September through November 2018.

Siong, Patia. 2011. Supervising Air Quality Specialist. San Joaquin Valley Air Pollution Control District, Fresno, CA. Email to ICF regarding construction emission thresholds. May 23, 2011.

The Climate Registry. 2018. *Default GHG Emission Factors*. March 15.

Trinity Consultants. 2016. *California Emissions Estimator Model User's Guide. Version 2016.3.1. Appendix A: Calculation Details*. Prepared for California Air Pollution Control Officers Association (CAPCOA). September 2016.

U.S. Environmental Protection Agency (USEPA). 1978. *Air Pollutant Emission Factors for Military and Civil Aircraft*. EPA-450/3-78-117. October 1978.

———. 1992. *Guideline for Modeling Carbon Monoxide from Roadway Intersections*. EPA 454/R-92-005. November 1992. www3.epa.gov/scram001/guidance/guide/coguide.pdf (accessed January 2019).

———. 1998. *Compilation of Air Pollutant Emission Factors*. Section 11.9, *Western Surface Coal Mining*. www.epa.gov/ttn/chief/ap42/index.html (accessed October 17, 2016).

———. 2000. *Asbestos*. www3.epa.gov/airtoxics/hlthef/asbestos.html (accessed August 2016).

———. 2002. *Health Assessment Document for Diesel Engine Exhaust*. http://nepis.epa.gov/Exe/ZyPDF.cgi/300055PV.PDF?Dockey=300055PV.PDF (accessed August 2016).

———. 2003. *Ozone: Good Up High, Bad Nearby*. EPA-451/K-03-001. Office of Air and Radiation. June 2003. Washington, DC. www.epa.gov/oar/oaqps/gooduphigh/ozone.pdf (accessed August 2016).

———. 2006a. *Compilation of Air Pollutant Emission Factors*, Chapter 13.2.5, *Industrial Wind Erosion*. www.epa.gov/ttn/chief/ap42/index.html (accessed October 2016).

———. 2006b. *Compilation of Air Pollutant Emission Factors*, Chapter 13.2.2, *Unpaved Roads*. www.epa.gov/ttn/chief/ap42/index.html (accessed October 2016).

———. 2009. *Emission Factors for Locomotives*. EPA-420-F-09-025. April.

———. 2011. *Compilation of Air Pollutant Emission Factors,* Chapter 13.2.1, *Paved Roads*. www.epa.gov/ttn/chief/ap42/ch13/bgdocs/b13s0201.pdf. (accessed October 2016).

———. 2015a. *Mobile Source Air Toxics*. www.epa.gov/otaq/toxics.htm (accessed January 2015).

———. 2015b. *Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act*. www.epa.gov/climatechange/endangerment/ (accessed January 2015).

———. 2015c. *Particulate Matter—Basic Information*. www.epa.gov/pm-pollution (accessed August 2016).

———. 2015d. *Motor Vehicle Emission Simulator (MOVES) 2014a User Guide*. Assessment and Standards Division, Office of Transportation and Air Quality. https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNCY.txt (accessed August 2016).

———. 2015e. *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas.* November 2015.

———. 2016a. *USEPA and NHTSA Adopt Standards to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium- and Heavy-Duty vehicles for Model Year 2018 and Beyond*. www3.epa.gov/otaq/climate/documents/420f16044.pdf (accessed: September 2016).

———. 2016b. *Polycyclic Organic Matter*. www3.epa.gov/airtoxics/hlthef/polycycl.html (accessed August 2016).

———. 2016c. *Climate Change Indicators in the United States*. www3.epa.gov/climatechange/science/indicators/weather-climate/ (accessed August 2016).

———. 2017. *Air Emissions Inventories*. www3.epa.gov/cgi-bin/broker?_service=data&_debug=0&_program=dataprog.state_1.sas&pol=CO&stfips=0 (accessed December 2017).

———. 2018a. *AirData Monitor Values Report*. www3.epa.gov/airdata/ad_rep_mon.html (accessed August 2018).

———. 2018b. *Nonattainment Areas for Criteria Pollutants*. June 30, 2018. www.epa.gov/green-book (accessed August 2018).

———. 2020. *Emissions & Generation Resource Integrated Database (eGrid)*. March 20, 2020. www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid (accessed July 24, 2020).

U.S. Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and National Highway Transportation Safety Administration (NHTSA) (USEPA et al.). 2016. *Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025*. www.nhtsa.gov/staticfiels/rulemaking/pdf/cafe/Draft-TAR-Final.pdf (accessed September 2016).

U.S. Geological Survey (USGS). 2000. *Operational Guidelines (version 1.0) for Geological Fieldwork in Areas Endemic for Coccidioidomycosis (Valley Fever)*. U.S. Geological Survey Open-File Report 00-348. Version 1.0. 2000.

Watson, J. G. 1996. *Effectiveness Demonstration of Fugitive Dust Control Methods for Public Unpaved Roads and Unpaved Shoulders on Paved Roads*. DRI Document No. 685-5200. IF2: August 2, 1996.

Western Governors' Association. 2006. *WRAP Fugitive Dust Handbook*. WGA Contract No. 30204-111. Prepared by Countess Environmental, Westlake Village, CA. September 7, 2006. Denver. CO. www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf (accessed September 27, 2018).

Winkel, Jaclyn. 2018. Senior Planner. Bay Area Air Quality Management District, San Francisco, CA. Email communication to ICF regarding health risk analyses in BAAQMD. April 12, 2018.

13 PREPARER QUALIFICATIONS

Project Role	Name, Credential	Qualifications
ICF		
Senior Manager, Air Quality and Climate Change	Laura Yoon	11 years' experience B.A., Environmental Studies, University of Washington, Seattle, Washington M.S., Environmental Management, University of San Francisco, San Francisco, California
Managing Director, Air Quality and Climate Change	Edward Carr, Certified Consulting Meteorologist, 1989, No. 442	35 years' experience B.S., Meteorology, San Jose State University, M.S., Atmospheric Science, University of Washington

APPENDIX 3.3-A, APPENDIX A: CALEEMOD OUTPUTS FOR STATION AND MAINTENANCE FACILITY OPERATION, MOWF CALCULATIONS, EAST GILROY TRANSIT CALCULATIONS

CalEEMod Outputs

Existing Diridon Station - Santa Clara County, Annual

Existing Diridon Station
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	22.20	1000sqft	0.51	22,205.00	0
Parking Lot	581.00	Space	5.23	232,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2015
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	391	**CH4 Intensity**	0.033	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2015 EF from eGrid and PG&E
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	11,103.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	33,308.00	0.00
tblArchitecturalCoating	ConstArea_Parking	13,944.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58
tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDA	0.58	0.71

tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblLandUse	LandUseSquareFeet	22,200.00	22,205.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	391
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	21.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	108.80
tblVehicleTrips	SU_TR	0.68	108.80
tblVehicleTrips	WD_TR	6.97	108.80
tblWater	IndoorWaterUseRate	5,133,750.00	1,308,162.00
tblWater	OutdoorWaterUseRate	0.00	665,199.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1187	6.00E-05	5.73E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0108	0.0108	3.00E-05	0	0.0116
Energy	5.50E-04	5.01E-03	4.21E-03	3.00E-05		3.80E-04	3.80E-04		3.80E-04	3.80E-04	0	116.0797	116.0797	9.44E-03	1.23E-03	116.6828

Mobile	1.0535	1.4193	14.7506	0.0291	2.7709	0.0183	2.7892	0.7363	0.0169	0.7532	0	2,622.68	2,622.68	0.1111	0	2,625.45
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	5.5883	0	5.5883	0.3303	0	13.8449
Water						0	0		0	0	0.415	1.6683	2.0833	0.0428	1.02E-03	3.4575
Total	**1.2168**	**1.621**	**14.8727**	**0.0294**	**2.7709**	**0.0252**	**2.7961**	**0.7363**	**0.0238**	**0.7601**	**6.0034**	**2,760.846**	**2,766.85**	**0.4965**	**2.25E-03**	**2,779.93**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	2,415.46	2,415.46	2415.46	7,559,585	7,559,585
Parking Lot	0.00	0.00	0.00		
Total	2,415.46	2,415.46	2,415.46	7,559,585	7,559,585

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0
Parking Lot	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr		tons/yr										MT/yr					
General Light Industry	102176		5.50E-04	5.01E-03	4.21E-03	3.00E-05		3.80E-04	3.80E-04		3.80E-04	3.80E-04	0	5.4525	5.4525	1.00E-04	1.00E-04	5.4849
Parking Lot	0		0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total			**5.50E-04**	**5.01E-03**	**4.21E-03**	**3.00E-05**		**3.80E-04**	**3.80E-04**		**3.80E-04**	**3.80E-04**	**0**	**5.4525**	**5.4525**	**1.00E-04**	**1.00E-04**	**5.4849**

5.3 Energy by Land Use - Electricity

	Electricity Use		Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	tons/yr	MT/yr			

General Light Industry	623763		110.6273	9.3400e-003	1.1300e-003	111.1979
Parking Lot	0		0.0000	0.0000	0.0000	0.0000
Total			**110.6273**	**9.3400e-003**	**1.1300e-003**	**111.1979**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0164					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.1017					0	0		0	0	0	0	0	0	0	0
Landscaping	5.70E-04	6.00E-05	5.73E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0108	0.0108	3.00E-05	0	0.0116
Total	**0.1187**	**6.00E-05**	**5.73E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.0108**	**0.0108**	**3.00E-05**	**0**	**0.0116**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	1.30816 / 0.665199	2.0833	0.0428	1.02E-03	3.4575
Parking Lot	0 / 0	0.0000	0	0	0
Total		**2.0833**	**0.0428**	**1.02E-03**	**3.4575**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	27.53	5.5883	0.3303	0	13.8449
Parking Lot	0	0	0	0	0
Total		**5.5883**	**0.3303**	**0**	**13.8449**

10.0 Stationary Equipment

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Existing Diridon Station with Project - Santa Clara County, Annual

Existing Diridon Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	99.29	1000sqft	2.28	99,289.00	0
Parking Lot	635.00	Space	5.71	254,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2015
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	391	**CH4 Intensity**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2015 EF from eGrid and PG&E
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Operational Off-Road Equipment - -
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	49,645.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	148,934.00	0.00
tblArchitecturalCoating	ConstArea_Parking	15,240.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	49645	11103
tblAreaCoating	Area_Nonresidential_Interior	148934	33308
tblAreaCoating	Area_Parking	15240	13944
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58
tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00

tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblLandUse	LandUseSquareFeet	99,290.00	99,289.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	391
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	30.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	39.60
tblVehicleTrips	SU_TR	0.68	39.60
tblVehicleTrips	WD_TR	6.97	39.60
tblWater	IndoorWaterUseRate	22,960,812.50	5,849,408.00
tblWater	OutdoorWaterUseRate	0.00	2,974,418.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Area	0.4213	7.00E-05	6.98E-03	0		3.00E-05	3.00E-05		3.00E-05	3.00E-05	0	0.0131	0.0131	4.00E-05	0	0.0141
Energy	2.46E-03	0.0224	0.0188	1.30E-04		1.70E-03	1.70E-03		1.70E-03	1.70E-03	0	518.8437	518.8437	0.0422	5.51E-03	521.5393
Mobile	1.7149	2.3103	24.0111	0.0474	4.5104	0.0299	4.5402	1.1985	0.0276	1.2261	0	4,269.20	4,269.20	0.1809	0	4,273.72
Stationary	0.1319	0.59	0.3364	6.30E-04		0.0194	0.0194		0.0194	0.0194	0	61.2322	61.2322	8.58E-03	0	61.4468
Waste						0	0		0	0	24.9923	0	24.9923	1.477	0	61.9172
Water						0	0		0	0	1.8558	7.4598	9.3156	0.1912	4.58E-03	15.4603
Total	**2.2706**	**2.9228**	**24.3733**	**0.0481**	**4.5104**	**0.051**	**4.5614**	**1.1985**	**0.0487**	**1.2472**	**26.848**	**4,856.75**	**4,883.59**	**1.8999**	**0.0101**	**4,934.10**

4.0 Operational Detail - Mobile

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	3,931.88	3,931.88	3931.88	12,305,507	12,305,507
Parking Lot	0.00	0.00	0.00		
Total	3,931.88	3,931.88	3,931.88	12,305,507	12,305,507

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0
Parking Lot	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr		tons/yr										MT/yr					
General Light Industry	456729		2.46E-03	0.0224	0.0188	1.30E-04		1.70E-03	1.70E-03		1.70E-03	1.70E-03	0	24.3728	24.3728	4.70E-04	4.50E-04	24.5177
Parking Lot	0		0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total			**2.46E-03**	**0.0224**	**0.0188**	**1.30E-04**		**1.70E-03**	**1.70E-03**		**1.70E-03**	**1.70E-03**	**0**	**24.3728**	**24.3728**	**4.70E-04**	**4.50E-04**	**24.5177**

5.3 Energy by Land Use - Electricity

	Electricity Use		Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	tons/yr	MT/yr			
General Light Industry	2.79E+06		494.4709	0.0417	5.06E-03	497.0217
Parking Lot	0		0	0	0	0
Total			**494.4709**	**0.0417**	**5.06E-03**	**497.0217**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0164					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.4042					0	0		0	0	0	0	0	0	0	0
Landscaping	6.90E-04	7.00E-05	6.98E-03	0		3.00E-05	3.00E-05		3.00E-05	3.00E-05	0	0.0131	0.0131	4.00E-05	0	0.0141
Total	**0.4213**	**7.00E-05**	**6.98E-03**	**0**		**3.00E-05**	**3.00E-05**		**3.00E-05**	**3.00E-05**	**0**	**0.0131**	**0.0131**	**4.00E-05**	**0**	**0.0141**

7.0 Water Detail

	Indoor/Outdoor Use		Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr	MT/yr			
General Light Industry	5.84941 / 2.97442		9.3156	0.1912	4.5800e-003	15.4603
Parking Lot	0 / 0		0.0000	0.0000	0.0000	0.0000
Total			**9.3156**	**0.1912**	**4.5800e-003**	**15.4603**

8.0 Waste Detail

	Waste Disposed		Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr	MT/yr			
General Light Industry	123.12		24.9923	1.4770	0.0000	61.9172
Parking Lot	0		0.0000	0.0000	0.0000	0.0000
Total			**24.9923**	**1.4770**	**0.0000**	**61.9172**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	3	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.1319	0.59	0.3364	6.30E-04		0.0194	0.0194		0.0194	0.0194	0	61.2322	61.2322	8.58E-03	0	61.4468
Total	**0.1319**	**0.59**	**0.3364**	**6.30E-04**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0**	**61.2322**	**61.2322**	**8.58E-03**	**0**	**61.4468**

Existing Downtown Gilroy Station
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	2.64	1000sqft	0.06	2,641.00	0
Parking Lot	471.00	Space	4.24	188,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2015
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	391	**CH4 Intensity**	0.033	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2015 EF from eGrid and PG&E
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	1,321.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	3,962.00	0.00
tblArchitecturalCoating	ConstArea_Parking	11,304.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblEnergyUse	LightingElect	3.08	0.71
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	0.86
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.48	0.34
tblEnergyUse	T24NG	19.71	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDA	0.58	0.71

tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	MCY	5.4870e-003	6.6620e-003
tblFleetMix	MCY	5.4870e-003	6.6620e-003
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblLandUse	LandUseSquareFeet	2,640.00	2,641.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	391
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	16.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	73.46
tblVehicleTrips	SU_TR	0.68	73.46
tblVehicleTrips	WD_TR	6.97	73.46
tblWater	IndoorWaterUseRate	610,500.00	88,328.00
tblWater	OutdoorWaterUseRate	0.00	41,672.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0282	4.00E-05	4.50E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	8.46E-03	8.46E-03	2.00E-05	0	9.08E-03
Energy	0	0	0	0		0	0		0	0	0	0.894	0.894	8.00E-05	1.00E-05	0.8987
Mobile	0.0859	0.1144	1.1941	2.34E-03	0.2225	1.47E-03	0.2239	0.0591	1.36E-03	0.0605	0	210.507	210.507	9.08E-03	0	210.7341
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	0.6638	0	0.6638	0.0392	0	1.6445
Water						0	0		0	0	0.028	0.1106	0.1387	2.89E-03	7.00E-05	0.2314

Total	**0.1581**	**0.3111**	**1.3107**	**2.55E-03**	**0.2225**	**7.96E-03**	**0.2304**	**0.0591**	**7.85E-03**	**0.067**	**0.6918**	**231.9309**	**232.6227**	**0.0542**	**8.00E-05**	**234.0001**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	193.93	193.93	193.93	606,951	606,951
Parking Lot	0.00	0.00	0.00		
Total	193.93	193.93	193.93	606,951	606,951

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.705543	0.053746	0.234048	0	0	0	0	0	0	0	0.006662	0	0.000000
Parking Lot	0.705543	0.053746	0.234048	0	0	0	0	0	0	0	0.006662	0	0.000000

5.0 Energy Detail

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**		**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5041	0.894	8.00E-05	1.00E-05	0.8987
Parking Lot	0	0	0	0	0
Total		**0.894**	**8.00E-05**	**1.00E-05**	**0.8987**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.31E-03					0	0		0	0	0	0	0	0	0	0

Consumer Products	0.0225					0	0		0	0	0	0	0	0	0	0
Landscaping	4.50E-04	4.00E-05	4.50E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	8.46E-03	8.46E-03	2.00E-05	0	9.08E-03
Total	**0.0283**	**4.00E-05**	**4.50E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**8.46E-03**	**8.46E-03**	**2.00E-05**	**0**	**9.08E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0.088328 / 0.041672	0.1387	2.8900e-003	7.0000e-005	0.2314
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.1387**	**2.8900e-003**	**7.0000e-005**	**0.2314**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	3.27	0.6638	0.0392	0.0000	1.6445
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.6638**	**0.0392**	**0.0000**	**1.6445**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Existing DT Gilroy Station with Project - Santa Clara County, Annual

Existing DT Gilroy Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	64.91	1000sqft	1.49	64,913.00	0
Parking Lot	1,441.00	Space	12.97	576,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2015
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	391	**CH4 Intensity**	0.033	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2015 EF from eGrid and PG&E
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	49,645.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	148,934.00	0.00
tblArchitecturalCoating	ConstArea_Parking	15,240.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58

tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	391
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblSolidWaste	SolidWasteGenerationRate	123.12	80.49
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	2.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	30.00	0.00

tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	38.94
tblVehicleTrips	SU_TR	0.68	38.94
tblVehicleTrips	WD_TR	6.97	38.94
tblWater	IndoorWaterUseRate	22,960,812.50	3,824,216.00
tblWater	OutdoorWaterUseRate	0.00	1,944,610.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3493	1.40E-04	0.0143	0		5.00E-05	5.00E-05		5.00E-05	5.00E-05	0	0.0269	0.0269	8.00E-05	0	0.0289
Energy	1.61E-03	0.0146	0.0123	9.00E-05		1.11E-03	1.11E-03		1.11E-03	1.11E-03	0	339.2088	339.2088	0.0276	3.60E-03	340.9711
Mobile	1.1026	1.4854	15.4377	0.0305	2.8999	0.0192	2.9191	0.7706	0.0177	0.7883	0	2,744.84	2,744.84	0.1163	0	2,747.75
Stationary	0.088	0.3934	0.2243	4.20E-04		0.0129	0.0129		0.0129	0.0129	0	40.8215	40.8215	5.72E-03	0	40.9645
Waste						0	0		0	0	16.3387	0	16.3387	0.9656	0	40.4785
Water						0	0		0	0	1.2133	4.8771	6.0903	0.125	2.99E-03	10.1076
Total	**1.5414**	**1.8935**	**15.6886**	**0.031**	**2.8999**	**0.0333**	**2.9332**	**0.7706**	**0.0318**	**0.8024**	**17.552**	**3,129.78**	**3,147.33**	**1.2403**	**6.59E-03**	**3,180.30**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	2,527.97	2,527.97	2527.97	7,911,723	7,911,723
Parking Lot	0.00	0.00	0.00		
Total	2,527.97	2,527.97	2,527.97	7,911,723	7,911,723

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706000	0.054000	0.234000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000
Parking Lot	0.706000	0.054000	0.234000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	298600	1.61E-03	0.0146	0.0123	9.00E-05		1.11E-03	1.11E-03		1.11E-03	1.11E-03	0	15.9344	15.9344	3.10E-04	2.90E-04	16.0291
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**1.61E-03**	**0.0146**	**0.0123**	**9.00E-05**		**1.11E-03**	**1.11E-03**		**1.11E-03**	**1.11E-03**	**0**	**15.9344**	**15.9344**	**3.10E-04**	**2.90E-04**	**16.0291**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.82E+06	323.2744	0.0273	3.31E-03	324.942
Parking Lot	0	0	0	0	0
Total		**323.2744**	**0.0273**	**3.31E-03**	**324.942**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0571					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.2908					0	0		0	0	0	0	0	0	0	0
Landscaping	1.42E-03	1.40E-04	0.0143	0		5.00E-05	5.00E-05		5.00E-05	5.00E-05	0	0.0269	0.0269	8.00E-05	0	0.0289
Total	**0.3493**	**1.40E-04**	**0.0143**	**0**		**5.00E-05**	**5.00E-05**		**0.00005**	**0.00005**	**0**	**0.0269**	**0.0269**	**0.00008**	**0**	**0.0289**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3.82422 / 1.94461	6.0903	0.1250	2.9900e-003	10.1076
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**6.0903**	**0.1250**	**2.9900e-003**	**10.1076**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	80.49	16.3387	0.9656	0.0000	40.4785
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**16.3387**	**0.9656**	**0.0000**	**40.4785**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	2	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.088	0.3934	0.2243	4.20E-04		0.0129	0.0129		0.0129	0.0129	0	40.8215	40.8215	5.72E-03	0	40.9645
Total	**0.088**	**0.3934**	**0.2243**	**0.00042**		**0.0129**	**0.0129**		**0.0129**	**0.0129**	**0**	**40.8215**	**40.8215**	**0.00572**	**0**	**40.9645**

Existing East Gilroy Station with Project - Santa Clara County, Annual

Existing East Gilroy Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	63.01	1000sqft	1.45	63,011.00	0
Parking Lot	1,240.00	Space	11.16	496,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2015
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	391	**CH4 Intensity**	0.033	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2015 EF from eGrid and PG&E
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	31,506.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	94,517.00	0.00
tblArchitecturalCoating	ConstArea_Parking	29,760.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	31506	32457
tblAreaCoating	Area_Nonresidential_Interior	94517	97370
tblAreaCoating	Area_Parking	29760	34584
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58
tblEnergyUse	NT24NG	6.67	1.16

tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDA	0.58	0.71
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MCY	5.4870e-003	6.0000e-003
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblLandUse	LandUseSquareFeet	63,010.00	63,011.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	391
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	47.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	40.12
tblVehicleTrips	SU_TR	0.68	40.12
tblVehicleTrips	WD_TR	6.97	40.12
tblWater	IndoorWaterUseRate	14,571,062.50	3,712,164.00

tblWater	OutdoorWaterUseRate	0.00	1,887,631.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3253	1.20E-04	0.0124	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05	0	0.0233	0.0233	7.00E-05	0	0.025
Energy	1.56E-03	0.0142	0.0119	9.00E-05		1.08E-03	1.08E-03		1.08E-03	1.08E-03	0	329.3988	329.3988	0.0268	3.50E-03	331.1101
Mobile	1.1026	1.4854	15.4377	0.0305	2.8999	0.0192	2.9191	0.7706	0.0177	0.7883	0	2,744.83	2,744.83	0.1163	0	2,747.74
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	15.8597	0	15.8597	0.9373	0	39.2917
Water						0	0		0	0	1.1777	4.7342	5.9119	0.1214	2.90E-03	9.8114
Total	**1.4734**	**1.6964**	**15.5741**	**0.0308**	**2.8999**	**0.0268**	**2.9267**	**0.7706**	**0.0253**	**0.7959**	**17.0374**	**3,099.40**	**3,116.44**	**1.2047**	**6.40E-03**	**3,148.46**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	2,527.96	2,527.96	2527.96	7,911,689	7,911,689
Parking Lot	0.00	0.00	0.00		
Total	2,527.96	2,527.96	2,527.96	7,911,689	7,911,689

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0
Parking Lot	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	289943	1.56E-03	0.0142	0.0119	9.00E-05		1.08E-03	1.08E-03		1.08E-03	1.08E-03	0	15.4725	15.4725	3.00E-04	2.80E-04	15.5644

Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**1.56E-03**	**0.0142**	**0.0119**	**9.00E-05**		**1.08E-03**	**1.08E-03**		**1.08E-03**	**1.08E-03**	**0**	**15.4725**	**15.4725**	**3.00E-04**	**2.80E-04**	**15.5644**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.77E+06	313.9263	0.0265	3.21E-03	315.5457
Parking Lot	0	0	0	0	0
Total		**313.9263**	**0.0265**	**3.21E-03**	**315.5457**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural	0.0459					0	0		0	0	0	0	0	0	0	0
Consumer	0.2782					0	0		0	0	0	0	0	0	0	0
Landscaping	1.22E-03	1.20E-04	0.0124	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05	0	0.0233	0.0233	7.00E-05	0	0.025
Total	**0.3252**	**1.20E-04**	**0.0124**	**0**		**4.00E-05**	**4.00E-05**		**4.00E-05**	**4.00E-05**	**0**	**0.0233**	**0.0233**	**7.00E-05**	**0**	**0.025**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3.71216 / 1.88763	5.9119	0.1214	2.9000e-003	9.8114
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**5.9119**	**0.1214**	**2.9000e-003**	**9.8114**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	78.13	15.8597	0.9373	0.0000	39.2917
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.8597**	**0.9373**	**0.0000**	**39.2917**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Existing MOWS - Merced County, Annual

Existing MOWS
Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	155.10	1000sqft	3.56	155,100.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2015
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	391	**CH4 Intensity**	0.033	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for SB 350
Vehicle Trips - Haul
Operational Off-Road Equipment - Equipment provided by HSR
Fleet Mix - Haul
Stationary Sources - Emergency Generators and Fire Pumps - Back up generator

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	77,550.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	232,650.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblFleetMix	HHD	0.14	1.00
tblFleetMix	LDA	0.44	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.16	0.00
tblFleetMix	LHD1	0.03	0.00
tblFleetMix	LHD2	6.7460e-003	0.00
tblFleetMix	MCY	7.2850e-003	0.00
tblFleetMix	MDV	0.15	0.00
tblFleetMix	MH	9.8300e-004	0.00

tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.3290e-003	0.00
tblFleetMix	SBUS	1.7290e-003	0.00
tblFleetMix	UBUS	2.9320e-003	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	391
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,072.82
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblVehicleTrips	CC_TL	7.30	120.00
tblVehicleTrips	CNW_TL	7.30	120.00
tblVehicleTrips	CW_TL	9.50	120.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.13
tblVehicleTrips	SU_TR	0.68	0.13
tblVehicleTrips	WD_TR	6.97	0.13

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7137	1.00E-05	1.47E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	2.77E-03	2.77E-03	1.00E-05	0	2.97E-03
Energy	0.0175	0.1587	0.1333	9.50E-04		0.0121	0.0121		0.0121	0.0121	0	415.3532	415.3532	0.0238	5.65E-03	417.6313
Mobile	0.2677	6.7231	1.1797	0.016	0.3758	0.0775	0.4533	0.1033	0.0742	0.1775	0	1,525.30	1,525.30	0.0354	0	1,526.19
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	39.0392	0	39.0392	2.3072	0	96.718
Water						0	0		0	0	11.3789	34.4202	45.7991	1.1716	0.028	83.4184
Total	**1.0429**	**7.08E+00**	**1.43E+00**	**1.72E-02**	**3.76E-01**	**9.61E-02**	**4.72E-01**	**1.03E-01**	**9.28E-02**	**1.96E-01**	**5.04E+01**	**2.00E+03**	**2.05E+03**	**3.54E+00**	**3.37E-02**	**2.14E+03**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	20.16	20.16	20.16	880,720	880,720
Total	20.16	20.16	20.16	880,720	880,720

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	120.00	120.00	120.00	59.00	28.00	13.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0	0	0	0	0	0	0	1	0	0	0	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	3.24E+06	0.0175	0.1587	0.1333	9.50E-04		0.0121	0.0121		0.0121	0.0121	0	172.7353	172.7353	3.31E-03	3.17E-03	173.7618
Total		**0.0175**	**0.1587**	**0.1333**	**9.50E-04**		**0.0121**	**0.0121**		**0.0121**	**0.0121**	**0**	**172.7353**	**172.7353**	**3.31E-03**	**3.17E-03**	**173.7618**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.37E+06	242.6179	0.0205	2.4800e-003	243.8695
Total		**242.6179**	**0.0205**	**2.4800e-003**	**243.8695**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1078					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.6057					0	0		0	0	0	0	0	0	0	0
Landscaping	1.50E-04	1.00E-05	1.47E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	2.77E-03	2.77E-03	1.00E-05	0	2.97E-03
Total	**0.7137**	**1.00E-05**	**1.47E-03**	**0**		**1.00E-05**	**1.00E-05**		**1.00E-05**	**1.00E-05**	**0**	**2.77E-03**	**2.77E-03**	**1.00E-05**	**0**	**2.97E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal		MT/yr		
General Light Industry	35.8669 / 0	45.7991	1.1716	0.0280	83.4184
Total		**45.7991**	**1.1716**	**0.0280**	**83.4184**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons		MT/yr		
General Light Industry	192.32	39.0392	2.3072	0.0000	96.7180
Total		**39.0392**	**2.3072**	**0.0000**	**96.7180**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072.82	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Existing MOWF - Santa Clara County, Annual

Existing MOWF
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	132.50	1000sqft	3.04	132,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2015
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	391	**CH4 Intensity**	0.033	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for SB 350
Vehicle Trips - Employee + haul (trip distance weighted based on H-W employee miles + 120 haul truck miles)
Fleet Mix - Reweighted for LDA/LDT/MCY/HHD
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	66,250.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	198,750.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblFleetMix	HHD	0.02	0.02
tblFleetMix	LDA	0.58	0.69
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	4.8780e-003	0.00
tblFleetMix	MCY	5.4870e-003	7.0000e-003
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.4700e-004	0.00
tblFleetMix	MHD	0.01	0.00

tblFleetMix	OBUS	1.9090e-003	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	UBUS	1.7450e-003	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	391
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	11.00	0.00
tblVehicleTrips	CC_TL	7.30	15.45
tblVehicleTrips	CNW_TL	7.30	15.45
tblVehicleTrips	CW_TL	9.50	15.45
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	3.55
tblVehicleTrips	SU_TR	0.68	3.55
tblVehicleTrips	WD_TR	6.97	3.55

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5867	1.00E-05	1.26E-03	0		0	0		0	0	0	2.37E-03	2.37E-03	1.00E-05	0	2.54E-03
Energy	0.0189	0.1713	0.1439	1.03E-03		0.013	0.013		0.013	0.013	0	380.631	380.631	0.02	5.41E-03	382.7407
Mobile	0.2935	1.0823	4.784	0.011	0.9726	0.0118	0.9845	0.2587	0.0111	0.2698	0	1,000.89	1,000.89	0.0432	0	1,001.97
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	33.3514	0	33.3514	1.971	0	82.6267
Water						0	0		0	0	9.7209	29.4048	39.1256	1.0009	0.0239	71.2633
Total	**0.943**	**1.4504**	**5.0414**	**0.0123**	**0.9726**	**0.0313**	**1.004**	**0.2587**	**0.0306**	**0.2893**	**43.0723**	**1,431.34**	**1,474.41**	**3.038**	**0.0293**	**1,559.09**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	470.38	470.38	470.38	2,645,295	2,645,295
Total	470.38	470.38	470.38	2,645,295	2,645,295

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	15.45	15.45	15.45	59.00	28.00	13.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.690000	0.053000	0.229000	0.000000	0.000000	0.000000	0.000000	0.021000	0.000000	0.000000	0.007000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	3.50E+06	0.0189	0.1713	0.1439	1.03E-03		0.013	0.013		0.013	0.013	0	186.5252	186.5252	3.58E-03	3.42E-03	187.6336
Total		**0.0189**	**0.1713**	**0.1439**	**1.03E-03**		**0.013**	**0.013**		**0.013**	**0.013**	**0**	**186.5252**	**186.5252**	**3.58E-03**	**3.42E-03**	**187.6336**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.09E+06	194.1058	0.0164	1.99E-03	195.1071
Total		**194.1058**	**0.0164**	**1.99E-03**	**195.1071**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0691					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.5175					0	0		0	0	0	0	0	0	0	0
Landscaping	1.20E-04	1.00E-05	1.26E-03	0		0	0		0	0	0	2.37E-03	2.37E-03	1.00E-05	0	2.54E-03
Total	**0.5867**	**1.00E-05**	**1.26E-03**	**0**		**0**	**0**		**0**	**0**	**0**	**2.37E-03**	**2.37E-03**	**1.00E-05**	**0**	**2.54E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	30.6406 / 0	39.1256	1.0009	0.0239	71.2633
Total		**39.1256**	**1.0009**	**0.0239**	**71.2633**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	164.3	33.3514	1.9710	0.0000	82.6267
Total		**33.3514**	**1.9710**	**0.0000**	**82.6267**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Horizon Diridon Station - Santa Clara County, Annual

Horizon Diridon Station
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	22.20	1000sqft	0.51	22,205.00	0
Parking Lot	581.00	Space	5.23	232,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	149.1428571	**CH4 Intensity**	0.018317797	**N2O Intensity**	0.002220339

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	11,103.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	33,308.00	0.00
tblArchitecturalCoating	ConstArea_Parking	13,944.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58
tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44

tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblLandUse	LandUseSquareFeet	22,200.00	22,205.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.0183177966101695
tblProjectCharacteristics	CO2IntensityFactor	641.35	149.142857142857
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.00222033898305085
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	21.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	193.47
tblVehicleTrips	SU_TR	0.68	193.47
tblVehicleTrips	WD_TR	6.97	193.47
tblWater	IndoorWaterUseRate	5,133,750.00	1,308,162.00
tblWater	OutdoorWaterUseRate	0.00	665,199.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1187	5.00E-05	5.51E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0108	0.0108	3.00E-05	0	0.0115
Energy	5.50E-04	5.01E-03	4.21E-03	3.00E-05		3.80E-04	3.80E-04		3.80E-04	3.80E-04	0	47.6501	47.6501	5.29E-03	7.30E-04	47.9993
Mobile	0.4489	0.4239	6.3058	0.0268	4.927	0.0118	4.9388	1.3092	0.0109	1.3201	0	2,429.11	2,429.11	0.0575	0	2,430.55
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	5.5883	0	5.5883	0.3303	0	13.8449
Water						0	0		0	0	0.415	0.6364	1.0514	0.0427	1.02E-03	2.4218
Total	**0.6121**	**0.6257**	**6.4276**	**0.0271**	**4.927**	**0.0187**	**4.9456**	**1.3092**	**0.0177**	**1.3269**	**6.0034**	**2,497.82**	**2,503.82**	**0.4386**	**1.75E-03**	**2,515.31**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	4,295.03	4,295.03	4295.03	13,442,043	13,442,043
Parking Lot	0.00	0.00	0.00		
Total	4,295.03	4,295.03	4,295.03	13,442,043	13,442,043

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000
Parking Lot	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					

General Light Industry	102176	5.50E-04	5.01E-03	4.21E-03	3.00E-05		3.80E-04	3.80E-04		3.80E-04	3.80E-04	0	5.4525	5.4525	1.00E-04	1.00E-04	5.4849
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**5.50E-04**	**5.01E-03**	**4.21E-03**	**3.00E-05**		**3.80E-04**	**3.80E-04**		**3.80E-04**	**3.80E-04**	**0**	**5.4525**	**5.4525**	**1.00E-04**	**1.00E-04**	**5.4849**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	623763	42.1976	5.18E-03	6.30E-04	42.5144
Parking Lot	0	0	0	0	0
Total		**42.1976**	**5.18E-03**	**6.30E-04**	**42.5144**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0164					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.1017					0	0		0	0	0	0	0	0	0	0
Landscaping	5.00E-04	5.00E-05	5.51E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0108	0.0108	3.00E-05	0	0.0115
Total	**0.1187**	**5.00E-05**	**5.51E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.0108**	**0.0108**	**3.00E-05**	**0**	**0.0115**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	1.30816 / 0.665199	1.0514	0.0427	1.0200e-003	2.4218
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.0514**	**0.0427**	**1.0200e-003**	**2.4218**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	27.53	5.5883	0.3303	0.0000	13.8449
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**5.5883**	**0.3303**	**0.0000**	**13.8449**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Horizon Diridon Station with Project - Santa Clara County, Annual

Horizon Diridon Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	99.29	1000sqft	2.28	99,289.00	0
Parking Lot	635.00	Space	5.71	254,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	149.14	**CH4 Intensity**	0.018	**N2O Intensity**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	49,645.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	148,934.00	0.00
tblArchitecturalCoating	ConstArea_Parking	15,240.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	49645	11103
tblAreaCoating	Area_Nonresidential_Interior	148934	33308
tblAreaCoating	Area_Parking	15240	13944
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58

tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblLandUse	LandUseSquareFeet	99,290.00	99,289.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	641.35	149.14
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	30.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	100.84
tblVehicleTrips	SU_TR	0.68	100.84

tblVehicleTrips	WD_TR	6.97	100.84
tblWater	IndoorWaterUseRate	22,960,812.50	5,849,408.00
tblWater	OutdoorWaterUseRate	0.00	2,974,418.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4212	6.00E-05	6.70E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0131	0.0131	3.00E-05	0	0.014
Energy	2.46E-03	0.0224	0.0188	1.30E-04		1.70E-03	1.70E-03		1.70E-03	1.70E-03	0	212.98	212.98	0.0232	2.98E-03	214.4476
Mobile	1.0464	0.9882	14.6993	0.0625	11.4852	0.0275	11.5127	3.0518	0.0253	3.0771	0	5,662.47	5,662.47	0.134	0	5,665.82
Stationary	0.1319	0.59	0.3364	6.30E-04		0.0194	0.0194		0.0194	0.0194	0	61.2322	61.2322	8.58E-03	0	61.4468
Waste						0	0		0	0	24.9923	0	24.9923	1.477	0	61.9172
Water						0	0		0	0	1.8558	2.8454	4.7012	0.191	4.54E-03	10.8274
Total	**1.602**	**1.6007**	**15.0612**	**0.0633**	**11.4852**	**0.0486**	**11.5338**	**3.0518**	**0.0464**	**3.0983**	**26.848**	**5,939.54**	**5,966.39**	**1.8338**	**7.52E-03**	**6,014.48**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	10,012.10	10,012.10	10012.10	31,334,592	31,334,592
Parking Lot	0.00	0.00	0.00		
Total	10,012.10	10,012.10	10,012.10	31,334,592	31,334,592

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000
Parking Lot	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	456729	2.46E-03	0.0224	0.0188	1.30E-04		1.70E-03	1.70E-03		1.70E-03	1.70E-03	0	24.3728	24.3728	4.70E-04	4.50E-04	24.5177
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**2.46E-03**	**0.0224**	**0.0188**	**1.30E-04**		**1.70E-03**	**1.70E-03**		**1.70E-03**	**1.70E-03**	**0**	**24.3728**	**24.3728**	**4.70E-04**	**4.50E-04**	**24.5177**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.78804e+006	188.6071	0.0228	2.5300e-003	189.9299
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**188.6071**	**0.0228**	**2.5300e-003**	**189.9299**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0164					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.4042					0	0		0	0	0	0	0	0	0	0
Landscaping	6.10E-04	6.00E-05	6.70E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0131	0.0131	3.00E-05	0	0.014
Total	**0.4212**	**6.00E-05**	**6.70E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.0131**	**0.0131**	**3.00E-05**	**0**	**0.014**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	5.84941 / 2.97442	4.7012	0.1910	4.5400e-003	10.8274
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**4.7012**	**0.1910**	**4.5400e-003**	**10.8274**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	123.12	24.9923	1.4770	0.0000	61.9172

Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**24.9923**	**1.4770**	**0.0000**	**61.9172**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	3	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.1319	0.59	0.3364	6.30E-04		0.0194	0.0194		0.0194	0.0194	0	61.2322	61.2322	8.58E-03	0	61.4468
Total	**0.1319**	**0.59**	**0.3364**	**6.30E-04**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0**	**61.2322**	**61.2322**	**8.58E-03**	**0**	**61.4468**

Horizon Downtown Gilroy Station - Santa Clara County, Annual

Horizon Downtown Gilroy Station
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	2.64	1000sqft	0.06	2,641.00	0
Parking Lot	471.00	Space	4.24	188,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	149.14	**CH4 Intensity**	0.018	**N2O Intensity**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	1,321.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	3,962.00	0.00
tblArchitecturalCoating	ConstArea_Parking	11,304.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblEnergyUse	LightingElect	3.08	0.71
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	0.86
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.48	0.34
tblEnergyUse	T24NG	19.71	0.00
tblFleetMix	HHD	0.02	0.00

tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblLandUse	LandUseSquareFeet	2,640.00	2,641.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	641.35	149.14
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblTripsAndVMT	WorkerTripNumber	16.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	130.25
tblVehicleTrips	SU_TR	0.68	130.25
tblVehicleTrips	WD_TR	6.97	130.25
tblWater	IndoorWaterUseRate	610,500.00	88,328.00
tblWater	OutdoorWaterUseRate	0.00	41,672.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Area	0.0282	4.00E-05	4.32E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	8.46E-03	8.46E-03	2.00E-05	0	9.01E-03
Energy	0	0	0	0		0	0		0	0	0	0.341	0.341	4.00E-05	0	0.3434
Mobile	0.0359	0.0339	0.5049	2.15E-03	0.3945	9.40E-04	0.3954	0.1048	8.70E-04	0.1057	0	194.48	194.48	4.60E-03	0	194.595
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	0.6638	0	0.6638	0.0392	0	1.6445
Water						0	0		0	0	0.028	0.0422	0.0702	2.88E-03	7.00E-05	0.1627
Total	**0.1081**	**0.2307**	**0.6213**	**2.36E-03**	**0.3945**	**7.43E-03**	**0.4019**	**0.1048**	**7.36E-03**	**0.1122**	**0.6918**	**215.2824**	**215.9742**	**0.0496**	**7.00E-05**	**217.2369**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	343.87	343.87	343.87	1,076,200	1,076,200
Parking Lot	0.00	0.00	0.00		
Total	343.87	343.87	343.87	1,076,200	1,076,200

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000
Parking Lot	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5041	0.3410	4.0000e-005	0.0000	0.3434
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.3410**	**4.0000e-005**	**0.0000**	**0.3434**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.31E-03					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.0225					0	0		0	0	0	0	0	0	0	0
Landscaping	4.00E-04	4.00E-05	4.32E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	8.46E-03	8.46E-03	2.00E-05	0	9.01E-03
Total	**0.0282**	**4.00E-05**	**4.32E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**8.46E-03**	**8.46E-03**	**2.00E-05**	**0**	**9.01E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0.088328 / 0.041672	0.0702	2.8800e-003	7.0000e-005	0.1627
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0702**	**2.8800e-003**	**7.0000e-005**	**0.1627**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	3.27	0.6638	0.0392	0	1.6445
Parking Lot	0	0	0	0	0
Total		**0.6638**	**0.0392**	**0**	**1.6445**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Horizon DT Gilroy Station with Project - Santa Clara County, Annual

Horizon DT Gilroy Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	64.91	1000sqft	1.49	64,913.00	0
Parking Lot	1,441.00	Space	12.97	576,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	149.14	**CH4 Intensity**	0.018	**N2O Intensity**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	32,457.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	97,370.00	0.00
tblArchitecturalCoating	ConstArea_Parking	34,584.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	32457	49645
tblAreaCoating	Area_Nonresidential_Interior	97370	148934
tblAreaCoating	Area_Parking	34584	15240
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58
tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03

tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblLandUse	LandUseSquareFeet	64,910.00	64,913.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	641.35	149.14
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	54.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	110.27
tblVehicleTrips	SU_TR	0.68	110.27
tblVehicleTrips	WD_TR	6.97	110.27
tblWater	IndoorWaterUseRate	15,010,437.50	3,824,216.00
tblWater	OutdoorWaterUseRate	0.00	1,944,610.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3491	1.20E-04	0.0138	0		5.00E-05	5.00E-05		5.00E-05	5.00E-05	0	0.0269	0.0269	7.00E-05	0	0.0286
Energy	1.61E-03	0.0146	0.0123	9.00E-05		1.11E-03	1.11E-03		1.11E-03	1.11E-03	0	139.2417	139.2417	0.0152	1.95E-03	140.2012
Mobile	0.7481	0.7064	10.5085	0.0447	8.2108	0.0197	8.2304	2.1818	0.0181	2.1999	0	4,048.11	4,048.11	0.0958	0	4,050.51
Stationary	0.088	0.3934	0.2243	4.20E-04		0.0129	0.0129		0.0129	0.0129	0	40.8215	40.8215	5.72E-03	0	40.9645
Waste						0	0		0	0	16.3387	0	16.3387	0.9656	0	40.4785
Water						0	0		0	0	1.2133	1.8603	3.0735	0.1248	2.97E-03	7.0787
Total	**1.1868**	**1.1146**	**10.7589**	**0.0452**	**8.2108**	**0.0338**	**8.2445**	**2.1818**	**0.0322**	**2.214**	**17.552**	**4,230.06**	**4,247.61**	**1.2072**	**4.92E-03**	**4,279.26**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	7,157.67	7,157.67	7157.67	22,401,157	22,401,157
Parking Lot	0.00	0.00	0.00		
Total	7,157.67	7,157.67	7,157.67	22,401,157	22,401,157

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000
Parking Lot	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive PM2.5	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	298600	1.61E-03	0.0146	0.0123	9.00E-05		1.11E-03	1.11E-03		1.11E-03	1.11E-03	0	15.9344	15.9344	3.10E-04	2.90E-04	16.0291
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**1.61E-03**	**0.0146**	**0.0123**	**9.00E-05**		**1.11E-03**	**1.11E-03**		**1.11E-03**	**1.11E-03**	**0**	**15.9344**	**15.9344**	**3.10E-04**	**2.90E-04**	**16.0291**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.82E+06	123.3073	0.0149	1.65E-03	124.1721
Parking Lot	0	0	0	0	0
Total		**123.3073**	**0.0149**	**1.65E-03**	**124.1721**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0571					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.2908					0	0		0	0	0	0	0	0	0	0
Landscaping	1.26E-03	1.20E-04	0.0138	0		5.00E-05	5.00E-05		5.00E-05	5.00E-05	0	0.0269	0.0269	7.00E-05	0	0.0286
Total	**0.3491**	**1.20E-04**	**0.0138**	**0**		**5.00E-05**	**5.00E-05**		**5.00E-05**	**5.00E-05**	**0**	**0.0269**	**0.0269**	**7.00E-05**	**0**	**0.0286**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3.82422 / 1.94461	3.0735	0.1248	2.9700e-003	7.0787
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**3.0735**	**0.1248**	**2.9700e-003**	**7.0787**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	80.49	16.3387	0.9656	0	40.4785
Parking Lot	0	0	0	0	0
Total		**16.3387**	**0.9656**	**0**	**40.4785**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	2	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.088	0.3934	0.2243	4.20E-04		0.0129	0.0129		0.0129	0.0129	0	40.8215	40.8215	5.72E-03	0	40.9645
Total	**0.088**	**0.3934**	**0.2243**	**4.20E-04**		**0.0129**	**0.0129**		**0.0129**	**0.0129**	**0**	**40.8215**	**40.8215**	**5.72E-03**	**0**	**40.9645**

Horizon East Gilroy Station with Project - Santa Clara County, Annual

Horizon East Gilroy Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	63.01	1000sqft	1.45	63,011.00	0
Parking Lot	1,240.00	Space	11.16	496,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	149.14	**CH4 Intensity**	0.018	**N2O Intensity**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	31,506.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	94,517.00	0.00
tblArchitecturalCoating	ConstArea_Parking	29,760.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	31506	32457
tblAreaCoating	Area_Nonresidential_Interior	94517	97370
tblAreaCoating	Area_Parking	29760	34584
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58

tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDA	0.62	0.74
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LDT2	0.18	0.21
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MCY	5.0770e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblLandUse	LandUseSquareFeet	63,010.00	63,011.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	641.35	149.14
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	47.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	127.88
tblVehicleTrips	SU_TR	0.68	127.88

tblVehicleTrips	WD_TR	6.97	127.88
tblWater	IndoorWaterUseRate	14,571,062.50	3,712,164.00
tblWater	OutdoorWaterUseRate	0.00	1,887,631.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3251	1.10E-04	0.0119	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05	0	0.0233	0.0233	6.00E-05	0	0.0248
Energy	1.56E-03	0.0142	0.0119	9.00E-05		1.08E-03	1.08E-03		1.08E-03	1.08E-03	0	135.2141	135.2141	0.0148	1.89E-03	136.1458
Mobile	0.8422	0.7953	11.8302	0.0503	9.2434	0.0221	9.2656	2.4562	0.0204	2.4765	0	4,557.23	4,557.23	0.1079	0	4,559.93
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	15.8597	0	15.8597	0.9373	0	39.2917
Water						0	0		0	0	1.1777	1.8058	2.9835	0.1212	2.88E-03	6.8713
Total	**1.2128**	**1.0063**	**11.9662**	**0.0506**	**9.2434**	**0.0297**	**9.2732**	**2.4562**	**0.028**	**2.4841**	**17.0374**	**4,714.69**	**4,731.73**	**1.184**	**4.77E-03**	**4,762.75**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	8,057.87	8,057.87	8057.87	25,218,497	25,218,497
Parking Lot	0.00	0.00	0.00		
Total	8,057.87	8,057.87	8,057.87	25,218,497	25,218,497

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000
Parking Lot	0.741000	0.040000	0.213000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.006000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	289943	1.56E-03	0.0142	0.0119	9.00E-05		1.08E-03	1.08E-03		1.08E-03	1.08E-03	0	15.4725	15.4725	3.00E-04	2.80E-04	15.5644
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**1.56E-03**	**0.0142**	**0.0119**	**9.00E-05**		**1.08E-03**	**1.08E-03**		**1.08E-03**	**1.08E-03**	**0**	**15.4725**	**15.4725**	**3.00E-04**	**2.80E-04**	**15.5644**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.77E+06	119.7416	0.0145	1.61E-03	120.5814
Parking Lot	0	0	0	0	0
Total		**119.7416**	**0.0145**	**1.61E-03**	**120.5814**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0459					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.2782					0	0		0	0	0	0	0	0	0	0
Landscaping	1.09E-03	1.10E-04	0.0119	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05	0	0.0233	0.0233	6.00E-05	0	0.0248
Total	**0.3251**	**1.10E-04**	**0.0119**	**0**		**4.00E-05**	**4.00E-05**		**4.00E-05**	**4.00E-05**	**0**	**0.0233**	**0.0233**	**6.00E-05**	**0**	**0.0248**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3.71216 / 1.88763	2.9835	0.1212	2.8800e-003	6.8713
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.9835**	**0.1212**	**2.8800e-003**	**6.8713**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e

Land Use	tons	MT/yr			
General Light Industry	78.13	15.8597	0.9373	0.0000	39.2917
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.8597**	**0.9373**	**0.0000**	**39.2917**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.0440	0.1967	0.1121	2.1000e-004		6.4700e-003	6.4700e-003		6.4700e-003	6.4700e-003	0.0000	20.4107	20.4107	2.8600e-003	0.0000	20.4823
Total	**0.0440**	**0.1967**	**0.1121**	**2.1000e-004**		**6.4700e-003**	**6.4700e-003**		**6.4700e-003**	**6.4700e-003**	**0.0000**	**20.4107**	**20.4107**	**2.8600e-003**	**0.0000**	**20.4823**

Horizon MOWS - Merced County, Annual

Horizon MOWS
Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	155.10	1000sqft	3.56	155,100.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	149.14	**CH4 Intensity**	0.018	**N2O Intensity**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for SB 350
Vehicle Trips - Haul
Fleet Mix - Haul
Stationary Sources - Emergency Generators and Fire Pumps - Back up generator

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	77,550.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	232,650.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblFleetMix	HHD	0.15	1.00
tblFleetMix	LDA	0.53	0.00
tblFleetMix	LDT1	0.03	0.00
tblFleetMix	LDT2	0.16	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	3.4450e-003	0.00
tblFleetMix	MCY	5.5820e-003	0.00
tblFleetMix	MDV	0.09	0.00
tblFleetMix	MH	4.5000e-004	0.00
tblFleetMix	MHD	0.01	0.00

tblFleetMix	OBUS	2.3520e-003	0.00
tblFleetMix	SBUS	1.3580e-003	0.00
tblFleetMix	UBUS	1.6400e-003	0.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	2.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	641.35	149.14
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblVehicleTrips	CC_TL	7.30	120.00
tblVehicleTrips	CNW_TL	7.30	120.00
tblVehicleTrips	CW_TL	9.50	120.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.13
tblVehicleTrips	SU_TR	0.68	0.13
tblVehicleTrips	WD_TR	6.97	0.13

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7137	1.00E-05	1.42E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	2.77E-03	2.77E-03	1.00E-05	0	2.95E-03
Energy	0.0175	0.1587	0.1333	9.50E-04		0.0121	0.0121		0.0121	0.0121	0	265.2776	265.2776	0.0145	4.41E-03	266.9531
Mobile	0.0821	1.6084	0.9546	0.0136	0.3751	5.21E-03	0.3803	0.1031	4.99E-03	0.1081	0	1,328.87	1,328.87	0.0525	0	1,330.19
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	39.0392	0	39.0392	2.3072	0	96.718
Water						0	0		0	0	11.3789	13.129	24.5079	1.1703	0.0278	62.0417
Total	**0.8573**	**1.96E+00**	**1.20E+00**	**0.01476**	**0.3751**	**2.38E-02**	**3.99E-01**	**0.1031**	**2.36E-02**	**1.27E-01**	**50.4181**	**1,627.69**	**1,678.11**	**3.55E+00**	**0.03221**	**1,776.39**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	20.16	20.16	20.16	880,720	880,720
Total	20.16	20.16	20.16	880,720	880,720

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	120.00	120.00	120.00	59.00	28.00	13.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	3.24E+06	0.0175	0.1587	0.1333	9.5000e-004		0.0121	0.0121		0.0121	0.0121	0	172.7353	172.7353	3.31E-03	3.17E-03	173.7618
Total		**0.0175**	**0.1587**	**0.1333**	**9.5000e-004**		**0.0121**	**0.0121**		**0.0121**	**0.0121**	**0**	**172.7353**	**172.7353**	**3.31E-03**	**3.17E-03**	**173.7618**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.37E+06	92.5423	0.0112	1.24E-03	93.1913
Total		**92.5423**	**0.0112**	**1.24E-03**	**93.1913**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1078					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.6057					0	0		0	0	0	0	0	0	0	0
Landscaping	1.30E-04	1.00E-05	1.42E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	2.77E-03	2.77E-03	1.00E-05	0	2.95E-03
Total	**0.7137**	**1.00E-05**	**1.42E-03**	**0**		**1.00E-05**	**1.00E-05**		**1.00E-05**	**1.00E-05**	**0**	**2.77E-03**	**2.77E-03**	**1.00E-05**	**0**	**2.95E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	35.8669 / 0	24.5079	1.1703	0.0278	62.0417
Total		**24.5079**	**1.1703**	**0.0278**	**62.0417**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	192.32	39.0392	2.3072	0.0000	96.7180
Total		**39.0392**	**2.3072**	**0.0000**	**96.7180**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072.82	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Horizon MOWF
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	132.50	1000sqft	3.04	132,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	149.14	**CH4 Intensity**	0.018	**N2O Intensity**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for SB 350
Vehicle Trips - Employee + haul (trip distance weighted based on H-W employee miles + 120 haul truck miles)
Fleet Mix - Reweighted for LDA/LDT/MCY/HHD
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generator

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	66,250.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	198,750.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblFleetMix	HHD	0.02	0.02
tblFleetMix	LDA	0.62	0.69
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1260e-003	0.00
tblFleetMix	MCY	5.0770e-003	7.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.4200e-004	0.00
tblFleetMix	MHD	0.01	0.00

tblFleetMix	OBUS	2.2990e-003	0.00
tblFleetMix	SBUS	6.5300e-004	0.00
tblFleetMix	UBUS	1.4220e-003	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	641.35	149.14
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblTripsAndVMT	WorkerTripNumber	11.00	0.00
tblVehicleTrips	CC_TL	7.30	15.45
tblVehicleTrips	CNW_TL	7.30	15.45
tblVehicleTrips	CW_TL	9.50	15.45
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	3.55
tblVehicleTrips	SU_TR	0.68	3.55
tblVehicleTrips	WD_TR	6.97	3.55

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5867	1.00E-05	1.21E-03	0		0	0		0	0	0	2.37E-03	2.37E-03	1.00E-05	0	2.52E-03
Energy	0.0189	0.1713	0.1439	1.03E-03		0.013	0.013		0.013	0.013	0	260.5634	260.5634	0.0125	4.41E-03	262.1911
Mobile	0.0833	0.291	1.2968	6.16E-03	0.9727	2.47E-03	0.9752	0.2587	2.29E-03	0.261	0	564.9731	564.9731	0.0165	0	565.3857
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	33.3514	0	33.3514	1.971	0	82.6267
Water						0	0		0	0	9.7209	11.2159	20.9368	0.9998	0.0237	53.0014
Total	**0.7328**	**0.659**	**1.5541**	**7.40E-03**	**0.9727**	**0.022**	**0.9946**	**0.2587**	**0.0218**	**0.2804**	**43.0723**	**857.1655**	**900.2377**	**3.0027**	**0.0281**	**983.6897**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	470.38	470.38	470.38	2,645,295	2,645,295
Total	470.38	470.38	470.38	2,645,295	2,645,295

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	15.45	15.45	15.45	59.00	28.00	13.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.690000	0.053000	0.229000	0.000000	0.000000	0.000000	0.000000	0.021000	0.000000	0.000000	0.007000	0.000000	0.000000

5.0 Energy Detail

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	3.50E+06	0.0189	0.1713	0.1439	1.03E-03		0.013	0.013		0.013	0.013	0	186.5252	186.5252	3.58E-03	3.42E-03	187.6336
Total		**0.0189**	**0.1713**	**0.1439**	**1.03E-03**		**0.013**	**0.013**		**0.013**	**0.013**	**0**	**186.5252**	**186.5252**	**3.58E-03**	**3.42E-03**	**187.6336**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.09E+06	74.0382	8.94E-03	9.90E-04	74.5575
Total		**74.0382**	**8.94E-03**	**9.90E-04**	**74.5575**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0691					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.5175					0	0		0	0	0	0	0	0	0	0
Landscaping	1.10E-04	1.00E-05	1.21E-03	0		0	0		0	0	0	2.37E-03	2.37E-03	1.00E-05	0	2.52E-03
Total	**0.5867**	**1.00E-05**	**1.21E-03**	**0**		**0**	**0**		**0**	**0**	**0**	**2.37E-03**	**2.37E-03**	**1.00E-05**	**0**	**2.52E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	30.6406 / 0	20.9368	0.9998	0.0237	53.0014
Total		**20.9368**	**0.9998**	**0.0237**	**53.0014**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	164.3	33.3514	1.9710	0.0000	82.6267
Total		**33.3514**	**1.9710**	**0.0000**	**82.6267**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072.82	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Opening Diridon Station - Santa Clara County, Annual

Opening Diridon Station
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	22.20	1000sqft	0.51	22,205.00	0
Parking Lot	581.00	Space	5.23	232,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	163.2285714	**CH4 Intensity**	0.019506356	**N2O Intensity**	0.002364407

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	11,103.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	33,308.00	0.00
tblArchitecturalCoating	ConstArea_Parking	13,944.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58
tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00

tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblLandUse	LandUseSquareFeet	22,200.00	22,205.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.0195063559322034
tblProjectCharacteristics	CO2IntensityFactor	641.35	163.228571428571
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.00236440677966102
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	21.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	152.94
tblVehicleTrips	SU_TR	0.68	152.94
tblVehicleTrips	WD_TR	6.97	152.94
tblWater	IndoorWaterUseRate	5,133,750.00	1,308,162.00
tblWater	OutdoorWaterUseRate	0.00	665,199.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1187	5.00E-05	5.53E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0108	0.0108	3.00E-05	0	0.0115
Energy	5.50E-04	5.01E-03	4.21E-03	3.00E-05		3.80E-04	3.80E-04		3.80E-04	3.80E-04	0	51.6354	51.6354	5.62E-03	7.70E-04	52.0051
Mobile	0.519	0.5116	7.0467	0.0252	3.8948	0.0179	3.9127	1.0349	0.0165	1.0514	0	2,276.92	2,276.92	0.0592	0	2,278.40
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	5.5883	0	5.5883	0.3303	0	13.8449
Water						0	0		0	0	0.415	0.6965	1.1115	0.0427	1.02E-03	2.4822
Total	**0.6822**	**0.7134**	**7.1686**	**0.0254**	**3.8948**	**0.0247**	**3.9195**	**1.0349**	**0.0233**	**1.0582**	**6.0034**	**2,349.68**	**2,355.68**	**0.4406**	**1.79E-03**	**2,367.23**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	3,395.24	3,395.24	3395.24	10,625,973	10,625,973
Parking Lot	0.00	0.00	0.00		
Total	3,395.24	3,395.24	3,395.24	10,625,973	10,625,973

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0
Parking Lot	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	102176	5.50E-04	5.01E-03	4.21E-03	3.00E-05		3.80E-04	3.80E-04		3.80E-04	3.80E-04	0	5.4525	5.4525	1.00E-04	1.00E-04	5.4849

Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**5.50E-04**	**5.01E-03**	**4.21E-03**	**3.00E-05**		**3.80E-04**	**3.80E-04**		**3.80E-04**	**3.80E-04**	**0**	**5.4525**	**5.4525**	**1.00E-04**	**1.00E-04**	**5.4849**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	623763	46.1829	5.52E-03	6.70E-04	46.5203
Parking Lot	0	0	0	0	0
Total		**46.1829**	**5.52E-03**	**6.70E-04**	**46.5203**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0164					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.1017					0	0		0	0	0	0	0	0	0	0
Landscaping	5.10E-04	5.00E-05	5.53E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0108	0.0108	3.00E-05	0	0.0115
Total	**0.1187**	**5.00E-05**	**5.53E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.0108**	**0.0108**	**3.00E-05**	**0**	**0.0115**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	1.30816 / 0.665199	1.1115	0.0427	1.0200e-003	2.4822
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.1115**	**0.0427**	**1.0200e-003**	**2.4822**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	27.53	5.5883	0.3303	0.0000	13.8449
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**5.5883**	**0.3303**	**0.0000**	**13.8449**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Opening Diridon Station with Project - Santa Clara County, Annual

Opening Diridon Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	99.29	1000sqft	2.28	99,289.00	0
Parking Lot	635.00	Space	5.71	254,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	163.2285714	**CH4 Intensity**	0.019506356	**N2O Intensity**	0.002364407

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	49,645.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	148,934.00	0.00
tblArchitecturalCoating	ConstArea_Parking	15,240.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	49645	11103
tblAreaCoating	Area_Nonresidential_Interior	148934	33308
tblAreaCoating	Area_Parking	15240	13944
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58

tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblLandUse	LandUseSquareFeet	99,290.00	99,289.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.0195063559322034
tblProjectCharacteristics	CO2IntensityFactor	641.35	163.228571428571
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.00236440677966102
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	30.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	49.47
tblVehicleTrips	SU_TR	0.68	49.47

tblVehicleTrips	WD_TR	6.97	49.47
tblWater	IndoorWaterUseRate	22,960,812.50	5,849,408.00
tblWater	OutdoorWaterUseRate	0.00	2,974,418.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4212	6.00E-05	6.73E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0131	0.0131	3.00E-05	0	0.014
Energy	2.46E-03	0.0224	0.0188	1.30E-04		1.70E-03	1.70E-03		1.70E-03	1.70E-03	0	230.7968	230.7968	0.0251	3.44E-03	232.4494
Mobile	0.7509	0.7402	10.1948	0.0364	5.6348	0.0259	5.6606	1.4973	0.0238	1.5211	0	3,294.13	3,294.13	0.0856	0	3,296.27
Stationary	0.1319	0.59	0.3364	6.30E-04		0.0194	0.0194		0.0194	0.0194	0	61.2322	61.2322	8.58E-03	0	61.4468
Waste						0	0		0	0	24.9923	0	24.9923	1.477	0	61.9172
Water						0	0		0	0	1.8558	3.1142	4.97	0.191	4.55E-03	11.0989
Total	**1.3065**	**1.3527**	**10.5568**	**0.0372**	**5.6348**	**0.047**	**5.6818**	**1.4973**	**0.0449**	**1.5422**	**26.848**	**3,589.29**	**3,616.14**	**1.7873**	**7.99E-03**	**3,663.20**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	4,912.05	4,912.05	4912.05	15,373,104	15,373,104
Parking Lot	0.00	0.00	0.00		
Total	4,912.05	4,912.05	4,912.05	15,373,104	15,373,104

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0
Parking Lot	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	456729	2.46E-03	0.0224	0.0188	1.30E-04		1.70E-03	1.70E-03		1.70E-03	1.70E-03	0	24.3728	24.3728	4.70E-04	4.50E-04	24.5177
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**2.46E-03**	**0.0224**	**0.0188**	**1.30E-04**		**1.70E-03**	**1.70E-03**		**1.70E-03**	**1.70E-03**	**0**	**24.3728**	**24.3728**	**4.70E-04**	**4.50E-04**	**24.5177**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.79E+06	206.424	0.0247	2.99E-03	207.9318
Parking Lot	0	0	0	0	0
Total		**206.424**	**0.0247**	**2.99E-03**	**207.9318**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0164					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.4042					0	0		0	0	0	0	0	0	0	0
Landscaping	6.20E-04	6.00E-05	6.73E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0131	0.0131	3.00E-05	0	0.014
Total	**0.4212**	**6.00E-05**	**6.73E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.0131**	**0.0131**	**3.00E-05**	**0**	**0.014**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	5.84941 / 2.97442	4.9700	0.1910	4.5500e-003	11.0989
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**4.9700**	**0.1910**	**4.5500e-003**	**11.0989**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	123.12	24.9923	1.4770	0.0000	61.9172
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**24.9923**	**1.4770**	**0.0000**	**61.9172**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	3	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.1319	0.59	0.3364	6.30E-04		0.0194	0.0194		0.0194	0.0194	0	61.2322	61.2322	8.58E-03	0	61.4468
Total	**0.1319**	**0.59**	**0.3364**	**6.30E-04**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0**	**61.2322**	**61.2322**	**8.58E-03**	**0**	**61.4468**

Opening Downtown Gilroy Station - Santa Clara County, Annual

Opening Downtown Gilroy Station
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	2.64	1000sqft	0.06	2,641.00	0
Parking Lot	471.00	Space	4.24	188,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	163.2285714	**CH4 Intensity**	0.019506356	**N2O Intensity**	0.002364407

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	1,321.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	3,962.00	0.00
tblArchitecturalCoating	ConstArea_Parking	11,304.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblEnergyUse	LightingElect	3.08	0.71
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	0.86
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.48	0.34
tblEnergyUse	T24NG	19.71	0.00

tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	MCY	5.1390e-003	6.6620e-003
tblFleetMix	MCY	5.1390e-003	6.6620e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblLandUse	LandUseSquareFeet	2,640.00	2,641.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.0195063559322034
tblProjectCharacteristics	CO2IntensityFactor	641.35	163.228571428571
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.00236440677966102
tblTripsAndVMT	WorkerTripNumber	16.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	103.75
tblVehicleTrips	SU_TR	0.68	103.75
tblVehicleTrips	WD_TR	6.97	103.75
tblWater	IndoorWaterUseRate	610,500.00	88,328.00
tblWater	OutdoorWaterUseRate	0.00	41,672.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0282	4.00E-05	4.34E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	8.46E-03	8.46E-03	2.00E-05	0	9.01E-03
Energy	0	0	0	0		0	0		0	0	0	0.3732	0.3732	4.00E-05	1.00E-05	0.376
Mobile	0.0435	0.042	0.5799	2.03E-03	0.3142	1.44E-03	0.3156	0.0835	1.33E-03	0.0848	0	183.6641	183.6641	5.04E-03	0	183.7901
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	0.6638	0	0.6638	0.0392	0	1.6445
Water						0	0		0	0	0.028	0.0462	0.0742	2.88E-03	7.00E-05	0.1668
Total	**0.1157**	**0.2387**	**0.6964**	**2.24E-03**	**0.3142**	**7.93E-03**	**0.3221**	**0.0835**	**7.82E-03**	**0.0913**	**0.6918**	**204.5027**	**205.1945**	**0.0501**	**8.00E-05**	**206.4686**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	273.90	273.90	273.90	857,205	857,205
Parking Lot	0.00	0.00	0.00		
Total	273.90	273.90	273.90	857,205	857,205

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.705543	0.053746	0.234048	0	0	0	0	0	0	0	0.006662	0	0
Parking Lot	0.705543	0.053746	0.234048	0	0	0	0	0	0	0	0.006662	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**		**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light	5041	0.3732	4.00E-05	1.00E-05	0.376
Parking Lot	0	0	0	0	0
Total		**0.3732**	**4.00E-05**	**1.00E-05**	**0.376**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.31E-03					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.0225					0	0		0	0	0	0	0	0	0	0
Landscaping	4.00E-04	4.00E-05	4.34E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	8.46E-03	8.46E-03	2.00E-05	0	9.01E-03
Total	**0.0282**	**4.00E-05**	**4.34E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**8.46E-03**	**8.46E-03**	**2.00E-05**	**0**	**9.01E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0.088328 / 0.041672	0.0742	2.8800e-003	7.0000e-005	0.1668
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0742**	**2.8800e-003**	**7.0000e-005**	**0.1668**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	3.27	0.6638	0.0392	0	1.6445
Parking Lot	0	0	0	0	0
Total		**0.6638**	**0.0392**	**0.0000**	**1.6445**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Opening DT Gilroy Station with Project - Santa Clara County, Annual

Opening DT Gilroy Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	64.91	1000sqft	1.49	64,913.00	0
Parking Lot	1,441.00	Space	12.97	576,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	163.2285714	**CH4 Intensity**	0.019506356	**N2O Intensity**	0.002364407

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	32,457.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	97,370.00	0.00
tblArchitecturalCoating	ConstArea_Parking	34,584.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	32457	49645
tblAreaCoating	Area_Nonresidential_Interior	97370	148934
tblAreaCoating	Area_Parking	34584	15240
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00

tblEnergyUse	NT24E	3.70	12.58
tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblLandUse	LandUseSquareFeet	64,910.00	64,913.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.0195063559322034
tblProjectCharacteristics	CO2IntensityFactor	641.35	163.228571428571
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.00236440677966102
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	54.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00

tblVehicleTrips	ST_TR	1.32	51.73
tblVehicleTrips	SU_TR	0.68	51.73
tblVehicleTrips	WD_TR	6.97	51.73
tblWater	IndoorWaterUseRate	15,010,437.50	3,824,216.00
tblWater	OutdoorWaterUseRate	0.00	1,944,610.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3491	1.30E-04	0.0138	0		5.00E-05	5.00E-05		5.00E-05	5.00E-05	0	0.0269	0.0269	7.00E-05	0	0.0287
Energy	1.61E-03	0.0146	0.0123	9.00E-05		1.11E-03	1.11E-03		1.11E-03	1.11E-03	0	150.89	150.89	0.0164	2.25E-03	151.9704
Mobile	0.5133	0.506	6.9691	0.0249	3.8519	0.0177	3.8696	1.0235	0.0163	1.0398	0	2,251.85	2,251.85	0.0585	0	2,253.31
Stationary	0.088	0.3934	0.2243	4.20E-04		0.0129	0.0129		0.0129	0.0129	0	40.8215	40.8215	5.72E-03	0	40.9645
Waste						0	0		0	0	16.3387	0	16.3387	0.9656	0	40.4785
Water						0	0		0	0	1.2133	2.036	3.2493	0.1249	2.97E-03	7.2563
Total	**0.952**	**0.9141**	**7.2195**	**0.0254**	**3.8519**	**0.0318**	**3.8837**	**1.0235**	**0.0304**	**1.0539**	**17.552**	**2,445.62**	**2,463.17**	**1.1712**	**5.22E-03**	**2,494.01**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	3,357.84	3,357.84	3357.84	10,508,953	10,508,953
Parking Lot	0.00	0.00	0.00		
Total	3,357.84	3,357.84	3,357.84	10,508,953	10,508,953

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0
Parking Lot	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	298600	1.61E-03	0.0146	0.0123	9.00E-05		1.11E-03	1.11E-03		1.11E-03	1.11E-03	0	15.9344	15.9344	3.10E-04	2.90E-04	16.0291
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**1.61E-03**	**0.0146**	**0.0123**	**9.00E-05**		**1.11E-03**	**1.11E-03**		**1.11E-03**	**1.11E-03**	**0**	**15.9344**	**15.9344**	**3.10E-04**	**2.90E-04**	**16.0291**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.82E+06	134.9555	0.0161	1.95E-03	135.9413
Parking Lot	0	0	0	0	0
Total		**134.9555**	**0.0161**	**1.95E-03**	**135.9413**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0571					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.2908					0	0		0	0	0	0	0	0	0	0
Landscaping	1.27E-03	1.30E-04	0.0138	0		5.00E-05	5.00E-05		5.00E-05	5.00E-05	0	0.0269	0.0269	7.00E-05	0	0.0287
Total	**0.3491**	**1.30E-04**	**0.0138**	**0**		**5.00E-05**	**5.00E-05**		**5.00E-05**	**5.00E-05**	**0**	**0.0269**	**0.0269**	**7.00E-05**	**0**	**0.0287**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3.82422 / 1.94461	3.2493	0.1249	2.9700e-003	7.2563
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**3.2493**	**0.1249**	**2.9700e-003**	**7.2563**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	80.49	16.3387	0.9656	0	40.4785
Parking Lot	0	0	0	0	0
Total		**16.3387**	**0.9656**	**0**	**40.4785**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	2	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.088	0.3934	0.2243	4.20E-04		0.0129	0.0129		0.0129	0.0129	0	40.8215	40.8215	5.72E-03	0	40.9645
Total	**0.088**	**0.3934**	**0.2243**	**4.20E-04**		**0.0129**	**0.0129**		**0.0129**	**0.0129**	**0**	**40.8215**	**40.8215**	**5.72E-03**	**0**	**40.9645**

Opening East Gilroy Station with Project - Santa Clara County, Annual

Opening East Gilroy Station with Project
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	63.01	1000sqft	1.45	63,011.00	0
Parking Lot	1,240.00	Space	11.16	496,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	163.2285714	**CH4 Intensity**	0.019506356	**N2O Intensity**	0.002364407

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Electricity EF adjusted for SB 350
Vehicle Trips - Employee and passenger
Energy Use - Re-weighted per project specific consumption
Water And Wastewater - Gallons per project specific data
Fleet Mix - Re-weighted to LDA/LDT/MCY
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generators

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	31,506.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	94,517.00	0.00
tblArchitecturalCoating	ConstArea_Parking	29,760.00	0.00
tblAreaCoating	Area_Nonresidential_Exterior	31506	32457
tblAreaCoating	Area_Nonresidential_Interior	94517	97370
tblAreaCoating	Area_Parking	29760	34584
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.08	10.47
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	12.58

tblEnergyUse	NT24NG	6.67	1.16
tblEnergyUse	T24E	1.48	5.03
tblEnergyUse	T24NG	19.71	3.44
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDA	0.62	0.71
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MCY	5.1390e-003	6.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblLandUse	LandUseSquareFeet	63,010.00	63,011.00
tblOffRoadEquipment	HorsePower	78.00	0.00
tblOffRoadEquipment	LoadFactor	0.48	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.0195063559322034
tblProjectCharacteristics	CO2IntensityFactor	641.35	163.228571428571
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.00236440677966102
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	47.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	65.67
tblVehicleTrips	SU_TR	0.68	65.67

tblVehicleTrips	WD_TR	6.97	65.67
tblWater	IndoorWaterUseRate	14,571,062.50	3,712,164.00
tblWater	OutdoorWaterUseRate	0.00	1,887,631.00

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3251	1.10E-04	0.0119	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05	0	0.0233	0.0233	6.00E-05	0	0.0248
Energy	1.56E-03	0.0142	0.0119	9.00E-05		1.08E-03	1.08E-03		1.08E-03	1.08E-03	0	146.5255	146.5255	0.016	2.18E-03	147.5747
Mobile	0.6326	0.6235	8.5881	0.0307	4.7468	0.0218	4.7685	1.2613	0.0201	1.2814	0	2,774.99	2,774.99	0.0721	0	2,776.80
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	15.8597	0	15.8597	0.9373	0	39.2917
Water						0	0		0	0	1.1777	1.9764	3.154	0.1212	2.88E-03	7.0436
Total	**1.0032**	**0.8345**	**8.7242**	**0.031**	**4.7468**	**0.0294**	**4.7761**	**1.2613**	**0.0276**	**1.289**	**17.0374**	**2,943.93**	**2,960.97**	**1.1494**	**5.06E-03**	**2,991.21**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	4,137.93	4,137.93	4137.93	12,950,377	12,950,377
Parking Lot	0.00	0.00	0.00		
Total	4,137.93	4,137.93	4,137.93	12,950,377	12,950,377

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0
Parking Lot	0.706	0.054	0.234	0	0	0	0	0	0	0	0.006	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	289943	1.56E-03	0.0142	0.0119	9.00E-05		1.08E-03	1.08E-03		1.08E-03	1.08E-03	0	15.4725	15.4725	3.00E-04	2.80E-04	15.5644
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**1.56E-03**	**0.0142**	**0.0119**	**9.00E-05**		**1.08E-03**	**1.08E-03**		**1.08E-03**	**1.08E-03**	**0**	**15.4725**	**15.4725**	**3.00E-04**	**2.80E-04**	**15.5644**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.77E+06	131.0531	0.0157	1.90E-03	132.0103
Parking Lot	0	0	0	0	0
Total		**131.0531**	**0.0157**	**1.90E-03**	**132.0103**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0459					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.2782					0	0		0	0	0	0	0	0	0	0
Landscaping	1.10E-03	1.10E-04	0.0119	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05	0	0.0233	0.0233	6.00E-05	0	0.0248
Total	**0.3251**	**1.10E-04**	**0.0119**	**0**		**4.00E-05**	**4.00E-05**		**4.00E-05**	**4.00E-05**	**0**	**0.0233**	**0.0233**	**6.00E-05**	**0**	**0.0248**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3.71216 / 1.88763	3.1540	0.1212	2.8800e-003	7.0436
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**3.1540**	**0.1212**	**2.8800e-003**	**7.0436**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	78.13	15.8597	0.9373	0	39.2917
Parking Lot	0	0	0	0	0
Total		**15.8597**	**0.9373**	**0**	**39.2917**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Opening MOWS - Merced County, Annual

Opening MOWS
Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	155.10	1000sqft	3.56	155,100.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	163.23	**CH4 Intensity**	0.02	**N2O Intensity**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for SB 350
Vehicle Trips - Haul
Fleet Mix - Haul
Stationary Sources - Emergency Generators and Fire Pumps - Back up generator

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	77,550.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	232,650.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblFleetMix	HHD	0.15	1.00
tblFleetMix	LDA	0.53	0.00
tblFleetMix	LDT1	0.03	0.00
tblFleetMix	LDT2	0.16	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	3.4450e-003	0.00
tblFleetMix	MCY	5.5820e-003	0.00
tblFleetMix	MDV	0.09	0.00
tblFleetMix	MH	4.5000e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	2.3520e-003	0.00
tblFleetMix	SBUS	1.3580e-003	0.00

tblFleetMix	UBUS	1.6400e-003	0.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	2.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	163.23
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblVehicleTrips	CC_TL	7.30	120.00
tblVehicleTrips	CNW_TL	7.30	120.00
tblVehicleTrips	CW_TL	9.50	120.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.13
tblVehicleTrips	SU_TR	0.68	0.13
tblVehicleTrips	WD_TR	6.97	0.13

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7137	1.00E-05	1.42E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	2.77E-03	2.77E-03	1.00E-05	0	2.95E-03
Energy	0.0175	0.1587	0.1333	9.50E-04		0.0121	0.0121		0.0121	0.0121	0	274.0205	274.0205	0.0157	4.41E-03	275.7271
Mobile	0.085	1.8357	0.955	0.0139	0.3749	5.59E-03	0.3805	0.103	5.35E-03	0.1084	0	1,353.83	1,353.83	0.0522	0	1,355.14
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	39.0392	0	39.0392	2.3072	0	96.718
Water						0	0		0	0	11.3789	14.3693	25.7482	1.1705	0.0278	63.2864
Total	**0.8602**	**2.1911**	**1.2018**	**0.0151**	**0.3749**	**0.0242**	**0.3991**	**0.1030**	**0.0239**	**0.1270**	**50.4181**	**1,662.6374**	**1,713.0555**	**3.5485**	**0.0322**	**1,811.3564**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	20.16	20.16	20.16	880,720	880,720
Total	20.16	20.16	20.16	880,720	880,720

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	120.00	120.00	120.00	59.00	28.00	13.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0	0	0	0	0	0	0	1	0	0	0	0	0

5.0 Energy Detail

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	3.24E+06	0.0175	0.1587	0.1333	9.50E-04		0.0121	0.0121		0.0121	0.0121	0	172.7353	172.7353	3.31E-03	3.17E-03	173.7618
Total		**0.0175**	**0.1587**	**0.1333**	**9.50E-04**		**0.0121**	**0.0121**		**0.0121**	**0.0121**	**0**	**172.7353**	**172.7353**	**3.31E-03**	**3.17E-03**	**173.7618**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.37E+06	101.2852	0.0124	1.24E-03	101.9653
Total		**101.2852**	**0.0124**	**1.24E-03**	**101.9653**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1078					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.6057					0	0		0	0	0	0	0	0	0	0
Landscaping	1.30E-04	1.00E-05	1.42E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	2.77E-03	2.77E-03	1.00E-05	0	2.95E-03
Total	**0.7137**	**1.00E-05**	**1.42E-03**	**0**		**1.00E-05**	**1.00E-05**		**1.00E-05**	**1.00E-05**	**0**	**2.77E-03**	**2.77E-03**	**1.00E-05**	**0**	**2.95E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	35.8669 / 0	25.7482	1.1705	0.0278	63.2864
Total		**25.7482**	**1.1705**	**0.0278**	**63.2864**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	192.32	39.0392	2.3072	0.0000	96.7180
Total		**39.0392**	**2.3072**	**0.0000**	**96.7180**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072.82	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

Opening MOWF - Santa Clara County, Annual

Opening MOWF
Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	132.50	1000sqft	3.04	132,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	163.2285714	**CH4 Intensity**	0.019506356	**N2O Intensity**	0.002364407

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for SB 350
Vehicle Trips - Employee + haul (trip distance weighted based on H-W employee miles + 120 haul truck miles)
Fleet Mix - Reweighted for LDA/LDT/MCY/HHD
Stationary Sources - Emergency Generators and Fire Pumps - Back Up Generator

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	66,250.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	198,750.00	0.00
tblConstructionPhase	NumDays	18.00	0.00
tblFleetMix	HHD	0.02	0.02
tblFleetMix	LDA	0.62	0.69
tblFleetMix	LDT1	0.03	0.05
tblFleetMix	LDT2	0.18	0.23
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.0500e-003	0.00
tblFleetMix	MCY	5.1390e-003	7.0000e-003
tblFleetMix	MDV	0.10	0.00
tblFleetMix	MH	6.5600e-004	0.00
tblFleetMix	MHD	0.01	0.00

tblFleetMix	OBUS	2.2140e-003	0.00
tblFleetMix	SBUS	6.4500e-004	0.00
tblFleetMix	UBUS	1.4750e-003	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.0195063559322034
tblProjectCharacteristics	CO2IntensityFactor	641.35	163.228571428571
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.00236440677966102
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,072.82
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	11.00	0.00
tblVehicleTrips	CC_TL	7.30	15.45
tblVehicleTrips	CNW_TL	7.30	15.45
tblVehicleTrips	CW_TL	9.50	15.45
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	3.55
tblVehicleTrips	SU_TR	0.68	3.55
tblVehicleTrips	WD_TR	6.97	3.55

2.0 Emissions Summary

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5867	1.00E-05	1.21E-03	0		0	0		0	0	0	2.37E-03	2.37E-03	1.00E-05	0	2.52E-03
Energy	0.0189	0.1713	0.1439	1.03E-03		0.013	0.013		0.013	0.013	0	267.5574	267.5574	0.0133	4.59E-03	269.2577
Mobile	0.109	0.347	1.7334	7.07E-03	0.9727	4.43E-03	0.9771	0.2587	4.09E-03	0.2628	0	646.5157	646.5157	0.0197	0	647.0071
Stationary	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Waste						0	0		0	0	33.3514	0	33.3514	1.971	0	82.6267
Water						0	0		0	0	9.7209	12.2754	21.9963	0.9999	0.0238	54.0719
Total	**0.7585**	**0.7151**	**1.9907**	**8.31E-03**	**0.9727**	**0.0239**	**0.9966**	**0.2587**	**0.0236**	**0.2823**	**43.0723**	**946.7617**	**989.834**	**3.0067**	**0.0283**	**1,073.45**

4.0 Operational Detail - Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	470.38	470.38	470.38	2,645,295	2,645,295
Total	470.38	470.38	470.38	2,645,295	2,645,295

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	15.45	15.45	15.45	59.00	28.00	13.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.69	0.053	0.229	0	0	0	0	0.021	0	0	0.007	0	0

5.0 Energy Detail

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	3.50E+06	0.0189	0.1713	0.1439	1.03E-03		0.013	0.013		0.013	0.013	0	186.5252	186.5252	3.58E-03	3.42E-03	187.6336
Total		**0.0189**	**0.1713**	**0.1439**	**1.03E-03**		**0.013**	**0.013**		**0.013**	**0.013**	**0**	**186.5252**	**186.5252**	**3.58E-03**	**3.42E-03**	**187.6336**

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.09E+06	81.0322	9.68E-03	1.17E-03	81.6241
Total		**81.0322**	**9.68E-03**	**1.17E-03**	**81.6241**

6.0 Area Detail

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0691					0	0		0	0	0	0	0	0	0	0
Consumer Products	0.5175					0	0		0	0	0	0	0	0	0	0
Landscaping	1.10E-04	1.00E-05	1.21E-03	0		0	0		0	0	0	2.37E-03	2.37E-03	1.00E-05	0	2.52E-03
Total	**0.5867**	**1.00E-05**	**1.21E-03**	**0**		**0**	**0**		**0**	**0**	**0**	**2.37E-03**	**2.37E-03**	**1.00E-05**	**0**	**2.52E-03**

7.0 Water Detail

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			

General Light Industry	30.6406 / 0	21.9963	0.9999	0.0238	54.0719
Total		**21.9963**	**0.9999**	**0.0238**	**54.0719**

8.0 Waste Detail

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	164.3	33.3514	1.9710	0.0000	82.6267
Total		**33.3514**	**1.9710**	**0.0000**	**82.6267**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	1	50	1072.82	0.73	Diesel

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.044	0.1967	0.1121	2.10E-04		6.47E-03	6.47E-03		6.47E-03	6.47E-03	0	20.4107	20.4107	2.86E-03	0	20.4823
Total	**0.044**	**0.1967**	**0.1121**	**2.10E-04**		**6.47E-03**	**6.47E-03**		**6.47E-03**	**6.47E-03**	**0**	**20.4107**	**20.4107**	**2.86E-03**	**0**	**20.4823**

MOWF Calculations

Offroad Yard Equipment

Year	Equip	Annual Hours	CMOD	HP	Tons per year						Metric tons per year				Gal per year
					ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O	CO2e	Fuel
2015	Plain Line Track Tamper	208	Other General Industrial Equipment	400	0.0	0.0	0.1	0.0	0.0	0.0	14.6	0.0	0.0	14.8	1427
2015	Special trackwork tamper	64	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5	439
2015	Ballast regulator	104	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.0	0.0	10.0	961
2015	Dynamic Track Stabilizer	52	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.7	357
2015	Multipurpose Stone Blower	64	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5	439
2015	Sleeper changing unit	104	Other General Industrial Equipment	88	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	156
2015	Structure inspection train (Snooper)	52	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	5.0	481
2015	Rail butt Welder	52	Welders	46	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.6	60
2015	Drainage train	52	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	5.0	481
2015	Road rail construction vehicles	312	Tractors/Loaders/Backhoes	97	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	5.9	565
2015	Hi-Rail Dumper	104	Dumpers/Tenders	16	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	35
2015	Rail butt Welder	208	Welders	46	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	2.5	240
2015	Other General Industrial Equipment	1800	Other General Industrial Equipment	88	0.0	0.0	0.2	0.0	0.0	0.0	27.6	0.0	0.0	28.0	2699
2015	Generator Sets	1800	Generator sets	84	0.0	0.3	0.5	0.0	0.0	0.0	63.6	0.0	0.0	64.4	6228
2015	Excavators	208	Excavators	158	0.0	0.0	0.0	0.0	0.0	0.0	6.4	0.0	0.0	6.5	629
2015	Forklift	180	Forklifts	89	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.7	161
2015	Aerial Lifts	208	Aerial Lifts	63	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	2.3	225
2029	Plain Line Track Tamper	208	Other General Industrial Equipment	400	0.0	0.0	0.1	0.0	0.0	0.0	16.2	0.0	0.0	16.3	1582
2029	Special trackwork tamper	64	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	487
2029	Ballast regulator	104	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	10.9	1059
2029	Dynamic Track Stabilizer	52	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.1	396
2029	Multipurpose Stone Blower	64	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	487
2029	Sleeper changing unit	104	Other General Industrial Equipment	88	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.8	174
2029	Structure inspection train (Snooper)	52	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	5.5	529
2029	Rail butt Welder	52	Welders	46	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.6	60
2029	Drainage train	52	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	5.5	529
2029	Road rail construction vehicles	312	Tractors/Loaders/Backhoes	97	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	6.4	621
2029	Hi-Rail Dumper	104	Dumpers/Tenders	16	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	35
2029	Rail butt Welder	208	Welders	46	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	2.5	240
2029	Other General Industrial Equipment	1800	Other General Industrial Equipment	88	0.0	0.0	0.2	0.0	0.0	0.0	30.8	0.0	0.0	31.0	3013
2029	Generator Sets	1800	Generator sets	84	0.0	0.3	0.5	0.0	0.0	0.0	63.6	0.0	0.0	64.1	6228
2029	Excavators	208	Excavators	158	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	7.2	699
2029	Forklift	180	Forklifts	89	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.8	179
2029	Aerial Lifts	208	Aerial Lifts	63	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	2.3	225
2040	Plain Line Track Tamper	208	Other General Industrial Equipment	400	0.0	0.0	0.1	0.0	0.0	0.0	16.2	0.0	0.0	16.3	1582
2040	Special trackwork tamper	64	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	487
2040	Ballast regulator	104	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	10.9	1059
2040	Dynamic Track Stabilizer	52	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.1	396
2040	Multipurpose Stone Blower	64	Other General Industrial Equipment	400	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	487
2040	Sleeper changing unit	104	Other General Industrial Equipment	88	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.8	174
2040	Structure inspection train (Snooper)	52	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	5.5	529
2040	Rail butt Welder	52	Welders	46	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.6	60
2040	Drainage train	52	Off-Highway Trucks	479	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	5.5	529
2040	Road rail construction vehicles	312	Tractors/Loaders/Backhoes	97	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	6.4	621
2040	Hi-Rail Dumper	104	Dumpers/Tenders	16	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	35
2040	Rail butt Welder	208	Welders	46	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	2.5	240
2040	Other General Industrial Equipment	1800	Other General Industrial Equipment	88	0.0	0.0	0.2	0.0	0.0	0.0	30.8	0.0	0.0	31.0	3013
2040	Generator Sets	1800	Generator sets	84	0.0	0.3	0.5	0.0	0.0	0.0	63.6	0.0	0.0	64.1	6228
2040	Excavators	208	Excavators	158	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	7.2	699
2040	Forklift	180	Forklifts	89	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.8	179

2040	Aerial Lifts	208	Aerial Lifts	63	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	2.3	225

Year	Train	HP	Annual Hours	Tons per year						Metric tons per year				Gal per year
				ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O	CO2e	Fuel
2015	Mobile Maintenance Train	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2015	Plain Line Rail grinding Train	3000	52	0.0	0.2	0.3	0.0	0.0	0.0	105	0.0	0.0	106	10270
2015	Rail Milling Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2015	Inspection train	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2015	Lazer/Clearance Train	3000	52	0.0	0.2	0.3	0.0	0.0	0.0	105	0.0	0.0	106	10270
2015	OCS inspection and maintenance train (UTU)	3000	104	0.0	0.3	0.6	0.0	0.0	0.0	210	0.0	0.0	211	20540
2015	Motive power	3000	208	0.1	0.7	1.3	0.0	0.0	0.1	419	0.0	0.0	422	41081
2015	Long Welded Rail Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2015	Kirow Crane	231	52	0.0	0.0	0.0	0.0	0.0	0.0	8	0.0	0.0	8	791
2015	Ballast Cleaning Train	88	24	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0	0.0	1	139
2015	Track Renewal Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2015	Multi-purpose vehicles (MPV)	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2029	Mobile Maintenance Train	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2029	Plain Line Rail grinding Train	3000	52	0.0	0.2	0.3	0.0	0.0	0.0	105	0.0	0.0	106	10270
2029	Rail Milling Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2029	Inspection train	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2029	Lazer/Clearance Train	3000	52	0.0	0.2	0.3	0.0	0.0	0.0	105	0.0	0.0	106	10270
2029	OCS inspection and maintenance train (UTU)	3000	104	0.0	0.3	0.6	0.0	0.0	0.0	210	0.0	0.0	211	20540
2029	Motive power	3000	208	0.1	0.7	1.3	0.0	0.0	0.1	419	0.0	0.0	422	41081
2029	Long Welded Rail Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2029	Kirow Crane	231	52	0.0	0.0	0.0	0.0	0.0	0.0	8	0.0	0.0	8	791
2029	Ballast Cleaning Train	88	24	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0	0.0	1	139
2029	Track Renewal Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2029	Multi-purpose vehicles (MPV)	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2040	Mobile Maintenance Train	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2040	Plain Line Rail grinding Train	3000	52	0.0	0.2	0.3	0.0	0.0	0.0	105	0.0	0.0	106	10270
2040	Rail Milling Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2040	Inspection train	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551
2040	Lazer/Clearance Train	3000	52	0.0	0.2	0.3	0.0	0.0	0.0	105	0.0	0.0	106	10270
2040	OCS inspection and maintenance train (UTU)	3000	104	0.0	0.3	0.6	0.0	0.0	0.0	210	0.0	0.0	211	20540
2040	Motive power	3000	208	0.1	0.7	1.3	0.0	0.0	0.1	419	0.0	0.0	422	41081
2040	Long Welded Rail Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2040	Kirow Crane	231	52	0.0	0.0	0.0	0.0	0.0	0.0	8	0.0	0.0	8	791
2040	Ballast Cleaning Train	88	24	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0	0.0	1	139
2040	Track Renewal Train	3000	24	0.0	0.1	0.1	0.0	0.0	0.0	48	0.0	0.0	49	4740
2040	Multi-purpose vehicles (MPV)	3000	180	0.1	0.6	1.1	0.0	0.0	0.1	363	0.0	0.0	366	35551

Onroad Calculations

Year	Vehicle	Shift/Yr	Veh/ Shift	Annual Hours	Annual Miles	Tons per year								Metric tons per year				Gal per year
						ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e	Fuel
2015	Frog and Switch inspection hi-rail inspection vehicle	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0.0	0.0	3	319
2015	Hi-rail general (Road rail)	45	3	540	2,700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	0.0	0.0	5	478
2015	Hi rail backhoe (Road rail)	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0.0	0.0	3	319
2015	Hi-rail specialist vehicles (road rail [Welding])	45	3	540	2,700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	0.0	0.0	5	478
2015	Hi-rail Truck (Road rail[ultrasonic and lubrication])	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0.0	0.0	3	319
2015	6 pack (road vehicle)	45	4	720	3,600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0.0	0.0	3	267
2015	SUV's	45	8	1440	7,200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13	0.0	0.0	13	1282
2015	Section truck	45	4	720	3,600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7	0.0	0.0	7	638
2029	Frog and Switch inspection hi-rail inspection vehicle	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0.0	0.0	3	253
2029	Hi-rail general (Road rail)	45	3	540	2,700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	0.0	0.0	4	380
2029	Hi rail backhoe (Road rail)	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0.0	0.0	3	253
2029	Hi-rail specialist vehicles (road rail [Welding])	45	3	540	2,700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	0.0	0.0	4	380
2029	Hi-rail Truck (Road rail[ultrasonic and lubrication])	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0.0	0.0	3	253
2029	6 pack (road vehicle)	45	4	720	3,600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2	196
2029	SUV's	45	8	1440	7,200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11	0.0	0.0	11	1034
2029	Section truck	45	4	720	3,600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	0.0	0.0	5	507
2040	Flash butt welder (Road rail)	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2	230
2040	Frog and Switch inspection hi-rail inspection vehicle	45	3	540	2,700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	0.0	0.0	4	344
2040	Hi-rail general (Road rail)	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2	230
2040	Hi-rail specialist vehicles (road rail [Welding])	45	3	540	2,700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	0.0	0.0	4	344
2040	Hi-rail Truck (Road rail[ultrasonic and lubrication])	45	2	360	1,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2	230
2040	6 pack (road vehicle)	45	4	720	3,600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2	171
2040	SUV's	45	8	1440	7,200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10	0.0	0.0	10	932
2040	Section truck	45	4	720	3,600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	0.0	0.0	5	459

East Gilroy Transit Calculations

Assumptions

Parameter	Result	Unit
Bus trips	107	per day
Idle time	5	minutes per trip
Travel distance	2000[a]	feet
Total station idle	535	min/day
Total station VMT	41	miles/day

[a] *Assumes 1,000 foot segment upon entry and exit*

Conversions/Defaults

Parameter	Result
Pounds per gram	0.0022
Tons per pound	0.0005
Days per year	365
miles per feet	0.0002

EMFAC2017 Emission Factors[a]

Pollutant/process	Factor	Unit
PM10, running	0.00544	grams/mile
PM2.5, running	0.00521	grams/mile
PM10, idling[b]	0.00057	grams/min
PM2.5, idling[b]	0.00055	grams/min

[a] *Based on outputs for Santa Clara County, 2029, DSL UBUS at 15 miles per hour*

[b] *Convert the 5-mph factor to grams per idle-min assuming 0.08333 miles are traveled per minute*

Emissions

	Grams per Day		Pounds per Day		Tons per Year	
Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Idle	0.3073	0.2940	0.0007	0.0006	0.0001	0.0001
Approach/Depart	0.2205	0.2110	0.0005	0.0005	0.0001	0.0001

APPENDIX 3.3-A, APPENDIX B: CALINE4 OUTPUTS FOR CO HOT-SPOT ANALYSIS

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	755	5.0	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	893	5.0	0.0	13.3
C. WBA	*	1000	5	0	5	* AG	689	5.0	0.0	17.0
D. WBD	*	0	4	-1000	4	* AG	661	5.0	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1550	5.0	0.0	17.0
F. SBD	*	-4	0	-4	-1000	* AG	1382	5.0	0.0	13.3
G. NBA	*	5	-1000	5	0	* AG	775	5.0	0.0	17.0
H. NBD	*	4	0	4	1000	* AG	833	5.0	0.0	13.3

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-14	10	1.8
2. R_002	*	10	14	1.8
3. R_003	*	-10	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	97.	1.6	0.0	0.4	0.4	0.1	0.5	0.0	0.0	0.2
2. R_002	188.	1.6	0.0	0.2	0.2	0.0	0.0	0.6	0.4	0.2
3. R_003	6.	1.9	0.2	0.0	0.0	0.1	0.9	0.3	0.0	0.4
4. R_004	350.	1.5	0.0	0.3	0.2	0.0	0.5	0.0	0.1	0.4

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Exi
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	678	5.0	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	838	5.0	0.0	13.3
C. WBA	*	1000	4	0	4	* AG	863	5.0	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	1039	5.0	0.0	13.3
E. SBA	*	-4	1000	-4	0	* AG	58	5.0	0.0	13.3
F. SBD	*	-2	0	-2	-1000	* AG	0	5.0	0.0	10.0
G. NBA	*	5	-1000	5	0	* AG	419	5.0	0.0	17.0
H. NBD	*	2	0	2	1000	* AG	141	5.0	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-10	10	1.8
2. R_002	*	7	11	1.8
3. R_003	*	-7	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Exi
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	98.	1.1	0.0	0.4	0.5	0.2	0.0	0.0	0.0	0.0
2. R_002	262.	1.1	0.3	0.0	0.1	0.7	0.0	0.0	0.0	0.0
3. R_003	81.	0.9	0.0	0.5	0.3	0.0	0.0	0.0	0.1	0.0
4. R_004	277.	1.1	0.4	0.2	0.0	0.4	0.0	0.0	0.1	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Existing B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-4	0	-4	* AG	10	5.0	0.0	13.3
B. EBD	*	0	-4	1000	-4	* AG	1063	5.0	0.0	13.3
C. WBA	*	1000	7	0	7	* AG	736	5.0	0.0	20.6
D. WBD	*	0	2	-1000	2	* AG	13	5.0	0.0	10.0
E. SBA	*	-9	1000	-9	0	* AG	2370	5.0	0.0	24.3
F. SBD	*	-5	0	-5	-1000	* AG	1931	5.0	0.0	17.0
G. NBA	*	5	-1000	5	0	* AG	1697	5.0	0.0	17.0
H. NBD	*	5	0	5	1000	* AG	1806	5.0	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-21	7	1.8
2. R_002	*	14	18	1.8
3. R_003	*	-15	-11	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Existing B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	93.	1.8	0.0	0.5	0.4	0.0	0.6	0.0	0.0	0.2
2. R_002	189.	2.2	0.0	0.2	0.2	0.0	0.0	0.6	0.8	0.3
3. R_003	6.	1.9	0.0	0.0	0.0	0.0	1.2	0.1	0.0	0.5
4. R_004	351.	2.4	0.0	0.3	0.2	0.0	0.7	0.0	0.2	1.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Monterey Road/Blossom Hill Rd Existing B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBD	*	0	-4	1000	-4	* AG	196	5.0	0.0	13.3
B. WBA	*	1000	4	0	4	* AG	805	5.0	0.0	13.3
C. WBD	*	0	2	-1000	2	* AG	561	5.0	0.0	10.0
D. SBA	*	-7	1000	-7	0	* AG	1858	5.0	0.0	20.6
E. SBD	*	-4	0	-4	-1000	* AG	1574	5.0	0.0	13.3
F. NBA	*	5	-1000	5	0	* AG	1024	5.0	0.0	17.0
G. NBD	*	5	0	5	1000	* AG	1356	5.0	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-18	7	1.8
2. R_002	*	14	10	1.8
3. R_003	*	-15	-7	1.8
4. R_004	*	14	-11	1.8

JOB: Monterey Road/Blossom Hill Rd Existing B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G
1. R_001	94.	1.5	0.1	0.5	0.2	0.5	0.0	0.0	0.2
2. R_002	189.	1.6	0.0	0.3	0.0	0.0	0.5	0.6	0.1
3. R_003	7.	1.7	0.0	0.0	0.2	1.1	0.0	0.0	0.4
4. R_004	351.	1.7	0.1	0.2	0.0	0.6	0.0	0.1	0.7

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: US101/Blossom Hill Rd Existing B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	2395	5.0	0.0	17.0
B. EBD	*	0	-5	1000	-5	* AG	2411	5.0	0.0	17.0
C. WBA	*	1000	4	0	4	* AG	881	5.0	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	2455	5.0	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1826	5.0	0.0	17.0
F. SBD	*	-2	0	-2	-1000	* AG	236	5.0	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-15	11	1.8
2. R_002	*	3	11	1.8
3. R_003	*	-8	-15	1.8
4. R_004	*	3	-15	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F
1. R_001	261.	2.5	0.9	0.0	0.0	1.6	0.0	0.0
2. R_002	261.	3.0	0.9	0.0	0.0	1.5	0.6	0.0
3. R_003	1.	2.2	0.7	0.0	0.0	0.4	1.1	0.0
4. R_004	279.	2.2	1.4	0.0	0.0	0.7	0.0	0.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	755	5.0	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	893	5.0	0.0	13.3
C. WBA	*	1000	5	0	5	* AG	689	5.0	0.0	17.0
D. WBD	*	0	4	-1000	4	* AG	661	5.0	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1550	5.0	0.0	17.0
F. SBD	*	-4	0	-4	-1000	* AG	1382	5.0	0.0	13.3
G. NBA	*	5	-1000	5	0	* AG	775	5.0	0.0	17.0
H. NBD	*	4	0	4	1000	* AG	833	5.0	0.0	13.3

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-14	10	1.8
2. R_002	*	10	14	1.8
3. R_003	*	-10	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	97.	1.6	0.0	0.4	0.4	0.1	0.5	0.0	0.0	0.2
2. R_002	188.	1.6	0.0	0.2	0.2	0.0	0.0	0.6	0.4	0.2
3. R_003	6.	1.9	0.2	0.0	0.0	0.1	0.9	0.3	0.0	0.4
4. R_004	350.	1.5	0.0	0.3	0.2	0.0	0.5	0.0	0.1	0.4

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autumn Street/West Santa Clara Street Exi
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	661	5.0	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	733	5.0	0.0	13.3
C. WBA	*	1000	4	0	4	* AG	840	5.0	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	928	5.0	0.0	13.3
E. SBA	*	-4	1000	-4	0	* AG	58	5.0	0.0	13.3
F. SBD	*	-2	0	-2	-1000	* AG	0	5.0	0.0	10.0
G. NBA	*	5	-1000	5	0	* AG	243	5.0	0.0	17.0
H. NBD	*	2	0	2	1000	* AG	141	5.0	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-10	10	1.8
2. R_002	*	7	11	1.8
3. R_003	*	-7	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autumn Street/West Santa Clara Street Exi
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	98.	1.0	0.0	0.3	0.5	0.1	0.0	0.0	0.0	0.0
2. R_002	262.	1.1	0.3	0.0	0.1	0.6	0.0	0.0	0.0	0.0
3. R_003	81.	0.8	0.0	0.4	0.3	0.0	0.0	0.0	0.1	0.0
4. R_004	277.	1.0	0.4	0.1	0.0	0.4	0.0	0.0	0.1	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Existing NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-4	0	-4	* AG	10	5.0	0.0	13.3
B. EBD	*	0	-4	1000	-4	* AG	1063	5.0	0.0	13.3
C. WBA	*	1000	7	0	7	* AG	651	5.0	0.0	20.6
D. WBD	*	0	2	-1000	2	* AG	13	5.0	0.0	10.0
E. SBA	*	-9	1000	-9	0	* AG	2370	5.0	0.0	24.3
F. SBD	*	-5	0	-5	-1000	* AG	1931	5.0	0.0	17.0
G. NBA	*	5	-1000	5	0	* AG	1697	5.0	0.0	17.0
H. NBD	*	5	0	5	1000	* AG	1721	5.0	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-21	7	1.8
2. R_002	*	14	18	1.8
3. R_003	*	-15	-11	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Existing NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	9.	1.7	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.5
2. R_002	189.	2.1	0.0	0.2	0.2	0.0	0.0	0.6	0.8	0.3
3. R_003	6.	1.9	0.0	0.0	0.0	0.0	1.2	0.1	0.0	0.5
4. R_004	351.	2.3	0.0	0.3	0.1	0.0	0.7	0.0	0.2	0.9

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Monterey Road/Blossom Hill Rd Existing N
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBD	*	0	-4	1000	-4	* AG	190	5.0	0.0	13.3
B. WBA	*	1000	4	0	4	* AG	828	5.0	0.0	13.3
C. WBD	*	0	2	-1000	2	* AG	481	5.0	0.0	10.0
D. SBA	*	-7	1000	-7	0	* AG	1800	5.0	0.0	20.6
E. SBD	*	-4	0	-4	-1000	* AG	1596	5.0	0.0	13.3
F. NBA	*	5	-1000	5	0	* AG	1033	5.0	0.0	17.0
G. NBD	*	5	0	5	1000	* AG	1394	5.0	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-18	7	1.8
2. R_002	*	14	10	1.8
3. R_003	*	-15	-7	1.8
4. R_004	*	14	-11	1.8

JOB: Monterey Road/Blossom Hill Rd Existing N
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G
1. R_001	94.	1.5	0.1	0.5	0.1	0.5	0.0	0.0	0.2
2. R_002	189.	1.6	0.0	0.3	0.0	0.0	0.5	0.6	0.2
3. R_003	7.	1.6	0.0	0.0	0.1	1.1	0.0	0.0	0.4
4. R_004	351.	1.7	0.1	0.2	0.0	0.6	0.0	0.1	0.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: US101/Blossom Hill Rd Existing NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	2346	5.0	0.0	17.0
B. EBD	*	0	-5	1000	-5	* AG	2348	5.0	0.0	17.0
C. WBA	*	1000	4	0	4	* AG	881	5.0	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	2439	5.0	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1747	5.0	0.0	17.0
F. SBD	*	-2	0	-2	-1000	* AG	187	5.0	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-15	11	1.8
2. R_002	*	3	11	1.8
3. R_003	*	-8	-15	1.8
4. R_004	*	3	-15	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F
1. R_001	261.	2.5	0.8	0.0	0.0	1.6	0.0	0.0
2. R_002	261.	2.9	0.8	0.0	0.0	1.5	0.5	0.0
3. R_003	1.	2.1	0.7	0.0	0.0	0.4	1.0	0.0
4. R_004	279.	2.1	1.3	0.0	0.0	0.7	0.0	0.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1835	1.6	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	2030	1.6	0.0	13.3
C. WBA	*	1000	5	0	5	* AG	1460	1.6	0.0	17.0
D. WBD	*	0	4	-1000	4	* AG	1433	1.6	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1891	1.6	0.0	17.0
F. SBD	*	-4	0	-4	-1000	* AG	1666	1.6	0.0	13.3
G. NBA	*	5	-1000	5	0	* AG	1326	1.6	0.0	17.0
H. NBD	*	4	0	4	1000	* AG	1383	1.6	0.0	13.3

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-14	10	1.8
2. R_002	*	10	14	1.8
3. R_003	*	-10	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	98.	0.8	0.0	0.2	0.2	0.1	0.2	0.0	0.0	0.1
2. R_002	188.	0.8	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.1
3. R_003	7.	0.8	0.2	0.0	0.0	0.1	0.3	0.1	0.0	0.2
4. R_004	277.	0.8	0.3	0.1	0.0	0.2	0.0	0.1	0.1	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Hor
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1906	1.6	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	1748	1.6	0.0	13.3
C. WBA	*	1000	4	0	4	* AG	1520	1.6	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	1385	1.6	0.0	13.3
E. SBA	*	-4	1000	-4	0	* AG	1178	1.6	0.0	13.3
F. SBD	*	-2	0	-2	-1000	* AG	1409	1.6	0.0	10.0
G. NBA	*	5	-1000	5	0	* AG	864	1.6	0.0	17.0
H. NBD	*	2	0	2	1000	* AG	926	1.6	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-10	10	1.8
2. R_002	*	7	11	1.8
3. R_003	*	-7	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Hor
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	99.	0.7	0.0	0.2	0.3	0.1	0.1	0.0	0.0	0.1
2. R_002	261.	0.7	0.2	0.0	0.0	0.3	0.1	0.0	0.0	0.1
3. R_003	7.	0.8	0.2	0.0	0.0	0.1	0.2	0.1	0.0	0.1
4. R_004	277.	0.8	0.3	0.1	0.0	0.2	0.0	0.1	0.1	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Horizon B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-4	0	-4	* AG	20	1.6	0.0	13.3
B. EBD	*	0	-4	1000	-4	* AG	1094	1.6	0.0	13.3
C. WBA	*	1000	7	0	7	* AG	850	1.6	0.0	20.6
D. WBD	*	0	2	-1000	2	* AG	20	1.6	0.0	10.0
E. SBA	*	-9	1000	-9	0	* AG	3289	1.6	0.0	24.3
F. SBD	*	-5	0	-5	-1000	* AG	3039	1.6	0.0	17.0
G. NBA	*	5	-1000	5	0	* AG	2291	1.6	0.0	17.0
H. NBD	*	5	0	5	1000	* AG	2297	1.6	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-21	7	1.8
2. R_002	*	14	18	1.8
3. R_003	*	-15	-11	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Horizon B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	9.	0.7	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.2
2. R_002	189.	0.9	0.0	0.1	0.1	0.0	0.0	0.3	0.3	0.1
3. R_003	6.	0.8	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.2
4. R_004	351.	0.9	0.0	0.1	0.1	0.0	0.3	0.0	0.1	0.4

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Monterey Road/Blossom Hill Rd Horizon B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBD	*	0	-4	1000	-4	* AG	320	1.6	0.0	13.3
B. WBA	*	1000	4	0	4	* AG	980	1.6	0.0	13.3
C. WBD	*	0	2	-1000	2	* AG	700	1.6	0.0	10.0
D. SBA	*	-7	1000	-7	0	* AG	3300	1.6	0.0	20.6
E. SBD	*	-4	0	-4	-1000	* AG	2900	1.6	0.0	13.3
F. NBA	*	5	-1000	5	0	* AG	2110	1.6	0.0	17.0
G. NBD	*	5	0	5	1000	* AG	2470	1.6	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-18	7	1.8
2. R_002	*	14	10	1.8
3. R_003	*	-15	-7	1.8
4. R_004	*	14	-11	1.8

JOB: Monterey Road/Blossom Hill Rd Horizon B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G
1. R_001	9.	0.8	0.0	0.0	0.0	0.6	0.0	0.0	0.2
2. R_002	189.	0.8	0.0	0.1	0.0	0.0	0.3	0.3	0.1
3. R_003	7.	0.8	0.0	0.0	0.1	0.6	0.0	0.0	0.2
4. R_004	351.	0.8	0.0	0.1	0.0	0.3	0.0	0.1	0.4

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: US101/Blossom Hill Rd Horizon B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	2950	1.6	0.0	17.0
B. EBD	*	0	-5	1000	-5	* AG	2980	1.6	0.0	17.0
C. WBA	*	1000	4	0	4	* AG	1090	1.6	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	3030	1.6	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	2260	1.6	0.0	17.0
F. SBD	*	-2	0	-2	-1000	* AG	290	1.6	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-15	11	1.8
2. R_002	*	3	11	1.8
3. R_003	*	-8	-15	1.8
4. R_004	*	3	-15	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F
1. R_001	260.	0.9	0.3	0.0	0.0	0.6	0.0	0.0
2. R_002	261.	1.1	0.3	0.0	0.0	0.6	0.2	0.0
3. R_003	1.	0.8	0.3	0.0	0.0	0.2	0.4	0.0
4. R_004	280.	0.8	0.5	0.0	0.0	0.3	0.0	0.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1830	1.6	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	2030	1.6	0.0	13.3
C. WBA	*	1000	5	0	5	* AG	1460	1.6	0.0	17.0
D. WBD	*	0	4	-1000	4	* AG	1430	1.6	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1800	1.6	0.0	17.0
F. SBD	*	-4	0	-4	-1000	* AG	1570	1.6	0.0	13.3
G. NBA	*	5	-1000	5	0	* AG	1250	1.6	0.0	17.0
H. NBD	*	4	0	4	1000	* AG	1310	1.6	0.0	13.3

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-14	10	1.8
2. R_002	*	10	14	1.8
3. R_003	*	-10	-14	1.8
4. R_004	*	14	-10	1.8

1

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	98.	0.8	0.0	0.2	0.2	0.1	0.2	0.0	0.0	0.1
2. R_002	188.	0.7	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.1
3. R_003	7.	0.8	0.2	0.0	0.0	0.1	0.3	0.1	0.0	0.2
4. R_004	277.	0.8	0.3	0.1	0.0	0.2	0.0	0.1	0.1	0.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Hor
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1920	1.6	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	1730	1.6	0.0	13.3
C. WBA	*	1000	4	0	4	* AG	1310	1.6	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	1050	1.6	0.0	13.3
E. SBA	*	-4	1000	-4	0	* AG	1030	1.6	0.0	13.3
F. SBD	*	-2	0	-2	-1000	* AG	1310	1.6	0.0	10.0
G. NBA	*	5	-1000	5	0	* AG	530	1.6	0.0	17.0
H. NBD	*	2	0	2	1000	* AG	700	1.6	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-10	10	1.8
2. R_002	*	7	11	1.8
3. R_003	*	-7	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Hor
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	99.	0.7	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.1
2. R_002	261.	0.6	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.1
3. R_003	7.	0.7	0.2	0.0	0.0	0.1	0.2	0.1	0.0	0.1
4. R_004	277.	0.7	0.3	0.1	0.0	0.1	0.0	0.1	0.0	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Horizon NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-4	0	-4	* AG	0	1.6	0.0	13.3
B. EBD	*	0	-4	1000	-4	* AG	1070	1.6	0.0	13.3
C. WBA	*	1000	7	0	7	* AG	850	1.6	0.0	20.6
D. WBD	*	0	2	-1000	2	* AG	20	1.6	0.0	10.0
E. SBA	*	-9	1000	-9	0	* AG	3220	1.6	0.0	24.3
F. SBD	*	-5	0	-5	-1000	* AG	2950	1.6	0.0	17.0
G. NBA	*	5	-1000	5	0	* AG	2180	1.6	0.0	17.0
H. NBD	*	5	0	5	1000	* AG	2210	1.6	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-21	7	1.8
2. R_002	*	14	18	1.8
3. R_003	*	-15	-11	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Horizon NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	9.	0.7	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.2
2. R_002	189.	0.8	0.0	0.1	0.1	0.0	0.0	0.3	0.3	0.1
3. R_003	6.	0.8	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.2
4. R_004	351.	0.9	0.0	0.1	0.1	0.0	0.3	0.0	0.1	0.4

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Monterey Road/Blossom Hill Rd Horizon NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBD	*	0	-4	1000	-4	* AG	310	1.6	0.0	13.3
B. WBA	*	1000	4	0	4	* AG	1010	1.6	0.0	13.3
C. WBD	*	0	2	-1000	2	* AG	600	1.6	0.0	10.0
D. SBA	*	-7	1000	-7	0	* AG	870	1.6	0.0	20.6
E. SBD	*	-4	0	-4	-1000	* AG	570	1.6	0.0	13.3
F. NBA	*	5	-1000	5	0	* AG	2180	1.6	0.0	17.0
G. NBD	*	5	0	5	1000	* AG	2580	1.6	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-18	7	1.8
2. R_002	*	14	10	1.8
3. R_003	*	-15	-7	1.8
4. R_004	*	14	-11	1.8

JOB: Monterey Road/Blossom Hill Rd Horizon NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G
1. R_001	94.	0.5	0.1	0.2	0.1	0.1	0.0	0.0	0.1
2. R_002	188.	0.6	0.0	0.1	0.0	0.0	0.1	0.4	0.1
3. R_003	9.	0.4	0.0	0.0	0.1	0.2	0.0	0.0	0.2
4. R_004	351.	0.7	0.0	0.1	0.0	0.1	0.0	0.1	0.4

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: US101/Blossom Hill Rd Horizon NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	2890	1.6	0.0	17.0
B. EBD	*	0	-5	1000	-5	* AG	2900	1.6	0.0	17.0
C. WBA	*	1000	4	0	4	* AG	1090	1.6	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	3010	1.6	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	2160	1.6	0.0	17.0
F. SBD	*	-2	0	-2	-1000	* AG	230	1.6	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-15	11	1.8
2. R_002	*	3	11	1.8
3. R_003	*	-8	-15	1.8
4. R_004	*	3	-15	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F
1. R_001	260.	0.9	0.3	0.0	0.0	0.6	0.0	0.0
2. R_002	261.	1.1	0.3	0.0	0.0	0.6	0.2	0.0
3. R_003	1.	0.8	0.3	0.0	0.0	0.2	0.4	0.0
4. R_004	279.	0.8	0.5	0.0	0.0	0.3	0.0	0.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1415	1.7	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	1590	1.7	0.0	13.3
C. WBA	*	1000	5	0	5	* AG	1160	1.7	0.0	17.0
D. WBD	*	0	4	-1000	4	* AG	1143	1.7	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1801	1.7	0.0	17.0
F. SBD	*	-4	0	-4	-1000	* AG	1596	1.7	0.0	13.3
G. NBA	*	5	-1000	5	0	* AG	1146	1.7	0.0	17.0
H. NBD	*	4	0	4	1000	* AG	1193	1.7	0.0	13.3

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-14	10	1.8
2. R_002	*	10	14	1.8
3. R_003	*	-10	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	97.	0.8	0.0	0.2	0.2	0.1	0.2	0.0	0.0	0.1
2. R_002	188.	0.7	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.1
3. R_003	7.	0.8	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.2
4. R_004	277.	0.7	0.3	0.1	0.0	0.2	0.0	0.1	0.1	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Ope
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1356	1.7	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	1238	1.7	0.0	13.3
C. WBA	*	1000	4	0	4	* AG	1340	1.7	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	1285	1.7	0.0	13.3
E. SBA	*	-4	1000	-4	0	* AG	798	1.7	0.0	13.3
F. SBD	*	-2	0	-2	-1000	* AG	899	1.7	0.0	10.0
G. NBA	*	5	-1000	5	0	* AG	634	1.7	0.0	17.0
H. NBD	*	2	0	2	1000	* AG	706	1.7	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-10	10	1.8
2. R_002	*	7	11	1.8
3. R_003	*	-7	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Ope
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	99.	0.6	0.0	0.2	0.3	0.1	0.1	0.0	0.0	0.1
2. R_002	261.	0.7	0.2	0.0	0.0	0.3	0.1	0.0	0.0	0.1
3. R_003	6.	0.6	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.1
4. R_004	277.	0.6	0.3	0.1	0.0	0.2	0.0	0.1	0.1	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Opening B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-4	0	-4	* AG	10	1.7	0.0	13.3
B. EBD	*	0	-4	1000	-4	* AG	1094	1.7	0.0	13.3
C. WBA	*	1000	7	0	7	* AG	780	1.7	0.0	20.6
D. WBD	*	0	2	-1000	2	* AG	20	1.7	0.0	10.0
E. SBA	*	-9	1000	-9	0	* AG	2999	1.7	0.0	24.3
F. SBD	*	-5	0	-5	-1000	* AG	2669	1.7	0.0	17.0
G. NBA	*	5	-1000	5	0	* AG	2103	1.7	0.0	17.0
H. NBD	*	5	0	5	1000	* AG	2109	1.7	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-21	7	1.8
2. R_002	*	14	18	1.8
3. R_003	*	-15	-11	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Opening B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	9.	0.7	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.2
2. R_002	189.	0.9	0.0	0.1	0.1	0.0	0.0	0.3	0.3	0.1
3. R_003	6.	0.8	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.2
4. R_004	351.	0.9	0.0	0.1	0.1	0.0	0.3	0.0	0.1	0.4

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Monterey Road/Blossom Hill Rd Opening B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBD	*	0	-4	1000	-4	* AG	720	1.7	0.0	13.3
B. WBA	*	1000	4	0	4	* AG	830	1.7	0.0	13.3
C. WBD	*	0	2	-1000	2	* AG	0	1.7	0.0	10.0
D. SBA	*	-7	1000	-7	0	* AG	2080	1.7	0.0	20.6
E. SBD	*	-4	0	-4	-1000	* AG	1820	1.7	0.0	13.3
F. NBA	*	5	-1000	5	0	* AG	1320	1.7	0.0	17.0
G. NBD	*	5	0	5	1000	* AG	1690	1.7	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-18	7	1.8
2. R_002	*	14	10	1.8
3. R_003	*	-15	-7	1.8
4. R_004	*	14	-11	1.8

JOB: Monterey Road/Blossom Hill Rd Opening B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G
1. R_001	9.	0.6	0.0	0.0	0.0	0.4	0.0	0.0	0.2
2. R_002	189.	0.7	0.1	0.1	0.0	0.0	0.2	0.2	0.1
3. R_003	7.	0.6	0.0	0.0	0.0	0.4	0.0	0.0	0.2
4. R_004	351.	0.7	0.1	0.1	0.0	0.2	0.0	0.1	0.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: US101/Blossom Hill Rd Opening B
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	2730	1.7	0.0	17.0
B. EBD	*	0	-5	1000	-5	* AG	2760	1.7	0.0	17.0
C. WBA	*	1000	4	0	4	* AG	1010	1.7	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	2820	1.7	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	2100	1.7	0.0	17.0
F. SBD	*	-2	0	-2	-1000	* AG	260	1.7	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-15	11	1.8
2. R_002	*	3	11	1.8
3. R_003	*	-8	-15	1.8
4. R_004	*	3	-15	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F
1. R_001	261.	0.9	0.3	0.0	0.0	0.6	0.0	0.0
2. R_002	261.	1.1	0.3	0.0	0.0	0.6	0.2	0.0
3. R_003	1.	0.8	0.3	0.0	0.0	0.2	0.4	0.0
4. R_004	279.	0.8	0.5	0.0	0.0	0.3	0.0	0.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1410	1.7	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	1590	1.7	0.0	13.3
C. WBA	*	1000	5	0	5	* AG	1160	1.7	0.0	17.0
D. WBD	*	0	4	-1000	4	* AG	1140	1.7	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	1710	1.7	0.0	17.0
F. SBD	*	-4	0	-4	-1000	* AG	1500	1.7	0.0	13.3
G. NBA	*	5	-1000	5	0	* AG	1070	1.7	0.0	17.0
H. NBD	*	4	0	4	1000	* AG	1120	1.7	0.0	13.3

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-14	10	1.8
2. R_002	*	10	14	1.8
3. R_003	*	-10	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: The Alameda (SR 82)/Taylor Street-Naglee
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	97.	0.8	0.0	0.2	0.2	0.1	0.2	0.0	0.0	0.1
2. R_002	188.	0.7	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.1
3. R_003	7.	0.8	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.2
4. R_004	277.	0.7	0.3	0.1	0.0	0.2	0.0	0.1	0.1	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Ope
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	1430	1.7	0.0	17.0
B. EBD	*	0	-4	1000	-4	* AG	1340	1.7	0.0	13.3
C. WBA	*	1000	4	0	4	* AG	1130	1.7	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	1010	1.7	0.0	13.3
E. SBA	*	-4	1000	-4	0	* AG	650	1.7	0.0	13.3
F. SBD	*	-2	0	-2	-1000	* AG	800	1.7	0.0	10.0
G. NBA	*	5	-1000	5	0	* AG	420	1.7	0.0	17.0
H. NBD	*	2	0	2	1000	* AG	480	1.7	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-10	10	1.8
2. R_002	*	7	11	1.8
3. R_003	*	-7	-14	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Autum Street/West Santa Clara Street Ope
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	99.	0.6	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0
2. R_002	261.	0.6	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.1
3. R_003	80.	0.5	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0
4. R_004	277.	0.6	0.3	0.1	0.0	0.1	0.0	0.1	0.0	0.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Opening NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-4	0	-4	* AG	10	1.7	0.0	13.3
B. EBD	*	0	-4	1000	-4	* AG	1070	1.7	0.0	13.3
C. WBA	*	1000	7	0	7	* AG	780	1.7	0.0	20.6
D. WBD	*	0	2	-1000	2	* AG	20	1.7	0.0	10.0
E. SBA	*	-9	1000	-9	0	* AG	2890	1.7	0.0	24.3
F. SBD	*	-5	0	-5	-1000	* AG	2560	1.7	0.0	17.0
G. NBA	*	5	-1000	5	0	* AG	1910	1.7	0.0	17.0
H. NBD	*	5	0	5	1000	* AG	1940	1.7	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-21	7	1.8
2. R_002	*	14	18	1.8
3. R_003	*	-15	-11	1.8
4. R_004	*	14	-10	1.8

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Coleman/I-880 Opening NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	9.	0.7	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.2
2. R_002	189.	0.8	0.0	0.1	0.1	0.0	0.0	0.3	0.3	0.1
3. R_003	6.	0.7	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.2
4. R_004	351.	0.9	0.0	0.1	0.1	0.0	0.3	0.0	0.1	0.3

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Monterey Road/Blossom Hill Rd Opening NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBD	*	0	-4	1000	-4	* AG	270	1.7	0.0	13.3
B. WBA	*	1000	4	0	4	* AG	940	1.7	0.0	13.3
C. WBD	*	0	2	-1000	2	* AG	560	1.7	0.0	10.0
D. SBA	*	-7	1000	-7	0	* AG	2750	1.7	0.0	20.6
E. SBD	*	-4	0	-4	-1000	* AG	2480	1.7	0.0	13.3
F. NBA	*	5	-1000	5	0	* AG	1760	1.7	0.0	17.0
G. NBD	*	5	0	5	1000	* AG	2140	1.7	0.0	17.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-18	7	1.8
2. R_002	*	14	10	1.8
3. R_003	*	-15	-7	1.8
4. R_004	*	14	-11	1.8

JOB: Monterey Road/Blossom Hill Rd Opening NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G
1. R_001	9.	0.7	0.0	0.0	0.0	0.5	0.0	0.0	0.2
2. R_002	189.	0.8	0.0	0.1	0.0	0.0	0.2	0.3	0.1
3. R_003	7.	0.8	0.0	0.0	0.1	0.5	0.0	0.0	0.2
4. R_004	351.	0.8	0.0	0.1	0.0	0.3	0.0	0.1	0.4

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: US101/Blossom Hill Rd Opening NB
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	15. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EBA	*	-1000	-5	0	-5	* AG	2680	1.7	0.0	17.0
B. EBD	*	0	-5	1000	-5	* AG	2690	1.7	0.0	17.0
C. WBA	*	1000	4	0	4	* AG	1010	1.7	0.0	13.3
D. WBD	*	0	4	-1000	4	* AG	2800	1.7	0.0	13.3
E. SBA	*	-5	1000	-5	0	* AG	2010	1.7	0.0	17.0
F. SBD	*	-2	0	-2	-1000	* AG	210	1.7	0.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. R_001	*	-15	11	1.8
2. R_002	*	3	11	1.8
3. R_003	*	-8	-15	1.8
4. R_004	*	3	-15	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F
1. R_001	261.	0.9	0.3	0.0	0.0	0.6	0.0	0.0
2. R_002	261.	1.1	0.3	0.0	0.0	0.6	0.2	0.0
3. R_003	1.	0.8	0.3	0.0	0.0	0.2	0.4	0.0
4. R_004	279.	0.8	0.5	0.0	0.0	0.3	0.0	0.0

APPENDIX C: CONSTRUCTION EMISSION AND CUMULATIVE HRA ASSUMPTIONS

Construction Schedule

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A1-1_Aerial4-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Utility Relocation	6/5/2023	11/10/2023	115
A1-1_Aerial4-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Demolition	6/5/2023	4/5/2024	220
A1-1_Aerial4-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Excavate Contaminated Materials	7/10/2023	9/15/2023	50
A1-1_Aerial4-104	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Excavation for Footings	7/17/2023	11/17/2023	90
A1-1_Aerial4-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	CIPH Construction	7/31/2023	5/31/2024	220
A1-1_Aerial4-202	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Pour Footings	8/28/2023	6/14/2024	210
A1-1_Aerial4-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Form Columns	9/25/2023	7/5/2024	205
A1-1_Aerial4-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Pour Columns	10/23/2023	7/26/2024	200
A1-1_Aerial4-401	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Form Aerial Bridge	12/4/2023	6/13/2025	400
A1-1_Aerial4-402	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Pour Aerial Bridge	12/9/2024	7/11/2025	155
A1-1_Aerial4-501	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track Bed Construction	3/24/2025	7/25/2025	90
A1-1_Aerial4-502	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track & Signal	7/28/2025	11/28/2025	90
A1-1_Aerial2-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Utility Relocation	6/5/2023	11/24/2023	125
A1-1_Aerial2-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Demolition	6/5/2023	8/2/2024	305
A1-1_Aerial2-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Excavate Contaminated Materials	7/10/2023	10/6/2023	65
A1-1_Aerial2-104	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Excavation for Footings	7/17/2023	1/5/2024	125
A1-1_Aerial2-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	CIPH Construction	7/31/2023	5/17/2024	210
A1-1_Aerial2-202	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Pour Footings	8/28/2023	5/31/2024	200
A1-1_Aerial2-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Form Columns	9/25/2023	6/14/2024	190
A1-1_Aerial2-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Pour Columns	10/9/2023	6/28/2024	190
A1-1_Aerial2-401	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Form Aerial Bridge	11/13/2023	6/6/2025	410
A1-1_Aerial2-402	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Pour Aerial Bridge	11/4/2024	7/11/2025	180
A1-1_Aerial2-501	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track Bed Construction	12/2/2024	7/25/2025	170
A1-1_Aerial2-502	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track & Signal	7/7/2025	1/9/2026	135
A1-1_Berm2-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Utility Relocation	6/5/2023	7/7/2023	25
A1-1_Berm2-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Demolition	6/5/2023	6/23/2023	15
A1-1_Berm2-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Excavate Contaminated Materials	6/19/2023	6/26/2023	6
A1-1_Berm2-104	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Misc Concrete and Prep	6/26/2023	7/3/2023	6
A1-1_Berm2-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Place Starter Panels for Walls	7/3/2023	9/22/2023	60
A1-1_Berm2-202	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Place Fill Material	9/25/2023	3/15/2024	125
A1-1_Berm2-203	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Place Panels and Straps	9/25/2023	3/15/2024	125
A1-1_Berm2-401	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track Bed Construction	6/9/2025	7/11/2025	25
A1-1_Berm2-402	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track & Signal	7/7/2025	8/15/2025	30
A1-1_At Grade4-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Utility Relocation	6/5/2023	9/6/2024	330
A1-1_At Grade4-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Demolition	6/5/2023	9/6/2024	330
A1-1_At Grade4-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Removal of Existing Track	9/4/2023	9/13/2024	270
A1-1_At Grade4-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track Subgrade Construction	11/13/2023	7/4/2025	430
A1-1_At Grade4-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track Ballasted	9/16/2024	7/18/2025	220
A1-1_At Grade4-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track & Signal	7/7/2025	1/9/2026	135
A1-1_At Grade2-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Utility Relocation	6/5/2023	2/21/2025	450
A1-1_At Grade2-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Demolition	6/5/2023	2/21/2025	450
A1-1_At Grade2-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Removal of Existing Track	6/12/2023	11/15/2024	375
A1-1_At Grade2-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track Subgrade Construction	7/17/2023	7/4/2025	515
A1-1_At Grade2-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track Ballasted	9/16/2024	7/11/2025	215
A1-1_At Grade2-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to I-880	1	Track & Signal	7/7/2025	1/9/2026	135
A1-2_Aerial2-101	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Utility Relocation	6/5/2023	8/9/2024	310
A1-2_Aerial2-102	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Demolition	6/5/2023	5/30/2025	520
A1-2_Aerial2-103	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Excavate Contaminated Materials	7/10/2023	2/9/2024	155
A1-2_Aerial2-104	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Excavation for Footings	7/17/2023	4/5/2024	190
A1-2_Aerial2-201	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	CIPH Construction	7/31/2023	5/10/2024	205
A1-2_Aerial2-202	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Pour Footings	8/28/2023	5/24/2024	195
A1-2_Aerial2-301	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Form Columns	9/25/2023	6/14/2024	190
A1-2_Aerial2-302	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Pour Columns	10/9/2023	6/28/2024	190
A1-2_Aerial2-401	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Form Aerial Bridge	11/13/2023	6/6/2025	410

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A1-2_Aerial2-402	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Pour Aerial Bridge	11/4/2024	7/11/2025	180
A1-2_Aerial2-501	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track Bed Construction	12/2/2024	7/25/2025	170
A1-2_Aerial2-502	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track & Signal	7/7/2025	1/9/2026	135
A1-2_Berm2-101	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Utility Relocation	6/5/2023	5/31/2024	260
A1-2_Berm2-102	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Demolition	6/5/2023	12/1/2023	130
A1-2_Berm2-103	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Excavate Contaminated Materials	6/19/2023	9/22/2023	70
A1-2_Berm2-104	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Misc Concrete and Prep	6/26/2023	9/29/2023	70
A1-2_Berm2-201	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Place Starter Panels for Walls	7/3/2023	2/21/2025	430
A1-2_Berm2-202	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Place Fill Material	9/25/2023	7/11/2025	470
A1-2_Berm2-203	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Place Panels and Straps	9/25/2023	7/11/2025	470
A1-2_Berm2-401	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track Bed Construction	7/22/2024	7/18/2025	260
A1-2_Berm2-402	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track & Signal	7/7/2025	1/9/2026	135
A1-2_At Grade4-101	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Utility Relocation	6/5/2023	4/5/2024	220
A1-2_At Grade4-102	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Demolition	6/5/2023	4/5/2024	220
A1-2_At Grade4-103	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Removal of Existing Track	9/4/2023	5/17/2024	185
A1-2_At Grade4-201	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track Subgrade Construction	11/13/2023	7/11/2025	435
A1-2_At Grade4-301	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track Ballasted	12/23/2024	7/18/2025	150
A1-2_At Grade4-302	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track & Signal	7/7/2025	1/9/2026	135
A1-2_At Grade2-101	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Utility Relocation	6/5/2023	7/26/2024	300
A1-2_At Grade2-102	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Demolition	6/5/2023	7/26/2024	300
A1-2_At Grade2-103	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Removal of Existing Track	6/12/2023	5/24/2024	250
A1-2_At Grade2-201	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track Subgrade Construction	7/17/2023	7/4/2025	515
A1-2_At Grade2-301	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track Ballasted	9/23/2024	7/11/2025	210
A1-2_At Grade2-302	Monterey Corridor (West Alma Ave to Bernal Way)	Viaduct	1, 3	Track & Signal	7/7/2025	1/9/2026	135
A1-3_Aerial4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Utility Relocation	1/25/2022	3/10/2023	294
A1-3_Aerial4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Demolition	1/25/2022	4/19/2024	584
A1-3_Aerial4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Excavate Contaminated Materials	2/28/2022	8/12/2022	120
A1-3_Aerial4-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Excavation for Footings	3/7/2022	1/27/2023	235
A1-3_Aerial4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	CIPH Construction	3/21/2022	6/7/2024	580
A1-3_Aerial4-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Footings	4/18/2022	7/5/2024	580
A1-3_Aerial4-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Form Columns	5/16/2022	8/16/2024	590
A1-3_Aerial4-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Columns	5/30/2022	9/27/2024	610
A1-3_Aerial4-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Form Aerial Bridge	7/4/2022	6/26/2026	1040
A1-3_Aerial4-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Aerial Bridge	7/3/2023	8/7/2026	810
A1-3_Aerial4-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Bed Construction	4/5/2027	1/11/2028	202
A1-3_Aerial4-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track & Signal	1/10/2028	9/15/2028	180
A1-3_Aerial2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Utility Relocation	1/25/2022	6/26/2026	1154
A1-3_Aerial2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Demolition	1/25/2022	7/3/2026	1159
A1-3_Aerial2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Excavate Contaminated Materials	2/28/2022	10/25/2024	695
A1-3_Aerial2-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Excavation for Footings	3/7/2022	4/11/2025	810
A1-3_Aerial2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	CIPH Construction	3/21/2022	5/2/2025	815
A1-3_Aerial2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Footings	4/25/2022	5/16/2025	800
A1-3_Aerial2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Form Columns	5/9/2022	6/6/2025	805
A1-3_Aerial2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Columns	5/30/2022	6/27/2025	805
A1-3_Aerial2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Form Aerial Bridge	6/20/2022	6/26/2026	1050
A1-3_Aerial2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Aerial Bridge	6/19/2023	8/7/2026	820
A1-3_Aerial2-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Bed Construction	4/5/2027	1/11/2028	202
A1-3_Aerial2-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track & Signal	1/10/2028	9/15/2028	180
A1-3_At Grade4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Utility Relocation	1/25/2022	7/15/2022	124
A1-3_At Grade4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Demolition	1/25/2022	7/15/2022	124
A1-3_At Grade4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Removal of Existing Track	1/31/2022	6/24/2022	105
A1-3_At Grade4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Subgrade Construction	3/7/2022	2/10/2023	245
A1-3_At Grade4-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Ballasted	4/5/2027	7/30/2027	85
A1-3_At Grade4-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track & Signal	1/10/2028	5/5/2028	85
A1-3_At Grade2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Utility Relocation	1/25/2022	12/30/2022	244
A1-3_At Grade2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Demolition	1/25/2022	12/30/2022	244

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A1-3_At Grade2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Removal of Existing Track	1/31/2022	11/11/2022	205
A1-3_At Grade2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Subgrade Construction	3/7/2022	1/12/2024	485
A1-3_At Grade2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Ballasted	4/5/2027	11/19/2027	165
A1-3_At Grade2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track & Signal	1/10/2028	8/25/2028	165
A1-3_Tunnel-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	TBM Tunneling	5/2/2022	2/24/2023	215
A1-3_Tunnel-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Muck Handling Crew	5/2/2022	2/24/2023	215
A1-3_Tunnel-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Form Interior Walls	3/18/2024	9/13/2024	130
A1-3_Tunnel-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Interior Walls	4/8/2024	9/20/2024	120
A1-3_Tunnel-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Form Floor	4/15/2024	10/4/2024	125
A1-3_Tunnel-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Floor	4/29/2024	10/11/2024	120
A1-3_Tunnel-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Form Upper Walls	5/6/2024	10/25/2024	125
A1-3_Tunnel-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Pour Upper Walls	5/20/2024	11/1/2024	120
A1-3_Tunnel-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Bed Construction	4/5/2027	12/3/2027	175
A1-3_Tunnel-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track & Signal	1/10/2028	9/15/2028	180
A1-3_Large2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Utility Relocation	1/25/2022	6/17/2022	104
A1-3_Large2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Clear and Grub	1/25/2022	11/11/2022	209
A1-3_Large2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Excavation	1/31/2022	8/21/2026	1190
A1-3_Large2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Place and Compact Fill	2/7/2022	8/28/2026	1190
A1-3_Large2-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Slope Finish	2/14/2022	9/4/2026	1190
A1-3_Large2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track Bed Construction	4/5/2027	1/11/2028	202
A1-3_Large2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to Downtown Gilroy	1	Track & Signal	1/10/2028	9/15/2028	180
A1-4_Aerial4-101	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Utility Relocation	1/25/2022	2/3/2023	269
A1-4_Aerial4-102	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Demolition	1/25/2022	2/2/2024	529
A1-4_Aerial4-103	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Excavate Contaminated Materials	2/28/2022	7/29/2022	110
A1-4_Aerial4-104	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Excavation for Footings	3/7/2022	12/30/2022	215
A1-4_Aerial4-201	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	CIPH Construction	3/21/2022	3/29/2024	530
A1-4_Aerial4-202	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Footings	4/18/2022	4/12/2024	520
A1-4_Aerial4-301	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Form Columns	5/16/2022	4/26/2024	510
A1-4_Aerial4-302	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Columns	5/30/2022	5/10/2024	510
A1-4_Aerial4-401	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Form Aerial Bridge	7/4/2022	6/19/2026	1035
A1-4_Aerial4-402	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Aerial Bridge	7/3/2023	7/31/2026	805
A1-4_Aerial4-501	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track Bed Construction	4/5/2027	1/11/2028	202
A1-4_Aerial4-502	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track & Signal	1/10/2028	9/15/2028	180
A1-4_Aerial2-101	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Utility Relocation	1/25/2022	6/24/2022	109
A1-4_Aerial2-102	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Demolition	1/25/2022	1/27/2023	264
A1-4_Aerial2-103	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Excavate Contaminated Materials	2/28/2022	5/13/2022	55
A1-4_Aerial2-104	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Excavation for Footings	3/7/2022	8/5/2022	110
A1-4_Aerial2-201	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	CIPH Construction	3/21/2022	3/24/2023	265
A1-4_Aerial2-202	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Footings	4/25/2022	4/7/2023	250
A1-4_Aerial2-301	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Form Columns	5/9/2022	4/28/2023	255
A1-4_Aerial2-302	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Columns	5/30/2022	5/19/2023	255
A1-4_Aerial2-401	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Form Aerial Bridge	6/20/2022	6/19/2026	1045
A1-4_Aerial2-402	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Aerial Bridge	6/19/2023	7/31/2026	815
A1-4_Aerial2-501	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track Bed Construction	4/5/2027	1/11/2028	202
A1-4_Aerial2-502	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track & Signal	1/10/2028	9/15/2028	180
A1-4_At Grade2-101	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Utility Relocation	1/25/2022	5/6/2022	74
A1-4_At Grade2-102	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Demolition	1/25/2022	5/6/2022	74
A1-4_At Grade2-103	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Removal of Existing Track	1/31/2022	4/22/2022	60
A1-4_At Grade2-201	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track Subgrade Construction	3/7/2022	9/16/2022	140
A1-4_At Grade2-301	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track Ballasted	4/5/2027	6/11/2027	50
A1-4_At Grade2-302	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track & Signal	1/10/2028	3/17/2028	50
A1-4_Tunnel-101	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	TBM Tunneling	2/27/2023	1/29/2027	1025
A1-4_Tunnel-102	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Muck Handling Crew	2/27/2023	1/29/2027	1025
A1-4_Tunnel-201	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Form Interior Walls	3/23/2026	2/12/2027	235
A1-4_Tunnel-202	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Interior Walls	4/13/2026	2/19/2027	225
A1-4_Tunnel-301	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Form Floor	4/20/2026	3/5/2027	230

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A1-4_Tunnel-302	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Floor	5/4/2026	3/12/2027	225
A1-4_Tunnel-401	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Form Upper Walls	5/11/2026	3/26/2027	230
A1-4_Tunnel-402	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Pour Upper Walls	5/25/2026	4/2/2027	225
A1-4_Tunnel-501	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track Bed Construction	4/5/2027	12/3/2027	175
A1-4_Tunnel-502	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track & Signal	1/10/2028	9/15/2028	180
A1-4_Large2-101	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Utility Relocation	1/25/2022	9/23/2022	174
A1-4_Large2-102	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Clear and Grub	1/25/2022	5/26/2023	349
A1-4_Large2-201	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Excavation	1/31/2022	6/5/2026	1135
A1-4_Large2-202	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Place and Compact Fill	2/7/2022	6/12/2026	1135
A1-4_Large2-203	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Slope Finish	2/14/2022	6/19/2026	1135
A1-4_Large2-401	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track Bed Construction	4/5/2027	1/11/2028	202
A1-4_Large2-402	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Tunnel	1, 2, 3, 4	Track & Signal	1/10/2028	9/15/2028	180
A1-5_Aerial2-101	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Utility Relocation	1/25/2022	3/3/2023	289
A1-5_Aerial2-102	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Demolition	1/25/2022	10/11/2024	709
A1-5_Aerial2-103	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Excavate Contaminated Materials	2/28/2022	9/16/2022	145
A1-5_Aerial2-104	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Excavation for Footings	3/7/2022	4/7/2023	285
A1-5_Aerial2-201	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	CIPH Construction	3/21/2022	12/6/2024	710
A1-5_Aerial2-202	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Pour Footings	4/25/2022	12/20/2024	695
A1-5_Aerial2-301	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Form Columns	5/9/2022	1/10/2025	700
A1-5_Aerial2-302	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Pour Columns	5/30/2022	1/31/2025	700
A1-5_Aerial2-401	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Form Aerial Bridge	6/20/2022	6/19/2026	1045
A1-5_Aerial2-402	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Pour Aerial Bridge	6/19/2023	7/31/2026	815
A1-5_Aerial2-501	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Track Bed Construction	4/5/2027	1/11/2028	202
A1-5_Aerial2-502	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Track & Signal	1/10/2028	9/15/2028	180
A1-5_Berm2-101	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Utility Relocation	1/25/2022	7/8/2022	119
A1-5_Berm2-102	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Demolition	1/25/2022	4/22/2022	64
A1-5_Berm2-103	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Excavate Contaminated Materials	2/7/2022	3/25/2022	35
A1-5_Berm2-104	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Misc Concrete and Prep	2/14/2022	4/1/2022	35
A1-5_Berm2-201	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Place Starter Panels for Walls	2/21/2022	4/7/2023	295
A1-5_Berm2-202	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Place Fill Material	5/2/2022	9/6/2024	615
A1-5_Berm2-203	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Place Panels and Straps	5/2/2022	9/6/2024	615
A1-5_Berm2-401	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Track Bed Construction	4/5/2027	9/17/2027	120
A1-5_Berm2-402	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Track & Signal	1/10/2028	6/23/2028	120
A1-5_Large2-101	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Utility Relocation	1/25/2022	3/17/2023	299
A1-5_Large2-102	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Clear and Grub	1/25/2022	4/26/2024	589
A1-5_Large2-201	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Excavation	1/31/2022	6/5/2026	1135
A1-5_Large2-202	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Place and Compact Fill	2/7/2022	6/12/2026	1135
A1-5_Large2-203	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Slope Finish	2/14/2022	6/19/2026	1135
A1-5_Large2-401	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Track Bed Construction	4/5/2027	1/11/2028	202
A1-5_Large2-402	San Joaquin Valley (I-5 to Carlucci Road)	Henry Miller Road	1, 2, 3, 4	Track & Signal	1/10/2028	9/15/2028	180
A2-1_Aerial4-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Utility Relocation	6/5/2023	11/10/2023	115
A2-1_Aerial4-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Demolition	6/5/2023	4/12/2024	225
A2-1_Aerial4-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Excavate Contaminated Materials	7/10/2023	9/15/2023	50
A2-1_Aerial4-104	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Excavation for Footings	7/17/2023	11/17/2023	90
A2-1_Aerial4-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	CIPH Construction	7/31/2023	5/3/2024	200
A2-1_Aerial4-202	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Pour Footings	8/28/2023	5/17/2024	190
A2-1_Aerial4-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Form Columns	9/25/2023	6/7/2024	185
A2-1_Aerial4-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Pour Columns	10/23/2023	6/21/2024	175
A2-1_Aerial4-401	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Form Aerial Bridge	12/4/2023	6/13/2025	400
A2-1_Aerial4-402	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Pour Aerial Bridge	12/9/2024	7/11/2025	155
A2-1_Aerial4-501	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track Bed Construction	3/24/2025	7/25/2025	90
A2-1_Aerial4-502	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track & Signal	7/28/2025	11/28/2025	90
A2-1_Aerial2-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Utility Relocation	6/5/2023	5/17/2024	250
A2-1_Aerial2-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Demolition	6/5/2023	4/25/2025	495
A2-1_Aerial2-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Excavate Contaminated Materials	7/10/2023	1/5/2024	130
A2-1_Aerial2-104	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Excavation for Footings	7/17/2023	4/12/2024	195

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A2-1_Aerial2-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	CIPH Construction	7/31/2023	5/17/2024	210
A2-1_Aerial2-202	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Pour Footings	8/28/2023	5/31/2024	200
A2-1_Aerial2-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Form Columns	9/25/2023	6/14/2024	190
A2-1_Aerial2-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Pour Columns	10/9/2023	6/28/2024	190
A2-1_Aerial2-401	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Form Aerial Bridge	11/13/2023	6/6/2025	410
A2-1_Aerial2-402	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Pour Aerial Bridge	11/4/2024	7/11/2025	180
A2-1_Aerial2-501	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track Bed Construction	12/2/2024	7/25/2025	170
A2-1_Aerial2-502	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track & Signal	7/7/2025	1/9/2026	135
A2-1_Berm2-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Utility Relocation	6/5/2023	7/7/2023	25
A2-1_Berm2-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Demolition	6/5/2023	6/23/2023	15
A2-1_Berm2-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Excavate Contaminated Materials	6/19/2023	6/26/2023	6
A2-1_Berm2-104	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Misc Concrete and Prep	6/26/2023	7/3/2023	6
A2-1_Berm2-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Place Starter Panels for Walls	7/3/2023	9/22/2023	60
A2-1_Berm2-202	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Place Fill Material	9/25/2023	3/15/2024	125
A2-1_Berm2-203	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Place Panels and Straps	9/25/2023	3/15/2024	125
A2-1_Berm2-401	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track Bed Construction	6/9/2025	7/11/2025	25
A2-1_Berm2-402	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track & Signal	7/7/2025	8/15/2025	30
A2-1_At Grade4-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Utility Relocation	6/5/2023	11/1/2024	370
A2-1_At Grade4-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Demolition	6/5/2023	11/1/2024	370
A2-1_At Grade4-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Removal of Existing Track	9/4/2023	11/8/2024	310
A2-1_At Grade4-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track Subgrade Construction	11/13/2023	7/4/2025	430
A2-1_At Grade4-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track Ballasted	8/5/2024	7/18/2025	250
A2-1_At Grade4-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track & Signal	7/7/2025	1/9/2026	135
A2-1_At Grade2-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Utility Relocation	6/5/2023	12/1/2023	130
A2-1_At Grade2-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Demolition	6/5/2023	12/1/2023	130
A2-1_At Grade2-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Removal of Existing Track	6/12/2023	11/10/2023	110
A2-1_At Grade2-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track Subgrade Construction	7/17/2023	6/28/2024	250
A2-1_At Grade2-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track Ballasted	3/31/2025	7/25/2025	85
A2-1_At Grade2-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Viaduct to Scott Blvd	2, 3	Track & Signal	7/28/2025	11/21/2025	85
A2-2_Aerial2-101	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Utility Relocation	6/5/2023	8/11/2023	50
A2-2_Aerial2-102	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Demolition	6/5/2023	11/10/2023	115
A2-2_Aerial2-103	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Excavate Contaminated Materials	7/10/2023	8/11/2023	25
A2-2_Aerial2-104	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Excavation for Footings	7/17/2023	9/22/2023	50
A2-2_Aerial2-201	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	CIPH Construction	7/31/2023	1/5/2024	115
A2-2_Aerial2-202	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Pour Footings	8/28/2023	1/19/2024	105
A2-2_Aerial2-301	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Form Columns	9/25/2023	2/9/2024	100
A2-2_Aerial2-302	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Pour Columns	10/9/2023	3/1/2024	105
A2-2_Aerial2-401	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Form Aerial Bridge	11/13/2023	6/6/2025	410
A2-2_Aerial2-402	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Pour Aerial Bridge	11/4/2024	7/11/2025	180
A2-2_Aerial2-501	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track Bed Construction	3/24/2025	7/25/2025	90
A2-2_Aerial2-502	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track & Signal	7/7/2025	11/7/2025	90
A2-2_Berm2-101	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Utility Relocation	6/5/2023	3/28/2025	475
A2-2_Berm2-102	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Demolition	6/5/2023	8/2/2024	305
A2-2_Berm2-103	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Excavate Contaminated Materials	6/19/2023	1/19/2024	155
A2-2_Berm2-104	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Misc Concrete and Prep	6/26/2023	1/26/2024	155
A2-2_Berm2-201	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Place Starter Panels for Walls	7/3/2023	2/7/2025	420
A2-2_Berm2-202	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Place Fill Material	9/25/2023	6/27/2025	460
A2-2_Berm2-203	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Place Panels and Straps	9/25/2023	6/27/2025	460
A2-2_Berm2-401	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track Bed Construction	6/17/2024	7/11/2025	280
A2-2_Berm2-402	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track & Signal	7/7/2025	1/9/2026	135
A2-2_At Grade4-101	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Utility Relocation	6/5/2023	4/5/2024	220
A2-2_At Grade4-102	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Demolition	6/5/2023	4/5/2024	220
A2-2_At Grade4-103	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Removal of Existing Track	9/4/2023	5/17/2024	185
A2-2_At Grade4-201	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track Subgrade Construction	11/6/2023	7/4/2025	435
A2-2_At Grade4-301	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track Ballasted	12/23/2024	7/18/2025	150
A2-2_At Grade4-302	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track & Signal	7/7/2025	1/9/2026	135

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A2-2_At Grade2-101	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Utility Relocation	6/5/2023	3/21/2025	470
A2-2_At Grade2-102	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Demolition	6/5/2023	3/21/2025	470
A2-2_At Grade2-103	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Removal of Existing Track	6/12/2023	12/13/2024	395
A2-2_At Grade2-201	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track Subgrade Construction	7/17/2023	7/4/2025	515
A2-2_At Grade2-301	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track Ballasted	9/16/2024	7/11/2025	215
A2-2_At Grade2-302	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track & Signal	7/7/2025	1/9/2026	135
A2-2_Trench-101	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Utility Relocation	6/5/2023	6/13/2025	530
A2-2_Trench-102	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Demolition	6/5/2023	5/3/2024	240
A2-2_Trench-103	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Cast-In-Place Driled Pier Construction	6/12/2023	4/12/2024	220
A2-2_Trench-104	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Sheet Pile Between Tracks	6/12/2023	4/12/2024	220
A2-2_Trench-201	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Excavation of Contaminated Material	6/12/2023	9/22/2023	75
A2-2_Trench-202	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Excavation for Slurry Wall	7/10/2023	3/22/2024	185
A2-2_Trench-203	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Excavation for Trench	8/14/2023	1/3/2025	365
A2-2_Trench-204	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Trench Bottom Finish	9/9/2024	1/31/2025	105
A2-2_Trench-301	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Gravel/Class II Base	12/9/2024	2/28/2025	60
A2-2_Trench-302	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Rat Slab	12/16/2024	3/7/2025	60
A2-2_Trench-303	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Form Concrete Base Slab	6/17/2024	4/11/2025	215
A2-2_Trench-304	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Pour Concrete Base Slab	7/15/2024	5/16/2025	220
A2-2_Trench-401	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Form Concrete Walls	8/19/2024	6/20/2025	220
A2-2_Trench-402	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Pour Concrete Walls	11/18/2024	7/11/2025	170
A2-2_Trench-501	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track Bed Construction	4/7/2025	7/18/2025	75
A2-2_Trench-502	Monterey Corridor (West Alma Ave to Bernal Way)	Embankment	2	Track & Signal	7/7/2025	10/17/2025	75
A2-3_Aerial4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Utility Relocation	1/25/2022	10/21/2022	194
A2-3_Aerial4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Demolition	1/25/2022	7/21/2023	389
A2-3_Aerial4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavate Contaminated Materials	2/28/2022	6/17/2022	80
A2-3_Aerial4-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavation for Footings	3/7/2022	10/14/2022	160
A2-3_Aerial4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	CIPH Construction	3/21/2022	9/15/2023	390
A2-3_Aerial4-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Footings	4/18/2022	10/13/2023	390
A2-3_Aerial4-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Columns	5/16/2022	11/24/2023	400
A2-3_Aerial4-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Columns	5/30/2022	1/5/2024	420
A2-3_Aerial4-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Aerial Bridge	7/4/2022	7/3/2026	1045
A2-3_Aerial4-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Aerial Bridge	7/3/2023	8/7/2026	810
A2-3_Aerial4-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Bed Construction	4/5/2027	11/12/2027	160
A2-3_Aerial4-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	8/18/2028	160
A2-3_Aerial2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Utility Relocation	1/25/2022	11/11/2022	209
A2-3_Aerial2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Demolition	1/25/2022	1/12/2024	514
A2-3_Aerial2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavate Contaminated Materials	2/28/2022	7/22/2022	105
A2-3_Aerial2-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavation for Footings	3/7/2022	12/23/2022	210
A2-3_Aerial2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	CIPH Construction	3/21/2022	3/1/2024	510
A2-3_Aerial2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Footings	4/25/2022	3/15/2024	495
A2-3_Aerial2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Columns	5/9/2022	4/5/2024	500
A2-3_Aerial2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Columns	5/30/2022	4/26/2024	500
A2-3_Aerial2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Aerial Bridge	6/20/2022	6/26/2026	1050
A2-3_Aerial2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Aerial Bridge	6/19/2023	8/7/2026	820
A2-3_Aerial2-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Bed Construction	4/5/2027	1/11/2028	202
A2-3_Aerial2-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	9/15/2028	180
A2-3_Berm4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Utility Relocation	1/25/2022	6/10/2022	99
A2-3_Berm4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Demolition	1/25/2022	4/22/2022	64
A2-3_Berm4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavate Contaminated Materials	2/28/2022	4/15/2022	35
A2-3_Berm4-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Misc Concrete and Prep	3/7/2022	4/22/2022	35
A2-3_Berm4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Place Starter Panels for Walls	3/21/2022	2/10/2023	235
A2-3_Berm4-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Place Fil Material	4/18/2022	10/18/2024	655
A2-3_Berm4-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Place Panels and Straps	4/18/2022	10/18/2024	655
A2-3_Berm4-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Bed Construction	4/5/2027	10/1/2027	130
A2-3_Berm4-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	7/7/2028	130
A2-3_Berm2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Utility Relocation	1/25/2022	6/26/2026	1154

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A2-3_Berm2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Demolition	1/25/2022	11/28/2025	1004
A2-3_Berm2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavate Contaminated Materials	2/7/2022	1/12/2024	505
A2-3_Berm2-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Misc Concrete and Prep	2/14/2022	1/19/2024	505
A2-3_Berm2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Place Starter Panels for Walls	2/21/2022	3/20/2026	1065
A2-3_Berm2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Place Fill Material	5/16/2022	8/7/2026	1105
A2-3_Berm2-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Place Panels and Straps	5/16/2022	8/7/2026	1105
A2-3_Berm2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Bed Construction	4/5/2027	1/11/2028	202
A2-3_Berm2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	9/15/2028	180
A2-3_At Grade2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Utility Relocation	1/25/2022	8/28/2026	1199
A2-3_At Grade2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Demolition	1/25/2022	8/28/2026	1199
A2-3_At Grade2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Removal of Existing Track	1/31/2022	5/15/2026	1120
A2-3_At Grade2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Subgrade Construction	3/7/2022	8/7/2026	1155
A2-3_At Grade2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Ballasted	4/5/2027	1/11/2028	202
A2-3_At Grade2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	9/15/2028	180
A2-3_Trench-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Utility Relocation	1/25/2022	1/24/2025	784
A2-3_Trench-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Demolition	1/25/2022	6/2/2023	354
A2-3_Trench-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Cast-In-Place Driled Pier Construction	1/31/2022	4/28/2023	325
A2-3_Trench-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Sheet Pile Between Tracks	1/31/2022	4/28/2023	325
A2-3_Trench-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavation of Contaminated Material	1/31/2022	7/1/2022	110
A2-3_Trench-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavation for Slurry Wall	2/28/2022	3/17/2023	275
A2-3_Trench-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavation for Trench	4/4/2022	7/18/2025	860
A2-3_Trench-204	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Trench Bottom Finish	5/1/2023	8/15/2025	600
A2-3_Trench-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Gravel/Class II Base	7/31/2023	9/5/2025	550
A2-3_Trench-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Rat Slab	8/7/2023	9/26/2025	560
A2-3_Trench-303	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Concrete Base Slab	9/4/2023	10/31/2025	565
A2-3_Trench-304	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Concrete Base Slab	10/2/2023	12/5/2025	570
A2-3_Trench-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Concrete Walls	11/6/2023	2/27/2026	605
A2-3_Trench-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Concrete Walls	2/5/2024	3/20/2026	555
A2-3_Trench-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Bed Construction	4/5/2027	9/3/2027	110
A2-3_Trench-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	6/9/2028	110
A2-3_Tunnel-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	TBM Tunneling	5/2/2022	2/24/2023	215
A2-3_Tunnel-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Muck Handling Crew	5/2/2022	2/24/2023	215
A2-3_Tunnel-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Interior Walls	3/18/2024	9/13/2024	130
A2-3_Tunnel-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Interior Walls	4/8/2024	9/20/2024	120
A2-3_Tunnel-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Floor	4/15/2024	10/4/2024	125
A2-3_Tunnel-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Floor	4/29/2024	10/11/2024	120
A2-3_Tunnel-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Form Upper Walls	5/6/2024	10/25/2024	125
A2-3_Tunnel-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Pour Upper Walls	5/20/2024	11/1/2024	120
A2-3_Tunnel-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Bed Construction	4/5/2027	12/3/2027	175
A2-3_Tunnel-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	9/15/2028	180
A2-3_Large2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Utility Relocation	1/25/2022	10/7/2022	184
A2-3_Large2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Clear and Grub	1/25/2022	6/16/2023	364
A2-3_Large2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Excavation	1/31/2022	8/21/2026	1190
A2-3_Large2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Place and Compact Fill	2/7/2022	8/28/2026	1190
A2-3_Large2-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Slope Finish	2/14/2022	9/4/2026	1190
A2-3_Large2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track Bed Construction	4/5/2027	1/11/2028	202
A2-3_Large2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Embankment to Downtown Gilroy	2	Track & Signal	1/10/2028	9/15/2028	180
A3-3_Aerial4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Utility Relocation	1/25/2022	3/28/2025	829
A3-3_Aerial4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Demolition	1/25/2022	6/20/2025	889
A3-3_Aerial4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Excavate Contaminated Materials	2/28/2022	6/9/2023	335
A3-3_Aerial4-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Excavation for Footings	3/7/2022	9/20/2024	665
A3-3_Aerial4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	CIPH Construction	3/21/2022	5/23/2025	830
A3-3_Aerial4-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Footings	4/18/2022	6/6/2025	820
A3-3_Aerial4-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Form Columns	5/16/2022	6/27/2025	815
A3-3_Aerial4-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Columns	5/30/2022	7/18/2025	820
A3-3_Aerial4-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Form Aerial Bridge	7/4/2022	6/26/2026	1040

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A3-3_Aerial4-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Aerial Bridge	6/5/2023	8/7/2026	830
A3-3_Aerial4-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track Bed Construction	4/5/2027	1/11/2028	202
A3-3_Aerial4-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track & Signal	1/10/2028	9/15/2028	180
A3-3_Aerial2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Utility Relocation	1/25/2022	6/26/2026	1154
A3-3_Aerial2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Demolition	1/25/2022	7/3/2026	1159
A3-3_Aerial2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Excavate Contaminated Materials	2/28/2022	10/25/2024	695
A3-3_Aerial2-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Excavation for Footings	3/7/2022	4/11/2025	810
A3-3_Aerial2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	CIPH Construction	3/21/2022	5/2/2025	815
A3-3_Aerial2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Footings	4/25/2022	5/16/2025	800
A3-3_Aerial2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Form Columns	5/9/2022	6/6/2025	805
A3-3_Aerial2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Columns	5/30/2022	6/27/2025	805
A3-3_Aerial2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Form Aerial Bridge	6/20/2022	6/26/2026	1050
A3-3_Aerial2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Aerial Bridge	6/19/2023	8/7/2026	820
A3-3_Aerial2-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track Bed Construction	4/5/2027	1/11/2028	202
A3-3_Aerial2-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track & Signal	1/10/2028	9/15/2028	180
A3-3_At Grade2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Utility Relocation	1/25/2022	3/1/2024	549
A3-3_At Grade2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Demolition	1/25/2022	3/1/2024	549
A3-3_At Grade2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Removal of Existing Track	1/31/2022	11/3/2023	460
A3-3_At Grade2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track Subgrade Construction	3/7/2022	5/15/2026	1095
A3-3_At Grade2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track Ballasted	4/5/2027	1/11/2028	202
A3-3_At Grade2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track & Signal	1/10/2028	9/15/2028	180
A3-3_Tunnel-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	TBM Tunneling	5/2/2022	2/24/2023	215
A3-3_Tunnel-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Muck Handling Crew	5/2/2022	2/24/2023	215
A3-3_Tunnel-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Form Interior Walls	3/18/2024	9/13/2024	130
A3-3_Tunnel-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Interior Walls	4/8/2024	9/20/2024	120
A3-3_Tunnel-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Form Floor	4/15/2024	10/4/2024	125
A3-3_Tunnel-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Floor	4/29/2024	10/11/2024	120
A3-3_Tunnel-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Form Upper Walls	5/6/2024	10/25/2024	125
A3-3_Tunnel-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Pour Upper Walls	5/20/2024	11/1/2024	120
A3-3_Tunnel-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track Bed Construction	4/5/2027	12/3/2027	175
A3-3_Tunnel-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track & Signal	1/10/2028	9/15/2028	180
A3-3_Large2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Utility Relocation	1/25/2022	10/7/2022	184
A3-3_Large2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Clear and Grub	1/25/2022	6/16/2023	364
A3-3_Large2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Excavation	1/31/2022	8/21/2026	1190
A3-3_Large2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Place and Compact Fill	2/7/2022	8/28/2026	1190
A3-3_Large2-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Slope Finish	2/14/2022	9/4/2026	1190
A3-3_Large2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track Bed Construction	4/5/2027	1/11/2028	202
A3-3_Large2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Viaduct to East Gilroy	3	Track & Signal	1/10/2028	9/15/2028	180
A4-1_Berm4-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Utility Relocation	6/5/2023	5/3/2024	240
A4-1_Berm4-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Demolition	6/5/2023	1/12/2024	160
A4-1_Berm4-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Excavate Contaminated Materials	7/10/2023	10/27/2023	80
A4-1_Berm4-104	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Misc Concrete and Prep	7/17/2023	11/3/2023	80
A4-1_Berm4-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Place Starter Panels for Walls	7/31/2023	10/25/2024	325
A4-1_Berm4-202	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Place Fil Material	8/28/2023	7/4/2025	485
A4-1_Berm4-203	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Place Panels and Straps	8/28/2023	7/4/2025	485
A4-1_Berm4-401	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Track Bed Construction	7/22/2024	7/25/2025	265
A4-1_Berm4-402	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Track & Signal	7/7/2025	1/9/2026	135
A4-1_At Grade2-101	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Utility Relocation	6/5/2023	11/22/2024	385
A4-1_At Grade2-102	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Demolition	6/5/2023	11/22/2024	385
A4-1_At Grade2-103	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Removal of Existing Track	6/12/2023	8/30/2024	320
A4-1_At Grade2-201	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Track Subgrade Construction	6/26/2023	7/4/2025	530
A4-1_At Grade2-301	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Track Ballasted	7/29/2024	7/18/2025	255
A4-1_At Grade2-302	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Blended	4	Track & Signal	7/7/2025	1/9/2026	135
A4-2_Berm4-101	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Utility Relocation	6/5/2023	9/22/2023	80
A4-2_Berm4-102	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Demolition	6/5/2023	8/18/2023	55
A4-2_Berm4-103	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Excavate Contaminated Materials	6/19/2023	7/28/2023	30

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A4-2_Berm4-104	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Misc Concrete and Prep	6/26/2023	8/4/2023	30
A4-2_Berm4-201	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Place Starter Panels for Walls	7/3/2023	3/22/2024	190
A4-2_Berm4-202	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Place Fil Material	9/25/2023	7/4/2025	465
A4-2_Berm4-203	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Place Panels and Straps	9/25/2023	7/4/2025	465
A4-2_Berm4-401	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Track Bed Construction	2/24/2025	7/18/2025	105
A4-2_Berm4-402	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Track & Signal	7/7/2025	11/28/2025	105
A4-2_Berm2-101	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Utility Relocation	6/5/2023	6/21/2024	275
A4-2_Berm2-102	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Demolition	6/5/2023	12/15/2023	140
A4-2_Berm2-103	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Excavate Contaminated Materials	6/19/2023	9/22/2023	70
A4-2_Berm2-104	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Misc Concrete and Prep	6/26/2023	9/29/2023	70
A4-2_Berm2-201	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Place Starter Panels for Walls	7/3/2023	3/28/2025	455
A4-2_Berm2-202	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Place Fill Material	9/18/2023	7/11/2025	475
A4-2_Berm2-203	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Place Panels and Straps	9/18/2023	7/11/2025	475
A4-2_Berm2-401	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Track Bed Construction	7/1/2024	7/18/2025	275
A4-2_Berm2-402	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Track & Signal	6/30/2025	1/9/2026	140
A4-2_At Grade4-101	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Utility Relocation	6/5/2023	7/4/2025	545
A4-2_At Grade4-102	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Demolition	6/5/2023	7/4/2025	545
A4-2_At Grade4-103	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Removal of Existing Track	7/3/2023	6/20/2025	515
A4-2_At Grade4-201	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Track Subgrade Construction	9/11/2023	7/4/2025	475
A4-2_At Grade4-301	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Track Ballasted	7/22/2024	7/18/2025	260
A4-2_At Grade4-302	Monterey Corridor (West Alma Ave to Bernal Way)	Blended	4	Track & Signal	7/7/2025	1/9/2026	135
A4-3_Aerial4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Utility Relocation	1/25/2022	8/19/2022	149
A4-3_Aerial4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Demolition	1/25/2022	3/17/2023	299
A4-3_Aerial4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Excavate Contaminated Materials	2/28/2022	5/27/2022	65
A4-3_Aerial4-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Excavation for Footings	3/7/2022	8/19/2022	120
A4-3_Aerial4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	CIPH Construction	3/21/2022	5/5/2023	295
A4-3_Aerial4-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Footings	4/18/2022	6/2/2023	295
A4-3_Aerial4-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Form Columns	5/16/2022	7/14/2023	305
A4-3_Aerial4-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Columns	5/30/2022	8/25/2023	325
A4-3_Aerial4-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Form Aerial Bridge	7/4/2022	7/3/2026	1045
A4-3_Aerial4-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Aerial Bridge	7/3/2023	8/7/2026	810
A4-3_Aerial4-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Bed Construction	4/5/2027	9/17/2027	120
A4-3_Aerial4-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	6/23/2028	120
A4-3_Aerial2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Utility Relocation	1/25/2022	12/30/2022	244
A4-3_Aerial2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Demolition	1/25/2022	5/24/2024	609
A4-3_Aerial2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Excavate Contaminated Materials	2/28/2022	8/19/2022	125
A4-3_Aerial2-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Excavation for Footings	3/7/2022	2/10/2023	245
A4-3_Aerial2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	CIPH Construction	3/21/2022	7/19/2024	610
A4-3_Aerial2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Footings	4/25/2022	8/2/2024	595
A4-3_Aerial2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Form Columns	5/9/2022	8/23/2024	600
A4-3_Aerial2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Columns	5/30/2022	9/13/2024	600
A4-3_Aerial2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Form Aerial Bridge	6/20/2022	6/26/2026	1050
A4-3_Aerial2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Aerial Bridge	6/19/2023	8/7/2026	820
A4-3_Aerial2-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Bed Construction	4/5/2027	1/11/2028	202
A4-3_Aerial2-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	9/15/2028	180
A4-3_Berm4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Utility Relocation	1/25/2022	5/23/2025	869
A4-3_Berm4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Demolition	1/25/2022	5/23/2025	869
A4-3_Berm4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Excavate Contaminated Materials	2/28/2022	5/23/2025	845
A4-3_Berm4-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Misc Concrete and Prep	3/7/2022	5/23/2025	840
A4-3_Berm4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Place Starter Panels for Walls	3/21/2022	9/5/2025	905
A4-3_Berm4-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Place Fil Material	4/18/2022	6/26/2026	1095
A4-3_Berm4-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Place Panels and Straps	4/18/2022	6/26/2026	1095
A4-3_Berm4-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Bed Construction	4/5/2027	1/7/2028	200
A4-3_Berm4-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	9/15/2028	180
A4-3_Berm2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Utility Relocation	1/25/2022	4/8/2022	54
A4-3_Berm2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Demolition	1/25/2022	3/4/2022	29

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A4-3_Berm2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Excavate Contaminated Materials	2/7/2022	2/25/2022	15
A4-3_Berm2-104	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Misc Concrete and Prep	2/14/2022	3/4/2022	15
A4-3_Berm2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Place Starter Panels for Walls	2/21/2022	8/19/2022	130
A4-3_Berm2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Place Fill Material	5/16/2022	5/19/2023	265
A4-3_Berm2-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Place Panels and Straps	5/16/2022	5/19/2023	265
A4-3_Berm2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Bed Construction	4/5/2027	6/18/2027	55
A4-3_Berm2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	3/24/2028	55
A4-3_At Grade4-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Utility Relocation	7/28/2025	12/19/2025	105
A4-3_At Grade4-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Demolition	7/28/2025	12/19/2025	105
A4-3_At Grade4-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Removal of Existing Track	8/25/2025	12/26/2025	90
A4-3_At Grade4-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Subgrade Construction	9/1/2025	6/26/2026	215
A4-3_At Grade4-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Ballasted	4/5/2027	7/16/2027	75
A4-3_At Grade4-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	4/21/2028	75
A4-3_At Grade2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Utility Relocation	1/25/2022	11/1/2024	724
A4-3_At Grade2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Demolition	1/25/2022	11/1/2024	724
A4-3_At Grade2-103	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Removal of Existing Track	1/31/2022	5/24/2024	605
A4-3_At Grade2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Subgrade Construction	3/7/2022	8/7/2026	1155
A4-3_At Grade2-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Ballasted	4/5/2027	1/11/2028	202
A4-3_At Grade2-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	9/15/2028	180
A4-3_Tunnel-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	TBM Tunneling	5/2/2022	2/24/2023	215
A4-3_Tunnel-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Muck Handling Crew	5/2/2022	2/24/2023	215
A4-3_Tunnel-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Form Interior Walls	3/18/2024	9/13/2024	130
A4-3_Tunnel-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Interior Walls	4/8/2024	9/20/2024	120
A4-3_Tunnel-301	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Form Floor	4/15/2024	10/4/2024	125
A4-3_Tunnel-302	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Floor	4/29/2024	10/11/2024	120
A4-3_Tunnel-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Form Upper Walls	5/6/2024	10/25/2024	125
A4-3_Tunnel-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Pour Upper Walls	5/20/2024	11/1/2024	120
A4-3_Tunnel-501	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Bed Construction	4/5/2027	12/3/2027	175
A4-3_Tunnel-502	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	9/15/2028	180
A4-3_Large2-101	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Utility Relocation	1/25/2022	6/17/2022	104
A4-3_Large2-102	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Clear and Grub	1/25/2022	11/4/2022	204
A4-3_Large2-201	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Excavation	1/31/2022	8/21/2026	1190
A4-3_Large2-202	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Place and Compact Fill	2/7/2022	8/28/2026	1190
A4-3_Large2-203	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Slope Finish	2/14/2022	9/4/2026	1190
A4-3_Large2-401	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track Bed Construction	4/5/2027	1/11/2028	202
A4-3_Large2-402	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Blended	4	Track & Signal	1/10/2028	9/15/2028	180
EGS-101	East Gilroy Station	East Gilroy Station	3	Demolition	5/13/2024	6/10/2024	21
EGS-102	East Gilroy Station	East Gilroy Station	3	Grading	6/3/2024	7/29/2024	41
EGS-201	East Gilroy Station	East Gilroy Station	3	Utilities	6/10/2024	7/8/2024	21
EGS-202	East Gilroy Station	East Gilroy Station	3	Footings / Foundations Excavation	6/17/2024	9/9/2024	61
EGS-203	East Gilroy Station	East Gilroy Station	3	Pour Footings / Retaining Walls	7/1/2024	9/16/2024	56
EGS-301	East Gilroy Station	East Gilroy Station	3	Erect Building Frames	7/29/2024	11/18/2024	81
EGS-302	East Gilroy Station	East Gilroy Station	3	Shell / Interior Equipment	9/23/2024	6/30/2025	201
EGS-303	East Gilroy Station	East Gilroy Station	3	Roof	6/2/2025	6/30/2025	21
EGS-401	East Gilroy Station	East Gilroy Station	3	Exterior Concrete	6/23/2025	8/18/2025	41
EGS-402	East Gilroy Station	East Gilroy Station	3	Paving	7/21/2025	11/10/2025	81
EGS-403	East Gilroy Station	East Gilroy Station	3	Finish Grading / Landscaping	11/10/2025	12/1/2025	16
EGS-501	East Gilroy Station	East Gilroy Station	3	Commissioning	9/22/2025	1/12/2026	81
DGS-101	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Demolition	5/13/2024	6/10/2024	21
DGS-102	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Grading	6/3/2024	7/29/2024	41
DGS-201	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Utilities	6/10/2024	7/8/2024	21
DGS-202	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Footings / Foundations Excavation	6/17/2024	9/9/2024	61
DGS-203	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Pour Footings / Retaining Walls	7/1/2024	9/16/2024	56
DGS-301	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Erect Building Frames	7/29/2024	11/18/2024	81
DGS-302	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Shell / Interior Equipment	9/23/2024	6/30/2025	201
DGS-303	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Roof	6/2/2025	6/30/2025	21

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
DGS-401	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Exterior Concrete	6/23/2025	8/18/2025	41
DGS-402	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Paving	7/21/2025	10/13/2025	61
DGS-403	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Finish Grading / Landscaping	10/13/2025	11/3/2025	16
DGS-501	Downtwon Gilroy Station	Downtwon Gilroy Station	1, 2, 4	Commissioning	9/22/2025	1/12/2026	81
DS-101	Diridon Station	Diridon Station	1, 2, 3	Demolition	5/13/2024	6/10/2024	21
DS-102	Diridon Station	Diridon Station	1, 2, 3	Grading	6/3/2024	7/29/2024	41
DS-201	Diridon Station	Diridon Station	1, 2, 3	Utilities	6/10/2024	7/8/2024	21
DS-202	Diridon Station	Diridon Station	1, 2, 3	Footings / Foundations Excavation	6/17/2024	9/9/2024	61
DS-203	Diridon Station	Diridon Station	1, 2, 3	Pour Footings / Retaining Walls	7/1/2024	9/16/2024	56
DS-301	Diridon Station	Diridon Station	1, 2, 3	Erect Building Frames	7/29/2024	11/18/2024	81
DS-302	Diridon Station	Diridon Station	1, 2, 3	Shell / Interior Equipment	9/23/2024	6/30/2025	201
DS-303	Diridon Station	Diridon Station	1, 2, 3	Roof	6/2/2025	6/30/2025	21
DS-401	Diridon Station	Diridon Station	1, 2, 3	Exterior Concrete	6/23/2025	8/18/2025	41
DS-402	Diridon Station	Diridon Station	1, 2, 3	Paving	7/21/2025	8/18/2025	21
DS-403	Diridon Station	Diridon Station	1, 2, 3	Finish Grading / Landscaping	8/18/2025	9/8/2025	16
DS-501	Diridon Station	Diridon Station	1, 2, 3	Commissioning	9/8/2025	12/29/2025	81
DS2-101	Diridon Station	Diridon Station At Grade	4	Demolition	5/13/2024	6/10/2024	21
DS2-102	Diridon Station	Diridon Station At Grade	4	Grading	6/3/2024	7/1/2024	21
DS2-201	Diridon Station	Diridon Station At Grade	4	Utilities	6/10/2024	7/8/2024	21
DS2-202	Diridon Station	Diridon Station At Grade	4	Footings / Foundations Excavation	6/17/2024	7/15/2024	21
DS2-203	Diridon Station	Diridon Station At Grade	4	Pour Footings / Retaining Walls	7/1/2024	7/22/2024	16
DS2-301	Diridon Station	Diridon Station At Grade	4	Erect Building Frames	7/22/2024	8/19/2024	21
DS2-302	Diridon Station	Diridon Station At Grade	4	Shell / Interior Equipment	8/19/2024	1/6/2025	101
DS2-303	Diridon Station	Diridon Station At Grade	4	Roof	12/16/2024	1/13/2025	21
DS2-401	Diridon Station	Diridon Station At Grade	4	Exterior Concrete	1/13/2025	2/10/2025	21
DS2-402	Diridon Station	Diridon Station At Grade	4	Paving	3/24/2025	5/19/2025	41
DS2-403	Diridon Station	Diridon Station At Grade	4	Finish Grading / Landscaping	5/19/2025	6/9/2025	16
DS2-501	Diridon Station	Diridon Station At Grade	4	Commissioning	6/30/2025	12/29/2025	131
LMF-101	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Demolition	2/19/2024	3/18/2024	21
LMF-102	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Grading	3/18/2024	4/15/2024	21
LMF-201	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Utilities	4/15/2024	4/29/2024	11
LMF-202	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Footings / Foundations Excavation	4/29/2024	5/27/2024	21
LMF-203	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Pour Footings / Retaining Walls	5/27/2024	6/24/2024	21
LMF-301	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Erect Building Frames	6/24/2024	8/19/2024	41
LMF-302	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Shell / Interior Equipment	8/19/2024	12/9/2024	81
LMF-303	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Roof	12/9/2024	1/6/2025	21
LMF-401	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Exterior Concrete	1/6/2025	1/27/2025	16
LMF-402	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Paving	1/20/2025	2/10/2025	16
LMF-403	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Finish Grading / Landscaping	2/10/2025	3/10/2025	21
LMF-501	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Track Ballasted	3/10/2025	5/5/2025	41
LMF-502	Maintance of Way Facility	Maintance of Way Facility	1, 2, 3, 4	Track & Signal	5/5/2025	6/16/2025	31
MOIS-101	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Demolition	11/18/2024	12/2/2024	11
MOIS-102	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Grading	12/2/2024	12/16/2024	11
MOIS-201	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Utilities	12/9/2024	12/16/2024	6
MOIS-202	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Footings / Foundations Excavation	12/16/2024	12/30/2024	11
MOIS-203	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Pour Footings / Retaining Walls	12/30/2024	1/27/2025	21
MOIS-402	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Paving	1/27/2025	2/10/2025	11
MOIS-403	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Finish Grading / Landscaping	2/3/2025	2/10/2025	6
MOIS-501	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Track Bed Construction	4/5/2027	4/19/2027	11
MOIS-502	Maintance of Infastructure Sidings	Maintance of Infastructure Sidings	1, 2, 3, 4	Track & Signal	1/10/2028	1/24/2028	11
PGE-1	PG&E Power Lines	PG&E Power Lines	1, 2, 3, 4	Site Preparation	1/1/2027	4/30/2027	85
PGE-2	PG&E Power Lines	PG&E Power Lines	1, 2, 3, 4	Auger Holes	5/1/2027	8/28/2027	85
PGE-3	PG&E Power Lines	PG&E Power Lines	1, 2, 3, 4	Haul Material	6/1/2027	11/15/2027	120
PGE-4	PG&E Power Lines	PG&E Power Lines	1, 2, 3, 4	Tower Installation	8/1/2027	4/3/2028	175
PGE-5	PG&E Power Lines	PG&E Power Lines	1, 2, 3, 4	Conductor Installation	4/4/2028	11/5/2028	175
A1-3_Batch_1-1	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	1/24/2022	11/25/2022	261

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A1-3_Batch_1-2	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	4/8/2024	9/20/2024	141
A1-3_Batch_1-3	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	4/29/2024	10/11/2024	141
A1-3_Batch_1-4	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	5/20/2024	11/1/2024	141
A1-3_Batch_1-5	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	1/24/2022	11/25/2022	261
A1-3_Batch_1-6	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	4/8/2024	9/20/2024	141
A1-3_Batch_1-7	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	4/29/2024	10/11/2024	141
A1-3_Batch_1-8	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	1, 2, 4	Batching Facility 1	5/20/2024	11/1/2024	141
A3-3_Batch_1-1	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	1/24/2022	11/25/2022	261
A3-3_Batch_1-2	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	4/8/2024	9/20/2024	141
A3-3_Batch_1-3	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	4/29/2024	10/11/2024	141
A3-3_Batch_1-4	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	5/20/2024	11/1/2024	141
A3-3_Batch_1-5	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	1/24/2022	11/25/2022	261
A3-3_Batch_1-6	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	4/8/2024	9/20/2024	141
A3-3_Batch_1-7	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	4/29/2024	10/11/2024	141
A3-3_Batch_1-8	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Batching	3	Batching Facility 1	5/20/2024	11/1/2024	141
A1-4_Batch_2-1	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 2	8/29/2022	7/31/2026	1227
A1-4_Batch_2-2	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 2	4/13/2026	2/19/2027	267
A1-4_Batch_2-3	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 2	5/4/2026	3/12/2027	267
A1-4_Batch_2-4	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 2	5/25/2026	4/2/2027	267
A1-4_Batch_3-1	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 3	8/29/2022	7/31/2026	1227
A1-4_Batch_3-2	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 3	4/13/2026	2/19/2027	267
A1-4_Batch_3-3	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 3	5/4/2026	3/12/2027	267
A1-4_Batch_3-4	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Batching	1, 2, 3, 4	Batching Facility 3	5/25/2026	4/2/2027	267
A1-1_Berm2-401b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	1	Ballast Hauling	7/9/2025	7/11/2025	1
A1-1_Berm2-401s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	1	Ballast Hauling	7/2/2025	7/4/2025	2
A1-1_At Grade4-301b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	1	Ballast Hauling	7/6/2025	7/18/2025	8
A1-1_At Grade4-301s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	1	Ballast Hauling	6/29/2025	7/11/2025	12
A1-1_At Grade2-301b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	1	Ballast Hauling	6/27/2025	7/11/2025	10
A1-1_At Grade2-301s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	1	Ballast Hauling	6/20/2025	7/10/2025	20
A1-2_Berm2-401b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	1, 3	Ballast Hauling	7/4/2025	7/18/2025	10
A1-2_Berm2-401s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	1, 3	Ballast Hauling	6/27/2025	7/7/2025	10
A1-2_At Grade4-301b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	1, 3	Ballast Hauling	7/11/2025	7/18/2025	5
A1-2_At Grade4-301s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	1, 3	Ballast Hauling	7/4/2025	7/11/2025	7
A1-2_At Grade2-301b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	1, 3	Ballast Hauling	6/29/2025	7/11/2025	8
A1-2_At Grade2-301s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	1, 3	Ballast Hauling	6/22/2025	7/1/2025	9
A1-3_At Grade4-301b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	1	Ballast Hauling	7/23/2027	7/30/2027	5
A1-3_At Grade4-301s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	1	Ballast Hauling	7/16/2027	7/21/2027	5
A1-3_At Grade2-301b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	1	Ballast Hauling	11/9/2027	11/19/2027	7
A1-3_At Grade2-301s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	1	Ballast Hauling	11/2/2027	11/12/2027	10
A1-3_Large2-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	1	Ballast Hauling	12/21/2027	1/11/2028	15
A1-3_Large2-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	1	Ballast Hauling	12/14/2027	12/29/2027	15
A1-4_At Grade2-301b	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	6/8/2027	6/11/2027	2
A1-4_At Grade2-301s	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	6/1/2027	6/3/2027	2
A1-4_Large2-401b	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	12/7/2027	1/11/2028	25
A1-4_Large2-401s	Pacheco Pass (Casa de Fruta/SR 152 to I-5)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	11/30/2027	12/28/2027	28
A1-5_Berm2-401b	San Joaquin Valley (I-5 to Carlucci Road)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	9/10/2027	9/17/2027	5
A1-5_Berm2-401s	San Joaquin Valley (I-5 to Carlucci Road)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	9/8/2027	9/13/2027	5
A1-5_Large2-401b	San Joaquin Valley (I-5 to Carlucci Road)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	11/11/2027	1/11/2028	43
A1-5_Large2-401s	San Joaquin Valley (I-5 to Carlucci Road)	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	11/4/2027	12/19/2027	45
A2-1_Berm2-401b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	2, 3	Ballast Hauling	7/8/2025	7/11/2025	2
A2-1_Berm2-401s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	2, 3	Ballast Hauling	7/1/2025	7/3/2025	2
A2-1_At Grade4-301b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	2, 3	Ballast Hauling	7/4/2025	7/18/2025	10
A2-1_At Grade4-301s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	2, 3	Ballast Hauling	6/27/2025	7/7/2025	10
A2-1_At Grade2-301b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	2, 3	Ballast Hauling	7/18/2025	7/25/2025	5
A2-1_At Grade2-301s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	2, 3	Ballast Hauling	7/11/2025	7/16/2025	5
A2-2_Berm2-401b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	2	Ballast Hauling	6/6/2025	7/11/2025	25

Code	Section	Profile	Alternative(s)	Phase	Start Date	End Date	Working Days
A2-2_Berm2-401s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	2	Ballast Hauling	5/30/2025	6/24/2025	25
A2-2_At Grade4-301b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	2	Ballast Hauling	7/11/2025	7/18/2025	5
A2-2_At Grade4-301s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	2	Ballast Hauling	7/4/2025	7/11/2025	7
A2-2_At Grade2-301b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	2	Ballast Hauling	6/22/2025	7/11/2025	13
A2-2_At Grade2-301s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	2	Ballast Hauling	6/15/2025	6/28/2025	13
A2-3_Berm4-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	9/24/2027	10/1/2027	5
A2-3_Berm4-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	9/17/2027	9/22/2027	5
A2-3_Berm2-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	10/5/2027	1/11/2028	70
A2-3_Berm2-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	10/3/2027	12/17/2027	75
A2-3_At Grade2-301b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	11/16/2027	1/11/2028	40
A2-3_At Grade2-301s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	11/9/2027	12/19/2027	40
A2-3_Large2-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	12/4/2027	1/11/2028	27
A2-3_Large2-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	2	Ballast Hauling	11/27/2027	12/24/2027	27
A3-3_At Grade2-301b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	3	Ballast Hauling	12/22/2027	1/11/2028	14
A3-3_At Grade2-301s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	3	Ballast Hauling	12/15/2027	12/29/2027	14
A3-3_Large2-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	3	Ballast Hauling	11/30/2027	1/11/2028	30
A3-3_Large2-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	3	Ballast Hauling	11/23/2027	12/23/2027	30
A4-1_Berm4-401b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	4	Ballast Hauling	6/27/2025	7/25/2025	20
A4-1_Berm4-401s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	4	Ballast Hauling	6/20/2025	7/18/2025	20
A4-1_At Grade2-301b	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	4	Ballast Hauling	7/4/2025	7/18/2025	10
A4-1_At Grade2-301s	San Jose Diridon Station Approach (Scott Blvd to West Alma Avenue)	Ballast Hauling	4	Ballast Hauling	6/27/2025	7/11/2025	10
A4-2_Berm4-401b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	4	Ballast Hauling	7/11/2025	7/18/2025	5
A4-2_Berm4-401s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	4	Ballast Hauling	7/4/2025	7/11/2025	5
A4-2_Berm2-401b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	4	Ballast Hauling	7/1/2025	7/18/2025	12
A4-2_Berm2-401s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	4	Ballast Hauling	6/29/2025	7/16/2025	12
A4-2_At Grade4-301b	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	4	Ballast Hauling	5/23/2025	7/18/2025	40
A4-2_At Grade4-301s	Monterey Corridor (West Alma Ave to Bernal Way)	Ballast Hauling	4	Ballast Hauling	5/16/2025	7/11/2025	40
A4-3_Berm4-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	6/11/2027	1/7/2028	150
A4-3_Berm4-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	6/4/2027	12/31/2027	150
A4-3_Berm2-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	6/11/2027	6/18/2027	5
A4-3_Berm2-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	6/9/2027	6/16/2027	5
A4-3_At Grade4-301b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	7/9/2027	7/16/2027	5
A4-3_At Grade4-301s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	7/2/2027	7/9/2027	5
A4-3_At Grade2-301b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	12/14/2027	1/11/2028	20
A4-3_At Grade2-301s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	12/7/2027	1/4/2028	20
A4-3_Large2-401b	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	12/21/2027	1/11/2028	15
A4-3_Large2-401s	Morgan Hill and Gilroy (Bernal Way to Casa de Fruta/SR 152)	Ballast Hauling	4	Ballast Hauling	12/14/2027	1/4/2028	15
LMF-501b	Maintance of Way Facility	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	4/14/2025	5/5/2025	15
LMF-501s	Maintance of Way Facility	Ballast Hauling	1, 2, 3, 4	Ballast Hauling	4/7/2025	4/22/2025	15

Offroad Equipment

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-1_Aerial4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-1_Aerial4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-1_Aerial4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-1_Aerial4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-1_Aerial4-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A1-1_Aerial4-103	CAT D4	Rubber Tired Loaders	1	7	95	Diesel	29
A1-1_Aerial4-103	CAT 385	Excavators	1	7	513	Diesel	145
A1-1_Aerial4-103	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	58
A1-1_Aerial4-104	CAT 385	Excavators	1	8	513	Diesel	158
A1-1_Aerial4-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-1_Aerial4-201	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	26
A1-1_Aerial4-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	13
A1-1_Aerial4-201	Commachio CH450	Bore/Drill Rigs	2	6	269	Diesel	57
A1-1_Aerial4-201	Grove GMK5240	Cranes	1	8	165	Diesel	48
A1-1_Aerial4-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	42
A1-1_Aerial4-301	Grove GMK5240	Cranes	1	5	165	Diesel	31
A1-1_Aerial4-301	Pettibone 944B	Forklifts	1	3	117	Diesel	10
A1-1_Aerial4-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	22
A1-1_Aerial4-401	Grove GMK5240	Cranes	3	7	165	Diesel	44
A1-1_Aerial4-401	Pettibone 944B	Forklifts	3	7	117	Diesel	29
A1-1_Aerial4-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	47
A1-1_Aerial4-501	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	63
A1-1_Aerial4-501	Bobcat S590	Tractors/Loaders/Backhoes	2	8	66	Diesel	16
A1-1_Aerial4-501	Grove GMK5240	Cranes	4	8	165	Diesel	47
A1-1_Aerial4-501	Pettibone 944B	Forklifts	2	8	117	Diesel	32
A1-1_Aerial4-501	Jackson Tamper	Other Construction Equipment	2	8	450	Diesel	119
A1-1_Aerial4-502	Grove GMK5240	Cranes	2	8	165	Diesel	47
A1-1_Aerial4-502	CAT 420F	Tractors/Loaders/Backhoes	2	8	93	Diesel	32
A1-1_Aerial4-502	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	63
A1-1_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-1_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-1_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-1_Aerial2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-1_Aerial2-102	Grove GMK5240	Cranes	1	8	165	Diesel	47
A1-1_Aerial2-103	CAT D4	Rubber Tired Loaders	1	7	95	Diesel	29
A1-1_Aerial2-103	CAT 385	Excavators	1	7	513	Diesel	145
A1-1_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	58
A1-1_Aerial2-104	CAT 385	Excavators	1	8	513	Diesel	152
A1-1_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A1-1_Aerial2-201	CAT 926 E	Rubber Tired Loaders	3	8	110	Diesel	31
A1-1_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	6	210	Diesel	48

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-1_Aerial2-201	Commachio CH450	Bore/Drill Rigs	3	8	269	Diesel	69
A1-1_Aerial2-201	Grove GMK5240	Cranes	3	6	165	Diesel	35
A1-1_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	35
A1-1_Aerial2-301	Grove GMK5240	Cranes	1	8	165	Diesel	46
A1-1_Aerial2-301	Pettibone 944B	Forklifts	1	8	117	Diesel	31
A1-1_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	42
A1-1_Aerial2-401	Grove GMK5240	Cranes	8	7	165	Diesel	44
A1-1_Aerial2-401	Pettibone 944B	Forklifts	8	7	117	Diesel	29
A1-1_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	4	7	210	Diesel	56
A1-1_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	2	6	210	Diesel	46
A1-1_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	2	6	66	Diesel	11
A1-1_Aerial2-501	Grove GMK5240	Cranes	3	8	165	Diesel	46
A1-1_Aerial2-501	Pettibone 944B	Forklifts	2	6	117	Diesel	23
A1-1_Aerial2-501	Jackson Tamper	Other Construction Equipment	2	6	450	Diesel	86
A1-1_Aerial2-502	Grove GMK5240	Cranes	4	7	165	Diesel	41
A1-1_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	2	7	93	Diesel	28
A1-1_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	2	7	210	Diesel	56
A1-1_Berm2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-1_Berm2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-1_Berm2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-1_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	30
A1-1_Berm2-102	Grove GMK5240	Cranes	1	7	165	Diesel	44
A1-1_Berm2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	96
A1-1_Berm2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A1-1_Berm2-103	CAT 385	Excavators	1	8	513	Diesel	157
A1-1_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-1_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	39
A1-1_Berm2-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-1_Berm2-201	Grove GMK5240	Cranes	1	4	165	Diesel	25
A1-1_Berm2-202	CAT D6 LGP	Crawler Tractors	1	8	145	Diesel	49
A1-1_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A1-1_Berm2-202	CAT 815	Rollers	1	8	216	Diesel	62
A1-1_Berm2-202	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-1_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A1-1_Berm2-203	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-1_Berm2-203	Pettibone 944B	Forklifts	1	8	117	Diesel	31
A1-1_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	119
A1-1_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-1_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	64
A1-1_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	119
A1-1_Berm2-402	CAT 349F	Excavators	1	7	396	Diesel	109
A1-1_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	1	7	93	Diesel	27
A1-1_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	55

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-1_At Grade4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-1_At Grade4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-1_At Grade4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-1_At Grade4-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	85
A1-1_At Grade4-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A1-1_At Grade4-102	Grove GMK5240	Cranes	1	7	165	Diesel	39
A1-1_At Grade4-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93
A1-1_At Grade4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-1_At Grade4-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A1-1_At Grade4-201	CAT 623	Scrapers	2	6	365	Diesel	83
A1-1_At Grade4-201	CAT 14G	Graders	2	6	200	Diesel	48
A1-1_At Grade4-201	CAT 815	Rollers	2	6	216	Diesel	48
A1-1_At Grade4-201	Hand Compactor	Plate Compactors	2	6	8	Gas	2
A1-1_At Grade4-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	118
A1-1_At Grade4-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-1_At Grade4-301	CAT 815	Rollers	1	8	216	Diesel	63
A1-1_At Grade4-302	CAT 349F	Excavators	2	6	396	Diesel	103
A1-1_At Grade4-302	CAT 420F	Tractors/Loaders/Backhoes	2	6	93	Diesel	26
A1-1_At Grade4-302	CAT 966	Tractors/Loaders/Backhoes	2	6	210	Diesel	52
A1-1_At Grade4-302	CAT 815	Rollers	2	6	216	Diesel	52
A1-1_At Grade4-302	Hand Compactor	Plate Compactors	2	6	8	Gas	2
A1-1_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A1-1_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-1_At Grade2-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-1_At Grade2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	91
A1-1_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	28
A1-1_At Grade2-102	Grove GMK5240	Cranes	1	7	165	Diesel	42
A1-1_At Grade2-103	CAT D8N	Crawler Tractors	1	8	285	Diesel	98
A1-1_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-1_At Grade2-103	Grove GMK5240	Cranes	1	4	165	Diesel	25
A1-1_At Grade2-201	CAT 623	Scrapers	2	7	365	Diesel	110
A1-1_At Grade2-201	CAT 14G	Graders	2	7	200	Diesel	59
A1-1_At Grade2-201	CAT 815	Rollers	2	7	216	Diesel	59
A1-1_At Grade2-201	Hand Compactor	Plate Compactors	2	7	8	Gas	3
A1-1_At Grade2-301	CAT 988	Rubber Tired Loaders	2	6	375	Diesel	88
A1-1_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	2	6	210	Diesel	47
A1-1_At Grade2-301	CAT 815	Rollers	2	6	216	Diesel	47
A1-1_At Grade2-301	Jackson Tamper	Other Construction Equipment	2	6	450	Diesel	94
A1-1_At Grade2-302	CAT 349F	Excavators	3	6	396	Diesel	101
A1-1_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	3	6	93	Diesel	25
A1-1_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	50
A1-1_At Grade2-302	CAT 815	Rollers	3	6	216	Diesel	50
A1-1_At Grade2-302	Hand Compactor	Plate Compactors	3	6	8	Gas	2

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-2_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-2_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-2_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-2_Aerial2-102	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	24
A1-2_Aerial2-102	Grove GMK5240	Cranes	2	6	165	Diesel	36
A1-2_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A1-2_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	157
A1-2_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-2_Aerial2-104	CAT 385	Excavators	2	7	513	Diesel	131
A1-2_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	2	7	210	Diesel	52
A1-2_Aerial2-201	CAT 926 E	Rubber Tired Loaders	8	8	110	Diesel	30
A1-2_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	8	210	Diesel	63
A1-2_Aerial2-201	Commachio CH450	Bore/Drill Rigs	8	8	269	Diesel	68
A1-2_Aerial2-201	Grove GMK5240	Cranes	6	8	165	Diesel	46
A1-2_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	53
A1-2_Aerial2-301	Grove GMK5240	Cranes	3	7	165	Diesel	39
A1-2_Aerial2-301	Pettibone 944B	Forklifts	3	7	117	Diesel	26
A1-2_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	7	210	Diesel	54
A1-2_Aerial2-401	Grove GMK5240	Cranes	20	8	165	Diesel	45
A1-2_Aerial2-401	Pettibone 944B	Forklifts	20	8	117	Diesel	30
A1-2_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	9	8	210	Diesel	64
A1-2_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	4	7	210	Diesel	59
A1-2_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	4	7	66	Diesel	15
A1-2_Aerial2-501	Grove GMK5240	Cranes	8	7	165	Diesel	44
A1-2_Aerial2-501	Pettibone 944B	Forklifts	4	7	117	Diesel	29
A1-2_Aerial2-501	Jackson Tamper	Other Construction Equipment	4	7	450	Diesel	110
A1-2_Aerial2-502	Grove GMK5240	Cranes	5	7	165	Diesel	44
A1-2_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	5	7	93	Diesel	30
A1-2_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	5	7	210	Diesel	59
A1-2_Berm2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-2_Berm2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-2_Berm2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-2_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-2_Berm2-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A1-2_Berm2-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	104
A1-2_Berm2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	30
A1-2_Berm2-103	CAT 385	Excavators	1	8	513	Diesel	150
A1-2_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	60
A1-2_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	31
A1-2_Berm2-201	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	24
A1-2_Berm2-201	Grove GMK5240	Cranes	1	6	165	Diesel	36
A1-2_Berm2-202	CAT D6 LGP	Crawler Tractors	3	7	145	Diesel	46
A1-2_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	3	7	66	Diesel	15

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-2_Berm2-202	CAT 815	Rollers	3	7	216	Diesel	58
A1-2_Berm2-202	Hand Compactor	Plate Compactors	3	7	8	Gas	3
A1-2_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	3	7	66	Diesel	15
A1-2_Berm2-203	Hand Compactor	Plate Compactors	3	7	8	Gas	3
A1-2_Berm2-203	Pettibone 944B	Forklifts	3	7	117	Diesel	29
A1-2_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	118
A1-2_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-2_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	63
A1-2_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	118
A1-2_Berm2-402	CAT 349F	Excavators	2	8	396	Diesel	123
A1-2_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	2	8	93	Diesel	31
A1-2_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	61
A1-2_At Grade4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-2_At Grade4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-2_At Grade4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-2_At Grade4-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A1-2_At Grade4-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A1-2_At Grade4-102	Grove GMK5240	Cranes	1	7	165	Diesel	40
A1-2_At Grade4-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	92
A1-2_At Grade4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-2_At Grade4-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A1-2_At Grade4-201	CAT 623	Scrapers	1	7	365	Diesel	110
A1-2_At Grade4-201	CAT 14G	Graders	1	8	200	Diesel	64
A1-2_At Grade4-201	CAT 815	Rollers	1	8	216	Diesel	64
A1-2_At Grade4-201	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A1-2_At Grade4-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	117
A1-2_At Grade4-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A1-2_At Grade4-301	CAT 815	Rollers	1	8	216	Diesel	62
A1-2_At Grade4-302	CAT 349F	Excavators	1	8	396	Diesel	128
A1-2_At Grade4-302	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A1-2_At Grade4-302	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-2_At Grade4-302	CAT 815	Rollers	1	8	216	Diesel	64
A1-2_At Grade4-302	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-2_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-2_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-2_At Grade2-102	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-2_At Grade2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A1-2_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	27
A1-2_At Grade2-101	Grove GMK5240	Cranes	1	7	165	Diesel	40
A1-2_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93
A1-2_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-2_At Grade2-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A1-2_At Grade2-201	CAT 623	Scrapers	2	5	365	Diesel	69

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-2_At Grade2-201	CAT 14G	Graders	2	5	200	Diesel	37
A1-2_At Grade2-201	CAT 815	Rollers	2	5	216	Diesel	37
A1-2_At Grade2-201	Hand Compactor	Plate Compactors	2	4	8	Gas	1
A1-2_At Grade2-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	114
A1-2_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A1-2_At Grade2-301	CAT 815	Rollers	1	8	216	Diesel	61
A1-2_At Grade2-301	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	122
A1-2_At Grade2-302	CAT 349F	Excavators	2	6	396	Diesel	95
A1-2_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	2	6	93	Diesel	24
A1-2_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	2	6	210	Diesel	48
A1-2_At Grade2-302	CAT 815	Rollers	2	6	216	Diesel	48
A1-2_At Grade2-302	Hand Compactor	Plate Compactors	2	6	8	Gas	2
A1-3_Aerial4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-3_Aerial4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-3_Aerial4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-3_Aerial4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-3_Aerial4-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A1-3_Aerial4-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A1-3_Aerial4-103	CAT 385	Excavators	1	8	513	Diesel	157
A1-3_Aerial4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-3_Aerial4-104	CAT 385	Excavators	1	8	513	Diesel	159
A1-3_Aerial4-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-3_Aerial4-201	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	26
A1-3_Aerial4-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	13
A1-3_Aerial4-201	Commachio CH450	Bore/Drill Rigs	2	6	269	Diesel	58
A1-3_Aerial4-201	Grove GMK5240	Cranes	1	6	165	Diesel	38
A1-3_Aerial4-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	40
A1-3_Aerial4-301	Grove GMK5240	Cranes	1	3	165	Diesel	19
A1-3_Aerial4-301	Pettibone 944B	Forklifts	1	2	117	Diesel	9
A1-3_Aerial4-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	19
A1-3_Aerial4-401	Grove GMK5240	Cranes	3	7	165	Diesel	45
A1-3_Aerial4-401	Pettibone 944B	Forklifts	3	7	117	Diesel	30
A1-3_Aerial4-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	28
A1-3_Aerial4-501	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	37
A1-3_Aerial4-501	Bobcat S590	Tractors/Loaders/Backhoes	2	5	66	Diesel	9
A1-3_Aerial4-501	Grove GMK5240	Cranes	3	6	165	Diesel	37
A1-3_Aerial4-501	Pettibone 944B	Forklifts	2	5	117	Diesel	18
A1-3_Aerial4-502	Jackson Tamper	Other Construction Equipment	2	5	450	Diesel	69
A1-3_Aerial4-502	Grove GMK5240	Cranes	2	5	165	Diesel	31
A1-3_Aerial4-502	CAT 420F	Tractors/Loaders/Backhoes	2	5	93	Diesel	21
A1-3_Aerial4-502	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	42
A1-3_Aerial2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A1-3_Aerial2-101	CAT 926 E	Rubber Tired Loaders	2	5	110	Diesel	19

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-3_Aerial2-101	Hand Compactor	Plate Compactors	1	5	8	Gas	2
A1-3_Aerial2-102	CAT 926 E	Rubber Tired Loaders	3	8	110	Diesel	32
A1-3_Aerial2-102	Grove GMK5240	Cranes	3	8	165	Diesel	48
A1-3_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A1-3_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	160
A1-3_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-3_Aerial2-104	CAT 385	Excavators	2	7	513	Diesel	137
A1-3_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	2	7	210	Diesel	55
A1-3_Aerial2-201	CAT 926 E	Rubber Tired Loaders	9	8	110	Diesel	30
A1-3_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	3	6	210	Diesel	47
A1-3_Aerial2-201	Commachio CH450	Bore/Drill Rigs	9	8	269	Diesel	68
A1-3_Aerial2-201	Grove GMK5240	Cranes	6	8	165	Diesel	48
A1-3_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	7	210	Diesel	58
A1-3_Aerial2-301	Grove GMK5240	Cranes	3	7	165	Diesel	41
A1-3_Aerial2-301	Pettibone 944B	Forklifts	3	7	117	Diesel	28
A1-3_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	7	210	Diesel	57
A1-3_Aerial2-401	Grove GMK5240	Cranes	35	8	165	Diesel	45
A1-3_Aerial2-401	Pettibone 944B	Forklifts	35	8	117	Diesel	30
A1-3_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	9	8	210	Diesel	62
A1-3_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	14	8	210	Diesel	63
A1-3_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	14	8	66	Diesel	16
A1-3_Aerial2-501	Grove GMK5240	Cranes	28	8	165	Diesel	47
A1-3_Aerial2-501	Pettibone 944B	Forklifts	14	8	117	Diesel	32
A1-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	14	8	450	Diesel	118
A1-3_Aerial2-502	Grove GMK5240	Cranes	31	8	165	Diesel	48
A1-3_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	16	8	93	Diesel	31
A1-3_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	16	8	210	Diesel	62
A1-3_At Grade4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-3_At Grade4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-3_At Grade4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-3_At Grade4-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	85
A1-3_At Grade4-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A1-3_At Grade4-102	Grove GMK5240	Cranes	1	7	165	Diesel	39
A1-3_At Grade4-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	91
A1-3_At Grade4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A1-3_At Grade4-103	Grove GMK5240	Cranes	1	4	165	Diesel	23
A1-3_At Grade4-201	CAT 623	Scrapers	1	7	365	Diesel	109
A1-3_At Grade4-201	CAT 14G	Graders	1	8	200	Diesel	63
A1-3_At Grade4-201	CAT 815	Rollers	1	8	216	Diesel	63
A1-3_At Grade4-201	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A1-3_At Grade4-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	116
A1-3_At Grade4-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A1-3_At Grade4-301	CAT 815	Rollers	1	8	216	Diesel	62

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-3_At Grade4-301	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	116
A1-3_At Grade4-302	CAT 349F	Excavators	1	8	396	Diesel	124
A1-3_At Grade4-302	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	31
A1-3_At Grade4-302	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A1-3_At Grade4-302	CAT 815	Rollers	1	8	216	Diesel	62
A1-3_At Grade4-302	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-3_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-3_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-3_At Grade2-102	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-3_At Grade2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A1-3_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A1-3_At Grade2-101	Grove GMK5240	Cranes	1	7	165	Diesel	40
A1-3_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	92
A1-3_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-3_At Grade2-103	Grove GMK5240	Cranes	1	8	165	Diesel	47
A1-3_At Grade2-201	CAT 623	Scrapers	1	7	365	Diesel	110
A1-3_At Grade2-201	CAT 14G	Graders	1	8	200	Diesel	64
A1-3_At Grade2-201	CAT 815	Rollers	1	8	216	Diesel	64
A1-3_At Grade2-201	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A1-3_At Grade2-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	118
A1-3_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-3_At Grade2-301	CAT 815	Rollers	1	8	216	Diesel	63
A1-3_At Grade2-302	CAT 349F	Excavators	1	8	396	Diesel	118
A1-3_At Grade2-301	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	118
A1-3_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	31
A1-3_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-3_At Grade2-302	CAT 815	Rollers	1	8	216	Diesel	63
A1-3_At Grade2-302	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-3_Tunnel-102	CAT 988	Rubber Tired Loaders	1	22	375	Diesel	331
A1-3_Tunnel-102	CAT 966	Tractors/Loaders/Backhoes	1	22	210	Diesel	177
A1-3_Tunnel-102	Grove GMK5240	Cranes	1	22	165	Diesel	132
A1-3_Tunnel-201	Pettibone 944B	Forklifts	2	8	117	Diesel	31
A1-3_Tunnel-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A1-3_Tunnel-301	Pettibone 944B	Forklifts	1	5	117	Diesel	22
A1-3_Tunnel-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A1-3_Tunnel-401	Pettibone 944B	Forklifts	2	5	117	Diesel	22
A1-3_Tunnel-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A1-3_Tunnel-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A1-3_Tunnel-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A1-3_Tunnel-501	Grove GMK5240	Cranes	2	8	165	Diesel	47
A1-3_Tunnel-501	Pettibone 944B	Forklifts	1	8	117	Diesel	31
A1-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	117
A1-3_Tunnel-502	Grove GMK5240	Cranes	2	8	165	Diesel	45

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-3_Tunnel-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	30
A1-3_Tunnel-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A1-3_Large2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-3_Large2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-3_Large2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-3_Large2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-3_Large2-102	CAT D4	Rubber Tired Loaders	2	8	95	Diesel	31
A1-3_Large2-201	CAT D8N	Crawler Tractors	1	7	285	Diesel	89
A1-3_Large2-201	CAT 385	Excavators	3	5	513	Diesel	110
A1-3_Large2-201	CAT 773G	Off-Highway Trucks	26	8	775	Diesel	237
A1-3_Large2-202	CAT D8N	Crawler Tractors	2	4	285	Diesel	54
A1-3_Large2-202	CAT 623	Scrapers	2	4	365	Diesel	62
A1-3_Large2-202	CAT 14-H	Graders	2	4	240	Diesel	41
A1-3_Large2-202	CAT 834	Rollers	2	4	450	Diesel	74
A1-3_Large2-202	CAT 825	Rollers	2	4	315	Diesel	49
A1-3_Large2-203	CAT D4	Rubber Tired Loaders	3	5	95	Diesel	22
A1-3_Large2-203	CAT 623	Scrapers	3	5	365	Diesel	82
A1-3_Large2-401	CAT 988	Rubber Tired Loaders	2	8	375	Diesel	119
A1-3_Large2-401	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	63
A1-3_Large2-401	CAT 815	Rollers	2	8	216	Diesel	63
A1-3_Large2-401	Jackson Tamper	Other Construction Equipment	2	8	450	Diesel	119
A1-3_Large2-402	CAT 349F	Excavators	3	6	396	Diesel	98
A1-3_Large2-402	CAT 420F	Tractors/Loaders/Backhoes	3	6	93	Diesel	24
A1-3_Large2-402	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	49
A1-4_Aerial4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A1-4_Aerial4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-4_Aerial4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-4_Aerial4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-4_Aerial4-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A1-4_Aerial4-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A1-4_Aerial4-103	CAT 385	Excavators	1	8	513	Diesel	156
A1-4_Aerial4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A1-4_Aerial4-104	CAT 385	Excavators	1	8	513	Diesel	158
A1-4_Aerial4-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-4_Aerial4-201	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	26
A1-4_Aerial4-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	13
A1-4_Aerial4-201	Commachio CH450	Bore/Drill Rigs	2	6	269	Diesel	57
A1-4_Aerial4-201	Grove GMK5240	Cranes	1	6	165	Diesel	38
A1-4_Aerial4-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	40
A1-4_Aerial4-301	Grove GMK5240	Cranes	1	3	165	Diesel	20
A1-4_Aerial4-301	Pettibone 944B	Forklifts	1	2	117	Diesel	10
A1-4_Aerial4-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	21
A1-4_Aerial4-401	Grove GMK5240	Cranes	3	7	165	Diesel	41

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-4_Aerial4-401	Pettibone 944B	Forklifts	3	7	117	Diesel	27
A1-4_Aerial4-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	26
A1-4_Aerial4-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-4_Aerial4-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A1-4_Aerial4-501	Grove GMK5240	Cranes	2	8	165	Diesel	48
A1-4_Aerial4-501	Pettibone 944B	Forklifts	1	8	117	Diesel	32
A1-4_Aerial4-502	Grove GMK5240	Cranes	2	5	165	Diesel	28
A1-4_Aerial4-502	Grove GMK5240	Cranes	2	5	165	Diesel	19
A1-4_Aerial4-502	CAT 420F	Tractors/Loaders/Backhoes	2	5	93	Diesel	38
A1-4_Aerial4-502	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	0
A1-4_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-4_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-4_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-4_Aerial2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-4_Aerial2-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A1-4_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A1-4_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	158
A1-4_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-4_Aerial2-104	CAT 385	Excavators	1	8	513	Diesel	155
A1-4_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A1-4_Aerial2-201	CAT 926 E	Rubber Tired Loaders	2	8	110	Diesel	32
A1-4_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
A1-4_Aerial2-201	Commachio CH450	Bore/Drill Rigs	2	8	269	Diesel	71
A1-4_Aerial2-201	Grove GMK5240	Cranes	2	6	165	Diesel	33
A1-4_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	28
A1-4_Aerial2-301	Grove GMK5240	Cranes	1	5	165	Diesel	30
A1-4_Aerial2-301	Pettibone 944B	Forklifts	1	5	117	Diesel	20
A1-4_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A1-4_Aerial2-401	Grove GMK5240	Cranes	3	7	165	Diesel	40
A1-4_Aerial2-401	Pettibone 944B	Forklifts	3	7	117	Diesel	27
A1-4_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	43
A1-4_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-4_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A1-4_Aerial2-501	Grove GMK5240	Cranes	2	8	165	Diesel	48
A1-4_Aerial2-501	Pettibone 944B	Forklifts	1	8	117	Diesel	32
A1-4_Aerial2-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	120
A1-4_Aerial2-502	Grove GMK5240	Cranes	3	6	165	Diesel	37
A1-4_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	2	5	93	Diesel	19
A1-4_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	37
A1-4_At Grade2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	9
A1-4_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-4_At Grade2-102	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-4_At Grade2-102	CAT D8N	Crawler Tractors	1	6	285	Diesel	83

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-4_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	25
A1-4_At Grade2-101	Grove GMK5240	Cranes	1	6	165	Diesel	38
A1-4_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93
A1-4_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-4_At Grade2-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A1-4_At Grade2-201	CAT 623	Scrapers	1	7	365	Diesel	110
A1-4_At Grade2-201	CAT 14G	Graders	1	8	200	Diesel	64
A1-4_At Grade2-201	CAT 815	Rollers	1	8	216	Diesel	64
A1-4_At Grade2-201	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A1-4_At Grade2-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	115
A1-4_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A1-4_At Grade2-301	CAT 815	Rollers	1	8	216	Diesel	61
A1-4_At Grade2-302	CAT 349F	Excavators	1	8	396	Diesel	101
A1-4_At Grade2-301	Jackson Tamper	Other Construction Equipment	1	7	450	Diesel	101
A1-4_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	31
A1-4_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A1-4_At Grade2-302	CAT 815	Rollers	1	8	216	Diesel	61
A1-4_At Grade2-302	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-4_Tunnel-102	CAT 988	Rubber Tired Loaders	2	21	375	Diesel	313
A1-4_Tunnel-102	CAT 966	Tractors/Loaders/Backhoes	2	21	210	Diesel	167
A1-4_Tunnel-102	Grove GMK5240	Cranes	2	21	165	Diesel	125
A1-4_Tunnel-201	Pettibone 944B	Forklifts	9	8	117	Diesel	32
A1-4_Tunnel-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	53
A1-4_Tunnel-301	Pettibone 944B	Forklifts	3	8	117	Diesel	32
A1-4_Tunnel-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	53
A1-4_Tunnel-401	Pettibone 944B	Forklifts	7	7	117	Diesel	29
A1-4_Tunnel-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	53
A1-4_Tunnel-501	CAT 966	Tractors/Loaders/Backhoes	9	7	210	Diesel	59
A1-4_Tunnel-501	Bobcat S590	Tractors/Loaders/Backhoes	9	7	66	Diesel	15
A1-4_Tunnel-501	Grove GMK5240	Cranes	18	7	165	Diesel	44
A1-4_Tunnel-501	Pettibone 944B	Forklifts	9	7	117	Diesel	29
A1-4_Aerial2-501	Jackson Tamper	Other Construction Equipment	9	7	450	Diesel	110
A1-4_Tunnel-502	Grove GMK5240	Cranes	16	8	165	Diesel	48
A1-4_Tunnel-502	CAT 420F	Tractors/Loaders/Backhoes	8	8	93	Diesel	32
A1-4_Tunnel-502	CAT 966	Tractors/Loaders/Backhoes	8	8	210	Diesel	64
A1-4_Large2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-4_Large2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-4_Large2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-4_Large2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-4_Large2-102	CAT D4	Rubber Tired Loaders	2	8	95	Diesel	32
A1-4_Large2-201	CAT D8N	Crawler Tractors	2	6	285	Diesel	79
A1-4_Large2-201	CAT 385	Excavators	4	7	513	Diesel	146
A1-4_Large2-201	CAT 773G	Off-Highway Trucks	50	7	775	Diesel	219

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-4_Large2-202	CAT D8N	Crawler Tractors	2	7	285	Diesel	95
A1-4_Large2-202	CAT 623	Scrapers	2	7	365	Diesel	109
A1-4_Large2-202	CAT 14-H	Graders	2	7	240	Diesel	73
A1-4_Large2-202	CAT 834	Rollers	2	7	450	Diesel	131
A1-4_Large2-202	CAT 825	Rollers	2	7	315	Diesel	87
A1-4_Large2-203	CAT D4	Rubber Tired Loaders	4	7	95	Diesel	29
A1-4_Large2-203	CAT 623	Scrapers	4	7	365	Diesel	109
A1-4_Large2-401	CAT 988	Rubber Tired Loaders	4	7	375	Diesel	103
A1-4_Large2-401	CAT 966	Tractors/Loaders/Backhoes	4	7	210	Diesel	55
A1-4_Large2-401	CAT 815	Rollers	4	7	216	Diesel	55
A1-4_Large2-401	Jackson Tamper	Other Construction Equipment	4	7	450	Diesel	103
A1-4_Large2-402	CAT 349F	Excavators	4	8	396	Diesel	124
A1-4_Large2-402	CAT 420F	Tractors/Loaders/Backhoes	4	8	93	Diesel	31
A1-4_Large2-402	CAT 966	Tractors/Loaders/Backhoes	4	8	210	Diesel	62
A1-5_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-5_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A1-5_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-5_Aerial2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-5_Aerial2-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A1-5_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A1-5_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	158
A1-5_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-5_Aerial2-104	CAT 385	Excavators	1	8	513	Diesel	160
A1-5_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A1-5_Aerial2-201	CAT 926 E	Rubber Tired Loaders	2	8	110	Diesel	32
A1-5_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
A1-5_Aerial2-201	Commachio CH450	Bore/Drill Rigs	2	8	269	Diesel	72
A1-5_Aerial2-201	Grove GMK5240	Cranes	2	6	165	Diesel	34
A1-5_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A1-5_Aerial2-301	Grove GMK5240	Cranes	1	5	165	Diesel	29
A1-5_Aerial2-301	Pettibone 944B	Forklifts	1	5	117	Diesel	19
A1-5_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A1-5_Aerial2-401	Grove GMK5240	Cranes	7	8	165	Diesel	46
A1-5_Aerial2-401	Pettibone 944B	Forklifts	7	8	117	Diesel	31
A1-5_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	7	210	Diesel	58
A1-5_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	3	8	210	Diesel	60
A1-5_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	3	8	66	Diesel	15
A1-5_Aerial2-501	Grove GMK5240	Cranes	6	8	165	Diesel	45
A1-5_Aerial2-501	Pettibone 944B	Forklifts	3	8	117	Diesel	30
A1-5_Aerial2-501	Jackson Tamper	Other Construction Equipment	3	8	450	Diesel	113
A1-5_Aerial2-502	Grove GMK5240	Cranes	7	7	165	Diesel	44
A1-5_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	4	6	93	Diesel	25
A1-5_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	4	6	210	Diesel	51

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-5_Berm2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-5_Berm2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-5_Berm2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-5_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	30
A1-5_Berm2-102	Grove GMK5240	Cranes	1	7	165	Diesel	45
A1-5_Berm2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	97
A1-5_Berm2-103	CAT D4	Rubber Tired Loaders	1	7	95	Diesel	28
A1-5_Berm2-103	CAT 385	Excavators	1	7	513	Diesel	142
A1-5_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	57
A1-5_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	29
A1-5_Berm2-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-5_Berm2-201	Grove GMK5240	Cranes	1	4	165	Diesel	24
A1-5_Berm2-202	CAT D6 LGP	Crawler Tractors	1	8	145	Diesel	48
A1-5_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A1-5_Berm2-202	CAT 815	Rollers	1	8	216	Diesel	61
A1-5_Berm2-202	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-5_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A1-5_Berm2-203	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A1-5_Berm2-203	Pettibone 944B	Forklifts	1	8	117	Diesel	30
A1-5_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	114
A1-5_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A1-5_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	61
A1-5_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	114
A1-5_Berm2-402	CAT 349F	Excavators	1	8	396	Diesel	126
A1-5_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A1-5_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A1-5_Large2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A1-5_Large2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-5_Large2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A1-5_Large2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A1-5_Large2-102	CAT D4	Rubber Tired Loaders	2	8	95	Diesel	32
A1-5_Large2-201	CAT D8N	Crawler Tractors	3	7	285	Diesel	90
A1-5_Large2-201	CAT 385	Excavators	7	7	513	Diesel	142
A1-5_Large2-201	CAT 773G	Off-Highway Trucks	78	8	775	Diesel	239
A1-5_Large2-202	CAT D8N	Crawler Tractors	4	6	285	Diesel	81
A1-5_Large2-202	CAT 623	Scrapers	4	6	365	Diesel	93
A1-5_Large2-202	CAT 14-H	Graders	4	6	240	Diesel	62
A1-5_Large2-202	CAT 834	Rollers	4	6	450	Diesel	112
A1-5_Large2-202	CAT 825	Rollers	4	6	315	Diesel	75
A1-5_Large2-203	CAT D4	Rubber Tired Loaders	4	6	95	Diesel	25
A1-5_Large2-203	CAT 623	Scrapers	4	6	365	Diesel	93
A1-5_Large2-401	CAT 988	Rubber Tired Loaders	6	8	375	Diesel	117
A1-5_Large2-401	CAT 966	Tractors/Loaders/Backhoes	6	8	210	Diesel	62

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A1-5_Large2-401	CAT 815	Rollers	6	8	216	Diesel	62
A1-5_Large2-401	Jackson Tamper	Other Construction Equipment	6	8	450	Diesel	117
A1-5_Large2-402	CAT 349F	Excavators	7	8	396	Diesel	121
A1-5_Large2-402	CAT 420F	Tractors/Loaders/Backhoes	7	8	93	Diesel	30
A1-5_Large2-402	CAT 966	Tractors/Loaders/Backhoes	7	8	210	Diesel	60
A2-1_Aerial4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A2-1_Aerial4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A2-1_Aerial4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-1_Aerial4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A2-1_Aerial4-102	Grove GMK5240	Cranes	1	8	165	Diesel	47
A2-1_Aerial4-103	CAT D4	Rubber Tired Loaders	1	7	95	Diesel	29
A2-1_Aerial4-103	CAT 385	Excavators	1	7	513	Diesel	146
A2-1_Aerial4-103	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	58
A2-1_Aerial4-104	CAT 385	Excavators	1	8	513	Diesel	159
A2-1_Aerial4-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-1_Aerial4-201	CAT 926 E	Rubber Tired Loaders	2	7	110	Diesel	28
A2-1_Aerial4-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	15
A2-1_Aerial4-201	Commachio CH450	Bore/Drill Rigs	2	7	269	Diesel	64
A2-1_Aerial4-201	Grove GMK5240	Cranes	1	4	165	Diesel	21
A2-1_Aerial4-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	31
A2-1_Aerial4-301	Grove GMK5240	Cranes	1	4	165	Diesel	23
A2-1_Aerial4-301	Pettibone 944B	Forklifts	1	3	117	Diesel	11
A2-1_Aerial4-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	25
A2-1_Aerial4-401	Grove GMK5240	Cranes	3	7	165	Diesel	44
A2-1_Aerial4-401	Pettibone 944B	Forklifts	3	7	117	Diesel	29
A2-1_Aerial4-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	47
A2-1_Aerial4-501	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	64
A2-1_Aerial4-501	Bobcat S590	Tractors/Loaders/Backhoes	2	8	66	Diesel	16
A2-1_Aerial4-501	Grove GMK5240	Cranes	4	8	165	Diesel	48
A2-1_Aerial4-501	Pettibone 944B	Forklifts	2	8	117	Diesel	32
A2-1_Aerial4-501	Jackson Tamper	Other Construction Equipment	2	8	450	Diesel	119
A2-1_Aerial4-502	Grove GMK5240	Cranes	2	8	165	Diesel	48
A2-1_Aerial4-502	CAT 420F	Tractors/Loaders/Backhoes	2	8	93	Diesel	32
A2-1_Aerial4-502	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	64
A2-1_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A2-1_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-1_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A2-1_Aerial2-102	CAT 926 E	Rubber Tired Loaders	2	5	110	Diesel	20
A2-1_Aerial2-102	Grove GMK5240	Cranes	2	5	165	Diesel	30
A2-1_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A2-1_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	154
A2-1_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A2-1_Aerial2-104	CAT 385	Excavators	2	5	513	Diesel	102

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-1_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	41
A2-1_Aerial2-201	CAT 926 E	Rubber Tired Loaders	6	8	110	Diesel	32
A2-1_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	49
A2-1_Aerial2-201	Commachio CH450	Bore/Drill Rigs	6	8	269	Diesel	71
A2-1_Aerial2-201	Grove GMK5240	Cranes	5	7	165	Diesel	43
A2-1_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	41
A2-1_Aerial2-301	Grove GMK5240	Cranes	2	8	165	Diesel	47
A2-1_Aerial2-301	Pettibone 944B	Forklifts	2	8	117	Diesel	31
A2-1_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	43
A2-1_Aerial2-401	Grove GMK5240	Cranes	16	8	165	Diesel	45
A2-1_Aerial2-401	Pettibone 944B	Forklifts	16	8	117	Diesel	30
A2-1_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	7	8	210	Diesel	66
A2-1_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	3	8	210	Diesel	63
A2-1_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	3	8	66	Diesel	16
A2-1_Aerial2-501	Grove GMK5240	Cranes	6	8	165	Diesel	47
A2-1_Aerial2-501	Pettibone 944B	Forklifts	3	8	117	Diesel	31
A2-1_Aerial2-501	Jackson Tamper	Other Construction Equipment	3	8	450	Diesel	117
A2-1_Aerial2-502	Grove GMK5240	Cranes	8	7	165	Diesel	44
A2-1_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	4	7	93	Diesel	30
A2-1_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	4	7	210	Diesel	59
A2-1_Berm2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A2-1_Berm2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-1_Berm2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A2-1_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	29
A2-1_Berm2-102	Grove GMK5240	Cranes	1	7	165	Diesel	43
A2-1_Berm2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	94
A2-1_Berm2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A2-1_Berm2-103	CAT 385	Excavators	1	8	513	Diesel	158
A2-1_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-1_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	39
A2-1_Berm2-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-1_Berm2-201	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-1_Berm2-202	CAT D6 LGP	Crawler Tractors	1	8	145	Diesel	48
A2-1_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A2-1_Berm2-202	CAT 815	Rollers	1	8	216	Diesel	61
A2-1_Berm2-202	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-1_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A2-1_Berm2-203	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-1_Berm2-203	Pettibone 944B	Forklifts	1	8	117	Diesel	30
A2-1_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	119
A2-1_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-1_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	64
A2-1_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	119

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-1_Berm2-402	CAT 349F	Excavators	1	7	396	Diesel	107
A2-1_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	1	7	93	Diesel	27
A2-1_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	54
A2-1_At Grade4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A2-1_At Grade4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-1_At Grade4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-1_At Grade4-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A2-1_At Grade4-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	27
A2-1_At Grade4-102	Grove GMK5240	Cranes	1	7	165	Diesel	40
A2-1_At Grade4-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93
A2-1_At Grade4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-1_At Grade4-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-1_At Grade4-201	CAT 623	Scrapers	2	6	365	Diesel	94
A2-1_At Grade4-201	CAT 14G	Graders	2	7	200	Diesel	55
A2-1_At Grade4-201	CAT 815	Rollers	2	7	216	Diesel	55
A2-1_At Grade4-201	Hand Compactor	Plate Compactors	2	6	8	Gas	2
A2-1_At Grade4-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	118
A2-1_At Grade4-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-1_At Grade4-301	CAT 815	Rollers	1	8	216	Diesel	63
A2-1_At Grade4-302	CAT 349F	Excavators	2	7	396	Diesel	118
A2-1_At Grade4-302	CAT 420F	Tractors/Loaders/Backhoes	2	7	93	Diesel	29
A2-1_At Grade4-302	CAT 966	Tractors/Loaders/Backhoes	2	7	210	Diesel	59
A2-1_At Grade4-302	CAT 815	Rollers	2	7	216	Diesel	59
A2-1_At Grade4-302	Hand Compactor	Plate Compactors	2	7	8	Gas	3
A2-1_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A2-1_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A2-1_At Grade2-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-1_At Grade2-102	CAT D8N	Crawler Tractors	1	6	285	Diesel	84
A2-1_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	26
A2-1_At Grade2-102	Grove GMK5240	Cranes	1	6	165	Diesel	39
A2-1_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	90
A2-1_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A2-1_At Grade2-103	Grove GMK5240	Cranes	1	4	165	Diesel	23
A2-1_At Grade2-201	CAT 623	Scrapers	1	7	365	Diesel	110
A2-1_At Grade2-201	CAT 14G	Graders	1	8	200	Diesel	64
A2-1_At Grade2-201	CAT 815	Rollers	1	8	216	Diesel	64
A2-1_At Grade2-201	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A2-1_At Grade2-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
A2-1_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-1_At Grade2-301	CAT 815	Rollers	1	8	216	Diesel	64
A2-1_At Grade2-301	Jackson Tamper	Other Construction Equipment	1	7	450	Diesel	128
A2-1_At Grade2-302	CAT 349F	Excavators	1	8	396	Diesel	128
A2-1_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-1_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-1_At Grade2-302	CAT 815	Rollers	1	8	216	Diesel	64
A2-1_At Grade2-302	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-2_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	7
A2-2_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	29
A2-2_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A2-2_Aerial2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A2-2_Aerial2-102	Grove GMK5240	Cranes	1	8	165	Diesel	46
A2-2_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	30
A2-2_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	152
A2-2_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A2-2_Aerial2-104	CAT 385	Excavators	1	7	513	Diesel	145
A2-2_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	58
A2-2_Aerial2-201	CAT 926 E	Rubber Tired Loaders	2	8	110	Diesel	31
A2-2_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	32
A2-2_Aerial2-201	Commachio CH450	Bore/Drill Rigs	2	8	269	Diesel	69
A2-2_Aerial2-201	Grove GMK5240	Cranes	1	5	165	Diesel	28
A2-2_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	28
A2-2_Aerial2-301	Grove GMK5240	Cranes	1	5	165	Diesel	32
A2-2_Aerial2-301	Pettibone 944B	Forklifts	1	5	117	Diesel	21
A2-2_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	28
A2-2_Aerial2-401	Grove GMK5240	Cranes	3	7	165	Diesel	42
A2-2_Aerial2-401	Pettibone 944B	Forklifts	3	7	117	Diesel	28
A2-2_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	40
A2-2_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-2_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A2-2_Aerial2-501	Grove GMK5240	Cranes	2	8	165	Diesel	47
A2-2_Aerial2-501	Pettibone 944B	Forklifts	1	8	117	Diesel	32
A2-2_Aerial2-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	118
A2-2_Aerial2-502	CAT 349F	Excavators	1	8	396	Diesel	126
A2-2_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A2-2_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-2_Berm2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A2-2_Berm2-101	CAT 926 E	Rubber Tired Loaders	2	5	110	Diesel	20
A2-2_Berm2-101	Hand Compactor	Plate Compactors	1	5	8	Gas	2
A2-2_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-2_Berm2-102	Grove GMK5240	Cranes	1	8	165	Diesel	47
A2-2_Berm2-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	103
A2-2_Berm2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A2-2_Berm2-103	CAT 385	Excavators	1	8	513	Diesel	157
A2-2_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-2_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	32
A2-2_Berm2-201	CAT 926 E	Rubber Tired Loaders	4	7	110	Diesel	29

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-2_Berm2-201	Grove GMK5240	Cranes	2	7	165	Diesel	43
A2-2_Berm2-202	CAT D6 LGP	Crawler Tractors	7	7	145	Diesel	47
A2-2_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	7	7	66	Diesel	15
A2-2_Berm2-202	CAT 815	Rollers	7	7	216	Diesel	60
A2-2_Berm2-202	Hand Compactor	Plate Compactors	7	7	8	Gas	3
A2-2_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	7	7	66	Diesel	15
A2-2_Berm2-203	Hand Compactor	Plate Compactors	7	7	8	Gas	3
A2-2_Berm2-203	Pettibone 944B	Forklifts	7	7	117	Diesel	30
A2-2_Berm2-401	CAT 988	Rubber Tired Loaders	3	6	375	Diesel	86
A2-2_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	46
A2-2_Berm2-401	CAT 815	Rollers	3	6	216	Diesel	46
A2-2_Berm2-401	Jackson Tamper	Other Construction Equipment	3	6	450	Diesel	86
A2-2_Berm2-402	CAT 349F	Excavators	5	7	396	Diesel	115
A2-2_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	5	7	93	Diesel	29
A2-2_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	5	7	210	Diesel	58
A2-2_At Grade4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A2-2_At Grade4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-2_At Grade4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-2_At Grade4-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A2-2_At Grade4-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A2-2_At Grade4-102	Grove GMK5240	Cranes	1	7	165	Diesel	40
A2-2_At Grade4-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	92
A2-2_At Grade4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-2_At Grade4-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-2_At Grade4-201	CAT 623	Scrapers	1	7	365	Diesel	110
A2-2_At Grade4-201	CAT 14G	Graders	1	8	200	Diesel	64
A2-2_At Grade4-201	CAT 815	Rollers	1	8	216	Diesel	64
A2-2_At Grade4-201	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A2-2_At Grade4-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	117
A2-2_At Grade4-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A2-2_At Grade4-301	CAT 815	Rollers	1	8	216	Diesel	62
A2-2_At Grade4-302	CAT 349F	Excavators	2	4	396	Diesel	69
A2-2_At Grade4-302	CAT 420F	Tractors/Loaders/Backhoes	2	4	93	Diesel	17
A2-2_At Grade4-302	CAT 966	Tractors/Loaders/Backhoes	2	4	210	Diesel	35
A2-2_At Grade4-302	CAT 815	Rollers	2	4	216	Diesel	35
A2-2_At Grade4-302	Hand Compactor	Plate Compactors	2	4	8	Gas	2
A2-2_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A2-2_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-2_At Grade2-102	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-2_At Grade2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A2-2_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	27
A2-2_At Grade2-101	Grove GMK5240	Cranes	1	7	165	Diesel	40
A2-2_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-2_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-2_At Grade2-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-2_At Grade2-201	CAT 623	Scrapers	2	7	365	Diesel	100
A2-2_At Grade2-201	CAT 14G	Graders	2	7	200	Diesel	58
A2-2_At Grade2-201	CAT 815	Rollers	2	7	216	Diesel	58
A2-2_At Grade2-201	Hand Compactor	Plate Compactors	2	7	8	Gas	2
A2-2_At Grade2-301	CAT 988	Rubber Tired Loaders	2	6	375	Diesel	88
A2-2_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	2	6	210	Diesel	47
A2-2_At Grade2-301	CAT 815	Rollers	2	6	216	Diesel	47
A2-2_At Grade2-301	Jackson Tamper	Other Construction Equipment	2	5	450	Diesel	94
A2-2_At Grade2-302	CAT 349F	Excavators	3	6	396	Diesel	100
A2-2_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	3	6	93	Diesel	25
A2-2_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	50
A2-2_At Grade2-302	CAT 815	Rollers	3	6	216	Diesel	50
A2-2_At Grade2-302	Hand Compactor	Plate Compactors	3	6	8	Gas	2
A2-2_Trench-101	CAT 385	Excavators	1	5	513	Diesel	96
A2-2_Trench-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A2-2_Trench-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-2_Trench-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-2_Trench-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	102
A2-2_Trench-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A2-2_Trench-102	Grove GMK5240	Cranes	1	8	165	Diesel	47
A2-2_Trench-103	CAT D8N	Crawler Tractors	1	2	285	Diesel	26
A2-2_Trench-103	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A2-2_Trench-103	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
A2-2_Trench-103	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A2-2_Trench-103	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	16
A2-2_Trench-103	Commachio CH450	Bore/Drill Rigs	1	8	269	Diesel	71
A2-2_Trench-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-2_Trench-104	CAT 988	Rubber Tired Loaders	1	2	375	Diesel	30
A2-2_Trench-104	Commachio CH450	Bore/Drill Rigs	1	8	269	Diesel	71
A2-2_Trench-201	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A2-2_Trench-201	CAT 385	Excavators	1	8	513	Diesel	158
A2-2_Trench-201	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-2_Trench-202	CAT 966	Tractors/Loaders/Backhoes	1	4	210	Diesel	32
A2-2_Trench-202	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-2_Trench-203	CAT D8N	Crawler Tractors	3	7	285	Diesel	93
A2-2_Trench-203	CAT 385	Excavators	3	7	513	Diesel	143
A2-2_Trench-204	CAT D6 LGP	Crawler Tractors	3	6	145	Diesel	35
A2-2_Trench-301	CAT 623	Scrapers	1	7	365	Diesel	112
A2-2_Trench-301	CAT 14G	Graders	1	7	200	Diesel	60
A2-2_Trench-301	CAT 815	Rollers	1	7	216	Diesel	60
A2-2_Trench-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	31

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-2_Trench-303	Grove GMK5240	Cranes	1	3	165	Diesel	20
A2-2_Trench-303	Pettibone 944B	Forklifts	1	3	117	Diesel	14
A2-2_Trench-304	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	14
A2-2_Trench-401	Grove GMK5240	Cranes	1	7	165	Diesel	40
A2-2_Trench-401	Pettibone 944B	Forklifts	1	8	117	Diesel	32
A2-2_Trench-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	4	210	Diesel	36
A2-2_Trench-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-2_Trench-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A2-2_Trench-501	Grove GMK5240	Cranes	2	8	165	Diesel	47
A2-2_Trench-501	Pettibone 944B	Forklifts	1	8	117	Diesel	32
A2-2_Trench-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	119
A2-2_Trench-502	Grove GMK5240	Cranes	1	8	165	Diesel	47
A2-2_Trench-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A2-2_Trench-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-3_Aerial4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A2-3_Aerial4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Aerial4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-3_Aerial4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Aerial4-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A2-3_Aerial4-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A2-3_Aerial4-103	CAT 385	Excavators	1	8	513	Diesel	157
A2-3_Aerial4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-3_Aerial4-104	CAT 385	Excavators	1	8	513	Diesel	155
A2-3_Aerial4-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A2-3_Aerial4-201	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	25
A2-3_Aerial4-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	13
A2-3_Aerial4-201	Commachio CH450	Bore/Drill Rigs	2	6	269	Diesel	57
A2-3_Aerial4-201	Grove GMK5240	Cranes	1	6	165	Diesel	38
A2-3_Aerial4-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	39
A2-3_Aerial4-301	Grove GMK5240	Cranes	1	3	165	Diesel	18
A2-3_Aerial4-301	Pettibone 944B	Forklifts	1	2	117	Diesel	9
A2-3_Aerial4-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	18
A2-3_Aerial4-401	Grove GMK5240	Cranes	2	7	165	Diesel	44
A2-3_Aerial4-401	Pettibone 944B	Forklifts	2	7	117	Diesel	29
A2-3_Aerial4-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	19
A2-3_Aerial4-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A2-3_Aerial4-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A2-3_Aerial4-501	Grove GMK5240	Cranes	2	8	165	Diesel	47
A2-3_Aerial4-501	Pettibone 944B	Forklifts	1	8	117	Diesel	31
A2-3_Aerial4-502	Grove GMK5240	Cranes	1	8	165	Diesel	47
A2-3_Aerial4-502	Grove GMK5240	Cranes	1	8	165	Diesel	31
A2-3_Aerial4-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	62
A2-3_Aerial4-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	0

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-3_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A2-3_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A2-3_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A2-3_Aerial2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Aerial2-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A2-3_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A2-3_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	158
A2-3_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-3_Aerial2-104	CAT 385	Excavators	1	8	513	Diesel	156
A2-3_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A2-3_Aerial2-201	CAT 926 E	Rubber Tired Loaders	2	8	110	Diesel	32
A2-3_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
A2-3_Aerial2-201	Commachio CH450	Bore/Drill Rigs	2	8	269	Diesel	72
A2-3_Aerial2-201	Grove GMK5240	Cranes	2	6	165	Diesel	34
A2-3_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A2-3_Aerial2-301	Grove GMK5240	Cranes	1	5	165	Diesel	29
A2-3_Aerial2-301	Pettibone 944B	Forklifts	1	5	117	Diesel	20
A2-3_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A2-3_Aerial2-401	Grove GMK5240	Cranes	5	8	165	Diesel	46
A2-3_Aerial2-401	Pettibone 944B	Forklifts	5	8	117	Diesel	31
A2-3_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	41
A2-3_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	65
A2-3_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	2	8	66	Diesel	16
A2-3_Aerial2-501	Grove GMK5240	Cranes	4	8	165	Diesel	49
A2-3_Aerial2-501	Pettibone 944B	Forklifts	2	8	117	Diesel	32
A2-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	2	8	450	Diesel	121
A2-3_Aerial2-502	Grove GMK5240	Cranes	5	7	165	Diesel	44
A2-3_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	3	6	93	Diesel	24
A2-3_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	49
A2-3_Berm4-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A2-3_Berm4-101	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	26
A2-3_Berm4-101	Hand Compactor	Plate Compactors	1	6	8	Gas	2
A2-3_Berm4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Berm4-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A2-3_Berm4-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	104
A2-3_Berm4-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	30
A2-3_Berm4-103	CAT 385	Excavators	1	8	513	Diesel	151
A2-3_Berm4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	60
A2-3_Berm4-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	31
A2-3_Berm4-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Berm4-201	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-3_Berm4-202	CAT D6 LGP	Crawler Tractors	1	8	145	Diesel	48
A2-3_Berm4-202	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-3_Berm4-202	CAT 815	Rollers	1	8	216	Diesel	61
A2-3_Berm4-202	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-3_Berm4-203	Bobcat S590	Tractors/Loaders/Backhoes	1	6	66	Diesel	11
A2-3_Berm4-203	Hand Compactor	Plate Compactors	1	6	8	Gas	2
A2-3_Berm4-203	Pettibone 944B	Forklifts	1	6	117	Diesel	23
A2-3_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	116
A2-3_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A2-3_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	62
A2-3_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	116
A2-3_Berm2-402	CAT 349F	Excavators	1	8	396	Diesel	124
A2-3_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	31
A2-3_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A2-3_Berm2-101	Ditch Witch RT45	Trenchers	1	7	49	Diesel	14
A2-3_Berm2-101	CAT 926 E	Rubber Tired Loaders	2	7	110	Diesel	28
A2-3_Berm2-101	Hand Compactor	Plate Compactors	1	7	8	Gas	2
A2-3_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Berm2-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A2-3_Berm2-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	104
A2-3_Berm2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A2-3_Berm2-103	CAT 385	Excavators	1	8	513	Diesel	159
A2-3_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-3_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
A2-3_Berm2-201	CAT 926 E	Rubber Tired Loaders	5	8	110	Diesel	30
A2-3_Berm2-201	Grove GMK5240	Cranes	3	6	165	Diesel	38
A2-3_Berm2-202	CAT D6 LGP	Crawler Tractors	10	7	145	Diesel	46
A2-3_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	10	7	66	Diesel	15
A2-3_Berm2-202	CAT 815	Rollers	10	7	216	Diesel	58
A2-3_Berm2-202	Hand Compactor	Plate Compactors	10	7	8	Gas	3
A2-3_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	10	7	66	Diesel	15
A2-3_Berm2-203	Hand Compactor	Plate Compactors	10	7	8	Gas	3
A2-3_Berm2-203	Pettibone 944B	Forklifts	10	7	117	Diesel	29
A2-3_Berm2-401	CAT 988	Rubber Tired Loaders	10	8	375	Diesel	115
A2-3_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	10	8	210	Diesel	61
A2-3_Berm2-401	CAT 815	Rollers	10	8	216	Diesel	61
A2-3_Berm2-401	Jackson Tamper	Other Construction Equipment	10	8	450	Diesel	115
A2-3_Berm2-402	CAT 349F	Excavators	12	8	396	Diesel	120
A2-3_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	12	8	93	Diesel	30
A2-3_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	12	8	210	Diesel	60
A2-3_At Grade2-101	Ditch Witch RT45	Trenchers	1	7	49	Diesel	13
A2-3_At Grade2-101	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	23
A2-3_At Grade2-102	Hand Compactor	Plate Compactors	2	6	8	Gas	2
A2-3_At Grade2-102	CAT D8N	Crawler Tractors	2	5	285	Diesel	61
A2-3_At Grade2-102	CAT 926 E	Rubber Tired Loaders	2	5	110	Diesel	19

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-3_At Grade2-101	Grove GMK5240	Cranes	2	5	165	Diesel	28
A2-3_At Grade2-103	CAT D8N	Crawler Tractors	2	5	285	Diesel	59
A2-3_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	40
A2-3_At Grade2-103	Grove GMK5240	Cranes	2	5	165	Diesel	30
A2-3_At Grade2-201	CAT 623	Scrapers	3	7	365	Diesel	107
A2-3_At Grade2-201	CAT 14G	Graders	3	8	200	Diesel	63
A2-3_At Grade2-201	CAT 815	Rollers	3	8	216	Diesel	63
A2-3_At Grade2-201	Hand Compactor	Plate Compactors	3	7	8	Gas	3
A2-3_At Grade2-301	CAT 988	Rubber Tired Loaders	6	7	375	Diesel	112
A2-3_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	6	7	210	Diesel	60
A2-3_At Grade2-301	CAT 815	Rollers	6	7	216	Diesel	60
A2-3_At Grade2-302	CAT 349F	Excavators	6	7	396	Diesel	112
A2-3_At Grade2-301	Jackson Tamper	Other Construction Equipment	7	7	450	Diesel	109
A2-3_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	7	7	93	Diesel	29
A2-3_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	7	7	210	Diesel	58
A2-3_At Grade2-302	CAT 815	Rollers	7	7	216	Diesel	58
A2-3_At Grade2-302	Hand Compactor	Plate Compactors	7	7	8	Gas	3
A2-3_Trench-101	CAT 385	Excavators	1	5	513	Diesel	97
A2-3_Trench-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A2-3_Trench-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Trench-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A2-3_Trench-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	103
A2-3_Trench-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Trench-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A2-3_Trench-103	CAT D8N	Crawler Tractors	1	2	285	Diesel	26
A2-3_Trench-103	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A2-3_Trench-103	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
A2-3_Trench-103	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A2-3_Trench-103	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	17
A2-3_Trench-103	Commachio CH450	Bore/Drill Rigs	1	8	269	Diesel	72
A2-3_Trench-103	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-3_Trench-104	CAT 988	Rubber Tired Loaders	1	2	375	Diesel	30
A2-3_Trench-104	Commachio CH450	Bore/Drill Rigs	1	8	269	Diesel	72
A2-3_Trench-201	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A2-3_Trench-201	CAT 385	Excavators	1	8	513	Diesel	159
A2-3_Trench-201	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-3_Trench-202	CAT 966	Tractors/Loaders/Backhoes	1	4	210	Diesel	31
A2-3_Trench-202	Grove GMK5240	Cranes	1	4	165	Diesel	24
A2-3_Trench-203	CAT D8N	Crawler Tractors	2	7	285	Diesel	88
A2-3_Trench-203	CAT 385	Excavators	2	7	513	Diesel	135
A2-3_Trench-204	CAT D6 LGP	Crawler Tractors	1	4	145	Diesel	27
A2-3_Trench-301	CAT 623	Scrapers	1	1	365	Diesel	18
A2-3_Trench-301	CAT 14G	Graders	1	1	200	Diesel	9

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-3_Trench-301	CAT 815	Rollers	1	1	216	Diesel	9
A2-3_Trench-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	1	210	Diesel	5
A2-3_Trench-303	Grove GMK5240	Cranes	1	2	165	Diesel	11
A2-3_Trench-303	Pettibone 944B	Forklifts	1	2	117	Diesel	8
A2-3_Trench-304	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	1	210	Diesel	8
A2-3_Trench-401	Grove GMK5240	Cranes	1	4	165	Diesel	21
A2-3_Trench-401	Pettibone 944B	Forklifts	1	4	117	Diesel	17
A2-3_Trench-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	32
A2-3_Trench-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-3_Trench-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A2-3_Trench-501	Grove GMK5240	Cranes	2	8	165	Diesel	48
A2-3_Trench-501	Pettibone 944B	Forklifts	1	8	117	Diesel	32
A2-3_Trench-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	119
A2-3_Trench-502	CAT 349F	Excavators	1	8	396	Diesel	127
A2-3_Trench-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A2-3_Trench-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A2-3_Tunnel-102	CAT 988	Rubber Tired Loaders	1	22	375	Diesel	331
A2-3_Tunnel-102	CAT 966	Tractors/Loaders/Backhoes	1	22	210	Diesel	177
A2-3_Tunnel-102	Grove GMK5240	Cranes	1	22	165	Diesel	132
A2-3_Tunnel-201	Pettibone 944B	Forklifts	2	8	117	Diesel	31
A2-3_Tunnel-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A2-3_Tunnel-301	Pettibone 944B	Forklifts	1	5	117	Diesel	22
A2-3_Tunnel-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A2-3_Tunnel-401	Pettibone 944B	Forklifts	2	5	117	Diesel	22
A2-3_Tunnel-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A2-3_Tunnel-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A2-3_Tunnel-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A2-3_Tunnel-501	Grove GMK5240	Cranes	2	8	165	Diesel	47
A2-3_Tunnel-501	Pettibone 944B	Forklifts	1	8	117	Diesel	31
A2-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	117
A2-3_Tunnel-502	Grove GMK5240	Cranes	2	8	165	Diesel	45
A2-3_Tunnel-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	30
A2-3_Tunnel-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A2-3_Large2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A2-3_Large2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Large2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A2-3_Large2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A2-3_Large2-102	CAT D4	Rubber Tired Loaders	2	8	95	Diesel	32
A2-3_Large2-201	CAT D8N	Crawler Tractors	2	6	285	Diesel	79
A2-3_Large2-201	CAT 385	Excavators	4	7	513	Diesel	145
A2-3_Large2-201	CAT 773G	Off-Highway Trucks	50	7	775	Diesel	218
A2-3_Large2-202	CAT D8N	Crawler Tractors	2	7	285	Diesel	94
A2-3_Large2-202	CAT 623	Scrapers	2	7	365	Diesel	109

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A2-3_Large2-202	CAT 14-H	Graders	2	7	240	Diesel	73
A2-3_Large2-202	CAT 834	Rollers	2	7	450	Diesel	131
A2-3_Large2-202	CAT 825	Rollers	2	7	315	Diesel	87
A2-3_Large2-203	CAT D4	Rubber Tired Loaders	4	7	95	Diesel	29
A2-3_Large2-203	CAT 623	Scrapers	4	7	365	Diesel	109
A2-3_Large2-401	CAT 988	Rubber Tired Loaders	4	7	375	Diesel	107
A2-3_Large2-401	CAT 966	Tractors/Loaders/Backhoes	4	7	210	Diesel	57
A2-3_Large2-401	CAT 815	Rollers	4	7	216	Diesel	57
A2-3_Large2-401	Jackson Tamper	Other Construction Equipment	4	7	450	Diesel	107
A2-3_Large2-402	CAT 349F	Excavators	4	8	396	Diesel	126
A2-3_Large2-402	CAT 420F	Tractors/Loaders/Backhoes	4	8	93	Diesel	32
A2-3_Large2-402	CAT 966	Tractors/Loaders/Backhoes	4	8	210	Diesel	63
A3-3_Aerial4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A3-3_Aerial4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A3-3_Aerial4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A3-3_Aerial4-102	CAT 926 E	Rubber Tired Loaders	2	7	110	Diesel	30
A3-3_Aerial4-102	Grove GMK5240	Cranes	2	7	165	Diesel	45
A3-3_Aerial4-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A3-3_Aerial4-103	CAT 385	Excavators	1	8	513	Diesel	159
A3-3_Aerial4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A3-3_Aerial4-104	CAT 385	Excavators	1	8	513	Diesel	160
A3-3_Aerial4-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A3-3_Aerial4-201	CAT 926 E	Rubber Tired Loaders	4	6	110	Diesel	26
A3-3_Aerial4-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A3-3_Aerial4-201	Commachio CH450	Bore/Drill Rigs	4	6	269	Diesel	58
A3-3_Aerial4-201	Grove GMK5240	Cranes	2	6	165	Diesel	38
A3-3_Aerial4-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	40
A3-3_Aerial4-301	Grove GMK5240	Cranes	1	7	165	Diesel	39
A3-3_Aerial4-301	Pettibone 944B	Forklifts	1	5	117	Diesel	20
A3-3_Aerial4-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	40
A3-3_Aerial4-401	Grove GMK5240	Cranes	8	8	165	Diesel	48
A3-3_Aerial4-401	Pettibone 944B	Forklifts	8	8	117	Diesel	32
A3-3_Aerial4-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	40
A3-3_Aerial4-501	CAT 966	Tractors/Loaders/Backhoes	4	7	210	Diesel	53
A3-3_Aerial4-501	Bobcat S590	Tractors/Loaders/Backhoes	4	7	66	Diesel	13
A3-3_Aerial4-501	Grove GMK5240	Cranes	7	8	165	Diesel	45
A3-3_Aerial4-501	Pettibone 944B	Forklifts	4	7	117	Diesel	26
A3-3_Aerial4-502	Jackson Tamper	Other Construction Equipment	4	7	450	Diesel	99
A3-3_Aerial4-502	Grove GMK5240	Cranes	4	7	165	Diesel	45
A3-3_Aerial4-502	CAT 420F	Tractors/Loaders/Backhoes	4	7	93	Diesel	30
A3-3_Aerial4-502	CAT 966	Tractors/Loaders/Backhoes	4	7	210	Diesel	60
A3-3_Aerial2-101	Ditch Witch RT45	Trenchers	1	3	49	Diesel	7
A3-3_Aerial2-101	CAT 926 E	Rubber Tired Loaders	2	3	110	Diesel	13

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A3-3_Aerial2-101	Hand Compactor	Plate Compactors	1	3	8	Gas	1
A3-3_Aerial2-102	CAT 926 E	Rubber Tired Loaders	3	5	110	Diesel	22
A3-3_Aerial2-102	Grove GMK5240	Cranes	3	5	165	Diesel	33
A3-3_Aerial2-103	CAT D4	Rubber Tired Loaders	1	5	95	Diesel	22
A3-3_Aerial2-103	CAT 385	Excavators	1	5	513	Diesel	110
A3-3_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	5	210	Diesel	44
A3-3_Aerial2-104	CAT 385	Excavators	2	5	513	Diesel	94
A3-3_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	38
A3-3_Aerial2-201	CAT 926 E	Rubber Tired Loaders	10	5	110	Diesel	19
A3-3_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	3	4	210	Diesel	32
A3-3_Aerial2-201	Commachio CH450	Bore/Drill Rigs	10	5	269	Diesel	42
A3-3_Aerial2-201	Grove GMK5240	Cranes	7	5	165	Diesel	28
A3-3_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	40
A3-3_Aerial2-301	Grove GMK5240	Cranes	3	5	165	Diesel	28
A3-3_Aerial2-301	Pettibone 944B	Forklifts	3	5	117	Diesel	19
A3-3_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	5	210	Diesel	39
A3-3_Aerial2-401	Grove GMK5240	Cranes	34	5	165	Diesel	32
A3-3_Aerial2-401	Pettibone 944B	Forklifts	34	5	117	Diesel	21
A3-3_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	10	5	210	Diesel	39
A3-3_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	10	8	210	Diesel	61
A3-3_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	10	8	66	Diesel	15
A3-3_Aerial2-501	Grove GMK5240	Cranes	20	8	165	Diesel	45
A3-3_Aerial2-501	Pettibone 944B	Forklifts	10	8	117	Diesel	30
A3-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	10	8	450	Diesel	114
A3-3_Aerial2-502	Grove GMK5240	Cranes	22	8	165	Diesel	47
A3-3_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	11	8	93	Diesel	31
A3-3_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	11	8	210	Diesel	62
A3-3_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A3-3_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A3-3_At Grade2-102	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A3-3_At Grade2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A3-3_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	27
A3-3_At Grade2-101	Grove GMK5240	Cranes	1	7	165	Diesel	40
A3-3_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93
A3-3_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A3-3_At Grade2-103	Grove GMK5240	Cranes	1	8	165	Diesel	48
A3-3_At Grade2-201	CAT 623	Scrapers	1	7	365	Diesel	110
A3-3_At Grade2-201	CAT 14G	Graders	1	8	200	Diesel	64
A3-3_At Grade2-201	CAT 815	Rollers	1	8	216	Diesel	64
A3-3_At Grade2-201	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A3-3_At Grade2-301	CAT 988	Rubber Tired Loaders	2	7	375	Diesel	108
A3-3_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	2	7	210	Diesel	58
A3-3_At Grade2-301	CAT 815	Rollers	2	7	216	Diesel	58

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A3-3_At Grade2-302	CAT 349F	Excavators	2	7	396	Diesel	106
A3-3_At Grade2-301	Jackson Tamper	Other Construction Equipment	2	8	450	Diesel	119
A3-3_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	2	8	93	Diesel	32
A3-3_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	64
A3-3_At Grade2-302	CAT 815	Rollers	2	8	216	Diesel	64
A3-3_At Grade2-302	Hand Compactor	Plate Compactors	2	8	8	Gas	3
A3-3_Tunnel-102	CAT 988	Rubber Tired Loaders	1	22	375	Diesel	332
A3-3_Tunnel-102	CAT 966	Tractors/Loaders/Backhoes	1	22	210	Diesel	177
A3-3_Tunnel-102	Grove GMK5240	Cranes	1	22	165	Diesel	133
A3-3_Tunnel-201	Pettibone 944B	Forklifts	2	8	117	Diesel	31
A3-3_Tunnel-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A3-3_Tunnel-301	Pettibone 944B	Forklifts	1	5	117	Diesel	22
A3-3_Tunnel-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A3-3_Tunnel-401	Pettibone 944B	Forklifts	2	5	117	Diesel	22
A3-3_Tunnel-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A3-3_Tunnel-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A3-3_Tunnel-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A3-3_Tunnel-501	Grove GMK5240	Cranes	2	8	165	Diesel	47
A3-3_Tunnel-501	Pettibone 944B	Forklifts	1	8	117	Diesel	31
A3-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	117
A3-3_Tunnel-502	Grove GMK5240	Cranes	2	8	165	Diesel	46
A3-3_Tunnel-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	30
A3-3_Tunnel-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A3-3_Large2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A3-3_Large2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	30
A3-3_Large2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A3-3_Large2-102	CAT 926 E	Rubber Tired Loaders	2	4	110	Diesel	17
A3-3_Large2-102	CAT D4	Rubber Tired Loaders	3	6	95	Diesel	23
A3-3_Large2-201	CAT D8N	Crawler Tractors	2	6	285	Diesel	84
A3-3_Large2-201	CAT 385	Excavators	4	8	513	Diesel	155
A3-3_Large2-201	CAT 773G	Off-Highway Trucks	50	8	775	Diesel	232
A3-3_Large2-202	CAT D8N	Crawler Tractors	2	8	285	Diesel	101
A3-3_Large2-202	CAT 623	Scrapers	2	8	365	Diesel	116
A3-3_Large2-202	CAT 14-H	Graders	2	8	240	Diesel	77
A3-3_Large2-202	CAT 834	Rollers	2	8	450	Diesel	139
A3-3_Large2-202	CAT 825	Rollers	2	8	315	Diesel	93
A3-3_Large2-203	CAT D4	Rubber Tired Loaders	4	8	95	Diesel	31
A3-3_Large2-203	CAT 623	Scrapers	4	8	365	Diesel	116
A3-3_Large2-401	CAT 988	Rubber Tired Loaders	4	8	375	Diesel	114
A3-3_Large2-401	CAT 966	Tractors/Loaders/Backhoes	4	8	210	Diesel	61
A3-3_Large2-401	CAT 815	Rollers	4	8	216	Diesel	61
A3-3_Large2-401	Jackson Tamper	Other Construction Equipment	4	8	450	Diesel	114
A3-3_Large2-402	CAT 349F	Excavators	5	7	396	Diesel	110

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A3-3_Large2-402	CAT 420F	Tractors/Loaders/Backhoes	5	7	93	Diesel	28
A3-3_Large2-402	CAT 966	Tractors/Loaders/Backhoes	5	7	210	Diesel	55
EGS-101	CAT D8N	Crawler Tractors	1	6	285	Diesel	78
EGS-101	CAT 385	Excavators	1	8	513	Diesel	160
EGS-101	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
EGS-102	CAT 623	Scrapers	1	8	365	Diesel	120
EGS-102	CAT 14-H	Graders	1	8	240	Diesel	80
EGS-102	CAT 825	Rollers	1	8	315	Diesel	96
EGS-201	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
EGS-201	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
EGS-201	Hand Compactor	Plate Compactors	1	8	8	Gas	3
EGS-202	CAT 385	Excavators	1	8	513	Diesel	160
EGS-202	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
EGS-202	Commachio CH450	Bore/Drill Rigs	1	6	269	Diesel	54
EGS-203	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	18
EGS-301	Grove GMK5240	Cranes	2	8	165	Diesel	48
EGS-301	Pettibone 944B	Forklifts	3	8	117	Diesel	32
EGS-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	1	210	Diesel	5
EGS-302	Grove GMK5240	Cranes	2	6	165	Diesel	36
EGS-302	Pettibone 944B	Forklifts	4	7	117	Diesel	28
EGS-303	Grove GMK5240	Cranes	1	8	165	Diesel	48
EGS-303	Pettibone 944B	Forklifts	3	8	117	Diesel	32
EGS-401	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
EGS-402	CAT AC Paver	Pavers	2	8	154	Diesel	48
EGS-403	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
EGS-403	Pettibone 944B	Forklifts	1	4	117	Diesel	16
DGS-101	CAT D8N	Crawler Tractors	1	6	285	Diesel	78
DGS-101	CAT 385	Excavators	1	8	513	Diesel	160
DGS-101	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
DGS-102	CAT 623	Scrapers	1	8	365	Diesel	120
DGS-102	CAT 14-H	Graders	1	8	240	Diesel	80
DGS-102	CAT 825	Rollers	1	8	315	Diesel	96
DGS-201	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
DGS-201	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
DGS-201	Hand Compactor	Plate Compactors	1	8	8	Gas	3
DGS-202	CAT 385	Excavators	1	8	513	Diesel	160
DGS-202	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
DGS-202	Commachio CH450	Bore/Drill Rigs	1	6	269	Diesel	54
DGS-203	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	18
DGS-301	Grove GMK5240	Cranes	2	8	165	Diesel	48
DGS-301	Pettibone 944B	Forklifts	3	8	117	Diesel	32
DGS-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	1	210	Diesel	5
DGS-302	Grove GMK5240	Cranes	2	6	165	Diesel	36

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
DGS-302	Pettibone 944B	Forklifts	4	7	117	Diesel	28
DGS-303	Grove GMK5240	Cranes	1	8	165	Diesel	48
DGS-303	Pettibone 944B	Forklifts	3	8	117	Diesel	32
DGS-401	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
DGS-402	CAT AC Paver	Pavers	2	8	154	Diesel	48
DGS-403	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
DGS-403	Pettibone 944B	Forklifts	1	4	117	Diesel	16
DS-101	CAT D8N	Crawler Tractors	1	6	285	Diesel	78
DS-101	CAT 385	Excavators	1	8	513	Diesel	160
DS-101	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
DS-102	CAT 623	Scrapers	1	8	365	Diesel	120
DS-102	CAT 14-H	Graders	1	8	240	Diesel	80
DS-102	CAT 825	Rollers	1	8	315	Diesel	96
DS-201	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
DS-201	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
DS-201	Hand Compactor	Plate Compactors	1	8	8	Gas	3
DS-202	CAT 385	Excavators	1	8	513	Diesel	160
DS-202	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
DS-202	Commachio CH450	Bore/Drill Rigs	1	6	269	Diesel	54
DS-203	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	18
DS-301	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	6	210	Diesel	50
DS-301	Grove GMK5240	Cranes	2	8	165	Diesel	48
DS-301	Pettibone 944B	Forklifts	3	8	117	Diesel	32
DS-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	20
DS-302	Grove GMK5240	Cranes	2	7	165	Diesel	43
DS-302	Pettibone 944B	Forklifts	4	8	117	Diesel	32
DS-303	Grove GMK5240	Cranes	1	8	165	Diesel	48
DS-303	Pettibone 944B	Forklifts	3	8	117	Diesel	32
DS-401	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
DS-402	CAT AC Paver	Pavers	1	8	154	Diesel	48
DS-403	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
DS-403	Pettibone 944B	Forklifts	1	4	117	Diesel	16
DS2-101	CAT D8N	Crawler Tractors	1	6	285	Diesel	78
DS2-101	CAT 385	Excavators	1	8	513	Diesel	160
DS2-101	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
DS2-102	CAT 623	Scrapers	1	8	365	Diesel	120
DS2-102	CAT 14-H	Graders	1	8	240	Diesel	80
DS2-102	CAT 825	Rollers	1	8	315	Diesel	96
DS2-201	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
DS2-201	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24
DS2-201	Hand Compactor	Plate Compactors	1	8	8	Gas	3
DS2-202	CAT 385	Excavators	1	8	513	Diesel	160
DS2-202	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	24

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
DS2-202	Commachio CH450	Bore/Drill Rigs	1	6	269	Diesel	54
DS2-203	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	22
DS2-301	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	17
DS2-301	Grove GMK5240	Cranes	2	8	165	Diesel	48
DS2-301	Pettibone 944B	Forklifts	3	8	117	Diesel	32
DS2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
DS2-302	Grove GMK5240	Cranes	2	8	165	Diesel	48
DS2-302	Pettibone 944B	Forklifts	4	8	117	Diesel	32
DS2-303	Grove GMK5240	Cranes	1	8	165	Diesel	48
DS2-303	Pettibone 944B	Forklifts	3	8	117	Diesel	32
DS2-401	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	8	210	Diesel	66
DS2-402	CAT AC Paver	Pavers	1	8	154	Diesel	48
DS2-403	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
DS2-403	Pettibone 944B	Forklifts	1	4	117	Diesel	16
LMF-101	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
LMF-101	CAT 385	Excavators	1	8	513	Diesel	160
LMF-101	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
LMF-102	CAT 623	Scrapers	1	8	365	Diesel	120
LMF-102	CAT 14-H	Graders	1	8	240	Diesel	80
LMF-102	CAT 825	Rollers	2	8	315	Diesel	96
LMF-201	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
LMF-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
LMF-201	Hand Compactor	Plate Compactors	1	8	8	Gas	3
LMF-202	CAT 385	Excavators	1	6	513	Diesel	120
LMF-202	CAT 926 E	Rubber Tired Loaders	1	4	110	Diesel	16
LMF-203	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
LMF-301	Grove GMK5240	Cranes	2	8	165	Diesel	48
LMF-301	Pettibone 944B	Forklifts	2	8	117	Diesel	32
LMF-302	Grove GMK5240	Cranes	2	6	165	Diesel	36
LMF-302	Pettibone 944B	Forklifts	2	8	117	Diesel	32
LMF-303	Grove GMK5240	Cranes	1	8	165	Diesel	48
LMF-303	Pettibone 944B	Forklifts	1	4	117	Diesel	16
LMF-401	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
LMF-402	CAT AC Paver	Pavers	1	6	154	Diesel	36
LMF-403	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
LMF-403	Pettibone 944B	Forklifts	1	4	117	Diesel	16
LMF-501	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
LMF-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
LMF-501	CAT 815	Rollers	1	8	216	Diesel	64
LMF-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	120
LMF-502	CAT 349F	Excavators	1	8	396	Diesel	128
LMF-502	CAT 420F	Tractors/Loaders/Backhoes	2	4	93	Diesel	16
LMF-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
LMF-502	CAT 815	Rollers	1	8	216	Diesel	64
LMF-502	Hand Compactor	Plate Compactors	1	8	8	Gas	3
MOIS-101	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
MOIS-101	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
MOIS-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
MOIS-102	CAT 623	Scrapers	1	8	365	Diesel	120
MOIS-102	CAT 14-H	Graders	1	8	240	Diesel	80
MOIS-102	CAT 825	Rollers	1	8	315	Diesel	96
MOIS-201	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
MOIS-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
MOIS-201	Hand Compactor	Plate Compactors	1	8	8	Gas	3
MOIS-202	CAT 385	Excavators	1	8	513	Diesel	160
MOIS-202	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
MOIS-203	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
MOIS-402	CAT AC Paver	Pavers	1	6	154	Diesel	36
MOIS-403	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
MOIS-403	Pettibone 944B	Forklifts	1	8	117	Diesel	32
MOIS-501	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
MOIS-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
MOIS-501	CAT 815	Rollers	1	8	216	Diesel	64
MOIS-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	120
MOIS-502	CAT 349F	Excavators	1	8	396	Diesel	128
MOIS-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
MOIS-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
PGE-1	Backhoe	Tractors/Loaders/Backhoes	1	8	97	Diesel	0
PGE-1	Bulldozer	Rubber Tired Dozers	1	8	247	Diesel	0
PGE-1	Grader	Graders	1	8	187	Diesel	0
PGE-1	Plate Compactor	Plate Compactors	1	8	8	Gas	0
PGE-2	Bore/drill rig	Bore/Drill Rigs	1	8	221	Diesel	0
PGE-2	Backhoe	Tractors/Loaders/Backhoes	1	8	97	Diesel	0
PGE-2	Pump	Pumps	1	8	84	Diesel	0
PGE-3	RT Forklift	Rough Terrain Forklifts	1	8	100	Diesel	0
PGE-4	Crane	Cranes	2	8	231	Diesel	1
PGE-4	Tractors	Tractors/Loaders/Backhoes	2	8	97	Diesel	0
PGE-5	Crane	Cranes	2	8	231	Diesel	1
PGE-5	Tractors	Tractors/Loaders/Backhoes	2	8	97	Diesel	0
A4-1_Berm4-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A4-1_Berm4-101	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A4-1_Berm4-101	Hand Compactor	Plate Compactors	1	7	8	Gas	2
A4-1_Berm4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A4-1_Berm4-102	Grove GMK5240	Cranes	1	8	165	Diesel	47
A4-1_Berm4-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	102
A4-1_Berm4-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-1_Berm4-103	CAT 385	Excavators	1	8	513	Diesel	159
A4-1_Berm4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-1_Berm4-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
A4-1_Berm4-201	CAT 926 E	Rubber Tired Loaders	2	7	110	Diesel	29
A4-1_Berm4-201	Grove GMK5240	Cranes	1	7	165	Diesel	43
A4-1_Berm4-202	CAT D6 LGP	Crawler Tractors	4	7	145	Diesel	42
A4-1_Berm4-202	Bobcat S590	Tractors/Loaders/Backhoes	4	7	66	Diesel	13
A4-1_Berm4-202	CAT 815	Rollers	4	7	216	Diesel	54
A4-1_Berm4-202	Hand Compactor	Plate Compactors	4	7	8	Gas	2
A4-1_Berm4-203	Bobcat S590	Tractors/Loaders/Backhoes	3	7	66	Diesel	13
A4-1_Berm4-203	Hand Compactor	Plate Compactors	3	7	8	Gas	2
A4-1_Berm4-203	Pettibone 944B	Forklifts	3	7	117	Diesel	27
A4-1_Berm4-401	CAT 988	Rubber Tired Loaders	2	5	375	Diesel	71
A4-1_Berm4-401	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	38
A4-1_Berm4-401	CAT 815	Rollers	2	5	216	Diesel	38
A4-1_Berm4-401	Jackson Tamper	Other Construction Equipment	2	5	450	Diesel	71
A4-1_Berm4-402	CAT 349F	Excavators	3	6	396	Diesel	100
A4-1_Berm4-402	CAT 420F	Tractors/Loaders/Backhoes	3	6	93	Diesel	25
A4-1_Berm4-402	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	50
A4-1_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A4-1_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-1_At Grade2-102	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A4-1_At Grade2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A4-1_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A4-1_At Grade2-102	Grove GMK5240	Cranes	1	7	165	Diesel	40
A4-1_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93
A4-1_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-1_At Grade2-103	Grove GMK5240	Cranes	1	8	165	Diesel	48
A4-1_At Grade2-201	CAT 623	Scrapers	2	5	365	Diesel	79
A4-1_At Grade2-201	CAT 14G	Graders	2	6	200	Diesel	46
A4-1_At Grade2-201	CAT 815	Rollers	2	6	216	Diesel	46
A4-1_At Grade2-201	Hand Compactor	Plate Compactors	2	5	8	Gas	2
A4-1_At Grade2-301	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	120
A4-1_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-1_At Grade2-301	CAT 815	Rollers	1	8	216	Diesel	64
A4-1_At Grade2-302	CAT 349F	Excavators	1	8	396	Diesel	120
A4-1_At Grade2-301	Jackson Tamper	Other Construction Equipment	2	8	450	Diesel	114
A4-1_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	2	8	93	Diesel	30
A4-1_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	61
A4-1_At Grade2-302	CAT 815	Rollers	2	8	216	Diesel	61
A4-1_At Grade2-302	Hand Compactor	Plate Compactors	2	8	8	Gas	3
A4-2_Berm4-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A4-2_Berm4-101	CAT 926 E	Rubber Tired Loaders	1	6	110	Diesel	26

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-2_Berm4-101	Hand Compactor	Plate Compactors	1	6	8	Gas	2
A4-2_Berm4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	30
A4-2_Berm4-102	Grove GMK5240	Cranes	1	8	165	Diesel	45
A4-2_Berm4-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	98
A4-2_Berm4-103	CAT D4	Rubber Tired Loaders	1	7	95	Diesel	29
A4-2_Berm4-103	CAT 385	Excavators	1	7	513	Diesel	144
A4-2_Berm4-103	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	57
A4-2_Berm4-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	30
A4-2_Berm4-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-2_Berm4-201	Grove GMK5240	Cranes	1	4	165	Diesel	24
A4-2_Berm4-202	CAT D6 LGP	Crawler Tractors	2	5	145	Diesel	29
A4-2_Berm4-202	Bobcat S590	Tractors/Loaders/Backhoes	2	5	66	Diesel	9
A4-2_Berm4-202	CAT 815	Rollers	2	5	216	Diesel	36
A4-2_Berm4-202	Hand Compactor	Plate Compactors	2	5	8	Gas	2
A4-2_Berm4-203	Bobcat S590	Tractors/Loaders/Backhoes	1	7	66	Diesel	13
A4-2_Berm4-203	Hand Compactor	Plate Compactors	1	7	8	Gas	2
A4-2_Berm4-203	Pettibone 944B	Forklifts	1	7	117	Diesel	27
A4-2_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	117
A4-2_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A4-2_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	62
A4-2_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	117
A4-2_Berm2-402	CAT 349F	Excavators	1	8	396	Diesel	124
A4-2_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	31
A4-2_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A4-2_Berm2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A4-2_Berm2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-2_Berm2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A4-2_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A4-2_Berm2-102	Grove GMK5240	Cranes	1	8	165	Diesel	47
A4-2_Berm2-102	CAT D8N	Crawler Tractors	1	8	285	Diesel	102
A4-2_Berm2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A4-2_Berm2-103	CAT 385	Excavators	1	8	513	Diesel	159
A4-2_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-2_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
A4-2_Berm2-201	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	24
A4-2_Berm2-201	Grove GMK5240	Cranes	1	6	165	Diesel	36
A4-2_Berm2-202	CAT D6 LGP	Crawler Tractors	3	8	145	Diesel	50
A4-2_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	3	8	66	Diesel	16
A4-2_Berm2-202	CAT 815	Rollers	3	8	216	Diesel	64
A4-2_Berm2-202	Hand Compactor	Plate Compactors	3	8	8	Gas	3
A4-2_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	3	8	66	Diesel	16
A4-2_Berm2-203	Hand Compactor	Plate Compactors	3	8	8	Gas	3
A4-2_Berm2-203	Pettibone 944B	Forklifts	3	8	117	Diesel	32

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-2_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	119
A4-2_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A4-2_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	63
A4-2_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	119
A4-2_Berm2-402	CAT 349F	Excavators	2	8	396	Diesel	125
A4-2_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	2	8	93	Diesel	31
A4-2_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	63
A4-2_At Grade4-101	Ditch Witch RT45	Trenchers	2	7	49	Diesel	14
A4-2_At Grade4-101	CAT 926 E	Rubber Tired Loaders	3	8	110	Diesel	32
A4-2_At Grade4-101	Hand Compactor	Plate Compactors	3	8	8	Gas	3
A4-2_At Grade4-102	CAT D8N	Crawler Tractors	3	8	285	Diesel	104
A4-2_At Grade4-102	CAT 926 E	Rubber Tired Loaders	3	8	110	Diesel	32
A4-2_At Grade4-102	Grove GMK5240	Cranes	3	8	165	Diesel	48
A4-2_At Grade4-103	CAT D8N	Crawler Tractors	3	6	285	Diesel	84
A4-2_At Grade4-103	CAT 966	Tractors/Loaders/Backhoes	3	7	210	Diesel	57
A4-2_At Grade4-103	Grove GMK5240	Cranes	2	5	165	Diesel	32
A4-2_At Grade4-201	CAT 623	Scrapers	7	7	365	Diesel	110
A4-2_At Grade4-201	CAT 14G	Graders	7	8	200	Diesel	64
A4-2_At Grade4-201	CAT 815	Rollers	7	8	216	Diesel	64
A4-2_At Grade4-201	Hand Compactor	Plate Compactors	7	7	8	Gas	3
A4-2_At Grade4-301	CAT 988	Rubber Tired Loaders	5	7	375	Diesel	102
A4-2_At Grade4-301	CAT 966	Tractors/Loaders/Backhoes	5	7	210	Diesel	55
A4-2_At Grade4-301	CAT 815	Rollers	5	7	216	Diesel	55
A4-2_At Grade4-301	Jackson Tamper	Other Construction Equipment	9	7	450	Diesel	110
A4-2_At Grade4-302	CAT 349F	Excavators	9	7	396	Diesel	118
A4-2_At Grade4-302	CAT 420F	Tractors/Loaders/Backhoes	9	7	93	Diesel	29
A4-2_At Grade4-302	CAT 966	Tractors/Loaders/Backhoes	9	7	210	Diesel	59
A4-2_At Grade4-302	CAT 815	Rollers	9	7	216	Diesel	59
A4-2_At Grade4-302	Hand Compactor	Plate Compactors	9	7	8	Gas	3
A4-3_Aerial4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	10
A4-3_Aerial4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-3_Aerial4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A4-3_Aerial4-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-3_Aerial4-102	Grove GMK5240	Cranes	1	8	165	Diesel	47
A4-3_Aerial4-103	CAT D4	Rubber Tired Loaders	1	7	95	Diesel	30
A4-3_Aerial4-103	CAT 385	Excavators	1	7	513	Diesel	149
A4-3_Aerial4-103	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	60
A4-3_Aerial4-104	CAT 385	Excavators	1	8	513	Diesel	159
A4-3_Aerial4-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-3_Aerial4-201	CAT 926 E	Rubber Tired Loaders	2	6	110	Diesel	26
A4-3_Aerial4-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	13
A4-3_Aerial4-201	Commachio CH450	Bore/Drill Rigs	2	6	269	Diesel	58
A4-3_Aerial4-201	Grove GMK5240	Cranes	1	6	165	Diesel	38

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-3_Aerial4-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	40
A4-3_Aerial4-301	Grove GMK5240	Cranes	1	3	165	Diesel	19
A4-3_Aerial4-301	Pettibone 944B	Forklifts	1	2	117	Diesel	9
A4-3_Aerial4-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	18
A4-3_Aerial4-401	Grove GMK5240	Cranes	2	6	165	Diesel	34
A4-3_Aerial4-401	Pettibone 944B	Forklifts	2	6	117	Diesel	22
A4-3_Aerial4-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	2	210	Diesel	14
A4-3_Aerial4-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-3_Aerial4-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A4-3_Aerial4-501	Grove GMK5240	Cranes	2	8	165	Diesel	48
A4-3_Aerial4-501	Pettibone 944B	Forklifts	1	8	117	Diesel	32
A4-3_Aerial4-502	Grove GMK5240	Cranes	1	8	165	Diesel	119
A4-3_Aerial4-502	Grove GMK5240	Cranes	1	8	165	Diesel	48
A4-3_Aerial4-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	32
A4-3_Aerial4-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-3_Aerial2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A4-3_Aerial2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-3_Aerial2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A4-3_Aerial2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-3_Aerial2-102	Grove GMK5240	Cranes	1	8	165	Diesel	48
A4-3_Aerial2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	32
A4-3_Aerial2-103	CAT 385	Excavators	1	8	513	Diesel	158
A4-3_Aerial2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	63
A4-3_Aerial2-104	CAT 385	Excavators	1	8	513	Diesel	160
A4-3_Aerial2-104	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-3_Aerial2-201	CAT 926 E	Rubber Tired Loaders	2	8	110	Diesel	32
A4-3_Aerial2-201	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	33
A4-3_Aerial2-201	Commachio CH450	Bore/Drill Rigs	2	8	269	Diesel	72
A4-3_Aerial2-201	Grove GMK5240	Cranes	2	6	165	Diesel	33
A4-3_Aerial2-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A4-3_Aerial2-301	Grove GMK5240	Cranes	1	5	165	Diesel	29
A4-3_Aerial2-301	Pettibone 944B	Forklifts	1	5	117	Diesel	19
A4-3_Aerial2-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	27
A4-3_Aerial2-401	Grove GMK5240	Cranes	6	8	165	Diesel	46
A4-3_Aerial2-401	Pettibone 944B	Forklifts	6	8	117	Diesel	31
A4-3_Aerial2-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	2	6	210	Diesel	49
A4-3_Aerial2-501	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	51
A4-3_Aerial2-501	Bobcat S590	Tractors/Loaders/Backhoes	3	6	66	Diesel	13
A4-3_Aerial2-501	Grove GMK5240	Cranes	5	8	165	Diesel	46
A4-3_Aerial2-501	Pettibone 944B	Forklifts	3	6	117	Diesel	26
A4-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	3	6	450	Diesel	97
A4-3_Aerial2-502	Grove GMK5240	Cranes	6	7	165	Diesel	44
A4-3_Aerial2-502	CAT 420F	Tractors/Loaders/Backhoes	3	7	93	Diesel	29

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-3_Aerial2-502	CAT 966	Tractors/Loaders/Backhoes	3	7	210	Diesel	58
A4-3_Berm4-101	Ditch Witch RT45	Trenchers	2	8	49	Diesel	15
A4-3_Berm4-101	CAT 926 E	Rubber Tired Loaders	4	6	110	Diesel	25
A4-3_Berm4-101	Hand Compactor	Plate Compactors	4	6	8	Gas	2
A4-3_Berm4-102	CAT 926 E	Rubber Tired Loaders	3	7	110	Diesel	27
A4-3_Berm4-102	Grove GMK5240	Cranes	3	7	165	Diesel	40
A4-3_Berm4-102	CAT D8N	Crawler Tractors	3	7	285	Diesel	87
A4-3_Berm4-103	CAT D4	Rubber Tired Loaders	2	5	95	Diesel	21
A4-3_Berm4-103	CAT 385	Excavators	2	5	513	Diesel	104
A4-3_Berm4-103	CAT 966	Tractors/Loaders/Backhoes	2	5	210	Diesel	41
A4-3_Berm4-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	5	210	Diesel	43
A4-3_Berm4-201	CAT 926 E	Rubber Tired Loaders	9	8	110	Diesel	32
A4-3_Berm4-201	Grove GMK5240	Cranes	5	7	165	Diesel	44
A4-3_Berm4-202	CAT D6 LGP	Crawler Tractors	21	8	145	Diesel	50
A4-3_Berm4-202	Bobcat S590	Tractors/Loaders/Backhoes	21	8	66	Diesel	16
A4-3_Berm4-202	CAT 815	Rollers	21	8	216	Diesel	64
A4-3_Berm4-202	Hand Compactor	Plate Compactors	21	8	8	Gas	3
A4-3_Berm4-203	Bobcat S590	Tractors/Loaders/Backhoes	20	6	66	Diesel	12
A4-3_Berm4-203	Hand Compactor	Plate Compactors	20	6	8	Gas	2
A4-3_Berm4-203	Pettibone 944B	Forklifts	20	6	117	Diesel	24
A4-3_Berm2-401	CAT 988	Rubber Tired Loaders	22	8	375	Diesel	119
A4-3_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	22	8	210	Diesel	63
A4-3_Berm2-401	CAT 815	Rollers	22	8	216	Diesel	63
A4-3_Berm2-401	Jackson Tamper	Other Construction Equipment	22	8	450	Diesel	119
A4-3_Berm2-402	CAT 349F	Excavators	25	8	396	Diesel	126
A4-3_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	25	8	93	Diesel	31
A4-3_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	25	8	210	Diesel	63
A4-3_Berm2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A4-3_Berm2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A4-3_Berm2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A4-3_Berm2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	29
A4-3_Berm2-102	Grove GMK5240	Cranes	1	7	165	Diesel	44
A4-3_Berm2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	96
A4-3_Berm2-103	CAT D4	Rubber Tired Loaders	1	8	95	Diesel	31
A4-3_Berm2-103	CAT 385	Excavators	1	8	513	Diesel	156
A4-3_Berm2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A4-3_Berm2-104	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	4	210	Diesel	32
A4-3_Berm2-201	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A4-3_Berm2-201	Grove GMK5240	Cranes	1	4	165	Diesel	23
A4-3_Berm2-202	CAT D6 LGP	Crawler Tractors	1	8	145	Diesel	48
A4-3_Berm2-202	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A4-3_Berm2-202	CAT 815	Rollers	1	8	216	Diesel	61
A4-3_Berm2-202	Hand Compactor	Plate Compactors	1	8	8	Gas	3

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-3_Berm2-203	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	15
A4-3_Berm2-203	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A4-3_Berm2-203	Pettibone 944B	Forklifts	1	8	117	Diesel	30
A4-3_Berm2-401	CAT 988	Rubber Tired Loaders	1	8	375	Diesel	114
A4-3_Berm2-401	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A4-3_Berm2-401	CAT 815	Rollers	1	8	216	Diesel	61
A4-3_Berm2-401	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	114
A4-3_Berm2-402	CAT 349F	Excavators	1	8	396	Diesel	121
A4-3_Berm2-402	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	30
A4-3_Berm2-402	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A4-3_At Grade4-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A4-3_At Grade4-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-3_At Grade4-101	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A4-3_At Grade4-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	86
A4-3_At Grade4-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	26
A4-3_At Grade4-102	Grove GMK5240	Cranes	1	7	165	Diesel	40
A4-3_At Grade4-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	91
A4-3_At Grade4-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A4-3_At Grade4-103	Grove GMK5240	Cranes	1	4	165	Diesel	23
A4-3_At Grade4-201	CAT 623	Scrapers	1	7	365	Diesel	105
A4-3_At Grade4-201	CAT 14G	Graders	1	8	200	Diesel	61
A4-3_At Grade4-201	CAT 815	Rollers	1	8	216	Diesel	61
A4-3_At Grade4-201	Hand Compactor	Plate Compactors	1	7	8	Gas	2
A4-3_At Grade4-301	CAT 988	Rubber Tired Loaders	1	7	375	Diesel	112
A4-3_At Grade4-301	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	60
A4-3_At Grade4-301	CAT 815	Rollers	1	7	216	Diesel	60
A4-3_At Grade4-301	Jackson Tamper	Other Construction Equipment	1	7	450	Diesel	112
A4-3_At Grade4-302	CAT 349F	Excavators	1	7	396	Diesel	119
A4-3_At Grade4-302	CAT 420F	Tractors/Loaders/Backhoes	1	7	93	Diesel	30
A4-3_At Grade4-302	CAT 966	Tractors/Loaders/Backhoes	1	7	210	Diesel	60
A4-3_At Grade4-302	CAT 815	Rollers	1	7	216	Diesel	60
A4-3_At Grade4-302	Hand Compactor	Plate Compactors	1	7	8	Gas	3
A4-3_At Grade2-101	Ditch Witch RT45	Trenchers	1	5	49	Diesel	9
A4-3_At Grade2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-3_At Grade2-102	Hand Compactor	Plate Compactors	1	8	8	Gas	3
A4-3_At Grade2-102	CAT D8N	Crawler Tractors	1	7	285	Diesel	87
A4-3_At Grade2-102	CAT 926 E	Rubber Tired Loaders	1	7	110	Diesel	27
A4-3_At Grade2-101	Grove GMK5240	Cranes	1	7	165	Diesel	40
A4-3_At Grade2-103	CAT D8N	Crawler Tractors	1	7	285	Diesel	93
A4-3_At Grade2-103	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	64
A4-3_At Grade2-103	Grove GMK5240	Cranes	1	8	165	Diesel	48
A4-3_At Grade2-201	CAT 623	Scrapers	2	5	365	Diesel	69
A4-3_At Grade2-201	CAT 14G	Graders	2	5	200	Diesel	40

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-3_At Grade2-201	CAT 815	Rollers	2	5	216	Diesel	40
A4-3_At Grade2-201	Hand Compactor	Plate Compactors	2	5	8	Gas	2
A4-3_At Grade2-301	CAT 988	Rubber Tired Loaders	3	6	375	Diesel	96
A4-3_At Grade2-301	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	51
A4-3_At Grade2-301	CAT 815	Rollers	3	6	216	Diesel	51
A4-3_At Grade2-302	CAT 349F	Excavators	3	6	396	Diesel	96
A4-3_At Grade2-301	Jackson Tamper	Other Construction Equipment	3	7	450	Diesel	108
A4-3_At Grade2-302	CAT 420F	Tractors/Loaders/Backhoes	3	7	93	Diesel	29
A4-3_At Grade2-302	CAT 966	Tractors/Loaders/Backhoes	3	7	210	Diesel	58
A4-3_At Grade2-302	CAT 815	Rollers	3	7	216	Diesel	58
A4-3_At Grade2-302	Hand Compactor	Plate Compactors	3	7	8	Gas	3
A4-3_Tunnel-102	CAT 988	Rubber Tired Loaders	1	22	375	Diesel	331
A4-3_Tunnel-102	CAT 966	Tractors/Loaders/Backhoes	1	22	210	Diesel	177
A4-3_Tunnel-102	Grove GMK5240	Cranes	1	22	165	Diesel	132
A4-3_Tunnel-201	Pettibone 944B	Forklifts	2	8	117	Diesel	31
A4-3_Tunnel-202	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A4-3_Tunnel-301	Pettibone 944B	Forklifts	1	5	117	Diesel	22
A4-3_Tunnel-302	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A4-3_Tunnel-401	Pettibone 944B	Forklifts	2	5	117	Diesel	22
A4-3_Tunnel-402	Concrete Pump, Truck Mtd, 117 cy/hr	Pumps	1	3	210	Diesel	24
A4-3_Tunnel-501	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	62
A4-3_Tunnel-501	Bobcat S590	Tractors/Loaders/Backhoes	1	8	66	Diesel	16
A4-3_Tunnel-501	Grove GMK5240	Cranes	2	8	165	Diesel	47
A4-3_Tunnel-501	Pettibone 944B	Forklifts	1	8	117	Diesel	31
A4-3_Aerial2-501	Jackson Tamper	Other Construction Equipment	1	8	450	Diesel	117
A4-3_Tunnel-502	Grove GMK5240	Cranes	2	8	165	Diesel	45
A4-3_Tunnel-502	CAT 420F	Tractors/Loaders/Backhoes	1	8	93	Diesel	30
A4-3_Tunnel-502	CAT 966	Tractors/Loaders/Backhoes	1	8	210	Diesel	61
A4-3_Large2-101	Ditch Witch RT45	Trenchers	1	4	49	Diesel	8
A4-3_Large2-101	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	31
A4-3_Large2-101	Hand Compactor	Plate Compactors	1	4	8	Gas	1
A4-3_Large2-102	CAT 926 E	Rubber Tired Loaders	1	8	110	Diesel	32
A4-3_Large2-102	CAT D4	Rubber Tired Loaders	2	8	95	Diesel	32
A4-3_Large2-201	CAT D8N	Crawler Tractors	1	7	285	Diesel	88
A4-3_Large2-201	CAT 385	Excavators	2	8	513	Diesel	160
A4-3_Large2-201	CAT 773G	Off-Highway Trucks	26	8	775	Diesel	234
A4-3_Large2-202	CAT D8N	Crawler Tractors	1	8	285	Diesel	104
A4-3_Large2-202	CAT 623	Scrapers	1	8	365	Diesel	120
A4-3_Large2-202	CAT 14-H	Graders	1	8	240	Diesel	80
A4-3_Large2-202	CAT 834	Rollers	1	8	450	Diesel	144
A4-3_Large2-202	CAT 825	Rollers	1	8	315	Diesel	96
A4-3_Large2-203	CAT D4	Rubber Tired Loaders	2	8	95	Diesel	32
A4-3_Large2-203	CAT 623	Scrapers	2	8	365	Diesel	120

Code	Equipment	Equipment Category	#/day	hrs/day	HP	Fuel	Fuel (gal/day/eq)
A4-3_Large2-401	CAT 988	Rubber Tired Loaders	2	8	375	Diesel	120
A4-3_Large2-401	CAT 966	Tractors/Loaders/Backhoes	2	8	210	Diesel	64
A4-3_Large2-401	CAT 815	Rollers	2	8	216	Diesel	64
A4-3_Large2-401	Jackson Tamper	Other Construction Equipment	2	8	450	Diesel	120
A4-3_Large2-402	CAT 349F	Excavators	3	6	396	Diesel	96
A4-3_Large2-402	CAT 420F	Tractors/Loaders/Backhoes	3	6	93	Diesel	24
A4-3_Large2-402	CAT 966	Tractors/Loaders/Backhoes	3	6	210	Diesel	48

Employees

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A1-1_Aerial4-101	27	72	Gas	60
A1-1_Aerial4-102	32	72	Gas	71
A1-1_Aerial4-103	51	72	Gas	112
A1-1_Aerial4-104	77	72	Gas	171
A1-1_Aerial4-201	30	72	Gas	66
A1-1_Aerial4-202	10	72	Gas	22
A1-1_Aerial4-301	18	72	Gas	40
A1-1_Aerial4-302	16	72	Gas	35
A1-1_Aerial4-401	79	72	Gas	176
A1-1_Aerial4-402	34	72	Gas	75
A1-1_Aerial4-501	36	72	Gas	79
A1-1_Aerial4-502	14	72	Gas	31
A1-1_Aerial2-101	27	72	Gas	60
A1-1_Aerial2-102	32	72	Gas	70
A1-1_Aerial2-103	53	72	Gas	118
A1-1_Aerial2-104	76	72	Gas	168
A1-1_Aerial2-201	43	72	Gas	96
A1-1_Aerial2-202	15	72	Gas	32
A1-1_Aerial2-301	27	72	Gas	59
A1-1_Aerial2-302	23	72	Gas	51
A1-1_Aerial2-401	214	72	Gas	473
A1-1_Aerial2-402	81	72	Gas	179
A1-1_Aerial2-501	51	72	Gas	114
A1-1_Aerial2-502	25	72	Gas	56
A1-1_Berm2-101	29	72	Gas	65
A1-1_Berm2-102	30	72	Gas	66
A1-1_Berm2-103	33	72	Gas	74
A1-1_Berm2-104	24	72	Gas	53
A1-1_Berm2-201	23	72	Gas	50
A1-1_Berm2-202	122	72	Gas	270
A1-1_Berm2-203	14	72	Gas	32
A1-1_Berm2-401	117	72	Gas	258
A1-1_Berm2-402	15	72	Gas	34
A1-1_At Grade4-101	25	72	Gas	56
A1-1_At Grade4-102	27	72	Gas	61
A1-1_At Grade4-103	70	72	Gas	155
A1-1_At Grade4-201	168	72	Gas	372
A1-1_At Grade4-301	110	72	Gas	244
A1-1_At Grade4-302	29	72	Gas	64
A1-1_At Grade2-101	27	72	Gas	60
A1-1_At Grade2-102	29	72	Gas	65
A1-1_At Grade2-103	73	72	Gas	163
A1-1_At Grade2-201	205	72	Gas	454
A1-1_At Grade2-301	165	72	Gas	365
A1-1_At Grade2-302	42	72	Gas	94

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A1-2_Aerial2-101	28	72	Gas	62
A1-2_Aerial2-102	48	72	Gas	105
A1-2_Aerial2-103	56	72	Gas	125
A1-2_Aerial2-104	128	72	Gas	283
A1-2_Aerial2-201	114	72	Gas	252
A1-2_Aerial2-202	38	72	Gas	85
A1-2_Aerial2-301	69	72	Gas	152
A1-2_Aerial2-302	59	72	Gas	131
A1-2_Aerial2-401	549	72	Gas	1216
A1-2_Aerial2-402	208	72	Gas	460
A1-2_Aerial2-501	132	72	Gas	292
A1-2_Aerial2-502	65	72	Gas	144
A1-2_Berm2-101	28	72	Gas	61
A1-2_Berm2-102	32	72	Gas	71
A1-2_Berm2-103	26	72	Gas	58
A1-2_Berm2-104	19	72	Gas	42
A1-2_Berm2-201	33	72	Gas	72
A1-2_Berm2-202	343	72	Gas	759
A1-2_Berm2-203	40	72	Gas	89
A1-2_Berm2-401	111	72	Gas	245
A1-2_Berm2-402	34	72	Gas	76
A1-2_At Grade4-101	26	72	Gas	57
A1-2_At Grade4-102	28	72	Gas	61
A1-2_At Grade4-103	69	72	Gas	153
A1-2_At Grade4-201	112	72	Gas	247
A1-2_At Grade4-301	109	72	Gas	241
A1-2_At Grade4-302	20	72	Gas	43
A1-2_At Grade2-101	26	72	Gas	57
A1-2_At Grade2-102	28	72	Gas	62
A1-2_At Grade2-103	70	72	Gas	155
A1-2_At Grade2-201	130	72	Gas	287
A1-2_At Grade2-301	107	72	Gas	236
A1-2_At Grade2-302	21	72	Gas	46
A1-3_Aerial4-101	28	72	Gas	61
A1-3_Aerial4-102	32	72	Gas	70
A1-3_Aerial4-103	55	72	Gas	122
A1-3_Aerial4-104	77	72	Gas	171
A1-3_Aerial4-201	30	72	Gas	66
A1-3_Aerial4-202	10	72	Gas	21
A1-3_Aerial4-301	17	72	Gas	37
A1-3_Aerial4-302	14	72	Gas	30
A1-3_Aerial4-401	81	72	Gas	179
A1-3_Aerial4-402	17	72	Gas	38
A1-3_Aerial4-501	41	72	Gas	92
A1-3_Aerial4-502	18	72	Gas	40
A1-3_Aerial2-101	34	72	Gas	75
A1-3_Aerial2-102	96	72	Gas	212

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A1-3_Aerial2-103	56	72	Gas	124
A1-3_Aerial2-104	134	72	Gas	296
A1-3_Aerial2-201	128	72	Gas	283
A1-3_Aerial2-202	42	72	Gas	92
A1-3_Aerial2-301	73	72	Gas	160
A1-3_Aerial2-302	62	72	Gas	138
A1-3_Aerial2-401	963	72	Gas	2131
A1-3_Aerial2-402	203	72	Gas	450
A1-3_Aerial2-501	497	72	Gas	1100
A1-3_Aerial2-502	218	72	Gas	483
A1-3_At Grade4-101	26	72	Gas	57
A1-3_At Grade4-102	28	72	Gas	61
A1-3_At Grade4-103	68	72	Gas	151
A1-3_At Grade4-201	111	72	Gas	245
A1-3_At Grade4-301	108	72	Gas	239
A1-3_At Grade4-302	14	72	Gas	30
A1-3_At Grade2-101	26	72	Gas	57
A1-3_At Grade2-102	28	72	Gas	62
A1-3_At Grade2-103	69	72	Gas	153
A1-3_At Grade2-201	112	72	Gas	247
A1-3_At Grade2-301	110	72	Gas	244
A1-3_At Grade2-302	18	72	Gas	39
A1-3_Tunnel-101	28	72	Gas	61
A1-3_Tunnel-102	192	72	Gas	424
A1-3_Tunnel-201	32	72	Gas	70
A1-3_Tunnel-202	9	72	Gas	19
A1-3_Tunnel-301	19	72	Gas	42
A1-3_Tunnel-302	9	72	Gas	19
A1-3_Tunnel-401	18	72	Gas	39
A1-3_Tunnel-402	9	72	Gas	19
A1-3_Tunnel-501	23	72	Gas	52
A1-3_Tunnel-502	13	72	Gas	29
A1-3_Large2-101	28	72	Gas	62
A1-3_Large2-102	20	72	Gas	44
A1-3_Large2-201	78	72	Gas	173
A1-3_Large2-202	78	72	Gas	173
A1-3_Large2-203	8	72	Gas	18
A1-3_Large2-401	227	72	Gas	503
A1-3_Large2-402	41	72	Gas	91
A1-4_Aerial4-101	28	72	Gas	66
A1-4_Aerial4-102	32	72	Gas	77
A1-4_Aerial4-103	55	72	Gas	131
A1-4_Aerial4-104	77	72	Gas	185
A1-4_Aerial4-201	30	72	Gas	72
A1-4_Aerial4-202	10	72	Gas	23
A1-4_Aerial4-301	17	72	Gas	42
A1-4_Aerial4-302	15	72	Gas	36

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A1-4_Aerial4-401	74	72	Gas	178
A1-4_Aerial4-402	16	72	Gas	38
A1-4_Aerial4-501	38	72	Gas	91
A1-4_Aerial4-502	17	72	Gas	40
A1-4_Aerial2-101	27	72	Gas	65
A1-4_Aerial2-102	32	72	Gas	76
A1-4_Aerial2-103	55	72	Gas	133
A1-4_Aerial2-104	75	72	Gas	181
A1-4_Aerial2-201	30	72	Gas	71
A1-4_Aerial2-202	10	72	Gas	24
A1-4_Aerial2-301	17	72	Gas	42
A1-4_Aerial2-302	15	72	Gas	36
A1-4_Aerial2-401	73	72	Gas	175
A1-4_Aerial2-402	15	72	Gas	37
A1-4_Aerial2-501	37	72	Gas	90
A1-4_Aerial2-502	16	72	Gas	39
A1-4_At Grade2-101	25	72	Gas	60
A1-4_At Grade2-102	27	72	Gas	64
A1-4_At Grade2-103	69	72	Gas	167
A1-4_At Grade2-201	112	72	Gas	269
A1-4_At Grade2-301	107	72	Gas	258
A1-4_At Grade2-302	17	72	Gas	42
A1-4_Tunnel-101	49	72	Gas	117
A1-4_Tunnel-102	337	72	Gas	811
A1-4_Tunnel-201	147	72	Gas	353
A1-4_Tunnel-202	38	72	Gas	92
A1-4_Tunnel-301	87	72	Gas	210
A1-4_Tunnel-302	38	72	Gas	92
A1-4_Tunnel-401	81	72	Gas	195
A1-4_Tunnel-402	38	72	Gas	92
A1-4_Tunnel-501	198	72	Gas	475
A1-4_Tunnel-502	112	72	Gas	269
A1-4_Large2-101	28	72	Gas	67
A1-4_Large2-102	20	72	Gas	48
A1-4_Large2-201	138	72	Gas	333
A1-4_Large2-202	138	72	Gas	333
A1-4_Large2-203	15	72	Gas	35
A1-4_Large2-401	384	72	Gas	923
A1-4_Large2-402	70	72	Gas	167
A1-5_Aerial2-101	28	72	Gas	66
A1-5_Aerial2-102	32	72	Gas	77
A1-5_Aerial2-103	55	72	Gas	133
A1-5_Aerial2-104	78	72	Gas	187
A1-5_Aerial2-201	30	72	Gas	72
A1-5_Aerial2-202	10	72	Gas	24
A1-5_Aerial2-301	17	72	Gas	41
A1-5_Aerial2-302	15	72	Gas	35

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A1-5_Aerial2-401	197	72	Gas	474
A1-5_Aerial2-402	42	72	Gas	100
A1-5_Aerial2-501	101	72	Gas	244
A1-5_Aerial2-502	44	72	Gas	107
A1-5_Berm2-101	28	72	Gas	67
A1-5_Berm2-102	30	72	Gas	72
A1-5_Berm2-103	25	72	Gas	60
A1-5_Berm2-104	18	72	Gas	43
A1-5_Berm2-201	22	72	Gas	53
A1-5_Berm2-202	120	72	Gas	287
A1-5_Berm2-203	14	72	Gas	34
A1-5_Berm2-401	111	72	Gas	266
A1-5_Berm2-402	18	72	Gas	43
A1-5_Large2-101	28	72	Gas	66
A1-5_Large2-102	20	72	Gas	48
A1-5_Large2-201	236	72	Gas	568
A1-5_Large2-202	236	72	Gas	568
A1-5_Large2-203	25	72	Gas	60
A1-5_Large2-401	655	72	Gas	1574
A1-5_Large2-402	119	72	Gas	286
A2-1_Aerial4-101	27	72	Gas	60
A2-1_Aerial4-102	31	72	Gas	69
A2-1_Aerial4-103	51	72	Gas	113
A2-1_Aerial4-104	77	72	Gas	172
A2-1_Aerial4-201	30	72	Gas	66
A2-1_Aerial4-202	11	72	Gas	25
A2-1_Aerial4-301	20	72	Gas	44
A2-1_Aerial4-302	18	72	Gas	40
A2-1_Aerial4-401	80	72	Gas	177
A2-1_Aerial4-402	34	72	Gas	76
A2-1_Aerial4-501	36	72	Gas	79
A2-1_Aerial4-502	14	72	Gas	31
A2-1_Aerial2-101	28	72	Gas	61
A2-1_Aerial2-102	40	72	Gas	88
A2-1_Aerial2-103	54	72	Gas	119
A2-1_Aerial2-104	99	72	Gas	220
A2-1_Aerial2-201	89	72	Gas	196
A2-1_Aerial2-202	30	72	Gas	66
A2-1_Aerial2-301	55	72	Gas	122
A2-1_Aerial2-302	47	72	Gas	104
A2-1_Aerial2-401	439	72	Gas	972
A2-1_Aerial2-402	166	72	Gas	367
A2-1_Aerial2-501	105	72	Gas	234
A2-1_Aerial2-502	52	72	Gas	115
A2-1_Berm2-101	29	72	Gas	63
A2-1_Berm2-102	29	72	Gas	64
A2-1_Berm2-103	33	72	Gas	72

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A2-1_Berm2-104	23	72	Gas	52
A2-1_Berm2-201	22	72	Gas	49
A2-1_Berm2-202	119	72	Gas	264
A2-1_Berm2-203	14	72	Gas	31
A2-1_Berm2-401	114	72	Gas	253
A2-1_Berm2-402	15	72	Gas	33
A2-1_At Grade4-101	26	72	Gas	57
A2-1_At Grade4-102	28	72	Gas	62
A2-1_At Grade4-103	69	72	Gas	154
A2-1_At Grade4-201	192	72	Gas	424
A2-1_At Grade4-301	110	72	Gas	244
A2-1_At Grade4-302	33	72	Gas	73
A2-1_At Grade2-101	25	72	Gas	56
A2-1_At Grade2-102	27	72	Gas	60
A2-1_At Grade2-103	67	72	Gas	148
A2-1_At Grade2-201	112	72	Gas	248
A2-1_At Grade2-301	112	72	Gas	247
A2-1_At Grade2-302	14	72	Gas	31
A2-2_Aerial2-101	25	72	Gas	56
A2-2_Aerial2-102	31	72	Gas	68
A2-2_Aerial2-103	53	72	Gas	117
A2-2_Aerial2-104	71	72	Gas	156
A2-2_Aerial2-201	29	72	Gas	64
A2-2_Aerial2-202	10	72	Gas	22
A2-2_Aerial2-301	19	72	Gas	41
A2-2_Aerial2-302	15	72	Gas	34
A2-2_Aerial2-401	77	72	Gas	171
A2-2_Aerial2-402	29	72	Gas	65
A2-2_Aerial2-501	35	72	Gas	79
A2-2_Aerial2-502	14	72	Gas	31
A2-2_Berm2-101	35	72	Gas	78
A2-2_Berm2-102	32	72	Gas	70
A2-2_Berm2-103	27	72	Gas	61
A2-2_Berm2-104	20	72	Gas	43
A2-2_Berm2-201	79	72	Gas	174
A2-2_Berm2-202	823	72	Gas	1822
A2-2_Berm2-203	96	72	Gas	213
A2-2_Berm2-401	241	72	Gas	534
A2-2_Berm2-402	81	72	Gas	179
A2-2_At Grade4-101	26	72	Gas	57
A2-2_At Grade4-102	28	72	Gas	61
A2-2_At Grade4-103	69	72	Gas	153
A2-2_At Grade4-201	112	72	Gas	247
A2-2_At Grade4-301	109	72	Gas	241
A2-2_At Grade4-302	15	72	Gas	34
A2-2_At Grade2-101	26	72	Gas	57
A2-2_At Grade2-102	28	72	Gas	62

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A2-2_At Grade2-103	69	72	Gas	153
A2-2_At Grade2-201	204	72	Gas	451
A2-2_At Grade2-301	164	72	Gas	362
A2-2_At Grade2-302	33	72	Gas	73
A2-2_Trench-101	40	72	Gas	88
A2-2_Trench-102	35	72	Gas	78
A2-2_Trench-103	38	72	Gas	83
A2-2_Trench-104	18	72	Gas	40
A2-2_Trench-201	59	72	Gas	131
A2-2_Trench-202	24	72	Gas	52
A2-2_Trench-203	382	72	Gas	845
A2-2_Trench-204	46	72	Gas	102
A2-2_Trench-301	21	72	Gas	45
A2-2_Trench-302	19	72	Gas	41
A2-2_Trench-303	14	72	Gas	30
A2-2_Trench-304	9	72	Gas	20
A2-2_Trench-401	36	72	Gas	79
A2-2_Trench-402	39	72	Gas	86
A2-2_Trench-501	36	72	Gas	79
A2-2_Trench-502	18	72	Gas	39
A2-3_Aerial4-101	28	72	Gas	62
A2-3_Aerial4-102	32	72	Gas	70
A2-3_Aerial4-103	55	72	Gas	122
A2-3_Aerial4-104	76	72	Gas	168
A2-3_Aerial4-201	30	72	Gas	66
A2-3_Aerial4-202	9	72	Gas	21
A2-3_Aerial4-301	16	72	Gas	36
A2-3_Aerial4-302	13	72	Gas	29
A2-3_Aerial4-401	54	72	Gas	118
A2-3_Aerial4-402	11	72	Gas	25
A2-3_Aerial4-501	35	72	Gas	77
A2-3_Aerial4-502	14	72	Gas	30
A2-3_Aerial2-101	27	72	Gas	61
A2-3_Aerial2-102	32	72	Gas	70
A2-3_Aerial2-103	55	72	Gas	122
A2-3_Aerial2-104	76	72	Gas	169
A2-3_Aerial2-201	30	72	Gas	66
A2-3_Aerial2-202	10	72	Gas	22
A2-3_Aerial2-301	17	72	Gas	38
A2-3_Aerial2-302	15	72	Gas	32
A2-3_Aerial2-401	141	72	Gas	312
A2-3_Aerial2-402	30	72	Gas	66
A2-3_Aerial2-501	73	72	Gas	161
A2-3_Aerial2-502	32	72	Gas	71
A2-3_Berm4-101	27	72	Gas	59
A2-3_Berm4-102	32	72	Gas	71
A2-3_Berm4-103	26	72	Gas	58

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A2-3_Berm4-104	19	72	Gas	42
A2-3_Berm4-201	22	72	Gas	49
A2-3_Berm4-202	120	72	Gas	265
A2-3_Berm4-203	14	72	Gas	31
A2-3_Berm4-401	109	72	Gas	240
A2-3_Berm4-402	17	72	Gas	39
A2-3_Berm2-101	49	72	Gas	108
A2-3_Berm2-102	32	72	Gas	71
A2-3_Berm2-103	28	72	Gas	62
A2-3_Berm2-104	20	72	Gas	44
A2-3_Berm2-201	104	72	Gas	229
A2-3_Berm2-202	1144	72	Gas	2533
A2-3_Berm2-203	134	72	Gas	296
A2-3_Berm2-401	1118	72	Gas	2474
A2-3_Berm2-402	203	72	Gas	449
A2-3_At Grade2-101	37	72	Gas	81
A2-3_At Grade2-102	40	72	Gas	87
A2-3_At Grade2-103	88	72	Gas	195
A2-3_At Grade2-201	328	72	Gas	727
A2-3_At Grade2-301	629	72	Gas	1391
A2-3_At Grade2-302	114	72	Gas	252
A2-3_Trench-101	40	72	Gas	88
A2-3_Trench-102	36	72	Gas	79
A2-3_Trench-103	38	72	Gas	84
A2-3_Trench-104	18	72	Gas	40
A2-3_Trench-201	60	72	Gas	132
A2-3_Trench-202	24	72	Gas	52
A2-3_Trench-203	241	72	Gas	533
A2-3_Trench-204	12	72	Gas	26
A2-3_Trench-301	3	72	Gas	7
A2-3_Trench-302	3	72	Gas	6
A2-3_Trench-303	8	72	Gas	17
A2-3_Trench-304	5	72	Gas	12
A2-3_Trench-401	19	72	Gas	43
A2-3_Trench-402	18	72	Gas	39
A2-3_Trench-501	36	72	Gas	79
A2-3_Trench-502	18	72	Gas	40
A2-3_Tunnel-101	28	72	Gas	61
A2-3_Tunnel-102	192	72	Gas	424
A2-3_Tunnel-201	32	72	Gas	70
A2-3_Tunnel-202	9	72	Gas	19
A2-3_Tunnel-301	19	72	Gas	42
A2-3_Tunnel-302	9	72	Gas	19
A2-3_Tunnel-401	18	72	Gas	39
A2-3_Tunnel-402	9	72	Gas	19
A2-3_Tunnel-501	23	72	Gas	52
A2-3_Tunnel-502	13	72	Gas	29

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A2-3_Large2-101	28	72	Gas	61
A2-3_Large2-102	20	72	Gas	44
A2-3_Large2-201	138	72	Gas	305
A2-3_Large2-202	138	72	Gas	305
A2-3_Large2-203	15	72	Gas	32
A2-3_Large2-401	401	72	Gas	888
A2-3_Large2-402	73	72	Gas	161
A3-3_Aerial4-101	28	72	Gas	62
A3-3_Aerial4-102	60	72	Gas	132
A3-3_Aerial4-103	56	72	Gas	123
A3-3_Aerial4-104	78	72	Gas	172
A3-3_Aerial4-201	60	72	Gas	133
A3-3_Aerial4-202	19	72	Gas	43
A3-3_Aerial4-301	34	72	Gas	76
A3-3_Aerial4-302	29	72	Gas	64
A3-3_Aerial4-401	232	72	Gas	514
A3-3_Aerial4-402	48	72	Gas	106
A3-3_Aerial4-501	119	72	Gas	263
A3-3_Aerial4-502	52	72	Gas	115
A3-3_Aerial2-101	23	72	Gas	51
A3-3_Aerial2-102	66	72	Gas	145
A3-3_Aerial2-103	38	72	Gas	85
A3-3_Aerial2-104	92	72	Gas	203
A3-3_Aerial2-201	88	72	Gas	194
A3-3_Aerial2-202	29	72	Gas	63
A3-3_Aerial2-301	50	72	Gas	110
A3-3_Aerial2-302	43	72	Gas	94
A3-3_Aerial2-401	660	72	Gas	1462
A3-3_Aerial2-402	139	72	Gas	309
A3-3_Aerial2-501	341	72	Gas	755
A3-3_Aerial2-502	150	72	Gas	331
A3-3_At Grade2-101	26	72	Gas	57
A3-3_At Grade2-102	28	72	Gas	62
A3-3_At Grade2-103	69	72	Gas	154
A3-3_At Grade2-201	112	72	Gas	247
A3-3_At Grade2-301	203	72	Gas	448
A3-3_At Grade2-302	37	72	Gas	81
A3-3_Tunnel-101	28	72	Gas	61
A3-3_Tunnel-102	192	72	Gas	425
A3-3_Tunnel-201	32	72	Gas	70
A3-3_Tunnel-202	9	72	Gas	19
A3-3_Tunnel-301	19	72	Gas	43
A3-3_Tunnel-302	9	72	Gas	19
A3-3_Tunnel-401	18	72	Gas	39
A3-3_Tunnel-402	9	72	Gas	19
A3-3_Tunnel-501	23	72	Gas	52
A3-3_Tunnel-502	13	72	Gas	29

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A3-3_Large2-101	29	72	Gas	65
A3-3_Large2-102	21	72	Gas	47
A3-3_Large2-201	147	72	Gas	325
A3-3_Large2-202	147	72	Gas	325
A3-3_Large2-203	15	72	Gas	34
A3-3_Large2-401	427	72	Gas	946
A3-3_Large2-402	77	72	Gas	172
EGS-101	28	72	Gas	62
EGS-102	20	72	Gas	44
EGS-201	28	72	Gas	62
EGS-202	28	72	Gas	62
EGS-203	10	72	Gas	23
EGS-301	40	72	Gas	89
EGS-302	62	72	Gas	137
EGS-303	30	72	Gas	66
EGS-401	20	72	Gas	44
EGS-402	46	72	Gas	102
EGS-403	28	72	Gas	62
EGS-501	4	72	Gas	9
DGS-101	28	72	Gas	62
DGS-102	20	72	Gas	44
DGS-201	28	72	Gas	62
DGS-202	28	72	Gas	62
DGS-203	10	72	Gas	23
DGS-301	40	72	Gas	89
DGS-302	62	72	Gas	137
DGS-303	30	72	Gas	66
DGS-401	20	72	Gas	44
DGS-402	46	72	Gas	102
DGS-403	28	72	Gas	62
DGS-501	4	72	Gas	9
DS-101	28	72	Gas	62
DS-102	20	72	Gas	44
DS-201	28	72	Gas	62
DS-202	28	72	Gas	62
DS-203	10	72	Gas	23
DS-301	44	72	Gas	97
DS-302	62	72	Gas	137
DS-303	30	72	Gas	66
DS-401	20	72	Gas	44
DS-402	36	72	Gas	80
DS-403	28	72	Gas	62
DS-501	4	72	Gas	9
DS2-101	28	72	Gas	62
DS2-102	20	72	Gas	44
DS2-201	28	72	Gas	62
DS2-202	28	72	Gas	62

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
DS2-203	19	72	Gas	41
DS2-301	44	72	Gas	97
DS2-302	62	72	Gas	137
DS2-303	30	72	Gas	66
DS2-401	20	72	Gas	44
DS2-402	36	72	Gas	80
DS2-403	28	72	Gas	62
DS2-501	4	72	Gas	8
LMF-101	28	72	Gas	62
LMF-102	40	72	Gas	89
LMF-201	28	72	Gas	62
LMF-202	28	72	Gas	62
LMF-203	28	72	Gas	62
LMF-301	40	72	Gas	89
LMF-302	62	72	Gas	137
LMF-303	30	72	Gas	66
LMF-401	20	72	Gas	44
LMF-402	36	72	Gas	80
LMF-403	28	72	Gas	62
LMF-501	112	72	Gas	248
LMF-502	18	72	Gas	40
MOIS-101	28	72	Gas	67
MOIS-102	20	72	Gas	48
MOIS-201	28	72	Gas	67
MOIS-202	20	72	Gas	48
MOIS-203	18	72	Gas	43
MOIS-402	18	72	Gas	43
MOIS-403	18	72	Gas	43
MOIS-501	112	72	Gas	269
MOIS-502	14	72	Gas	34
PGE-1	20	72	Gas	33
PGE-2	12	72	Gas	20
PGE-3	12	72	Gas	20
PGE-4	24	72	Gas	40
PGE-5	24	72	Gas	40
A4-1_Berm4-101	27	72	Gas	61
A4-1_Berm4-102	31	72	Gas	70
A4-1_Berm4-103	28	72	Gas	62
A4-1_Berm4-104	20	72	Gas	44
A4-1_Berm4-201	40	72	Gas	88
A4-1_Berm4-202	404	72	Gas	895
A4-1_Berm4-203	47	72	Gas	104
A4-1_Berm4-401	132	72	Gas	292
A4-1_Berm4-402	42	72	Gas	93
A4-1_At Grade2-101	26	72	Gas	57
A4-1_At Grade2-102	28	72	Gas	61
A4-1_At Grade2-103	70	72	Gas	154

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A4-1_At Grade2-201	161	72	Gas	356
A4-1_At Grade2-301	112	72	Gas	248
A4-1_At Grade2-302	34	72	Gas	76
A4-2_Berm4-101	27	72	Gas	60
A4-2_Berm4-102	30	72	Gas	67
A4-2_Berm4-103	25	72	Gas	56
A4-2_Berm4-104	18	72	Gas	40
A4-2_Berm4-201	22	72	Gas	49
A4-2_Berm4-202	136	72	Gas	301
A4-2_Berm4-203	16	72	Gas	35
A4-2_Berm4-401	109	72	Gas	241
A4-2_Berm4-402	18	72	Gas	39
A4-2_Berm2-101	28	72	Gas	61
A4-2_Berm2-102	31	72	Gas	69
A4-2_Berm2-103	28	72	Gas	62
A4-2_Berm2-104	20	72	Gas	44
A4-2_Berm2-201	33	72	Gas	73
A4-2_Berm2-202	360	72	Gas	796
A4-2_Berm2-203	42	72	Gas	93
A4-2_Berm2-401	111	72	Gas	245
A4-2_Berm2-402	35	72	Gas	78
A4-2_At Grade4-101	79	72	Gas	175
A4-2_At Grade4-102	85	72	Gas	188
A4-2_At Grade4-103	188	72	Gas	415
A4-2_At Grade4-201	782	72	Gas	1730
A4-2_At Grade4-301	478	72	Gas	1058
A4-2_At Grade4-302	116	72	Gas	257
A4-3_Aerial4-101	28	72	Gas	62
A4-3_Aerial4-102	32	72	Gas	70
A4-3_Aerial4-103	52	72	Gas	115
A4-3_Aerial4-104	77	72	Gas	172
A4-3_Aerial4-201	30	72	Gas	66
A4-3_Aerial4-202	10	72	Gas	21
A4-3_Aerial4-301	16	72	Gas	36
A4-3_Aerial4-302	13	72	Gas	29
A4-3_Aerial4-401	41	72	Gas	90
A4-3_Aerial4-402	9	72	Gas	19
A4-3_Aerial4-501	36	72	Gas	79
A4-3_Aerial4-502	14	72	Gas	31
A4-3_Aerial2-101	28	72	Gas	62
A4-3_Aerial2-102	32	72	Gas	71
A4-3_Aerial2-103	55	72	Gas	122
A4-3_Aerial2-104	78	72	Gas	172
A4-3_Aerial2-201	30	72	Gas	66
A4-3_Aerial2-202	10	72	Gas	22
A4-3_Aerial2-301	17	72	Gas	38
A4-3_Aerial2-302	15	72	Gas	32

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A4-3_Aerial2-401	168	72	Gas	372
A4-3_Aerial2-402	36	72	Gas	79
A4-3_Aerial2-501	87	72	Gas	192
A4-3_Aerial2-502	38	72	Gas	84
A4-3_Berm4-101	106	72	Gas	234
A4-3_Berm4-102	81	72	Gas	179
A4-3_Berm4-103	36	72	Gas	80
A4-3_Berm4-104	26	72	Gas	58
A4-3_Berm4-201	200	72	Gas	442
A4-3_Berm4-202	2520	72	Gas	5579
A4-3_Berm4-203	294	72	Gas	651
A4-3_Berm4-401	2475	72	Gas	5478
A4-3_Berm4-402	442	72	Gas	979
A4-3_Berm2-101	27	72	Gas	59
A4-3_Berm2-102	29	72	Gas	65
A4-3_Berm2-103	27	72	Gas	60
A4-3_Berm2-104	19	72	Gas	43
A4-3_Berm2-201	22	72	Gas	48
A4-3_Berm2-202	120	72	Gas	265
A4-3_Berm2-203	14	72	Gas	31
A4-3_Berm2-401	106	72	Gas	235
A4-3_Berm2-402	17	72	Gas	38
A4-3_At Grade4-101	26	72	Gas	57
A4-3_At Grade4-102	28	72	Gas	61
A4-3_At Grade4-103	68	72	Gas	150
A4-3_At Grade4-201	107	72	Gas	238
A4-3_At Grade4-301	105	72	Gas	231
A4-3_At Grade4-302	13	72	Gas	29
A4-3_At Grade2-101	26	72	Gas	58
A4-3_At Grade2-102	28	72	Gas	62
A4-3_At Grade2-103	70	72	Gas	155
A4-3_At Grade2-201	140	72	Gas	310
A4-3_At Grade2-301	269	72	Gas	594
A4-3_At Grade2-302	49	72	Gas	108
A4-3_Tunnel-101	28	72	Gas	61
A4-3_Tunnel-102	192	72	Gas	424
A4-3_Tunnel-201	32	72	Gas	70
A4-3_Tunnel-202	9	72	Gas	19
A4-3_Tunnel-301	19	72	Gas	42
A4-3_Tunnel-302	9	72	Gas	19
A4-3_Tunnel-401	18	72	Gas	39
A4-3_Tunnel-402	9	72	Gas	19
A4-3_Tunnel-501	23	72	Gas	52
A4-3_Tunnel-502	13	72	Gas	29
A4-3_Large2-101	28	72	Gas	61
A4-3_Large2-102	20	72	Gas	44
A4-3_Large2-201	77	72	Gas	171

Code	Trips/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A4-3_Large2-202	77	72	Gas	171
A4-3_Large2-203	8	72	Gas	18
A4-3_Large2-401	224	72	Gas	496
A4-3_Large2-402	41	72	Gas	90

Onroad Vehicles

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A1-1_Aerial4-101	Truck, End Dump, 10-13cy, Hwy	1	38	Diesel	49
A1-1_Aerial4-101	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-1_Aerial4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-1_Aerial4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_Aerial4-103	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A1-1_Aerial4-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	50
A1-1_Aerial4-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_Aerial4-201	Truck, End Dump, 10-13cy, Hwy	2	36	Diesel	46
A1-1_Aerial4-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A1-1_Aerial4-202	Transit Mix Truck, 10cy	1	17	Diesel	34
A1-1_Aerial4-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A1-1_Aerial4-301	Truck, Water, 4 mgal, Hwy	1	13	Diesel	7
A1-1_Aerial4-302	Transit Mix Truck, 10cy	1	26	Diesel	54
A1-1_Aerial4-302	Truck, Water, 4 mgal, Hwy	1	13	Diesel	8
A1-1_Aerial4-401	Truck, Flatbed, 10T, Hwy	3	36	Diesel	22
A1-1_Aerial4-401	Boom Truck, 8 Tn Boom	3	36	Diesel	63
A1-1_Aerial4-401	Truck, Water, 4 mgal, Hwy	3	36	Diesel	21
A1-1_Aerial4-402	Truck, Water, 4 mgal, Hwy	2	28	Diesel	16
A1-1_Aerial4-402	Transit Mix Truck, 10cy	3	38	Diesel	78
A1-1_Aerial4-501	Truck, Flatbed, 10T, Hwy	4	40	Diesel	24
A1-1_Aerial4-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_Aerial4-502	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A1-1_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A1-1_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-1_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A1-1_Aerial2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A1-1_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	30	39	Diesel	50
A1-1_Aerial2-104	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-1_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	3	38	Diesel	49
A1-1_Aerial2-201	Truck, Water, 4 mgal, Hwy	3	38	Diesel	22
A1-1_Aerial2-202	Transit Mix Truck, 10cy	1	24	Diesel	50
A1-1_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A1-1_Aerial2-301	Truck, Water, 4 mgal, Hwy	1	19	Diesel	11
A1-1_Aerial2-302	Transit Mix Truck, 10cy	1	26	Diesel	52
A1-1_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	13	Diesel	7
A1-1_Aerial2-401	Truck, Flatbed, 10T, Hwy	8	37	Diesel	22
A1-1_Aerial2-401	Boom Truck, 8 Tn Boom	8	37	Diesel	63
A1-1_Aerial2-401	Truck, Water, 4 mgal, Hwy	8	37	Diesel	21
A1-1_Aerial2-402	Truck, Water, 4 mgal, Hwy	4	34	Diesel	19
A1-1_Aerial2-402	Transit Mix Truck, 10cy	7	38	Diesel	79
A1-1_Aerial2-501	Truck, Flatbed, 10T, Hwy	2	29	Diesel	17
A1-1_Aerial2-501	Truck, Water, 4 mgal, Hwy	2	29	Diesel	17
A1-1_Aerial2-502	Truck, Flatbed, 10T, Hwy	2	27	Diesel	17
A1-1_Berm2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A1-1_Berm2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	37	Diesel	47
A1-1_Berm2-102	Truck, Water, 4 mgal, Hwy	1	37	Diesel	21
A1-1_Berm2-103	Truck, End Dump, 10-13cy, Hwy	3	32	Diesel	40
A1-1_Berm2-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-1_Berm2-104	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A1-1_Berm2-104	Transit Mix Truck, 10cy	1	39	Diesel	81
A1-1_Berm2-201	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A1-1_Berm2-202	Truck, End Dump, 10-13cy, Hwy	25	39	Diesel	49
A1-1_Berm2-202	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_Berm2-203	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_Berm2-401	Truck, End Dump, 10-13cy, Hwy	42	40	Diesel	50
A1-1_Berm2-401	Truck, Water, 4 mgal, Hwy	1	21	Diesel	12
A1-1_Berm2-402	Truck, Flatbed, 10T, Hwy	1	34	Diesel	21
A1-1_At Grade4-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A1-1_At Grade4-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-1_At Grade4-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A1-1_At Grade4-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-1_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	51
A1-1_At Grade4-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_At Grade4-201	Truck, End Dump, 10-13cy, Hwy	60	40	Diesel	51
A1-1_At Grade4-201	Truck, Water, 4 mgal, Hwy	2	30	Diesel	17
A1-1_At Grade4-301	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	50
A1-1_At Grade4-301	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-1_At Grade4-302	Truck, Flatbed, 10T, Hwy	2	32	Diesel	20
A1-1_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A1-1_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-1_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	21	40	Diesel	51
A1-1_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-1_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	80	37	Diesel	47
A1-1_At Grade2-201	Truck, Water, 4 mgal, Hwy	2	37	Diesel	21
A1-1_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	60	39	Diesel	50
A1-1_At Grade2-301	Truck, Water, 4 mgal, Hwy	2	29	Diesel	17
A1-1_At Grade2-302	Truck, Flatbed, 10T, Hwy	3	31	Diesel	19
A1-2_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A1-2_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	3	40	Diesel	50
A1-2_Aerial2-102	Truck, Water, 4 mgal, Hwy	2	30	Diesel	17
A1-2_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-2_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	50	39	Diesel	50
A1-2_Aerial2-104	Truck, Water, 4 mgal, Hwy	2	33	Diesel	19
A1-2_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	8	38	Diesel	48
A1-2_Aerial2-201	Truck, Water, 4 mgal, Hwy	8	38	Diesel	22
A1-2_Aerial2-202	Transit Mix Truck, 10cy	2	32	Diesel	65
A1-2_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	32	Diesel	18
A1-2_Aerial2-301	Truck, Water, 4 mgal, Hwy	2	25	Diesel	14
A1-2_Aerial2-302	Transit Mix Truck, 10cy	2	33	Diesel	67
A1-2_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	33	Diesel	19
A1-2_Aerial2-401	Truck, Flatbed, 10T, Hwy	20	38	Diesel	23
A1-2_Aerial2-401	Boom Truck, 8 Tn Boom	20	38	Diesel	65
A1-2_Aerial2-401	Truck, Water, 4 mgal, Hwy	20	38	Diesel	22
A1-2_Aerial2-402	Truck, Water, 4 mgal, Hwy	9	38	Diesel	22
A1-2_Aerial2-402	Transit Mix Truck, 10cy	18	38	Diesel	79
A1-2_Aerial2-501	Truck, Flatbed, 10T, Hwy	15	39	Diesel	24
A1-2_Aerial2-501	Truck, Water, 4 mgal, Hwy	4	37	Diesel	21
A1-2_Aerial2-502	Truck, Flatbed, 10T, Hwy	5	37	Diesel	23
A1-2_Berm2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A1-2_Berm2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-2_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-2_Berm2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_Berm2-103	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	48
A1-2_Berm2-103	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-2_Berm2-104	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-2_Berm2-104	Transit Mix Truck, 10cy	1	38	Diesel	77
A1-2_Berm2-201	Truck, Flatbed, 10T, Hwy	2	30	Diesel	18
A1-2_Berm2-202	Truck, End Dump, 10-13cy, Hwy	75	36	Diesel	46
A1-2_Berm2-202	Truck, Water, 4 mgal, Hwy	3	38	Diesel	22
A1-2_Berm2-203	Truck, Water, 4 mgal, Hwy	3	38	Diesel	22
A1-2_Berm2-401	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	50
A1-2_Berm2-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	11
A1-2_Berm2-402	Truck, Flatbed, 10T, Hwy	2	38	Diesel	23
A1-2_At Grade4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	50
A1-2_At Grade4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_At Grade4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A1-2_At Grade4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	20	39	Diesel	50
A1-2_At Grade4-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-2_At Grade4-201	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A1-2_At Grade4-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_At Grade4-301	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	50
A1-2_At Grade4-301	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-2_At Grade4-302	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A1-2_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A1-2_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-2_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	51
A1-2_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-2_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	48	39	Diesel	49
A1-2_At Grade2-201	Truck, Water, 4 mgal, Hwy	2	23	Diesel	13
A1-2_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	40	38	Diesel	48
A1-2_At Grade2-301	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-2_At Grade2-302	Truck, Flatbed, 10T, Hwy	2	30	Diesel	18
A1-3_Aerial4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	50
A1-3_Aerial4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-3_Aerial4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A1-3_Aerial4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-3_Aerial4-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-3_Aerial4-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	50
A1-3_Aerial4-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-3_Aerial4-201	Truck, End Dump, 10-13cy, Hwy	2	36	Diesel	46
A1-3_Aerial4-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A1-3_Aerial4-202	Transit Mix Truck, 10cy	1	16	Diesel	33
A1-3_Aerial4-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A1-3_Aerial4-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A1-3_Aerial4-302	Transit Mix Truck, 10cy	1	23	Diesel	47
A1-3_Aerial4-302	Truck, Water, 4 mgal, Hwy	1	11	Diesel	7
A1-3_Aerial4-401	Truck, Flatbed, 10T, Hwy	3	37	Diesel	23
A1-3_Aerial4-401	Boom Truck, 8 Tn Boom	3	37	Diesel	64
A1-3_Aerial4-401	Truck, Water, 4 mgal, Hwy	3	37	Diesel	21

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A1-3_Aerial4-402	Truck, Water, 4 mgal, Hwy	1	26	Diesel	15
A1-3_Aerial4-402	Transit Mix Truck, 10cy	2	26	Diesel	54
A1-3_Aerial4-501	Truck, Flatbed, 10T, Hwy	5	37	Diesel	23
A1-3_Aerial4-501	Truck, Water, 4 mgal, Hwy	2	23	Diesel	13
A1-3_Aerial4-502	Truck, Flatbed, 10T, Hwy	2	26	Diesel	16
A1-3_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	2	24	Diesel	31
A1-3_Aerial2-101	Truck, Water, 4 mgal, Hwy	2	24	Diesel	14
A1-3_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	6	40	Diesel	51
A1-3_Aerial2-102	Truck, Water, 4 mgal, Hwy	3	40	Diesel	23
A1-3_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	32	Diesel	18
A1-3_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	55	37	Diesel	48
A1-3_Aerial2-104	Truck, Water, 4 mgal, Hwy	2	34	Diesel	20
A1-3_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	9	38	Diesel	48
A1-3_Aerial2-201	Truck, Water, 4 mgal, Hwy	9	38	Diesel	22
A1-3_Aerial2-202	Transit Mix Truck, 10cy	2	35	Diesel	71
A1-3_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	35	Diesel	20
A1-3_Aerial2-301	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15
A1-3_Aerial2-302	Transit Mix Truck, 10cy	2	35	Diesel	71
A1-3_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	35	Diesel	20
A1-3_Aerial2-401	Truck, Flatbed, 10T, Hwy	35	38	Diesel	23
A1-3_Aerial2-401	Boom Truck, 8 Tn Boom	35	38	Diesel	65
A1-3_Aerial2-401	Truck, Water, 4 mgal, Hwy	35	38	Diesel	22
A1-3_Aerial2-402	Truck, Water, 4 mgal, Hwy	9	38	Diesel	22
A1-3_Aerial2-402	Transit Mix Truck, 10cy	18	38	Diesel	77
A1-3_Aerial2-501	Truck, Flatbed, 10T, Hwy	14	39	Diesel	24
A1-3_Aerial2-501	Truck, Water, 4 mgal, Hwy	14	39	Diesel	23
A1-3_Aerial2-502	Truck, Flatbed, 10T, Hwy	16	39	Diesel	24
A1-3_At Grade4-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A1-3_At Grade4-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-3_At Grade4-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A1-3_At Grade4-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-3_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	20	39	Diesel	49
A1-3_At Grade4-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A1-3_At Grade4-201	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	50
A1-3_At Grade4-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-3_At Grade4-301	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	49
A1-3_At Grade4-301	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A1-3_At Grade4-302	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A1-3_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	38	Diesel	48
A1-3_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-3_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	48
A1-3_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-3_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	50
A1-3_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-3_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A1-3_At Grade2-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-3_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	50
A1-3_At Grade2-301	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-3_At Grade2-302	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A1-3_Tunnel-101	Truck, Water, 4 mgal, Hwy	1	110	Diesel	64
A1-3_Tunnel-102	Truck, End Dump, 10-13cy, Hwy	80	110	Diesel	140
A1-3_Tunnel-102	Truck, Water, 4 mgal, Hwy	1	110	Diesel	64
A1-3_Tunnel-201	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A1-3_Tunnel-501	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A1-3_Tunnel-501	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-3_Tunnel-502	Truck, Flatbed, 10T, Hwy	1	28	Diesel	17
A1-3_Large2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A1-3_Large2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-3_Large2-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A1-3_Large2-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-3_Large2-201	Truck, Water, 4 mgal, Hwy	2	21	Diesel	12
A1-3_Large2-202	Truck, End Dump, 10-13cy, Hwy	21	39	Diesel	50
A1-3_Large2-202	Truck, Water, 4 mgal, Hwy	2	21	Diesel	12
A1-3_Large2-401	Truck, End Dump, 10-13cy, Hwy	80	40	Diesel	51
A1-3_Large2-401	Truck, Water, 4 mgal, Hwy	2	30	Diesel	18
A1-3_Large2-402	Truck, Flatbed, 10T, Hwy	3	31	Diesel	19
A1-4_Aerial4-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A1-4_Aerial4-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-4_Aerial4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-4_Aerial4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_Aerial4-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-4_Aerial4-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	50
A1-4_Aerial4-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_Aerial4-201	Truck, End Dump, 10-13cy, Hwy	2	36	Diesel	46
A1-4_Aerial4-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A1-4_Aerial4-202	Transit Mix Truck, 10cy	1	16	Diesel	33
A1-4_Aerial4-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A1-4_Aerial4-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A1-4_Aerial4-302	Transit Mix Truck, 10cy	1	25	Diesel	51
A1-4_Aerial4-302	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A1-4_Aerial4-401	Truck, Flatbed, 10T, Hwy	3	34	Diesel	21
A1-4_Aerial4-401	Boom Truck, 8 Tn Boom	3	34	Diesel	58
A1-4_Aerial4-401	Truck, Water, 4 mgal, Hwy	3	34	Diesel	20
A1-4_Aerial4-402	Truck, Water, 4 mgal, Hwy	1	26	Diesel	15
A1-4_Aerial4-402	Transit Mix Truck, 10cy	2	26	Diesel	54
A1-4_Aerial4-501	Truck, Flatbed, 10T, Hwy	5	34	Diesel	21
A1-4_Aerial4-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_Aerial4-501	Truck, Flatbed, 10T, Hwy	2	24	Diesel	14
A1-4_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	49
A1-4_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A1-4_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-4_Aerial2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-4_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	30	39	Diesel	49
A1-4_Aerial2-104	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A1-4_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A1-4_Aerial2-201	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
A1-4_Aerial2-202	Transit Mix Truck, 10cy	1	17	Diesel	34
A1-4_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A1-4_Aerial2-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A1-4_Aerial2-302	Transit Mix Truck, 10cy	1	16	Diesel	34
A1-4_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A1-4_Aerial2-401	Truck, Flatbed, 10T, Hwy	3	33	Diesel	20
A1-4_Aerial2-401	Boom Truck, 8 Tn Boom	3	33	Diesel	57
A1-4_Aerial2-401	Truck, Water, 4 mgal, Hwy	3	33	Diesel	19
A1-4_Aerial2-402	Truck, Water, 4 mgal, Hwy	1	26	Diesel	15

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A1-4_Aerial2-402	Transit Mix Truck, 10cy	2	26	Diesel	53
A1-4_Aerial2-501	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A1-4_Aerial2-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_Aerial2-502	Truck, Flatbed, 10T, Hwy	2	26	Diesel	16
A1-4_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	38	Diesel	49
A1-4_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-4_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	49
A1-4_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-4_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A1-4_At Grade2-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	40	38	Diesel	49
A1-4_At Grade2-301	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A1-4_At Grade2-302	Truck, Flatbed, 10T, Hwy	1	38	Diesel	23
A1-4_Tunnel-101	Truck, Water, 4 mgal, Hwy	2	104	Diesel	60
A1-4_Tunnel-102	Truck, End Dump, 10-13cy, Hwy	160	104	Diesel	133
A1-4_Tunnel-102	Truck, Water, 4 mgal, Hwy	2	104	Diesel	60
A1-4_Tunnel-201	Truck, Water, 4 mgal, Hwy	7	35	Diesel	20
A1-4_Tunnel-501	Truck, Flatbed, 10T, Hwy	9	37	Diesel	22
A1-4_Tunnel-501	Truck, Water, 4 mgal, Hwy	9	37	Diesel	21
A1-4_Tunnel-502	Truck, Flatbed, 10T, Hwy	6	40	Diesel	24
A1-4_Large2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A1-4_Large2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_Large2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A1-4_Large2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-4_Large2-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A1-4_Large2-202	Truck, End Dump, 10-13cy, Hwy	40	36	Diesel	46
A1-4_Large2-202	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A1-4_Large2-401	Truck, End Dump, 10-13cy, Hwy	160	34	Diesel	44
A1-4_Large2-401	Truck, Water, 4 mgal, Hwy	4	26	Diesel	15
A1-4_Large2-402	Truck, Flatbed, 10T, Hwy	4	39	Diesel	24
A1-5_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A1-5_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-5_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-5_Aerial2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-5_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-5_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	51
A1-5_Aerial2-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-5_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-5_Aerial2-201	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
A1-5_Aerial2-202	Transit Mix Truck, 10cy	1	16	Diesel	33
A1-5_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A1-5_Aerial2-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A1-5_Aerial2-302	Transit Mix Truck, 10cy	1	16	Diesel	33
A1-5_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A1-5_Aerial2-401	Truck, Flatbed, 10T, Hwy	7	39	Diesel	24
A1-5_Aerial2-401	Boom Truck, 8 Tn Boom	7	39	Diesel	67
A1-5_Aerial2-401	Truck, Water, 4 mgal, Hwy	7	39	Diesel	22
A1-5_Aerial2-402	Truck, Water, 4 mgal, Hwy	2	35	Diesel	20
A1-5_Aerial2-402	Transit Mix Truck, 10cy	4	35	Diesel	71
A1-5_Aerial2-501	Truck, Flatbed, 10T, Hwy	3	38	Diesel	23
A1-5_Aerial2-501	Truck, Water, 4 mgal, Hwy	3	38	Diesel	22
A1-5_Aerial2-502	Truck, Flatbed, 10T, Hwy	4	32	Diesel	19

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A1-5_Berm2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A1-5_Berm2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-5_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	37	Diesel	48
A1-5_Berm2-102	Truck, Water, 4 mgal, Hwy	1	37	Diesel	22
A1-5_Berm2-103	Truck, End Dump, 10-13cy, Hwy	2	35	Diesel	45
A1-5_Berm2-103	Truck, Water, 4 mgal, Hwy	1	35	Diesel	20
A1-5_Berm2-104	Truck, Water, 4 mgal, Hwy	1	35	Diesel	20
A1-5_Berm2-104	Transit Mix Truck, 10cy	1	35	Diesel	73
A1-5_Berm2-201	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A1-5_Berm2-202	Truck, End Dump, 10-13cy, Hwy	25	38	Diesel	48
A1-5_Berm2-202	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-5_Berm2-203	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-5_Berm2-401	Truck, End Dump, 10-13cy, Hwy	40	38	Diesel	49
A1-5_Berm2-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	11
A1-5_Berm2-402	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A1-5_Large2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A1-5_Large2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A1-5_Large2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A1-5_Large2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A1-5_Large2-201	Truck, Water, 4 mgal, Hwy	4	31	Diesel	18
A1-5_Large2-202	Truck, End Dump, 10-13cy, Hwy	63	39	Diesel	50
A1-5_Large2-202	Truck, Water, 4 mgal, Hwy	4	31	Diesel	18
A1-5_Large2-401	Truck, End Dump, 10-13cy, Hwy	240	39	Diesel	50
A1-5_Large2-401	Truck, Water, 4 mgal, Hwy	5	35	Diesel	20
A1-5_Large2-402	Truck, Flatbed, 10T, Hwy	7	38	Diesel	23
A2-1_Aerial4-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	49
A2-1_Aerial4-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A2-1_Aerial4-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A2-1_Aerial4-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-1_Aerial4-103	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A2-1_Aerial4-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	51
A2-1_Aerial4-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_Aerial4-201	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-1_Aerial4-201	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
A2-1_Aerial4-202	Transit Mix Truck, 10cy	1	19	Diesel	38
A2-1_Aerial4-202	Truck, Water, 4 mgal, Hwy	1	9	Diesel	5
A2-1_Aerial4-301	Truck, Water, 4 mgal, Hwy	1	14	Diesel	8
A2-1_Aerial4-302	Transit Mix Truck, 10cy	1	30	Diesel	62
A2-1_Aerial4-302	Truck, Water, 4 mgal, Hwy	1	15	Diesel	9
A2-1_Aerial4-401	Truck, Flatbed, 10T, Hwy	3	37	Diesel	22
A2-1_Aerial4-401	Boom Truck, 8 Tn Boom	3	37	Diesel	63
A2-1_Aerial4-401	Truck, Water, 4 mgal, Hwy	3	37	Diesel	21
A2-1_Aerial4-402	Truck, Water, 4 mgal, Hwy	2	29	Diesel	17
A2-1_Aerial4-402	Transit Mix Truck, 10cy	3	38	Diesel	78
A2-1_Aerial4-501	Truck, Flatbed, 10T, Hwy	4	40	Diesel	24
A2-1_Aerial4-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_Aerial4-502	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A2-1_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	50
A2-1_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	3	33	Diesel	42
A2-1_Aerial2-102	Truck, Water, 4 mgal, Hwy	2	25	Diesel	14
A2-1_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A2-1_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	40	38	Diesel	49

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A2-1_Aerial2-104	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15
A2-1_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	6	39	Diesel	50
A2-1_Aerial2-201	Truck, Water, 4 mgal, Hwy	6	39	Diesel	23
A2-1_Aerial2-202	Transit Mix Truck, 10cy	2	25	Diesel	51
A2-1_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	25	Diesel	14
A2-1_Aerial2-301	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-1_Aerial2-302	Transit Mix Truck, 10cy	2	26	Diesel	54
A2-1_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	26	Diesel	15
A2-1_Aerial2-401	Truck, Flatbed, 10T, Hwy	16	38	Diesel	23
A2-1_Aerial2-401	Boom Truck, 8 Tn Boom	16	38	Diesel	65
A2-1_Aerial2-401	Truck, Water, 4 mgal, Hwy	16	38	Diesel	22
A2-1_Aerial2-402	Truck, Water, 4 mgal, Hwy	7	40	Diesel	23
A2-1_Aerial2-402	Transit Mix Truck, 10cy	14	40	Diesel	81
A2-1_Aerial2-501	Truck, Flatbed, 10T, Hwy	4	29	Diesel	18
A2-1_Aerial2-501	Truck, Water, 4 mgal, Hwy	4	29	Diesel	17
A2-1_Aerial2-502	Truck, Flatbed, 10T, Hwy	4	28	Diesel	17
A2-1_Berm2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A2-1_Berm2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	36	Diesel	46
A2-1_Berm2-102	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A2-1_Berm2-103	Truck, End Dump, 10-13cy, Hwy	3	31	Diesel	40
A2-1_Berm2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_Berm2-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_Berm2-104	Transit Mix Truck, 10cy	1	40	Diesel	81
A2-1_Berm2-201	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A2-1_Berm2-202	Truck, End Dump, 10-13cy, Hwy	25	38	Diesel	48
A2-1_Berm2-202	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-1_Berm2-203	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-1_Berm2-401	Truck, End Dump, 10-13cy, Hwy	41	40	Diesel	51
A2-1_Berm2-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
A2-1_Berm2-402	Truck, Flatbed, 10T, Hwy	1	33	Diesel	20
A2-1_At Grade4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A2-1_At Grade4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_At Grade4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-1_At Grade4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	50
A2-1_At Grade4-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_At Grade4-201	Truck, End Dump, 10-13cy, Hwy	70	39	Diesel	50
A2-1_At Grade4-201	Truck, Water, 4 mgal, Hwy	2	34	Diesel	20
A2-1_At Grade4-301	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	50
A2-1_At Grade4-301	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-1_At Grade4-302	Truck, Flatbed, 10T, Hwy	2	37	Diesel	22
A2-1_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	49
A2-1_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A2-1_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	49
A2-1_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A2-1_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	20	38	Diesel	49
A2-1_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A2-1_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A2-1_At Grade2-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A2-1_At Grade2-301	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-1_At Grade2-302	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A2-2_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	36	Diesel	46
A2-2_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A2-2_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	49
A2-2_Aerial2-102	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A2-2_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A2-2_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	30	36	Diesel	46
A2-2_Aerial2-104	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A2-2_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	49
A2-2_Aerial2-201	Truck, Water, 4 mgal, Hwy	2	38	Diesel	22
A2-2_Aerial2-202	Transit Mix Truck, 10cy	1	17	Diesel	35
A2-2_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A2-2_Aerial2-301	Truck, Water, 4 mgal, Hwy	1	13	Diesel	8
A2-2_Aerial2-302	Transit Mix Truck, 10cy	1	17	Diesel	35
A2-2_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A2-2_Aerial2-401	Truck, Flatbed, 10T, Hwy	3	35	Diesel	22
A2-2_Aerial2-401	Boom Truck, 8 Tn Boom	3	35	Diesel	61
A2-2_Aerial2-401	Truck, Water, 4 mgal, Hwy	3	35	Diesel	20
A2-2_Aerial2-402	Truck, Water, 4 mgal, Hwy	2	24	Diesel	14
A2-2_Aerial2-402	Transit Mix Truck, 10cy	3	32	Diesel	67
A2-2_Aerial2-501	Truck, Flatbed, 10T, Hwy	4	39	Diesel	24
A2-2_Aerial2-501	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-2_Aerial2-502	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A2-2_Berm2-101	Truck, End Dump, 10-13cy, Hwy	2	25	Diesel	32
A2-2_Berm2-101	Truck, Water, 4 mgal, Hwy	2	25	Diesel	15
A2-2_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A2-2_Berm2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_Berm2-103	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A2-2_Berm2-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-2_Berm2-104	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-2_Berm2-104	Transit Mix Truck, 10cy	1	39	Diesel	80
A2-2_Berm2-201	Truck, Flatbed, 10T, Hwy	4	36	Diesel	22
A2-2_Berm2-202	Truck, End Dump, 10-13cy, Hwy	165	40	Diesel	50
A2-2_Berm2-202	Truck, Water, 4 mgal, Hwy	7	39	Diesel	23
A2-2_Berm2-203	Truck, Water, 4 mgal, Hwy	7	39	Diesel	23
A2-2_Berm2-401	Truck, End Dump, 10-13cy, Hwy	88	39	Diesel	50
A2-2_Berm2-401	Truck, Water, 4 mgal, Hwy	2	22	Diesel	12
A2-2_Berm2-402	Truck, Flatbed, 10T, Hwy	5	36	Diesel	22
A2-2_At Grade4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	50
A2-2_At Grade4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_At Grade4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A2-2_At Grade4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	20	39	Diesel	50
A2-2_At Grade4-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-2_At Grade4-201	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A2-2_At Grade4-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_At Grade4-301	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	50
A2-2_At Grade4-301	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-2_At Grade4-302	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A2-2_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A2-2_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-2_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	50

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A2-2_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	80	36	Diesel	46
A2-2_At Grade2-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A2-2_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	60	39	Diesel	50
A2-2_At Grade2-301	Truck, Water, 4 mgal, Hwy	2	29	Diesel	17
A2-2_At Grade2-302	Truck, Flatbed, 10T, Hwy	3	31	Diesel	19
A2-2_Trench-101	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A2-2_Trench-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_Trench-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A2-2_Trench-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-2_Trench-103	Truck, End Dump, 10-13cy, Hwy	3	40	Diesel	50
A2-2_Trench-103	Transit Mix Truck, 10cy	1	10	Diesel	20
A2-2_Trench-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_Trench-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_Trench-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_Trench-202	Truck, End Dump, 10-13cy, Hwy	2	24	Diesel	30
A2-2_Trench-202	Transit Mix Truck, 10cy	1	12	Diesel	24
A2-2_Trench-202	Truck, Water, 4 mgal, Hwy	1	24	Diesel	14
A2-2_Trench-203	Truck, End Dump, 10-13cy, Hwy	161	40	Diesel	51
A2-2_Trench-203	Truck, Water, 4 mgal, Hwy	3	36	Diesel	21
A2-2_Trench-204	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
A2-2_Trench-301	Truck, Water, 4 mgal, Hwy	1	37	Diesel	22
A2-2_Trench-302	Transit Mix Truck, 10cy	1	19	Diesel	38
A2-2_Trench-302	Truck, Water, 4 mgal, Hwy	1	37	Diesel	22
A2-2_Trench-501	Truck, Flatbed, 10T, Hwy	4	40	Diesel	24
A2-2_Trench-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-2_Trench-502	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A2-3_Aerial4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A2-3_Aerial4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Aerial4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A2-3_Aerial4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Aerial4-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-3_Aerial4-104	Truck, End Dump, 10-13cy, Hwy	30	39	Diesel	49
A2-3_Aerial4-104	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A2-3_Aerial4-201	Truck, End Dump, 10-13cy, Hwy	2	36	Diesel	45
A2-3_Aerial4-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A2-3_Aerial4-202	Transit Mix Truck, 10cy	1	16	Diesel	32
A2-3_Aerial4-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A2-3_Aerial4-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A2-3_Aerial4-302	Transit Mix Truck, 10cy	1	22	Diesel	45
A2-3_Aerial4-302	Truck, Water, 4 mgal, Hwy	1	11	Diesel	6
A2-3_Aerial4-401	Truck, Flatbed, 10T, Hwy	2	37	Diesel	22
A2-3_Aerial4-401	Boom Truck, 8 Tn Boom	2	37	Diesel	63
A2-3_Aerial4-401	Truck, Water, 4 mgal, Hwy	2	37	Diesel	21
A2-3_Aerial4-402	Truck, Water, 4 mgal, Hwy	1	19	Diesel	11
A2-3_Aerial4-402	Transit Mix Truck, 10cy	1	38	Diesel	78
A2-3_Aerial4-501	Truck, Flatbed, 10T, Hwy	4	39	Diesel	24
A2-3_Aerial4-501	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A2-3_Aerial4-502	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A2-3_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A2-3_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-3_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A2-3_Aerial2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A2-3_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-3_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	30	39	Diesel	50
A2-3_Aerial2-104	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-3_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-3_Aerial2-201	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
A2-3_Aerial2-202	Transit Mix Truck, 10cy	1	16	Diesel	34
A2-3_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A2-3_Aerial2-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A2-3_Aerial2-302	Transit Mix Truck, 10cy	1	16	Diesel	33
A2-3_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A2-3_Aerial2-401	Truck, Flatbed, 10T, Hwy	5	39	Diesel	24
A2-3_Aerial2-401	Boom Truck, 8 Tn Boom	5	39	Diesel	67
A2-3_Aerial2-401	Truck, Water, 4 mgal, Hwy	5	39	Diesel	22
A2-3_Aerial2-402	Truck, Water, 4 mgal, Hwy	2	25	Diesel	14
A2-3_Aerial2-402	Transit Mix Truck, 10cy	3	33	Diesel	68
A2-3_Aerial2-501	Truck, Flatbed, 10T, Hwy	2	40	Diesel	25
A2-3_Aerial2-501	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
A2-3_Aerial2-502	Truck, Flatbed, 10T, Hwy	3	30	Diesel	19
A2-3_Berm4-101	Truck, End Dump, 10-13cy, Hwy	1	38	Diesel	49
A2-3_Berm4-101	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A2-3_Berm4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-3_Berm4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Berm4-103	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	48
A2-3_Berm4-103	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A2-3_Berm4-104	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A2-3_Berm4-104	Transit Mix Truck, 10cy	1	28	Diesel	58
A2-3_Berm4-201	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A2-3_Berm4-202	Truck, End Dump, 10-13cy, Hwy	25	40	Diesel	51
A2-3_Berm4-202	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Berm4-203	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Berm4-401	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	49
A2-3_Berm4-401	Truck, Water, 4 mgal, Hwy	1	19	Diesel	11
A2-3_Berm4-402	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A2-3_Berm2-101	Truck, End Dump, 10-13cy, Hwy	2	35	Diesel	44
A2-3_Berm2-101	Truck, Water, 4 mgal, Hwy	2	35	Diesel	20
A2-3_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-3_Berm2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Berm2-103	Truck, End Dump, 10-13cy, Hwy	3	40	Diesel	51
A2-3_Berm2-103	Truck, Water, 4 mgal, Hwy	2	30	Diesel	17
A2-3_Berm2-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Berm2-104	Transit Mix Truck, 10cy	1	40	Diesel	82
A2-3_Berm2-201	Truck, Flatbed, 10T, Hwy	5	38	Diesel	23
A2-3_Berm2-202	Truck, End Dump, 10-13cy, Hwy	230	39	Diesel	50
A2-3_Berm2-202	Truck, Water, 4 mgal, Hwy	10	38	Diesel	22
A2-3_Berm2-203	Truck, Water, 4 mgal, Hwy	10	38	Diesel	22
A2-3_Berm2-401	Truck, End Dump, 10-13cy, Hwy	400	39	Diesel	49
A2-3_Berm2-401	Truck, Water, 4 mgal, Hwy	5	40	Diesel	23
A2-3_Berm2-402	Truck, Flatbed, 10T, Hwy	12	38	Diesel	23
A2-3_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	2	27	Diesel	34
A2-3_At Grade2-101	Truck, Water, 4 mgal, Hwy	2	27	Diesel	16
A2-3_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	3	36	Diesel	46
A2-3_At Grade2-102	Truck, Water, 4 mgal, Hwy	2	27	Diesel	16
A2-3_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	26	39	Diesel	49

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A2-3_At Grade2-103	Truck, Water, 4 mgal, Hwy	2	25	Diesel	15
A2-3_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	120	39	Diesel	50
A2-3_At Grade2-201	Truck, Water, 4 mgal, Hwy	3	39	Diesel	23
A2-3_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	240	37	Diesel	48
A2-3_At Grade2-301	Truck, Water, 4 mgal, Hwy	5	39	Diesel	23
A2-3_At Grade2-302	Truck, Flatbed, 10T, Hwy	6	37	Diesel	23
A2-3_Trench-101	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-3_Trench-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Trench-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A2-3_Trench-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Trench-103	Truck, End Dump, 10-13cy, Hwy	3	40	Diesel	51
A2-3_Trench-103	Transit Mix Truck, 10cy	1	10	Diesel	20
A2-3_Trench-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Trench-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Trench-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Trench-202	Truck, End Dump, 10-13cy, Hwy	2	24	Diesel	30
A2-3_Trench-202	Transit Mix Truck, 10cy	1	12	Diesel	24
A2-3_Trench-202	Truck, Water, 4 mgal, Hwy	1	24	Diesel	14
A2-3_Trench-203	Truck, End Dump, 10-13cy, Hwy	100	39	Diesel	50
A2-3_Trench-203	Truck, Water, 4 mgal, Hwy	2	34	Diesel	20
A2-3_Trench-204	Truck, Water, 4 mgal, Hwy	1	22	Diesel	12
A2-3_Trench-301	Truck, Water, 4 mgal, Hwy	1	6	Diesel	3
A2-3_Trench-302	Transit Mix Truck, 10cy	1	1	Diesel	3
A2-3_Trench-302	Truck, Water, 4 mgal, Hwy	1	6	Diesel	3
A2-3_Trench-501	Truck, Flatbed, 10T, Hwy	4	40	Diesel	24
A2-3_Trench-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Trench-502	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A2-3_Tunnel-101	Truck, Water, 4 mgal, Hwy	1	110	Diesel	64
A2-3_Tunnel-102	Truck, End Dump, 10-13cy, Hwy	80	110	Diesel	140
A2-3_Tunnel-102	Truck, Water, 4 mgal, Hwy	1	110	Diesel	64
A2-3_Tunnel-201	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15
A2-3_Tunnel-501	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A2-3_Tunnel-501	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-3_Tunnel-502	Truck, Flatbed, 10T, Hwy	1	28	Diesel	17
A2-3_Large2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A2-3_Large2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A2-3_Large2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A2-3_Large2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A2-3_Large2-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A2-3_Large2-202	Truck, End Dump, 10-13cy, Hwy	40	36	Diesel	46
A2-3_Large2-202	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A2-3_Large2-401	Truck, End Dump, 10-13cy, Hwy	160	36	Diesel	46
A2-3_Large2-401	Truck, Water, 4 mgal, Hwy	4	27	Diesel	16
A2-3_Large2-402	Truck, Flatbed, 10T, Hwy	4	39	Diesel	24
A3-3_Aerial4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A3-3_Aerial4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A3-3_Aerial4-102	Truck, End Dump, 10-13cy, Hwy	4	37	Diesel	47
A3-3_Aerial4-102	Truck, Water, 4 mgal, Hwy	2	37	Diesel	22
A3-3_Aerial4-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A3-3_Aerial4-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	51
A3-3_Aerial4-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A3-3_Aerial4-201	Truck, End Dump, 10-13cy, Hwy	4	36	Diesel	46
A3-3_Aerial4-201	Truck, Water, 4 mgal, Hwy	4	36	Diesel	21

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A3-3_Aerial4-202	Transit Mix Truck, 10cy	1	32	Diesel	66
A3-3_Aerial4-202	Truck, Water, 4 mgal, Hwy	1	16	Diesel	9
A3-3_Aerial4-301	Truck, Water, 4 mgal, Hwy	1	24	Diesel	14
A3-3_Aerial4-302	Transit Mix Truck, 10cy	2	24	Diesel	50
A3-3_Aerial4-302	Truck, Water, 4 mgal, Hwy	1	24	Diesel	14
A3-3_Aerial4-401	Truck, Flatbed, 10T, Hwy	8	40	Diesel	24
A3-3_Aerial4-401	Boom Truck, 8 Tn Boom	8	40	Diesel	69
A3-3_Aerial4-401	Truck, Water, 4 mgal, Hwy	8	40	Diesel	23
A3-3_Aerial4-402	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A3-3_Aerial4-402	Transit Mix Truck, 10cy	4	36	Diesel	75
A3-3_Aerial4-501	Truck, Flatbed, 10T, Hwy	14	38	Diesel	23
A3-3_Aerial4-501	Truck, Water, 4 mgal, Hwy	4	33	Diesel	19
A3-3_Aerial4-502	Truck, Flatbed, 10T, Hwy	4	37	Diesel	23
A3-3_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	2	17	Diesel	21
A3-3_Aerial2-101	Truck, Water, 4 mgal, Hwy	2	17	Diesel	10
A3-3_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	6	27	Diesel	35
A3-3_Aerial2-102	Truck, Water, 4 mgal, Hwy	3	27	Diesel	16
A3-3_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	27	Diesel	16
A3-3_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	60	24	Diesel	30
A3-3_Aerial2-104	Truck, Water, 4 mgal, Hwy	2	24	Diesel	14
A3-3_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	10	23	Diesel	30
A3-3_Aerial2-201	Truck, Water, 4 mgal, Hwy	10	23	Diesel	14
A3-3_Aerial2-202	Transit Mix Truck, 10cy	2	24	Diesel	49
A3-3_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	24	Diesel	14
A3-3_Aerial2-301	Truck, Water, 4 mgal, Hwy	2	18	Diesel	10
A3-3_Aerial2-302	Transit Mix Truck, 10cy	2	24	Diesel	49
A3-3_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	24	Diesel	14
A3-3_Aerial2-401	Truck, Flatbed, 10T, Hwy	34	27	Diesel	16
A3-3_Aerial2-401	Boom Truck, 8 Tn Boom	34	27	Diesel	46
A3-3_Aerial2-401	Truck, Water, 4 mgal, Hwy	34	27	Diesel	15
A3-3_Aerial2-402	Truck, Water, 4 mgal, Hwy	10	23	Diesel	13
A3-3_Aerial2-402	Transit Mix Truck, 10cy	19	24	Diesel	50
A3-3_Aerial2-501	Truck, Flatbed, 10T, Hwy	10	38	Diesel	23
A3-3_Aerial2-501	Truck, Water, 4 mgal, Hwy	10	38	Diesel	22
A3-3_Aerial2-502	Truck, Flatbed, 10T, Hwy	11	39	Diesel	24
A3-3_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	38	Diesel	49
A3-3_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A3-3_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	49
A3-3_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A3-3_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	50
A3-3_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A3-3_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A3-3_At Grade2-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A3-3_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	80	36	Diesel	46
A3-3_At Grade2-301	Truck, Water, 4 mgal, Hwy	2	32	Diesel	18
A3-3_At Grade2-302	Truck, Flatbed, 10T, Hwy	2	36	Diesel	22
A3-3_Tunnel-101	Truck, Water, 4 mgal, Hwy	1	111	Diesel	64
A3-3_Tunnel-102	Truck, End Dump, 10-13cy, Hwy	80	111	Diesel	141
A3-3_Tunnel-102	Truck, Water, 4 mgal, Hwy	1	111	Diesel	64
A3-3_Tunnel-201	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15
A3-3_Tunnel-501	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A3-3_Tunnel-501	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A3-3_Tunnel-502	Truck, Flatbed, 10T, Hwy	1	28	Diesel	17

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A3-3_Large2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A3-3_Large2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A3-3_Large2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A3-3_Large2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A3-3_Large2-201	Truck, Water, 4 mgal, Hwy	2	39	Diesel	22
A3-3_Large2-202	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	49
A3-3_Large2-202	Truck, Water, 4 mgal, Hwy	2	39	Diesel	22
A3-3_Large2-401	Truck, End Dump, 10-13cy, Hwy	160	38	Diesel	49
A3-3_Large2-401	Truck, Water, 4 mgal, Hwy	3	38	Diesel	22
A3-3_Large2-402	Truck, Flatbed, 10T, Hwy	5	34	Diesel	21
EGS-101	Truck, End Dump, 10-13cy, Hwy	2	20	Diesel	25
EGS-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
EGS-102	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
EGS-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
EGS-201	Truck, End Dump, 10-13cy, Hwy	1	20	Diesel	25
EGS-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
EGS-202	Truck, End Dump, 10-13cy, Hwy	2	30	Diesel	38
EGS-202	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
EGS-203	Transit Mix Truck, 10cy	1	9	Diesel	19
EGS-203	Truck, Water, 4 mgal, Hwy	1	7	Diesel	4
EGS-301	Truck, Flatbed, 10T, Hwy	1	10	Diesel	6
EGS-301	Truck, Water, 4 mgal, Hwy	1	30	Diesel	17
EGS-302	Truck, Flatbed, 10T, Hwy	1	10	Diesel	6
EGS-302	Transit Mix Truck, 10cy	1	3	Diesel	5
EGS-302	Truck, Water, 4 mgal, Hwy	1	10	Diesel	6
EGS-303	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
EGS-401	Transit Mix Truck, 10cy	1	20	Diesel	41
EGS-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
EGS-402	Truck, End Dump, 10-13cy, Hwy	4	40	Diesel	51
EGS-402	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
EGS-403	Truck, End Dump, 10-13cy, Hwy	1	27	Diesel	34
EGS-403	Truck, Water, 4 mgal, Hwy	1	13	Diesel	8
DGS-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
DGS-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DGS-102	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
DGS-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DGS-201	Truck, End Dump, 10-13cy, Hwy	1	20	Diesel	25
DGS-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DGS-202	Truck, End Dump, 10-13cy, Hwy	2	30	Diesel	38
DGS-202	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DGS-203	Transit Mix Truck, 10cy	1	9	Diesel	19
DGS-203	Truck, Water, 4 mgal, Hwy	1	7	Diesel	4
DGS-301	Truck, Flatbed, 10T, Hwy	1	10	Diesel	6
DGS-301	Truck, Water, 4 mgal, Hwy	1	30	Diesel	17
DGS-302	Truck, Flatbed, 10T, Hwy	1	10	Diesel	6
DGS-302	Transit Mix Truck, 10cy	1	3	Diesel	5
DGS-302	Truck, Water, 4 mgal, Hwy	1	10	Diesel	6
DGS-303	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DGS-401	Transit Mix Truck, 10cy	1	20	Diesel	41
DGS-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DGS-402	Truck, End Dump, 10-13cy, Hwy	4	40	Diesel	51
DGS-402	Truck, Water, 4 mgal, Hwy	1	27	Diesel	15
DGS-403	Truck, End Dump, 10-13cy, Hwy	1	27	Diesel	34

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
DGS-403	Truck, Water, 4 mgal, Hwy	1	13	Diesel	8
DS-101	Truck, End Dump, 10-13cy, Hwy	3	33	Diesel	42
DS-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DS-102	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
DS-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DS-201	Truck, End Dump, 10-13cy, Hwy	1	20	Diesel	25
DS-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DS-202	Truck, End Dump, 10-13cy, Hwy	2	30	Diesel	38
DS-202	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DS-203	Transit Mix Truck, 10cy	1	9	Diesel	19
DS-203	Truck, Water, 4 mgal, Hwy	1	7	Diesel	4
DS-301	Transit Mix Truck, 10cy	1	30	Diesel	62
DS-301	Truck, Flatbed, 10T, Hwy	1	15	Diesel	9
DS-301	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
DS-302	Truck, Flatbed, 10T, Hwy	1	12	Diesel	7
DS-302	Transit Mix Truck, 10cy	1	3	Diesel	6
DS-302	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
DS-303	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DS-401	Transit Mix Truck, 10cy	1	20	Diesel	41
DS-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DS-402	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
DS-402	Truck, Water, 4 mgal, Hwy	1	28	Diesel	16
DS-403	Truck, End Dump, 10-13cy, Hwy	1	27	Diesel	34
DS-403	Truck, Water, 4 mgal, Hwy	1	13	Diesel	8
DS2-101	Truck, End Dump, 10-13cy, Hwy	3	33	Diesel	42
DS2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DS2-102	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
DS2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DS2-201	Truck, End Dump, 10-13cy, Hwy	1	20	Diesel	25
DS2-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
DS2-202	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
DS2-202	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DS2-203	Transit Mix Truck, 10cy	1	20	Diesel	41
DS2-203	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DS2-301	Transit Mix Truck, 10cy	1	10	Diesel	21
DS2-301	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
DS2-301	Truck, Water, 4 mgal, Hwy	1	10	Diesel	6
DS2-302	Truck, Flatbed, 10T, Hwy	1	10	Diesel	6
DS2-302	Transit Mix Truck, 10cy	1	5	Diesel	10
DS2-302	Truck, Water, 4 mgal, Hwy	1	10	Diesel	6
DS2-303	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
DS2-401	Transit Mix Truck, 10cy	1	20	Diesel	41
DS2-401	Truck, Water, 4 mgal, Hwy	1	10	Diesel	6
DS2-402	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
DS2-402	Truck, Water, 4 mgal, Hwy	1	10	Diesel	6
DS2-403	Truck, End Dump, 10-13cy, Hwy	1	27	Diesel	34
DS2-403	Truck, Water, 4 mgal, Hwy	1	13	Diesel	8
LMF-101	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
LMF-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
LMF-102	Truck, End Dump, 10-13cy, Hwy	10	40	Diesel	51
LMF-102	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
LMF-201	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
LMF-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
LMF-202	Truck, End Dump, 10-13cy, Hwy	1	20	Diesel	25
LMF-202	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
LMF-203	Transit Mix Truck, 10cy	1	20	Diesel	41
LMF-203	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
LMF-301	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
LMF-301	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
LMF-302	Transit Mix Truck, 10cy	1	20	Diesel	41
LMF-302	Truck, Water, 4 mgal, Hwy	1	10	Diesel	6
LMF-303	Truck, End Dump, 10-13cy, Hwy	1	30	Diesel	38
LMF-303	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
LMF-401	Transit Mix Truck, 10cy	1	20	Diesel	41
LMF-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
LMF-402	Truck, End Dump, 10-13cy, Hwy	2	30	Diesel	38
LMF-402	Truck, Water, 4 mgal, Hwy	1	30	Diesel	17
LMF-403	Truck, End Dump, 10-13cy, Hwy	1	30	Diesel	38
LMF-403	Truck, Water, 4 mgal, Hwy	1	30	Diesel	17
LMF-501	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
LMF-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
LMF-502	Truck, Flatbed, 10T, Hwy	1	27	Diesel	16
MOIS-101	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
MOIS-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
MOIS-102	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
MOIS-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
MOIS-201	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
MOIS-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
MOIS-202	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
MOIS-202	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
MOIS-203	Transit Mix Truck, 10cy	1	10	Diesel	21
MOIS-203	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
MOIS-402	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
MOIS-402	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
MOIS-403	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
MOIS-403	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
MOIS-501	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
MOIS-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
MOIS-502	Truck, Flatbed, 10T, Hwy	1	30	Diesel	18
PGE-1	Water Truck	1	40	Diesel	4826
PGE-1	Trailer Truck	1	40	Diesel	4826
PGE-1	Pick Up Truck	1	120	Diesel	4826
PGE-2	Water Truck	1	40	Diesel	4826
PGE-2	Pick Up Truck	1	120	Diesel	4826
PGE-2	Line Truck	1	40	Diesel	4826
PGE-3	Trailer Truck	1	40	Diesel	4826
PGE-4	Cement Truck	3	40	Diesel	4826
PGE-4	Line Truck	1	40	Diesel	4826
PGE-5	Line Truck	2	40	Diesel	4826
PGE-5	Pick Up Truck	4	120	Diesel	4826
A4-1_Berm4-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A4-1_Berm4-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A4-1_Berm4-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A4-1_Berm4-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A4-1_Berm4-103	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A4-1_Berm4-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A4-1_Berm4-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-1_Berm4-104	Transit Mix Truck, 10cy	1	30	Diesel	61
A4-1_Berm4-201	Truck, Flatbed, 10T, Hwy	2	36	Diesel	22
A4-1_Berm4-202	Truck, End Dump, 10-13cy, Hwy	85	40	Diesel	50
A4-1_Berm4-202	Truck, Water, 4 mgal, Hwy	4	34	Diesel	19
A4-1_Berm4-203	Truck, Water, 4 mgal, Hwy	4	34	Diesel	19
A4-1_Berm4-401	Truck, End Dump, 10-13cy, Hwy	48	39	Diesel	50
A4-1_Berm4-401	Truck, Water, 4 mgal, Hwy	1	24	Diesel	14
A4-1_Berm4-402	Truck, Flatbed, 10T, Hwy	3	31	Diesel	19
A4-1_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	50
A4-1_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-1_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A4-1_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-1_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	51
A4-1_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-1_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	58	40	Diesel	50
A4-1_At Grade2-201	Truck, Water, 4 mgal, Hwy	2	29	Diesel	17
A4-1_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	40	40	Diesel	51
A4-1_At Grade2-301	Truck, Water, 4 mgal, Hwy	1	20	Diesel	12
A4-1_At Grade2-302	Truck, Flatbed, 10T, Hwy	2	38	Diesel	23
A4-2_Berm4-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	49
A4-2_Berm4-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A4-2_Berm4-102	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	48
A4-2_Berm4-102	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A4-2_Berm4-103	Truck, End Dump, 10-13cy, Hwy	2	36	Diesel	46
A4-2_Berm4-103	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A4-2_Berm4-104	Truck, Water, 4 mgal, Hwy	1	36	Diesel	21
A4-2_Berm4-104	Transit Mix Truck, 10cy	1	27	Diesel	55
A4-2_Berm4-201	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A4-2_Berm4-202	Truck, End Dump, 10-13cy, Hwy	29	39	Diesel	50
A4-2_Berm4-202	Truck, Water, 4 mgal, Hwy	2	23	Diesel	13
A4-2_Berm4-203	Truck, Water, 4 mgal, Hwy	2	23	Diesel	13
A4-2_Berm4-401	Truck, End Dump, 10-13cy, Hwy	40	39	Diesel	49
A4-2_Berm4-401	Truck, Water, 4 mgal, Hwy	1	19	Diesel	11
A4-2_Berm4-402	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A4-2_Berm2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	50
A4-2_Berm2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-2_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A4-2_Berm2-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A4-2_Berm2-103	Truck, End Dump, 10-13cy, Hwy	3	40	Diesel	51
A4-2_Berm2-103	Truck, Water, 4 mgal, Hwy	2	30	Diesel	17
A4-2_Berm2-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-2_Berm2-104	Transit Mix Truck, 10cy	1	40	Diesel	82
A4-2_Berm2-201	Truck, Flatbed, 10T, Hwy	2	30	Diesel	18
A4-2_Berm2-202	Truck, End Dump, 10-13cy, Hwy	75	38	Diesel	48
A4-2_Berm2-202	Truck, Water, 4 mgal, Hwy	3	40	Diesel	23
A4-2_Berm2-203	Truck, Water, 4 mgal, Hwy	3	40	Diesel	23
A4-2_Berm2-401	Truck, End Dump, 10-13cy, Hwy	40	38	Diesel	49
A4-2_Berm2-401	Truck, Water, 4 mgal, Hwy	1	20	Diesel	11
A4-2_Berm2-402	Truck, Flatbed, 10T, Hwy	2	39	Diesel	24
A4-2_At Grade4-101	Truck, End Dump, 10-13cy, Hwy	3	40	Diesel	51
A4-2_At Grade4-101	Truck, Water, 4 mgal, Hwy	3	40	Diesel	23
A4-2_At Grade4-102	Truck, End Dump, 10-13cy, Hwy	6	40	Diesel	51

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A4-2_At Grade4-102	Truck, Water, 4 mgal, Hwy	3	40	Diesel	23
A4-2_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	54	40	Diesel	51
A4-2_At Grade4-103	Truck, Water, 4 mgal, Hwy	3	36	Diesel	21
A4-2_At Grade4-201	Truck, End Dump, 10-13cy, Hwy	280	40	Diesel	51
A4-2_At Grade4-201	Truck, Water, 4 mgal, Hwy	7	40	Diesel	23
A4-2_At Grade4-301	Truck, End Dump, 10-13cy, Hwy	172	40	Diesel	50
A4-2_At Grade4-301	Truck, Water, 4 mgal, Hwy	5	34	Diesel	20
A4-2_At Grade4-302	Truck, Flatbed, 10T, Hwy	8	40	Diesel	24
A4-3_Aerial4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A4-3_Aerial4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Aerial4-102	Truck, End Dump, 10-13cy, Hwy	2	39	Diesel	50
A4-3_Aerial4-102	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A4-3_Aerial4-103	Truck, Water, 4 mgal, Hwy	1	37	Diesel	22
A4-3_Aerial4-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	51
A4-3_Aerial4-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Aerial4-201	Truck, End Dump, 10-13cy, Hwy	2	36	Diesel	46
A4-3_Aerial4-201	Truck, Water, 4 mgal, Hwy	2	36	Diesel	21
A4-3_Aerial4-202	Transit Mix Truck, 10cy	1	16	Diesel	33
A4-3_Aerial4-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A4-3_Aerial4-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A4-3_Aerial4-302	Transit Mix Truck, 10cy	1	22	Diesel	45
A4-3_Aerial4-302	Truck, Water, 4 mgal, Hwy	1	11	Diesel	6
A4-3_Aerial4-401	Truck, Flatbed, 10T, Hwy	2	28	Diesel	17
A4-3_Aerial4-401	Boom Truck, 8 Tn Boom	2	28	Diesel	48
A4-3_Aerial4-401	Truck, Water, 4 mgal, Hwy	2	28	Diesel	16
A4-3_Aerial4-402	Truck, Water, 4 mgal, Hwy	1	14	Diesel	8
A4-3_Aerial4-402	Transit Mix Truck, 10cy	1	29	Diesel	59
A4-3_Aerial4-501	Truck, Flatbed, 10T, Hwy	4	40	Diesel	24
A4-3_Aerial4-501	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Aerial4-502	Truck, Flatbed, 10T, Hwy	1	40	Diesel	24
A4-3_Aerial2-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	51
A4-3_Aerial2-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Aerial2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A4-3_Aerial2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Aerial2-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A4-3_Aerial2-104	Truck, End Dump, 10-13cy, Hwy	30	40	Diesel	51
A4-3_Aerial2-104	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Aerial2-201	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A4-3_Aerial2-201	Truck, Water, 4 mgal, Hwy	2	40	Diesel	23
A4-3_Aerial2-202	Transit Mix Truck, 10cy	1	16	Diesel	33
A4-3_Aerial2-202	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A4-3_Aerial2-301	Truck, Water, 4 mgal, Hwy	1	12	Diesel	7
A4-3_Aerial2-302	Transit Mix Truck, 10cy	1	16	Diesel	33
A4-3_Aerial2-302	Truck, Water, 4 mgal, Hwy	1	8	Diesel	5
A4-3_Aerial2-401	Truck, Flatbed, 10T, Hwy	6	39	Diesel	24
A4-3_Aerial2-401	Boom Truck, 8 Tn Boom	6	39	Diesel	66
A4-3_Aerial2-401	Truck, Water, 4 mgal, Hwy	6	39	Diesel	22
A4-3_Aerial2-402	Truck, Water, 4 mgal, Hwy	2	30	Diesel	17
A4-3_Aerial2-402	Transit Mix Truck, 10cy	3	39	Diesel	81
A4-3_Aerial2-501	Truck, Flatbed, 10T, Hwy	3	32	Diesel	20
A4-3_Aerial2-501	Truck, Water, 4 mgal, Hwy	3	32	Diesel	19
A4-3_Aerial2-502	Truck, Flatbed, 10T, Hwy	3	36	Diesel	22
A4-3_Berm4-101	Truck, End Dump, 10-13cy, Hwy	4	38	Diesel	48

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A4-3_Berm4-101	Truck, Water, 4 mgal, Hwy	4	38	Diesel	22
A4-3_Berm4-102	Truck, End Dump, 10-13cy, Hwy	5	40	Diesel	51
A4-3_Berm4-102	Truck, Water, 4 mgal, Hwy	3	34	Diesel	19
A4-3_Berm4-103	Truck, End Dump, 10-13cy, Hwy	3	35	Diesel	44
A4-3_Berm4-103	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15
A4-3_Berm4-104	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15
A4-3_Berm4-104	Transit Mix Truck, 10cy	1	39	Diesel	80
A4-3_Berm4-201	Truck, Flatbed, 10T, Hwy	9	40	Diesel	24
A4-3_Berm4-202	Truck, End Dump, 10-13cy, Hwy	525	40	Diesel	51
A4-3_Berm4-202	Truck, Water, 4 mgal, Hwy	21	40	Diesel	23
A4-3_Berm4-203	Truck, Water, 4 mgal, Hwy	21	40	Diesel	23
A4-3_Berm4-401	Truck, End Dump, 10-13cy, Hwy	884	40	Diesel	51
A4-3_Berm4-401	Truck, Water, 4 mgal, Hwy	12	37	Diesel	21
A4-3_Berm4-402	Truck, Flatbed, 10T, Hwy	25	39	Diesel	24
A4-3_Berm2-101	Truck, End Dump, 10-13cy, Hwy	1	38	Diesel	49
A4-3_Berm2-101	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A4-3_Berm2-102	Truck, End Dump, 10-13cy, Hwy	2	37	Diesel	47
A4-3_Berm2-102	Truck, Water, 4 mgal, Hwy	1	37	Diesel	21
A4-3_Berm2-103	Truck, End Dump, 10-13cy, Hwy	3	39	Diesel	49
A4-3_Berm2-103	Truck, Water, 4 mgal, Hwy	2	29	Diesel	17
A4-3_Berm2-104	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A4-3_Berm2-104	Transit Mix Truck, 10cy	1	39	Diesel	80
A4-3_Berm2-201	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A4-3_Berm2-202	Truck, End Dump, 10-13cy, Hwy	25	38	Diesel	48
A4-3_Berm2-202	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Berm2-203	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Berm2-401	Truck, End Dump, 10-13cy, Hwy	40	37	Diesel	47
A4-3_Berm2-401	Truck, Water, 4 mgal, Hwy	1	19	Diesel	11
A4-3_Berm2-402	Truck, Flatbed, 10T, Hwy	1	38	Diesel	23
A4-3_At Grade4-101	Truck, End Dump, 10-13cy, Hwy	1	40	Diesel	50
A4-3_At Grade4-101	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_At Grade4-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	50
A4-3_At Grade4-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_At Grade4-103	Truck, End Dump, 10-13cy, Hwy	20	39	Diesel	49
A4-3_At Grade4-103	Truck, Water, 4 mgal, Hwy	1	39	Diesel	22
A4-3_At Grade4-201	Truck, End Dump, 10-13cy, Hwy	40	38	Diesel	49
A4-3_At Grade4-201	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A4-3_At Grade4-301	Truck, End Dump, 10-13cy, Hwy	40	37	Diesel	47
A4-3_At Grade4-301	Truck, Water, 4 mgal, Hwy	1	37	Diesel	22
A4-3_At Grade4-302	Truck, Flatbed, 10T, Hwy	1	37	Diesel	23
A4-3_At Grade2-101	Truck, End Dump, 10-13cy, Hwy	1	38	Diesel	49
A4-3_At Grade2-101	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A4-3_At Grade2-102	Truck, End Dump, 10-13cy, Hwy	2	38	Diesel	49
A4-3_At Grade2-102	Truck, Water, 4 mgal, Hwy	1	38	Diesel	22
A4-3_At Grade2-103	Truck, End Dump, 10-13cy, Hwy	20	40	Diesel	51
A4-3_At Grade2-103	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_At Grade2-201	Truck, End Dump, 10-13cy, Hwy	51	39	Diesel	50
A4-3_At Grade2-201	Truck, Water, 4 mgal, Hwy	2	25	Diesel	14
A4-3_At Grade2-301	Truck, End Dump, 10-13cy, Hwy	96	40	Diesel	51
A4-3_At Grade2-301	Truck, Water, 4 mgal, Hwy	2	24	Diesel	14
A4-3_At Grade2-302	Truck, Flatbed, 10T, Hwy	3	36	Diesel	22
A4-3_Tunnel-101	Truck, Water, 4 mgal, Hwy	1	110	Diesel	64
A4-3_Tunnel-102	Truck, End Dump, 10-13cy, Hwy	80	110	Diesel	140

Code	Vehicle	Trucks/Day	RT Mi/ Truck	Fuel	Fuel (gal/day/veh)
A4-3_Tunnel-102	Truck, Water, 4 mgal, Hwy	1	110	Diesel	64
A4-3_Tunnel-201	Truck, Water, 4 mgal, Hwy	2	26	Diesel	15
A4-3_Tunnel-501	Truck, Flatbed, 10T, Hwy	1	39	Diesel	24
A4-3_Tunnel-501	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A4-3_Tunnel-502	Truck, Flatbed, 10T, Hwy	1	28	Diesel	17
A4-3_Large2-101	Truck, End Dump, 10-13cy, Hwy	1	39	Diesel	50
A4-3_Large2-101	Truck, Water, 4 mgal, Hwy	1	39	Diesel	23
A4-3_Large2-102	Truck, End Dump, 10-13cy, Hwy	2	40	Diesel	51
A4-3_Large2-102	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Large2-201	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Large2-202	Truck, End Dump, 10-13cy, Hwy	21	39	Diesel	49
A4-3_Large2-202	Truck, Water, 4 mgal, Hwy	1	40	Diesel	23
A4-3_Large2-401	Truck, End Dump, 10-13cy, Hwy	80	40	Diesel	51
A4-3_Large2-401	Truck, Water, 4 mgal, Hwy	2	30	Diesel	17
A4-3_Large2-402	Truck, Flatbed, 10T, Hwy	3	30	Diesel	18

Long Distance Hauling Vehicles

Code	Trip/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A1-1_Aerial4-103	4	400	Diesel	1,097
A1-1_Aerial2-103	4	400	Diesel	1,097
A1-1_Berm2-103	8	400	Diesel	2,194
A1-1_At Grade4-103	8	340	Diesel	1,865
A1-1_At Grade2-103	4	360	Diesel	987
A1-2_Aerial2-103	4	400	Diesel	1,097
A1-2_Berm2-103	8	400	Diesel	2,194
A1-2_At Grade4-103	8	340	Diesel	1,865
A1-2_At Grade2-103	4	360	Diesel	987
A1-3_Aerial4-103	4	400	Diesel	1,097
A1-3_Aerial2-103	4	400	Diesel	1,097
A1-3_At Grade4-103	8	340	Diesel	1,865
A1-3_At Grade2-103	4	360	Diesel	987
A1-4_Aerial4-103	4	400	Diesel	1,097
A1-4_Aerial2-103	4	400	Diesel	1,097
A1-4_At Grade2-103	4	360	Diesel	987
A1-5_Aerial2-103	4	400	Diesel	1,097
A1-5_Berm2-103	8	400	Diesel	2,194
A2-1_Aerial4-103	4	400	Diesel	1,097
A2-1_Aerial2-103	4	400	Diesel	1,097
A2-1_Berm2-103	8	400	Diesel	2,194
A2-1_At Grade4-103	8	340	Diesel	1,865
A2-1_At Grade2-103	4	360	Diesel	987
A2-2_Aerial2-103	4	400	Diesel	1,097
A2-2_Berm2-103	8	400	Diesel	2,194
A2-2_At Grade4-103	8	340	Diesel	1,865
A2-2_At Grade2-103	4	360	Diesel	987
A2-2_Trench-103	6	400	Diesel	1,646
A2-3_Aerial4-103	4	400	Diesel	1,097
A2-3_Aerial2-103	4	400	Diesel	1,097
A2-3_Berm4-103	8	400	Diesel	2,194
A2-3_Berm2-103	8	400	Diesel	2,194
A2-3_At Grade2-103	4	360	Diesel	987
A2-3_Trench-103	6	400	Diesel	1,646
A3-3_Aerial4-103	4	400	Diesel	1,097
A3-3_Aerial2-103	4	400	Diesel	1,097
A3-3_At Grade2-103	4	360	Diesel	987
EGS-101	6	80	Diesel	329
DGS-101	6	80	Diesel	329
DS-101	6	80	Diesel	329
DS2-101	6	80	Diesel	329
A4-1_Berm4-103	8	400	Diesel	2,194
A4-1_At Grade2-103	4	360	Diesel	987
A4-2_Berm4-103	8	400	Diesel	2,194
A4-2_Berm2-103	8	400	Diesel	2,194
A4-2_At Grade4-103	8	340	Diesel	1,865

Code	Trip/Day	RT Mi/Trip	Fuel	Fuel (gal/day)
A4-3_Aerial4-103	4	400	Diesel	1,097
A4-3_Aerial2-103	4	400	Diesel	1,097
A4-3_Berm4-103	8	400	Diesel	2,194
A4-3_Berm2-103	8	400	Diesel	2,194
A4-3_At Grade4-103	8	340	Diesel	1,865
A4-3_At Grade2-103	4	360	Diesel	987

Helicopters

Code	Days	Number per Day
PGE-4	5	2
PGE-5	5	2

Earthmoving

Code	Grading (acres/day)	Cut/fill (cy/day)	Dozing (hr/day)
A1-1_Aerial4-101	0.00	43	0
A1-1_Aerial4-103	0.03	50	0
A1-1_Aerial4-104	0.04	102	0
A1-1_Aerial4-201	0.00	37	0
A1-1_Aerial2-101	0.00	43	0
A1-1_Aerial2-103	0.07	106	0
A1-1_Aerial2-104	0.02	100	0
A1-1_Aerial2-201	0.00	54	0
A1-1_Berm2-101	0.00	46	0
A1-1_Berm2-102	0.00	0	7
A1-1_Berm2-103	0.08	123	0
A1-1_Berm2-202	0.01	187	8
A1-1_At Grade4-101	0.00	44	0
A1-1_At Grade4-102	0.00	0	7
A1-1_At Grade4-103	0.03	0	7
A1-1_At Grade4-201	0.01	139	0
A1-1_At Grade2-101	0.00	47	0
A1-1_At Grade2-102	0.00	0	7
A1-1_At Grade2-103	0.03	0	8
A1-1_At Grade2-201	0.02	97	0
A1-2_Aerial2-101	0.00	44	0
A1-2_Aerial2-103	0.07	112	0
A1-2_Aerial2-104	0.04	168	0
A1-2_Aerial2-201	0.00	141	0
A1-2_Berm2-101	0.00	44	0
A1-2_Berm2-102	0.00	0	8
A1-2_Berm2-103	0.06	97	0
A1-2_Berm2-202	0.03	527	22
A1-2_At Grade4-101	0.00	44	0
A1-2_At Grade4-102	0.00	0	7
A1-2_At Grade4-103	0.03	0	7
A1-2_At Grade4-201	0.01	92	0
A1-2_At Grade2-101	0.00	44	0
A1-2_At Grade2-102	0.00	0	7
A1-2_At Grade2-103	0.03	0	7
A1-2_At Grade2-201	0.01	97	0
A1-3_Aerial4-101	0.00	44	0
A1-3_Aerial4-103	0.03	54	0
A1-3_Aerial4-104	0.04	102	0
A1-3_Aerial4-201	0.00	37	0
A1-3_Aerial2-101	0.01	53	0
A1-3_Aerial2-103	0.07	111	0
A1-3_Aerial2-104	0.04	176	0
A1-3_Aerial2-201	0.00	159	0
A1-3_At Grade4-101	0.00	44	0
A1-3_At Grade4-102	0.00	0	7

Code	Grading (acres/day)	Cut/fill (cy/day)	Dozing (hr/day)
A1-3_At Grade4-103	0.03	0	7
A1-3_At Grade4-201	0.01	92	0
A1-3_At Grade2-101	0.00	44	0
A1-3_At Grade2-102	0.00	0	7
A1-3_At Grade2-103	0.03	0	7
A1-3_At Grade2-201	0.01	118	0
A1-3_Tunnel-102	0.00	2355	0
A1-3_Large2-101	0.00	44	0
A1-3_Large2-201	0.03	3407	7
A1-3_Large2-202	0.02	3414	8
A1-4_Aerial4-101	0.00	44	0
A1-4_Aerial4-103	0.03	54	0
A1-4_Aerial4-104	0.04	102	0
A1-4_Aerial4-201	0.00	37	0
A1-4_Aerial2-101	0.00	43	0
A1-4_Aerial2-103	0.07	110	0
A1-4_Aerial2-104	0.02	99	0
A1-4_Aerial2-201	0.00	37	0
A1-4_At Grade2-101	0.00	42	0
A1-4_At Grade2-102	0.00	0	6
A1-4_At Grade2-103	0.03	0	7
A1-4_At Grade2-201	0.01	118	0
A1-4_Tunnel-102	0.00	4143	0
A1-4_Large2-101	0.00	44	0
A1-4_Large2-201	0.05	6029	12
A1-4_Large2-202	0.04	6042	15
A1-5_Aerial2-101	0.00	44	0
A1-5_Aerial2-103	0.07	110	0
A1-5_Aerial2-104	0.02	103	0
A1-5_Aerial2-201	0.00	37	0
A1-5_Berm2-101	0.00	44	0
A1-5_Berm2-102	0.00	0	7
A1-5_Berm2-103	0.06	92	0
A1-5_Berm2-202	0.01	184	8
A1-5_Large2-101	0.00	44	0
A1-5_Large2-201	0.09	10289	21
A1-5_Large2-202	0.07	10311	25
A2-1_Aerial4-101	0.00	43	0
A2-1_Aerial4-103	0.03	51	0
A2-1_Aerial4-104	0.04	102	0
A2-1_Aerial4-201	0.00	41	0
A2-1_Aerial2-101	0.00	44	0
A2-1_Aerial2-103	0.07	107	0
A2-1_Aerial2-104	0.03	131	0
A2-1_Aerial2-201	0.00	110	0
A2-1_Berm2-101	0.00	45	0
A2-1_Berm2-102	0.00	0	7
A2-1_Berm2-103	0.07	121	0

Code	Grading (acres/day)	Cut/fill (cy/day)	Dozing (hr/day)
A2-1_Berm2-202	0.01	184	8
A2-1_At Grade4-101	0.00	44	0
A2-1_At Grade4-102	0.00	0	7
A2-1_At Grade4-103	0.03	0	7
A2-1_At Grade4-201	0.01	158	0
A2-1_At Grade2-101	0.00	43	0
A2-1_At Grade2-102	0.00	0	6
A2-1_At Grade2-103	0.03	0	7
A2-1_At Grade2-201	0.01	202	0
A2-2_Aerial2-101	0.00	40	0
A2-2_Aerial2-103	0.07	105	0
A2-2_Aerial2-104	0.02	93	0
A2-2_Aerial2-201	0.00	36	0
A2-2_Berm2-101	0.01	56	0
A2-2_Berm2-102	0.00	0	8
A2-2_Berm2-103	0.06	101	0
A2-2_Berm2-202	0.08	1265	52
A2-2_At Grade4-101	0.00	44	0
A2-2_At Grade4-102	0.00	0	7
A2-2_At Grade4-103	0.03	0	7
A2-2_At Grade4-201	0.01	92	0
A2-2_At Grade2-101	0.00	44	0
A2-2_At Grade2-102	0.00	0	7
A2-2_At Grade2-103	0.03	0	7
A2-2_At Grade2-201	0.02	97	0
A2-2_Trench-101	0.00	9	0
A2-2_Trench-102	0.00	0	8
A2-2_Trench-201	0.01	18	0
A2-2_Trench-202	0.00	525	0
A2-2_Trench-203	0.01	342	21
A2-2_Trench-204	0.00	0	17
A2-3_Aerial4-101	0.00	44	0
A2-3_Aerial4-103	0.03	55	0
A2-3_Aerial4-104	0.04	100	0
A2-3_Aerial4-201	0.00	37	0
A2-3_Aerial2-101	0.00	44	0
A2-3_Aerial2-103	0.07	110	0
A2-3_Aerial2-104	0.02	100	0
A2-3_Aerial2-201	0.00	37	0
A2-3_Berm4-101	0.00	43	0
A2-3_Berm4-102	0.00	0	8
A2-3_Berm4-103	0.06	96	0
A2-3_Berm4-202	0.01	150	8
A2-3_Berm2-101	0.01	77	0
A2-3_Berm2-102	0.00	0	8
A2-3_Berm2-103	0.06	103	0
A2-3_Berm2-202	0.12	1758	73
A2-3_At Grade2-101	0.01	63	0

Code	Grading (acres/day)	Cut/fill (cy/day)	Dozing (hr/day)
A2-3_At Grade2-102	0.00	0	9
A2-3_At Grade2-103	0.04	0	9
A2-3_At Grade2-201	0.03	347	0
A2-3_Trench-102	0.00	0	8
A2-3_Trench-103	0.00	0	2
A2-3_Trench-203	0.00	0	14
A2-3_Trench-204	0.00	0	4
A2-3_Tunnel-102	0.00	2355	0
A2-3_Large2-101	0.00	44	0
A2-3_Large2-201	0.05	6013	12
A2-3_Large2-202	0.04	6025	15
A3-3_Aerial4-101	0.00	44	0
A3-3_Aerial4-103	0.03	55	0
A3-3_Aerial4-104	0.04	103	0
A3-3_Aerial4-201	0.00	74	0
A3-3_Aerial2-101	0.00	37	0
A3-3_Aerial2-103	0.05	76	0
A3-3_Aerial2-104	0.03	121	0
A3-3_Aerial2-201	0.00	109	0
A3-3_At Grade2-101	0.00	44	0
A3-3_At Grade2-102	0.00	0	7
A3-3_At Grade2-103	0.03	0	7
A3-3_At Grade2-201	0.01	118	0
A3-3_Tunnel-102	0.00	2359	0
A3-3_Large2-101	0.00	47	0
A3-3_Large2-201	0.05	6403	13
A3-3_Large2-202	0.04	6417	15
EGS-101	0.00	0	6
EGS-102	1.50	0	0
DGS-101	0.00	0	6
DGS-102	1.50	0	0
DS-101	0.00	0	6
DS-102	0.50	0	0
DS2-101	0.00	0	6
DS2-102	1.00	0	0
LMF-101	0.00	0	0
LMF-102	4.50	0	0
MOIS-101	1.15	1852	0
MOIS-202	0.03	237	0
PGE-1	0.66	0	8
PGE-2	0.00	18	0
A4-1_Berm4-101	0.00	43	0
A4-1_Berm4-202	0.00	0	27
A4-1_Berm4-103	0.06	101	0
A4-1_Berm4-202	0.03	1090	27
A4-1_At Grade2-101	0.00	44	0
A4-1_At Grade2-102	0.00	0	7
A4-1_At Grade2-103	0.03	0	7

Code	Grading (acres/day)	Cut/fill (cy/day)	Dozing (hr/day)
A4-1_At Grade2-201	0.01	170	0
A4-2_Berm4-101	0.00	43	0
A4-2_Berm4-102	0.00	0	8
A4-2_Berm4-103	0.06	91	0
A4-2_Berm4-202	0.01	195	9
A4-2_Berm2-101	0.00	44	0
A4-2_Berm2-103	0.06	103	0
A4-2_Berm2-102	0.00	0	8
A4-2_Berm2-202	0.04	251	24
A4-2_At Grade4-101	0.01	135	0
A4-2_At Grade4-102	0.00	0	24
A4-2_At Grade4-103	0.08	0	19
A4-2_At Grade4-201	0.05	646	0
A4-3_Aerial4-101	0.00	44	0
A4-3_Aerial4-103	0.03	52	0
A4-3_Aerial4-104	0.04	102	0
A4-3_Aerial4-201	0.00	37	0
A4-3_Aerial2-101	0.00	44	0
A4-3_Aerial2-103	0.07	109	0
A4-3_Aerial2-104	0.02	102	0
A4-3_Aerial2-201	0.00	37	0
A4-3_Berm4-101	0.02	168	0
A4-3_Berm4-102	0.00	0	20
A4-3_Berm4-103	0.08	132	0
A4-3_Berm4-202	0.17	230	168
A4-3_Berm2-101	0.00	43	0
A4-3_Berm2-102	0.00	0	7
A4-3_Berm2-103	0.06	101	0
A4-3_Berm2-202	0.01	184	8
A4-3_At Grade4-101	0.00	44	0
A4-3_At Grade4-102	0.00	0	7
A4-3_At Grade4-103	0.03	0	7
A4-3_At Grade4-201	0.01	89	0
A4-3_At Grade2-101	0.00	44	0
A4-3_At Grade2-102	0.00	0	7
A4-3_At Grade2-103	0.03	0	7
A4-3_At Grade2-201	0.01	148	0
A4-3_Tunnel-102	0.00	2355	0
A4-3_Large2-101	0.00	44	0
A4-3_Large2-201	0.03	3357	7
A4-3_Large2-202	0.02	3364	8

Demolition

Alternative/Subsection	Square Feet
Alternative/Subsection	
San Jose Diridon Station Approach	1,173,712
Monterey Corridor	393,532
Morgan Hill and Gilroy	2,491,417
Pacheco Pass	25,739
San Joaquin Valley	248,618
Total	*4,333,019*
Alternative 2	
San Jose Diridon Station Approach	1,341,825
Monterey Corridor	412,031
Morgan Hill and Gilroy	5,037,528
Pacheco Pass	25,739
San Joaquin Valley	248,618
Total	*7,065,741*
Alternative 3	
San Jose Diridon Station Approach	1,341,825
Monterey Corridor	393,532
Morgan Hill and Gilroy	2,007,632
Pacheco Pass	25,739
San Joaquin Valley	248,618
Total	*4,017,347*
Alternative 4	
San Jose Diridon Station Approach	589,882
Monterey Corridor	280,099
Morgan Hill and Gilroy	814,256
Pacheco Pass	25,739
San Joaquin Valley	248,618
Total	*1,958,594*

Paving

Code	Paving Year	Paving Days	Paved (sf/day)
A1-1_Aerial4-101	2023	20	200
A1-1_Aerial4-402	2025	25	1000
A1-1_Aerial2-101	2023	25	200
A1-1_Aerial2-402	2025	60	1000
A1-1_Berm2-101	2023	5	200
A1-1_At Grade4-101	2024	65	200
A1-1_At Grade4-201	2025	6	10000
A1-1_At Grade2-101	2025	45	200
A1-1_At Grade2-201	2025	8	10000
A1-2_Aerial2-101	2024	60	200
A1-2_Aerial2-402	2025	75	2000
A1-2_Berm2-101	2024	50	200
A1-2_At Grade4-101	2024	45	200
A1-2_At Grade4-201	2025	25	2000
A1-2_At Grade2-101	2024	30	200
A1-2_At Grade2-201	2025	55	1000
A1-3_Aerial4-101	2023	60	200
A1-3_Aerial4-402	2026	60	1000
A1-3_Aerial2-101	2026	275	200
A1-3_Aerial2-402	2026	220	3000
A1-3_At Grade2-101	2022	25	200
A1-3_At Grade2-201	2023	20	1000
A1-3_Large2-101	2022	10	200
A1-4_Aerial4-101	2023	55	200
A1-4_Aerial4-402	2026	50	1000
A1-4_Aerial2-101	2022	20	200
A1-4_Aerial2-402	2026	50	1000
A1-4_At Grade2-101	2022	15	200
A1-4_At Grade2-201	2022	15	1000
A1-4_Large2-101	2022	15	200
A1-5_Aerial2-101	2023	55	200
A1-5_Aerial2-402	2026	135	1000
A1-5_Berm2-101	2022	25	200
A1-5_Large2-101	2023	30	200
A2-1_Aerial4-101	2023	20	200
A2-1_Aerial4-402	2025	25	1000
A2-1_Aerial2-101	2024	50	200
A2-1_Aerial2-402	2025	120	1000
A2-1_Berm2-101	2023	5	200
A2-1_At Grade4-101	2024	75	200
A2-1_At Grade4-201	2025	7	10000
A2-1_At Grade2-101	2023	10	200
A2-1_At Grade2-201	2024	3	10000
A2-2_Aerial2-101	2023	10	200
A2-2_Aerial2-402	2025	25	1000
A2-2_Berm2-101	2025	120	200

Code	Paving Year	Paving Days	Paved (sf/day)
A2-2_At Grade4-101	2024	45	200
A2-2_At Grade4-201	2025	40	1000
A2-2_At Grade2-101	2025	45	200
A2-2_At Grade2-201	2025	85	1000
A2-2_Trench-101	2025	50	200
A2-2_Trench-203	2024	40	1000
A2-3_Aerial4-101	2022	40	200
A2-3_Aerial4-402	2026	40	1000
A2-3_Aerial2-101	2022	40	200
A2-3_Aerial2-402	2026	100	1000
A2-3_At Grade2-101	2026	170	200
A2-3_At Grade2-201	2026	125	1000
A2-3_Large2-101	2022	20	200
A3-3_Aerial4-101	2024	165	200
A3-3_Aerial4-402	2026	155	1000
A3-3_Aerial2-101	2025	190	200
A3-3_Aerial2-402	2025	225	2000
A3-3_At Grade2-101	2024	55	200
A3-3_At Grade2-201	2026	40	1000
A3-3_Large2-101	2022	20	200
EGS-402	2025	80	30000
DGS-402	2025	60	30000
DS-402	2025	18	5000
DS2-402	2025	40	18000
LMF-402	2025	15	15000
MOIS-101	2024	6	10000
A4-1_Berm4-101	2024	45	200
A4-1_At Grade2-101	2024	40	200
A4-1_At Grade2-201	2025	20	1000
A4-2_Berm4-101	2023	15	200
A4-2_Berm2-101	2024	55	200
A4-2_At Grade4-101	2024	330	200
A4-2_At Grade4-201	2025	35	1000
A4-3_Aerial4-101	2022	30	200
A4-3_Aerial4-402	2026	30	1000
A4-3_Aerial2-101	2022	50	200
A4-3_Aerial2-402	2026	115	1000
A4-3_Berm4-101	2024	330	200
A4-3_Berm2-101	2022	10	200
A4-3_At Grade4-101	2025	20	200
A4-3_At Grade4-201	2026	5	1000
A4-3_At Grade2-101	2024	70	200
A4-3_At Grade2-201	2026	30	1000
A4-3_Large2-101	2022	10	200

Coating

Code	Coating Year	Coating Days	Coated (sf/day)
EGS-302	2025	35	5,000
DGS-302	2025	40	5,000
DS-302	2025	80	6,000
DS2-302	2025	80	6,000
LMF-302	2024	25	9,000

Ballast

Code	Type	Total Cubic Yardage Ballasted
A1-1_Berm2-401b	Ballast	2,000
A1-1_Berm2-401s	Subballast	3,000
A1-1_At Grade4-301b	Ballast	13,000
A1-1_At Grade4-301s	Subballast	22,000
A1-1_At Grade2-301b	Ballast	17,000
A1-1_At Grade2-301s	Subballast	33,000
A1-2_Berm2-401b	Ballast	17,000
A1-2_Berm2-401s	Subballast	27,000
A1-2_At Grade4-301b	Ballast	9,000
A1-2_At Grade4-301s	Subballast	15,000
A1-2_At Grade2-301b	Ballast	13,000
A1-2_At Grade2-301s	Subballast	21,000
A1-3_At Grade4-301b	Ballast	5,000
A1-3_At Grade4-301s	Subballast	8,000
A1-3_At Grade2-301b	Ballast	11,000
A1-3_At Grade2-301s	Subballast	17,000
A1-3_Large2-401b	Ballast	27,000
A1-3_Large2-401s	Subballast	44,000
A1-4_At Grade2-301b	Ballast	3,000
A1-4_At Grade2-301s	Subballast	5,000
A1-4_Large2-401b	Ballast	46,000
A1-4_Large2-401s	Subballast	74,000
A1-5_Berm2-401b	Ballast	8,000
A1-5_Berm2-401s	Subballast	12,000
A1-5_Large2-401b	Ballast	78,000
A1-5_Large2-401s	Subballast	125,000
A2-1_Berm2-401b	Ballast	2,000
A2-1_Berm2-401s	Subballast	2,000
A2-1_At Grade4-301b	Ballast	16,000
A2-1_At Grade4-301s	Subballast	25,000
A2-1_At Grade2-301b	Ballast	6,000
A2-1_At Grade2-301s	Subballast	9,000
A2-2_Berm2-401b	Ballast	40,000
A2-2_Berm2-401s	Subballast	64,000
A2-2_At Grade4-301b	Ballast	9,000
A2-2_At Grade4-301s	Subballast	15,000
A2-2_At Grade2-301b	Ballast	21,000
A2-2_At Grade2-301s	Subballast	33,000
A2-3_Berm4-401b	Ballast	8,000
A2-3_Berm4-401s	Subballast	13,000
A2-3_Berm2-401b	Ballast	134,000
A2-3_Berm2-401s	Subballast	214,000
A2-3_At Grade2-301b	Ballast	75,000
A2-3_At Grade2-301s	Subballast	120,000
A2-3_Large2-401b	Ballast	48,000
A2-3_Large2-401s	Subballast	77,000

Code	Type	Total Cubic Yardage Ballasted
A3-3_At Grade2-301b	Ballast	24,000
A3-3_At Grade2-301s	Subballast	39,000
A3-3_Large2-401b	Ballast	51,000
A3-3_Large2-401s	Subballast	82,000
A4-1_Berm4-401b	Ballast	30,000
A4-1_Berm4-401s	Subballast	48,000
A4-1_At Grade2-301b	Ballast	17,000
A4-1_At Grade2-301s	Subballast	27,000
A4-2_Berm4-401b	Ballast	6,000
A4-2_Berm4-401s	Subballast	10,000
A4-2_Berm2-401b	Ballast	18,000
A4-2_Berm2-401s	Subballast	29,000
A4-2_At Grade4-301b	Ballast	70,000
A4-2_At Grade4-301s	Subballast	112,000
A4-3_Berm4-401b	Ballast	281,000
A4-3_Berm4-401s	Subballast	446,000
A4-3_Berm2-401b	Ballast	3,000
A4-3_Berm2-401s	Subballast	5,000
A4-3_At Grade4-301b	Ballast	4,000
A4-3_At Grade4-301s	Subballast	7,000
A4-3_At Grade2-301b	Ballast	32,000
A4-3_At Grade2-301s	Subballast	51,000
A4-3_Large2-401b	Ballast	27,000
A4-3_Large2-401s	Subballast	43,000
LMF-501b	Ballast	24,000
LMF-501s	Subballast	41,000

Concrete Batching

Code	Batch Plant	Daily Batch (CY)
A1-3_Batch_1-1	Tunnel 1 West (Facility 1)	136.94
A1-3_Batch_1-2	Tunnel 1 West (Facility 1)	23.14
A1-3_Batch_1-3	Tunnel 1 West (Facility 1)	39.67
A1-3_Batch_1-4	Tunnel 1 West (Facility 1)	10.64
A1-3_Batch_1-5	Tunnel 1 West (Facility 1)	136.94
A1-3_Batch_1-6	Tunnel 1 West (Facility 1)	23.14
A1-3_Batch_1-7	Tunnel 1 West (Facility 1)	39.67
A1-3_Batch_1-8	Tunnel 1 West (Facility 1)	10.64
A3-3_Batch_1-1	Tunnel 1 West (Facility 1)	137.18
A3-3_Batch_1-2	Tunnel 1 West (Facility 1)	23.18
A3-3_Batch_1-3	Tunnel 1 West (Facility 1)	39.74
A3-3_Batch_1-4	Tunnel 1 West (Facility 1)	10.66
A3-3_Batch_1-5	Tunnel 1 West (Facility 1)	137.18
A3-3_Batch_1-6	Tunnel 1 West (Facility 1)	23.18
A3-3_Batch_1-7	Tunnel 1 West (Facility 1)	39.74
A3-3_Batch_1-8	Tunnel 1 West (Facility 1)	10.66
A1-4_Batch_2-1	Tunnel 2 West (Facility 2)	246.57
A1-4_Batch_2-2	Tunnel 2 West (Facility 2)	103.45
A1-4_Batch_2-3	Tunnel 2 West (Facility 2)	177.34
A1-4_Batch_2-4	Tunnel 2 West (Facility 2)	47.59
A1-4_Batch_3-1	Tunnel 2 East (Facility 3)	246.57
A1-4_Batch_3-2	Tunnel 2 East (Facility 3)	103.45
A1-4_Batch_3-3	Tunnel 2 East (Facility 3)	177.34
A1-4_Batch_3-4	Tunnel 2 East (Facility 3)	47.59

Total Cubic Yards by Alternative

Alternative	Tunnel (Onsite Batching)	Non-Tunnel*	Total
Alternative 1	873,304	2,996,952	3,870,256
Alternative 2	873,304	3,150,772	4,024,076
Alternative 3	873,468	3,191,268	4,064,736
Alternative 4	873,304	2,656,707	3,530,011

* Sourced from an offsite facility.

Electricity Consumption

Alternative 1

Alternative 1 Year	kWh/Year (Total) Equipment	kWh/Year (Total) Batch Plants	kWh/Year (Total) Total
2022	37,082,477	138,651	37,221,128
2023	96,610,109	175,680	96,785,789
2024	100,152,402	216,411	100,368,814
2025	100,152,402	175,680	100,328,082
2026	100,152,402	128,695	100,281,097
2027	22,033,528	47,232	22,080,760
2028	0	0	0
Total	456,183,320	882,350	457,065,670

Alternative 2

Alternative 2 Year	kWh/Year Equipment	kWh/Year Batch Plants	kWh/Year Total
2022	37,082,477	138,651	37,221,128
2023	96,610,109	175,680	96,785,789
2024	100,152,402	216,411	100,368,814
2025	100,152,402	175,680	100,328,082
2026	100,152,402	128,695	100,281,097
2027	22,033,528	47,232	22,080,760
2028	0	0	0
Total	456,183,320	882,350	457,065,670

Alternative 3

Alternative 3 Year	kWh/Year Equipment	kWh/Year Batch Plants	kWh/Year Total
2022	37,082,477	138,651	37,221,128
2023	96,610,109	175,680	96,785,789
2024	100,152,402	216,411	100,368,814
2025	100,152,402	175,680	100,328,082
2026	100,152,402	128,695	100,281,097
2027	22,033,528	47,232	22,080,760
2028	0	0	0
Total	456,183,320	882,350	457,065,670

Alternative 4

Alternative 4 Year	kWh/Year Equipment	kWh/Year Batch Plants	kWh/Year Total
2022	37,082,477	138,651	37,221,128
2023	96,610,109	175,680	96,785,789
2024	100,152,402	216,411	100,368,814

2025	100,152,402	175,680	100,328,082
2026	100,152,402	128,695	100,281,097
2027	22,033,528	47,232	22,080,760
2028	0	0	0
Total	456,183,320	882,350	457,065,670

Cumulative HRA Sources (Construction)

Subsection	ID	Name	Address	Type (if adjustment needed)	Source Ft to Property	Unadjusted Risk from BAAQMD PM2.5	Unadjusted Risk from BAAQMD Cancer	Unadjusted Risk from BAAQMD Chronic HI	Adjusted Generator/GDF Multipliers, Freight PM2.5	Adjusted Generator/GDF Multipliers, Freight Risk	Adjusted Generator/GDF Multipliers, Freight Chronic HI
San Jose Approach	100435	Santa Clara Police Dept	601 El Camino Real	Generator (Y)	733	0.0	1.0	0.0	0.0	0.1	0.0
Alts 1 through 4, cancer/HI	15839	Santa Clara Police Facility	601 El Camino Real	Generator (Y)	510	0.0	9.7	0.0	0.0	1.2	0.0
	17237	City of Santa Clara - Well Site: Zone 1, 3-02	500 Benton Street	Generator (Y)	281	0.0	8.6	0.0	0.0	2.4	0.0
	0	Santa Clara University	500 El Camino Real	Generator (Y)	437	0.0	1.1	0.0	0.0	0.2	0.0
	0	Santa Clara University	500 El Camino Real	Generator (Y)	424	0.0	0.9	0.0	0.0	0.2	0.0
	0	Santa Clara University	500 El Camino Real	Generator (Y)	806	0.0	10.3	0.0	0.0	0.6	0.0
	-	Roads	-	N	-	0.7	32.6	0.1	0.7	32.6	0.1
	-	Rail	-	N	-	0.1	0.7	0.0	0.1	0.9	0.0
San Jose Approach	2049	Central Concrete Supply Company, Inc	790 Stockton Avenue	Multiple	140	51.1	0.0	0.0	51.1	0.0	0.0
Alts 1 through 4, PM		Roads		N	-	0.4	16.5	0.1	0.4	16.5	0.1
		Rail		N	-	0.1	0.4	0.0	0.1	0.6	0.0
Monterey Corridor	19807	San Jose Water Company	500 Willow Glen Way	Generator (Y)	92	0.3	196.4	0.1	0.2	166.9	0.1
Alts 1 through 4, cancer/HI	-	Roads	-	N	-	0.6	24.0	0.1	0.6	24.0	0.1
	-	Rail	-	N	-	0.0	5.5	0.0	0.0	7.4	0.0
Monterey Corridor	2155	CEMEX Construction Materials Pacific, LLC	2005 Stone Avenue	Multiple	560	16.3	0.0	0.0	16.3	0.0	0.0
Alts 1 through 4, PM	19116	Verizon Wireless (Curtner Almaden)	2179 Stone Ave, Ste #15	Generator (Y)	675	0.0	1.0	0.0	0.0	0.1	0.0
	-	Roads	-	N	-	0.4	19.3	0.1	0.4	19.3	0.1
	-	Rail	-	N	-	0.0	4.8	0.0	0.0	6.4	0.0
Morgan Hill and Gilroy	111371	Chevron Inc #9-0049	401 Leavesley Rd	Gasoline Dispensing (Y)	435	0.0	43.2	0.2	0.0	2.5	0.0
Alt 1 cancer/PM/HI	111256	ARCO AMPM of Gilroy	400 Leavesley Rd	Gasoline Dispensing (Y)	235	0.0	38.1	0.2	0.0	5.9	0.0
Alt 2,4 cancer/HI	108705	Rotten Robbie #31	390 Leavesley Road	Gasoline Dispensing (Y)	93	0.0	43.3	0.2	0.0	31.5	0.2
	15774	City of Gilroy	8295 Murray	Generator (Y)	10	0.0	3.6	0.0	0.0	3.6	0.0
	110886	Gilroy Valero	300 Leavesley Rd	Gasoline Dispensing (Y)	500	0.0	9.4	0.0	0.0	0.4	0.0
	-	Roads	-	N	-	0.4	22.0	0.1	0.4	22.0	0.1
	-	Rail	-	N	-	0.0	1.6	0.0	0.0	2.2	0.0
Morgan Hill and Gilroy	7573	Associated Concrete Co	130 E Main Avenue	Multiple	50	29.5	0.0	0.0	29.5	0.0	0.0
Alt 2,4 PM	-	Roads	-	N	-	0.1	9.4	0.0	0.1	9.4	0.0
	-	Rail	-	N	-	0.0	2.8	0.0	0.0	3.8	0.0
Morgan Hill and Gilroy	3329	Saint Louise Regional Hospital	9400 N Name Uno	Generator (Y)	375	1.2	670.8	2.2	0.2	120.7	0.4
Alt 3, cancer/PM/HI	-	Roads	-	N	-	0.6	34.3	0.1	0.6	34.3	0.1
	-	Rail	-	N	-	0.0	1.1	0.0	0.0	1.4	0.0
Pacheco Pass	-	Roads	-	N	-	n/a	n/a	n/a	n/a	n/a	n/a
Alts 1 through 4, cancer/HI/PM	-	Rail	-	N	-	n/a	n/a	n/a	n/a	n/a	n/a

Cumulative HRA Sources (Stations-MOWF)

						Unadjusted Risk from BAAQMD			Adjusted Generator/GDF Multipliers, Freight		
Facility	ID	Name	Address	Type (if adjustment needed)	Source Ft to Property	PM2.5	Cancer	Chronic HI	PM2.5	Risk	Chronic HI
Diridon Station	-	Roads	-	N	-	0.4	16.9	0.1	0.4	16.9	0.1
	-	Rail	-	N	-	0.1	34.6	0.0	0.1	51.3	0.0
DT Gilroy Station	18550	City of Gilroy	7235 Forest Street	Generator (Y)	400	0.0	0.8	0.0	0.0	0.1	0.0
	15827	City of Gilroy	613 Old Gilroy St	Generator (Y)	460	0.0	3.7	0.0	0.0	0.5	0.0
	111415	City of Gilroy	613 Old Gilroy St	Gasoline Dispensing (Y)	440	0.0	0.7	0.0	0.0	0.0	0.0
	-	Roads	-	N	-	0.2	14.7	0.0	0.2	14.7	0.0
	-	Rail	-	N	-	0.0	1.9	0.0	0.0	2.8	0.0
East Gilroy Station	-	Roads	-	N	-	0.1	4.0	0.0	0.1	4.0	0.0
	-	Rail	-	N	-	0.0	0.5	0.0	0.0	0.8	0.0
East MOWF	-	Roads	-	N	-	n/a	n/a	n/a	n/a	n/a	n/a
Alternative 3	-	Rail	-	N	-	0.0	0.4	0.0	0.0	0.7	0.0

Cumulative HRA Sources (Freight Relocation)

General Location	ID	Name	Address	Type (if adjustment needed)	Source Ft to Property	Unadjusted Risk from BAAQMD PM2.5	Unadjusted Risk from BAAQMD Cancer	Unadjusted Risk from BAAQMD Chronic HI	Adjusted Generator/GDF Multipliers PM2.5	Adjusted Generator/GDF Multipliers Risk	Adjusted Generator/GDF Multipliers Chronic HI
Near Monterey Road and Blanchard Road	-	Roads	-	N	-	0.3	19.4	0.1	0.3	19.4	0.1
	-	Rail	-	N	-	0.0	14.6	0.0	0.0	14.6	0.0
Between Monterey Road and Crowner Avenue	-	Roads	-	N	-	0.1	7.2	0.0	0.1	7.2	0.0
	-	Rail	-	N	-	0.0	7.2	0.0	0.0	7.2	0.0
Near Monterey Road and California Avenue	13538	Pacific Bell	20 California Avenue	Generator (Y)	200	0.0	22.5	0.0	0.0	9.2	0.0
	-	Rail	-	N	-	0.0	9.0	0.0	0.0	9.0	0.0
	-	Roads	-	N	-	0.1	6.4	0.0	0.1	6.4	0.0
Near Monterey Road and Ronan Avenue	17130	Animal Memorial Service	8860 Muraoka Drive	Crematory Retort	90	0.1	0.1	0.0	0.1	0.1	0.0
	22251	Cardlock Fuels System, Inc	10 Ronan Avenue	Multiple	560	0.0	2.7	0.0	0.0	2.7	0.0
	19566	Verizon Wireless (Hwy 101 & Levesley)	8655 Monterey St	Generator (Y)	700	0.0	1.4	0.0	0.0	0.1	0.0
	-	Rail	-	N	-	0.0	4.0	0.0	0.0	4.0	0.0
	-	Roads	-	N	-	0.2	9.7	0.0	0.2	9.7	0.0
Near Monterey Road and Leavesley Road	6237	Germain Seed Technology	8333 Swanston Lane	Multiple	150	3.1	0.0	0.0	3.1	0.0	0.0
	110886	Gilroy Valero	300 Leavesley Rd	Gasoline Dispensing (Y)	500	0.0	9.4	0.0	0.0	0.4	0.0
	-	Roads	-	N	-	0.2	11.0	0.0	0.2	11.0	0.0
		Rail	-	N	-	0.0	3.0	0.0	0.0	3.0	0.0
Near Monterey Road and 1st Street	-	Roads	-	N	-	0.2	9.0	0.0	0.2	9.0	0.0
		Rail	-	N	-	0.0	5.6	0.0	0.0	5.6	0.0
Near Monterey Road and W 10th Street	-	Roads	-	N	-	n/a	n/a	n/a	n/a	n/a	n/a
	-	Rail	-	N	-	0.0	4.0	0.0	0.0	4.0	0.0
Near Pacheco Court and Frazier Lake Road	-	Roads	-	N	-	n/a	n/a	n/a	n/a	n/a	n/a
	-	Rail	-	N	-	0.0	0.4	0.0	0.0	0.4	0.0
Near Chestnut Street and Asbury St	-	Roads	-	N	-	0.4	17.2	0.1	0.4	17.2	0.1
	-	Rail	-	N	-	0.1	82.9	0.0	0.1	82.9	0.0
	21753	Eric Reich & Assoc Inc	848 Chestnut Street	Surface Coating	750	0.0	0.0	0.0	0.0	0.0	0.0
	20397	Progressive Collision Repair	790 Chestnut Avenue	Surface Coating	315	0.0	0.0	0.0	0.0	0.0	0.0
	2049	Central Concrete Supply Company, Inc	790 Stockton Avenue	Multiple	615	51.1	0.0	0.0	51.1	0.0	0.0
	2408	Master Metal Products	495 Emory Street	Surface Coating	320	0.0	0.0	0.0	0.0	0.0	0.0
	18409	Michael J's Body Shop	597 Taylor Street	Surface Coating	480	0.0	0.0	0.0	0.0	0.0	0.0
Near Harrison Street and Fuller Ave	-	Rail	-	N	-	0.1	35.2	0.0	0.1	35.2	0.0
	-	Roads	-	N	-	0.8	26.1	0.2	0.8	26.1	0.2
Near Cross Way and Northern Road	-	Roads	-	N	-	2.3	77.0	0.5	2.3	77.0	0.5
	-	Rail	-	N	-	0.0	9.4	0.0	0.0	9.4	0.0
	16744	Almaden Body & Paint	380 San Jose Avenue	Surface Coating	880	0.0	0.0	0.0	0.0	0.0	0.0
	19807	San Jose Water Company	500 Willow Glen Way	Generator (Y)	920	0.3	196.4	0.1	0.0	7.9	0.0
End of Promme Court	-	Rail	-	N	-	0.0	15.3	0.0	0.0	15.3	0.0
	-	Roads	-	N	-	0.5	23.2	0.1	0.5	23.2	0.1
Near Prindiville Road and Urshan Way	-	Rail	-	N	-	0.0	10.9	0.0	0.0	10.9	0.0
	-	Roads	-	N	-	0.3	19.9	0.1	0.3	19.9	0.1
Near Madrone Ave and Dougherty Ave	-	Rail	-	N	-	0.0	7.6	0.0	0.0	7.6	0.0
	-	Roads	-	N	-	0.1	6.1	0.0	0.1	6.1	0.0
Near Butterfield Blvd and E Dunne Ave	-	Roads	-	N	-	0.1	8.9	0.0	0.1	8.9	0.0
	-	Rail	-	N	-	0.0	2.8	0.0	0.0	2.8	0.0
	20861	JCC/AOC Morgan Hill Courthouse	301 Diana Avenue	Generator (Y)	920	0.0	4.0	0.0	0.0	0.2	0.0
	8765	Greif Packaging LLC	235 San Pedro Avenue	Multiple	620	0.0	0.0	0.0	0.0	0.0	0.0
	18567	Concrete Designs	16890 Church St, Bl #10	Polyester Resin Operation	385	0.0	0.0	0.0	0.0	0.0	0.0
End of Sister City Way	-	Roads	-		-	n/a	n/a	n/a	n/a	n/a	n/a
	-	Rail	-	N	-	0.0	3.7	0.0	0.0	3.7	0.0
	21732	International Paper	6791 Alexander St	Multiple	450	1.2	0.5	0.0	1.2	0.5	0.0
Near Garlic Farms Dr and Trave Park Cir	-	Roads	-	N	-	n/a	n/a	n/a	n/a	n/a	n/a
	-	Rail	-	N	-	0.0	2.4	0.0	0.0	2.4	0.0

General Location	ID	Name	Address	Type (if adjustment needed)	Source Ft to Property	Unadjusted Risk from BAAQMD			Adjusted Generator/GDF Multipliers		
						PM2.5	Cancer	Chronic HI	PM2.5	Risk	Chronic HI
	110463	The Garlic Farm Center	5920 Travel Park Crcl	Gasoline Dispensing (Y)	125	0.0	35.8	0.2	0.0	15.9	0.1
	108810	Gilroy Gas & Mini Mart	5887 Monterey St	Gasoline Dispensing (Y)	620	0.0	122.4	0.6	0.0	4.0	0.0
Near Bolsa Rd	-	Roads	-	N	-	n/a	n/a	n/a	n/a	n/a	n/a
	-	Rail	-	N	-	0.0	2.7	0.0	0.0	2.7	0.0
	111403	Christopher Ranch	305 Bloomfield Ave	Gasoline Dispensing (Y)	800	0.0	0.6	0.0	0.0	0.0	0.0
Near West Julian St and North Montgomery St	-	Roads	-	N	-	0.5	20.9	0.1	0.5	20.9	0.1
	-	Rail	-	N	-	0.1	78.9	0.0	0.1	78.9	0.0
		Fleet Body Worx Inc	345 N Montgomery St	N	185	0.0	0.0	0.0	0.0	0.0	0.0
		S & S Toy Shop	350B N MONTGOMERY ST	N	464	0.0	0.0	0.0	0.0	0.0	0.0

APPENDIX 3.3-A, APPENDIX D: BALLAST HAULING MEMORANDUM

Memorandum

To:	Gary Kennerley, HSR Alice Lovegrove, HSR
From:	Laura Yoon, ICF Kim Avila, ICF
Date:	February 23, 2019
Re:	**High-Speed Rail San Jose to Central Valley Wye Project Extent: Estimated Emissions from Hauling Ballast Material**

Introduction

Construction of the San Jose to Central Valley Wye Project Extent (project) would require a substantial amount of railroad sub-ballast and ballast material to serve as the foundation for the track alignment. This memorandum describes the methods used to: (1) determine two possible scenarios of material hauling that could occur during construction of the project, and (2) calculate criteria pollutant and greenhouse gas (GHG) emissions associated with the material hauling activities for each project alternative. The information presented in this memo is intended to be used as an initial estimate of criteria pollutant and GHG emissions associated with truck and rail trips from material hauling that would occur within the San Francisco Bay Area Air Basin (SFBAAB), the North Central Coast Air Basin (NCCAB), and the San Joaquin Valley Air Basin (SJVAB). The actual distances and quantities associated with material hauling activities for the project are not known at this time, but this memo reflects a reasonable estimate of these activities given currently available information.

Table 1 shows total ballast and sub-ballast requirements for the project alternatives based on construction data provided by the project engineering team, AnchorCM (Scholz pers. comm.).

Table 1. Material Quantities by Alternative (cubic yards)

Material Type	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Ballast	273,000	518,000	297,000	647,000
Sub-ballast	447,000	829,000	477,000	1,035,000
Total	720,000	1,347,000	774,000	1,682,000

Source: Scholz pers. comm.

Quarries Evaluated

A list of all active quarries in California was obtained from the California Department of Conservation, Division of Mine Reclamation's interactive Mines Online (MOL) map (California Department of Conservation 2017). Quarries were filtered for those supplying a primary commodity that could potentially be used for ballast material (rock or sand and gravel), and those quarries that are in the air basins nearest to the project (SFBAAB, NCCAB, and SJVAB). Quarries with 200 or more acres of permitted area were considered to be of sufficient size to effectively serve the demand, consistent with the analysis approach taken for the Bakersfield to Palmdale Project Section (URS/HMM/Arup 2012).

Based on these criteria, the list of all active quarries in California was narrowed down to 11 quarries. It was assumed that the fewest possible quarries would be used for efficiency, and that the selection of quarries would differ through the project based on proximity to transportation infrastructure. Four quarries were identified to serve the San Jose Diridon Station Approach and Monterey Corridor Subsections, and two quarries were identified to serve the Morgan Hill and Gilroy Subsection. These two quarries, as well as an additional quarry in the SJVAB, would also serve the Pacheco Pass Subsection. Five quarries were identified to serve the San Joaquin Valley Subsection.

All selected quarries were evaluated using the following criteria:

1. Distance to the project in rail miles.
2. Distance from the quarry to the nearest railhead for transport (via roads).
3. Truck hauling distance (road miles) to project work sites through the SFBAAB, NCCAB, and SJVAB.

Table 2 shows the results of these inquiries. Distances were measured to the centerpoint of each subsection.

Table 2. Quarry Information

Quarry Name (Air Basin)	San Jose Diridon Station Approach		Monterey Corridor		Morgan Hill and Gilroy		Pacheco Pass		San Joaquin Valley	
	Rail Miles[1]	Road Miles[2]	Rail Miles[1]	Road Miles[2]	Rail Miles[1]	Road Miles[2]	Rail Miles[1]	Road Miles[2]	Rail Miles[1]	Road Miles[2]
Sunol SMP 24 (SFBAAB)	N/A	24	N/A	26	–	–	–	–	–	–
Eliot Facility (SFBAAB)	32	35	37	37	–	–	–	–	–	–
Calmat/Pleasanton (SFBAAB)	32	40	37	43	–	–	–	–	–	–
Pilarcitos Quarry (SFBAAB)	N/A	37	N/A	42	–	–	–	–	–	–
A.R. Wilson quarry (SFBAAB)	–	–	–	–	18	23	20	25	–	–
Southside Sand & Gravel (NCCAB)	–	–	–	–	N/A	29	N/A	15	–	–
Los Banos Sand & Gravel (SJVAB)	–	–	–	–	–	–	N/A	39	N/A	15
Woolstenhulme Quarry (SJVAB)	–	–	–	–	–	–	–	–	N/A	57
Kerlinger – Rhodes (SJVAB)	–	–	–	–	–	–	–	–	N/A	88
Waterford Plant (SJVAB)	–	–	–	–	–	–	–	–	N/A	57
Vernalis (SJVAB)	–	–	–	–	–	–	–	–	N/A	49

N/A = values represent quarries with no visible railhead.

– = Quarry not assumed to supply ballast for the subsection.

[1] Measured by Regional Consultant staff from each railhead, following the rail tracks, to the centerpoint of the alignment, using Google Earth imagery.

[2] Measured by Regional Consultant staff from each quarry to the centerpoint of the alignment using Google Earth directions.

Methodology for Developing Ballast Hauling Scenarios

The actual hauling scenarios that would take place during construction are not known at this time. Accordingly, the following two potential total hauling scenarios for ballast and sub-ballast material for the four project alternatives were developed for the quarries listed in Table 2.

- **Scenario 1**—All ballast and sub-ballast materials from quarries would be hauled by truck. This scenario represents the maximum emissions scenario for truck hauling.
- **Scenario 2**—All ballast and sub-ballast materials from quarries without rail or where rail would be infeasible would be hauled by truck. All ballast and sub-ballast materials from quarries with rail would be hauled by rail. Rail was considered infeasible if there was determined to be no direct route of train tracks from the quarry to the project. This scenario represents the maximum emissions scenario for rail hauling.

These scenarios were developed to provide a reasonable range of potential criteria pollutant and GHG emissions that might be generated by material hauling activities. The scenarios characterize a range of supply from the different quarries, representing the maximum amount of haul activity for truck transport to a maximum amount of haul activity for rail transport. Each of the selected quarries in each subsection was assumed to supply an equal amount of ballast (i.e., for the San Jose Diridon Station Approach Subsection, each of the four quarries was assumed to supply one-fourth of the total amount of ballast and sub-ballast material required for the subsection).

Table 3 shows the amount of ballast and sub-ballast hauled by truck and rail under Scenarios 1 and 2 for each project alternative.

Table 3. Amount of Ballast and Sub-Ballast Material Hauled from Each Quarry for Scenarios 1 and 2 (cubic yards per year)

	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
Quarry Name	**Scenario 1**	**Scenario 2**	**Scenario 1**	**Scenario 2**	**Scenario 1**	**Scenario 2**	**Scenario 1**	**Scenario 2**
Sunol SMP 24								
Rail	0	0	0	0	0	0	0	0
Truck	48,000	48,000	60,500	60,500	40,500	40,500	91,750	91,750
Eliot Facility								
Rail	0	48,000	0	60,500	0	40,500	0	91,750
Truck	48,000	0	60,500	0	40,500	0	91,750	0
Calmat/Pleasanton								
Rail	0	48,000	0	60,500	0	40,500	0	91,750
Truck	48,000	0	60,500	0	40,500	0	91,750	0
Pilarcitos Quarry								
Rail	0	0	0	0	0	0	0	0
Truck	48,000	48,000	60,500	60,500	40,500	40,500	91,750	91,750
A.R. Wilson Quarry								
Rail	0	131,167	0	419,667	0	173,167	0	524,667
Truck	131,167	0	419,667	0	173,167	0	524,667	0
Southside Sand & Gravel								
Rail	0	0	0	0	0	0	0	0
Truck	131,167	131,167	419,667	419,667	173,167	173,167	524,667	524,667
Los Banos Sand & Gravel								
Rail	0	0	0	0	0	0	0	0
Truck	87,267	87,267	87,267	87,267	87,267	87,267	87,267	87,267
Woolstenhulme Quarry								
Rail	0	0	0	0	0	0	0	0
Truck	44,600	44,600	44,600	44,600	44,600	44,600	44,600	44,600
Kerlinger–Rhodes								
Rail	0	0	0	0	0	0	0	0
Truck	44,600	44,600	44,600	44,600	44,600	44,600	44,600	44,600
Waterford Plant								
Rail	0	0	0	0	0	0	0	0
Truck	44,600	44,600	44,600	44,600	44,600	44,600	44,600	44,600
Vernalis								
Rail	0	0	0	0	0	0	0	0
Truck	44,600	44,600	44,600	44,600	44,600	44,600	44,600	44,600

Considerations for the Criteria Pollutant and Greenhouse Gas Emissions Analysis

The material quantities shown in Table 3 were used to determine the pollutant emissions that would be generated within the SFBAAB, NCCAB, and SJVAB from hauling activities for each construction phase that requires ballast and sub-ballast material hauling. The criteria pollutants evaluated were carbon monoxide (CO), nitrogen oxide (NO_X), particulate matter with a diameter of 10 micrometers or less (PM_{10}), particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$), reactive organic gases (ROG), and sulfur dioxide (SO_2). Analysts also evaluated carbon dioxide equivalents (CO_2e)—the contributions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O). Emissions were calculated by multiplying the mileage associated with each scenario by criteria pollutant and GHG emission factors for rail and truck hauling.

The distances between each quarry and the centerpoint of the alignment were estimated for rail hauling using Google Earth imagery. The distances between each quarry and the centerpoint of the alignments were estimated for truck hauling using Google Earth directions. The truck and rail hauling distances within each air basin were estimated using haul distances from Google Earth directions to the boundary of each air basin.

Total hauling distances associated with each scenario were calculated by multiplying the number of truck trips needed by the hauling trip distances associated with each scenario. The number of truck trips needed was determined by dividing the material quantities for each scenario by an assumed capacity of 20 cubic yards per truck. Material hauled by rail was converted to tons using a conversion factor of 1.3 ton of ballast/sub-ballast per cubic yard. Table 4 shows the emission factors used in the analysis. Rail emission factors are based on *Emission Factors for Locomotives* (USEPA 2009) and are presented in units of grams per ton-mile. Haul truck emission factors are from EMFAC2017 and are presented in units of grams per mile.

Table 4. Rail and Truck Emission Factors

Emission Source	Emission Factors						
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2
Rail[1] (all air districts)							
2025	0.01	0.15	0.06	<0.01	<0.01	<0.01	21
2026	0.01	0.14	0.06	<0.01	<0.01	<0.01	21
2027	0.01	0.13	0.06	<0.01	<0.01	<0.01	21
2028	**0.00**	**0.13**	**0.06**	**<0.01**	**<0.01**	**<0.01**	**21**
Trucks[2] (SFBAAB)							
2025	0.03	3.06	0.41	0.11	0.05	0.02	1,673
2026	0.04	3.43	0.43	0.11	0.05	0.02	1,661
2027	0.04	3.40	0.43	0.11	0.05	0.02	1,636
2028	0.04	3.38	0.43	0.11	0.05	0.02	1,614
Trucks[2] (NCCAB)							
2025	0.04	3.48	0.43	0.12	0.05	0.02	1,682
2026	0.04	3.44	0.43	0.11	0.05	0.02	1,661
2027	0.04	3.42	0.43	0.11	0.05	0.02	1,636
2028	0.04	3.40	0.43	0.11	0.05	0.02	1,614
Trucks[2] (SJVAB)							
2025	0.03	3.08	0.41	0.11	0.05	0.02	1,673
2026	0.04	3.44	0.43	0.11	0.05	0.02	1,661
2027	0.04	3.41	0.43	0.11	0.05	0.02	1,636
2028	0.04	3.39	0.43	0.11	0.05	0.02	1,614

Sources: EMFAC2017, USEPA 2009

Emission factors are presented for 2025 through 2028, which are the years in which ballast hauling would occur.

ROG = reactive organic gases

NO_X = nitrogen oxide

CO = carbon monoxide

PM_{10} = particulate matter with a diameter of 10 micrometers or less

$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less

SO_2 = sulfur dioxide

CO_2 = carbon dioxide

USEPA = U.S. Environmental Protection Agency

[1] Emission units are grams per ton-mile. Based on a conversion factor of 484 ton-miles/gallon from the Association of American Railroads and grams/gallon emission factors from the USEPA's *Emission Factors for Locomotives* (USEPA 2009; American of Railroads 2016).

[2] Emission units are grams per mile. Based on EMFAC2017 regional fleet for heavy-heavy duty vehicles.

For this analysis, the significance of the criteria pollutant emissions associated with hauling activities is determined by comparing the emissions to the emissions thresholds relevant to the SFBAAB, NCCAB, and SJVAB, the basins in which all the quarries that were considered in this analysis are located. The applicable air districts in the SFBAAB, the NCCAB, and the SJVAB are the Bay Area Air Quality Management District (BAAQMD), the Monterey Bay Air Resources District (MBARD), and the San Joaquin Valley Air Pollution Control District (SJVAPCD), respectively. The federal and state air quality attainment status of the three air basins—which determines the General

Conformity *de minimis* thresholds that apply to the project—is shown in Table 5. The General Conformity *de minimis* thresholds that are applicable to the project are shown in Table 6, and the applicable air district California Environmental Quality Act (CEQA) thresholds are shown in Table 7. None of the local air districts (BAAQMD, MBARD, or SJVAPCD) has adopted a GHG emission threshold for construction-related emissions.

Table 5. Federal and State Attainment Status of the Study Area within the SFBAAB, NCCAB, and SJVAB

	SFBAAB		NCCAB		SJVAB	
Pollutant	**Federal**	**State**	**Federal**	**State**	**Federal**	**State**
Ozone (O_3)	N (marginal)	N	A/U	N-T	N (extreme)	N
Particulate matter (PM_{10})	A/U	N	A/U	N	M (serious)	N
Particulate matter ($PM_{2.5}$)	N (moderate)	N	A/U	A	N (serious/ moderate)	N
Carbon monoxide (CO)	A	A	A	U	A	U
Nitrogen dioxide (NO_2)	A/U	A	A/U	A	A/U	A
Sulfur dioxide (SO_2)	A/U	A	A/U	A	A/U	A

Sources: CARB 2017; USEPA 2018.
A/U = attainment/unclassified
CO = carbon monoxide
M = maintenance
N = nonattainment
N-T = nonattainment-transitional
U = unclassified

Table 6. General Conformity *de minimis* Thresholds for the Resource Study Area

	Annual Air Pollutant Emissions in Tons per Year					
Air Basin	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**SO_2[1]**
San Francisco Bay Area Air Basin	100	100	None	None	100	100
North Central Coast Air Basin[2]	None	None	None	None	None	None
San Joaquin Valley Air Basin	10	10	None	100	70	70

Source: 40 Code of Federal Regulations Section 93.153
CO = carbon monoxide
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
PM_{10} = particulate matter 10 microns in diameter or less
ROG = reactive organic gases
SO_2 = sulfur dioxide
RSA = resource study area
[1] Although the RSA is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.
[2] The NCCAB is considered attainment with respect to federal standards for all criteria pollutants. Accordingly, a general conformity analysis is not required and there are no applicable *de minimis* thresholds.

Table 7. BAAQMD, MBARD, and SJVAPCD Mass Emission Construction CEQA Thresholds

BAAQMD	MBARD	SJVAPCD
ROG: 54 lbs/day	PM_{10}: 82 lbs/day[1]	ROG: 10 tons/year or 100 lbs/day[2]
NO_X: 54 lbs/day		NO_X: 10 tons/year or 100 lbs/day[2]
PM_{10}: 82 lbs/day (exhaust only)		PM_{10}: 15 tons/year or 100 lbs/day[2]
$PM_{2.5}$: 54 lbs/day (exhaust only)		$PM_{2.5}$: 15 tons/year or 100 lbs/day[2]
		CO: 100 tons/year or 100 lbs/day[2]
		SO_X: 27 tons/year or 100 lbs/day[2]

Sources: MBUAPCD 2008; BAAQMD 2017; SJVAPCD 2015
BAAQMD = Bay Area Air Quality Management District
MBARD = Monterey Bay Air Resources District
SJVAPCD = San Joaquin Valley Air Pollution Control District
ROG = reactive organic gases
lbs = pounds
NO_X = nitrogen oxide
PM_{10} = particulate matter that is 10 microns in diameter and smaller
$PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller
CO = carbon monoxide
SO_X = sulfur oxide
CAAQS = California ambient air quality standards
NAAQS = national ambient air quality standards

[1] According to the MBARD CEQA guidelines, construction projects that temporarily emit precursors of ozone (i.e., ROG or NO_X) are accommodated in the emission inventories of state and federally required air plans and would not have a significant impact on the attainment and maintenance of state or federal ozone ambient air quality standard (MBUAPCD 2008). The MBARD guidelines have an exception if a project uses "non-typical equipment, e.g., grinders, and portable equipment"; the project would use standard construction equipment.

[2] The 100-pound-per-day threshold is a screening-level threshold to help determine whether increased emissions from a proposed project would cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the threshold would not be in violation of CAAQS or NAAQS. Projects with emissions above the threshold would require an Ambient Air Quality Analysis to confirm this conclusion (SJVAPCD 2015).

Annual Hauling Activity Emissions

Maximum annual criteria pollutant and GHG emissions associated with hauling the ballast and sub-ballast material within the SFBAAB, NCCAB, and SJVAB are shown in Tables 8 through 10, respectively, for the two potential hauling scenarios. Ballast and sub-ballast hauling would occur in 2025, 2027, and 2028. In Tables 8 through 10, annual emissions are assessed against the General Conformity *de minimis* thresholds and annual CEQA thresholds applicable to the resource study area, respectively (see Tables 6 and 7).

As shown in Tables 8 through 10, ballast and sub-ballast hauling under all alternatives would not exceed any annual air basin or General Conformity *de minimis* thresholds. Ballast and sub-ballast hauling emissions have been incorporated into the larger project construction analysis presented in the *San Jose to Merced Project Section Air Quality and Greenhouse Gases Technical Report* (technical report) (Authority and FRA 2019) (see Chapter 7, Air Quality Effects Analysis).

Daily Hauling Activity Emissions

Daily maximum criteria pollutant emissions associated with hauling the ballast and sub-ballast material in the BAAQMD and MBARD are shown in Tables 11 and 12, respectively, for the two potential hauling scenarios. The highest average daily emissions in the SJVAPCD are shown in Table 13. Emission estimates were developed based on the hauling schedule, as provided by the project engineers (Scholz pers. comm.).

As shown in Table 11, ballast and sub-ballast hauling would exceed the BAAQMD's daily NO_X threshold under all project alternatives and both hauling scenarios. None of the project alternatives would exceed MBARD's daily PM_{10} CEQA threshold (see Table 12). All project alternatives under both hauling scenarios would exceed SJVAPCD's AAQA trigger for NO_X (see Table 13).

Ballast and sub-ballast hauling emissions have been incorporated into the larger project construction analysis presented in the technical report (see Chapter 7). Emissions more than BAAQMD's CEQA threshold would be offset to below the air district threshold level through implementation of AQ-MM#3: *Offset Project Construction Emissions in the San Francisco Bay Area Air Basin*.

Greenhouse Gas Emissions

Total GHG emissions (in terms of CO_2e over the entire hauling period) associated with hauling the ballast and sub-ballast material within the SFBAAB, NCCAB, and SJVAB are shown in Tables 8 through 10, respectively. The tables indicate total combined hauling emissions in all air basins would range from 3,449 to 6,877 metric tons CO_2e, depending on the project alternative and hauling scenario. Amortized GHG emissions over a 25-year period ranges from 138 to 275 metric tons CO_2e per year.

Ballast and sub-ballast hauling emissions have been incorporated into the larger project construction analysis presented in the technical report (see Chapter 8, Global Climate Change Effects Analysis). The short-term increase in construction-related emissions would be offset by long-term emissions reductions achieved during project operation.

Table 8. Ballast and Sub-Ballast Hauling Emissions within the SFBAAB (max tons/year)

Scenario	ROG	NO_X	CO	PM_{10}			$PM_{2.5}$			SO_2	CO_2e (Total)[1]
				Dust	Exhaust	Total	Dust	Exhaust	Total		
Alternative 1											
Scenario 1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	1,392
Scenario 2	<1	3	1	<1	<1	<1	<1	<1	<1	<1	870
Alternative 2											
Scenario 1	<1	3	<1	<1	<1	<1	<1	<1	<1	<1	2,314
Scenario 2	<1	3	1	<1	<1	<1	<1	<1	<1	<1	1,509
Alternative 3											
Scenario 1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	1,299
Scenario 2	<1	2	1	<1	<1	<1	<1	<1	<1	<1	827
Alternative 4											
Scenario 1	<1	5	1	1	<1	1	<1	<1	<1	<1	3,302
Scenario 2	<1	5	1	<1	<1	<1	<1	<1	<1	<1	2,132
General Conformity Threshold for SFBAAB	100	100	-	-	-	-	-	-	100	100	-
Exceed the General Conformity Threshold	No	No	-	-	-	-	-	-	No	No	-

Source: Scholz pers. comm.; USEPA 2009; EMFAC2017
SFBAAB = San Francisco Bay Area Air Basin
ROG = reactive organic gases
NO_X = nitrogen oxide
PM_{10} = particulate matter that is 10 microns in diameter and smaller
$PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller
CO = carbon monoxide
SO_2 = sulfur dioxide
CO_2e = carbon dioxide equivalent
[1] The units for CO_2e are metric tons, not short tons. Values also represent total GHG over the hauling period, not max annual.

Table 9. Ballast and Sub-Ballast Hauling Emissions within the NCCAB (max tons/year)

Scenario	ROG	NO_X	CO	PM_{10}			$PM_{2.5}$			SO_2	CO_2e (Total)[1]
				Dust	Exhaust	Total	Dust	Exhaust	Total		
Alternative 1											
Scenario 1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	366
Scenario 2	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	306
Alternative 2											
Scenario 1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	1,052
Scenario 2	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	798
Alternative 3											
Scenario 1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	466
Scenario 2	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	377
Alternative 4											
Scenario 1	<1	3	<1	<1	<1	<1	<1	<1	<1	<1	1,302
Scenario 2	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	978
General Conformity Threshold for NCCAB[2]	-	-	-	-	-	-	-	-	-	-	-
Exceed the General Conformity Threshold	-	-	-	-	-	-	-	-	-	-	-

Source: Scholz pers. comm.; USEPA 2009; EMFAC2017
NCCAB = North Central Coast Air Basin
ROG = reactive organic gases
NO_X = nitrogen oxide
PM_{10} = particulate matter that is 10 microns in diameter and smaller
$PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller
CO = carbon monoxide
SO_2 = sulfur dioxide
CO_2e = carbon dioxide equivalent
[1] The units for CO_2e are metric tons, not short tons. Values also represent total GHG over the hauling period, not max annual.
[2] The NCCAB is considered attainment for all criteria pollutants. As such, a general conformity analysis is not required and there are no applicable *de minimis* thresholds.

Table 10. Ballast and Sub-Ballast Hauling Emissions within the SJVAB (max tons/year)

Scenario	ROG	NO_X	CO	PM_{10}			$PM_{2.5}$			SO_2	CO_2e (Total)[1]
				Dust	Exhaust	Total	Dust	Exhaust	Total		
Alternative 1											
Scenario 1	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
Scenario 2	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
Alternative 2											
Scenario 1	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
Scenario 2	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
Alternative 3											
Scenario 1	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
Scenario 2	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
Alternative 4											
Scenario 1	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
Scenario 2	<1	5	1	1	<1	1	<1	<1	<1	<1	2,273
General Conformity Threshold for SJVAB	10	10	-	-	-	100	-	-	70	70	-
SJVAPCD Yearly Construction Threshold	10	10	100	-	-	15	-	-	15	27	-
Exceed the General Conformity Threshold	No	No	-	-	-	No	-	-	No	No	-
Exceed SJVAPCD Threshold	No	No	No	-	-	No	-	-	No	No	-

Source: Scholz pers. comm.; USEPA 2009; EMFAC2017
SJVAB = San Joaquin Valley Air Basin
SJVAPCD = San Joaquin Valley Air Pollution Control District
ROG = reactive organic gases
NO_X = nitrogen oxide
PM_{10} = particulate matter that is 10 microns in diameter and smaller
$PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller
CO = carbon monoxide
SO_2 = sulfur dioxide
CO_2e = carbon dioxide equivalent
[1] The units for CO_2e are metric tons, not short tons. Values also represent total GHG over the hauling period, not max annual.

Table 11. Maximum Daily Ballast and Sub-Ballast Hauling Emissions within the BAAQMD (pounds/day)[1]

Scenario	ROG	NO_X	CO	PM_{10}			$PM_{2.5}$			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total	
Alternative 1										
Scenario 1	3	359	48	2	45	47	2	12	14	2
Scenario 2	10	390	104	6	21	26	5	6	11	1
Alternative 2										
Scenario 1	3	279	38	1	35	36	1	10	11	1
Scenario 2	9	345	92	5	18	23	5	5	10	1
Alternative 3										
Scenario 1	3	297	40	1	37	39	1	10	12	2
Scenario 2	9	348	93	5	19	24	5	5	10	1
Alternative 4										
Scenario 1	5	480	65	2	60	63	2	17	19	2
Scenario 2	13	515	137	7	27	35	7	8	15	2
BAAQMD daily construction threshold	54	54	-	82	-	-	54	-	-	-
Exceedances of the BAAQMD threshold	No	Yes	-	No	-	-	No	-	-	-

Source: Scholz pers. comm.; USEPA 2009; EMFAC2017
BAAQMD = Bay Area Air Quality Management District
ROG = reactive organic gases
NO_X = nitrogen oxide
PM_{10} = particulate matter that is 10 microns in diameter and smaller
$PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller
CO = carbon monoxide
SO_2 = sulfur dioxide
CO_2e = carbon dioxide equivalent
[1] Table presents the highest daily emissions that would be incurred over the hauling period.

Table 12. Maximum Daily Ballast and Sub-Ballast Hauling Emissions within the MBARD (pounds/day)[1]

Scenario	ROG	NO_X	CO	PM_{10}			$PM_{2.5}$			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total	
Alternative 1										
Scenario 1	1	48	6	<1	5	6	<1	2	2	<1
Scenario 2	1	42	6	<1	5	5	<1	1	1	<1
Alternative 2										
Scenario 1	1	98	12	<1	11	12	<1	3	4	<1
Scenario 2	1	80	11	<1	9	9	<1	2	3	<1
Alternative 3										
Scenario 1	1	85	11	<1	10	10	<1	3	3	<1
Scenario 2	1	70	10	<1	8	8	<1	2	2	<1
Alternative 4										
Scenario 1	1	95	12	<1	11	11	<1	3	3	<1
Scenario 2	1	78	11	<1	8	9	<1	2	3	<1
MBARD Daily Construction Threshold	-	-	-	-	-	82[2]	-	-	-	-
Exceed MBARD Threshold	-	-	-	-	-	No	-	-	-	-

Source: Scholz pers. comm.; USEPA 2009; EMFAC2017
MBARD = Monterey Bay Air Resources District
ROG = reactive organic gases
NO_X = nitrogen oxide
PM_{10} = particulate matter that is 10 microns in diameter and smaller
$PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller
CO = carbon monoxide
SO_2 = sulfur dioxide
CO_2e = carbon dioxide equivalent

[1] Table presents the highest daily emissions that would be incurred over the hauling period.

[2] According to the MBARD CEQA guidelines, construction projects that temporarily emit precursors of ozone (i.e., ROG or NO_X) are accommodated in the emission inventories of state- and federally required air plans and would not have a significant impact on the attainment and maintenance of state or federal ozone ambient air quality standards (MBUAPCD 2008). The MBARD guidelines have an exception if a project uses "non-typical equipment, e.g., grinders, and portable equipment." The project would use standard construction equipment.

Table 13. Highest Average Daily[1] Ballast and Sub-Ballast Hauling Emissions within the SJVAPCD (pounds/day)[1]

Scenario	ROG	NO_X	CO	PM_{10}			$PM_{2.5}$			SO_2
				Dust	Exhaust	Total	Dust	Exhaust	Total	
Alternative 1										
Scenario 1	2	210	26	24	1	25	7	1	8	1
Scenario 2	2	210	26	24	1	25	7	1	8	1
Alternative 2										
Scenario 1	2	210	26	24	1	25	7	1	8	1
Scenario 2	2	210	26	24	1	25	7	1	8	1
Alternative 3										
Scenario 1	2	210	26	24	1	25	7	1	8	1
Scenario 2	2	210	26	24	1	25	7	1	8	1
Alternative 4										
Scenario 1	2	210	26	24	1	25	7	1	8	1
Scenario 2	2	210	26	24	1	25	7	1	8	1
SJVAPCD Daily Construction Threshold	100[2]	100[2]	100[2]	-	-	100[2]	-	-	100[2]	100[2]
Exceed SJVAPCD Threshold	No	Yes	No	-	-	Yes	-	-	No	No

Source: Scholz pers. comm.; USEPA 2009; EMFAC2017
SJVAPCD = San Joaquin Valley Air Pollution Control District
ROG = reactive organic gases
NO_X = nitrogen oxide
PM_{10} = particulate matter that is 10 microns in diameter and smaller
$PM_{2.5}$ = particulate matter that is 2.5 microns in diameter and smaller
CO = carbon monoxide
SO_2 = sulfur dioxide
CO_2e = carbon dioxide equivalent
AAQA = ambient air quality analysis
CAAQS = California ambient air quality standards
NAAQS = national ambient air quality standards

[1] Presents the average emissions estimate during a single day of construction in the highest emissions year. Average emissions are presented in SJVAPCD (rather than maximum), consistent with SJVAPCD (2015) guidance for correct application of their 100-pound-per-day AAQA screening criteria.

[2] The 100-pound-per-day threshold is a screening-level threshold to help determine whether increased emissions from a project would cause or contribute to a violation of CAAQS or NAAQS. Projects with emissions below the threshold would not be in violation of CAAQS or NAAQS. Projects with emissions above the threshold would require an AAQA to confirm this conclusion (SJVAPCD 2015).

Conclusion

The material hauling scenarios discussed in this memorandum represent possible ballast and sub-ballast material hauling activities for the project. While it is currently unknown which quarries and transport methods would be used, this memorandum provides a reasonable estimation of potential hauling scenarios and the corresponding criteria pollutant and CO_2e emissions.

Ballast and sub-ballast hauling would not independently exceed the General Conformity *de minimis* thresholds in the SFBAAB but would exceed the BAAQMD's NO_X CEQA threshold. Combined GHG emissions in all air basins would range from 3,449 to 6,877 metric tons CO_2e or 138 to 275 metric tons CO_2e per year over a 25-year project life.

Ballast and sub-ballast hauling emissions have been incorporated into the larger project construction analysis presented in the technical report. Emissions more than BAAQMD's CEQA threshold would be offset to below the air district threshold level through implementation of AQ-MM#3. GHG emissions would be offset by long-term emissions reductions achieved during project operation.

References

Association of American Railroads. 2016. *The Environmental Benefits of Moving Freight by Rail*. April. Available: https://www.aar.org/BackgroundPapers/Environmental%20Benefits%20of%20Moving%20Freight%20by%20Rail.pdf. Accessed: March 15, 2017.

Bay Area Air Quality Management District (BAAQMD). 2017. *California Environmental Quality Act Air Quality Guidelines*. May.

California Air Resources Board (CARB). 2017. *Area Designations Maps/State and National*. Last Revised: October 18, 2017. Available: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed: August 2018.

California Department of Conservation, Division of Mine Reclamation. 2016. *Mines Online* (MOL). Last Revised: 2016. Available: http://maps.conservation.ca.gov/mol/index.html. Accessed: March 8, 2017.

Monterey Bay Unified Air Pollution Control District (MBUAPCD). 2008. *CEQA Air Quality Guidelines*. February.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. Adopted March 19, 2015

URS/HMM/Arup. 2012. *Memorandum: Estimated Emissions from Hauling Ballast Material – Merced to Fresno and Fresno to Bakersfield Sections of the California High-Speed Train Project*.

U.S. Environmental Protection Agency (USEPA). 2009. *Emission Factors for Locomotives*. Available: http://www.epa.gov/nonroad/locomotv/420f09025.pdf. Accessed: March 15, 2017.

———. 2018. *Nonattainment Areas for Criteria Pollutants*. Last Revised: June 30, 2018. Available: https://www.epa.gov/green-book. Accessed: August 2018.

Personal Communications

Scholz, Dan. Construction Manager. AnchorCM, San Francisco, CA. November 15, 2018—email message to ICF.

APPENDIX 3.3-A, APPENDIX E: LOCALIZED IMPACTS FROM CONSTRUCTION

APPENDIX E: LOCALIZED IMPACTS FROM CONSTRUCTION

1 INTRODUCTION

The California high-speed rail (HSR) program would include a wide variety of construction activities in numerous locations, extending from Scott Boulevard in Santa Clara through downtown San Jose and south to Gilroy across Pacheco Pass to Carlucci Road in Merced County (San Jose to Central Valley Wye Project Extent [project extent or project]). Because the total construction area would include laying of nearly 90 miles of track and three major tunnels with numerous portions built with various techniques (e.g., at grade, viaduct, berm, cut and fill, and possibly three concrete batch plants), analyzing the project as a whole is not practical. In general, analysts modeled representative sections of track for each construction activity within each subsection for long-term and short-term (less than 24-hour) air quality effects. Where feasible, the entire length of the subsection was modeled for all construction techniques. In addition, for short-term emissions, one construction activity may occur adjacent to another construction source type, and combined emissions would potentially be greater than either part alone. Based on the construction activities and engineering design, the following construction source types were evaluated for the potential to cause localized air quality effects:

- Berm
- At grade
- Aerial
- Trench
- Tunnel
- Cut and fill
- Operation of concrete batch plants to support construction

For each of these types of construction activities, maximum activities were determined, and air quality effects were evaluated. This appendix provides additional detail regarding the methods described in the *San Jose to Merced Project Section Air Quality and Greenhouse Gases Technical Report* (Air Quality and Greenhouse Gases Technical Report) to which this appendix is attached. This detail includes identification of the pollutants of concern, air quality modeling of the construction sites, determination of the modeled emission rates for the air dispersion modeling, and development of air quality modeling inputs and model output. Air dispersion modeling results were used to predict the ambient effects of criteria pollutant emissions and evaluate these effects with respect to the national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS). Health risk calculations were also performed to evaluate the incremental cancer risks and acute and chronic noncancer health effects on receptors located near the construction work areas.

2 POLLUTANTS OF CONCERN

Criteria pollutants and toxic air contaminants (TAC)[1] were assessed for localized effects. The following criteria pollutants were considered in this analysis of potential localized effects:[2]

- Carbon monoxide
- Nitrogen dioxide (NO_2)
- Particulate matter (PM) smaller than or equal to 2.5 microns
- PM smaller than or equal to 10 microns
- Sulfur dioxide (SO_2)

TACs were analyzed for potential localized effects in terms of health risk. Sources of TACs include construction equipment exhaust and fugitive dust from concrete batch plant processes. The California Air Resources Board (CARB) and the California Office of Environmental Health Hazard Assessment (OEHHA) have identified TACs that may be emitted from these sources. Construction equipment exhaust may contain diesel particulate matter (DPM), and fugitive dust emissions from concrete batch plants may contain a number of toxic pollutants (in particular, heavy metals and sulfates). DPM has been identified by CARB as a TAC based on its potential to cause cancer and other adverse health problems, including respiratory illnesses and increased risk of heart disease. Heavy metals and sulfate associated with concrete batch plant emissions present potential carcinogenic and noncarcinogenic health risks.[3] Finally, some criteria pollutants pose acute and chronic health risks (such as NO_2 and SO_2). These pollutants are analyzed for both health effects and their effects relative to air quality standards.

Analyses were conducted that considered chronic (long-term) carcinogenic, chronic noncarcinogenic, and acute (short-term) health risks. These analyses were conducted following San Joaquin Valley Air Pollution Control District (SJVAPCD) guidance in the San Joaquin Valley and Bay Area Air Quality Management District (BAAQMD) guidance in the San Francisco Bay Area. OEHHA modeling guidance was followed for the health risk assessment. Further details on the cancer risk from DPM are discussed in Section 6.4.8, Construction Health Risk Assessment, of the Air Quality and Greenhouse Gases Technical Report.

[1] TACs (sometimes referred to as hazardous air pollutants) are noncriteria pollutants that pose health risk.

[2] Ozone and its precursors (reactive organic gases or volatile organic compounds) are classified as regional effects due to the atmospheric transport and chemical conversions that take place over long distances and time scales. Therefore, they were not analyzed in terms of localized effects. Lead emissions were not considered because the mass emissions are negligible and thus unlikely to exceed the ambient air quality standards. Lead was quantified as part of the TACs because it has health toxicity factors.

[3] Current analyses do not associate any combustion emissions, including DPM, with the concrete batch plants as combustion activities would not occur with batching activities.

3 MODELED CONSTRUCTION SITES

As described in Section 6.4.8 of the Air Quality and Greenhouse Gases Technical Report, the following construction source types were evaluated for the potential to cause localized air quality effects:

- Berm construction of the rail segment
- Aerial construction for an elevated rail segment
- At-grade construction for development of the rail segment
- Trench construction for a below-grade rail segment
- Tunnel construction and ventilation shafts for the rail segment
- Cut and fill for the rail segment
- Concrete batch plants to support construction

Not all subsections include all construction source types, but in each subsection, at least one modeling analysis was performed for at least one construction activity. A brief description of the approach and study area for each construction source type is provided in this section. More detailed modeling source parameters are provided in Section 6.4.8 of the Air Quality and Greenhouse Gases Technical Report. In addition to analysis of each of these seven construction source types, an analysis was conducted for potential effects from those short-term activities that could be co-located and occur simultaneously in each subsection. This approach assured that the maximum effect would be found, given the likelihood that construction activities could occur simultaneously at the same location.

Berm construction of the rail segment—The construction emissions associated with berm construction include phases such as utility relocation, earth excavation, concrete work preparation, retaining wall construction, form work, and track bed construction. Long-term emissions associated with berm construction were analyzed for the entire 90-mile project extent; however, for short-term emissions (maximum daily emissions) modeling over the entire 90-mile project extent would not be realistic because many combinations of adjacent construction activity types do not occur over the length of each subsection. Therefore, localized effects for short-term emissions in each subsection were evaluated for potential construction of 1,000-foot sections of track where concurrent construction activity types could take place. Anywhere from one to three track orientations were modeled depending on the alignment, with receptors located either adjacent or close to the rail line right-of-way.

Aerial construction for an elevated rail segment—The construction emissions associated with aerial (viaduct) construction include phases such as utility relocation; earth excavation; cast-in-place drilled pier construction; formwork for concrete work preparation, including aerial bridges; and concrete pouring. As in the case for berm construction, aerial construction was modeled for the entire 90-mile project extent for long-term activity; however, for short-term emissions (maximum daily emissions), modeling over the entire 90-mile project extent would not be practical because many combinations of adjacent construction activity types would occur over the length of each subsection. Therefore, localized effects for short-term emissions in each subsection were evaluated for potential construction of 1,000-foot sections of track where concurrent construction activity types could take place. Anywhere from one to three track orientations were modeled depending on alignment, with receptors located either adjacent or close to the rail line right-of-way.

At-grade construction of the rail segment—The construction emissions associated with at-grade construction include phases such as utility relocation, demolition, cast-in-place drilled pier construction, excavation for slurry wall, base slab formwork, and pouring of concrete slab and walls. As in the case for berm construction, the at-grade construction was modeled for the entire 90-mile project extent for long-term activity; however for short-term emissions (maximum daily emissions) modeling over the entire 90-mile project extent would not be practical because many combinations of adjacent construction activity types would occur over the length of each subsection. Therefore, localized effects for short-term emissions in each subsection were evaluated for potential construction of 1,000-foot sections of track where concurrent construction

activity types could take place. Anywhere from one to three track orientations were modeled depending on alignment, with receptors located either adjacent or close to the rail line right-of-way.

Trench construction of the below-grade rail segment—The construction emissions associated with trench construction include phases such as demolition, cast-in-place drilled pier construction, excavation for slurry wall and trench, base slab formwork, concrete slab and walls pouring. The locations for trench construction are well defined and limited to the Morgan Hill and Gilroy Subsection for Alternative 2. Therefore, localized effects for this subsection were evaluated for potential construction of the entire trench rail segment, with receptors located either adjacent or close to the rail line right-of-way.

Tunnel construction and ventilation shafts for the rail segment—The construction emissions associated with tunnel construction include phases such as tunnel boring,[4] muck handling (earth removal), forming and pouring of interior and upper walls and floors, and track bed construction. The locations for tunnel construction are well defined and limited to the Pacheco Pass Subsection and the Morgan Hill and Gilroy Subsection. Therefore, localized effects for these subsections were evaluated for potential construction of the entire tunnel rail segment. For the longest tunnel over the Pacheco Pass (13.6 miles), effects were evaluated at tunnel openings and for three ventilation shaft locations. The shorter tunnel as part of the Morgan Hill and Gilroy Subsection was evaluated for air quality effects at the tunnel openings.

Cut and fill for the rail segment—The construction emissions associated with cut-and-fill construction include phases such as land clearing, excavation, compact filling and slope finishing, and track bed construction. As in the case for berm construction, the cut-and-fill construction long-term activities were modeled for the entire 90-mile project extent; however, for short-term emissions (maximum daily emissions) modeling over the entire 90-mile project extent would not be practical because many combinations of adjacent construction activity types would occur over the length of each subsection. Therefore, localized effects for short-term emissions in each subsection were evaluated for potential construction of 1,000-foot sections of track where concurrent activity types could take place. Anywhere from one to three track orientations were modeled depending on alignment, with receptors located either adjacent or close to the rail line right-of-way.

Operation of concrete batch plants to support construction—Concrete batch plants and storage areas would be located near the west portal of the shorter tunnel and at the east and west portal of the longer tunnel that traverses the Pacheco Pass. The emissions from these plants were modeled at the proposed locations for these facilities. To capture the maximum effects, modeling results from the concrete batch plant were coupled with the maximum rail segment construction.

[4] The tunnel-boring machine would be electrically powered so there would be no direct on-site emissions.

4 CONSTRUCTION EMISSIONS AND EMISSION RATES

Air quality analyses were performed for two types of construction emission scenarios: (1) long-term (annual) mitigated emissions that characterized maximum annual average activity for each construction year (2022–2028) and source type of construction by subsection and (2) short-term mitigated emissions that characterized the maximum daily emissions for each subsection and source type of construction. The methods for modeling of each source type and determination of the maximum emission rate addressed both long-term and short-term emissions.

4.1 Long-Term

Long-term construction emissions were modeled as follows.

- Identify source type(s): embankment, aerial, tunnel, cut and fill, and trench
  - Embankment, aerial, and cut and fill were best characterized as area sources.
  - Tunneling activity was characterized as a horizontal point source at portal openings and a capped point source at ventilation shafts.
  - Trenching activity was modeled as an open-pit source.
- Determine the annual emissions for each source type and calculate the maximum annual criteria pollutant emissions for each of the 7 years (2022–2028).
- Use the information from the engineering construction analysis for the linear distance of construction for each source type and calculate the source-type emissions for the particular linear length for the AERMOD-modeled subsection.
- Express the emissions in units of grams per second (g/s) using an activity level of 250 days a year and 8 hours a day (except 365 days a year and 24 hours a day for the tunnel construction).
- Determine the maximum on-site emission density for each pollutant using the maximum year emission rate.
- Include the off-site activity (e.g., haul trucks) and include adjacent emission density for each modeled area source using a width of 12 feet. Maximum ballast emissions are included in the off-site modeling.

4.2 Short-Term

Short-term construction emissions were modeled as follows:

- Determine the maximum daily emissions for each construction activity subsection (e.g., berm activity concrete work and retaining walls may be done concurrently, as well as formwork and earthwork).
- For each subsection, determine the maximum daily emissions from among the 7 years (2022–2028)
- Each construction subsection is resolved to 1,000 linear feet within the engineering construction analysis. To determine the emissions density for the AERMOD air dispersion modeling (Section 5, Dispersion Modeling), divide the maximum daily emissions for each subsection by the total number of 1,000-foot segments.
- Express the emissions from pounds per day to g/s assuming 8 hours a day (except 24 hours a day for tunnel construction).
- Determine the emission density for each modeled subsection, model the subsection, and combine concentration results for activities that may occur in parallel.

Finally, the concrete batch plant fugitive dust contains several metals and sulfates that have chronic and acute health effects. These metals include arsenic, beryllium, cadmium, nickel, manganese, selenium, and lead. The emissions of these air contaminates from the concrete batch plants were based on the PM emissions and a speciation factor for each pollutant appropriate for concrete batching. The speciation factors were determined as the portion of the PM emissions composed of these pollutants based on the BAAQMD Permit Handbook on emission factors concrete batch plants (BAAQMD 2016).

5 DISPERSION MODELING

Because the project construction activities have the potential to cause adverse health effects, detailed dispersion modeling analyses were conducted to determine whether these effects would be significant. The U.S. Environmental Protection Agency's (USEPA) AERMOD atmospheric dispersion model was used to simulate physical conditions and predict pollutant concentrations near the construction work areas using historical meteorological data. This allowed for an assessment of the local air quality effects from the construction emissions.

AERMOD is the USEPA's recommended air dispersion model for near-field modeling from vented and unvented (fugitive) sources. The model uses hourly meteorological observations and emission rates to determine hourly average concentrations from which other averaging periods (3-hour, 24-hour, annual averages) are determined. The detailed information on the methods and data used to conduct the air dispersion modeling is summarized here and in Sections 6.4.8 and 6.4.9, Other Localized Construction Effects, of the Air Quality and Greenhouse Gases Technical Report.

5.1 Inputs

5.1.1 Model and Inputs

AERMOD (version 18081) was used to conduct the modeling analysis. All calculation inputs are identical between the simulations used in the health risk assessments and for air quality (those used for comparison of the NAAQS and CAAQS), except for site-specific health risk receptor placement, which was located at the nearest receptor locations. The modeling used terrain height information in the analysis. No removal through deposition of air contaminants was considered, and the FASTAREA computation method was used for all area sources. AERMOD's urban dispersion option was used in the analysis for locations between San Jose and Gilroy. The rural dispersion algorithm was used in the analysis for locations south and east of Gilroy and into the San Joaquin Valley.

5.1.2 Meteorological Data

AERMOD requires meteorological data as input into the model. These data are typically processed using AERMET and AERSURFACE, preprocessors to AERMOD. AERMET requires surface meteorological data, upper air meteorological data, and surface parameter data (supplied from AERSURFACE).

The SJVAPCD has meteorological datasets developed for use in air quality modeling within its boundaries. The dataset used in this analysis was based on data derived from a mesoscale meteorological model (MM5) that uses historical meteorological data to develop meteorological data where there are no airports (in this case, Los Banos). Five years of hourly meteorological data (2004–2008) were used in the Merced County portion of the analysis.

The BAAQMD has meteorological preprocessed data based on observations from San Jose International Airport for surface observations and Oakland International Airport for upper air data. Five years of meteorological data (2009–2013) were used in the analyses for the San Jose Diridon Station Approach and Monterey Corridor Subsections.

The BAAQMD had meteorological data available from an instrumented tower located in San Martin for the period 2010–2014. Use of this data required AERMET processing for use in the AERMOD model.

Meteorological data used in the creation of the San Martin AERMET data for input to AERMOD are shown in Table 1.

Table 1 Meteorological Data for AERMET Processing at the San Martin Site

Site ID	Site Name	Latitude (deg N)	Longitude (deg W)	Elevation (m)	Source of Data
7901	San Martin	37.086	121.601	85.3	BAAQMD
23293/KSJC	San Jose Intl.	37.359	112.924	15.5	ftp://ftp.ncdc.noaa.gov/pub/data/noaa/
23230/OAK	Oakland Intl.	37.750	122.220	6	http://esrl.noaa.gov/raobs/
047821	San Jose Climate Station	37.333	121.900	19.5	http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7821

Source: BAAQMD 2017; NOAA 2017a, b; WRCC 2017
deg N = degrees north
deg W = degrees west
m = meters
BAAQMD = Bay Area Air Quality Management District

The surface data for the San Martin site was available in the ONSITE format required by AERMET for the period 2010–2014. Upon the suggestion of the BAAQMD (Cordova pers. comm.; BAAQMD 2016), data from San Jose International Airport were used for cloud cover when processing the ONSITE data, precipitation data from the San Jose Climate Station were used to determine surface moisture conditions for use in AERSURFACE, and data from the Oakland upper-air site at Oakland International Airport were used to represent conditions aloft.

5.1.2.1 AERSURFACE Processing

The National Land Cover Dataset 1992 (NLCD92) (Vogelmann et al. 2001) was downloaded[5] and used with AERSURFACE (version 13016) to provide the surface parameters for the third stage of AERMET. The coordinates of the San Martin BAAQMD meteorological site were used to determine surface characteristics in AERSURFACE. AERSURFACE was run with specifications that the area was not arid and that the site was not at an airport. Per the BAAQMD's recommendation (Cordova pers. comm; BAAQMD 2016), five sectors were used for San Martin processing to account for variations in land cover near the measurement site:

- SECTOR 1: 48–186 degrees
- SECTOR 2: 186–237 degrees
- SECTOR 3: 237–284 degrees
- SECTOR 4: 284–342 degrees
- SECTOR 5: 342–48 degrees

The study radius for surface roughness was set at 1 kilometer. The monthly seasonal profile used is shown in Table 2.

Table 2 Monthly Seasonal Profile at the San Martin Site

Months	Season
November, December, January	Late autumn after frost and harvest or winter with no snow
February, March	Transitional spring with partial green coverage or short annuals
April, May, June, July	Midsummer with lush vegetation
August, September, October	Autumn with unharvested cropland

[5] http://landcover.usgs.gov/natllandcover.php

AERSURFACE was run separately specifying dry, average, and wet surface moisture, and the results were later used to create composite surface characteristics for the third stage of AERMET.

5.1.2.2 Determination of Dry, Average, and Wet Months

Based on recommendations from BAAQMD (Cordova pers. comm.; BAAQMD 2016) and information provided in the AERSURFACE users' guide, each month in the modeling period was classified as either dry, average, or wet, and this information was later used in Stage 3 of AERMET. The rainfall data for the San Jose Climate Station for the 30-year period ending 2015 were gathered, and 30-year monthly averages were computed for each month. The monthly statistics for a given month were not used in the average if more than 5 days of data were missing in a given month. The next step was to compute the ratio of the monthly precipitation total for a given month during the modeling period and the corresponding 30-year monthly average. If the ratio was less than 0.5, the month was designated as dry. If the ratio was greater than or equal to 0.5 but less than 2, the month was designated as average. If the ratio was greater than or equal to 2, the month was designated as wet. Table 3 provides the information for the moisture classification of the region.

Table 3 Precipitation at the San Jose Climate Site

YEAR	Precipitation (in)											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2010	4.58	2.12	2.05	2.99	0.35	0	0	0	0	0.25	1.76	3.05
2011	0.96	3.15	4.32	0.2	0.4	1.51	0	0	0	0.77	0.7	0.08
2012	0.9	0.67	1.98	1.88	0	0.15	0	0	0.01	0.35	2.58	4.24
2013	0.69	0.37	0.87	0.26	0.01	0.04	0	0	0.66	0	0.77	0.13
2014	0.12	2.65	1.35	0.64	0	0.01	0	0	0.36	0.62	1.57	7.74
30 year mean (1986–2015)	2.56	3.04	2.20	1.07	0.53	0.15	0.01	0.02	0.15	0.66	1.30	22.73
Ratio to 30-Year Mean												
2010	1.79	0.70	0.93	2.79	0.66	0.00	0.00	0.00	0.00	0.38	1.35	1.12
2011	0.38	1.04	1.96	0.19	0.76	10.04	0.00	0.00	0.00	1.16	0.54	0.03
2012	0.35	0.22	0.90	1.75	0.00	1.00	0.00	0.00	0.07	0.53	1.99	1.55
2013	0.27	0.12	0.40	0.24	0.02	0.27	0.00	0.00	4.44	0.00	0.59	0.05
2014	0.05	0.87	0.61	0.60	0.00	0.07	0.00	0.00	2.42	0.94	1.21	2.84

YEAR	Precipitation (in)											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Moisture Classification												
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2010	avg	avg	avg	wet	avg	dry	dry	dry	dry	dry	avg	avg
2011	dry	avg	avg	dry	avg	wet	dry	dry	dry	avg	avg	dry
2012	dry	dry	avg	avg	dry	avg	dry	dry	dry	avg	avg	avg
2013	dry	dry	dry	dry	dry	dry	dry	dry	wet	dry	avg	dry
2014	dry	avg	avg	avg	dry	dry	dry	dry	wet	avg	avg	wet

Source: WRCC 2014
in = inches
avg = average

5.1.2.3 AERMET

Version 15181 of AERMET was used to process the meteorological data. The first step used data from the Oakland upper-air soundings with the MODIFY option turned on. San Jose International Airport data were used for the SURFACE portion of the processing, and San Martin on-site data were used for the ONSITE portion. The missing flags were set per BAAQMD recommendations (Cordova pers. comm.; BAAQMD 2016) and are shown in Tables 4 and 5.

Table 4 AERMET Single-Value and Date/Time Variable Descriptions and QA Values

AERMET Name	Description	Units	Missing Indicator	Lower Bound	Type	Upper Bound
OSDY	Day		-9	1	<=	31
OSMP	Month		-9	1	<=	12
OSYR	Year		-9	0	<=	99
OSHR	Hour		-9	0	<=	24
PAMT	Precipitation	cm	999	0	<=	100
INSO	Insulation	watts/square meter	9999	0	<	1250

Sources: Cordova pers. comm.; BAAQMD 2016; USEPA 2016
cm = centimeter

Table 5 AERMET Multi-value Variable Descriptions and Quality Assurance Values

AERMET Name	Description	Units	Missing Indicator	Lower Bound	Type	Upper Bound
TT01	Temperature	degrees Centigrade	99	-30	<	46
WS01	Wind speed	meters / second	999	0	<	50
WD01	Wind direction	degrees from north	999	0	<=	360
RH01	Relative humidity	percent	999	0	<=	100
DP01	Dew-point temperature	degrees Centigrade	99	-65	<	35
SA01	Standard deviation, horizontal wind	degrees	999	0	<	104

Sources: Cordova pers. comm.; BAAQD 2016; USEPA 2016

The second step was a simple merging of the quality assurance files produced from step one. The third step was to set the following options per BAAQMD suggestion (Cordova pers. comm.; BAAQMD 2016):

- SUBNWS option was turned off. REFLEV SUBNWS was not turned on, so entire substitution of all meteorological parameters was not used.
- METHOD CCVR SUB_CC was turned on; therefore, cloud cover substitution from the NWS site was performed.
- METHOD TEMP SUB_TT was turned on; therefore, temperature substitution from the NWS site was performed.

This final step was repeated separately for each of the 5 years. The surface characteristics portions of the input files were created by using the AERSURFACE output corresponding to the moisture characteristics of each month and year. The output message and report files were checked for error messages. The error messages were examined and the errors were corrected when possible. Warning messages were also reviewed. In some cases, changes in inputs were made based on warnings (e.g., discrepancies in elevations provided in site list files and in the actual data). In other cases, they were left unchanged (e.g., variations in elevations throughout the data files). Other warnings regarding missing data and substituted data were noted, but no changes were made to the data.

- **Terrain—**Terrain information for modeling used terrain data available from the National Elevation Dataset at 1/3 arc-second database.
- **Receptors—**Receptors were modeled using a network of discrete receptors. Details on the spacing, height, and layout are provided in Sections 6.4.8 and 6.4.9 of the Air Quality and Greenhouse Gases Technical Report.
- **Source parameters—**Details on the source type configurations, release height, and spatial dimensions are provided in Section 6.4.8 (Tables 6-6 and 6-7) of the Air Quality and Greenhouse Gases Technical Report. Construction is modeled as occurring 5 days per week with 8-hour days (250 days per year), except for construction of the tunnels, which occurs 7 days per week, 24 hours per day. For the non-tunnel emissions, AERMOD's HRDOW7 option was used to have emissions occur from 8:00 a.m. to 4:00 p.m., Monday through Friday.

5.2 Output Options

The dispersion model outputs hourly concentrations and these can be expressed in terms of different averaging periods, such as hourly, daily, and annual, in the same form as the air quality standard. The averaging times used for the ambient air quality standards and concentration thresholds are different for each pollutant. To compare the model results to the applicable ambient air quality standards and thresholds, criteria pollutant concentrations were calculated relative to the form of the air quality standard for the CAAQS and the NAAQS.

AERMOD output files and Hotspots Analysis and Reporting Program (HARP) Risk Assessment Standalone Tool (RAST) summary output files for the simulations are available upon request.

6 REFERENCES

Bay Area Air Quality Management District (BAAQMD). 2016. *Bay Area Air Quality Management District Permit Handbook*. www.baaqmd.gov/~/media/files/engineering/permit-handbook/baaqmd-permit-handbook.pdf?la=en (accessed March 2017).

———. 2017. Surface Meteorological Data. www.baaqmd.gov/ (accessed February 2017).

Cordova, James. Air Quality Meteorologist. Bay Area Quality Management District. San Francisco, CA. November 16 and 17, 2016—Email messages to ICF regarding San Martin Meteorological Data.

National Oceanic and Atmospheric Administration. 2017. FTP Directory, Integrated Surface Data. ftp://ftp.ncdc.noaa.gov/pub/data/noaa/ (accessed January 2017).

———. 2017b. NOAA/ESRL Radiosonde Database. http://esrl.noaa.gov/raobs/ (accessed February 2017).

U.S. Environmental Protection Agency (USEPA). 2016. *User's Guide for the AERMOD Meteorological Preprocessor (AERMET)*. EPA-454/B-16-010. www3.epa.gov/ttn/scram/7thconf/aermod/aermet_userguide.pdf (accessed August 2016).

Vogelmann, J. E., S. M. Howard, L. Yang, C. R. Larson, B. K. Wylie, and J. N. Van Driel. 2001. *Completion of the 1990s National Land Cover Data Set for the conterminous United States.* Photogrammetric Engineering and Remote Sensing 67: 650-662.

Western Regional Climate Center (WRCC). 2014. *San Jose, CA Total Precipitation (Inches)*. Recent Climate in the West. www.wrcc.dri.edu/WRCCWrappers.py?sodxtrmts+047821+por+por+pcpn+none+msum+5+01+F (accessed August 2016).

———. 2017. Period of Record Monthly Climate Summary. www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5378 (accessed February 2017).

APPENDIX 3.3-A, APPENDIX F: POTENTIAL IMPACT FROM INDUCED WINDS

Potential Impact from Induced Winds for High-Speed Trains

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COPIES: file

DATE: March 28, 2012

1.0 Background

The operation of a high-speed train (HST) causes aerodynamic forces such as airflow induced by these trains. These aerodynamic forces are influenced by factors such as train speed and distance from the train. The moving train creates a boundary layer along the length of the train and a wake behind the train that results in airflow in the general direction of the moving train. Turbulent fluctuations at the wake behind the train and sideways turbulent fluctuations accompany the airflow. Trains for the California HST system could reach a maximum speed of 220 miles per hour (mph).

This technical memorandum summarizes existing credible scientific evidence related to evaluating potential impacts from induced winds from HSTs on the environment. Specifically, it evaluates the potential for generating fugitive dust emissions and the potential for impacts to honeybees used to pollinate crops. It also includes a discussion of the relevance of incomplete or unavailable information to evaluating potential impacts.

2.0 Induced Wind

The Federal Railroad Administration (FRA) document, *Assessment of Potential Aerodynamic Effects on Personnel and Equipment in Proximity to High-Speed Train Operations* (FRA 1999), based on reviews of both the theoretical and experimental data available at the time, made conclusions on induced winds for trains with speeds of 150 mph or less. The document concludes that at a distance of 26 feet from a train traveling at 150 mph, the induced wind would be in the range of 10 mph to 40 mph. There is a range of induced wind speeds because of variations between trains and uncertainties in the experimental data.

A literature search for HST aerodynamics showed that most research in this area is concerned with determining the dynamic forces on the HST itself (Schetz 2001; Baker 2010) and has been conducted to facilitate the design of HSTs that are both safe and comfortable. In addition to that body of work, Chris Baker and Mark Sterling have produced recent papers on the induced wind caused by HSTs (Baker et al. 2001; Sterling et al. 2008; Jordan et al. 2010).

Sterling and Baker are both professors at the School of Civil Engineering at the University of Birmingham, Birmingham, UK. Their studies focus mainly on the impact of the induced wind (which they refer to as the "slipstream") on the safety of both workers and the public, waiting along the track. The paper *Modelling the Response of a Standing Person to the Slipstream Generated by a Passenger Train* (Jordan et al. 2010) illustrates that, due to the complex nature of the fluid flow around an HST (such as the shape of the train and the resultant turbulent fluid flow), there is no simple mathematical formula for the induced wind as a function of train speed.

During an August 2010 phone call, Professors Sterling and Baker said that due to European HST safety standards, the measurements of induced wind speed done in Europe are at distances of 9.8 feet or less (Sterling and Baker 2010). They said they considered two sets of induced wind profiles from the German

Intercity Connect HST (presented in Figure 18 of their recent paper [Sterling et al. 2008]) to be high-quality data that show the induced velocity as a function of the distance from the train (Sterling and Baker 2010).

Jordan et al., 2010, notes that the induced winds caused by an HST have three distinct components: (1) flow around the nose of the train, (2) flow along the train, and (3) flow in the wake of the train. As explained above, exact analytical solutions for these flow fields are not possible. This is especially true of the flow in the wake of the train. However, the average magnitude of the induced wind does diminish as the distance from the train increases. For the analysis in their most recent paper, the authors represent the induced velocity in the wake of the train as the product of an exponential and parabolic function of the distance with each function having a separate decay constant (Jordan et al. 2010).

Understanding that while an exact analytic solution to the induced winds from HSTs is not possible, it is nevertheless possible and useful to quantify certain aspects of the flow, such as average and peak speeds, in order to evaluate the potential impacts on the environment. Consequently, URS and CH2M HILL developed a methodology based on papers by Li and the FRA (Li, Renxian et al. 2008; FRA 1999) to estimate induced wind speed as a function of distance.

2.1 Methodology to Estimate Induced Winds

A study on the potential aerodynamic forces created by a passing HST on nearby objects (such as humans standing in the proximity of the train) are influenced by train speed, distance from the train, and the geometry of the train. *A Study of the Influence of Aerodynamic Forces on a Human Body near a High-Speed Train, Aerodynamics of Heavy Vehicles, Trucks, Buses, and Trains*, analyzed the maximum wind velocity around a human body, assumed to be a cylinder with a height of approximately 5.7 feet, for a specific train speed, as a function of human-train distance based on different train shape models (Li et al. 2008). The range of distance from train specified for Eq. 1 is between 0 feet to 11 feet.

$$u = \left(1.2319\right)^{0.072v-4} \times \left(0.4575d^2 - 3.5496d + 9.1545\right) \qquad \text{(Eq.1)}$$

Where:

u: the maximum wind velocity around human body near the train (mph).
d: human-train distance (feet).
v: train running speed (mph).

The analysis above is only appropriate for distance from the train up to 11 feet. If this equation is used for distance beyond 11 feet, then the results become invalid and another equation is needed. According to *Assessment of Potential Aerodynamic Effects on Personnel and Equipment in Proximity to HST Operations*, a train passing a station platform induces wind in its surroundings that diminishes with distance away from the train (FRA 1999). The paper computed induced wind speeds for two different train-passing speeds (100 mph and 150 mph), based on the high and low induced wind speed curves. The speed of the induced wind can be very high near the passing train but drops off sharply a short distance away. There are sufficient variations in the strength of the aerodynamic forces due to a train's design, such that a streamlined train with a slender nose, traveling at high speeds, creates aerodynamic forces that are no more severe than a train with a bluff nose traveling at slow speeds. If a train proposed for high-speed operation has a streamlined body design with a slender nose at the head and tail ends (such as the California HST traveling at 200 mph), it is possible that its favorable aerodynamic characteristics would offset the higher aerodynamic forces that would otherwise be created by its increase in speed. Therefore, a streamlined HST traveling at 220 mph could have an induced wind speed curve similar to a blunt-nosed train traveling at 150 mph, and the induced wind speed curve equation for a train traveling at 150 mph can be used to estimate wind speeds for an HST traveling at 220 mph by fitting a logarithmic equation to FRA-computed airflow for passing trains. This equation can be used to obtain the following model for distances from 11 feet to 30 feet):

$$u = -3.5515 \times \ln d + 8.8894 \quad \text{(Eq.2)}$$

Where:

u: the maximum wind velocity around human body near the train (mph).
d: human-train distance (feet).
This equation is only applicable for a train traveling at a speed of 220 mph

Based on the FRA-computed model, induced air flow beyond 30 feet would be significantly less because induced airflow tends to plateau (as shown in Figure 1). Again, a cylinder of approximately 5.7 feet was assumed to represent the human body for this analysis.

Eq. 2 cannot be applied to distances beyond 30 feet because the results become invalid, and literature searches have not shown any quantitative models to estimate induced wind speed past this distance. Therefore, Table 1 only lists the induced airflow as a function of distance from the train from 0 feet to 30 feet.

Table 1
Induced Air Flow from Passing Train Traveling at 220 mph

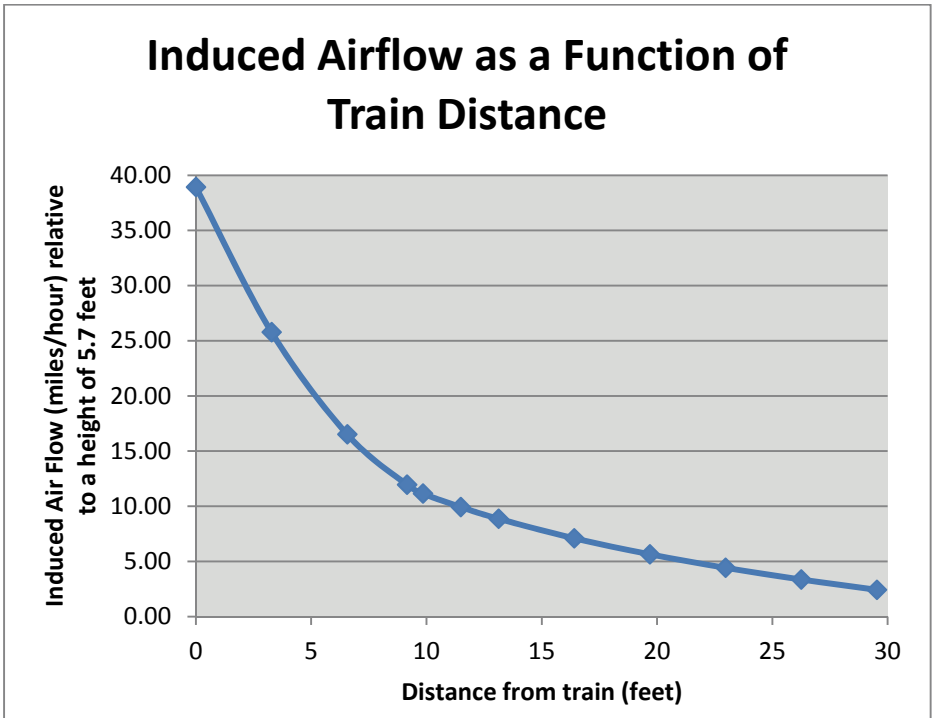
Distance from Train-Body[a] (feet)	Wind Speed u (mph)
0	38.94
3	25.79
7	16.53
9	11.96
10	11.16
11	9.93
13	8.87
16	7.10
20	5.65
23	4.43
26	3.36
30	2.43

[a] The values in Table 1 were developed with the methodology listed in Section 2.1, using the following equations:

For distance of 0 to 11 feet, the following equation is used to estimate induced air flow: $u = (1.2319)^{0.072v-4} \times (0.4575d^2 - 3.5496d + 9.1545)$ (Eq. 1).

For distance of 11 to 30 feet, the following equation is used to estimate induced air flow: $u = -3.5515 \times \ln d + 8.8894$ (Eq. 2).

Where:
u: the maximum wind velocity around human body near the train.
d: human-train distance.
v: train running speed (mph).



Note: Figure 1 was created using the methodology listed in Section 2.1, through the use of Eq. 1 and Eq. 2.

Figure 1
Induced Airflow as a Function of Train Distance
for a Train Traveling at 200 mph

2.2 Check of Induced Wind Speed Methodology

A number of assumptions are made regarding the methodology described in Section 2.1 to estimate the induced wind from the California HST System. As an independent check of the estimates from this approach, the data from the high-quality measurements of the Intercity Connect HST recommended by Sterling and Baker (2010) were used. In Table 1 of *A Study of the Slipstreams of High-Speed Passenger Trains and Freight Trains* (Sterling et al. 2008), distances at which induced velocities were measured are defined as, "Distance from train side or platform edge" in meters. From examining the data given in Figure 18 of that study, it was concluded that these data show that, for trackside measurements, the induced winds are between 5% and 10% of the speed of the train at a distance of 9.8 feet. Using this relationship, for an HST traveling at 220 mph, 5% and 10% of the train speed would be 11 mph (16.1 feet per second) and 22 mph (32.2 feet per second), respectively. These values bound the 16.37 feet per second (11.2 mph) estimate from Eq. 1 in Section 2.1 (shown in Table 1 below). The agreement between Eq. 1, which was derived from the *Assessment of Potential Aerodynamic Effects on Personnel and Equipment in Proximity to High-Speed Train Operations* (FRA 1999), and independent experimental measurements, is indicative of the validity of both approaches for estimating induced winds from the proposed California HST.

2.3 Induced Wind Speed and Elevation

While the wind speed generated by a train does vary relative to the elevation above the ground, Li et al. (2008) states,

> *The aerodynamic force acting on human body produced by train wind is related to many factors, such as train running speed, human-train distance, train head/tail shapes, smoothness of train surface, relative height between human and train, temperature and moisture of ambient air and so on. But the main factors are three: train running speed, human-train distance and train head/tail shape*

So distance from the train dictates the force and wind speed substantially more than the elevation does.

In the FRA paper, different trainsets were modeled to understand the impacts of high-speed use at existing stations in the Northeast Corridor (FRA 1999). One of the conclusions was that the "Induced airflow effects from a passing Acela trainset will be greater at 2.5 feet. above a platform than at 5.0 feet. above the platform, whether the platform is high-level or low-level." The paper also shows that, as the platform is elevated, wind speed and force are reduced at both 2.5 feet and 5.0 feet above the platform. This means that maximum wind speeds and forces modeled by the equations presented in this memo likely represent the highest wind speeds and forces created by the train, as the studies took the maximum force from the ground at a height of approximately 5.7 feet.

So, while the elevation relative to the ground does affect the induced wind speed from the train, the effect is small compared to the main factors (i.e., train speed, distance from train, and train head/tail shape), and this memo likely captures the maximum wind speed and forces produced by the train. For an elevated guideway, it is not anticipated that the wind speed and forces at-grade would be any greater than those calculated and presented in this memo.

2.4 Potential Impact of Induced Wind on Honeybees

Concern has been expressed that the wind gusts induced by the proposed HST might affect the bees that pollinate almond trees along the HST alignments. During an August 2010 phone call, Professors Sterling and Baker said they were not aware of any research done on the impact of HSTs on bees or pollination. (Sterling and Baker 2010). Right-of-way width for trains at-grade would be 100 feet and, according to design criteria, the nearest track would be at least 20 feet away from the edge of the HST right-of-way. Consequently, bounding the induced wind speeds at a distance of 20 feet or more was needed to evaluate the potential impact on bees pollinating almond trees.

The methods described in Section 2.0 are expanded upon in the following sections to estimate the wind gusts from a passing HST. These are compared to information about potential induced wind gusts and meteorological data for the Merced Regional Airport / Macready Field (KMCE), the Fresno Yosemite International Airport (KFAT), and the Bakersfield Meadows Field Airport (KBFL).

2.4.1 Meteorological Data

Meteorological data for Merced Regional Airport / Macready Field for the period of record of August 1998 to December 2008 (Western Regional Climate Center 2010a), Fresno Yosemite International Airport for the period of record of July 1996 to December 2008 (Western Regional Climate Center 2010b), and Bakersfield Meadows Field Airport for the period of record July 1996 to December 2008 (Western Regional Climate Center 2010c) were reviewed. The wind data for these three airports are very similar. Wind statistics are organized by month of the year:

- Merced Regional Airport / Macready Field:
  - The daily average wind speed ranges from 4.2 mph for November to 8.2 mph for June.
  - The daily average maximum 2-minute wind speed ranges from 12.1 mph for November to 16.7 mph in May.
  - The daily average peak gust, which is a maximum 5-second average, ranges from 15.0 mph in November to 21.3 mph in May.
  - The maximum daily average wind speed ranges from 10.9 mph for August to 22.1 mph for May.

  - The maximum 2-minute average wind speed range from 24 mph for September to 43 mph for December.
  - The maximum peak gust ranges from 29 mph for September to 51 mph for December.
- Fresno Yosemite International Airport:
  - The daily average wind speed ranges from 4.0 mph for December to 8.5 mph for June.
  - The daily average maximum 2-minute wind speed ranges from 11.5 mph for November to 17.7 mph in May.
  - The daily average peak gust, which is a maximum 5-second average, ranges from 14.2 mph for both November and December to 21.7 mph in May.
  - The maximum daily average wind speed ranges from 12.6 mph for July to 19.3 mph for March.
  - The maximum 2-minute average wind speed range from 25 mph for August to 38 mph for January.
  - The maximum peak gust ranges from 33 mph for both August and September to 46 mph for January.
- Bakersfield Meadows Field Airport (KBFL), CA:
  - The daily average wind speed ranges from 4.3 mph for November to 7.4 mph for June.
  - The daily average maximum 2-minute wind speed ranges from 12.4 mph for November to 17.3 mph in April.
  - The daily average peak gust, which is a maximum 5-second average, ranges from 14.7 mph for November to 21.4 mph in April.
  - The maximum daily average wind speed ranges from 9.4 mph for November to 22.3 mph for January.
  - The maximum 2-minute average wind speed range from 28 mph for July to 49 mph for February.
  - The maximum peak gust ranges from 33 mph for July to 57 mph for February.

2.4.2 Comparison with HST Induced Wind Gusts

Using the relationships from the German Intercity Connect HST data, induced winds from an HST traveling at 220 mph would be expected to range from 11 mph to 22 mph at 9.8 feet from the train. At 50 feet and 100 feet, the induced winds would be significantly less. As shown above in Table 1, at 20 feet the induced wind would be expected to be approximately 6 mph. A 1,400-foot-long train traveling at 220 mph would completely pass by an observer in less than 5 seconds; therefore a comparable wind statistic would be the daily average peak gust, where a peak gust is a maximum 5-second average wind speed. For Merced Regional Airport / Macready Field, Fresno Yosemite International Airport, and KBFL, the daily average peak gusts ranged from 15.0 mph to 21.3 mph, 14.2 mph to 21.7, and 14.7 to 21.4 mph, respectively. These ranges of speed are equivalent to the expected range of speeds of the induced winds at 9.8 feet from the train and two to three times greater than the 6 mph expected at 20 feet. Consequently, at 20 feet, 50 feet, and 100 feet from the train, the magnitude of the speeds of the induced winds would be expected to be less than and indistinguishable from naturally occurring wind gusts. Therefore, no impact on bee pollination from induced winds from the proposed HST would be expected to occur.

3.0 Wind-Generated Fugitive Dust Emissions from a Passing High-Speed Train

Wind erosion occurs when drag forces or shear stresses exerted by the wind exceed the retention forces acting on particles or debris at the surface. Once the minimum wind speed required to initiate particle motion (i.e., threshold friction velocity) has been reached, wind erosion occurs as a function of wind power or wind speed. The strong turbulent airflow along the sides of a moving train and the wake at the rear of the train may resuspend erodible debris and fine particulates from the surface of the surrounding impacted area, similar to particle resuspension from wind erosion. Attachment 1, *Wind-Generated Fugitive Dust Emissions from a Passing High-Speed Train* (URS 2010), provides more detail regarding methodology and findings.

3.1 Methodology

To estimate the fugitive dust emission from the particle resuspension, the AP-42 guidance Chapter 13.2.5 Industrial Wind Erosion (EPA 2006) was used to quantify the emission factor for wind-generated fugitive particulates emissions from a passing HST. This section presents the approach used to estimate the annual emissions of particulate matter smaller than or equal to 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively) from HST operation, based on the AP-42 guidance and project-specific data such as the impacted area.

Annual wind-generated fugitive dust/particulates emissions from a passing HST are a function of the impacted zone area and the wind erosion emission factor (per unit area). According to the AP-42 guidance, the wind erosion emission factor emission factor (in terms of mass per unit area) is a function of the disturbance frequency (where disturbance is defined as an action that results in the exposure of fresh surface material) in a year and erosion potential (which depends on friction velocity and threshold friction velocity).

3.1.1 Wind Erosion Emission Factor

Based on the AP-42 guidance, the emission factor for wind-generated dust emissions from the surface material of the impacted zone should be calculated as follows:

$$\text{Emission factor (g/m2):} \quad k\sum_{i=1}^{N} P_i \qquad \text{(Eq. 3)}$$

Where:

k = particle size multiplier
N = number of disturbances per year
P_i = erosion potential corresponding to the observed (or probable) fastest mile of wind for the ith period between disturbances (grams/$feet^2$).

3.1.2 Particulate Emission Factor

As described in Eq. 3, the emission factor is a function of the disturbance frequency and erosion potential. The disturbance frequencies for various HST alignments were provided by the project engineers and are discussed in the *California High-Speed Train Project Merced to Fresno Section Air Quality Technical Report* (Authority and FRA 2012).

The erosion potential is the finite availability of erodible material (mass/area) on a surface. The AP-42 equations 1 and 3 for erosion potential were substituted into the Eq. 3 listed above, and the following emission factor (grams/feet^2) as a function of induced wind was derived:

$$k\sum_{i=1}^{N}\left[58\left(0.038955\text{u} - 0.19\right)^2 + 25\left(0.038955\text{u} - 0.19\right)\right]_i \quad \text{(Eq.4)}$$

Where:

k = particle size multiplier (0.5 for PM_{10} and 0.075 for $PM_{2.5}$).
u = induced wind speed at a certain height above the surface (mph)

3.1.2 Induced Wind Speed

As shown in Eq. 4, the emission factor can be expressed as a function of induced wind speed along the side of the train body. The induced wind profile could be estimated using Eq.1 from Section 2.1 of this memo.

3.1.3 Impacted Zone Area

The impacted zone area for the HST is defined as the surface area within both shoulders of the train track or within the right-of-way, at which the maximum friction velocity on the surface material is higher than the threshold friction velocity (i.e., the minimum wind speed required to initiate particle motion). The length of the impacted zone area is equal to the length of the at-grade track, and was obtained from the *California High-Speed Train Project Merced to Fresno Section Air Quality Technical Report* (Authority and FRA 2012)

3.2 Fugitive Dust Calculation

By integrating the emission factor function in Eq. 4 across the induced wind speed values within the impacted zone boundary area and multiplying the emission factor by the number of disturbance (N) and the particle size multiplier (k), the annual fugitive dust emissions from HST activity can be estimated.

Dust emissions generated by the wake at the rear of the train were not added to this calculation to avoid double counting. The erodible dust is already suspended in the air when the rear end of the train passes through, so additional turbulence or the rear wake will not contribute to more raised dust in the air.

The emission factor profiles over the distance from the train body are presented in Figure 2, and the emission factor over the impacted zone area is summarized in Table 2.

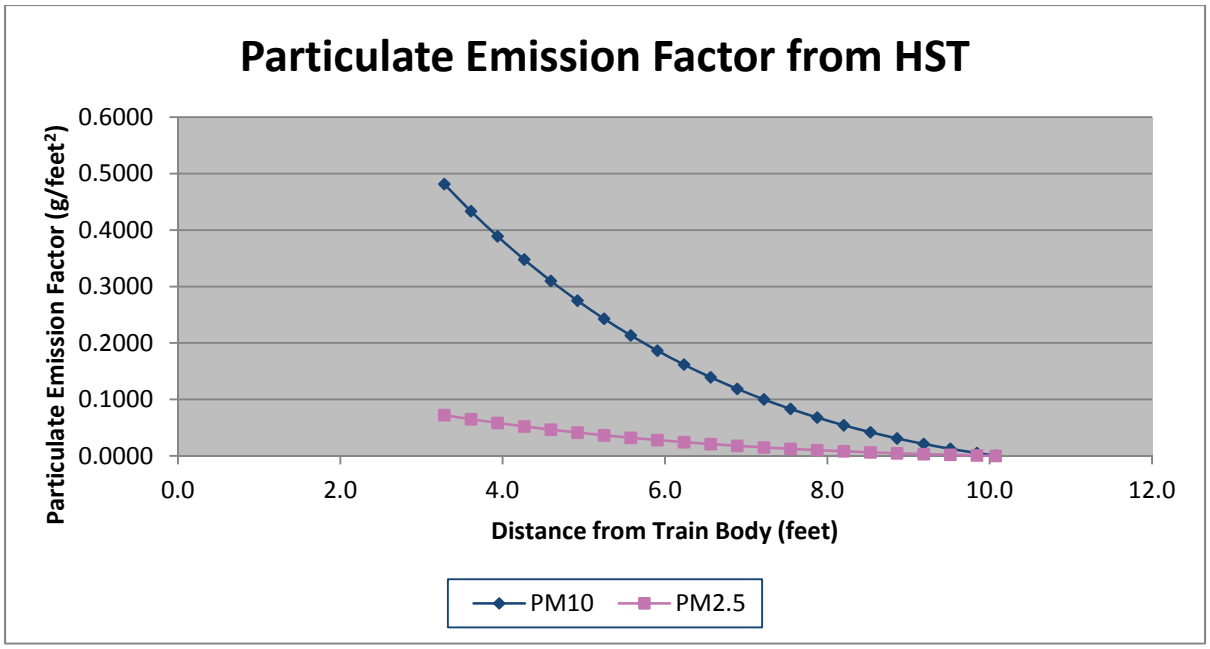


Figure 2
Particulate Emission Factor from Passing Train

Table 2
Emission Factor from Passing Train

Distance from Train-Body (feet)	Emission Factor (g/feet^2)	
	PM_{10}	$PM_{2.5}$
3.3	0.48	0.07
3.6	0.43	0.07
3.9	0.39	0.06
4.3	0.35	0.05
4.6	0.31	0.05
4.9	0.28	0.04
5.2	0.24	0.04
5.6	0.21	0.03
5.9	0.19	0.03
6.2	0.16	0.02
6.6	0.14	0.02
6.9	0.12	0.02
7.2	0.10	0.02
7.5	0.08	0.01
7.9	0.07	0.01

Distance from Train-Body (feet)	Emission Factor (g/feet^2)	
	PM_{10}	$PM_{2.5}$
8.2	0.05	0.01
8.5	0.04	0.01
8.9	0.03	0.00
9.2	0.02	0.00
9.5	0.01	0.00
9.8	0.01	0.00
10.1	0.00	0.00

The emission factor for wind-generated particulate emissions from a passing HST moving at 220 mph was calculated using the following steps:

- Using Eq. 1 and Eq. 4, integrate the emission factor over the distance of 3.3 feet to 10.1 feet from the train body.
- Multiply by particle size multiplier, k (0.5 for PM10 and 0.075 for PM 2.5)
- Multiply by the length of at-grade track length (impacted zone length).
- Multiply by 2 (to account for the left and right shoulders).
- Multiply by the number of disturbances per year, N

The trapezoidal rule for numerical integration is used to estimate the results for the particulate emission factor for a passing HST moving at 220 mph. For at-grade track lengths that range from 50 miles (264,000 feet) to 120 miles (633,600 feet), the PM_{10} fugitive dust ranges from 15.9 tons per year to 38.2 tons per year, and the $PM_{2.5}$ fugitive dust ranges from 2.4 tons per year to 5.7 tons per year. These emissions represent the total fugitive dust that will be suspended within the HST impacted zone area along the entire length of the alignment. As can be seen from Figure 2 and Table 2, the amount of fugitive dust suspended beyond 10.1 feet will be insignificant. Therefore, even though the train travels at speeds of 220 mph, it will not suspend herbicides, fungicides, or other harmful residues in the soil outside the HST-impacted zone area. The detailed results of these calculations can be found for various alignments in the *California High-Speed Train Project Merced to Fresno Section Air Quality Technical Report* (Authority and FRA 2012).

4.0 Incomplete and Unavailable Information

As noted earlier, an exact, analytical equation describing the induced wind from passing HSTs is unavailable because the technical means of obtaining it do not exist. Consequently, generally accepted scientific methods were used to extrapolate data from existing HST studies to approximate the induced winds expected from the California HST. The level of uncertainty in these estimates is sufficiently small that it is inconsequential to the evaluation of potential impacts from induced wind from the proposed California HST.

5.0 References

Baker, Chris, 2010. "The Flow Around High Speed Trains." *Journal of Wind Engineering and Industrial Aerodynamics*. Volume 98, pages 277–299.

Baker, C.J., Dalley, S.J., Johnson, T., Quinn, A., and Wright, N.G. 2001. "The Slipstream and Wake of a High-Speed Train." *Proc. IMechE, Part F: Journal of Rail and Rapid Transit*. 2001, Volume 215, pages 83–99.

California High-Speed Rail Authority and USDOT Federal Railroad Administration (Authority and FRA). 2012. *Air Quality Technical Report.* Sacramento and Washington, DC: California High-Speed Rail Authority and U.S. Department of Transportation, Federal Railroad Administration. 2012.

Federal Railroad Administration (FRA). 1999. Assessment of Potential Aerodynamic Effects on Personnel and Equipment in Proximity to High-Speed Train Operations: Safety of High-Speed Ground Transportation Systems. DOT-NVTSC-FRA-98-3. Washington, DC. December 1999.

Li, Renxian, Zhao, Jing and Zhang, Shu. 2008. A Study of the Influence of Aerodynamic Forces on a Human Body near a High-Speed Train, Aerodynamics of Heavy Vehicles, Trucks, Buses, and Trains.

Luft, Arnold. 2010. Email correspondence between Thomas Baily (URS) with Arnold Luft (ARUP), regarding disturbances of right-of-way, dated July 6, 2010.

Sterling, M., C.J. Baker, S.C. Jordan, and T. Johnson. 2008. "A Study of the Slipstreams of High-Speed Passenger Trains and Freight Trains," Proc. *IMechE, Part F: Journal of Rail and Rapid Transit*. 2008, Volume 222, pages 177–193.

Jordan, S.C., M. Sterling, and C.J. Baker. 2010. "Modelling the Response of a Standing Person to the Slipstream Generated by a Passenger Train," *Proc. IMechE, Part F: Journal of Rail and Rapid Transit*. 2010, Volume 223, pages 567–579.

Schetz, Joseph A. 2001. "Aerodynamics of High-Speed Trains." *Annual Review of Fluid Mechanics.* Volume 33, pages 371–414.

Sterling, M. and C.J. Baker. 2010. Telephone call from Mark Bennett, CH2M HILL, to Mark Sterling and Chris Baker about induced winds from HSTs. August 23, 2010.

United States Environmental Protection Agency (EPA). 2006. *Industrial Wind Erosion*. AP 42, Fifth Edition, Volume I. Chapter 13.2.5. November 2006.

URS. 2010. Wind-Generated Fugitive Dust Emissions from a Passing High-Speed Train. Prepared by Prasetyo Jo, Nathalia. July 12, 2010.

Watson, J.G, 1996. Effectiveness Demonstration of Fugitive Dust Control Methods for Public Unpaved Roads and Unpaved Shoulders on Paved Roads. DRI Document No. 685-5200. IF2: August 2, 1996.

Western Regional Climate Center. 2010a. Climatologically summary for the "Merced Muni/Macready FLD APT (KMCE)," for the period of record August 1998 to December 2008. http://www.wrcc.dri.edu/summary/mce.ca.html. Accessed September 1, 2010.

Western Regional Climate Center. 2010b. Climatologically summary for the "Fresno Yosemite International Airport (KFAT)," for the period of record July 1996 to December 2008. http://www.wrcc.dri.edu/summary/fat.ca.html. Accessed September 1, 2010.

Western Regional Climate Center. 2010c. Climatologically summary for the "Bakersfield Meadows Field Airport (KBFL)," for the period of record July 1996 to December 2008. http://www.wrcc.dri.edu/summary/BFL.CA.HTML. Accessed September 1, 2010.

ATTACHMENT 1

Fugitive Dust Memo

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MEMORANDUM

To: **PMT**
From: Nathalia Prasetyo Jo (URS)
Date: July 12, 2010
Subject: **Wind-Generated Fugitive Dust Emissions from a Passing High-Speed Train**

Wind erosion occurs when drag forces or shear stresses exerted by the wind exceed the retention forces acting on particles or debris at the surface. Once the minimum wind speed required to initiate particle motion (threshold friction velocity) has been reached, wind erosion occurs as a function of wind power or wind speed.
Trains traveling at high velocity, such as the High-Speed Train, drag the surrounding air along the side of its body, which induces sideways turbulent fluctuations and rear wake. The strong turbulent airflow along the sides of a moving train and the wake at the rear of the train may resuspend erodible debris and fine particulates from the surface of the surrounding impacted area, similar to particle resuspension from wind erosion.

Methodology

To estimate the fugitive dust emission from the particle resuspension, the AP42 guidance Chapter 13.2.5 Wind Erosion was used to quantify the emission factor for wind-generated fugitive particulates emissions from a passing High-Speed Train. This memo presents the approach used to estimate the annual PM_{10} and $PM_{2.5}$ emissions from the High-Speed Train operation based on the AP42 guidance and current project description (at 15%design).
Annual wind-generated fugitive dust/particulates emissions from a passing High-Speed Train are a function of the impacted zone area and the wind erosion emission factor (per unit area). According to the AP42 guidance, the wind erosion emission factor emission factor (in terms of mass per unit area) is a function of the disturbance frequency (where disturbance is defined as an action that results in the exposure of fresh surface material) in a year and erosion potential (which depends on friction velocity and threshold friction velocity).
The influencing factors such as the impacted zone area, wind erosion emission factor, disturbance frequency, erosion potential and induced wind speed profile are discussed in detail in the following subsections.

Impacted Zone Area

The impacted zone area for the High-Speed Train scenario is defined as the surface area within both shoulders of the train track or within the right of way, at which the maximum friction velocity on the surface material is higher than the threshold friction velocity (the minimum wind

speed required to initiate particle motion).
The length of the impacted zone area is equal to the length of the at-grade track. Along the Fresno to Bakersfield alignment, the length of the at-grade track is approximately 43.56 miles (total track length subtracted by the elevated track section length)[1].
The width of the impacted zone is twice the distance from the beginning of the right of way area to the point where the corresponding maximum surface friction velocity generated by the induced turbulence is equal to the threshold friction velocity (assumed 0.19 m/s, based on the lowest value available for disturbed desert soil[2]). In this memo, the width of the impacted zone is referred to in terms of distance from the train body. The doubling of width was to account for the right of way area on the left and right side of the train track.
The boundary for the impacted zone is assumed to start at beginning of the right of way area (approximately one meter from the train body) and end at the distance where the corresponding friction velocity is equal to the threshold friction velocity. The surface area from the train body to the beginning of the right of way area was assumed to consist of non-erodible material because that area is within the embankment and rock ballast area.
To quantify the fugitive dust emissions generated by a High-Speed train passing at the speed of 220 mph, the emission factor needs to account for the induced wind speed profile and the distance within the impacted zone. Further discussion on the determination of the impacted zone boundary is presented in the induced wind speed section.

Wind Erosion Emission Factor

Based on the AP42 guidance, the emission factor for wind-generated dust emissions from the surface material of the impacted zone should be calculated as follows:

Emission factor (g/m2): $k\sum_{i=1}^{N} P_i$ (Eq.1)

Where:

k = particle size multiplier
N = number of disturbances per year
Pi = erosion potential corresponding to the observed (or probable) fastest mile of wind for the ith period between disturbances, g/m^2

As described in Eq.1, the emission factor is a function of the disturbance frequency and erosion potential. The approach and assumptions used to determine the disturbance frequency and erosion potential for the High-Speed Train operation scenario are presented as follows:

Disturbance Frequency

The disturbance is defined as an action that results in the exposure of fresh surface material. The number of disturbances per year during normal High-Speed Train operation is equal to the frequency of right of way access in a year (for maintenance or other purposes). The wind

1 The length of at-grade track was estimated based on the Fresno to Bakersfield HST Alignments Preliminary Draft Map, URS, 2010.
2 Watson, J.G, "Effectiveness Demonstration of Fugitive Dust Control Methods for Public Unpaved Roads and Unpaved Shoulders on Paved Roads", DRI Document No. 685-5200. IF2: August 2, 1996.

generated emission factor is dependent on the disturbance frequency because each time that the right of way surface area is disturbed, its erosion potential is restored.
The right of way surface area is currently expected to be disturbed twice monthly for visual inspection based on the operational and maintenance schedule of the High-Speed Train. Therefore, the erosion potential is assumed to be restored twice a month, which translates to 24 disturbances/year or N=24[3].

Erosion Potential

The erosion potential (P_i) is the finite availability of erodible material (mass/area) on a surface. For the wind erosion emission factor calculation, Pi is defined as the erosion potential corresponding to the observed fastest mile of wind[4] for the ith period between disturbances, and can be calculated as follows:

$P = 58 (u^* - u^*_t)^2 + 25 (u^* - u^*_t)$ (Eq.2)

$P = 0$ for $u^* < u^*_t$ (Eq.3)

Where:

u^* = friction velocity (m/s)

u^*_t = threshold friction velocity (m/s). Assumed 0.19 m/s, based on the lowest value available for disturbed desert soil.

Since there was no documentation for the friction velocity from High-Speed Train operation, induced wind velocity was used to estimate the friction velocity on the right of way surface based on the correlation given by Eq.4.

$$u_z = \frac{u^*}{0.4} \ln\left(\frac{z}{z_0}\right) \qquad (z > z_o) \qquad \text{(Eq.4)}$$

Where:

u_z = induced wind speed, m/s

u^* = friction velocity, m/s

z = height above test surface, cm

z_0 = roughness height, cm

0.4 = von Karman's constant, dimensionless

By substituting the friction velocity (u^*) from Eq.4 into Eq.2 and the erosion potential (Pi) from Eq. 2 into Eq. 1, the emission factor in Eq.1 can be expressed as a function of induced wind speed as shown in Eq. 5

3 Email correspondence between Thomas Baily (URS) with Arnold Luft (ARUP) dated July 6, 2010.
4 Fastest mile is the fastest one minute observed wind speed taken from a multiple register that contains a time record of the passing of each mile of wind

Emission factor (g/m^2): $$k\sum_{i=1}^{N}\left[58\left(\frac{0.4\,u_z}{\ln\left(\frac{z}{z_0}\right)}-u_t^*\right)^2+25\left(\frac{0.4\,u_z}{\ln\left(\frac{z}{z_0}\right)}-u_t^*\right)\right]_i \quad \text{(Eq.5)}$$

Where:
k = particle size multiplier (0.5 for PM_{10} and 0.075 for $PM_{2.5}$).
u_z = induced wind speed at a certain height above the surface (m/s). Note that emissions are only calculated in area with $u^* > u^*_t$. Because, when $u^* < u^*_t$, the erosion potential (P) is equal to zero.
u^*_t = threshold friction velocity. Assumed 0.19 m/s, based on the lowest value available for disturbed desert soil.
z = height above the surface (288 cm), based on 1/2 of the train height (1.88 m) and the average embankment height (3ft ~1 meter) with respect to the right of way5.
z_0 = surface roughness height (cm), assume 0.01 cm for the at grade right of way
0.4 = von Karman's constant, dimensionless

By substituting the assumptions above and other known parameters into Eq. 5, the equation can be simplified to.

Emission factor (g/m^2): $$k\sum_{i=1}^{N}\left[58\left(0.038955u_z-0.19\right)^2+25\left(0.038955u_z-0.19\right)\right]_i \quad \text{(Eq.6)}$$

Where:
k = particle size multiplier (0.5 for PM_{10} and 0.075 for $PM_{2.5}$).
u_z = induced wind speed at a certain height above the surface (m/s). Note that emissions are only calculated in area with $u_z > 4.88$ m/s (a substitute for $u^* > u^*_t$). Because, when $u^* < u^*_t$, the erosion potential (P) is equal to zero.

As shown in Eq. 6, the emission factor can be expressed as a function of induced wind speed along the side of the train body. By integrating the emission factor function in Eq.6 across the induced wind speed values within the impacted zone boundary (u_z) area, and multiplying the emission factor by the number of disturbance (24 times per year) and the particle size multiplier (k), the annual fugitive dust emissions from the High-Speed Train activity can be estimated. Dust emissions generated by the wake at the rear of the train were not added to this calculation to avoid double counting. The erodible dust is already suspended in the air when the rear end of the train passes through and therefore additional turbulence or the rear wake will not contribute to more raised dust in the air.

Induced Wind Speed Profile

The width of the impacted zone is twice the distance from the beginning of the right of way to the point where the corresponding maximum surface friction velocity generated by the induced turbulence is equal to the threshold friction velocity. To determine the distance where the corresponding maximum surface friction velocity generated by the induced turbulence is equal to the threshold friction velocity, a wind speed profile analysis is required.
A study on the potential aerodynamic forces created by a passing High-Speed Train on nearby

5 Track related measurements are based on Technical Memorandum, Typical Cross Sections for 15% Design TM 1.1.21 Appendix A: Two Track At-Grade Drawing and Project Description Summary (June 28, 2010)

objects (such as humans standing in the proximity of the train) are influenced by train speed, distance from the train, and the geometry of the train[6]. Li, et. al. analyzed the maximum wind velocity around a human body for a specific train speed as a function of human-train distance based on different train shape models:

$$u = (1.2319)^{0.072v-4} \times (0.4575d^2 - 3.5496d + 9.1545) \qquad \text{(Eq.7)}$$

Where:
u: the maximum wind velocity around human body near the train (m/s).
d: human-train distance (m).
v: train running speed (m/s).

The range of train speeds specified for Eq. 7 are between 55.56 m/s and 97.22 m/s (between 124 mph and 217 mph) with a human-train distance between 1.0 m and 3.5 m. This raises questions about the validity of this equation to estimate aerodynamic forces from a High Speed train traveling at a speed of 220 mph.
An induced wind speed profile comparison was graphed to determine the relative accuracy of using Eq 7 to estimated aerodynamic forces for train speeds of 220 mp compared to 217 mph (the upper bound of the train speed range for Eq 7). Figure 1 shows that Eq. 7 presents a similar trend when a train speed of 220 mph is used as compared to a train speed of 217 mph. Therefore Eq. 7 can be used to determine the induced wind speed profile as a function of distance from train body for train passing at 220 mph.

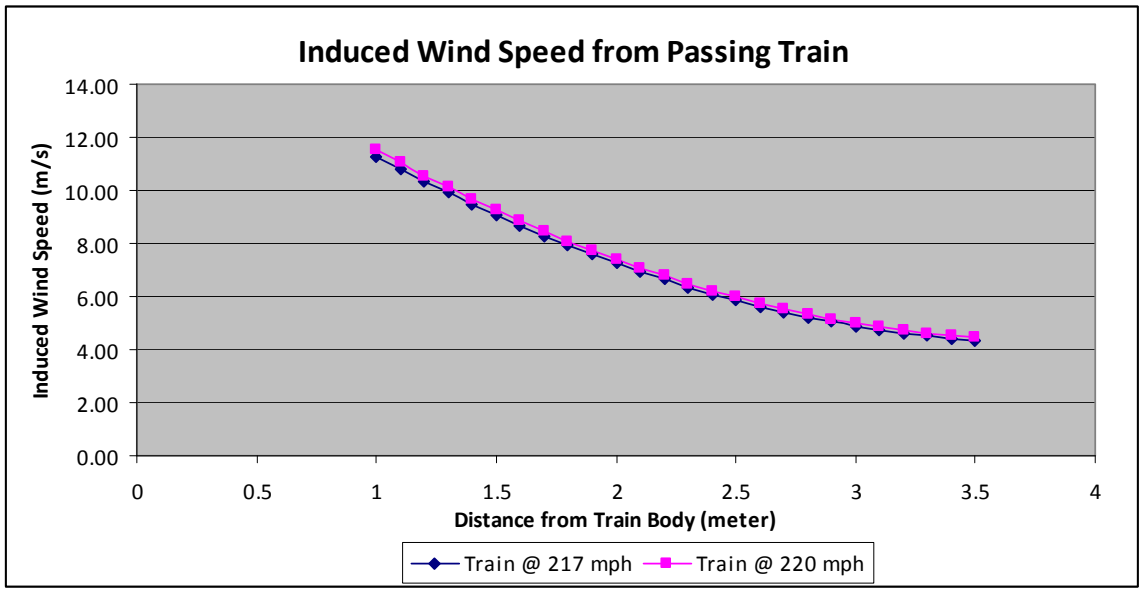


Figure 1. Wind Speed Profile Comparison from Train at 220 mph and 217 mph

6 Li, Renxian, et.al, "A Study of the Influence of Aerodynamic Forces on a Human Body near a High-Speed Train, Aerodynamics of Heavy Vehicles", Trucks, Buses, and Trains, 2008.

Emission Calculation

The emission factor profiles over the distance from the train body are presented in Figure 2 and the emission factor over the impacted zone area is summarized in Table 1.

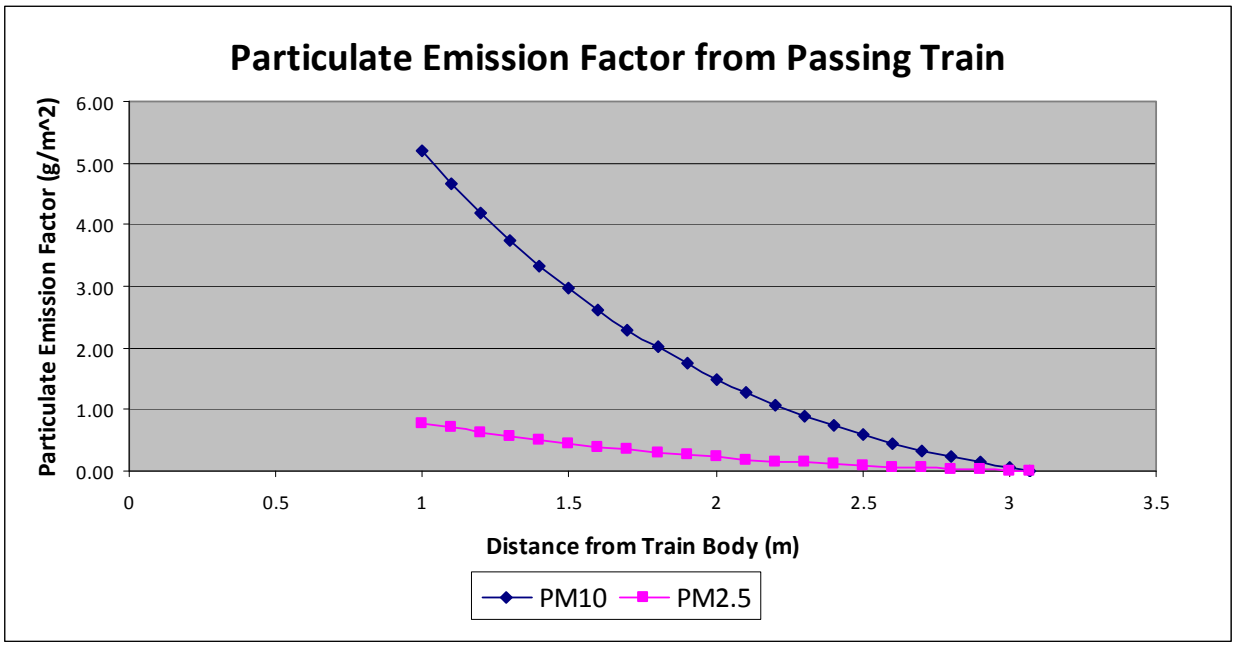


Figure 2. Particulate Emission Factor from Passing Train

Table 1. Emission Factor from Passing Train

Distance from Train-Body	Wind Speed (220 mph Train)	Friction Velocity	Erosion Potential	Emission Factor (g/m^2)	
(m)	u (m/s)	u*(m/s)	P (g/m^2)	PM_{10}	$PM_{2.5}$
1	11.53	0.45	10.37	5.18	0.78
1.1	11.03	0.43	9.33	4.67	0.70
1.2	10.56	0.41	8.38	4.19	0.63
1.3	10.10	0.39	7.49	3.75	0.56
1.4	9.66	0.38	6.68	3.34	0.50
1.5	9.24	0.36	5.92	2.96	0.44
1.6	8.83	0.34	5.23	2.62	0.39
1.7	8.45	0.33	4.60	2.30	0.34
1.8	8.08	0.31	4.02	2.01	0.30
1.9	7.72	0.30	3.48	1.74	0.26
2	7.39	0.29	3.00	1.50	0.22
2.1	7.07	0.28	2.56	1.28	0.19
2.2	6.77	0.26	2.16	1.08	0.16
2.3	6.48	0.25	1.79	0.90	0.13
2.4	6.22	0.24	1.46	0.73	0.11
2.5	5.97	0.23	1.17	0.58	0.09
2.6	5.74	0.22	0.90	0.45	0.07
2.7	5.53	0.22	0.67	0.33	0.05
2.8	5.33	0.21	0.46	0.23	0.03
2.9	5.15	0.20	0.27	0.14	0.02
3	4.99	0.19	0.11	0.05	0.01
3.07	4.88	0.19	0.01	0.00	0.00

As shown in Table 1, the corresponding friction velocity at the distance of 3.07 meters from the train body is equal to the threshold friction velocity of 0.19 m/s. Therefore, emission factor for wind-generated dust emissions should be calculated from the beginning of the right of way (1 meter from the train body) to the distance of 3.07 meters from the train body.

The emission factor for wind-generated particulate emissions from a passing High-Speed Train moving at 220 mph was calculated with the following steps:

- Using Eq. 6 and Eq. 7, integrate the emission factor over the distance of 1 meter to 3.07 meter from the train body.
- Multiply by particle size multiplier, k (0.5 for PM_{10} and 0.075 for $PM_{2.5}$)
- Multiply by 43.56 miles of at grade track length (impacted zone length).
- Multiply by two (to account for the left and right shoulders).
- Multiply by 24 disturbances per year (twice monthly).

Using the trapezoidal rule for numerical integration, the results for emission factor for wind-generated particulate emissions from a passing High-Speed train moving at 220 mph are 26.53 lb PM_{10} /miles of at grade track and 3.98 lb $PM_{2.5}$/ miles of at grade track. Multiplied by the

impacted zone length and disturbance frequency, the annual PM_{10} and $PM_{2.5}$ emissions from the High-Speed Train operation for the Fresno-Bakersfield section are 28.97 ton of PM_{10} /year and 4.3 ton of $PM_{2.5}$ /year.

Reference

H. Lee, "Assessment of Potential Aerodynamic Effects on Personnel and Equipment in Proximity to High-Speed Trains Operations", DOT/FRA/ORD-99/11, December 1999.

U.S. Environmental Protection Agency (USEPA), “Compilation of Air Pollutant Emission Factors Chapter 13.2.5”, AP-42, 5th ed., Washington, D. C., 2006.

Li, Renxian, et.al, “A Study of the Influence of Aerodynamic Forces on a Human Body near a High-Speed Train, Aerodynamics of Heavy Vehicles”, Trucks, Buses, and Trains, 2008.

Watson, J.G, “Effectiveness Demonstration of Fugitive Dust Control Methods for Public Unpaved Roads and Unpaved Shoulders on Paved Roads”, DRI Document No. 685-5200. IF2: August 2, 1996.

APPENDIX 3.3-A, APPENDIX G: COUNCIL ON ENVIRONMENTAL QUALITY PROVISIONS COVERING INCOMPLETE OR UNAVAILABLE INFORMATION

Council on Environmental Quality (CEQ) Provisions Covering Incomplete or Unavailable Information (40 CFR 1502.22)

Sec. 1502.22 INCOMPETE OR UNAVAILABLE INFORMATION

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

(a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

1. a statement that such information is incomplete or unavailable;
2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

(c) The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA’s view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in mobile source air toxic (MSAT) emissions associated with a proposed set of highway alternatives. The outcome of such

an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, https://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of

occupational exposure data to the general population, a concern expressed by HEI (Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (https://www.epa.gov/iris)."

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable (https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf).

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Due to the limitations cited, a discussion such as the example provided in this Appendix (reflecting any local and project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with Council on Environmental Quality (CEQ) regulations [40 CFR 1502.22(b)]. The FHWA Headquarters and Resource Center staff, Victoria Martinez (787) 771-2524, James Gavin (202) 366-1473, and Michael Claggett (505) 820-2047, are available to provide guidance and technical assistance and support.

APPENDIX 3.3-B: DRAFT FEDERAL GENERAL CONFORMITY DETERMINATION

California High-Speed Rail Authority

San Jose to Merced Project Section

Draft Federal General Conformity Determination

November 2021

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

EXECUTIVE SUMMARY

The California High-Speed Rail (HSR) system, proposed by the California High-Speed Rail Authority (Authority), will provide intercity, high-speed service on more than 800 miles of guideway throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The San Jose to Central Valley Wye Project Extent (Project)[1], which is the focus of this General Conformity Determination, is a critical link connecting San Jose to the Central Valley portion of the HSR system at the Central Valley Wye in Merced County, which in turn connects to the portion of the system running north to Merced and south to Fresno and southern California.[2]

The General Conformity Rule, as codified in Title 40 Code of Federal Regulations Part 93, Subpart B, establishes the process by which federal agencies determine conformance of proposed projects that are federally funded or require federal approval with applicable air quality standards. This determination must demonstrate that a project would not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment.

This draft General Conformity Determination documents the FRA's finding that the Project complies with the General Conformity Rule and that it conforms to the purposes of the area's approved State Implementation Plan and is consistent with all applicable requirements. This draft General Conformity Determination is being issued for public review and comment. The draft General Conformity Determination is available for public review on FRA's docket at https://www.regulations.gov/, Docket FRA-2021-X. Compliance is demonstrated as follows:

- Operations of the Project would result in a reduction of regional emissions of all applicable air pollutants and would not cause a localized exceedance of an air quality standard.
- While emissions generated during construction of the Project would exceed the General Conformity thresholds for nitrogen oxides in the San Francisco Bay Area Air Basin and San Joaquin Valley Air Basin, these emission increases would be offset through a new agreement with BAAQMD and an existing Memorandum of Understanding and Voluntary Emission Reduction Agreement with the San Joaquin Valley Air Pollution Control District, respectively.

[1] The Project Section has been evaluated in three extents: from San Jose to the western limit of the Central Valley Wye; the Central Valley Wye itself; and from the northern limit of the Central Valley Wye to Merced (i.e., the northern portion of the Merced to Fresno Project Section).

[2] As part of its first phase, the California HSR System is planned as seven distinct sections from San Francisco in the north to Los Angeles and Anaheim in the south.

TABLE OF CONTENTS

EXECUTIVE SUMMARY I

1 INTRODUCTION 1-7
1.1 Regulatory Status of Resource Study Area 1-7
1.2 General Conformity Regulations 1-2

2 CALIFORNIA HIGH-SPEED RAIL PROJECT 2-1
2.1 California High-Speed Rail System 2-1
2.2 California High-Speed Rail System—San Jose to Central Valley Wye Project Extent 2-1

3 AIR QUALITY CONDITIONS IN THE RESOURCE STUDY AREA 3-1
3.1 Meteorology and Climate 3-1
3.2 Ambient Air Quality in the Resource Study Area 3-1
3.3 Resource Study Area Emissions 3-1

4 RELATIONSHIP TO NEPA 4-1

5 PROJECT FEATURES TO REDUCE EMISSIONS 5-1

6 REGULATORY PROCEDURES 6-1
6.1 Use of Latest Planning Assumptions 6-1
6.2 Use of Latest Emission Estimation Techniques 6-1
6.3 Major Construction-Phase Activities 6-2
6.4 Emission Scenarios 6-2

7 APPLICABILITY ANALYSIS 7-1
7.1 Attainment Status of Resource Study Area 7-1
7.2 Exemptions from General Conformity Requirements 7-2
7.3 Applicability for Project 7-2
7.4 *De Minimis* Emission Rates 7-2

8 CONSTRUCTION ACTIVITIES CONSIDERED 8-1
8.1 Models and Methods for Emissions Modeling 8-1
8.2 Ballast and Subballast Hauling 8-2
8.3 Annual Emissions Estimates 8-3
8.4 Emissions by Air Basin 8-3
8.5 Project Design Features 8-5

9 ESTIMATED EMISSION RATES AND COMPARISON TO *DE MINIMIS* THRESHOLDS 9-1

10 REGIONAL EFFECTS 10-1

11 GENERAL CONFORMITY EVALUATION 11-1
11.1 Conformity Requirements of Project 11-1
11.2 Compliance with Conformity Requirements 11-1
11.3 Consistency with Requirements and Milestones in Applicable SIP 11-3
11.3.1 Applicable Requirements from U.S. Environmental Protection Agency 11-3
11.3.2 Applicable Requirements from California Air Resources Board 11-3

11.3.3 Applicable Requirements from Bay Area Air Quality Management District and San Joaquin Valley Air Pollution Control District 11-4
11.3.4 Consistency with Applicable Requirements for the California High-Speed Rail Authority 11-4
12 ESTIMATED EMISSION RATES AND COMPARISON TO *DE MINIMIS* THRESHOLDS—CUMULATIVE ANALYSIS 12-1
13 REPORTING AND PUBLIC COMMENTS 13-1
14 FINDINGS AND CONCLUSIONS 14-1
15 REFERENCES 15-1

Tables

Table 1 Planning Documents Relevant to the Resource Study Area 1-1
Table 2 Ambient Criteria Pollutant Concentration Data at Air Quality Monitoring Stations along the Project Extent 3-3
Table 3 Estimated Annual Average Emissions for Santa Clara, San Benito, and Merced Counties (2012 data published in 2017) (tons per day) 3-5
Table 4 Federal Attainment Status of the SFBAAB, NCCAB, and SJVAB 7-1
Table 5 *De Minimis* Rates for Determining Applicability of General Conformity Requirements to Federal Actions 7-3
Table 6 Track Miles and Construction Scaling Factors by Air Basin 8-4
Table 7 San Jose to Central Valley Wye Annual Construction Emissions in the SFBAAB (tons per year)[1] 9-2
Table 8 San Jose to Central Valley Wye Annual Construction Emissions in the SJVAB (tons per year)[1] 9-3
Table 9 Overlapping HSR System Construction Emissions in the SFBAAB (tons per year) 12-2
Table 10 Overlapping HSR System Construction Emissions in the SJVAB (tons per year) 12-1

Figures

Figure 1 Resource Study Area Air Basins 1-8

Attachments

Appendix 3.3-B: Draft Federal General Conformity Determination
Attachment A: Letters of Agreement with BAAQMD

ACRONYMS AND ABBREVIATIONS

AP-42	USEPA's AP-42 Compilation of Air Pollutant Emission Factors
APCD	air pollution control district
Authority	California High-Speed Rail Authority
BAAQMD	Bay Area Air Quality Management District
Bay Area	San Francisco Bay Area
C.F.R.	Code of Federal Regulations
CAA	Clean Air Act
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CO	carbon monoxide
EIR	environmental impact report
EIS	environmental impact statement
EMFAC2017	EMission FACtors 2017
EMMA	Environmental Mitigation Management and Assessment system
FRA	Federal Railroad Administration's
Fresno to Bakersfield Final EIR/EIS	Fresno to Bakersfield Section Final EIR/EIS
g/L	grams per liter
GHG	greenhouse gas
HSIPR	High-Speed Intercity Passenger Rail
HSR	High-Speed Rail
I-	Interstate
IAMF	impact avoidance and minimization feature
MBARD	Monterey Bay Air Resources District
Merced to Fresno Final EIR/EIS	Merced to Fresno Section Final EIR/EIS
MOU	memorandum of understanding
mph	miles per hour
MPO	metropolitan planning organizations
NAAQS	national ambient air quality standards
NCCAB	North Central Coast Air Basin
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NO_X	nitrogen oxide
O_3	ozone
PM	particulate matter

PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
Project	San Jose to Central Valley Wye Project Extent
Project Section	San Jose to Merced Project Section
ROD	record of decision
RSA	resource study area
SAFE	Safer Affordable Fuel-Efficient
SFBAAB	San Francisco Bay Area Air Basin
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_X	sulfur oxide
SR	State Route
Statewide Program EIR/EIS	Final Program EIR/EIS for the Proposed California High-Speed Train System
tpy	tons per year
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
VERA	Voluntary Emissions Reduction Agreement
VMT	vehicle miles traveled
VOC	volatile organic compound

1 INTRODUCTION

This draft General Conformity Determination for the San Jose to Central Valley Wye Section of the California High-Speed Rail (HSR) System (Project) (a portion of the San Jose to Merced Project Section [Project Section]) and was prepared consistent with the implementing regulations of Section 176 of the Clean Air Act (CAA). Section 176(c)(1) of the CAA prohibits federal agencies from engaging in, supporting, or providing financial assistance for licensing, permitting or approving any activities that do not conform to an approved CAA implementation plan. That approved plan may be a federal, state, or tribal implementation plan.

The CAA defines nonattainment areas as geographic regions that have been designated as not meeting one or more of the national ambient air quality standards (NAAQS)The CAA requires that each state prepare a State Implementation Plan (SIP) A maintenance plan must be prepared for each former nonattainment area that subsequently demonstrated compliance with the standards. The SIP is a state's plan for how it will meet the NAAQS by the CAA deadlines established by the CAA.

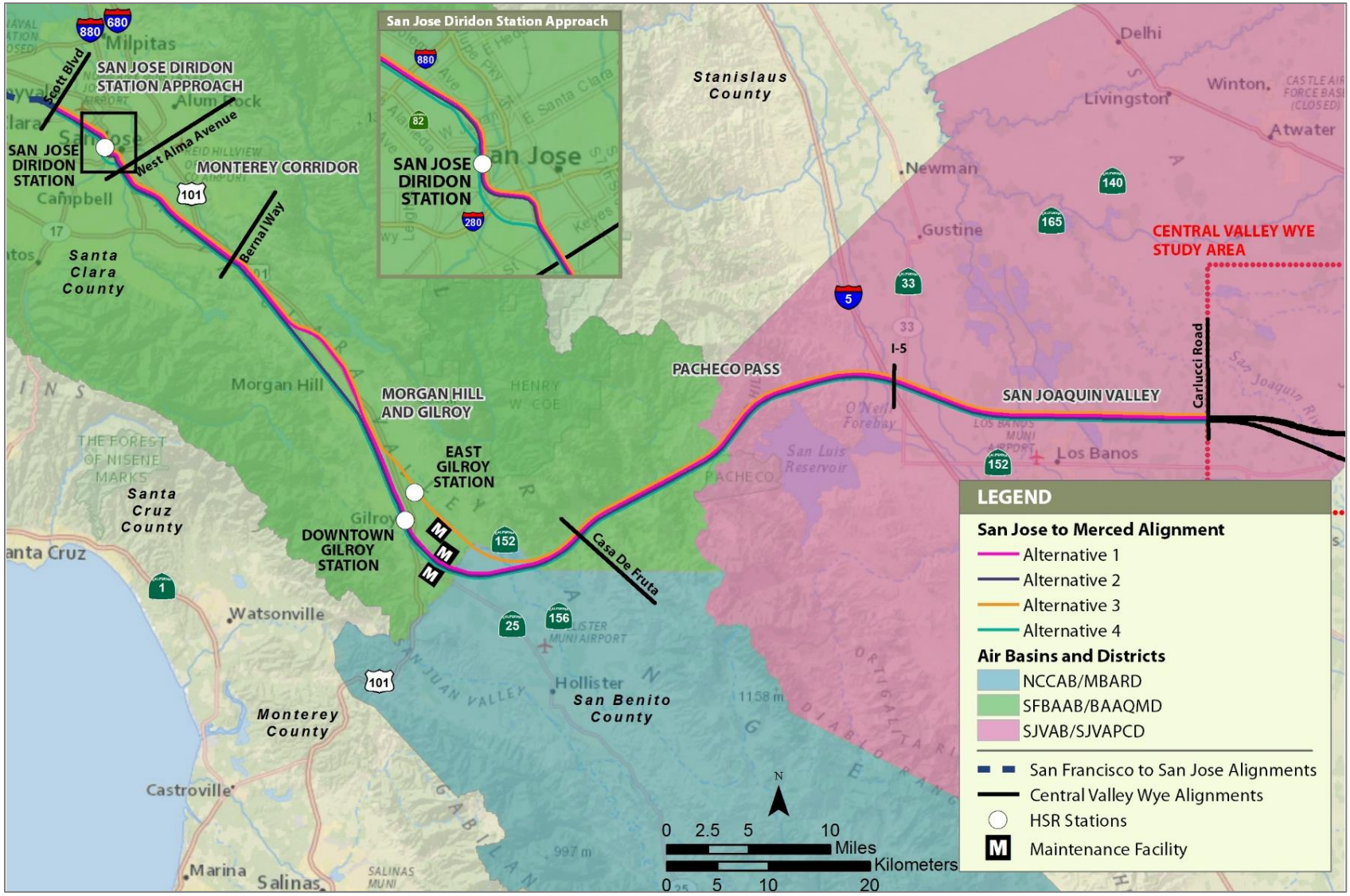
The General Conformity Rule is codified in Title 40 Code of Federal Regulations (C.F.R.)Conformity is defined as "upholding an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards." 40 C.F.R. Part 93 also establishes the process by which federal agencies determine conformity. This determination must demonstrate that the Project would not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment. Since the Project is receiving federal funds through grants from the Federal Railroad Administration (FRA), it is an action that may be subject to the General Conformity Rule.

FRA prepared this draft General Conformity Determination for public review and comment. The final General Conformity Determination will be published after the public comment period. Analysis used for preparation of the *San Jose to Merced Environmental Impact Report (EIR)/Environmental Impact Statement (EIS)* was also reviewed and, where appropriate, integrated into this draft General Conformity Determination.

1.1 Regulatory Status of Resource Study Area

In November 1993, the U.S. Environmental Protection Agency (USEPA) two sets of regulations to implement section 176(c) of the CAA. The final transportation conformity regulations were approved on November 24, 1993 to address transportation plans, programs, and projects developed, funded, or approved under title 23 United States Code (U.S.C.) or the Federal Transit Act, 49 U.S.C Section 1601 et seq. (40 C.F.R. § 93 Subpart A). These regulations have been revised several times since they were first issued. While the Transportation Conformity regulations do not apply to the Project, many of the transportation planning documents developed under those regulations are helpful in understanding the regional air quality and planning status of the resource study area (RSA)The final general conformity regulations were approved on November 30, 1993. Because of the federal funding and potential safety and other approvals, the Project is subject to the general conformity regulations. The final general conformity regulations were approved on November 30, 1993. Because of the federal funding and potential safety and other approvals, the Project is subject to the general conformity regulations.

The RSA for the Project is the San Francisco Bay Area Air Basin (SFBAAB) San Joaquin Valley Air Basin (SJVAB), and the North Central Coast Air Basin (NCCAB). Figure 1 shows the Project footprint as it is situated in the three air basins. Planning documents for pollutants for which the RSA is classified as federal nonattainment or maintenance are developed by the Bay Area Air Quality Management District (BAAQMD), Monterey Bay Air Resources District (MBARD), San Joaquin Valley Air Pollution Control District (SJVAPCD), and the California Air Resources Board (CARB) and approved by the USEPA. Table 1 lists the planning documents relevant to the Project's RSA.



Source: Authority 2017, CARB 2012

Figure 1 Resource Study Area Air Basins

Table 1 Planning Documents Relevant to the Resource Study Area

Plan	Status
San Francisco Bay Area Air Basin	
2001 San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard	In a March 30, 2001, *Federal Register* notice (66 Fed. Reg. 17379), the USEPA proposed to make a finding that the Bay Area has not attained the national 1-hour O_3 standard. The USEPA proposed partial approval and partial disapproval of the 1999 Ozone Attainment Plan. On August 28, 2001, the USEPA took final action on its March 2001 notice, triggering a CAA requirement that a new plan be submitted within 1 year of the effective date of the USEPA's final action. The revised 2001 Ozone Attainment Plan included the necessary changes to address the USEPA's disapproval of the prior plan. In addition, to address the requirements triggered by the USEPA's finding of failure to attain, the plan included a new emissions inventory and commitments to adopt and implement additional control measures to attain the standard by 2006, the attainment deadline. It also included additional contingency measures in the event the Bay Area did not attain the standard by 2006.
2017 Clean Air Plan	Although not a federal planning document, the Bay Area 2017 Spare the Air, Cool the Climate (Clean Air Plan) provided a comprehensive plan to improve Bay Area air quality and protect public health. The Clean Air Plan defined a control strategy that the BAAQMD and its partners is implementing to: (1) attain all state and national ambient air quality standards; (2) eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants; and (3) reduce GHG emissions to protect the climate.
North Central Coast Air Basin	
2005 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region	Although not a federal planning document, the plan fulfilled the requirements of Senate Bill 656 to reduce public exposure to PM. The plan outlines readily available, feasible, and cost-effective control measures for PM within the MBARD.
2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region	This plan presents the strategy for maintaining the NAAQS for O_3 in the NCCAB. The NCCAB attained the 8-hour NAAQS in 2014.
2012–2015 Air Quality Management Plan	Although not a federal planning document, the Air Quality Management Plan is prepared triennially by the MBARD to document the region's continued progress toward meeting the state 8-hour O_3 standard.
San Joaquin Valley Air Basin	
2007 PM_{10} Maintenance Plan and Request for Redesignation	On September 25, 2008, the USEPA redesignated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the 2007 PM_{10} Maintenance Plan.
2007 8-Hour Ozone Plan	On May 5, 2010, the USEPA reclassified the 8-hour O_3 nonattainment status of the San Joaquin Valley from "serious" to "extreme." The reclassification required the state to incorporate more stringent requirements, such as lower permitting thresholds, and implement reasonably available control technologies at more sources. The 2007 8-hour Ozone Plan contained a comprehensive and exhaustive list of regulatory and incentive-based measures to reduce emissions of O_3 and PM precursors throughout the San Joaquin Valley. On December 18, 2007, the SJVAPCD Governing Board adopted the plan with an amendment to extend

Plan	Status
	the rule adoption schedule for organic waste operations. On January 8, 2009, the USEPA found that the motor vehicle budgets for 2008, 2020, and 2030 from the 2007 8-hour Ozone Plan were not adequate for transportation conformity purposes. The next plan will address the USEPA's 2008 8-hour O_3 standard of 75 parts per billion.
2013 Plan for the Revoked 1-Hour Ozone Standard	On September 19, 2013, the USEPA approved the San Joaquin Valley's 2013 Plan for the Revoked 1-Hour Ozone Standard. Effective June 15, 2005, the USEPA revoked the federal 1-hour O_3 standard for areas including the SJVAB.
2015 Plan for the 1997 $PM_{2.5}$ Standard	On April 30, 2008, the SJVAPCD adopted the 2008 $PM_{2.5}$ Plan satisfying all federal implementation requirements for the 1997 federal $PM_{2.5}$ standard. Per guidance from the USEPA, the plan addressed the 1997 $PM_{2.5}$ standard under Subpart 1 of federal CAA Title 1, Part D (Subpart 1). Subsequently, in 2013, the D.C. Circuit Court ruled that the USEPA erred by solely using CAA Subpart 1 in establishing its $PM_{2.5}$ implementation rule, without consideration of the PM-specific provisions in CAA Title 1, Part D, Subpart 4 (Subpart 4). In June 2014, the USEPA classified the SJVAB as a "moderate" nonattainment area under Subpart 4. The USEPA recently reclassified the Valley as "serious" nonattainment effective May 7, 2015. The 2015 $PM_{2.5}$ Plan addresses the federal mandates for a "serious" nonattainment area related to the 1997 $PM_{2.5}$ standard.
2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard	The 2016 Moderate Area Plan addresses the federal mandates for areas classified as "moderate" nonattainment for the 2012 $PM_{2.5}$ federal annual air quality standard of 12 micrograms per cubic meter
2016 Plan for the 2008 8-Hour Ozone Standard[1]	The District adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016. This plan satisfies CAA requirements and ensures expeditious attainment of the 75 parts per billion 8-hour O_3 standard.
2018 $PM_{2.5}$ Plan	The 2018 $PM_{2.5}$ Plan provides a single integrated plan to attain the federal health-based 1997, 2006, and 2012 NAAQS. The plan builds upon comprehensive strategies already in place from previously adopted SJVAPCD attainment plans and measures.

Sources: BAAQMD 2001, 2017; MBUAPCD 2005, 2007, 2017; SJVAPCD 2007a, 2007b, 2013, 2015, 2016a, 2016b, 2018

BAAQMD = Bay Area Air Quality Management District
Bay Area = San Francisco Bay Area
CAA = Clean Air Act
CARB = California Air Resources Board
CO = carbon monoxide
GHG = greenhouse gases
MBARD = Monterey Bay Air Resources District
NAAQS = national ambient air quality standards
NCCAB = North Central Coast Air Basin
O_3 = ozone
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
SFBAAB = San Francisco Bay Area Air Basin
SIP = State Implementation Plan
SJVAB = San Joaquin Valley Air Basin
SJVAPCD = San Joaquin Valley Air Pollution Control District
USEPA = U.S. Environmental Protection Agency

1.2 General Conformity Regulations

On November 30, 1993, the USEPA promulgated final General Conformity regulations at 40 C.F.R. Part 93 Subpart B for all federal activities except highways and transit programs covered by Transportation Conformity. The regulations in Subpart B were subsequently amended in March 2010. Because the Project will not be funded or require approval(s) under Title 23 U.S.C. or the Federal Transit Act, 49 U.S.C Section 1601 et seq., the General Conformity requirements are applicable, rather than Transportation Conformity. In general terms, unless a project is exempt under 40 C.F.R. Section 93.153(c) or is not on the agency's presumed-to-conform list pursuant to 40 C.F.R. Section 93.153(f), a General Conformity Determination is required where a federal action in a nonattainment or maintenance area causes an increase in the total of direct

and indirect emissions of the relevant criteria pollutants and precursor pollutants that are equal to or exceed certain *de minimis* rates.

During the applicability analysis, the federal agency determines the following:

- Whether the action will occur in a nonattainment or maintenance area
- Whether one or more of the specific exemptions apply to the action
- Whether the federal agency has included the action on its list of presumed-to-conform actions
- Whether the total direct and indirect emissions are below or above the *de minimis* levels
- Where a facility has an emissions budget approved by the state or tribe as part of the SIP or Tribal Implementation Plan, the federal agency determines that the emissions from the Project are within the budget

The USEPA Guidance states that the applicability analysis can be, but is not required to be, completed concurrently with any analysis required under NEPA. The applicability analysis for this Project is described in Section 8, Applicability Analysis. If after the applicability analysis, the Federal agency concludes it should conduct a conformity determination, it may demonstrate conformity by one or more of several prescribed methods. These methods include:

- Demonstrating that the direct and indirect emissions are specifically identified in the relevant implementation plan
- Obtaining a written statement from the entity responsible for the implementation plan that the total indirect and direct emissions from the action, along with other emissions in the area, will not exceed the total implementation plan emission budget
- Fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant in the same nonattainment or maintenance area

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2 CALIFORNIA HIGH-SPEED RAIL PROJECT

2.1 California High-Speed Rail System

The Authority, is responsible for planning, designing, constructing, and operating the HSR system. Its mandate is to develop an HSR system connecting the state's major population centers and coordinate with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

The HSR system will provide intercity, high-speed service on more than 800 miles of railroad throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area (Bay Area), the Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. It would use state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology, including contemporary safety, signaling, and automated train-control systems, with trains capable of operating up to 220 miles per hour (mph) over a grade-separated, dedicated guideway alignment.

The FRA is responsible for oversight and regulation of railroad safety and implementation of the High-Speed Intercity Passenger Rail (HSIPR)As part of the HSIPR Program, the FRA is providing partial funding for the environmental analysis and documentation required under NEPA, CEQA, and other related environmental laws. Pursuant to U.S. Code Title 23 Section 327, under the NEPA Assignment Memorandum of Understanding between the FRA and the State of California, effective July 23, 2019, the Authority is the federal lead agency for environmental reviews for all Authority Phase 1 and Phase 2 California HSR System projects. The FRA performs Clean Air Act Conformity determinations and other federal approvals retained by the FRA under the NEPA Assignment Memorandum of Understanding.

In April 2012 and May 2014, respectively, the FRA and the Authority published the *Merced to Fresno Section Final EIR/EIS* (Merced to Fresno Final EIR/EIS) (Authority and FRA 2012)and *Fresno to Bakersfield Section Final EIR/EIS* (Fresno to Bakersfield Final EIR/EIS) (Authority and FRA 2014). The FRA issued the Record of Decision (ROD) for the Fresno to Bakersfield Project in June 2014. Both projects are within the SJVAB, and a General Conformity Determination was prepared as part of the environmental processes to comply with the CAA. The Merced to Fresno and Fresno to Bakersfield General Conformity Determinations include the Authority's commitment to offset all emissions to net zero through a Voluntary Emissions Reduction Agreement (VERA) between the Authority and the SJVAPCD. between the Authority and the SJVAPCD. Although the San Jose to Merced Project Section of the HSR system is independent of the other HSR system project sections for purposes of NEPA and CEQA analysis, certain construction activities may occur concurrently with construction activities for other project sections within the SFBAAB and SJVAB. Therefore, estimates of cumulative emissions, where available, have been presented in Section 13, Estimated Emission Rates and Comparison to *de minimis* Thresholds—Cumulative Analysis, of this document. These future emissions estimates have been included in this document in the interest of full disclosure of future construction emissions that may occur in the SFBAAB and SJVAB from other sections of the HSR system; each of these sections would undergo separate conformity determinations later.

2.2 California High-Speed Rail System—San Jose to Central Valley Wye Project Extent

The Project will provide HSR service between San Jose Diridon Station in downtown San Jose, with a Gilroy station in either downtown Gilroy or east Gilroy, and a station in downtown Merced. It will connect San Jose to the Central Valley portion of the HSR system at the Central Valley Wye in Merced County, which in turn would connect to the portion of the system running north to Merced and south to Fresno and southern California.

The Project is designed to allow trains to and from the Bay Area to transition smoothly from north-south to east-west travel with a minimum reduction in speed to achieve the Proposition 1A travel time requirement. Proposition 1A requires that the HSR system be designed to achieve a nonstop

service travel time of 2 hours and 10 minutes between San Jose and Los Angeles Union Station.[3] The Project follows existing transportation corridors to the extent feasible, as directed by Proposition 1A.[4]

The Project corridor is between Scott Boulevard and Carlucci Road and constitutes approximately 91 miles of the approximately 145-mile-long Project Section, which includes dedicated HSR track and systems, and station locations at San Jose Diridon and Gilroy; an MOWF in the Gilroy area, and an MOWS near Turner Island Road in the Central Valley. HSR stations at San Jose Diridon and Gilroy would support transit-oriented development, provide an interface with regional and local mass transit services, and provide connectivity to the South Bay and Central Valley highway network.[5] The Project begins at Scott Boulevard in Santa Clara. The HSR infrastructure and operations transition from the blended system between San Francisco and Santa Clara to a fully dedicated system north of the San Jose Diridon Station, either at Scott Boulevard in Santa Clara or near I-880; or, in the case of Alternative 4, the blended system extends to downtown Gilroy. The Project continues south and east from Gilroy, continuing east through the Pacheco Pass to the Central Valley to its end at Carlucci Road, the western limit of the Central Valley Wye.

The Project comprises the following five subsections:

- **San Jose Diridon Station Approach—**Extends approximately 6 miles from north of the San Jose Diridon Station at I-880 in San Jose or Scott Boulevard in Santa Clara to West Alma Avenue in San Jose. This subsection includes San Jose Diridon Station and overlaps the southern portion of the San Francisco to San Jose Project Section.
- **Monterey Corridor—**Extends approximately 9 miles from West Alma Avenue to Bernal Way in the community of South San Jose. This subsection is entirely within the city of San Jose.
- **Morgan Hill and Gilroy**—Extends 30–32 miles from Bernal Way in the community of South San Jose to Casa de Fruta Parkway/State Route (SR) 152 in the community of Casa de Fruta in Santa Clara County.
- **Pacheco Pass**—Extends approximately 25 miles from Casa de Fruta Parkway/SR 152 to I-5 in Merced County.
- **San Joaquin Valley**—Extends approximately 18 miles from I-5 to Carlucci Road in unincorporated Merced County.

The Authority has developed four end-to-end alternatives for the Project: Alternative 1, Alternative 2, Alternative 3, and Alternative 4. Each alternative consists of a variety of alignment and station options. It is estimated that construction of the Project would take approximately 7 years, with initiation of construction in 2022 and completion in 2028.

[3] Proposition 1A requires that the HSR system be designed to achieve a nonstop service travel time of 2 hours and 40 minutes between San Francisco and Los Angeles Union Station, including a 30-minute ride between San Francisco and San Jose (§ 2704.09(b)(4)).

[4] Proposition 1A requires that the HSR system be designed to operate on an alignment that follows existing transportation and utility corridors to the extent feasible (§ 2704.09(g)).

[5] *South Bay* refers to Santa Clara County.

3 AIR QUALITY CONDITIONS IN THE RESOURCE STUDY AREA

3.1 Meteorology and Climate

Air quality is affected by the rate and location of pollutant emissions and by meteorological conditions that influence movement and dispersal of pollutants in the atmosphere. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and local air quality levels.

Elevation and topography can affect localized air quality. The Project extent crosses the SFBAAB, NCCAB, and SJVAB. Within the SFBAAB, temperatures in the Santa Clara Valley are warm on summer days and cool on summer nights, and winter temperatures are mild. Winds in the valley are greatly influenced by the terrain, resulting in a prevailing flow that roughly parallels the valley's northwest-southeast axis. Within the NCCAB, the semi-permanent high-pressure cell in the eastern Pacific, known as the Pacific High, is the basic controlling factor in the climate. The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. In the fall and winter, the surface winds become weak, which can lead to pollutant transport from the SFBAAB and SJVAPCD into the NCAAB. Within the SJVAB, summer temperatures often exceed 100 degrees Fahrenheit, and the surrounding mountain ranges restrict air movement through and out of the valley. Air pollutants often tend to collect, leading to higher concentrations of emitted pollutants.

3.2 Ambient Air Quality in the Resource Study Area

The CARB maintains ambient air monitoring stations for criteria pollutants throughout California. There are three monitoring stations in the vicinity of the HSR alignment alternatives in Santa Clara County, and one relevant monitoring station in both San Benito and Merced Counties. These stations provide representative ambient criteria pollutant concentrations. The addresses and distances of the stations to the HSR alignment are summarized below.

- San Jose—Jackson Street (156B Jackson Street, San Jose, CA 95110): Approximately 1 mile northeast.
- San Martin—Murphy Avenue (13030 Murphy Ave., San Martin, CA 95046): Approximately 0.25 mile east.
- Gilroy—9th Street (9th and Princeville, Gilroy, CA 95020): Approximately 0.5 mile west.
- Hollister—Fairview Road (1979 Fairview Rd., Hollister, CA 95023): Approximately 9 miles south.
- Merced—S. Coffee Avenue (385 S. Coffee Avenue, Merced, CA 95340): Approximately 18 miles northeast.

Table 2 summarizes the results of ambient monitoring at these stations for the most recent 3 years of available data. Some stations only monitor ozone (O_3), whereas others monitor carbon monoxide (CO), nitrogen dioxide (NO_2), and particulate matter less than or equal to 10 microns in diameter (PM_{10})and PM less than or equal to 2.5 microns in diameter ($PM_{2.5}$).

Between 2016 and 2018, monitored CO, sulfur dioxide (SO_2) NO_2 concentrations did not exceed any federal or state standards at any of the stations that reported monitoring data for these pollutants. However, the state and federal standards for O_3, PM_{10}, and $PM_{2.5}$ were exceeded at one or more stations that reported monitoring data for these pollutants. Using violations of the ambient air quality standards as a proxy for air quality, O_3 and PM conditions tend to be poorest in the vicinity of the eastern portion of the Project in Merced County, with air quality improving westward toward the SFBAAB.

3.3 Resource Study Area Emissions

The CARB maintains an annual emission inventory for each county and air basin in the state. The inventories for Santa Clara, San Benito, and Merced Counties consist of data submitted to CARB

by the local air districts plus estimates for certain source categories, which are provided by CARB staff.

The most recent published inventory data for Santa Clara, San Benito, and Merced Counties is summarized in Table 3. Based on the 2012 air pollutant inventory data, except for San Benito County, mobile source emissions represent most of the volatile organic compounds (VOC), NO_X, and CO emissions. In San Benito County, area sources represent most VOC emissions, and mobile source emissions represent the majority of NO_X and CO. Area sources represent the majority of PM_{10} and $PM_{2.5}$ emissions in all three counties.

Table 2 Ambient Criteria Pollutant Concentration Data at Air Quality Monitoring Stations along the Project Extent

Pollutant and Standards	San Jose—Jackson Street			San Martin—Murphy Avenue			Gilroy—9th Street			Hollister—Fairview Road			Merced—S. Coffee Avenue		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Ozone (O_3) [a]															
Maximum 1-hour concentration (ppm)	0.087	0.121	0.078	0.096	0.096	0.092	0.079	0.096	0.097	0.073	0.078	0.077	0.097	0.093	0.104
Maximum 8-hour concentration (ppm)	0.066	0.098	0.061	0.071	0.086	0.080	0.070	0.084	0.065	0.060	0.072	0.063	0.086	0.084	0.082
Number of days standard exceeded[1]															
CAAQS 1-hour (>0.09 ppm)	0	3	0	1	1	0	0	1	1	0	0	0	2	0	4
NAAQS 8-hour (>0.070 ppm)	0	4	0	1	3	1	0	1	0	0	1	0	28	16	21
CAAQS 8-hour (>0.070 ppm)	0	4	0	1	3	1	0	1	0	0	1	0	29	17	23
Carbon Monoxide (CO) [b]															
Maximum 8-hour concentration (ppm)	1.4	1.8	2.1	Station does not monitor CO			Station does not monitor CO			Station does not monitor CO			Station does not monitor CO		
Maximum 1-hour concentration (ppm)	1.9	2.1	2.5												
Number of days standard exceeded[1]															
NAAQS 8-hour (≥9 ppm)	0	0	0												
CAAQS 8-hour (≥9.0 ppm)	0	0	0												
NAAQS 1-hour (≥35 ppm)	0	0	0												
CAAQS 1-hour (≥20 ppm)	0	0	0												
Nitrogen Dioxide (NO_2) [a]															
National maximum 1-hour concentration (ppm)	51.1	67.5	86.1	Station does not monitor NO_2			Station does not monitor NO_2			Station does not monitor NO_2			35.4	38.9	45.8
State maximum 1-hour concentration (ppm)	51	67	86										35	38	45
State annual average concentration (ppm)	11	N/A	12										6	7	7
Number of days standard exceeded															
NAAQS 1-hour (98th Percentile>0.100 ppm)	0	0	0										0	0	0
CAAQS 1-hour (0.18 ppm)	0	0	0										0	0	0
Annual standard exceeded?															
NAAQS annual (>0.053 ppm)	No	No	No										No	No	No
CAAQS annual (>0.030 ppm)	No	No	No										No	No	No
Particulate Matter (PM_{10})[2, a]															
National[3] maximum 24-hour concentration (mg/m^3)	40.0	69.4	155.8	Station does not monitor PM_{10}			Station does not monitor PM_{10}			44.3	80.9	95.9	Station does not monitor PM_{10}		
National[3] second-highest 24-hour concentration (mg/m^3)	35.2	67.3	115.4							43.2	74.7	84.1			
State[4] maximum 24-hour concentration (mg/m^3)	41.0	69.8	121.8							N/A	N/A	N/A			
State[4] second-highest 24-hour concentration (mg/m^3)	37.5	67.6	118.5							N/A	N/A	N/A			
National annual average concentration (mg/m^3)	17.5	20.7	23.0							16.5	19.6	20.4			
State annual average concentration (mg/m^3)[5]	18.3	21.3	23.1							N/A	N/A	N/A			

Pollutant and Standards	San Jose—Jackson Street			San Martin—Murphy Avenue			Gilroy—9th Street			Hollister—Fairview Road			Merced—S. Coffee Avenue		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Number of days standard exceeded[1]															
NAAQS 24-hour (>150 mg/m^3)[6]	0	0	3							0	0	0			
CAAQS 24-hour (>50 mg/m^3)[6]	0	19	12							N/A	N/A	N/A			
Annual standard exceeded?															
CAAQS annual (>20 mg/m^3)	No	Yes	Yes							N/A	N/A	N/A			
Particulate Matter ($PM_{2.5}$)[a]															
National[3] maximum 24-hour concentration (mg/m^3)	22.6	49.7	133.9				16.0	48.4	97.5	20.4	42.0	52.7	43.0	69.3	88.2
National[3] second-highest 24-hour concentration (mg/m^3)	21.8	46.5	130.5				15.8	40.7	84.0	17.2	34.3	49.4	43.0	60.6	81.7
State[4] maximum 24-hour concentration (mg/m^3)	22.7	49.7	133.9				16.0	48.4	97.5	20.4	42.0	52.7	43.0	69.3	88.2
State[4] second-highest 24-hour concentration (mg/m^3)	21.8	46.5	130.5				15.3	40.7	84.0	17.2	34.3	49.4	43.0	60.6	81.7
National annual average concentration (mg/m^3)	8.3	9.5	12.7				5.6	5.4	7.7	4.3	5.0	7.1	11.9	13.2	15.1
State annual average concentration (mg/m^3)[5]	8.4	N/A	12.9	Station does not monitor $PM_{2.5}$			N/A	N/A	7.9	N/A	5.1	7.2	11.9	13.2	15.1
Number of days standard exceeded[1]															
NAAQS 24-hour (>35 mg/m^3)	0	6	16				0	2	13	0	1	11	5	19	21
Annual standard exceeded?															
NAAQS annual (>12.0 mg/m^3)	No	No	Yes				No	No	No	No	No	No	No	Yes	Yes
CAAQS annual (>12 mg/m^3)	No	No	Yes				No	No	No	No	No	No	No	Yes	Yes
Sulfur Dioxide (SO_2)															
Maximum 1-hour concentration (ppm)	0.0018	0.0036	0.0069	Station does not monitor SO_2			Station does not monitor SO_2			Station does not monitor SO_2			Station does not monitor SO_2		
Number of days standard exceeded[1]															
NAAQS 1-hour (>0.0075 ppm)	0	0	0												
CAAQS 1-hour (>0.25 ppb)	0	0	0												

Sources: [a] CARB 2020 [b] USEPA 2020

[1] An exceedance of a standard is not necessarily a violation because of the regulatory definition of a violation.

[2] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

[3] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California-approved samplers.

[4] Measurements usually are collected every 6 days.

[5] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than national criteria.

[6] Mathematical estimate of how many days' concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

CAAQS = California ambient air quality standards

mg/m^3 = milligrams per cubic meter

NAAQS = national ambient air quality standards

ppm = parts per million

> = greater than

N/A = not applicable or there was insufficient or no data available to determine the value

Table 3 Estimated Annual Average Emissions for Santa Clara, San Benito, and Merced Counties (2012 data published in 2017) (tons per day)

Source Category	Santa Clara County						San Benito County						Merced County					
	VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources																		
Fuel Combustion	1	7	10	3	1	1	<1	<1	1	0	<1	<1	<1	2	2	<1	<1	<1
Waste Disposal	1	<1	<1	<1	<1	<1	<1	0	0	0	0	0	2	<1	<1	<1	0	0
Cleaning and Surface Coatings	7	0	0	0	0	0	<1	0	0	0	<1	<1	1	0	0	0	<1	<1
Petroleum Production & Marketing	2	0	0	0	0	0	<1	0	0	0	0	0	<1	0	0	0	0	0
Industrial Processes	2	<1	1	<1	1	1	<1	<1	<1	0	1	<1	2	<1	<1	<1	1	<1
Area-Wide Sources																		
Solvent Evaporation	15	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	0	0
Miscellaneous Processes	2	15	3	<1	14	4	1	2	<1	<1	6	1	18	5	1	<1	26	5
Mobile Sources																		
On-Road Motor Vehicles	17	133	34	<1	3	1	1	8	5	0	<1	<1	4	30	18	<1	1	1
Other Mobile Sources	9	81	12	<1	1	1	<1	3	1	0	<1	<1	2	12	8	<1	<1	<1
Grand Total (all sources)	**55**	**238**	**61**	**3**	**20**	**7**	**4**	**13**	**6**	**0**	**8**	**1**	**32**	**48**	**29**	<1	**29**	**6**

Source: CARB 2017
CO = carbon monoxide
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter smaller than or equal to 2.5 microns in diameter
PM_{10} = particulate matter smaller than or equal to 10 microns in diameter
VOC = violate organic compounds
SO_X = sulfur oxide

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4 RELATIONSHIP TO NEPA

The *San Jose to Merced Section Draft EIR/EIS* identifies potential environmental impacts of the Project, both adverse and beneficial, identifies appropriate measures to mitigate adverse impacts, and identifies the agencies' preferred alternative. The EIR/EIS was prepared to comply with both NEPA and CEQA.

The General Conformity regulations establish certain procedural requirements that must be followed when preparing a General Conformity evaluation and are similar, but not identical, to those for conducting an air quality impact analysis under NEPA regulations. NEPA requires that the air quality impacts of the Project's implementation be analyzed and disclosed. For purposes of NEPA, the air quality impacts of the Project were determined by identifying the Project's associated incremental emissions and air pollutant concentrations and comparing them, respectively, to emissions thresholds and to the CAAQS and NAAQS. The air quality impacts of the Project under future Plus Project conditions were also compared in the Draft EIR/EIS to the future No Project conditions for NEPA purposes, and they were compared to existing conditions. The General Conformity Determination process and proposed general findings are discussed in Sections 3.3.4.4, 3.3.6.1, and 3.3.8 of the EIR/EIS.

To appropriately document the identification and offset, where necessary, of the emissions resulting from the Project, the FRA is issuing this draft General Conformity Determination. The Authority has entered into a memorandum of understanding (MOU) with the SJVAPCD that establishes the framework for fully mitigating to net-zero construction emissions of NOx, volatile organic compounds (VOC), PM_{10}, and $PM_{2.5}$. For the SFBAAB and in coordination with the BAAQMD, the Authority will commit to purchase of additional offsets to net all criteria pollutant emissions to levels that are below the General Conformity de minimis level for each calendar year that exceedances occur. Refer to Section 11.2, Compliance with Conformity Requirements, for details on the Authority's commitments.

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5 PROJECT FEATURES TO REDUCE EMISSIONS

To reduce impacts on the environment, the construction of the Project will include Project features to avoid and minimize impacts on air quality. These Project features will be included in the Mitigation Monitoring and Enforcement Program, which would be issued concurrently with the Final EIR/EIS and ROD for the Project and are enforceable commitments undertaken by the Authority. Construction of the Project is anticipated to occur through contract. The Authority will include all Project features in the construction contract, which would create binding and enforceable commitments to implement.

The Authority would be responsible for implementing and overseeing a mitigation monitoring program so the contractor meets all air quality design features.

Project design features as part of the Project include the following:

AQ-IAMF#1: Fugitive Dust Emissions

During construction, the Contractor shall employ the following measures to minimize and control fugitive dust emissions. The Contractor shall prepare a fugitive dust control plan for each distinct construction segment. At a minimum, the plan shall describe how each measure will be employed and identify an individual responsible for ensuring implementation. At a minimum, the plan shall address the following components unless alternative measures are approved by the applicable air quality management district.

- Cover all vehicle loads transported on public roads to limit visible dust emissions, and maintain at least 6 inches of freeboard space from the top of the container or truck bed.
- Clean all trucks and equipment before exiting the construction site using an appropriate cleaning station that does not allow runoff to leave the site or mud to be carried on tires off the site.
- Water exposed surfaces and unpaved roads at a minimum three times daily with adequate volume to result in wetting the top 1 inch of soil while avoiding overland flow. Rain events may sufficiently wet the top 1 inch of soil to alleviate the need to manually apply water.
- Limit vehicle travel speed on unpaved roads to 15 miles per hour (mph).
- Suspend any dust-generating activities when average wind speed exceeds 25 mph.
- Stabilize all disturbed areas, including storage piles that are not being used on a daily basis for construction purposes, by using water, a chemical stabilizer/suppressant, or hydro mulch or by covering with a tarp or other suitable cover or vegetative ground cover. In areas adjacent to organic farms, the Authority will use nonchemical means of dust suppression.
- Stabilize all on-site unpaved roads and off-site unpaved access roads using water or a chemical stabilizer/suppressant. In areas adjacent to organic farms, the Authority will use nonchemical means of dust suppression.
- Apply water to or presoak all areas where land clearing, grubbing, scraping, excavation, land leveling, grading, cut-and-fill, and demolition activities are carried out.
- For buildings up to six stories tall, wet all exterior surfaces of buildings during demolition.
- Limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at a minimum of once daily, using a vacuum type sweeper.
- After the addition of materials to or the removal of materials from the surface or outdoor storage piles, apply sufficient water or a chemical stabilizer/suppressant.

AQ-IAMF#2: Selection of Coatings

During construction, the contractor will use:

- Low–volatile organic compound (VOC) paint that contains less than 10 percent of VOC contents (VOC, 10%).
- Super-compliant or Clean Air paint that has a lower VOC content than that required by Bay Area Air Quality Management District Regulation 8, Rule 3, Monterey Bay Unified Air Pollution Control District Rule 426, and San Joaquin Valley Unified Air Pollution Control District Rule 4601, when available. If not available, the contractor will document the lack of availability, recommend alternative measure(s) to comply with Regulation 8, Rule 3, Rule 426, and Rule 4601 or disclose absence of measure(s) for full compliance, and obtain concurrence from the Authority.

AQ-IAMF#3: Renewable Diesel

During construction, the Contractor will use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks. Renewable diesel must meet the most recent ASTM D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50% of diesel with the lowest carbon intensity among petroleum fuels sold in California. The Contractor will provide the Authority with monthly and annual reports, through the Environmental Mitigation Management and Application (EMMA) system, of renewable diesel purchase records and equipment and vehicle fuel consumption. Exemptions to use traditional diesel can be made where renewable diesel is not available from suppliers within 200 miles of the project site. The construction contract must identify the quantity of traditional diesel purchased and fully document the availability and price of renewable diesel to meet project demand.

AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment

Prior to issuance of construction contracts, the Authority will incorporate the following construction equipment exhaust emissions requirements into the contract specifications:

- All heavy-duty off-road construction diesel equipment used during the construction phase will meet Tier 4 engine requirements.
- A copy of each unit's certified tier specification and any required CARB or air pollution control district operating permit will be made available to the Authority at the time of mobilization of each piece of equipment.
- The contractor will keep a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment.
- The contractor will provide the Authority with monthly reports of equipment operating hours (through the Environmental Mitigation Management and Assessment [EMMA] system) and annual reports documenting compliance.

AQ-IAMF#5: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment

Prior to issuance of construction contracts, the Authority will incorporate the following material-hauling truck fleet mix requirements into the contract specifications:

- All diesel on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, shall use a model year 2010 or newer engine.
- The contractor will provide documentation to the Authority of efforts to secure such a fleet mix.
- The contractor will keep a written record of equipment usage during Project construction for each piece of equipment and provide the Authority with monthly reports of vehicle miles traveled (VMT) (through EMMA) and annual reports documenting compliance.

AQ-IAMF#6: Reduce the Potential Impact of Concrete Batch Plants

Prior to construction of any concrete batch plant, the contractor will provide the Authority with a technical memorandum documenting consistency with the Authority's concrete batch plant siting criteria and utilization of typical control measures. Concrete batch plants will be sited at least 1,000 feet from sensitive receptors, including places such as daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant will implement typical control measures to reduce fugitive dust such as water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central dust collection systems, and other suitable technology, to reduce emissions to be equivalent to the USEPA AP-42 controlled emission factors for concrete batch plants. The contractor will provide to the Authority documentation that each batch plant meets this standard during operation.

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6 REGULATORY PROCEDURES

The General Conformity regulations establish certain procedural requirements that must be followed when preparing a General Conformity evaluation. The procedures required for the General Conformity evaluation are similar, but not identical, to those for conducting an air quality impact analysis pursuant to NEPA. This draft General Conformity Determination is being released for public and agency review pursuant to 40 C.F.R. Section 93.156, and the final General Conformity Determination will be published concurrently with the ROD for the Project.

The Authority identified the appropriate emission estimation techniques and planning assumptions in close consultation with the state entities charged with regulating air pollution in the SFBAAB, NCCAB, and SJVAB.

6.1 Use of Latest Planning Assumptions

The General Conformity regulations require the use of the latest planning assumptions for the area encompassing the Project, derived from the estimates of population, employment, travel, and congestion most recently approved by the area's metropolitan planning organizations (MPO)C.F.R. § 93.159(a)).

The emission estimation techniques, which were slightly different from those used in establishing the applicable SIP emissions budgets, have been approved by the BAAQMD, MBARD, and SJVAPCD. The traffic data used in the air quality analysis are based on the level of ridership as presented in *Connecting and Transforming California, 2016 Business Plan* (2016 Business Plan) (Authority 2016).[6] Further, the traffic data are consistent with the most recent estimates made by the MPOs for traffic volume growth rates, including forecast changes in VMT and vehicle hours traveled. The MPO developed these estimates from their traffic assignment models based on current and future population, employment, and travel and congestion information. These assumptions are consistent with those in the current conformity determinations for the regional transportation plans and transportation improvement programs.

6.2 Use of Latest Emission Estimation Techniques

The General Conformity regulations require the use of the latest and most accurate emission estimation techniques available, unless such techniques are inappropriate (40 C.F.R. § 93.159(b)). Emissions from construction activities were calculated using a combination of emission factors and methodologies from the California Emissions Estimator Model (CalEEMod2, the CARB's EMFAC2017 model, and the USEPA's AP-42 Compilation of Air Pollutant Emission Factors (AP-42) based on Project-specific construction data (e.g., schedule, equipment, truck volumes) provided by the Project design team (Scholz pers. comm.). CalEEMod provides the latest emission factors for construction off-road equipment. It accounts for lower fleet population and growth factors because of the economic recession and updated load factors based on feedback from engine manufacturers. The use of emission rates from CalEEMod reflects the recommendation of the CARB to capture the latest off-road construction assumptions. CalEEMod default load factors (the ratio of average equipment horsepower utilized to maximum equipment horsepower) and useful life parameters were used for emission estimates. CalEEMod default load factors (the ratio of average equipment horsepower utilized to maximum equipment horsepower) and useful life parameters were used for emission estimates.

Construction exhaust emissions from equipment; fugitive dust emissions from earthmoving activities; and emissions from worker trips, deliveries, and material hauling were calculated and

[6] As described in Volume 2, Appendix 3.3-C, Changes to Project Benefits Based on 2018 Business Plan of the EIR/EIS, the Authority Board adopted the 2018 Business Plan on May 15, 2018. The 2018 Business Plan assumes an opening year of 2033 for Phase 1 and presents different ridership forecasts for 2029 and 2040 than were assumed in this EIR/EIS. Under the 2018 Business Plan ridership forecasts, the HSR project would achieve the same benefits described in this section, but they would occur at different times and may be less than those presented in Section 3.3.6, Environmental Consequences. Nonetheless, HSR would ultimately afford a more energy-efficient choice for personal travel that would help alleviate highway congestion, provide greater capacity for goods movement, and reduce criteria pollutant and GHG emissions.

compiled in a spreadsheet tool specific to the Project for each year of construction. Mobile source emission burdens from worker trips and truck trips were calculated using VMT estimates and appropriate emission factors from EMFAC2017. Fugitive dust from re-entrained road dust was calculated using emission factors from USEPA's AP-42, Sections 13.2.1 and 13.2.2. Refer to Chapter 9, Construction Activities Considered, for further detail on the emissions estimation techniques.

6.3 Major Construction-Phase Activities

Project-specific data, including construction equipment lists and the construction schedule, were used for the analysis. Calculations were performed for each year of construction for the Project using default emission factors, as described further in Section 9, Construction Activities Considered.

Major activities were grouped into the following categories:

- Viaduct
- Embankment
- At grade
- Trench
- Tunnel
- Cut and fill

Construction activities associated with each component included demolition, excavation, utilities, roadwork, concrete forming, and other rail work. Each of these activities was considered to evaluate the regional and localized air quality effects during the construction phase. Analysts also quantified emissions from reconductoring approximately 11.1 miles of the existing single-circuit Spring to Llagas and Green Valley to Llagas 115-kilovolt power lines. Refer to Section 9, Construction Activities Considered, for further detail on the construction schedule.

6.4 Emission Scenarios

The General Conformity regulations require that the evaluation reflect certain emission scenarios (40 C.F.R. § 93.159(d)). Specifically, these scenarios generally include the evaluation of direct and indirect emissions from the Project for the following years: (1) for nonattainment areas, the attainment year specified in the SIP, or if the SIP does not specify an attainment year, the latest attainment year possible under the CAA, and for maintenance areas, the farthest year for which emissions are projected in the approved maintenance plan; (2) the year during which the total of direct and indirect emissions for the Project are projected to be the greatest on an annual basis; and (3) any year for which the applicable SIP specifies an emissions budget. Both the operational and construction phases of the Project must be analyzed, and the following applies to the Project:

- Emissions generated during the operational phase of the Project would meet the emission requirements for the years associated with Items 1 and 3 because the emissions generated during the operational phase would be less than those emitted in the No Project scenario. In addition, microscale analyses conducted for the EIR/EIS demonstrate that the operational phase of the Project would not cause or exacerbate a violation of the NAAQS for all applicable pollutants (see Draft EIR/EIS, Section 3.3.6.1).
- Emissions generated during the Project's construction phase, which would include the year with the greatest amount of total direct and indirect emissions (2025, as identified in Item 2), may be subject to General Conformity regulations because they would increase regional emission rates and, as such, have the potential to cause or exacerbate an exceedance of the NAAQS. Therefore, analyses were conducted to estimate the amounts of emissions that would be generated during the construction phase (for comparison with the General Conformity applicability rates) and the potential impacts of these emissions on local air quality levels. Emissions generated at the construction sites (e.g., tailpipe emissions from the on-site heavy-duty diesel equipment and fugitive dust emissions generated by vehicles traveling within the construction sites) and on the area's roadways by vehicles traveling to and from

these sites (by vehicles transporting materials and the workers traveling to and from work) were considered.

- Air quality dispersion modeling would be required for this conformity analysis to estimate the Project's localized impacts on PM concentrations if the annual emissions of the pollutants generated during construction were to exceed the General Conformity *de minimis* thresholds.

Annual emissions were estimated for each year of the Project's construction period. These emissions, which are the maximum values for the Project, are described in more detail in Section 10, Estimated Emission Rates and Comparison to *de minimis* Thresholds, of this report.

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7 APPLICABILITY ANALYSIS

The first step in a General Conformity evaluation is an analysis of whether the requirements apply to a proposed federal action in a nonattainment or a maintenance area. Unless exempted by the regulations or otherwise presumed to conform, a Federal action requires a General Conformity Determination for each pollutant where the total of direct and indirect emissions caused by the Project would equal or exceed an annual *de minimis* emission rate.

7.1 Attainment Status of Resource Study Area

The USEPA designates each county (or portions of counties) within California as attainment, maintenance, or nonattainment based on the area's ability to maintain ambient air concentrations below the air quality standards. Areas are designated as attainment if ambient air concentrations of a criteria pollutant are below the ambient standards. Areas are designated as nonattainment if ambient air concentrations are above the ambient standards. Areas previously designated as nonattainment that subsequently demonstrated compliance with the standards are designated as maintenance. Table 4 summarizes the attainment status of the SFBAAB, NCCAB, and SJVAB with regard to the NAAQS and CAAQS.

Table 4 Federal Attainment Status of the SFBAAB, NCCAB, and SJVAB

Pollutant	SFBAAB	NCCAB	SJVAB
O_3	Marginal Nonattainment	Attainment	Extreme Nonattainment
PM_{10}	Attainment	Attainment	Serious Maintenance
$PM_{2.5}$	Moderate Nonattainment	Attainment	Serious/Moderate Nonattainment[1]
CO	Attainment	Attainment	Attainment
NO_2	Attainment	Attainment	Attainment
SO_2	Attainment	Attainment	Attainment

Source: USEPA 2018
CO = carbon monoxide
NCCAB = North Central Coast Air Basin
NO_2 = nitrogen dioxide
O_3 = ozone
$PM_{2.5}$ = particulate matter smaller than or equal to 2.5 microns in diameter
PM_{10} = particulate matter smaller than or equal to 10 microns in diameter
SFBAAB = San Francisco Bay Area Air Basin
SJVAB = San Joaquin Valley Air Basin
SO_2 = sulfur dioxide
[1] The SJVAB is serious nonattainment for the 2006 $PM_{2.5}$ standard and moderate nonattainment for the 2012 $PM_{2.5}$ standard.

Under federal designations, the RSA is currently designated as extreme and marginal nonattainment for 8-hour O_3[7] in the SJVAB and SFBAAB, respectively; moderate/serious nonattainment for $PM_{2.5}$ in the SFBAAB and SJVAB; and maintenance for PM_{10} in the SJVAB. As such, the FRA is required to demonstrate project-level compliance with the General Conformity Rule for NO_X and VOCs (O_3 precursors), $PM_{2.5}$, PM_{10}, and SO_2 ($PM_{2.5}$ precursor[8]), if Project-related emissions of these pollutants in the SFBAAB or SJVAB would exceed the General Conformity *de minimis* thresholds.

[7] It should be noted that because O_3 is a secondary pollutant (i.e., it is not emitted directly into the atmosphere, but is formed in the atmosphere from the photochemical reactions of VOCs and NO_X in the presence of sunlight), its *de minimis* threshold is based on primary emissions of its precursor pollutants, NO_X and VOCs. If the net emissions of either NO_X or VOCs exceeds the *de minimis* applicability thresholds (USEPA 1994), the Project is subject to a general conformity evaluation for O_3.

[8] Ammonia is also a precursor to $PM_{2.5}$. However, neither construction nor operation of the Project would result in material emissions of ammonia.

As shown in Table 4, the portion of the RSA in the NCCAB is in attainment for all criteria pollutants. As outlined in Section III.A of the General Conformity Rule, “only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations.” As such, a General Conformity analysis is not required for the portion of the Project within the NCCAB. There are no applicable *de minimis* thresholds, and no further discussion of Project activities in the NCCAB is provided in this General Conformity Determination.

7.2 Exemptions from General Conformity Requirements

As noted previously, the General Conformity requirements apply to a federal action if the net Project emissions equal or exceed certain *de minimis* emission rates. The only exceptions to this applicability criterion are if the activity is on the federal agency’s presumed-to-conform list (40 C.F.R. § 93.153(f)), meets the narrow exemption for federal actions in response to an emergency or disaster (40 C.F.R. § 93.153(e)), or is one of the following topical exemptions:

- Actions that would result in no emissions increase or an increase in emissions that is clearly below the *de minimis* levels (40 C.F.R. § 93.153(c)(2)). Examples include administrative actions and routine maintenance and repair.
- Actions where the emissions are not reasonably foreseeable (40 C.F.R. § 93.153(c)(3))
- Actions which implement a decision to conduct or carry out a conforming program (40 C.F.R. § 93.153 (c)(4))
- Actions which include major new or modified sources requiring a permit under the New Source Review program (40 C.F.R. § 93.153(d)(1))
- Actions in response to emergencies or natural disasters (40 C.F.R. § 93.153(d)(2))
- Actions which include air quality research not harming the environment (40 C.F.R. § 93.153(d)(3))
- Actions which include modifications to existing sources to enable compliance with applicable environmental requirements (40 C.F.R. § 93.153(d)(4))
- Actions which include emissions from remedial measures carried out under the Comprehensive Environmental Response, Compensation and Liability Act that comply with other applicable requirements (40 C.F.R. § 93.153(d)(5)).

However, the Project does not meet any of the exemption categories described above. In addition, the FRA has not established a presumed-to-conform list of activities at the time of this evaluation, and the Project does not meet the requirements of 40 C.F.R. Section 93.153(e).

7.3 Applicability for Project

After determining that the Project is not otherwise exempt, the applicability of the General Conformity requirements to the Project is evaluated by comparing the total of direct and indirect emissions for the calendar year of greatest emissions to the General Conformity *de minimis* thresholds. Where the total of direct and indirect emissions attributable to the Project is found to be below the *de minimis* emission rates for a pollutant, that pollutant is excluded from General Conformity requirements, and no further analysis is required. However, when the emissions of an applicable pollutant are at or above a *de minimis* threshold, that pollutant must undergo a General Conformity evaluation.

7.4 *De Minimis* Emission Rates

The General Conformity requirements would apply to the Project for each pollutant for which the total of direct and indirect emissions caused by the Project equal or exceed the *de minimis* emission rates shown in Table 5. These emission rates are expressed in units of tons per year (tpy) for the Project in each air basin for the calendar year. The applicable threshold levels for the pollutants for which General Conformity is required in the RSA are shown in Table 5.

Table 5 *De Minimis* Rates for Determining Applicability of General Conformity Requirements to Federal Actions

Air Basin	Annual Air Pollutant Emissions in Tons per Year					
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$	SO_2
San Francisco Bay Area Air Basin[1]	100	100	None	None	100	100
San Joaquin Valley Air Basin[2]	10	10	None	100	70	70
North Central Coast Air Basin[3]	None	None	None	None	None	None

Source: 40 C.F.R. Section 93.153
CO = carbon monoxide
NO_X = oxides of nitrogen
O_3 = ozone
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
PM_{10} = particulate matter 10 microns in diameter or less
VOC = violate organic compounds
SO_2 = sulfur dioxide
[1] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the RSA in the SFBAAB. The RSA is considered a marginal nonattainment area for the O_3 NAAQS and a moderate nonattainment area for the $PM_{2.5}$ NAAQS. Although the RSA is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.
[2] The General Conformity *de minimis* thresholds for criteria pollutants are based on the federal attainment status of the RSA in the SJVAB. The RSA is considered an extreme nonattainment area for the O_3 NAAQS, a serious/moderate nonattainment area for the $PM_{2.5}$ NAAQS, and a serious maintenance area for the PM_{10} NAAQS. Although the RSA is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used. For $PM_{2.5}$ and SO_2, the *de minimis* threshold for projects located in serious nonattainment areas are used because this threshold is lower than the 100 tons per year threshold for projects exclusively in moderate nonattainment areas.
[3] The NCCAB is in attainment for all criteria pollutants (see Table 4).

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8 CONSTRUCTION ACTIVITIES CONSIDERED

As shown in Section 3.3.6.1 of the Draft EIR/EIS, the results of the regional analyses conducted for the Project demonstrate that emissions generated during the operational phase would be less than those emitted in the No Project and existing conditions scenarios and that the microscale analyses demonstrate that the Project would not cause or exacerbate a violation of the NAAQS for these pollutants. As such, no further analysis of the operational period emissions is necessary for this General Conformity Determination. This section focuses on the emissions generated from the construction period emissions for the Project.

The analysis conducted for the EIR/EIS to estimate potential air quality impacts caused by on-site (e.g., demolition activities, construction equipment operations, and truck movements) and off-site (e.g., motor vehicle traffic effects because of truck trips) construction-phase activities included the following:

- Estimation of emissions generated by the construction activities (e.g., deconstruction, concrete and steel construction), including fugitive dust emissions and emissions released from diesel-powered equipment and trucks based on the hours of operation of each piece of equipment[9]
- Identification of heavily traveled truck routes to estimate the cumulative effects of on-site construction activity emissions and off-site traffic emissions
- An on-site dispersion modeling analysis of the major construction areas
- An off-site dispersion modeling analysis of the roadway intersections and interchanges adjacent to the construction areas, using traffic data that include construction-related vehicles and background traffic
- A comparison of the on-site and off-site modeling results to the applicable NAAQS for the applicable pollutants

Emission rates for these activities were estimated based on the following:

- The number of hours per day and duration of each construction activity
- The number and type of construction equipment to be used
- HP and utilization rates (hours per day) for each piece of equipment
- The quantities of construction/demolition material produced and removed from each site
- The number of truck trips needed to remove construction and demolition material and to bring the supply materials to each site

The following is a discussion of the construction analysis methodology. A full list of assumptions can be found in the EIR/EIS, Appendix C to the *San Jose to Merced Project Section Air Quality and Greenhouse Gases Technical Report* (Authority and FRA 2019).

8.1 Models and Methods for Emissions Modeling

Construction of the Project would generate emissions of VOC, NO_X, CO, sulfur oxide (SO_X) PM_{10}, and $PM_{2.5}$. Emissions would originate from off-road equipment exhaust, employee and haul truck vehicle exhaust (on-road vehicles) site grading and earth movement, concrete batching, demolition, paving, architectural coating, and helicopters (for reconductoring work). These emissions would be temporary (i.e., limited to the construction period) and would cease when construction activities are complete.

[9] It is possible changes in VMT, speeds, or idle times resulting from traffic detours during construction could result in additional emissions. However, it is unknown to what extent motorists will change their driving patterns as a result of traffic detours and impediments, and, as such, it would be speculative to quantify the impact of temporary roadway restrictions on criteria pollutant emissions.

Combustion exhaust, fugitive dust (PM_{10} and $PM_{2.5}$), and fugitive off-gassing (VOCs) were estimated using a combination of emission factors and methodologies from CalEEMod, version 2016.3.2; the CARB's EMFAC2017 model, and the USEPA's AP-42 Compilation of Air Pollutant Emission Factors based on Project-specific construction data (e.g., schedule, equipment, truck volumes) provided by the Project design team (Scholz pers. comm.).

- **Off-road equipment**—Emission factors for off-road construction equipment (e.g., loaders, graders, bulldozers) were obtained from the CalEEMod (version 2016.3.2) User's Guide appendix, which provides values per unit of activity (in grams per horsepower-hour) by calendar year (Trinity Consultants 2016. Analysts estimated criteria pollutants by multiplying the CalEEMod emission factors by the equipment inventory provided by the Project engineering team (Scholz pers. comm.).
- **On-road vehicles**—On-road vehicles (e.g., pickup trucks, flatbed trucks) would be required for material and equipment hauling, on-site crew and material movement, and employee commuting. The analysis estimated exhaust emissions from on-road vehicles using the EMFAC2017 emissions model and activity data (miles traveled per day) provided by the Project engineering team (Scholz pers. comm.). Emission factors for haul trucks are based on aggregated-speed emission rates for EMFAC's T7 Single vehicle category. Factors for on-site dump, water, boom, and concrete trucks were based on 5 mph emission rates for the T6 Heavy category. Factors for employee commute vehicles were based on a weighted average for all vehicle speeds for EMFAC's light-duty automobile/light-duty truck vehicle categories. CARB's (2019) Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule adjustment factors were applied to the emission factors for gasoline-powered vehicles. Fugitive re-entrained road dust emissions were estimated using the USEPA's *Compilation of Air Pollutant Emission Factors* (AP-42), Sections 13.2.1 and 13.2.2 (USEPA 2006, 2011).
- **Site grading and earth movement**—Fugitive dust emissions from earth movement (e.g., site grading, bulldozing, and truck loading) were quantified using emission factors from CalEEMod and USEPA (1998) AP-42cut-and-fill material were provided by the Project engineering team (Scholz pers. comm.).
- **Concrete batching**—Fugitive dust emissions from concrete batching at the three new temporary batch plants were quantified using emission factors from BAAQMD's (2016) Permit Handbook and USEPA's AP-42. Daily and annual batch quantities (cubic yards) were provided by the Project engineering team (Scholz pers. comm
- **Demolition**—Fugitive dust emissions from building demolition were based on the anticipated amount of square feet to be demolished and calculation method from the CalEEMod User's Guide (Trinity Consultants 2016).
- **Paving**—Fugitive VOC emissions associated with paving were calculated using activity data (e.g., square feet paved) provided by the Project engineer and the CalEEMod default emission factor of 2.62 pounds of VOC per acre paved (Scholz pers. comm.).
- **Architectural coating**—Fugitive VOC emissions associated with architectural coatings of the stations were calculated using activity data (e.g., square feet coated) provided by the Project engineering team and methods contained in the CalEEMod User's Guide (Scholz pers. comm.). Emissions calculations assume a VOC content of 150 grams per liter (g/L), consistent with BAAQMD's Regulation 8, Rule 3, Section 301.
- **Helicopters**—Helicopters would be required for the reconductoring work. Exhaust emissions were calculated using emission factors and assumptions derived from a review of guidance manuals published by USEPA (1978) The Climate Registry (2018).

8.2 Ballast and Subballast Hauling

Ballast and subballast materials could be transported from multiple quarry locations throughout Northern California and the Central Valley. Analysts estimated emissions from ballast and subballast material hauling by trucks and locomotives based on the travel distances and

transportation method (by rail or by truck) from the locations where ballast materials would be available. Analysts used heavy-duty truck emission factors (T7 Single) from EMFAC2017 to estimate emissions from haul trucks and rail emission factors from the USEPA (2009 to estimate the locomotive emissions. to estimate the locomotive emissions.

Analysts identified up to 11 potential quarries that could provide ballast material. All quarries are within the SFBAAB, MBARD, and SJVAPCD, with the furthest quarry located 37 rail miles and 89 highway miles from the Project footprint. Ballast and subballast quantities for the Project were provided by the Project engineering team and distributed equally among the identified quarries (Scholz pers. comm.). Scenario 1 assumed ballast and subballast would be hauled to the Project footprint using a combination of trucks and locomotives, and Scenario 2 assumed ballast and subballast would be hauled to the Project footprint using only trucks.

8.3 Annual Emissions Estimates

As discussed in Section 7.3, Major Construction-Phase Activities, up to six construction activities (viaduct, embankment, at grade, trench, tunnel, and large cut and fill) would be constructed, depending on the subsection and alternative. The analysis assumes that each component would be constructed over multiple phases between 2022 and 2028.[10]

8.4 Emissions by Air Basin

Activities occurring within the SFBAAB and SJVAB were quantified and analyzed separately to compare emissions to appropriate *de minimis* thresholds. Emissions generated by construction of subsections that would occur exclusively within one air basin (e.g., San Jose Diridon Station Approach in the SFBAAB) were wholly assigned to that air basin. Emissions estimates for alternatives that span more than one air district were apportioned based on the location of construction activity. For example, construction of the Pacheco Pass Subsection would occur in both the SFBAAB and SJVAB. Accordingly, the emissions estimates were apportioned to the SFBAAB and SJVAB based on the number of rail miles constructed within each air basin. Table 6 summarizes the location of each subsection and the air basin scaling factors used in the analysis, as appropriate. All reconductoring work would occur in the SFBAAB.

[10] Construction is expected to take place later than the dates assumed in the air quality analysis. The construction emissions estimates are therefore conservative, as future emissions rates will be lower due to the implementation of cleaner and newer equipment.

Table 6 Track Miles and Construction Scaling Factors by Air Basin

Subsection	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	SFBAAB	SJVAB	SFBAAB	SJVAB	SFBAAB	SJVAB	SFBAAB	SJVAB
Constructed Rail Miles								
San Jose Diridon Station Approach	3	0	3	0	3	0	3	0
Monterey Corridor	4	0	4	0	4	0	4	0
Morgan Hill and Gilroy	14	0	14	0	13	0	14	0
Pacheco Pass	5	7	5	7	5	7	5	7
San Joaquin Valley	0	9	0	9	0	9	0	9
Emission Scaling Factors								
San Jose Diridon Station Approach	100%	0%	100%	0%	100%	0%	100%	0%
Monterey Corridor	100%	0%	100%	0%	100%	0%	100%	0%
Morgan Hill and Gilroy	85%[1]	0%	85%[1]	0%	87%[1]	0%	85%[1]	0%
Pacheco Pass	43%	57%	43%	57%	43%	57%	43%	57%
San Joaquin Valley	0%	100%	0%	100%	0%	100%	0%	100%

Sources: Authority 2017; CARB 2012
SFBAAB = San Francisco Bay Area Air Basin
SJVAB = San Joaquin Valley Air Basin
[1] The remaining 13–15 percent of track miles would be constructed in the NCCAB. However, as discussed in Section 8.1, Attainment Status of Resource Study Area, the portion of the RSA in the NCAAB is in attainment for all criteria pollutants. As such, a general conformity analysis is not required, and no further discussion of Project activities in the NCCAB is provided in this General Conformity Determination.

8.5 Project Design Features

The Authority has developed IAMFs to reduce air quality effects. Because IAMFs are included as part of the Project design, they are not considered mitigation, and are included as part of the Project construction emissions estimate. Specifically, the following emissions benefits achieved by AQ-IAMF#1 through AQ-IAMF#6 were assumed in the modeling. estimate. Specifically, the following emissions benefits achieved by AQ-IAMF#1 through AQ-IAMF#6 were assumed in the modeling.

- Fugitive dust reductions from earthmoving best management practices (AQ-IAMF#1) (Countess Environmental 2006).
  - PM from ground disturbance (i.e., scraping and grading activities), 75 percent (BAAQMD 2017a)
  - PM from unpaved vehicle travel (i.e., re-entrained road dust), 75 percent[11]
  - PM from demolition, 36 percent (Countess Environmental 2006)
- VOC reductions (93 percent) from application of architectural coatings (AQ-IAMF#2).[12]
- Criteria pollutant and greenhouse gas (GHG) Lovegrove and Tadross 2017))
  - CO, 10 percent (Tier 2 tunneling equipment)
  - NO_X, 10 percent (Tier 2 tunneling equipment)
  - PM, 30 percent (all engines)
- Criteria pollutant and GHG reductions from use of Tier 4 off-road engines (AQ-IAMF#4). Emissions reductions vary by pollutant and equipment type. Emissions were modeled using Tier 4 emission rates from CalEEMod.
- Criteria pollutant and GHG reductions from use of model year 2010 or newer on-road engines in heavy-duty, diesel powered trucks (AQ-IAMF#5). Emissions reductions vary by pollutant, analysis year, and air basin. Emissions were modeled using emission rates for model year 2010 or newer engines derived from the CARB's EMFAC2017 model. The emissions rates for model year 2010 and newer engines reflect implementation of EPA's December 2000 Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements.
- Fugitive dust reductions from implementation of typical control measures at new concrete batch plants, such as water sprays, enclosures, and hoods (AQ-IAMF#6). Emissions were modeled using USEPA AP-42 controlled emission factors for concrete batch plants

[11] Among other controls, this IAMF requires watering unpaved roads three times daily and limiting vehicle speeds. The 75 percent efficacy is based on a 55 percent reduction for watering and a 44 percent reduction for vehicle speed limits (1-(.55*.44)) = 0.75% (Countess Environmental 2006).

[12] Assumes an uncontrolled VOC content of 150 g/L per BAAQMD Regulation 8, Rule 3, Section 301 and a controlled VOC content of 10 g/L per AQ-IAMF#2.

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9 ESTIMATED EMISSION RATES AND COMPARISON TO *DE MINIMIS* THRESHOLDS

Total annual estimated emissions generated within the SFBAAB and SJVAB during the construction period, as presented in the EIR/EIS, are provided in Tables 7 and 8. These values are the peak on-site emissions during each analysis year, plus maximum annual off-site emissions. The modeling accounts for implementation of AQ-IAMF#1 through AQ-IAMF#6 and reflects the impact of the SAFE Vehicle Rule (CARB 2019Emissions for each Project alternative, including the Preferred Alternative 4, are presented and analyzed in this General Conformity Determination.

As shown in the tables, annual construction emissions of all Project alternatives would exceed the General Conformity *de minimis* threshold in the SJVAB for NO_X for all years of construction between 2022 and 2028. NOx emissions would also exceed the General Conformity *de minimis* threshold in the SFBAAB in 2024 under Alternatives 1 and 3, and between 2023 and 2025 under Alternatives 2 and 4. All other pollutants would be below applicable *de minimis* thresholds.

Table 7 San Jose to Central Valley Wye Annual Construction Emissions in the SFBAAB (tons per year)[1]

Alternative/Year [2]	VOC	NO_X	CO	SO_2[3]	PM_{10}	$PM_{2.5}$
Alternative 1						
2022	4	50	145	<1	28	6
2023	6	79	200	1	46	10
2024	7	**106 ***	245	1	66	15
2025	6	85	205	1	49	11
2026	3	37	89	<1	18	4
2027	2	35	53	<1	12	3
2028	1	11	28	<1	3	1
Alternative 2						
2022	6	76	192	1	41	10
2023	7	**118 ***	255	1	67	16
2024	9	**155 ***	304	1	93	21
2025	7	**112 ***	241	1	63	15
2026	4	56	125	<1	29	7
2027	3	69	76	<1	29	6
2028	1	14	38	<1	5	1
Alternative 3						
2022	5	51	173	<1	27	6
2023	7	89	244	1	50	11
2024	8	**114 ***	293	1	69	15
2025	7	85	233	1	47	11
2026	3	41	116	<1	19	4
2027	2	41	54	<1	15	3
2028	1	12	30	<1	4	1
Alternative 4						
2022	5	77	177	1	47	11
2023	7	**113 ***	222	1	70	17
2024	8	**156 ***	272	1	95	23
2025	7	**139 ***	241	1	79	19
2026	3	62	109	<1	34	8
2027	3	84	70	<1	37	7
2028	1	13	29	<1	5	1
De minimis threshold	100	100	-	100	-	100

Sources: Trinity Consultants 2016; USEPA 1998, 2006, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz pers. comm.
Exceedances of the *de minimis* thresholds are shown in **bolded underline with an asterisk (*)**.

CO = carbon monoxide
NO_X = oxides of nitrogen
PG&E = Pacific Gas and Electric Company
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
PM_{10} = particulate matter 10 microns in diameter or less
SFBAAB = San Francisco Bay Area Air Basin
SO_2 = sulfur dioxide
VOC = volatile organic compound

[1] Emissions results include implementation of air quality IAMFs, as described in Section 6.
[2] Construction is expected to take place later than the dates assumed in the air quality analysis. The construction emissions estimates are therefore conservative, as future emissions rates will be lower due to the implementation of cleaner and newer equipment.
[3] Although the RSA is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.

Table 8 San Jose to Central Valley Wye Annual Construction Emissions in the SJVAB (tons per year)[1]

Alternative/Year [2]	VOC	NO_X	CO	SO_2[3]	PM_{10}	$PM_{2.5}$
Alternatives 1, 2, 3, or 4[5]						
2022	6	**42 ***	218	1	18	5
2023	6	**55 ***	226	1	24	6
2024	6	**56 ***	220	1	23	5
2025	6	**54 ***	209	1	21	5
2026	4	**45 ***	131	<1	17	4
2027	2	**50 ***	49	<1	17	3
2028	1	**10 ***	22	<1	2	1
De minimis threshold	10	10	-	70	100	70

Sources: Trinity Consultants 2016; USEPA 1998, 2006, 2009, 2011; BAAQMD 2016; The Climate Registry 2018; Scholz pers. comm.
Exceedances of the *de minimis* thresholds are shown in **bolded underline with an asterisk (*)**.

CO = carbon monoxide
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
PM_{10} = particulate matter 10 microns in diameter or less
SJVAB = San Joaquin Valley Air Basin
SO_2 = sulfur dioxide
VOC = volatile organic compound

[1] Emissions results include implementation of air quality IAMFs, as described in Section 6.
[2] Construction is expected to take place later than the dates assumed in the air quality analysis. The construction emissions estimates are therefore conservative, as future emissions rates will be lower due to the implementation of cleaner and newer equipment.
[3] Although the RSA is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.
[4] Construction activities and associated emissions are the same among the four alternatives in the SJVAB.

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10 REGIONAL EFFECTS

As shown in Section 3.3.6.1 of the Draft EIR/EIS, the total regional emissions for all applicable pollutants are lower during the operations phase of the Project than under No Project conditions (and would therefore not exceed the *de minimis* emission thresholds). As such, only emissions generated during the construction phase were compared to the conformity threshold levels to determine conformity compliance. As shown in Tables 7 and 8, construction-phase emissions, compared to the General Conformity applicability rates, are as follows:

- Annual estimated NO_X emissions in the SJVAB are greater than the applicability rate of 10 tpy for all years of construction between 2022 and 2028 for all Project alternatives with implementation of IAMFs.
- Annual estimated NO_X emissions in the SFBAAB are greater than the applicability rate of 100 tpy in 2024 under Alternatives 1 and 3 and for all years of construction between 2023 and 2025 under Alternatives 2 and 4 with implementation of IAMFs.
- Annual estimated VOC, CO, SO_2, PM_{10}, and $PM_{2.5}$ emissions are less than the applicability rates in the SFBAAB and SJVAB with implementation of IAMFs.

Therefore, a General Conformity Determination is required for the Project for NO_X for the years during construction when the emissions would exceed the *de minimis* thresholds in the SFBAAB and SJVAB and do not meet any of the exceptions cited in 40 C.F.R. Section 93.154(c).

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11 GENERAL CONFORMITY EVALUATION

For federal actions subject to a General Conformity evaluation, the regulations delineate several ways an agency can demonstrate conformity (40 C.F.R. § 93.158). This section summarizes the findings that were used to make the determination for the Project.

11.1 Conformity Requirements of Project

Based on the results shown in Tables 7 and 8, conformity determinations are required for construction-phase emissions for NO_X because annual estimated emissions are greater than the applicability rates of 100 tpy in the SFBAAB and 10 tpy in the SJVAB.

11.2 Compliance with Conformity Requirements

NO_X (a precursor to O_3) emissions caused by the construction of the Project would not result in an increase in regional NO_X emissions in the SFBAAB or SJVAB because exceedances would be mitigated by offsets. This would be achieved by additional on-site controls and offsetting remaining NO_X emissions generated by the construction of the Project in a manner consistent with the General Conformity regulations.

The requirements for offsets (as described below) would be implemented as part of the Project and will be included in the mitigation measures in the Final EIR/EIS. Any required offsets are anticipated to be accomplished by entering into an agreement with BAAQMD and project-level VERA with the SJVAPCD. The requirement for the VERA (as described below) would be implemented as part of the project and will be included in the mitigation measures in the Final EIR/EIS:

AQ-MM#1: Implement Additional On-Site Emissions Controls to Reduce Fugitive Dust

During construction, the contractor shall employ the following measures to minimize and control fugitive dust emissions:

- Where feasible, install wind breaks (e.g., dust curtains, plastic tarps, solid fencing) on the average dominant windward side(s) of station construction areas. For purposes of implementation, chain-link fencing with added landscape mesh fabric adequately qualifies as solid fencing.
- Post a publicly visible sign with the telephone number and person to contact at the Authority regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number for the local air district shall also be visible to ensure compliance with applicable regulations.

AQ-MM#2: Construction Emissions Reductions – Requirements for use of Zero Emission (ZE) and/or Near Zero Emission (NZE) Vehicles and off-road equipment

This mitigation measure will reduce the impact of construction emissions from Project

This mitigation measure will reduce the impact of construction emissions from project-related on-road vehicles and off-road equipment.

The Authority and all project construction contractors shall require that a minimum of 25 percent, with a goal of 100 percent, of all light-duty on-road vehicles (e.g., passenger cars, light-duty trucks) associated with the project (e.g., on-site vehicles, contractor vehicles) use ZE or NZE technology.

The Authority and all project construction contractors shall have the goal that a minimum of 25 percent of all heavy-duty on-road vehicles (e.g., for hauling, material delivery and soil import/export) associated with the project use ZE or NZE technology.

The Authority and all project construction contractors shall have the goal that a minimum of 10 percent of off-road construction equipment use ZE or NZE vehicles.

If local or state regulations mandate a faster transition to using ZE and/or NZE vehicles at the time of construction, the more stringent regulations will be applied. For example, Executive Order (EO) N-79-20, issued by California Governor Newsom September 23, 2020, currently states the following:

- Light duty and passenger car sales be 100 percent ZE vehicles by 2035
- Full transition to ZE short haul/drayage trucks by 2035
- Full transition to ZE heavy-duty long-haul trucks, where feasible, by 2045
- Full transition to ZE off-road equipment by 2035, where feasible.

The project will have a goal of surpassing the requirements of these or other future regulations as a mitigation measure.

AQ-MM#3: Offset Project Construction Emissions in the San Francisco Bay Area Air Basin

Prior to issuance of construction contracts, the Authority will conduct an air quality analysis that evaluates the conditions that exist at that time. If the analysis determines that there will be exceedances of the VOC or NOx thresholds, even after the application of the mitigation in AQ-MM#2, the Authority will enter into an agreement with BAAQMD to reduce VOC and NO_X to the required levels by acquiring offsets. The required levels in the SFBAAB are as follows:

1. For emissions in excess of the General Conformity *de minimis* thresholds (NO_X): net zero.
2. For emissions not in excess of *de minimis* thresholds but above the BAAQMD's daily emission thresholds (VOC and NO_X): below the appropriate CEQA threshold levels.

The mitigation offset fee amount will be determined at the time of mitigation to fund one or more emissions reduction projects within the SFBAAB. The offset fee will be determined by the Authority and BAAQMD based on the type of projects that present appropriate emission reduction opportunities. These funds may be spent to reduce either VOC or NO_X emissions ("O_3 precursors"). Documentation of payment will be provided to the Authority or its designated representative.

The agreement will include details regarding the annual calculation of required offsets the Authority must achieve, funds to be paid, administrative fee, and the timing of the emissions reductions projects. Acceptance of this fee by BAAQMD will serve as an acknowledgment and commitment by BAAQMD to: (1) implement an emissions reduction project(s) within a timeframe to be determined based on the type of project(s) selected after receipt of the mitigation fee designed to achieve the emission reduction objectives; and (2) provide documentation to the Authority or its designated representative describing the project(s) funded by the mitigation fee, including the amount of emissions reduced (tons per year) in the SFBAAB from the emissions reduction project(s). To qualify under this mitigation measure, the specific emissions reduction project(s) must result in emission reductions in the SFBAAB that are real, surplus, quantifiable, enforceable, and will not otherwise be achieved through compliance with existing regulatory requirements or any other legal requirement. Pursuant to 40 C.F.R. Section 93.163(a), the necessary reductions must be achieved (contracted and delivered) by the applicable year in question. Funding will need to be received by BAAQMD prior to contracting with participants and should allow enough time to receive and process applications to fund and implement off-site reduction projects prior to commencement of project activities being reduced. This will roughly equate to 1 year prior to the required mitigation; additional lead time may be necessary depending on the level of off-site emission reductions required for a specific year.

This mitigation measure will be effective in offsetting emissions generated during project construction through the funding of emission-reduction projects. It is BAAQMD's experience that emissions offsets are feasible mitigation that effectively achieves actual emission reductions (Kirk 2018).

The implementation of this mitigation measure will not be expected to affect air quality in the BAAQMD because purchasing emissions offsets will not result in any physical change to the environment, and therefore will not result in other secondary environmental impacts. In addition to

VOC and NO_X, the implementation of emission-reduction projects could result in reductions of other criteria pollutants and/or GHGs. However, this will be a secondary effect of this mitigation measure and is not a required outcome to mitigate any impacts of the project.

AQ-MM#4: Offset Project Construction Emissions in the San Joaquin Valley Air Basin

On June 19, 2014, the SJVAPCD and the Authority entered an MOU that establishes the framework for fully mitigating to net-zero construction emissions of NOx, VOC, PM_{10}, and $PM_{2.5}$ from the entire HSR project within the SJVAB (Authority and SJVUAPCD 2014). Emissions generated by construction of the portion of the project within the SJVAB are subject to this MOU and, therefore, must be offset to net zero. Pursuant to the MOU, the Authority and the SJVAPCD will enter into a Voluntary Emissions Reduction Agreement (VERA) to cover the portion of the project approved and funded for construction within the SJVAB. The project-level VERA must be executed prior to commencement of construction and the mitigation fees and offsets delivered and achieved according to the requirements of the VERA and MOU.

This mitigation measure will be effective in offsetting emissions generated during construction of the project through the funding of emission-reduction projects. It is SJVAPCD's experience that implementation of a VERA is feasible mitigation that effectively achieves actual emission reductions. Based on the performance of current incentive programs and reasonably foreseeable future growth, the SJVAPCD has confirmed that enough emissions reduction credits will be available to offset emissions generated by the project for all years in excess of the SJVAPCD's thresholds and the General Conformity *de minimis* threshold (Authority and SJVUAPCD 2014).

The implementation of this mitigation measure will not be expected to affect air quality in the SJVAPCD because purchasing emissions offsets will not result in any physical change to the environment, and therefore will not result in other secondary environmental impacts. In addition to NO_X and PM_{10}, the implementation of emission-reduction projects could result in reductions of other criteria pollutants, GHGs, or both. However, this will be a secondary effect of this mitigation measure and is not a required outcome to mitigate any impacts of the project.

11.3 Consistency with Requirements and Milestones in Applicable SIP

The General Conformity regulations state that notwithstanding the other requirements of the rule, a federal action may not be determined to conform unless the total of direct and indirect emissions from the federal action is in compliance or consistent with all relevant requirements and milestones in the applicable SIP (40 C.F.R. § 93.158(c)). This includes, but is not limited to, such issues as reasonable further progress schedules, assumptions specified in the attainment or maintenance demonstration, prohibitions, numerical emission limits, and work practice standards. This section briefly addresses how the construction emissions for the Project were assessed for SIP consistency for this evaluation.

11.3.1 Applicable Requirements from U.S. Environmental Protection Agency

The USEPA promulgates requirements to support the goals of the CAA with respect to the NAAQS. Typically, these requirements take the form of rules regulating emissions from significant new sources, including emission standards for major stationary point sources and classes of mobile sources, as well as permitting requirements for new major stationary point sources. Since states have the primary responsibility for implementation and enforcement of requirements under the CAA and can impose stricter limitations than the USEPA, the USEPA requirements often serve as guidance to the states in formulating their air quality management strategies.

11.3.2 Applicable Requirements from California Air Resources Board

In California, to support the attainment and maintenance of the NAAQS, the CARB is primarily responsible for regulating emissions from mobile sources. In fact, the USEPA has delegated authority to the CARB to establish emission standards for on-road and some non-road vehicles separate from the USEPA vehicle emission standards, although the CARB is preempted by the CAA from regulating emissions from many non-road mobile sources, including marine craft. Emission standards for preempted equipment can only be set by the USEPA.

11.3.3 Applicable Requirements from Bay Area Air Quality Management District and San Joaquin Valley Air Pollution Control District

To support the attainment and maintenance of the NAAQS in the SFBAAB and SJVAB, the BAAQMD and SJVAPCD have primarily been responsible for regulating emissions from stationary sources. As noted above, the BAAQMD and SJVAPCD develop and update their air quality management plans regularly to support the California SIP. While the plans contain rules and regulations geared to attain and maintain the NAAQS, these rules and regulations also have the much more difficult goal of attaining and maintaining the CAAQS.

11.3.4 Consistency with Applicable Requirements for the California High-Speed Rail Authority

The Authority already complies with, and will continue to comply with, a myriad of rules and regulations implemented and enforced by federal, state, regional, and local agencies to protect and enhance ambient air quality in the SFBAAB and SJVAB.

In particular, because of the long persistence of challenges to attain the ambient air quality standards in the SFBAAB and SJVAB, the rules and regulations promulgated by the CARB, BAAQMD, and SJVAPCD are among the most stringent in the U.S.

The Authority will continue to comply with all existing applicable air quality regulatory requirements for activities over which it has direct control and would meet in a timely manner all regulatory requirements that become applicable in the future.

These are appropriate USEPA, CARB, BAAQMD, and SJVAPCD rules which are standard practices and best management practices for construction in the BAAQMD and SJVAPCD, including control of emissions and exhaust:

- **BAAQMD Regulation 2, Rule 2 (New Source Review)**—This rule contains requirements for Best Available Control Technology and emission offsets.
- **BAAQMD Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminates)**—This rule outlines guidance for evaluating TAC emissions and their potential health risks.
- **BAAQMD Regulation 6, Rule 1 (Particulate Matter)**—This rule restricts emissions of PM darker than No. 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- **BAAQMD Regulation 6, Rule 6 (Prohibition of Trackout)**—This rule limits the quantity of PM in the atmosphere through control of trackout of solid materials onto paved public roads outside the boundaries of Large Bulk Material Sites, Large Construction Sites, and Large Disturbed Surface sites including landfills.
- **BAAQMD Regulation 7 (Odorous Substances)**—This regulation establishes general odor limitations on odorous substances and specific emission limitations on certain odorous compounds.
- **BAAQMD Regulation 8, Rule 3 (Architectural Coatings)**—This rule limits the quantity of VOC in architectural coatings.
- **BAAQMD Regulation 9, Rule 6 (Nitrogen Oxides Emission from Natural Gas–Fired Boilers and Water Heaters)**—This rule limits emissions of NO_X generated by natural gas–fired boilers.
- **BAAQMD Regulation 9, Rule 8 (Stationary Internal Combustion Engines)**—This rule limits emissions of NO_X and CO from stationary internal combustion engines of more than 50 horsepower.
- **BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing)**—This rule controls emissions of asbestos to the atmosphere during demolition, renovation, milling, and manufacturing and establishes appropriate waste disposal procedures.

- **SJVAPCD Rule 2010 (Permits Required)—**This rule requires any person constructing, altering, replacing or operating any source operation which emits, may emit, or may reduce emissions to obtain an Authority to Construct or a Permit to Operate.
- **SJVAPCD Rule 2201 (New and Modified Stationary Source Review)**—This rule requires that sources not increase emissions above the specified thresholds.
- **SJVAPCD Rule 2280 (Portable Equipment Registration)**—This rule requires portable equipment used at project sites for less than 6 consecutive months be registered with the SJVAPCD.
- **SJVAPCD Rule 4002 (National Emission Standards for Hazardous Air Pollutants)**—This rule incorporates by reference the National Emission Standards for Hazardous Air Pollutants from Part 61, Chapter I, Subchapter C, Title 40, Code of Federal Regulations (CFR) and the National Emission Standards for Hazardous Air Pollutants for Source Categories from Part 63, Chapter I, Subchapter C, Title 40, Code of Federal Regulations (CFR).
- **SJVAPCD Rule 4102 (Nuisance)**—This rule prohibits discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.
- **SJVAPCD Rule 4201 and Rule 4202 (Particulate Matter Concentration and Emission Rates)**—These rules provide PM emission limits for sources operating within the district.
- **SJVAPCD Rule 4301 (Fuel-Burning Equipment)**—This rule limits the emissions from fuel-burning equipment whose primary purpose is to produce heat or power by indirect heat transfer.
- **SJVAPCD Rule 4601 (Architectural Coatings)**—This rule limits VOC emissions from architectural coatings.
- **SJVAPCD Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving, and Maintenance Operations)**—This rule limits VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.
- **SJVAPCD Rule 8011 (General Requirements—Fugitive Dust Emission Sources)**—This rule outlines requirements for implementation of control measures for fugitive dust emission sources.
- **SJVAPCD Rule 9510 (Indirect Source Review)**—This rule outlines mitigation requirements for construction and operations emissions that exceed certain thresholds. The rule applies to any transportation project in which construction emissions equal or exceed 2 tons of NO_X or PM_{10} per year. Projects subject to Rule 9510 must submit an Air Impact Assessment application to the SJVAPCD prior to construction.
- **BAAQMD and SJVAPCD CEQA Guidelines—**The BAAQMD and SJVAPCD prepared their *Air Quality Guidelines* and *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI), respectively, to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SFBAAB and SJVAB (BAAQMD 2017b; SJVAPCD 2015). The Air Quality Guidelines and GAMAQI provide BAAQMD- and SJVAPCD-recommended procedures for evaluating potential air quality impacts during the CEQA environmental review process. The documents provide guidance on evaluating short-term (construction) and long-term (operational) air emissions. The Air Quality Guidelines and GAMAQI used in this evaluation contain guidance on the following:
  - Criteria and thresholds for determining whether a project may have a significant adverse air quality impact
  - Specific procedures and modeling protocols for quantifying and analyzing air quality impacts

- Methods to mitigate air quality impacts
- Information for use in air quality assessments and environmental documents that will be updated more frequently, such as air quality data, regulatory setting, climate, and topography
- USEPA Rule 40 C.F.R. Part 89, Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines: requires stringent emission standards for mobile nonroad diesel engines of almost all types using a tiered phase-in of standards
- CARB Rule 13 California Code of Regulations Section 1956.8, California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles: requires significant reductions in emissions of NO_X, PM, and nonmethane organic compounds using exhaust treatment on heavy-duty diesel engines manufactured in model year 2007 and later years.

12 ESTIMATED EMISSION RATES AND COMPARISON TO *DE MINIMIS* THRESHOLDS—CUMULATIVE ANALYSIS

The RSA for cumulative air quality impacts is the SFBAAB and SJVAB. While these are separate projects for purposes of planning the HSR system, construction of the Project would overlap with the construction period for the following other HSR sections[13]:

- San Francisco to San Jose, construction in the SFBAAB between 2022 and 2025
- Merced to Fresno, construction in the SJVAB in 2022
- Central Valley Wye, construction in the SJVAB in 2022 and material hauling in the SFBAAB in 2022
- Fresno to Bakersfield, construction in the SJVAB between 2022 and 2023
- Bakersfield to Palmdale, construction in the SJVAB between 2022 and 2025

Overlapping construction activities could add to cumulative air quality impacts within the SFBAAB and SJVAB. For purposes of full disclosure of the potential impacts, the cumulative emissions that could result from potential concurrent construction activities are presented in Tables 9 and 10. As the analysis demonstrates, concurrent construction could result in exceedances of the NO_X General Conformity *de minimis* threshold in the SFBAAB and VOC and NO_X General Conformity *de minimis* thresholds in the SJVAB. As previously discussed, the Authority has already entered into an MOU with the SJVAPCD that will offset all emissions of VOC, NO_x, and PM generated in the SJVAB by construction of the High Speed Rail Project to net zero. Pursuant to AQ-MM#-3, the Authority will enter into an agreement with BAAQMD to offset VOC and NOx emissions from construction of the Project in excess of the federal *de minimis* thresholds to net zero, if there will be exceedances of the VOC or NOx thresholds as determined by an analysis to be conducted prior to the issuance of construction contracts.

The Merced to Sacramento Project would also generate emissions in the SJVAB. However, this section would not be completed until Phase 2, which is after the mandated Los Angeles to San Francisco line. It is likely construction activities would therefore take place after this Project is completed (i.e., after 2028).

[13] The analysis assumed that Project construction would take place from 2022 to 2028, and that construction of other HSR project sections would occur according to the schedules presented in their respective environmental documents.

Table 9 Overlapping HSR System Construction Emissions in the SFBAAB (tons per year)

Year[1]	VOC	NOx	CO	SO_2[2]	PM_{10}	$PM_{2.5}$
2022						
JM[3,4]	6	77	192	1	47	11
FJ[3,5]	5	99	136	1	134	30
CVY	1	31	9	<1	1	1
Total	*11*	***207 ****	*337*	*1*	*182*	*43*
2023						
JM[3,4]	7	**118 ***	255	1	70	17
FJ[3,5]	4	91	117	<1	117	27
CVY	0	0	0	0	0	0
Total	*10*	***209 ****	*372*	*1*	*187*	*44*
2024						
JM[3,4]	9	**156 ***	304	1	95	23
FJ[3,5]	3	80	105	<1	106	24
CVY	0	0	0	0	0	0
Total	*12*	***237 ****	*409*	*1*	*202*	*46*
2025						
JM[3,4]	7	**139 ***	241	1	79	19
FJ[3,5]	4	96	132	<1	102	23
CVY	0	0	0	0	0	0
Total	*12*	***235 ****	*372*	*1*	*181*	*42*
De minimis threshold	100	100	-	100	-	100

Source: See Table 7 in Section 10.0; Authority and FRA 2017a

Exceedances of the *de minimis* thresholds are shown in **bolded underline with an asterisk (*)**.

CO = carbon monoxide
CVY = Central Valley Wye
FJ = San Francisco to San Jose
IAMF = impact avoidance and minimization feature
JM = San Jose to Merced
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
PM_{10} = particulate matter 10 microns in diameter or less
RSA = resource study area
SO_2 = sulfur dioxide
VOC = volatile organic compound

[1] The analysis assumed that Project construction would take place from 2022 to 2028, and that construction of other HSR project sections would occur according to the schedules presented in their respective environmental documents.
[2] Although the RSA is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.
[3] Emissions results include implementation of air quality IAMFs, as described in Section 6.
[4] Presents the highest emissions estimate that would occur under any of the four alternatives.
[5] Presents emissions under Alternative B, which is the alternative with the greatest emissions in the SFBAAB.

Table 10 Overlapping HSR System Construction Emissions in the SJVAB (tons per year)

Year[1]	VOC	NOx	CO	SO_2[2]	PM_{10}	$PM_{2.5}$
2022						
JM[3,4]	6	**42 ***	218	1	18	5
B-P[5]	**11 ***	**103 ***	87	1	10	5
F-B[5]	<1	1	1	<1	<1	<1
M-F[5]	5	4	3	<1	9	2
CVY[5]	2	44	20	<1	2	2
Total[6]	***25 ****	***194 ****	*330*	*2*	*39*	*13*
2023						
JM[3,4]	6	**55 ***	226	1	24	6
B-P[5]	8	**70 ***	66	1	9	4
F-B[5]	<1	<1	<1	<1	<1	<1
M-F[5]	0	0	0	0	0	0
CVY[5]	0	0	0	0	0	0
Total[6]	***14 ****	***125 ****	*292*	*2*	*33*	*10*
2024						
JM[3,4]	6	**56 ***	220	1	23	5
B-P[5]	6	**50 ***	50	1	6	3
F-B[5]	0	0	0	0	0	0
M-F[5]	0	0	0	0	0	0
CVY[5]	0	0	0	0	0	0
Total[6]	***12 ****	***106 ****	*270*	*2*	*29*	*8*
2025						
JM[3,4]	6	**54 ***	209	1	21	5
B-P[5]	2	**10 ***	11	1	1	1
F-B[5]	0	0	0	0	0	0
M-F[5]	0	0	0	0	0	0
CVY[5]	0	0	0	0	0	0
Total[6]	*8*	***64 ****	*220*	*2*	*22*	*6*
De minimis threshold	10	10	-	70	100	70

Source: See Table 8 in Section 10; Authority and FRA 2012, Authority and FRA 2017a, Authority and FRA 2014b, Authority and FRA 2017b
Exceedances of the *de minimis* thresholds are shown in **bolded underline with an asterisk (*)**.
B-P = Bakersfield to Palmdale
CO = carbon monoxide
CVY = Central Valley Wye
F-B = Fresno to Bakersfield
IAMF = impact avoidance and minimization feature
JM = San Jose to Merced

M-F = Merced to Fresno
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
PM_{10} = particulate matter 10 microns in diameter or less
RSA = resource study area
SO_2 = sulfur dioxide
VOC = volatile organic compound
[1] The analysis assumed that Project construction would take place from 2022 to 2028, and that construction of other HSR project sections would occur according to the schedules presented in their respective environmental documents.
[2] Although the RSA is in attainment for SO_2, because SO_2 is a precursor for $PM_{2.5}$, the $PM_{2.5}$ General Conformity *de minimis* thresholds are used.
[3] Emissions results include implementation of air quality IAMFs, as described in Section 6.
[4] Refer to Table 8 in Section 10.
[5] The highest annual emissions for each pollutant among the analyzed alternatives is presented.
[6] Totals may not add due to rounding.

13 REPORTING AND PUBLIC COMMENTS

To support a decision concerning the Project, the FRA is issuing this draft General Conformity Determination for a 30-day public ad agency review. In developing the analysis underlying this general conformity determination, the Authority has consulted extensively with the BAAQMD and SJVAPCD on a variety of technical and modeling issues. The Authority has also consulted with the USEPA and CARB on the overall approach to demonstrating general conformity.

The FRA has provided copies of the draft General Conformity Determination to the appropriate regional offices of the USEPA, CARB, BAAQMD, and SJVAPCD for a 30-day review. The FRA will also issue a notice in the *Federal Register* announcing the availability of the draft general conformity determination and requesting written public comments during a 30-day period. This draft conformity determination will be made available on FRA's docket at https://www.regulations.gov/, Docket FRA-2021-X.

Any comments on the draft General Conformity Determination will be included in the Final EIR/EIS for the Project and will be addressed in the Final General Conformity Determination.

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14 FINDINGS AND CONCLUSIONS

FRA conducted a General Conformity evaluation consistent with 40 C.F.R. Part 93 Subpart B. The General Conformity regulations apply at this time to this Project because the Project is in an area that is designated as either nonattainment or maintenance for the 8-hour O_3, 24-hour $PM_{2.5}$, and 24-hour PM_{10} standards. The FRA conducted the General Conformity evaluation consistent with all regulatory criteria and procedures and following the Authority's coordination with the USEPA, BAAQMD, SJVAPCD, and CARB. As a result of this review, the FRA concluded, because Project-generated emissions would either be fully offset (for construction phase) or less than zero (for operational phase), that the Project's emissions can be accommodated in the SIP for the SFBAAB and SJVAB. The FRA has determined that the Project as designed would conform to the approved SIP based on the following:

- The Authority would commit that construction-phase NO_X emissions would be offset consistent with the applicable federal regulations by entering into an agreement with BAAQMD and through the Authority's existing commitments in its June 2014 MOU and VERA with the SJVAPCD, respectively.
- The Authority, BAAQMD, and SJVAPCD would enter into a contractual agreement to mitigate the Project's NO_X emissions by providing funds to BAAQMD's and SJVAPCD's to fund grants for projects that achieve the necessary emission reductions.
- BAAQMD and SJVAPCD would seek and implement the necessary emission reduction measures, using Authority funds.
- BAAQMD and SJVAPCD would serve as administrators of the emissions reduction projects and verifiers of the successful mitigation effort.

Therefore, the FRA intends to issue a final determination that concludes that the Project, as designed, conforms to the purpose of the approved SIP and is consistent with all applicable requirements.

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15 REFERENCES

Bay Area Air Quality Management District (BAAQMD). 2001. San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard. October 24, 2011. www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2001%20Ozone%20Attainment%20Plan/oap_2001.ashx (accessed August 17, 2016).

———. 2016. Bay Area Air Quality Management District Permit Handbook. www.baaqmd.gov/~/media/files/engineering/permit-handbook/baaqmd-permit-handbook.pdf?la=en (accessed March 2017).

———. 2017a. *California Environmental Quality Act Air Quality Guidelines*. May 2017.

———. 2017b. Spare the Air, Cool the Climate. April 19, 2017. www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en (accessed October 2018).

California Air Resources Board (CARB). 2012. CARB's Geographical Information System (GIS) Library. www.arb.ca.gov/ei/gislib/gislib.htm (accessed March 2017).

———. 2017. 2012 Base Year Emissions. January 26, 2017. www.arb.ca.gov/ei/emissiondata.htm (accessed October 2018).

———. 2019. EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One. https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf (accessed July 2020).

———. 2020. iADAM: Air Quality Data Statistics. www.arb.ca.gov/adam/topfour/topfour1.php (accessed June 2020).

California High-Speed Rail Authority (Authority). 2016. *Connecting and Transforming California, 2016 Business Plan*. May 1, 2016.

———. 2017. *Draft Footprint Exhibits*. February 2017.

California High-Speed Rail Authority and Federal Railroad Administration (Authority and FRA). 2012. *Merced to Fresno Section California High-Speed Train (HST) Final Project Environmental Impact Report/Environmental Impact Statement (EIR/EIS)* and *Merced to Fresno Section Air Quality and Global Climate Change Technical Report.* Sacramento, CA, and Washington, D.C. April 2012.

Authority and FRA 2014a. Final EIR/EIS Fresno to Bakersfield Section. April. https://www.hsr.ca.gov/docs/programs/fresno-baker-eir/final_ERIS_FresBaker_Vol_I_Cover.pdf (accessed: March 6, 2019).

———. 2014b. *Fresno to Bakersfield Section Air Quality and Global Climate Change Technical Report.* Sacramento, CA, and Washington, D.C. April 2014.

———. 2016. *Merced to Fresno Section: Central Valley Wye Supplemental EIR/EIS*. Sacramento, CA. December 2016.

———. 2017a. *Merced to Fresno Section: Central Valley Wye Air Quality and Global Climate Change Technical Report.* Sacramento, CA, and Washington, D.C.

———. 2017b. *Bakersfield to Palmdale Air Quality and Global Climate Change Technical Report.* Sacramento, CA, and Washington, D.C.

Countess Environmental. 2006. WRAP Fugitive Dust Handbook. www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf (accessed September 27, 2018).

Lovegrove, Alice and Tadross, Edward. 2017. Memo to Bryan Porter, HSR Authority, regarding Incorporating the Use of Tier 4 Engines and Renewable Diesel Fuel in Environmental Documentation. November 9.

Monterey Bay Unified Air Pollution Control District (MBUAPCD). 2005. Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region. December 1, 2005. http://mbard.org/pdf/358%20(1).pdf (accessed August 17, 2016).

———. 2007. Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region. March 21, 2007. http://mbard.org/pdf/451.pdf (accessed August 17, 2016).

———. 2017. 2012-2015 Air Quality Management Plan (AQMP). March 15, 2017. http://mbard.org/wp-content/uploads/2017/03/2012-2015-AQMP_FINAL.pdf (accessed March 30, 2017).

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2007a. PM10 Maintenance Plan and Request for Redesignation. September 20, 2007. www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed January 22, 2015).

———. 2007b. 2007 Ozone Plan. April 2007. www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_Ozone2007.htm (accessed January 22, 2015).

———. 2013. 2013 Plan for the Revoked 1-Hour Ozone Standard. September 2013. www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/AdoptedPlan.pdf (accessed January 22, 2015).

———. 2015. 2015 Plan for the 1997 PM2.5 Standard. April 16, 2015. www.valleyair.org/Air_Quality_Plans/docs/PM25-2015/2015-PM2.5-Plan-Complete.pdf (accessed May 14, 2015).

———. 2016a. 2016 Moderate Area Plan for the 2012 PM2.5 Standard. September 15, 2016. www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2016/September/final/05.pdf (accessed November 22, 2016).

———. 2016b. 2016 Plan for the 2008 8-Hour Ozone Standard. June 16, 2016. www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm (accessed January 8, 2018).

———. 2018. 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards. October 16, 2018. www.valleyair.org/pmplans/ (accessed October 2018).

Scholz, Dan. Construction Manager. AnchorCM, San Francisco, CA. September and October 2018—email messages to ICF.

The Climate Registry. 2018. Default GHG Emission Factors. March 15, 2018.

Trinity Consultants. 2016. Appendix A Calculation Details for CalEEMod. October 2016.

U.S. Environmental Protection Agency (USEPA). 1978. Air Pollutant Emission Factors for Military and Civil Aircraft. EPA-450/3-78-117. October 1978.

———. 1994. *General Conformity Guidance: Questions and Answers*. July 13, 1994. www.epa.gov/sites/production/files/2016-03/documents/gcgqa_940713.pdf (accessed August 2016).

———. 1998. *Compilation of Air Pollutant Emission Factors*. Section 11.9 Western Surface Coal Mining. www.epa.gov/ttn/chief/ap42/index.html (accessed October 17, 2016).

———. 2006. *Compilation of Air Pollutant Emission Factors*, Chapter 13.2.2, Unpaved Roads. www.epa.gov/ttn/chief/ap42/index.html (accessed October 2016).

———. 2009. Emission Factors for Locomotives. EPA-420-F-09-025. April 2009.

———. 2011. *Compilation of Air Pollutant Emission Factors*, Chapter 13.2.1, Paved Roads. www.epa.gov/ttn/chief/ap42/ch13/bgdocs/b13s0201.pdf (accessed October 2016).

———. 2018. Nonattainment Areas for Criteria Pollutants. June 30, 2018. www.epa.gov/green-book (accessed August 2018).

———. 2020. AirData Monitor Values Report. www3.epa.gov/airdata/ad_rep_mon.html (accessed June 2020).

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ATTACHMENT A: LETTERS OF AGREEMENT WITH BAAQMD

To be added to the Final Federal General Conformity Determination.

APPENDIX 3.3-C: CHANGES TO PROJECT BENEFITS BASED ON 2018 BUSINESS PLAN

California High-Speed Rail Authority

San Jose to Merced Project Section

Changes to Project Benefits Based on 2018 Business Plan

October 2019

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

TABLE OF CONTENTS

1 INTRODUCTION 1

2 OVERVIEW OF KEY ASSUMPTIONS IN THE 2016 AND 2018 BUSINESS PLANS 1
- 2.1.1 2016 Business Plan 1
- 2.1.2 2018 Business Plan 1
- 2.1.3 Ridership Comparison 2

3 COMPARSION OF KEY PROJECT BENEFITS UNDER THE 2016 AND 2018 BUSINESS PLANS 3

4 OTHER POTENTIAL BENEFITS 4

5 CONCLUSION 4

6 REFERENCES 1

Tables

Table 1 Summary of Key EIR/EIS Annual Statewide Benefits Compared to the No Project Alternative 3

1 INTRODUCTION

This document provides additional information regarding the benefits associated with the long-term operation of the high-speed rail (HSR) project. The document briefly summarizes assumptions about the HSR system and the corresponding key project benefit information that was presented in the San Jose to Merced Section Project Environmental Impact Report (EIR)/Environmental Impact Statement (EIS). The benefits described in the EIR/EIS are based on the scenarios and assumptions contained in the 2016 Business Plan, which was adopted by the California High-Speed Rail Authority (Authority) Board on May 1, 2016. This document provides information on how those benefits may change based on updated scenarios and assumptions contained in the 2018 Business Plan, which was adopted by the Authority Board on May 15, 2018. This information is intended to reflect the potential range of outcomes for HSR project benefits in the future and to inform the decision-making process.

The information contained in this appendix is part of the EIR/EIS. However, it does not constitute a change in the proposed HSR system and does not identify new or more severe adverse environmental impacts or changes to the discussion of adverse environmental impacts from the HSR system. The additional information does not change the feasibility of any alternatives or mitigation strategies that were considered infeasible or not reasonable for purposes of project-level analysis. This additional information is solely for the purpose of providing a comparison of the analysis provided in the EIR/EIS to the 2018 Business Plan.

2 OVERVIEW OF KEY ASSUMPTIONS IN THE 2016 AND 2018 BUSINESS PLANS

2.1.1 2016 Business Plan

The EIR/EIS includes information on project benefits, including reduced vehicles miles traveled (VMT), energy use, and air pollution. These benefits were derived based on the assumptions in the 2016 Business Plan for the opening year for passenger service of the Silicon Valley to Central Valley Line (Valley-to-Valley Line) and Phase 1 of the HSR System (Phase 1). The Valley to Valley Line would connect San Jose to north of Bakersfield. Phase 1 would connect San Francisco and the Bay Area to Los Angeles and Anaheim.

Two primary forecasting scenarios were created: one assumes that the Valley-to-Valley line would open in 2025 and the other assumes that Phase 1 would begin in 2029. Forecasts were also made for 2040, the planning horizon for the environmental analysis. A 5-year ramp-up assumption was made for growth in ridership after the opening of each section for revenue service. It was assumed that only 40 percent of the forecast ridership would materialize in the first year, 55 percent in the second, 70 percent in the third, 85 percent in the fourth, and 100 percent in the fifth.

Because the ultimate ridership of the HSR system would depend on many uncertain factors, such as the price of gasoline and population growth, the forecasts in the 2016 Business Plan and EIR/EIS consider medium and high ridership scenarios for each analysis year.

2.1.2 2018 Business Plan

The 2018 Business Plan builds on and updates the 2016 Business Plan. It summarizes the progress made since 2016, updates information and forecasts, and outlines a path for advancing the HSR project. The revised cost estimates and forecasts have been informed by and improved through rigorous scrutiny and review by a range of external experts and academics. The 2018 Business Plan also includes an updated analysis of the economic impacts of the system, which shows that the program is financially viable and a sound investment opportunity.

One of the key revisions to the 2018 Business Plan that could affect the benefits analysis presented in the EIR/EIS is opening year assumption for the Valley-to-Valley Line and Phase 1. In its 2016 Business Plan, the Authority adopted the goal of completing a connection between San Jose to north of Bakersfield as part of the initial Valley-to-Valley Line. The 2018 Business Plan extends the Valley-to-Valley Line with service between San Francisco and Bakersfield.

Extending the Silicon Valley to Central Valley Line to San Francisco and Bakersfield expands high-speed rail to major urban centers at both ends of the line, which results in different ridership forecasts than the Valley-to-Valley Line as defined in the 2016 Business Plan. The extended Valley-to-Valley Line would not be complete until 2029. Accordingly, the opening year for Phase 1, which includes the sections from Bakersfield to Anaheim, from Madera to Merced, and final improvements between San José to San Francisco (Salesforce Transit Center), was updated in the 2018 Business Plan to 2033. As discussed above, the EIR/EIS assumed that the Valley-to-Valley line would begin operating and generating benefits in 2025 and Phase 1 would begin in 2029.

In addition to different opening years, the 2018 Business Plan presents different ridership forecasts for 2029 and 2040 than were assumed in the EIR/EIS. All forecasts presented in the 2018 Business Plan used the same models as the 2016 Business Plan. However, since the 2016 Business Plan, the ridership model has gone through additional internal and external reviews. In addition, key model inputs for all forecasting have been updated to reflect the latest available data, such as population forecasts and auto operating costs. Specifically, input data were updated for the following:

- Socioeconomic forecasts
- Transit network plans
- Auto travel time
- Auto operating cost
- Parking costs
- Operations planning

Finally, the ridership forecast includes an enhanced risk analysis that considers new and additional risk variables. This enhanced risk analysis builds upon the risk analysis conducted in 2016 by including the following risk variables:

- **Reliability of high-speed rail**—Capturing uncertainty around on-time reliability
- **Travel time in autonomous vehicles**—Measuring the disutility of time spent in an automobile and considers how travel choices might change with autonomous vehicles
- **Visitor travel**—Including out-of-state trips from tourism, business, and other travel
- **Induced travel**—Including trips that would not have otherwise been made without the increased connections created by the HSR system
- An enhanced penalty applied to long-distance HSR trips that require long access/egress travel time

2.1.3 Ridership Comparison

Based on the assumptions of the 2016 Business Plan, the EIR/EIS presents ridership forecasts for the initial segment of the Valley-to-Valley line in 2025 under the medium and high ridership forecasts. The EIR/EIS also presents ridership forecasts for Phase 1 in 2029 and the 2040 planning horizon. Table 1 presents a comparison of the ridership forecasts from the 2016 and 2018 Business Plans.

Based on the assumptions of the 2018 Business Plan, the extended Valley-to-Valley line would open in 2029 and carry 71 percent fewer annual riders compared to the HSR system described in the 2016 Business Plan. The ridership comparison for 2029 is not exact given that the 2016 Business Plan assumes Phase 1 would be open by 2029 and the 2018 Business Plan assumes that only the extended Valley-to-Valley line would be open by 2029. The most direct and applicable comparison is under 2040 conditions where both the 2016 and 2018 Business Plans assumed full build of the HSR system. As shown in Table 1, the 2018 Business Plan forecasts 9 to 18 percent fewer annual riders in 2040 than the 2016 Business Plan.

Table 2 Comparison of High-Speed Rail System Ridership Forecasts Under the 2016 and 2018 Business Plans (millions of riders per year)

Forecasts	2025[1]	2029[2,3]	2033[4]	2040[5]
Medium Ridership				
2016 Business Plan	3.0	19.3	-	42.8
2018 Business Plan	-	5.7	23.6	40.1
Change	*N/A*	*-71%*	*N/A*	*-18%*
High Ridership				
2016 Business Plan	4.2	26.0	-	56.8
2018 Business Plan	-	7.6	30.8	51.6
Percent Change (%)	*N/A*	*-71%*	*N/A*	*-9%*

Sources: Authority 2016, 2018a
- = data not available
N/A = comparison not available
[1] 2016 Business Plan assumes Valley-to-Valley line will be open by 2025.
[2] 2016 Business Plan assumes Phase 1 will be open by 2029.
[3] 2018 Business Plan assumes extended Valley-to-Valley line will be open by 2029.
[4] 2018 Business Plan assumes Phase 1 will be open by 2033.
[5] Both the 2016 and 2018 Business Plans use 2040 as the environmental analysis planning horizon.

3 COMPARSION OF KEY PROJECT BENEFITS UNDER THE 2016 AND 2018 BUSINESS PLANS

Ridership estimates from the 2016 Business Plan (see Table 1) were used in the EIR/EIS to assess project benefits under the medium and high rider forecasts for 2029 and 2040 in terms of reduced VMT, air quality emissions, and energy consumption, as compared to the No Project Alternative (Authority 2018). Table 2 presents a summary of these key benefits. Note that criteria pollutant reductions are not shown as all pollutants would be reduced for all years and under all ridership forecasts. Refer to Table 3.3-22 and Table 3.3-23 in Section 3.3, Air Quality and Greenhouse Gases, for estimated criteria pollutant reductions.

Table 1 Summary of Key EIR/EIS Annual Statewide Benefits Compared to the No Project Alternative

Forecast	VMT (million miles)	Diverted Aircraft Flights	GHG Emissions (million metric tons CO_2e)	Energy Use (million BTUs)
2029				
Medium Ridership	2,300	52,000	0.5	11.7
High Ridership	3,100	58,000	0.3	9.5
2040				
Medium Ridership	4,800	111,000	1.0	19.3
High Ridership	6,600	107,000	1.5	28.1

VMT = vehicle miles traveled
CO_2e = carbon dioxide equivalent
BTU = British thermal unit

The HSR project would provide a new travel mode and divert automobile trips and aircraft flights to the HSR. The reduction in both automobile and air travel VMT would provide benefits in the form of reduced congestion on both the state's highway system as well as at airports. Shifting

passenger trips to HSR would also achieve substantial criteria pollutant and GHG emissions reductions, as well as energy savings. Under the 2018 Business Plan ridership forecasts, the HSR project would achieve these benefits, but they would occur at different times and may be less than described in the EIR/EIS under Phase 1 in 2040.

The EIR/EIS assumes that Phase 1 would open in 2029, whereas the 2018 Business Plan assumes that in 2029, only the Valley-to-Valley line would be open. This results in about 70 percent fewer riders in 2029 as compared to the EIR/EIS, which would likely lower estimated VMT and aircraft reductions in this year by a similar percentage. However, once Phase 1 is completed in 2033, the project would yield the same types of Phase 1 ridership benefits as presented in the EIR/EIS.

Under Phase 1 in 2040, the 2018 Business Plan estimates that the HSR project would achieve 9 to 18 percent fewer annual riders than expected under the 2016 Business Plan. Because project benefits in the form of reduced VMT, air pollution, GHG emissions, and energy use are based on the public's use of the HSR system, it is reasonable to expect that the lower ridership forecasts of the 2018 Business Plan scenarios (see Table 1) would lead to benefits in these areas accruing more slowly than anticipated in the EIR/EIS (see Table 2). Accordingly, benefits achieved under the 2018 Business Plan may be 9 to 18 percent less than those presented in the EIR/EIS, depending on the ridership scenario.

4 OTHER POTENTIAL BENEFITS

Additional benefits of the HSR project described in the EIR/EIS and 2018 Business Plan include:

- Travel time savings for HSR riders
- Travel time savings for highway users
- Travel time savings for airline passengers
- Reliability in travel times
- Reductions in vehicle operating costs
- Increased productivity for HSR riders
- Reduction in parking infrastructure needs
- Airline operator savings
- Improved transportation safety and reduced costs from accidents
- Jobs to operate and maintain the HSR system

In the 2014 Business Plan, a benefit-cost analysis concluded that the anticipated quantifiable benefits from the HSR system exceed anticipated costs, regardless of buildout phasing or scenarios (Authority 2014). This is true for assumptions in both the 2016 and 2018 Business Plans. However, the quantifiable benefits achieved under the 2018 Business Plan may follow the same trend of ridership and be 71 percent less in 2029 and 9 to 18 percent less in 2040 than the quantifiable benefits presented in the 2016 Business Plan.

5 CONCLUSION

Although the 2018 Business Plan assumes fewer annual riders in 2029 and 2040 and therefore reduced benefits when compared to the 2016 Business Plan, in both business plans the HSR ultimately affords a more energy-efficient choice for personal travel that will help alleviate highway congestion and provide greater capacity for goods movement. Benefits would be achieved in terms of reduced VMT, air quality emissions, and energy consumption. With the HSR as a backbone for the state's transportation infrastructure, there are also new opportunities for transit connectivity and refocusing land use patterns that can take advantage of mass transit investment and other alternatives to automobile travel, reducing GHG emissions and moving the state closer to the "sustainable community" goals laid out in Senate Bill 375 (see Chapter 1 of the EIR/EIS).

6 REFERENCES

California High Speed-Rail Authority (Authority). 2014. *2014 Business Plan.* April 30, 2014. www.hsr.ca.gov/docs/about/business_plans/BPlan_2014_Business_Plan_Final.pdf (accessed October 26, 2018).

———. 2016. *2016 Business Plan.* May 1, 2016. www.hsr.ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf (accessed October 2018).

———. 2018. *2018 Business Plan.* June 1, 2018. www.hsr.ca.gov/docs/about/business_plans/2018_BusinessPlan.pdf (accessed October 2018).

APPENDIX 3.4-A: NOISE AND VIBRATION TECHNICAL REPORT

California High-Speed Rail Authority

San Jose to Merced Project Section

Noise and Vibration Technical Report

February 2022

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

TABLE OF CONTENTS

EXECUTIVE SUMMARY IX
Summary of Effects ix

1 INTRODUCTION 1-1
1.1 Background of the HSR Program 1-1
1.2 Purpose of this Technical Report 1-2
1.3 Organization of this Technical Report 1-2

2 DESCRIPTION OF THE SAN JOSE TO CENTRAL VALLEY WYE PROJECT 2-1
2.1 Summary of Design Features 2-2
2.2 Description of Alternatives 2-10
2.2.1 Alternative 1 2-10
2.2.2 Alternative 2 2-25
2.2.3 Alternative 3 2-34
2.2.4 Alternative 4 (State's Preferred Alternative, CEQA Proposed Project) 2-42
2.3 Impact Avoidance and Minimization Features 2-52

3 LAWS, REGULATIONS, AND ORDERS 3-1
3.1 Federal 3-1
3.1.1 Noise Control Act of 1972 (42 U.S.C. § 4910) 3-1
3.1.2 Occupational Safety and Health Administration Occupational Noise Exposure (29 C.F.R. § 1910.95) 3-1
3.1.3 Federal Railroad Administration 3-1
3.1.4 Federal Transit Administration Guidelines 3-2
3.1.5 Federal Highway Administration Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 C.F.R. Part 772) 3-3
3.2 State 3-3
3.2.1 General Plan Guidelines (Cal. Gov. Code § 65302(f)), Appendix C, Noise Element Guidelines 3-3
3.2.2 California Department of Transportation Traffic Noise Analysis Protocol 3-4
3.2.3 California Noise Control Act of 1973 (Cal. Health and Safety Code, Division 28, Noise Control Act, § 46000 et seq.) 3-5
3.3 Regional and Local 3-5

4 METHODS FOR EVALUATING IMPACTS 4-1
4.1 Noise 4-1
4.1.1 Descriptors 4-1
4.1.2 Resource Study Area 4-3
4.1.3 Impact Criteria 4-4
4.1.4 Methods for Establishing Existing Noise Levels 4-9
4.1.5 Prediction Methods 4-10
4.2 Vibration 4-28
4.2.1 Descriptors 4-28
4.2.2 Resource Study Area 4-30
4.2.3 Impact Criteria 4-31
4.2.4 Methods for Establishing Existing Vibration Levels 4-37
4.2.5 Prediction Methods 4-38

5 EXISTING CONDITIONS AND EFFECTS ANALYSIS 5-1
5.1 Noise 5-1
5.1.1 Existing Noise Environment 5-1
5.1.2 Noise Impact Assessment 5-15
5.2 Vibration 5-94
5.2.1 Existing Vibration Environment 5-94
5.2.2 Vibration Impact Assessment 5-99
5.3 Summary of Impacts 5-127
5.3.1 Noise 5-127
5.3.2 Vibration 5-128
6 REFERENCES 6-1
7 PREPARER QUALIFICATIONS 7-1

Tables

Table 2-1 San Jose to Central Valley Wye Design Options by Subsection 2-4
Table 2-2 Noise and Vibration Impact Avoidance and Minimization Features 2-52
Table 3-1 Applicable Local Plans and Policies 3-5
Table 4-1 Federal Railroad Administration Recommended Screening Distances for Evaluation of HSR Noise Impacts[1] 4-4
Table 4-2 Detailed Assessment Criteria for Construction Noise 4-4
Table 4-3 Federal Railroad Administration Land Use Categories for Noise Exposure 4-5
Table 4-4 Interim Criteria for High-Speed Rail Train Noise Effects on Livestock 4-9
Table 4-5 Assumed 2029 and 2040 Project Operations for Noise Impact Assessment 4-11
Table 4-6 Federal Railroad Administration Noise Source Reference Levels for High-Speed Trains (SELs at 50 feet) 4-13
Table 4-7 Assumed HSR Operating Speeds 4-14
Table 4-8 Existing (2017) Passenger and Freight Train Operations 4-17
Table 4-9 Assumed 2029 Passenger and Freight Train Operations 4-18
Table 4-10 Assumed 2040 Passenger and Freight Train Operations 4-19
Table 4-11 Grade Crossings and Horn-Sounding Locations 4-21
Table 4-12 Benchmark Noise Model Results at 100 mph 4-26
Table 4-13 Benchmark Noise Model Results at 200 mph 4-27
Table 4-14 FRA-Recommended Screening Distances for Vibration Assessments 4-31
Table 4-15 Construction Vibration Damage Criteria 4-31
Table 4-16 Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Assessment 4-32
Table 4-17 Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for Special Buildings 4-33
Table 4-18 Interpretation of Vibration Criteria for Detailed Analysis 4-37
Table 5-1 Ambient Noise Measurement Results 5-7

Table 5-2 Comparison of Existing Noise Model Results to Existing Measurement Results 5-13
Table 5-3 Construction Equipment Noise Emission Levels 5-16
Table 5-4 Construction Activity Noise Levels 5-17
Table 5-5 Differences Among Alternatives 5-19
Table 5-6 Summary of 2029 No Project and 2029 Plus Project Noise Impacts 5-21
Table 5-7 Summary of 2029 No Project and Plus Project Cumulative Noise Impacts 5-22
Table 5-8 Summary of 2040 No Project and 2040 Plus Project Noise Impacts 5-23
Table 5-9 Summary of 2040 No Project and Plus Project Cumulative Noise Impacts 5-44
Table 5-10 Detailed 2040 Plus Project Noise Impacts—Alternative 1 5-46
Table 5-11 Detailed 2040 Plus Project Noise Impacts—Alternative 2 5-49
Table 5-12 Detailed 2040 Plus Project Noise Impacts—Alternative 3 5-53
Table 5-13 Detailed 2040 Plus Project Noise Impacts—Alternative 4 5-57
Table 5-14 Change in 2029 Traffic Noise Levels due to Project—Alternative 1 5-64
Table 5-15 Change in 2029 Traffic Noise Levels due to Project—Alternative 2 5-67
Table 5-16 Change in 2029 Traffic Noise Levels due to Project—Alternative 3 5-70
Table 5-17 Change in 2029 Traffic Noise Levels due to Project—Alternative 4 5-73
Table 5-18 Change in 2040 Traffic Noise Levels due to Project—Alternative 1 5-76
Table 5-19 Change in 2040 Traffic Noise Levels due to Project—Alternative 2 5-79
Table 5-20 Change in 2040 Traffic Noise Levels due to Project—Alternative 3 5-82
Table 5-21 Change in 2040 Traffic Noise Levels due to Project—Alternative 4 5-85
Table 5-22 Screening Distances for Effects on Livestock 5-89
Table 5-23 Transfer Power Facility Noise Analysis Results 5-91
Table 5-24 Existing Vibration Measurement Locations 5-94
Table 5-25 Vibration Propagation Measurement Locations 5-96
Table 5-26 Construction Equipment Vibration Impact Distances (feet) 5-100
Table 5-27 2029 and 2040 Plus Project Potential Vibration Impacts 5-104
Table 5-28 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 1 5-118
Table 5-29 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 2 5-120
Table 5-30 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 3 5-122
Table 5-31 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 4 5-124
Table 5-32 Summary of Impacts 5-129

Figures

Figure 2-1 Proposed San Jose to Merced Project Section 2-2
Figure 2-2 Overview of Subsection Design Options 2-3
Figure 2-3 San Jose Diridon Station Approach Subsection 2-5
Figure 2-4 Monterey Corridor Subsection 2-6

Figure 2-5 Morgan Hill and Gilroy Subsection 2-7
Figure 2-6 Pacheco Pass Subsection 2-8
Figure 2-7 San Joaquin Valley Subsection 2-9
Figure 2-8 Conceptual Diridon Aerial Station Plan 2-12
Figure 2-9 Conceptual San Jose Diridon Station Cross Section 2-13
Figure 2-10 Conceptual Downtown Gilroy Aerial Station Plan 2-18
Figure 2-11 Cross Section of Downtown Gilroy Station (Viaduct) 2-19
Figure 2-12 South Gilroy Maintenance of Way Facility 2-22
Figure 2-13 Maintenance of Way Siding near Turner Island Road 2-25
Figure 2-14 Conceptual Downtown Gilroy Embankment Station Plan 2-31
Figure 2-15 Cross Section of Downtown Gilroy Station (Embankment) 2-32
Figure 2-16 Conceptual East Gilroy Station Plan 2-38
Figure 2-17 Cross Section of East Gilroy Station 2-39
Figure 2-18 East Gilroy Maintenance of Way Facility 2-41
Figure 2-19 Conceptual San Jose Diridon At-Grade Station Plan 2-43
Figure 2-20 Conceptual Downtown Gilroy At-Grade Station Plan 2-48
Figure 2-21 South Gilroy Maintenance of Way Facility for Alternative 4 2-51
Figure 3-1 State of California Land Use Compatibility Guidelines 3-4
Figure 4-1 Typical A-Weighted Maximum Sound Levels 4-2
Figure 4-2 Noise Impact Criteria for High-Speed Rail Projects 4-6
Figure 4-3 Allowable Increase in Cumulative Noise Levels (Land Use Categories 1 & 2) 4-7
Figure 4-4 Allowable Increase in Cumulative Noise Levels (Land Use Category 3) 4-7
Figure 4-5 Distance from Tracks within which Startle Can Occur 4-8
Figure 4-6 Projected HSR 24-Hour Noise Levels versus Distance for Typical Embankment Track Section without Shielding Effects 4-16
Figure 4-7 Propagation of Ground-Borne Vibration into Buildings 4-29
Figure 4-8 Typical Levels of Ground-Borne Vibration and Response to Vibration 4-30
Figure 4-9 FRA Vibration Impact Criteria Flowchart 4-35
Figure 4-10 FRA Criteria for Detailed Vibration Analysis 4-36
Figure 4-11 Force Density Level Spectra Used in the Vibration Analysis 4-40
Figure 4-12 Surface Vibration Propagation Test (cross section) 4-41
Figure 4-13 Borehole Vibration Propagation Test (cross section) 4-42
Figure 5-1 Noise and Vibration Measurement Locations 5-2
Figure 5-2 Noise and Vibration Measurement Locations 5-3
Figure 5-3 Noise and Vibration Measurement Locations 5-4
Figure 5-4 Noise and Vibration Measurement Locations 5-5
Figure 5-5 Noise and Vibration Measurement Locations 5-6
Figure 5-6 2040 Plus Project Noise Impacts—Alternative 1 5-24
Figure 5-7 2040 Plus Project Noise Impacts—Alternative 1 5-25
Figure 5-8 2040 Plus Project Noise Impacts—Alternative 1 without the Tunnel Design Variant 5-26

Figure 5-9 2040 Plus Project Noise Impacts—Alternative 1 with the Tunnel Design Variant 5-27
Figure 5-10 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 without the Tunnel Design Variant 5-28
Figure 5-11 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 with the Tunnel Design Variant 5-29
Figure 5-12 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 without the Tunnel Design Variant 5-30
Figure 5-13 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 with the Tunnel Design Variant 5-31
Figure 5-14 2040 Plus Project Noise Impacts—Alternative 2 5-32
Figure 5-15 2040 Plus Project Noise Impacts—Alternative 2 5-33
Figure 5-16 2040 Plus Project Noise Impacts—Alternative 2 without the Tunnel Design Variant 5-34
Figure 5-17 2040 Plus Project Noise Impacts—Alternative 2 with the Tunnel Design Variant 5-35
Figure 5-18 2040 Plus Project Noise Impacts—Alternative 3 5-36
Figure 5-19 2040 Plus Project Noise Impacts—Alternative 3 5-37
Figure 5-20 2040 Plus Project Noise Impacts—Alternative 3 without the Tunnel Design Variant 5-38
Figure 5-21 2040 Plus Project Noise Impacts—Alternative 3 with the Tunnel Design Variant 5-39
Figure 5-22 2040 Plus Project Noise Impacts—Alternative 4 5-40
Figure 5-23 2040 Plus Project Noise Impacts—Alternative 4 5-41
Figure 5-24 2040 Plus Project Noise Impacts—Alternative 4 without the Tunnel Design Variant 5-42
Figure 5-25 2040 Plus Project Noise Impacts—Alternative 4 with the Tunnel Design Variant 5-43
Figure 5-26 Existing Vibration Measurement Levels 5-96
Figure 5-27 Projected HSR Vibration Levels 5-101
Figure 5-28 Projected HSR Vibration Levels 5-102
Figure 5-29 Comparison of Projected HSR and Caltrain Vibration Levels 5-103
Figure 5-30 2029 and 2040 Plus Project Vibration Impacts—Alternative 1 5-106
Figure 5-31 2029 and 2040 Plus Project Vibration Impacts—Alternative 1 5-107
Figure 5-32 2029 and 2040 Plus Project Vibration Impacts—Alternative 2 5-108
Figure 5-33 2029 and 2040 Plus Project Vibration Impacts—Alternative 2 5-109
Figure 5-34 2029 and 2040 Plus Project Vibration Impacts—Alternative 2 5-110
Figure 5-35 2029 and 2040 Plus Project Vibration Impacts—Alternative 3 5-111
Figure 5-36 2029 and 2040 Plus Project Vibration Impacts—Alternative 3 5-112
Figure 5-37 2029 and 2040 Plus Project Vibration Impacts—Alternative 4 5-113
Figure 5-38 2029 and 2040 Plus Project Vibration Impacts—Alternative 4 5-114
Figure 5-39 2029 and 2040 Plus Project Vibration Impacts—Alternative 4 5-115

ACRONYMS AND ABBREVIATIONS

2016 Business Plan	Connecting and Transforming California: 2016 Business Plan
2018 Business Plan	California High-Speed Rail 2018 Business Plan
µin/sec	microinch per second
ADT	average daily traffic
ATC	automatic train control
Authority	California High-Speed Rail Authority
BART	Bay Area Rapid Transit
Bay Area	San Francisco Bay Area
C.F.R.	Code of Federal Regulations
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	community noise equivalent level
CP	Control Point
dB	decibel(s)
dB/sec	decibels per second
dBA	A-weighted decibel(s)
DDV	Diridon design variant
EIR	environmental impact report
EIS	environmental impact statement
EMU	electric multiple unit
FDL	force density level
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FRA guidance manual	*High-Speed Ground Transportation Noise and Vibration Impact Assessment*
FTA	Federal Transit Administration
FTA guidance manual	*Transit Noise and Vibration Impact Assessment Manual*
GEA	Grasslands Ecological Area
HSR	high-speed rail
Hz	Hertz, cycles per second
I-	Interstate
IAMF	impact avoidance and minimization feature
in/sec	inches per second
kV	kilovolt
L_{dn}	day-night sound level, dBA

L_{eq}	equivalent sound level, dBA
$L_{eq}(h)$	hourly equivalent sound level, dBA
L_{max}	maximum sound level
LSR	line source response
L_v	velocity level, VdB
MOWS	maintenance of way siding
MOWF	maintenance of way facility
mph	miles per hour
MT	mainline track
MVA	megavolt amperes
NEPA	National Environmental Policy Act
PCEP	Peninsula Corridor Electrification Project
PG&E	Pacific Gas and Electric
PPV	peak particle velocity
project extent, project	San Jose to Central Valley Wye Project Extent
Project Section	San Jose to Merced Project Section
PS	paralleling station
PTC	positive train control
RMS	root-mean-square
RSA	resource study area
SEL	sound exposure level, dBA
SR	State Route
Statewide Program EIR/EIS	Final Program Environmental Impact Report (EIR) / Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System
SWS	switching station
TBM	tunnel-boring machine
TDV	tunnel design variant
TPF	traction power facility
TPSS	traction power substation
UPRR	Union Pacific Railroad
US	U.S. Highway
U.S.C.	United States Code
VdB	vibration decibel(s)
VHS	very high-speed
VTA	(Santa Clara) Valley Transportation Authority

EXECUTIVE SUMMARY

The California High-Speed Rail Authority (Authority) has prepared this *San Jose to Merced Project Section Noise and Vibration Technical Report* to support the *San Jose to Merced Project Section Final Environmental Impact Report (EIR)/Environmental Impact Statement (EIS).* This technical report characterizes existing conditions and analyzes noise and vibration effects of four alternatives.

This technical report addresses effects resulting from construction and operations of the San Jose to Merced Project Section (Project Section or project), focusing on the portion of the Project Section between San Jose and Carlucci Road (San Jose to Central Valley Wye Project Extent, or simply the project). It describes relevant federal, state, regional, and local regulations and requirements; methods used for the analysis of effects; the affected environment; impact avoidance and minimization features (IAMF) incorporated into the project design that would avoid, minimize, or reduce specific environmental effects; and the potential effects of noise and vibration in the resource study area (RSA) that would result from construction and operations of the project alternatives. Project noise and vibration effects consist of construction-related noise and vibration effects, high-speed rail (HSR) operations noise and vibration effects, including noise from stations and maintenance facilities, and operations traffic noise effects.

Summary of Effects

This analysis evaluates noise and vibration impacts[1] associated with the four project alternatives for both the construction and operations phases. Construction of the project, including Pacific Gas and Electric (PG&E) network upgrades, would require the use of mechanical equipment that would generate temporary increases in noise and ground-borne vibration and result in temporary construction impacts at noise-sensitive locations. The Authority and its contractors would comply with Federal Transit Administration (FTA) and Federal Railroad Administration (FRA) guidelines for minimizing noise and vibration impacts at sensitive receptors during project construction (NV-IAMF#1: Noise and Vibration), but construction noise and vibration effects would remain.

Project operations would permanently increase noise levels above existing ambient noise levels, potentially resulting in environment noise impacts at sensitive receptors. Alternative 4 would have the most severe and moderate operations noise impacts, followed by Alternative 2, Alternative 1, and Alternative 3 under the 2040 Plus Project conditions. Under the 2040 Plus Project condition, there would be 337 severe noise impacts and 1,200 moderate impacts under Alternative 1; there would be 755 severe impacts and 1,844 moderate impacts under Alternative 2; there would be 222 severe impacts and 834 moderate impacts under Alternative 3; and there would be 1,212 severe impacts and 1,666 moderate impacts under Alternative 4.

With the Diridon design variant (DDV) and tunnel design variant (TDV) under the 2040 Plus Project condition, there would be 347 severe noise impacts and 1,195 moderate impacts under Alternative 1; there would be 766 severe impacts and 1,838 moderate impacts under Alternative 2; there would be 233 severe impacts and 845 moderate impacts under Alternative 3; and there would be 1,224 severe impacts and 1,658 moderate impacts under Alternative 4.

Project operations would generate traffic and associated noise at HSR stations. Near the San Jose Diridon Station, the largest day-night sound level (L_{dn}) contribution from the parking facilities at nearby noise receptors would be 29 A-weighted decibels (dBA). Near the Downtown Gilroy Station, the largest L_{dn} contribution from the parking facilities at the nearby noise receptors would be 40 dBA. Near the East Gilroy Station, the largest L_{dn} contribution from the parking facilities at nearby noise receptors would be 28 dBA. The additional noise from parking facilities would be substantially lower (at least 18 dBA lower) than the projected L_{dn} from project operations.

[1] The terms *impact* and *effect* have the same meaning in this document. The use of the term “impact” in this document does not imply that the impact is necessarily significant as defined in NEPA or CEQA. Instead, the term refers to an effect that may exceed a relevant FRA or FTA impact criteria level. The significance impact determinations are made in the EIR/EIS section and not in this document.

Project operations would also generate additional noise associated with train movements in and out of the maintenance of way facility (MOWF) near Gilroy. Under Alternatives 1 and 2, the L_{dn} contribution from the South Gilroy MOWF at the nearest receptor would be 40 dBA (more than 20 dBA below HSR operations). Under Alternative 3, the L_{dn} contribution from the East Gilroy MOWF at the nearest receptor would be 47 dBA (more than 20 dBA below HSR operations). Under Alternative 4, the L_{dn} contribution from the MOWF at that nearest receptor would be 45 dBA (i.e., more than 18 dBA below HSR operations). The MOWFs would not contribute to noise impacts of nearby sensitive receptors under any of the alternatives.

The potential for passing HSR train noise to startle or surprise humans near the HSR track and result in human annoyance is included in this analysis as "additional information" per FRA guidance (FRA 2012). Annoyance and startle effects for humans would be primarily limited to areas within the project's proposed right-of-way and limited areas adjacent to the right-of-way. Analysts also evaluated the potential for livestock to experience stress associated with the noise of passing trains in exceedance of the FRA's recommended threshold. Livestock within approximately 30 feet of the edge of the HSR right-of-way would experience startle effects and stress from train passbys, and livestock within 65 feet of horn-sounding locations would experience startle effects and stress from horn sounding. Noise effects on wildlife are evaluated separately in the *San Jose to Merced Project Section Biological and Aquatic Resources Technical Report* (Authority 2019a).

Construction of the project would result in temporary and permanent changes in the local roadway network that would require some diversion and rerouting of traffic. The diversion of traffic would not be expected to affect noise levels because traffic on local roadways provides only a minor contribution to overall noise levels.

Project operations would generate additional traffic and traffic-related noise under the 2029 Plus Project and 2040 Plus Project conditions. Permanent increases in traffic-related noise would be similar for all four alternatives and would occur at roadway segments near San Jose Diridon Station, along Monterey Corridor, and near Gilroy. In 2029, seven roadway segments under Alternatives 1 and 2 and six roadway segments under Alternatives 3 and 4 would have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. In 2040, operations of each project alternative would result in 12 roadway segments with the potential for noise level increases greater than or equal to 3 dB. The majority of these traffic noise impacts would occur near the San Jose Diridon Station and along Monterey Road.

Traction power facilities would generate noise, potentially affecting receptors within 110 feet of TPF serving the Project (2029 and 2040). In all cases, receptors would also be affected by HSR train operations TPF operations would not result in moderate or severe noise impacts on their own (absent train operations) for any alternative.

Construction of the project would require the use of mechanical equipment that would generate temporary increases in ground-borne vibration which could result in human annoyance and building damage. Construction activities, such as pile driving, would have the potential to cause structural damage to buildings close to these activities (within 50 feet). Most construction activities would only have the potential to cause annoyance from vibration within 160 feet of the mechanical equipment. Some equipment, such as pile driving or ongoing demolition work would have the potential to cause annoyance from vibration within 300 feet. Construction of tunnels in the Pacheco Pass Subsection would have the potential to generate temporary increases in ground-borne vibration that would reach 64 VdB at the closest receptor at 200 feet slant distance and would not be perceptible in buildings proximate to the tunnel boring machine (TBM) operations.

Project operations would have the potential to result in permanent increases in vibration levels at sensitive receptors. The evaluation of potential vibration impacts for the project alternatives indicates that there is a greater potential for vibration impacts associated with Alternative 4, followed by Alternative 2, Alternative 3, and Alternative 1.

1 INTRODUCTION

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- Where appropriate, the verb "would," when used specifically to describe impact avoidance and minimization features (IAMF) or mitigation measures, as well as their directly related activities, was changed to "will," indicating their integration into project design.
- A typographic error in the noise measurement data for noise measurement location N128 was corrected in Table 5-1. Corrections to Figures B-168, B-169, and B-170 for this measurement site were made in Appendix B, Noise Measurement Data, and Draft EIR/EIS Figure B-171 for this measurement site was deleted.
- Analysis about the DDV and TDV was included in this appendix. Figures 5-9, 5-11, 5-13, 5-17, 5-21, and 5-25 were added to illustrate these effects, and Tables 5-6, 5-7, 5-8, 5-9, 5-10, 5-11, 5-12, and 5-13 were updated to include effects of the DDV and TDV.
- As a result of public comments, revisions were made to the Alternative 4 noise impact assessment to correct errors in the analysis. This changed the number of noise impacts in the San Jose Diridon Station Approach, Monterey Corridor, and the Morgan Hill and Gilroy Subsections. Changes were made to Figures 5-22, 5-23, and 5-24 and Tables 5-6, 5-7, and 5-8.
- Changes were made to Figures 5-6, 5-7, 5-8, 5-14, 5-15, 5-16, 5-18, 5-19, and 5-20.
- Additional noise-sensitive receptors were identified and determined to have noise impacts under all alternatives in the Pacheco Pass and San Joaquin Valley Subsections. Changes were made to Figures 5-10, 5-11, 5-12, and 5-13 and Tables 5-6, 5-7, and 5-8.

This report presents a noise and vibration technical evaluation for the California High-Speed Rail San Jose to Merced Project Section (Project Section or project), focusing on the portion of the Project Section between San Jose and Carlucci Road (San Jose to Central Valley Wye Project Extent, or simply the project), prepared in support of environmental reviews required under the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA).

1.1 Background of the HSR Program

The California High-Speed Rail Authority (Authority) proposes to build, operate, and maintain an electric-powered high-speed rail (HSR) system in California, connecting the San Francisco Bay Area and Central Valley to Southern California. When completed, the nearly 800-mile train system would provide new passenger rail service to more than 90 percent of the state's population. More than 200 weekday trains would serve the statewide intercity travel market. The system would be capable of operating speeds up to 220 miles per hour (mph) in certain HSR sections, with state-of-the art safety, signaling, and automatic train control systems. The California HSR System would connect and serve the state's major metropolitan areas, extending from San Francisco to Los Angeles and Anaheim in Phase 1, with extensions to Sacramento and San Diego in Phase 2.

The Authority and Federal Railroad Administration (FRA) commenced their tiered environmental planning process with the *2005 Final Program Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System* (Statewide Program EIR/EIS) (Authority and FRA 2005), followed by the *Bay Area to Central Valley High-Speed Train Final Program EIR/EIS* (Authority and FRA 2008). These documents established the HSR sections constituting the California HSR System and evaluated the impacts of proposed HSR corridors. After completion of the first-tier programmatic environmental documents, the Authority and FRA approved the HSR system, selected corridors and stations for further study, and began preparing second-tier project environmental evaluations for sections of the statewide HSR system. Chapter 2, Description of the San Jose to Central Valley Wye Project Extent, provides details of the project and the four alternatives under consideration.

1.2 Purpose of this Technical Report

This report supports the San Jose to Merced Project Section Final EIR/EIS. The resource assessment presented in this report is consistent with the Authority and FRA's *California High Speed Rail Project EIR/EIS Environmental Methodology Guidelines Version 5.09* (Version 5 Environmental Methods), adopted in April 2017 (Authority and FRA 2017) and the following federal guidelines established by the FRA, Federal Transit Administration (FTA), and Federal Highway Administration (FHWA):

- ***High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA guidance manual) (FRA 2012)—** Establishes guidelines for the evaluation of noise and vibration impacts associated with HSR trains;
- ***Transit Noise and Vibration Impact Assessment* (FTA guidance manual) (FTA 2018)—** Establishes methodology applicable to HSR station activities, yard and maintenance facility activities, and conventional-speed rail operations;
- ***Roadway Construction Noise Model* (FHWA 2006)—**Guidance used in conjunction with the FRA guidance manual to assess construction noise.

1.3 Organization of this Technical Report

This technical report comprises the following chapters in addition to this introductory chapter:

- Chapter 2 describes the project alternatives as currently proposed.
- Chapter 3, Laws, Regulations, and Orders, describes federal, state, regional and local laws, regulations, and policies relevant to noise and vibration.
- Chapter 4, Methods for Evaluating Effects, provides an overview of noise and vibration descriptors, describes the noise and vibration resource study area (RSA), the impact assessment criteria, and the noise and vibration prediction methodology used in the assessment.
- Chapter 5, Existing Conditions and Effects Analysis, describes the environmental setting and assesses the construction and operations effects related to noise and vibration.
- Chapter 6, References, provides complete reference information for the published, online, agency, institutional, and individual sources consulted in preparation of this report.
- Chapter 7, Preparer Qualifications, presents the credentials of the staff who oversaw the preparation of this report.
- Supporting information is provided in the following appendices:
  - Appendix A, Measurement Site Photographs
  - Appendix B, Noise Measurement Data
  - Appendix C, Vibration Propagation Measurement Data

2 DESCRIPTION OF THE SAN JOSE TO CENTRAL VALLEY WYE PROJECT

The Project Section would provide HSR service between Diridon Station in downtown San Jose and a station in downtown Merced, with a Gilroy station either in downtown Gilroy or east of Gilroy. The Project Section is designed to allow trains to and from the Bay Area to transition smoothly from north-south to east-west travel with a minimum reduction in speed to achieve the Proposition 1A operational service time requirement. Proposition 1A requires that the system be designed to be capable of a nonstop operational service time of 2 hours and 10 minutes between San Jose and Los Angeles Union Station.[2] The Project Section follows existing transportation corridors to the extent feasible, as directed by Proposition 1A.[3]

The Project Section is comprised of three project extents (Figure 2-1):

- From Scott Boulevard in Santa Clara to Carlucci Road in Merced County, at the western terminus of the Central Valley Wye (the project)
- The Central Valley Wye, which connects the east-west portion of HSR from the Bay Area to the Central Valley with the north-south portion from Merced to Fresno
- The northernmost portion of the Merced to Fresno Project Section, from the northern limit of the Central Valley Wye (Ranch Road) to the Merced Station

The project would connect San Jose to the Central Valley portion of the HSR system at the Central Valley Wye in Merced County, which in turn connects to the portion of the system running north to Merced and south to Fresno and Southern California. Because the portion of the Project Section between Carlucci Road and Merced has been analyzed in the *Merced to Fresno Section Final EIR/EIS* (Authority and FRA 2012) and the *Merced to Fresno Section: Central Valley Wye Supplemental EIR/EIS* (Authority 2019b), the analysis in this document focuses on the project extent between Scott Boulevard and Carlucci Road (the project).

[2] Proposition 1A requires that the HSR system be designed to achieve a nonstop operational service time of 2 hours and 40 minutes between San Francisco and Los Angeles Union Station, including a 30-minute ride between San Francisco and San Jose (Streets & Highways Code § 2704.09(b)(4)).

[3] Proposition 1A directs that the HSR system maximize use of existing transportation and utility corridors to the extent feasible (Streets & Highways Code § 2704.09(g)).

Source: Authority 2019c JUNE 2019

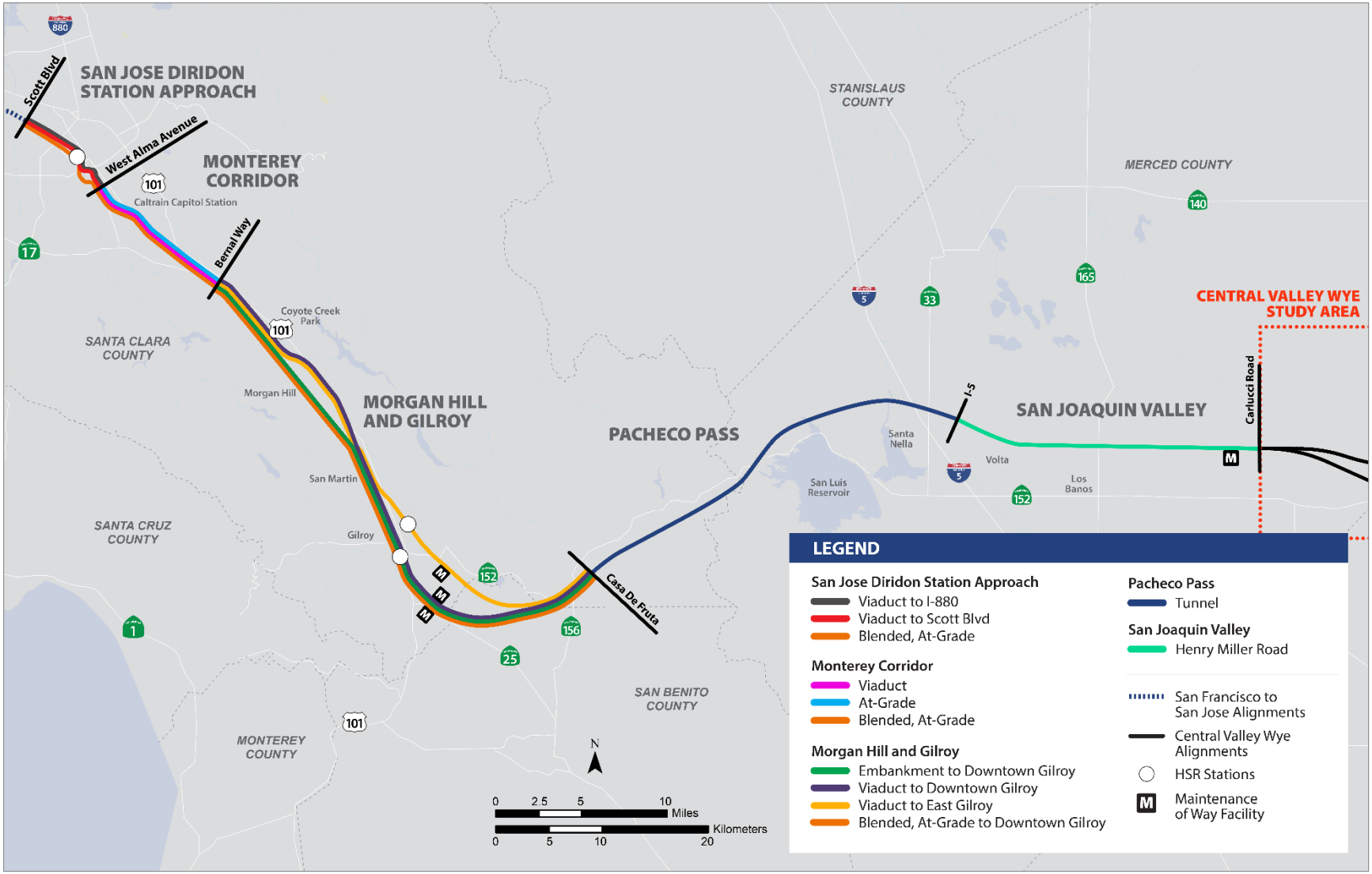
Figure 2-1 Proposed San Jose to Merced Project Section

2.1 Summary of Design Features

While the northern service limit of the project would be the San Jose Diridon Station, the engineering design and evaluation includes infrastructure and train operations north to Scott Boulevard to serve the San Jose Diridon Station; this additional analysis overlaps with the analysis of the San Francisco to San Jose Project Section to the north. The project is an approximately 90-mile portion of the 145-mile-long Project Section, which includes dedicated or blended[4] HSR track and systems; HSR stations located at San Jose Diridon and Gilroy; a maintenance of way facility (MOWF) in the Gilroy area; and a maintenance of way siding (MOWS) near Turner Island Road in the Central Valley (Figure 2-2). HSR stations at San Jose Diridon and Gilroy would support transit-oriented development, provide an interface with regional and local mass transit services, and provide connectivity to the South Bay and Central Valley highway network.[5] While the northern service limit of the project would be the San Jose Diridon Station, the engineering design and evaluation includes train operations north to Scott Boulevard in Santa Clara to support the independent utility of an HSR station at Diridon Station and to describe the proposed interface of HSR alternatives with blended Caltrain railroad infrastructure. This additional analysis between San Jose Diridon Station and Scott Boulevard overlaps with the analysis of the San Francisco to San Jose Project Section to the north. Under three alternatives, the transition of HSR infrastructure and operations from the blended system between San Francisco and Santa Clara to a fully dedicated system south of the San Jose Diridon Station would occur at either Scott Boulevard or near Interstate (I-) 880. A fourth alternative would extend the blended system through San Jose to Gilroy. The project would extend south from San Jose to Gilroy, then east through the Pacheco Pass to the Central Valley to end at Carlucci Road, the western boundary of the Central Valley Wye.

4 *Blended* refers to operating HSR trains with existing intercity, commuter, and regional trains on shared infrastructure.

5 *South Bay* refers to Santa Clara County.



Source: Authority 2019c

JUNE 2019

Figure 2-2 Overview of Subsection Design Options

The project comprises the following five subsections:

- **San Jose Diridon Station Approach**—Extends approximately 6 miles from north of San Jose Diridon Station at Scott Boulevard in Santa Clara to West Alma Avenue in San Jose. This subsection includes San Jose Diridon Station and overlaps the southern portion of the San Francisco to San Jose Project Section.
- **Monterey Corridor**—Extends approximately 9 miles from West Alma Avenue to Bernal Way in the community of South San Jose. This subsection is entirely within the city of San Jose.
- **Morgan Hill and Gilroy**—Extends approximately 30–32 miles from Bernal Way in the community of South San Jose to Casa de Fruta Parkway/State Route (SR) 152 in the community of Casa de Fruta in Santa Clara County.
- **Pacheco Pass**—Extends approximately 25 miles from Casa de Fruta Parkway/SR 152 to I-5 in Merced County.
- **San Joaquin Valley**—Extends approximately 18 miles from I-5 to Carlucci Road in unincorporated Merced County.

The Authority and FRA have developed four end-to-end alternatives for the project (Figure 2-2). Table 2-1 shows the design options that distinguish the alternatives by subsection; Figures 2-3 through 2-7 illustrate the features of the four alternatives by subsection.

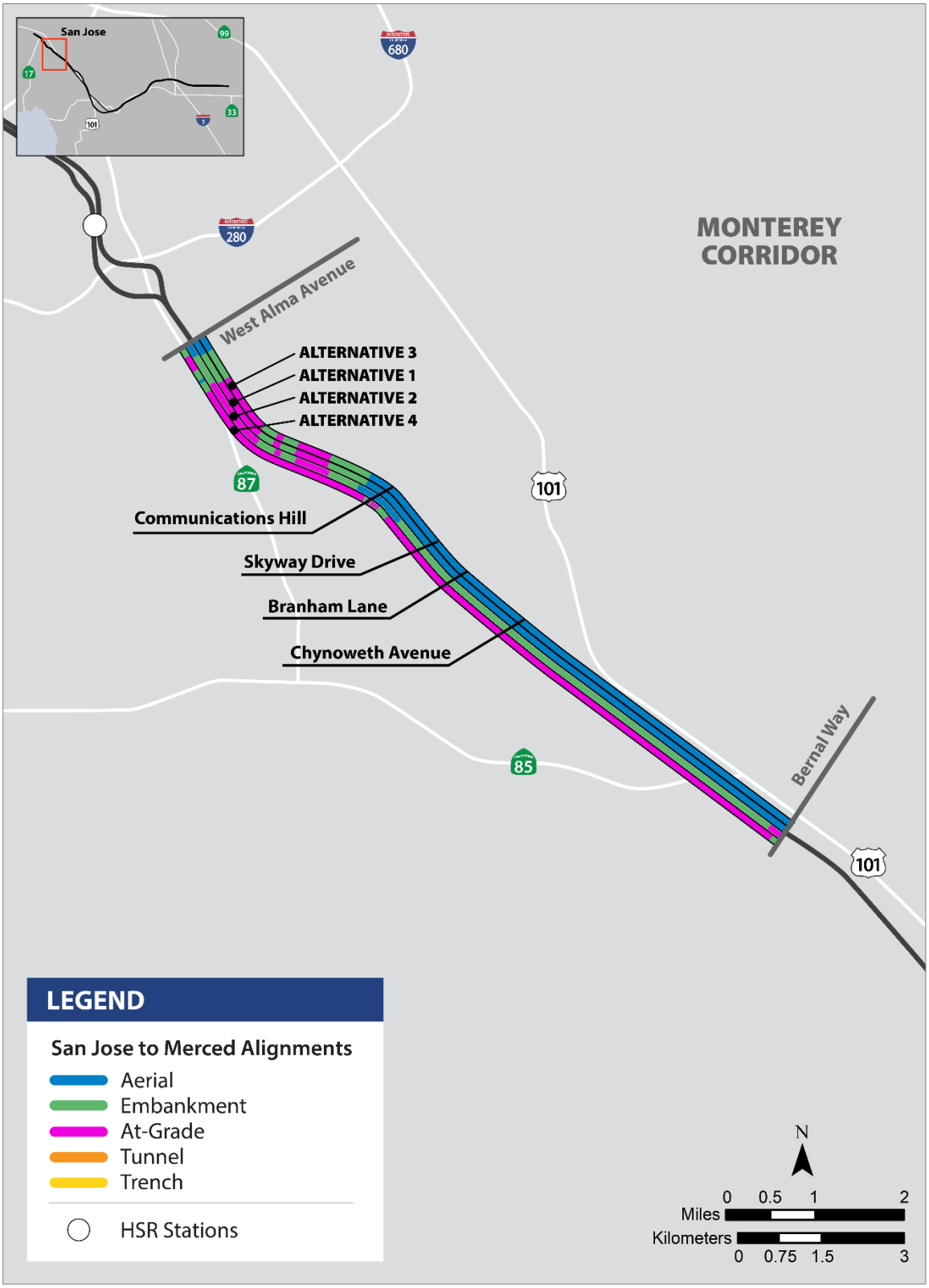
Table 2-1 San Jose to Central Valley Wye Design Options by Subsection

Subsection/Design Options	Alternative 1	Alternative 2	Alternative 3	Alternative 4
San Jose Diridon Station Approach				
Viaduct to Scott Boulevard		X	X	
Viaduct to I-880	X			
Blended, At-Grade				X
Monterey Corridor				
Viaduct	X		X	
At grade		X		
Blended, At-Grade				X
Morgan Hill and Gilroy				
Embankment to downtown Gilroy		X		
Viaduct to downtown Gilroy	X			
Viaduct to east Gilroy			X	
Blended, At-Grade to downtown Gilroy				X
Pacheco Pass				
Tunnel	X	X	X	X
San Joaquin Valley				
Henry Miller Road	X	X	X	X

Source: Authority 2019c

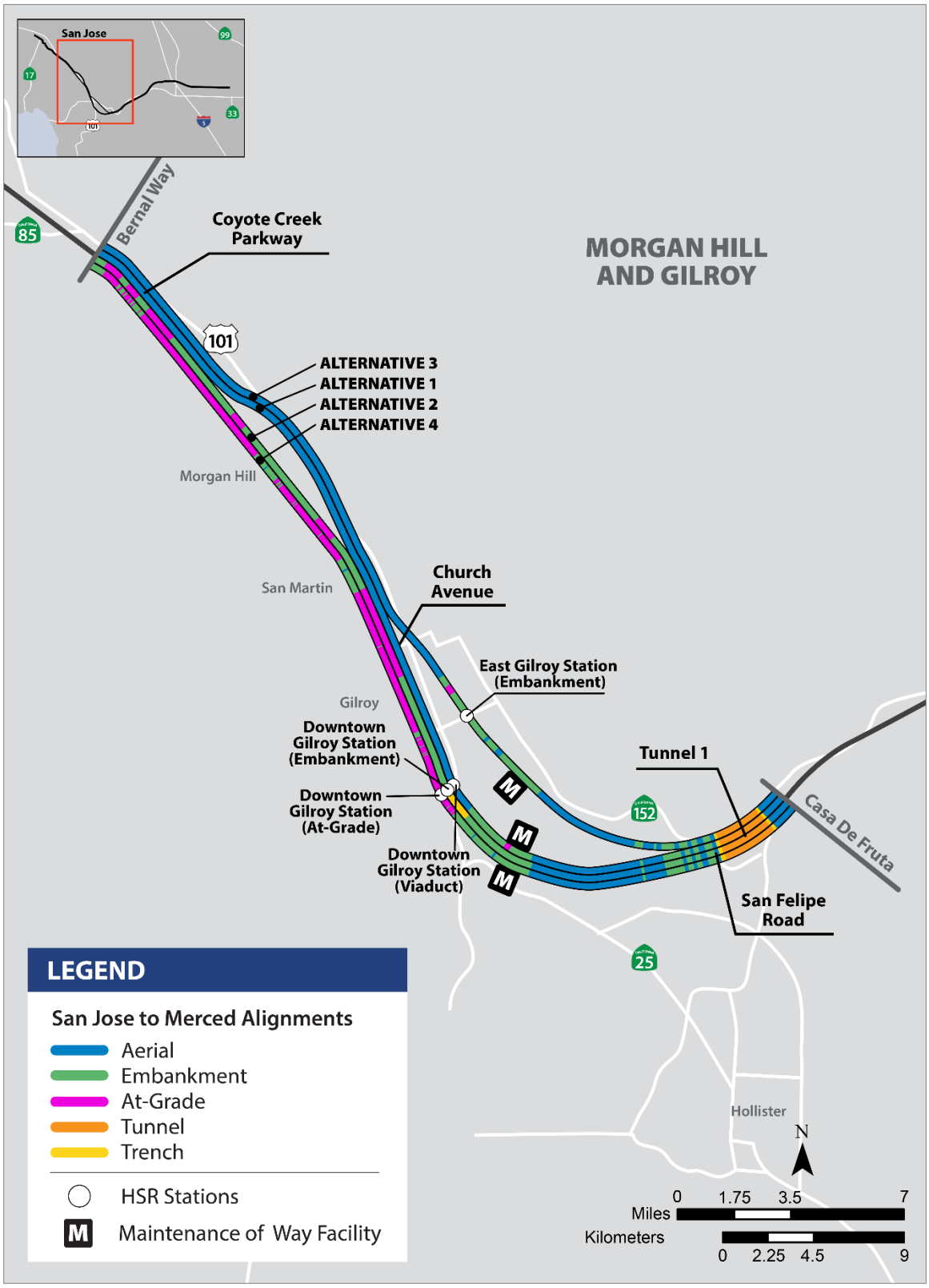
Source: Authority 2019c JUNE 2019
CEMOF = Centralized Equipment Maintenance and Operation Facility

Figure 2-3 San Jose Diridon Station Approach Subsection



Source: Authority 2019c JUNE 2019

Figure 2-4 Monterey Corridor Subsection



Source: Authority 2019c

JUNE 2019

Figure 2-5 Morgan Hill and Gilroy Subsection

Source: Authority 2019c

JUNE 2019

Figure 2-6 Pacheco Pass Subsection

Source: Authority 2019c JUNE 2019

Figure 2-7 San Joaquin Valley Subsection

2.2 Description of Alternatives

This section describes the proposed design options of the project alternatives in each subsection. The alternatives are similar in length, differing only in the Morgan Hill and Gilroy Subsection, where divergent alignments in Morgan Hill and the alternative alignments through the Downtown Gilroy Station and the East Gilroy Station result in linear variations.

2.2.1 Alternative 1

Development of Alternative 1 was intended to minimize the project footprint, minimize ground disturbance, minimize continuous surface features, and decrease necessary right-of-way acquisition through extensive use of viaduct structures and bypassing downtown Morgan Hill. The HSR alignment for this alternative would consist of 45.4 miles of viaduct, 4.3 miles at grade, 21.9 miles of embankment, two tunnels totaling 15.0 miles, and 2.3 miles in trench.

2.2.1.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

The San Jose Diridon Station Approach Subsection, from Scott Boulevard in Santa Clara to West Alma Avenue in San Jose, would be approximately 6 miles through the cities of Santa Clara and San Jose (Figure 2-3). The existing Caltrain track in this subsection consists of a predominantly two-track and three-track at-grade alignment. South of De La Cruz Boulevard, the Union Pacific Railroad (UPRR) tracks of the Coast Line from the northeast converge with the Caltrain corridor tracks and continue south adjacent to the east side of the railroad corridor to the Santa Clara Caltrain Station. Between the Caltrain College Park Station and San Jose Diridon Station, Caltrain's Central Equipment Maintenance and Operations Facility comprises three mainline tracks, a maintenance building, and nine yard tracks. San Jose Diridon Station includes five passenger platforms served by nine yard tracks along the west side of the station house. HSR diverges from the Caltrain corridor at Park Avenue, just south of San Jose Diridon Station, and returns to the Caltrain corridor at the north end of the Caltrain Tamien Station, which includes a passenger platform served by two tracks and a single through-track.

Alternative 1 would begin at Scott Boulevard in blended service with Caltrain at grade. The blended service would entail several minor realignments of existing Caltrain track between Scott Boulevard and I-880. New UPRR and Caltrain track would be constructed just north of the HSR guideway beginning north of I-880 to just past the Santa Clara Station.

Beginning at I-880 on the southbound approach to West Hedding Street, Caltrain tracks would be realigned to accommodate the HSR tracks. Dedicated HSR tracks would diverge from the Caltrain Mainline Track (MT) 2 and MT3 tracks and continue southeast along the north side of the existing Caltrain corridor, crossing under West Hedding Street. To accommodate the new track configuration, the West Hedding Street roadway overpass would be replaced with a new overpass bridge that would also pass over Stockton Avenue.

Southeast of West Hedding Street, the dedicated HSR tracks would transition from a two-track at-grade configuration to retained fill and finally to a two-track aerial profile. The HSR alignment would begin the short viaduct option by rising on embankment to an approximately 70-foot-high aerial structure. A new bridge structure would be built to carry the realigned UPRR/Caltrain MT2 tracks over the West Taylor Street underpass. University Avenue would become a cul-de-sac. A new pedestrian underpass would be constructed near the alignment of Emory Street to allow Caltrain riders to reach both platforms of the Caltrain College Park Station. The HSR viaduct would also cross over West Taylor Street, then shift horizontally a maximum of 500 feet east of the existing UPRR/Caltrain mainline tracks to maintain high-speed track curvature.

Both legs of the UPRR Warm Springs Subdivision Lenzen Wye would be relocated, and North Montgomery Street would be extended north of the alignment of Lenzen Avenue almost to the former Lenzen Wye to maintain property access beneath the 60-foot-high HSR viaduct. The HSR viaduct would cross over Cinnabar Street, both legs of the relocated Lenzen Wye and North Montgomery Street, West Julian Street, and West Santa Clara Street while curving west toward

the UPRR/Caltrain mainline tracks to enter a new aerial dedicated HSR station at San Jose Diridon Station.

Continuing on an aerial structure, the alignment would diverge from the Caltrain right-of-way south of the San Jose Diridon Station HSR platforms by turning sharply east at the Park Avenue undercrossing of UPRR/Caltrain tracks. The HSR aerial structure would cross over Los Gatos Creek and San Carlos Street, then over Royal Avenue and the intersection of Bird Avenue and Auzerais Avenue, then over the I-280/SR 87 interchange. Continuing south along the east side of SR 87, the HSR aerial structure would cross over West Virginia Street and the Guadalupe River Trail, then over the Caltrain rail bridge, the Guadalupe River, and Willow Street. The HSR aerial structure would continue south over the Caltrain Tamien Station on an alignment between Tamien Station and the SR 87 freeway, transitioning to the Monterey Corridor Subsection at West Alma Avenue.

Wildlife Crossings

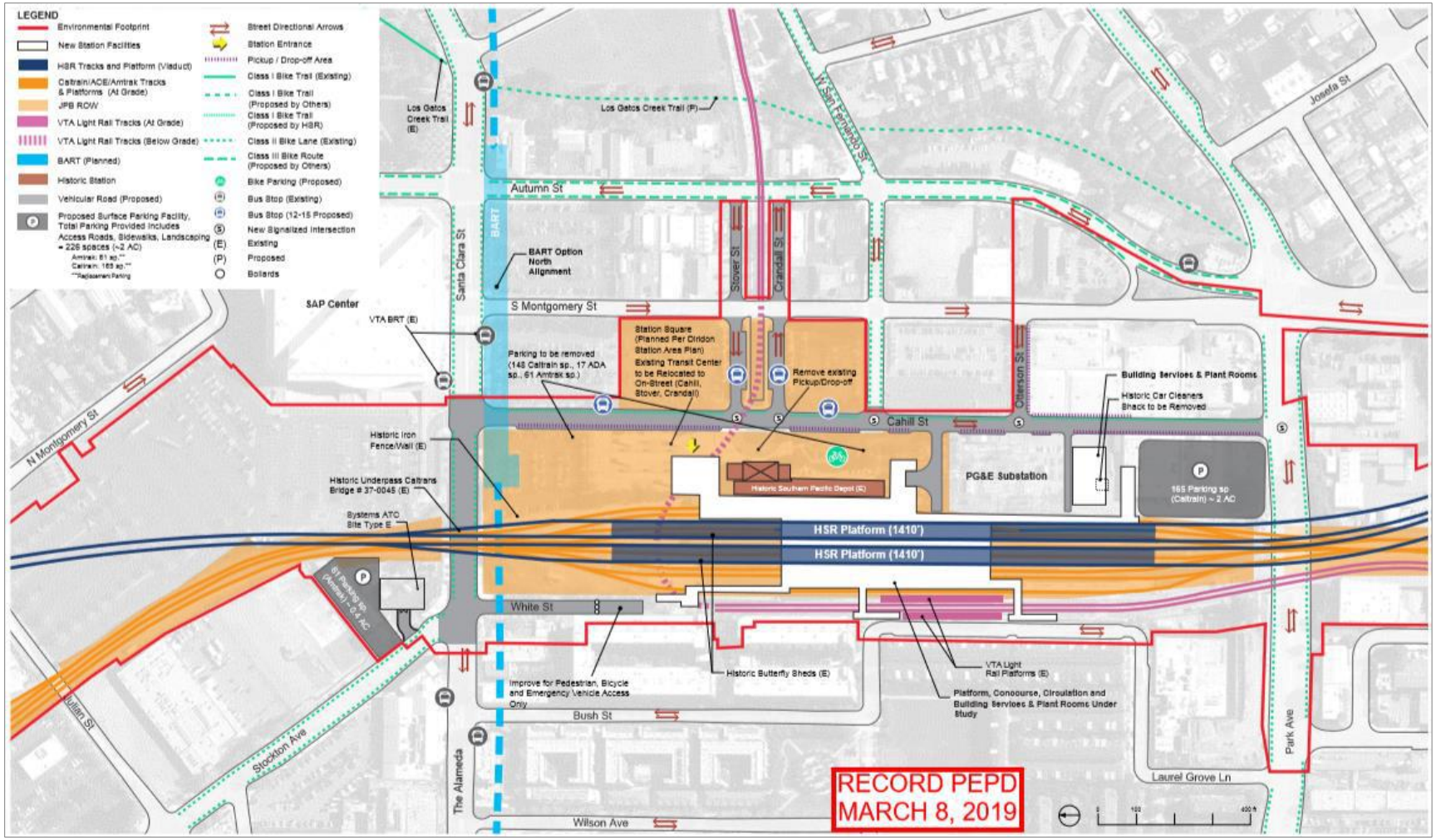
There would be no wildlife crossings in this subsection.

Stations

The HSR San Jose Diridon Station would entail a four-track aerial alignment over the existing Diridon Station at approximately 62 feet to top of rail with 1,410-foot-long platforms above the existing Caltrain rail yard centered between Santa Clara Street and Park Avenue. The existing historic train station would remain in place. As illustrated on Figures 2-8 and 2-9, the primary HSR station building would be constructed north of the existing station building but would continue to the south, wrapping around the existing Caltrain station building. The HSR station building would be accessed from the east at three entrances—the main entrance on the east side of the tracks north of the existing Historic Depot next to the future Bay Area Rapid Transit (BART) alignment; an entrance south of the existing historic Diridon Station building; and an entrance on the east side south of the Pacific Gas and Electric Company (PG&E) power station. There would also be three entrances to the HSR station on the west side of the tracks—a north entrance at the end of White Street and two entrances on Laurel Grove Lane, one north and one south. The aerial station would require viaduct columns within the PG&E substation. The HSR station building would encompass 99,289 square feet with a 4,400-square-foot substation and systems building. The concourse would consist of a mezzanine level above the existing Caltrain tracks and below the HSR platforms, with three east-west connections across the tracks at the north, south, and middle.

Existing parking spaces (226) at Cahill Street would be displaced and replaced 1:1 with new parking areas at Cahill and Park Streets and at Stockton and Alameda Streets. HSR parking demand of 1,050 spaces in 2040 would be met by commercially available parking downtown or at the airport. The Authority has provided a Station Area Planning grant to the City of San Jose to advance the implementation of the Diridon Station Area Plan adopted by the San Jose City Council. Through this effort, the City would address short-term parking needs during HSR and BART Phase II construction and would also address plans for transitioning the parking needed during construction to the highest and best use after construction. Another Station Area Planning grant to the (Santa Clara) Valley Transportation Authority (VTA) would fund a San Jose Diridon Station Facilities Master Plan. This grant would develop a parking program to manage parking demand and supply over time to reflect changes in ridership and park-and-ride mode share. These two studies would provide input into a multimodal access plan for the station that would be developed prior to final station design and construction.

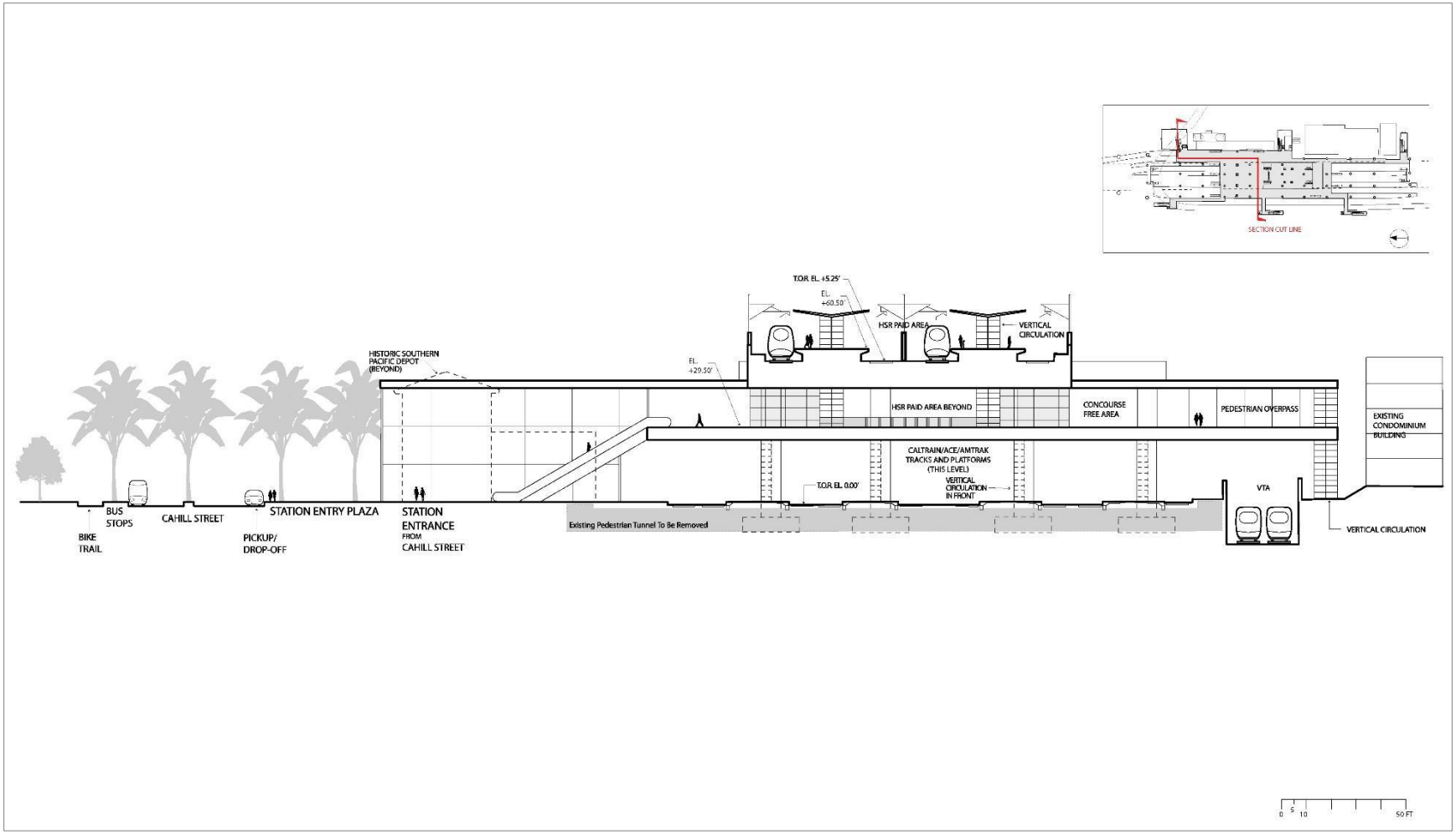
Existing underutilized parking capacity at and around the station would be used to meet the estimated HSR parking demand until a station area parking policy and program are implemented. The Authority would rely on commercially available parking to meet HSR parking demand, provided and priced in accordance with local conditions. HSR riders would be able to walk or take a shuttle, such as the City of San Jose's DASH, from parking located downtown or adjacent to the station.



Source: Authority 2019c

JUNE 2019

Figure 2-8 Conceptual Diridon Aerial Station Plan



Source: Authority 2019c

JUNE 2019

Figure 2-9 Conceptual San Jose Diridon Station Cross Section

The existing off-site bus transit center would be relocated to an on-street facility on Cahill, Stover, and Crandall Streets. Street improvements would include reconfiguring and extending Cahill Street from Santa Clara Street to Park Avenue, and converting Cahill, Stover, and Crandall Streets to a transit street with 12–15 bus stops. Montgomery Street would be reconfigured to provide curb space for a bus layover. A pick-up/drop-off zone of 1,900 square feet would be provided. New two-way cycle tracks would be installed on the east side of Cahill Street. A 4,000-square-foot bicycle facility would be constructed. New signals and pedestrian crossings would be developed at Cahill and Park, Otterson, Stover, West San Fernando, and Crandall Streets.

Other rail operators in the station area are Caltrain, Altamont Corridor Express, Amtrak, VTA light rail, and future BART. VTA has plans to construct new light rail station platforms as a separate project, and BART plans to extend service from the Berryessa Station to Santa Clara with a stop at Diridon by 2026. As a separate project, VTA has plans to construct new light rail station platforms.

Traction Power Sites and Power Connections

One new traction power substation (TPSS) would be constructed in this subsection on the east side of the Caltrain corridor south of I-880 in San Jose (just southeast of the I-880 overcrossing). The TPSS would be interconnected to two new gas-insulated substation breaker-and-a-half bays. The bays would be installed within the fenceline of the PG&E FMC substation, just north of the I-880 overcrossing, via an aerial double-circuit 115-kilovolt (kV) tie-line.

Train Control and Communication Facilities

An enhanced ATC system would control the trains and comply with the FRA-mandated positive train control requirements, including safe separation of trains, over-speed prevention, and work zone protection. This system would include communications towers at intervals of approximately 1.5–3 miles. Signaling and train control elements within the right-of-way would include 10- by 8-foot communications shelters that house signal relay components and microprocessor components, cabling to the field hardware and track, signals, and switch machines on the track. Communications towers in these facilities would use a 6- to 8-foot-diameter 100-foot-tall pole. The communications facilities would be located near track switches and would be grouped with other traction power, maintenance, station, and similar HSR facilities where possible. Where communications towers cannot be co-located with TPSSs or other HSR facilities, the communications facilities would be sited near the HSR corridor in a fenced area approximately 20 by 15 feet.

Under Alternative 1, there would be six ATC sites located between I-880 in San Jose and the I-280 and SR 87 interchange:

- Two sites near the TPSS facility
- One site just north of the San Jose Diridon Station
- Three sites between Park Avenue and the proposed HSR crossing of SR 87

One stand-alone communications radio site would be constructed, at one of two alternative locations, both south of Scott Boulevard along the east side of the Caltrain corridor.

Maintenance Facility

No maintenance facilities are proposed for this subsection.

2.2.1.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The Monterey Corridor Subsection would be approximately 9 miles long and entirely within the San Jose city limits. From the San Jose Diridon Station Approach Subsection at West Alma Avenue, just south of the Caltrain Tamien Station, the alignment would extend primarily southeast to Bernal Way (Figure 2-4). Alternative 1 would be on viaduct in the median of Monterey Road. UPRR MT1, Caltrain MT2, and Caltrain storage tracks would be shifted east between West Alma Avenue and Caltrain/UPRR control point (CP) Lick, at the southeast base of Communications Hill.

Railroad bridges over Almaden Road and Almaden Expressway would be extended to accommodate the track shift. The UPRR Luther spur track south of Almaden Expressway would also be relocated to accommodate the MT shifts.

From West Alma Avenue, the HSR alignment would descend from a viaduct 54 feet above grade to embankment (i.e., 5 feet or higher) north of Almaden Road. The alignment would continue primarily on embankment to cross over Almaden Road on a short aerial structure, then under Almaden Expressway, then continue south on embankment to at grade under Curtner Avenue. The alignment would continue south primarily at grade along the northern base of Communications Hill and ascend to aerial structure before crossing over and entering the Monterey Road median just south of Hillsdale Avenue. Construction of the viaduct over the existing Caltrain Capitol Station would require falsework over the station if constructed by cast-in-place methods or would require relocating the station 500 feet to the south if constructed by precast segments. The alignment would continue south on viaduct in the median of Monterey Road, crossing over Capitol Expressway, Skyway Drive, Branham Lane, Roeder Road/Chynoweth Avenue, Blossom Hill Highway, SR 85/West Valley Freeway, and Bernal Road.

The design assumes a reduction from six to four travel lanes on Monterey Road, beginning south of Southside Drive and continuing to a short distance south of Blossom Hill Road where the existing roadway is already four travel lanes. Three existing mid-block left-turn lanes would be closed because of substandard stopping sight distance. Additionally, the design assumes a combined left-turn and through lane at Palm Avenue.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Two traction power paralleling stations would be constructed in this subsection:

- North of the alignment near Curtner Avenue or south of the alignment at Communications Hill
- South of SR 85 or between Bernal Road and the Bernal Road ramp onto Monterey Road

Train Control and Communication Facilities

One ATC site would be constructed in the Monterey Corridor Subsection at one of two locations east of the guideway in the vicinity of Chynoweth Avenue.

Three stand-alone communications radio sites are proposed:

- Near Almaden Road on the east side of the Caltrain corridor (two site options)
- Near Capitol Expressway (two site options)

Maintenance Facility

No maintenance facilities are proposed for this subsection.

2.2.1.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection would be approximately 30 to 32 miles long and located south of the Monterey Corridor Subsection (Figure 2-5). From Bernal Way in South San Jose, the alignment would extend through Morgan Hill and San Martin to the Downtown Gilroy Station, then curve generally east across the Pajaro River floodplain and through a portion of northern San Benito County before entering a tunnel (Tunnel 1) at the base of the Diablo Range. The alignment would exit the tunnel at Casa de Fruta Parkway/SR 152 in unincorporated eastern Santa Clara County, where it would transition to the Pacheco Pass Subsection. Alternative 1 in this subsection

would construct the Viaduct to downtown Gilroy design option and an aerial Downtown Gilroy Station.

Beginning at the southern limit of the Monterey Corridor Subsection, the alignment would be on viaduct in the median of Monterey Road. In this four-lane section of the road, the design assumes a combined left-turn and through lane to Palm Avenue. The alignment would begin curving east on viaduct (approximately 40 feet above grade) near Ogier Avenue in Santa Clara County. The northbound lanes of Monterey Road would be realigned at this transition to cross beneath the HSR viaduct between columns of the aerial structure.

After crossing the Coyote Valley on viaduct, the alignment would cross over Burnett Avenue in Morgan Hill and parallel US 101 on the west side of the freeway. Continuing south, the alignment would bypass downtown Morgan Hill by crossing over Cochrane Road and associated freeway ramps, East Main Avenue, East Dunne Avenue and associated freeway ramps, and Tennant Avenue and associated freeway ramps.

South of Tennant Avenue and the city limits of Morgan Hill, the alignment would turn west, relocating the cul-de-sac at Fisher Avenue to the west of the HSR facility, then crossing over Maple Avenue, West Little Llagas Creek, East Middle Avenue, and Llagas Creek before rejoining Monterey Road and the UPRR corridor in the community of San Martin. The crossing of Llagas Creek would allow for wildlife movement by clear-spanning both banks and riparian habitat. New storm drainage infrastructure would be constructed on the west side of the alignment along Llagas Creek. The alignment would continue on viaduct along the east side of UPRR and cross over East San Martin Avenue.

South of Las Animas Avenue and the west branch of Llagas Creek, the alignment would curve east over Leavesley Road and Casey Lane. Continuing south, the viaduct would cross the Gilroy Prep School/South Valley Middle School sports field, a portion of the Gilroy Prep School campus, and Upper Miller Slough (with armor added to the channel to strengthen the stormwater conveyance) before crossing over IOOF Avenue, Lewis Street, Martin Street, East 6th Street, and a realigned East 7th Street, to arrive at the downtown Gilroy station on low viaduct (approximately 33 feet high).

South of the Downtown Gilroy Station, the alignment would continue on viaduct over East 10th Street l. Banes Lane would be reconstructed to provide a standard cul-de-sac. South of the Princevale Channel crossing, the alignment would ascend, still on viaduct, over Luchessa Avenue, US 101, and one spur UPRR track. After branching from the main UPRR track and crossing under the HSR viaduct, the new UPRR track for freight access to the MOWF would be provided to travel at grade on the east side of the new HSR track toward the South Gilroy MOWF site. Both the UPRR track and HSR tracks would cross the City of Gilroy wastewater disposal ponds. Continuing south, the alignment would ascend onto embankment. New storm drainage infrastructure would be constructed on the west side of the alignment at Carnadero Avenue, which would be closed where it meets the alignment. Bloomfield Avenue would be realigned to cross over the South Gilroy MOWF site. Sheldon Avenue would become a cul-de-sac south of the HSR alignment and would be abandoned north of the alignment. Before crossing the Pajaro River, the alignment would ascend onto viaduct.

The HSR alignment south and east of Gilroy would cross an agricultural area in Santa Clara and San Benito Counties that is part of the upper Pajaro River floodplain, historically referred to as Soap Lake. HSR guideway on viaduct would be built over the major watercourses to provide a floodplain crossing that is neutral to the hydrology and hydraulics of the floodplain and to accommodate wildlife movement. Because of the Calaveras fault crossing at this location, Tequisquita Slough would be partially filled by approximately 800 feet of HSR embankment. The embankment area would include cross-culverts and 1.3 acres of adjacent floodwater detention basins; in addition, an extended viaduct over Pacheco Creek would serve to maintain floodplain capacity and function. HSR would be on embankment between Pacheco Creek and Lovers Lane. The alignment would return to viaduct at Lovers Lane. After Lovers Lane, the alignment would continue in a combination of embankment and viaduct until reaching the portal for Tunnel 1 on the east side of SR 152.

After exiting the 1.4-mile Tunnel 1 on the west side of SR 152, the alignment would cross over SR 152 and the southern portion of the Pacheco Creek Valley on an aerial structure south of Casa de Fruta. The alignment would move onto embankment just beyond Southside Way at the western transition to the Pacheco Pass Subsection.

Wildlife Crossings

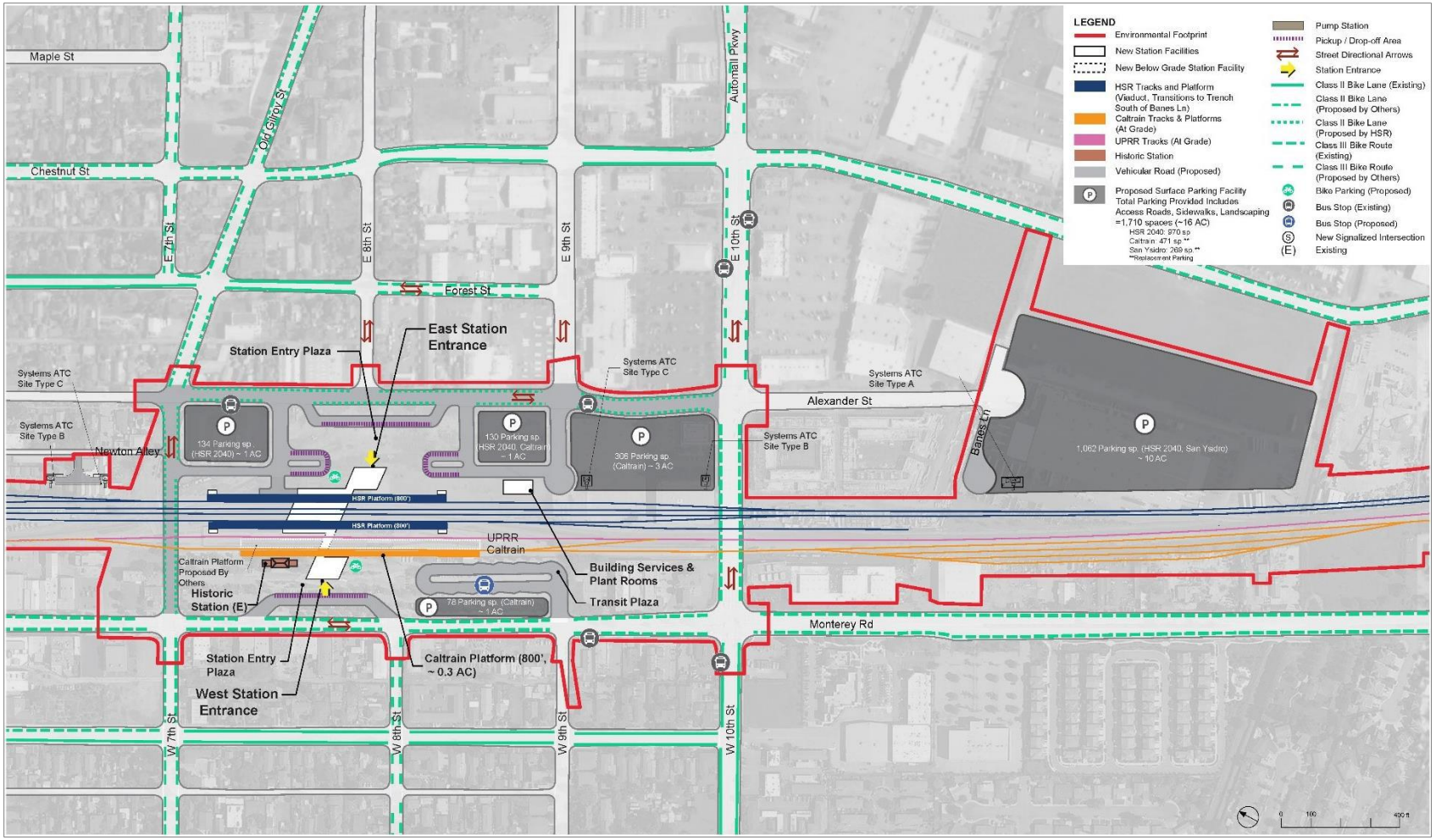
Three wildlife crossings would be provided at the base of Tulare Hill north of the Metcalf Substation connecting to Coyote Creek. The existing culvert under Monterey Road at Fisher Creek would be realigned and replaced with a larger box culvert to improve wildlife movement under Monterey Road and the HSR track. The crossing of Llagas Creek would allow for wildlife movement by clear-spanning both banks and riparian habitat. The alignment would be primarily on viaduct through the Soap Lake area to allow for wildlife movement. Viaducts have heights, widths and depths considered to be very favorable for wildlife movement.

Stations

Alternative 1 would enter the Downtown Gilroy Station on aerial structure (Figures 2-10 and 2-11). The HSR Downtown Gilroy Station would be constructed south of the existing Caltrain station. The station approach would be on a low viaduct—approximately 33 feet to top of rail—with dedicated HSR tracks to the east of UPRR between relocated Old Gilroy/7th Streets and 9th Street. The 800-foot platforms would be on the east and west side of the HSR tracks. The new HSR station building would have both east and west entrances: the main entrance for passengers arriving by auto or bicycle would be on the east side while the main entrance for passengers arriving on foot or by transit would be on the west side. The HSR station building would encompass 60,513 square feet with a 4,400-square-foot substation and systems building. The concourse would be below the new HSR tracks.

The existing 471 Caltrain parking spaces on the west side of the station would be replaced 1:1 by either reconfiguring parking on the west side of the station or relocating it to the east side of the station. The existing 269 San Ysidro housing development parking spaces would be replaced 1:1 with new surface parking at the south end of Alexander Street. HSR parking demand would be 970 spaces in 2040. In addition, the station site plan provides 970 new parking spaces in five areas, for a total of 1,710 parking spaces in 2040. One site would be west of the station along Monterey Road at 9th Street. The other four would be east of the station along Alexander Street at Old Gilroy Street, 9th Street, 10th Street, and Banes Lane. A multimodal access plan would be developed prior to design and construction of the station. The plan would be developed in coordination with local agencies and would include a parking strategy that would confirm the location, amount, and phasing of parking.

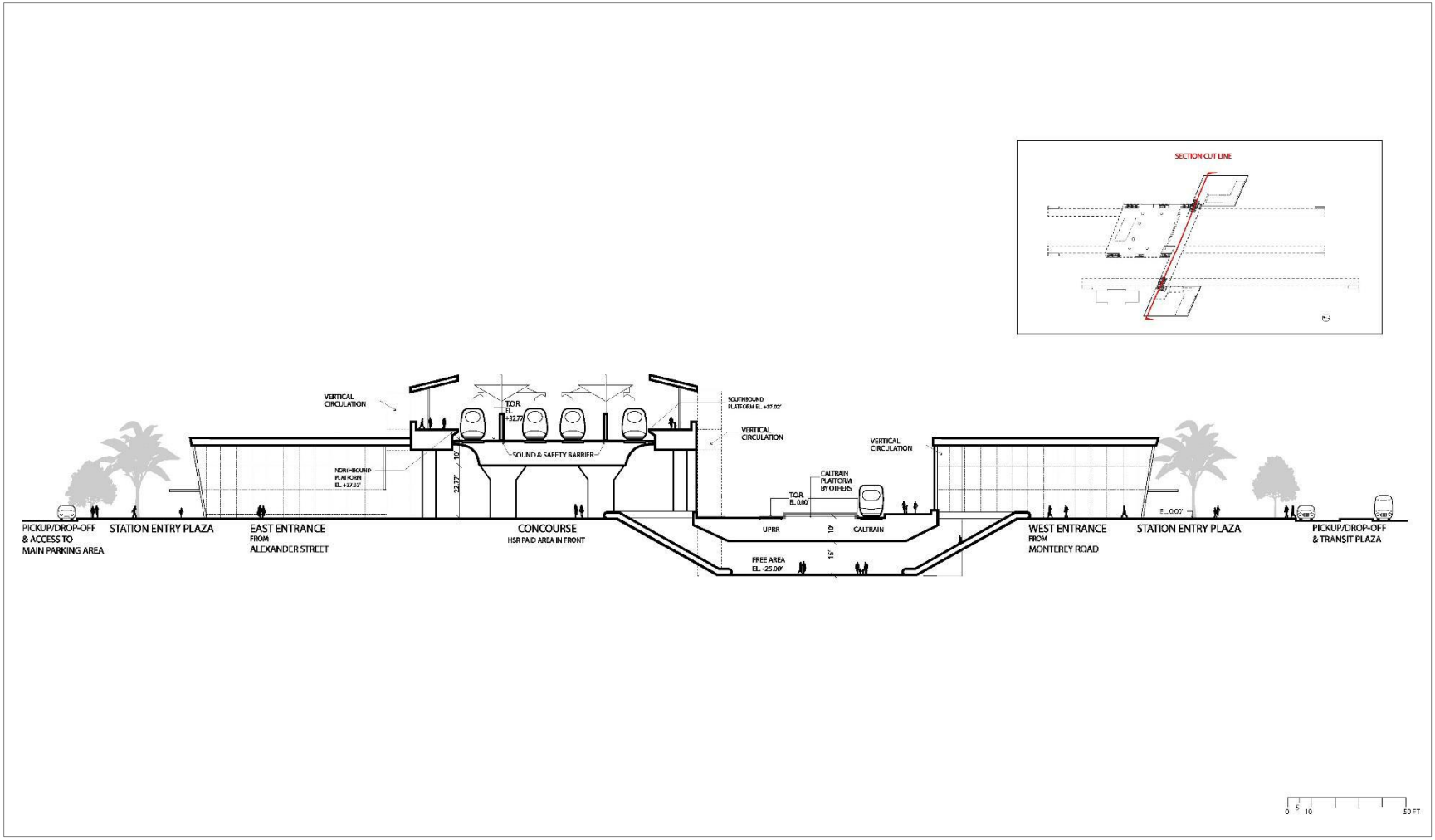
A total of eight bus bays would be provided. Street improvements would include realignment of Old Gilroy Street at East 7th Street; existing grade crossings would remain unchanged. A 4,000-square-foot bicycle facility would be constructed. Class II bike lanes would be provided on 7th and Alexander Streets.



Source: Authority 2019c

JUNE 2019

Figure 2-10 Conceptual Downtown Gilroy Aerial Station Plan



Source: Authority 2019c

JUNE 2019

Figure 2-11 Cross Section of Downtown Gilroy Station (Viaduct)

Traction Power Facilities

One new TPSS, Site 4—Gilroy, would be constructed at one of two alternate locations on the north side of the alignment: either east or west of Bloomfield Avenue. At this site, one new PG&E switching station would be co-located with the TPSS. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnections connecting the TPSS to a new utility switching station, to existing PG&E facilities, or both, typically within tie-line/utility corridors. North of Site 4—Gilroy, a traction power switching station would be constructed east of the HSR alignment at a location north of Palm Avenue.

Four traction power paralleling stations would be constructed adjacent to the guideway at the following locations:

- South of the alignment, either south of Diana Avenue or at the intersection of San Pedro Avenue and Walnut Grove Drive
- North of the alignment, either south of Masten Avenue or south of Rucker Avenue
- In the vicinity of Lovers Lane, either south of the alignment and west of Lovers Lane or north of the alignment and west of Lovers Lane
- At Tunnel 1 east portal

PG&E would reinforce the electric power distribution network to meet HSR traction and distribution power requirements by replacing (reconductoring) the 9.8-mile Metcalf to Morgan Hill and the 10.8-mile Morgan Hill to Llagas 115-kV power lines. The existing power lines to be reconductored, reusing the poles and towers, begin at the Metcalf Energy Center in San Jose and continue southeast parallel to the alignment on the east side before crossing to the west side near Ogier Avenue. Continuing on the west side to the Morgan Hill Substation on West Main Avenue in Morgan Hill, the lines then cross the east side of Peak Avenue and Dewitt Avenue, spanning West Dunne Avenue, Chargin Drive, Spring Avenue, and several residences. The alignment would continue south across an open-space area, then follow Sunnyside Avenue for approximately 0.5 mile. The alignment would continue south for approximately 4 miles, spanning additional open-space areas of wineries and the Corde Valle Golf Course. The alignment would then turn east along the north side of Day Road before heading south for approximately 2.5 miles and terminating at the Llagas Substation in Gilroy. Reconductoring at Metcalf Energy Center in San Jose would be required as well.

A permanent overhead distribution electrical power line from TPSS Site 4 to the Tunnel 1 portal location would provide power to the tunnel boring machine during construction and the tunnel fire-life-safety system during operation.

There are alternative sites for power drops at both portals for Tunnel 1. At each portal, one site is north of the alignment and one is south.

Train Control and Communication Facilities

A total of 17 ATC sites would be constructed in the Morgan Hill and Gilroy Subsection for this alternative:

- One site east of Monterey Road near Palm Avenue (two site options)
- One site at East Middle Avenue (two site options)
- One site between Las Animas Avenue and Leavesley Road
- One site south of Leavesley Road
- One site south of Lewis Street
- One site north of 6th Street in Gilroy
- Two sites south of 6th Street in Gilroy
- Two sites north of 10th Street in Gilroy
- One site south of Banes Lane
- Five sites north of Carnadero Avenue

- Three sites east of the Pajaro River
- One site near Lake Road (two site options)

Six stand-alone communication radio sites would be constructed within this subsection:

- Forsum Road or Blanchard Road (two site options)
- Near Bailey Avenue (two site options)
- Between Barnhart Avenue and Kirby Avenue (two site options)
- South of Cochrane Road along US 101 (two site options)
- North of Cox Avenue and south of West San Martin Avenue (two site options)
- East of the Pajaro River, south of Gilroy

Maintenance Facilities

The MOWF under Alternative 1 would be located in South Gilroy between Carnadero Road and Bloomfield Avenue (Figure 2-12) to accommodate machinery and inspection and maintenance staff. The MOWF would cover approximately 75 acres. The freight connection would be provided as described above.

2.2.1.4 Pacheco Pass Subsection

Alignment and Ancillary Features

The Pacheco Pass Subsection would be approximately 25 miles long. The alignment would generally follow the existing SR 152 corridor east from Casa de Fruta for approximately 17 miles, then diverge north around the Cottonwood Creek ravine of the San Luis Reservoir for approximately 8 miles before transitioning to the San Joaquin Valley Subsection near I-5 (Figure 2-6). Tunnel is the only design option in this subsection.

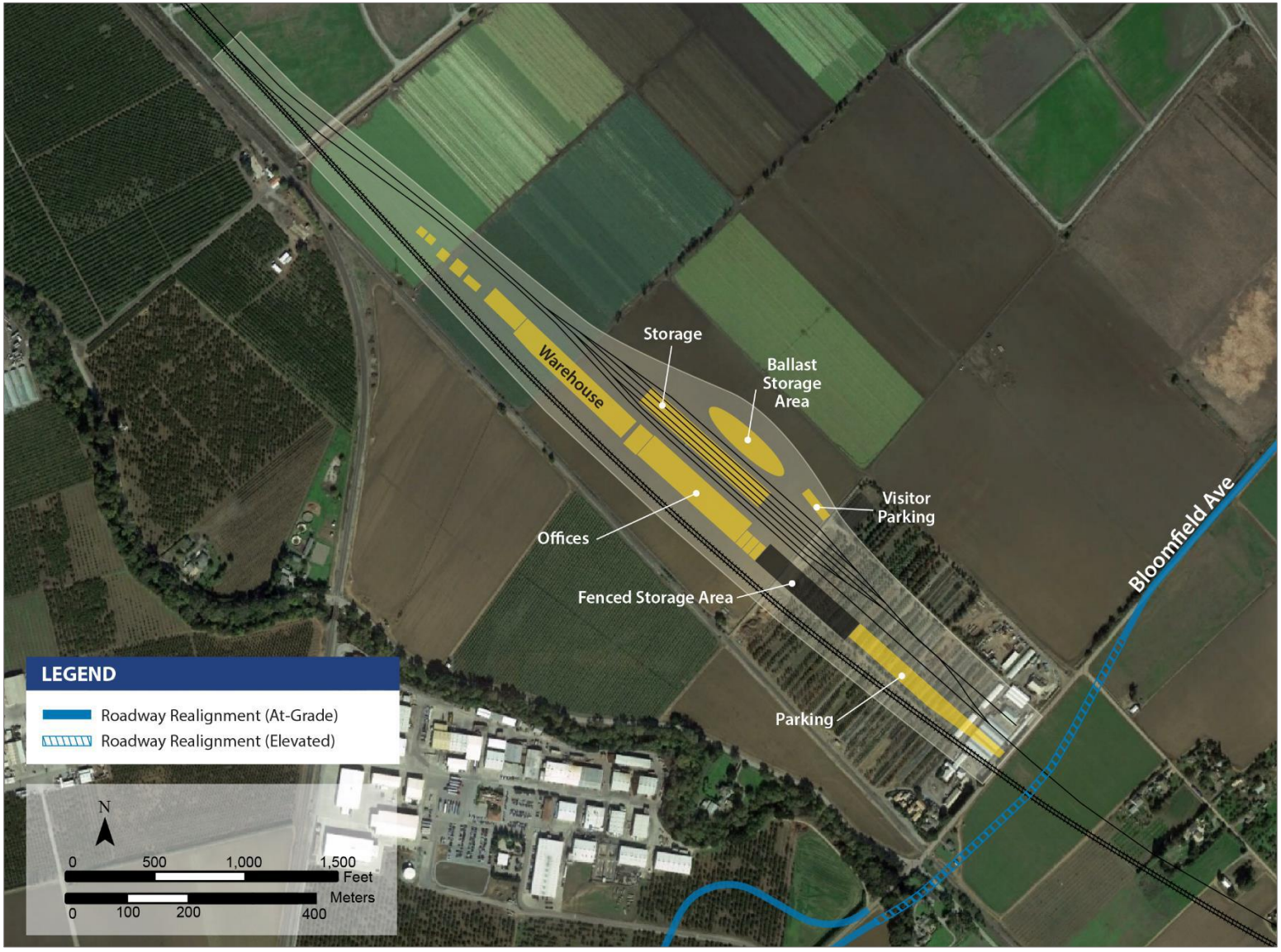
From the eastern limit of the Morgan Hill and Gilroy Subsection, the guideway would transition from aerial structure to embankment along the southern boundary of Casa de Fruta. This stretch of embankment would be on fill or in excavated hillside cuts to accommodate a level HSR guideway profile over varied surface elevations and to control unstable slopes known for vulnerability to landslip (i.e., areas subject to the downward falling or sliding of a mass of soil, detritus, or rock on or from a steep slope). The alignment would ascend to viaduct over Pacheco Creek along the south side of SR 152 and remain on viaduct to the Tunnel 2 portal. This portal would include a staging area for tunnel construction and a permanent area for traction and facility power with access provided by a service road from SR 152. Tunnel 2 would extend northeast approximately 13.5 miles. Access to the Tunnel 2 east portal for HSR construction, operations, and maintenance would be on McCabe Road north of Romero Ranch. Continuing east, the HSR guideway would be predominantly on a combination of embankment and aerial structures, with viaducts over Romero Creek and the California Aqueduct. Romero Road would be realigned at its intersection with I-5. East of I-5, the alignment would cross over SR 33/Santa Nella Road and the CCID Outside Canal before transitioning to the San Joaquin Valley Subsection at Fahey Road.

Wildlife Crossings

Four wildlife crossing culverts would be provided west of the California Aqueduct, with an additional two wildlife crossings between the California Aqueduct and the Delta-Mendota Canal and one between the Delta-Mendota Canal and I-5. Three wildlife crossings would be provided between I-5 and Santa Nella Road, and three more between Santa Nella Road and Fahey Road. Viaducts would also function as wildlife movement areas in this subsection.

Stations

No new HSR stations are proposed for this subsection.



Source: Authority 2019c

JUNE 2019

Figure 2-12 South Gilroy Maintenance of Way Facility

Traction Power Facilities

One new TPSS, Site 5—O'Neill, would be constructed approximately 1.2 miles west of the Calfornia Aqueduct. A new 230-kV double-circuit tie-line would be constructed from the expanded Quinto switching station to the TPSS, paralleling an existing PG&E transmission line for approximately 0.6 mile. The tie-line would be installed either underground in a utility easement or overhead, requiring the existing 500-kV transmission line to be raised. No reinforcements to the PG&E power system would be required for this site. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnection. The interconnection would link the TPSS to a new PG&E switching station, to existing PG&E facilities, or both—typically within tie-line/utility corridors.

A traction power switching station would be constructed at each Tunnel 2 portal. A power drop site would be co-located with the switching stations. A new permanent distribution power line from the Quinto switching station along McCabe Road to the Tunnel 2 east portal location would provide power for tunnel construction and fire and life safety systems during operations. The existing PG&E 230-kV Quinto switching station would be expanded within the fence line to support the HSR system.

Traction power paralleling stations would be constructed at three locations:

- Two stations within Tunnel 2 cross passages, approximately 5 miles apart
- One station located either southeast or northwest of the alignment crossing of Fahey Road

Train Control and Communication Facilities

Three ATC sites would be constructed in the Pacheco Pass Subsection at the following locations:

- West portal of Tunnel 2
- Underground within the limits of Tunnel 2
- Adjacent to TPSS Site 5

One stand-alone communications radio antenna site would be constructed in the Pacheco Pass Subsection:

- Near SR 152 and the Tunnel 2 west portal
- 1 mile west of Tunnel 2
- Delta-Mendota Canal crossing

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.1.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

The San Joaquin Valley Subsection would be approximately 18 miles long, from east of I-5 (at Fahey Road) to the intersection of Henry Miller Road and Carlucci Road in Merced County, where the alignment would connect to the Central Valley Wye (Figure 2-7). The single design option in this subsection is a combination of viaduct and embankment along Henry Miller Road, identified as the Henry Miller Road design option.

South of Fahey Road, the guideway would continue east and cross over three irrigation ditches, Cherokee Road, the CCID Main Canal, two additional irrigation ditches, and adjacent farmland on viaduct. Continuing east, the alignment would be on embankment (including four proposed culvert crossings for irrigation ditches) before ascending on an approximately 1.4-mile-long viaduct over the San Luis (Volta) Wasteway, the UPRR West Side branch line, and Ingomar Grade Road.

The alignment would descend to embankment west of Volta Road while turning southeast before crossing to the south side of Henry Miller Road. Henry Miller Road would be realigned to pass over the HSR alignment on a bridge. The HSR embankment between the Volta Road

overcrossing and Los Banos Creek would cross over two proposed culverts to maintain irrigation canals. The alignment would then ascend to cross over Los Banos Creek and Badger Flat Road on a 0.8-mile-long viaduct before descending onto embankment.

The alignment would continue east for 3.6 miles on embankment, over several combined wildlife crossing/drainage culverts and drainage culverts, including an irrigation ditch at Wilson Road, an irrigation ditch at Johnson Road, two irrigation ditches at Nantes Avenue, the Santa Fe Canal, the San Luis Canal, the San Luis Drain, and the Porter-Blake Bypass. A road would be constructed between Badger Flat Road and Nantes Avenue. SR 165/Mercey Springs Road would be raised to cross over the HSR alignment and Henry Miller Road on a bridge. East of SR 165 and the Santa Fe Grade, the alignment would ascend to an approximately 1.8-mile viaduct south of the Los Banos State Wildlife Area across Mud Slough to maintain wildlife movement within the Grasslands Ecological Area (GEA). Baker Road, Midway Road, and Hereford/Salt Slough would be closed south of Henry Miller Road. Box Car Road would become a cul-de-sac with a new road to the east. Hutchins Road would be abandoned. The alignment would continue on embankment to the eastern limit of the subsection and the project. Culvert crossings would be provided for the San Pedro Canal, Boundary Drain, Lone Tree Canal, Devon Drain, West Delta Drain, West Delta Canal, Dambrosia Ditch, Delta Canal and seepage drain, East Delta Canal, Poso Drain, Belmont Drain, Delta Canal #1, West San Juan Drain, San Juan #1, and several other irrigation ditches and drains in the section of viaduct over the GEA. Several local roadways—Delta Road, Turner Island Road, and Carlucci Road—would be elevated over the HSR guideway, maintaining access to adjacent properties. The alignment would transition to the Central Valley Wye at Carlucci Road.

Wildlife Crossings

The rail alignment would be primarily on viaduct where it overlaps with the GEA boundary and modeled wildlife movement corridors. Three additional wildlife crossing culverts would be added between Fahey Road and Cherokee Road. Regularly spaced wildlife crossing culverts would be provided through the remainder of this subsection. In total, there would be 64 wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

A traction power switching station would be constructed on the north or south side of the alignment at one of two alternate sites east of the intersection of Henry Miller Road and Santa Fe Grade. Traction power paralleling stations would be constructed at the following locations:

- Either east or west of the Henry Miller Road overcrossing of the HSR alignment near Volta Road (two site options)
- Intersection of Henry Miller Road and Box Car Road (two site options either north or south of the alignment)

Train Control and Communication Facilities

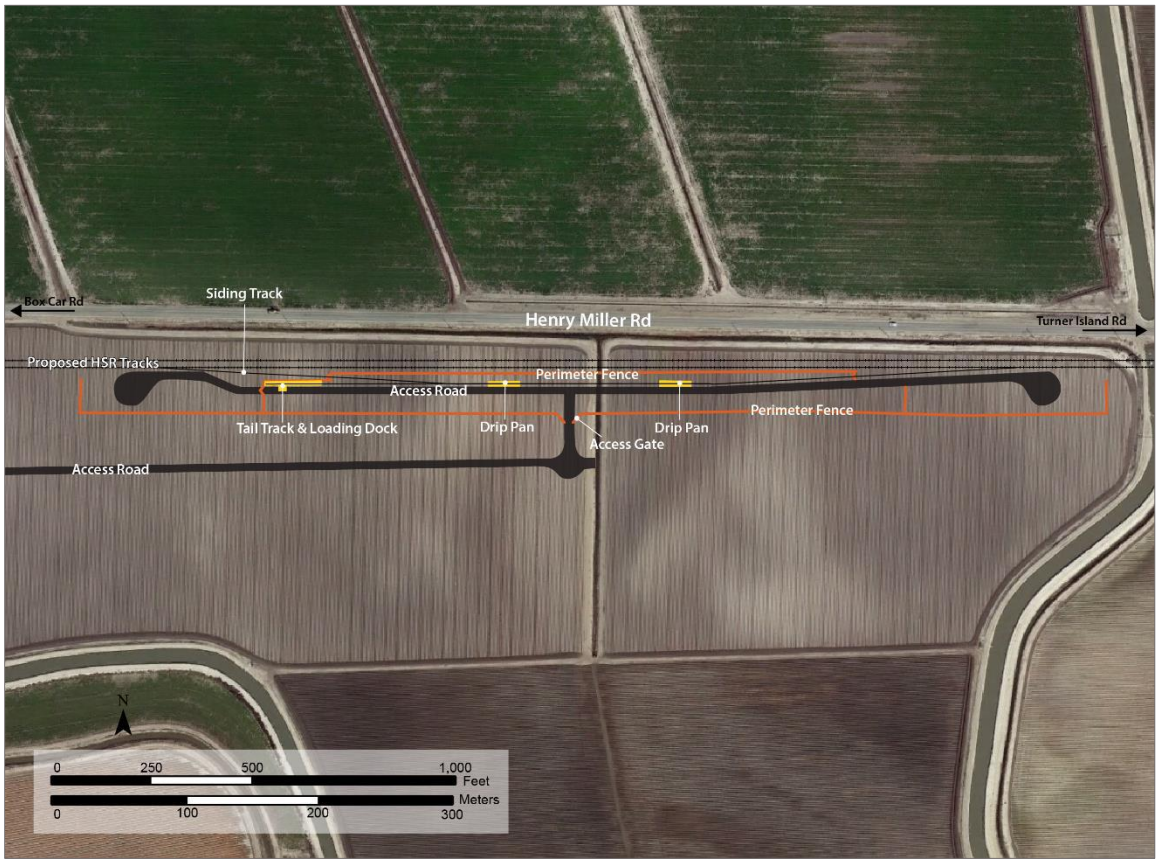
Four ATC sites would be constructed in the San Joaquin Valley Subsection:

- One site east of the CCID Main Canal (two options)
- Three sites near Johnson Road
- One site near Box Car Road (two site options)

One stand-alone communication radio site would be constructed: at Wilson Road (two site options): east of the San Pedro Canal and at Carlucci Road.

Maintenance Facility

An MOWS is proposed near Turner Island Road near the eastern limit of the project (Figure 2-13). The MOWS would be about 0.5 mile long, encompassing about 4 acres. The facility would be constructed near Henry Miller Road to avoid the GEA and other sensitive habitat.



Source: Authority 2019c JUNE 2019

Figure 2-13 Maintenance of Way Siding near Turner Island Road

2.2.2 Alternative 2

Alternative 2 is the alternative that most closely approximates the alignment and structure types identified in the prior program-level documents, implemented by limiting longitudinal encroachment into the UPRR right-of-way to combine railroad grade separations with minimum property displacements. The HSR guideway under this alternative would be comprised of 20.9 miles on viaduct, 8.5 miles at grade, 41.0 miles on embankment, two tunnels totaling 15.0 miles, and 3.2 miles in trench.

2.2.2.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

Alternative 2 would begin at Scott Boulevard at grade in blended service with Caltrain. Approximately 300 feet south of Scott Boulevard, the HSR tracks would separate from the Caltrain tracks and begin ascending to embankment and then to the 50-foot-tall dedicated viaduct at Main Street. The long viaduct under Alternative 2 would have a wider footprint than the short viaduct to I-880 under Alternative 1, requiring more curve straightening of the Caltrain tracks north of I-880. At the Lafayette Street crossing, the project would replace the existing pedestrian

overpass with an underpass. The existing De La Cruz Boulevard overcrossing would be replaced with an undercrossing to enable the HSR aerial structure to cross 43 feet high over De La Cruz Boulevard, the relocated UPRR MT1 and two industry tracks, and the Caltrain Santa Clara Station. The Santa Clara Station northbound platform would be reconstructed to accommodate the supports for the HSR aerial structure. South of Santa Clara Station, the three relocated UPRR tracks would cross under the HSR viaduct so that all Caltrain and UPRR tracks would be west of the HSR viaduct. The HSR viaduct would then ascend to 68 feet to cross over I-880.

Farther south, the existing West Hedding Street roadway overcrossing would be replaced by an undercrossing under the rail corridor. A short section of retained fill would be used to support the tracks over the future BART to San Jose tunnel. The intersection of Stockton Avenue and University Avenue would be replaced by cul-de-sacs; Emory Street would be a new cul-de-sac on the north side of HSR. The curve from westbound West Taylor Street to northbound Chestnut Street would be realigned for the HSR crossing over West Taylor Street; the alignment would then ascend on a viaduct to cross over Cinnabar Street. The UPRR Warm Springs Subdivision Lenzen Wye would be relocated to the southwest. North Montgomery Street would be extended to Cinnabar Street to maintain property access beneath the 68-foot-high HSR viaduct. The alignment would curve west toward the UPRR/Caltrain MTs before crossing over the western part of the SAP Center parking lot, then over West Santa Clara Street to enter the new dedicated HSR aerial platforms at the San Jose Diridon Station.

Between San Jose Diridon Station and West Alma Avenue, Alternative 2 would be identical to Alternative 1. Continuing on an aerial structure, the alignment would diverge from the Caltrain right-of-way south of the San Jose Diridon Station HSR platforms by turning sharply east at the Park Avenue undercrossing of UPRR/Caltrain tracks. The HSR aerial structure would cross over Los Gatos Creek and San Carlos Street, then over Royal Avenue and the intersection of Bird Avenue and Auzerais Avenue, then over the I-280/SR 87 interchange. Continuing south along the east side of SR 87, the HSR aerial structure would cross over West Virginia Street and the Guadalupe River Trail, then over the Caltrain rail bridge, the Guadalupe River, and Willow Street. The HSR aerial structure would continue south over the Caltrain Tamien Station on an alignment between Tamien Station and the SR 87 freeway, transitioning to the Monterey Corridor Subsection at West Alma Avenue.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

The San Jose Diridon Station would be the same as described for Alternative 1.

Traction Power Facilities

One new TPSS would be constructed on the east side of the Caltrain corridor south of I-880 as described for Alternative 1.

Train Control and Communication Facilities

Alternative 2 would have six ATC sites within this subsection:

- One site at Scott Boulevard
- One site at Main Street
- One site just north of the San Jose Diridon Station
- Three sites between Park Avenue and the proposed HSR crossing of SR 87 (same as under Alternative 1)

No stand-alone communications radio sites would be built in this subsection under Alternative 2.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.2.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The Monterey Corridor Subsection is approximately 9 miles long and entirely within the San Jose city limits. However, Alternative 2 would begin the viaduct transition to the Monterey Road/UPRR corridor approximately 400 feet north of the transition under Alternatives 1 and 3 but would be primarily at grade or on embankment upon entering the road/rail corridor. Alterations of existing railroad track and systems between West Alma Avenue and CP Lick (near the east base of Communications Hill) would be the same as under Alternatives 1 and 3, except for a new, continuous intrusion barrier between the existing UPRR tracks and HSR tracks.

From West Alma Avenue, the HSR alignment would descend from a viaduct 54 feet above grade to embankment north of Almaden Road. The alignment would continue primarily on embankment on the west side of the Caltrain/UPRR tracks, crossing over Almaden Road on a short aerial structure, then proceeding at grade under West Almaden Expressway and Curtner Avenue. South of Curtner Avenue, the alignment would continue south at grade along the west side of the Caltrain/UPRR tracks around the northern base of Communications Hill, ascending to aerial structure before crossing over and entering the Monterey Road/UPRR corridor just south of Hillsdale Avenue. On the approach to Monterey Road, the aerial structure would cross over the UPRR tracks and the Caltrain Capitol Station while curving southeast to return to grade within the road/rail corridor northwest of the Capitol Expressway. Monterey Road would be realigned to the east, while HSR would run along the east side of UPRR. South of Fehren Drive, Monterey Road would be reduced from six to four lanes. Continuing south, the alignment would descend into trench beneath a widened Capitol Expressway bridge before ascending to grade at Skyway Drive. Under Skyway Drive Variant A, Monterey Road would retain its current at-grade configuration, and a new connector ramp located northwest of the intersection of Skyway Drive and Monterey Road would connect Monterey Road to the depressed Skyway Drive underpass. San Jose Fire Station #18 would have access along the connector ramp. Skyway Drive Variant B would depress Monterey Road to connect to the Skyway Drive underpass. Under this variant, access to the mobile home park northwest of the intersection of Skyway Drive and Monterey Road would be provided by a driveway across the northern portion of the San Jose South Service Yard property. Variant B would not provide access to the fire station.

Continuing south, the HSR alignment would be at grade or on embankment between Monterey Road and UPRR for the remainder of the subsection. Branham Lane and Roeder Road/Chynoweth Avenue would be lowered to be separated from the HSR and existing railroad crossings. Because of the new grade difference between Branham Lane and Roeder Road/Chynoweth, access to Rice Way and four driveways from Monterey Road would be closed. A new Branham Lane pedestrian bridge would span the combined railroad and Monterey Road corridor. The westbound Blossom Hill Road ramp at Monterey Road would be shifted to the east side of Monterey Road. A new pedestrian bridge would be built to maintain connectivity between Ford Road and the Caltrain Blossom Hill Station. The alignment would continue south at grade under SR 85/West Valley Freeway, with modifications to the existing highway bridge to allow HSR to pass underneath. The alignment would then cross under Bernal Road before transitioning to the Morgan Hill and Gilroy Subsection at Bernal Way.

Like the other alternatives, the design assumes a reduction from six to four travel lanes on Monterey Road, beginning north of Capitol Expressway and continuing to just south of Blossom Hill Road, where the existing roadway is already four travel lanes. Under Alternative 2, one left turn lane would be removed south of Senter Street and one left turn lane would be removed south of Roeder where Monterey Road would be depressed and grade separated from adjacent properties. Existing mid-block left-turn lanes would be closed because of substandard stopping sight distance. Alternative 2 (and Alternative 4) differs from Alternatives 1 and 3 by shifting all Monterey Road travel lanes and median to the east of their current locations.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

In the Monterey Corridor Subsection, traction power stations would be in the same area under Alternatives 1, 2 and 3. Traction power paralleling stations would be constructed at the following locations:

- Either the north side of the alignment near Curtner Avenue or the south side of the alignment at Communications Hill (same as Alternative 1)
- Either the south side of SR 85 or between Bernal Road and the Bernal Road ramp onto Monterey Road

Train Control and Communication Facilities

Train control and communication facilities under Alternative 2 would be the same as described for Alternative 1.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.2.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection under Alternative 2 would be approximately 31 miles long and located south of the Monterey Corridor Subsection. From Bernal Way in South San Jose, the alignment would extend through Morgan Hill and San Martin to the Downtown Gilroy Station, then curve generally eastward across the Pajaro River floodplain and through a portion of northern San Benito County before entering a tunnel (Tunnel 1) at the base of the Diablo Range. The alignment would exit the tunnel at Casa de Fruta Parkway/SR 152 in unincorporated eastern Santa Clara County, and then transition to the Pacheco Pass Subsection (Figure 2-8).

Continuing from the southern limit of the Monterey Corridor Subsection, Alternative 2 would be at grade on retained fill between the UPRR right-of-way and Monterey Road in South San Jose. Due to the proximity of the alignment to UPRR, a 3-foot-thick continuous intrusion barrier would be constructed between the proposed HSR and UPRR tracks. In contrast to the other alternatives, Alternative 2 would require the construction of new roadway grade separations to maintain east-west connectivity across the Monterey Corridor. Before turning south near Kittery Court, the two UPRR tracks would be realigned to the west to accommodate the alignment curvature required for HSR operations until returning to the existing alignment adjacent to the south side of the Calpine Metcalf Energy Center. The existing Fisher Creek culvert would be improved with a new culvert installed beneath the new HSR alignment and realigned Monterey Road and UPRR. The creek crossing would be improved to provide a suitable wildlife crossing. The Blanchard Road grade crossing would be closed.

As the UPRR and Monterey Road rights-of-way converge to the south approaching Bailey Avenue, the four-lane Monterey Road would be realigned eastward to accommodate the HSR alignment at grade between the railroad and roadway. The existing Bailey Avenue bridge would remain in place and HSR would cross beneath the road. The alignment would continue south, ascending onto embankment, crossing beneath a new Palm Avenue bridge and a new Live Oak Avenue bridge (which would also cross over UPRR, eliminating both existing at-grade crossings). Tilton Avenue would become a cul-de-sac. Madrone Parkway would be lowered to allow HSR and UPRR to cross over the roadway. At Cochrane Road, the realigned Monterey Road would converge with the existing roadway alignment.

As the alignment proceeds south along the UPRR alignment through Morgan Hill, a new culvert would be placed in the HSR embankment for Fisher Creek. The alignment would then cross over Monterey Road on a clear-span bridge. Continuing south on embankment along the east side of

UPRR, the HSR and UPRR alignments would cross over Main, East/West Dunne, San Pedro, and Tennant Avenues on short bridges over the roadways, which would be lowered 17–30 feet below grade to maintain east-west connections. A new pedestrian underpass would be provided to maintain access from east of the HSR corridor to the Morgan Hill Caltrain Station. Railroad Avenue would be closed between San Pedro Avenue and Barrett Avenue and relocated eastward between Barrett Avenue and Maple Avenue to accommodate the HSR alignment adjacent to UPRR. The existing bridge at Butterfield Boulevard would be extended to cross over the realigned Railroad Avenue and at-grade HSR alignment. The Butterfield Canal would be relocated to the east to accommodate the HSR alignment adjacent to UPRR.

Continuing south, the alignment would ascend onto embankment, and West Little Llagas Creek would flow through a new culvert. The existing East Middle Avenue would become cul-de-sacs on both sides of the alignment. A new alignment of East Middle Avenue would be constructed to the south, where it would cross over the HSR tracks and Monterey Road on a bridge. Monterey Road and UPRR would be realigned westward between East Middle Avenue and Roosevelt Avenue to accommodate the southward alignment curvature required for HSR operations. The realigned roadway and UPRR and the new HSR alignment would cross Llagas Creek on new clear-span bridges. South of Llagas Creek, Monterey Road would return to the existing alignment near Roosevelt Avenue.

San Martin Avenue would be realigned between Murphy and Harding Avenues to connect to Oak Street at Llagas Avenue (north of the HSR alignment) in San Martin. HSR would cross over San Martin Avenue and Oak Street, which would be below grade. A pedestrian path under the HSR embankment would be provided south to San Martin Avenue. Depot Street, UPRR, and Monterey Road, which parallel the HSR tracks at Oak Street, would cross the newly depressed San Martin (formerly Oak) Street on bridges supported by retained fill. HSR would continue south at grade adjacent to the east side of UPRR. Church Avenue would be raised onto a bridge over both HSR and UPRR. Fitzgerald and Masten Avenues would be realigned to the south and would be depressed beneath Monterey Road, UPRR, and HSR. Similarly, Rucker Avenue and Buena Vista Avenue would be depressed beneath Monterey Road, UPRR, and HSR. Both Cohansey Avenue and Las Animas Avenue would remain at grade with bridges for HSR and UPRR to cross over the existing streets.

Continuing south into Gilroy, the alignment would shift east for the approach to the Downtown Gilroy HSR Station. The existing culvert for the West Branch of Llagas Creek would be extended to the east to accommodate the rail alignment shift. HSR and UPRR would be on embankment (approximately 15–25 feet high) and cross over Leavesley Road, Casey Street, IOOF Avenue, Lewis Street, East 6th Street, and the realigned East 7th Street/Old Gilroy on bridges before arriving at the Downtown Gilroy Station embankment (approximately 16 feet high). East 7th Street and Old Gilroy would be realigned (as under Alternative 1). Each of these streets would be lowered approximately 20 feet beneath existing grade, and a pedestrian underpass would replace Martin Street across the rail alignment. Miller Slough would be realigned eastward in a new culvert beneath the railroad alignment. HSR and UPRR would continue on embankment, crossing over East 9th Street and East 10th Street.

The HSR alignment would continue on embankment south from the Downtown Gilroy Station to the Princevale Channel, then descend into a trench under Luchessa Avenue and US 101, where existing bridges would be demolished and reconstructed to accommodate the freeway undercrossing, and two UPRR spur tracks. Just south of the US 101 overcrossing, a freight connection would be made from UPRR on the south side of HSR, crossing over the HSR trench to connect to the South Gilroy MOWF on the north side of HSR. Two UPRR spur tracks would be realigned to connect to the MOWF freight track north of HSR.

The remainder of this subsection—to Casa de Fruta—would be the same as under Alternative 1.

Wildlife Crossings

Three adjacent box culverts would be installed to provide wildlife with a connection between Tulare Hill and Coyote Creek south of Metcalf Road. The box culverts under Monterey Road and

UPRR would be replaced with larger box culverts at Fisher Creek. HSR would also be on a box culvert over Fisher Creek. These three box culverts would have larger openings than existing culverts to improve wildlife movement. There would be seven additional crossings at Emado Avenue, Laguna Avenue, Richmond Avenue, Fox Lane, Paquita Espana Court, south of Palm Avenue, and south of Live Oak Avenue.

Stations

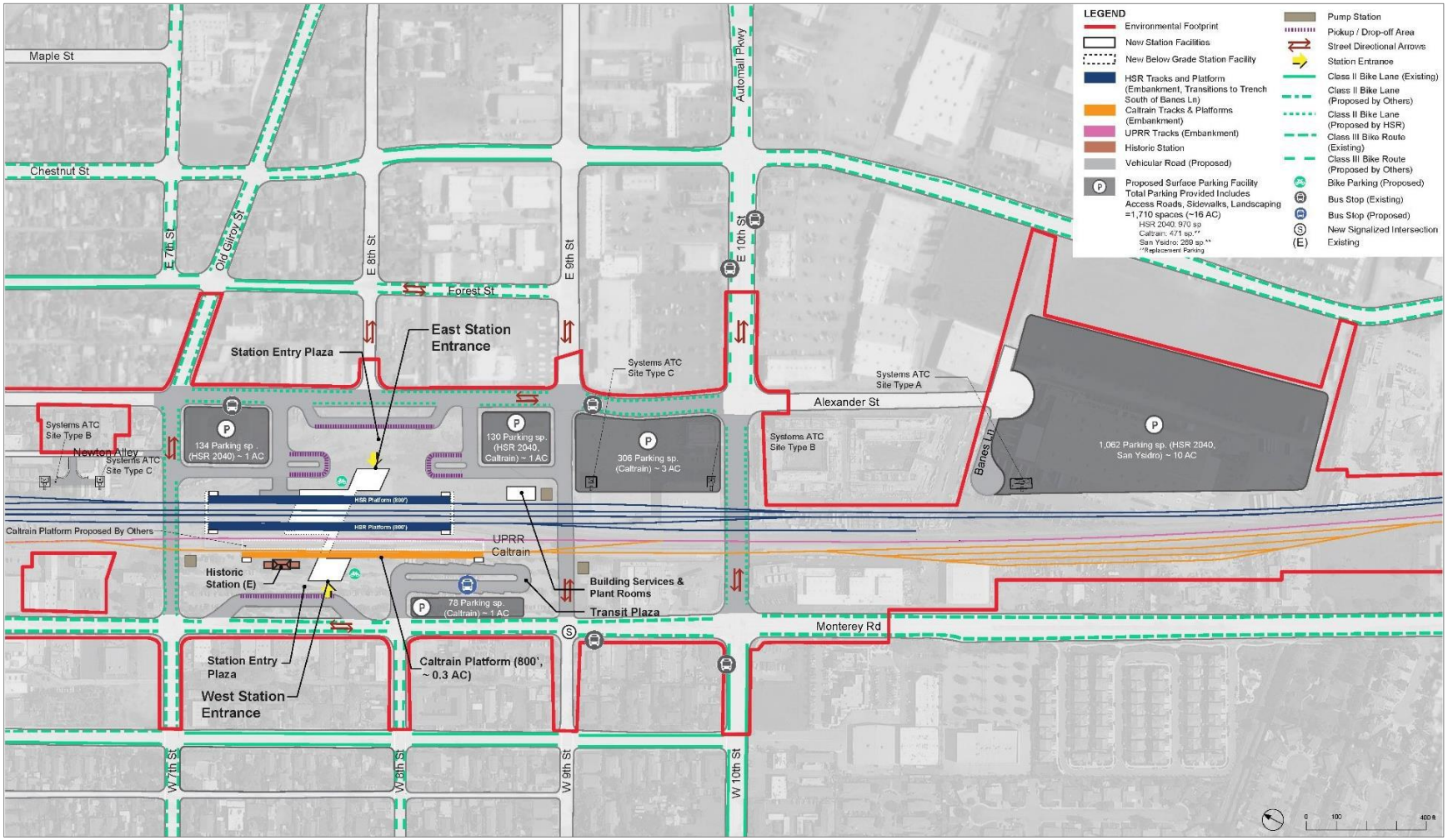
Alternative 2 would enter the Downtown Gilroy Station on embankment (Figures 2-14 and 2-15). The station layout and configuration would be similar to that described for Alternative 1, except that UPRR and Caltrain would be elevated to the same height as HSR on the embankment. The embankment station would also lower East 7th/Old Gilroy Street, East 9th Street, and East 10th Street by approximately 16 feet to maintain street access.

As under Alternative 1, the existing 471 Caltrain parking spaces on the west side of the station would be replaced 1:1 by either reconfiguring parking on the west side of the station or relocating it to the east side of the station. The existing 269 San Ysidro housing development parking spaces would be replaced 1:1 with new surface parking along Automall Parkway with access from the south end of Alexander Street. HSR would provide an additional 970 spaces in 2040, for a total of 1,710 parking spaces in 2040 (including existing demand). The station site plan provides 970 new parking spaces in five areas. One site would be located west of the station along Monterey Road at 9th Street. The other four would be on the east side of the station along Alexander Street at Old Gilroy Street, 9th Street, 10th Street, and Banes Lane. A multimodal access plan that includes a parking strategy would be developed in coordination with local agencies prior to design and construction of the station. A total of eight bus bays would be provided. Street improvements would include realignment of Old Gilroy Street at East 7th Street; existing grade crossings would remain unchanged. A 4,000-square-foot bicycle facility would be constructed. Class II bike lanes would be provided on 7th, Alexander, and 10th Streets.

Traction Power Facilities

As under Alternative 1, one new TPSS, Site 4—Gilroy, would be constructed at one of two alternate sites on the north side of the alignment: either east or west of Bloomfield Avenue. At this location, one new utility switching station would be co-located with the TPSS. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnection of the TPSS to a new utility switching station or to existing PG&E facilities, typically within tie-line/utility corridors. Site 4—Gilroy would connect to the Llagas PG&E substation via existing and proposed transmission or distribution lines along SR 152, Frazier Lake Road, and Bloomfield Avenue. Fiber optic and high-voltage lines would be reconductored overhead on existing towers where available. Where no overhead connections exist, both fiber optic and high-voltage lines would be undergrounded within or adjacent to the public right-of-way.

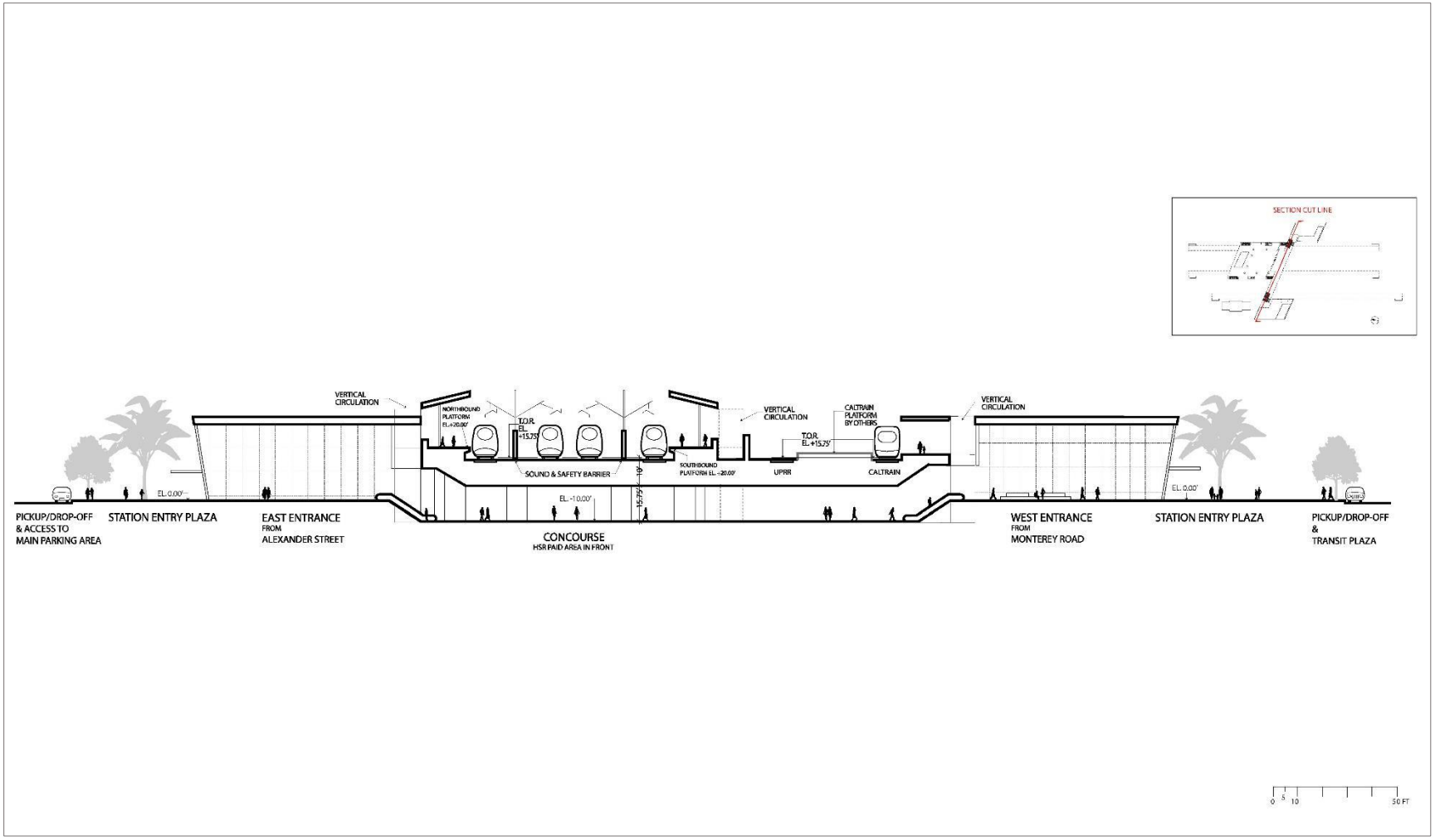
A traction power switching station would be constructed east of the HSR alignment at a location north of Paquita Espana Court or north of Palm Avenue.



Source: Authority 2019c

JUNE 2019

Figure 2-14 Conceptual Downtown Gilroy Embankment Station Plan



Source: Authority 2019c

JUNE 2019

Figure 2-15 Cross Section of Downtown Gilroy Station (Embankment)

Four traction power paralleling stations would be constructed at the following locations:

- Either the east side of the alignment between East Dunne and San Pedro Avenues or south of San Pedro Avenue
- East of the alignment, either north or south of a new Masten Avenue/Fitzgerald Avenue in-trench alignment

South of US 101, Alternative 2 would have the same two switching stations as Alternative 1:

- Either south of the alignment and west of Lovers Lane or north of the alignment and west of Lovers Lane
- In the vicinity of the Tunnel 1 east portal, either at the portal or east of SR 152 in the southern area of Casa de Fruta

PG&E would reinforce the electric power distribution network to meet HSR traction and distribution power requirements by replacing (reconductoring) the approximately 9.8-mile Metcalf to Morgan Hill and 10.6-mile Morgan Hill to Llagas 115-kV power lines. These PG&E transmission network upgrades described under Alternative 1 would also be necessary under Alternative 2.

Train Control and Communication Facilities

A total of 20 ATC sites would be constructed in the Morgan Hill and Gilroy Subsection for this alternative:

- One site east of Monterey Road north of Paquita Espana Court or at Palm Avenue, co-located with the TPSS (two site options)
- One site north of East Middle Avenue (two site options)
- One site between Las Animas Avenue and Leavesley Road
- One site south of Leavesley Road
- One site south of Lewis Street
- One site north of 6th Street in Gilroy
- Two sites south of 6th Street in Gilroy
- Two sites between 9th and 10th Streets in Gilroy
- One site south of Banes Lane

South of US 101, Alternative 2 would have the same ATC sites as Alternative 1:

- Five sites north of Carnadero Avenue
- Three sites east of the Pajaro River
- One site near Lake Road (two site options)

A total of six stand-alone communication radio sites would be constructed in this subsection at the following locations:

- Between Forsum Road and Blanchard Road (two site options)
- Near Bailey Avenue (two site options)
- Near Kirby Avenue (two site options)
- West of the intersection of Cochrane Road and Monterey Road (two site options)
- Near South Street (two site options)

South of US 101, Alternative 2 would have the same radio sites as Alternative 1:

- East of the Pajaro River south of Gilroy.

Maintenance Facilities

The MOWF under Alternative 2 would be constructed along the HSR alignment near Carnadero Avenue as described for Alternative 1 and illustrated on Figure 2-12. The freight connection would be provided as described above.

2.2.2.4 Pacheco Pass Subsection

Alignment and Ancillary Features

The characteristics of the Pacheco Pass Subsection under Alternative 2 would be the same as those described for Alternative 1 in Section 2.2.1.4, Pacheco Pass Subsection.

Wildlife Crossings

The wildlife crossings under Alternative 2 would be the same as described for Alternative 1.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

One new TPSS, Site 5—O'Neill, would be constructed approximately 1.2 miles west of the California Aqueduct as described for Alternative 1.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 2 would be the same as for Alternative 1.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.2.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

The characteristics of the San Joaquin Valley Subsection of Alternative 2 would be the same as those described for Alternative 1 in Section 2.2.1.5, San Joaquin Valley Subsection.

Wildlife Crossings

The wildlife crossings under Alternative 2 would be as described for Alternative 1.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities under Alternative 2 would be as described for Alternative 1.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 2 would be as described for Alternative 1.

Maintenance Facilities

An MOWS would be constructed near Turner Island Road near Carlucci Road as described for Alternative 1 and illustrated on Figure 2-15.

2.2.3 Alternative 3

Alternative 3 was designed to minimize the project footprint through the use of viaduct and by going around downtown Morgan Hill, as is proposed in Alternative 1. Alternative 3 would bypass downtown Gilroy to an East Gilroy Station, further minimizing interface with the UPRR corridor in

comparison to Alternative 1. The HSR guideway under this alternative would comprise 43.2 miles on viaduct, 1.8 miles at grade, 24.9 miles on embankment, 2.4 miles in trench, and two tunnels totaling 15.0 miles.

2.2.3.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

Under Alternative 3, the alignment and characteristics of this subsection would be the same as described for Alternative 2 in Section 2.2.2.1, San Jose Diridon Station Approach Subsection.

Wildlife Crossings

As under Alternative 2, there would be no wildlife crossings in this subsection.

Stations

The San Jose Diridon Station would be as described for Alternatives 1 and 2.

Traction Power Facilities

Traction power facilities under Alternative 3 would be as described for Alternative 2.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 3 would be as described for Alternative 2. No stand-alone communication radio antenna would be constructed in this subsection of Alternative 3.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.3.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The alignment and characteristics of Alternative 3 in this subsection would the same as those described for Alternative 1 in Section 2.2.1.2, Monterey Corridor Subsection.

Wildlife Crossings

As under Alternative 1, there would be no wildlife crossings in this subsection.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities of Alternative 3 would be as described for Alternative 1.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 3 would be as described for Alternative 1 and Alternative 2.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.3.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection under Alternative 3 would be approximately 30 miles long and located south of the Monterey Corridor Subsection. From Bernal Way in South San Jose, the alignment through Morgan Hill and San Martin would be the same as described for Alternative 1 in Section 2.2.1.3, Morgan Hill and Gilroy Subsection. The Alternative 3 alignment would diverge

from Alternative 1 by turning east north of Gilroy to arrive at the East Gilroy Station and an MOWF near SR 152. South of the MOWF, the alignment would curve generally east across the Pajaro River floodplain and through a portion of northern San Benito County before entering a tunnel (Tunnel 1) at the base of the Diablo Range. The Morgan Hill and Gilroy Subsection would end in the Pacheco Pass at Casa de Fruta Parkway/SR 152 (Figure 2-8), where the Alternative 3 alignment would converge with that of Alternatives 1 and 2.

South of the Monterey Corridor Subsection, Alternative 3 would diverge east from Alternative 1 north of Gilroy, near the intersection of Monterey Road and Church Avenue. Beginning at Church Avenue, a new freight track would diverge from the UPRR mainline to provide a freight connection to the MOWF. The freight track would continue parallel to the HSR alignment on the west side to the MOWF. The HSR alignment would cross over Church Avenue, Lena Avenue, Masten Avenue, and US 101 at Rucker Avenue on viaduct approximately 60 feet above grade. The aerial alignment would also cross over Denio Avenue and Buena Vista Avenue on viaduct before descending onto embankment. Cohansey Avenue would be closed. At the north end of the East Gilroy Station site, the alignment would cross beneath Las Animas Avenue; at the south end of the station site, Leavesley Road would be raised on a bridge over the HSR embankment. At the south end of the East Gilroy Station site, the Llagas Creek overbank flow would be directed across the HSR alignment through two culvert crossings. Farther southeast, the alignment would cross over Gilman Avenue on viaduct. The alignment would cross Llagas Creek on a low viaduct, and Holsclaw Road would be closed to vehicular traffic. Levee Road would be realigned south of Llagas Creek.

Continuing south, the alignment would ascend to approximately 25 feet above grade on embankment approaching the MOWF site. SR 152 would be grade separated and realigned, crossing over the MOWF on a bridge. Both Frazier Lake Road and Holsclaw Road would connect to the grade-separated SR 152. The MOWF, on the south side of the alignment, would have the same features as the MOWF under Alternatives 1 and 2 and would similarly be on an embankment. Additional flood detention basins would be installed around the eastern edge of the MOWF to provide sufficient flood capacity in the Soap Lake floodplain. Jones Creek would be realigned around the eastern boundary of the MOWF, crossing beneath the HSR viaduct over Bloomfield Avenue. Continuing on a 40-foot-high embankment and then on viaduct, the alignment would cross the Pajaro River, Millers Canal, Lake Road, Pacheco Creek, Lovers Lane, San Felipe Road, and SR 152 before entering the west portal of Tunnel 1. Tequisquita Slough would be partially filled by the HSR embankment, which would include cross-culverts, 3.1 acres of adjacent floodwater detention basins, and extended viaduct over Pacheco Creek to maintain floodplain capacity and function.

The Alternative 3 alignment would converge at Tunnel 1 with those of the other alternatives.

Wildlife Crossings

Wildlife crossings would be provided between Bernal Way and San Martin as described for Alternative 1 with crossings at Tulare Hill, Fisher Creek, and Llagas Creek. Although Alternative 3 would include more embankment than Alternative 1, it would be similar to Alternative 1 by continuing primarily on viaduct through the Soap Lake area to allow for wildlife movement.

Stations

Alternative 3 would enter the East Gilroy Station on embankment (approximately 17 feet to top of rail) north of Leavesley Road (Figures 2-16 and 2-17). The station platforms would be 800 feet long and the station buildings would be constructed on both the east and west sides of the tracks with a connections concourse under the tracks. The MOWF freight access track would continue through the station on the west side of the west station platform. Access for passengers arriving by auto would be available from either the east or west entrance, while the main entrance on the west side would also provide access for passengers arriving by transit or bicycle. The HSR station buildings would encompass 58,611 square feet with a 4,400-square-foot substation and systems building. The concourse would be below the tracks and embankment. Approximately 1,520 on-site parking spaces would be provided to meet the projected demand in 2040. Spaces would be located on the east and west sides of the building. The west side station parking would

be accessed from Leavesley Road and a new station access road east of the outlet mall. The east side station parking would be accessed from Marcella Avenue. A multimodal access plan would be developed prior to design and construction of the station.

Seven bus bays would be provided on site on the west side of the station. A 4,000-square-foot bicycle parking facility would be constructed; a new Class III bike route would be provided from the outlet mall to the site entrance; then Class II lanes from the station entrance to the parking. Class I bidirectional off-street path would be provided adjacent to parking which connects to the bike station. This would be a new station without any other rail operators in the station area.

Traction Power Facilities

Under Alternative 3, one new TPSS, Site 4—Gilroy, would be constructed at one of two sites: north of HSR either east or west of the former SR 152. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnection of the TPSS to a new utility switching station and/or to existing PG&E facilities, typically within tie-line/utility corridors.

As under Alternative 1, a traction power switching station would be constructed at one of two locations north of Palm Avenue and east of the alignment.

Four traction power paralleling stations would be constructed at the following locations:

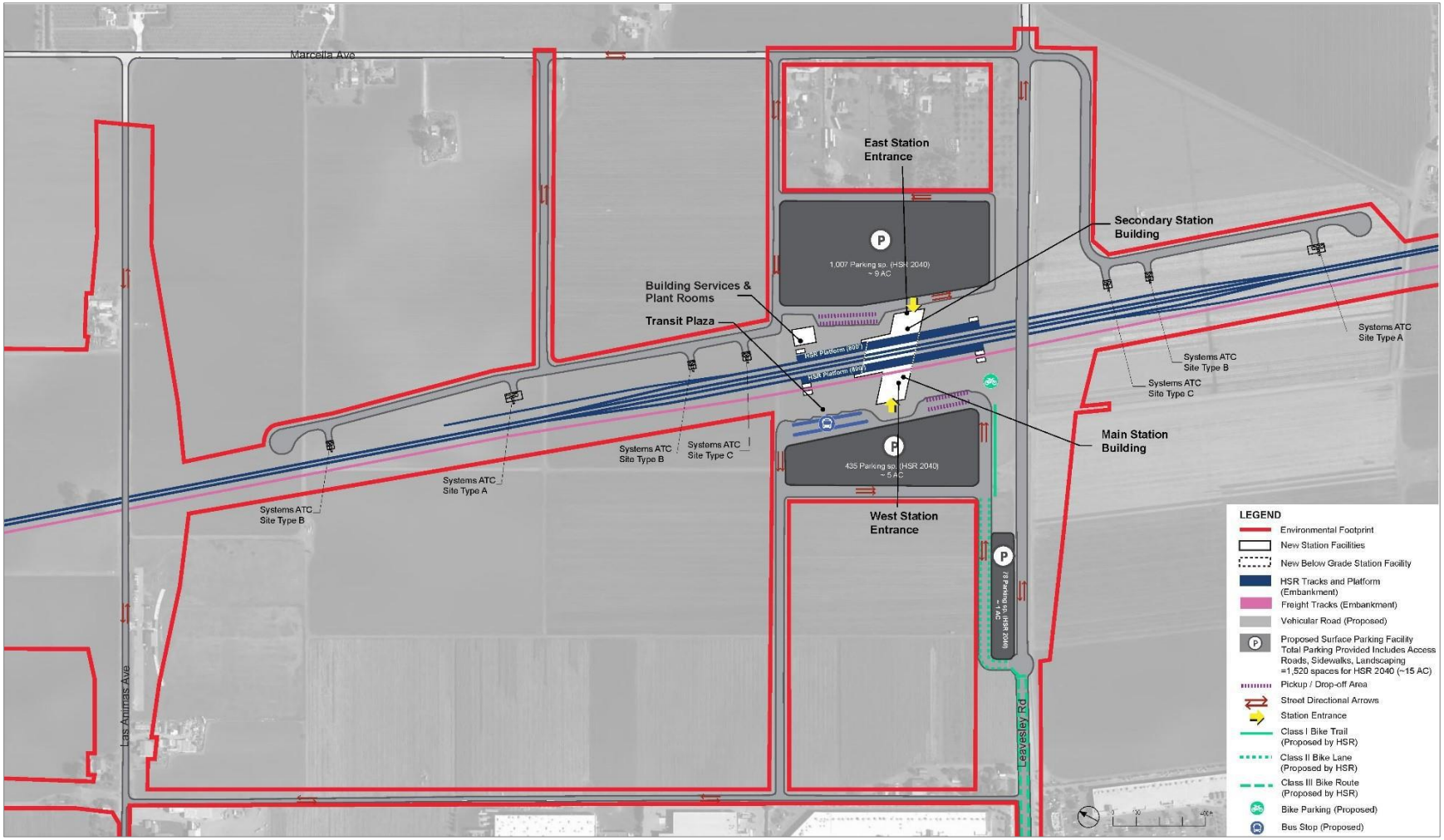
- South of the alignment, located either south of Diana Avenue or at the intersection of San Pedro Avenue and Walnut Grove Drive (like Alternative 1)
- Either at the northwest or southeast corner of the HSR crossing of Masten Avenue
- South of Gilroy at one of three site options: on Lake Road north of the alignment, on Lake Road south of the alignment, or at Lovers Lane south of the alignment
- Near the Tunnel 1 east portal, either at the portal or east of SR 152 in the southern area of Casa de Fruta

The PG&E transmission network upgrades from Metcalf to Morgan Hill and from Morgan Hill to Llagas described for Alternative 1 would also be necessary under Alternative 3. In addition to a new utility switching station co-located with the TPSS, a tie-line route and power distribution to the Tunnel 1 portal under this alternative would be the same, albeit with shorter electrical line routes, as those described for Alternative 1. A distribution power line for the Tunnel 1 portals would be constructed on the south side of the alignment northeast of the intersection of Walnut Lane and SR 152, crossing over and connecting with the TPSS from the north. One power drop site would be provided at the east and west portals (two options for each portal location).

Train Control and Communication Facilities

A total of 19 ATC sites would be constructed in the Morgan Hill and Gilroy Subsection for this alternative:

- One site east of Monterey Road near Palm Avenue (two site options)
- One site near East Middle Avenue (two site options)
- Two sites near Cohansey Way
- Four sites between Las Animas Avenue and Leavesley Road
- Three sites south of Leavesley Road
- Four sites north of SR 152, east of Gilroy
- Two sites within the MOWF
- Three sites north of Bloomfield Avenue
- One site near Lake Road (two site options)



Source: Authority 2019c

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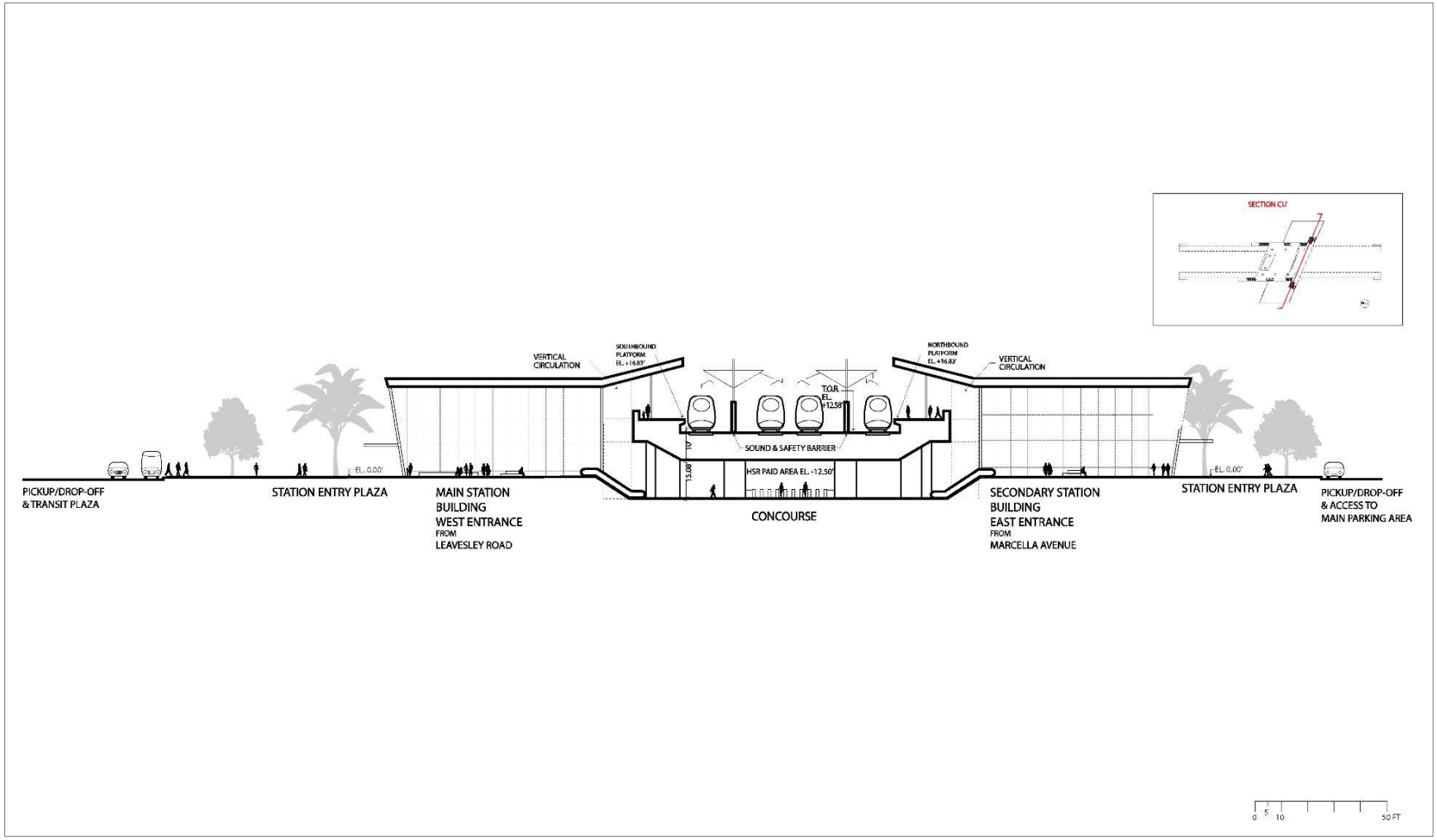
Figure 2-16 Conceptual East Gilroy Station Plan



Source: Authority 2019c

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Figure 2-17 Cross Section of East Gilroy Station

A total of six stand-alone communication radio sites would be constructed in this subsection (five locations are the same as those for Alternative 1):

- Between Barnhart Avenue and Kirby Avenue (two site options)
- South of Cochrane Road along US 101 (two site options)
- North of Cox Avenue and south of West San Martin Avenue (two site options)
- At Bloomfield Avenue

Maintenance Facilities

The East Gilroy MOWF would be located west of the HSR mainline, south of the community of Old Gilroy. The MOWF would encompass approximately 75 acres and extend along the west side of the HSR alignment from the intersection of the SR 152 and Frazer Lake Road south to Jones Creek (Figure 2-18). The freight connection would be provided as described in the discussion of the alignment and ancillary facilities.

2.2.3.4 Pacheco Pass Subsection

Alignment and Ancillary Features

The characteristics of the Pacheco Pass Subsection of Alternative 3 would be the same as Alternatives 1 and 2.

Wildlife Crossings

The wildlife crossings under Alternative 3 would be as described under Alternative 1.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities of Alternative 3 would be as described for Alternatives 1 and 2.

Train Control and Communication Facilities

Train control and communications facilities of Alternative 3 would be as described for Alternatives 1 and 2.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

2.2.3.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

The characteristics of the San Joaquin Valley Subsection under Alternative 3 would be the same as under Alternatives 1 and 2.

Wildlife Crossings

The wildlife crossings under Alternative 3 would be as described for Alternatives 1 and 2.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities of Alternative 3 would be as described for Alternatives 1 and 2.

Train Control and Communication Facilities

Train control and communications facilities would be as described for Alternatives 1 and 2.

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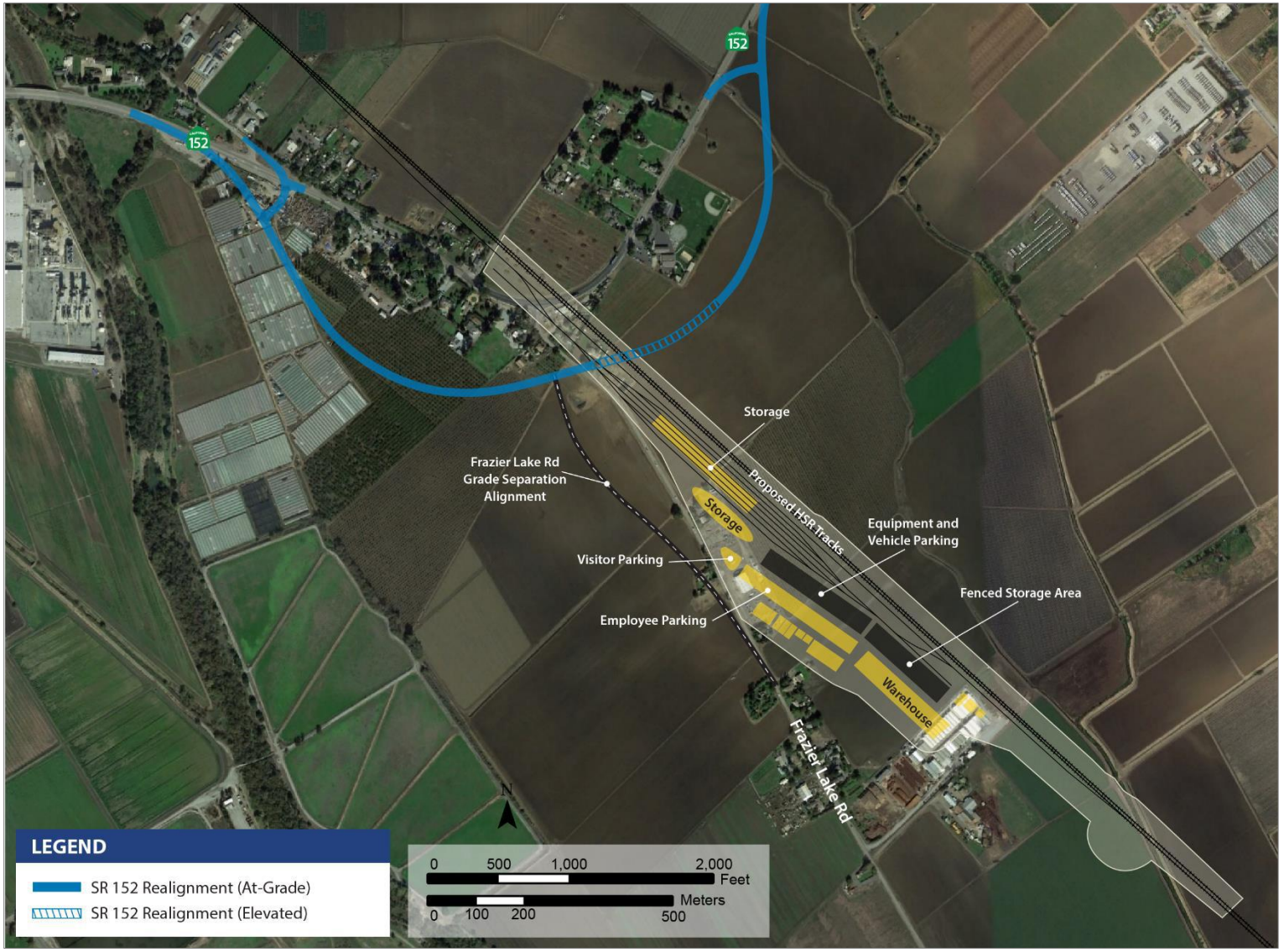


Source: Authority 2019c

JUNE 2019

Figure 2-18 East Gilroy Maintenance of Way Facility

Maintenance Facilities

An MOWS would be constructed near Turner Island Road near Carlucci Road as described for Alternatives 1 and 2 (Figure 2-13).

2.2.4 Alternative 4 (State's Preferred Alternative, CEQA Proposed Project)

On September 17, 2019, the Authority Board of Directors reviewed a staff recommendation on the State's Preferred Alternative and a summary of key identified outreach concerns. The Board confirmed that Alternative 4 is the State's Preferred Alternative for purposes of the Draft EIR/EIS and serves as the CEQA proposed project for purposes of State CEQA Guidelines Section 15124.

The process for considering and the rationale for selecting the State's Preferred Alternative are presented in Chapter 8, Preferred Alternative, of the Final EIR/EIS.

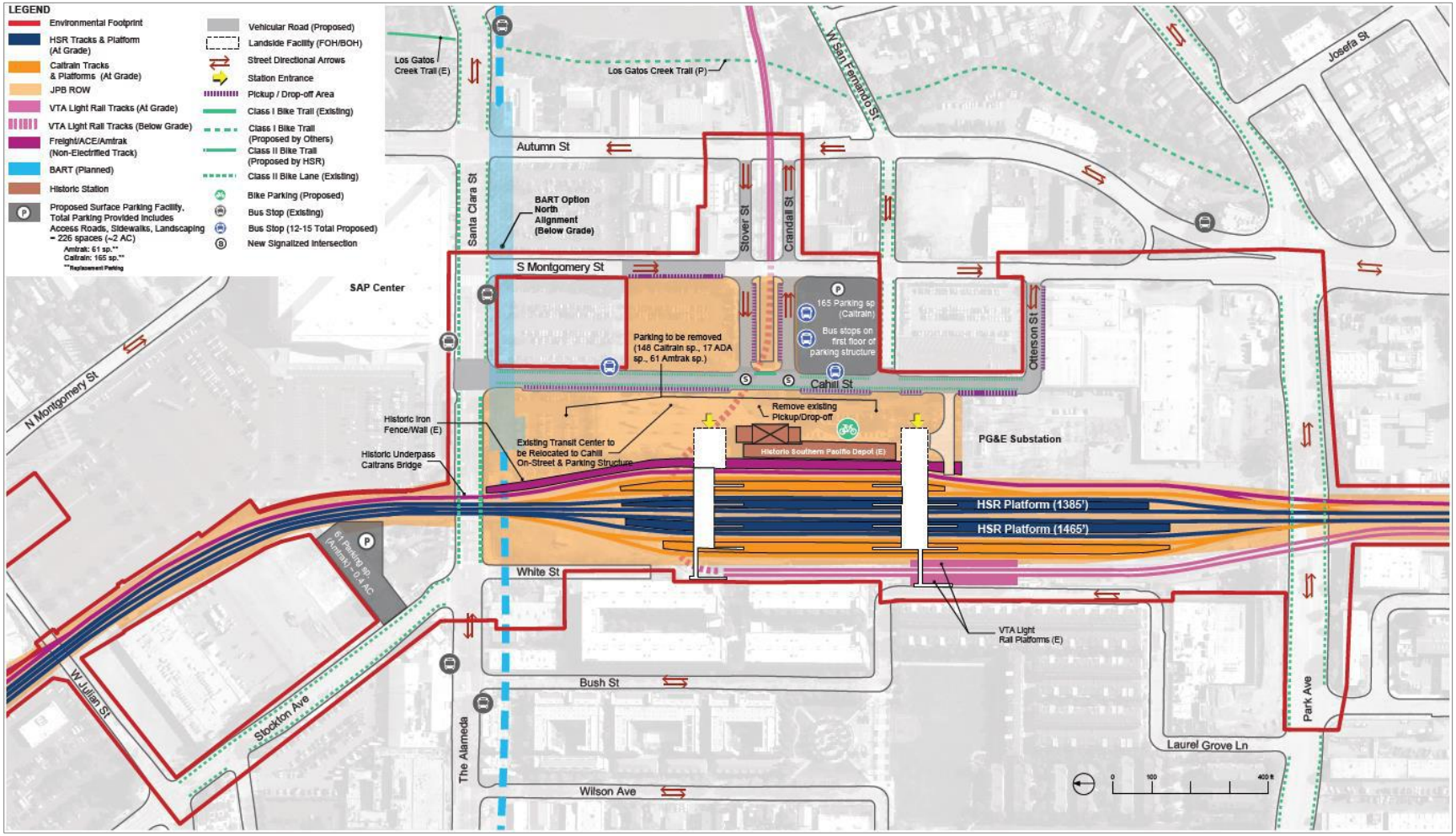
Development of Alternative 4 was intended to extend blended electric-powered passenger railroad infrastructure from the southern limit of the Caltrain Peninsula Corridor Electrification Project through Gilroy. South and east of Gilroy, HSR would operate in a dedicated guideway similar to Alternatives 1, 2, and 3. The objectives of this approach are to minimize property displacements and natural resource impacts, retain local community development patterns, improve the operational efficiency and safety of the existing railroad corridor, and accelerate delivery of electrified passenger rail services in the increasingly congested southern Santa Clara Valley corridor. The alternative is distinguished from the three other project alternatives by a blended, at-grade alignment that would operate on two electrified passenger tracks and one conventional freight track predominantly within the existing Caltrain and UPRR rights-of-way. The maximum train speed of 110 mph in the blended guideway would be enabled by continuous access-restriction fencing; four-quadrant gates, roadway lane channels, and railroad trespass deterrents at all public road grade crossings; and fully integrated communications and controls for train operations, grade crossings, and roadway traffic. Caltrain stations would be reconstructed to enable directional running as part of blended operations. Overall, this alternative would be comprised of 15.2 miles on viaduct, 30.3 miles at grade, 25.9 miles on embankment, 2.3 miles in trench, and two tunnels with a combined length of 15.0 miles.

2.2.4.1 San Jose Diridon Station Approach Subsection

Alignment and Ancillary Features

Alternative 4 would begin at Scott Boulevard in blended service with Caltrain on an at-grade profile following Caltrain MT2 and MT3 south along the east side of the existing Caltrain corridor. The existing Lafayette Street pedestrian overpass would remain in place, as would the De La Cruz Boulevard and West Hedding Street roadway overpasses. New UPRR track would start just south of Emory Street to maintain freight movement capacity north of San Jose Diridon Station. The new UPRR track would be east of Caltrain MT1. The existing College Park Caltrain Station would be reconstructed just north of Emory Street on the west side of the Caltrain Corridor on the existing siding track to eliminate the existing holdout rule at the station. A portion of both legs of the UPRR Warm Springs Subdivision Lenzen Wye would undergo minor track adjustments, and a new bridge would be built over Taylor Street for UPRR to tie into the Lenzen Wye.

The blended at-grade alignment would continue along MT2 and MT3 to enter new dedicated HSR platforms at grade at the center of San Jose Diridon Station (Figure 2-19). HSR platforms would be extended south to provide 1,385-foot and 1,465-foot platforms and would be raised to provide level boarding with the HSR trains. The existing Santa Clara Street underpass would remain, but the track in the throat and yard would require modification. There would be no need for modifications to the VTA light rail.



Source: Authority 2019c

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Figure 2-19 Conceptual San Jose Diridon At-Grade Station Plan

Continuing south, the blended at-grade three-track alignment would remain in the Caltrain right-of-way through the Gardner neighborhood. The existing underpass at Park Avenue and the existing overpass at San Carlos Street would remain in place. Four-quadrant gates with channelization would be built at Auzerais Avenue and West Virginia Street. A new bridge for the blended HSR/MT3 track over I-280 would be constructed. The existing underpasses at Bird Avenue and Delmas Avenue would be reconstructed, as would the rail bridge overpasses. New standalone rail bridges over Prevost Street, SR 87, the Guadalupe River, and Willow Street would be built for MT3. MT1 and MT2 would remain on the existing structures. The existing Tamien Caltrain Station would remain in place.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

The San Jose Diridon Station would entail a four-track at-grade alignment through the center of the existing Diridon station, with 1,385- and 1,465-foot platforms centered between Santa Clara Street and Park Avenue (Figure 2-19). The existing historic train station would remain in place. A pedestrian concourse would be built above the yard to provide access to the platforms below. The concourse would consist of a pedestrian walkway above the existing Caltrain tracks and below the HSR platforms, with two entrances on the east side and one on the west.

Construction of San Jose Diridon Station would require displacement of 226 parking spaces. These would be replaced 1:1 in a parking structure at Cahill/Crandall Streets and a second site at Stockton/Alameda Streets. The existing on-site/off-street bus transit center would be relocated to an off-street facility between Cahill, Crandall, South Montgomery, and West San Fernando Streets. Street improvements would include reconfiguring and extending Cahill Street from Santa Clara Street to Otterson Street and extending Stover and Crandall Streets to South Montgomery Street. New bike lanes would be installed on the east side of Cahill Street. New signals and pedestrian crossings would be developed at Cahill and Stover Streets and Cahill and Crandall Streets.

Phasing for interim operations (2027) includes a pedestrian overhead crossing (PED OC) south of the existing historic station and would provide circulation access from the PED OC only to HSR platforms. Caltrain would continue to use the existing tunnel for access. Phasing for Valley-to-Valley (2029) includes access to and from all Caltrain and HSR platforms. At this stage, the existing tunnel would be used only for exiting purposes on HSR platforms. At buildout, there would be an additional PED OC north of the historic station with access to all Caltrain and HSR platforms. From the HSR platforms, the existing tunnel would continue to be used only for exiting.

Train Control and Communication Facilities

Under Alternative 4, HSR would use the existing ATC sites included as part of the Caltrain Positive Control and Electrification Project.

One stand-alone communications radio site would be constructed at one of two locations, both south of Scott Boulevard along the east side of the Caltrain corridor.

Maintenance Facilities

No maintenance facilities are proposed within this subsection.

2.2.4.2 Monterey Corridor Subsection

Alignment and Ancillary Features

The Monterey Corridor Subsection would be approximately 9 miles long and entirely within the San Jose city limits. From the San Jose Diridon Station Approach at West Alma Avenue, just south of the Caltrain Tamien Station, the alignment would extend primarily southeast to Bernal Way (Figure 2-4). Unlike Alternatives 1, 2, and 3, Alternative 4 would be in blended service with Caltrain on an at-grade profile within the Caltrain and UPRR right-of-way. HSR and Caltrain

would operate on the electrified MT2 and MT3 tracks, while UPRR would operate on a nonelectrified MT1. The two existing tracks would be shifted to accommodate the third track. The existing Tamien Caltrain Station would remain in place with two new electrified turnback tracks constructed south of the station to facilitate turning trains outside the station platform areas. The Michael Yard would be reconfigured to a double-ended facility to accommodate storage of Altamont Corridor Express trains and relocated to the east side of the corridor. A new standalone bridge over West Alma Avenue would be constructed for MT3 and a maintenance track, with MT1 and 2 remaining on the existing structure. A new bridge over Almaden Road would be constructed for MT2 and MT3, while MT1 would remain on the existing structures. The existing pedestrian overpass at Communications Hill would remain in place. Capitol Caltrain Station would be reconstructed with a new center platform between MT2 and MT3. The platform would be reached by a new pedestrian overpass built at the north end of the platform. The existing Capitol Expressway overpass would remain in place. Four-quadrant barrier gates with channelization would be built at Skyway Drive, Branhan Lane, and Chynoweth Avenue. The existing Blossom Hill Road overpass and adjacent pedestrian overpass would remain in place. The Blossom Hill Caltrain Station would be reconstructed; the existing pedestrian overpass and platform would be removed and a new center platform constructed between MT2 and MT3. The platform would be reached by a new pedestrian overpass built at the south end of the platform. Great Oaks Parkway would be realigned for approximately 1,350 feet to accommodate the widened rail corridor. SR 85 and Bernal Road overpasses would remain in place.

Wildlife Crossings

There would be no wildlife crossings in this subsection.

Stations

There would be no HSR stations within this subsection.

Traction Power Facilities

One traction power paralleling station would be built on the west side of the Caltrain Corridor near the Blossom Hill Caltrain Station.

Train Control and Communication Facilities

Five ATC sites would be built in the subsection:

- Near Communications Hill on the east side of the Caltrain corridor near Chateau La Salle Drive
- Near Communications Hill on the east side of the Caltrain corridor near Montecito Vista Way
- Near Communications Hill on the east side of the Caltrain corridor near Chateau La Salle Drive or Montecito Vista Way (two site options)
- Near Monterey Road on the west side of the Caltrain corridor near Capitol Caltrain Station
- Near Skyway Drive on the west side of the Caltrain corridor (two site options)
- Near Branham Lane on the west side of the Caltrain corridor

Two stand-alone communications radio sites built:

- Near Almaden Road on the east side of the Caltrain corridor
- Near Branham Lane on the west side of the Caltrain corridor

PTC sites would be constructed at the following locations:

- Two sites south of Almaden Road
- One site north of Capitol Caltrain Station
- One site co-located with the ATC site at Branham Lane

2.2.4.3 Morgan Hill and Gilroy Subsection

Alignment and Ancillary Features

The Morgan Hill and Gilroy Subsection under Alternative 4 would be approximately 32 miles long, continuing south from the Monterey Corridor Subsection. From Bernal Way in South San Jose, the alignment would extend through Morgan Hill and San Martin to the Downtown Gilroy Station, then curve generally east across the Pajaro River floodplain and through a portion of northern San Benito County before entering Tunnel 1 at the base of the Diablo Range. The alignment would exit the tunnel at Casa de Fruta Parkway/SR 152 in unincorporated eastern Santa Clara County, where it would transition to the Pacheco Pass Subsection. This subsection under Alternative 4 would be blended service with Caltrain on an at-grade profile within the Caltrain and UPRR right-of-way with an at-grade Downtown Gilroy Station. Past the Downtown Gilroy Station and south of the US 101 overpass, HSR would enter the fully grade-separated, dedicated track needed to operate HSR trains at speeds faster than 125 mph.

Beginning at the southern limit of the Monterey Corridor Subsection, the alignment would continue in blended service with Caltrain on an at-grade profile in the existing UPRR right-of-way. HSR and Caltrain would operate on the electrified MT2 and MT3 tracks, while UPRR would operate on MT1. A UPRR siding track would be provided between Blanchard Road and Bailey Avenue. Four-quadrant barrier gates would be installed at all existing public road crossings. Intrusion deterrents would be installed at all at-grade crossings. Three private roads crossing would be eliminated and alternate access provided to those properties. The existing Bailey Avenue overpass would remain in place. Under Alternative 4 the Monterey Road underpass would be reconstructed to accommodate the future widening of Monterey Road to four lanes. The Morgan Hill Caltrain Station would be reconstructed with two new side platforms built outside MT2 and MT3. The platform would be reached by a new pedestrian underpass constructed at the north end of the platform. The existing Butterfield Boulevard overpass would remain in place. Upper Llagas Creek bridge would be reconstructed.

The San Martin Caltrain Station would be reconstructed—the existing platform would be removed and a new center platform would be built between MT2 and MT3. The platform would be reached by a new pedestrian overpass constructed at the south end of the platform. The existing bridge at Miller Slough would be replaced with a triple-cell box. Blended service would end just south of the Downtown Gilroy Station, where Caltrain would have access to turn back and stabling tracks relocated from the station area to south of 10th Street on the west side of the UPRR right-of-way. The Gilroy Caltrain Station would be reconstructed—the existing Caltrain platform would be shifted south and served by a southbound station track. A northbound Caltrain side platform would be provided to the east of a northbound station track. Two side platforms would be provided for HSR on the outside of the MT2 and MT3 tracks. The platforms would be reached by a new pedestrian overpass constructed over the center of the platforms. HSR would continue south under the US 101 overpass, which would remain in place. Past the Industry spur, HSR would ascend onto embankment and then a bridge over the UPRR. Two bridges would be constructed, one for MT2 and MT3 and a separate one for the MOWF lead track. The UPRR Hollister branch line would be realigned to the west to accommodate HSR bridging over the UPRR tracks at a single location. HSR MT2 and MT3 would descend from the embankment before crossing over Bloomfield Avenue on a new structure. Four-quadrant barrier gates and intrusion deterrents would be installed at Bloomfield Avenue for the MOWF lead track and UPRR service track. HSR would continue past the MOWF and transition to a new viaduct structure to cross over Pajaro Creek. Continuing on viaduct until just west of Millers Canal, Alternative 4 would join Alternative 1 as described for Alternative 1.

Wildlife Crossings

Twelve wildlife crossings or jump-outs would be built in this subsection:

- Three adjacent wildlife crossings with jump-outs integrated into the wing walls at Tulare Hill
- Fisher Creek culvert under UPRR and Monterey Road replaced with a larger box culvert to improve wildlife crossing potential at this location
- Wildlife crossings and integrated jump-outs south of Emado Avenue, south of Fisher Road, and south of Live Oak
- Wildlife crossings at Richmond Avenue, Paquita Espana Court, and north of Kalana Avenue
- Dedicated jump-outs north of Fisher Creek, south of Blanchard Road, north of Kalana Avenue, and at Miramonte Avenue

Wildlife intrusion deterrents would be constructed for at-grade crossings at Blanchard Road, Palm Avenue, Live Oak Avenue, and Bloomfield Avenue.

Stations

The Downtown Gilroy Station approach would be at grade with dedicated HSR tracks to the west of UPRR between Old Gilroy Street/7th Street, which would be closed, and 9th Street (Figure 2-20). A new HSR station with 800-foot platforms would be built south of the existing Caltrain station. A pedestrian concourse would be built above the UPRR and Caltrain tracks to provide access to the platforms below.

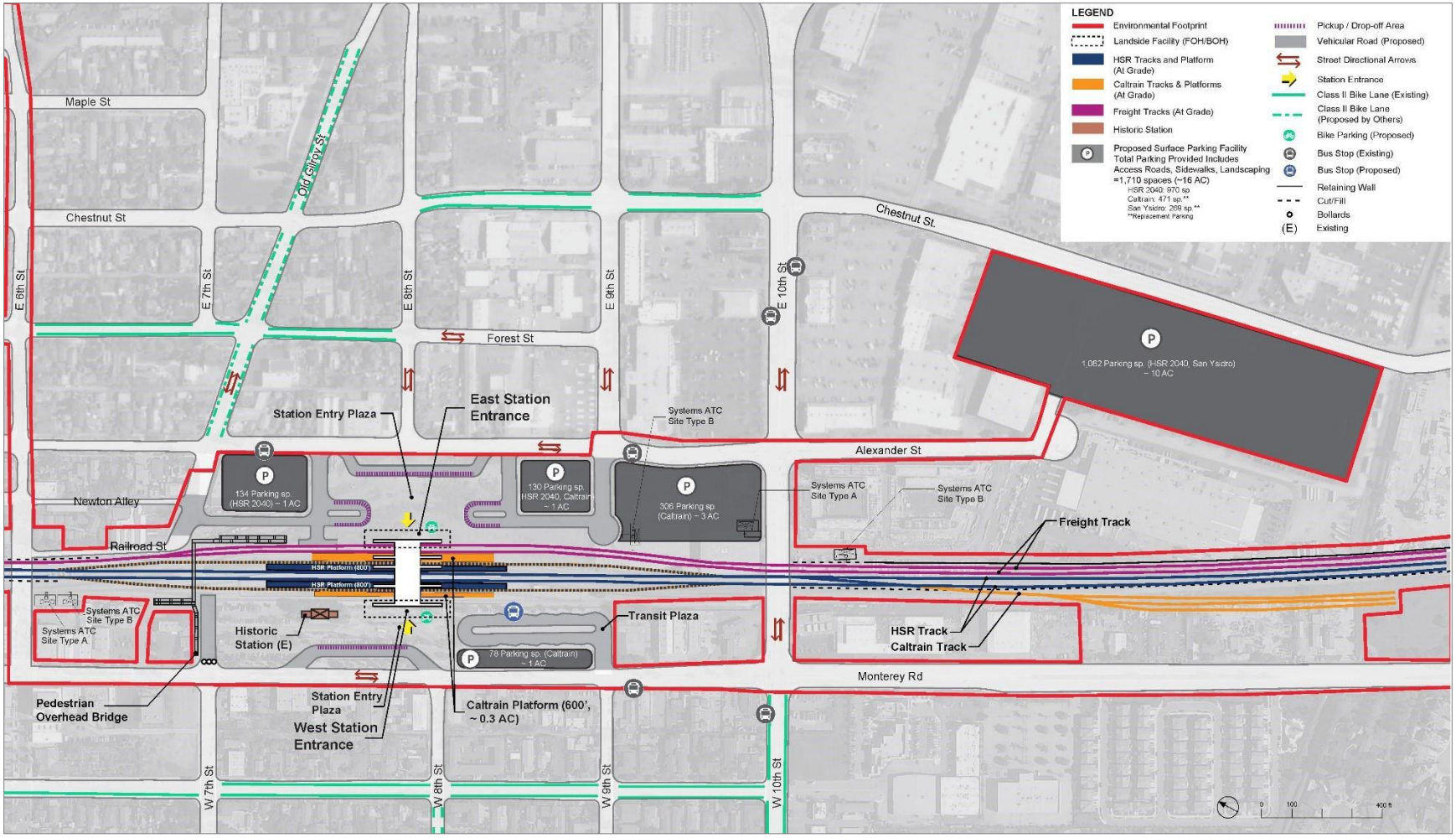
The existing 489 Caltrain parking spaces on the west side of the station would be replaced 1:1 in parking lots on the east and west sides of the alignment. The existing 269 parking spaces at the San Ysidro housing development would be replaced 1:1 with new surface parking at the south end of Alexander Street. HSR parking demand would be 970 spaces in 2040, for a total of 1,728 aggregated parking spaces in 2040. The station site plan provides 970 new parking spaces in five areas. One site would be west of the station along Monterey Road at 9th Street. The other four would be on the east side of the station along Alexander Avenue at 7th Street, 9th Street, 10th Street, and Banes Lane. A multimodal access plan would be developed prior to design and construction of the station. The plan would be developed in coordination with local agencies and would include a parking strategy that would specify the location, amount, and phasing of parking.

A total of eight bus bays would be provided, adding one bay to the existing seven. East 7th Street would be closed and East 10th Street would be modified with quadrant gates and channelization. A pedestrian overcrossing would be installed to provide access between East and West 7th Street. A 4,000-square-foot bicycle facility would be constructed. Figure 2-20 illustrates the conceptual at-grade Downtown Gilroy Station.

The Morgan Hill Caltrain Station would be reconstructed with two new side platforms built outside MT2 and MT3. The platform would be reached by a new pedestrian underpass built at the north end of the platform. The San Martin Caltrain Station would be reconstructed where the existing platform would be removed and a new center platform would be built between MT2 and MT3. The platform would be reached by a new pedestrian overpass constructed at the south end of the platform.

Traction Power Facilities

One new TPSS, Site 4—Gilroy, would be constructed at one of two locations on the east side of the alignment: south of Buena Vista Avenue or north of Cohansey Avenue. At this site, one new utility switching station could be co-located with the TPSS. Communication facilities (i.e., redundant [two underground or one underground and one overhead on existing power structures] fiber optic lines) would also be required to support the electrical interconnections of the TPSS to a new PG&E switching station and/or to existing PG&E facilities, typically within tie-line/utility corridors.



Source: Authority 2019c

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Figure 2-20 Conceptual Downtown Gilroy At-Grade Station Plan

A traction power switching station would be constructed west of the HSR alignment at Richmond Avenue.

Three traction power paralleling stations would be constructed adjacent to the guideway:

- Either south of San Pedro Avenue on the west side of the alignment or just north of Butterfield Boulevard on the east side of the alignment
- West of Lovers Lane either south of the alignment or north of the alignment (like Alternative 1)
- Near the Tunnel 1 east portal, either at the portal or east of SR 152 in the southern area of Casa de Fruta (like Alternatives 1 and 2)

PG&E would reinforce the electric power distribution network to meet HSR traction and distribution power requirements by replacing (reconductoring) approximately 11.1 miles of existing power line associated with the Spring to Llagas and Green Valley to Llagas 115-kV power lines. The existing power lines to be reconductored, reusing the poles and towers, begin at the Morgan Hill Substation on West Main Avenue in Morgan Hill, then cross the east side of Peak Avenue and Dewitt Avenue, spanning West Dunne Avenue, Chargin Drive, Spring Avenue, and several residences. The alignment would continue south across an open-space area, then follow Sunnyside Avenue for approximately 0.5 mile. The alignment would continue south for approximately 4 miles, spanning additional open-space areas of wineries and the Corde Valley Golf Course. The alignment would then turn east along the north side of Day Road before heading south for approximately 2.5 miles and terminating at the Llagas Substation in Gilroy.

A permanent overhead distribution electrical power line from TPSS Site 4 to the Tunnel 1 portal location would provide power to the tunnel boring machine during construction and the tunnel fire-life-safety system during operations.

Train Control and Communication Facilities

Twenty-two ATC sites would be constructed:

- One site south of Blanchard Road on the east side of the alignment (two site options)
- Three sites south of Live Oak Avenue on the west side of the alignment
- One site north of San Pedro Avenue on the west side of the alignment
- One site north of Barrett Avenue on the west side of the alignment (two site options)
- One site north of East Middle Avenue on the west side of the alignment
- One site in the vicinity of either Church Avenue or Lena Avenue on the east side of the alignment (two site options)
- One site between Leavesley Road and IOOF Avenue
- Two sites south north of Lewis Street on the east side of the alignment
- Two sites south of 6th Street on the west side of the alignment
- Three sites in the vicinity of 10th Street on the east side of the alignment
- Four sites north of Carnadero Avenue on the west side of the alignment
- Two sites east of the Pajaro River
- One site near Lake Road (two site options) (like Alternative 1)

PTC sites would be constructed at the following locations:

- One site south of Blanchard Road
- One site north of Bailey Avenue
- One site co-located with ATC site south of Live Oak Avenue

- One site at Cohansey Avenue
- One site south of Lewis Street
- One site south of East 6th Street

Five stand-alone communications radio sites would be constructed:

- Near Bernal Way on the west side of the alignment (two site options)
- South of Live Oak Avenue on the west side of the alignment (two site options)
- In the vicinity of East Central Avenue (two site options, one on either side of the alignment)
- South of California Avenue on the east side of the alignment
- East of the Pajaro River south of Gilroy

Maintenance Facilities

The South Gilroy MOWF (Figure 2-21) near Bloomfield Avenue would encompass approximately 50 acres and the program and layout would be as described for Alternatives 1 and 2. In contrast to Alternatives 1 and 2, the MOWF for Alternative 4 would be located on the west side of the tracks between Carnadero Avenue and the Pajaro River. This configuration would require realignment of the UPRR Hollister Subdivision. HSR mainline and MOWF lead track would pass over UPRR Coast Subdivision tracks.

2.2.4.4 Pacheco Pass Subsection

Alignment and Ancillary Features

Alternative 4 would be as described for Alternatives 1–3 for this subsection.

Wildlife Crossings

The wildlife crossings under Alternative 4 would be as described for Alternatives 1–3.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

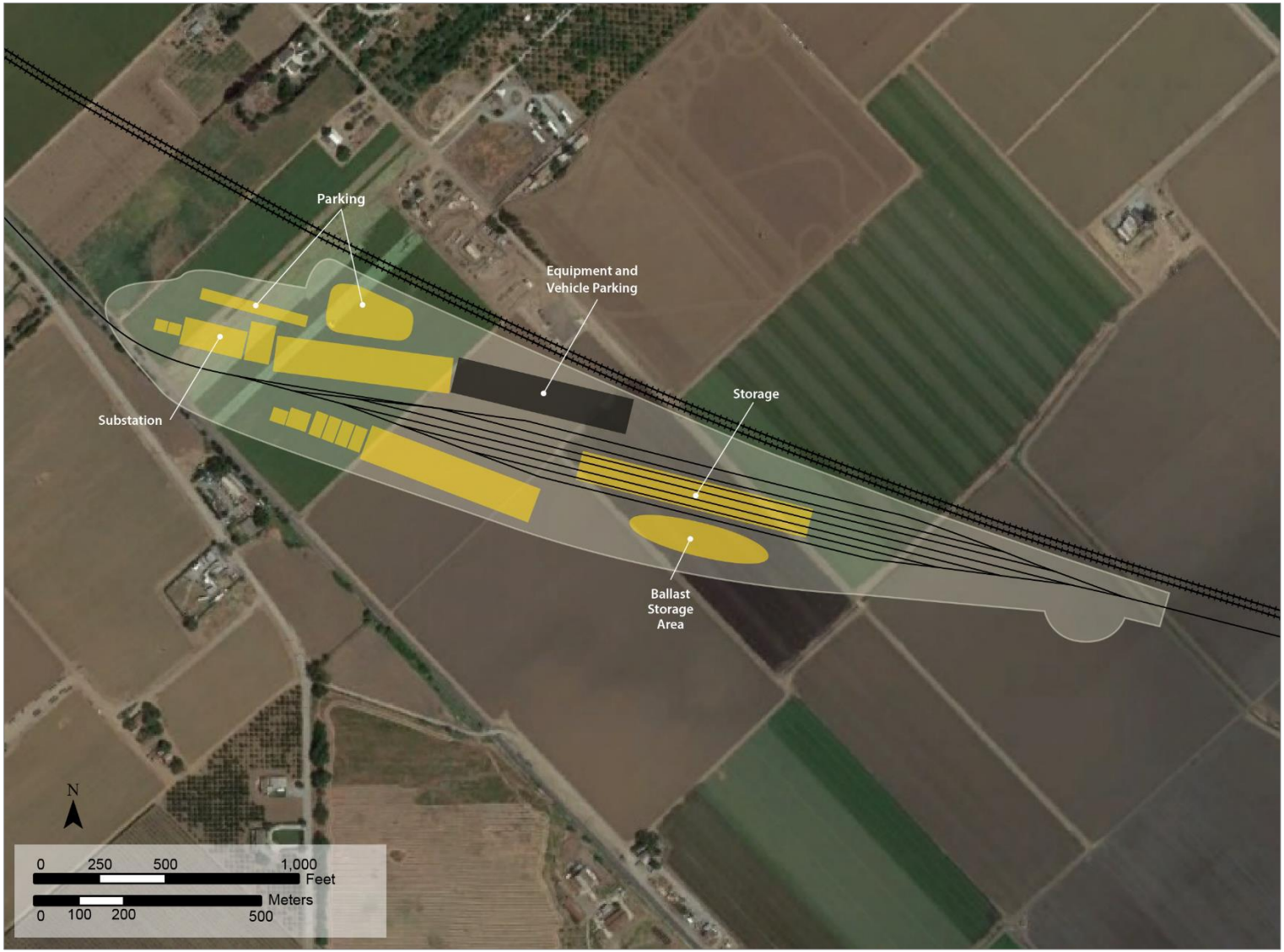
Traction power facilities of Alternative 4 would be as described for Alternatives 1–3.

Train Control and Communication Facilities

Train control and communications facilities would be as described for Alternatives 1–3.

Maintenance Facilities

An MOWS would be built near Turner Island Road near Carlucci Road as described for Alternatives 1–3 (Figure 2-13).



Source: Authority 2019c

JUNE 2019

Figure 2-21 South Gilroy Maintenance of Way Facility for Alternative 4

2.2.4.5 San Joaquin Valley Subsection

Alignment and Ancillary Features

Alternative 4 would be the same as described for Alternatives 1–3 for this subsection.

Wildlife Crossings

The wildlife crossings under Alternative 4 would be as described for Alternatives 1–3.

Stations

No new HSR stations are proposed for this subsection.

Traction Power Facilities

Traction power facilities would be as described for Alternatives 1–3.

Train Control and Communication Facilities

Train control and communications facilities would be as described for Alternatives 1–3.

Maintenance Facilities

An MOWS would be built near Turner Island Road near Carlucci Road as described for Alternatives 1–3 (Figure 2-13).

2.3 Impact Avoidance and Minimization Features

The Authority has developed impact avoidance and minimization features (IAMF) that would avoid or minimize potential noise and vibration effects. IAMFs are incorporated into the project design and construction to avoid or minimize environmental effects. The description of each IAMF details the means and effectiveness of the feature in avoiding or minimizing effects, as well as the environmental benefits of implementing the measure. Table 2-2 shows complete descriptions of all IAMFs that the Authority and FRA would implement to address potential effects related to noise and vibration.

Table 2-2 Noise and Vibration Impact Avoidance and Minimization Features

IAMF	Description
NV-IAMF#1: Noise and Vibration	Prior to construction, the contractor will prepare and submit to the Authority a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts will be employed when work is being conducted within 1,000 feet of sensitive receptors. Typical construction practices contained in the FTA and FRA guidelines for minimizing construction noise and vibration impacts include the following: ▪ Construct noise barriers, such as temporary walls or piles on excavated material, between noisy activities and noise-sensitive resources. ▪ Route truck traffic away from residential streets where possible. ▪ Construct walled enclosures around especially noisy activities or around clusters of noisy equipment. ▪ Combine noisy operations so that they occur in the same period. ▪ Phase demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period. ▪ Avoid impact pile driving where possible in vibration-sensitive areas.

Source: Authority and FRA 2019
FTA = Federal Transportation Administration
FRA = Federal Railroad Administration

3 LAWS, REGULATIONS, AND ORDERS

This chapter provides a summary of federal, state, and local laws, regulations, orders, or plans that pertain to noise and vibration in the geographic area that would be affected by the project.

3.1 Federal

3.1.1 Noise Control Act of 1972 (42 U.S.C. § 4910)

The Noise Control Act of 1972 (42 United States Code [U.S.C.] § 4910) was the first comprehensive statement of national noise policy. It declared, "it is the policy of the U.S. to promote an environment for all Americans free from noise that jeopardizes their health or welfare." Although the act, as a funded program, was ultimately abandoned at the federal level, it served as the catalyst for comprehensive noise studies and the generation of noise assessment and mitigation policies, regulations, ordinances, standards, and guidance for many states, counties and municipal governments. For example, the noise elements of community general plans and local noise ordinances studied as part of this technical report were largely created in response to passage of the act.

3.1.2 Occupational Safety and Health Administration Occupational Noise Exposure (29 C.F.R. § 1910.95)

The Occupational Safety and Health Administration has regulated worker noise exposure to a time-weighted-average of 90 A-weighted decibels (dBA) over an 8-hour work shift. Areas where levels exceed 85 dBA must be designated and labeled as high-noise-level areas where hearing protection is required. This noise exposure criterion for workers would apply to construction activities in the RSA. Noise from construction activities might also elevate noise levels at nearby construction sites to levels that exceed 85 dBA and thus trigger the need for administrative or engineering controls and hearing conservation programs for worker safety, as detailed by the Occupational Safety and Health Administration.

3.1.3 Federal Railroad Administration

3.1.3.1 Noise and Vibration Impact Assessment Guidelines

The FRA provides guidance regarding the evaluation of noise and vibration impacts of HSR trains in the FRA guidance manual (FRA 2012). The manual includes prediction methodology, assessment procedures, and impact criteria for noise and vibration. The noise and vibration impact criteria are discussed in this technical report in Section 4.1.3, Impact Criteria, and Section 4.2.3, Impact Criteria, respectively.

3.1.3.2 Railroad Noise Emission Compliance Regulations (49 C.F.R. Part 210)

The FRA's Railroad Noise Emission Compliance Regulation (49 Code of Federal Regulations [C.F.R.] Part 210) prescribes minimum compliance regulations for enforcement of Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers (40 C.F.R. Part 201) adopted by the U.S. Environmental Protection Agency. New locomotives must meet the following noise standards: 70 dBA at 100 feet while stationary at idle throttle setting, 87 dBA at 100 feet while stationary at all other throttle settings, 90 dBA at 100 feet while moving. Rail cars must meet the following noise standards: 88 dBA at 100 feet while moving at speeds of 45 mph or less, and 93 dBA at 100 feet while moving at speeds greater than 45 mph.

Whether or not the EPA standard applies to high-speed trainsets, the analysis in this EIR/EIS does not assume that Authority trainsets will comply with it because the Authority and FRA are not aware of any high-speed trainsets manufactured in the world today that meet this standard at all speeds. A noise-generation standard specific to high-speed trains does exist in Europe (European TSI Standard), and a trainset manufactured to that standard complies with the US EPA standard (if applicable) generally at speeds below 190 to 200 mph. Above that speed, airflow over the trainset and its pantograph and related apparatus is the main source of noise, which presently-known technology cannot resolve to comply with the US EPA standard (if applicable). The analysis in this EIR/EIS – both prior to mitigation and after mitigation – assumes

a trainset generating noise in compliance with the European TSI standard, because trainsets currently in manufacture and operation in Europe can meet this standard; the analysis does not assume a trainset that meets the US EPA standard.

3.1.3.3 Locomotive Horn Rule (49 C.F.R. Part 222 & Part 229)

FRA regulations require that engineers sound their locomotive horns while approaching public grade crossings until the lead locomotive fully occupies the crossing. In general, the regulations require locomotive engineers to begin to sound the train horn for a minimum of 15 seconds, and a maximum of 20 seconds, in advance of public grade crossings. Engineers must also sound the train horn in a standardized pattern of two long, one short and one long blast and the horn must continue to sound until the lead locomotive or train car occupies the grade crossing. Additionally, the minimum sound level for the locomotive horn is 96 dB(A), while the maximum sound level is 110 dB(A), both measured at 100 feet forward of the locomotive.

FRA allows public authorities to establish a quiet zone, which is segment of a rail line, within which is situated one or a number of consecutive public road-rail crossings at which locomotive horns are not routinely sounded, provided sufficient safety measures are implemented at the crossing to prevent/minimize the potential for accidents to occur. Railroad authorities, including Caltrain, CHSRA and railroad companies (such as UPRR) cannot establish quiet zones; only local cities and counties can establish them by applying to the FRA.

At a minimum, new quiet zones must be at least one-half mile in length and contain at least one public grade crossing (i.e., a location where a public highway, road, or street crosses one or more railroad tracks at grade). Every public grade crossing in a quiet zone must be equipped at a minimum with active grade crossing warning devices consisting of flashing lights and gates.

If a public authority wants to establish a new quiet zone, it must conduct an assessment of hazards related to the crossings in the proposed zone and implement sufficient safety measures to reduce the proposed quiet zone's risk level to an acceptable level. Improvements may include: Roadway medians or channelization devices to discourage motorists from driving around a lowered crossing gate; a four-quadrant gate system to block all lanes of highway traffic; converting a two-way street into a one-way street and installing crossing gates, and permanent or temporary (nighttime) closure of the crossing to highway traffic. As an alternative, communities may also choose to silence routine locomotive horn sounding through the installation of wayside horns at public grade crossings. Wayside horns are train-activated stationary acoustic devices at grade crossings that are directed at highway traffic as a one-for-one substitute for train horns.

As described in Chapter 2, Alternatives, the project includes the following improvements in all blended service segments with at-grade crossings: fencing of the right of way; four-quadrant gates and roadway channelization at at-grade crossings, and intrusion detection and monitoring systems The installation of these features would assist local cities and counties to establish quiet zones should they decide to do so but cities or counties would need to go through the quiet zone process with the FRA first to establish such zones.

3.1.4 Federal Transit Administration Guidelines

The FTA provides guidance regarding the evaluation of noise and vibration impacts associated with construction and operations of non-high-speed trains in the FTA guidance manual (FTA 2018). The manual includes prediction methods, assessment procedures, and impact criteria for noise and vibration. Although it was originally developed for use on public mass transit projects the FTA guidance manual includes a method that is applicable to HSR station activities, yard and maintenance facility activities, and conventional-speed rail operations. The FTA construction noise and vibration assessment method is consistent with the FRA method. The noise and vibration impact criteria are discussed in this technical report in Section 4.1.3 and Section 4.2.3, respectively.

3.1.5 Federal Highway Administration Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 C.F.R. Part 772)

The FHWA stipulates procedures and criteria for noise assessment studies of highway projects (23 C.F.R. Part 772). It requires that noise abatement measures be considered on all major highway projects if the project would cause a substantial increase in traffic noise levels or if projected traffic noise levels approach or exceed the noise abatement criteria level for activities occurring on adjacent lands. These noise criteria are assigned to exterior and interior activities.

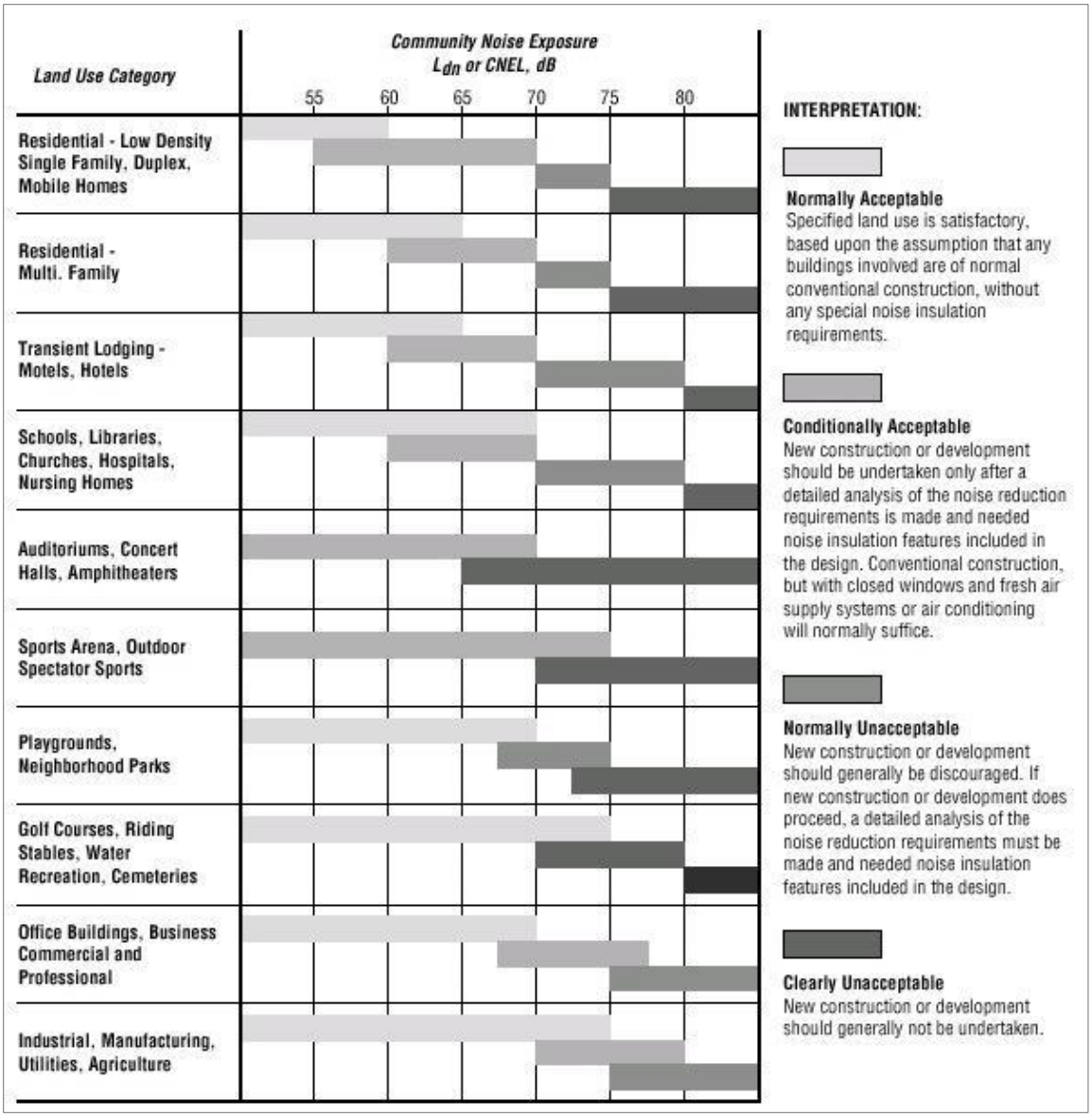
If motor vehicle traffic noise from federally funded projects is predicted to approach or exceed the noise abatement criteria during the noisiest 1-hour period, noise abatement measures must be considered, and, if determined to be reasonable and feasible, they must be incorporated as part of the project. Consistent with FHWA guidelines, the California Department of Transportation (Caltrans) defines *approach* as being within 1 dBA of the noise abatement criteria. Caltrans criteria also consider that a 12-decibel (dB) increase in peak-noise-hour traffic noise is a significant increase as defined by the FHWA procedures.

3.2 State

3.2.1 General Plan Guidelines (Cal. Gov. Code § 65302(f)), Appendix C, Noise Element Guidelines

The noise element of a community's general plan provides a basis for a comprehensive local program to control and abate environmental noise and to protect citizens from excessive exposure. The California Governor's Office of Planning and Research *General Plan Guidelines* (OPR 2003) outlines the development of the noise element for local agencies.

Figure 3-1 from the noise compatible land use planning guidance is often adopted by city and county agencies for land use planning purposes for acoustical compatibility based on existing ambient noise levels in the community. For example, commercial land uses are considered appropriate where existing noise levels might be considered too high for residential development.



Source: OPR 2003

Figure 3-1 State of California Land Use Compatibility Guidelines

3.2.2 California Department of Transportation Traffic Noise Analysis Protocol

The Caltrans *Traffic Noise Analysis Protocol* (Caltrans 2011) establishes guidelines for evaluating traffic noise impacts along highways where frequent outdoor use takes place and for determining reasonable and feasible noise abatement measures. These criteria are relevant to the extent that the project would result in reconstruction or reconfiguration of an existing highway or traffic lanes, or would affect traffic patterns. Under FHWA (23 C.F.R. Part 772) and Caltrans policies, noise barriers should be considered for transportation improvement projects when various traffic noise abatement criteria are exceeded.

3.2.3 California Noise Control Act of 1973 (Cal. Health and Safety Code, Division 28, Noise Control Act, § 46000 et seq.)

The relevant legacy of the California Noise Control Act of 1973 was the development of the required content of the Noise Element of General Plans. This legislation provides guidance to local governments for preparing the required noise elements in city and county general plans, pursuant to California Government Code Section 65302(f).

3.3 Regional and Local

Counties and cities in California prepare general plans with noise policies and ordinances (outlined in the discussion of state regulations). In preparing the noise element, a city or county must identify local noise sources, and analyze and quantify, to the extent practicable, current and projected noise levels for various sources. These sources may include highways and freeways; passenger and freight railroad operations; ground rapid transit systems; commercial, general, and military aviation and airport operations; and other ground stationary noise sources (these would include HSR alignments). Noise-level contours must be mapped for these sources using the community noise equivalent level (CNEL) or the day-night sound level (L_{dn}), and are to be used as a guide in land use decisions to minimize the exposure of community residents to excessive noise.

These noise elements often incorporate specific allowable noise levels to achieve a quality environment. Where airports exist- many airports identify an airport noise impact area, which identifies adverse noise impacts within the 65 CNEL noise contour generated by the airport. In some instances, general plans include the existing L_{dn} near airports. The HSR system is not subject to local general plan policies and ordinances related to noise limits or to locally based criteria concerning noise and vibration for the project alternatives.

Table 3-1 shows a summary of noise and vibration elements in the plans and policies adopted by the cities and counties in the RSA that were identified and considered in the preparation of this analysis.

Table 3-1 Applicable Local Plans and Policies

Plan/Policy Document	Summary
Santa Clara County	
Santa Clara County General Plan (1994)	The *Santa Clara County General Plan* was adopted in 1994 with amendments published in 2016. The general plan includes the following strategies, policies, and implementation recommendations relevant to noise and vibration: **Strategy 1: Prevent or Minimize Noise Conflicts** ▪ Policy C-HS 24: Environments for all residents of Santa Clara County free from noises that jeopardize their health and well-being should be provided through measures which promote noise and land use compatibility. ▪ Policy C-HS 25: Noise impacts from public and private projects should be mitigated. – Implementation C-HS(i) 24: Where necessary, construct sound walls or other noise mitigations. – Implementation C-HS(i) 25: Prohibit construction in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented.
Santa Clara County Ordinance Code (2016)	The Santa Clara Ordinance Code was originally adopted in 1972. The Code establishes the following sections of Division B11, Chapter VIII, Control of Noise and Vibration, relevant to noise and vibration: **Section B11-152. – Exterior noise limits** Maximum permissible sound levels by receiving land use:

Plan/Policy Document	Summary
	▪ The noise standards for the various receiving land use categories as presented in [the following bullets, derived from Table B11-152] will apply to all property within any zoning district: – One and Two-Family Residential – 45 dBA between 10 pm to 7 am, and 55 dBA between 7 am to 10 pm; – Multiple Family Dwelling – 50 dBA between 10 pm and 7 am; – Residential Public Space – 55 dBA between 7 am to 10 pm; – Commercial – 60 dBA between 10 pm and 7 am, and 65 dBA between 7 am to 10 pm; – Light Industrial – 70 dBA at all times; and – Heavy Industrial – 75 dBA at all times. ▪ No person may operate or cause to be operated any source of sound at any location within the unincorporated territory of the County or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by the person, which causes the noise level when measured on any other property either incorporated or unincorporated, to exceed: a) The noise standard for that land use as specified [above] for a cumulative period of more than 30 minutes in any hour; or b) The noise standard plus five dB for a cumulative period of more than 15 minutes in any hour; or c) The noise standard plus ten dB for a cumulative period of more than five minutes in any hour; or d) The noise standard plus 15 dB for a cumulative period of more than one minute in any hour; or e) The noise standard plus 20 dB or the maximum measured ambient, for any period of time. **Sec. B11-153. – Interior noise standards** Maximum permissible dwelling interior sound levels: ▪ The interior noise standards for multifamily residential dwellings as presented in [the following bullet, derived from Table B11-153] will apply, unless otherwise specifically indicated, within all dwellings: – Multi-Family Dwelling – 35 dBA allowable interior noise level between 10 pm and 7 pm, and 45 dBA between 7 am and 10 pm. ▪ No person will operate or cause to be operated within a dwelling unit any source of sound or allow creation of any noise which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed: a) The noise standard as specified [above] for a cumulative period of more than five minutes in any hour; or b) The noise standard plus five dB for a cumulative period of more than one minute in any hour; or c) The noise standard plus ten dB or the maximum measured ambient, for any period of time. – If the measured ambient level exceeds that permissible within any of the noise limit categories above, the allowable noise exposure standard will be increased in five-dB increments in each category as appropriate to reflect the ambient noise level. **Section B11-154. – Prohibited acts**

Plan/Policy Document	Summary
	• Construction/demolition a) Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekdays and Saturday hours of 7 p.m. and 7 a.m., or at any time on Sundays or holidays, that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance. b) Where technically and economically feasible, construction activities will be conducted in a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule: i. Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment: [See full ordinance for table of maximum noise levels] ii. Stationary equipment. Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of ten days or more) of stationary equipment are as follows: [See full ordinance for table of maximum noise levels] ▪ Vibration a) Operating or permitting the operation of any device that creates a vibrating or quivering effect that: i. Endangers or injures the safety or health of human beings or animals; or ii. Annoys or disturbs a person of normal sensitivities; or iii. Endangers or injures personal or real properties.
City of Santa Clara	
City of Santa Clara 2010-2035 General Plan (2010)	The City of Santa Clara adopted the 2010-2035 General Plan on November 16, 2010. Updates were published in 2013 and 2014. The general plan includes the following environmental quality goals and policies which are applicable to noise and vibration: Goals ▪ 5.10.6-G1 Noise sources restricted to minimize impacts in the community. ▪ 5.10.6-G2 Sensitive uses protected from noise intrusion. Policies ▪ 5.10.6-P2 Incorporate noise attenuation measures for all projects that have noise exposure levels greater than General Plan “normally acceptable” levels. ▪ 5.10.6-P6 Discourage noise sensitive uses, such as residences, hospitals, schools, libraries and rest homes, from areas with high noise levels, and discourage high noise generating uses from areas adjacent to sensitive uses. ▪ 5.10.6-P10 Encourage transit agencies to develop and apply noise reduction technologies for their vehicles to reduce the noise and vibration impacts of Caltrain, Bay Area Rapid Transit, future High Speed Rail, light rail and bus traffic.

Plan/Policy Document	Summary
Santa Clara City Code (2017)	The Santa Clara City Code is current through Ordinance 1969, passed in 2017. Chapter 9.10, Regulation of Noise and Vibration, is relevant to noise and vibration: **9.10.040 Noise or sound regulation:** [. . .] The maximum noise or sound levels are set forth, as follows: ▪ Category 1: Single Family and Duplex Residential – 55 dBA between 7 am to 10 pm, and 50 dBA between 10 pm to 7 am; ▪ Category 2: Multiple Family Residential – 55 dBA between 7 am to 10 pm; 50 dBA between 10 pm and 7 am; ▪ Category 3: Commercial, Office – 65 dBA between 7 am and 10 pm, and 60 dBA between 10 pm and 7 am; ▪ Light Industrial – 70 dBA at all times; and ▪ Heavy Industrial – 75 dBA at all times. **9.10.050 Vibration regulation:** [. . .] Vibration [should not exceed] the vibration perception threshold of an individual at the closest property line point to the vibration source on the real property affected by the vibration.
City of San Jose	
Envision San Jose 2040 General Plan (2011)	The *Envision*: *San Jose 2040 General Plan* was adopted in 2011. The Plan establishes the following goals and policies relevant to noise and vibration: **Goal EC-1 – Community Noise Levels and Land Use Compatibility.** Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies. ▪ **Policy EC-1.1:** Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state and City noise standards and guidelines as a part of new development review. **Interior Noise Levels** – The City's standard for interior noise levels in residences, hotels, motels, residential care facilities, and hospitals is 45 dBA DNL. […] **Exterior Noise Levels** – The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses. The acceptable exterior noise level objective is established for the City, except in the environs of the San José International Airport and the Downtown, as described below: – For new multi-family residential projects, the residential component of mixed-use development, [and single family residential uses] use a standard of 60 dBA DNL in usable outdoor activity areas [. . .] ▪ **Policy EC-1.2:** Minimize the noise impacts of new development on land uses sensitive to increased noise levels (Categories 1, 2, 3 and 6) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would: – Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable"; or – Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level. ▪ **EC-1.7** Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise

Plan/Policy Document	Summary
	impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would: – Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months. For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses. ▪ **Policy EC-1.9** Require noise studies for land use proposals where known or suspected loud intermittent noise sources occur which may impact adjacent existing or planned land uses. For new residential development affected by noise from heavy rail, light rail, BART or other single-event noise sources, implement mitigation so that recurring maximum instantaneous noise levels do not exceed 50 dBA Lmax in bedrooms and 55 dBA Lmax in other rooms. **Goal EC-2 – Vibration. Minimize vibration impacts on people, residences, and business operations.** ▪ **Policy EC-2.1:** Near light and heavy rail lines or other sources of ground-borne vibration, minimize vibration impacts on people, residences, and businesses through the use of setbacks and/or structural design features that reduce vibration to levels at or below the guidelines of the Federal Transit Administration. Require new development within 100 feet of rail lines to demonstrate prior to project approval that vibration experienced by residents and vibration sensitive uses would not exceed these guidelines. ▪ **Policy EC-2.2:** Require new sources of ground-borne vibration, such as transit along fixed rail systems or the operation of impulsive equipment, to minimize vibration impacts on existing sensitive land uses to levels at or below the guidelines of the Federal Transit Administration. ▪ **Policy EC-2.3** Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.

Plan/Policy Document	Summary
San Jose Municipal Code (2017)	The San Jose Municipal Code, codified through Ordinance No. 29912, was last adopted in May 2017. The Code includes the following titles and chapters relevant to noise and vibration: **Chapter 20.100: Administration and Permits** The City of San José does not establish quantitative noise limits for demolition or construction activities occurring in the City. According to San José Municipal Code, the legal hours of construction within 500 feet of a residential unit are limited to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday. The City's Municipal Code also contains a Zoning Ordinance that limits noise levels generated by stand-by/backup and emergency generators. The noise level emitted by these generators shall not exceed 55 decibels at the property line of residential properties. The standards and criteria for stand-by/ backup generators are set as follows: ▪ Maximum noise levels, based upon a noise analysis by an acoustical engineer, will not exceed the applicable noise standards set forth in Title 20.80.2030. ▪ Testing of generators is limited to 7 a.m. to 7 p.m., Monday through Friday.

Plan/Policy Document	Summary
City of Morgan Hill	
Morgan Hill 2035 General Plan (2016)	The Morgan Hill 2035 General Plan was adopted in 2016. The Plan includes the following goals and policies relevant to noise and vibration: **Goal SSI-8. Prevention of noise from interfering with human activities or causing health problems Policies** ▪ **Policy SSI-8.1 Exterior Noise Level Standards.** Require new development projects to be designed and constructed to meet acceptable exterior noise level standards, as follows: – Apply a maximum exterior noise level of 60 dBA Ldn in residential areas where outdoor use is a major consideration (e.g., backyards in single-family housing developments and recreation areas in multi-family housing projects). Where the City determines that providing an Ldn of 60 dBA or lower cannot be achieved after the application of reasonable and feasible mitigation, an Ldn of 65 dBA may be permitted. – Indoor noise levels should not exceed an Ldn of 45 dBA in new residential housing units. – Noise levels in new residential development exposed to an exterior Ldn 60 dBA or greater should be limited to a maximum instantaneous noise level (e.g., trucks on busy streets, train warning whistles) in bedrooms of 50 dBA. Maximum instantaneous noise levels in all other habitable rooms should not exceed 55 dBA. The maximum outdoor noise level for new residences near the railroad shall be 70 dBA Ldn, recognizing that train noise is characterized by relatively few loud events. ▪ **Policy SSI-8.3 Commercial and Industrial Noise Level Standards**. Evaluate interior noise levels in commercial and industrial structures on a case-by-case basis based on the use of the space. ▪ **Policy SSI-8.4 Office Noise Level Standards.** Interior noise levels in office buildings should be maintained at 45 dBA Leq (hourly average) or less, rather than 45 dBA Ldn (daily average). ▪ **Policy SSI-8.5 Traffic Noise Level Standards.** Consider noise level increases resulting from traffic associated with new projects significant if: a) the noise level increase is 5 dBA Ldn or greater, with a future noise level of less than 60 dBA Ldn, or b) the noise level increase is 3 dBA Ldn or greater, with a future noise level of 60 dBA Ldn or greater. ▪ **Policy SSI-8.6 Stationary Noise Level Standards.** Consider noise levels produced by stationary noise sources associated with new projects significant if they substantially exceed existing ambient noise levels. ▪ **Policy SSI-9.3 Sound Wall Design.** The maximum height of sound walls shall be eight feet [. . .]

Plan/Policy Document	Summary
Morgan Hill Municipal Code (2017)	The Morgan Hill Municipal Code was originally published in 1987. The current code is updated through Ordinance Number 2256 N.S., enacted June 28, 2017. The following sections from Chapter 8.28, Noise, of Title 8, Health and Safety, of the municipal code are applicable to noise and vibration: **8.28.040 – Enumeration of unlawful noises.** Unlawful noises include: **D.1. Construction activities as limited below**. "Construction activities" are defined as including but not limited to excavation, grading, paving, demolition, construction, alteration or repair of any building, site, street or highway, delivery or removal of construction material to a site, or movement of construction materials on a site. Construction activities are prohibited other than between the hours of seven a.m. and eight p.m., Monday through Friday and between the hours of nine a.m. to six p.m. on Saturday. Construction activities may not occur on Sundays or federal holidays. […] **I. Noises Adjacent to Schools, Courts, Churches and Hospitals**. The creation of any excessive noise on any street adjacent to any school, institution of learning, church or court while the same is in use or adjacent to any hospital, which noise unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital; provided, conspicuous signs are displayed in such streets indicating that the street is adjacent to a school, hospital or court; **J. Pile Drivers, Hammers and Similar Equipment.** The operation, between the hours of eight p.m. and seven a.m. of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist or other appliance, the use of which is attended by loud or unusual noise.
City of Gilroy	
The City of Gilroy 2002-2020 General Plan (2002)	The City of Gilroy 2002-2020 General Plan was adopted in 2002. The Plan includes the following goals and policies relevant to noise and vibration from Chapter 8, Community Resources and Potential Hazards. **GOAL:** Protection of Gilroy residents from exposure to excessive noise and its effects through appropriate mitigation measures and responsive land use planning, especially in regard to noise-sensitive land uses such as schools, hospitals, and housing for seniors. ▪ **Policy 26.02 Maximum Permissible Noise Levels.** Ensure that outdoor and indoor noise levels are within the maximum permitted levels (see Figure A- 27). ▪ **Policy 26.04 Acoustical Design.** Consider the acoustical design of projects in the development review process to reduce noise to an acceptable level. Ensure that noise mitigation features are designed and implemented in an aesthetically pleasing and consistent manner. ▪ **Policy 26.05 Earth Berms.** Require landscaped earth berms as an alternative to soundwalls where feasible to buffer noise along major thoroughfares adjacent to residential areas. Where an earth berm is not feasible, a masonry wall screened with drought tolerant, low maintenance landscaping should be required.

Plan/Policy Document	Summary
Gilroy Municipal Code (2017)	The Gilroy Municipal Code is current through Ordinance 2017-03, passed in 2017. The Code includes the following chapters relevant to noise and vibration. **Chapter 16, Offences—Miscellaneous** **Section 16.38 Hours of construction** of the Gilroy Municipal Code states the following regarding construction noise: 2 Unless otherwise provided for in a validly issued permit or approval, construction activities shall be limited to the hours of 7 a.m. and 7 p.m., Monday through Friday and 9 a.m. to 7 p.m. on Saturday. Construction activities shall not occur on Sundays or city holidays, which include: New Years Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas. "Construction activities" are defined as including but not limited to, excavation, grading, paving, demolitions, construction, alteration or repair of any building, site, street or highway, delivery or removal of construction material to a site, or movement of construction materials on a site. […] **Chapter 30, Zoning Ordinance** **30.41.31 Specific provisions—Noise.** It shall be unlawful to generate noise within the city limits that exceeds the limits established in this section. (b) Maximum Outdoor Noise Levels. (2) Commercial and Industrial Noise Impacting Residentially Zoned Properties. Noise emanating from properties that are zoned for uses other than residential is limited to a maximum of 70 dBA (L10) measured at the residential property line. Such noise is limited to the hours of 7 a.m. to 10 p.m., and prohibited between the hours of 10 p.m. and 7 a.m.
San Benito County	
San Benito County 2035 General Plan (2015)	The San Benito County 2035 General Plan was adopted in 2015. The Plan includes the following goals and policies relevant to noise and vibration: **Health and Safety** **Goal HS-8:** To protect the health, safety, and welfare of county residents through the elimination of annoying or harmful noise levels. ▪ **Policy HS-8.1 Project Design.** The County shall require new development to comply with the noise standards shown in the tables in Figure A-29 through proper site and building design, such as building orientation, setbacks, barriers (e.g., earthen berms), and building construction practices. The County shall only consider the use of soundwalls after all design-related noise mitigation measures have been evaluated or integrated into the project or found infeasible. ▪ **Policy HS-8.2 Acoustical Analysis.** The County shall require an acoustical analysis to be performed prior to development approval where proposed land uses may produce or be exposed to noise levels exceeding the "normally acceptable" criteria (e.g. "conditionally acceptable", "normally unacceptable") shown in Table 9-2. Land uses should be prohibited from locating, or required to mitigate, in areas with a noise environment within the "unacceptable" range. ▪ **Policy HS-8.3 Construction Noise.** The County shall control the operation of construction equipment at specific sound intensities and frequencies during day time hours between 7 a.m. and 6 p.m. on weekdays and 8 a.m. and 5 p.m. on Saturdays. No construction shall be allowed on Sundays or federal holidays.

Plan/Policy Document	Summary
	▪ **Policy HS-8.7 Acceptable Vibration Levels.** The County shall require construction projects anticipated to generate a significant amount of vibration to ensure acceptable interior vibration levels at nearby noise-sensitive uses based FTA criteria. ▪ **Policy HS-8.10 Reduction in Noise Levels at Existing Land Uses**. Reduce traffic noise levels where expected to significantly impact sensitive receptors through the installation of noise control measures such as quiet pavement surfaces, noise barriers, traffic calming measures, and interior sound insulation treatments. ▪ **Policy HS-8.12 Construction Noise Control Plans.** Require all construction projects to be constructed within 500 feet of sensitive receptors to develop and implement construction noise control plans that consider the following available controls in order to reduce construction noise levels as low as practical: – Utilize 'quiet' models of air compressors and other stationary noise sources where technology exists; – Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment; – Locate all stationary noise-generating equipment, such as air compressors and portable power generators, as far away as possible from adjacent land uses; – Locate staging areas and construction material areas as far away as possible from adjacent land uses; – Prohibit all unnecessary idling of internal combustion engines; – Notify all abutting land uses of the construction schedule in writing; and – Designate a "disturbance coordinator" (e.g. contractor foreman or authorized representative) who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

Plan/Policy Document	Summary
San Benito County Ordinance Code (2016)	The San Benito County Ordinance Code, codified through Ordinance 937, was most recently adopted in 2015. The Code includes Chapter 19.39, Noise Control Regulations, of Title 19, Land Use and Environmental Regulations, relevant to noise and vibration: **Article IV. Sound Level Restrictions** **19.39.030 MAXIMUM PERMISSIBLE SOUND PRESSURE LEVELS.** No person shall operate, or permit to be operated, on private property any source of sound in such a manner as to create: (A) A sound pressure level which exceeds the limits set forth for the receiving land use category in Table 1 [summarized in the following bullets] which may be measured at or within the real property boundary of the receiving land use, or its vertical extension: ▪ Rangeland, Productive Rural Lands, and Rural Transitional – 45 dBA day and 35 dBA night ▪ Single Family Residential, Residential Multiple, and Planned Unit Development – 50 dBA day, 40 dBA night ▪ Commercial – 65 dBA day and 55 dBA night ▪ Controlled Manufacturing, Light Industrial, and Heavy Industrial – 70 dBA day and 60 dBA night (B) A sound pressure level which exceeds the limits set forth for the receiving land use category in Table A- 5 for more than 15 minutes in 60 minutes which may be measured at or within the real property boundary of the receiving land use, or its vertical extension; or I An equivalent A-weighted sound level that exceeds the limits set forth for the receiving land use category in Table A- 5 which may be measured at or within the real property boundary of the receiving land use or its vertical extension. (D) A sound level that exceeds the ambient sound level by 5 dB which may be measured at or within the real property boundary of the receiving land use or its vertical extension.

Plan/Policy Document	Summary
Frazier Lake Airpark Comprehensive Land Use Plan (2001)	The Frazier Lake Airpark Comprehensive Land Use Plan was adopted by the San Benito County Airport Land Use Commission in 2001. The following compatibility guidelines are relevant to noise and vibration: **4.3.1 Noise Compatibility:** The objective of noise compatibility criteria is to minimize the number of people exposed to frequent and/or high levels of aircraft noise. ▪ The maximum CNEL considered clearly acceptable for residential uses in the vicinity of the Airport is 55 dB CNEL. ▪ Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Table 4-1 presents acceptable noise levels for other land uses in the vicinity of the Airport. ▪ Single-event noise levels should be considered when evaluating the compatibility of highly noise sensitive land uses such as schools, libraries, and outdoor theaters. Single-event noise levels are especially important in the areas regularly overflown by aircraft, but which do not produce significant CNEL contours.
Merced County	

2030 Merced County General Plan (2013)	The 2030 Merced County General Plan was adopted in 2013. The Plan includes the following goals and policies relevant to noise and vibration:
	Public Facilities and Services
	▪ **Policy PFS-8.7: Incompatible Land Uses near Schools.** Coordinate with school districts to reduce the effects of incompatible land uses and noise adjacent to school facilities.
	Health and Safety
	Goal HS-7: Protect residents, employees, and visitors from the harmful and annoying effects of exposure to excessive noise.
	▪ **Policy HS-7.4: New Noise or Groundborne Vibration Generating Uses.** Require new commercial and industrial uses to minimize encroachment on incompatible noise or groundborne vibration sensitive land uses. Also consider the potential for encroachment by residential and other noise or groundborne vibration sensitive land uses on adjacent lands that could significantly impact the viability of the commercial or industrial areas.
	▪ **Policy HS-7.5: Noise Generating Activities.** Limit noise generating activities, such as construction, to hours of normal business operation.
	▪ **Policy HS-7.9: Transportation Project Construction/Improvements.** Require transportation project proponents to prepare all acoustical analysis for all roadway and railway construction projects in accordance with Policy HS-7.2; additionally, rail projects shall require the preparation of a groundborne vibration analysis in accordance with Policy HS-7.2. Consider noise mitigation measures to reduce traffic and/or rail noise levels to comply with Table HS-1 standards if pre-project noise levels already exceed the noise standards of Table HS-1 and the increase is significant. The County defines a significant increase as follows:
	  ▪ Pre-Project Noise Environment of Less than 60 dB – 5+ dB would result in a significant increase
	  ▪ Pre-Project Noise Environment of between –0 - 65 dB – 3+ dB would result in a significant increase
	  ▪ Pre-Project Noise Environment greater than 65 dB – 1.5+ dB would result in a significant increase
	▪ **Policy HS-7.11: Train Whistle Noise.** Support improvements to crossings in urban areas in order to eliminate the need for train whistle blasts near or within communities.

Plan/Policy Document	Summary
Merced County Ordinance Code (2016)	The Merced County Ordinance Code is current through Ordinance 1951, passed in 2017. The Code includes Chapter 10.60, Noise Control, of Title 10, Public Health and Safety, relevant to noise and vibration: **10.60.030 Sound level limitations.** A. No person shall cause, suffer, allow, or permit the operation of any sound source on private property in such a manner as to create a sound level that results in any of the following, when measured at or within the real property line of the receiving property: 1. Exceeds the background sound level by at least 10 dBA during daytime hours (7 a.m. to 10 p.m.) and by at least 5 dBA during nighttime hours (10 p.m. to 7 a.m.). The background sound level for purposes of this section shall be determined as set forth in Section 10.60.060; or 2. Exceeds 65 dBA Ldn on residential real property or 70 dBA Ldn on nonresidential real property; or 3. Exceeds 75 dBA Lmax on residential real property or 80 dBA Lmax on nonresidential real property. B. The following are exempt from the sound level limits of Section 10.60.030(A): 5. Noise from construction activity, provided that all construction in or adjacent to urban areas shall be limited to the daytime hours between 7 a.m. and 6 p.m., and all construction equipment shall be properly muffled and maintained.

Sources: City of Gilroy 2002; City of Morgan Hill 2016; City of San Jose 2011; City of Santa Clara 2010; County of Merced 2013; County of San Benito 2015; County of Santa Clara 1994; San Benito County Airport Land Use Commission 2001
dBA = A-weighted decibel
dB = decibel
SCCC = Santa Clara County Code
DNL = day/night sound level
BART = Bay Area Rapid Transit
Lmax = maximum sound level
PPV = peak particle velocity
SENL = single-event noise level
L_{dn} = day-night sound level
L_{eq} = sound level equivalent
FTA = Federal Transit Administration
CNEL = community noise equivalent level

4 METHODS FOR EVALUATING IMPACTS

Analysts evaluated the effects of noise and vibration from construction and operations of the project quantitatively using FRA-approved methods. Construction noise and vibration and high-speed ground transportation noise and vibration were evaluated in accordance with methods and criteria from the FRA guidance manual (FRA 2012). Non-high-speed transit noise and vibration and noise levels from passenger stations, transfer power facilities and maintenance facilities were evaluated in accordance with the FTA guidance manual (FTA 2018). Train horn noise was evaluated using the FRA horn noise model. Highway noise was evaluated in accordance with the FHWA's *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 C.F.R. Part 772) as defined by the Caltrans *Traffic Noise Analysis Protocol* (Caltrans 2011). Analysts used design information on the project alternatives and operations assumptions from the Authority's *Connecting and Transforming California, 2016 Business Plan* (2016 Business Plan) (Authority 2016) and its *Connecting California, Expanding Economy, Transforming Travel, 2018 Business Plan n* (2018 Business Plan) (Authority 2018) in the noise and vibration models, as well as field noise and vibration measurements, and professional judgment.

This technical report evaluates both direct and indirect noise and vibration effects. Direct effects consist of increases in noise and vibration because of construction activities or operations, while indirect effects for noise include the project's effect on traffic patterns, which indirectly affect noise levels. This chapter provides additional details of the methods for the noise and vibration assessments.

4.1 Noise

4.1.1 Descriptors

Noise is typically described as an unwanted sound[6] that is disagreeable or undesirable. Several factors affect sound as perceived by the human ear, including the amplitude (or loudness), the frequency (or pitch), and the time variation (or duration).

The amplitude of a sound is determined by the magnitude of fluctuation caused by sound waves in the air pressure above and below the atmospheric pressure at equilibrium. It is usually expressed in dB, which are logarithmic values of the ratio of the pressure produced by the sound wave to a reference pressure.[7] Decibels more understandably express the extremely large range of absolute sound pressure values that the human ear is capable of perceiving. For example, a train horn sound of 100 dB has about 5,600 times greater pressure than a very low sound of 35 dB typically found in a quiet rural environment.

The frequency describes the tonal character of noise. Individual frequencies or a range of frequencies are expressed in terms of the rate of fluctuation of the air pressure in cycles per seconds or Hertz (Hz). The average human ear and brain system can generally perceive noise frequencies between 20 Hz and 20,000 Hz. However, the human hearing system does not respond equally to all frequencies; it is more sensitive to mid-band frequencies (e.g., 500 to 2,000 Hz). Thus, when describing sound and its effects on a human population, dBA sound pressure levels are used to account for the response of the human ear by de-emphasizing the low and very high frequency components of the sound. The A-weighted sound level correlates well with human response and is expressed in terms of a single number. Figure 4-1 illustrates typical A-weighted noise levels of high-speed trains (including the German TransRapid TR08 maglev system, the French TGV, and the American Amtrak Acela train), as well as other indoor and outdoor noise sources. Typical A-weighted sound levels range from the 40s to the 90s (dBA), where 40 is very quiet and 90 is very loud. On average, each A-weighted sound level increase of 10 dB corresponds to an approximate doubling of subjective loudness.

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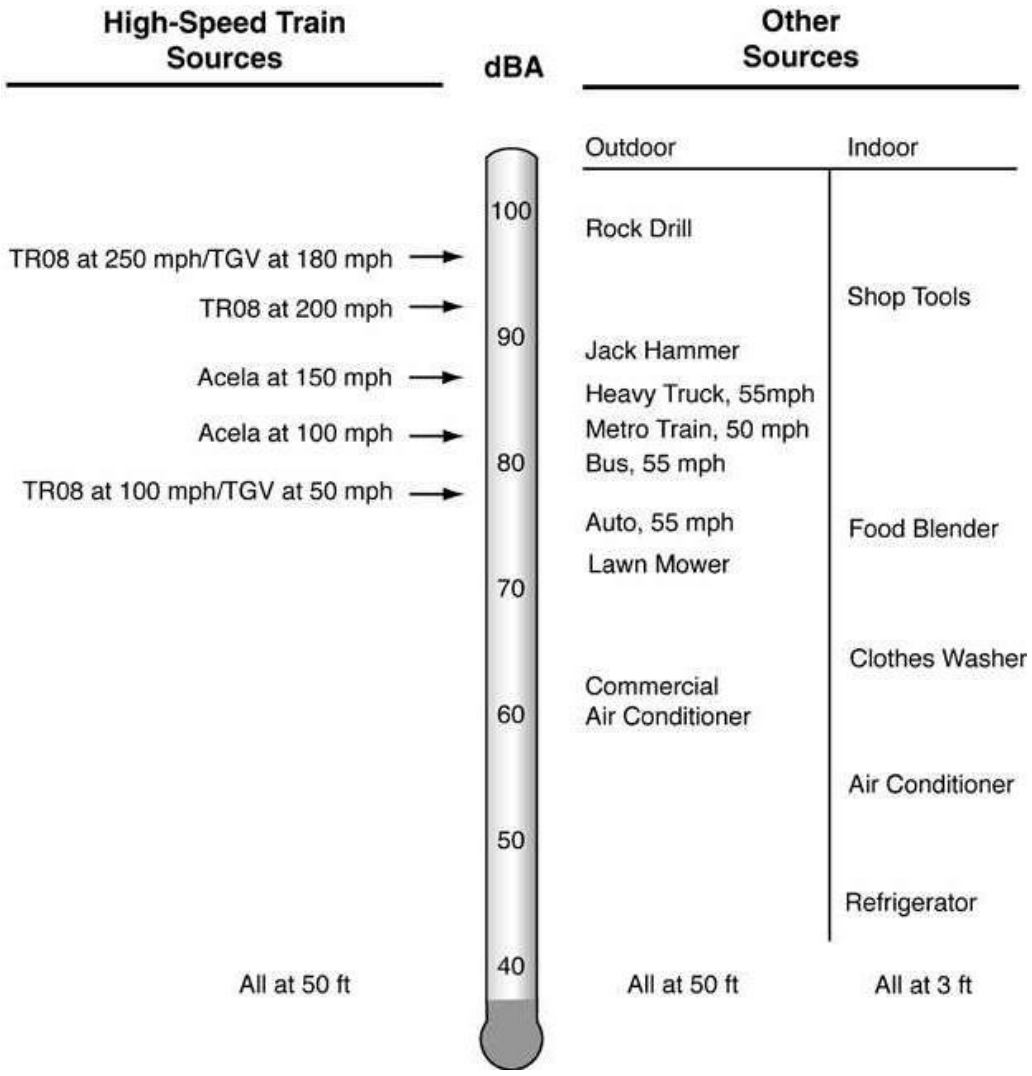
[6] Sound is caused by transmission of energy that propagates as waves of alternating pressure through a medium (fluids, solids, or gases such as the air).

[7] The standard reference sound pressure is 20 micro-Pascals as indicated in ANSI S1.8-1969 *Preferred Reference Quantities for Acoustical Levels.*



Source: FRA 2012

FEBRUARY 2019

Figure 4-1 Typical A-Weighted Maximum Sound Levels

The level of environmental noise commonly varies with time. There are several descriptors (also called *metrics*) to characterize environmental noises according to their duration. This analysis uses the following single-number descriptors, all based on the dBA sound pressure levels as the fundamental unit for environmental noise measurements, computations, and assessment:

- **Sound exposure level (SEL)**—The SEL describes noise exposure from a single noise event. It is represented by the total A-weighted sound energy during the event, normalized to a 1-second interval. The SEL decibel value is as if all the sound energy during the event would have occurred in 1 second. This is also the reason that SEL decibels may not be directly compared to normal sound level decibels. The SEL is the primary descriptor of HSR vehicle noise emissions and an intermediate value in the calculation of both equivalent sound level (L_{eq}) and L_{dn} (defined in the following text). Impact criteria for noise effects on livestock are also based on SEL.

- **L_{eq}**—The L_{eq} is the logarithmic summation of noise exposure during a period of interest, and it is widely used as a single-number descriptor of environmental noise. L_{eq} is used in this document to report results of short-term noise measurements and to calculate the L_{dn}. The FRA and FTA have adopted hourly L_{eq} ($L_{eq}(h)$) as the measure of cumulative noise impact for nonresidential land uses.
- **L_{dn}**—The L_{dn} is the A-weighted L_{eq} for a 24-hour period with a 10 dB penalty applied to noise levels occurring between 10:00 p.m. and 7:00 a.m. As a result, the L_{dn} considers the number of noise events during day and night separately, as well as the duration of each event, which is affected by vehicle speed. Studies have shown that the L_{dn} is well correlated with human annoyance for community noise. The FRA and FTA have adopted it as a measure of cumulative noise impact for residential land uses.
- **CNEL**—The CNEL is a 24-hour average A-weighted sound level for a given day, with the addition of a 5 dB penalty to sound levels occurring from 7:00 p.m. to 10:00 p.m., and with the addition of a 10 dB penalty to sound levels occurring from 10:00 p.m. to 7:00 a.m. Although the CNEL was developed and used in California for many years, L_{dn} is now the descriptor of choice.

The use of different descriptors may result in different numerical values for a given sound or acoustic environment even though the actual properties of the sound or environment such as amplitude, frequency, and duration are not altered. Because of this, some comparisons of dB may not be appropriate or may be invalid, such as comparing the SEL value to the maximum sound level (L_{max}) or to the L_{eq} of a train passby. Comparisons using the same metric however, may be very useful to evaluate different sounds or noise sources. Additional information about these noise descriptors is included in Section A.1 of the FRA guidance manual (FRA 2012).

4.1.2 Resource Study Area

The RSA is the area in which all environmental investigations specific to noise are conducted to determine the resource characteristics and potential effects of the project alternatives. The noise RSA extends approximately 2,500 feet from the alternatives' centerlines and includes all sensitive receptors potentially exposed to noise impacts. This noise RSA is larger than the maximum FRA-recommended screening distances for high-speed trains shown in Table 4-1. The maximum FRA-recommended screening distance for a new HSR corridor is 1,300 feet in quiet suburban or rural environments with train operation speeds greater than 170 mph; however, this recommendation assumes there would be 50 train operations per day. Consistent with FRA methods, analysts extended the noise RSA for the project farther than the maximum FRA-recommended screening distances to reflect the frequency of train operations, which would exceed 200 trains per day based on the Authority's 2016 Business Plan and 2018 Business Plan (Authority 2016, 2018).

Table 4-1 Federal Railroad Administration Recommended Screening Distances for Evaluation of HSR Noise Impacts[1]

Corridor Type	Existing Noise Environment	Screening Distance for Project Type and Speed Regime (feet from centerline)[2]	
		90 to 170 mph	> 170 mph
Railroad	Urban/noisy suburban—unobstructed	300	700
	Urban/noisy suburban—intervening buildings[3]	200	300
	Quiet suburban/rural	500	1,200
Highway	Urban/noisy suburban—unobstructed	250	600
	Urban/noisy suburban—intervening buildings[3]	200	350
	Quiet suburban/rural	400	1,100
New Rail	Urban/noisy suburban—unobstructed	350	700
	Urban/noisy suburban—intervening buildings[3]	250	350
	Quiet suburban/rural	600	1,300[4]

Source: FRA 2012
mph = miles per hour
[1] Noise screening distances for Regime II (mechanical noise resulting from wheel/rail interactions and guideway vibrations) and Regime III (aerodynamic noise resulting from airflow moving past the train)
[2] Measured from centerline of guideway or rail corridor. Minimum distance is assumed 50 feet.
[3] Rows of buildings assumed to be at 200 feet, 400 feet, 600 feet, 800 feet, and 1,000 feet parallel to the guideway.
[4] Distance was extended to 2,500 feet for analysis of the project.

4.1.3 Impact Criteria

4.1.3.1 Construction

The FRA guidance manual (FRA 2012) includes construction noise assessment criteria as shown in Table 4-2. An 8-hour L_{eq} and a 30-day average noise exposure L_{dn} are used to assess impacts. A 30-day average L_{dn} is used to assess impacts in residential areas, and a 30-day average 24-hour L_{eq} is used to assess impacts in commercial and industrial areas. The noise emission levels of the construction equipment, utilization factor, hours of operation, and location of equipment are used to calculate 8-hour and 30-day average noise exposures. FRA assessment criteria are used throughout the RSA.

Table 4-2 Detailed Assessment Criteria for Construction Noise

Land Use	8-Hour L_{eq} (dBA)		L_{dn} (dBA) 30-Day Average
	Day	Night	
Residential	80	70	75
Commercial	85	85	80[1]
Industrial	90	90	85[1]

Source: FRA 2012
L_{eq} = equivalent sound level
L_{dn} = day-night sound level
dBA = A-weighted decibel
[1] 24-hour L_{eq}, not L_{dn}

4.1.3.2 Operations

For the HSR system, analysts used noise impact criteria adopted by the FRA to assess the contribution of the noise from project operations and construction to the existing environment. Analysts used criteria adopted by the FTA to assess the contribution of the noise from

conventional speed rail operations and stationary facilities. These guidelines establish methods for analyzing and assessing noise and vibration impacts. The FRA noise impact criteria are based on maintaining a noise environment considered acceptable for land uses where noise may have an effect. Land use also factors into the determination of impact; while impacts on industrial uses are not considered, places where people sleep or where quiet is an integral component of the land use require evaluation to determine if noise impact would occur. Descriptions of the three land use categories are shown in Table 4-3. The noise exposure is measured in terms of L_{dn} for residential land uses or in terms of $L_{eq}(h)$ for other land uses.

Table 4-3 Federal Railroad Administration Land Use Categories for Noise Exposure

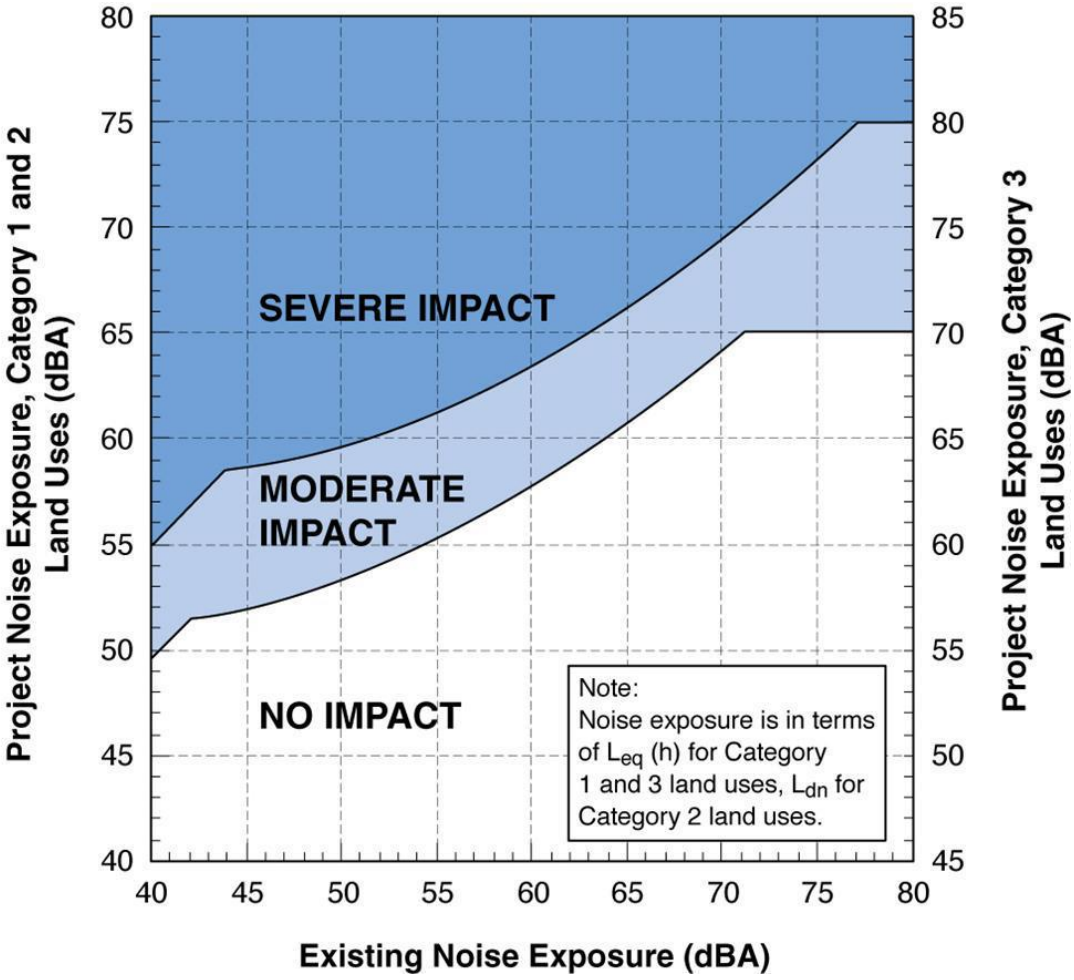
Land Use Category	Noise Metric (dBA)	Land Use Category[1, 2]
1	Outdoor $L_{eq}(h)$[3]	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as national historic landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)$[1]	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, and museums can be considered to be in this category. Certain historical sites, parks, campgrounds, and recreational facilities are also included.

Source: FRA 2012
dBA = A-weighted decibel
$L_{eq(h)}$ = hourly equivalent sound level
[1] Parks are only considered to be noise sensitive if the park is used in a manner that is noise sensitive; active outdoor land use, for example, such as pedestrian and bike paths, are not considered noise sensitive.
[2] Historic sites and properties protected under Section 4(f) of the U.S. Department of Transportation Act and Section 106 of the National Historic Preservation Act are not intrinsically noise-sensitive; inclusion in noise-sensitive land use categories is dependent upon land use activities (e.g., if outdoor interpretation is a critical component of a historic site, then the site would be included in Category 1)
[3] L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.

FRA noise impact criteria for human annoyance are based on comparison of the existing outdoor noise levels and the future outdoor noise levels from a proposed HSR project. The FRA noise impact criteria specify a comparison of future with existing noise levels, not with projections of future build versus no-build noise exposure, because comparison of a projection with an existing condition is more reflective of impact than a comparison of two projections. Noise-level increases are categorized as no impact, moderate impact, or severe impact. Moderate and severe impacts are defined as follows:

- **Moderate impact—**The change in noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. Project-specific factors would be considered to determine the magnitude of impact and the need for mitigation, including the number of affected noise-sensitive sites, the existing level of noise exposure, and the costs associated with mitigation.
- **Severe impact—**Project-generated noise in the severe impact range can be expected to cause a substantial percentage of people to be highly annoyed by the new noise levels. It is FRA policy to implement noise mitigation for sensitive receptors experiencing severe impacts unless there are truly extenuating circumstances that prevent implementation.

The noise impact criteria are illustrated on Figure 4-2. The figure shows the existing noise exposure and the additional noise exposure from project operations that would cause either a moderate impact or severe impact for each land use category. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure from project operations. The equations used to calculate the impact curves are found in Section A.3.3 of the FRA guidance manual (FRA 2012).

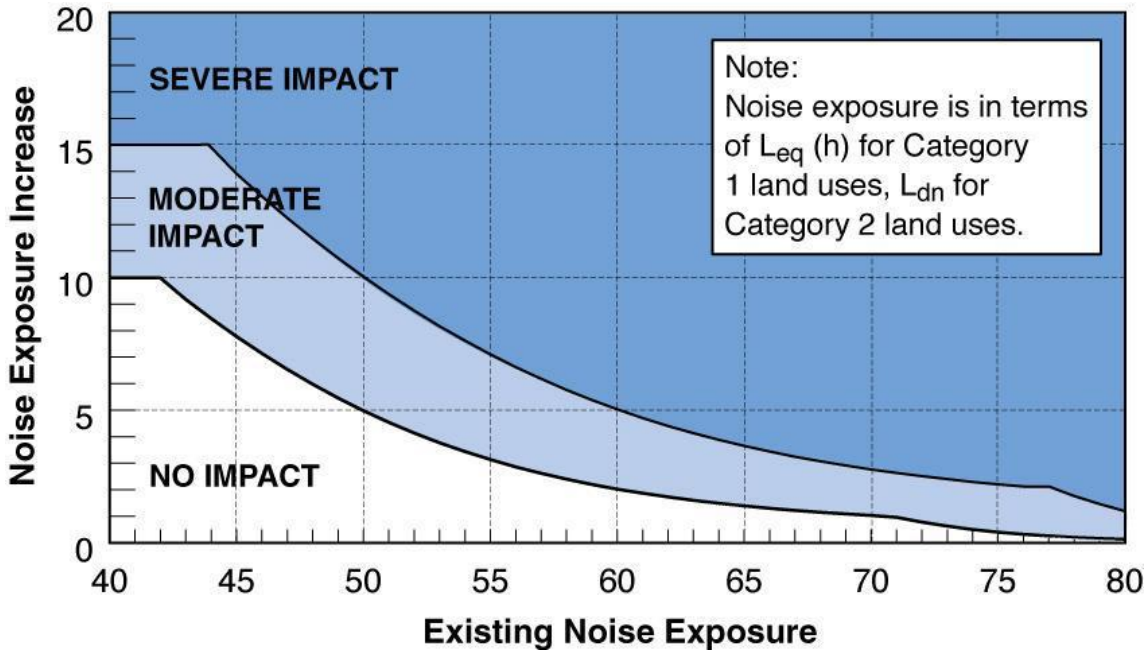


Source: FRA 2012

FEBRUARY 2019

Figure 4-2 Noise Impact Criteria for High-Speed Rail Projects

The absolute criteria illustrated on Figure 4-2 are only applicable to new HSR sources where the existing noise levels generated by existing transit systems, roadways, and other sources would not change because of the project. The FRA criteria can also be presented in terms of relative levels for evaluating the total future noise exposure increases, or increases in cumulative noise exposure, from the project alternatives. If the existing noise is dominated by a source that would change because of the project, it would be incorrect to add the project noise to the existing noise. Therefore, the relative form of the noise criteria must be used for projects involving proposed changes to an existing rail transit system such as a shift in the location or profile of existing passenger or freight tracks or a change in the vehicle technology. Figure 4-3 illustrates the relative form of the criteria as they apply to Category 1 and 2 land uses and Figure 4-4 illustrates the criteria as they apply to Category 3 land uses. These criteria are based on the increase of the existing ambient noise level associated with project operations and can be used to evaluate the project in combination with other new planned projects (i.e., cumulative impact).



Source: FRA 2012

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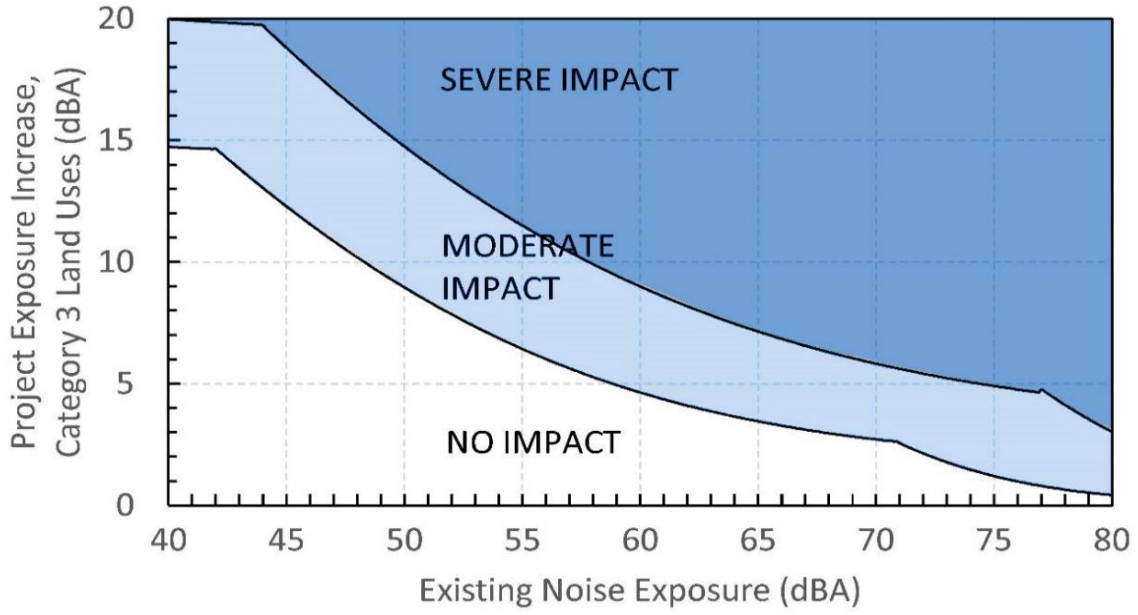
Figure 4-3 Allowable Increase in Cumulative Noise Levels (Land Use Categories 1 & 2)



Source: FRA 2012

FEBRUARY 2019

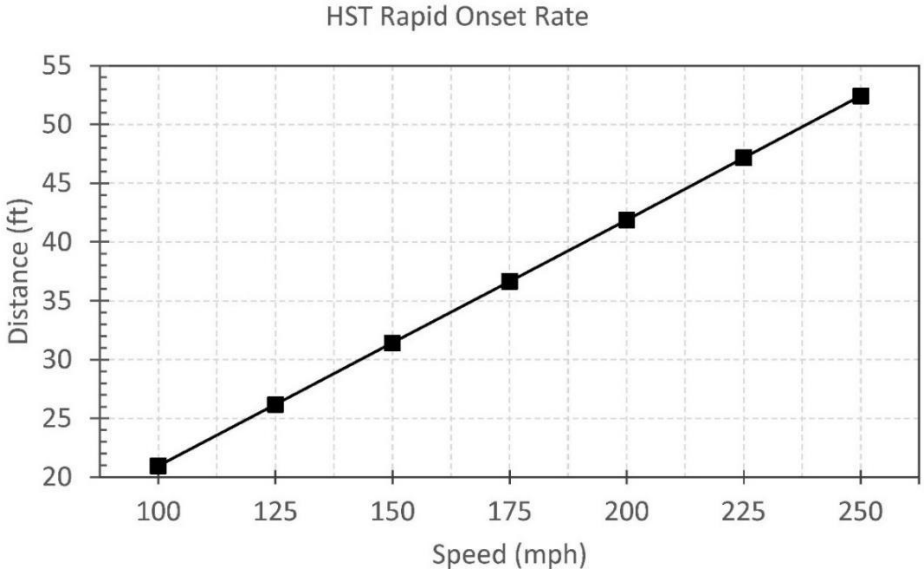
Figure 4-4 Allowable Increase in Cumulative Noise Levels (Land Use Category 3)

The noise criteria are applied at the outside of building locations at noise-sensitive areas. In some instances, the criteria apply to the building façade near doors and windows. Although noise impact is always determined based on exterior noise levels, interior noise levels may need to be evaluated when considering the need for mitigation at locations where land-use activity is solely indoors.

The process of determining impact severity begins with a determination of land use with reference to the land use categories shown in Table 4-2. Once the land use category has been determined, the appropriate noise metric (L_{dn} or L_{eq}) can be selected and used to determine the noise level and the severity of impact. The next steps are to determine the existing exterior noise exposure for each receptor or group of similar receptors and then to determine project noise exposure or the cumulative noise exposure associated with the project alternatives and other projects. Using the data on Figure 4-2 or Figures 4-3 and 4-4, the severity of impact is determined.

A hypothetical example would be to use a residential property that has an existing noise exposure of L_{dn} 60 dBA. The noise exposure resulting from the project alternatives, regional growth, and other planned projects could result in a project noise level exposure of L_{dn} 65 dBA. Adding (on a logarithmic basis) L_{dn} 65 dBA to the existing noise level would result in a total cumulative noise exposure of L_{dn} 66 dBA. This represents a potential increase of 6 dBA over the existing noise level. Using Figure 4-3, a line would be drawn vertically at 60 dBA and another line drawn horizontally at 6 dBA from left-hand axis. The intersection of these two lines determines the severity of impact. In this example, the resulting noise increase would be considered a severe impact on the residential receptor.

An additional environmental concern for HSR is the rapid rise in sound level that can occur for trains travelling at very high speeds. Under certain conditions, a rapid rise of sound level can result in a startle effect, in particular for a receptor near the tracks. The rate at which train sound levels increase is referred to as the *onset rate* and is a function of train speed and distance from the tracks. Research has found that a sudden unexpected increase in sound (a rapid onset rate) can result in greater annoyance than sounds of similar levels that vary less rapidly or are steady. When onset rates exceed about 30 dB per second people tend to be startled or surprised by the sudden onset of the sound. Consequently, analysts evaluated startle as an added annoyance factor and identified sensitive receptors that may experience a startle effect. The potential for startle as a function of train speed and distance from the train is illustrated on Figure 4-5.



Source: FRA 2012

FEBRUARY 2019

Figure 4-5 Distance from Tracks within which Startle Can Occur

The FRA guidance manual (FRA 2012) describes that the understanding of startle effects to date is partially based on using U.S. Air Force research for sudden onset of noise from aircraft. The FRA guidance describes that there are a number of unresolved issues regarding application of the U.S. Air Force research to determine the startle effects of high-speed rail, such as the

scheduled nature, lower sound levels and lower onset rates of train passbys compared to military aircraft flights. The FRA guidance states that without better definition of the application of results of noise from aircraft overflights to noise from high-speed rail passbys, it is appropriate to consider startle effects as "additional information" included in high-speed rail impact assessments as opposed to being included in the calculation of noise exposure itself. The FRA guidance does not provide a threshold in the form of an "onset rate that could be considered significant enough to cause startle on a regular basis." Thus, the 30 dB/second onset rate described above is considered indicative of when startle can occur, but is not considered a significance threshold for determining when startle would occur on a regular basis.

The FRA guidance manual (FRA 2012) also addresses potential impacts on livestock and poultry. The land use along the project corridor changes from urban and suburban to rural farmland, including some areas with livestock. Noise exposure limits for screening are shown in Table 4-4.

Table 4-4 Interim Criteria for High-Speed Rail Train Noise Effects on Livestock

Animal Category	Class	Noise Metric	Noise Level (dBA)
Domestic	Mammals (livestock)	SEL	100
	Birds (poultry)	SEL	100

Source: FRA 2012
dBA = A-weighted decibel
SEL = sound exposure level

4.1.4 Methods for Establishing Existing Noise Levels

Analysts established the existing noise levels throughout the noise RSA through extensive field noise measurement programs. Parsons Transportation Group conducted initial ambient noise measurements in 2010 (Authority 2011). Wilson Ihrig conducted additional measurements in 2009 and 2010 (Authority and FRA 2010a), 2013 (Wilson Ihrig 2014), and 2016 and 2017 (this analysis).

Analysts conducted long-term noise measurements (1 to 3 days in duration) to characterize the existing ambient noise in the RSA. The measurements were obtained by means of calibrated, precision, logging, sound level meters installed for a minimum of 24 hours at each location. All noise-measuring instruments used during the noise survey met ANSI S1.4-1993 specifications for Type I sound level meters. The sound level meters monitored the level of noise continuously and provided statistics on the ambient noise level for consecutive 1-hour intervals. During the monitoring period, the L_{max}, and L_{eq} values for each hour were obtained. The L_{eq} values were used to calculate the daily L_{dn} during each measured 24-hour period. For example, at a site where the measurement was conducted over a period of 3 full days, analysts calculated the average of the three hourly L_{eq} values in each hour of the day and subsequently used this to calculate an average L_{dn} at that site.

The L_{dn} describes the total noise exposure over a 24-hour period and is the noise metric FRA uses for residential (Category 2) land uses. The L_{eq} is used as the metric for evaluating noise impacts at institutional (Category 3) land uses with primarily daytime use. The hourly L_{eq} criterion is based on the daytime hour with the loudest sound level. This hour is generally referred to as the *peak-noise-hour*, which could occur at different times of the day depending on whether the noise source is from train operations or vehicular traffic. The long-term noise measurement data provided the peak-noise-hour L_{eq} for Category 3 land uses.

Analysts selected specific locations for conducting the noise measurements throughout the RSA and in a variety of settings. The selection was based on the environmental conditions expected in different areas of the communities along the alignment, the type of receptors potentially affected, the proximity of the receptors to a major arterial road or freeway, and the distance of the receptors (primarily residences) to the existing Caltrain tracks. The measurement locations where ambient noise levels were collected are representative of areas with similar environmental conditions in other areas along the HSR alignment. Areas that have primarily commercial and

industrial land uses have fewer noise-sensitive receptors and consequently fewer ambient measurement sites.

Most of the selected measurement sites would have clear line-of-sight to the HSR alignments and, therefore, are representative of receptors that are directly exposed to existing noise from Caltrain and other passenger and freight trains. To categorize the dominant existing noise sources in the RSA, analysts located some measurement sites adjacent to roadways along the alignment, some sites near existing rail sources, some sites near existing roadway sources, and some sites near both existing rail and roadway sources.

Since the existing environment is controlled by noise from conventional passenger and freight rail activity, guidance was taken from the FTA guidance manual. Analysts used the field noise measurement data to validate an existing noise spreadsheet model based on the FTA guidance manual (FTA 2018) methodology and to calculate existing ambient noise levels at all receptors. The existing noise model incorporated the known existing train (passenger and freight) operations, horn noise, and traffic noise from nearby roadways. FRA provides equivalent guidance to determine the existing ambient. (FRA 2012)

The rail noise model followed the method in Chapter 6 of the FTA guidance manual for a detailed noise analysis. Where noise measurement sites were located close to roadways, noise sources were modeled by adjusting the measured levels with distance following the procedures in Appendix D of the FTA guidance manual. In some instances, for smaller roadways, the noise model incorporated the procedures in Section 4.4 of the FTA guidance manual.

4.1.5 Prediction Methods

4.1.5.1 Construction Noise

Analysts assessed construction noise impacts according to the method described in the FRA guidance manual (FRA 2012). Construction noise estimates are always approximate because of the lack of specific information available at the time of the environmental analysis. Decisions about the procedures and equipment to be used would be made by the contractor. Project designers try to minimize constraints on how construction would be performed, and which equipment would be used to facilitate cost-effective construction. Nevertheless, estimated construction scenarios for typical railroad construction projects allow a quantitative construction noise assessment by comparing the predicted noise levels with impact criteria appropriate for the construction stage. The methods included the following data:

- Noise emissions from equipment expected to be used by contractors during typical construction activity types.
- Usage scenarios for how the equipment would be operated.
- Estimated site layouts of equipment along the right-of-way.
- Relationship of the construction operations to nearby noise-sensitive receptors.

Construction of the project would also necessitate PG&E network upgrades. The construction noise impact assessment for these upgrades follows the same methods as the typical construction noise activities discussed in Section 4.1.3.1, Construction. Analysts identified construction scenarios specific to the PG&E upgrades, along with equipment expected to be used by contractors. It is anticipated that helicopters would be used for the PG&E upgrades; therefore, the analysis specifically accounts for the noise from helicopter movements and hovering over construction sites. No annoyance penalties were applied to helicopter noise.

4.1.5.2 Operations Noise

The method used to assess operations noise impacts is consistent with the approach established in the FRA and FTA guidance manuals (FRA 2012; FTA 2018). Both guidelines provide for three levels of analysis during an environmental impact study: screening, general assessment, and detailed analysis. This analysis presents the assessment of potential noise impacts from project

operations in the adjacent communities along the project alignment following the methods for detailed analysis.

HSR Rail Traffic

HSR operations would include both revenue service trains and nonrevenue services trains with daily trips to and from the planned MOWF. Table 4-5 shows the number of HSR trains, which would be the same for all four project alternatives, from San Jose to Gilroy, from Gilroy to the planned MOWF near Gilroy, and from the MOWF to the San Joaquin Valley. The summary combines the number of daily trains in both directions of travel. Analysts conducted noise modeling for 2029 No Project, 2029 Plus Project, 2040 No Project, and 2040 Plus Project conditions. This analysis assumes that HSR service would be operational for Phase 1, which would connect San Francisco with Los Angeles via the Central Valley by 2029, and Phase 2, which would subsequently extend service to Sacramento and San Diego. The Phase 1 system analysis for the Final EIR/EIS is based on 2040 conditions. The Phase 1 build-out would be operational in 2029, and full system operations (Phase 2) would occur after the 2040 Phase 1 system operations envisioned in the Final EIR/EIS. The number of daily trains for 2029 and 2040 would be the same.

Table 4-5 Assumed 2029 and 2040 Project Operations for Noise Impact Assessment

Segment	Total Number of HSR Trains (Both Directions) - 2029			Total Number of HSR Trains (Both Directions) - 2040		
	Daytime[1]	Nighttime[2]	Peak Hour[3] (Approximate)	Daytime[1]	Nighttime[2]	Peak Hour[3] (Approximate)
Scott Boulevard to San Jose Diridon Station	40	8	4	108	26	8
San Jose Diridon Station to Gilroy Station	40	8	4	148	28	14
Gilroy Station to Gilroy MOWF	40	8	4	148	28	14
Gilroy MOWF to San Joaquin Valley	40	8	4	148	28	14

HSR = high-speed rail
MOWF = maintenance of way facility
[1] Daytime is defined as between 7:00 a.m. and 10:00 p.m.
[2] Nighttime is defined as between 10:00 p.m. and 7:00 a.m.
[3] There are six peak hours of operation per day from 6:30 AM to 9:30 AM and from 4:30 PM to 7:30 PM. There are 12 hours of nonpeak operation from 6:00 AM to 6:30 AM: 9:30 AM to 4:30 PM, and from 7:30 PM to 12:00 AM.

The specific vehicle technology proposed for the HSR system is a very high-speed (VHS) electric multiple unit (EMU) train. For the purposes of this analysis, the HSR trains are assumed to have a length of 660 feet. The various train technologies under consideration would incorporate 8 to 14 cars, with the length of each car varying to yield a train length of 660 feet.

The project's proposed maximum operation speed is 220 mph. This analysis is based on the maximum design speeds for the track throughout the Project Section. The design speeds used in the analysis were then decreased in some locations based on general operating parameters and track construction.

The noise predictions were based on the noise source reference levels in Table 5-2 of the FRA guidance manual (FRA 2012), which are shown in Table 4-6. The source reference level for VHS

EMU trains is divided into three categories or speed regimes where one sound source contributes most to the total noise level.

- Regime I: Propulsion or machinery noise
- Regime II: Mechanical noise resulting from wheel-rail interactions, guideway vibrations, or both
- Regime III: Aerodynamic noise resulting from airflow moving past the train, including the pantograph (device mounted to top of train to collect power through the overhead lines)

At train speeds up to approximately 125 mph, the propulsion noise subsource is typically the largest contributor to the total noise. The noise from the wheel-rail interface is typically dominant at speeds of 125–160 mph. Aerodynamic noise typically becomes equal to wheel-rail noise and, thus is an important component at speeds faster than 160 mph.

The noise source reference levels shown in Table 4-6 are associated with corresponding reference height, length, and speed reference terms.

Table 4-6 Federal Railroad Administration Noise Source Reference Levels for High-Speed Trains (SELs at 50 feet)

System Category and Features[1]	Example Systems	Subsource Component		Subsource Parameters		Reference Quantities			
				Length Definition, Len	Height Above Rails (feet)	SEL_{ref} (dBA)	Len_{ref} (feet)	S_{ref} (mph)	K
HS and VHS electric locomotive-hauled trains	Amtrak Acela, TGV, Eurostar, X2000, KTX-I/KTX-II, ETR 500	Propulsion		$Len_{(power)}$	12	86	73	(2)	(2)
		Wheel-rail		$Len_{(train)}$	1	91	634	90	20
		Aero	Train Nose	$Len_{(power)}$	10	89	73	180	60
			Wheel Region	$Len_{(train)}$	5	89	634	180	60
			Pantograph	(3)	15	86	(3)	180	60
		(Only include aerodynamic subsources for VHS trains above 150 mph)							
HS and VHS EMU trains	IC T, ICE 3, AVE S103, ETR450, KTX-III	Propulsion		$Len_{(power)}$	2	86	634	(2)	(2)
		Wheel-rail		$Len_{(train)}$	1	91	634	90	20
		Aero	Train Nose	$Len_{(power)}$	10	89	73	180	60
			Wheel Region	$Len_{(train)}$	5	89	634	180	60
			Pantograph	(3)	15	86	(3)	180	60
		(Only include aerodynamic subsources for VHS trains above 150 mph)							
Hs gas-turbine locomotive-hauled trains	Rohr RTL-2, Bombardier Jet-Train	Propulsion		$Len_{(power)}$	10	83	73	20	10
		Wheel-rail		$Len_{(train)}$	1	91	634	90	20

Source: FRA 2012
HS = high speed
VHS = very-high speed
EMU = electric multiple unit
SEL_{ref} = sound exposure level reference
LEN_{ref} = length reference
S_{ref} = speed reference
dBA = A-weighted decibel
mph = miles per hour
K = reference speed factor
[1] HS maximum speed 150 mph; VHS maximum speed 250 mph
[2] Source level is not adjusted for train speed
[3] Source level is not adjusted for train length

The aerodynamic subsource for a VHS EMU train is further divided by noise from the train nose region, the wheel region, and from the pantograph. The following equation from Section 5.2.2 of the FRA guidance manual (FRA 2012) is used to calculate the SEL for each of the subsources:

$$SEL = (SEL_{ref}) + 10 * Log\left(\frac{len}{len_{ref}}\right) + K * Log\left(\frac{S}{S_{ref}}\right)$$

where:

SEL	=	SEL of component subsource (dBA)
SEL_{ref}	=	Subsource reference SEL (dBA)
len	=	Subsource length (feet)
len_{ref}	=	Subsource reference length (feet)
K	=	Reference speed factor
S	=	Speed (mph)
S_{ref}	=	Reference speed (mph)

The length term in the previous equation, *len*, for the propulsion subsource is defined as the total length of the power units in the train (len_{power}), which for an EMU is the total length of all cars (660 feet). The length term for the wheel-rail noise subsource is the total length of the train (660 feet). The length term for the aerodynamic train nose subsource is the length of one car (84 feet) corresponding to an eight-car train. Because the total train length is known and the number of cars is not known, the train nose subsource component is based on the assumption of an eight-car train (corresponding to longer cars), which yields slightly higher noise levels.

Analysts used assumed HSR operating speeds provided by the design team in the noise and vibration analyses. Table 4-7 shows a summary of the range of operating speeds for each project alternative in each subsection.

Table 4-7 Assumed HSR Operating Speeds

Location	Geographic Extent	Range of HSR Operating Speeds (mph)
Alternative 1		
San Jose Diridon Station Approach	Scott Boulevard to San Jose Diridon Station	50 – 110
San Jose Diridon Station Approach	San Jose Diridon Station to Tamien Station	50 – 95
Monterey Corridor	Tamien Station to Communications Hill Boulevard	95 – 110
Monterey Corridor	Communications Hill Boulevard to Kittery Court	125 – 130
Morgan Hill and Gilroy	Kittery Court to Cox Avenue	125 – 175
Morgan Hill and Gilroy	Cox Avenue to Casa de Fruta	80 – 220
Morgan Hill and Gilroy	Casa de Fruta to Pacheco	200
Pacheco Pass	Pacheco to Henry Miller Road	200
San Joaquin Valley	Henry Miller Road to Carlucci Road	220
Alternative 2		
San Jose Diridon Station Approach	Scott Boulevard to San Jose Diridon Station	50 – 110
San Jose Diridon Station Approach	San Jose Diridon Station to Tamien Station	50 – 95
Monterey Corridor	Tamien Station to Communications Hill Boulevard	95 – 110

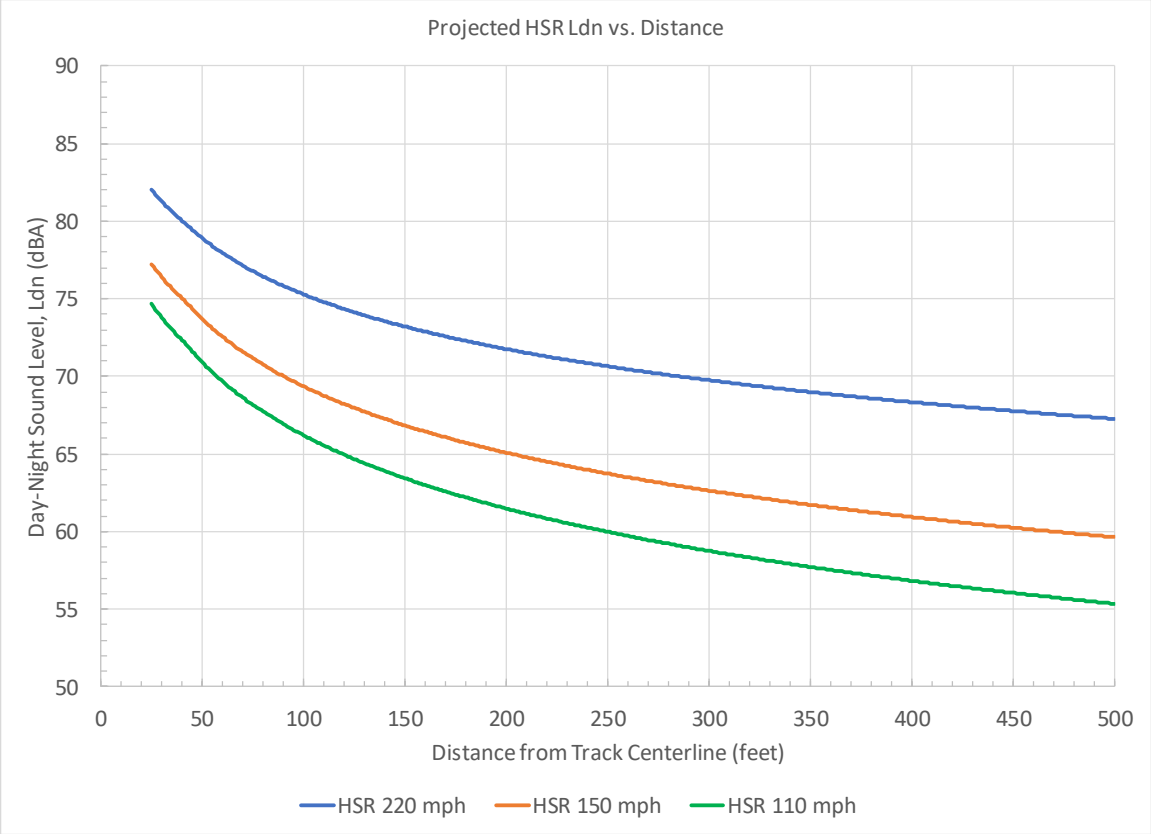
Location	Geographic Extent	Range of HSR Operating Speeds (mph)
Monterey Corridor	Communications Hill Boulevard to Kittery Court	125 – 185
Morgan Hill and Gilroy	Kittery Court to Cox Avenue	100 – 195
Morgan Hill and Gilroy	Cox Avenue to Casa de Fruta	80 – 220
Morgan Hill and Gilroy	Casa de Fruta to Pacheco	200
Pacheco Pass	Pacheco to Henry Miller Road	200
San Joaquin Valley	Henry Miller Road to Carlucci Road	220
Alternative 3		
San Jose Diridon Station Approach	Scott Boulevard to San Jose Diridon Station	50 – 110
San Jose Diridon Station Approach	San Jose Diridon Station to Tamien Station	50 – 95
Monterey Corridor	Tamien Station to Communications Hill Boulevard	95 – 110
Monterey Corridor	Communications Hill Boulevard to Kittery Court	125 – 130
Morgan Hill and Gilroy	Kittery Court to Cox Avenue	125 – 175
Morgan Hill and Gilroy	Cox Avenue to Casa de Fruta	180 – 220
Morgan Hill and Gilroy	Casa de Fruta to Pacheco	200
Pacheco Pass	Pacheco to Henry Miller Road	200
San Joaquin Valley	Henry Miller Road to Carlucci Road	220
Alternative 4		
San Jose Diridon Station Approach[1]	Scott Boulevard to San Jose Diridon Station	15 – 110
San Jose Diridon Station Approach[1]	San Jose Diridon Station to Tamien Station	20 – 110
Monterey Corridor[1]	Tamien Station to Communications Hill Boulevard	90 – 110
Monterey Corridor[1]	Communications Hill Boulevard to Kittery Court	110
Morgan Hill and Gilroy[1]	Kittery Court to Cox Avenue	110
Morgan Hill and Gilroy[1]	Cox Avenue to Downtown Gilroy	110
Morgan Hill and Gilroy[1]	Downtown Gilroy to Casa de Fruta	1–0 - 200
Morgan Hill and Gilroy	Casa de Fruta to Pacheco	200
Pacheco Pass	Pacheco to Henry Miller Road	200
San Joaquin Valley	Henry Miller Road to Carlucci Road	220

Source: Authority 2019c
HSR = high-speed rail
mph = miles per hour
[1] In this location Caltrain would use the same tracks as HSR with Alternative 4 and operate at the same speeds.

The predictions account for the proposed operations schedule, ground propagation attenuation effects, cross-sectional geometry of the guideway and superstructure (e.g., elevated guideway), and shielding provided by existing noise barriers and intervening rows of buildings. Analysts assumed all tracks were ballast-and-tie construction with concrete ties, except in tunnels where concrete slab track would be used. The project includes sections of track on embankment with the top-of-rail height approximately 10 to 15 feet above adjacent ground. Many sections of track

would be on aerial structures with the top-of-rail height approximately 50 feet above grade and a maximum height of approximately 85 feet above grade. The aerial structure guideway would incorporate a solid parapet on both outer edges approximately 3 feet higher than the top-of-rail. In many locations, the parapet would provide significant acoustical shielding from the propulsion and wheel-rail noise subsources, reducing sound levels. The noise predictions assume that the parapet would be included for all aerial structure sections of track. Alternative 4 would include blended HSR service with Caltrain on at-grade tracks.

Figure 4-6 illustrates the projected 24-hour noise levels from project operations versus distance at train speeds of 220 mph, 150 mph, and 110 mph. The data for the 220 mph and 150 mph speeds are representative of a typical embankment section of track between San Jose and Gilroy. The data for 110 mph are representative of a typical at-grade section of track between San Jose and Gilroy. The figure shows that L_{dn} from HSR operating at 220 mph is typically from 5 to 8 dB higher than when HSR is operating at 150 mph. The figure further illustrates how the noise levels from project operations would attenuate to typical L_{dn} at various distances from the track.



FEBRUARY 2019

Figure 4-6 Projected HSR 24-Hour Noise Levels versus Distance for Typical Embankment Track Section without Shielding Effects

Adjustments were made to predicted noise levels to account for increases in localized noise because of special trackwork, such as crossovers or turnouts. Alternatives 1, 2, and 3 would use special trackwork, such as moveable-point frogs, to avoid significant gaps in the rail running surface. Any insulated joints would be low-impact joints. Therefore, any increases in localized noise because of special trackwork with Alternatives 1, 2, and 3 are expected to be small and would not change overall effects on sensitive receptors. Alternative 4 would use the same type of

special trackwork as currently exists in the corridor. All special trackwork frogs in the Project Section for Alternative 4 were assumed to be standard frogs.

Other Rail Traffic

The noise analyses for the 2029 and 2040 conditions include noise-level changes associated with future Caltrain operations between San Jose and Gilroy. The Caltrain Peninsula Corridor Electrification Project (PCEP) will replace approximately 75 percent of the current train fleet, which currently consists of diesel locomotive-hauled coaches, with EMU trains between San Francisco and Tamien Station in San Jose by 2029, and 100 percent by 2040. The PCEP will also increase service to six Caltrain trains per peak hour north of Tamien. An environmental impact analysis for the PCEP was prepared in 2014. The details of the analysis are contained in the *Caltrain Peninsula Corridor Electrification Project Noise and Vibration Technical Report* (Wilson Ihrig 2014). The changes to Caltrain service will change the existing noise environment in the RSA; therefore, the PCEP is included as part of these analyses.

Under Alternatives 1, 2, and 3, Caltrain operations between Tamien and Gilroy would use only diesel locomotive-hauled coaches. Under Alternative 4, however, the blended HSR service would require that all Caltrain tracks from San Jose to Gilroy be upgraded to operate both HSR and Caltrain PCEP up to 110 mph. Therefore, under Alternative 4, Caltrain would operate EMU trains from San Jose to Gilroy, and the total Caltrain daily trips would increase from 6 to 8 trains per day.

Similar to the wayside noise projections for HSR, the noise predictions for Caltrain operations were based on the source reference levels and account for the proposed operations schedule, ground effect, cross-sectional geometries, the existing shielding of noise barriers, and intervening rows of buildings where applicable.

Existing freight operations were also included in the analysis, and future freight operations were included in the cumulative noise analysis. Freight operations occur mainly during the nighttime. Noise from freight operations was modeled based on FTA methods. Future freight operations in the future conditions 2029 and 2040 were determined based on growth factors and were used in the cumulative noise impact analysis. Freight train speeds were assumed to match existing speeds between San Jose and Gilroy.

Other passenger train services in the RSA were incorporated into the analyses, including the Altamont Corridor Express train, Amtrak Capital Corridor, and Coast Starlight passenger train service. Two planned new passenger services—the Coast Daylight and the Transportation Agency for Monterey County Salinas Rail Extension—were included in the future cumulative analyses as well as the Bay Area Rapid Transit (BART) Silicon Valley Santa Clara Extension. Caltrain accounts for the majority of the existing rail traffic along most of the Project Section, followed by ACE, freight, and Amtrak Coast Starlight (up to two trains per day). Other passenger train speeds were assumed to match existing speeds in the RSA. Table 4-8 shows the existing daily train operations, Table 4-9 shows the projected daily 2029 train operations, and Table 4-10 shows the projected daily 2040 train operations in the Project Section.

Table 4-8 Existing (2017) Passenger and Freight Train Operations

System	Period	Total Daily Trains (Both Directions) per Segment				
		Lawrence – Santa Clara	Santa Clara – Diridon	Diridon – Tamien	Tamien – Gilroy	South of Gilroy
Caltrain	Daytime[1]	77	77	33	4	0
	Nighttime[2]	15	15	7	2	0
	Peak hour[3]	10	10	4	2	0
	Total	**92**	**92**	**40**	**6**	**0**

System	Period	Total Daily Trains (Both Directions) per Segment				
		Lawrence – Santa Clara	Santa Clara – Diridon	Diridon – Tamien	Tamien – Gilroy	South of Gilroy
ACE / Amtrak Capitol Corridor	Daytime[1]	0	20	8	0	0
	Nighttime[2]	0	2	0	0	0
	Peak hour[3]	0	4	2	0	0
	Total	**0**	**22**	**8**	**0**	**0**
Coast Starlight	Daytime[1]	0	2	2	2	2
	Nighttime[2]	0	0	0	0	0
	Peak hour[3]	0	2	2	2	2
	Total	**0**	**2**	**2**	**2**	**2**
Freight	Daytime[1]	0	0	0	0	0
	Nighttime[2]	2	9	4	4	4
	Peak hour[3]	2	2	2	2	2
	Total	**2**	**9**	**4**	**4**	**4**
Total Trains		**94**	**125**	**54**	**12**	**6**

ACE = Altamont Corridor Express
[1] Daytime is defined as between 7:00 a.m. and 10:00 p.m.
[2] Nighttime is defined as between 10:00 p.m. and 7:00 a.m.
[3] Approximate

Table 4-9 Assumed 2029 Passenger and Freight Train Operations

System	Period	Total Daily Trains (Both Directions) per Segment				
		Lawrence – Santa Clara	Santa Clara – Diridon	Diridon – Tamien	Tamien – Gilroy	South of Gilroy
Caltrain[4]	Daytime[1]	100	100	49	4[5]	0
	Nighttime[2]	14	14	5	2-4[5]	0
	Peak hour[3]	12	12	4	2-4[5]	0
	Total	**114**	**114**	**54**	**6-8[5]**	**0**
ACE / Amtrak Capitol Corridor	Daytime[1]	0	40	40	0	0
	Nighttime[2]	0	2	2	0	0
	Peak hour[3]	0	14	14	0	0
	Total	**0**	**42**	**42**	**0**	**0**
Coast Starlight	Daytime[1]	0	2	2	2	2
	Nighttime[2]	0	0	0	0	0
	Peak hour[3]	0	2	2	2	2
	Total	**0**	**2**	**2**	**2**	**2**
Freight	Daytime[1]	0	0	0	0	0
	Nighttime[2]	3	15	7	7	7
	Peak hour[3]	2	2	2	2	2
	Total	**3**	**15**	**7**	**7**	**7**

System	Period	Total Daily Trains (Both Directions) per Segment				
		Lawrence – Santa Clara	Santa Clara – Diridon	Diridon – Tamien	Tamien – Gilroy	South of Gilroy
Coast Daylight	Daytime[1]	0	0	2	2	2
	Nighttime[2]	0	0	0	0	0
	Peak hour[3]	0	0	1	1	1
	Total	**0**	**0**	**2**	**2**	**2**
TAMC Salinas Rail Extension	Daytime[1]	0	0	8	8	8
	Nighttime[2]	0	0	0	0	0
	Peak hour[3]	0	0	1	1	1
	Total	**0**	**0**	**8**	**8**	**8**
BART SVSX	Daytime[1]	0	265	0	0	0
	Nighttime[2]	0	50	0	0	0
	Peak hour[3]	0	20	0	0	0
	Total	**0**	**315**	**0**	**0**	**0**
Total Trains		**117**	**488**	**115**	**25-27**	**19**

ACE = Altamont Corridor Express
BART = Bay Area Rapid Transit
SVSX = Silicon Valley Santa Clara Extension
TAMC = Transportation Agency for Monterey County
[1] Daytime is defined as between 7:00 a.m. and 10:00 p.m.
[2] Nighttime is defined as between 10:00 p.m. and 7:00 a.m.
[3] Approximate
[4] In 2029 under Alternatives 1, 2, and 3 Caltrain operations north of Tamien will be a mix of 75% EMU trains and 25% diesel locomotive-hauled trains, and Caltrain operations south of Tamien will be 100% diesel locomotive-hauled trains. Under Alternative 4 Caltrain operations will be 100% EMU trains.
[5] Under Alternatives 1, 2, and 3 there would be six Caltrain operations between Tamien and Gilroy. Under Alternative 4 there would be 8 Caltrain operations between Tamien and Gilroy.

Table 4-10 Assumed 2040 Passenger and Freight Train Operations

System	Period	Total Daily Trains (Both Directions) per Segment				
		Lawrence – Santa Clara	Santa Clara – Diridon	Diridon – Tamien	Tamien – Gilroy	South of Gilroy
Caltrain[4]	Daytime[1]	100	100	47	4[5]	0
	Nighttime[2]	14	14	5	2-4[5]	0
	Peak hour[3]	12	12	4	2-4[5]	0
	Total	**114**	**114**	**52**	**6-8[5]**	**0**
ACE / Amtrak Capitol Corridor	Daytime[1]	0	48	20	0	0
	Nighttime[2]	0	2	0	0	0
	Peak hour[3]	0	14	6	0	0
	Total	**0**	**50**	**20**	**0**	**0**
Coast Starlight	Daytime[1]	0	2	2	2	2
	Nighttime[2]	0	0	0	0	0
	Peak hour[3]	0	2	2	2	2
	Total	**0**	**2**	**2**	**2**	**2**

System	Period	Total Daily Trains (Both Directions) per Segment				
		Lawrence – Santa Clara	Santa Clara – Diridon	Diridon – Tamien	Tamien – Gilroy	South of Gilroy
Freight	Daytime[1]	0	0	0	0	0
	Nighttime[2]	5	23	10	10	10
	Peak hour[3]	2	2	2	2	2
	Total	**5**	**23**	**10**	**10**	**10**
Coast Daylight	Daytime[1]	0	0	4	4	4
	Nighttime[2]	0	0	0	0	0
	Peak hour[3]	0	0	1	1	1
	Total	**0**	**0**	**4**	**4**	**4**
TAMC Salinas Rail Extension	Daytime[1]	0	0	12	12	12
	Nighttime[2]	0	0	0	0	0
	Peak hour[3]	0	0	1	1	1
	Total	**0**	**0**	**12**	**12**	**12**
BART SVSX	Daytime[1]	0	265	0	0	0
	Nighttime[2]	0	50	0	0	0
	Peak hour[3]	0	20	0	0	0
	Total	**0**	**315**	**0**	**0**	**0**
Total Trains		**119**	**504**	**100**	**34-36**	**28**

ACE = Altamont Corridor Express
BART = Bay Area Rapid Transit
SVSX = Silicon Valley Santa Clara Extension
TAMC = Transportation Agency for Monterey County
[1] Daytime is defined as between 7:00 a.m. and 10:00 p.m.
[2] Nighttime is defined as between 10:00 p.m. and 7:00 a.m.
[3] Approximate
[4] In 2040 Caltrain operations north of Tamien would be 100% EMU trains. Caltrain operations south of Tamien would be 100% diesel locomotive-hauled trains.
[5] Under Alternatives 1, 2, and 3 there would be six Caltrain operations between Tamien and Gilroy. Under Alternative 4 there would be 8 Caltrain operations between Tamien and Gilroy.

Horn Noise

Future HSR tracks would predominately follow existing rail tracks between San Jose and Gilroy. These existing rail tracks include numerous at-grade crossings where Caltrain, freight, and other passenger service trains are currently required to sound their warning horns. Additionally, trains currently sound horns while approaching Caltrain passenger station platforms. Table 4-11 shows all the locations in the Project Section where trains currently sound warning horns. The table also shows the locations where Caltrain, freight, and other passenger trains would sound horns in the future with the project alternatives. An *X* in the table indicates that those trains do sound horns in those locations.

Under Alternatives 1, 2, and 3, HSR trains would not sound horns at any at-grade crossings in the RSA because the HSR tracks would be grade separated. Under Alternative 4, HSR trains would sound horns as they approach at-grade crossings and Caltrain passenger stations.

To assess noise levels associated with the at-grade crossings and horn-sounding locations for each project alternative, the noise predictions include a horn noise model. The horn noise model was based on the FRA horn noise model (FRA 2000) and field noise measurements. Analysts applied the model to receptors within 0.25 mile of each at-grade crossing and passenger station

location where horns must be sounded. Noise measurements in the RSA and in the adjacent San Francisco to San Jose Project Section indicate that the maximum sound level from Caltrain and other passenger trains are 96 dBA at a distance of 100 feet from the track. This is consistent with the minimum horn sound level allowable by FRA regulations to provide adequate warning of the train approach and is used by existing Caltrain locomotives and future Caltrain EMUs with PCEP.

The noise prediction model for freight train horns was based on a maximum sound level of 107 dBA at 100 feet from the track. This assumption is based on field measurement data by FRA showing that this is the average horn noise level from freight trains (FRA 2018). The noise prediction model for HSR train horns assumes a maximum sound level of 96 dBA at 100 feet from the track, consistent with Caltrain and FRA regulations. Crossing bells near existing at-grade crossings were included in the noise measurement program, and were modeled based on the methods in the FTA guidance manual (FTA 2018).

The mounting height location of train horns is also an important input to the noise modeling results, because the horn height affects the amount of ground attenuation and shielding provided by noise barriers. The height of the horns on existing Caltrain locomotives is modeled at 16 feet above-top-of-rail (ATOR). Future Caltrain EMUs will incorporate a lower mounted horn height of 3 feet ATOR. Horns on all freight trains and other passenger trains, including Amtrak and Ace, are located at a height of 16 feet ATOR. Future HSR trains will have horns mounted at a height of 7 feet ATOR.

Table 4-11 Grade Crossings and Horn-Sounding Locations

Grade Crossing / Station	Existing Horn	Future Caltrain / Freight Horn				Future HSR Horn			
		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Santa Clara Station[1]	X	X	X	X	X				X
College Park Station[1]	X	X	X	X	X				X
San Jose Diridon Station[1]	X	X	X	X	X				X
Auzerais Avenue (at Caltrain)	X	X	X	X	X				X
Auzerais Avenue (at HSR)									
West Virginia Street (at Caltrain)	X	X	X	X	X				X
West Virginia Street (at HSR)									
Tamien Station[1]	X	X	X	X	X				X
Capitol Station[1]	X	X	X	X	X				X
Skyway Drive	X	X		X	X				X
Branham Lane	X	X		X	X				X
Chynoweth Avenue	X	X		X	X				X
Blossom Hill Station[1]	X	X	X	X	X				X
Blanchard Road	X	X		X	X				X

Grade Crossing / Station	Existing Horn	Future Caltrain / Freight Horn				Future HSR Horn			
		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Emado Avenue	X	X		X	X				X
(Private)	X	X		X	X				X
Palm Avenue	X	X		X	X				X
Live Oak Avenue	X	X		X	X				X
Tilton Avenue	X	X		X	X				X
East Main Avenue	X	X		X	X				X
Morgan Hill Station[1]	X	X	X	X	X				X
Dunne Avenue	X	X		X	X				X
San Pedro Avenue	X	X		X	X				X
Tennant Avenue	X	X		X	X				X
East Middle Avenue	X	X		X	X				X
San Martin Station[1]	X	X	X	X	X				X
San Martin Avenue	X	X		X	X				X
Church Avenue	X	X		X	X				X
Masten Avenue	X	X		X	X				X
Rucker Avenue	X	X		X	X				X
Buena Vista Avenue	X	X		X	X				X
Cohansey Avenue	X	X		X	X				X
(Private)	X	X		X	X				X
Las Animas Avenue	X	X		X	X				X
Leavesley Road	X	X		X	X				X
Casey Street	X	X		X	X				X
Ioof Avenue	X	X		X	X				X
Lewis Street	X	X		X	X				X
Martin Street	X	X		X	X				X
Sixth Street	X	X		X	X				X
Seventh Street / Old Gilroy Street	X	X		X	X				X
Gilroy Station[1]	X	X	X	X	X				X
10th Street	X	X		X	X				X
Luchessa Avenue (Thomas)	X	X		X	X				X

Grade Crossing / Station	Existing Horn	Future Caltrain / Freight Horn				Future HSR Horn			
		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Bloomfield Avenue (at Freight)	X			X	X				X
Bloomfield Avenue (at HSR)									
(Private)	X	X		X	X				X

Source: Authority 2019c
HSR = high-speed rail
Alt = alternative
[1] Caltrain trains, other passenger trains, and freight trains sound horns at existing Caltrain stations in addition to sounding horns approaching at-grade crossings.

Annoyance from Rapid Onset of HSR Passbys

There is considerable evidence that increased annoyance is likely to occur for train noise events with high travel speeds (rapid onset rates) (FRA 2012). A rapid rise of sound level can result in a startle effect, particularly for a noise-sensitive receptor near the tracks. Analysts assessed the potential for annoyance from rapid onset based on HSR train speed and distance of the receptor from the track. Figure 4-5 on page 4-8 illustrates the relationship of speed and distance to locations where the onset rate for project operations may cause a startle effect.

Other Noise Sources

Station Noise

Analysts assessed noise impacts associated with the planned HSR stations in San Jose and Gilroy at each nearby noise-sensitive receptor by following the method for detailed noise analysis for HSR train operations summarized in Section 5.2 of the FRA guidance manual (FRA 2012) and the method for a general noise assessment for parking facilities summarized in Section 4.4 of the FTA guidance manual (FTA 2018).

The dominant noise source at the stations would be HSR train movements. The station noise analysis includes noise measurements at representative clusters of receptors near the stations, noise modeling to determine existing ambient noise conditions, and predictions of future noise conditions. The noise predictions at these receptors are based on the project operations noise levels, incorporating the type of train equipment to be used, train schedules, train consists (number of cars), speed profiles (including through trains), and track elevation.

Analysts used the station plan layouts and number of planned parking spaces to predict the noise exposure from the parking facilities at nearby noise-sensitive receptors. The FTA guidance manual (FTA 2018) Section 4.4 reference SEL of 92 dBA corresponding to 1,000 cars in a peak activity hour was used to predict the additional noise from the parking lots at each of the HSR stations.

Analysts tabulated the predicted noise levels from HSR trains at the stations and from the parking facilities along with the existing ambient noise exposures at the identified receptors or clusters of receptors. Levels of impact (no impact, moderate impact, or severe impact) were determined by comparing the existing and projected noise exposure based on the impact criteria described in Section 4.1.3.

Maintenance Facility Noise

Noise sources at the MOWF near Gilroy are expected to include daily inspections, pre-departure cleaning and testing, quarterly inspections, and train storage activities. Analysts used the method in Section 4.4 of the FTA guidance manual (FTA 2018) to predict noise exposure from the maintenance facility. A reference SEL of 118 dBA corresponding to 20 train movements in a peak activity hour was used to predict noise from the facility. The planned MOWF layouts and number of movements per day were used to calculate noise exposure at nearby noise-sensitive

receptors. The predicted noise levels from the MOWF were combined with the project operations noise predictions and compared to the impact criteria described in Section 4.1.3.

Vehicle Traffic Noise

In addition to noise from project operations, noise from changes in traffic volume due to the project was considered for 2029 and 2040 conditions. Analysts assessed the anticipated increases in noise levels resulting from increased traffic volumes near the HSR stations and maintenance facilities. Total daily traffic volumes for roadway segments near the HSR stations and maintenance facilities were calculated for each project alternative and were compared to existing traffic volumes.

Analysts used the following methods to determine locations with the potential for noise impacts from traffic:

- Where major roads would undergo changes due to the project alternatives, traffic growth factors for road segments were calculated to assess locations where the change in traffic volume would increase noise levels. Increases with and without the project were calculated separately.
- Traffic growth factors for road segments near HSR stations and MOWFs were calculated to assess locations where the change in traffic volume would increase noise levels. Increases with and without the project were calculated.
- For each project alternative, roadway segments were identified where the growth factors indicated a potential increase in noise of 3 dB or greater, which represents a noticeable increase in noise level.
- At locations where the growth factors for a project alternative resulted in a 3 dB or greater increase in noise, for instance, a doubling of traffic, an analysis was conducted to determine what portion of the increase in traffic volume would be related to the alternative.

Daily traffic volumes for these roadway segments were used to calculate traffic growth factors to assess the potential change in noise levels for each project alternative. Analysts calculated the potential noise level increase for each roadway segment by comparing the future traffic volume with the project alternatives to the existing volume and the future volume without the alternatives. The comparison to existing traffic volume is consistent with the FRA approach to assessing operations noise impacts. The increases with the alternatives over the projected future volumes without the alternatives are caused by the project. Increases in future traffic volumes without the project alternatives over the existing traffic volumes would be due to other growth factors not related to HSR.

The potential change in noise level for each roadway segment is calculated as follows:

$$\Delta = 10 * Log\left(\frac{a}{b}\right)$$

where:

Δ	=	Change in noise level (dBA) due to the project alternatives
a	=	Future average daily traffic (ADT) traffic volume with project alternatives
b	=	Existing ADT traffic volume *or* Future ADT traffic volume without project alternatives

Traction Power Substation Noise

In addition to the noise generated by project operations, impacts may be caused by some of the electrical traction power substations (TPSS) and facilities. TPSSs would be located at approximately 30-mile intervals and would include two 115/50 kV or 230/50 kV single-phase transformers at 60 megavolt amperes (MVA). The traction power switching stations would be required midway between the TPSSs and would include two (10 to 60 MVA) transformers. Traction power paralleling stations would be required at approximately 5-mile intervals between

the traction power switching stations and the TPSSs. Each traction power paralleling station would include one or two (10 to 60 MVA) transformers.

The FRA does not have its own analysis techniques because these facilities are not unique to high-speed systems, and they reference the FTA method. Thus, FTA reference levels were used to calculate the total project noise level at the receivers identified within the screening distances of 250 feet for facilities with no intervening buildings and 150 feet for the configurations where intervening buildings would shield traction power facilities (TPF) noise from noise sensitive receptors. The FTA reference SEL for substations is 99 dBA at 50 feet, which equates to an L_{dn} of 70 dBA at 50 feet (assuming continuous 24-hour usage).

Benchmark Tests to Validate HSR Noise Prediction Model

The Authority developed a protocol to validate HSR noise models for accurate HSR noise predictions and consistency among the multiple project sections. The *Benchmark Tests for Calibration of CAHST Noise Models* (May 26, 2010) (Authority and FRA 2010b) establishes a series of test cases and input parameters that practitioners use to validate individual noise models. The purpose is to make sure that the HSR noise models used by practitioners for each of the project sections throughout California agree and achieve consistent prediction results.

The test cases established by the Authority include calculations at two speeds (100 mph and 200 mph) for receptors at multiple distances and elevations for the project on typical embankment and aerial guideway locations. Input parameters include train vehicle type, length of train, number of trains during daytime and nighttime, as well as specific geometrical track configurations.

The results of the benchmark tests are shown in Table 4-12 and Table 4-13. The results agree with the HSR benchmark noise prediction model results and are consistent with the Authority's established noise model.

Table 4-12 Benchmark Noise Model Results at 100 mph

Results and Model Input Parameters Using VHS Electric (100 mph)							Reference Results			Modeled Results			Difference		
Test Case #	Receptor Height (feet)	Floor of Building	Receptor to Near Track CL Distance (feet)	Source Ground Height (feet)	Barrier Height (feet)	Barrier to Near Track CL Distance (feet)	L_{dn} (dBA)	Peak $L_{eq}(h)$ (dBA)	L_{max} (dBA)	L_{dn} (dBA)	Peak $L_{eq}(h)$ (dBA)	L_{max} (dBA)	L_{dn} (dBA)	Peak $L_{eq}(h)$ (dBA)	L_{max} (dBA)
Case # 1	5	1st	100	4	4	6	69.3	69.4	86.7	69.3	69.4	86.7	0.0	0.0	0.0
	5	1st	200	4	4	6	64.9	65.0	79.2	64.9	65.0	79.2	0.0	0.0	0.0
	5	1st	400	4	4	6	60.4	60.5	71.7	60.4	60.5	71.7	0.0	0.0	0.0
	25	3rd	100	4	4	6	70.2	70.3	87.6	70.2	70.3	87.6	0.0	0.0	0.0
	25	3rd	200	4	4	6	66.3	66.5	80.7	66.3	66.5	80.7	0.0	0.0	0.0
	25	3rd	400	4	4	6	62.4	62.5	73.7	62.4	62.5	73.7	0.0	0.0	0.0
Case # 2	5	1st	100	4	12	21.5	68.2	68.3	87.4	68.2	68.3	87.4	0.0	0.0	0.0
	5	1st	200	4	12	21.5	64.7	64.8	80.4	64.7	64.8	80.4	0.0	0.0	0.0
	25	3rd	100	4	12	21.5	70.3	70.4	88.4	70.3	70.4	88.4	0.0	0.0	0.0
	25	3rd	200	4	12	21.5	66.3	66.4	81.9	66.3	66.4	81.9	0.0	0.0	0.0
Case # 3	5	1st	200	60	63	15.5	66.2	66.4	83.5	66.2	66.4	83.5	0.0	0.0	0.0
	25	3rd	200	60	63	15.5	67.8	67.9	83.5	67.8	67.9	83.5	0.0	0.0	0.0
Case # 4	5	1st	200	60	67	15.5	61.0	61.1	78.7	61.0	61.1	78.7	0.0	0.0	0.0
	25	3rd	200	60	67	15.5	65.3	65.5	83.0	65.3	65.5	83.0	0.0	0.0	0.0

mph = miles per hour
VHS = very-high speed
dBA = A-weighted decibel
$L_{eq}(h)$ = hourly equivalent sound level
L_{max} = maximum sound level
L_{dn} = day-night sound level

Table 4-13 Benchmark Noise Model Results at 200 mph

Results and Model Input Parameters Using VHS Electric (100 mph)							Reference Results			Modeled Results			Difference		
Test Case #	Receptor Height (ft)	Floor of Building	Receptor to Near Track CL Distance (feet)	Source Ground Height (feet)	Barrier Height (feet)	Barrier to Near Track CL Distance (feet)	L_{dn} (dBA)	Peak $L_{eq}(h)$ (dBA)	L_{max} (dBA)	L_{dn} (dBA)	Peak $L_{eq}(h)$ (dBA)	L_{max} (dBA)	L_{dn} (dBA)	Peak $L_{eq}(h)$ (dBA)	L_{max} (dBA)
Case # 1	5	1st	100	4	4	6	74.0	74.2	89.3	74.0	74.2	89.3	0.0	0.0	0.0
	5	1st	200	4	4	6	70.3	70.4	84.2	70.3	70.4	84.2	0.0	0.0	0.0
	5	1st	400	4	4	6	66.6	66.7	78.3	66.6	66.7	78.3	0.0	0.0	0.0
	25	3rd	100	4	4	6	74.6	74.7	90.0	74.6	74.7	90.0	0.0	0.0	0.0
	25	3rd	200	4	4	6	71.0	71.2	85.4	71.0	71.2	85.4	0.0	0.0	0.0
	25	3rd	400	4	4	6	67.5	67.6	80.1	67.5	67.6	80.1	0.0	0.0	0.0
Case # 2	5	1st	100	4	12	21.5	71.3	71.4	89.8	71.3	71.4	89.8	0.0	0.0	0.0
	5	1st	200	4	12	21.5	68.3	68.5	82.7	68.3	68.5	82.7	0.0	0.0	0.0
	25	3rd	100	4	12	21.5	73.9	74.0	89.2	73.9	74.0	89.1	0.0	0.0	0.0
	25	3rd	200	4	12	21.5	69.6	69.7	84.2	69.6	69.7	84.2	0.0	0.0	0.0
Case # 3	5	1st	200	60	63	15.5	68.7	68.8	85.8	68.7	68.8	85.8	0.0	0.0	0.0
	25	3rd	200	60	63	15.5	70.0	70.1	85.8	70.0	70.1	85.8	0.0	0.0	0.0
Case # 4	5	1st	200	60	67	15.5	65.2	65.4	81.0	65.2	65.4	81.0	0.0	0.0	0.0
	25	3rd	200	60	67	15.5	67.8	67.9	85.4	67.8	67.9	85.4	0.0	0.0	0.0

mph = miles per hour
VHS = very-high speed
dBA = A-weighted decibel
$L_{eq}(h)$ = hourly equivalent sound level
L_{max} = maximum sound level
L_{dn} = day-night sound level

4.2 Vibration

4.2.1 Descriptors

Ground vibration is an oscillatory motion of the soil with respect to the equilibrium position and can be quantified in terms of displacement, velocity, or acceleration. Vibration can be described by its peak or root-mean-square (RMS) amplitudes. The RMS amplitude is useful for assessing human annoyance, while peak vibration is most often used for assessing the potential for damage to building structures. Building damage is often discussed in terms of peak velocity, or peak particle velocity (PPV). Construction vibration is assessed in terms of PPV.

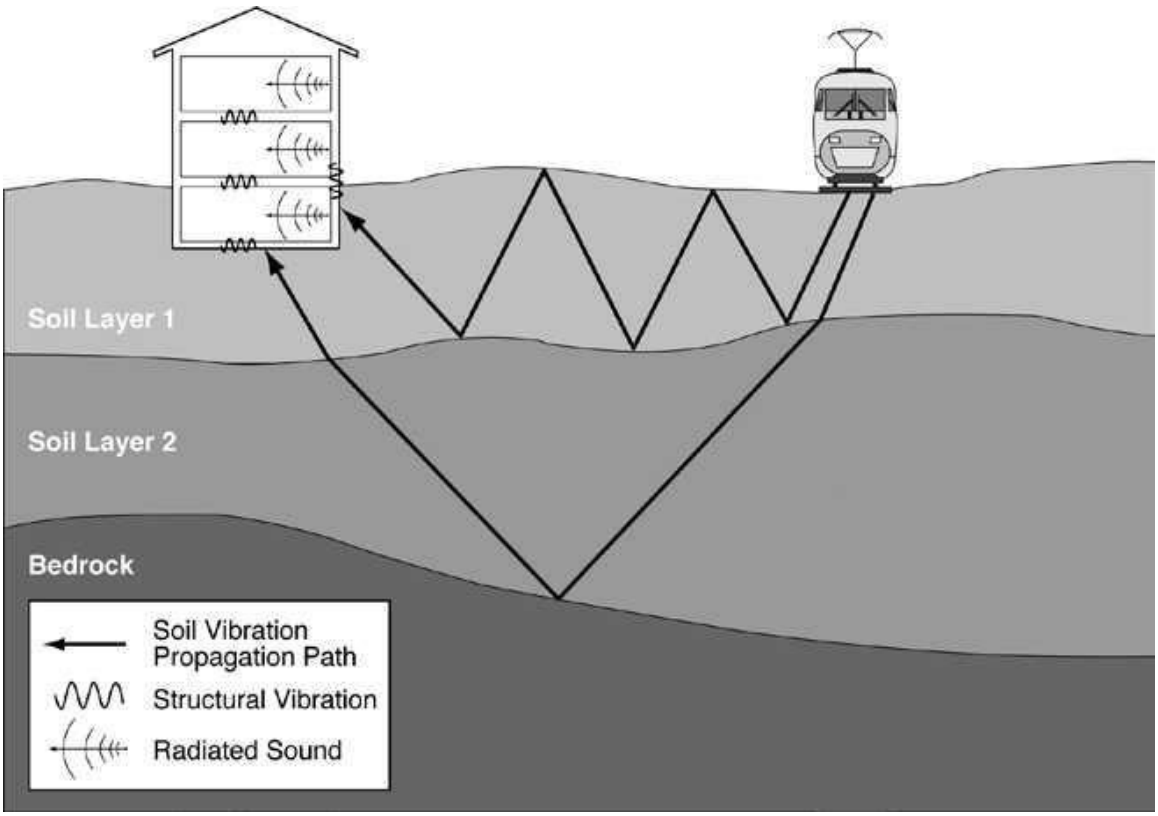
Although vibration velocity can be quantified in units of inches per second, it is common to use the velocity level to quantify vibration to cover the wide range of magnitudes that can be encountered. The vibration is expressed in terms of the velocity level (L_v) in decibel units, defined as:

$$Lv = 20 * Log(\frac{v}{v_{ref}})$$

Where, "v" is the RMS velocity amplitude and "v_{ref}" is the reference velocity amplitude (1 micro-inch per second [µin/sec]). Thus, the descriptor used to assess ground-borne vibration is L_v in vibration decibels (VdB). Like noise, VdB is related to a reference quantity; in this case, 1 micro-inch per second. Vibration is a function of the frequency of motion measured in Hz. Ground vibration of concern for transportation sources generally spans from 4 to 160 Hz. The overall vibration is the combined energy of ground motion at all frequencies, and this overall vibration level is used in this analysis.

Vibration attenuates as a function of the distance between the source and the receptor because of geometric spreading and inherent damping in the soil that absorbs energy of the ground motion. Ground-borne vibration from rapid transit systems is caused by dynamic forces at the wheel/rail interface. It is influenced by many factors, which include the rail and wheel roughness, out-of-round wheel conditions, the mass and stiffness of the rail vehicle truck and its suspension components, the mass and stiffness characteristics of the track support system, and the local soil conditions.

Vibration transmitted through the transit structure, such as at-grade ballast and tie track, radiates energy into the adjacent soil in the form of different types of waves that propagate through the various soil and rock strata to the foundation of nearby buildings. Buildings respond differently to ground vibration depending on the type of foundation, the mass of the building, and the building interaction with the soil. Once inside the building, vibration propagates throughout the building with some attenuation with distance from the foundation, but often with amplification due to floor resonances. The basic concepts for rail system-generated ground vibration are illustrated on Figure 4-7.

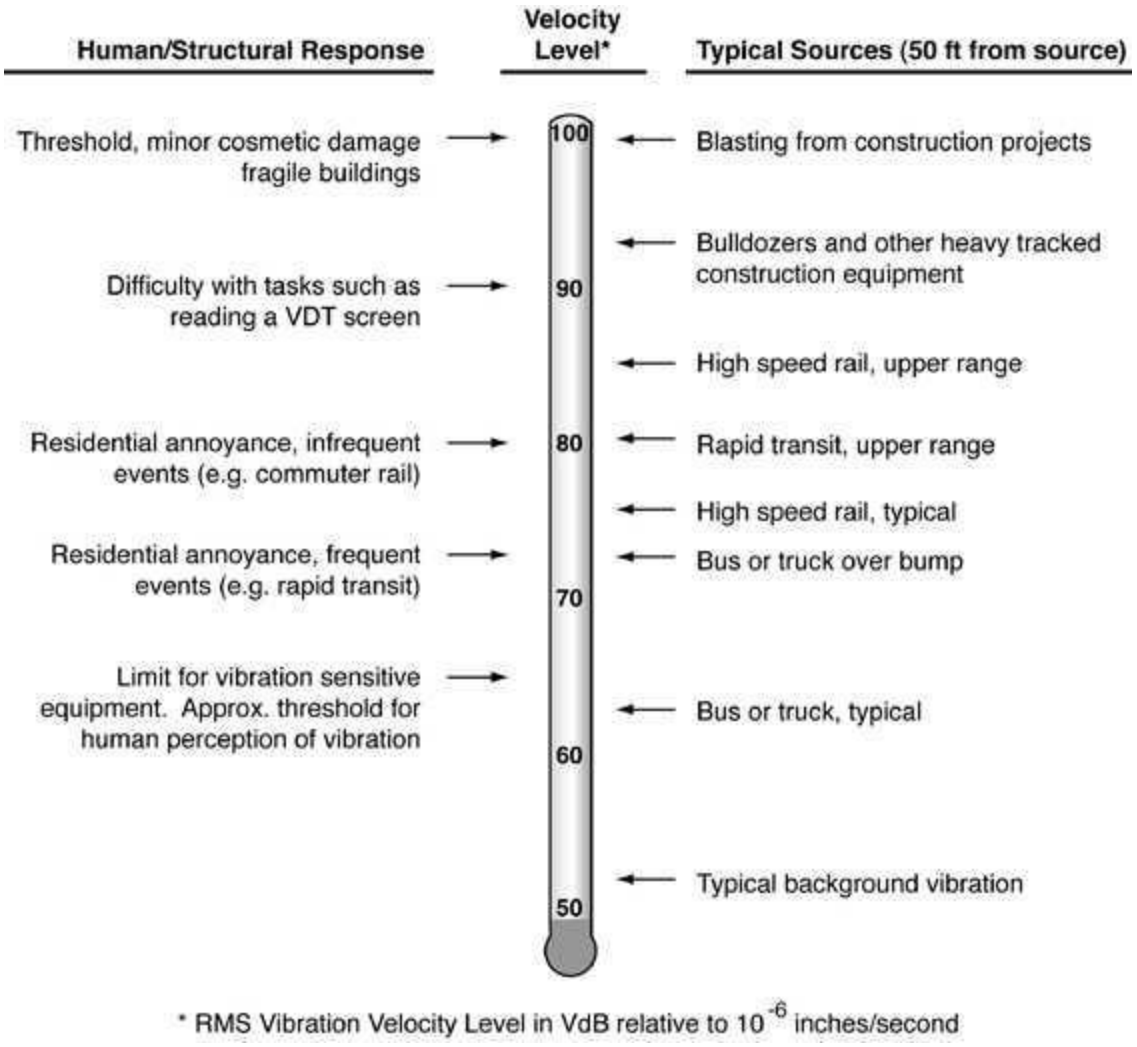


Source: FRA 2012 FEBRUARY 2019

Figure 4-7 Propagation of Ground-Borne Vibration into Buildings

Figure 4-8 illustrates the typical levels of human response and, at much higher levels, the structural response to ground-borne vibration. The figure shows that the threshold of human perception is about 65 VdB, while the threshold for cosmetic damage is about 100 VdB. However, the threshold for building damage is directly related to the condition of the structure. It is very rare that transportation-generated ground vibration approaches building damage levels.

Ground-borne noise is a secondary phenomenon of ground-borne vibration. When a building structure vibrates, noise is radiated into the interior of the building. Typically, this low- frequency sound would be perceived as a low rumble. The magnitude of the sound depends on the frequency characteristic of the vibration and the manner in which the room surfaces in the building radiate sound. Ground-borne noise is quantified by the A-weighted sound level inside the building.



Source: FRA 2012 FEBRUARY 2019

Figure 4-8 Typical Levels of Ground-Borne Vibration and Response to Vibration

4.2.2 Resource Study Area

The vibration RSA extends 275 feet from the project alternatives' centerlines, which is narrower than the noise RSA. This distance is consistent with the FRA screening procedures and was established to identify where vibration impacts from HSR might occur. Table 4-14 shows the FRA-recommended screening distances for vibration assessments of various land use types. To include all potentially affected areas along the project extent, the highest speed and frequent event categories were used to establish screening distances.

Table 4-14 FRA-Recommended Screening Distances for Vibration Assessments

Land Use	Train Frequency[1]	Screening Distance (feet from centerline) Train Speed[2]	
		100 to 200 mph	200 to 300 mph
Residential	Frequent	220	275
	Infrequent	100	140
Institutional	Frequent	160	220
	Infrequent	70	100

Source: FRA 2012
mph = miles per hour
[1] Frequent = more than 70 passbys per day; Infrequent = fewer than 70 passbys per day
[2] Screening distances are not provided for speeds of less than 100 mph, as train speeds would typically exceed 100 mph.

4.2.3 Impact Criteria

4.2.3.1 Construction

The construction vibration assessment is based on the FRA guidance manual (FRA 2012). To avoid temporary annoyances to building occupants or interference with vibration-sensitive equipment inside special-use buildings during construction, FRA recommends using the long-term operations vibration criteria for a general assessment. These are discussed in Section 4.2.3.2, Operations.

Table 4-15 shows the FRA guideline for vibration damage criteria from construction activity. The table provides PPV limits for four building categories. Analysts used a crest factor of 4 (representing a PPV–RMS difference of 12 VdB) to calculate the approximate RMS vibration velocity limits in VdB from the PPV limits. These limits were used to identify areas that should be addressed during engineering design of the project alternatives.

Table 4-15 Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_v[1]
I. Reinforced-concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Nonengineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FRA 2012
PPV= peak particle velocity
in/sec = inches per second
L_v = velocity level
RMS = root-mean squared
VdB = vibration decibels
µin/sec = microinch per second
[1] RMS VdB re: 1 µin/sec

4.2.3.2 Operations

Vibration impact levels are determined by the receptor land-use category and the daily number of the vibration events. The limits are based on the maximum RMS vibration level. The impact level also depends on the type of analysis being conducted (i.e., ground-borne vibration or ground-borne noise).

The FRA provides guidelines to assess the human response to different levels of ground-borne noise and vibration as shown in Table 4-16. Ground-borne noise and vibration levels represent the vibration during a train passby (RMS vibration level of an event). The guidelines provide

additional criteria for special-use buildings that are sensitive to ground-borne noise and vibration as shown in Table 4-17.

The criteria in Table 4-16 and Table 4-17 apply only to occupied spaces in potentially affected buildings (i.e., receptors). The number of daily train events are considered in determining which criterion to apply. HSR service would provide more than 70 trains per day, which would be characterized as frequent events. Ground-borne vibration is assessed at the building façade. Ground-borne noise is assessed inside buildings.

In most cases, for at-grade or aerial train operations, the airborne noise would be substantially louder than the ground-borne noise, and ground-borne noise is not perceived separately from the airborne noise. Therefore, the analysis focused on airborne noise to assess at-grade or aerial portions; ground-borne noise was used to assess tunnels.

Table 4-16 Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Assessment

Land Use Category	GBV Impact Levels (VdB re: 1 µin/sec)			GBN Impact Levels (dB re: 20 µPa)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FRA 2012
GBV = ground-borne vibration
GBN = ground-borne noise
VdB = vibration decibels
µin/sec = microinch per second
dB = decibel
µPa = micro-Pascal
dBA = A-weighted decibel
N/A = not applicable
[1] *Frequent Events* is defined as more than 70 vibration events of the same kind per day.
[2] *Occasional Events* is defined as between 30 and 70 vibration events of the same kind per day.
[3] *Infrequent Events* is defined as fewer than 30 vibration events of the same kind per day.
[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research requires detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened or vibration-isolated floors.
[5] Vibration-sensitive equipment is not sensitive to ground-borne noise.

Table 4-17 Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for Special Buildings

Land Use Category	GBV Impact Levels (VdB re: 1 µin/sec)		GBN Impact Levels (dB re: 20 µPa)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Concert halls	65 VdB	65 VdB	25 dBA	25 dBA
TV studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

Source: FRA 2012
[1] *Frequent Events* is defined as more than 70 vibration events per day.
[2] *Occasional or Infrequent Events* is defined as fewer than 70 vibration events per day.
GBV = ground-borne vibration
GBN = ground-borne noise
VdB = vibration decibels
µin/sec = microinch per second
dB = decibel
µPa = micro-Pascal
dBA = A-weighted decibel

Analysts applied additional vibration impact criteria where the project would be located in an existing rail corridor from San Jose to Gilroy. When there are existing substantial sources of vibration, such as trains, at locations affected by the project, the existing vibration levels were factored into the assessment. The FRA provides guidance on how to apply the vibration impact criteria based on the existing vibration conditions. The existing rail corridor is first defined by how many trains are on it per day. The following scenarios summarize the FRA guidance and a flow chart graphically summarizes the evaluation process (Figure 4-9):

- **Infrequently used rail corridor** (fewer than five trains per day):
  - Compare the vibration levels from the project to the vibration criteria in Table 4-16 and Table 4-17. If the vibration levels from the project exceed the criteria in Table 4-16 and Table 4-17, the project would have a vibration impact.
- **Moderately used rail corridor** (5 to 12 trains per day):
  - If the existing train vibration levels exceed the criteria in Table 4-16 and Table 4-17 and the project vibration levels are at least 5 VdB lower than the existing levels, the project would not have a vibration impact.
  - If the existing train vibration levels exceed the criteria in Table 4-16 and Table 4-17 and the project vibration levels are within 5 VdB of the existing levels, then compare the vibration levels from the project to the vibration criteria in Table 4-16 and Table 4-17.
  - If the existing train vibration levels do not exceed the criteria in Table 4-16 and Table 4-17, then compare the vibration levels from the project to the vibration criteria in Table 4-16 and Table 4-17. If the vibration levels from the project exceed the criteria in Table 4-16 and Table 4-17, the project would have a vibration impact.
- **Heavily used rail corridor** (more than 12 trains per day):
  - If the existing train vibration levels exceed the criteria in Table 4-16 and Table 4-17 and the project would cause a substantial increase in the total number of trains per day, the project would have a vibration impact. (A substantial increase is defined as approximately doubling the total number of trains per day.)

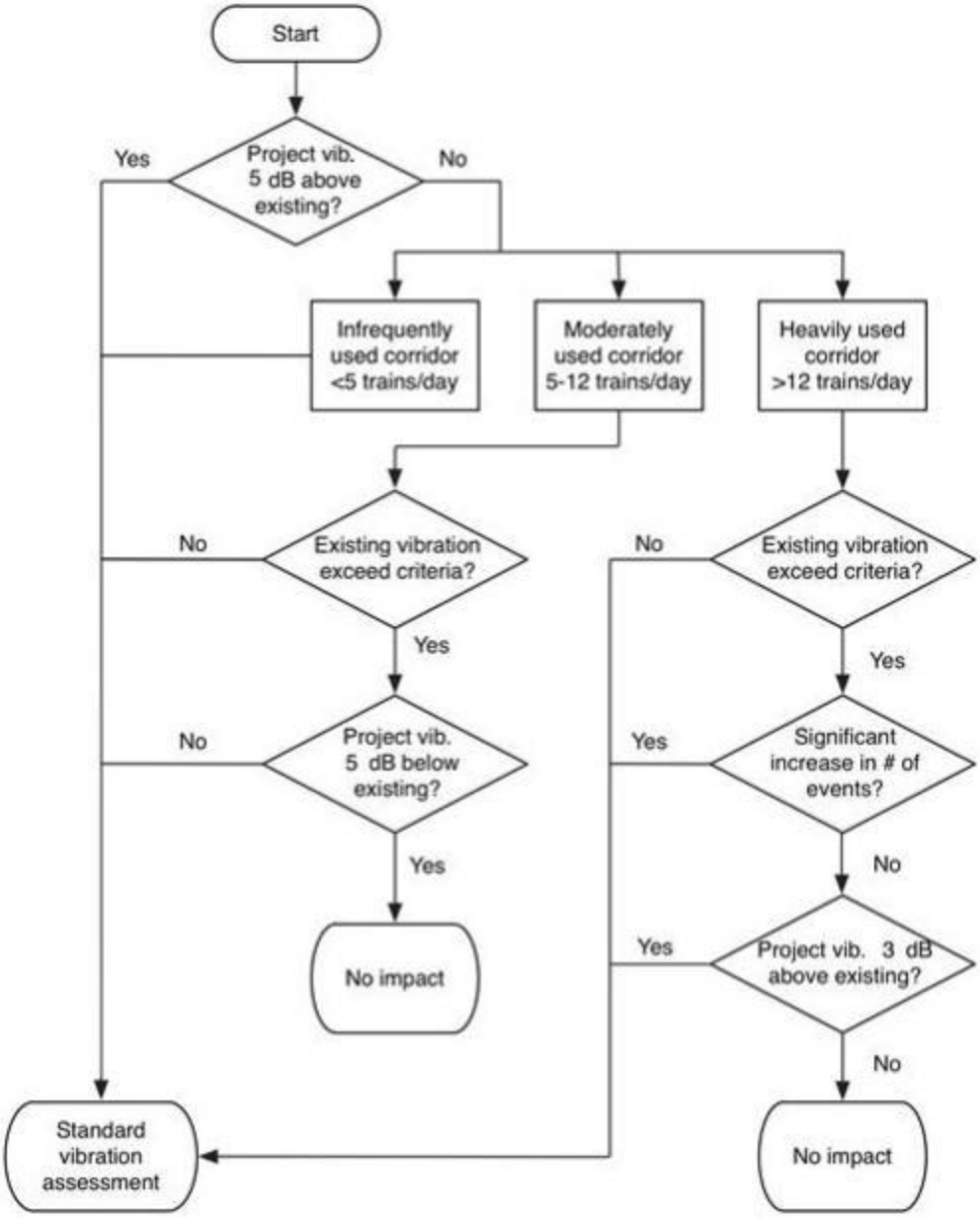
  - If there is not a substantial increase in the number of vibration events per day, the existing train vibration levels exceed the criteria in Table 4-16 and Table 4-17, and the project vibration levels are 3 VdB greater than the existing levels, the project would have a vibration impact.
  - If the vibration levels from the project are 5 VdB greater than the existing levels, then the existing source can be ignored, and the vibration levels from the project should be compared to the criteria in Table 4-16 and Table 4-17. If the vibration levels from the project exceed the criteria in Table 4-16 and Table 4-17, the project would have a vibration impact.

- **Moving existing tracks:**
  - Existing vibration can be substantial when an HSR project would share an existing rail right-of-way and shift the location of existing tracks. The relocated track can result in lower vibration levels from the existing trains at some locations and higher vibration levels at other locations.
  - If the vibration levels from the relocated existing trains would create higher levels, then the vibration levels from the relocated existing trains and from the project must be compared to the criteria in Table 4-16 and Table 4-17.
  - If the existing vibration levels prior to relocating the track did not exceed the criteria in Table 4-16 and Table 4-17, then the vibration levels from the relocated track must be compared to the criteria in Table 4-16 and Table 4-17. If the vibration levels from either the relocated existing trains or from the project exceed the criteria in Table 4-16 and Table 4-17, the project would have a vibration impact.
  - If the existing vibration levels prior to shifting the track exceeded the criteria in Table 4-16 and Table 4-17 and the vibration levels from the relocated track would increase by more than 3 VdB, then the project would have a vibration impact.

The vibration levels from the new project vibration source must also be compared separately to the criteria in Table 4-16 and Table 4-17.

The RSA includes portions of all of the previously noted situations because of the number of Caltrain, freight, and other passenger trains that travel the existing corridor daily. The corridor from Scott Boulevard to West Alma Avenue in San Jose is a heavily used rail corridor with a segment of new rail corridor between Diridon Station and Tamien outside the existing rail right-of-way (Alternatives 1, 2, 3, and 4). From West Alma Avenue in San Jose to 10th Street in Gilroy, the project would follow the existing rail right-of-way, in a moderately used rail corridor (Alternatives 1, 2, 3, and 4). The Morgan Hill Bypass would introduce a new rail corridor (Alternatives 1 and 3). The alignment through downtown Gilroy from 10th Street to the Santa Clara County line is an infrequently used rail corridor (Alternatives 1, 2, and 4). The alignment located east of Gilroy is a new rail corridor (Alternative 3). The corridor from south of the Santa Clara County line through Pacheco Pass and the San Joaquin Valley is a new rail corridor (Alternatives 1, 2, 3, and 4).

In addition to the criteria provided for general assessment purposes, FRA has established criteria in terms of 1/3-octave band frequency spectra for use in detailed analyses. Figure 4-10 illustrates the application of these criteria and Table 4-18 shows descriptions of the criteria. The VC-A through VC-E curves are used for special equipment that is very sensitive to vibration. Four vibration-sensitive facilities with sensitive equipment were identified in the vibration RSA.



Source: FRA 2012; FTA 2018

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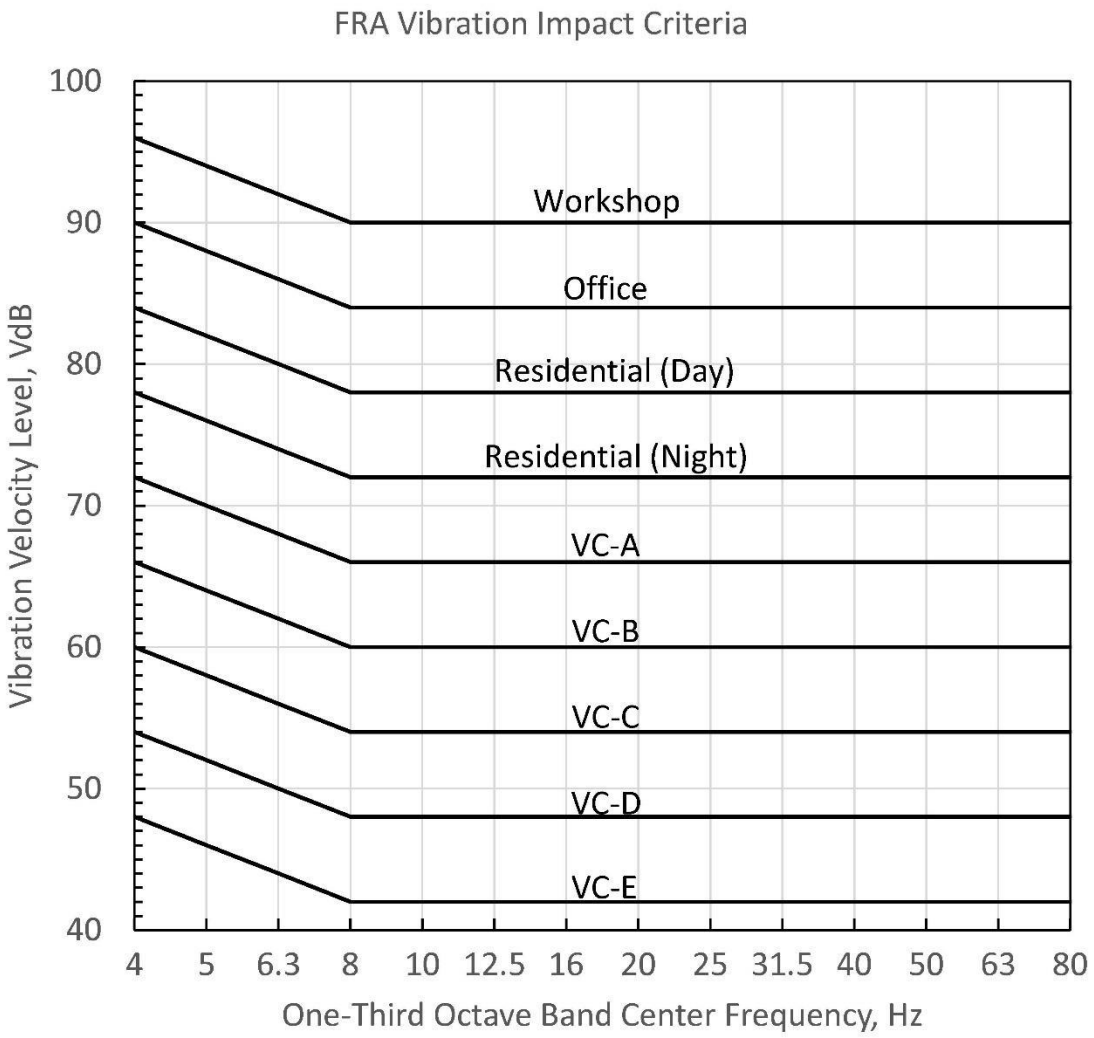
Figure 4-9 FRA Vibration Impact Criteria Flowchart



Source: FRA 2012

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Figure 4-10 FRA Criteria for Detailed Vibration Analysis

Table 4-18 Interpretation of Vibration Criteria for Detailed Analysis

Criterion Curve	Maximum Vibration Level (VdB re: 1 µin/sec)[1]	Description of Use
Workshop	90	Distinctly perceptible vibration. Appropriate to workshops and non-sensitive areas.
Office	84	Perceptible vibration. Appropriate to offices and non-sensitive areas.
Residential Day	78	Barely perceptible vibration. Adequate for computer equipment and low-power optical microscopes (up to ×20).
Residential night, operating rooms	72	Vibration not perceptible, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power optical microscopes (×100) and other equipment of low sensitivity.
VC-A	66	Adequate for medium- to high-power optical microscopes (×400), microbalances, optical balances, and similar specialized equipment.
VC-B	60	Adequate for high-power optical microscopes (×1,000), inspection and lithography equipment to 3-micron line widths.
VC-C	54	Appropriate for most lithography and inspection equipment to 1-micron detail size.
VC-D	48	Suitable in most instances for the most demanding equipment, including electron microscopes operating to the limits of their capability.
VC-E	42	The most demanding criterion for extremely vibration-sensitive equipment.

Source: FRA 2012
[1] As measured in 1/3 octave-bands over the frequency range of 8-100 Hz.
VC = vibration criteria
VdB = vibration decibels
µin/sec = microinch per second

4.2.4 Methods for Establishing Existing Vibration Levels

Locations for measuring the existing ground vibration levels in the RSA encompass the variable conditions along the HSR alignment. The primary source of existing ground vibration in the RSA is Caltrain operations and to a lesser degree other passenger rail and infrequent freight trains. Analysts selected measurement sites by project alternative to measure the overall ground vibration level due to train passbys as well as the spectral (frequency content of the ground vibration) components of the passby vibration, which are influenced by the local soil conditions and input forces unique to different types of trains. The selection of the vibration measurement sites was also based on a preliminary vibration analysis conducted for the project in 2011 (Authority 2011), which was based on the FRA General Assessment method as described in Section 8.2 of the FRA guidance manual (FRA 2012). The selection of measurement sites for this work prioritized those areas with higher potential for vibration impact.

Because Caltrain train vibration is the dominant existing source of ground vibration in most areas, the vibration survey focused on obtaining ground vibration measurements during Caltrain passbys. Vibration was measured for sensitive receptors at typical setback distances from the nearest track. For each site, train vibration was typically measured at two distances from the rail alignment simultaneously.

The ambient vibration survey establishes the existing overall vibration levels throughout the corridor. The variation in measured vibration levels from Caltrain trains in the RSA is due to the varying speed and the variability in the soil vibration attenuation characteristics. These factors

were used in the selection of field vibration propagation testing locations which for the detailed analysis.

Section 4.2.5.2, Operations Vibration, provides details about the vibration propagation measurement procedure.

4.2.5 Prediction Methods

4.2.5.1 Construction Vibration

Analysts assessed construction vibration impacts in accordance with the method described in Chapter 10 of the FRA guidance manual (FRA 2012) for quantitative construction vibration assessments. HSR construction activity scenarios were developed to estimate construction vibration quantitatively, comparing the predicted ground-borne vibration amplitudes with appropriate construction stage impact criteria. Quantitative construction vibration analysis was conducted where there was a potential for pile driving, vibratory compaction, demolition, or excavation near vibration-sensitive structures. Criteria for annoyance (Tables 4-16 and 4-17) and damage (Table 4-15) were applied to determine impacts from construction vibration. Analysts used the following information to assess the construction vibration:

- Vibration source levels from equipment expected to be used by contractors.
- Estimated site layouts of equipment along the right-of-way.
- Distance from the construction operations to nearby vibration-sensitive receptors.

4.2.5.2 Operations Vibration

The FRA guidance manual (FRA 2012) provides three levels of analysis: screening, general assessment, and detailed analysis. The screening analysis was used to determine the RSA for conducting the detailed analysis of operations vibration. For this analysis, analysts evaluated residential locations within 275 feet and institutional locations within 220 feet of the alternatives' centerlines.

The FRA criteria for assessing ground-borne vibration from shared corridors require that the levels resulting from the relocated existing tracks be compared to the existing vibration levels. Thus, analysts prepared separate analyses to predict ground-borne vibration from project operations and from existing and future Caltrain operations.

The FRA prediction method is based on an empirical modeling approach. The basis of the empirical model is the assumption that vibration generated by a train rolling on steel rail and its propagation through the surrounding geologic strata (soil and rock) and into buildings can be separated into independent elements. Each of the vibration elements can be quantified separately by measurements conducted in the field. The individual elements are combined to predict ground-borne noise and vibration inside occupied buildings, which are vibration-sensitive and adjacent to the rail alignment. Adjustments are made to the prediction model to account for other factors such as train speed and track and superstructure effects.

The prediction model for ground-borne vibration employs the following equation:

$$Lv = FDL + LSR + AF$$

where:

Lv	=	projected vibration velocity level in a specific building: VdB
FDL	=	force density level: dB re: 1 lb/ft$^{1/2}$
LSR	=	line source response: dB re: 10^{-6} (inch/sec)/(lb/ft$^{1/2}$)
AF	=	adjustment factor for track and structure: dB (relative level)

All of the model parameters are determined in terms of their 1/3-octave band frequency content. The overall vibration level at a specific building is the combination of the individual 1/3-octave band levels determined by an "energy sum" over all the bands. The energy sum, calculated by summing the energy in all 1/3-octave bands, results in a single-number level (also in decibels: VdB) accounting for the vibration energy in all of the 1/3-octave bands within the overall frequency range of interest. The FRA general assessment vibration criteria are based on the overall vibration level. The FRA detailed assessment criteria are based on the individual 1/3-octave band levels.

Each projection of ground-borne vibration begins with the force density level (FDL), which represents an excitation force caused by the wheels of a train rolling on the rail. As each train has several wheels rolling simultaneously, the prediction model incorporates this input as an incoherent line of vibration forces generated by the dynamic interaction of the rail vehicle and the rail and the track support system. This analysis uses the FDL indicated for the Pendolino train as the most representative FDL for the technology envisioned for the statewide HSR system because it is also a high-speed EMU vehicle.

The FDLs used in the vibration analyses are illustrated on Figure 4-11. The Pendolino FDL used to predict HSR vibration levels is shown at a reference speed of 150 mph. The FDL of Caltrain locomotives is also illustrated on Figure 4-11 at a reference speed of 50 mph. The Caltrain FDL was calculated from field measurements of existing trains in the Project Section and the San Francisco to San Jose Project Section. The figure shows that even at very different speeds, the HSR and Caltrain FDLs are similar below 31.5 Hz. The Caltrain FDL shows a peak at 100 Hz that is more than 10 dB greater than the HSR FDL, which would result in higher vibration levels in the 100 Hz 1/3-octave band.

The reference HSR Pendolino FDL is from a system where high-speed passenger trains were operating on their own dedicated tracks, with smooth rail in good condition. The HSR trains in the Project Section would operate on tracks that are shared with both Caltrain and freight trains, which increases the likelihood that the rail roughness could increase with time and potentially lead to increased vibration levels. To account for this, an added engineering factor of 5 VdB was added to the HSR vibration predictions where blended service would occur under Alternative 4. The FDL of the Caltrain system (locomotives and coaches) was empirically derived from train passby measurements and the impact testing performed at multiple sites throughout the Project Section and in the San Francisco to San Jose Project Section. The future Caltrain rolling stock will be EMU vehicles (no locomotive). The FTA guidelines provide an FDL for commuter rail; however, this assumes the use of a locomotive. Consideration was given to other previously measured FDLs that might approximate an FDL for an EMU, including FDL for heavy rail transit vehicles. However, none was found to be completely satisfactory. Consistent with the *Caltrain Peninsula Corridor Electrification Project Noise and Vibration Technical Report* (Wilson Ihrig 2014), the FDL for the existing Caltrain was selected with the assumption that the EMU would be no greater than the existing FDL.

Figure 4-11 illustrates the FDL spectra used in the vibration prediction model for HSR and Caltrain. The FDLs for HSR and Caltrain were adjusted for speed using the following formula.

$$20 * Log(S/Sref)$$

where:

S = operations speed (mph)
S_{ref} = speed reference (mph)

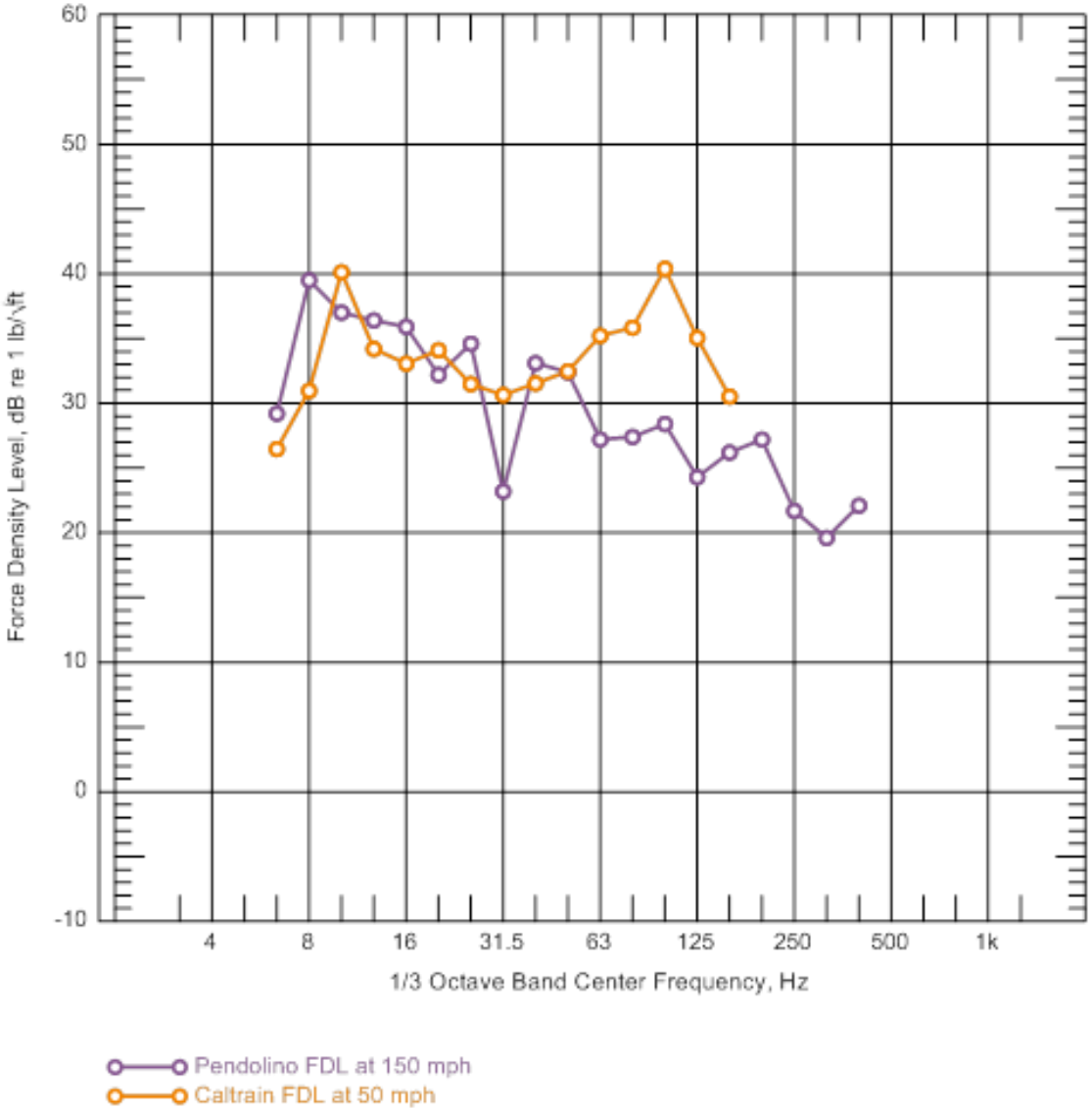

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Figure 4-11 Force Density Level Spectra Used in the Vibration Analysis

The second element in the FRA model is the line source response (LSR). The LSR quantifies the effect of soil conditions at a receptor location relative to the FDL. The LSR represents the response of the local soil strata to vibration and the attenuation of vibration energy due to its propagation through the surrounding soil. The LSR characterizes the vibration velocity response at a single location on the surface of the ground due to incoherent forces distributed over the length of a train (i.e., a finite line source). LSR as used in this analysis refers to the response of a free ground surface and not to the response of a built structure, such as a floor in a building. However, the response of an individual building can be measured if there are only a limited number of buildings potentially affected. This analysis addresses impacts on hundreds of buildings, making that approach impractical.

The LSR for a soil region is found by imparting a vertical force on the ground surface or bottom of a borehole for a subsurface alignment, measuring that force with a load cell or strain gage and simultaneously measuring the vertical vibration velocity of the ground surface at several distances

from the impact location. This procedure, described in the FRA guidance manual (FRA 2012), provides a set of point source responses (also referred to as transfer mobility), from which an LSR can be constructed.

The LSR is added to the FDL to obtain the ground surface vibration velocity levels in the absence of buildings. Analysts obtained the various LSRs used in the vibration analyses from numerous site measurements conducted in the field using the procedure described in the FRA guidance manual.

The normal procedure for obtaining transfer mobility data is to impact the ground at several locations and measure the ground surface velocity at various distances from the point of impact. For surface alignments, analysts used a pneumatic, force-instrumented hammer to generate impact forces. The pneumatic hammer consists of a 27-pound cylindrical mass guided by a 4-inch diameter tube with pneumatic assist to both raise the hammer and drive the hammer downward onto a load cell. Approximately 20 to 30 impacts are recorded at each surface position.

For subway alignments, boreholes were drilled and a force-instrumented transducer was attached to the end of a drill string. The impacts delivered to the bottom of the borehole were obtained with a standard, 130-pound driller's slide hammer. Force input from the hammer and geophone responses are recorded simultaneously for 40 to 50 impacts at each testing depth. A graphic representation of the surface test is illustrated on Figure 4-12 and the borehole test is illustrated on Figure 4-13.

Transfer mobility data collected by the vibration testing were then fit with polynomial functions of distance using least squares regression. The point source responses that are derived from the curve fitting were then numerically integrated over a length of 600 feet (to approximate the train length) to obtain the following mathematical function for the line source response with distance:

$$LSR(d) = A + B * Log(d) + C * Log^2(d)$$

where:

A, B, C	=	polynomial coefficients
d	=	perpendicular and horizontal distance from track centerline (feet)

Because ground-borne noise and vibration are typically not substantial at distances of more than 250 feet from the tracks, a 600-foot train length provides a reasonable approximation to the length of train that would affect ground-borne vibration.

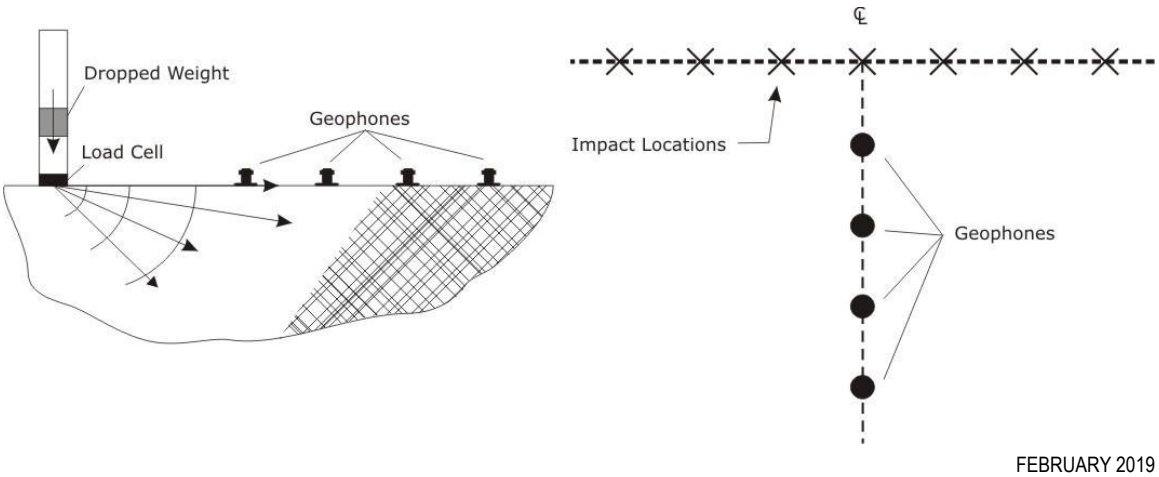

Figure 4-12 Surface Vibration Propagation Test (cross section)

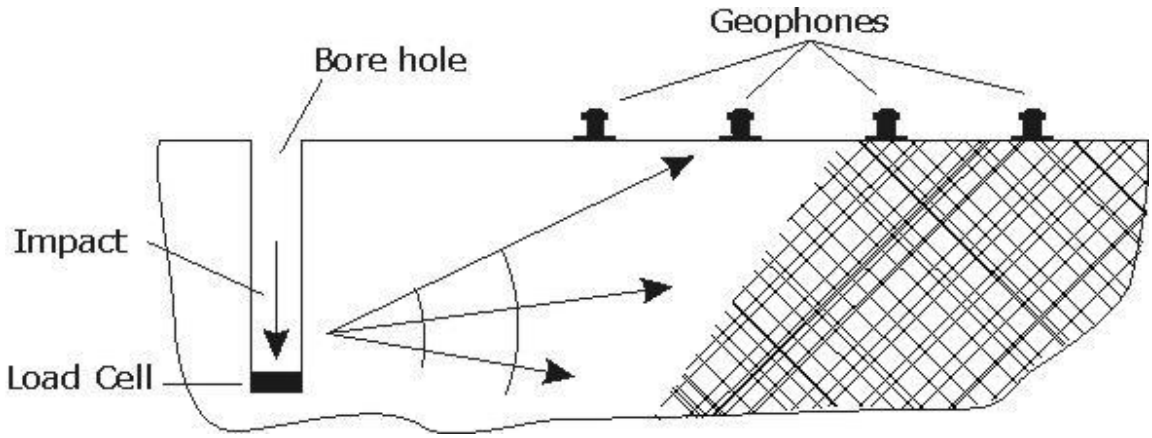

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Figure 4-13 Borehole Vibration Propagation Test (cross section)

To predict levels of ground-borne noise and vibration for project conditions different from those on which the FDL is based, analysts applied the adjustment factors specified in the FRA guidance manual (FRA 2012) to account for the effects of train speed and the specific alignment structures (e.g., at grade, embankment, aerial, and tunnel geometry). Vibration levels from HSR on an aerial structure are assumed 10 VdB less than vibration from at-grade or embankment sections of track based on Table 8-2 of the FRA guidance manual.

Ground-borne noise is generated when the surfaces of interior building elements such as floors, walls, and ceilings vibrate because of ground-borne vibration from trains. Ground-borne noise is commonly described as the “rumble” from a subway train. The prediction of such noise is directly related to the prediction of vibration inside a building.

The final step in the ground-borne noise and vibration prediction procedure is the prediction of interior noise levels in occupied building spaces due to acoustic radiation caused by the room’s vibrating elements. The following equation from Section 9.3.2 of the FRA guidance manual shows the relationship between ground-borne vibration and ground-borne noise:

$$L_A = L_v + K_{rad} + K_{A-wt}$$

where:

L_A	=	A-weighted sound level in 1/3 octave band (dBA re: 20 µPa)
L_v	=	RMS vibration velocity level in 1/3 octave band (VdB re: 1 µin/sec)
K_{rad}	=	adjustment to convert from vibration to sound pressure level and account for average acoustical absorption inside room (typically -5 dB for residential rooms)
K_{A-wt}	=	A-weighting adjustment in each 1/3 octave-band

Ground-borne noise is computed on a 1/3 octave-band basis. The 1/3 octave-band noise levels are A-weighted and combined to obtain an overall A-weighted noise level. The A-weighted ground-borne noise level is evaluated with respect to the FRA ground-borne noise criteria.

Where trains change tracks or cross over other tracks, wheel impacts at regular crossovers (conventional rail-bound manganese frogs) or special trackwork produce an increase in vibration relative to standard track and thus would require an adjustment factor to account for the ground vibration levels in the immediate vicinity of a track crossover or turnout. Adjustments were made to predicted vibration levels to account for increases in localized vibration due to special trackwork, such as crossovers or turnouts.

Alternatives 1, 2, and 3 would use special trackwork without significant gaps in the rail running surface, such as moveable-point frogs. Moveable-point frogs reduce noise and vibration because the wing rail closes the gap at the frog, reducing the impact as the wheel crosses it. Any insulated joints would be low-impact type joints. Therefore, any increases in localized vibration because of special trackwork are expected to be small and would not change overall effects on sensitive receptors.

Under Alternative 4, HSR trains would operate in blended service on the Caltrain tracks between San Jose and Gilroy and would use the same type of special trackwork currently in use in the corridor. All special trackwork frogs under Alternative 4 are assumed to be standard frogs. Wheel impacts at turnouts and crossovers with standard frogs were assumed to cause localized increases in vibration of up to 10 VdB within 50 feet, then decreasing with distance from the frogs.

5 EXISTING CONDITIONS AND EFFECTS ANALYSIS

This chapter presents the existing noise and vibration environment and existing measurement results. This chapter also provides the results of the noise and vibration impact assessments for construction and operations.

5.1 Noise

5.1.1 Existing Noise Environment

This section summarizes the noise measurement results and describes the noise-sensitive land uses in the RSA. Section 5.1.1.2, Noise Measurement and Modeling, summarizes the existing noise model used to identify the existing ambient noise conditions at all noise-sensitive receptors in the RSA.

5.1.1.1 Noise Measurement Results

A total of 65 measurements of ambient noise were conducted in the noise and vibration RSA. Measurements of ambient noise were conducted at 11 locations in the San Jose Diridon Approach Subsection between Scott Boulevard and West Alma Avenue, 10 locations in the Monterey Corridor Subsection between West Alma Avenue and Bernal Way, 36 locations in the Morgan Hill and Gilroy Subsection between Bernal Way and State Route (SR) 152, 2 locations in the Pacheco Pass Subsection between SR 152 and Interstate (I-) 5, and 6 locations in the San Joaquin Valley Subsection between I-5 and Carlucci Road. The long-term measurement locations are illustrated on Figures 5-1 through 5-5. Photographs of the noise measurement sites are provided in Appendix A.

The noise monitors were located at or near noise-sensitive locations. At some sites the noise measurement microphones were located in the back, front, or side yards of residences. At other sites, the microphones were mounted to utility poles near noise-sensitive locations. At all sites, the microphones were positioned in accordance with FRA guidance relative to both the dominant ambient noise sources and the noise-sensitive locations.

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Figure 5-1 Noise and Vibration Measurement Locations

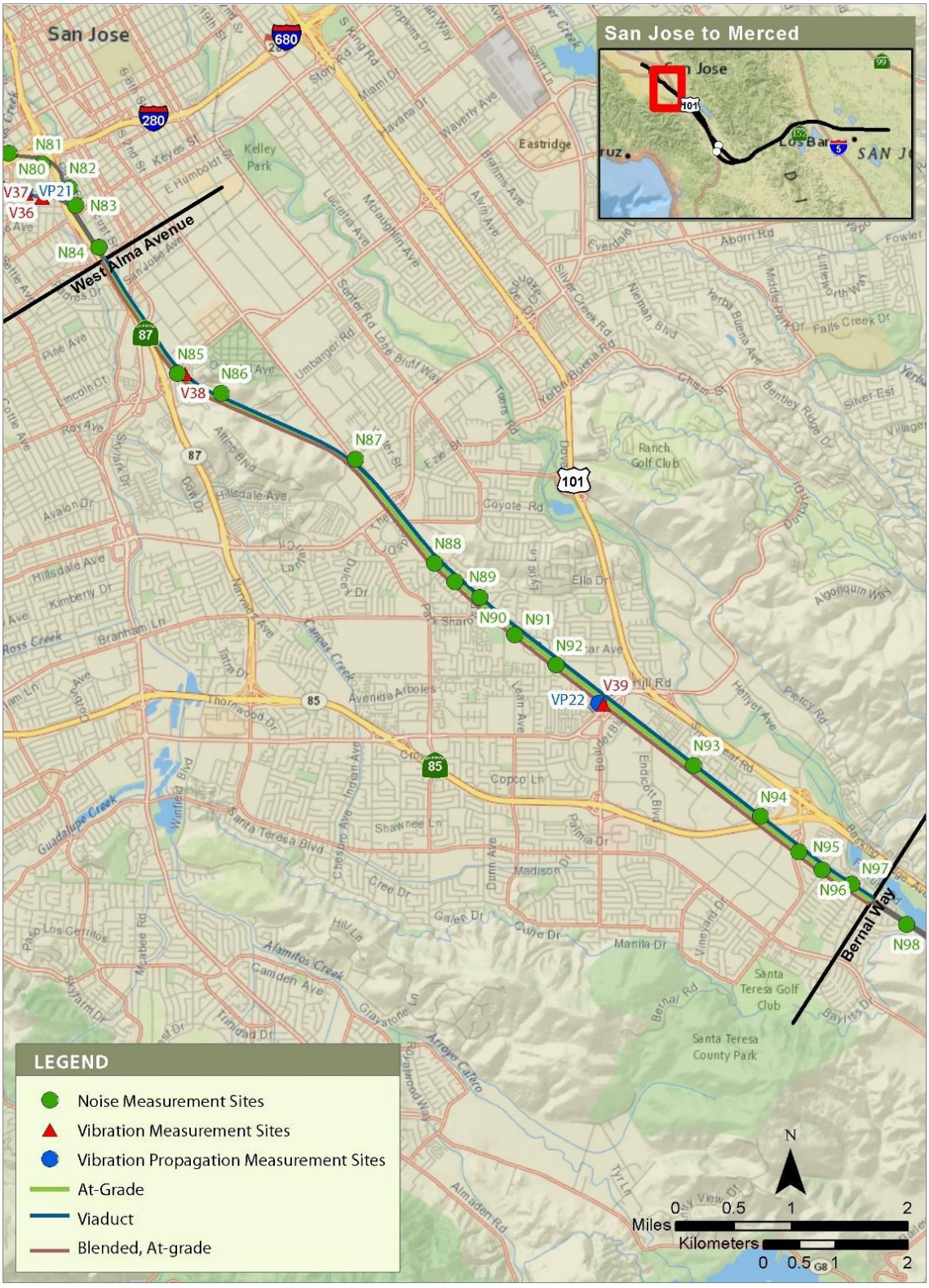

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Figure 5-2 Noise and Vibration Measurement Locations

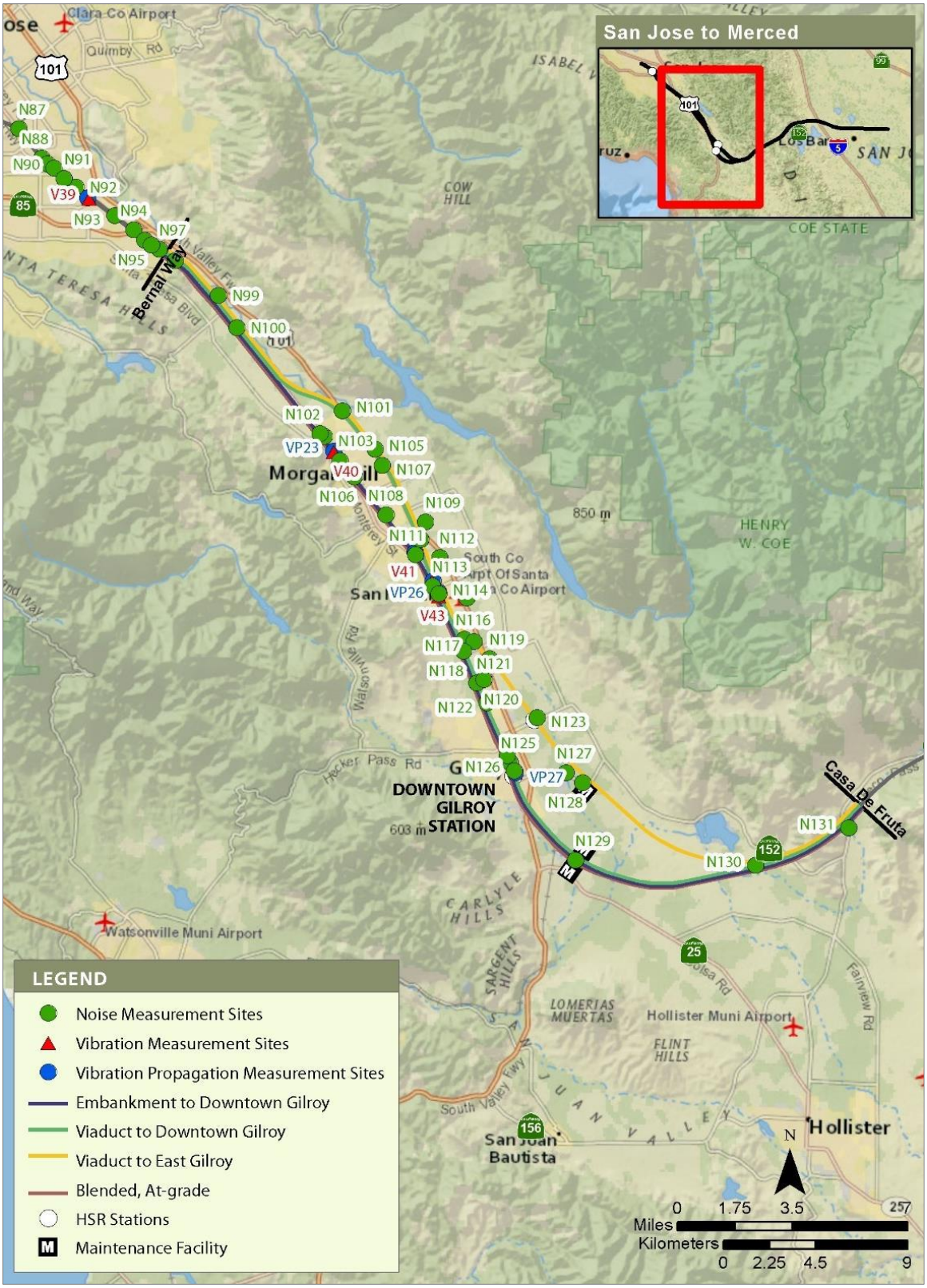

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Figure 5-3 Noise and Vibration Measurement Locations

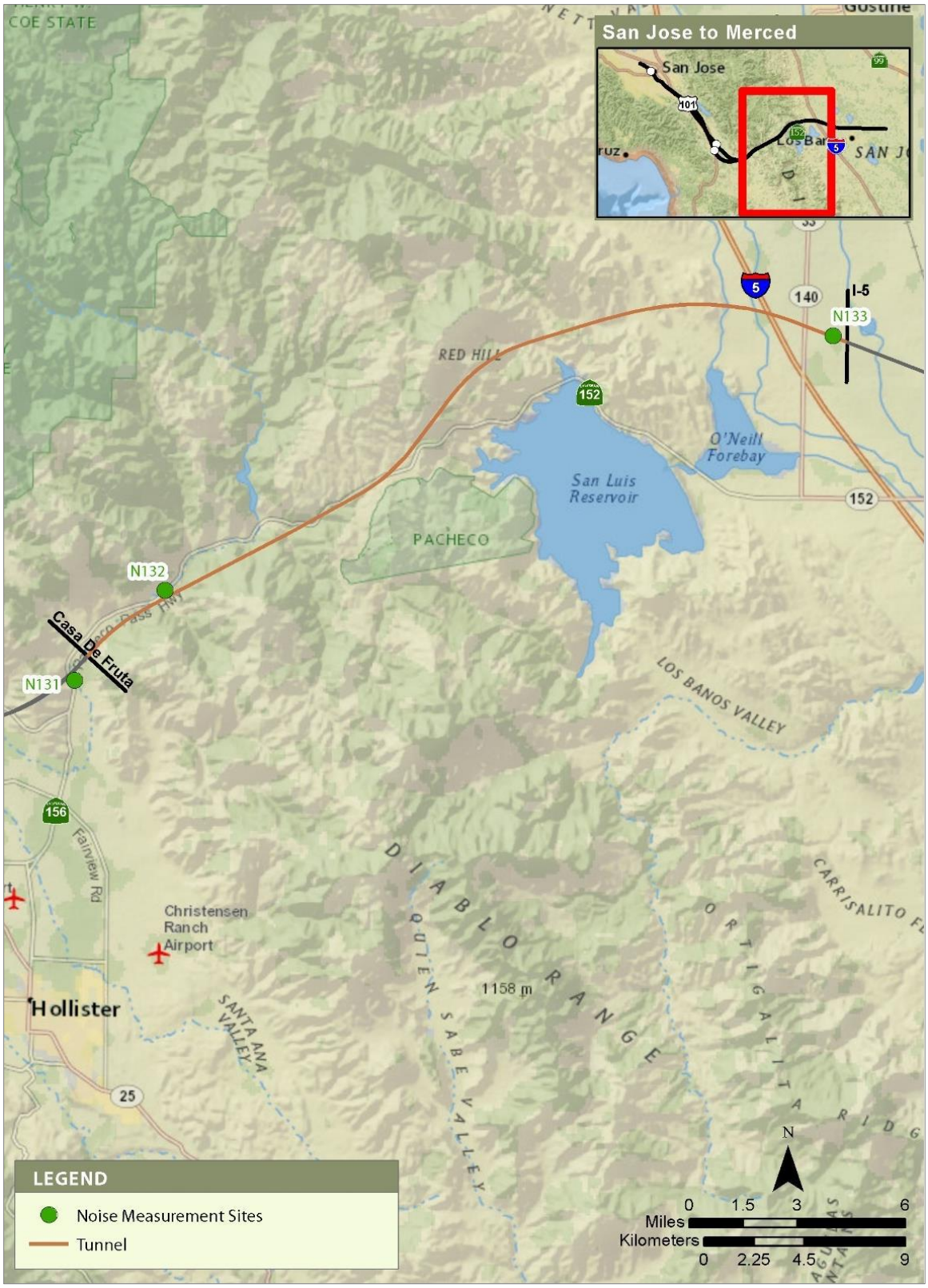

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Figure 5-4 Noise and Vibration Measurement Locations

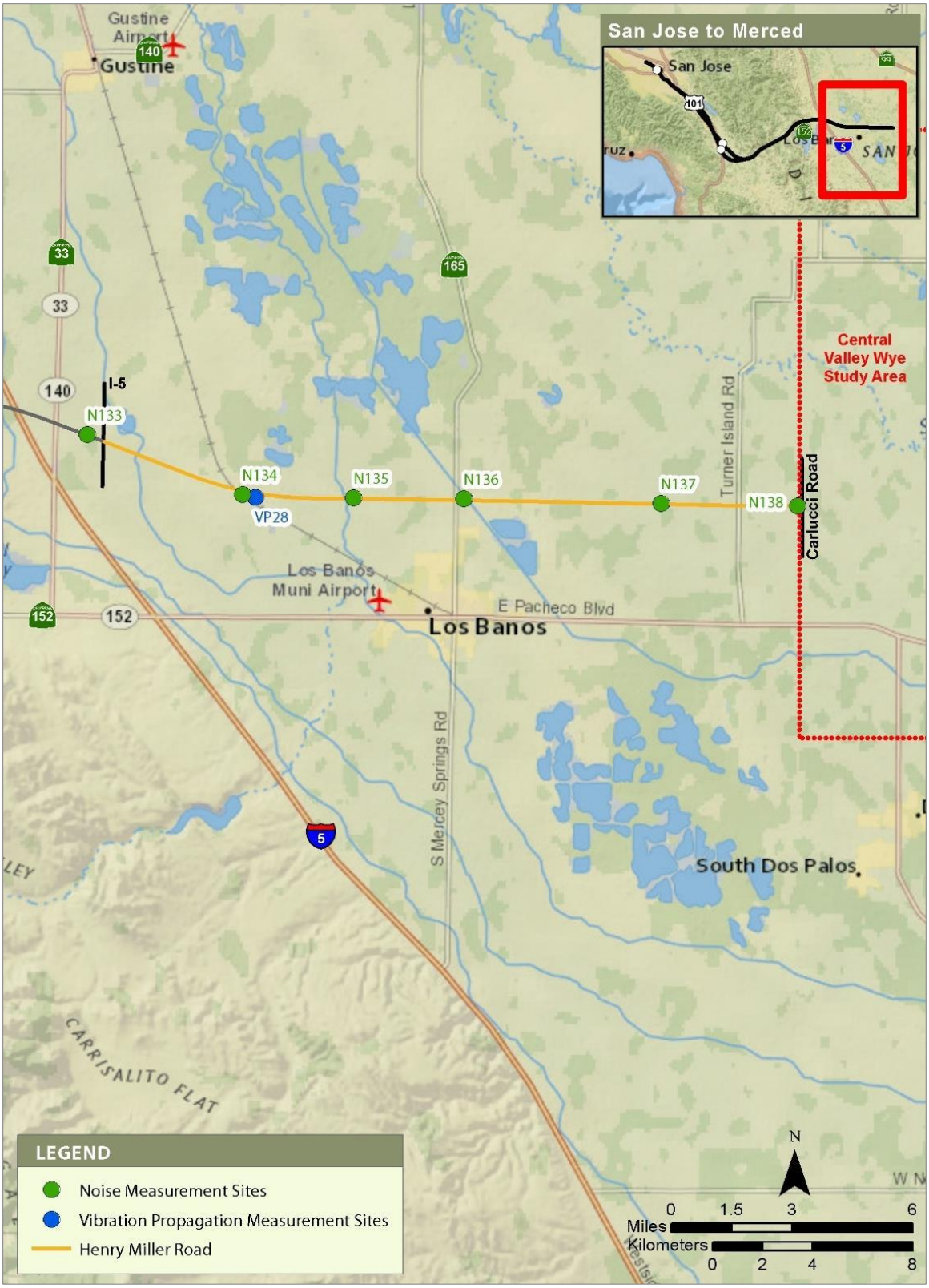

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Figure 5-5 Noise and Vibration Measurement Locations

The major noise sources for much of the project are trains in the existing rail corridor. In some locations, the project alternatives would deviate from the existing rail corridors and pass through rural areas. In some areas, the project alternatives would follow major highways where the existing noise environment is dominated by traffic noise. Noise monitors were located near noise-sensitive receptors and near existing major noise sources, such as roadways or rail lines. The noise measurement results shown in Table 5-1 represent the actual measured sound levels at the noise monitor locations. The results of the existing noise measurement program were used to validate the existing noise spreadsheet model developed by Wilson Ihrig to better predict existing noise levels at all noise-sensitive locations throughout the RSA. The existing noise spreadsheet model was used to identify the ambient existing noise levels at the exterior façade of building locations for residential land uses and at the nearest point of use for nonresidential noise-sensitive sites.

Commercial and industrial uses are the largest developed component in the northern portion of the San Jose Diridon Station Approach Subsection, with increasing residential use south of West Alma Avenue. South of San Jose Diridon Station, the alignment would pass through primarily residential areas but also some areas of commercial and industrial use to a point just north of Morgan Hill (near Kirby Avenue). In downtown Gilroy, dense urban commercial and residential uses are on both sides of the alignment. South and east of Gilroy, the primary land use is agricultural, interspersed with small rural communities and scattered residences on large acreages. The land uses east of Gilroy are predominantly agricultural and open space, with limited residential development and a commercial outlets center near Leavesley Road. The land use through the Pacheco Pass Subsection, where the alignment would pass through a new 13.5-mile tunnel, is open space and rangeland. Where the alignment would exit the tunnel in the eastern portion of the Pacheco Pass Subsection and then crosses I-5, residential and local commercial uses in the community of Santa Nella are located south of the alignment. The land uses in the San Joaquin Valley Subsection, along Henry Miller Road, are primarily agricultural (with supporting structures such as silos and barns) with scattered residences.

The noise measurement results are organized by subsection in Table 5-1. Table 5-1 shows the results of the ambient noise measurements conducted in 2010 by Parsons Transportation Group and ambient noise measurements conducted in 2009, 2010, 2013, 2016, and 2017 by Wilson Ihrig. Noise measurements conducted by Parsons Transportation Group are included in the *San Jose to Merced Section Noise and Vibration Technical Report* (Authority 2011). Noise measurements conducted by Wilson Ihrig in 2009 and 2010 are included in the *San Francisco to San Jose Section Noise and Vibration Technical Report* (Authority and FRA 2010a). Noise measurements conducted by Wilson Ihrig in 2013 are included in the *Caltrain Peninsula Corridor Electrification Project Noise and Vibration Technical Report* (Wilson Ihrig 2014). Noise measurements conducted by Wilson Ihrig in 2016 and 2017 are included in this assessment. Appendix B provides plots of the ambient noise measurement results.

Table 5-1 Ambient Noise Measurement Results

Site	Location	Land Use	Date Deployed	Average L_{dn}[1] (dBA)	Loudest Hour L_{eq} (dBA)
San Jose Diridon Station Approach Subsection					
N76[2]	2079 Main Street, San Jose, CA	Residential	5/3/2016	63	65
N77[2]	1315 De Altura Commons, San Jose, CA	Residential	10/16/2009	65	64
N78[2]	726 Emory Street, San Jose, CA	Residential	3/5/2010	64	65
N79	(adjacent to) 109 Laurel Grove Avenue, San Jose, CA	Residential	5/10/2016	67	70
N80	421 Illinois Avenue, San Jose, CA	Residential	10/12/2010	68	69

Site	Location	Land Use	Date Deployed	Average L_{dn}[1] (dBA)	Loudest Hour L_{eq} (dBA)
N81	663 Delmas Avenue, San Jose, CA	Residential	5/6/2016	61	63
N82	827 Harliss Avenue, San Jose, CA	Residential	10/12/2010	63	62
N83	(adjacent to) 974 McLellan Avenue, San Jose, CA	Residential	5/17/2016	66	63
N84	1197 Lick Avenue, San Jose, CA	Residential	11/11/2014	77	77
N139	782 Auzerais Avenue, San Jose, CA	Residential	5/20/2013	82	81
N140	748 Illinois Avenue, San Jose, CA	Residential	5/20/2013	71	68
Monterey Corridor Subsection					
N85	2320 Canoas Garden Avenue (Lot 608), San Jose, CA	Residential	10/11/2010	67	67
N86	Communications Hill Drive, San Jose, CA	Residential	5/17/2016	61	62
N87	3200 Monterey Road, Clarion Inn, San Jose, CA	Residential	5/17/2016	79	77
N88	4406 Pinon Place, San Jose, CA	Residential	10/13/2010	67	66
N89	23 Park Groton Place, San Jose, CA	Residential	10/12/2010	68	63
N90	4635 Rotherhaven Way, San Jose, CA	Residential	5/12/2016	77	77
N91	510 Saddle Brook Drive (Lot A), San Jose, CA	Residential	5/12/2016	67	67
N92	5272 Waterfall Court, San Jose, CA	Residential	10/19/2010	67	66
N93	60 Foxwell Place, San Jose, CA	Residential	5/10/2016	74	75
N94	5919 Southwind Drive, San Jose, CA	Residential	10/13/2010	73	76
Morgan Hill and Gilroy Subsection					
Along Monterey Road through Downtown Gilroy					
N95	6908 Sessions Drive, San Jose, CA	Residential	10/13/2010	59	58
N96	6998 Sessions Drive, San Jose, CA	Residential	5/10/2016	72	72
N97	7307 Urshan Way San Jose, CA	Residential	10/14/2010	60	58
N98	7465 Pegasus Court San Jose, CA	Residential	1/17/2011	61	59
N99	8470 Monterey Road, San Jose, CA	Residential	1/18/2011	61	62
N100	586 Monterey Road, Morgan Hill, CA	Residential	5/10/2016	81	81
N101	(adjacent to) 19271 Saffron Drive, Morgan Hill, CA	Residential	5/9/2016	73	76
N103	19260 Monterey Road, Morgan Hill, CA	Residential	10/18/2010	71	71
N104	157 Bender Circle, Morgan Hill, CA	Residential	5/3/2016	68	69
N106	95 E Central Avenue, Morgan Hill, CA	Residential	10/18/2010	66	66
N108	16250 Railroad Avenue, Morgan Hill, CA	Residential	6/22/2010	68	68

Site	Location	Land Use	Date Deployed	Average L_{dn}[1] (dBA)	Loudest Hour L_{eq} (dBA)
N111	14542 Crowner Avenue, San Martin, CA	Residential	5/12/2016	62	66
N113	13455 Monterey Road, San Martin, CA	Residential	10/19/2010	69	69
N114	13150 Depot Road, San Martin, CA	Residential	5/3/2016	64	67
N115	12675 Sycamore Avenue, San Martin, CA	Residential	5/9/2016	67	66
N118	110 Jacob Way, Gilroy, CA	Residential	6/22/2010	74	70
N120	325 Denio Avenue, Gilroy, CA	Residential	10/21/2010	56	56
N121	25 Denio Avenue, Gilroy, CA	Residential	10/20/2010	68	68
N122	70 Cohansey Avenue, Gilroy, CA	Residential	10/20/2010	60	61
N124	(adjacent to) 120 Sarafina Way, Gilroy, CA	Residential	5/9/2016	68	70
N125	111 Martin Street, Gilroy, CA	Residential	10/20/2010	58	65
N126	7250 Alexander Street, Gilroy, CA	Residential	2/14/2017	59	64
N129	1230 Bloomfield, Gilroy, CA	Residential	5/3/2016	71	74
N130	8247 Lovers Lane, Hollister, CA	Residential	5/6/2016	61	66
US 101 through Morgan Hill					
N102	(adjacent to) 19490 Vista De Lomas, Morgan Hill, CA	Residential	5/9/2016	69	67
N105	17905 Condit, Morgan Hill, CA	Residential	5/13/2016	66	68
N107	877 English Walnut Court, Morgan Hill, CA	Residential	10/19/2010	69	69
N109	15450 Murphy Avenue, Morgan Hill, CA	Residential	10/18/2010	57	60
N110	14916 Llagas Avenue, Morgan Hill, CA	Residential	12/19/2016	70	68
N112	14150 Murphy Avenue, San Martin, CA	Residential	10/18/2010	62	62
East Gilroy					
N116	11460 Rothe Avenue, Gilroy, CA	Residential	10/20/2010	56	59
N117	405 Lena Avenue, Gilroy, CA	Residential	10/21/2010	62	58
N119	695 Rucker Avenue, Gilroy, CA	Residential	5/6/2016	68	69
N123	8415 Marcella Avenue, Gilroy, CA	Residential	12/19/2016	66	65
N127	6780 Holsclaw Road, Gilroy, CA	Residential	5/6/2016	67	66
N128	1975 CA-152, Gilroy, CA	Residential	2/14/2017	82	79
Pacheco Pass Subsection					
N131	210 Walnut Avenue, Hollister, CA	Residential	11/17/2010	58	54
N132	Pacheco Pass Highway	Residential	5/13/2016	82	79

Site	Location	Land Use	Date Deployed	Average L_{dn}[1] (dBA)	Loudest Hour L_{eq} (dBA)
San Joaquin Valley Subsection					
N133	28263 Fahey Road, Los Banos, CA	Residential	5/20/2016	65	67
N134	(adjacent to) 24334 Henry Miller Avenue, Los Banos, CA	Residential	5/20/2016	74	72
N135	(adjacent to) 21534 Henry Miller Avenue, Los Banos, CA	Residential	5/20/2016	79	79
N136	(adjacent to) 18827 Henry Miller Road, Los Banos, CA	Residential	5/20/2016	73	72
N137	13893 Henry Miller Road, Los Banos, CA	Residential	11/15/2010	65	67
N138	12051 Carlucci Road, Los Banos, CA	Residential	5/20/2016	67	71

Sources: Authority 2011; Authority and FRA 2010a; Wilson Ihrig 2014
dBA = A-weighted decibel
L_{dn} = day-night sound level
SR = State Route
[1] The L_{dn} was calculated from the average hourly L_{eq} values collected over the entire measurement period.
[2] Includes existing noise from nearby airport

San Jose Diridon Station Approach Subsection

In San Jose, the noise RSA follows the Caltrain right-of-way through moderately dense urban areas with mixed land use. North of San Jose Diridon Station, the land use on the east side of the existing rail alignment is primarily industrial, while the western side is mainly residential. The closest residences are approximately 30 to 50 feet from the existing railway. Bellarmine College Preparatory School campus is on the western side of the RSA. The closest Bellarmine school buildings are more than 350 feet from the existing railway line.[8] At San Jose Diridon Station, there are multifamily buildings along the entire west side of San Jose Diridon Station facing the existing tracks and platforms. Templo La Hermosa church is on the eastern side of the station, beyond the parking lots approximately 550 feet from the station.

South of San Jose Diridon Station, land uses in the noise RSA include transportation rights-of-way associated with I-280 and SR 87, residential neighborhoods, and some commercial/industrial areas. The San Jose Fire Department Bureau of Field Operations campus is located just south of San Jose Diridon Station on the east side of the RSA. Gardner Elementary School is located approximately 275 feet south of I-280 on the south side of the RSA.

Existing noise in this portion of the RSA is dominated by a number of daily rail operations that share the alignment (Table 4-8). This alignment is a heavily used rail corridor with 92 daily weekday Caltrain passenger trains currently operating between San Francisco and San Jose Diridon Station. Forty daily Caltrain trains operate through to Tamien Station. Approximately two to nine freight trains run along the route per day. Fourteen Capital Corridor and eight ACE trains run along the alignment daily between De La Cruz Boulevard and San Jose Diridon Station. ACE trains continue to travel south to Tamien Station to access the layover facility. Amtrak Coast Starlight trains pass through the section twice daily. Santa Clara VTA light rail trains run along the center of SR 87. Other noise sources include traffic on I-880, SR 87, I-280, local roads, as well as aircraft activities associated with Norman Y Mineta San Jose International Airport.

[8] Outdoor sports fields associated with Bellarmine are adjacent to the existing railway, but are not considered noise-sensitive uses by the FRA guidance manual (FRA 2012).

Ambient noise conditions were characterized at eleven locations: N76 to N84 and N139 and 140. The ambient L_{dn} in the San Jose Diridon Station Approach Subsection ranged from 61 dBA to 82 dBA, depending on the location.

Monterey Corridor Subsection

South of West Alma Avenue, the noise RSA extends along SR 87 until south of Almaden Expressway, where it turns east toward Monterey Road following the Union Pacific Railroad (UPRR) right-of-way. Land uses along the Monterey Corridor Subsection include primarily single-family residential neighborhoods and some commercial/industrial areas. Toward the southern end of the subsection, land uses include scattered single-family homes and farms.

The closest residence is approximately 30 feet from the existing railway line, near Skyway Drive, where backyards of single-family homes abut the right-of-way. An Elk's Lodge on West Alma Avenue is approximately 180 feet from SR 87 on the west side of the RSA. A recording studio is on the east side of the RSA, although it is approximately 350 feet from the existing railway and behind some intervening commercial buildings. The School of the Blues music school is on Monterey Road, approximately 190 feet from the existing railway line. Other institutional land uses include Edenvale Branch Library and four places of worship.

Sources of existing noise include traffic on SR 87, Monterey Road (near Capitol Caltrain Station), SR 85, and local roads, as well as the existing rail traffic. South of Tamien Station the daily rail traffic consists of six Caltrain passenger trains, two Amtrak passenger trains, and approximately four freight trains per day. VTA light rail trains also run along the center of SR 87.

Ambient noise conditions were characterized at 10 locations: N85 to N94. The ambient L_{dn} in the Monterey Corridor Subsection ranged from 61 dBA to 79 dBA, depending on the location.

Morgan Hill and Gilroy Subsection

In this subsection, the noise RSA diverges to follow the different horizontal alignments. It is best characterized by separate discussion of the portion of the RSA along Monterey Road through downtown Gilroy, the portion of the RSA adjacent to U.S. Highway (US) 101 through Morgan Hill, and the portion of the RSA through east Gilroy.

Along Monterey Road through Downtown Gilroy

The noise RSA extends along the single UPRR track from Bernal Way into downtown Gilroy. It continues past the Gilroy Caltrain Station, along UPRR south of downtown, and then turns east toward the Pacheco Pass Highway near Bloomfield Avenue. Land uses include farms with scattered single-family homes, and residential neighborhoods and commercial areas in Morgan Hill and San Martin. The closest residences to the existing railway line are a row of single-family homes approximately 40 feet away, where backyards abut the right-of-way, between Bernal Way and Metcalf Road. Three hotels are within 200 feet of the existing railway line. The closest school is approximately 145 feet from the existing railway line. The closest place of worship is approximately 150 feet from the existing railway line. In downtown Morgan Hill, the Morgan Hill Community Center outdoor amphitheater is approximately 500 feet from the existing railway line and the South Valley Civic Theatre and Community Playhouse is more than 600 feet from the railway line.

In the downtown Gilroy area, land uses include a mix of residential neighborhoods and commercial/industrial areas. South of downtown, land uses include farms with scattered single-family homes. The closest residential building to the existing railway line is approximately 50 feet from UPRR track on Monterey Road and Lewis Street. The closest school is Gilroy Preparatory School, which is approximately 145 feet from the existing railway line. Pintello Comedy Theater is approximately 365 feet from the existing railway line and the District Theater Live Music Venue is 50 feet from the railway line.

Sources of existing noise include traffic on Monterey Road and local roads, as well as the rail traffic along UPRR consisting of six Caltrain passenger trains, two Amtrak passenger trains, and approximately four freight trains per day. Caltrain trains stop at the existing Gilroy station, which is

a terminal station. Amtrak and freight trains continue to operate south of Gilroy. Farming and industrial activities south of Metcalf Road also contribute to existing noise levels, as do aircraft activities associated with South County Airport and Frazier Lake Airpark

Ambient noise conditions were characterized at 24 locations in the portion of the RSA along Monterey Road through downtown Gilroy: N95 to N101, N103, N104, N106, N108, N111, N113 to 115, N118, N120 to N122, N124 to N126, N129, and N130. The ambient L_{dn} along this portion of the Morgan Hill and Gilroy Subsection ranged from 56 dBA to 81 dBA, depending on the location.

Adjacent to US 101 through Morgan Hill

Land uses include farms with scattered single-family homes, and residential neighborhoods and commercial areas in Morgan Hill near El Camino Real/US 101.

For most of this noise RSA, the noise environment is dominated by US 101 and local street traffic. At connection points on both ends, some receptors are exposed to the rail traffic along UPRR (six Caltrain passenger trains, two Amtrak passenger trains, and approximately four freight trains per day). Farming activities south of Morgan Hill also contribute to existing noise levels.

Ambient noise conditions were characterized at six locations: N102, N105, N107, N109, N110, and N112. The ambient L_{dn} along this portion of the Morgan Hill and Gilroy Subsection ranged from 57 dBA to 70 dBA, depending on the location.

East Gilroy

Land uses include farms with scattered single-family homes. For most of this RSA, the noise environment is dominated by rural traffic. At the connection point, some receptors are exposed to the rail traffic along UPRR (six Caltrain passenger trains, two Amtrak passenger trains, and approximately four freight trains per day). Other noise sources include aircraft activities associated with Frazier Lake Airpark and farming activities.

Ambient noise conditions were characterized at six locations: N116, N117, N119, N123, N127, and N128. The ambient L_{dn} along this portion of the Morgan Hill and Gilroy Subsection ranged from 56 dBA to 82 dBA, depending on the location.

Pacheco Pass Subsection

Land uses in this subsection are quite different from the rest of the project extent. There are some sparsely scattered single-family homes, but much of the subsection is not inhabited. The RSA passes through two portions of the Cottonwood Creek Wildlife Area.

For most of this RSA, the noise environment is dominated by SR 152 and rural traffic. The majority of the alignment in this subsection is in a tunnel. Ambient noise conditions were characterized at two locations where the alignment is above grade: N131 and N132. The ambient L_{dn} along this subsection ranged from 58 dBA to 82 dBA, depending on the location.

San Joaquin Valley Subsection

The RSA passes Santa Nella Road/I-5 then follows Henry Miller Road to Carlucci Road. Land uses include farms with scattered single-family homes and one elementary school.

For most of the San Joaquin Valley Section, there are no existing rail noise sources and the noise environment is dominated by rural traffic. In Volta, a freight railroad line crosses the RSA. One single-family residence is within 200 feet of the freight railway line. Sources of existing noise include traffic along Henry Miller Road and other local roadways as well as farming activities.

Ambient noise conditions were characterized at six locations: N133 to N138. The ambient L_{dn} along this subsection ranged from 65 dBA to 79 dBA, depending on the location.

5.1.1.2 Noise Measurement and Modeling Discussion

To validate the existing noise model, the existing noise spreadsheet model results were calculated at the exact locations of the noise monitors. In some instances, the noise monitors were closer to existing noise sources such as roadways and rail lines than the noise-sensitive

buildings themselves. Once the existing noise model was validated for existing conditions by showing close agreement with the measurement results (as shown in Table 5-2), the existing noise model was then used to predict ambient noise levels at all sensitive receptors, typically building facades, in the project extent.

Table 5-2 shows the results of the comparison of the existing noise model and the measured noise levels at the measurement locations. The comparison indicates that the existing noise model is in close agreement with the field noise measurement data. The data were within 3 dB at all but one measurement location (N137). Site N137 was located along Henry Miller Road in the San Joaquin Valley Subsection. Four noise measurement sites were along Henry Miller Road. The existing noise model for receptors in that area incorporated the measurement results from all four sites. Some variation of measured noise levels along Henry Miller Road was due to daily fluctuations in traffic, as would be expected.

Table 5-2 Comparison of Existing Noise Model Results to Existing Measurement Results

Site	Measured Average L_{dn}[1] (dBA)	Modeled L_{dn} (dBA)	Difference[2]
San Jose Diridon Station Approach Subsection			
N76	63	62	(1)
N77	65	68	3
N78	64	65	1
N79	67	70	3
N80	68	69	1
N81	61	62	1
N82	63	62	(1)
N83	66	64	(2)
N84	77	74	(3)
N139	82	80	(2)
N140	71	71	0
Monterey Corridor Subsection			
N85	67	67	2
N86	61	58	(2)
N87	79	79	0
N88	67	68	1
N89	68	68	0
N90	77	75	(2)
N91	67	69	2
N92	67	67	0
N93	74	74	0
N94	73	72	(1)

Site	Measured Average L_{dn}[1] (dBA)	Modeled L_{dn} (dBA)	Difference[2]
Morgan Hill and Gilroy Subsection			
Along Monterey Road through Downtown Gilroy			
N95	59	61	2
N96	72	70	(2)
N97	60	58	(2)
N98	61	59	(1)
N99	61	61	0
N100	81	81	0
N101	73	72	(1)
N103	71	72	1
N104	68	70	2
N106	66	66	0
N108	68	67	1
N111	62	62	0
N113	69	71	2
N114	64	67	3
N115	67	69	2
N118	74	74	0
N120	56	59	3
N121	68	66	(2)
N122	60	59	(1)
N124	68	67	(1)
N125	58	61	3
N126	59	61	2
N129	71	71	0
N130	61	62	1
Along Monterey Road through Downtown Gilroy			
N102	69	69	0
N105	66	66	0
N107	69	71	2
N109	57	58	1
N110	70	70	0
N112	62	61	(1)

Site	Measured Average L_{dn}[1] (dBA)	Modeled L_{dn} (dBA)	Difference[2]
East Gilroy			
N116	56	57	0
N117	62	62	0
N119	68	67	(1)
N123	66	66	0
N127	67	64	(3)
N128	82	80	(2)
Pacheco Pass Subsection			
N131	58	59	1
N132	82	82	0
San Joaquin Valley Subsection			
N133	65	65	0
N134	74	74	0
N135	79	76	(3)
N136	73	74	1
N137	65	70	5
N138	67	65	(2)

(Parentheses) indicate negative values
dBA = A-weighted decibel
L_{dn} = day-night sound level
[1] The L_{dn} was calculated from the average hourly L_{eq} values collected over the entire measurement period.
[2] The difference is the measured level minus the modeled level at each location.

5.1.2 Noise Impact Assessment

Noise impacts were assessed according to the criteria described in Section 4.1.3 and the method, data, and assumptions described in Section 4.1.4, Methods for Establishing Existing Noise Levels, and Section 4.1.5, Prediction Methods.

5.1.2.1 Construction Noise Impacts

Temporary noise and vibration impacts would result from activities associated with the construction of new tracks and stations, utility relocation, grading, excavation, track work, demolition, and installation of systems components. Impacts may occur in residential areas and at other noise-sensitive land uses within several hundred feet of the alignment. The potential for noise impacts would be greatest near pavement breaking and close to any nighttime construction work. Construction noise varies with the process used, layout of the sites, and the type and condition of the equipment used. The noisiest pieces of equipment determine the maximum sound levels from construction activities.

The alternatives incorporate project features (IAMFs) to avoid or minimize potential effects from construction and operations. NV-IAMF#1: Noise and Vibration would require the contractor to prepare and submit to the Authority prior to construction a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts would be employed when work is conducted within 1,000 feet of sensitive

receptors. Typical construction practices in the FRA guidance manual (FRA 2012) for minimizing construction noise and vibration impacts include the following:

- Build noise barriers, such as temporary walls or piles on excavated material, between noisy activities and noise-sensitive resources.
- Route truck traffic away from residential streets where possible.
- Build walled enclosures around especially noisy activities or around clusters of noisy equipment.
- Combine noisy operations so they occur in the same period.
- Phase demolition, earthmoving, and ground-impacting operations so they do not occur in the same period.
- Avoid impact pile driving where possible in noise- and vibration-sensitive areas.

Application of the FRA and FTA guidelines would minimize temporary construction effects on sensitive receptors. However, there is still the potential for adverse effects from construction noise for sensitive receptors located close to construction activity.

Table 5-3 shows data on noise emissions of construction equipment. It includes average values of the L_{max} for various pieces of typical construction equipment at a distance of 50 feet. The data are from Table 10-1 of the FRA guidance manual.

Table 5-3 Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level at 50 feet from Source (dBA)
Auger drill rig[1]	85
Backhoe	80
Compactor	82
Concrete mixer	85
Crane, mobile	83
Dozer	85
Drill rig truck[1]	84
Drum mixer[1]	80
Excavator[1]	85
Man lift[1]	85
Generator	82
Grader	85
Loader	80
Pickup truck[1]	55
Pile driver (impact)	101
Pile driver (vibratory)	95
Pump	77
Roller	85
Scraper	85
Truck	84
Vacuum street sweeper[1]	80

Equipment	Typical Noise Level at 50 feet from Source (dBA)
Vacuum excavator (vac-truck)[1]	85
Helicopter at 200 feet altitude[2]	84-89[2] (overflight) 89[2] (hovering)

Sources: FRA 2012; FHWA 2006;
dBA = A-weighted decibel
[1] Reference level from FHWA Roadway Construction Noise Model (FHWA 2006).
[2] SEL based on expected noise emissions from construction helicopters (Wilson Ihrig 2009).

Predicting construction noise requires a construction scenario of the equipment that would likely be used and average utilization factors. Utilization factors represent the percentage of time the equipment would be expected to be operating during each phase. Analysts used the typical noise levels for various pieces of equipment to calculate the L_{eq} at various distances from a construction site. Additional noise level data and utilization factor data were obtained from the FHWA *Roadway Construction Noise Model* (FHWA 2006).

Analysts identified five typical types of construction activities that would be used for project construction for analysis. Table 5-4 shows the results of the analysis. For each typical planned construction activity, including the PG&E network upgrades construction, the expected noisiest pieces of equipment are listed. For this level of detail, analysts assumed that all pieces of equipment would be located at the center of the construction site. The projection for the PG&E upgrades includes noise generated by helicopter overflights and hovering at the network tower installation location. The total 8-hour L_{eq} was calculated by incorporating the typical maximum sound levels of each piece of equipment and the utilization factor. For each construction activity type, the projections were adjusted to calculate the distance at which the L_{eq} would reach the criteria shown in Table 5-4.

The criteria are based on land use, with the most stringent category being for residential locations. For typical track construction scenarios, the residential nighttime 8-hour L_{eq} criterion of 70 dBA would potentially be exceeded up to 374 feet from the clear and grub construction activity, and as far away as 774 feet from the concrete pour aerial structure activity. These distances would be applicable to all four project alternatives because the same construction scenarios would apply to all of the alternatives. Concrete pour aerial structure activity would not apply to Alternative 4 between San Jose and Gilroy.

For the PG&E upgrade construction scenarios, the residential nighttime 8-hour L_{eq} criterion of 70 dBA would be exceeded up to 158 feet from the haul material construction activity and as far away as 522 feet from the conductor installation construction activity. These distances would be applicable to all four project alternatives because the same construction scenarios apply to all four alternatives. The Skyway Drive Variants A and B result in no measurable differences in noise impacts on sensitive receptors associated with Alternative 2.

Table 5-4 Construction Activity Noise Levels

Construction Activity	Equipment Type	Total 8-Hour Leq (dBA) at 50 feet	Distance to 70 dBA[1] Residential Nighttime Criterion (feet)	Distance to 80 dBA[1] Residential Daytime Criterion (feet)	Distance to 85 dBA[1] Commercial Criterion (feet)	Distance to 90 dBA[1] Industrial Criterion (feet)
Track Construction						
Clear and grub	Dump truck, water truck, rubber tired dozer, loader, crane	87	374	118	66	37

Construction Activity	Equipment Type	Total 8-Hour Leq (dBA) at 50 feet	Distance to 70 dBA[1] Residential Nighttime Criterion (feet)	Distance to 80 dBA[1] Residential Daytime Criterion (feet)	Distance to 85 dBA[1] Commercial Criterion (feet)	Distance to 90 dBA[1] Industrial Criterion (feet)
Grading	Scraper, grader, crushing equipment, dump truck, rubber tired dozer, excavator, loader, water truck	90	515	163	92	51
Concrete pour aerial structure	Transit mix truck, crane, drill rig, dump truck, flatbed truck, loader, forklift, pump, water truck	94	774	245	138	77
Ballast compaction	Loader, crushing equipment, water truck, dump truck	89	425	134	76	42
Track installation	Crushing equipment, plate compactor, dump truck, grader, scraper, water truck	91	585	185	104	59
PG&E Network Upgrades Construction						
Site preparation	Backhoe, small bulldozer, truck with trailer, water truck, light-duty pickup truck, sweeper/scrubber, plate compactor, motor grader	87	362	114	64	36
Auger holes	Water truck, pickup truck, line truck with auger attachment	82	202	64	36	20
Haul material	Line truck with trailer	80	158	50	28	16
Tower installation	Crane, helicopter, vacuum trailer, rough terrain forklift, pump, bucket truck	90	483	153	86	48
Conductor installation	Line truck with reel, pickup trucks, line truck with bucket/crane, line truck with conductor puller, line truck with conductor tensioner, helicopter, cement and mortar mixer, dump truck	90	522	165	93	52

L_{eq} = equivalent sound level
dBA = A-weighted decibel
[1] Distances for this analysis assume that all pieces of equipment are located at the center of the construction site.

Table 5-5 shows key differences among the alternatives that would affect how construction noise affects the communities. Areas with embankments could include retaining structures, and embankment and at-grade could include vibratory compaction. The right-of-way blended areas might also require a greater amount of nighttime work to minimize service disruptions.

Table 5-5 Differences Among Alternatives

Subsection	Alt. 1	Alt. 2	Alt. 3	Alt. 4
San Joaquin Valley	Aerial/embankment			
Pacheco Pass	Mostly tunnel			
Morgan Hill and Gilroy	Aerial	Embankment/at grade	Far east aerial would avoid downtown Gilroy and Morgan Hill	At grade, right-of-way blended
Monterey Corridor	Aerial	Embankment	Aerial	At grade, right-of-way blended
San Jose Diridon Station Approach	Aerial/interchange touchdown at I-880	Aerial/interchange Touchdown at Scott	Same as Alt 2	At grade, right-of-way blended

I = Interstate

For the Morgan Hill and Gilroy Subsection, construction of the viaduct structure (Alternative 1 and 2) would have a larger criterion distance than the embankment and at-grade track options (Alternatives 2 and 4, respectively) because of height of the structure and the concrete pumps. For the Monterey Corridor Subsection and the San Jose Diridon Approach Subsection, the aerial viaduct (Alternatives 1 and 2) similarly would have a larger criterion distance than Alternatives 2 and 4. Nighttime construction could be required for Alternative 4 to minimize disruption of existing passenger rail services.

5.1.2.2 Operations Noise Impacts

This section describes the projected noise impacts related to HSR train operations, activities near the HSR stations, and conceptual operations at maintenance facility locations for the 2029 and 2040 conditions.[9]

As discussed in Section 4.1.3, the FRA noise impact criteria are based on a comparison of future projected noise levels to existing noise levels. Where the project alternatives would cause existing noise sources to change, such as by shifting an existing rail alignment, those changes become part of the projected noise levels.

Additionally, when a noise source in the RSA is known to be changing either with or without the project alternatives, that change in future noise is included in the future projections as well. The assumption for this project is that the Caltrain PCEP will happen regardless of the HSR project. Therefore, either with or without the project alternatives, the future noise levels in part of the RSA will change. To quantify the effect of the project alternatives, the future noise levels at all noise-sensitive receptors were calculated both with and without the project alternatives and compared to the existing levels.

This analysis evaluates the No Project Alternative and the project alternatives in 2029 and 2040. Under the 2029 and 2040 No Project conditions, changes in noise levels would be associated with the Caltrain PCEP and the increased operations of other adjacent passenger and freight

[9] A qualitative noise impact analysis of the Interim 2025 Plus Project condition (an initial operating section of HSR service between San Jose Diridon Station to the Central Valley prior to commencement of service on the entire Phase 1 system in 2029), was also evaluated. The Interim 2025 Plus Project condition would include significantly fewer daily HSR trains than the 2029 Plus Project condition, and as a result, associated operations noise impacts would be substantially less under the Interim 2025 Plus Project condition than the 2029 Plus Project condition. Therefore, this analysis does not further address the Interim 2025 Plus Project condition.

railroads. Because the Caltrain PCEP would upgrade the existing diesel locomotives with new, quieter EMU trains, which would reduce noise levels, it is anticipated that any noise impacts under the No Project conditions would be associated with increased operations of non-Caltrain passenger rail and freight rail service in the existing rail corridor. The 2029 and 2040 Plus Project condition evaluates changes in noise associated with implementation of the Caltrain PCEP and the HSR project. The 2029 and 2040 Plus Project cumulative conditions evaluates changes in noise levels associated with project operations, in addition to implementation of the Caltrain PCEP and increased operations of passenger and freight railroads in the corridor.

Table 5-6 shows the results of the 2029 No Project and 2029 Plus Project noise impact assessment. In all cases the noise impact is determined from the increase in noise over the existing condition. Alternative 1 would result in 47 severe impacts and 310 moderate impacts, Alternative 2 would result in 38 severe impacts and 599 moderate impacts,[10] Alternative 3 would result in 34 severe impacts and 227 moderate impacts, and Alternative 4 would result 190 severe impacts and 1,001 moderate impacts. Alternative 4 would have the most severe and moderate operations noise impacts, followed by Alternative 2, Alternative 1, and Alternative 3.

Noise impacts, before mitigation, associated with the DDV (which applies only to Alternative 4 in the San Jose Diridon Station Approach Subsection) and the TDV (which applies to all alternatives within the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections) are shown in parentheses in Table 5-6. In some cases, receptors that would not have moderate or severe noise impacts with the preliminary design would have moderate or severe impacts with the DDV and TDV. In some cases, receptors that would have moderate noise impacts with the preliminary design would have severe impacts with the DDV and TDV. With the DDV and TDV, Alternative 1 would result in 51 severe impacts and 313 moderate impacts, Alternative 2 would result in 43 severe impacts and 601 moderate impacts,[11] Alternative 3 would result in 37 severe impacts and 233 moderate impacts, and Alternative 4 would result 197 severe impacts and 1,004 moderate impacts.

The difference in operations noise impacts among the four alternatives is predominately a result of the vertical and horizontal profile of each alternative. The greatest difference among the alternatives would occur in the Morgan Hill and Gilroy Subsection. Many Alternative 4 noise impacts would be from the HSR train horns in the Project Section. Alternative 2 would have a longer embankment profile than Alternatives 1 and 3, which are both predominately on aerial structures. Although the aerial structures of Alternatives 1 and 3 would be much higher in the air (which can sometimes lead to higher sound levels because of less ground attenuation), the design of the aerial structures includes a 3-foot-high parapet wall that functions as a short noise barrier. This parapet wall would reduce the noise levels from the propulsion and wheel-rail subsources under Alternatives 1 and 3, resulting in fewer noise impacts compared to Alternative 2. The horizontal alignment near Gilroy further differentiates the noise and vibration impacts among the four project alternatives. Alternatives 1 and 2 would extend through downtown Gilroy, while Alternative 3 would extend east of Gilroy through rural agricultural lands that are sparsely populated and have fewer sensitive receptors.

[10] The Skyway Drive Variants A and B under Alternative 2 would result in no measurable differences in noise impacts on sensitive receptors.

[11] The Skyway Drive Variants A and B under Alternative 2 would result in no measurable differences in noise impacts on sensitive receptors.

Table 5-6 Summary of 2029 No Project and 2029 Plus Project Noise Impacts

Subsection	Land Use Category[1]	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Mod	Sev	Mod	Sev	Mod	Sev	Mod	Sev	Mod	Sev
San Jose Diridon Station Approach	2	0	0	1	3	11	0	11	0	84 (85)[2]	38
	1, 3	0	0	0	0	0	0	0	0	0	0
Monterey Corridor	2	0	0	61	4	25	4	61	4	252	17
	1, 3	0	0	0	0	0	0	0	0	0	0
Morgan Hill and Gilroy	2	0	0	158 (162)	14 (16)	473 (477)	8 (11)	66 (73)	4 (5)	574 (577)	109 (114)
	1, 3	0	0	1	0	1 (0)	0	0	0	2	0
Pacheco Pass	2	0	0	9 (10)	1	9 (10)	1	9 (10)	1	9 (10)	1
	1, 3	0	0	0	0	0	0	0	0	0	0
San Joaquin Valley	2	0	0	80 (78)	25 (27)	80 (78)	25 (27)	80 (78)	25 (27)	80 (78)	25 (27)
	1, 3	0	0	0	0	0	0	0	0	0	0
Total	2	**0**	**0**	**309 (312)**	**47 (51)**	**598 (601)**	**38 (43)**	**227 (233)**	**34 (37)**	**999 (1,002)**	**190 (197)**
	1, 3	**0**	**0**	**1**	**0**	**1 (0)**	**0**	**0**	**0**	**2**	**0**

Mod = Moderate
Sev = Severe
[1] FRA Land Use Categories are summarized in Table 4-3. Land Use Category 1 = areas where quiet is an essential element to the land use; Category 2 = Residential; Category 3 = Institutional use and passive-use parks.
[2] Impacts associated with the design variants are shown in parentheses. The DDV affects Alternative 4 within the San Jose Diridon Station Approach Subsection; the remaining noise impacts are associated with the TDV.

A cumulative noise impact assessment was also conducted for both the 2029 No Project and 2029 Plus Project conditions. In all cases the noise impact is determined from the increase in cumulative noise over the existing condition. The cumulative analysis assumes that the Caltrain PCEP will be implemented and that the increase in other passenger and freight operations in 2029 (shown in Table 4-9) would occur. Table 5-7 shows the 2029 No Project and Plus Project cumulative noise impact assessment results. The results indicate that under the 2029 No Project cumulative condition there would be 9 severe noise impacts and 841 moderate noise impacts caused by increases in other, non-HSR train operations. Under the 2029 Plus Project cumulative condition there would be 71 severe noise impacts and 1,620 moderate impacts under Alternative 1; 200 severe impacts and 1,426 moderate impacts under Alternative 2; 48 severe impacts and 1,306 moderate impacts under Alternative 3; and 475 severe noise impacts and 1,500 moderate impacts under Alternative 4. Future 2027 CNEL airport noise contours for San Jose International Airport (2010) have also been used to evaluate the cumulative condition.

Noise impacts associated with the DDV and TDV are shown in parentheses in Table 5-7. Under the 2029 Plus Project cumulative condition with the DDV and TDV, there would be 75 sensitive receptors that would experience severe impacts and 1,623 sensitive receptors that would experience moderate impacts under Alternative 1; 205 severe impacts and 1,427 moderate impacts under Alternative 2; 51 severe impacts and 1,312 moderate impacts under Alternative 3; and 501 severe impacts and 1,496 moderate impacts under Alternative 4.

Table 5-7 Summary of 2029 No Project and Plus Project Cumulative Noise Impacts

Subsection	Land Use Category[1]	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Mod	Sev	Mod	Sev	Mod	Sev	Mod	Sev	Mod	Sev
San Jose Diridon Station Approach	2	191	1	193	11	228	1	228	1	152 (143)[2]	50 (70)
	1, 3	5	0	1	0	1	0	1	0	3 (5)	0
Monterey Corridor	2	279	4	388	16	214	12	388	16	397	83
	1, 3	0	0	1	0	1	0	1	0	0	0
Morgan Hill and Gilroy	2	365	4	947 (951)	17 (19)	890 (893)	161 (164)	598 (605)	5 (6)	857 (861)	315 (319)
	1, 3	1	0	1	1	3 (2)	0	1	0	2	1
Pacheco Pass	2	0	0	9 (10)	1	9 (10)	1	9 (10)	1	9 (10)	1
	1, 3	0	0	0	0	0	0	0	0	0	0
San Joaquin Valley	2	0	0	80 (78)	25 (27)	80 (78)	25 (27)	80 (78)	25 (27)	80 (78)	25 (27)
	1, 3	0	0	0	0	0	0	0	0	0	0
Total	**2**	**835**	**9**	**1,617 (1,620)**	**70 (74)**	**1,421 (1,423)**	**200 (205)**	**1,303 (1,309)**	**48 (51)**	**1,495 (1,489)**	**474 (500)**
	1, 3	**6**	**0**	**3**	**1**	**5 (4)**	**0**	**3**	**0**	**5 (7)**	**1**

Mod = Moderate
Sev = Severe
[1] FRA Land Use Categories are summarized in Table 4-3. Land Use Category 1 = areas where quiet is an essential element to the land use; Category 2 = Residential; Category 3 = Institutional use and passive-use parks.
[2] Impacts associated with the design variants are shown in parentheses. The DDV affects Alternative 4 within the San Jose Diridon Station Approach Subsection; the remaining noise impacts are associated with the TDV.

Table 5-8 shows the results of the 2040 No Project and 2040 Plus Project condition noise impact assessment. In all cases the noise impact is determined from the increase in noise over the existing condition. Alternative 1 would result in 337 severe impacts and 1,200 moderate impacts; Alternative 2 would result in 755 severe impacts and 1,844 moderate impacts; Alternative 3 would result in 222 severe impacts and 834 moderate impacts; and Alternative 4 would result in 1,212 severe impacts and 1,666 moderate impacts. The results of the 2040 Plus Project noise impact assessment indicate more noise impacts than the 2029 Plus Project noise impact assessment results due to significantly more HSR train operations in 2040. Many Alternative 4 noise impacts would result from the HSR train horns in the Project Section. The existing noise from non-project elements was unchanged, such as the airports and local roads.

Noise impacts associated with the DDV and TDV are shown in parentheses in Table 5-8. Under the 2040 Plus Project condition with the DDV and TDV, there would be 347 sensitive receptors that would experience severe impacts and 1,195 sensitive receptors that would experience moderate impacts under Alternative 1; 766 severe impacts and 1,838 moderate impacts under Alternative 2; 233 severe impacts and 845 moderate impacts under Alternative 3; and 1,224 severe impacts and 1,658 moderate impacts under Alternative 4.

Table 5-8 Summary of 2040 No Project and 2040 Plus Project Noise Impacts

Subsection	Land Use Category[1]	No Project		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Mod	Mod	Mod	Sev	Mod	Sev	Mod	Sev	Mod	Sev
San Jose Diridon Station Approach	2	0	0	117	20	73	0	73	0	218	136
	1, 3	0	0	1	0	0	0	0	0	3	0
Monterey Corridor	2	0	0	225	46	326	46	225	46	264	293
	1, 3	0	0	1	0	1	0	1	0	3	0
Morgan Hill and Gilroy	2	0	0	815 (812)[2]	160 (167)	1,399 (1,395)	598 (606)	498 (511)	65 (73)	1,133 (1,127)	671 (680)
	1, 3	0	0	4	0	8	0	0	0	8	1
Pacheco Pass	2	0	0	4	10 (11)	4	10 (11)	4	10 (11)	4	10 (11)
	1, 3	0	0	0	0	0	0	0	0	0	0
San Joaquin Valley	2	0	0	32 (30)	101 (103)	32 (30)	101 (103)	32 (30)	101 (103)	32 (30)	101 (103)
	1, 3	0	0	1	0	1	0	1	0	1	0
Total	**2**	**0**	**0**	**1,193 (1,188)**	**337 (347)**	**1,834 (1,828)**	**755 (766)**	**832 (843)**	**222 (233)**	**1,651 (1,643)**	**1,211 (1,223)**
	1, 3	**0**	**0**	**7**	**0**	**10**	**0**	**2**	**0**	**15**	**1**

Mod = Moderate
Sev = Severe
[1] FRA Land Use Categories are summarized in Table 4-3. Land Use Category 1 = areas where quiet is an essential element to the land use; Category 2 = Residential; Category 3 = Institutional use and passive-use parks.
[2] Impacts associated with the design variants are shown in parentheses. The DDV affects Alternative 4 within the San Jose Diridon Station Approach Subsection; the remaining noise impacts are associated with the TDV.

The 2040 Plus Project noise impact locations for each project alternative are illustrated on Figures 5-6 through 5-25. For the San Jose Diridon Station Approach, Monterey Corridor, and Morgan Hill and Gilroy Subsections, the noise impact locations for Alternative 1 with and without the DDV and TDV are illustrated on Figures 5-6 through 5-9. For the Pacheco Pass and San Joaquin Valley Subsections with and without the DDV and TDV, the noise impact locations are the same for the four project alternatives and are illustrated on Figures 5-10 through 5-13. Noise impact locations for Alternative 2 with and without the DDV and TDV in the San Jose Diridon Station Approach, Monterey Corridor, and Morgan Hill and Gilroy Subsections are illustrated on Figures 5-14 through 5-17; noise impact locations for Alternative 3 with and without the DDV and TDV are illustrated on Figures 5-18 through 5-21; and noise impact locations for Alternative 4 with and without the DDV and TDV are illustrated on Figures 5-22 through 5-25. Each red dot indicates a cluster of receptors predicted to have severe impacts and each yellow dot indicates a cluster of receptors predicted to have moderate impacts for the 2040 Plus Project condition.

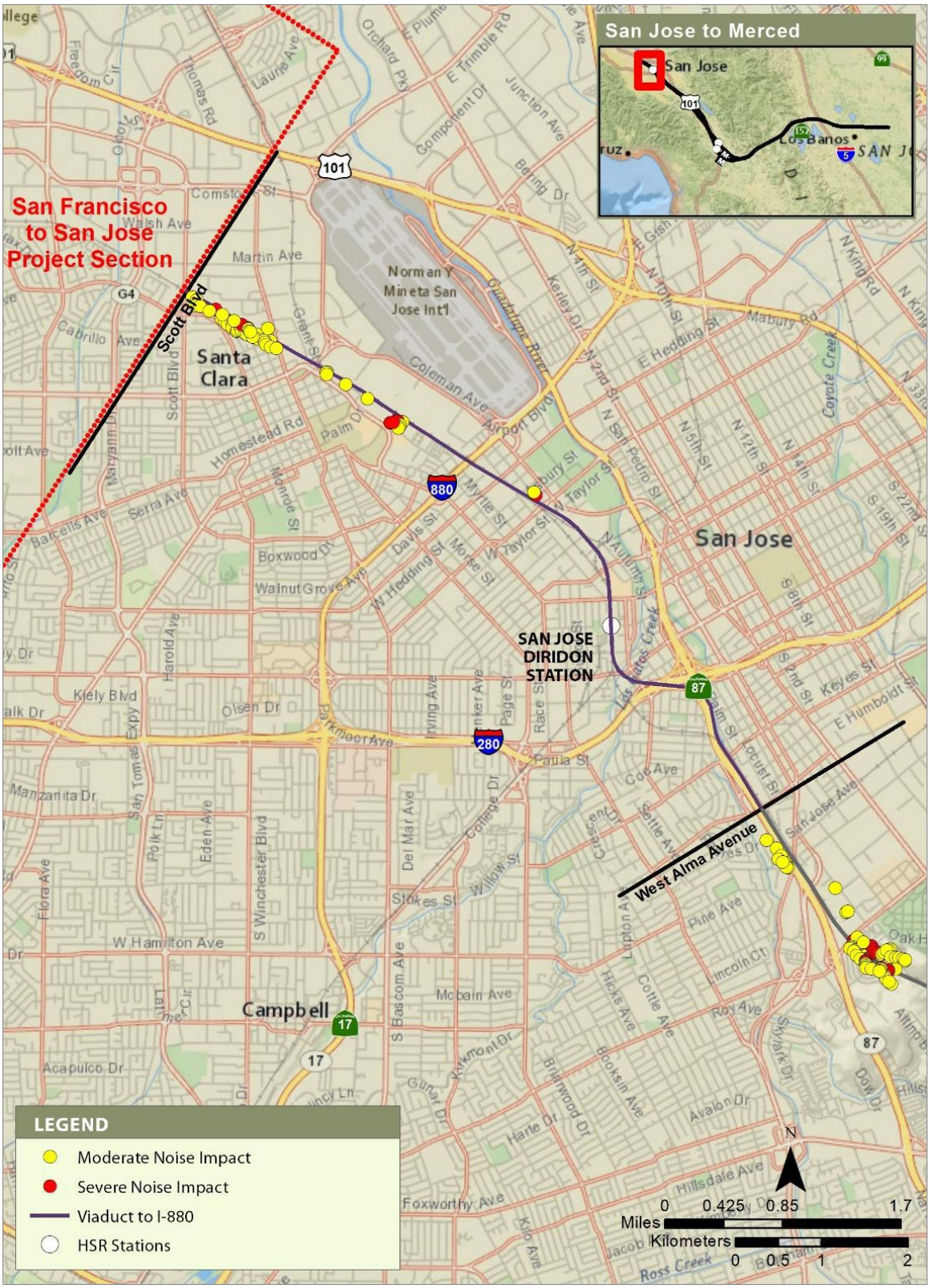

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Figure 5-6 2040 Plus Project Noise Impacts—Alternative 1

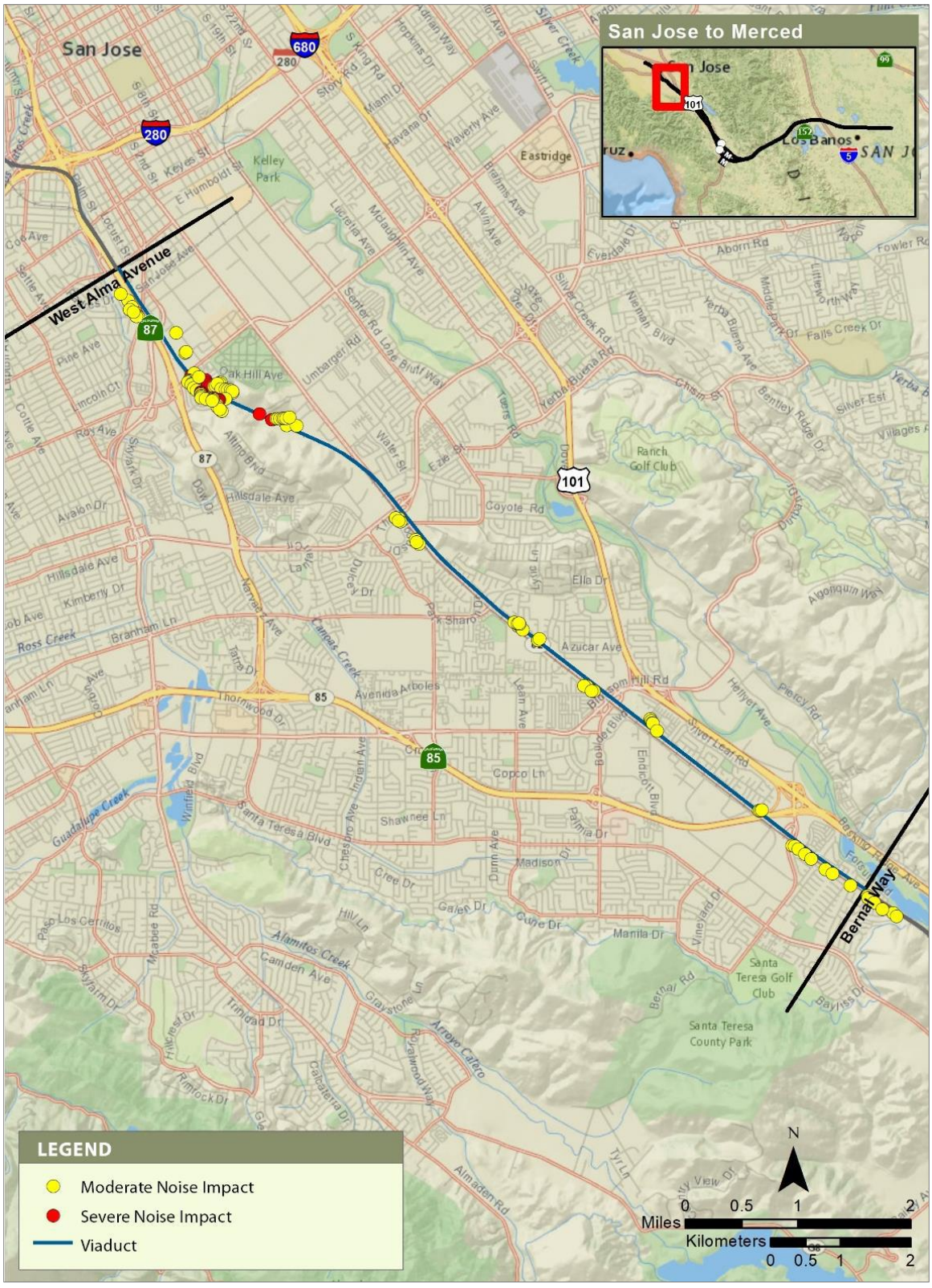

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Figure 5-7 2040 Plus Project Noise Impacts—Alternative 1

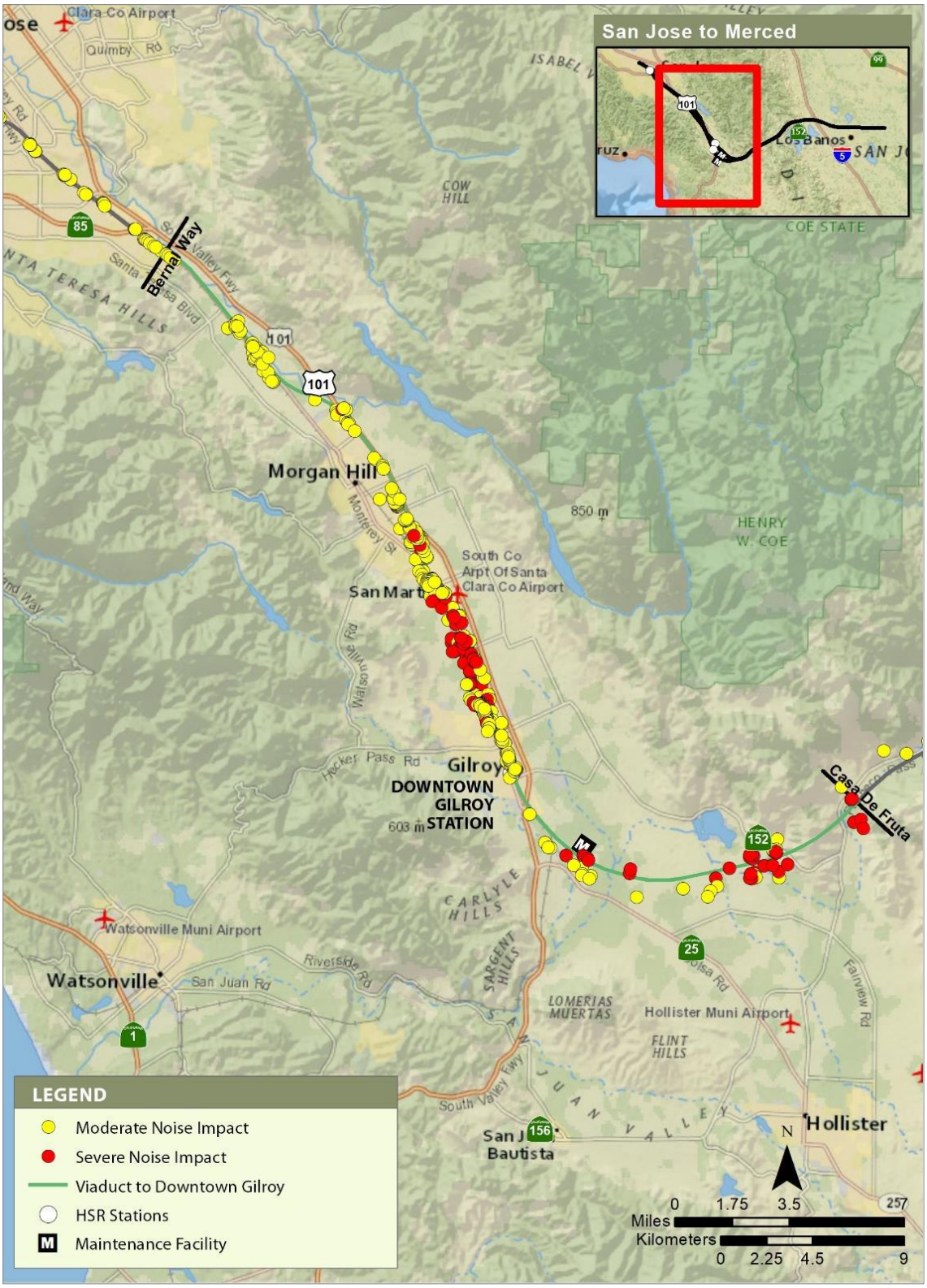

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Figure 5-8 2040 Plus Project Noise Impacts—Alternative 1 without the Tunnel Design Variant

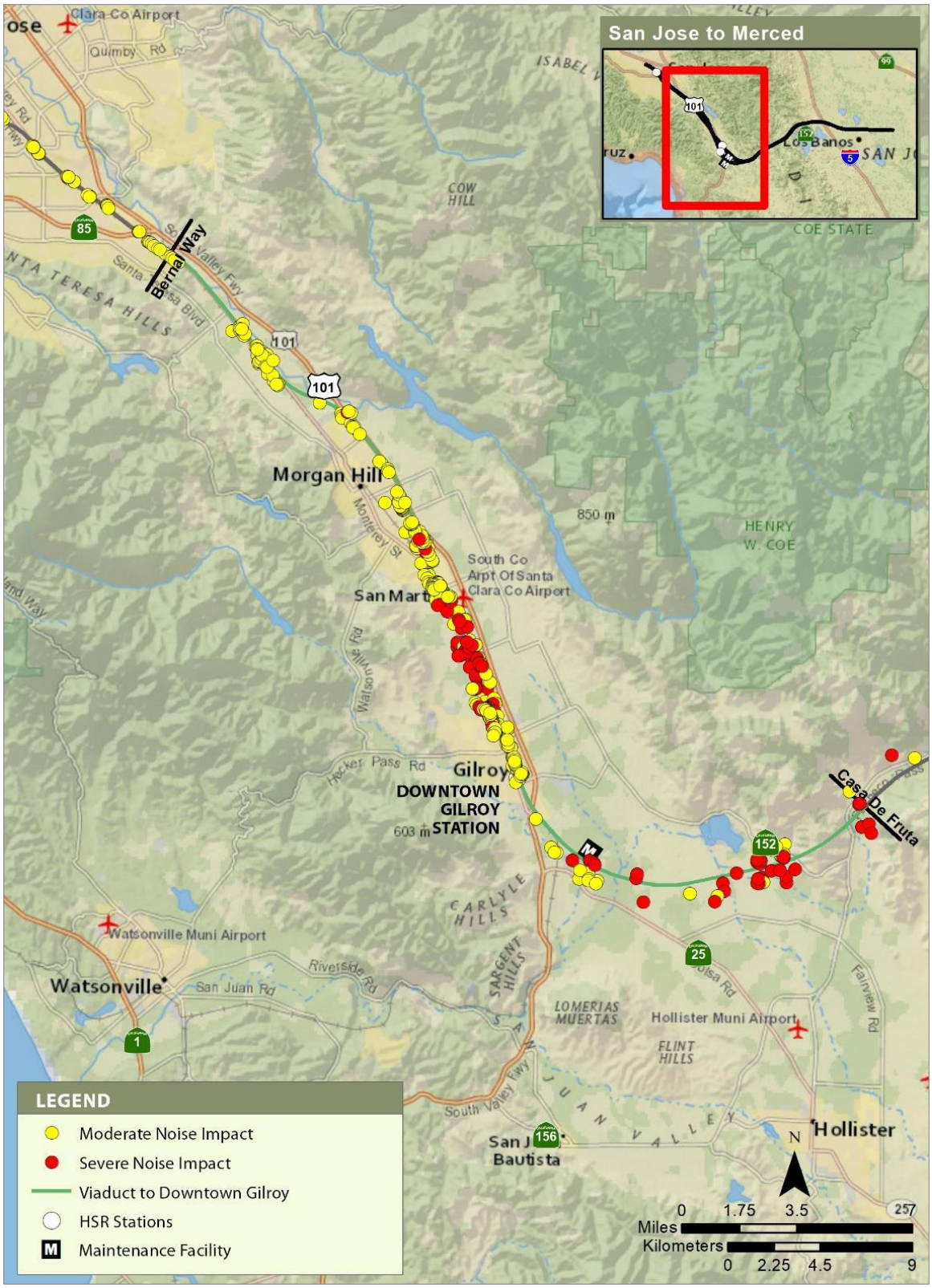

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Figure 5-9 2040 Plus Project Noise Impacts—Alternative 1 with the Tunnel Design Variant

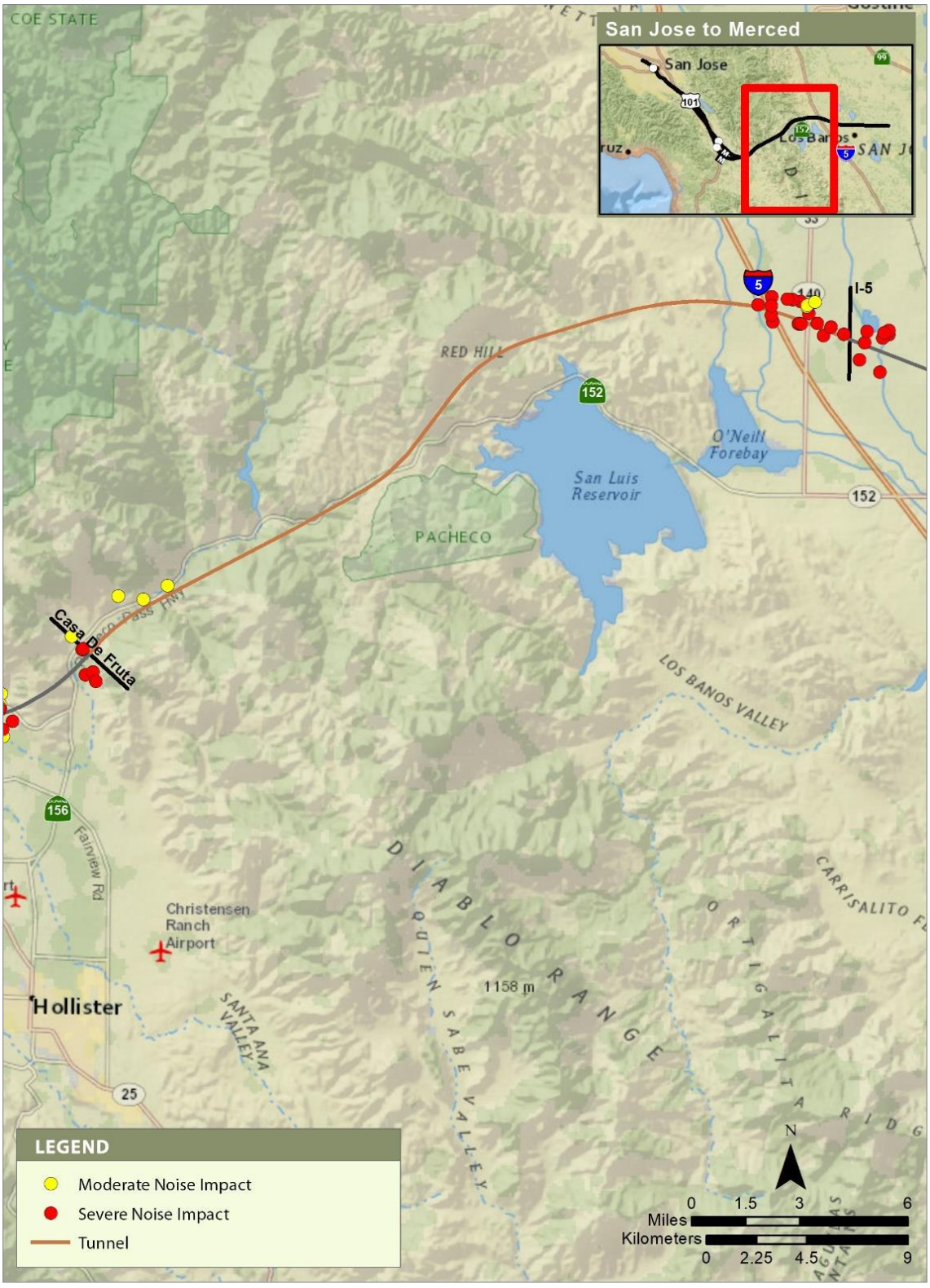

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Figure 5-10 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 without the Tunnel Design Variant

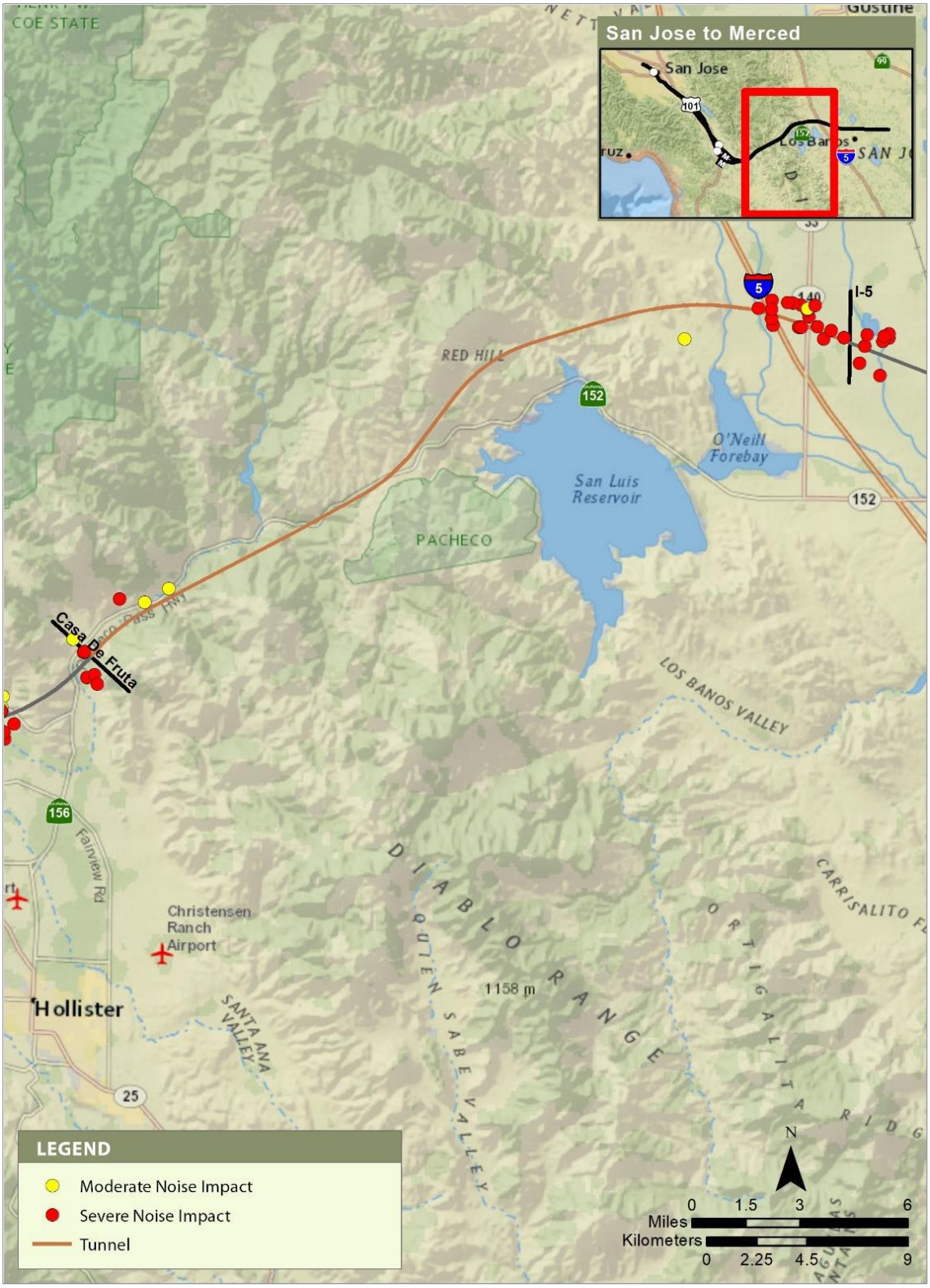

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Figure 5-11 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 with the Tunnel Design Variant

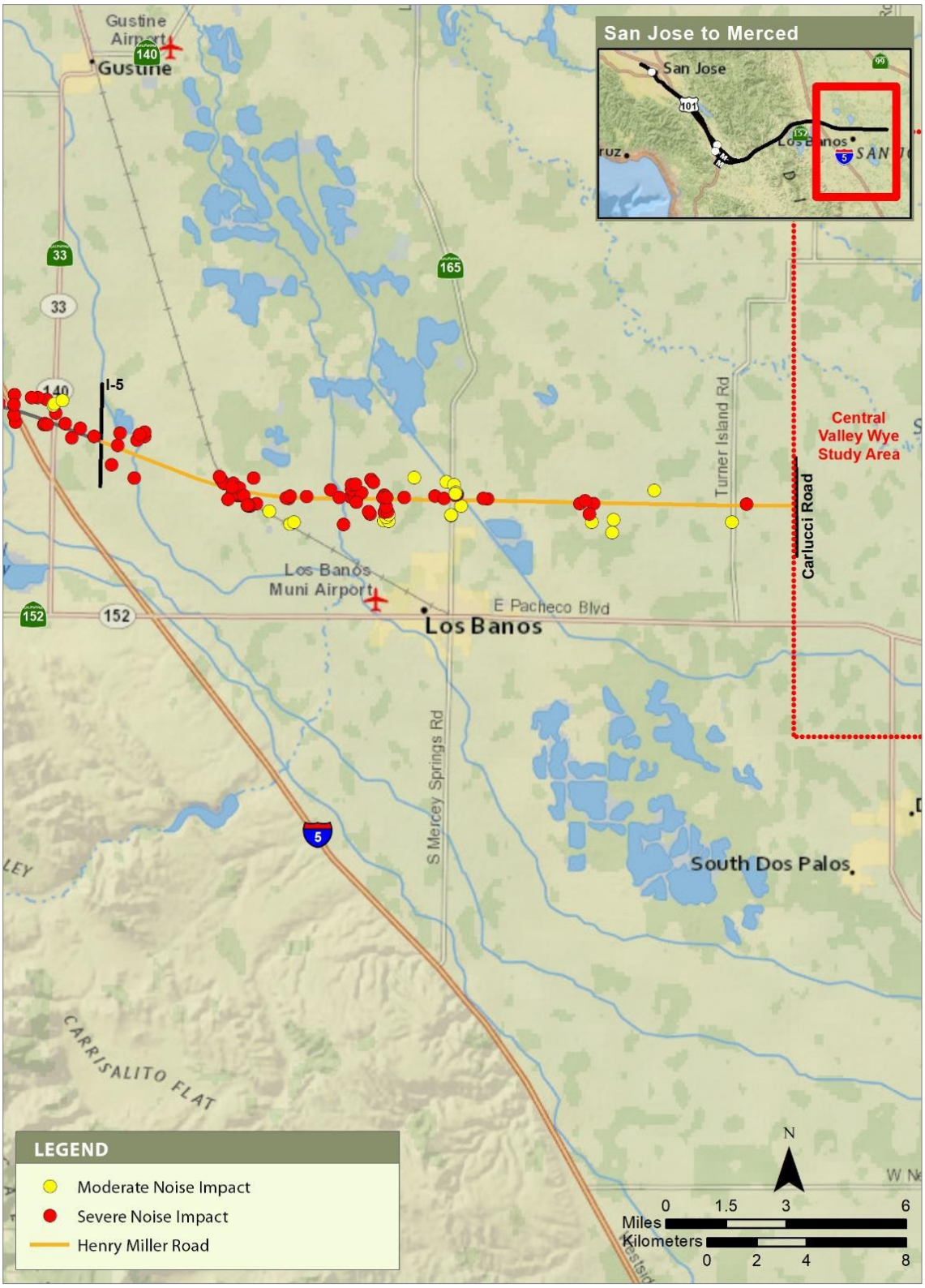

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Figure 5-12 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 without the Tunnel Design Variant

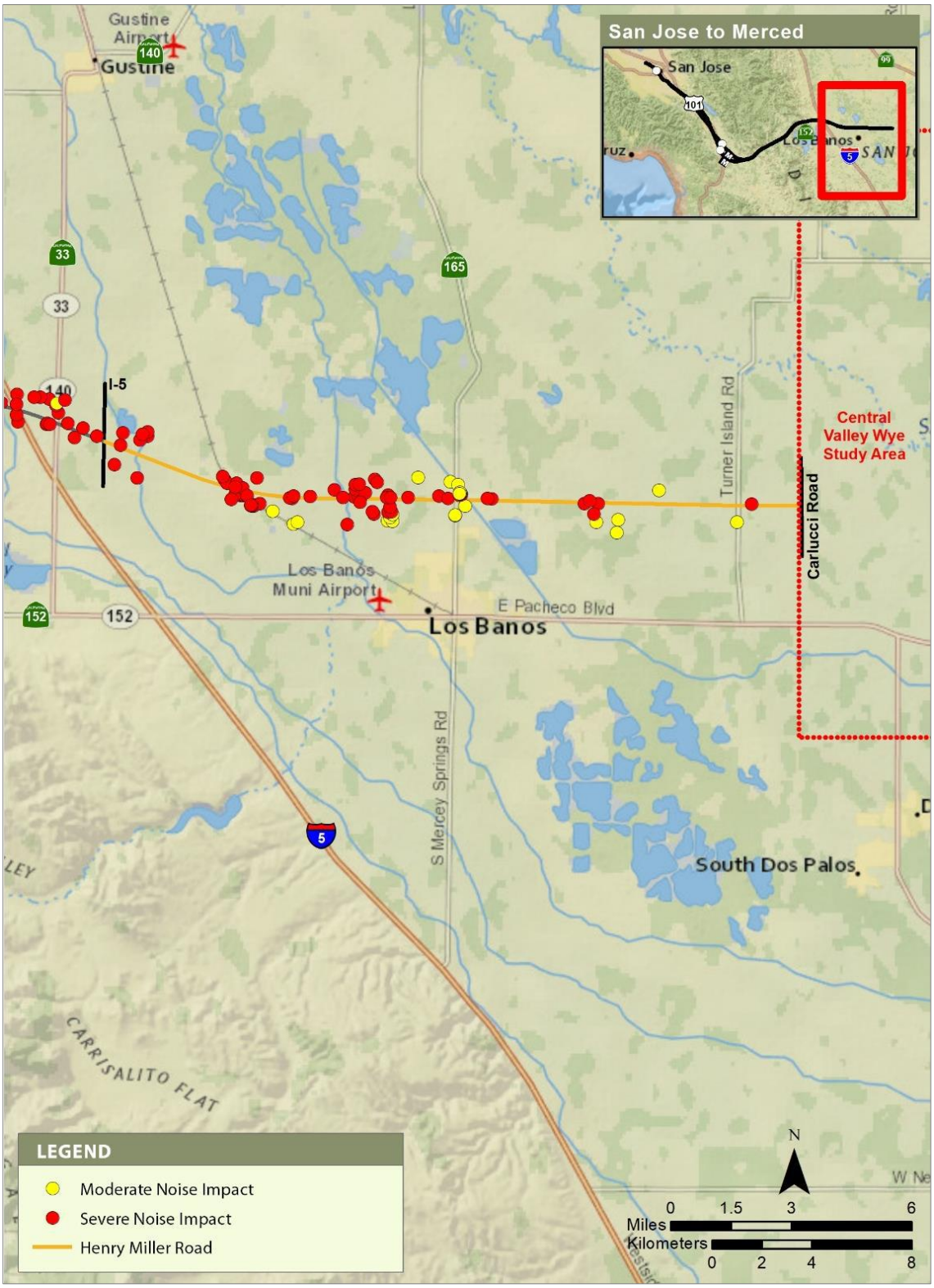

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Figure 5-13 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 with the Tunnel Design Variant

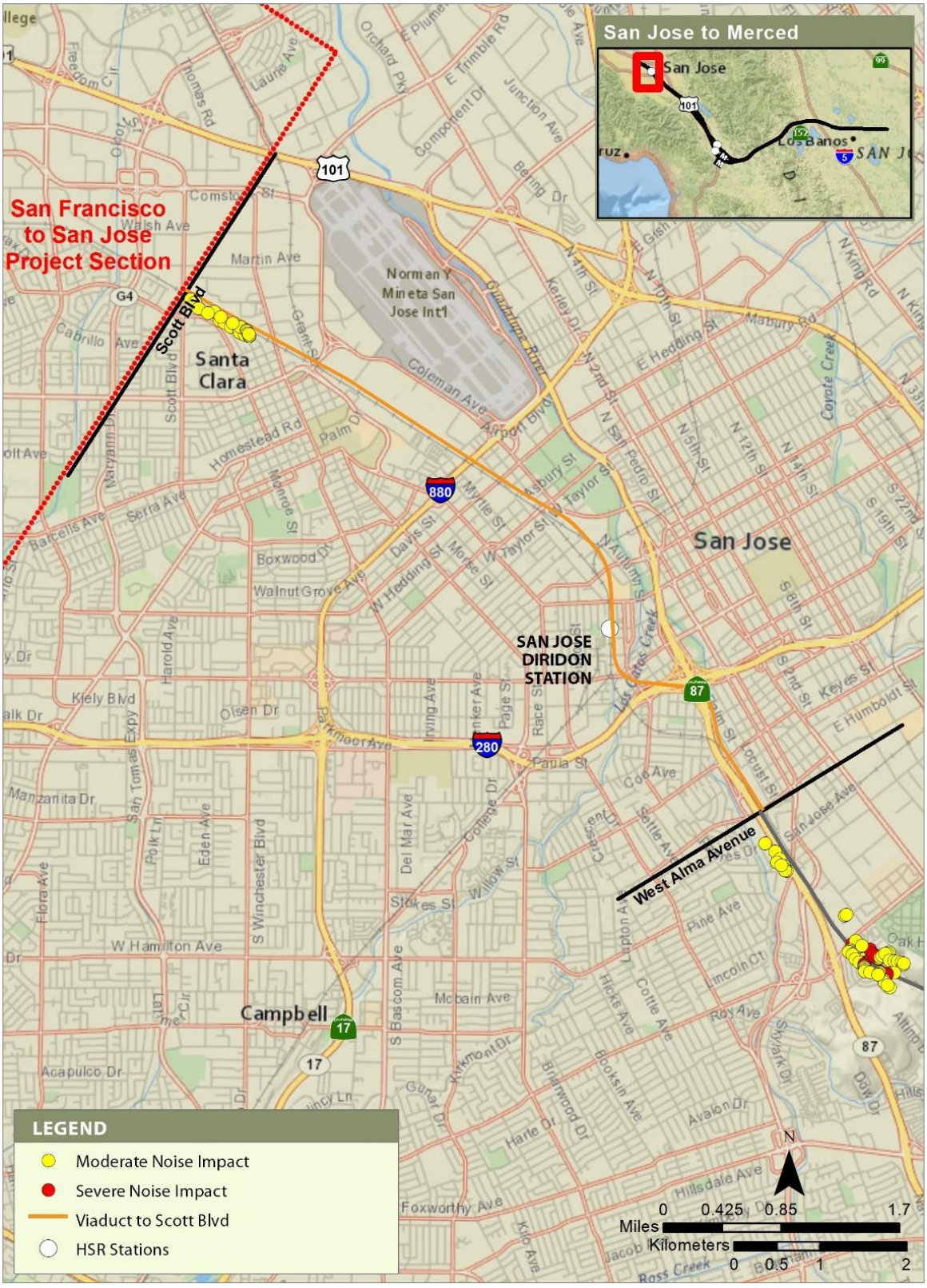

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Figure 5-14 2040 Plus Project Noise Impacts—Alternative 2

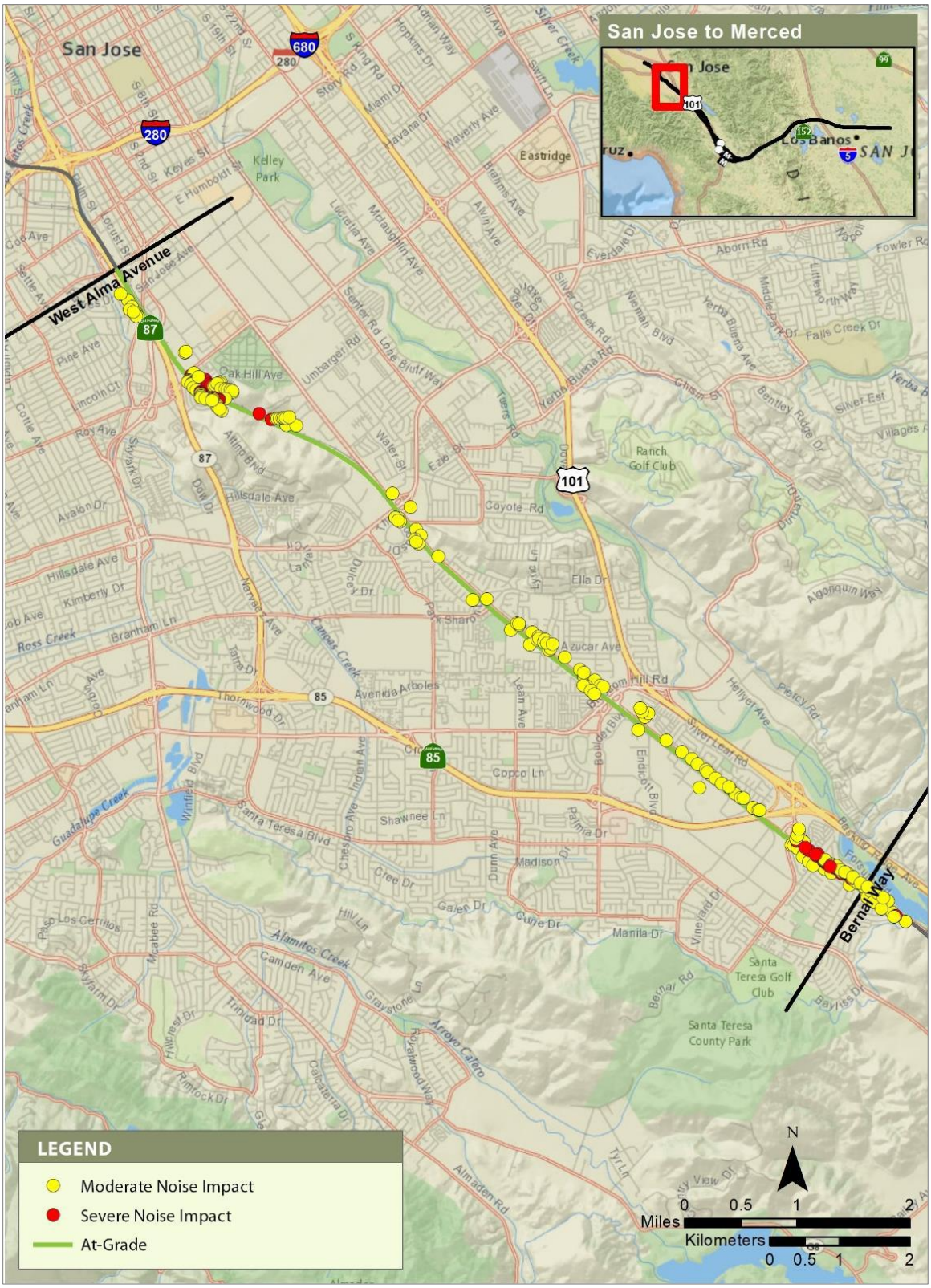

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Figure 5-15 2040 Plus Project Noise Impacts—Alternative 2

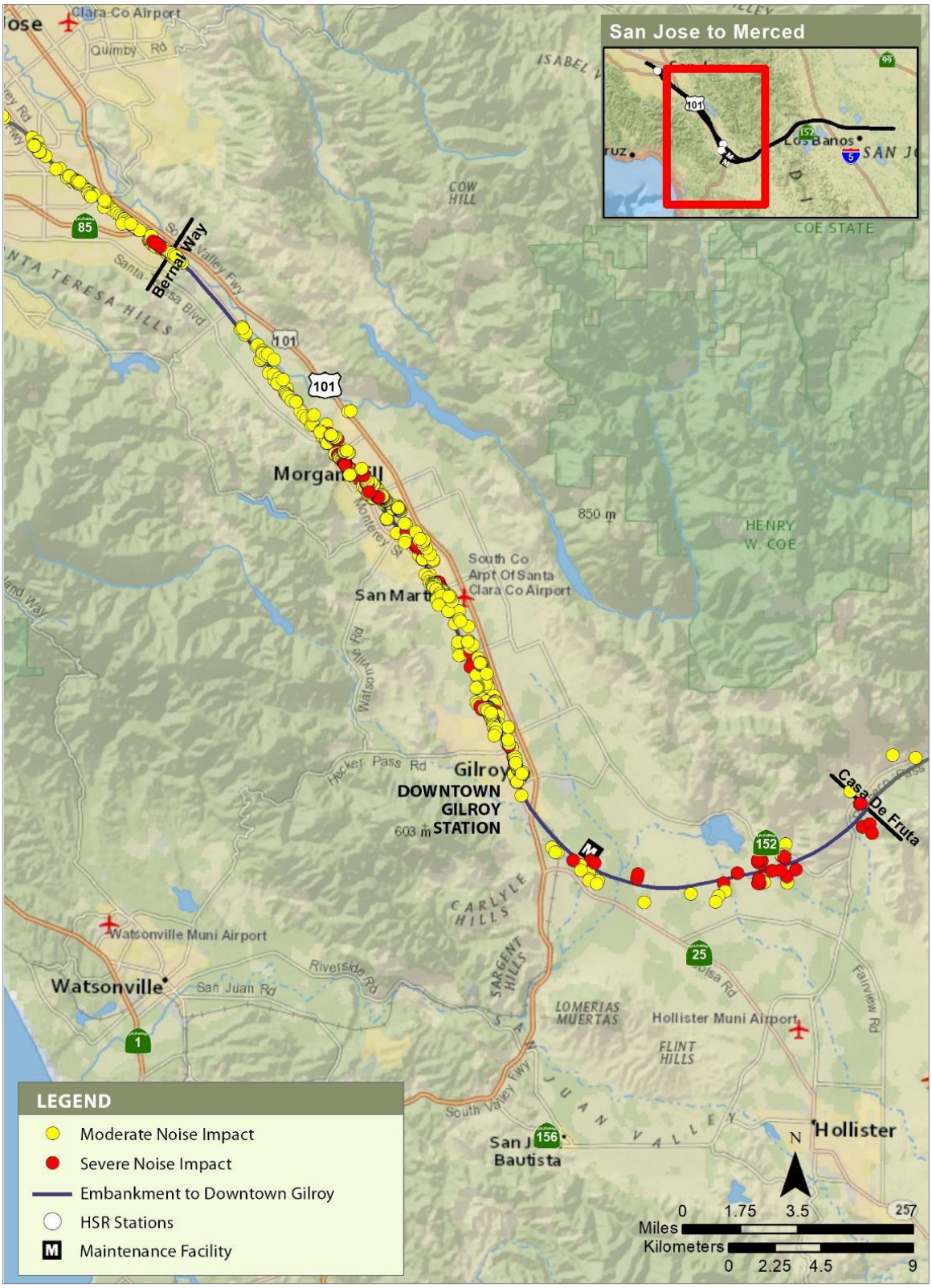

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Figure 5-16 2040 Plus Project Noise Impacts—Alternative 2 without the Tunnel Design Variant

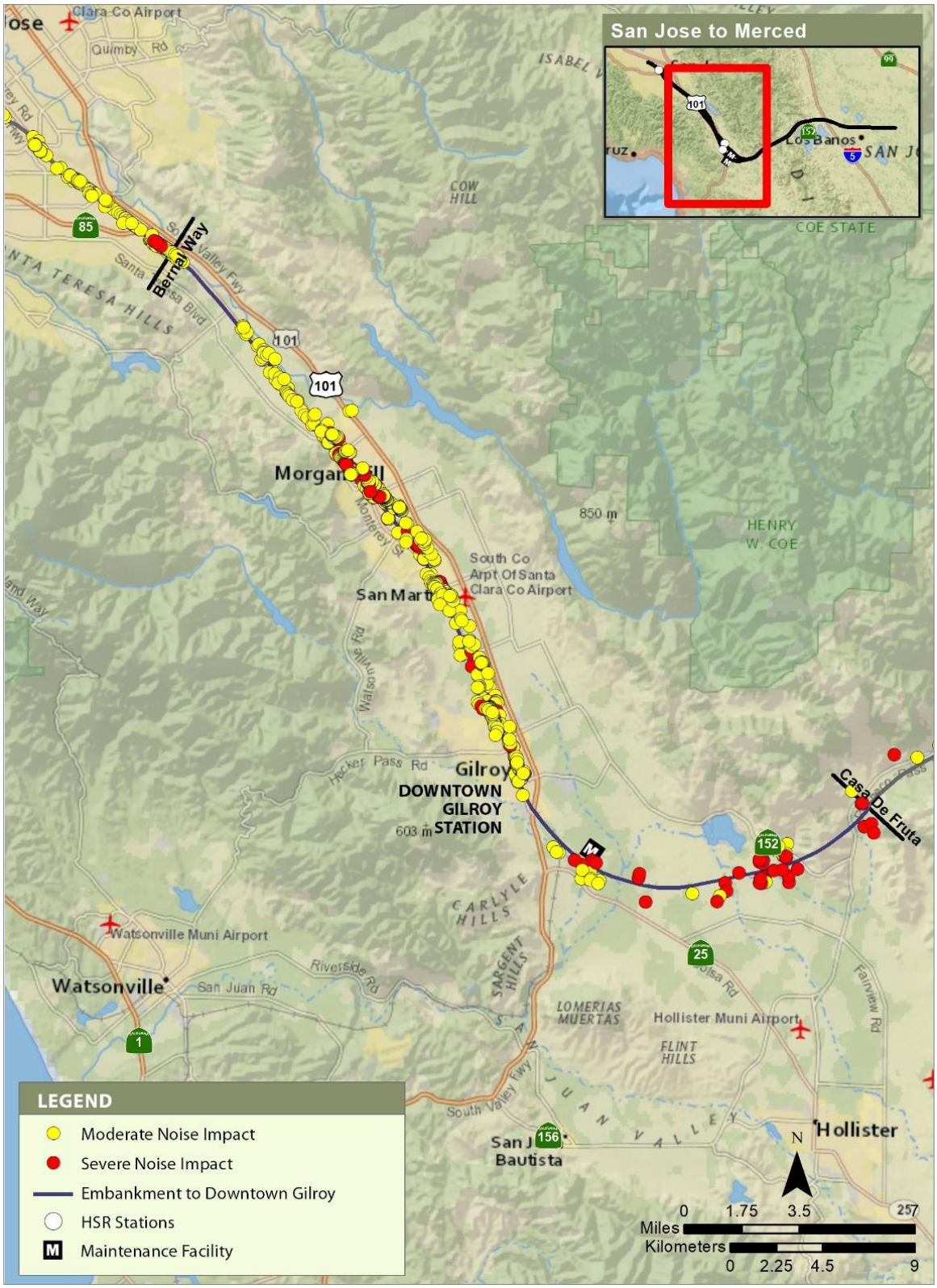

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Figure 5-17 2040 Plus Project Noise Impacts—Alternative 2 with the Tunnel Design Variant

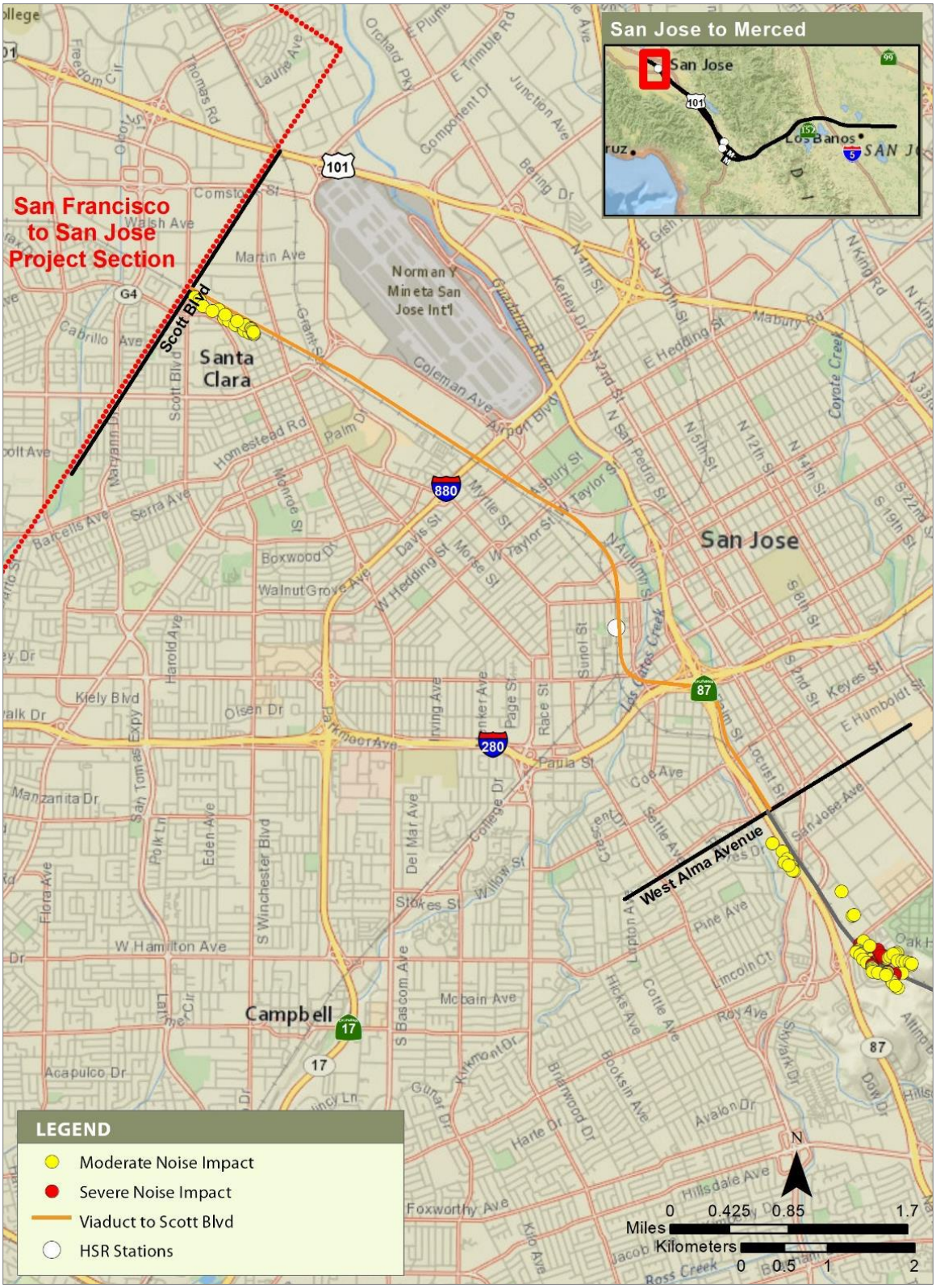

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Figure 5-18 2040 Plus Project Noise Impacts—Alternative 3

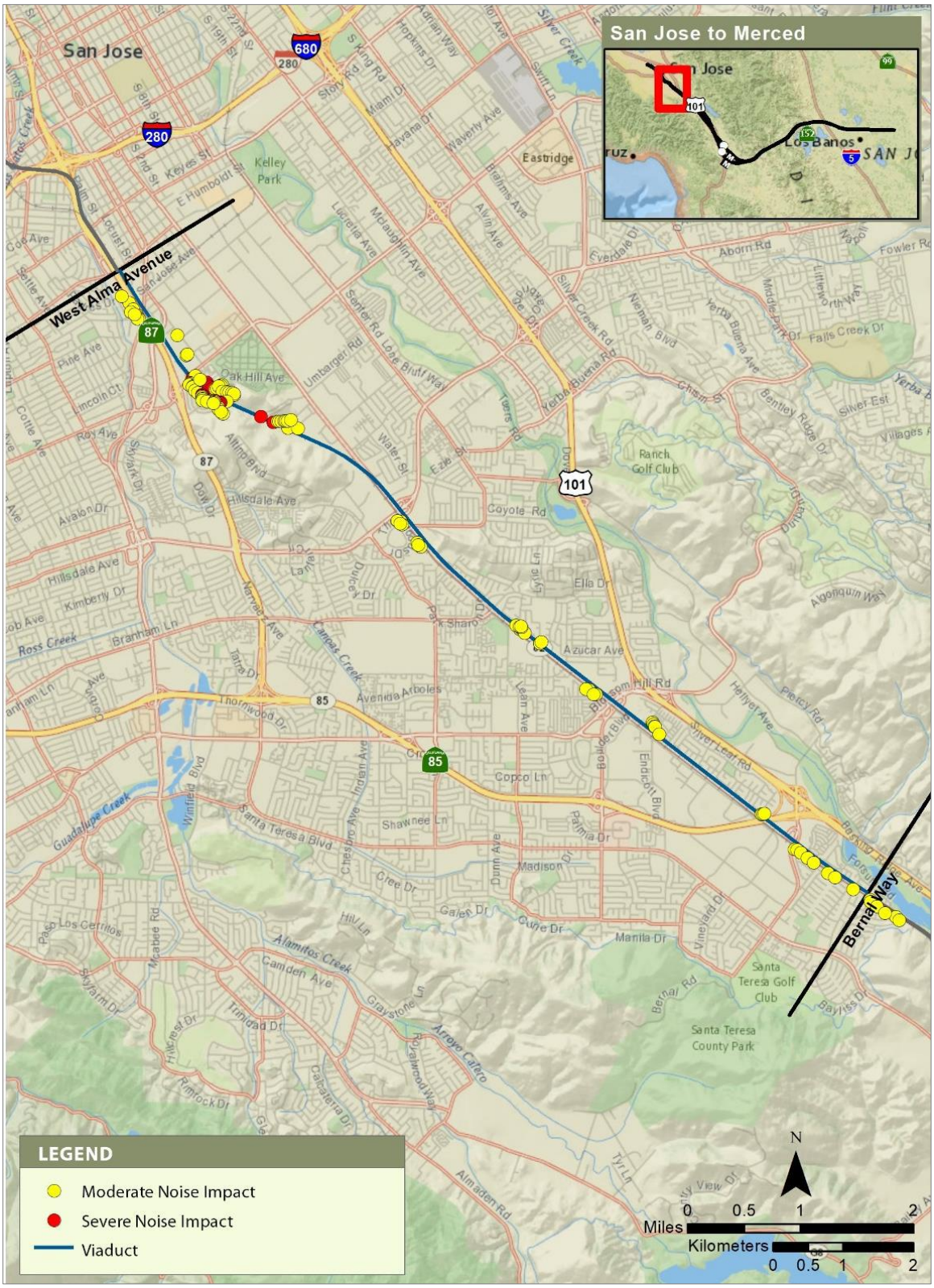

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Figure 5-19 2040 Plus Project Noise Impacts—Alternative 3

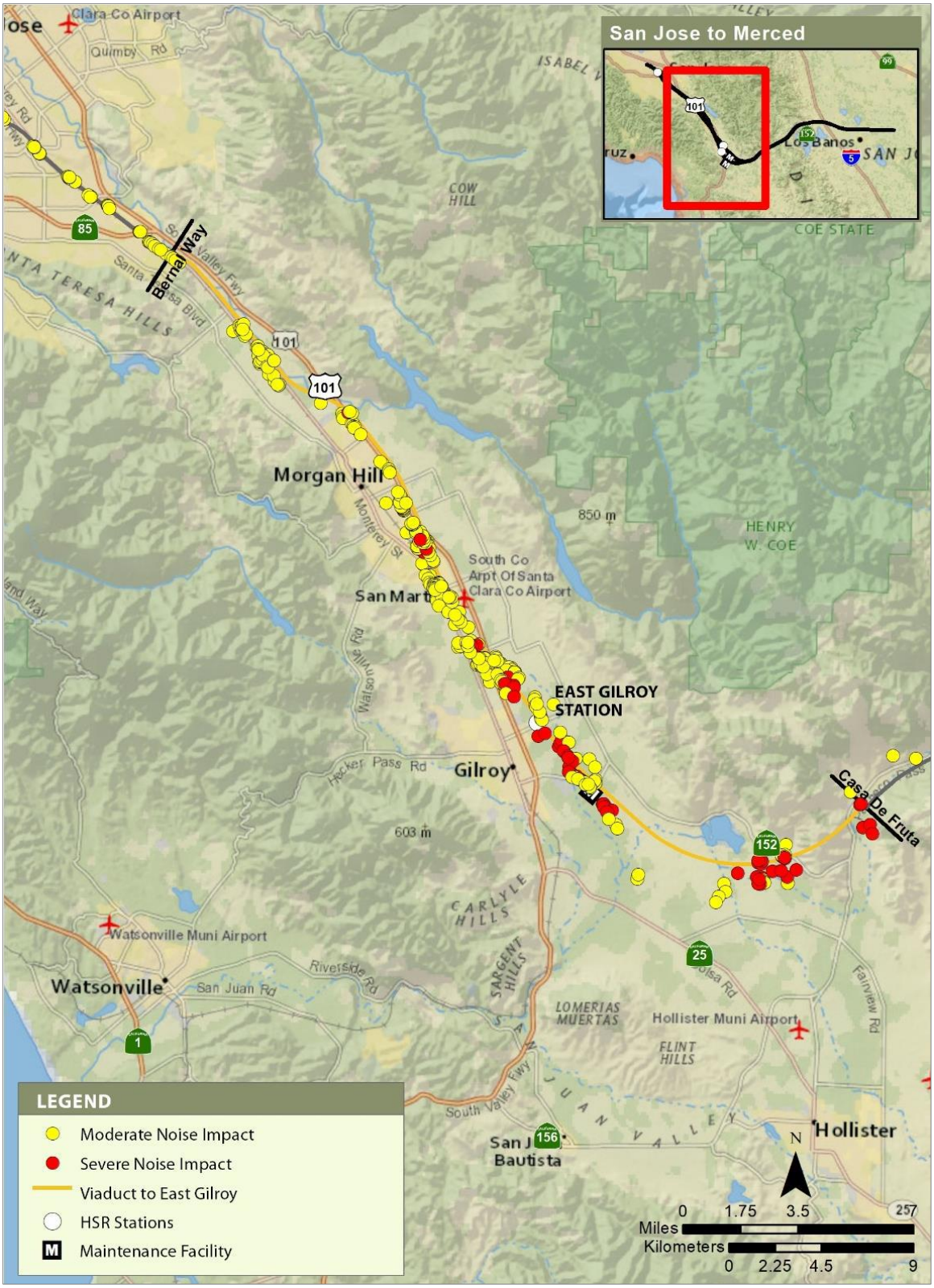

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Figure 5-20 2040 Plus Project Noise Impacts—Alternative 3 without the Tunnel Design Variant

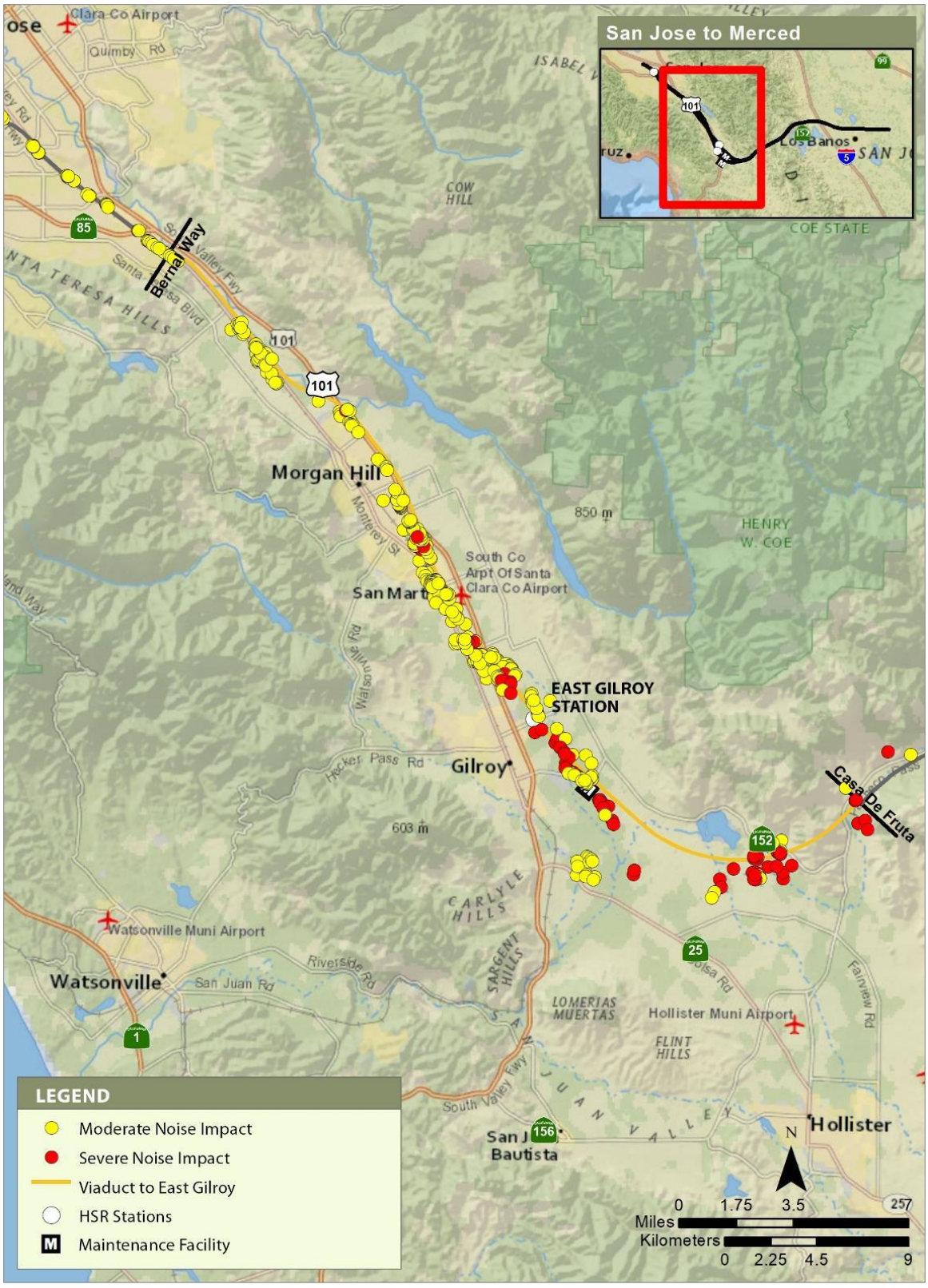

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Figure 5-21 2040 Plus Project Noise Impacts—Alternative 3 with the Tunnel Design Variant

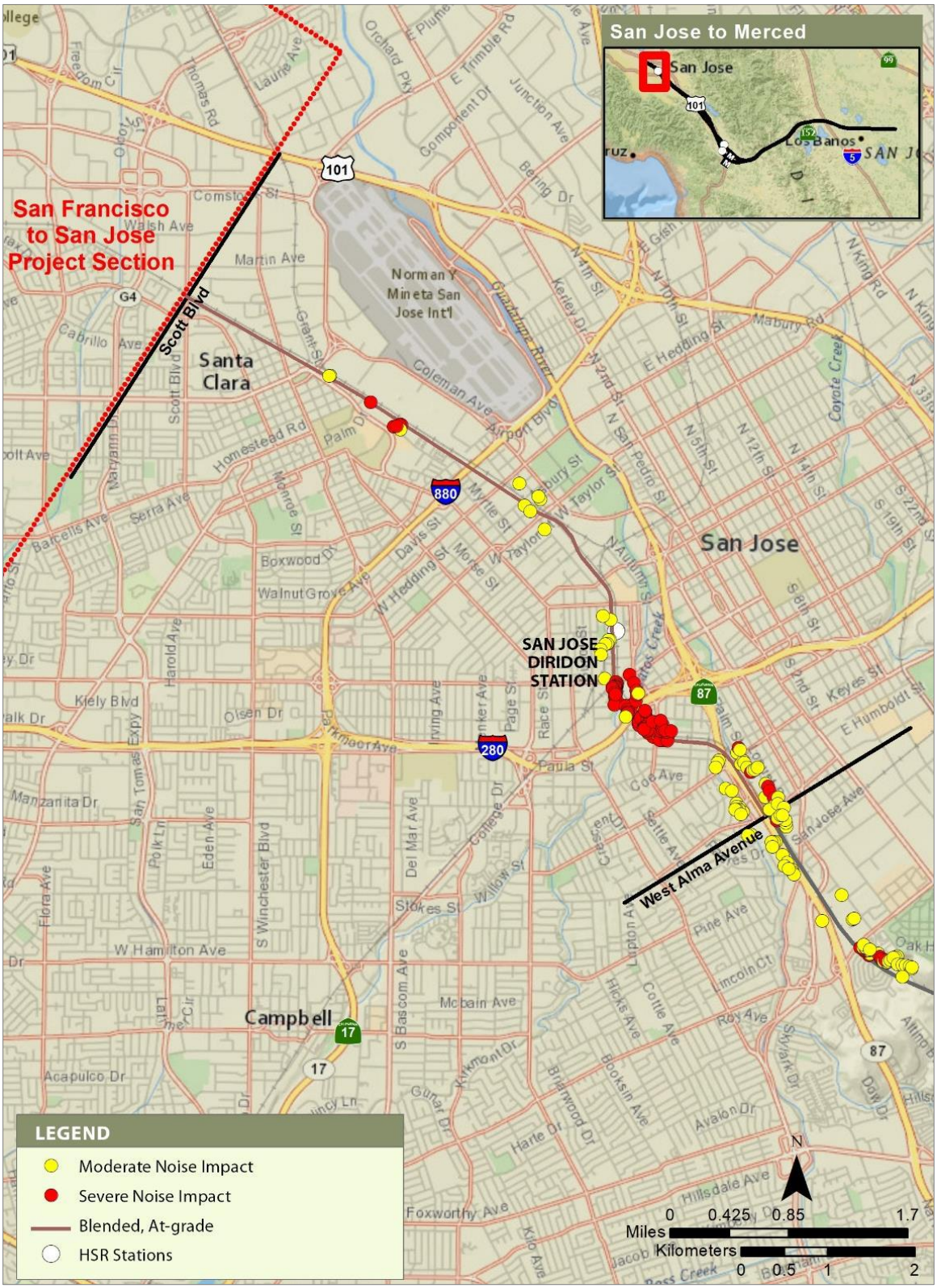

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Figure 5-22 2040 Plus Project Noise Impacts—Alternative 4

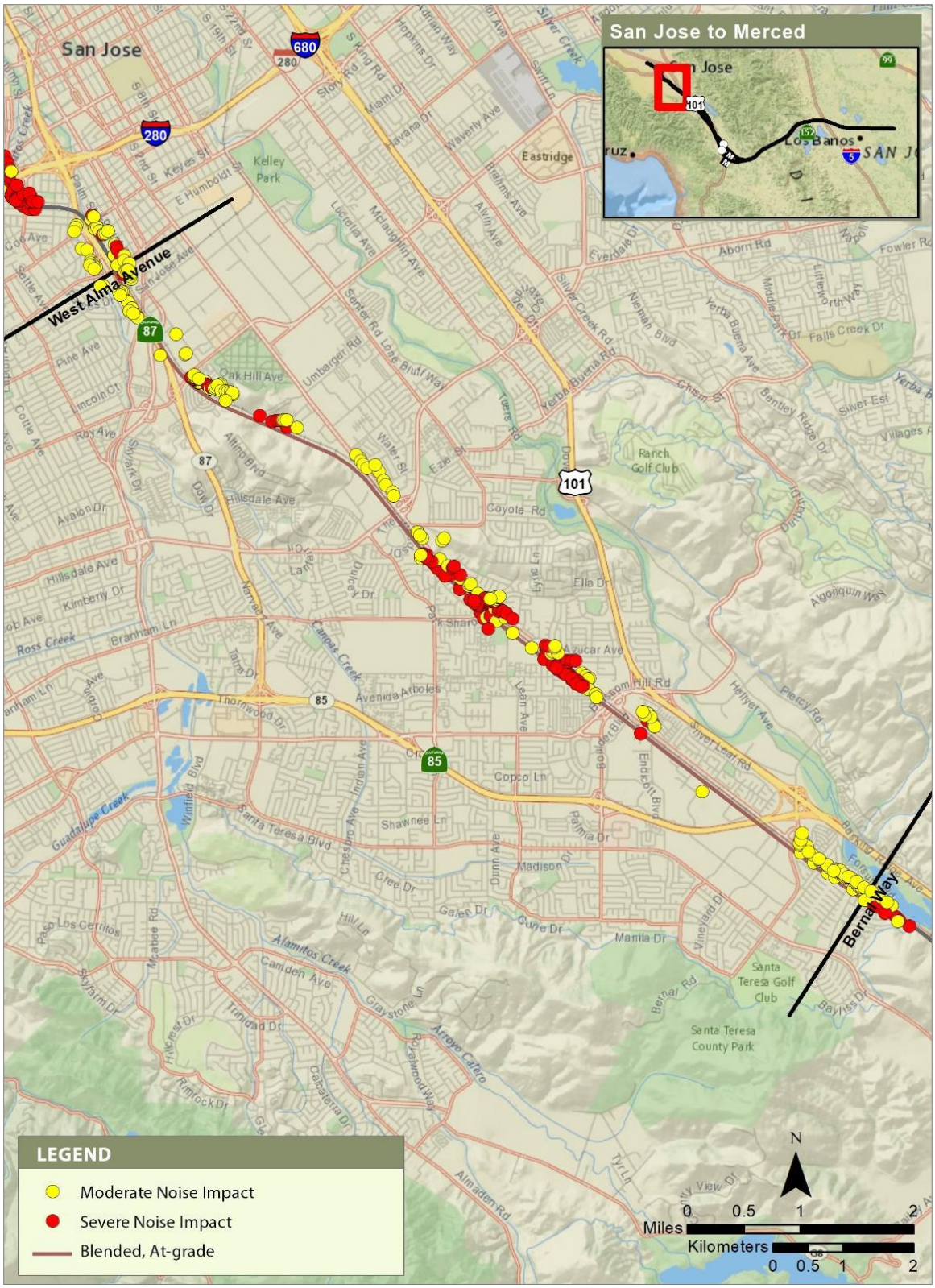

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Figure 5-23 2040 Plus Project Noise Impacts—Alternative 4

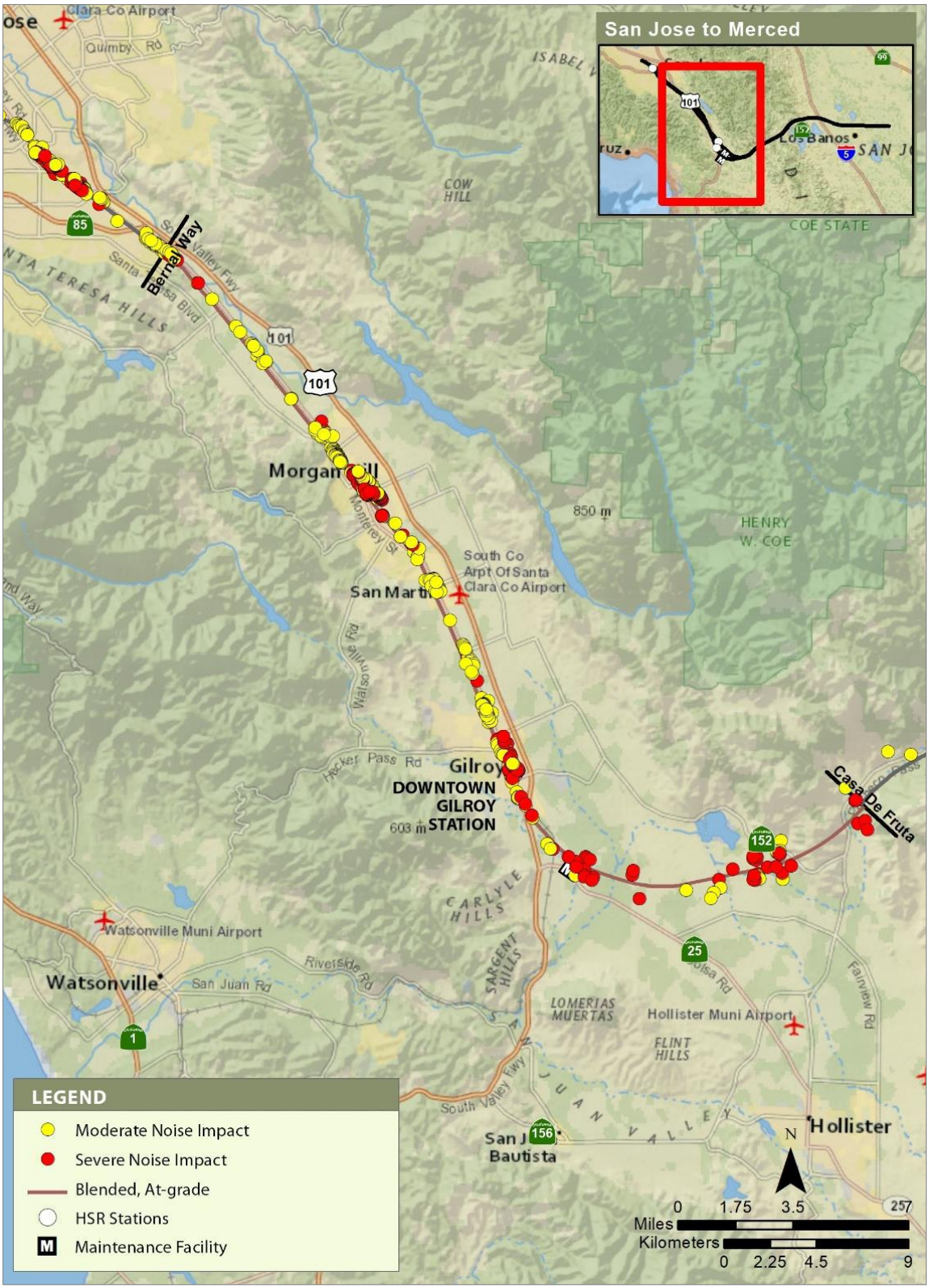

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Figure 5-24 2040 Plus Project Noise Impacts—Alternative 4 without the Tunnel Design Variant

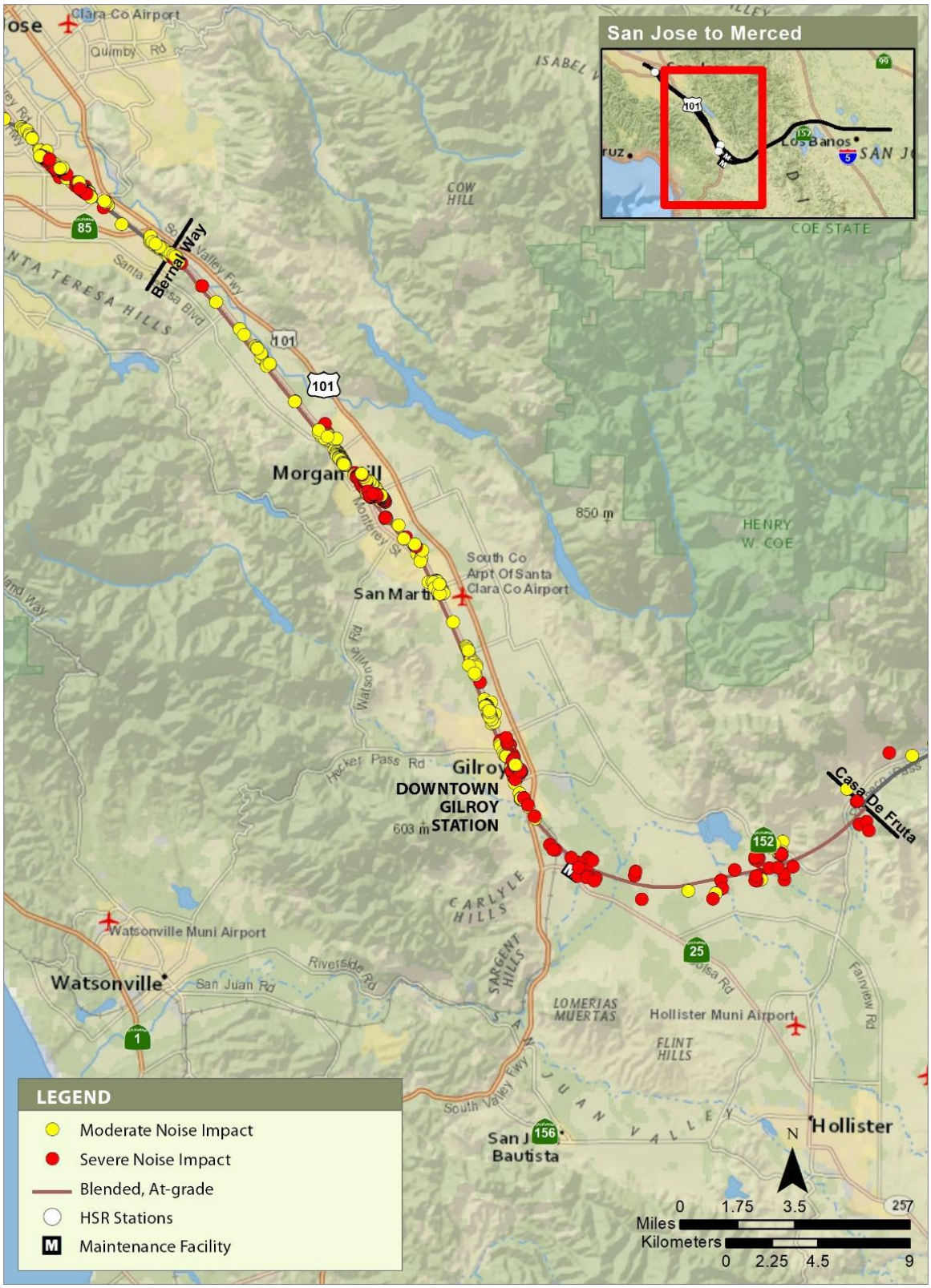

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Figure 5-25 2040 Plus Project Noise Impacts—Alternative 4 with the Tunnel Design Variant

Analysts also conducted a cumulative noise impact assessment for both the 2040 No Project and 2040 Plus Project conditions. The cumulative analysis assumes that the Caltrain PCEP will be implemented and that the increase in other 2040 passenger and freight operations (shown in Table 4-10) would occur. Table 5-9 shows the 2040 No Project and 2040 Plus Project cumulative noise impact assessment results. Under the 2040 No Project cumulative condition there would be 291 severe noise impacts and 1,506 moderate noise impacts caused by increases in other, non-HSR train operations. Under the 2040 Plus Project cumulative condition there would be 879 severe noise impacts and 2,556 moderate impacts under Alternative 1, 1,237 severe impacts and 1,932 moderate impacts under Alternative 2, 647 severe impacts and 2,357 moderate impacts under Alternative 3, and 1,589 severe impacts and 1,933 moderate impacts under Alternative 4. The results of the cumulative noise impact assessment for the 2040 No Project and 2040 Plus Project conditions indicate that there would be substantially more noise impacts in 2040 compared to 2029 because of the increase in other non-HSR train operations. Future 2027 CNEL airport noise contours for San Jose International Airport (2010) have also been used to evaluate the cumulative condition.

Noise impacts associated with the DDV and TDV are shown in parentheses in Table 5-9. Under the 2040 Plus Project cumulative condition with the DDV and TDV, there would be 890 sensitive receptors that would experience severe impacts and 2,550 sensitive receptors that would experience moderate impacts under Alternative 1; 1,249 severe impacts and 1,925 moderate impacts under Alternative 2; 658 severe impacts and 2,361 moderate impacts under Alternative 3; and 1,601 severe impacts and 1,928 moderate impacts under Alternative 4.

Table 5-9 Summary of 2040 No Project and Plus Project Cumulative Noise Impacts

Subsection	Land Use Category[1]	No Project Cumulative		Plus Project Cumulative							
				Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Mod	Sev	Mod	Sev	Mod	Sev	Mod	Sev	Mod	Sev
San Jose Diridon Station Approach	2	268	13	308	81	363	12	363	12	472 (475)[2]	174
	1, 3	3	0	0	1	0	0	0	0	4	0
Monterey Corridor	2	454	110	540	253	447	159	540	253	339	410
	1, 3	0	0	1	0	1	0	1	0	5	0
Morgan Hill and Gilroy	2	780	168	1,667 (1,663)	432 (440)	1,078 (1,073)	953 (962)	1,415 (1,421)	271 (279)	1,065 (1,059)	891 (900)
	1, 3	1	0	3	1	6	2	1	0	11	3
Pacheco Pass	2	0	0	4	10 (11)	4	10 (11)	4	10 (11)	4	10 (11)
	1, 3	0	0	0	0	0	0	0	0	0	0
San Joaquin Valley	2	0	0	32 (30)	101 (103)	32 (30)	101 (103)	32 (30)	101 (103)	32 (30)	101 (103)
	1, 3	0	0	1	0	1	0	1	0	1	0
Total	**2**	**1,502**	**291**	**2,551 (2,545)**	**877 (888)**	**1,924 (1,917)**	**1,235 (1,247)**	**2,354 (2,358)**	**647 (658)**	**1,912 (1,907)**	**1,586 (1,598)**
	1, 3	**4**	**0**	**5**	**2**	**8**	**2**	**3**	**0**	**21**	**3**

[1] FRA Land Use Categories are summarized in Table 4-3. Land Use Category 1 = areas where quiet is an essential element to the land use; Category 2 = Residential; Category 3 = Institutional use and passive-use parks.
[2] Impacts associated with the design variants are shown in parentheses. The DDV affects Alternative 4 within the San Jose Diridon Station Approach Subsection; the remaining noise impacts are associated with the TDV.
Mod = Moderate
Sev = Severe

Implementation of the project alternatives would change the current practices regarding the sounding of train horns and crossing bells in the noise RSA. Alternatives 1, 2, and 3 would be grade separated and would not regularly sound warning horns between the San Jose and Gilroy HSR stations. However, one existing at-grade railway crossing at Bloomfield Avenue in Gilroy would be eliminated with Alternative 1, eliminating horn noise at that location. Alternative 2 would be predominately located on an embankment in or adjacent to the existing Caltrain/UPRR railway, which would necessitate the elimination of 33 existing at-grade crossings where trains currently sound warning horns. The elimination of at-grade crossings associated with Alternative 2 would produce a beneficial impact because of reduced noise exposure from horns and crossing bells. Existing trains would still sound horns at Caltrain stations with Alternative 2.

Alternative 4 would be located at grade at the same locations as the existing Caltrain and other passenger and freight operations. As a result, HSR trains under Alternative 4 would regularly sound warning horns at all at-grade crossings and Caltrain passenger stations.

Based on the current tunnel designs, it is anticipated that roughly half of the sound generated in the tunnel would pass out through the portal, and the other half would propagate into the interior. The effect would be a rapid rise in sound level as the train leaves the tunnel and portal, forewarned by a propagating wave ahead of the train. Depending on the shape of the portal, shape of the train nose, and blockage ratio, the rate of pressure rise may be substantial. The pressure wave front rate of rise is reduced by friction between the moving air column and tunnel wall, so that the pressure wave does not easily develop into a shock wave. This portal noise effect has been studied theoretically and experimentally and is well understood. Attenuation of the portal noise is achieved with long, flared portals and low blockage ratios. In-tunnel cross-passages and vents can reduce pressure magnitudes and rates of rise, though passage of these vents may generate additional propagating and steepening wave fronts. This tunnel and tunnel portal design features will be used to attenuate any additional noise associated with the train entering or exiting a tunnel.

Tables 5-10 through 5-13 show a detailed breakdown of the 2040 Plus Project noise impact assessment results for each subsection. The subsections are divided into smaller areas by cross streets or other features. In each location, ranges of distance to the nearest HSR track and maximum HSR speed are shown. The ranges shown represent a composite of many receptors and are meant to provide the upper and lower limits of these values for each geographic location. In locations with noise impacts, the data represent the range for those affected receptors. In locations without noise impacts, the data are representative of the receptor with the largest projected noise level increase (typically the receptor located closest to the alignment).

The detailed impact tables provide ranges of existing noise levels, predicted future noise levels, and predicted increase in noise levels. The range of the impact criteria are also given for moderate and severe impacts in these areas. The numbers of moderate and severe noise impacts in each location are provided. In each area, the specific land uses of the projected noise impacts are included. Most of the noise impacts would occur at single-family residences; several multifamily residential buildings would also be affected. Results with the DDV and TDV are shown in parentheses where they are different than the results without the DDV and TDV.

Table 5-10 Detailed 2040 Plus Project Noise Impacts—Alternative 1

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
San Jose Diridon Approach Subsection										
Scott Boulevard to Asbury Street	2	53 - 426	81 - 110	56 - 72	60 - 74	1.4 - 4.9	0.9 - 2.8	2.6 - 6.5	93 SF, 23 MF, 1 Hotel	16 SF, 4 MF
	3	111	110	68	72	4.0	3.0	6.3	1 Police Sta.	0
Asbury Street to San Jose Diridon Station	2	906	56	71	70	0.0	1.0	2.7	0	0
	3	503	55	61	70	0.0	4.4	8.7	0	0
San Jose Diridon Station to West Alma Avenue	2	883	95	58	59	0.7	2.4	5.8	0	0
	1, 3	265	95	68	59	0.1	2.9	6.2	0	0
Monterey Corridor Subsection										
West Alma Avenue to Daylight Way	2	44 - 719	95 - 122	52 - 68	56 - 72	1.9 - 11.4	1.2 - 4.2	3.2 - 8.8	131 SF, 35 MF	44 SF, 2 MF
	1, 3	104	110	66	70	3.7	3.3	6.9	1 Park	0
Daylight Way to Blossom Hill Road	2	70 - 318	125 - 130	57 - 64	60 - 66	1.5 - 3.4	1.5 - 2.6	3.8 - 6.2	35 SF, 10 MF	0
	3	1,258	125	60	63	0.6	4.7	9.1	0	0
Blossom Hill Road to Bernal Way	2	127 - 419	130	57 - 58	60 - 61	2.4 - 3.6	2.4 - 2.6	5.7 - 6.2	13 SF, 1 MF	0
	1, 3	663	130	64	61	0.5	3.6	7.4	0	0
Morgan Hill and Gilroy Subsection										
Bernal Way to Metcalf Road	2	124 - 281	125 - 130	57 - 60	61 - 62	2.1 - 3.8	2 - 2.6	5 - 6.2	105 SF	0
	3	-	-	-	-	-	-	-	0	0
Metcalf Road to Palm Avenue	2	52 - 1,175	157 - 175	61 - 79	63 - 79	0.2 - 2.8	0.2 - 1.9	1.5 - 4.7	42 SF, 2 Hotels	0
	3	1,479	125	67	64	0.3	3.2	6.7	0	0
Palm Avenue to Burnett Avenue	2	141 - 1,064	150 - 156	61 - 67	63 - 69	1.5 - 2.6	1.3 - 1.9	3.3 - 4.7	21 SF	0
	3	1,298	150	61	64	0.9	4.3	8.6	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Burnett Avenue to Tennant Avenue	2	41 - 2,931	150	55 - 67	60 - 69	1.4 - 5.9	1.2 - 3.3	3.2 - 7.3	68 SF, 2 MF, 1 Hotel	1 SF
	1, 3	406	150	54	61	4.7	6.9	12.1	0	0
Tennant Avenue to California Avenue	2	83 - 1,798	150	55 - 66	60 - 67	1.6 - 8.8	1.4 - 3.2	3.5 - 7.2	31 SF	4 SF
	3	868	150	60	64	2.3	4.7	9.1	0	0
California Avenue to Highland Avenue	2	140 - 1,311	150 - 220	54 - 71	58 - 73	1.3 - 10.3	1 - 3.5	2.7 - 7.6	67 SF, 9 MF	16 SF
	3	521	150	58	65	2.7	5.4	10.1	0	0
Highland Avenue to Buena Vista	2	109 - 1,766	207 - 220	56 - 78	61 - 79	1 - 10.6	0.2 - 2.9	1.6 - 6.6	18 SF	64 SF
	3	214	220	80	81	0.6	0.4	3.0	1 Place of Worship	0
Buena Vista Avenue to Leavesley Road	2	122 - 1,822	171 - 205	51 - 74	57 - 75	1.2 - 9.3	0.5 - 4.6	2.3 - 9.4	229 SF, 83 MF, 1 Hotel	41 SF, 9 MF
	3	223	190	59	66	7.2	5.0	9.6	1 Place of Worship	0
Leavesley Road to 10th Street	2	65 - 849	150	52 - 72	57 - 73	0.8 - 5.5	0.8 - 4.4	2.5 - 9.1	80 SF, 32 MF	0
	1, 3	110 - 148	150	63 - 75	65 - 76	1 - 1.7	0.4 - 1.6	2.2 - 4.1	2 Performing Arts Centers	0
10th Street to Santa Clara County Line	2	405 - 2,249 (405 - 2,796)[5]	150 - 200 (150 - 220)	55 - 62	59 – 66 (59 - 68)	2.7 - 11.3 (2.7 - 13.1)	1.8 - 3.2	4.5 - 7.1	10 SF, 1 Hotel	5 SF (6 SF)
	3	1,872	200 (220)	58	66 (68)	1.6 (2.3)	5.3	9.9	0	0
Santa Clara County Line to SR 152	2	123 - 3,632	200 (220)	45 - 66	59 – 73 (60 - 75)	1.9 - 22.2 (1.4 - 24.4)	1.3 - 7.8	3.5 - 13.9 (3.4 - 13.9)	13 SF (10 SF)	20 SF (26 SF)
	3	-	-	-	-	-	-	-	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Pacheco Pass Subsection										
Tunnel (2255+00 to 2340+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Aerial/Embankment (2340+00 to 3325+00)	2	1,038 - 3,530	200 (220)	50 - 68	60 – 70 (62 - 71)	1.4 - 11.7 (2.1 - 13.7)	1.1 - 5	3 - 10	3 SF, 1 Fire Dept. (2 SF, 1 Fire Dept.)	3 SF, 1 Hotel, 1 Campground (4 SF, 1 Hotel, 1 Campground)
	3	-	-	-	-	-	-	-	0	0
Tunnel (3325+00 to 4035+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Tunnel Portal to I-5	2	360 - 1,929 (360 - 4,979)	200 (220)	50 - 60	62 - 68 (57 - 69)	7 - 17.6 (6.7 - 19.2)	2 - 5	5 - 10	0 (1 SF)	5 SF
	3	6,330	200 (220)	47	68 (69)	8.5 (9.8)	10.8	17.1	0	0
San Joaquin Valley Subsection										
I-5 to San Waste Way	2	283 - 3,232	200 - 220 (220)	47 - 58	60 - 70 (61 - 72)	4.2 - 23 (5.2 - 24.8)	2.3 - 6.6	5.6 - 12.3	3 SF (1 SF)	23 SF (25 SF)
	3	-	-	-	-	-	-	-	0	0
San Waste Way to North Mercey Springs Road	2	114 - 3,485	220	53 - 70	58 - 75	2.9 - 15.3	1.1 - 3.8	2.8 - 8.2	16 SF	52 SF, 1 Campground
	3	1,131	220	67	72	2.2	3.1	6.5	0	0
North Mercey Springs Road to Carlucci Road	2	156 - 3,940	220	53 - 69	57 - 73	3.7 - 13.4	1.1 - 3.8	3 - 8.2	6 SF, 7 MF	4 SF, 20 MF, 1 Campground
	3	779	220	56	64	7.8	5.9	10.8	1 Park	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
TOTAL	**2**								**1,193 (1,188)**	**337 (347)**
	1, 3								**7**	**0**

dBA = A-weighted decibel
MF = multifamily residential
mph = miles per hour
SF = single family residential
SR = State Route
Sta. = Station
[1] The ranges shown for the distances, speeds, and noise levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. In locations with noise impacts, the data represent the range for those affected receptors. In locations without noise impacts, the data are representative of the receptor with the highest projected noise level increase (typically the receptor located closest to the alignment.)
[2] Noise levels for land use category 2 are based on L_{dn} and measured in dBA. Noise levels for land use categories 1 and 3 are based on L_{eq} and measured in dBA.
[3] Predicted future noise levels represent the total future predicted noise levels with the project alternatives.
[4] Increases in noise level represent the predicted increase in future noise levels with the project alternatives over the existing noise levels.
[5] Results associated with the TDV are shown in parentheses.
[6] Airborne noise was not assessed in this portion of the alignment where the alternative is in a tunnel.

Table 5-11 Detailed 2040 Plus Project Noise Impacts—Alternative 2

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
San Jose Diridon Approach Subsection										
Scott Boulevard to Asbury Street	2	80 - 304	110	59 - 68	61 - 70	1.3 - 2.9	1.2 - 2.2	3.2 - 5.3	68 SF, 5 MF	0
	3	689	63	64	64	0.0	3.7	7.6	0	0
Asbury Street to San Jose Diridon Station	2	906	56	71	70	0.0	1.0	2.7	0	0
	3	503	55	61	60	0.0	4.4	8.7	0	0
San Jose Diridon Station to West Alma Avenue	2	883	95	58	59	0.6	2.4	5.8	0	0
	1, 3	230	50	73	73	0.0	1.9	5.3	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Monterey Corridor Subsection										
West Alma Avenue to Daylight Way	2	44 - 695	95 - 122	52 - 68	56 - 72	2.1 - 11.3	1.2 - 4.2	3.2 - 8.8	130 SF, 35 MF	44 SF, 2 MF
	1, 3	104	110	66	69	3.5	3.3	6.9	1 Park	0
Daylight Way to Blossom Hill Road	2	116 - 540	125 - 130	57 - 74	60 - 75	0.9 - 5.1	0.6 - 2.6	2.3 - 6.2	27 SF, 46 MF, 1 Hotel	0
	3	265	125	73	73	0.4	1.9	5.3	0	0
Blossom Hill Road to Bernal Way	2	116 - 668	130	57 - 69	60 - 70	1.4 - 3.3	1.1 - 2.6	2.9 - 6.2	79 SF, 8 MF	0
	1, 3	275	130	67	69	1.4	3.1	6.5	0	0
Morgan Hill and Gilroy Subsection										
Bernal Way to Metcalf Road	2	99 - 633	100 - 185	57 - 68	61 - 73	1.9 - 7.6	1.1 - 2.6	3 - 6.2	198 SF, 6 MF	52 SF, 12 MF
	3	-	-	-	-	-	-	-	0	0
Metcalf Road to Palm Avenue	2	120 - 796	168 - 190	62 - 75	65 - 77	1 - 2.5	0.4 - 1.7	2.2 - 4.3	18 SF, 2 Hotel	0
	3	189	100	81	81	0.0	0.3	2.6	0	0
Palm Avenue to Tilton Avenue	2	106 - 1,059	190	60 - 75	63 - 77	1.5 - 4.7	0.4 - 2.1	2.2 - 5.2	36 SF, 1 MF, 1 Hotel	0
	3	722	190	65	66	1.1	3.4	7.1	0	0
Tilton Avenue to Tennant Avenue	2	101 - 5,486	185 - 195	51 - 71	56 - 74	1.6 - 10.2	0.9 - 4.6	2.6 - 9.4	304 SF, 131 MF, 1 Hotel	225 SF, 79 MF
	1, 3	111 - 586	185 - 195	64 - 74	67 -70	1.9 - 3.9	1.4 - 3.3	3.5 - 6.9	1 Historic Bldg., 2 Courthouses, 1 Micro, 1 Amphitheater	0
Tennant Avenue to California Avenue	2	82 - 1,725	185 - 185	55 - 69	60 - 74	1.8 - 11.8	1.1 - 3.2	2.9 - 7.2	26 SF, 101 MF	6 SF, 100 MF
	3	749	185	61	63	2.4	4.5	8.8	0	0
California Avenue to Highland Avenue	2	145 - 1,311	185 - 210	54 - 71	58 - 73	1.6 - 7.1	1 - 3.5	2.7 - 7.6	61 SF, 8 MF	16 SF
	3	145	185	66	70	4.4	3.3	6.9	1 Place of Worship	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Highland Avenue to Buena Vista	2	109 - 1,569	207 - 220	56 - 78	59 - 79	0.6 - 8.2	0.2 - 2.9	1.6 - 6.6	50 SF	18 SF
	3	214	220	80	80	0.3	0.4	3.0	0	0
Buena Vista Avenue to Leavesley Road	2	122 - 1,822	171 - 201	51 - 74	57 - 75	1 - 8.4	0.5 - 4.6	2.3 - 9.4	245 SF, 88 MF, 1 Hotel	24 SF, 4 MF
	3	223	190	59	67	7.8	5.0	9.6	1 Place of Worship	0
Leavesley Road to 10th Street	2	65 - 874	150	52 - 68	58 - 72	1.5 - 7.2	1.2 - 4.4	3.1 - 9.1	65 SF, 31 MF	31 SF, 5 MF
	1, 3	110	150	63	67	3.9	1.6	4.1	1 Performing Arts Center	0
10th Street to Santa Clara County Line	2	335 - 2,249 (335 - 2,796)[5]	150 - 200 (150 - 220)	55 - 67	59 - 69	1.4 - 11.4 (1.4 - 13.4)	1.2 - 3.2	3.2 - 7.1	12 SF (11 SF)	6 SF (8 SF)
	3	1,872	200 (220)	58	60	1.6 (2.3)	5.3	9.9	0	0
Santa Clara County Line to SR 152	2	123 - 3,632	200 (220)	45 - 66	59 - 73 (60 - 75)	1.9 - 22.2 (1.4 - 24.4)	1.3 - 7.8	3.5 - 13.9 (3.4 - 13.9)	13 SF (10 SF)	20 SF (26 SF)
	3	-	-	-	-	-	-	-	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Pacheco Pass Subsection										
Tunnel (2255+00 to 2340+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Aerial/Embankment (2340+00 to 3325+00)	2	1,038 - 3,530	200 (220)	50 - 68	60 - 70 (62 - 71)	1.4 - 11.7 (2.1 - 13.7)	1.1 - 5	3 - 10	3 SF, 1 Fire Dept. (2 SF, 1 Fire Dept.)	3 SF, 1 Hotel, 1 Campground (4 SF, 1 Hotel, 1 Campground)
	3	-	-	-	-	-	-	-	0	0
Tunnel (3325+00 to 4035+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Tunnel Portal to I-5	2	360 - 1,929	200 (220)	50 - 60	62 - 68 (57 - 69)	7 - 17.6 (6.7 - 19.2)	2 - 5	5 - 10	0 (1 SF)	5 SF
	3	6,330	200 (220)	47	55 (57)	8.5 (9.8)	10.8	17.1	0	0
San Joaquin Valley Subsection										
I-5 to San Waste Way	2	283 - 3,232	200 - 220 (220)	47 - 58	60 - 70 (61 - 72)	4.2 - 23 (5.2 - 24.8)	2.3 - 6.6	5.6 - 12.3	3 SF (1 SF)	23 SF (25 SF)
	3	-	-	-	-	-	-	-	0	0
San Waste Way to North Mercey Springs Road	2	114 - 3,485	220	53 - 70	58 - 75	2.9 - 15.3	1.1 - 3.8	2.8 - 8.2	16 SF	52 SF, 1 Campground
	3	1,131	220	67	69	2.2	3.1	6.5	0	0
North Mercey Springs Road to Carlucci Road	2	156 - 3,940	220	53 - 69	57 - 73	3.7 - 13.4	1.1 - 3.8	3 - 8.2	6 SF, 7 MF	4 SF, 20 MF, 1 Campground
	3	779	220	56	64	7.8	5.9	10.8	1 Park	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Total	**2**								**1,834 (1,828)**	**755 (766)**
	1, 3								**10**	**0**

dBA = A-weighted decibel
MF = multifamily residential
Micro = microelectronics facility
mph = miles per hour
SF = single family residential
SR = State Route
[1] The ranges shown for the distances, speeds, and noise levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. In locations with noise impacts, the data represent the range for those affected receptors. In locations without noise impacts, the data are representative of the receptor with the highest projected noise level increase (typically the receptor located closest to the alignment.)
[2] Noise levels for land use category 2 are based on L_{dn} and measured in dBA. Noise levels for land use categories 1 and 3 are based on L_{eq} and measured in dBA.
[3] Predicted future noise levels represent the total future predicted noise levels with the project alternatives.
[4] Increases in noise level represent the predicted increase in future noise levels with the project alternatives over the existing noise levels.
[5] Results associated with the TDV are shown in parentheses.
[6] Airborne noise was not assessed in this portion of the alignment where the alternative is in a tunnel.

Table 5-12 Detailed 2040 Plus Project Noise Impacts—Alternative 3

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
San Jose Diridon Approach Subsection										
Scott Boulevard to Asbury Street	2	80 - 304	110	59 - 68	61 - 70	1.3 - 2.9	1.2 - 2.2	3.2 - 5.3	68 SF, 5 MF	0
	3	689	63	64	64	0.0	3.7	7.6	0	0
Asbury Street to San Jose Diridon Station	2	906	56	71	70	0.0	1.0	2.7	0	0
	3	503	55	61	60	0.0	4.4	8.7	0	0
San Jose Diridon Station to West Alma Avenue	2	883	95	58	59	0.7	2.4	5.8	0	0
	1, 3	265	95	68	69	0.1	2.9	6.2	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Monterey Corridor Subsection										
West Alma Avenue to Daylight Way	2	44 - 719	95 - 122	52 - 68	56 - 72	1.9 - 11.4	1.2 - 4.2	3.2 - 8.8	131 SF, 35 MF	44 SF, 2 MF
	1, 3	104	110	66	70	3.7	3.3	6.9	1 Park	0
Daylight Way to Blossom Hill Road	2	70 - 318	125 - 130	57 - 64	60 - 66	1.5 - 3.4	1.5 - 2.6	3.8 - 6.2	35 SF, 10 MF	0
	3	1,258	125	60	60	0.6	4.7	9.1	0	0
Blossom Hill Road to Bernal Way	2	127 - 419	130	57 - 58	60 - 61	2.4 - 3.6	2.4 - 2.6	5.7 - 6.2	13 SF, 1 MF	0
	3	663	130	64	65	0.5	3.6	7.4	0	0
Morgan Hill and Gilroy Subsection										
Bernal Way to Metcalf Road	2	124 - 281	125 - 130	57 - 60	61 - 62	2.1 - 3.8	2 - 2.6	5 - 6.2	105 SF	0
	3	-	-	-	-	-	-	-	0	0
Metcalf Road to Palm Avenue	2	52 - 1,175	157 - 175	61 - 79	63 - 79	0.2 - 2.8	0.2 - 1.9	1.5 - 4.7	43 SF, 2 Hotels	0
	3	1,479	125	67	67	0.3	3.2	6.7	0	0
Palm Avenue to Burnett Avenue	2	141 - 1,064	150 - 156	61 - 67	63 - 69	1.5 - 2.6	1.3 - 1.9	3.3 - 4.7	22 SF	0
	3	1,298	150	61	62	0.9	4.3	8.6	0	0
Burnett Avenue to Tennant Avenue	2	41 - 2,931	150	55 - 69	60 - 70	1.1 - 5.9	1.1 - 3.3	2.9 - 7.3	70 SF, 2 MF, 1 Hotel	1 SF
	1, 3	406	150	54	59	4.7	6.9	12.1	0	0
Tennant Avenue to California Avenue	2	83 - 1,798	150	55 - 66	60 - 67	1.6 - 8.8	1.4 - 3.2	3.5 - 7.2	31 SF	6 SF
	3	868	150	60	62	2.3	4.7	9.1	0	0
California Avenue to Highland Avenue	2	140 - 1,311	150 - 179	54 - 71	58 - 72	1.2 - 6.2	1 - 3.5	2.7 - 7.6	83 SF, 9 MF	0
	3	521	150	58	60	2.7	5.4	10.1	0	0
Highland Avenue to Buena Vista	2	119 - 2,136	180 - 187	56 - 78	59 - 79	0.3 - 11.3	0.2 - 2.9	1.6 - 6.6	79 SF	8 SF
	3	489	185	68	69	0.9	3.0	6.4	0	0
	2	311 - 4,040	188 - 213	56 - 67	59 - 69	1.4 - 7.3	1.2 - 2.9	3.2 - 6.6	15 SF	6 SF

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Buena Vista Avenue to Leavesley Road	1, 3	1,145	198	67	67	0.7	3.2	6.7	0	0
Leavesley Road to Bloomfield Avenue	2	158 - 2,868	204 - 220 (219 - 220)	58 - 74 (55 - 74)[5]	61 - 75 (58 - 76)	1.1 - 13.7 (1.0 - 13.7)	0.5 - 2.4 (0.5 - 3.2)	2.3 - 5.8 (2.3 - 7.1)	22 SF (34 SF)	26 SF (28 SF)
	1, 3	332	216 (220)	73	74	1.4 (1.5)	1.8	5.3	0	0
Bloomfield Avenue to SR 152	2	487 - 6,650	200 (220)	45 - 66	58 - 68 (59 - 69)	2 - 12.8 (1.5 - 14.6)	1.3 - 7.8	3.5 - 13.9 (3.4 - 13.9)	14 SF (15 SF)	18 SF (24 SF)
	3	-	-	-	-	-	-	-	0	0
Pacheco Pass Subsection										
Tunnel (2255+00 to 2340+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Aerial/Embankment (2340+00 to 3325+00)	2	1,038 - 3,530	200 (220)	50 - 68	60 - 70 (62 - 71)	1.4 - 11.7 (2.1 - 13.7)	1.1 - 5	3 - 10	3 SF, 1 Fire Dept. (2 SF, 1 Fire Dept.)	3 SF, 1 Hotel, 1 Campground (4 SF, 1 Hotel, 1 Campground)
	3	-	-	-	-	-	-	-	0	0
Tunnel (3325+00 to 4035+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Tunnel Portal to I-5	2	360 - 1,929 (360 - 4,979)	200 (220)	50 - 60	62 - 68 (57 - 69)	7 - 17.6 (6.7 - 19.2)	2 - 5	5 - 10	0 (1 SF)	5 SF
	3	6,330	200 (220)	47	55 (57)	8.5 (9.8)	10.8	17.1	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
San Joaquin Valley Subsection										
I-5 to San Waste Way	2	283 – 3,232	200 - 220 (220)	47 - 58	60 - 70 (61 - 72)	4.2 - 23 (5.2 - 24.8)	2.3 - 6.6	5.6 - 12.3	3 SF (1 SF)	23 SF (25 SF)
	3	-	-	-	-	-	-	-	0	0
San Waste Way to North Mercey Springs Road	2	114 - 3,485	220	53 - 70	58 - 75	2.9 - 15.3	1.1 - 3.8	2.8 - 8.2	16 SF	52 SF, 1 Campground
	3	1,131	220	67	69	2.2	3.1	6.5	0	0
North Mercey Springs Road to Carlucci Road	2	156 - 3,940	220	53 - 69	57 - 73	3.7 - 13.4	1.1 - 3.8	3 - 8.2	6 SF, 7 MF	4 SF, 20 MF, 1 Campground
	3	779	220	56	64	7.8	5.9	10.8	1 Park	0
Total	**2**								**832 (843)**	**222 (233)**
	1, 3								**2**	**0**

dBA = A-weighted decibel
MF = multifamily residential
mph = miles per hour
SF = single family residential

[1] The ranges shown for the distances, speeds, and noise levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. In locations with noise impacts, the data represent the range for those affected receptors. In locations without noise impacts, the data are representative of the receptor with the highest projected noise level increase (typically the receptor located closest to the alignment.)

[2] Noise levels for land use category 2 are based on L_{dn} and measured in dBA. Noise levels for land use categories 1 and 3 are based on L_{eq} and measured in dBA.

[3] Predicted future noise levels represent the total future predicted noise levels with the project alternatives.

[4] Increases in noise level represent the predicted increase in future noise levels with the project alternatives over the existing noise levels.

[5] Results associated with the TDV are shown in parentheses.

[6] Airborne noise was not assessed in this portion of the alignment where the alternative is in a tunnel.

Table 5-13 Detailed 2040 Plus Project Noise Impacts—Alternative 4

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
San Jose Diridon Approach Subsection										
Scott Boulevard to Asbury Street	2	53 - 420	41 - 79	61 - 77	65 - 78	0.7 - 5.0	0.3 - 1.9	2 - 4.7	7 SF, 7 MF	4 MF, 1 Hotel
	3	111	79	72	73	1.8	2.3	5.5	0	0
Asbury Street to San Jose Diridon Station	2	174 - 612	15 - 40	58 - 71	61 - 72	1.1 - 2.9	1 - 2.4	2.6 - 5.8	3 SF, 6 MF	0
	3	488	17	61	61	0.5	4.4	8.7	0	0
San Jose Diridon Station to West Alma Avenue	2	25 - 973	18 - 90	56 - 76	60 - 82	1.6 - 10 (1.6 - 10.2)[5]	0.3 - 2.9	2.1 - 6.6	180 SF, 15 MF	98 SF, 33 MF
	1, 3	165 - 481	20 - 83	64 - 68	66 - 72	1.8 - 4.0 (1.9 - 3.9)	1.5 - 3.0	3.9 – 6.4	1 Park, 1 School, 1 Performing Arts Center	0
Monterey Corridor Subsection										
West Alma Avenue to Daylight Way	2	70 - 1,065	90 - 110	52 - 70	57 - 75	0.5 - 9	1 - 4.0	2.8 - 8.6	83 SF, 31 MF	27 SF, 27 MF
	1, 3	90	110	66	69	3.4 (3.5)	3.3	6.9	1 Park	0
Daylight Way to Blossom Hill Road	2	28 - 989	110	57 - 76	61 - 77	0.5 - 10	0.3 - 2.6	2.1 - 6.2	76 SF, 54 MF, 1 Fire Dept., 4 Hotels	199 SF, 36 MF
	3	149 - 220	110	67 - 74	71 - 76	1.7 - 3.9	1.3 - 3	5.0 - 6.4	1 Library, 1 Park	0
Blossom Hill Road to Bernal Way	2	177 - 732	110	57 - 69	60 - 73	2.7 - 5.1	1.1 - 2.6	2.9 - 6.2	12 SF, 3 MF	4 MF
	1, 3	522	110	64	68	3.4	3.6	7.4	0	0
Morgan Hill and Gilroy Subsection										
Bernal Way to Metcalf Road	2	35 - 706	110	57 - 68	60 - 71	1.5 - 10.8	1.1 - 2.6	3 - 6.2	165 SF, 18 MF	49 SF
	3	-	-	-	-	-	-	-	0	0
Metcalf Road to Palm Avenue	2	68 - 302	110	67 - 79	68 - 79	0.3 - 3.6	0.2 - 1.3	1.5 - 3.3	11 SF, 1 Hotel	2 SF
	3	210	110	76	76	0.1	1.0	4.8	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Palm Avenue to Tilton Avenue	2	108 - 1,143	110	60 - 78	67 - 78	0.4 - 6.9	0.2 - 2.1	1.9 - 5.2	9 SF	1 SF, 1 MF
	3	639	110	63	66	2.7	3.9	7.8	0	0
Tilton Avenue to Tennant Avenue	2	20 - 1,119	110	51 - 75	56 - 80	0.5 - 10.9	0.4 - 4.6	2.2 - 9.4	223 SF, 67 MF, 2 Hotels	158 SF, 107 MF
	1, 3	289 - 508	110	66 - 71	69 - 74	3.2 - 3.4	1.4 - 3.1	3.5 - 6.5	1 Historic Bldg., 2 Places of Worship, 1 Amphitheater	0
Tennant Avenue to California Avenue	2	25 - 713	110	56 - 73	61 - 80	1.2 - 7.7	0.7 - 2.9	2.4 - 6.6	11 SF, 100 MF	17 SF, 100 MF
	3	1,721	110	60	60	0.3	4.7	9.1	0	0
California Avenue to Highland Avenue	2	152 - 1,006	110	54 - 72	58 - 73	1 - 5.7	0.8 - 3.5	2.5 - 7.6	49 SF, 3 MF	0
	3	227	110	66	68	2.3	3.3	6.9	0	0
Highland Avenue to Buena Vista	2	80 - 592	110	60 - 78	63 - 79	0.4 - 4.3	0.2 - 2.1	1.6 - 5.2	16 SF	3 SF
	3	138	110	80	80	0.1	0.4	3.0	0	0
Buena Vista Avenue to Leavesley Road	2	134 - 606	110	53 - 74	57 - 76	1.1 - 5.5	0.5 - 3.8	2.3 - 8.2	210 SF, 6 MF, 1 Hotel	1 SF
	3	364	110	59	62	2.7	5.0	9.6	0	0
Leavesley Road to 10th Street	2	71 - 925	110 - 117	51 - 75	61 - 78	0.8 - 10.8	0.4 - 4.6	2.2 - 9.4	60 SF, 9 MF, 2 Hotels	104 SF, 89 MF
	1, 3	61 - 674	110 - 113	58 - 74	64 - 78	3.5 - 6.0	0.5 - 5.2	2.3 - 9.8	2 Schools, 1 Banquet Hall, 1 Performing Arts Center	1 Performing Arts Center
10th Street to Santa Clara County Line	2	176 - 2,630	118 - 200 (217 - 220)	55 - 70	61 - 74 (62 - 74)	1.1 - 14.7 (1.1 - 15.6)	1 - 3.2	2.7 - 7.1	156 SF, 1 MF, 1 Hotel (153 SF, 1 MF, 1 Hotel)	16 SF, 2 Hotels (19 SF, 2 Hotels)
	3	1,584	200 (220)	58	61 (62)	3.0 (3.8)	5.3	9.9	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
Santa Clara County Line to SR 152	2	205 - 3,632	200 (220)	45 - 66	59 - 71 (60 - 73)	1.9 - 22.2 (1.4 - 24.4)	1.3 - 7.8	3.5 - 13.9 (3.4 - 13.9)	12 SF (9 SF)	21 SF (27 SF)
	3	-	-	-	-	-	-	-	0	0
Pacheco Pass Subsection										
Tunnel (2255+00 to 2340+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Aerial/Embankment (2340+00 to 3325+00)	2	1,038 - 3,530	200 (220)	50 - 68	60 – 70 (62 - 71)	1.4 - 11.7 (2.1 - 13.7)	1.1 - 5	3 - 10	3 SF, 1 Fire Dept. (2 SF, 1 Fire Dept.)	3 SF, 1 Hotel, 1 Campground (4 SF, 1 Hotel, 1 Campground)
	3	-	-	-	-	-	-	-	0	0
Tunnel (3325+00 to 4035+00)[6]	2	-	-	-	-	-	-	-	0	0
	3	-	-	-	-	-	-	-	0	0
Tunnel Portal to I-5	2	360 - 1,929 (360 - 4,979)	200 (220)	50 - 60	62 - 68 (57 - 69)	7 - 17.6 (6.7 - 19.2)	2 - 5	5 - 10	0 (1 SF)	5 SF
	3	6,330	200 (220)	47	55 (57)	8.5 (9.8)	10.8	17.1	0	0
I-5 to San Waste Way	2	283 - 3,232	200 - 220 (220)	47 - 58	60 - 70 (61 - 72)	4.2 - 23 (5.2 - 24.8)	2.3 - 6.6	5.6 - 12.3	3 SF (1 SF)	23 SF (25 SF)
	3	-	-	-	-	-	-	-	0	0
San Waste Way to North Mercey Springs Road	2	114 - 3,485	220	53 - 70	58 - 75	2.9 - 15.3	1.1 - 3.8	2.8 - 8.2	16 SF	52 SF, 1 Campground
	3	1,131	220	67	68	1.2	3.1	6.5	0	0

Location	Land Use Category	Distance to Near HSR Track (feet)[1]	Maximum HSR Speed (mph)	Existing Noise Level (dBA)	Future Noise Level[2]		Noise Impact Criteria		Number of Impacts	
					Predicted[3]	Increase[4]	Moderate	Severe	Moderate	Severe
North Mercey Springs Road to Carlucci Road	2	156 - 3,940	220	53 - 69	57 - 73	4.1 - 13.4	1.1 - 3.8	3 - 8.2	6 SF, 7 MF	4 SF, 20 MF, 1 Campground
	3	779	220	56	64	7.5	5.9	10.8	1 Park	0
Total	**2**								**1,651 (1,643)**	**1,211 (1,223)**
	1, 3								**15**	**1**

Bldg. = building
dBA = A-weighted decibel
MF = multifamily residential
mph = miles per hour
SF = single family residential
SR = State Route

[1] The ranges shown for the distances, speeds, and noise levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. In locations with noise impacts, the data represent the range for those affected receptors. In locations without noise impacts, the data are representative of the receptor with the highest projected noise level increase (typically the receptor located closest to the alignment.)

[2] Noise levels for land use category 2 are based on L_{dn} and measured in dBA. Noise levels for land use categories 1 and 3 are based on L_{eq} and measured in dBA.

[3] Predicted future noise levels represent the total future predicted noise levels with the project alternatives.

[4] Increases in noise level represent the predicted increase in future noise levels with the project alternatives over the existing noise levels.

[5] Results associated with the DDV and TDV are shown in parentheses.

[6] Airborne noise was not assessed in this portion of the alignment where the alternative is in a tunnel.

Annoyance from Onset of HSR Passbys

Operations of the project would result in a sudden increase in noise for receivers along the alignment because of the rapid approach of an HSR train and a quick onset rate. Onset rate is the average rate of change of increasing sound pressure level measured in decibels per second (dB/sec) during a single noise event. The rapid approach of an HSR train is accompanied by a sudden increase in noise for a receiver near the tracks. As described in Section 4.1.3.2, Operations, startle effects are likely to occur in humans as onset rates approach 30 dB/sec when there is no advance warning of train approach.

Trains for all project alternatives would reach maximum speeds of 220 mph in certain portions of the alignments with dedicated track. As illustrated on Figure 4-5, the onset rate of 30 dB/second would be experienced by receptors within 46 feet of the train when the train is operating at 220 mph and within 23 feet when the train is operating at 110 mph. For speeds between 110 mph and 220 mph, the onset rate of 30 dB/second would be experienced at distances between 23 and 46 feet from the train. For speeds less than 110 mph, the onset rate of 30 dB/second would be experienced at distances of less than 23 feet from the train.

The project's dedicated right-of-way would be a minimum of 85 feet wide. In addition, the dedicated segments are usually on viaduct or embankments instead of at-grade, which introduces additional vertical distance separation from sensitive receptors. As the distance for the startle effect for humans is 46 feet, it is expected that the distance in which startle effects would occur would be within the dedicated right-of-way. This would apply to Alternative 1 south of I-880, Alternatives 2 and 3 south of Scott Boulevard, and Alternative 4 south of Gilroy.

Under Alternative 1, blended operations would occur between Scott Boulevard and I-880 but the right-of-way is sufficiently wide that there are no noise-sensitive receptors within 23 feet of the planned track alignments.

Under Alternative 4, blended operations would occur between Scott Boulevard in Santa Clara and San Jose and Gilroy, with speeds up to 110 mph; noise-sensitive receptors located within 23 feet of the alignment would experience an onset rate of 30 dB/second. Between Scott Boulevard and the San Jose Diridon Station, there is extensive daily train traffic along the Caltrain Corridor, including Caltrain (92 daily trains), ACE (8 daily trains), Capitol Corridor (14 daily trains), Amtrak (2 daily trains), and freight (9 daily trains). Between the San Jose Diridon Station and Tamien Station, a moderate amount of daily train traffic operates along the Caltrain Corridor including Caltrain (40 daily trains), ACE (8 daily trains), Amtrak (2 daily trains), and freight (4 daily trains). Between Tamien and Gilroy, there is limited existing daily train traffic along the Caltrain and UPRR corridors including Caltrain (6 daily trains), Amtrak (2 daily trains), and freight (4 daily trains). In these areas, trains operate up to 79 mph at present.

Passengers may be on Caltrain or HSR platforms closer than 23 feet from the tracks. However, there would be advance warning of trains approaching with announcements, horns, bells, and signage, so substantial, ongoing startle effects would not occur there with train passage. The same would be true at the at-grade crossings for vehicles, bicyclists, and pedestrians under Alternative 4.

Analysts reviewed the Alternative 4 alignment between Scott Boulevard in Santa Clara and Gilroy and found that in most areas (outside of stations and at-grade crossings) there would be more than 23 feet from the outermost track to sensitive noise receptors, and no startle effects would occur. Analysts identified one noise-sensitive receptor (a residence) within 23 feet of the

Alternative 4 tracks (receptors in properties not immediately adjacent to the railroad right-of-way would not be affected):[12]

- Morgan Hill and Gilroy Subsection
  - In Morgan Hill, one mobile home east of Wright Avenue west of the right-of-way south of Butterfield Boulevard, is within 23 feet of the proposed southbound track.

Operations of all four project alternatives would result in wayside noise near the tunnel portals in Pacheco Pass, which could startle nearby wayside receptors. As described in detail in Volume 2, Appendix 3.4-A, because the closest receptors to the tunnel portals are more than 1,000 feet away, wayside noise near the tunnel portals is not expected to cause an adverse effect on sensitive receptors.

Station Noise

The project includes the construction of two HSR stations – one passenger station would be located in San Jose adjacent to the existing San Jose Diridon Station and the other would be located in Gilroy. The San Jose Diridon Station would be the same for all four alternatives. Two station location options have been identified in Gilroy—a Downtown Gilroy Station located adjacent to the existing Gilroy Caltrain Station would be used for Alternatives 1, 2, and 4, while an East Gilroy Station would be constructed in agricultural lands east of Gilroy for Alternative 3.

The method used to assess noise impact from HSR stations is summarized in Section 4.1.5.2, Operations Noise. The dominant noise source at receptors near the HSR stations would be assumed to be HSR train movements. This analysis also assessed additional noise from station parking facilities. Preliminary layouts of the parking facilities at the HSR stations were used to identify the location and total number of parking spaces at each station location options—San Jose Diridon Station, Downtown Gilroy Station, and East Gilroy Station.

The San Jose Diridon Station would be the same for Alternatives 1-3, with a variation for Alternative 4, and would remove and relocate approximately 226 parking spaces. The Downtown Gilroy Station would have four parking areas with approximately 1,710 spaces, and the East Gilroy Station would have two parking areas with approximately 1,520 spaces. The analysis assumed that on a typical day during the three peak morning hours and three peak afternoon hours all the parking spaces would be filled once and then vacated once. During the non-peak mid-day and evening hours, the analysis assumed that a percentage of the parking spaces corresponding to the ridership peaking factors (Authority 2008) would be filled and then vacated each hour.

A noise assessment following Section 4.4 of the FTA guidance manual (FTA 2018) was conducted using these inputs and the method in Section 4.1.5.2, Operations Noise, to calculate the total noise contribution from the parking facilities at the noise-sensitive receptors near the HSR stations. Near the San Jose Diridon Station, the largest L_{dn} contribution from the parking facilities at the nearby noise receptors would be 29 dBA. Near the Downtown Gilroy Station, the largest L_{dn} contribution from the parking facilities at the nearby noise receptors would be 40 dBA. Near the East Gilroy Station, the largest L_{dn} contribution from the parking facilities at the nearby noise receptors would be 28 dBA. The results of the station noise assessment indicate that the additional noise from parking facilities would be substantially lower than the projected L_{dn} from project operations. At all nearby receptors, the L_{dn} contribution from the parking facilities would be at least 18 dB less than project operations.

Maintenance Facility Noise

One MOWF would be located near Gilroy under each project alternative. There are two potential location options for the MOWF—a South Gilroy MOWF (located south of the Downtown Gilroy Station under Alternatives 1 and 2) and an East Gilroy MOWF (located south of the East Gilroy

[12] If residences are proposed for acquisition, they are not included in the profile of potentially affected areas, as residents would not be present during operations.

Station under Alternative 3). At both locations, the mainline HSR tracks would be directly adjacent to the MOWF and the HSR speeds would be approximately 200 mph. Therefore, the noise from project operations would dominate noise from occasional HSR train movements into and out of the MOWF.

Analysts used the methods to assess noise impacts from the proposed MOWFs summarized in Section 4.1.5.2, Operations Noise. Preliminary layouts of the two MOWFs were used to identify the approximate center of noise-producing activities at the facilities. A noise assessment following Section 4.4 of the FTA guidance manual was used to predict noise exposure from the MOWFs. The project operations schedule of train movements into and out of the MOWFs identified 24 planned HSR train movements during the daytime and 12 movements during the nighttime. The L_{dn} contribution from these MOWF train movements was then calculated at all nearby noise-sensitive receptors.

The closest identified receptor (single-family residence on Bolsa Road) to the South Gilroy MOWF is more than 1,500 feet away. The L_{dn} contribution from the South Gilroy MOWF at that nearest receptor would be 40 dBA, more than 20 dB less than the project operations contribution at that receptor. The nearest receptors (residences on Pacheco Pass Highway in the rural residential Old Gilroy neighborhood) to the East Gilroy MOWF would be approximately 800 feet away. In this neighborhood, the highest L_{dn} contribution from the East Gilroy MOWF would be 47 dBA, more than 20 dB less than the operations contribution at that receptor. The nearest receptors to the Alternative 4 South Gilroy MOWF are approximately 900 feet away. In this neighborhood, the highest L_{dn} contribution from the MOWF would be 45 dBA, more than 18 dB less than the operations contribution at that receptor. As a result, the additional noise from all of the MOWFs would not contribute to noise impacts of nearby sensitive receptors.

Vehicle Traffic Noise

In addition to noise from project train operations, noise from changes in vehicle traffic volume from the project was considered for 2029 and 2040 No Project and Plus Project conditions. The project would require the relocation of some local roads; however, traffic on local roads provides only a minor contribution to overall noise levels in the project extent. A number of existing at-grade crossings would be eliminated with Alternative 2 but these are not expected to result in increases in traffic volume. Monterey Road is the only major roadway that would be substantially reconfigured by the project, with the reduction of travel lanes from six to four lanes between approximately the Capitol Expressway and Blossom Hill Road.

Noise from changes in traffic volume due to the project was assessed following the method summarized in Section 4.1.5.2. The traffic noise analysis focused on roadway segments near the HSR stations, the MOWFs, and along Monterey Road where there would be permanent lane reductions. Daily traffic volumes for these select roadway segments were used to calculate traffic growth factors to assess the potential change in noise levels for each project alternative for 2029 and 2040.

Table 5-14 identifies the roadway segments assessed for Alternative 1 in 2029. It includes the existing total average daily traffic (ADT) volumes for each roadway segment, the 2029 No Project ADT, and the 2029 Plus Project ADT for Alternative 1. The potential noise increases over existing noise conditions and over the No Project Alternative are calculated. This assessment identifies that four roadway segments near San Jose Diridon Station have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. In all cases the noise impact is determined from the increase in noise over the existing condition. For context, in comparison with the No Project Alternative, two roadway segments have the potential for an increase of 3 dB. All other segments show increases of 2 dB or less over the No Project case.

Along Monterey Road, two segments have the potential for increases of 3 dB or greater compared to existing noise conditions. However, none of the segments would have an increase greater than 1 dB compared to the No Project Alternative. All comparisons to the No Project Alternative are for informational purposes only, and not a determinant of impact. None of the roadway segments near the Downtown Gilroy Station would have a noise level increase greater

than 1 dB compared to existing noise conditions or the No Project Alternative. The largest increase in noise level for the east Gilroy roadway segments is 1 dB compared to existing noise conditions, with no increase compared to the No Project Alternative. Near the South Gilroy MOWF, one segment has the potential for a 3 dB increase compared to existing noise conditions and the No Project Alternative.

Table 5-14 Change in 2029 Traffic Noise Levels due to Project—Alternative 1

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
San Jose Diridon Station Approach Subsection						
San Jose Roadway Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	12,278	12,311	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,167	6,944	5	3
3	Stockton Avenue between Julian Street and The Alameda	7,317	14,389	14,872	3	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	24,889	26,639	2	0
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,167	4,739	1	1
6	Cahill Street between Santa Clara and San Fernando Street	2,056	4,611	6,478	5	1
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	4,056	7,361	2	3
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	11,833	16,822	6	2
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	12,389	13,150	1	0
10	Montgomery Street between Park Avenue and San Carlos	20,328	21,278	22,083	0	0
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,167	22,239	1	0
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	33,444	34,172	1	0
Monterey Corridor Subsection						
Monterey Road Roadway Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	51,611	35,972	(1)	(2)
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	12,339	12,556	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
3	Houndshaven Way between Skyway Drive and Branham Lane	844	1,056	1,333	2	1
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	12,833	12,972	1	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	46,389	39,833	3	(1)
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	29,778	23,722	2	(1)
Morgan Hill and Gilroy Subsection						
Monterey Road Roadway Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	15,389	16,278	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	24,889	26,389	4	0
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	15,222	15,389	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	6,111	6,111	2	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	18,222	17,444	0	0
Downtown Gilroy Station Roadway Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	8,333	0	0
2	Leavesley Road between Monterey Road and US 101	24,689	26,444	27,028	0	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,339	0	0
4	Monterey Road between Welburn Avenue and First Street	19,956	19,944	22,117	0	0
5	First Street between Church Street and Monterey Road	13,733	14,000	14,611	0	0
6	Monterey Road between First Street and 10th Street	8,606	8,722	11,422	1	1
7	Sixth Street between Monterey Road and US 101	6,689	6,833	7,611	1	0
8	10th Street between Monterey Road and US 101	19,672	19,889	23,778	1	1
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	30,056	30,133	0	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
10	Monterey Road between [1]0th Street and Travel Park Circle	14,956	16,222	17,494	1	0
East Gilroy Roadway Segments						
1	Marcella Avenue between Buena Vista Avenue and Leavesley Road	417	528	528	1	0
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	8,056	8,056	0	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	8,333	0	0
4	Leavesley Road between Monterey Road and US 101	24,689	26,444	27,028	0	0
5	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,339	0	0
6	Monterey Road between Welburn Avenue and First Street	19,956	19,944	22,117	0	0
Gilroy MOWF Roadway Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	4,889	N/A	N/A	N/A
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	30,056	30,133	0	0
3	10th Street between Monterey Road and US 101	19,672	19,889	23,778	1	1
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,333	6,417	3	3
5	Monterey Road between 10th Street and Travel Park Circle	14,956	16,222	17,494	1	0

(Parentheses) indicate negative values
ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.

Table 5-15 shows the roadway segments assessed for Alternative 2 in 2029. Four roadway segments near San Jose Diridon Station have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. In all cases the noise impact is determined from the increase in noise over the existing condition. For context, in comparison with the No Project Alternative, two roadway segments have the potential for an increase of 3 dB. All other segments show increases of 2 dB or less compared to No Project.

Along Monterey Road, two segments have the potential for increases of 3 dB or greater compared to existing noise conditions. However, none of the segments would have an increase greater than 1 dB compared to the No Project Alternative. None of the roadway segments near

the Downtown Gilroy Station would have a noise level increase greater than 1 dB compared to existing noise conditions or the No Project Alternative. The largest increase in noise level for the east Gilroy roadway segments is 1 dB compared to existing noise conditions, with no increase compared to the No Project Alternative. Near the South Gilroy MOWF, one segment has the potential for a 3 dB increase compared to existing noise conditions and the No Project Alternative.

Table 5-15 Change in 2029 Traffic Noise Levels due to Project—Alternative 2

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
San Jose Diridon Station Approach Subsection						
San Jose Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	12,278	12,311	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,167	6,944	5	3
3	Stockton Avenue between Julian Street and The Alameda	7,317	14,389	14,872	3	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	24,889	26,639	2	0
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,167	4,739	1	1
6	Cahill Street between Santa Clara and San Fernando Street	2,056	4,611	6,478	5	1
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	4,056	7,361	2	3
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	11,833	16,822	6	2
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	12,389	13,150	1	0
10	Montgomery Street between Park Avenue and San Carlos	20,328	21,278	22,083	0	0
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,167	22,239	1	0
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	33,444	34,172	1	0
Monterey Corridor Subsection						
Monterey Road Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	51,611	35,972	(1)	(2)
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	12,339	13,556	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
3	Houndshaven Way between Skyway Drive and Branham Lane	844	1,056	1,333	2	1
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	12,833	12,972	1	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	46,389	40,278	3	(1)
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	29,778	23,056	2	(1)
Morgan Hill and Gilroy Subsection						
Monterey Road Roadway Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	15,389	16,278	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	24,889	26,389	4	0
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	15,222	15,389	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	6,111	6,111	2	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	18,222	17,444	0	0
Downtown Gilroy Station Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	8,333	0	0
2	Leavesley Road between Monterey Road and US 101	24,689	26,444	27,028	0	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,339	0	0
4	Monterey Road between Welburn Avenue and First Street	19,956	19,944	22,117	0	0
5	First Street between Church Street and Monterey Road	13,733	14,000	14,611	0	0
6	Monterey Road between First Street and 10th Street	8,606	8,722	11,422	1	1
7	Sixth Street between Monterey Road and US 101	6,689	6,833	7,611	1	0
8	10th Street between Monterey Road and US 101	19,672	19,889	23,778	1	1
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	30,056	30,133	0	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
10	Monterey Road between 10th Street and Travel Park Circle	14,956	16,222	17,494	1	0
East Gilroy Segments						
1	Marcella Avenue between Buena Vista Avenue and Leavesley Road	417	528	528	1	0
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	8,056	8,056	0	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	8,333	0	0
4	Leavesley Road between Monterey Road and US 101	24,689	26,444	27,028	0	0
5	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,339	0	0
6	Monterey Road between Welburn Avenue and First Street	19,956	19,944	22,117	0	0
Gilroy MOWF Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	4,889	N/A	N/A	N/A
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	30,056	30,133	0	0
3	10th Street between Monterey Road and US 101	19,672	19,889	23,778	1	1
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,333	6,417	3	3
5	Monterey Road between 10th Street and Travel Park Circle	14,956	16,222	17,494	1	0

(Parentheses) indicate negative values
ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.

Table 5-16 shows the roadway segments assessed for Alternative 3 in 2029. Four roadway segments near San Jose Diridon Station have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. Compared to the No Project Alternative, two roadway segments have the potential for an increase of 3 dB. All other segments show increases of 2 dB or less. Along Monterey Road, two segments have the potential for increases of 3 dB or greater compared to existing noise conditions. In all cases the noise impact is determined from the increase in noise over the existing condition. For context, none of the segments would have an increase greater than 1 dB compared to the No Project Alternative. None of the roadway segments near the Downtown Gilroy Station would have a noise level increase greater than 1 dB compared to existing noise conditions. No increase is anticipated compared to the No Project

Alternative. One roadway segment near east Gilroy has the potential for an increase of 2 dB compared to existing noise conditions. The largest increase compared to the No Project Alternative is 1 dB. Near the East Gilroy MOWF, no increase is anticipated compared to either the existing or the No Project Alternative.

Table 5-16 Change in 2029 Traffic Noise Levels due to Project—Alternative 3

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
San Jose Diridon Station Approach Subsection						
San Jose Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	12,278	12,311	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,167	6,944	5	3
3	Stockton Avenue between Julian Street and The Alameda	7,317	14,389	14,872	3	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	24,889	26,639	2	0
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,167	4,739	1	1
6	Cahill Street between Santa Clara and San Fernando Street	2,056	4,611	6,478	5	1
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	4,056	7,361	2	3
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	11,833	16,822	6	2
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	12,389	13,150	1	0
10	Montgomery Street between Park Avenue and San Carlos	20,328	21,278	22,083	0	0
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,167	22,239	1	0
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	33,444	34,172	1	0
Monterey Corridor Subsection						
Monterey Road Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	51,611	35,972	(1)	(2)
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	12,339	12,556	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
3	Houndshaven Way between Skyway Drive and Branham Lane	844	1,056	1,333	2	1
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	12,833	12,972	1	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	46,389	39,833	3	(1)
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	29,778	23,722	2	(1)
Morgan Hill and Gilroy Subsection						
Monterey Road Roadway Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	15,389	16,278	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	24,889	26,389	4	0
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	15,222	15,389	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	6,111	6,111	2	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	18,222	17,444	0	0
Downtown Gilroy Station Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	9,144	0	0
2	Leavesley Road between Monterey Road and US 101	24,689	26,444	28,939	1	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,506	0	0
4	Monterey Road between Welburn Avenue and First Street	19,956	19,944	20,317	0	0
5	First Street between Church Street and Monterey Road	13,733	14,000	14,561	0	0
6	Monterey Road between First Street and 10th Street	8,606	8,722	8,722	0	0
7	Sixth Street between Monterey Road and US 101	6,689	6,833	6,833	0	0
8	10th Street between Monterey Road and US 101	19,672	19,889	19,889	0	0
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	30,056	30,000	0	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
10	Monterey Road between 10th Street and Travel Park Circle	14,956	16,222	16,222	0	0
East Gilroy Segments						
1	Marcella Avenue between Buena Avenue Road and Leavesley Road	417	528	739	2	1
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	8,056	8,172	0	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	9,144	0	0
4	Leavesley Road between Monterey Road and US 101	24,689	26,444	28,939	1	0
5	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,506	0	0
6	Monterey Road between Welburn Avenue and First Street	19,956	19,944	20,317	0	0
Gilroy MOWF Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	4,889	N/A	N/A	N/A
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	30,056	30,000	0	0
3	10th Street between Monterey Road and US 101	19,672	19,889	19,889	0	0
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,333	3,333	0	0
5	Monterey Road between 10th Street and Travel Park Circle	14,956	16,222	16,222	0	0

(Parentheses) indicate negative values
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.
ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility

Table 5-17 shows the roadway segments assessed for Alternative 4 in 2029. Three roadway segments near San Jose Diridon Station have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. Compared to the No Project Alternative, zero roadway segments have the potential for an increase greater than 1 dB. Along Monterey Road, three segments have the potential for increases of 3 dB or greater compared to existing noise conditions. In all cases the noise impact is determined from the increase in noise over the existing condition. For context, none of the segments would have an increase greater than 1 dB compared to the No Project Alternative. None of the roadway segments near the Downtown Gilroy Station would have a noise level increase greater than 2 dB compared to existing noise conditions or the No Project Alternative. The largest increase in noise level for the east Gilroy

roadway segments is 1 dB compared to existing noise conditions, with no increase compared to the No Project Alternative. Near the South Gilroy MOWF, the largest increase in noise level compared to existing noise conditions or the No Project Alternative is 1 dB.

Table 5-17 Change in 2029 Traffic Noise Levels due to Project—Alternative 4

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
San Jose Diridon Station Approach Subsection						
San Jose Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	12,278	12,278	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,167	3,167	1	0
3	Stockton Avenue between Julian Street and The Alameda	7,317	14,389	14,411	3	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	24,889	26,100	2	0
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,167	4,167	1	0
6	Cahill Street between Santa Clara and San Fernando Street	2,056	4,611	6,433	5	1
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	4,056	4,056	0	0
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	11,833	12,567	4	0
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	12,389	12,389	1	0
10	Montgomery Street between Park Avenue and San Carlos	20,328	21,278	21,278	0	0
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,167	22,167	1	0
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	33,444	33,444	1	0
Monterey Corridor Subsection						
Monterey Road Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	51,611	51,611	1	0
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	12,339	12,339	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
3	Houndshaven Way between Skyway Drive and Branham Lane	844	1,056	1,056	1	0
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	12,833	12,833	1	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	46,389	46,389	4	0
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	29,778	29,778	3	0
Morgan Hill and Gilroy Subsection						
Monterey Road Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	15,389	15,389	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	24,889	24,889	4	0
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	15,222	15,222	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	6,111	6,111	2	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	18,222	18,222	1	0
Downtown Gilroy Station Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	8,333	0	0
2	Leavesley Road between Monterey Road and US 101	24,689	26,444	26,444	0	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,333	0	0
4	Monterey Road between Welburn Avenue and First Street	19,956	19,944	22,117	0	0
5	First Street between Church Street and Monterey Road	13,733	14,000	13,733	0	0
6	Monterey Road between First Street and 10th Street	8,606	8,722	9,472	0	0
7	Sixth Street between Monterey Road and US 101	6,689	6,833	10,867	2	2
8	10th Street between Monterey Road and US 101	19,672	19,889	23,111	1	1
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	30,056	30,056	0	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
10	Monterey Road between 10th Street and Travel Park Circle	14,956	16,222	17,361	1	0
East Gilroy Segments						
1	Marcella Avenue between Buena Vista Avenue and Leavesley Road	417	528	528	1	0
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	8,056	8,056	0	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	8,333	8,333	0	0
4	Leavesley Road between Monterey Road and US 101	24,689	26,444	26,444	0	0
5	Welburn Avenue between Church Street and Monterey Road	15,889	16,333	16,333	0	0
6	Monterey Road between Welburn Avenue and First Street	19,956	19,944	22,117	0	0
Gilroy MOWF Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	4,889	4,889	0	0
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	30,056	30,056	0	0
3	10th Street between Monterey Road and US 101	19,672	19,889	23,111	1	1
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,333	4,206	1	1
5	Monterey Road between 10th Street and Travel Park Circle	14,956	16,222	17,361	1	0

ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.

Overall, there are relatively few roadway segments where the noise increases associated with the project alternatives in 2029 are anticipated to be greater than or equal to 3 dB. Most of those segments where increases greater than or equal to 3 dB are projected are near San Jose Diridon Station and some along the Monterey Road segment. The results of the traffic noise analysis for 2029 are similar for all project alternatives, and differ only near the MOWF near Gilroy.

Table 5-18 shows the roadway segments assessed for Alternative 1 in 2040. It includes the existing ADT volumes for each roadway segment, the 2040 No Project ADT, and the 2040 Plus Project ADT for Alternative 1. This assessment indicates that for Alternative 1 in 2040, five roadway segments near San Jose Diridon Station would have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. Compared to the

2040 No Project Alternative, one roadway segment has the potential for an increase of 3 dB. All other segments show increases of 1 dB or less. Along Monterey Road, six segments have the potential for increases of 3 dB or greater compared to existing noise conditions. However, none of the segments would have an increase greater than 1 dB compared to the No Project Alternative. None of the roadway segments near the Downtown Gilroy Station would have a noise level increase greater than 2 dB compared to existing noise conditions, or greater than 1 dB compared to the No Project Alternative. The largest increase in noise level for the east Gilroy roadway segments would be 2 dB compared to existing noise conditions, with no increase compared to the No Project Alternative. Near the South Gilroy MOWF one segment has the potential for a 3 dB increase compared to existing noise conditions and the No Project Alternative.

Table 5-18 Change in 2040 Traffic Noise Levels due to Project—Alternative 1

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
San Jose Diridon Station Approach Subsection						
San Jose Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	13,444	13,478	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,444	7,278	5	3
3	Stockton Avenue between Julian Street and The Alameda	7,317	18,833	19,311	4	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	23,056	32,006	3	1
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,667	5,239	2	1
6	Cahill Street between Santa Clara and San Fernando Street	2,056	5,722	7,217	5	1
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	5,667	7,100	2	1
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	17,167	19,978	6	1
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	11,611	14,317	1	1
10	Montgomery Street between Park Avenue and San Carlos	20,328	25,611	29,683	2	1
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,611	25,911	2	1
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	35,722	37,783	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
Monterey Corridor Subsection						
Monterey Road Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	61,667	49,000	1	(1)
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	13,444	13,444	1	0
3	Houndshaven Way between Skyway Drive and Branham Lane	844	2,389	2,611	5	0
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	20,667	20,944	3	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	36,611	46,944	4	1
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	40,389	30,333	3	(1)
Morgan Hill and Gilroy Subsection						
Monterey Road Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	16,722	17,722	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	31,000	35,056	6	1
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	17,944	18,722	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	7,278	7,278	3	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	19,667	18,778	1	0
Downtown Gilroy Station Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	3,778	(3)	0
2	Leavesley Road between Monterey Road and US 101	24,689	27,389	27,850	1	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	18,500	18,772	1	0
4	Monterey Road between Welburn Avenue and First Street	19,956	25,778	28,067	1	0
5	First Street between Church Street and Monterey Road	13,733	14,667	16,350	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
6	Monterey Road between First Street and 10th Street	8,606	11,500	14,156	2	1
7	Sixth Street between Monterey Road and US 101	6,689	7,444	8,000	1	0
8	10th Street between Monterey Road and US 101	19,672	20,167	24,117	1	1
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	20,389	21,211	(1)	0
10	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	24,189	2	0
East Gilroy Segments						
1	Marcella Avenue between Buena Vista Avenue and Leavesley Road	417	611	611	2	0
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	3,389	3,444	(4)	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	3,778	(3)	0
4	Leavesley Road between Monterey Road and US 101	24,689	27,389	27,850	1	0
5	Welburn between Church Street and Monterey Road	15,889	18,500	18,772	1	0
6	Monterey Road between Welburn Avenue and First Street	19,956	25,778	28,067	1	0
Gilroy MOWF Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	5,167	N/A	N/A	N/A
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	19,778	22,100	(1)	0
3	10th Street between Monterey Road and US 101	19,672	20,167	24,117	1	1
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,889	6,961	3	3
5	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	24,189	2	0

(Parentheses) indicate negative values
ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.

Table 5-19 shows the roadway segments assessed for Alternative 2 in 2040. Five roadway segments near San Jose Diridon Station have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. Compared to the 2040 No Project Alternative, one roadway segment has the potential for an increase of 3 dB. All other segments show increases of 1 dB or less. Along Monterey Road, six segments have the potential for increases of 3 dB or greater compared to existing noise conditions. However, none of the segments would have an increase greater than 1 dB compared to the No Project Alternative. None of the roadway segments near the Downtown Gilroy Station would have a noise level increase greater than 2 dB compared to existing noise conditions, or greater than 1 dB compared to the No Project Alternative. The largest increase in noise level for the east Gilroy roadway segments is 2 dB compared to existing noise conditions, with no increase compared to the No Project Alternative. Near the South Gilroy MOWF, one segment has the potential for a 3 dB increase compared to existing noise conditions and the No Project Alternative.

Table 5-19 Change in 2040 Traffic Noise Levels due to Project—Alternative 2

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
San Jose Diridon Station Approach Subsection						
San Jose Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	13,444	13,478	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,444	7,278	5	3
3	Stockton Avenue between Julian Street and The Alameda	7,317	18,833	19,311	4	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	23,056	32,006	3	1
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,667	5,239	2	1
6	Cahill Street between Santa Clara and San Fernando Street	2,056	5,722	7,217	5	1
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	5,667	7,100	2	1
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	17,167	19,978	6	1
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	11,611	14,317	1	1
10	Montgomery Street between Park Avenue and San Carlos	20,328	25,611	29,683	2	1
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,611	25,911	2	1
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	35,722	37,783	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
Monterey Corridor Subsection						
Monterey Road Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	61,667	49,000	1	(1)
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	13,444	17,833	2	1
3	Houndshaven Way between Skyway Drive and Branham Lane	844	2,389	2,611	5	0
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	20,667	20,944	3	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	36,611	46,944	4	1
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	40,389	30,556	3	(1)
Morgan Hill and Gilroy Subsection						
Monterey Road Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	16,722	17,722	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	31,000	35,056	6	1
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	17,944	18,722	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	7,278	7,278	3	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	19,667	18,778	1	0
Downtown Gilroy Station Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	3,778	(3)	0
2	Leavesley Road between Monterey Road and US 101	24,689	27,389	27,850	1	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	18,500	18,772	1	0
4	Monterey Road between Welburn Avenue and First Street	19,956	25,778	28,067	1	0
5	First Street between Church Street and Monterey Road	13,733	14,667	16,350	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
6	Monterey Road between First Street and 10th Street	8,606	11,500	14,156	2	1
7	Sixth Street between Monterey Road and US 101	6,689	7,444	8,000	1	0
8	10th Street between Monterey Road and US 101	19,672	20,167	24,117	1	1
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	20,389	21,211	(1)	0
10	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	24,189	2	0
East Gilroy Segments						
1	Marcella Avenue between Buena Vista Avenue and Leavesley Road	417	611	611	2	0
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	3,389	3,444	(4)	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	3,778	(3)	0
4	Leavesley Road between Monterey Road and US 101	24,689	27,389	27,850	1	0
5	Welburn Avenue between Church Street and Monterey Road	15,889	18,500	18,772	1	0
6	Monterey Road between Welburn Avenue and First Street	19,956	25,778	28,067	1	0
Gilroy MOWF Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	5,167	N/A	N/A	N/A
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	19,778	22,100	(1)	0
3	10th Street between Monterey Road and US 101	19,672	20,167	24,117	1	1
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,889	6,961	3	3
5	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	24,189	2	0

(Parentheses) indicate negative values
ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.

Table 5-20 shows the roadway segments assessed for Alternative 3 in 2040. Five roadway segments near San Jose Diridon Station have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. Compared to the 2040 No Project Alternative, one roadway segment has the potential for an increase of 3 dB. All other segments show increases of 1 dB or less. Along Monterey Road, five segments have the potential for increases of 3 dB or greater compared to existing noise conditions. However, none of the segments would have an increase greater than 1 dB compared to the No Project Alternative. None of the roadway segments near the Downtown Gilroy Station would have a noise level increase greater than 2 dB compared to existing noise conditions or greater than 1 dB compared to the No Project Alternative. One roadway segment near east Gilroy as the potential for an increase of 3 dB compared to existing noise conditions and an increase of 1 dB compared to the No Project Alternative. Near the East Gilroy MOWF, the largest increase compared to existing noise conditions is 2 dB and 1 dB compared to the No Project Alternative.

Table 5-20 Change in 2040 Traffic Noise Levels due to Project—Alternative 3

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
San Jose Diridon Station Approach Subsection						
San Jose Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	13,444	13,478	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,444	7,278	5	3
3	Stockton Avenue between Julian Street and The Alameda	7,317	18,833	19,311	4	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	23,056	32,006	3	1
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,667	5,239	2	1
6	Cahill Street between Santa Clara and San Fernando Street	2,056	5,722	7,217	5	1
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	5,667	7,100	2	1
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	17,167	19,978	6	1
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	11,611	14,317	1	1
10	Montgomery Street between Park Avenue and San Carlos	20,328	25,611	29,683	2	1
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,611	25,911	2	1
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	35,722	37,783	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
Monterey Corridor Subsection						
Monterey Road Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	61,667	49,000	1	(1)
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	13,444	13,444	1	0
3	Houndshaven Way between Skyway Drive and Branham Lane	844	2,389	2,611	5	0
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	20,667	20,944	3	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	36,611	46,944	4	1
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	40,389	30,333	3	(1)
Morgan Hill and Gilroy Subsection						
Monterey Road Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	16,722	17,722	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	31,000	35,056	6	1
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	17,944	18,722	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	7,278	7,278	3	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	19,667	18,778	1	0
Downtown Gilroy Station Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	4,578	(3)	1
2	Leavesley Road between Monterey Road and US 101	24,689	27,389	29,583	1	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	18,500	18,894	1	0
4	Monterey Road between Welburn Avenue and First Street	19,956	25,778	26,178	1	0
5	First Street between Church Street and Monterey Road	13,733	14,667	16,344	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
6	Monterey Road between First Street and 10th Street	8,606	11,500	11,506	1	0
7	Sixth Street between Monterey Road and US 101	6,689	7,444	7,511	1	0
8	10th Street between Monterey Road and US 101	19,672	20,167	21,400	0	0
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	20,389	23,306	(1)	1
10	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	22,500	2	0
East Gilroy Segments						
1	Marcella Avenue between Buena Vista Avenue and Leavesley Road	417	611	822	3	1
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	3,389	3,506	(4)	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	4,578	(3)	1
4	Leavesley Road between Monterey Road and US 101	24,689	27,389	29,583	1	0
5	Welburn Avenue between Church Street and Monterey Road	15,889	18,500	18,894	1	0
6	Monterey Road between Welburn Avenue and First Street	19,956	25,778	26,178	1	0
Gilroy MOWF Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	5,167	N/A	N/A	N/A
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	19,778	23,306	(1)	1
3	10th Street between Monterey Road and US 101	19,672	20,167	21,400	0	0
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,889	3,889	1	0
5	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	22,500	2	0

(Parentheses) indicate negative values
ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.

Table 5-21 shows the roadway segments assessed for Alternative 4 in 2040. Four roadway segments near San Jose Diridon Station have the potential for noise level increases greater than or equal to 3 dB compared to existing noise conditions. Compared to the 2040 No Project Alternative, the largest increase is 2 dB, and all other segments show increases of 1 dB or less. Along Monterey Road, six segments have the potential for increases of 3 dB or greater compared to existing noise conditions. However, none of the segments would have an increase greater than 2 dB compared to the No Project Alternative. One roadway segment near the Downtown Gilroy Station would have a noise level increase greater than or equal to 3 dB compared to existing noise conditions, and compared to the No Project Alternative none would have increases greater than 2 dB. The largest increase in noise level for the east Gilroy roadway segments is 1 dB compared to existing noise conditions, with no increase compared to the No Project Alternative. Near the South Gilroy MOWF, one segment has the potential for an increase greater than 3 dB compared to existing noise conditions and the No Project Alternative.

Table 5-21 Change in 2040 Traffic Noise Levels due to Project—Alternative 4

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
San Jose Diridon Station Approach Subsection						
San Jose Segments						
1	Julian between Stockton Avenue and Autumn Street	10,400	13,444	13,444	1	0
2	Autumn Street between Julian and Santa Clara	2,400	3,444	3,444	2	0
3	Stockton Avenue between Julian Street and The Alameda	7,317	18,833	18,856	4	0
4	The Alameda between Sunol Avenue and Delmas Avenue	16,861	23,056	32,389	3	1
5	Sunol Avenue between The Alameda and Park Avenue	3,522	4,667	4,667	1	0
6	Cahill Street between Santa Clara and San Fernando Street	2,056	5,722	8,589	6	2
7	Montgomery Street between Santa Clara Street and Park Avenue	4,428	5,667	6,533	2	1
8	Autumn Street between Santa Clara Street and Park Avenue	4,494	17,167	18,456	6	0
9	Park Avenue between Sunol Avenue and Montgomery Street	10,550	11,611	13,722	1	1
10	Montgomery Street between Park Avenue and San Carlos	20,328	25,611	25,611	1	0
11	San Carlos Street between Sunol Avenue and Montgomery Street	16,089	22,611	25,833	2	1
12	Bird Avenue between San Carlos Street and West Virginia Street	27,206	35,722	35,722	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA) [1]
Monterey Corridor Subsection						
Monterey Road Segments						
1	Monterey Road between Capitol Expressway WB Ramps and Branham Lane	40,644	61,667	61,667	2	0
2	Skyway Drive between Monterey Road and Houndshaven Way	10,722	13,444	13,444	1	0
3	Houndshaven Way between Skyway Drive and Branham Lane	844	2,389	2,389	5	0
4	Branham Lane between Monterey Road and Houndshaven Way	11,178	20,667	20,667	3	0
5	Monterey Road between Branham Lane and Chynoweth Avenue	19,756	36,611	55,722	5	2
6[2]	Monterey Road between Chynoweth Avenue and Bernal Road	14,944	40,389	40,389	4	0
Morgan Hill and Gilroy Subsection						
Monterey Road Segments						
7	Bernal Road between Monterey Road and Santa Teresa Boulevard	13,117	16,722	16,722	1	0
8	Santa Teresa Boulevard between Bernal Road and Bailey Avenue	9,844	31,000	31,000	5	0
9	Hale Avenue between Baily Avenue and Llagas Road	10,661	17,944	17,944	2	0
10	Llagas Road between Hale Avenue and Old Monterey Road	4,022	7,278	7,278	3	0
11	Monterey Road between Bernal Road and Old Monterey Road	15,811	19,667	19,667	1	0
Downtown Gilroy Station Segments						
1	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	3,722	(4)	0
2	Leavesley Road between Monterey Road and US 101	24,689	27,389	27,389	0	0
3	Welburn Avenue between Church Street and Monterey Road	15,889	18,500	18,500	1	0
4	Monterey Road between Welburn Avenue and First Street	19,956	25,778	28,067	1	0
5	First Street between Church Street and Monterey Road	13,733	14,667	15,778	1	0

Segment	Roadway Segment Description	Existing ADT	No Project ADT	Plus Project ADT	Noise Increase Over Existing (dBA)	Noise Increase Over No Project (dBA)[1]
6	Monterey Road between First Street and 10th Street	8,606	11,500	14,444	2	1
7	Sixth Street between Monterey Road and US 101	6,689	7,444	12,568	3	2
8	10th Street between Monterey Road and US 101	19,672	20,167	25,128	1	1
9	Pacheco Pass Highway between US 101 and Cameron Boulevard	27,900	20,389	20,389	(1)	0
10	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	24,511	2	0
East Gilroy Segments						
1	Marcella Avenue between Buena Vista Avenue and Leavesley Road	417	611	528	1	(1)
2	Leavesley Road between Marcella Avenue and New Avenue	8,067	3,389	3,389	(4)	0
3	Leavesley Road between US 101 and Cameron Boulevard Extension	8,400	3,722	3,722	(4)	0
4	Leavesley Road between Monterey Road and US 101	24,689	27,389	27,389	0	0
5	Welburn Avenue between Church Street and Monterey Road	15,889	18,500	18,500	1	0
6	Monterey Road between Welburn Avenue and First Street	19,956	25,778	28,067	1	0
Gilroy MOWF Segments						
1	Frazier Lake Road south of Pacheco Pass Highway	4,317	5,167	5,167	1	0
2	Pacheco Pass Highway between US 101 and Frazier Lake Road	27,900	19,778	20,389	(1)	0
3	10th Street between Monterey Road and US 101	19,672	20,167	25,128	1	1
4	Alexander Street between Old Gilroy Street and 10th Street	3,233	3,889	7,872	4	3
5	Monterey Road between 10th Street and Travel Park Circle	14,956	22,278	24,511	2	0

(Parentheses) indicate negative values
ADT = average daily traffic
dBA = A-weighted decibel
MOWF = maintenance of way facility
[1] The noise increase over No Project data are presented only for reference purposes. The noise increase over existing is what determines impact.
[2] Monterey Road Roadway Segment number 6, Monterey Road between Chynoweth Avenue and Bernal Road, is in both the Monterey Corridor Subsection and the Morgan Hill and Gilroy Subsection.

Overall, there are relatively few roadway segments where the increases in traffic associated with the project alternatives under the 2040 Plus Project Alternative are anticipated to be greater than or equal to 3 dB. Most of the segments where increases greater than or equal to 3 dB are projected are near San Jose Diridon Station and some along the Monterey Road segment. The results of the traffic noise analysis for 2040 are similar for all project alternatives, and differ only near the MOWF near Gilroy.

The traffic noise predictions have been made by comparing the existing traffic volumes to 2040 Plus Project volumes and by comparing the 2040 No Project volumes to the 2040 Plus Project volumes. The traffic volume predictions include growth factors unrelated to the project alternatives. In all cases the noise impact is determined from the increase in noise over the existing condition. As would be expected, the analysis shows greater potential increases in traffic noise compared to the existing noise conditions than when compared to the No Project Alternative.

Noise Effects on Livestock Animals

The project would extend through rural, agricultural, and open space lands in southern Santa Clara, San Benito, and Merced Counties. Livestock (cattle) are present in rangelands along the project alignments, particularly in the Pacheco Pass Subsection. Additionally, dairy is an important agricultural product in Merced County and confined animal agricultural operations are prevalent in the San Joaquin Valley.

Operations of the project would stress livestock animals by subjecting them to increased noise and vibration levels within 30 feet of the HSR right-of-way. The FRA guidance manual (FRA 2012) establishes an SEL of 100 dBA from a single train passby as the criteria for potential noise impacts on livestock. The criteria for potential effects are shown in Table 4-4. Analysts conducted a noise screening assessment to determine typical and maximum distances from the HSR tracks at which the limits may be exceeded. HSR passby SELs were calculated for various track types typical in the project: at-grade track, track on 10-foot-high embankment, and track on 50-foot-high viaduct. The projections were calculated for a HSR train traveling at a typical speed of 150 mph and at the maximum speed in the Project Section of 220 mph. For reference, a projection was also calculated for a HSR train sounding a warning horn. To provide conservative estimates, no shielding from intervening structures was assumed.

Table 5-22 shows the results of the screening assessment. For HSR track at grade and on embankment, the screening distances for potential effects on animals would be 15 feet from the track centerline for trains traveling at 110 mph, 25 feet from the track centerline for trains traveling at 150 mph, and 70 feet for trains traveling at 220 mph. At locations where the project would be on a 50-foot-high viaduct, the passby SEL of 100 dBA would not be surpassed beyond the edge of the aerial structure, approximately 15 feet from the track centerline. At locations where the HSR train would sound warning horns, the screening distance would be approximately 285 feet from the track centerline. For reference, screening distances have also been calculated and added to Table 5-22 for a Caltrain train and a freight train passby sounding warning horns. The screening distances are 62 feet and 290 feet, respectively.

According to the screening distance information provided in Table 5-19, livestock might be within the screening distance for an at-grade or 10-foot-high embankment HSR (i.e., within 70 feet of either side of the track centerline [for a total width of 140 feet]). Because fences control access to the right-of-way and the right-of-way would be a minimum of 85 feet wide, livestock would have to be within approximately 30 feet of the edge of the HSR right-of-way to experience noise effects above the recommended threshold. Where domestic animal operations are adjacent to the HSR right-of-way, adverse effects would occur within 30 feet of the HSR right-of-way because of passbys or within 285 feet of horn-sounding locations. These impacts will be temporary and of short duration.

As described in Appendix 3.12-E, High-Speed Rail Impacts on Confined Animal Agriculture Facilities, several confined animal agriculture facilities along the HSR alignment would be located within 100 feet of the centerline of the project alignment in the San Joaquin Valley subsection, and livestock animals within 30 feet of the right-of-way fence could be affected by train passbys. The figures in Appendix 3.12-E, show confined animal agriculture facilities that would be affected by the alternatives. Livestock may become habituated to train noise over time.

Alternatives 1, 2, and 3 would be grade separated on dedicated tracks and thus no horn sounding would be necessary at any at-grade crossings, and since HSR would operate on tracks that are physically separate from Caltrain, HSR trains would not sound horns at Caltrain stations. For these reasons no horn-sounding effects on livestock would occur. With Alternative 4, HSR would sound horns at at-grade crossings and Caltrain stations between San Jose and Gilroy. In urban areas of San Jose, Morgan Hill, and Gilroy and the developed area of San Martin and adjacent to the Caltrain stations, there is limited to no livestock areas. Thus, potential horn-sounding effects on livestock with Alternative 4 are limited to the rural area between San Jose and Morgan Hill (e.g., Coyote Valley) and the semi-rural area between San Martin and Gilroy. In these two areas, livestock would be sporadically within the screening distance for an HSR train sounding the warning horn at an at-grade crossing (i.e., within 285 feet of either side of the track centerlines) similar to how existing livestock is within the screening distances for existing Caltrain and freight sounding warning horn noise at at-grade crossings. Horn sounding in these areas would increase in frequency, but horn intensity would not increase over current levels.

At locations adjacent to existing rail right-of-way or busy highways where existing noise is already high, there would be no effects because livestock would be expected to be habituated to high noise levels.

Table 5-22 Screening Distances for Effects on Livestock

HSR Configuration	Speed (mph)	SEL[1] (dBA)	Distance from HSR Centerline (feet)
HSR on at-grade track	110	100	15
	150	100	25
	220	100	70
HSR on 10-foot-high embankment	150	100	25
	220	100	70
HSR on 50-foot high viaduct[2]	150	88	15
	220	94	15
HSR on at-grade track, sounding warning horn	110	100	285
Caltrain on at-grade track, sounding warning horn	79	100	62
Freight train on at-grade track, sounding warning horn	60	100	290

mph = miles per hour
SEL = sound exposure level
dBA = A-weighted decibel
[1] The SEL represents a receptor's cumulative noise exposure from an event normalized to a 1-second interval. This noise descriptor is used to assess effects on livestock.
[2] The aerial structure projections assume a parapet barrier on the edge of the aerial structure assumed to be 3 feet above the top-of-rail height. The distance from the track centerline where the SEL = 100 dBA is less than 15 feet.

Traction Power Facility Noise

Analysts identified potentially affected noise-sensitive receivers near traction power facilities using the screening distance of 250 feet for receivers with an unobstructed view to the facilities and 125 feet for those with intervening buildings. FTA reference levels were used to calculate the total project noise level at the receivers identified within the screening distance. For Alternative 4, within the Diridon Station Approach subsection, the HSR TPF would be co-located with the Caltrain facility (PS2 – Option 2), which was previously analyzed for the PCEP (Wilson Ihrig 2014), for which no noise sensitive receptors were identified within the screening distance.

Train operations noise levels were also calculated using the methods described in Section 4.1.5.2 to assess the total project noise levels considering ambient noise at the receivers and accounting for both changes from project operations and the new substation/facility noise source. The noise levels from ancillary facilities were estimated. The highest noise levels from ancillary facilities would be 63 L_{dn} dBA at 110 feet, but no TPF would generate noise impact due to the substation facility alone. Furthermore, in combination with the HSR train operations, the substation noise would not affect any new receptors not separately affected by the train operation impacts shown previously in Table 5-23. TPF combined with HSR train operations would generate noise impacts at several areas (7 receptors with Alternative 1, 1 receptor for Alternative 2, 9 receptors with Alternative 3, and 33 receptors for Alternative 4). Furthermore, this analysis is conservative because distances were based on the closest outer footprint of facility, and the specific distance to noise sources would be greater in many cases.

Table 5-23 Transfer Power Facility Noise Analysis Results

City (Subsection)	Facility[1] (Alternative)[1]	Near Receptor Address	Land Use Category[2]	Land Use	Receptor Distance to Ancillary Facility (feet)	Ambient L_{dn}	Substation Noise, L_{dn} (dBA)	Project with TPF				Number of Receivers	Noise Impact Thresholds		Noise Increase with Project and TPF			
								Alt 1	Alt 2	Alt 3	Alt 4		Moderate	Severe	Alt 1	Alt 2	Alt 3	Alt 4
San Jose (Monterey Corridor)	PS	5560 Lexington Avenue, SJ	2	MFR	110 (first row)	69.1	63	N	N	N	73.2	15	1.1	2.9	N/A	N/A	N/A	5.8
San Jose (Monterey Corridor)	PS	5560 Lexington Avenue, SJ	2	MFR	150 (further away)	69.1	60	N	N	N	73.2	15	1.1	2.9	N/A	N/A	N/A	5.7
Morgan Hill (Morgan Hill and Gilroy)	PS	17359 Walnut Grove Drive Morgan Hill	2	SFR	218	66.3	57	67.6	N	67.6	N	5	1.3	3.4	3.9	N/A	3.9	N/A
Morgan Hill (Morgan Hill and Gilroy)	PS	890 San Bernardo Lane	2	MFR	246	65.1	56	66.6	N	66.6	N	1	1.3	3.4	3.4	N/A	3.4	0.0
Gilroy (Morgan Hill and Gilroy)	SWS	Cohansey Avenue at Monterey Road	2	MFR	200	71.7	61	N	N	N	73.4	2	1.4	3.6	N/A	N/A	N/A	9.1

City (Subsection)	Facility[1] (Alternative)[1]	Near Receptor Address	Land Use Category[2]	Land Use	Receptor Distance to Ancillary Facility (feet)	Ambient L_{dn}	Substation Noise, L_{dn} (dBA)	Project with TPF				Number of Receivers	Noise Impact Thresholds		Noise Increase with Project and TPF			
								Alt 1	Alt 2	Alt 3	Alt 4		Moderate	Severe	Alt 1	Alt 2	Alt 3	Alt 4
Gilroy (Morgan Hill and Gilroy)	PS	Pacific Point School, 2220 Pacheco Pass Highway	1	school	100	70.2	64	N	N	71.6	N	1	0.8	2.5	N/A	N/A	3.3	N/A
Gilroy (Morgan Hill and Gilroy)	PS	2225 Pacheco Pass Highway	2	SFR	115	70.2	63	N	N	71.9	N	1	1.0	2.7	N/A	N/A	4.3	N/A
Gilroy (Morgan Hill and Gilroy)	PS	2160 Pacheco Pass Highway	2	SFR	95	75.3	64	TAKE				1	N/A	N/A	N/A			
Hollister (Morgan Hill and Gilroy)	PS	7968 Lover's Lane, Hollister	2	SFR	240	54.1	56	TAKE				1	N/A	N/A	N/A			
Gilroy (Morgan Hill and Gilroy)	TPSS Site 4 Gilroy	Residence near San Felipe Road at SR 152	2	SFR	175	69.6	59	70.3	70.3	70.3	70.3	1	1.1	2.8	3.5	3.5	3.5	3.5
Gilroy (Morgan Hill and Gilroy)	TPSS Site 4 Gilroy	Bloomfield Avenue at Nursery	2	MFR	187	61.2	58	TAKE*		N	TAKE*	2	N/A	N/A	N/A			

City (Subsection)	Facility[1] (Alternative)[1]	Near Receptor Address	Land Use Category[2]	Land Use	Receptor Distance to Ancillary Facility (feet)	Ambient L_{dn}	Substation Noise, L_{dn} (dBA)	Project with TPF				Number of Receivers	Noise Impact Thresholds		Noise Increase with Project and TPF			
								Alt 1	Alt 2	Alt 3	Alt 4		Moderate	Severe	Alt 1	Alt 2	Alt 3	Alt 4
Gilroy (Morgan Hill and Gilroy)	TPSS Site 4 Gilroy	Bloomfield Avenue at Nursery	2	SFR	170	61.2	58	TAKE*		N	TAKE*	1	N/A	N/A				

L_{dn} = day-night sound level, dBA
dBA = A-weighted decibel
TPF = traction power facility
PS = paralleling station
MFR = multifamily residence
N: Building not affected by TPF for this alternative
N/A = not applicable
SFR = single-family residence
SWS = switching station
TPSS = traction power supply station
SR = State Route
[1] Facilities not listed have no noise sensitive receivers within 250 feet of the facility.
[2] FRA land use categories are summarized in Table 3.4-5. Land Use Category 1 = areas where quiet is an essential element to the land use; Category 2 = Residential; Category 3 = Institutional use and passive-use parks.
Take: property would be acquired by the Authority; buildings not counted
* Take only affects Alternatives 1, 2, and 4.

5.2 Vibration

5.2.1 Existing Vibration Environment

This section summarizes the locations of existing vibration measurement sites and the results of vibration measurement. This section also describes the vibration-sensitive land uses and sources of existing vibration in the RSA.

5.2.1.1 Vibration Measurement Results and Discussion

Measurements of the existing vibration levels were conducted at 14 sites in the RSA. The locations of the vibration measurement sites are illustrated on Figures 5-1 through 5-5, and photographs of these sites are provided in Appendix A.

The existing vibration measurement results are shown in Table 5-24. At each site, ground-borne vibration levels were recorded at multiple distances, and the range of distances from the track centerline from where the vibration levels were measured are shown in Table 5-24. The results include the range of maximum overall ground-borne vibration levels for each type of train passby based on the distance from the track. The range in measured vibration levels corresponds directly to the accelerometer or geophone distance from the track. Higher vibration levels occur closer to the existing tracks and the vibration levels decrease with distance from the track.

The FRA notes that typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible (FRA 2012). For most of the RSA, the dominant existing vibration sources are train traffic. In subsections where the vibration RSA diverges from existing railroad right-of-way, there are no significant sources of existing vibration. Traffic on roadways can cause some vibration, but because of the rubber tires on the vehicles, those vibration levels are typically low and isolated to locations close to roadways; vibration from traffic is only mentioned if the levels are comparable to 72 VdB. The vibration-sensitive land uses in the RSA are generally located where the vibration RSA is adjacent to existing rail rights-of-way and therefore, where existing ambient vibration measurements were conducted.

Table 5-24 Existing Vibration Measurement Locations

Site	Location	Date	Distance from Track (feet)	Overall Vibration Level (VdB)	Source
San Jose Diridon Station Approach Subsection					
V31	2075 Main Street, Santa Clara	10/20/2009	80 – 125	78 – 73	Caltrain
V32	890 Newhall Street, San Jose	7/1/2016	50 – 138	79 – 73	Caltrain
V33	855 McKendrie Street, San Jose	3/10/2010	70 – 195	77 – 70	Caltrain
			83 – 258	77 – 68	Amtrak
			100 – 270	73 – 64	Freight
V34	782 Auzerais Avenue, San Jose	5/29/2013	25 – 214	89 – 58	Caltrain
V35	704 Harrison Street, San Jose	7/1/2016	40 – 114	83 – 70	Caltrain
V36	Jerome Street & Willis Avenue, San Jose	7/28/2016	105 – 160	68 – 56	Caltrain
			45 – 150	74 – 59	Caltrain
			45 – 135	64 – 54	ACE

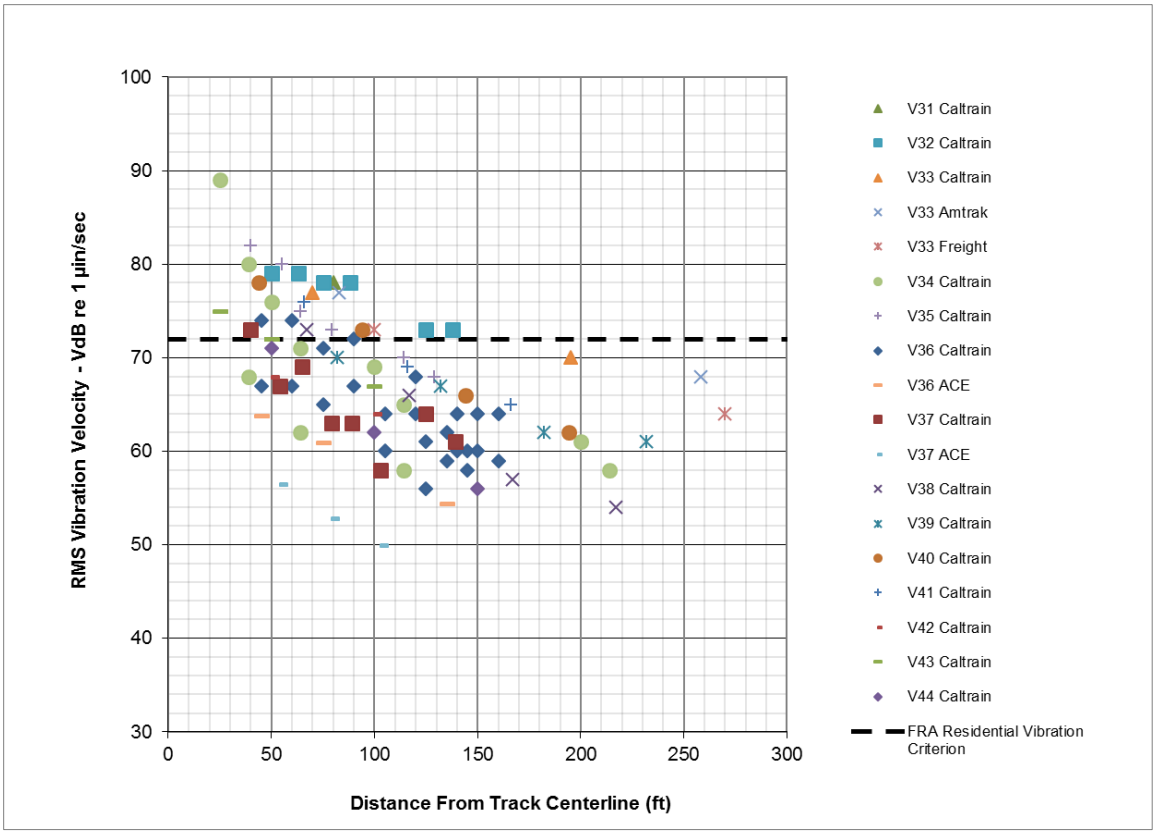
Site	Location	Date	Distance from Track (feet)	Overall Vibration Level (VdB)	Source
V37	Fuller Avenue & Delmas Avenue, San Jose	5/31/2016	40 – 139	73 – 58	Caltrain
			54 – 103	56 – 50	ACE
Monterey Corridor Subsection					
V38	Pomme Court & Olive Hill Drive, San Jose	6/01/2016	67 – 217	73 – 54	Caltrain
V39	Hayes Avenue & Endicott Boulevard, San Jose	5/17/2016	82 – 232	70 – 61	Caltrain
Morgan Hill and Gilroy Subsection					
V40	Old Monterey Road & Paloma Drive, Morgan Hill	5/18/2016	44 – 194	78 – 62	Caltrain
V41	East Middle Avenue & Crowner Avenue, San Martin	5/18/2016	66 – 166	76 – 65	Caltrain
V42	Depot Street & North Street, San Martin	7/21/2016	25 – 100	75 – 64	Caltrain
V43	Depot Street & South Street, San Martin	7/21/2016	25 – 100	75 – 67	Caltrain
V44	Railroad Street & Lewis Street, Gilroy	5/18/2016	50 – 150	71 – 56	Caltrain

VdB = vibration decibels

Figure 5-26 illustrates results of the existing vibration measurements. The overall ground-borne vibration velocity levels at each site at each measurement distance from the tracks are included. The various symbols in the figure identify the site and each type of train passby. For reference, the FRA residential vibration criterion of 72 VdB is also included, showing the range of distances at which existing train vibration currently exceeds the criterion. The measurements show that the vibration levels decrease with distance, which varies at each site as a function of distance from the track, the train type, and train speed. At most sites, the overall vibration levels exceeded the FRA residential criterion at locations less than 50 feet from the track and at some sites up to approximately 100 feet from the track, which is less than would typically be expected.

As discussed in Section 4.2.4, Methods for Establishing Existing Vibration Levels, vibration propagation measurements were conducted at 10 locations in the RSA to assist in the prediction of ground-borne vibration levels from project operations. The vibration propagation measurements shown in Table 5-25 are site-specific tests that quantify the efficiency of vibration propagation through the soil at specific locations. The results are used to conduct a detailed vibration analysis and predict future ground-borne vibration levels from project operations.

Surface vibration propagation tests were conducted at nine locations in the RSA. One borehole vibration propagation test was also conducted in the RSA during previous work in 2010. The LSR data from each propagation measurement site are plotted in Appendix C, which also provides LSR coefficients for each site.



FEBRUARY 2019

Figure 5-26 Existing Vibration Measurement Levels

Table 5-25 Vibration Propagation Measurement Locations

Site	Location	Date	Test Type	Depth (feet)[1]
San Jose Diridon Station Approach				
VP19	Main Street & Washington Street, Santa Clara	3/25/2010	Borehole	50, 60, 70
VP20	855 McKendrie Street, San Jose	3/10/2010	Surface	0
VP21	Jerome Street & Willis Avenue, San Jose	7/28/2016	Surface	0
Monterey Corridor Subsection				
VP22	Hayes Avenue & Endicott Boulevard, San Jose	5/17/2016	Surface	0
Morgan Hill and Gilroy				
VP23	Old Monterey Road & Paloma Drive, Morgan Hill	5/18/2016	Surface	0
VP24	Seymour Avenue & East Middle Avenue, San Martin	7/22/2016	Surface	0
VP25	Depot Street & North Avenue, San Martin	7/21/2016	Surface	0
VP26	Depot Street & Spring Street, San Martin	5/18/2016	Surface	0
VP27	Alexander Street & East Eighth Street, Gilroy	5/19/2016	Surface	0

Site	Location	Date	Test Type	Depth (feet)[1]
San Joaquin Valley				
VP28	Volta Road & Henry Miller Road, Los Banos	5/24/2016	Surface	0

[1] At site VP19, vibration propagation was measured at multiple borehole depths.
[2] No vibration propagation measurements were conducted in the Pacheco Pass Subsection because no sensitive receptors are near the project.

San Jose Diridon Station Approach Subsection

In San Jose, the vibration RSA follows the Caltrain right-of-way through moderately dense urban areas with mixed land use. North of San Jose Diridon Station, the land use on the east side of the existing rail alignment is primarily industrial, while the western side is mainly residential. The closest residence is approximately 50 feet from the existing railway line. Bellarmine College Preparatory School campus is on the western side of the vibration RSA. At San Jose Diridon Station, there are multifamily buildings along the entire west side of San Jose Diridon Station facing the existing tracks and platforms. Templo La Hermosa church is on the eastern side of the station, beyond the parking lots approximately 550 feet from the station.

South of San Jose Diridon Station, the vibration RSA follows I-280 and SR 87. Land uses include residential neighborhoods and some commercial/industrial areas. The San Jose Fire Department Bureau of Field Operations campus is located just south of San Jose Diridon Station on the east side of the RSA. Gardner Elementary School is located approximately 275 feet south of I-280 on the south side of the RSA.

Existing vibration in this portion of the RSA is dominated by a number of daily rail operations that share the alignment (Table 4-8). This alignment is a heavily used rail corridor with 92 daily weekday Caltrain passenger trains currently operating between San Francisco and San Jose Diridon Station. Forty daily Caltrain trains operate through to Tamien Station. Approximately two to nine freight trains run along the route per day. Fourteen Capital Corridor and eight ACE trains run along the alignment daily between De La Cruz Boulevard and San Jose Diridon Station. ACE trains continue to travel south to Tamien Station to access the layover facility. Amtrak Coast Starlight trains pass through the section twice daily. Santa Clara VTA light rail trains run along the center of SR 87.

Vibration from Caltrain trains was measured at three sites north of San Jose Diridon Station. Overall ground-borne vibration levels from Caltrain measured at the closest positions ranged from 79 VdB (at 50 feet) to 77 VdB (at 80 feet) from the tracks. The vibration levels from Amtrak trains measured at V33 were similar to Caltrain trains. Vibration levels from freight train operations measured at V33 ranged from 73 VdB (at 100 feet) to 64 VdB (at 270 feet).

Vibration from Caltrain trains was measured at three sites south of San Jose Diridon Station. Overall vibration levels from Caltrain at the closest positions ranged from 83 VdB (at 40 feet) to 68 VdB (at 105 feet). Vibration levels from ACE trains at V36 were lower than Caltrain trains.

Monterey Corridor Subsection

South of West Alma Avenue, the vibration RSA extends along SR 87 until south of Almaden Expressway where it turns east toward Monterey Road following the UPRR right-of-way. Land uses along the Monterey Corridor Subsection include primarily single-family residential neighborhoods and some commercial/industrial areas. Toward the southern end of the subsection, land uses include scattered single-family homes and farms.

The closest residence is approximately 30 feet from the existing railway line, near Skyway Drive, where backyards of single-family homes abut the right-of-way. An Elk's Lodge on West Alma Avenue is approximately 180 feet from SR 87 on the west side of the RSA. A recording studio is on the east side of the RSA, although it is approximately 350 feet from the existing railway and behind some intervening commercial buildings. The School of the Blues music school is located

on Monterey Road, approximately 190 feet from the existing railway line. Other institutional land uses include Edenvale Branch Library and four places of worship.

Sources of existing vibration include traffic on SR 87 and Monterey Road, as well as the existing rail traffic along UPRR. South of Tamien station the daily rail traffic consists of six Caltrain passenger trains, two Amtrak trains, and approximately four freight trains per day. VTA light rail also run along the center of SR 87.

Vibration from Caltrain trains was measured at site V38. Overall vibration levels from Caltrain ranged from 73 VdB (at 67 feet) to 54 VdB (at 217) feet from the tracks. Vibration from Caltrain trains was also measured at site V39. Overall vibration levels ranged from 70 VdB (at 82 feet) to 61 VdB (at 232) feet from the tracks.

Morgan Hill and Gilroy Subsection

Along Monterey Road through Downtown Gilroy

The vibration RSA extends along the single UPRR track from Bernal Way into downtown Gilroy. It continues past the existing Gilroy Caltrain Station, along UPRR south of downtown, and then turns east toward the Pacheco Pass Highway near Bloomfield Avenue. Land uses include farms with scattered single-family homes, and residential neighborhoods and commercial areas in Morgan Hill and San Martin. The closest residences to the existing railway line are a row of single-family homes approximately 40 feet away, where backyards abut the right-of-way, between Bernal Way and Metcalf Road. Three hotels are within 200 feet of the existing railway line. The closest school is approximately 145 feet from the existing railway line. The closest place of worship is located approximately 150 feet from the existing railway line. In downtown Morgan Hill, the Morgan Hill Community Center outdoor amphitheater is approximately 500 feet from the existing railway line and the South Valley Civic Theatre and Community Playhouse is more than 600 feet from the railway line.

In the downtown area, land uses include a mix of residential neighborhoods and commercial/industrial areas. South of downtown, land uses include farms with scattered single-family homes. The closest residential building to the existing railway line is approximately 50 feet from UPRR track on Monterey Road and Lewis Street. The closest school is Gilroy Preparatory School, which is approximately 145 feet from the existing railway line. Pintello Comedy Theater is approximately 365 feet from the existing railway line and the District Theater Live Music Venue is 50 feet from the railway line.

Sources of existing vibration include existing rail traffic along UPRR (six Caltrain passenger trains, two Amtrak passenger trains, and approximately four freight trains per day). Caltrain trains stop at the existing Gilroy station, which is where Caltrain service terminates. Amtrak and freight trains continue to operate south of Gilroy. Low level vibration occurs from traffic on Monterey Road.

Vibrations from Caltrain trains were measured at five sites from Morgan Hill to Gilroy. Overall ground-borne vibration levels from Caltrain measured at the closest positions ranged from 78 VdB (at 44 feet) to 71 VdB (at 50 feet) from the tracks. Levels at the farthest measured distances ranged from 67 VdB (at 100 feet) to 56 VdB (at 150 feet).

Adjacent to US 101 through Morgan Hill

Land uses include farms with scattered single-family homes, and residential neighborhoods and commercial areas in Morgan Hill near El Camino Real/US 101. For most of this RSA, there are no existing rail vibration sources and the existing low-level vibration environment is primarily traffic on US 101 and local streets. At connection points on both ends, some receptors are exposed to the existing rail traffic along UPRR (Caltrain passenger trains, two Amtrak passenger trains, and approximately four freight trains per day).

East Gilroy

Land uses include farms with scattered single-family homes. For most of this RSA, there are no existing rail vibration sources and the existing low-level vibration environment is primarily traffic

on rural streets. At the connection point, some receptors are exposed to the existing rail traffic along UPRR (Caltrain passenger trains, two Amtrak passenger trains, and approximately four freight trains per day).

Pacheco Pass Subsection

For most of this RSA, there are no existing rail vibration sources and the existing low-level vibration environment is primarily traffic on SR 152 and rural streets. The land uses in this subsection are quite different from the rest of the project. There are some sparsely scattered single-family homes, but much of the subsection is not inhabited. The RSA passes through two portions of the Cottonwood Creek Wildlife Area, which is not considered vibration sensitive because it is an outdoor land use. Vibration impact criteria have not been established for animals. Therefore, no vibration propagation measurements were conducted in the Pacheco Pass Subsection.

San Joaquin Valley Subsection

The vibration RSA passes Santa Nella Road/I-5 then follows Henry Miller Road to Carlucci Road. Land uses include farms with scattered single-family homes and one elementary school. For most of the San Joaquin Valley Section, there are no existing rail vibration sources and the existing low-level vibration environment is primarily traffic on rural streets. In Volta, a freight railroad line crosses the RSA. One single-family residence is within 200 feet of the existing freight railway line and in the RSA.

5.2.2 Vibration Impact Assessment

Vibration impacts were assessed according to the criteria described in Section 4.2.3 and the method, data, and assumptions described in Section 4.2.4 and Section 4.2.5, Prediction Methods.

5.2.2.1 Construction Vibration Impacts

Construction of project alternatives would require the use of equipment that would generate temporary ground-borne vibration during the construction period, with up to 2 years of continuous construction activity anticipated at any one location. The effects from construction-related vibration would be similar under all project alternatives.

Construction vibration would result in human annoyance and building damage. Human annoyance occurs when construction vibration rises above the threshold of human perception for extended periods. A threshold of 80 VdB was used to evaluate nighttime annoyance for infrequent events at residential land use, which would typically be applied to most project construction work. For sources such as pile driving, vibratory compaction and ongoing demolition work with jackhammers or hoe-rams, the frequent event criterion of 72 VdB is more appropriate. Nighttime annoyance would potentially occur as far out as 300 feet from pile- driving activities, 140 feet from vibratory compaction and 50 feet from short-duration, transient events. These activities could occur on any of the alternatives, but more likely to occur on Alternative 4.

Building damage occurs when construction activities produce waves in the ground that are strong enough to cause cosmetic or structural damage. Of the vibration-sensitive buildings along the project corridor that have been considered, the most sensitive are lightweight (wood-framed) buildings with plaster interior wall finishes, as shown in Table 4-15 for Type III structures. The potential for vibration impacts would occur near pile driving, vibratory compaction, demolition, or excavation activities near vibration-sensitive structures (building damage) or vibration-sensitive use (annoyance). Pile driving very close to buildings (within 50 feet) would be anticipated to exceed the threshold of 0.2 inch per second (in/sec) PPV and cause building damage at Type III, as shown in Table 5-26. Pile driving would only occur at limited worksites, such as the MOWF building foundations, bridge retrofit structures, and some aerial structure foundation support for any of the alternatives.

Construction of bored tunnels in the Pacheco Pass Subsection would require the use of a TBM). Ground-borne TBM vibration is often imperceptible to humans at distances greater than 100 feet and comparable to vibration from train operations. The vibration from the TBM would vary with

the diameter of the tunnel being constructed; a bigger TBM would create greater vibration than a smaller TBM. At slant distances (measured along a direct line from the TBM to a receptor of interest) less than 100 feet, the likelihood of perceptibility increases, and overall vibration levels might be expected range of 72 VdB to 80 VdB. In this range, a person in an occupied building would be aware of the vibration from the TBM, but because the TBM would be moving through the tunnel, the vibration may only last for approximately a day. At the residential building nearest to the alignment in Pacheco Pass, on Whiskey Flat Road, the tunnel depth would greater than 200 feet. At that distance, TBM vibration would be less than 64 VdB, which would not be perceptible.

Table 5-26 Construction Equipment Vibration Impact Distances (feet)

Construction Equipment	Source Vibration at 25 feet		Buffer Distances[1] and Thresholds (feet)				
	Peak Particle Velocity (PPV in/sec)	Vibration Level, L_v	Bldg. Damage (Type I) 0.5 in/sec PPV	Bldg. Damage (Type II) 0.3 in/sec PPV	Bldg. Damage (Type III) 0.2 in/sec PPV	Annoyance (Infrequent Events) 80 VdB	Annoyance (Frequent Events) 72 VdB
Impact pile driver	0.644	104	30	42	55	159	296
Vibratory pile driver	0.17	93	12	17	22	66	122
Vibratory compactor	0.21	94	14	20	26	76	140
Loaded trucks	0.076	86	7	10	13	38	71
Jackhammer	0.035	79	4	6	8	23	42
Small bulldozer	0.003	58	1	1	2	4	8
TBM	0.144	91	11	15	20	59	109

Sources: FRA 2012;
In/sec = inches per second
L_v = velocity level
VdB = velocity decibels
[1] Buffer distances calculated to the ground at the edge of structures.
Type I – Reinforced-concrete, no plaster.
Type II – Engineered concrete and masonry, no plaster
Type III – Nonengineered timber and masonry
Infrequent – less than 30 vibration events per day
Frequent – more than 70 vibration events per day

Construction key differences are discussed in Section 5.1.2.1. For the Morgan Hill and Gilroy Subsection, construction of the viaduct structure (Alternative 1 and 2) with cast-in drilled-hole piles would generally have a shorter criterion distance than the embankment and at-grade track options (Alternatives 2 and 4, respectively) because vibratory compaction would not be as widespread. For the Monterey Corridor and the San Jose Diridon Approach Subsections, the aerial viaduct (Alternatives 1 and 2) similarly would have a shorter criterion distance than Alternatives 2 and 4. Nighttime construction could be required for Alternative 4 to minimize disruption with existing passenger rail services.

5.2.2.2 Operations Vibration Impacts

This section describes the predicted vibration impacts from project operations, which are due to annoyance. The vibration propagation measurement results were combined with the FDL data illustrated on Figure 4-10 for HSR trains and Caltrain trains, as described in Section 4.2.5.2. Figure 5-27 illustrates the projections of maximum overall ground-borne vibration levels from HSR

operations for each of the vibration propagation measurement sites assuming HSR would operate on embankment at 220 mph. The figure also includes the FRA residential vibration criterion of 72 VdB as a reference. Figure 5-28 illustrates the sample projections of maximum overall ground-borne vibration levels from HSR operations at 110 mph on blended, at-grade track for each of the vibration propagation measurement sites (excluding site VP28, where HSR would operate on dedicated tracks).

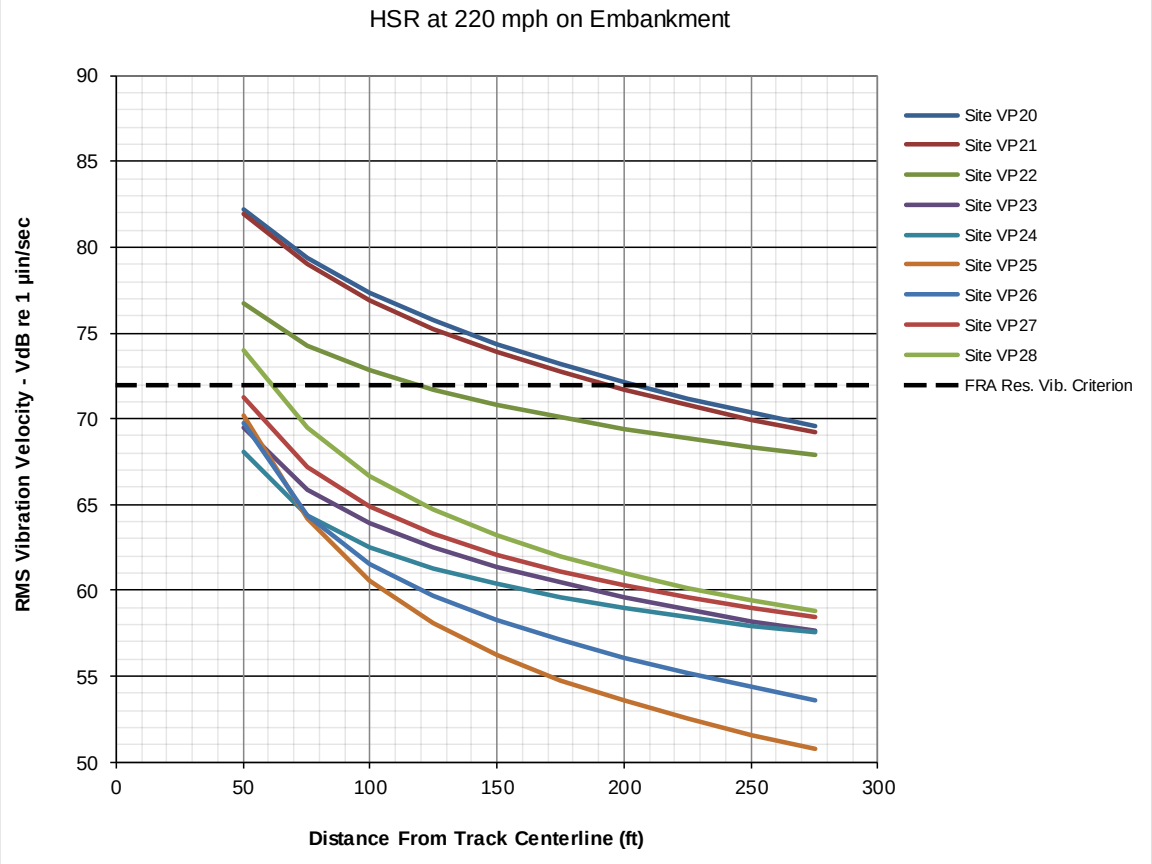


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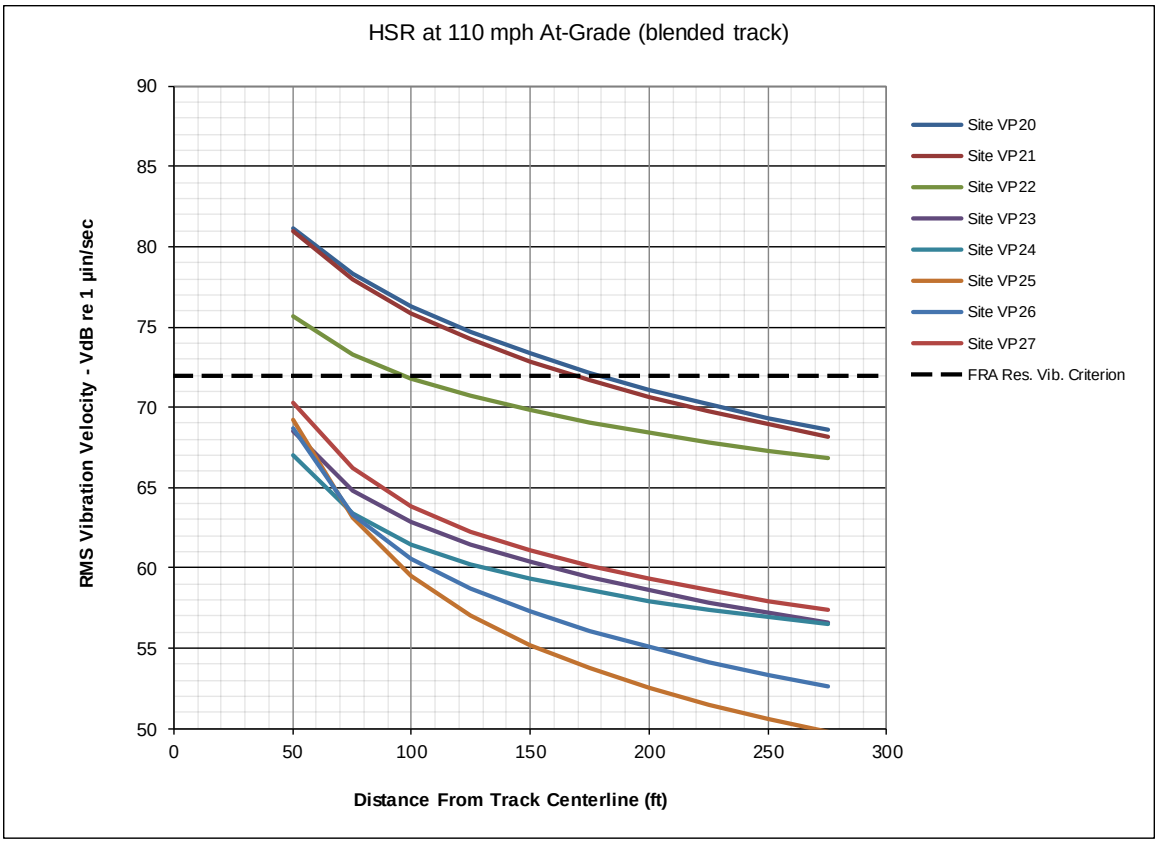
Figure 5-27 Projected HSR Vibration Levels

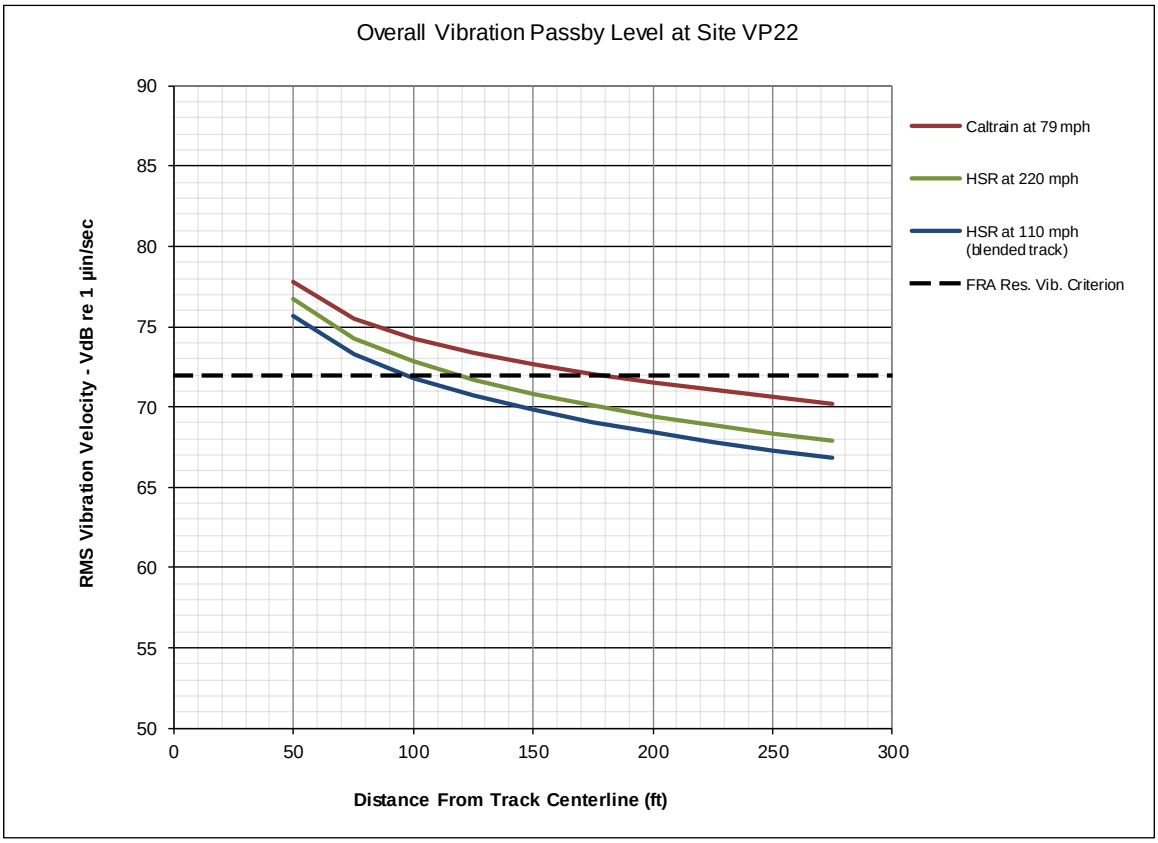


FEBRUARY 2019

Figure 5-28 Projected HSR Vibration Levels

The plots show the variation in vibration propagation throughout the RSA. The projections at the lower curves indicate much greater attenuation of vibration levels with distance compared to the higher curves. The most efficient propagation would be near McKendrie Street and near Jerome Street & Willis Avenue in San Jose. Locations in the RSA would experience different vibration levels for a train moving at the same speed because the ground conditions affect the vibration levels. At both sites, the projections for a 220-mph HSR train on embankment would be above the impact criterion within 200 feet of the track. The projections for these two sites for a 110 mph HSR train on blended at-grade track would be above the impact criterion within 170 feet of the track.

Figure 5-29 illustrates predicted HSR vibration levels at site VP22 for comparison with Caltrain vibration levels. The plot shows the vibration projections at this sample site for HSR on embankment at 220 mph and at 110 mph on blended at-grade track, in addition to projections of a Caltrain train at 79 mph (the maximum speed of Caltrain trains in the RSA with Alternatives 1, 2, and 3). As described in Section 4.2.5.2, vibration levels typically increase with increasing speed. However, even at 79 mph, the overall vibration level from a Caltrain passby is expected to be higher than from an HSR train traveling at 220 mph.



FEBRUARY 2019

Figure 5-29 Comparison of Projected HSR and Caltrain Vibration Levels

Potential vibration impacts from project operations were assessed according to the criteria described in Section 4.2.3.2. In the subsections of the vibration RSA with existing rail operations, analysts calculated the existing vibration levels and future project levels at vibration receptors. The modeled vibration levels for existing sources and shifted existing sources were calculated based on the measurement data and method discussed previously in Section 4.2.5.2. HSR vibration levels were predicted at each vibration-sensitive receptor or cluster of receptors for the project alternatives. In areas with existing train operations, the modeled existing vibration levels were compared to the modeled future project vibration levels from HSR operations and shifted existing train operations (where applicable).

The vibration impact criteria summarized in Section 4.2.3.2 are based on a maximum level of vibration from a train passby. This differs from the noise impact criteria, which are based on time-weighted metrics that account for the level of an event as well as the number of events in a specific period. Because the vibration impact criteria are based on single train passby events, a cumulative analysis was not necessary.

The vibration impact assessment was conducted for 2040.[13] HSR project operations would be fewer per day in 2029 than in 2040, but the maximum operating speeds would be the same, so

[13] A qualitative vibration impact analysis of the Interim 2025 Plus Project condition (an initial operating section of HSR service between San Jose Diridon Station to the Central Valley prior to commencement of service on the entire Phase 1 system in 2029), was also evaluated. The Interim 2025 Plus Project condition would include significantly fewer daily HSR trains than the 2029 Plus Project condition, which would be operated at the same train speeds. The vibration conditions

the maximum vibration levels would be the same for both 2029 and 2040 Plus Project conditions. Thus, the vibration impact assessment was conducted for only the 2040 Plus Project condition. Under the No Project Alternative, the Caltrain PCEP is assumed to use EMU vehicles in place of the current diesel locomotive-hauled coaches. The vibration analysis for the Caltrain PCEP assumed that the EMU vehicle would generate vibration similar to the existing vehicle (Wilson Ihrig 2014). Thus, no new vibration impacts are assumed associated with PCEP.

Table 5-27 summarizes the results of the vibration impact assessment (annoyance) by project alternative. Alternative 1 would result in 81 vibration impacts, Alternative 2 would result in 143 vibration impacts, Alternative 3 would result in 140 vibration impacts, and Alternative 4 would results in 1,203 vibration impacts. The majority of these vibration impacts would occur in the Monterey Corridor Subsection, with the remaining vibration impacts occurring in the San Jose Diridon Station Approach and Morgan Hill and Gilroy Subsections. There would be no building damage impacts from project operations.

These vibration impacts are caused by both HSR train operations and also in some cases by Caltrain operations. Where the HSR project causes Caltrain and freight tracks to be shifted closer to vibration-sensitive buildings the train operations on those closer tracks are treated as project vibration sources and compared to the impact criteria. Under Alternative 4, the project also causes Caltrain trains to operate at increased maximum speeds to accommodate blended service, and those Caltrain operations at higher speeds are treated as project vibration sources and compared to impact criteria.

Analysts also analyzed the DDV and TDV design effect on vibration effects. The vibration analysis indicated no change to the vibration impact assessment for the alternatives with the DDV and TDV. This is because the minor shifts in alignment and speed cause minor change in vibration levels.

Table 5-27 2029 and 2040 Plus Project Potential Vibration Impacts

Subsection	Number of Vibration Impacts				
	Land Use Category[1]	Alternative 1	Alternative 2	Alternative 3	Alternative 4
San Jose Diridon Station Approach	2	19	78	78	201
	1, 3	0	0	0	2
Monterey Corridor	2	62	63	62	581
	1, 3	0	0	0	2
Morgan Hill and Gilroy	2	0	1	0	416
	1, 3	0	1	0	1
Pacheco Pass	2	0	0	0	0
	1, 3	0	0	0	0
San Joaquin Valley	2	0	0	0	0
	1, 3	0	0	0	0
Total	**2**	**81**	**142**	**140**	**1,198**
	1, 3	**0**	**1**	**0**	**5**

[1] FRA Land Use Categories are summarized in Table 3.4-9. Land Use Category 1 = Areas where vibration would interfere with operations; Category 2 = Residential; Category 3 = Institutional use.

from HSR operations would be the same for the 2025 and 2029 conditions. Therefore, the vibration impacts of the Interim 2025 Plus Project condition are not further addressed in this analysis.

The potential vibration impact locations for each project alternative are illustrated on Figures 5-30 through 5-39. Figures 5-30 and 5-31 show the Alternative 1 vibration impact locations, Figures 5-32 through 5-34 show the Alternative 2 vibration impact locations, Figures 5-35 and 5-36 show the Alternative 3 locations, and figures 5-37 through 5-39 show the Alternative 4 vibration impact locations. Each red dot indicates a cluster of receptors predicted to have a potential vibration impact.

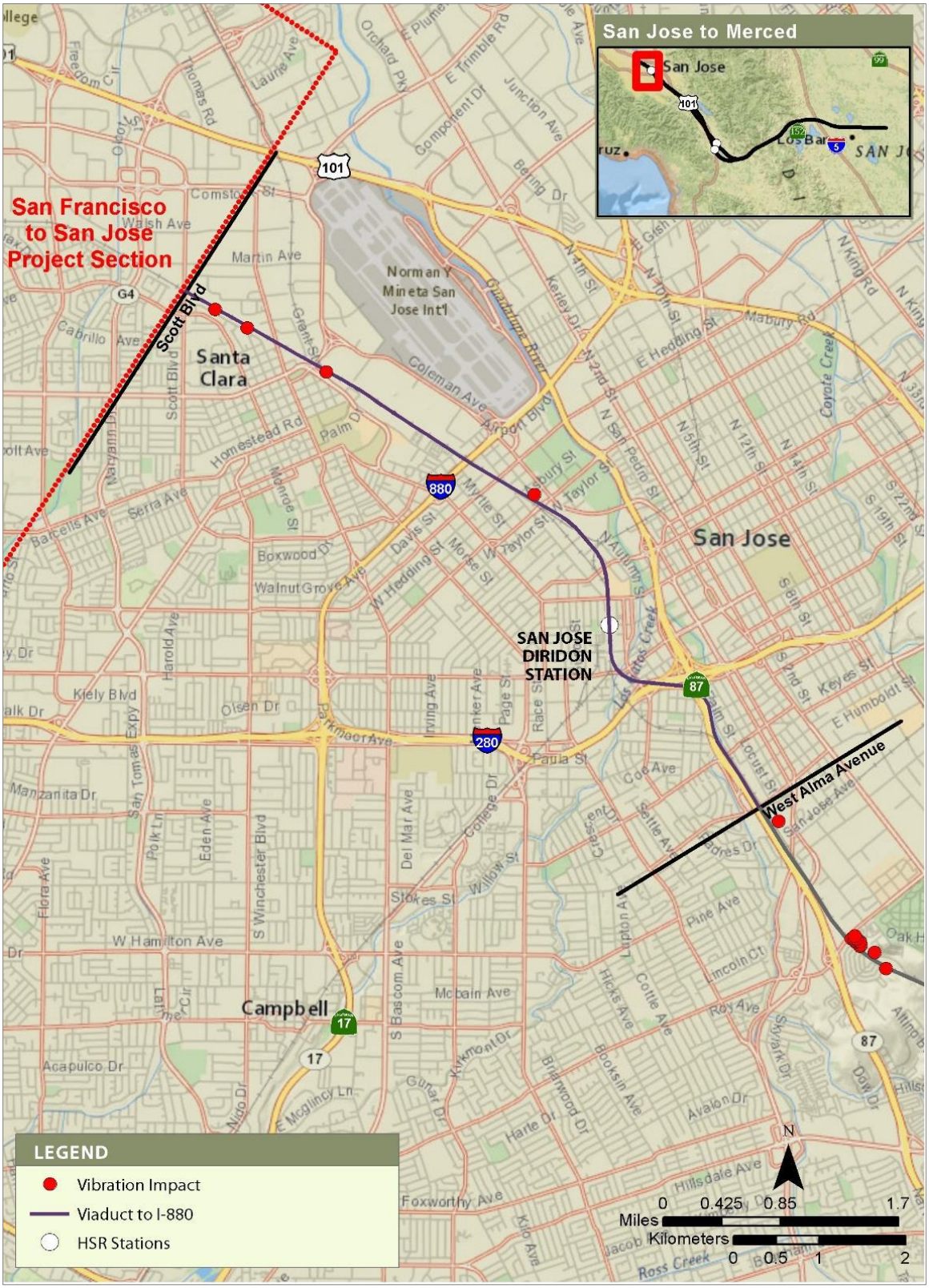


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Figure 5-30 2029 and 2040 Plus Project Vibration Impacts—Alternative 1

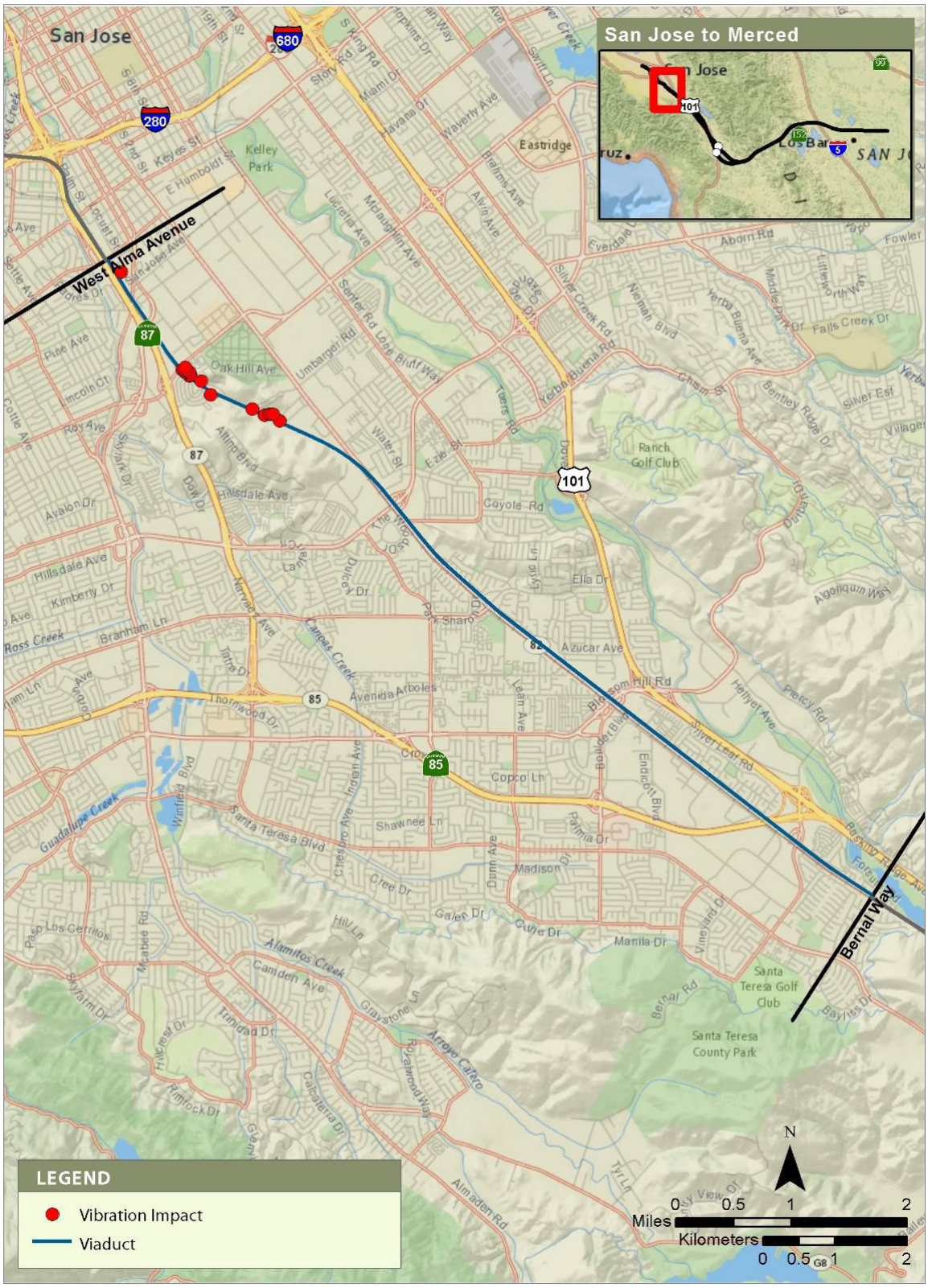

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Figure 5-31 2029 and 2040 Plus Project Vibration Impacts—Alternative 1

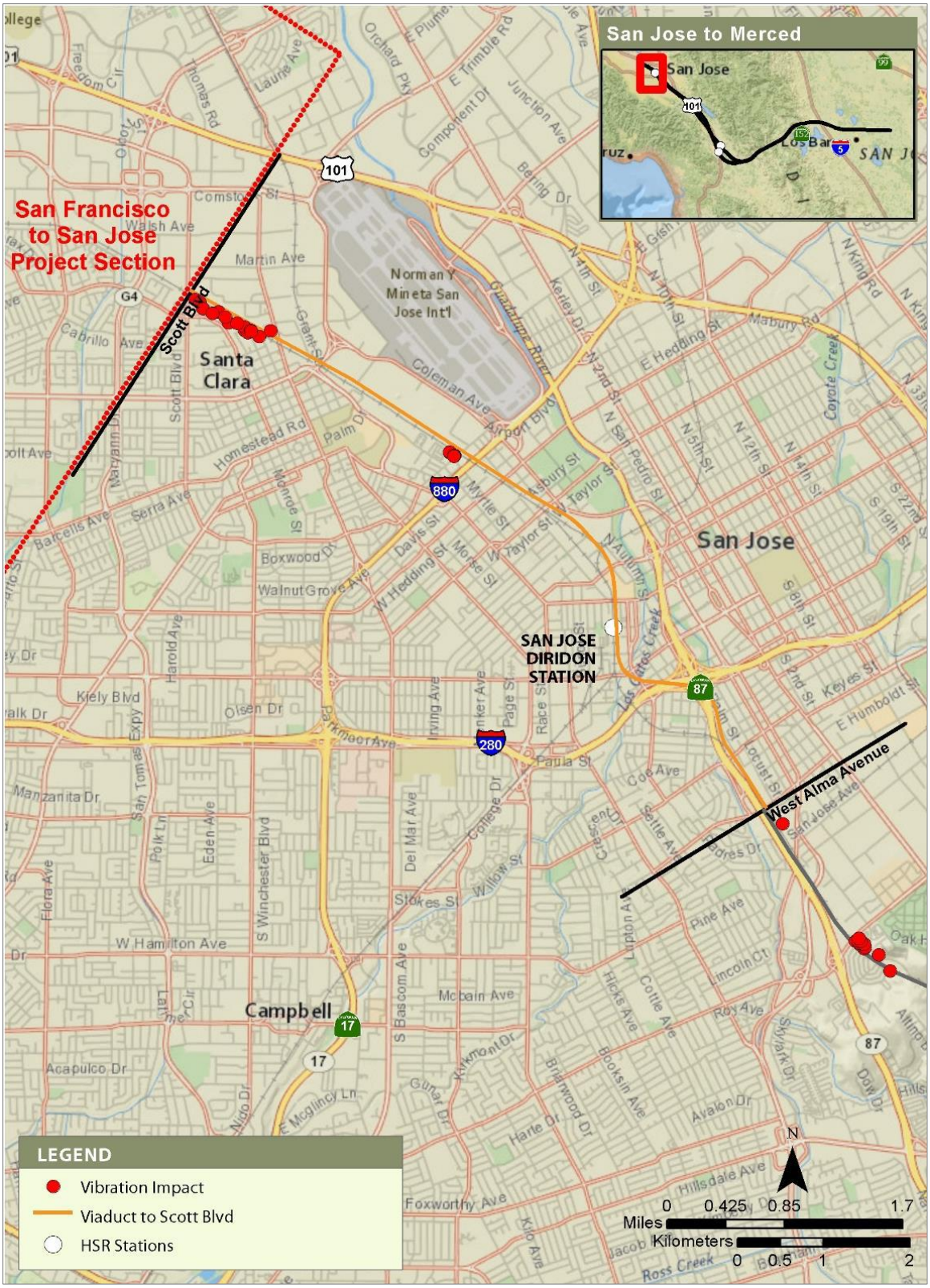

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Figure 5-32 2029 and 2040 Plus Project Vibration Impacts—Alternative 2

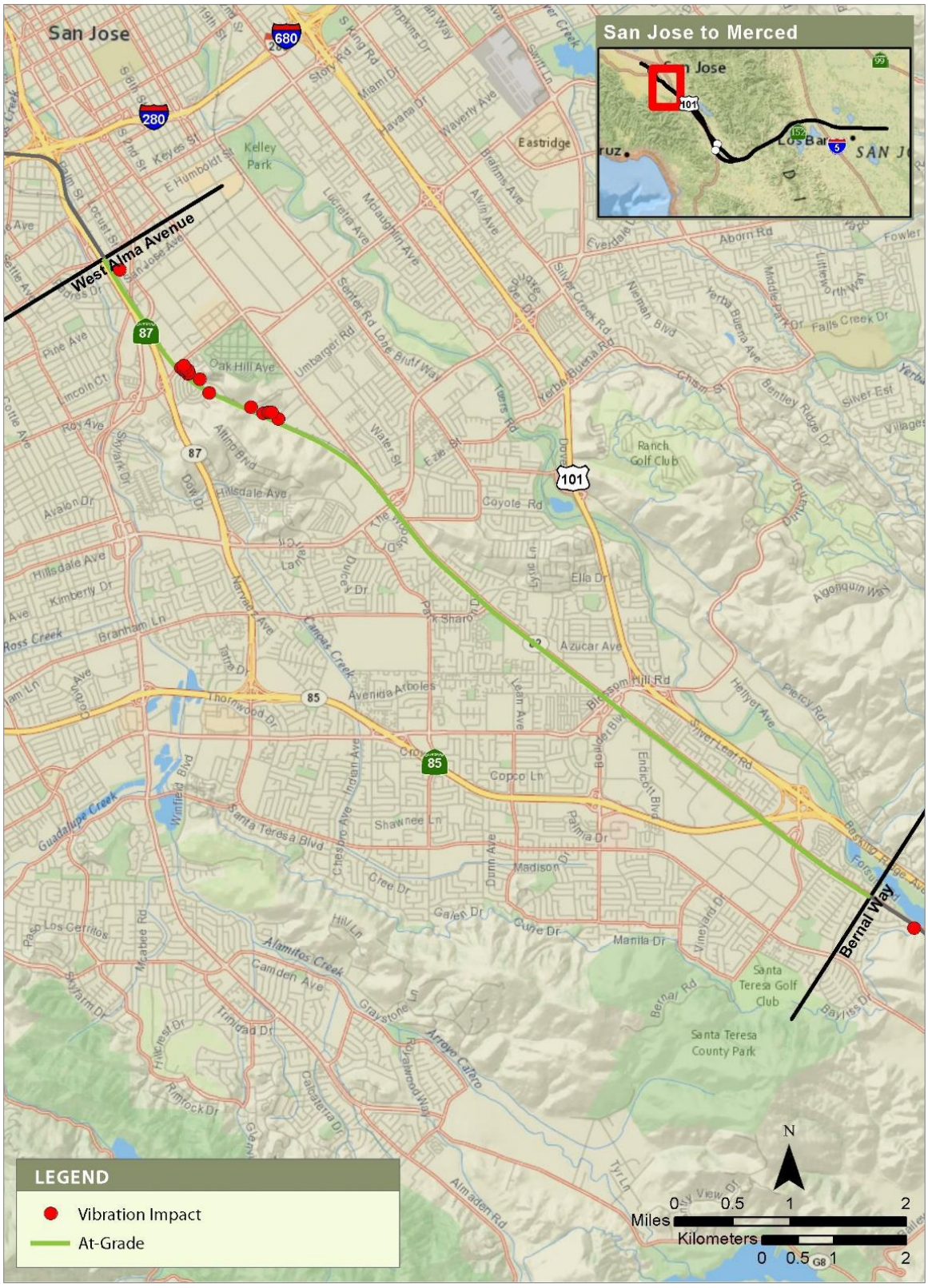

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Figure 5-33 2029 and 2040 Plus Project Vibration Impacts—Alternative 2

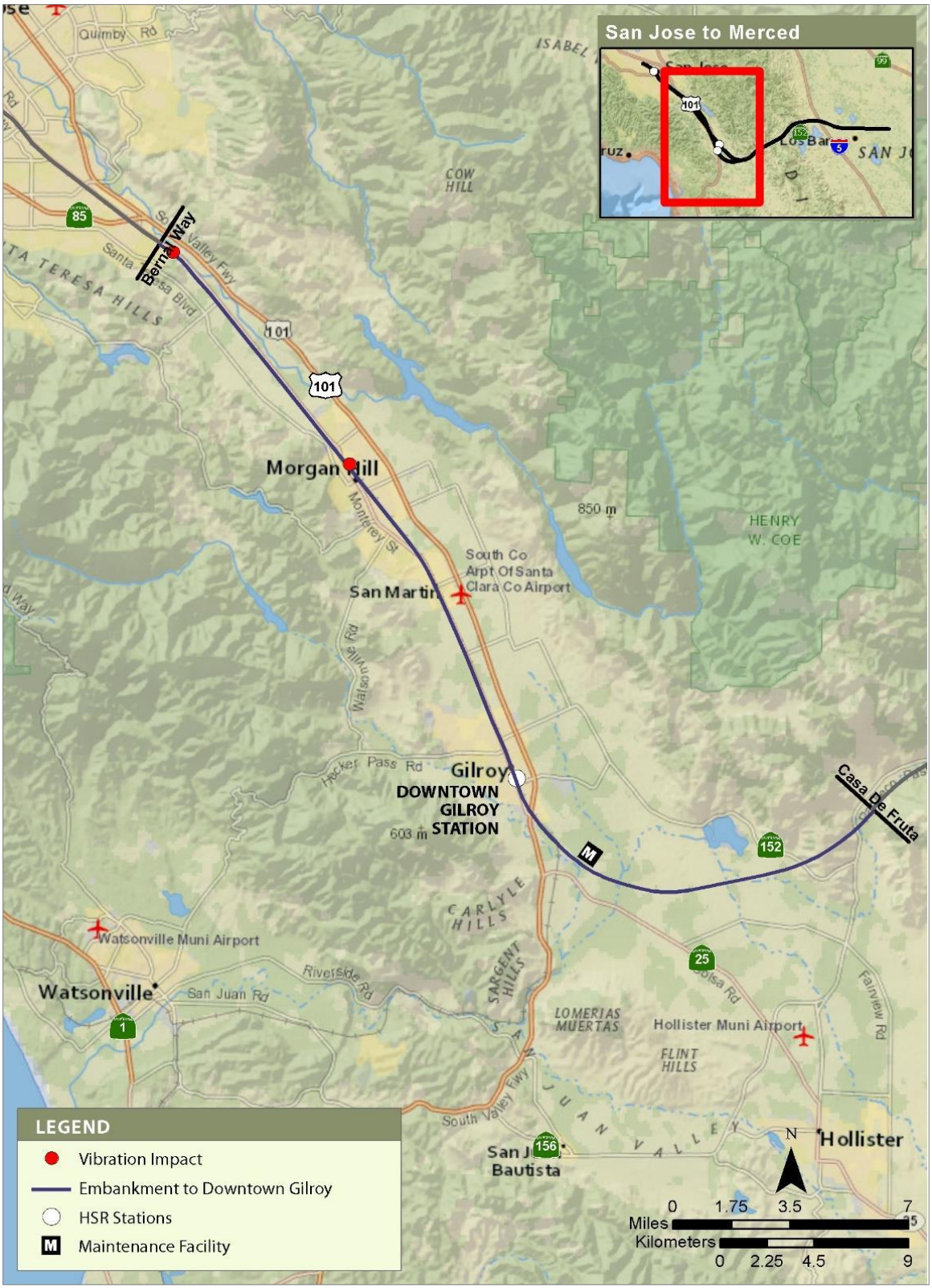

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Figure 5-34 2029 and 2040 Plus Project Vibration Impacts—Alternative 2

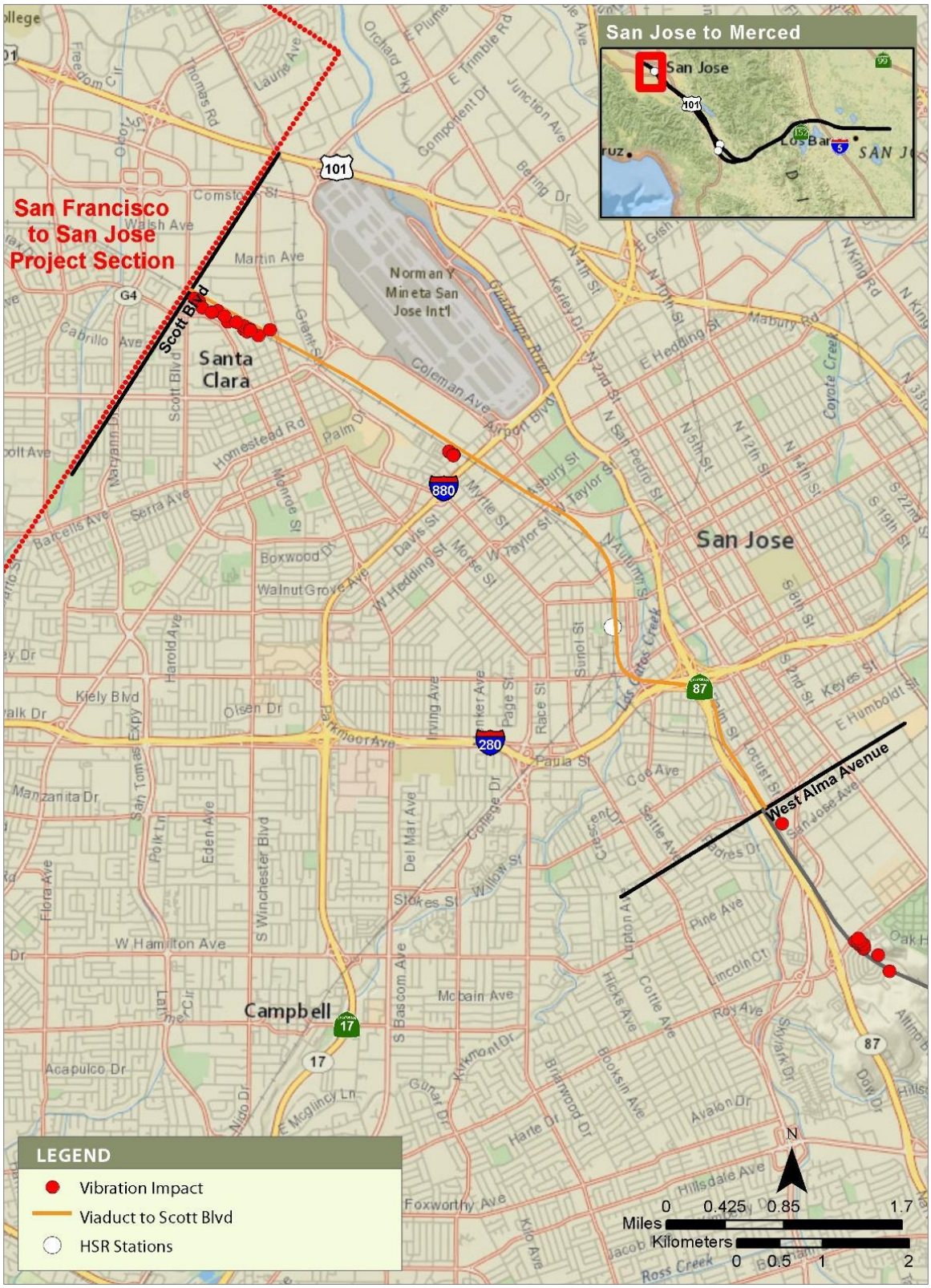

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Figure 5-35 2029 and 2040 Plus Project Vibration Impacts—Alternative 3

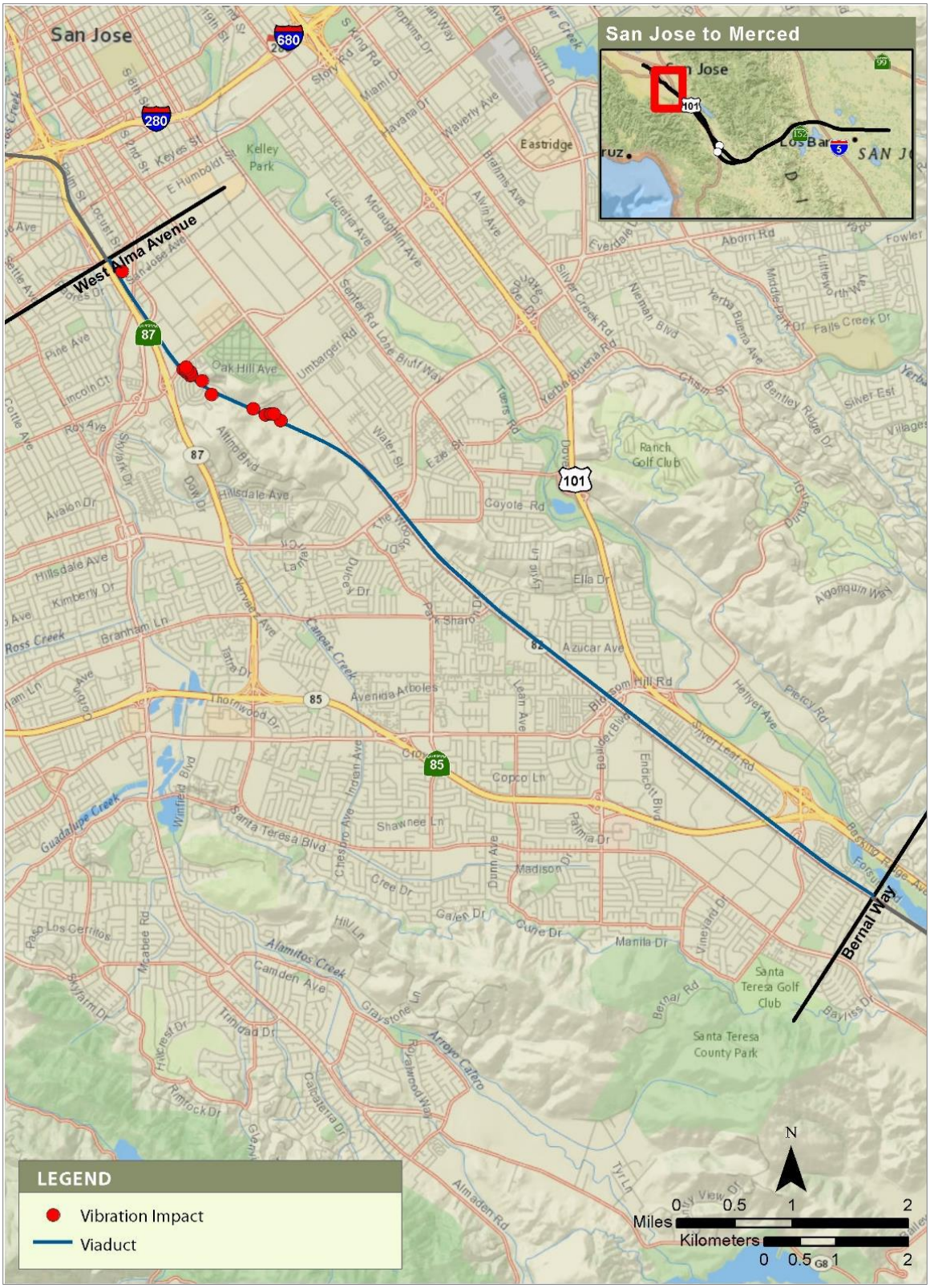

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Figure 5-36 2029 and 2040 Plus Project Vibration Impacts—Alternative 3

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Figure 5-37 2029 and 2040 Plus Project Vibration Impacts—Alternative 4

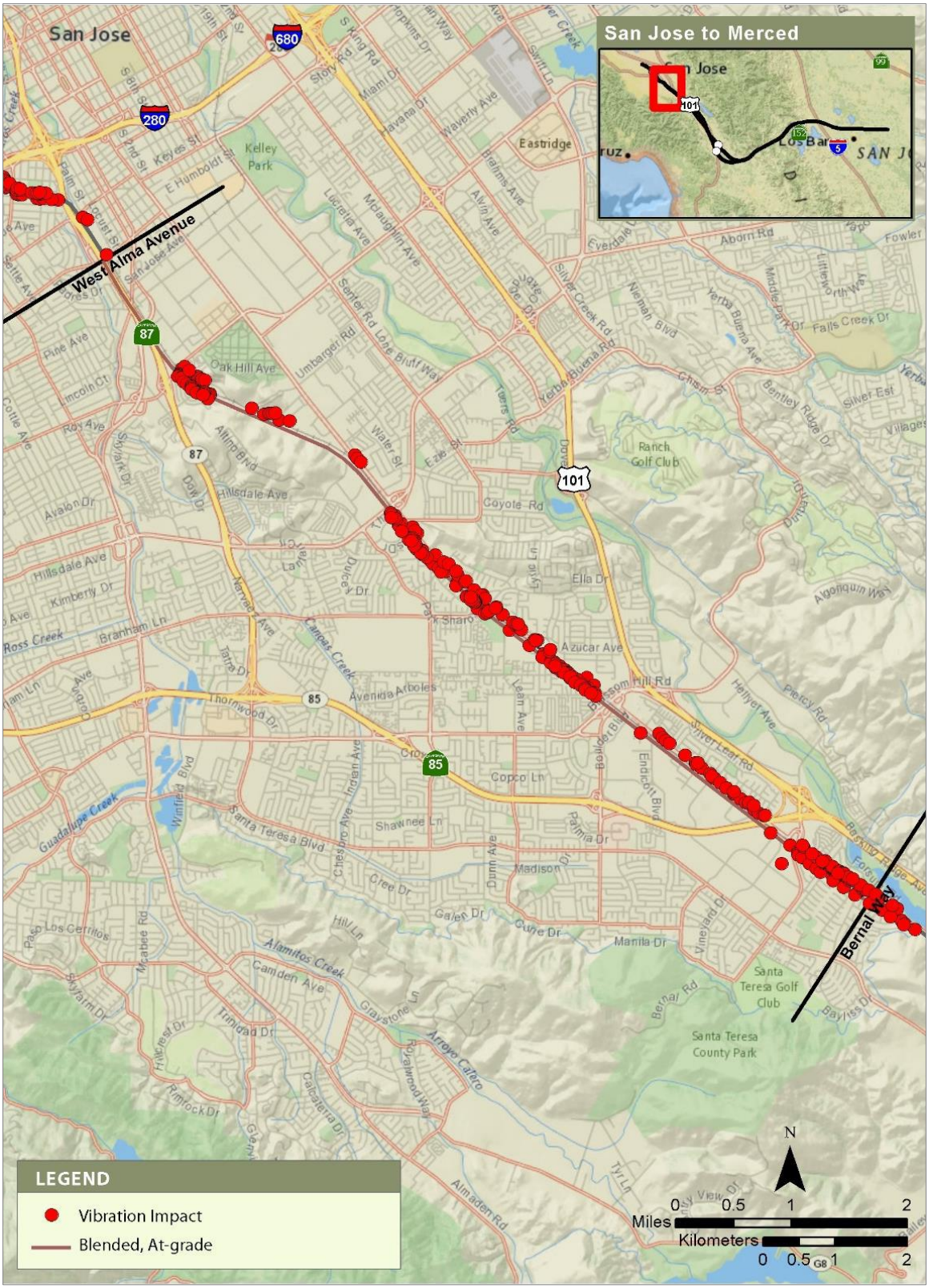

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Figure 5-38 2029 and 2040 Plus Project Vibration Impacts—Alternative 4

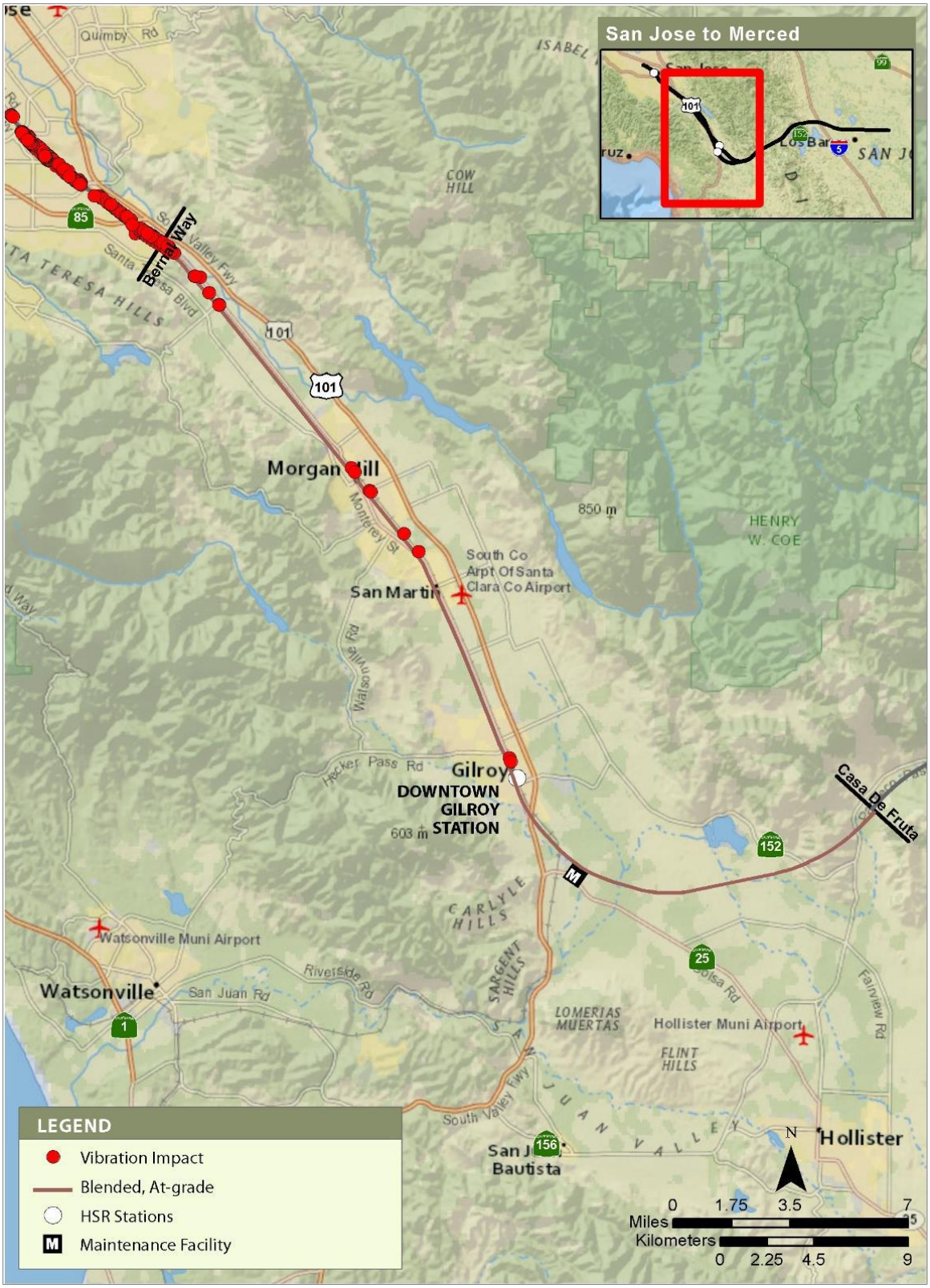

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Figure 5-39 2029 and 2040 Plus Project Vibration Impacts—Alternative 4

Tables 5-28 through 5-31 show the vibration impact assessment results by project alternative, subsection, and segments in each subsection. The distance to the nearest vibration-sensitive receptor is shown, along with the maximum speed of HSR trains in the area. The type of existing corridor, as defined in Section 4.2.3, is listed for each location. As discussed in Section 4.2.3, the type of existing rail corridor and the existing maximum vibration levels influence the impact assessment.

The detailed vibration impact assessment results tables include the range of maximum existing vibration velocity levels that the vibration receptors are currently exposed to in each location. In the San Jose Diridon Station Approach and Monterey Corridor Subsections, there are many vibration-sensitive locations where the existing levels exceed the residential criterion of 72 VdB. Caltrain trains are the dominant existing rail source of vibration in the RSA, because Caltrain speeds exceed those of freight trains and vibration levels increase with speed. Caltrain trains create similar ground-borne vibration levels to those from HSR trains in the RSA, even though the maximum speeds are generally slower. The tables also include the range of maximum future Caltrain vibration levels. In some areas, the project alternatives would cause the existing tracks to be shifted. The analysis accounts for where the existing vibration rail sources would be shifted closer to sensitive locations.

The range of maximum vibration levels from HSR trains is provided for each location. Throughout most of the RSA the projected vibration levels from HSR trains would be below the impact criterion and typically lower than the slower Caltrain trains. Much of Alternatives 1 and 3 would be on viaduct, and vibration levels from HSR trains on aerial structure are assumed 10 VdB lower than HSR at grade or on embankments. Even though the HSR train speeds are much higher than conventional-speed commuter rail such as Caltrain, the ground-borne vibration levels are often comparable or lower. This is likely because of the relatively low input forces from the HSR trains (the FDL). To operate trains at very high speeds, the rails and wheels typically have to be in very good condition, resulting in lower vibration levels.

Four category 1 vibration-sensitive facilities were identified near the project and potential impacts at each are described in subsequent paragraphs. The FRA general assessment impact criterion of 65 VdB for Category 1 vibration-sensitive facilities was used to assess potential impacts at these buildings because it is not known what specific equipment are located in the buildings, or where any sensitive equipment is located in the buildings. Analysts used the general assessment criterion to provide a conservative assessment of potential impact. Though the specific vibration-sensitive equipment at these facilities is not known, the projected maximum 1/3-octave band vibration levels are provided for reference.

The Great Oaks Research Park would be located approximately 180 feet from the nearest HSR track in the Monterey Corridor Subsection for Alternative 4, and approximately 250 feet from the nearest HSR track for Alternatives 1, 2, and 3. The maximum projected vibration levels from HSR trains at the Great Oaks Research Park would be approximately 52 VdB with Alternatives 1 and 3, 64 VdB with Alternative 2, and 69 VdB with Alternative 4; therefore, a vibration impact is predicted under Alternative 4. With Alternatives 1 and 3, the maximum 1/3-octave band vibration level is predicted to be approximately 47 VdB. With Alternative 2, the maximum 1/3-octave band vibration level is predicted to be approximately 58 VdB. With Alternative 4, the maximum vibration in any 1/3-octave band is predicted to be approximately 63 VdB.

Two vibration-sensitive facilities were identified in the Morgan Hill and Gilroy Subsection for Alternatives 2 and 4—Paramit Manufacturing and the Butterfield Professional Center—both between Tilton Avenue and Tennant Avenue. The Paramit Manufacturing building would be approximately 215 feet from the nearest HSR track for Alternative 2 and approximately 320 feet from the nearest HSR track for Alternative 4. The maximum projected vibration levels from HSR trains would be approximately 56 VdB; therefore, no vibration impact is predicted. The maximum 1/3-octave band vibration level is predicted to be approximately 49 VdB. The Butterfield Professional Center is located approximately 75 feet from the nearest HSR track with Alternative 2 and approximately 150 feet from the nearest HSR track with Alternative 4. The maximum projected vibration levels from HSR trains would be 60 VdB for Alternative 4 and 65 VdB for Alternative 2; therefore, a vibration impact is predicted at the Butterfield facility under Alternative 2. The maximum 1/3-octave band vibration level is predicted to be approximately 59 VdB.

The St. Louise Regional Hospital would be more than 1,000 feet from the nearest HSR track in Alternative 3. The maximum projected vibration levels would be less than 50 VdB; therefore, no vibration impact is predicted.

Tables 5-28 through 5-31 also show the number of vibration impacts in each segment of each subsection. With Alternative 1, 15 single-family residences and 4 multifamily residential buildings[14] have the potential for vibration impacts and in the San Jose Diridon Station Approach Subsection between Scott Boulevard to Asbury Street. In the Monterey Corridor Subsection, there are 38 single-family residences and 24 multifamily residential buildings with the potential for vibration impacts between West Alma Avenue and Daylight Way.

Alternative 2 differs in profile and track configuration from Alternative 1 in the San Jose Station Approach Subsection. In this subsection there would be potential vibration impacts at 73 single-family residences and 5 multifamily buildings. All of these impacts would be between Scott Boulevard and Asbury Street. In the Monterey Corridor and the Morgan Hill and Gilroy Subsections, the alignment for Alternative 2 would be largely on embankment. In the Monterey Corridor Subsection, there are 39 single-family residences and 24 multifamily residential buildings with the potential for vibration impacts between West Alma Avenue and Daylight Way. In the Morgan Hill and Gilroy Subsection, there is 1 single-family residence with the potential for vibration impact between Bernal Way and Metcalf Road. Potential vibration impacts are also predicted at the Butterfield Professional Center between Tilton Avenue and Tennant Avenue.

The projected vibration impacts for Alternative 3 are the same as Alternative 2 in the San Jose Diridon Station Approach Subsection—73 single-family residences and 5 multifamily buildings. In the Monterey Corridor Subsection the projected impacts are the same as Alternative 1—38 single-family residences and 24 multifamily residential buildings between West Alma Avenue and Daylight Way.

With Alternative 4, HSR trains would operate between San Jose and Gilroy on tracks that are shared with Caltrain, other passenger trains, and freight trains, which would cause increased vibration levels compared to other alternatives. In the San Jose Station Approach Subsection, there would be potential vibration impacts at 144 single-family residences, 56 multifamily residential buildings, 1 institutional building, and 1 place of worship, and 1 hotel. In the Monterey Corridor Subsection, potential vibration impacts are predicted at 479 single-family residences, 97 multifamily residential buildings, 1 Fire Dept., 4 hotels, 1 Place of Worship, and at the Great Oaks Research Park. In the Morgan Hill and Gilroy Subsection, potential vibration impacts are predicted at 297 single-family residences, 119 multifamily residential buildings, and 1 hospital. The greater number of vibration impacts under Alternative 4 are due to both HSR trains operating on blended tracks that are typically at-grade and due to increased speeds of Caltrain trains for Alternative 4.

In the areas categorized as a heavily used rail corridor in the San Jose Diridon Station Approach Subsection, many of the receptors currently experience vibration levels greater than the criterion of 72 VdB. The project alternatives would more than double the number of train passby events per day, therefore causing vibration impacts from the project alternatives. The predicted vibration impacts in the subsections characterized as a moderately used rail corridor are primarily caused by HSR trains on embankment that exceed the vibration impact criterion or by shifted existing rail sources that exceed the criteria, though HSR train vibration does exceed the criterion at some locations.

In the Pacheco Pass Subsection, the alignment would largely be in a tunnel. The tunnel depth would vary depending upon the terrain elevation. Near the closest sensitive buildings, the tunnel would be more than 200 feet deep and 1,000 feet away horizontally. At these large distances and depths, ground-borne vibration would be well below the impact criteria. Similarly, at the depth and distance from the tunnel to the sensitive buildings in Pacheco Pass, ground-borne noise levels would be expected to be below 25 dBA, well below the impact criteria. There is also a planned cut-and-cover tunnel area of the alignment as it passes under US 101 for Alternative 2 in Morgan Hill and Gilroy Subsection. At receptors in this location, the projected ground-borne noise levels would also be expected to be below 25 dBA, well below the criteria.

[14] The number of dwelling units in each potentially affected multifamily residential building is not specified.

Table 5-28 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 1

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
San Jose Diridon Station Approach Subsection								
Scott Boulevard to Asbury Street	53 - 83	110	Heavily Used	79 - 91	79 - 91	73 - 76	72	12 SF; 4 MF [3]
Asbury Street to San Jose Diridon Station	168	82	Heavily Used	65 [4]	74 [4]	55	72	3 SF [5]
San Jose Diridon Station to West Alma Avenue	143	55	Heavily Used / New	70	68	62	72	0
Monterey Corridor Subsection								
West Alma Avenue to Daylight Way	44 - 325	95 - 120	Moderately Used	72 - 87	73 - 89	51 - 77	72	38 SF; 24 MF [6]
Daylight Way to Blossom Hill Road	83	130	Moderately Used	71	72	59	72	0
Blossom Hill Road to Bernal Way	68	130	Moderately Used	72	72	60	72	0
Morgan Hill and Gilroy Subsection								
Bernal Way to Metcalf Road	66	130	Moderately Used	72	72	60	72	0
Metcalf Road to Palm Avenue	60	125	Moderately Used	72	72	61	72	0
Palm Avenue to Burnett Avenue	31	150	Moderately Used	61	61	63	72	0
Burnett Avenue to Tennant Avenue [2]	41	150	New	49	49	57	72	0
Tennant Avenue to California Avenue [2]	83	150	New	52	52	50	72	0
California Avenue to Highland Avenue	148	154	Moderately Used	57	57	45	72	0
Highland Avenue to Buena Vista	109	220	Moderately Used	58	58	51	72	0
Buena Vista Avenue to Leavesley Road	122	190	Moderately Used	62	62	52	72	0
Leavesley Road to 10th Street	209	150	Moderately Used	65	65	47	72	0

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
10th Street to Santa Clara County Line	480	150	Moderately Used	56[4]	57[4]	42	72	0
Santa Clara County Line to SR 152[2]	650	200	New	N/A	N/A	53	72	0
Pacheco Pass Subsection								
Tunnel (2255+00 to 2340+00)[2]	2541	200	New	N/A	N/A	43	72	0
Aerial/Embankment (2340+00 to 325+00)[2]	3530	200	New	N/A	N/A	43	72	0
Tunnel (3325+00 to 4035+00)[2]	1017	200	New	N/A	N/A	49	72	0
Tunnel Portal to I-5[2]	360	200	New	N/A	N/A	56	72	0
San Joaquin Valley Subsection								
I-5 to San Waste Way[2]	320	202	New	N/A	N/A	57	72	0
San Waste Way to North Mercey Springs Road[2]	114	220	New	N/A	N/A	66	72	0
North Mercey Springs Road to Carlucci Road[2]	156	220	New	N/A	N/A	63	72	0
TOTAL								**53 SF, 28 MF**

HSR = high-speed rail
VdB = vibration decibels
SF = single family residential
MF = multifamily residential
[1] Maximum overall vibration velocity levels (VdB re: 1 µin/sec). The ranges shown for the vibration levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. The data represent the range for vibration-sensitive receptors.
[2] Locations listed as new rail corridors are not adjacent to existing tracks, therefore no corresponding existing or future Caltrain vibration levels are listed.
[3] The vibration impacts between Scott Boulevard to Asbury Street with Alternative 1 are caused by HSR trains.
[4] Maximum existing vibration levels and future non-HSR train vibration levels are from freight trains.
[5] The vibration impacts between Asbury Street to San Jose Diridon Station with Alternative 1 are caused by freight trains due to track shifting closer to the buildings.
[6] The vibration impacts between West Alma Avenue to Daylight Way with Alternative 1 are caused by Caltrain trains and HSR trains.

Table 5-29 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 2

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
San Jose Diridon Station Approach Subsection								
Scott Boulevard to Asbury Street	80 - 245	50 - 110	Heavily Used	71 - 81	73 - 83	49 - 73	72	73 SF; 5 MF [3]
Asbury Street to San Jose Diridon Station	168	70	Heavily Used	64	64	54	72	0
San Jose Diridon Station to West Alma Avenue	143	55	Heavily Used / New	70	68	62	72	0
Monterey Corridor Subsection								
West Alma Avenue to Daylight Way	44 - 325	95 - 120	Moderately Used	72 - 87	73 - 89	51 - 77	72	39 SF; 24 MF [4]
Daylight Way to Blossom Hill Road	132	130	Moderately Used	71	72	67	72	0
Blossom Hill Road to Bernal Way	112	130	Moderately Used	72	72	68	72	0
Morgan Hill and Gilroy Subsection								
Bernal Way to Metcalf Road	127	100	Moderately Used	76	77	65	72	1 SF [5]
Metcalf Road to Palm Avenue	346	148	Moderately Used	70	70	63	72	0
Palm Avenue to Tilton Avenue	106	190	Moderately Used	61	61	62	72	0
Tilton Avenue to Tennant Avenue	101	185	Moderately Used	76	76	62	72	0
Tilton Avenue to Tennant Avenue[6]	75[6]	195[6]	Moderately Used	63[6]	63[6]	65[6]	65[6]	1 Vibration Sensitive Facility [6]
Tennant Avenue to California Avenue	202	185	Moderately Used	60	63	57	72	0
California Avenue to Highland Avenue	148	185	Moderately Used	57	57	57	72	0
Highland Avenue to Buena Vista	109	220	Moderately Used	58	58	61	72	0
Buena Vista Avenue to Leavesley Road	122	190	Moderately Used	62	62	62	72	0
Leavesley Road to 10th Street	65	150	Moderately Used	65	65	65	72	0

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
10th Street to Santa Clara County Line	480	150	Moderately Used	56[7]	57[7]	52	72	0
Santa Clara County Line to SR 152[2]	650	200	New	N/A	N/A	53	72	0
Pacheco Pass Subsection								
Tunnel (2255+00 to 2340+00)[2]	2541	200	New	N/A	N/A	43	72	0
Aerial/Embankment (2340+00 to 3325+00)[2]	3530	200	New	N/A	N/A	43	72	0
Tunnel (3325+00 to 4035+00)[2]	1017	200	New	N/A	N/A	49	72	0
Tunnel Portal to I-5[2]	360	200	New	N/A	N/A	56	72	0
San Joaquin Valley Subsection								
I-5 to San Waste Way[2]	320	202	New	N/A	N/A	57	72	0
San Waste Way to North Mercey Springs Road[2]	114	220	New	N/A	N/A	66	72	0
North Mercey Springs Road to Carlucci Road[2]	156	220	New	N/A	N/A	63	72	0
TOTAL								**113 SF, 29 MF, 1 Vibration Sensitive Facility**

HSR = high-speed rail
VdB = vibration decibels
SF = single family residential
MF = multifamily residential
[1] Maximum overall vibration velocity levels (VdB re: 1 µin/sec). The ranges shown for the vibration levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. The data represent the range for vibration-sensitive receptors.
[2] Locations listed as new rail corridors are not adjacent to existing tracks, therefore no corresponding existing or future Caltrain vibration levels are listed.
[3] The vibration impacts between Scott Boulevard to Asbury Street with Alternative 2 are caused by Caltrain trains and HSR trains.
[4] The vibration impacts between West Alma Avenue to Daylight Way with Alternative 2 are caused by Caltrain trains and HSR trains.
[5] The vibration impacts between Bernal Way and Metcalf Road with Alternative 2 are caused by Caltrain trains.
[6] Vibration impact is projected at one non-residential vibration sensitive facility in the Morgan Hill and Gilroy Subsection between Tilton Avenue and Tennant Avenue with Alternative 2 at the Butterfield Professional Center caused by HSR trains.
[7] Maximum existing vibration levels and future non-HSR train vibration levels are from freight trains.

Table 5-30 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 3

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
San Jose Diridon Station Approach Subsection								
Scott Boulevard to Asbury Street	80 - 245	50 - 110	Heavily Used	71 - 81	73 - 83	49 - 73	72	73 SF; 5 MF [3]
Asbury Street to San Jose Diridon Station	204	65	Heavily Used	52	52	51	72	0
San Jose Diridon Station to West Alma Avenue	143	55	Heavily Used / New	70	68	62	72	0
Monterey Corridor Subsection								
West Alma Avenue to Daylight Way	44 - 325	95 - 120	Moderately Used	72 - 87	73 - 89	51 - 77	72	38 SF; 24 MF [4]
Daylight Way to Blossom Hill Road	83	130	Moderately Used	71	72	59	72	0
Blossom Hill Road to Bernal Way	68	130	Moderately Used	72	72	60	72	0
Morgan Hill and Gilroy Subsection								
Bernal Way to Metcalf Road	66	130	Moderately Used	72	72	60	72	0
Metcalf Road to Palm Avenue	60	125	Moderately Used	72	72	61	72	0
Palm Avenue to Burnett Avenue	31	150	Moderately Used	61	61	63	72	0
Burnett Avenue to Tennant Avenue [2]	41	150	New	49	49	57	72	0
Tennant Avenue to California Avenue [2]	83	150	New	52	52	50	72	0
California Avenue to Highland Avenue	148	153	Moderately Used	57	57	45	72	0
Highland Avenue to Buena Vista Avenue [2]	119	185	Moderately Used / New	40	40	49	72	0
Buena Vista Avenue to Leavesley Road[2]	311	196	New	46	46	57	72	0
Leavesley Road to Bloomfield Avenue[2]	158	216	New	22	22	62	72	0
Bloomfield Avenue to SR 152[2]	487	200	New	N/A	N/A	54	72	0

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
Pacheco Pass Subsection								
Tunnel (2255+00 to 2340+00)[2]	2470	200	New	N/A	N/A	43	72	0
Aerial/Embankment (2340+00 to 3325+00)[2]	3530	200	New	N/A	N/A	43	72	0
Tunnel (3325+00 to 4035+00)[2]	1017	200	New	N/A	N/A	49	72	0
Tunnel Portal to I-5[2]	360	200	New	N/A	N/A	56	72	0
San Joaquin Valley Subsection								
I-5 to San Waste Way[2]	320	202	New	N/A	N/A	57	72	0
San Waste Way to North Mercey Springs Road[2]	114	220	New	N/A	N/A	66	72	0
North Mercey Springs Road to Carlucci Road[2]	156	220	New	N/A	N/A	63	72	0
TOTAL								**111 SF, 29 MF**

HSR = high-speed rail
VdB = vibration decibels
SF = single family residential
MF = multifamily residential
[1] Maximum overall vibration velocity levels (VdB re: 1 µin/sec). The ranges shown for the vibration levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. The data represent the range for vibration-sensitive receptors.
[2] Locations listed as new rail corridors are not adjacent to existing tracks, therefore no corresponding existing or future Caltrain vibration levels are listed.
[3] The vibration impacts between Scott Boulevard to Asbury Street with Alternative 3 are caused by Caltrain trains and HSR trains.
[4] The vibration impacts between West Alma Avenue to Daylight Way with Alternative 3 are caused by Caltrain trains and HSR trains.

Table 5-31 2029 and 2040 Plus Project Detailed Vibration Impacts—Alternative 4

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
San Jose Diridon Station Approach Subsection								
Scott Boulevard to Asbury Street	53 - 194	59 - 79	Heavily Used	66 - 91	73 - 91	68 - 87	72 - 75	62 SF; 43 MF; 1 Hotel; 1 Institutional [3]
Asbury Street to San Jose Diridon Station	302	41	Heavily Used	64	65	59	72	0
San Jose Diridon Station to West Alma Avenue	25 - 217	42 - 90	Heavily Used	61 - 82	73 - 89	67 - 85	72 - 75	82 SF; 13 MF; 1 Place of Worship [3]
Monterey Corridor Subsection								
West Alma Avenue to Daylight Way	60 - 346	110	Moderately Used	70 - 87	73 - 91	66 - 86	72	125 SF; 25 MF [4]
Daylight Way to Blossom Hill Road	28 - 311	110	Moderately Used	70 - 82	73 - 89	66 - 84	72	263 SF; 67 MF; 1 Fire Dept; 4 Hotel [4]
Blossom Hill Road to Bernal Way	177 - 315	110	Moderately Used	70 - 75	73 - 78	66 - 72	72 - 75	91 SF; 5 MF; 1 Place of Worship [4]
Blossom Hill Road to Bernal Way[5]	180[5]	110[5]	Moderately used	72[5]	72[5]	69[5]	65[5]	1 Vibration Sensitive Facility [5]

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
Morgan Hill and Gilroy Subsection								
Bernal Way to Metcalf Road	35 - 984	110	Moderately Used	65 - 80	68 - 83	61 - 78	65 - 72	279 SF; 14 MF; 1 Hospital[6]
Metcalf Road to Palm Avenue	207 - 304	110	Moderately Used	70 - 71	73 - 74	66 - 68	72	6 SF[6]
Palm Avenue to Burnett Avenue	108	110	Moderately Used	64	68	62	72	0
Burnett Avenue to Tennant Avenue	20 - 46	110	Moderately Used	69 - 76	75 - 91	69 - 83	72	1 SF; 3 MF[6]
Tennant Avenue to California Avenue	25 - 35	110	Moderately Used	69 - 82	77 - 83	72 - 77	72	11 SF; 100 MF[6]
California Avenue to Highland Avenue	152	110	Moderately Used	56	61	55	72	0
Highland Avenue to Buena Vista	80	110	Moderately Used	65	68	63	72	0
Buena Vista Avenue to Leavesley Road	134	110	Moderately Used	64	67	62	72	0
Leavesley Road to 10th Street	71 - 103	110	Moderately Used	67 - 76	75 - 79	70 - 74	72	2 MF[6]
10th Street to Santa Clara County Line	283	120	Moderately Used	56[7]	57[7]	53	72	0
Santa Clara County Line to SR 152[2]	650	200	New	N/A	N/A	53	72	0
Pacheco Pass Subsection								
Tunnel (2255+00 to 2340+00)[2]	2541	200	New	N/A	N/A	43	72	0
Aerial/Embankment (2340+00 to 3325+00)[2]	3530	200	New	N/A	N/A	43	72	0
Tunnel (3325+00 to 4035+00)[2]	1017	200	New	N/A	N/A	49	72	0
Tunnel Portal to I-5[2]	360	200	New	N/A	N/A	56	72	0

Location	Distance to Near HSR Track (feet)	Maximum HSR Speed (mph)	Type of Existing Corridor	Overall Vibration Velocity Level (VdB)[1]				Number of Impacts
				Maximum Existing Vibration Level	Maximum Future Caltrain Vibration Level	Maximum HSR Project Vibration Level	Vibration Impact Criteria	
San Joaquin Valley Subsection								
I-5 to San Waste Way[2]	320	202	New	N/A	N/A	57	72	0
San Waste Way to North Mercey Springs Road[2]	114	220	New	N/A	N/A	66	72	0
North Mercey Springs Road to Carlucci Road[2]	156	220	New	N/A	N/A	63	72	0
TOTAL								**920 SF, 272 MF, 1 Institutional, 2 Places of Worship, 5 Hotels, 1 Fire Dept, 1 Hospital, 1 Vibration Sensitive Facility**

HSR = high-speed rail
VdB = vibration decibels
SR = State Route
SF = single family residential
MF = multifamily residential

[1] Maximum overall vibration velocity levels (VdB re: 1 µin/sec). The ranges shown for the vibration levels in this table are a composite of many receptors and are meant to provide the limits of these values for each geographic location. The data represent the range for vibration-sensitive receptors.
[2] Locations listed as new rail corridors are not adjacent to existing tracks, therefore no corresponding existing or future Caltrain vibration levels are listed.
[3] The vibration impacts in the San Jose Diridon Station Approach Subsection with Alternative 4 are caused by Caltrain trains with increased maximum speed up to 110 mph and by HSR trains.
[4] The vibration impacts in the Monterey Corridor Subsection with Alternative 4 are caused by Caltrain trains with increased maximum speed up to 110 mph and by HSR trains.
[5] Vibration impact is projected at one non-residential vibration sensitive facility in the Monterey Corridor Subsection between Blossom Hill Road to Bernal Way with Alternative 4 at the Great Oaks Research Park caused by HSR trains.
[6] The vibration impacts in the Morgan Hill and Gilroy Subsection with Alternative 4 are caused by Caltrain trains with increased maximum speed up to 110 mph and by HSR trains.
[7] Maximum existing vibration levels and future non-HSR train vibration levels are from freight trains.

5.3 Summary of Impacts

The noise and vibration impacts for the four project alternatives are shown in Table 5-32 for both the construction phase and operations phase.

5.3.1 Noise

5.3.1.1 Construction Noise

Construction of the project would require the use of mechanical equipment that would generate temporary increases in noise and result in temporary construction impacts at noise-sensitive locations. For typical track construction scenarios, the residential nighttime 8-hour L_{eq} criterion of 70 dBA would potentially be exceeded up to 374 feet from the clear-and-grub construction activity and as far away as 774 feet from the concrete pour aerial structure activity; for the PG&E upgrades, these criteria would be exceeded as far away as 522 feet from the conductor installation construction activity. These distances would be applicable to all four project alternatives. The Authority and its contractors would comply with FTA and FRA guidelines for minimizing noise impacts at sensitive receptors during project construction (NV-IAMF#1), but construction noise impacts would remain. Distances to potential construction noise impacts for various types of activity would be the same for all alternatives.

5.3.1.2 Operations Noise

Project operations would permanently increase noise levels above the ambient noise environment at sensitive receptors. Alternative 4 would have the most severe and moderate operations noise impacts, followed by Alternative 2, Alternative 1, and Alternative 3, and impacts would be greater under the 2040 Plus Project condition compared to 2029. Under the 2040 Plus Project condition without the DDV and TDV, there would be 337 severe noise impacts and 1,200 moderate impacts under Alternative 1, 755 severe impacts and 1,844 moderate impacts under Alternative 2, 222 severe impacts and 834 moderate impacts under Alternative 3, and 1,212 severe impacts and 1,666 moderate impacts under Alternative 4. Under the 2040 Plus Project cumulative condition without the DDV and TDV, there would be 879 severe noise impacts and 2,556 moderate impacts under Alternative 1, 1,237 severe impacts and 1,932 moderate impacts under Alternative 2, 647 severe impacts and 2,357 moderate impacts under Alternative 3, and 1,589 severe impacts and 1,933 moderate impacts under Alternative 4.

With the DDV and TDV under the 2040 Plus Project condition, there would be 347 severe noise impacts and 1,195 moderate impacts under Alternative 1, 766 severe impacts and 1,838 moderate impacts under Alternative 2, 233 severe impacts and 845 moderate impacts under Alternative 3, and 1,224 severe impacts and 1,658 moderate impacts under Alternative 4. Under the 2040 Plus Project cumulative condition with the DDV and TDV, there would be 890 severe noise impacts and 2,550 moderate impacts under Alternative 1, 1,249 severe impacts and 1,925 moderate impacts under Alternative 2, 658 severe impacts and 2,361 moderate impacts under Alternative 3, and 1,601 severe impacts and 1,928 moderate impacts under Alternative 4.

Project operations would generate traffic and associated noise at HSR stations. Near the San Jose Diridon Station, the largest L_{dn} contribution from the parking facilities at the nearby noise receptors would be 29 dBA. Near the Downtown Gilroy Station, the largest L_{dn} contribution from the parking facilities at the nearby noise receptors would be 40 dBA. Near the East Gilroy Station, the largest L_{dn} contribution from the parking facilities at the nearby noise receptors would be 28 dBA. The additional noise from parking facilities would be substantially lower (at least 18 dB less) than the projected L_{dn} from HSR operations.

Project operations would also generate additional noise associated with train movements in and out of the MOWF near Gilroy. Under Alternatives 1 and 2, the L_{dn} contribution from the South Gilroy MOWF at that nearest receptor would be 40 dBA (more than 20 dBA less than HSR operations). Under Alternative 3, the L_{dn} contribution from the East Gilroy MOWF at that nearest receptor would be 47 dBA, more than 20 dB less than the HSR operations contribution at that receptor. The nearest receptors to the Alternative 4 South Gilroy MOWF would be approximately

900 feet away. In this neighborhood, the highest L_{dn} contribution from the MOWF would be 45 dBA, more than 18 dB less than the HSR operations contribution at that receptor.

Project construction would result in permanent changes in the local roadway network that would require some diversion and rerouting of traffic. The diversion of traffic would not be expected to affect noise levels because traffic on local roadways provides only a minor contribution to overall noise levels.

Project operations would generate additional traffic and traffic-related noise under the 2029 Plus Project and 2040 Plus Project conditions. Permanent increases in traffic-related noise would be similar for all four alternatives and would occur at roadways segments near San Jose Diridon Station, along Monterey Corridor, and near Gilroy. In 2029, seven roadway segments under Alternatives 1 and 2 and six roadway segments under Alternatives 3 and 4 would have the potential for noise level increases greater than or equal to 3 dB, compared to existing noise conditions. In 2040, operations of all project alternatives would result in 12 roadway segments with the potential for noise level increases greater than or equal to 3 dB. The majority of these traffic noise impacts would occur near the San Jose Diridon Station and along Monterey Road.

The potential for passing HSR train noise to startle or surprise humans near the HSR track and to result in human annoyance was determined to be unlikely for dedicated sections of the alignment and at one location for blended service in Morgan Hill under Alternative 4. Analysts also evaluated the potential for livestock to experience stress associated the noise of passing trains in exceedance of the FRA's recommended threshold. Where livestock operations are within approximately 30 feet of the edge of the HSR right-of-way, adverse effects would occur within 30 feet of the HSR right-of-way. In locations where HSR trains are sounding warning horns, livestock within approximately 285 feet of HSR tracks could experience adverse effects.

Substation operations would not generate additional noise impacts when compared to the operations train noise impacts that exceed FRA criteria. Under Alternative 4, the combined train and TPSS operations would generate severe noise impacts at 30 apartment residences; moderate noise impacts would occur for Alternates 2, 3, and 4. The greatest impacts would occur along Alternative 4, followed by Alternative 1 and 3, and with Alternative 2 having the fewest impacts. The difference in substation noise impacts among the project alternatives is predominately the result of site placement of TPSS or paralleling station sites; the Alternative 4 San Jose TPPS site would be directly adjacent to a large multifamily apartment building.

5.3.2 Vibration

5.3.2.1 Construction Vibration

Construction of the project alternatives would result in vibration impacts potentially causing human annoyance and building damage. Most construction activities would only cause annoyance from vibration within 160 feet of the mechanical equipment. Some equipment, such as pile driving or ongoing demolition work would have the potential to cause annoyance from vibration within 300 feet. Buildings close to pile-driving activity (within 50 feet) would have the potential for structural damage. Incorporation of NV-IAMF#1 would minimize construction vibration and the potential for it to cause annoyance or damage to buildings. However, even with NV-IAMF#1, some sensitive receptors would still be exposed to ground-borne vibration that could result in annoyance or building damage.

Construction of tunnels in the Pacheco Pass Subsection would result in human-perceptible vibration in occupied buildings within approximately 100 feet of TBM operations; however, the tunnel depth near the closest occupied building would be more than 200 feet. Near the closest sensitive buildings, the tunnel would be more than 200 feet deep and 1,000 feet away horizontally. At these large distances and depths, ground-borne vibration would be well below the impact criteria. Similarly, at the depth and distance from the tunnel to the sensitive buildings in Pacheco Pass, ground-borne noise levels are expected to be below 25 dBA, thus below the lowest impact criteria. There is also a planned cut-and-cover tunnel area of the alignment as it passes under US 101 for Alternatives 1 and 2 in Morgan Hill and Gilroy Subsection. At receptors

in this location, the projected ground-borne noise levels are expected to be below 25 dBA, also below the lowest impact criteria. At these distances, it is not anticipated that vibration from the TBM would be an issue.

5.3.2.2 Operations Vibration

Project operations would cause permanent vibration impacts (annoyance) at sensitive receptors. Alternative 1 would result in 81 vibration impacts, Alternative 2 would result in 143 vibration impacts, Alternative 3 would result in 140 vibration impacts, and Alternative 4 would result in 1,203 vibration impacts. Under Alternatives 1-3, the majority of these vibration impacts would occur in the San Jose Diridon Station Approach and the Monterey Corridor Subsections, with the remaining vibration impacts occurring in the Morgan Hill and Gilroy Subsection. Under Alternative 4, the majority of the vibration impacts would occur in the Monterey Corridor and Morgan Hill and Gilroy Subsections, with the remaining vibration impacts occurring in the San Jose Diridon Station Approach Subsection. Project operations would not have the potential to cause building damage because the vibration levels would not approach damage thresholds. See Section 4.2.1, Descriptors, for additional discussion.

Table 5-32 Summary of Impacts

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction-Related Noise				
Construction noise impacts	Temporary noise impacts at noise sensitive locations would exceed the residential nighttime 8-hour L_{eq} criterion of 70 dBA for typical track construction activities up to 374 feet from the clear-and-grub construction activity and up to 774 feet from the concrete pour aerial structure activity. For the PG&E upgrades, these criteria would be exceeded as far away as 522 feet from reconductoring activity. These distances would be applicable to all four project alternatives.	Similar to Alternative 1, with fewer noise impacts in Morgan Hill and Gilroy and Monterey Corridor Subsections.	Similar to Alternative 1, without noise impacts on downtown Gilroy businesses.	Similar to Alternative 1, but no concrete pour aerial structure activity from San Jose to Gilroy. This would have more impacts in Morgan Hill.
Operations-Related Noise				
2029 Plus Project operations noise impacts	▪ 310 (313) moderate impacts ▪ 47 (51) severe impacts	▪ 599 (601) moderate impacts ▪ 38 (43) severe impacts	▪ 227 (233) moderate impacts ▪ 34 (37) severe impacts	▪ 1,001 (1,004) moderate impacts ▪ 190 (197) severe impacts

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
2040 Plus Project operations noise impacts	▪ 1,200 (1,195) moderate impacts ▪ 337 (347) severe impacts	▪ 1,844 (1,838) moderate impacts ▪ 755 (766) severe impacts	▪ 834 (845) moderate impacts ▪ 222 (233) severe impacts	▪ 1,666 (1,658) moderate impacts ▪ 1,212 (1,224) severe impacts
2029 Plus Project cumulative operations noise impacts	▪ 1,620 (1,623) moderate impacts ▪ 71 (75) severe impacts	▪ 1,426 (1,427) moderate impacts ▪ 200 (205) severe impacts	▪ 1,306 (1,312) moderate impacts ▪ 48 (51) severe impacts	▪ 1,500 (1,496) moderate impacts ▪ 475 (501) severe impacts
2040 Plus Project cumulative operations noise impacts	▪ 2,556 (2,550) moderate impacts ▪ 879 (890) severe impacts	▪ 1,932 (1,925) moderate impacts ▪ 1,237 (1,249) severe impacts	▪ 2,357 (2,361) moderate impacts ▪ 647 (658) severe impacts	▪ 1,933 (1,928) moderate impacts ▪ 1,589 (1,601) severe impacts
Annoyance from onset of HSR passby	Operations would not cause human annoyance from the startle effect of HSR train passbys within dedicated sections of the alignment because the threshold for sudden onset noise would occur within the right-of-way, which would be fenced to prohibit public access			Operations would cause initial human annoyance from the startle effect of HSR train passbys at one location within 23 feet of the tracks in Morgan Hill. Effects south and east of Gilroy would be the same as Alternatives 1, 2 and 3.
HSR station noise	Noise contribution from parking facilities: ▪ 29 dBA L_{dn} at San Jose Diridon Station ▪ 40 dBA L_{dn} at the Downtown Gilroy Station This additional noise would be substantially lower than noise from HSR trains.	Noise contribution from parking facilities: ▪ 29 dBA L_{dn} at San Jose Diridon Station ▪ 40 dBA L_{dn} at the Downtown Gilroy Station This additional noise would be substantially lower than noise from HSR trains.	Noise contribution from parking facilities: ▪ 29 dBA L_{dn} at San Jose Diridon Station ▪ 28 dBA L_{dn} at the East Gilroy Station This additional noise would be substantially lower than noise from HSR trains.	Noise contribution from parking facilities: ▪ 29 dBA L_{dn} at San Jose Diridon Station ▪ 40 dBA L_{dn} at the Downtown Gilroy Station This additional noise would be substantially lower than noise from HSR trains.
Maintenance facility noise	40 dBA L_{dn} contribution from train movements at the South Gilroy MOWF, substantially lower than the noise from operating HSR trains. No additional impact is projected.		47 dBA L_{dn} contribution from train movements at the East Gilroy MOWF, substantially lower than the noise from operating HSR trains. No additional impact is projected.	45 dBA L_{dn} contribution from train movements at the Alternative 4 MOWF, substantially lower than the noise from operating HSR trains. No additional impact is projected.

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
2029 Plus Project traffic-related noise increases	Roadway segments with an anticipated increase in traffic noise of 3 dB or greater: ▪ 4 roadway segments near the San Jose Diridon Station ▪ 2 roadway segments along Monterey Road ▪ 1 roadway segment near the South Gilroy MOWF		Roadway segments with an anticipated increase in traffic noise of 3 dB or greater: ▪ 4 roadway segments near the San Jose Diridon Station ▪ 2 roadway segments along Monterey Road	Roadway segments with an anticipated increase in traffic noise of 3 dB or greater: ▪ 3 roadway segments near the San Jose Diridon Station ▪ 3 roadway segments along Monterey Road
2040 Plus Project traffic-related noise increases	Roadway segments with an anticipated increase in traffic noise of 3 dB or greater: ▪ 5 roadway segments near the San Jose Diridon Station ▪ 6 roadway segments along Monterey Road ▪ 1 roadway segment near the South Gilroy MOWF		Roadway segments with an anticipated increase in traffic noise of 3 dB or greater: ▪ 5 roadway segments near the San Jose Diridon Station ▪ 6 roadway segments along Monterey Road ▪ 1 roadway segment near the East Gilroy MOWF	Roadway segments with an anticipated increase in traffic noise of 3 dB or greater: ▪ 4 roadway segments near the San Jose Diridon Station ▪ 6 roadway segments along Monterey Road ▪ 1 roadway segment near the Downtown Gilroy Station ▪ 1 roadway segment near the South Gilroy MOWF
Noise effects on livestock	Livestock within approximately 30 feet of the edge of the HSR right-of-way would experience stress associated with exposure to noise levels above the recommended thresholds for passbys (all alternatives). Livestock within approximately 285 feet of the edge of the HSR right-of-way would experience stress associated with exposure to noise levels from sounding of HSR horns (Alternative 4 only).			
Traction power facility noise	The substation facilities would generate noise but would not incur additional noise impact beyond those from trains and horns.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction-Related Vibration				
Construction vibration impacts	Potential annoyance from nighttime vibratory methods within 300 feet of residential structures. Potential building damage from impact pile driving within 50 feet of structures.	Similar to Alternative 1, but potentially with more vibratory compaction at embankments and at grade in Morgan Hill and Gilroy and Monterey Corridor Subsections; less vibratory compaction in San Jose to Scott Boulevard touchdown.	Similar to Alternative 1 to Gilroy and in Monterey Corridor Subsection, but eastern alignment in Gilroy and Morgan Hill Subsection would affect fewer structures; similar to Alternative 2 from Monterey through San Jose.	Similar Alternative 1 east of Gilroy; most vibratory compaction at embankments and at grade of all alternatives; construction within existing right-of-way could require more nighttime work to minimize service disruptions.
Construction TBM vibration impacts	Potential perceptible vibration in occupied buildings within 100 feet of TBM operations for tunnel construction. Tunnel depth at closest occupied building is greater than 200 feet, so vibration from TBM not anticipated to be an issue.			
Operations-Related Vibration				
Operations vibration impacts	81 permanent vibration impacts	143 permanent vibration impacts	140 permanent vibration impacts	1,203 permanent vibration impacts

L_{eq} = sound level equivalent
dBA = A-weighted decibel
PG&E = Pacific Gas and Electric
HSR = high-speed rail
mph = miles per hour
UPRR = Union Pacific Railroad
L_{dn} = day-night sound level
MOWF = maintenance of way facility
dB = decibel
TBM = tunnel boring machine
Impacts associated with the design variants are shown in parentheses. The DDV affects Alternative 4 within the San Jose Diridon Station Approach Subsection; the TDV affects all alternatives within the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.

6 REFERENCES

California High-Speed Rail Authority (Authority). 2008. *California High-Seed Train Project Technical Memorandum Phase 1 Service Plan TM 4.2*, November 22, 2008.

———. 2011. *San Jose to Merced Section Noise and Vibration Technical Report*. Prepared by Parsons Transportation Group. August 2011.

———. 2016. *Connecting and Transforming California: 2016 Business Plan.* May 1, 2016. http://hsr.ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf (accessed October 2019).

———. 2018. *2018 Business Plan: Connecting California, Expanding Economy, Transforming Travel.* June 1, 2018. www.hsr.ca.gov/docs/about/business_plans/2018_BusinessPlan.pdf (accessed February 18, 2020).

———. 2019a. *San Jose to Merced Project Section Biological and Aquatic Resources Technical Report.* November 2019. Sacramento, CA.

———. 2019b. *Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR/EIS*. Sacramento, CA.

———. 2019c. *Merced to Fresno Section: Central Valley Wye Draft Supplemental Environmental Impact Report/Environmental Impact Statement*. Volume 1: Report. May 2019. Sacramento, CA.

California High-Speed Rail Authority (Authority) and Federal Railroad Administration (FRA). 2005. *Final Program Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System*. August 2005.

———. 2008. *San Francisco Bay Area (Bay Area) to Central Valley High-Speed Train (HST) Program Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS).* May 2008.

_____. 2010a. *San Francisco to San Jose Section Noise and Vibration Technical Report*. October 2010.

———. 2010b. *Benchmark Tests for Calibration of CAHST Noise Models*, May 26, 2010.

———. 2012. *Merced to Fresno Section California High-Speed Train Final Project Environmental Impact Report/Environmental Impact Statement and Final Section 4(f) Statement and Draft General Conformity Determination.* Volume I: Report. April 2012. Sacramento, CA, and Washington, DC.

———. 2017. *California High Speed Rail Project EIR/EIS Environmental Methodology Guidelines* Version 5.09. April 2017. Sacramento, CA and Washington, DC.

———. 2019. *Statewide Impact Avoidance and Minimization Features Library*. Revision 16. March 11, 2019. Sacramento, CA and Washington, DC.

California Department of Transportation (Caltrans). 2011. *Traffic Noise Analysis Protocol*. May 2011. www.dot.ca.gov/env/noise/.

California Office of Planning and Research (OPR). 2003. *General Plan Guidelines 2003.* www.opr.ca.gov/planning/general-plan/.

City of Gilroy. 2002. *Gilroy 2002–2020 General Plan*. www.cityofgilroy.org/274/2020-General-Plan (accessed March 23, 2017)

City of Morgan Hill. 2016. *2035 General Plan City of Morgan Hill.* Adopted July 27, 2016. www.ca-morganhill2.civicplus.com/DocumentCenter/View/20686 (accessed December 23, 2016)

City of San Jose. 2011. *Envision: San José 2040 General Plan*. Revised March 23, 2016. www.sanjoseca.gov/DocumentCenter/Home/View/474 (accessed June 3, 2016).

City of Santa Clara. 2010. *2010–2035 General Plan.* Adopted November 16, 2010. http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan (accessed on July 18, 2019)

County of Merced. 2013. *2030 Merced County General Plan*. Adopted December 10, 2013. www.co.merced.ca.us/DocumentCenter/View/6766/2030-General-Plan?bidId= (accessed July 17, 2019)

County of San Benito. 2015. *San Benito County 2035 General Plan.* Adopted July 21, 2015. http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf (accessed July 18, 2019).

County of Santa Clara. 1994. *Santa Clara County General Plan: Charting a Course for Santa Clara County's Future 1995–2010.* Adopted December 20, 1994. www.sccgov.org/sites/dpd/PlansOrdinances/GP/Pages/GP.aspx (accessed March 8, 2017).

Federal Highway Administration (FHWA). 2006. *Roadway Construction Noise Model User's Guide*, DOT-VNTSC-FHWA-05-01. U.S. Department of Transportation, Office of Environment and Planning. January 2006. Washington, DC.

Federal Railroad Administration (FRA). 2000. *Horn Noise MS Excel Spreadsheet Model.* July 2012. www.fra.dot.gov/eLib/Details/L04091.

_____. 2012. *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, DOT/FRA/ORD-12/15. U.S. Department of Transportation, Office of Railroad Policy and Development. September 2012. Washington, DC. www.fra.dot.gov/eLib/Details/L04090.

_____. 2018. Horn Noise FAQ. www.fra.dot.gov/Page/P0599.

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual.* FTA Report No. 0123. U.S. Department of Transportation, Office of Planning and Environment. September 2018. Washington, DC.

San Benito County Airport Land Use Commission. 2001. *Frazier Lake Airpark Comprehensive Land Use Plan*. www.sanbenitocog.org/clup.php.

San Jose International Airport. 2010. *2027 CNEL Contours for Airport Master Plan (amended 6/8/10)*. www.flysanjose.com/node/2206 (accessed February 8, 2020).

Wilson Ihrig & Associates. 2009. *Crystal Springs Pipeline No. 2 Noise and Vibration Study Impacts and Mitigation Technical Memo*. Orion-ESA Joint Venture. September 2009.

_____. 2014. *Caltrain Peninsula Corridor Electrification Project Noise and Vibration Technical Report*. Prepared for Peninsula Corridor Joint Powers Board. Revised November 2014.

7 PREPARER QUALIFICATIONS

Project Role	Name, Credential	Qualifications
Wilson Ihrig		
Technical Lead / Senior Consultant	Timothy Johnson	16 years' experience B.S. Mechanical Engineering with Acoustics Concentration, University of Hartford, West Hartford, CT
Principal in Charge / Principal	Deborah Jue	28 years' experience M.S. in Mechanical Engineering, University of California, Berkeley, CA B.S. Engineering: Acoustics, Stanford University, Stanford, CA
Project Engineer / Senior Consultant	Silas Bensing	10 years' experience B.A. Audio Arts and Acoustics, Columbia College, Chicago, IL
Project Engineer / Associate	Ani Toncheva	7 years' experience B.A. Physics, Bard College, Annandale-on-Hudson, NY
Project Engineer / Associate	Patrick Faner	10 years' experience B.S. Mechanical Engineering, University of California, Berkeley, CA
Project Engineer / Associate	Sarah Kaddatz	5 years' experience B.S. Acoustics, Columbia College, Chicago, IL
Project Engineer / Associate	Luke Watry	3 years' experience B.S. Mechanical Engineering, University of Colorado, Boulder, CO
Project Engineer / Associate	Taylor Hays	8 years' experience B.S. Meteorology, Rutgers University, New Brunswick, NJ

APPENDIX A: MEASUREMENT SITE PHOTOGRAPHS

NOISE MEASUREMENT SITE PHOTOGRAPHS

Source: Wilson Ihrig 2016

Figure A-1 Site N76: 2079 Main Street, San Jose, CA

Source: Wilson Ihrig 2009

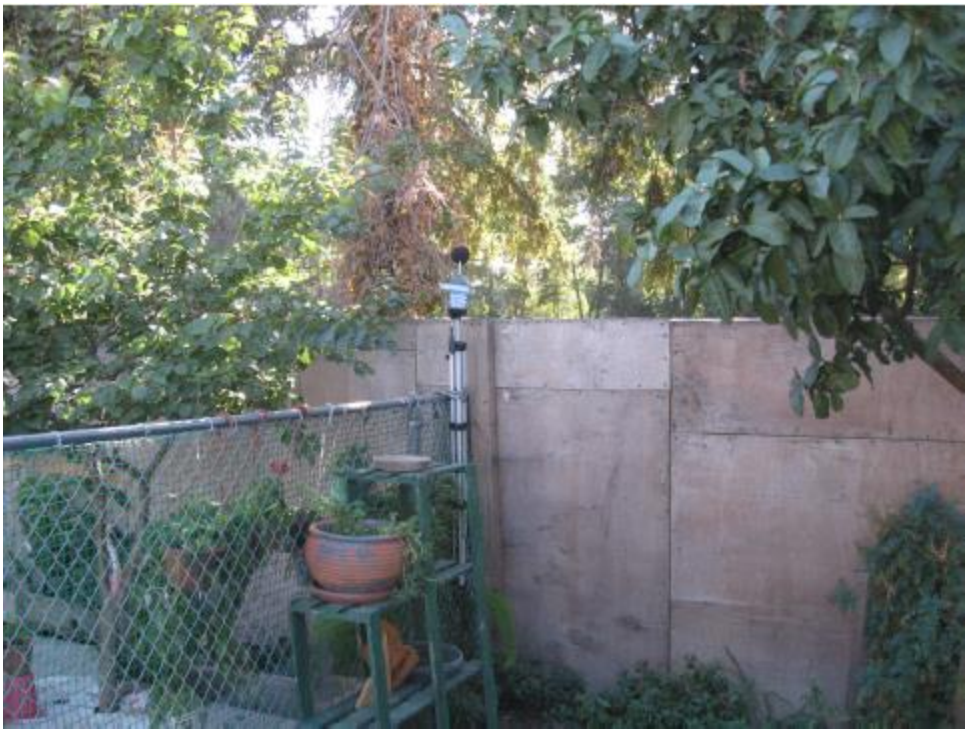
Figure A-2 Site N77: 1315 De Altura Commons, San Jose, CA

Source: Wilson Ihrig 2010

Figure A-3 Site N78: 726 Emory Street, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-4 Site N79: across 109 Laurel Grove Avenue, San Jose, CA



Source: Parsons Transportation 2010

Figure A-5 Site N80: 421 Illinois Avenue, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-6 Site N81: 663 Delmas Avenue, San Jose, CA

Source: Parsons Transportation 2010

Figure A-7 Site N82: 827 Hasliss Avenue, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-8 Site N83: across 974 McLellan Avenue, San Jose, CA

Source: Wilson Ihrig 2014

Figure A-9 Site N84: 1197 Lick Avenue, San Jose, CA

Source: Parsons Transportation 2010

Figure A-10 Site N85: 2320 Canoas Garden Avenue (Lot 608), San Jose, CA

Source: Wilson Ihrig 2016

Figure A-11 Site N86: Communications Hill Drive, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-12 Site N87: 3200 Monterey Road, Clarion Inn, San Jose, CA

Source: Parsons Transportation 2010

Figure A-13 Site N88: 4406 Pinon Place, San Jose, CA

Source: Parsons Transportation 2010

Figure A-14 Site N89: 23 Park Groton Place, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-15 Site N90: 4635 Rotherhaven Way, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-16 Site N91: 510 Saddle Brook Drive (Lot A), San Jose, CA

Source: Parsons Transportation 2010

Figure A-17 Site N92: 5272 Waterfall Court, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-18 Site N93: 60 Foxwell Place, San Jose, CA

Source: Parsons Transportation 2010

Figure A-19 Site N94: 5919 Southwind Drive, San Jose, CA

Source: Parsons Transportation 2010

Figure A-20 Site N95: 6908 Sessions Drive, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-21 Site N96: 6998 Sessions Drive, San Jose, CA

Source: Parsons Transportation 2010

Figure A-22 Site N97: 7307 Urshan Way San Jose, CA

Source: Parsons Transportation 2011

Figure A-23 Site N98: 7465 Pegasus Court San Jose, CA

Source: Parsons Transportation 2011

Figure A-24 Site N99: 8470 Monterey Highway, San Jose, CA

Source: Wilson Ihrig 2016

Figure A-25 Site N100: 586 Monterey Road, Morgan Hill, CA

Source: Wilson Ihrig 2016

Figure A-26 Site N101: across 19271 Saffron Drive, Morgan Hill, CA

Source: Wilson Ihrig 2016

Figure A-27 Site N102: across 19490 Vista De Lomas, Morgan Hill, CA

Source: Parsons Transportation 2010

Figure A-28 Site N103: 19260 Monterey Road, Morgan Hill, CA

Source: Wilson Ihrig 2016

Figure A-29 Site N104: 157 Bender Circle, Morgan Hill, CA

Source: Wilson Ihrig 2016

Figure A-30 Site N105: 17905 Condit, Morgan Hill, CA

Source: Parsons Transportation 2010

Figure A-31 Site N106: 95 E Central Avenue, Morgan Hill, CA

Source: Parsons Transportation 2010

Figure A-32 Site N107: 877 English Walnut Court, Morgan Hill, CA

Source: Parsons Transportation 2010

Figure A-33 Site N108: 16250 Railroad Avenue, Morgan Hill, CA

Source: Parsons Transportation 2010

Figure A-34 Site N109: 15450 Murphy Avenue, Morgan Hill, CA

Source: Wilson Ihrig 2016

Figure A-35 Site N110: 14916 Llagas Avenue, Morgan Hill, CA

Source: Wilson Ihrig 2016

Figure A-36 Site N111: 14542 Crowner Avenue, San Martin, CA

Source: Parsons Transportation 2010

Figure A-37 Site N112: 14150 Murphy Avenue, San Martin, CA

Source: Parsons Transportation 2010

Figure A-38 Site N113: 13455 Monterey Road, San Martin, CA

Source: Wilson Ihrig 2016

Figure A-39 Site N114: 13455 Monterey Road, San Martin, CA

Source: Wilson Ihrig 2016

Figure A-40 Site N115: 12675 Sycamore Avenue, San Martin, CA

Source: Parsons Transportation 2010

Figure A-41 Site N116: 11460 Rothe Avenue, Gilroy, CA

Source: Parsons Transportation 2010

Figure A-42 Site N117: 405 Lena Avenue, Gilroy, CA

Source: Parsons Transportation 2010

Figure A-43 Site N118: 110 Jacob Way, Gilroy, CA

Source: Wilson Ihrig 2016

Figure A-44 Site N119: 695 Rucker Avenue, Gilroy, CA

Source: Parsons Transportation 2010

Figure A-45 Site N120: 325 Denio Avenue, Gilroy, CA

Source: Parsons Transportation 2010

Figure A-46 Site N121: 25 Denio Avenue, Gilroy, CA

Source: Parsons Transportation 2010

Figure A-47 Site N122: 70 Cohansey Avenue, Gilroy, CA

Source: Wilson Ihrig 2016

Figure A-48 Site N123: 8415 Marcella Avenue, Gilroy, CA

Source: Wilson Ihrig 2016

Figure A-49 Site N124: across from 120 Sarafina Way, Gilroy, CA

Source: Parsons Transportation 2010

Figure A-50 Site N125: 111 Martin Street, Gilroy, CA

Source: Wilson Ihrig 2017

Figure A-51 Site N126: 7250 Alexander Street, Gilroy, CA

Source: Wilson Ihrig 2016

Figure A-52 Site N127: 6780 Holsclaw Road, Gilroy, CA

Source: Wilson Ihrig 2017

Figure A-53 Site N128: 1975 CA-152, Gilroy, CA

Source: Wilson Ihrig 2016

Figure A-54 Site N129: 1230 Bloomfield, Gilroy, CA

Source: Wilson Ihrig 2016

Figure A-55 Site N130: 8247 Lovers Lane, Hollister, CA

Source: Parsons Transportation 2010

Figure A-56 Site N131: 210 Walnut Avenue, Hollister, CA

Source: Wilson Ihrig 2016

Figure A-57 Site N132: Pacheco Pass Highway

Source: Wilson Ihrig 2016

Figure A-58 Site N133: 28263 Fahey Road, Los Banos, CA

Source: Wilson Ihrig 2016

Figure A-59 Site N134: across 24334 Henry Miller Avenue, Los Banos, CA

Source: Wilson Ihrig 2016

Figure A-60 Site N135: across 21534 Henry Miller Avenue, Los Banos, CA

Source: Wilson Ihrig 2016

Figure A-61 Site N136: across 18827 Henry Miller Road, Los Banos, CA

Source: Parsons Transportation 2010

Figure A-62 Site N137: 13893 Henry Miller Road, Los Banos, CA

Source: Wilson Ihrig 2016

Figure A-63 Site N138: 12051 Carlucci Road, Los Banos, CA

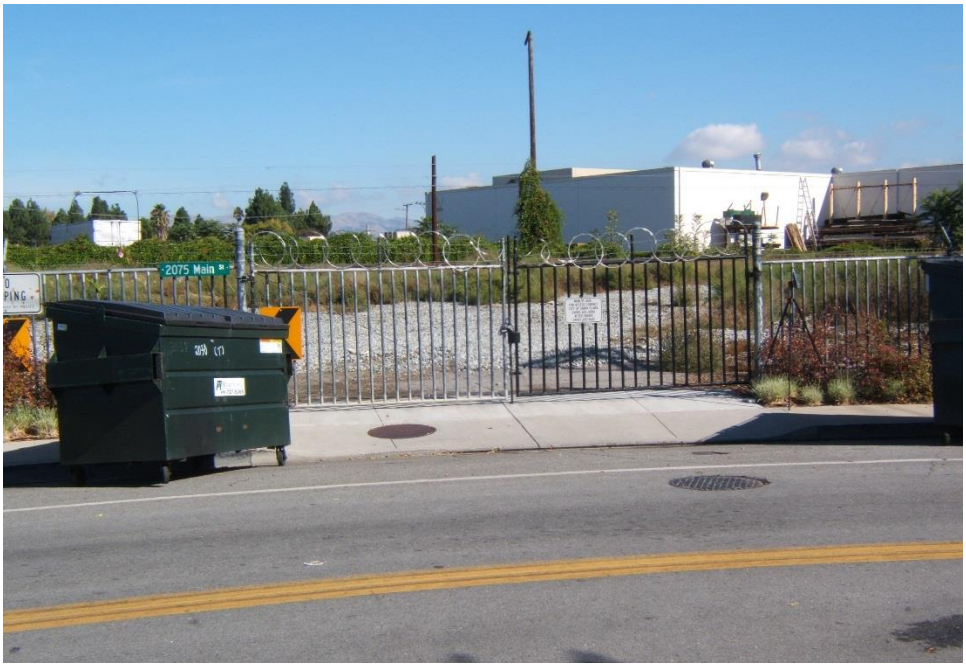
Source: Wilson Ihrig 2013

Figure A-64 Site N139: 782 Auzerais Avenue, San Jose, CA

Source: Wilson Ihrig 2013

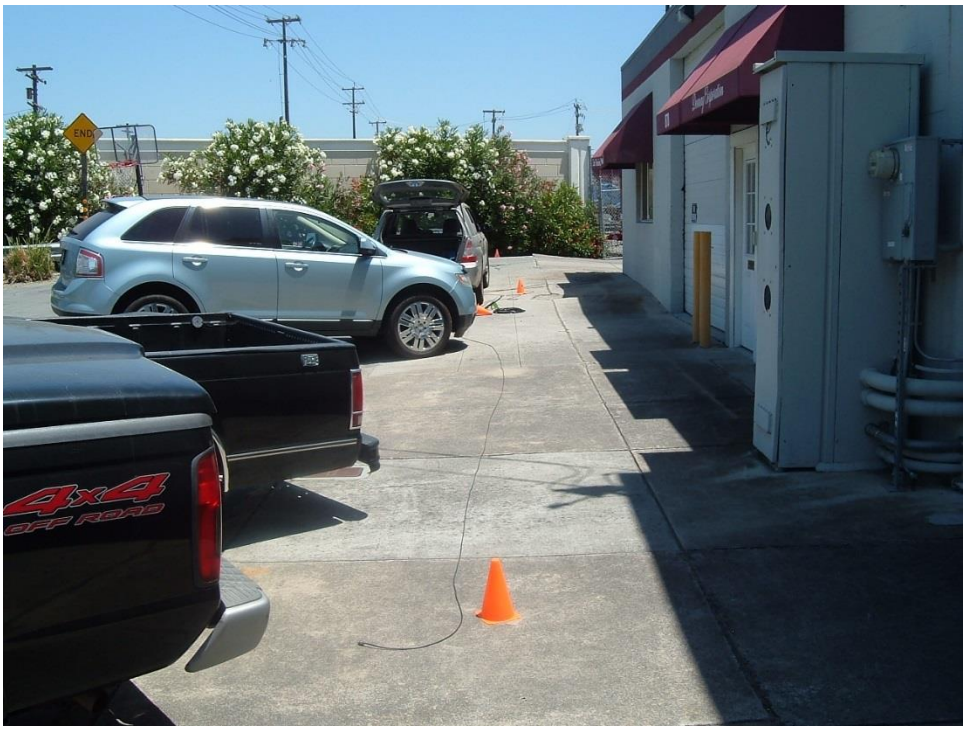
Figure A-65 Site N140: 748 Illinois Street, San Jose, CA

VIBRATION MEASUREMENT SITE PHOTOGRAPHS



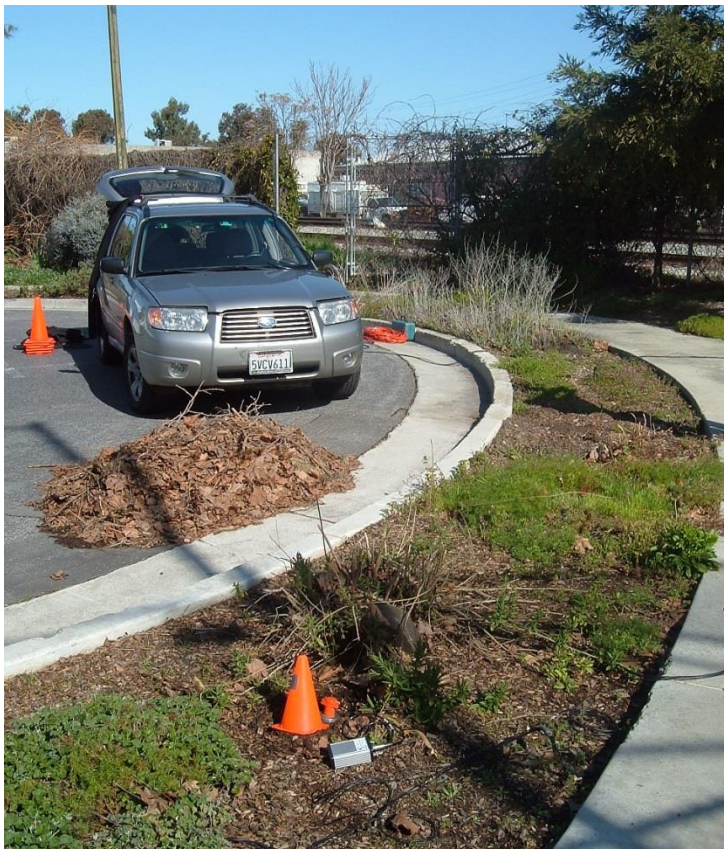
Source: Wilson Ihrig 2009

Figure A-66 Site V31: 2075 Main Street, Santa Clara



Source: Wilson Ihrig 2016

Figure A-67 Site V32: 890 Newhall Street, San Jose



Source: Wilson Ihrig 2010

Figure A-68 Site V33: 855 McKendrie Street, San Jose

Source: Wilson Ihrig 2013

Figure A-69 Site V34: 782 Auzerais Avenue, San Jose

Source: Wilson Ihrig 2016

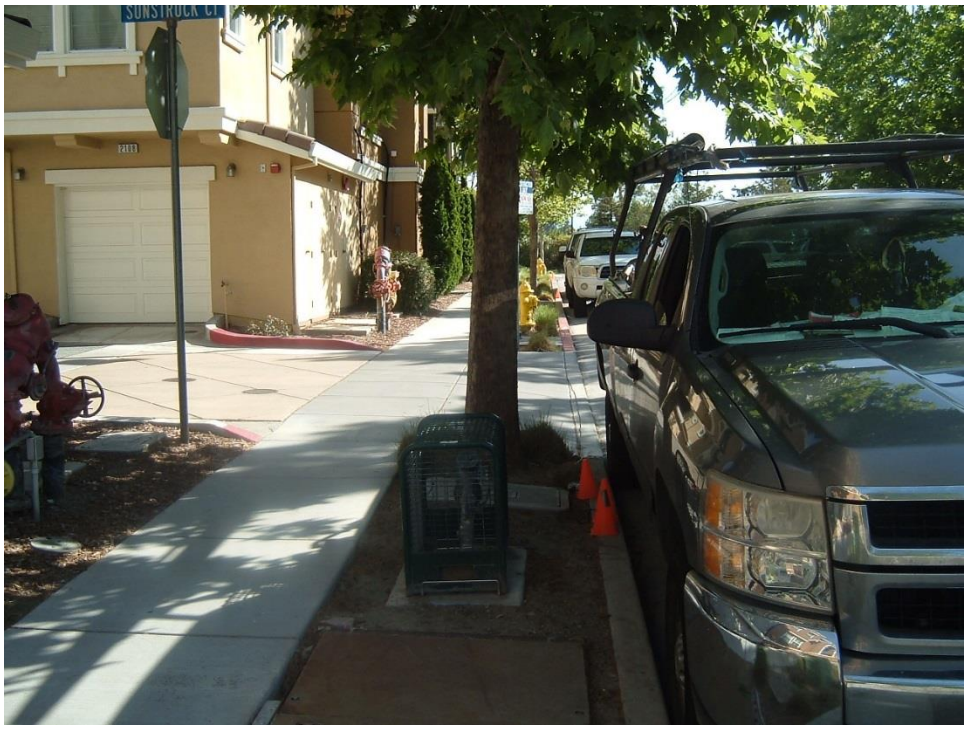
Figure A-70 Site V35: 704 Harrison Street, San Jose

Source: Wilson Ihrig 2016

Figure A-71 Site V36: Jerome St and Willis Avenue, San Jose

Source: Wilson Ihrig 2016

Figure A-72 Site V37: Fuller Ave and Delmas Avenue, San Jose



Source: Wilson Ihrig 2016

Figure A-73 Site V38: Pomme Ct and Olive Hill Drive, San Jose

Source: Wilson Ihrig 2016

Figure A-74 Site V39: Hayes Avenue and Endicott Boulevard, San Jose

Source: Wilson Ihrig 2016

Figure A-75 Site V40: Old Monterey Road and Paloma Drive, Morgan Hill

Source: Wilson Ihrig 2016

Figure A-76 Site V41: E Middle Avenue, San Martin

Source: Wilson Ihrig 2016

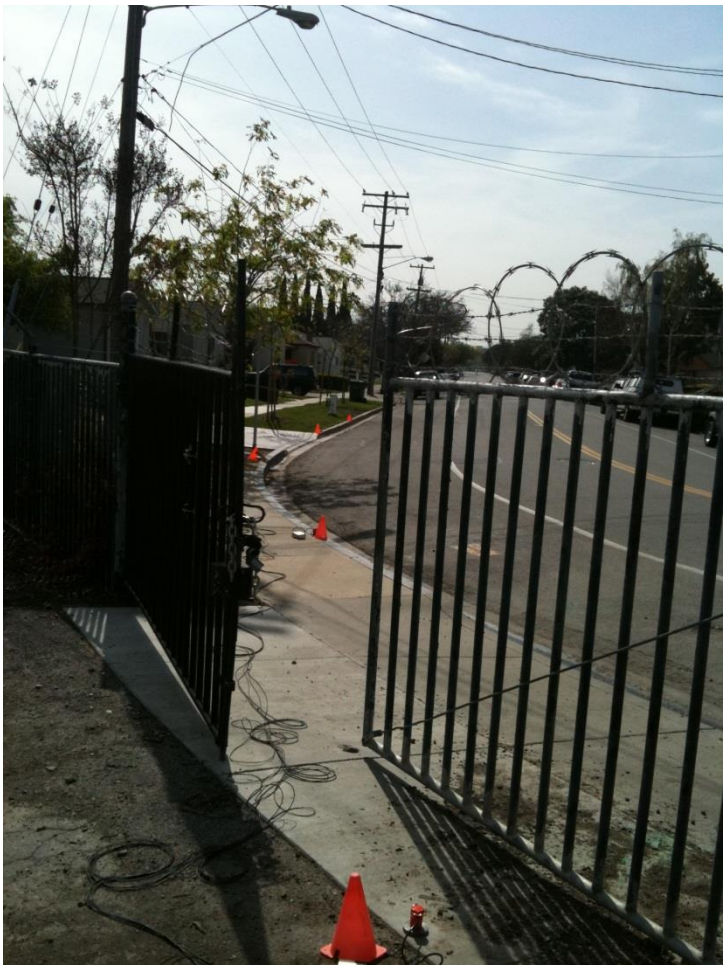
Figure A-77 Site V42: Dept Street and North Street, San Martin

Source: Wilson Ihrig 2016

Figure A-78 Site V43: Depot Street and South Street, San Martin

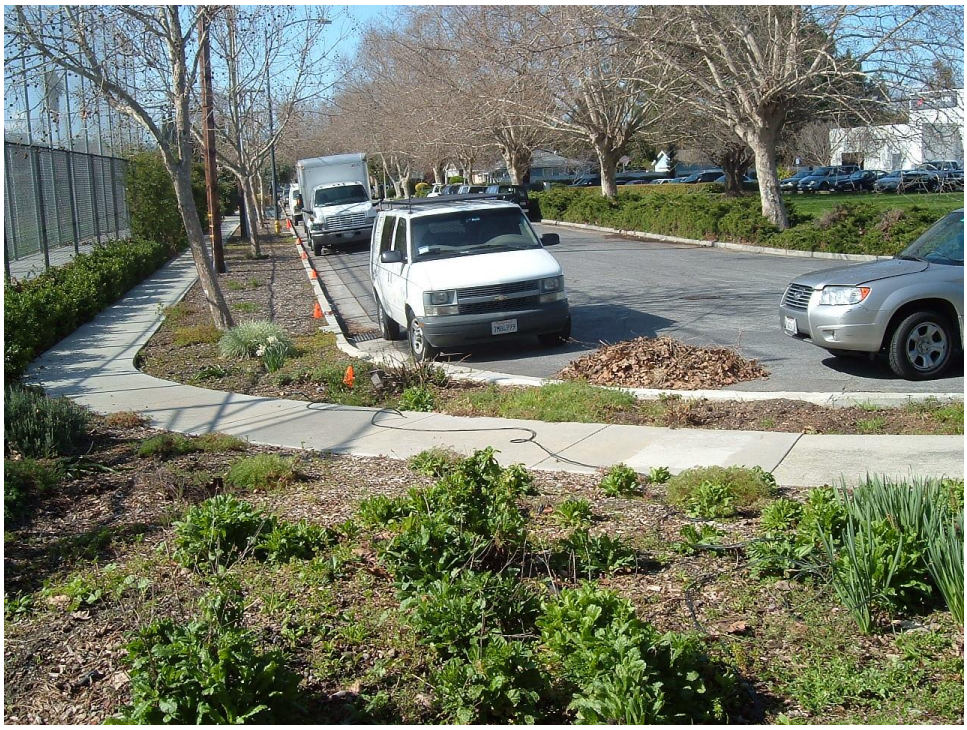
Source: Wilson Ihrig 2016

Figure A-79 Site V44: Railroad Street and Lewis Street, Gilroy



Source: Wilson Ihrig 2010

Figure A-80 Site VP19: Main Street and Washington Street, Santa Clara



Source: Wilson Ihrig 2010

Figure A-81 Site VP20: 855 McKendrie Street, San Jose

Source: Wilson Ihrig 2016

Figure A-82 Site VP21: Jerome Street and Willis Avenue, San Jose

Source: Wilson Ihrig 2016

Figure A-83 Site VP22: Hayes Avenue and Endicott Boulevard, San Jose

Source: Wilson Ihrig 2016

Figure A-84 Site VP23: Old Monterey Road and Paloma Drive, Morgan Hill

Source: Wilson Ihrig 2016

Figure A-85 Site VP24: Seymour Avenue and E Middle Avenue, San Martin

Source: Wilson Ihrig 2016

Figure A-86 Site VP25: Depot Street and North Avenue, San Martin

Source: Wilson Ihrig 2016

Figure A-87 Site VP26: Depot Street and Spring Street, San Martin

Source: Wilson Ihrig 2016

Figure A-88 Site VP27: Alexander Street and E Eighth Street, Gilroy

Source: Wilson Ihrig 2016

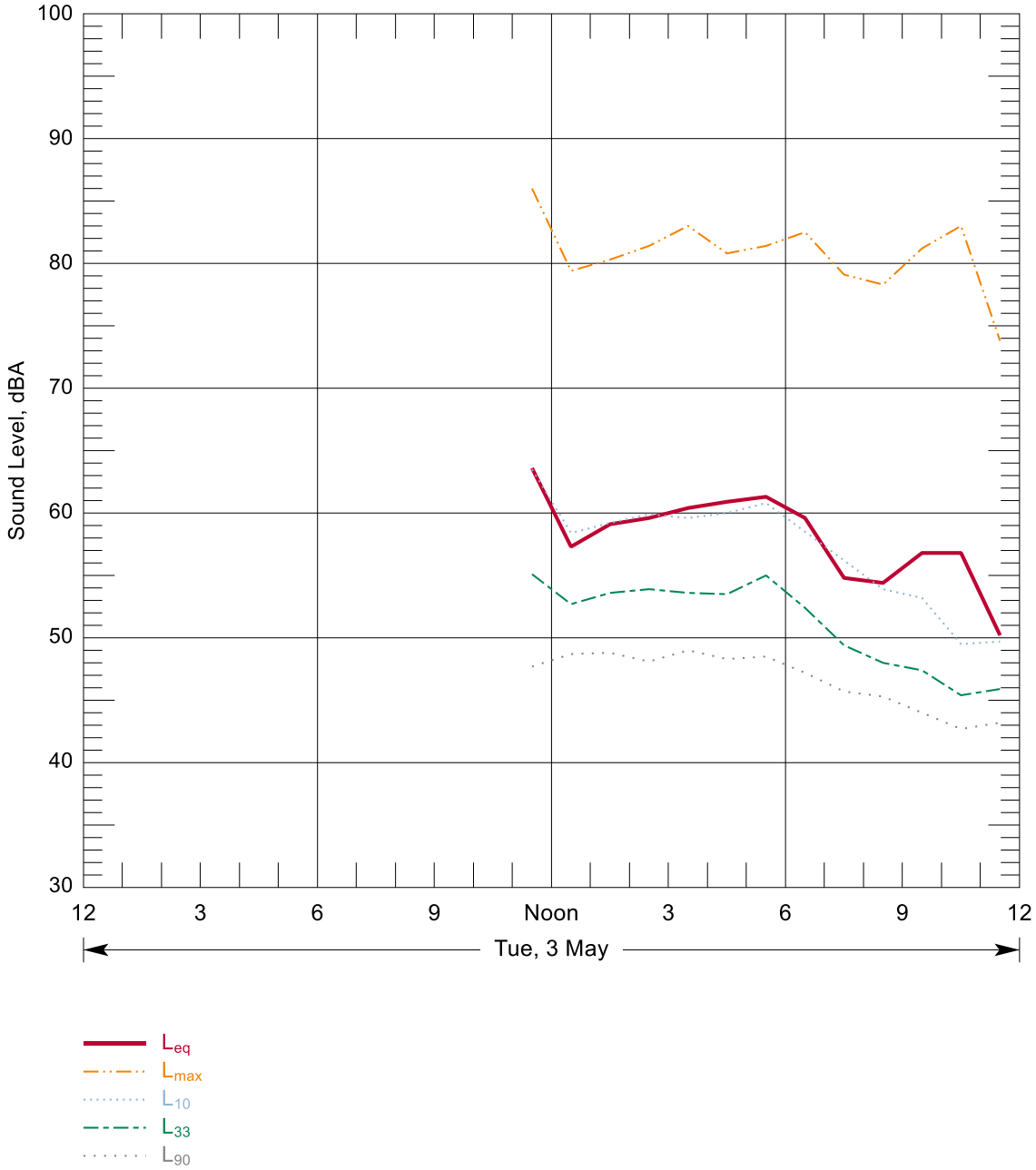
Figure A-89 Site VP28: Volta Road and Henry Miller Road, Los Banos

References

Parsons Transportation Group. 2011. *DRAFT San Jose to Merced Section Noise and Vibration Technical Report*, California High-Speed Rail Authority. August.

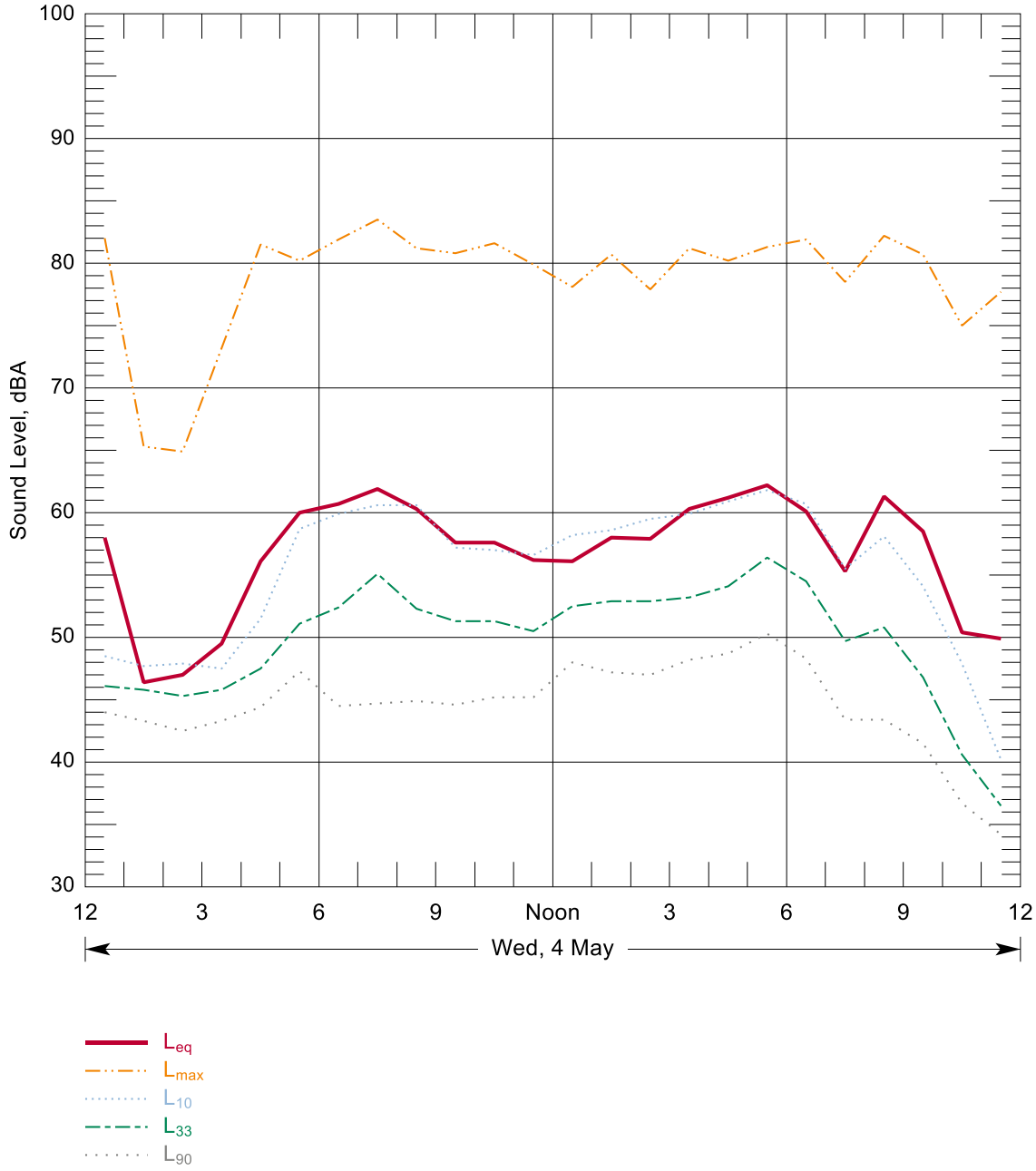
Wilson, Ihrig & Associates. 2010. *DRAFT San Francisco to San Jose Section Noise and Vibration Technical Report*. California High-Speed Rail Authority. October.

APPENDIX B: NOISE MEASUREMENT DATA



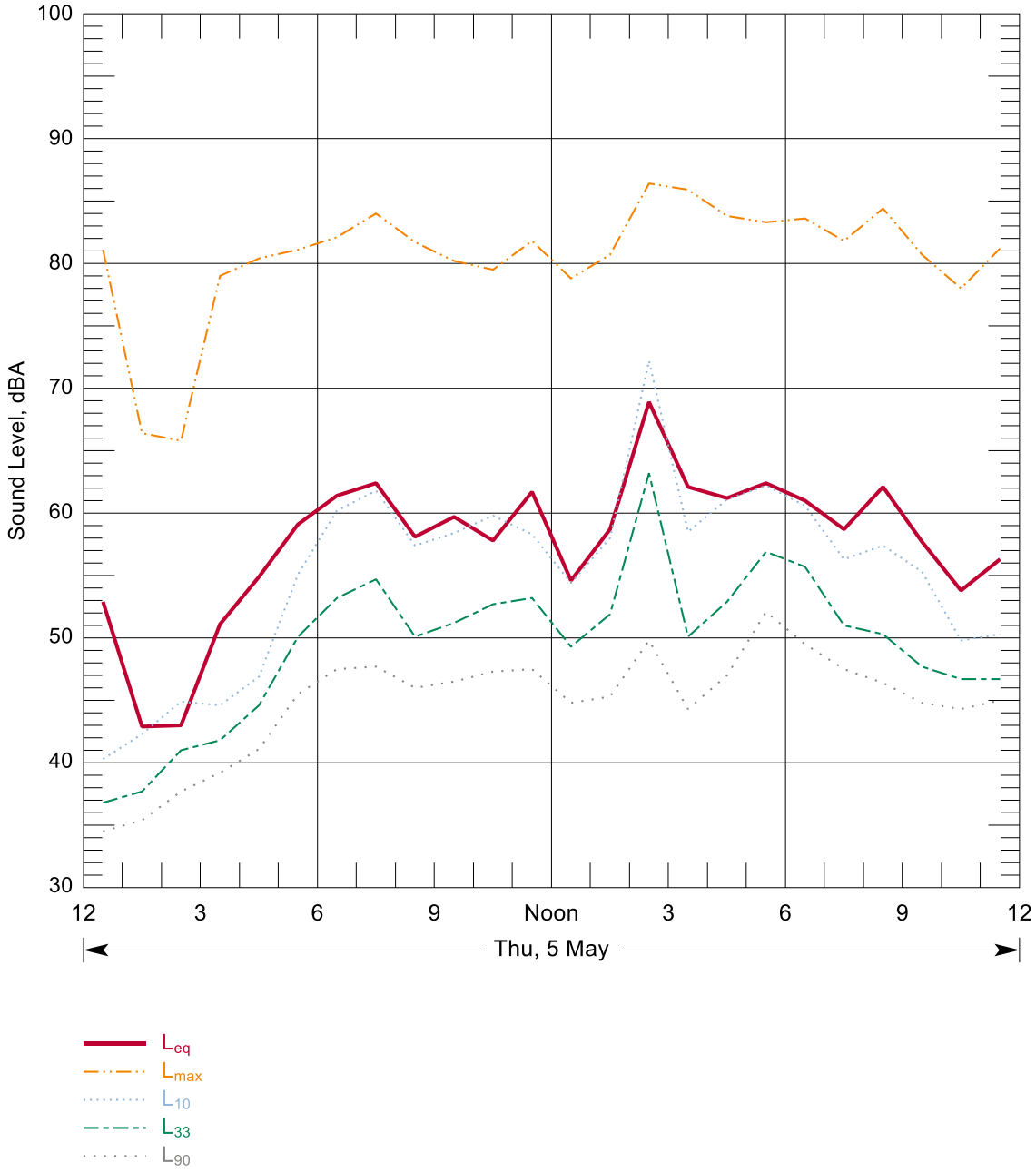
Source: Wilson Ihrig 2016

Figure B-1: Hourly Summary of Noise Levels Measured at N76 on 03 May, 2016



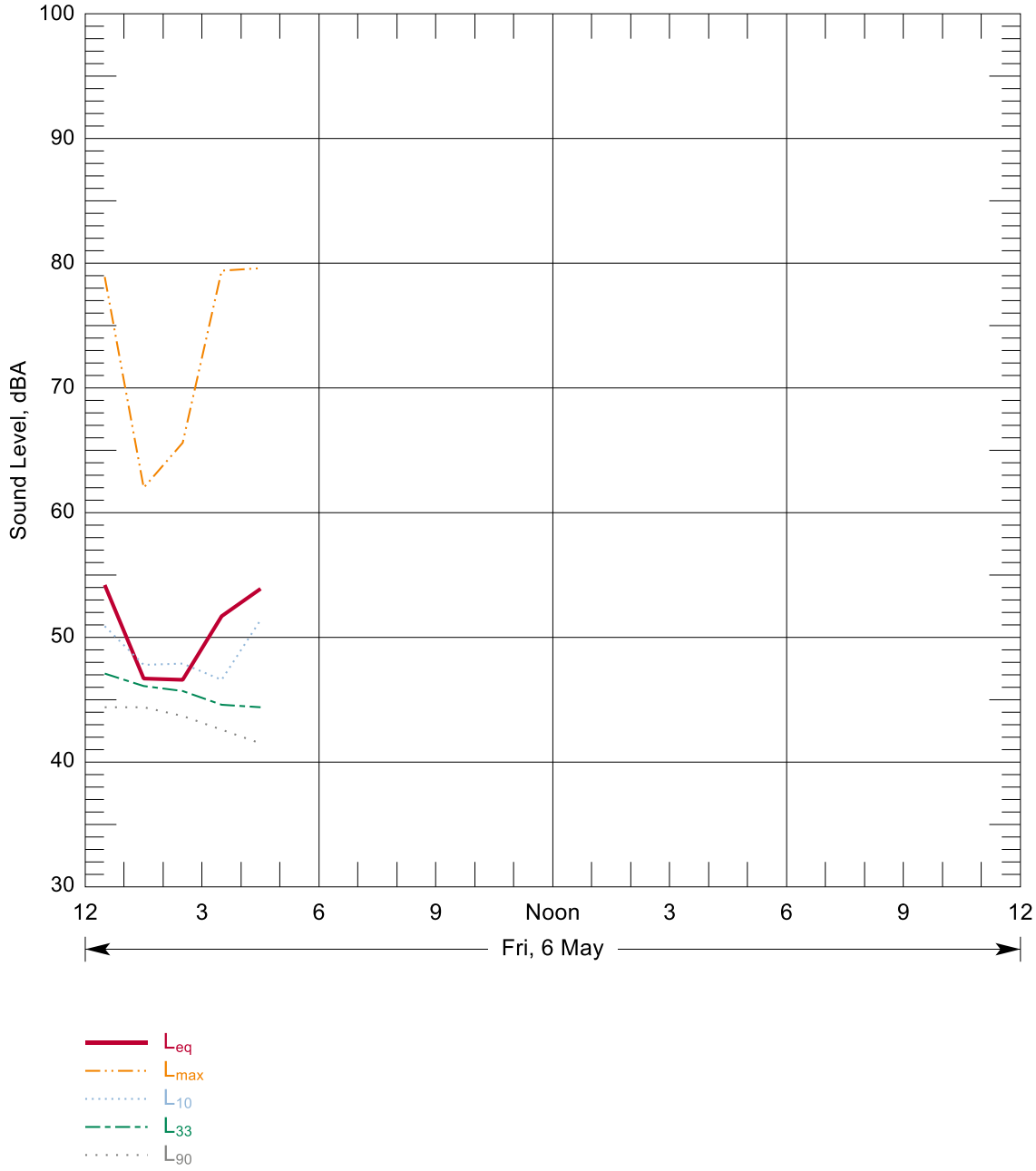
Source: Wilson Ihrig 2016

Figure B-2: Hourly Summary of Noise Levels Measured at N76 on 04 May, 2016



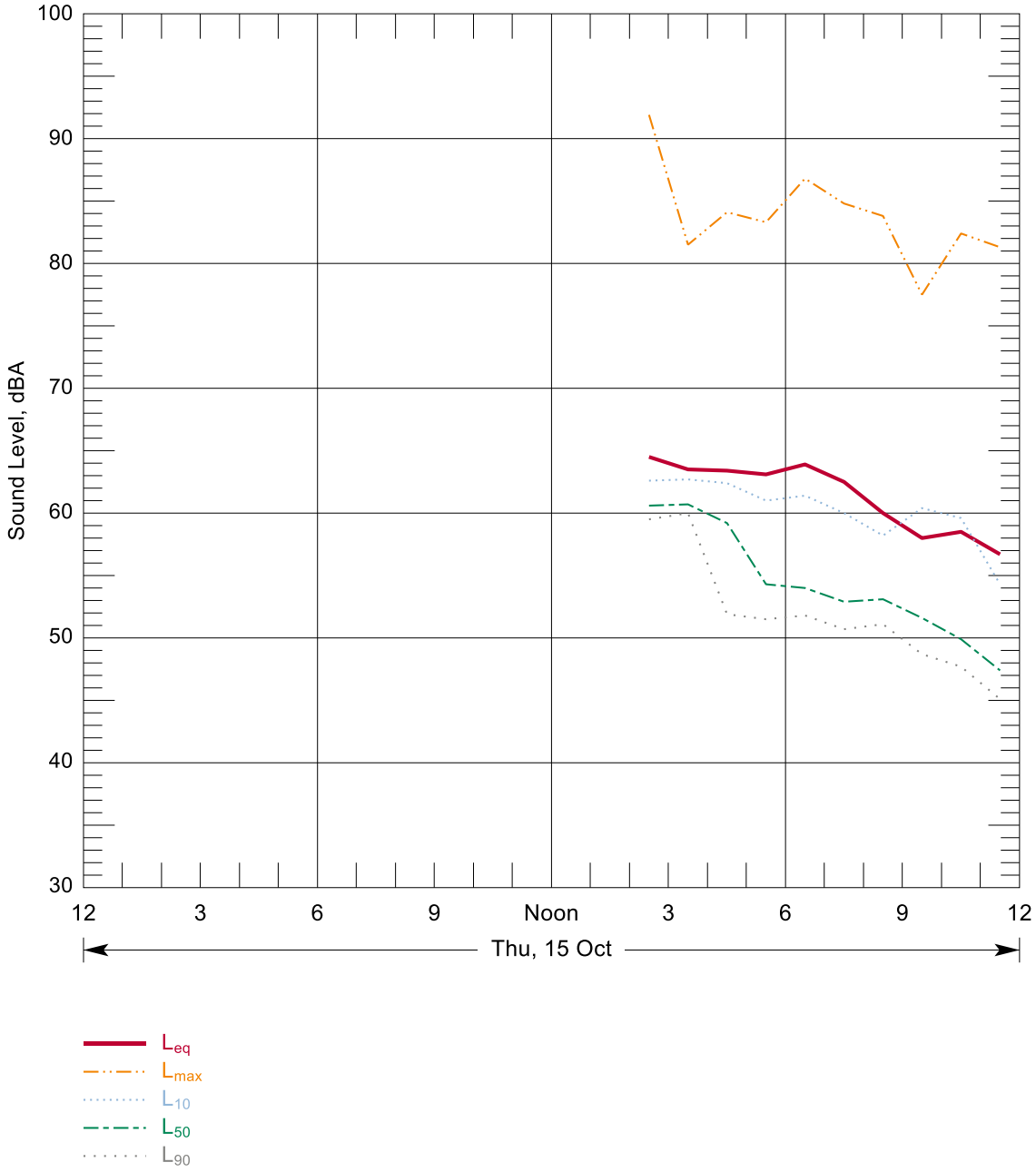
Source: Wilson Ihrig 2016

Figure B-3: Hourly Summary of Noise Levels Measured at N76 on 05 May, 2016



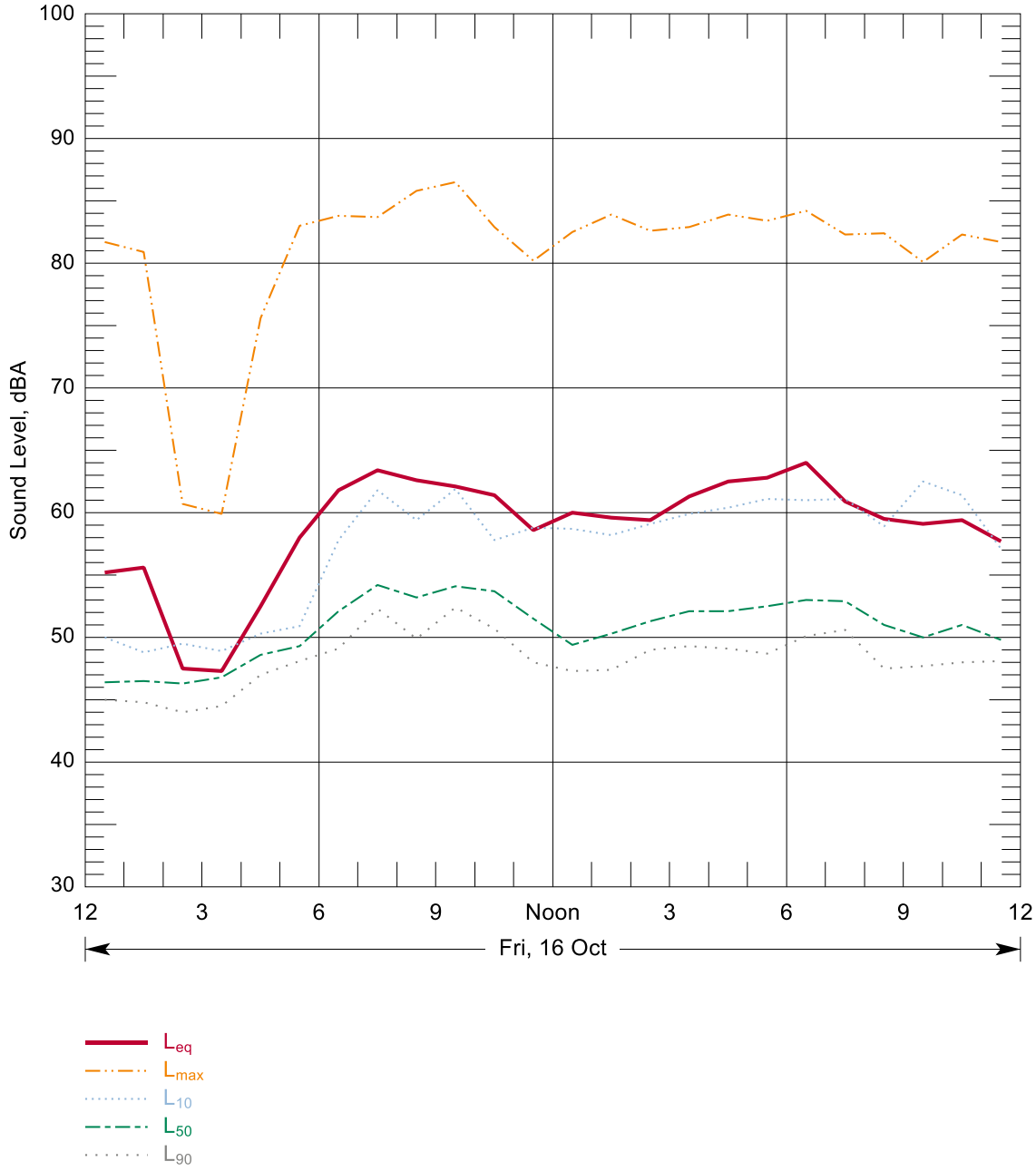
Source: Wilson Ihrig 2016

Figure B-4: Hourly Summary of Noise Levels Measured at N76 on 06 May, 2016



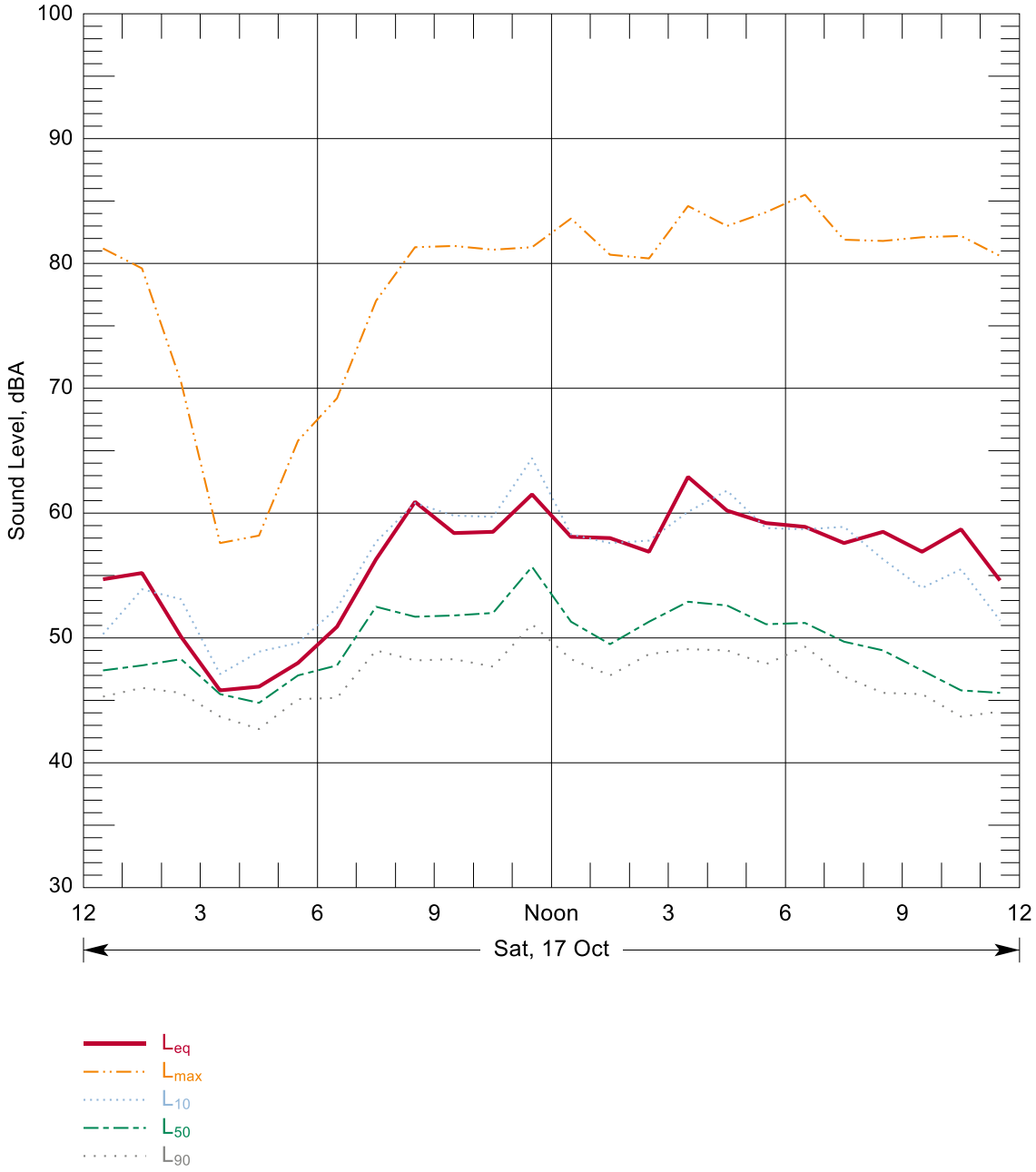
Source: Wilson Ihrig 2009

Figure B-5: Hourly Summary of Noise Levels Measured at N77 on 15 Oct, 2009



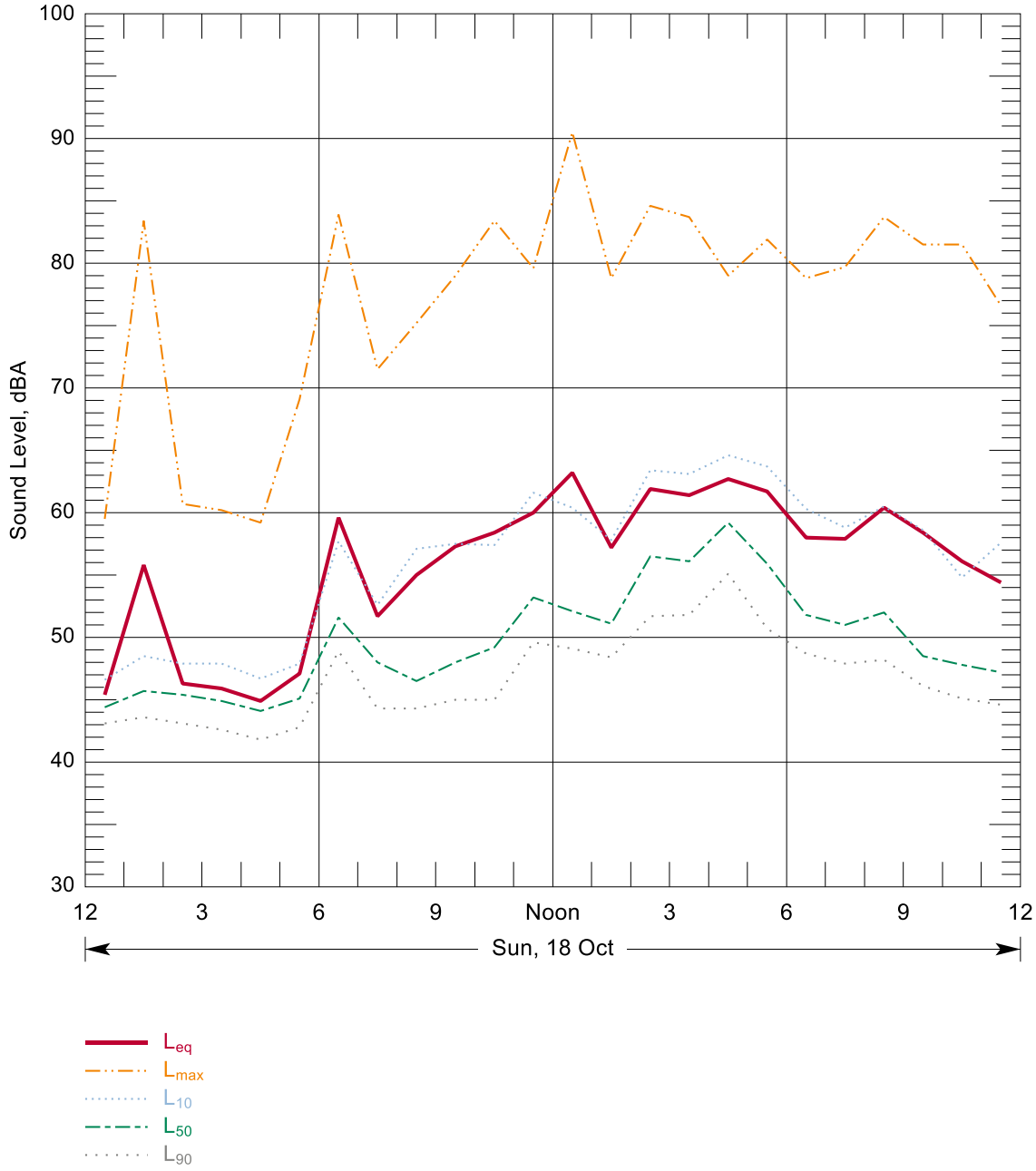
Source: Wilson Ihrig 2009

Figure B-6: Hourly Summary of Noise Levels Measured at N77 on 16 Oct, 2009



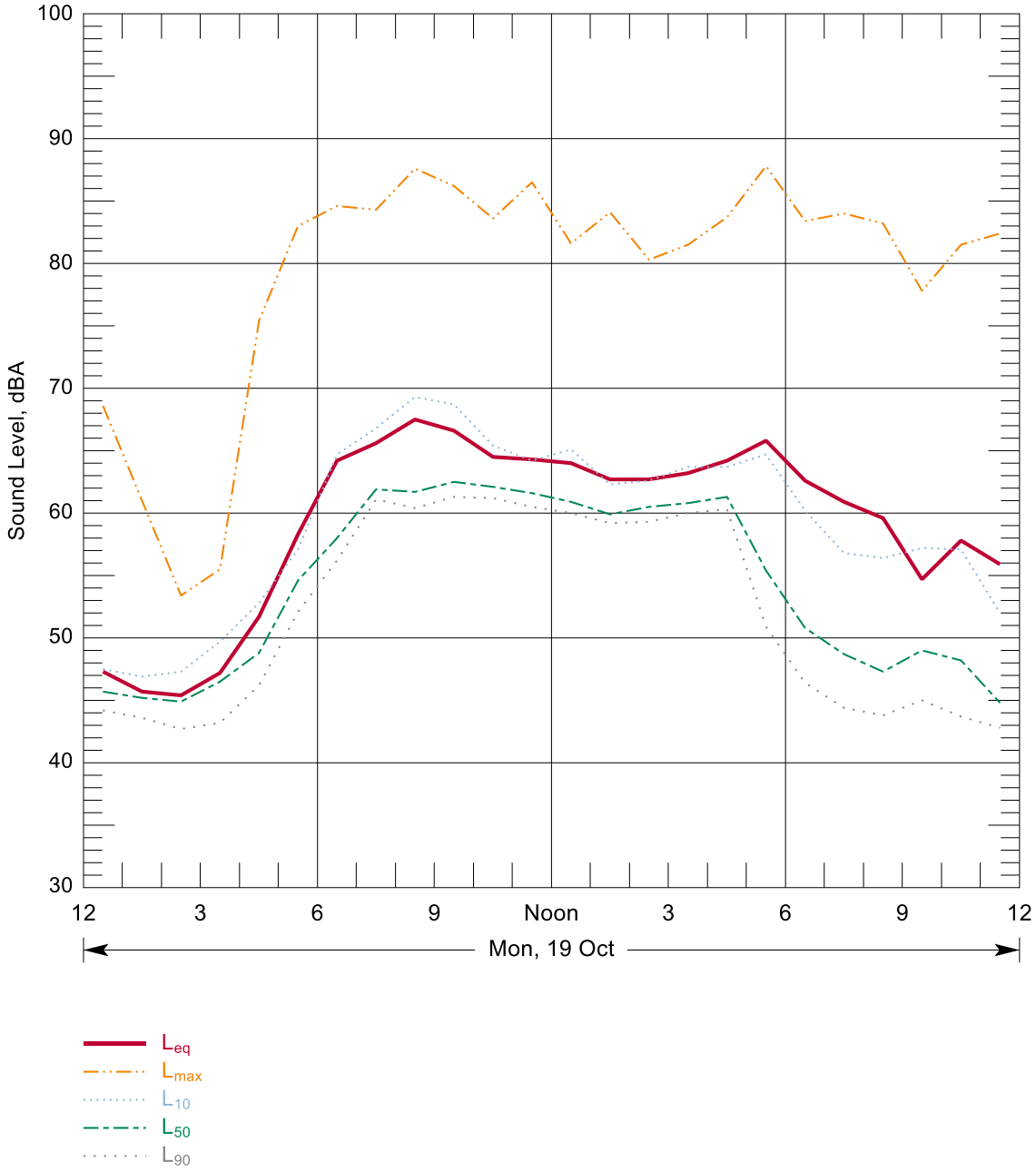
Source: Wilson Ihrig 2009

Figure B-7: Hourly Summary of Noise Levels Measured at N77 on 17 Oct, 2009



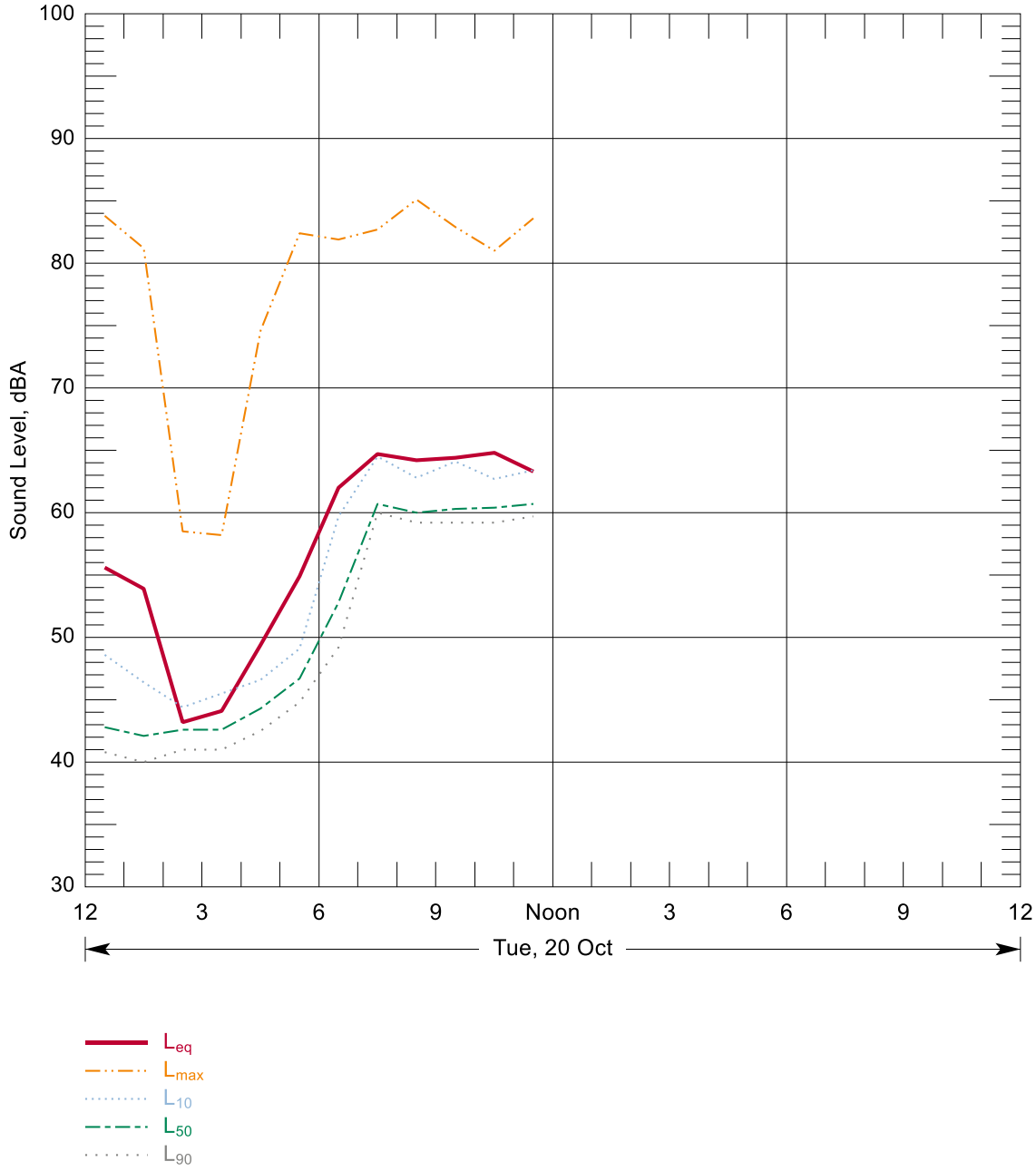
Source: Wilson Ihrig 2009

Figure B-8: Hourly Summary of Noise Levels Measured at N77 on 18 Oct, 2009



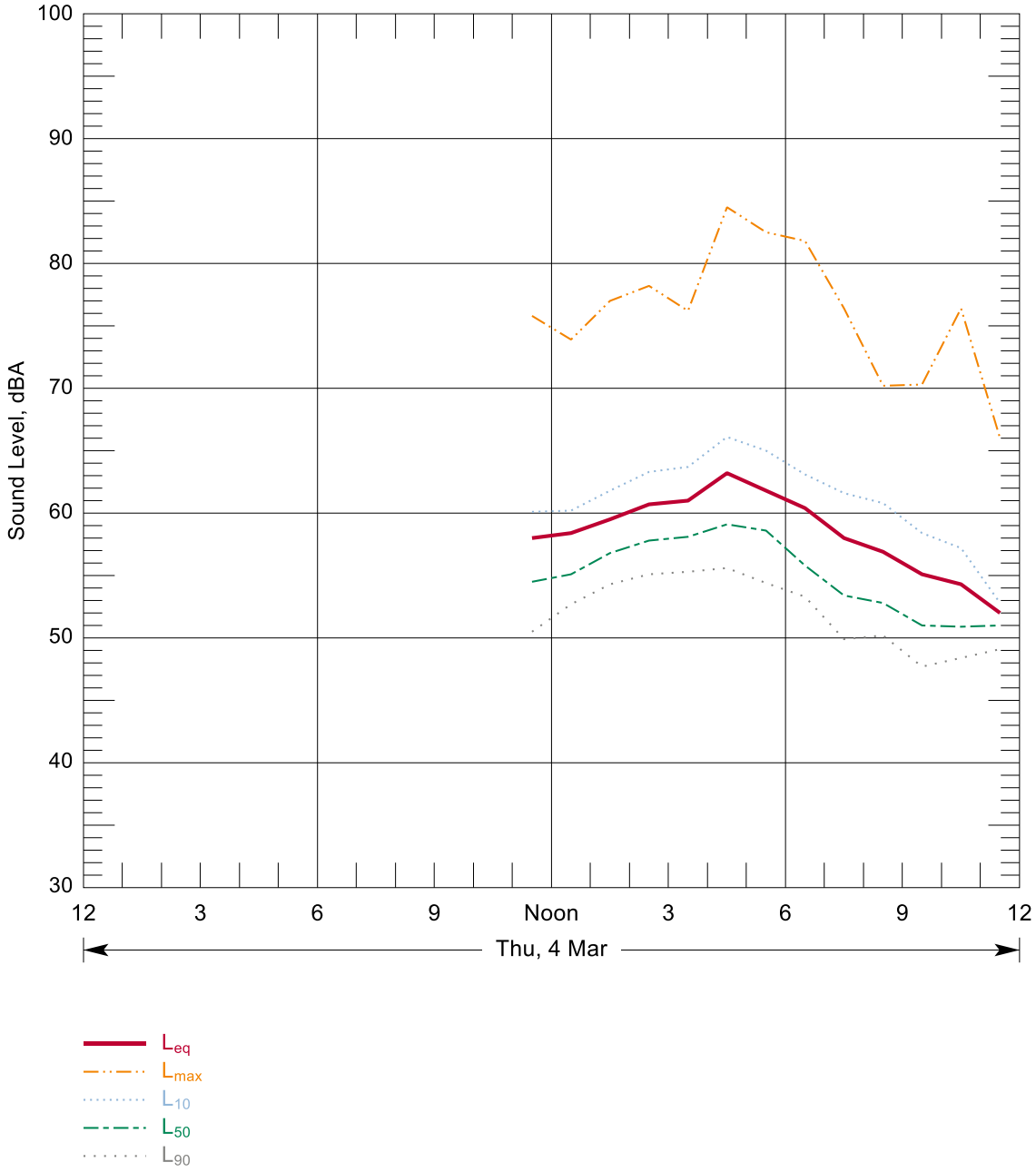
Source: Wilson Ihrig 2009

Figure B-9: Hourly Summary of Noise Levels Measured at N77 on 19 Oct, 2009



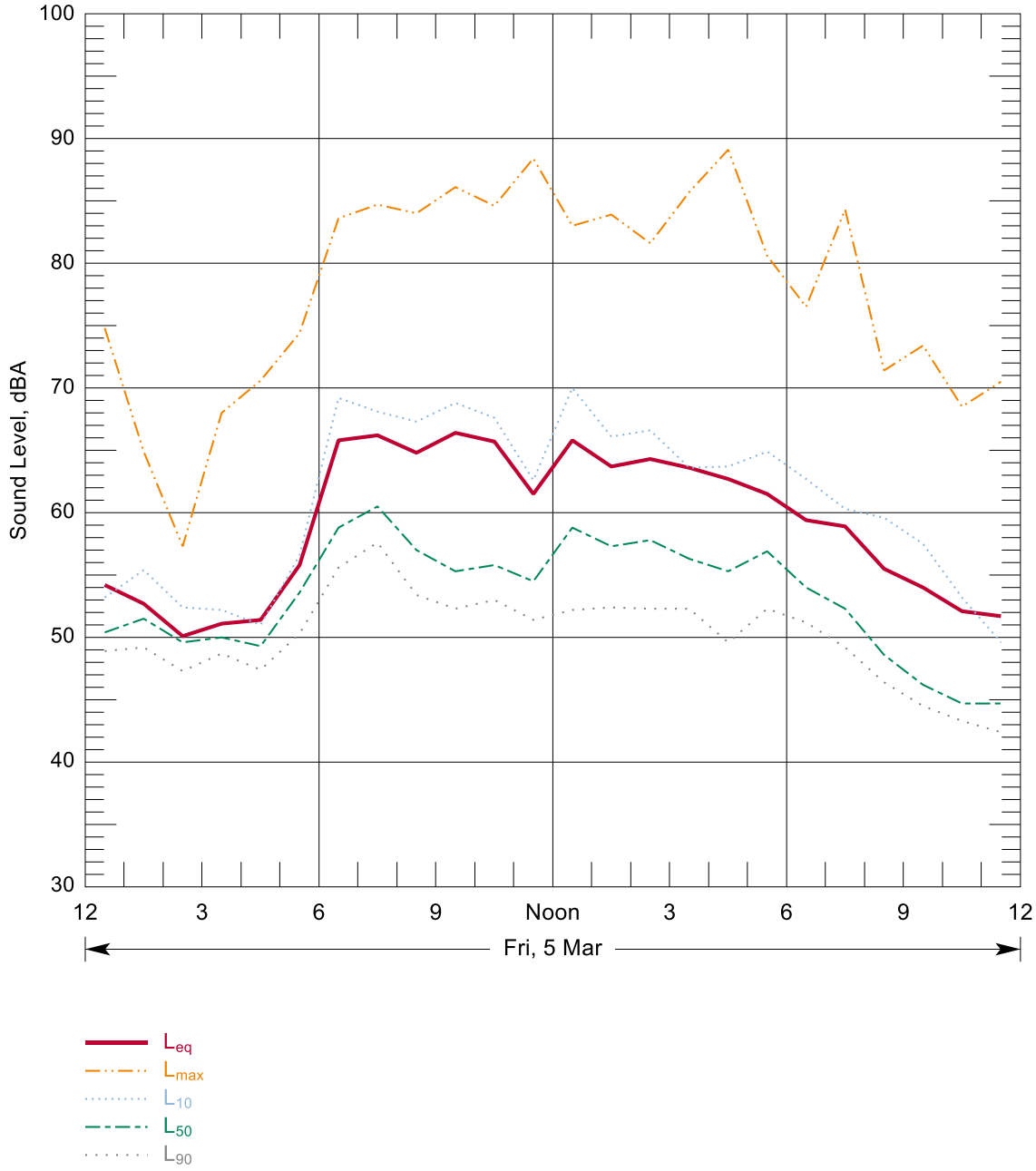
Source: Wilson Ihrig 2009

Figure B-10: Hourly Summary of Noise Levels Measured at N77 on 20 Oct, 2009



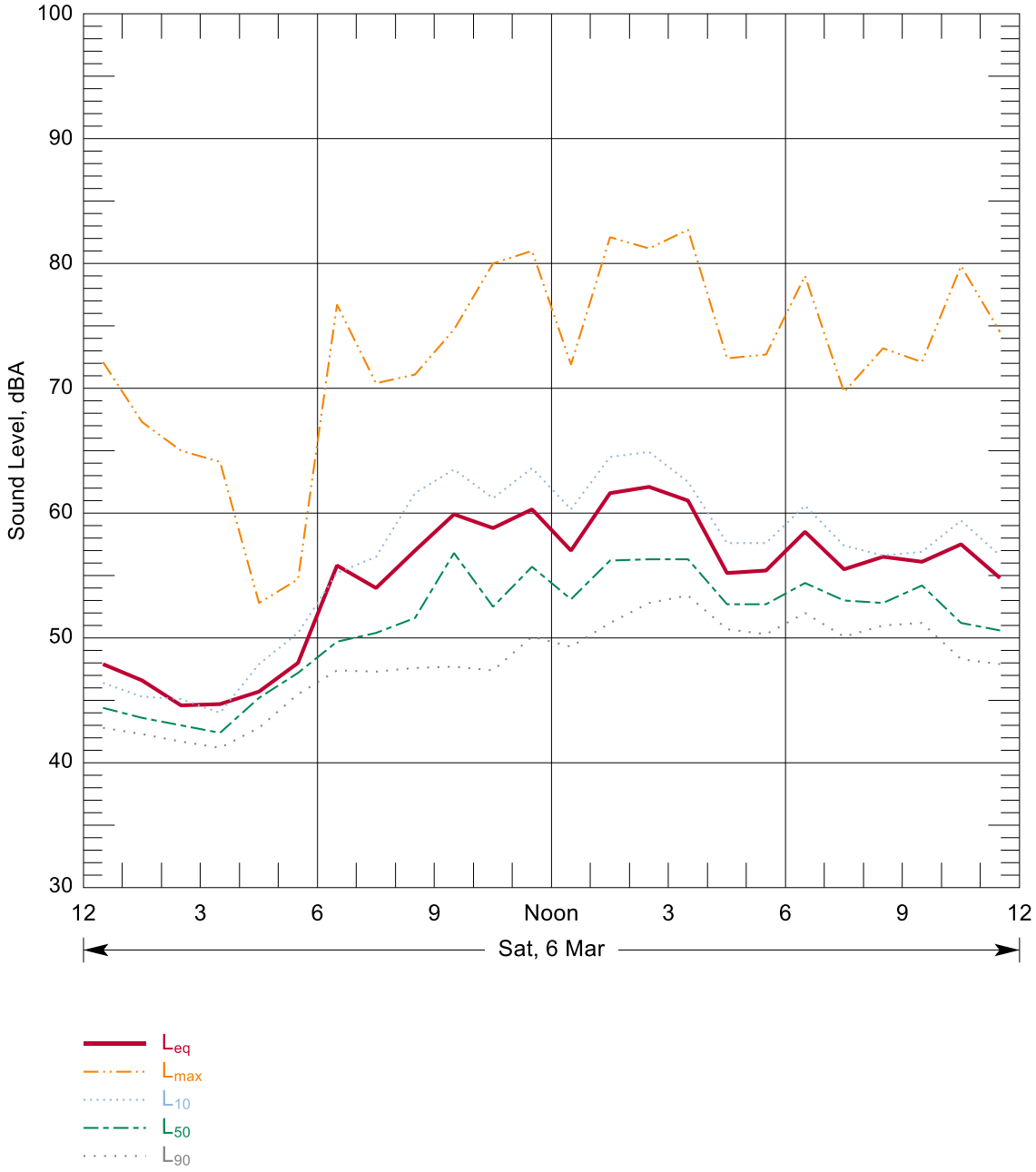
Source: Wilson Ihrig 2010

Figure B-11: Hourly Summary of Noise Levels Measured at N78 on 04 Mar, 2010



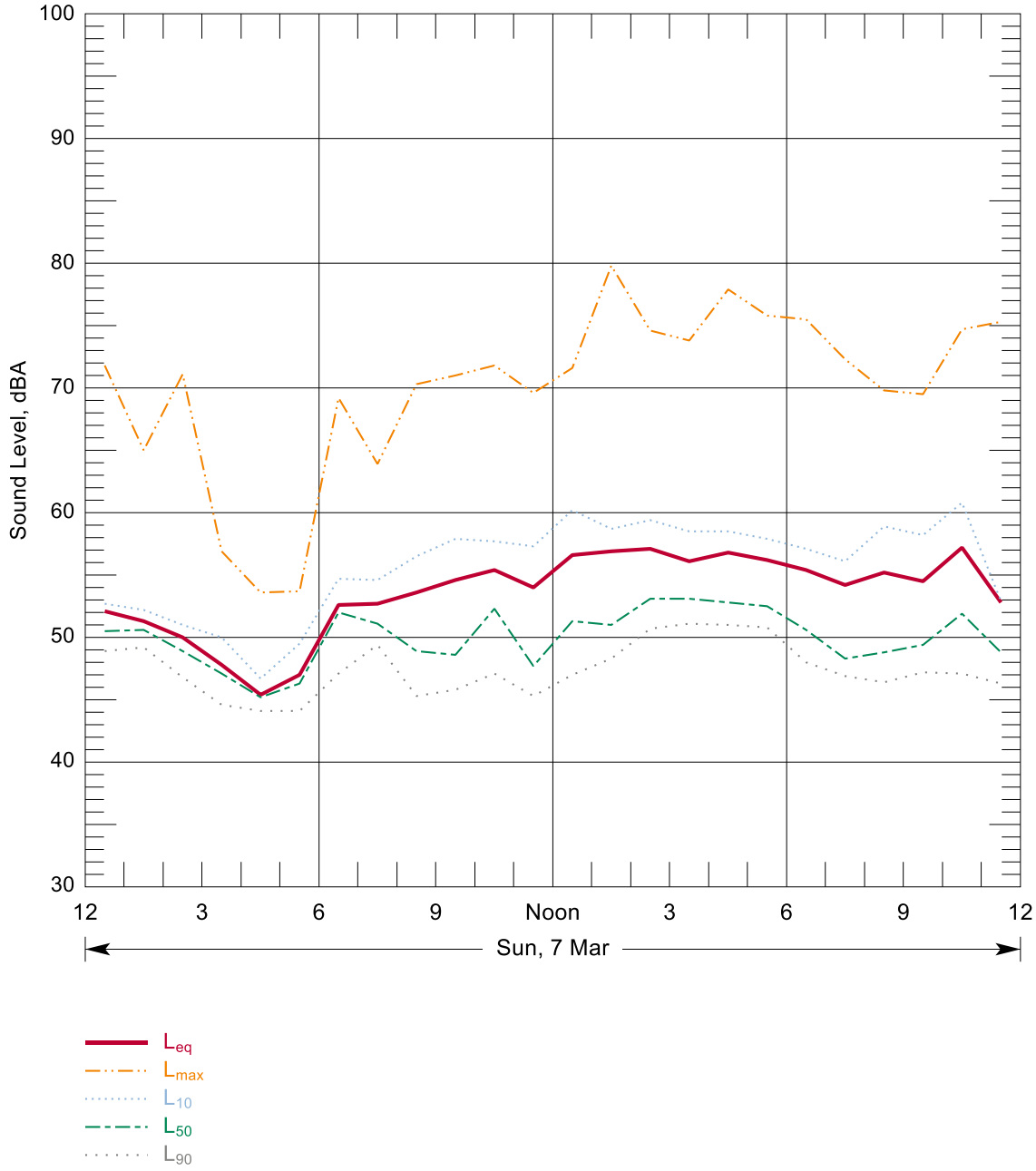
Source: Wilson Ihrig 2010

Figure B-12: Hourly Summary of Noise Levels Measured at N78 on 05 Mar, 2010



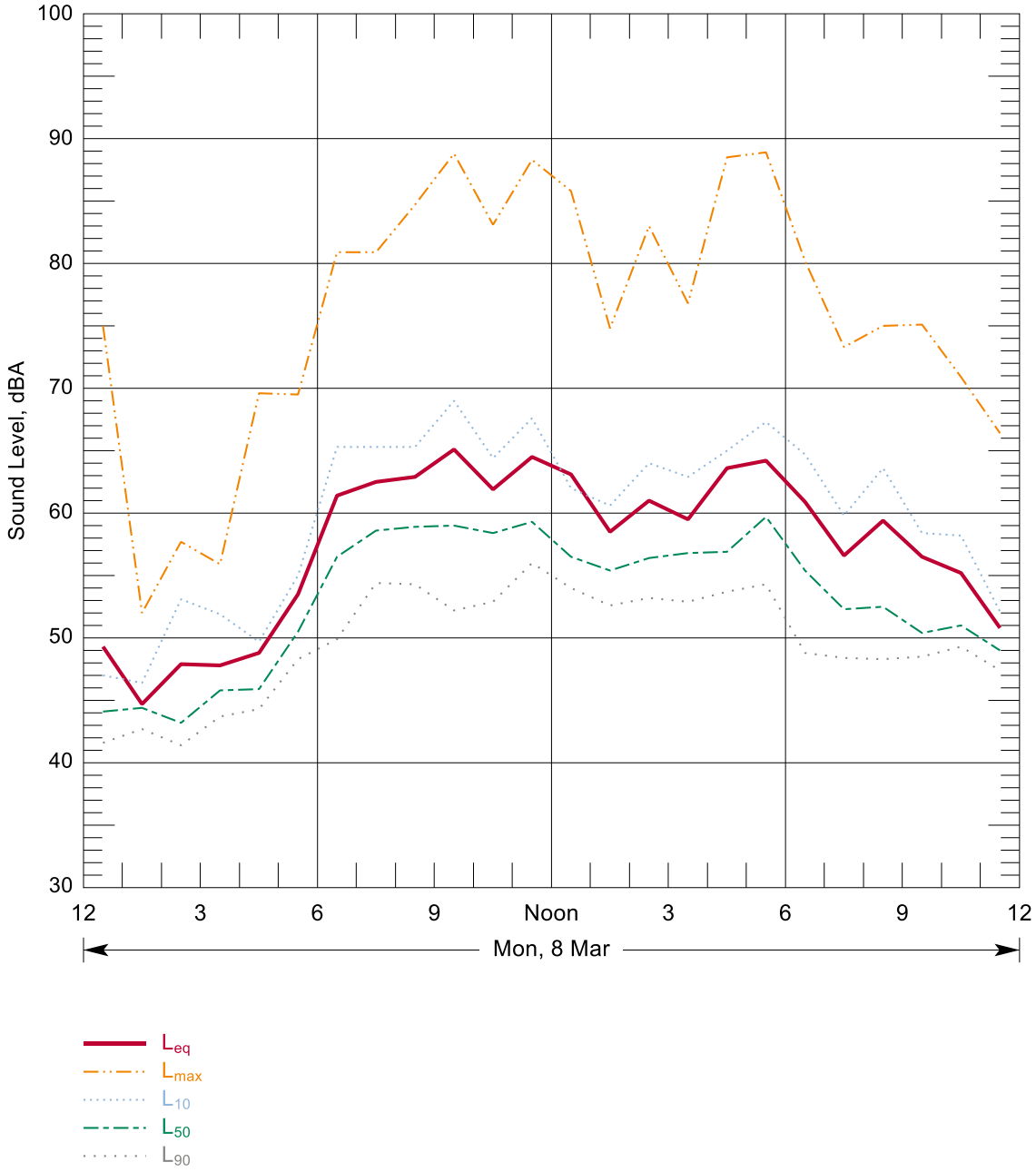
Source: Wilson Ihrig 2010

Figure B-13: Hourly Summary of Noise Levels Measured at N78 on 06 Mar, 2010



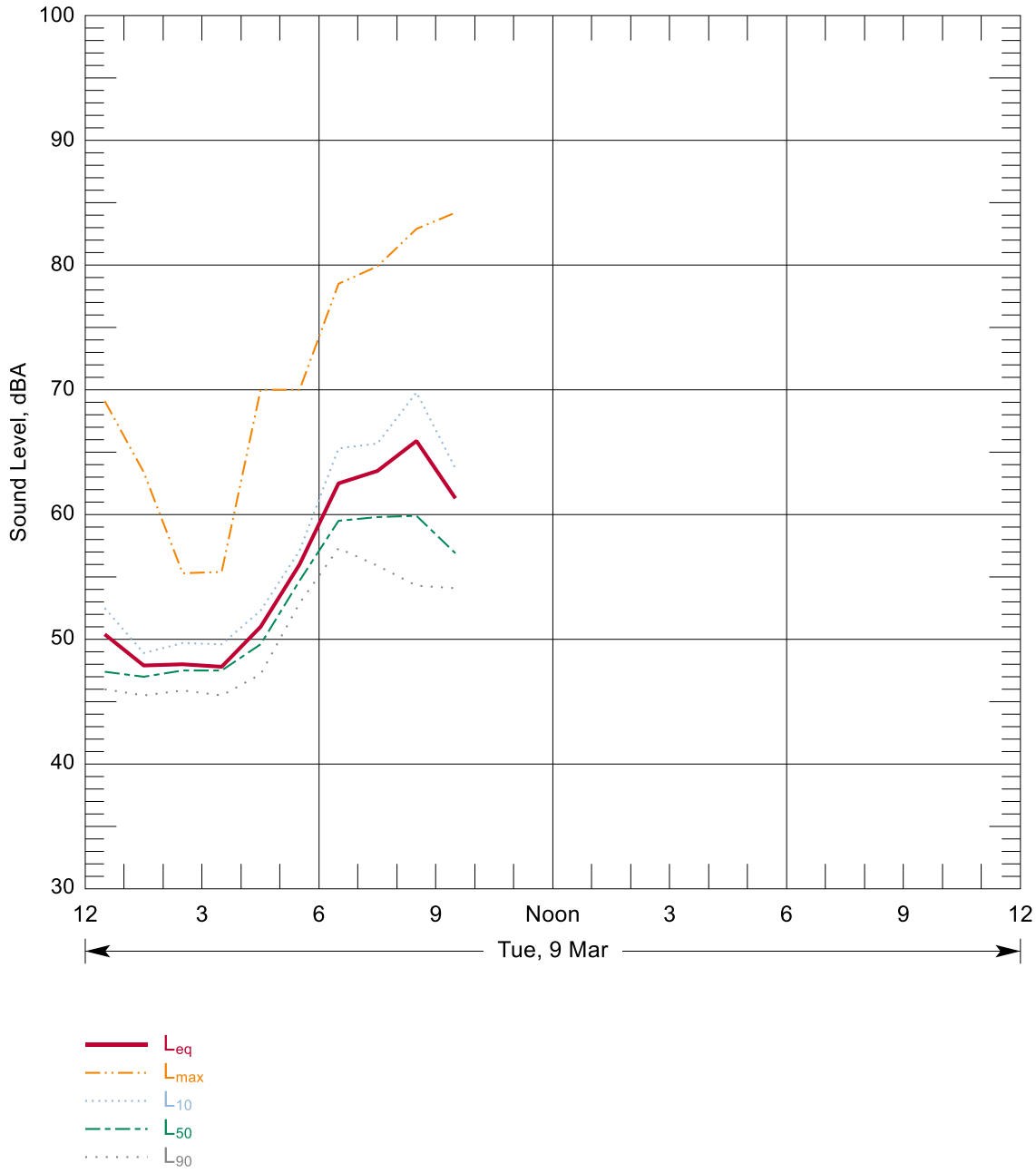
Source: Wilson Ihrig 2010

Figure B-14: Hourly Summary of Noise Levels Measured at N78 on 07 Mar, 2010



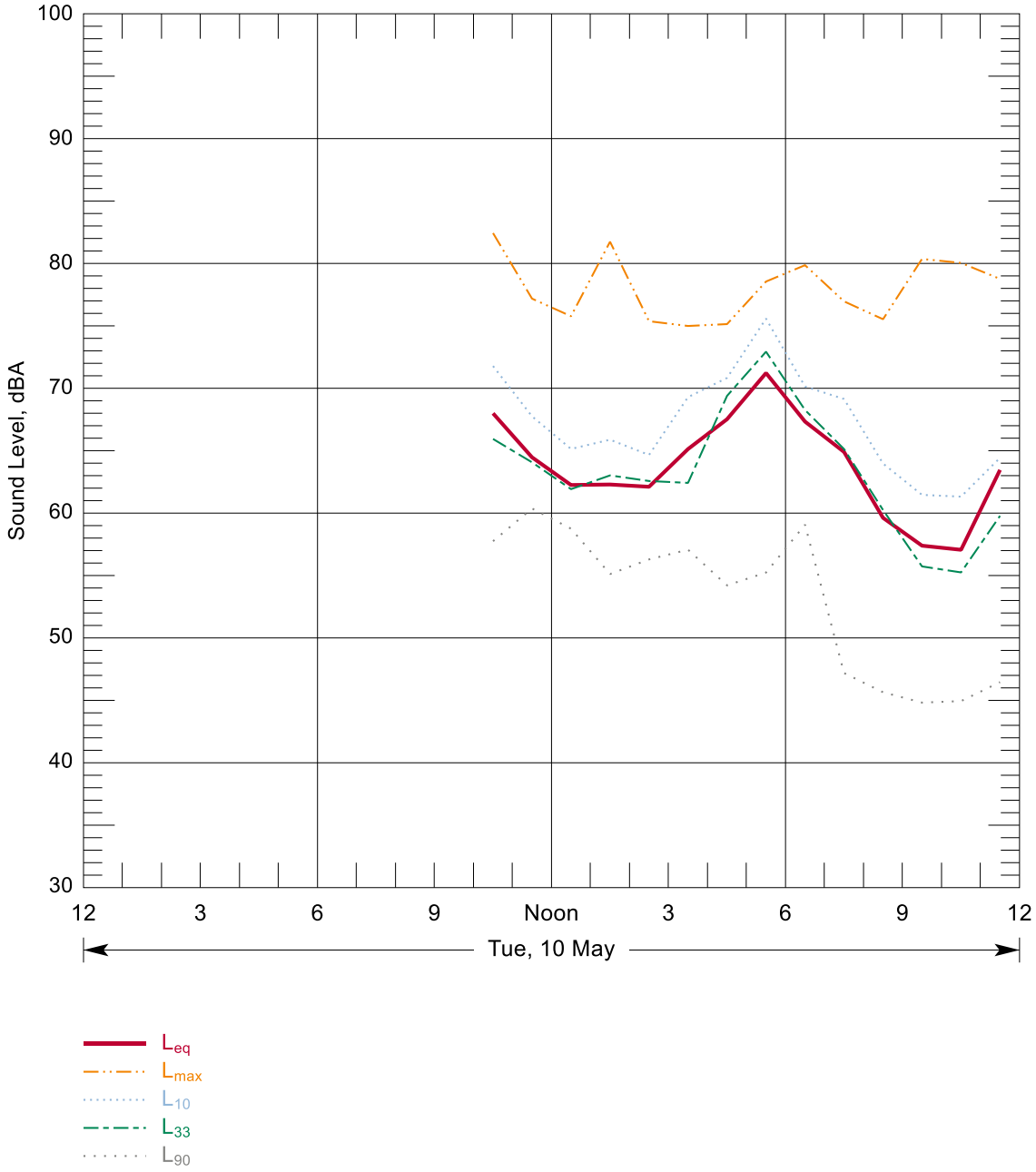
Source: Wilson Ihrig 2010

Figure B-15: Hourly Summary of Noise Levels Measured at N78 on 08 Mar, 2010



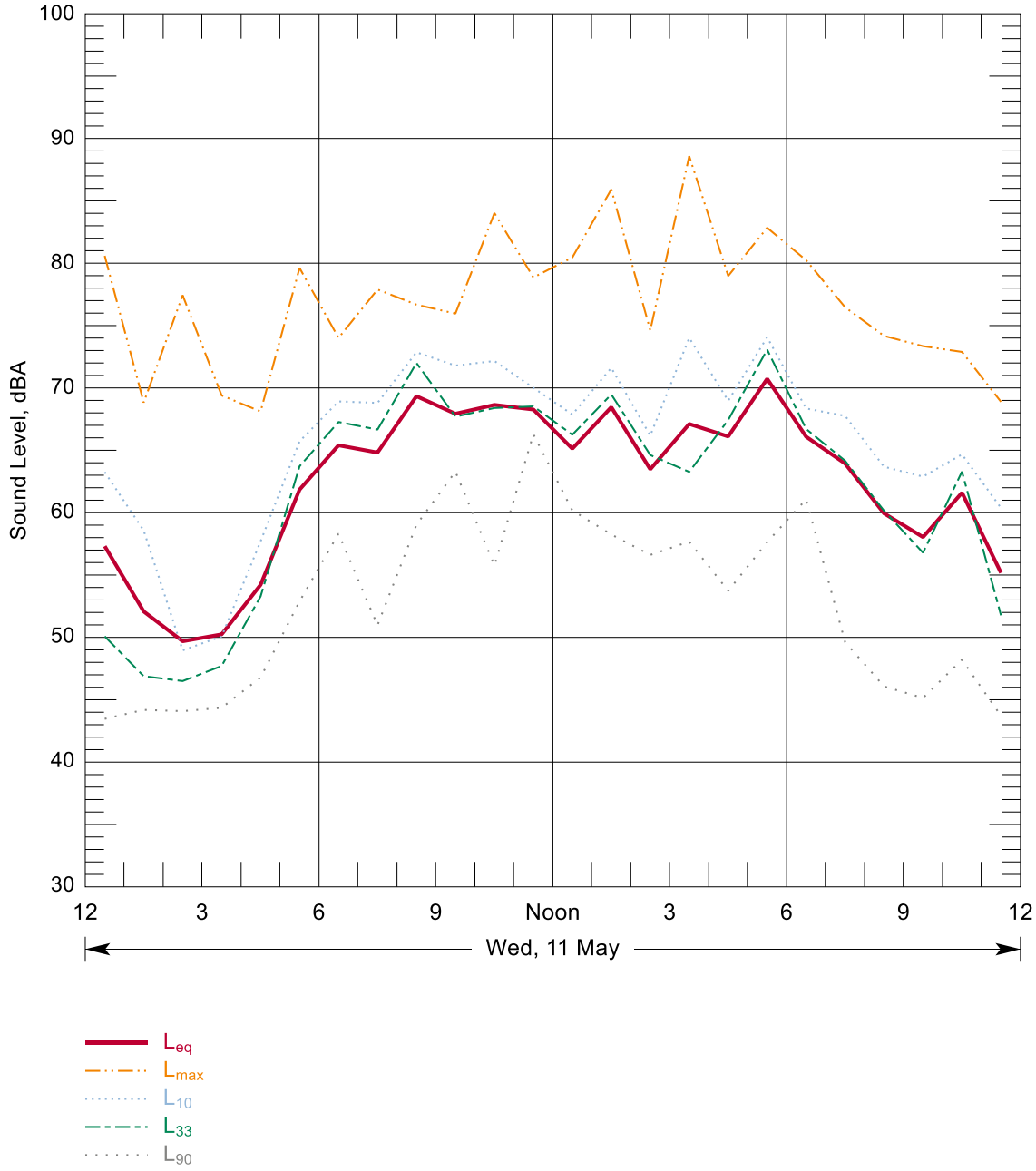
Source: Wilson Ihrig 2010

Figure B-16: Hourly Summary of Noise Levels Measured at N78 on 09 Mar, 2010



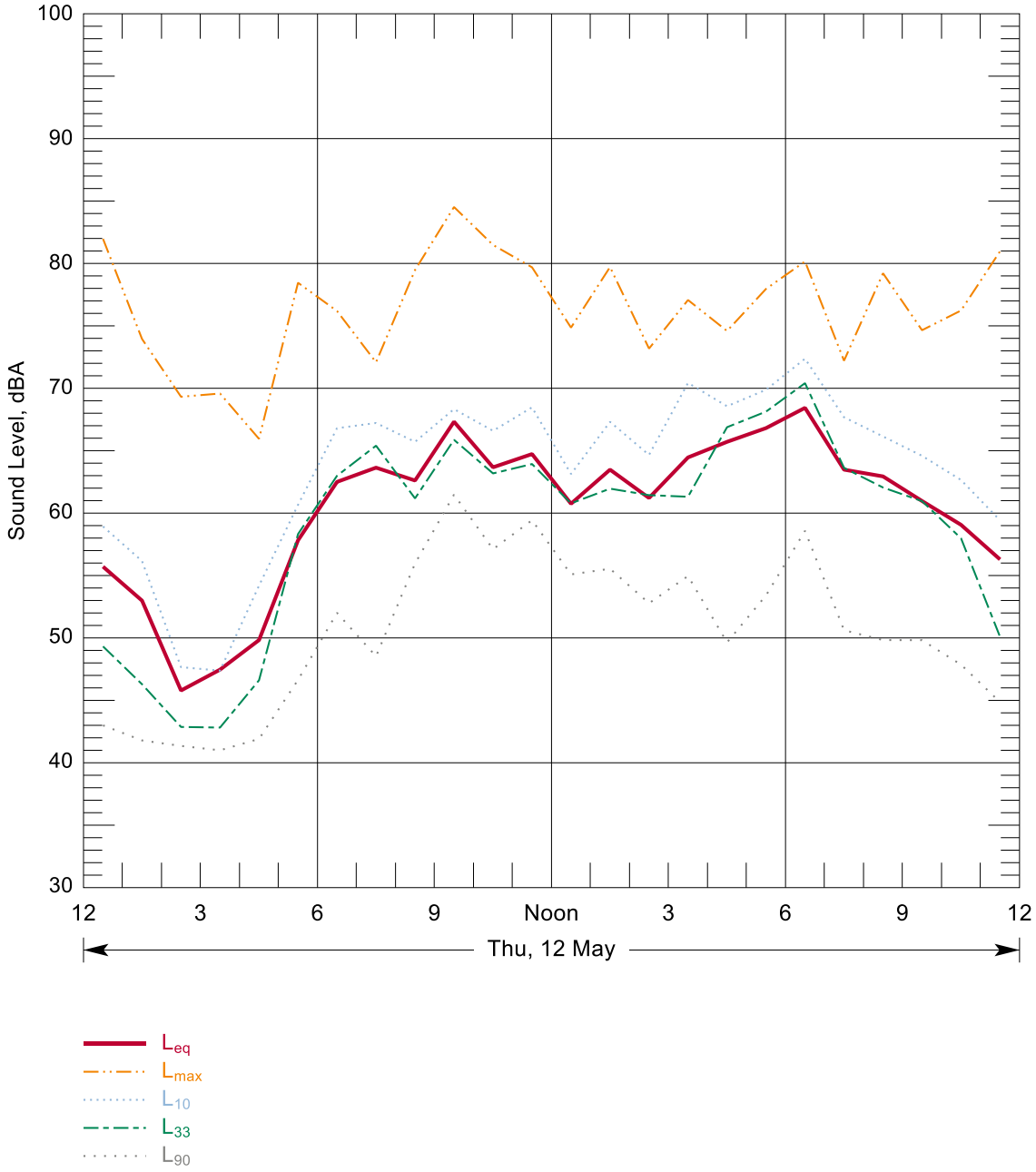
Source: Wilson Ihrig 2016

Figure B-17: Hourly Summary of Noise Levels Measured at N79 on 10 May, 2016



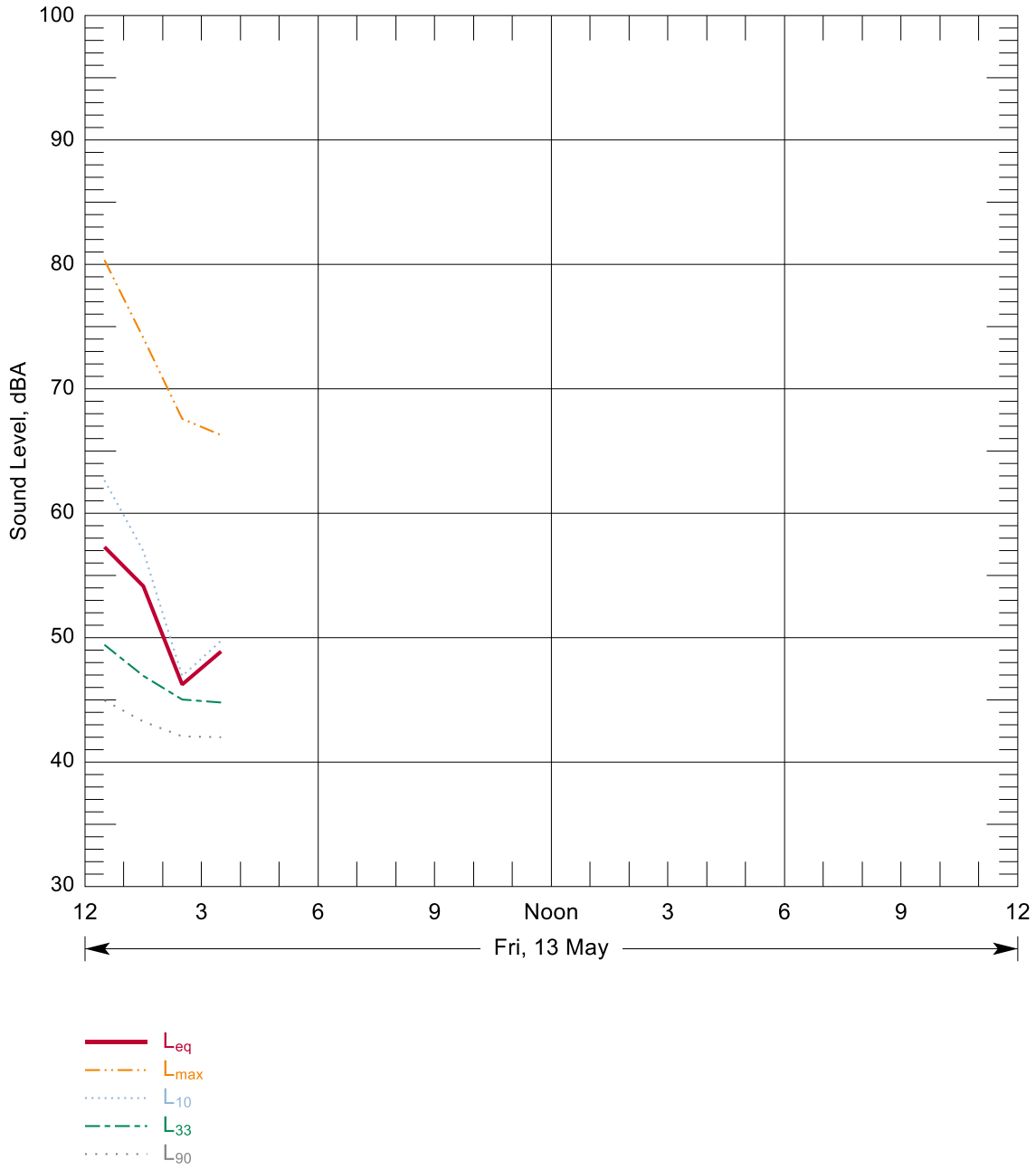
Source: Wilson Ihrig 2016

Figure B-18: Hourly Summary of Noise Levels Measured at N79 on 11 May, 2016



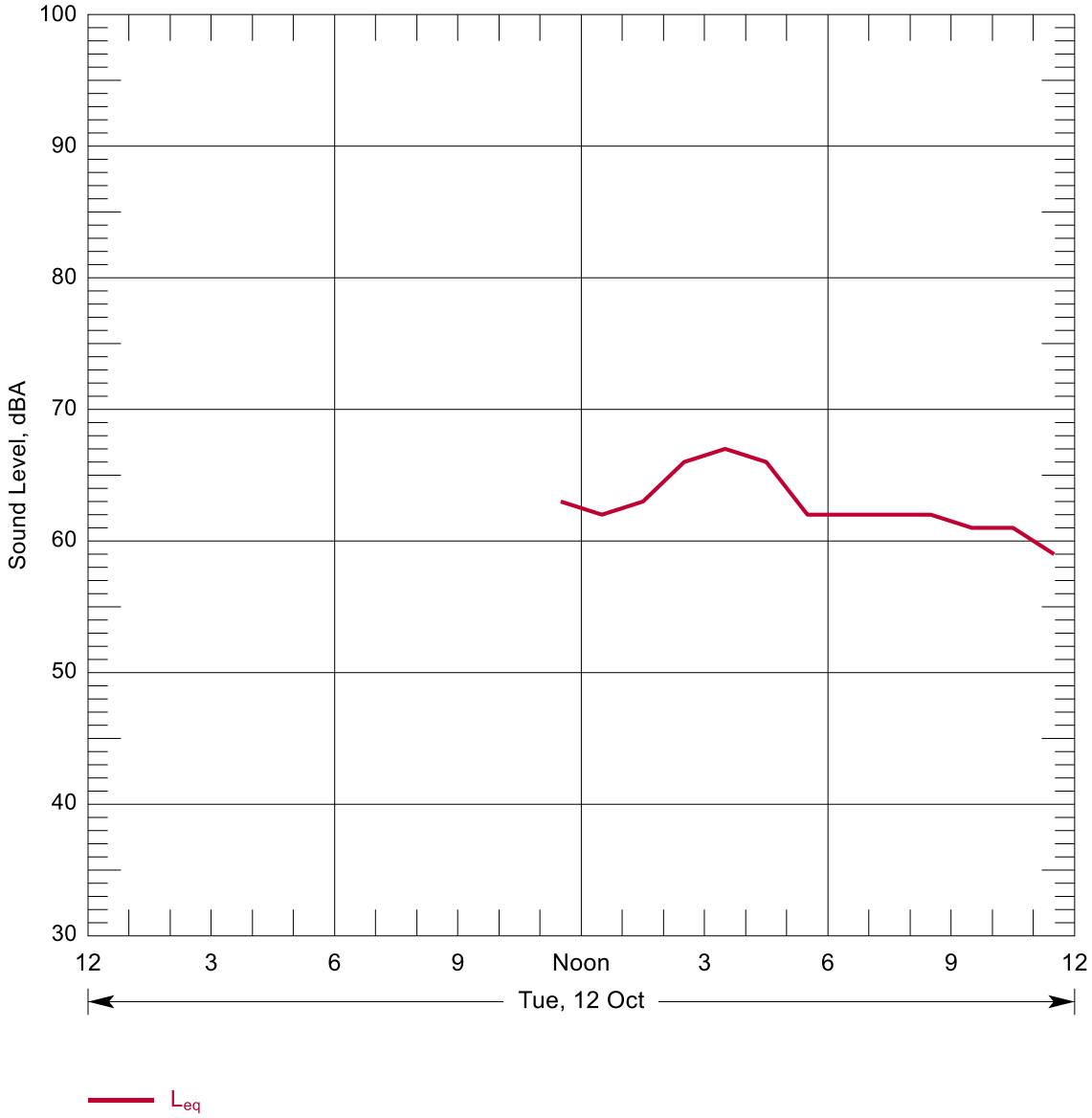
Source: Wilson Ihrig 2016

Figure B-19: Hourly Summary of Noise Levels Measured at N79 on 12 May, 2016



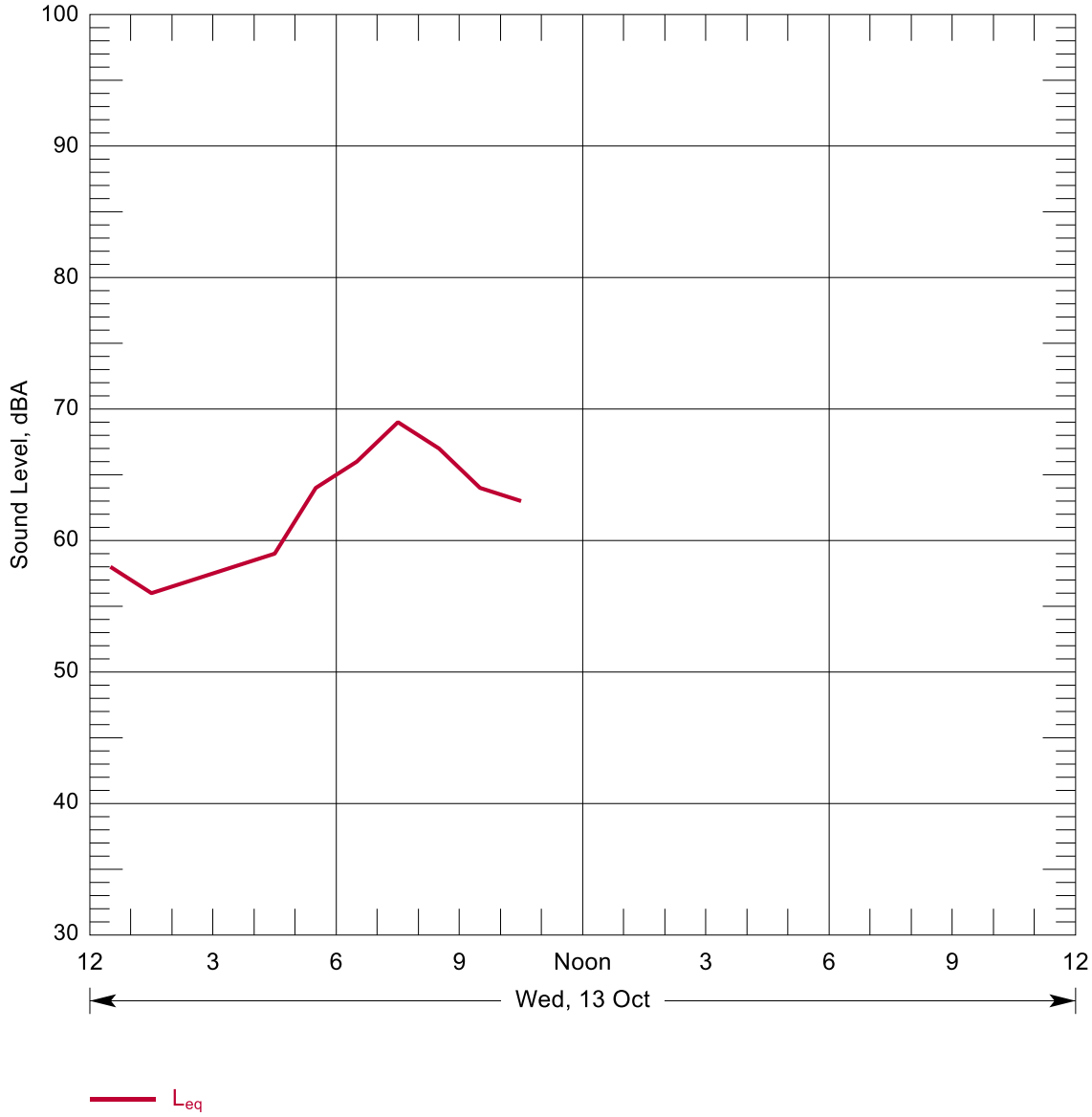
Source: Wilson Ihrig 2016

Figure B-20: Hourly Summary of Noise Levels Measured at N79 on 13 May, 2016



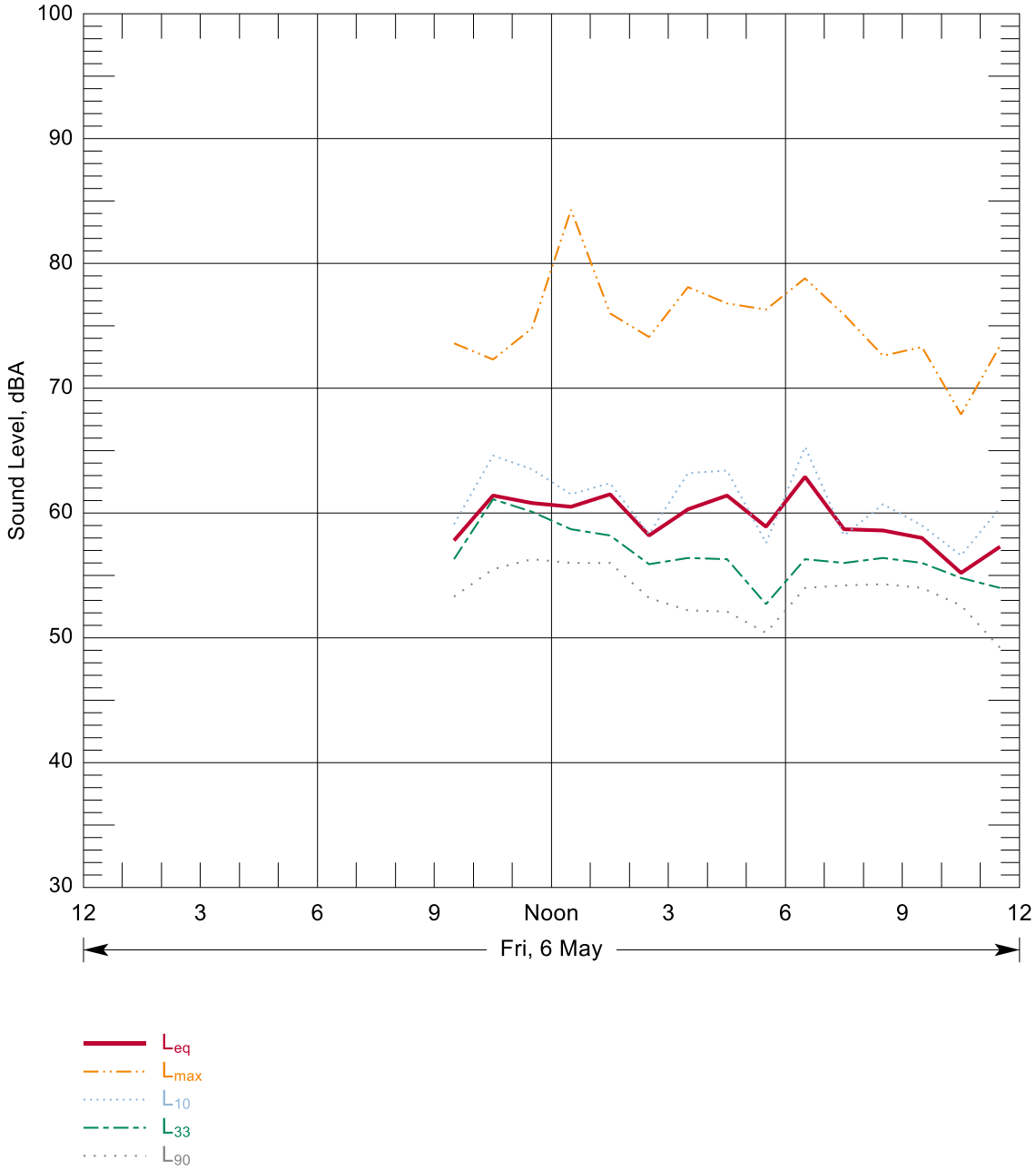
Source: Parsons Transportation 2010

Figure B-21: Hourly Summary of Noise Levels Measured at N80 on 12 Oct, 2010



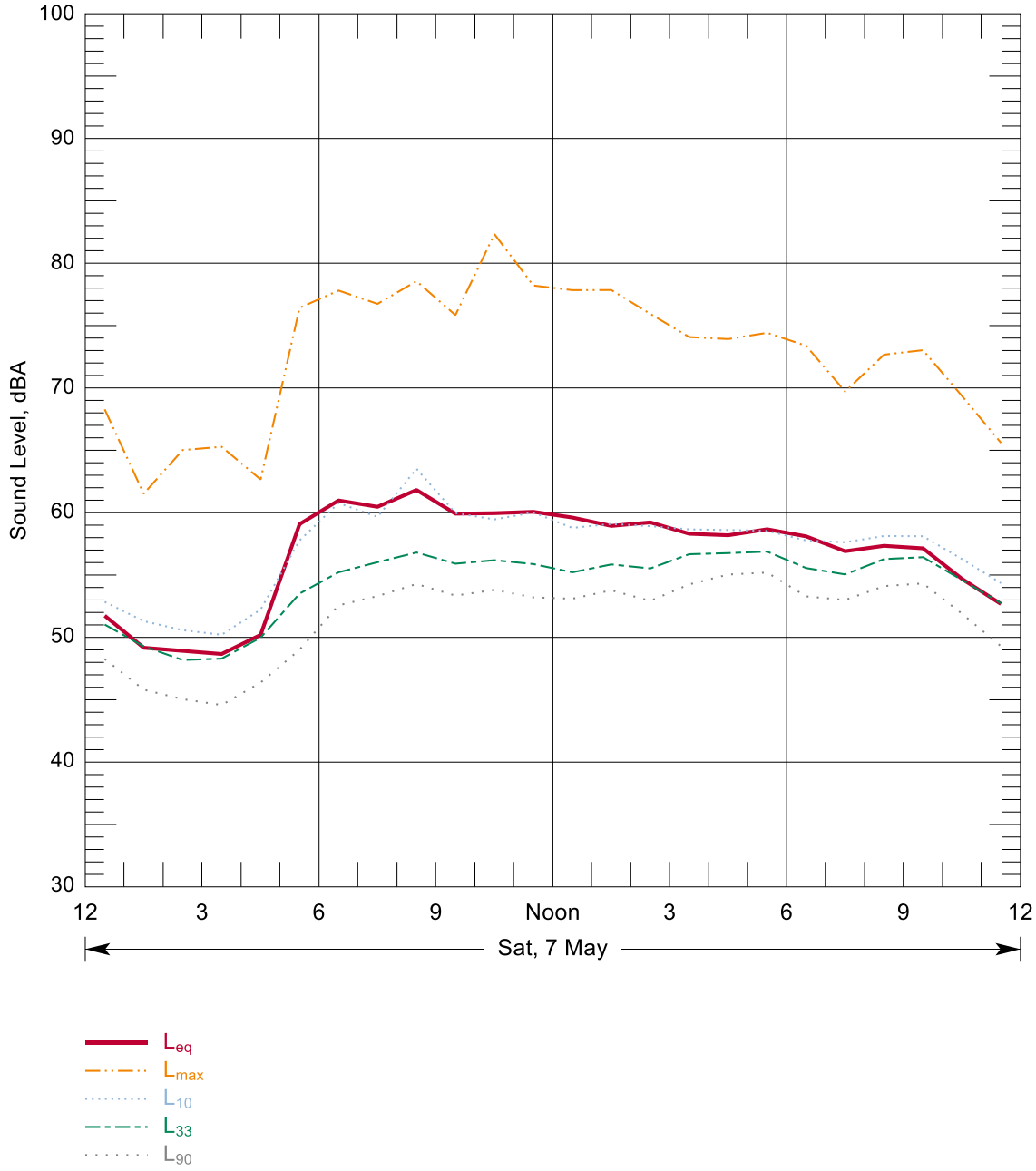
Source: Parsons Transportation 2010

Figure B-22: Hourly Summary of Noise Levels Measured at N80 on 13 Oct, 2010



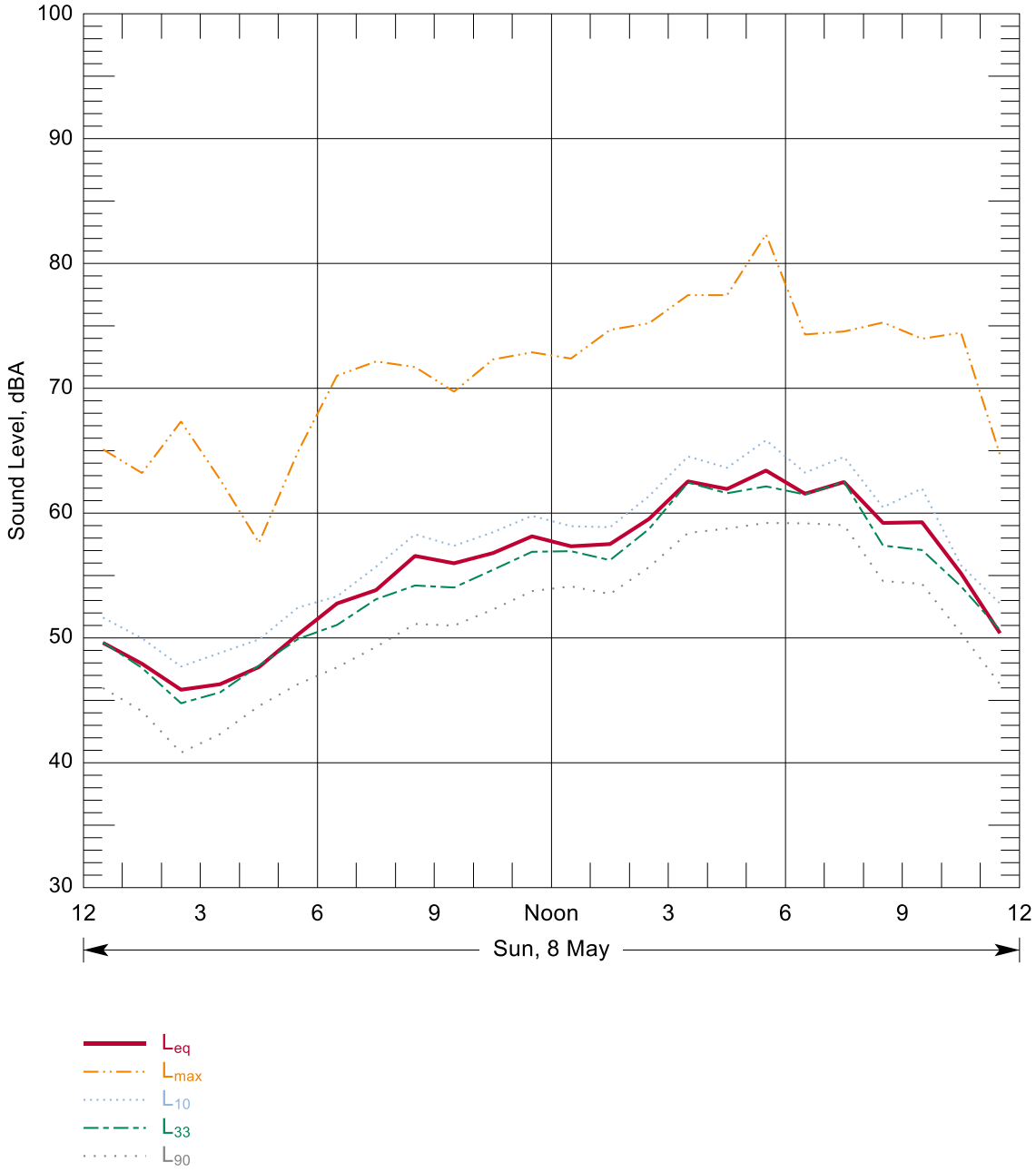
Source: Wilson Ihrig 2016

Figure B-23: Hourly Summary of Noise Levels Measured at N81 on 06 May, 2016



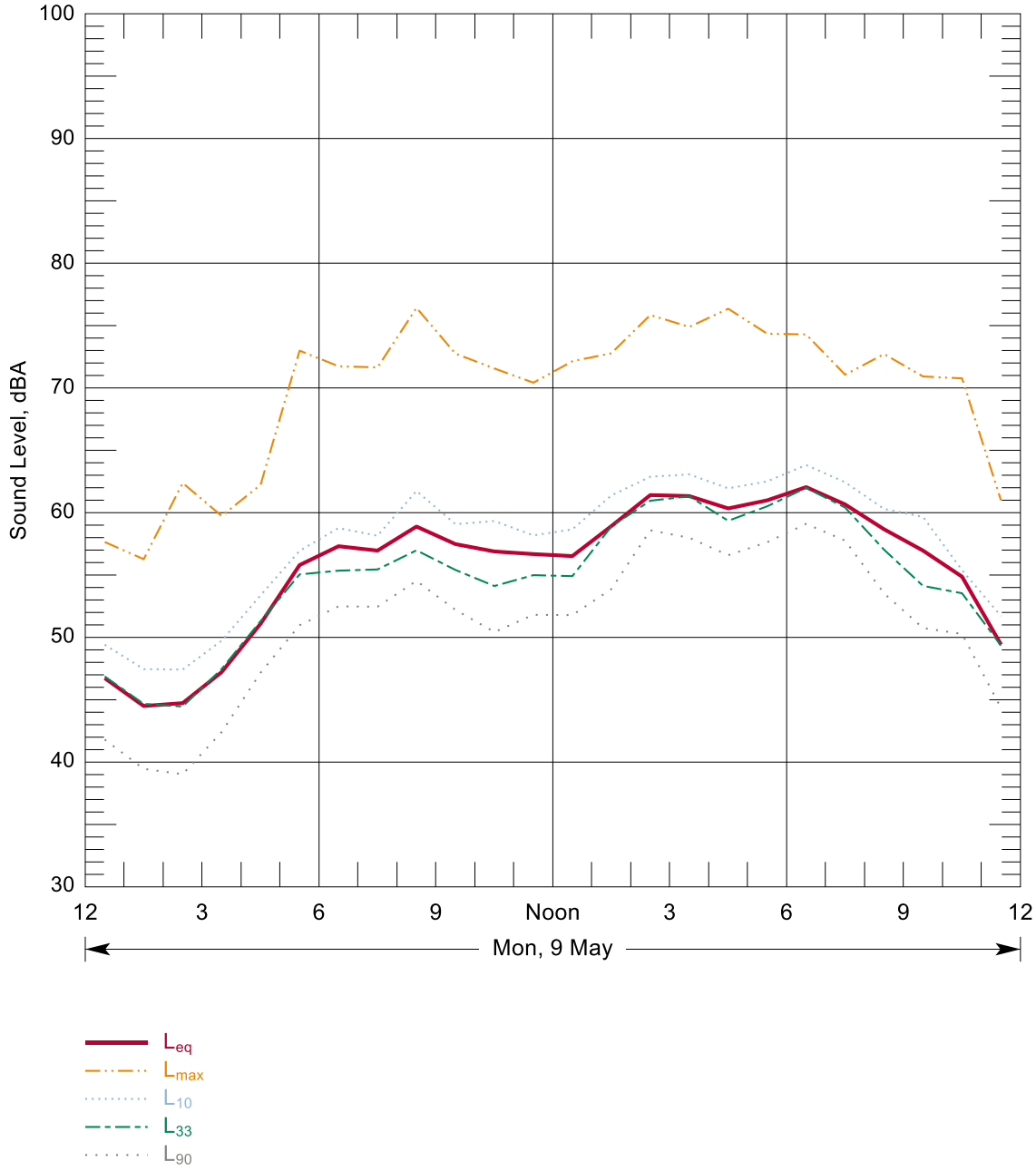
Source: Wilson Ihrig 2016

Figure B-24: Hourly Summary of Noise Levels Measured at N81 on 07 May, 2016



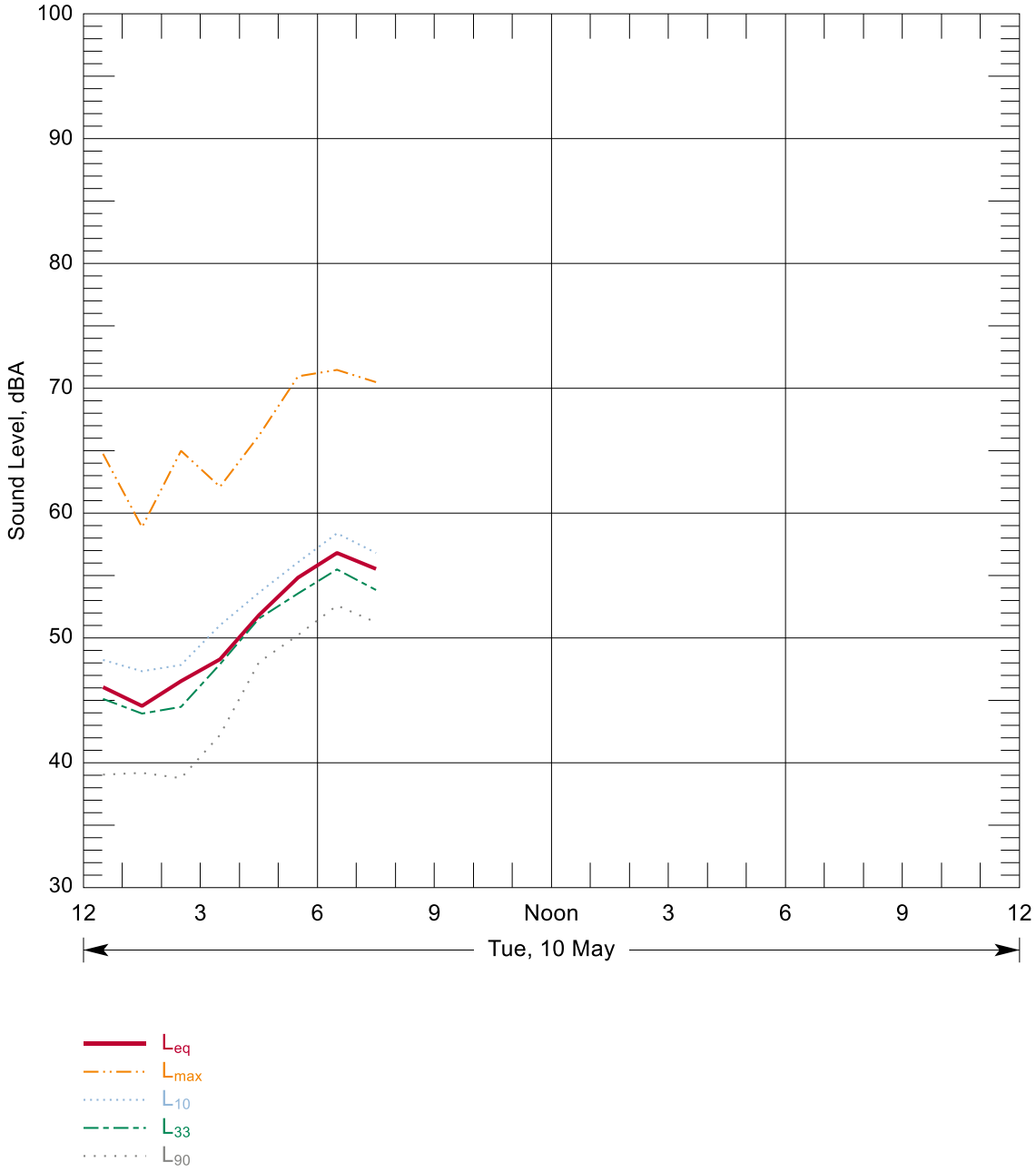
Source: Wilson Ihrig 2016

Figure B-25: Hourly Summary of Noise Levels Measured at N81 on 08 May, 2016



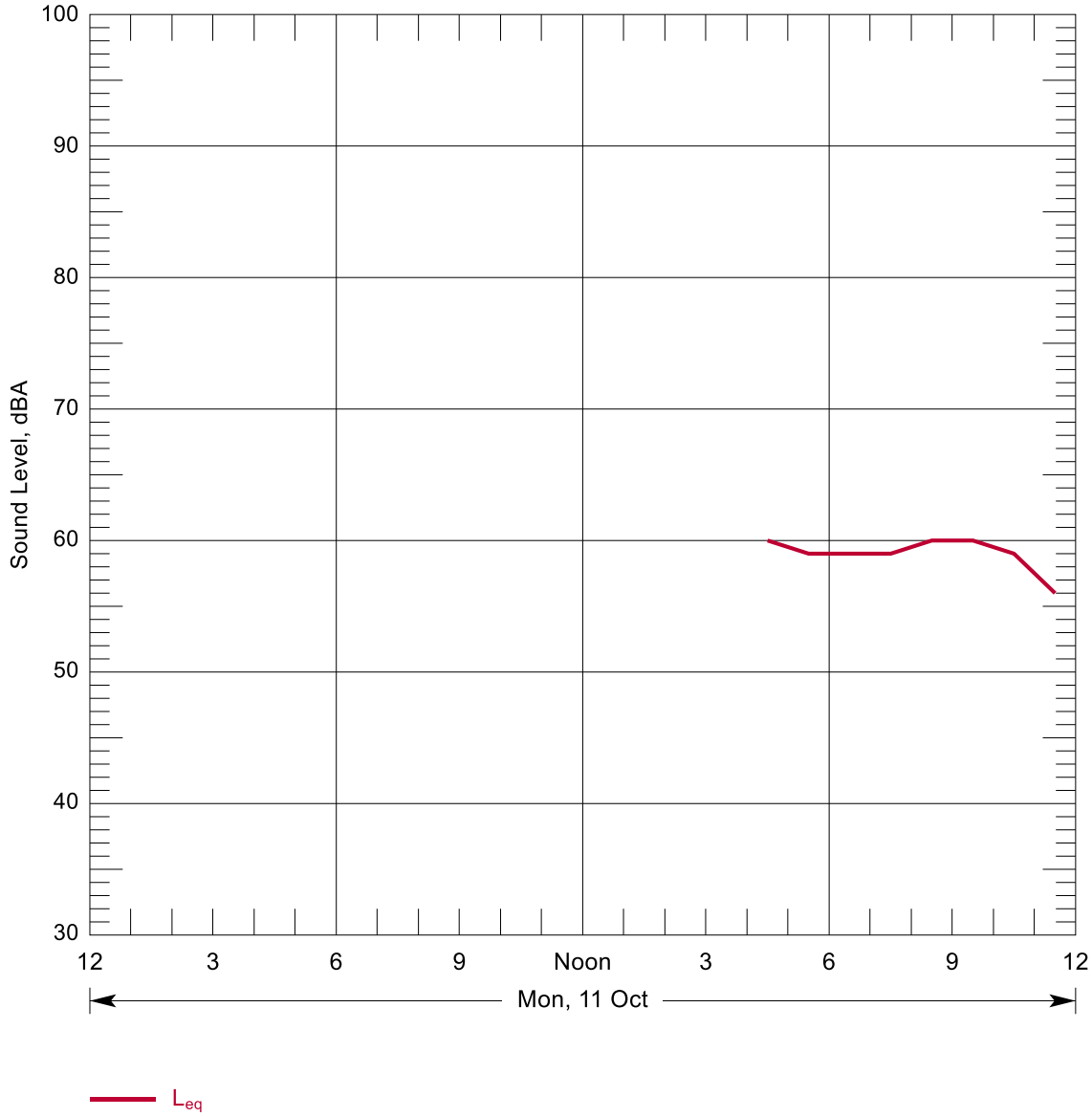
Source: Wilson Ihrig 2016

Figure B-26: Hourly Summary of Noise Levels Measured at N81 on 09 May, 2016



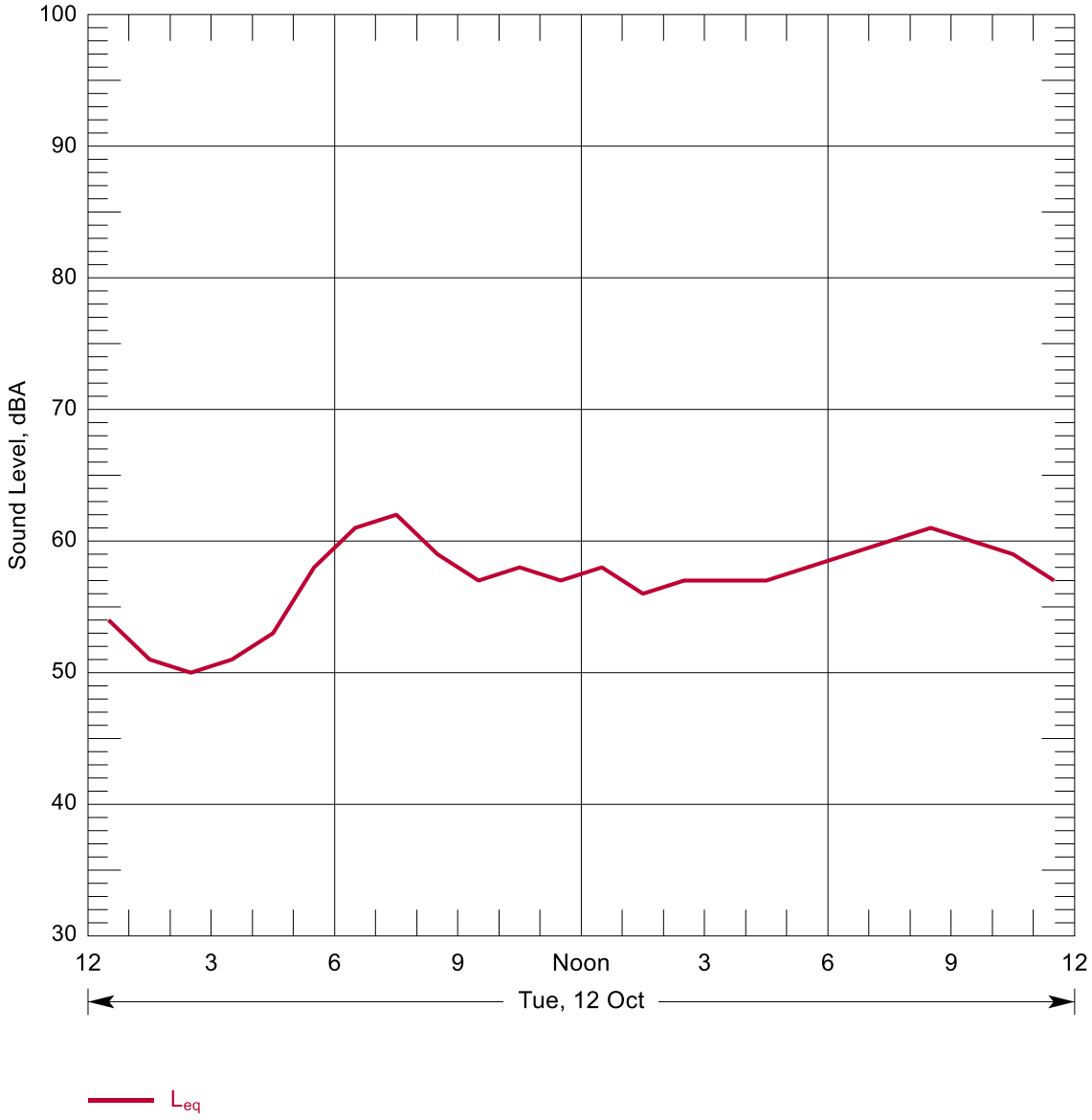
Source: Wilson Ihrig 2016

Figure B-27: Hourly Summary of Noise Levels Measured at N81 on 10 May, 2016



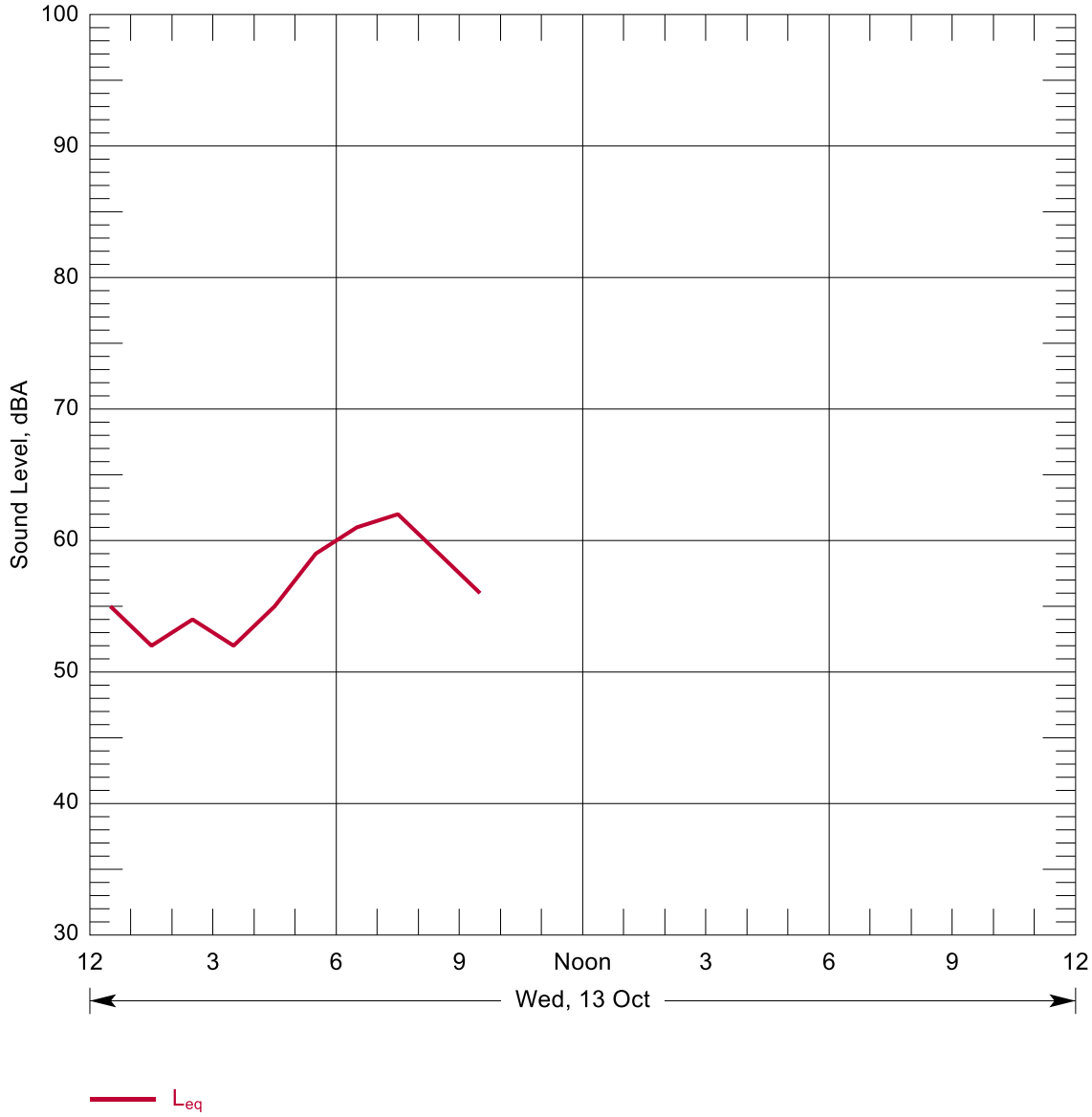
Source: Parsons Transportation 2010

Figure B-28: Hourly Summary of Noise Levels Measured at N82 on 11 Oct, 2010



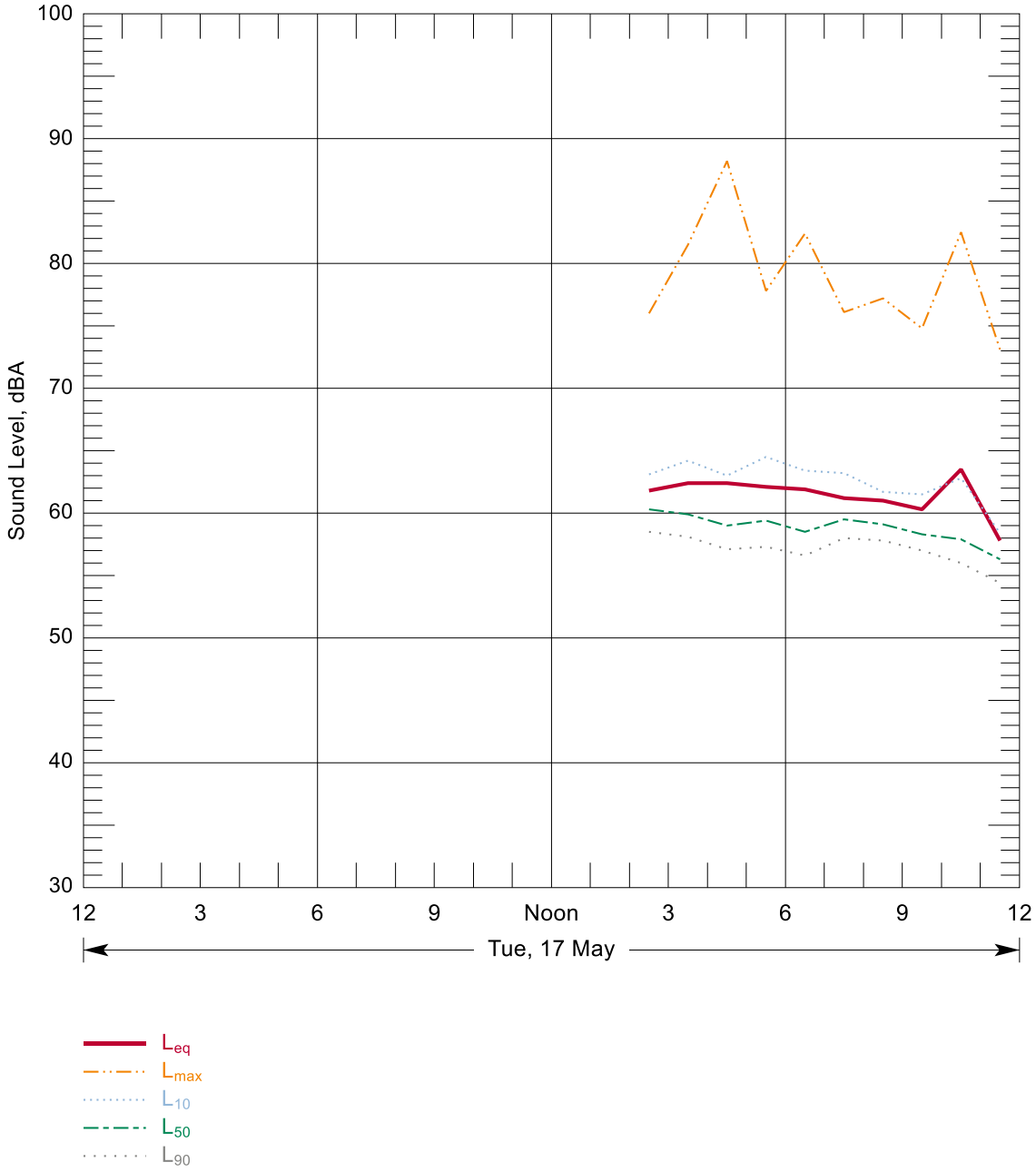
Source: Parsons Transportation 2010

Figure B-29: Hourly Summary of Noise Levels Measured at N82 on 12 Oct, 2010



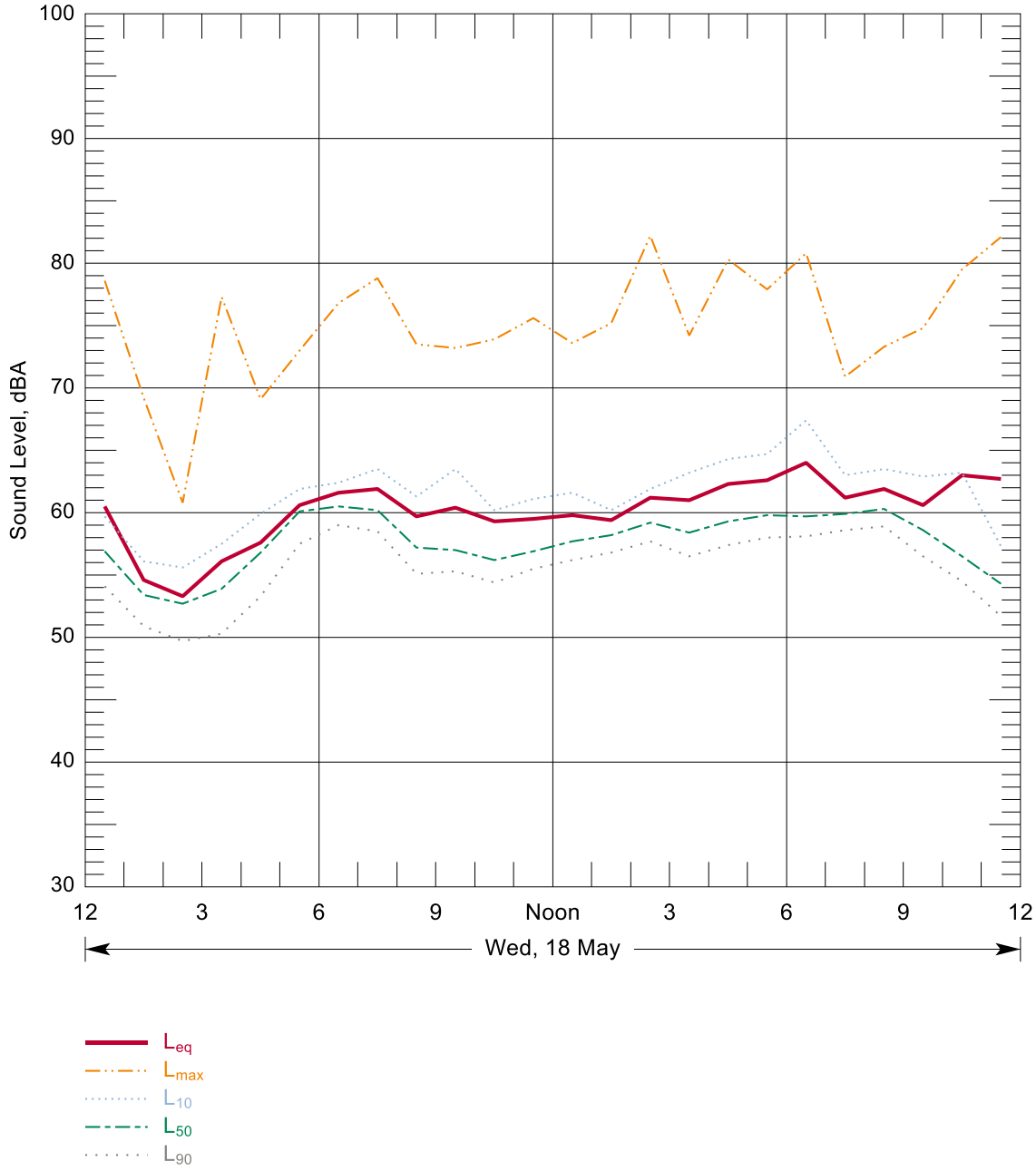
Source: Parsons Transportation 2010

Figure B-30: Hourly Summary of Noise Levels Measured at N82 on 13 Oct, 2010



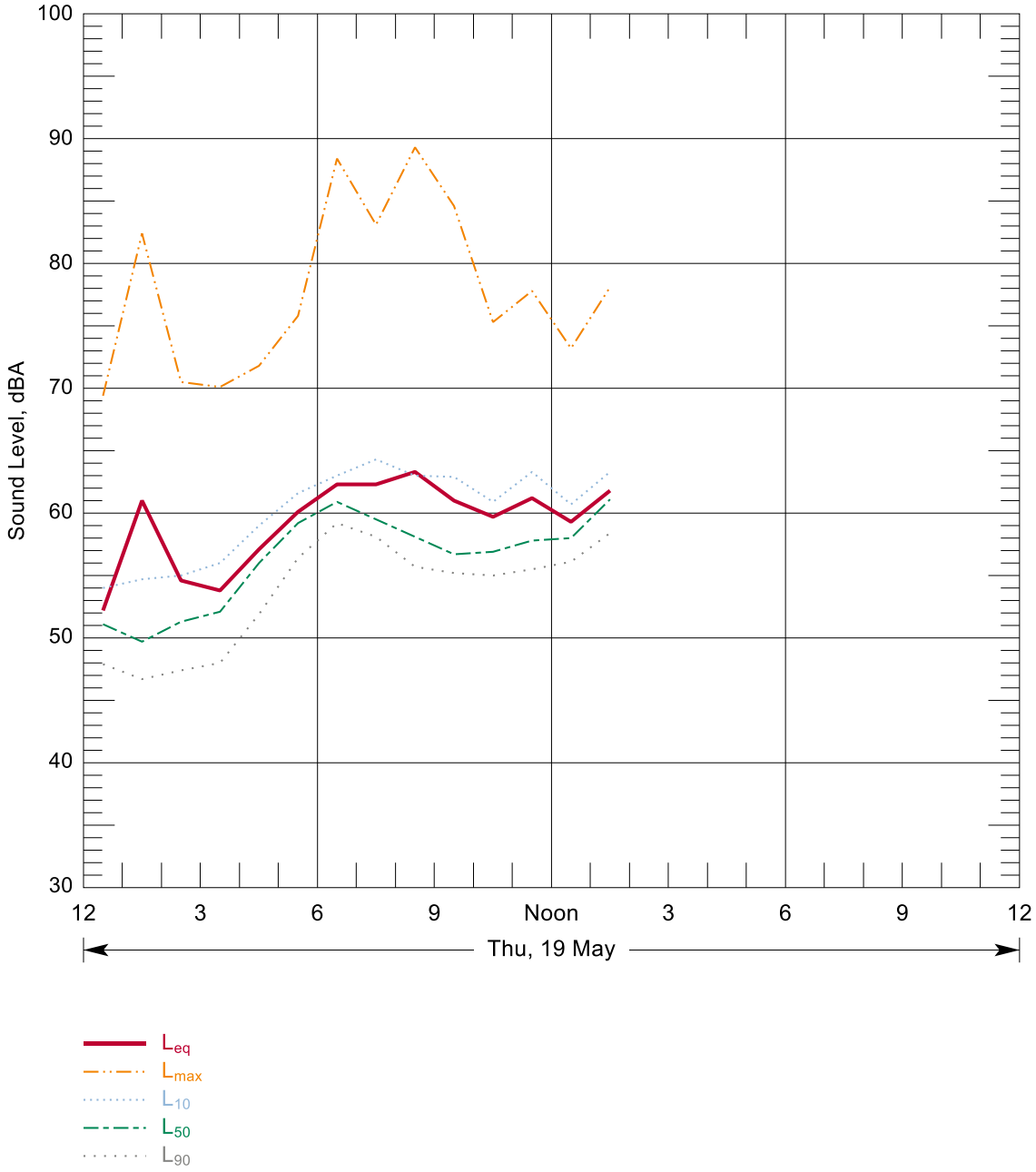
Source: Wilson Ihrig 2016

Figure B-31: Hourly Summary of Noise Levels Measured at N83 on 17 May, 2016



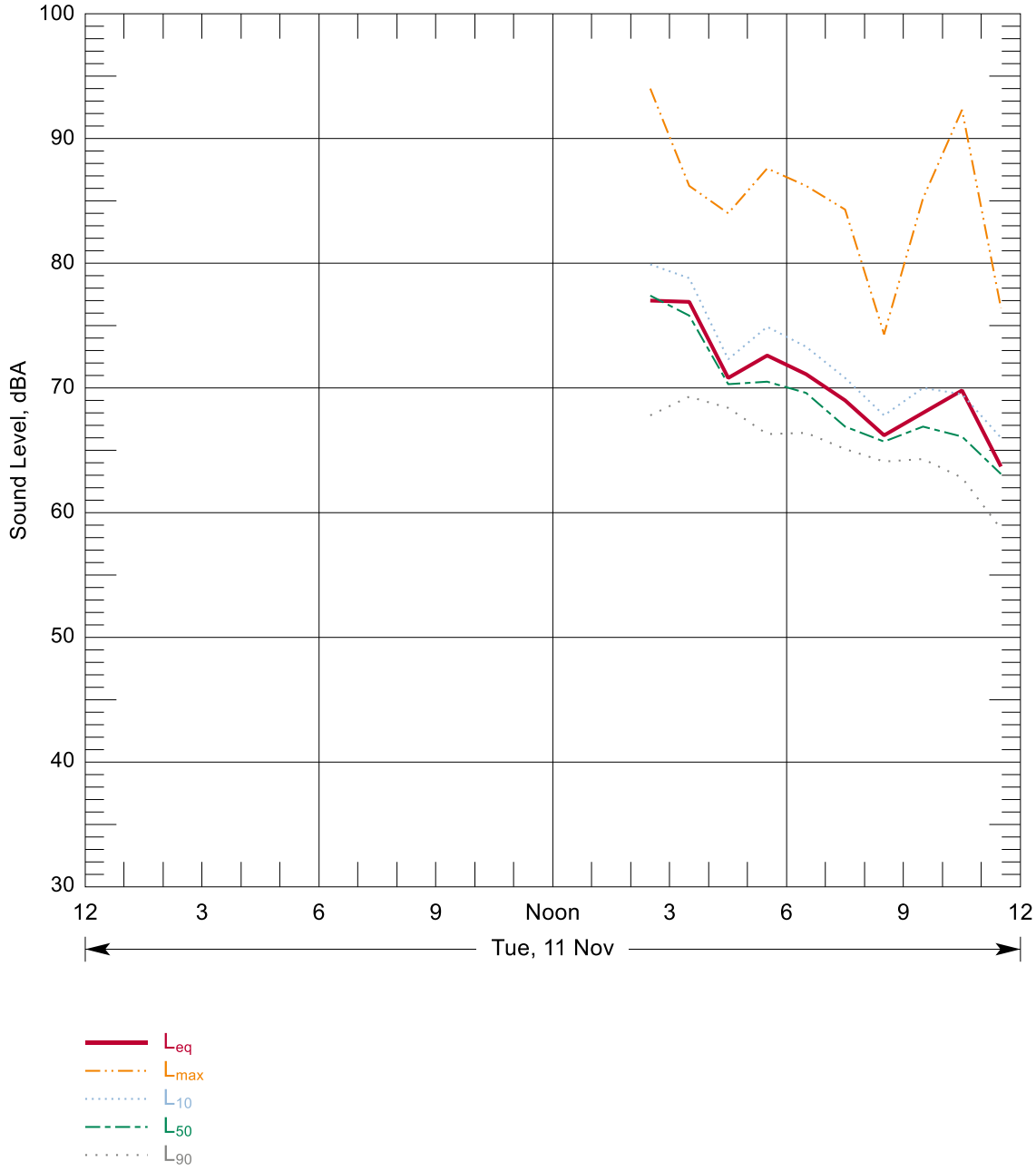
Source: Wilson Ihrig 2016

Figure B-32: Hourly Summary of Noise Levels Measured at N83 on 18 May, 2016



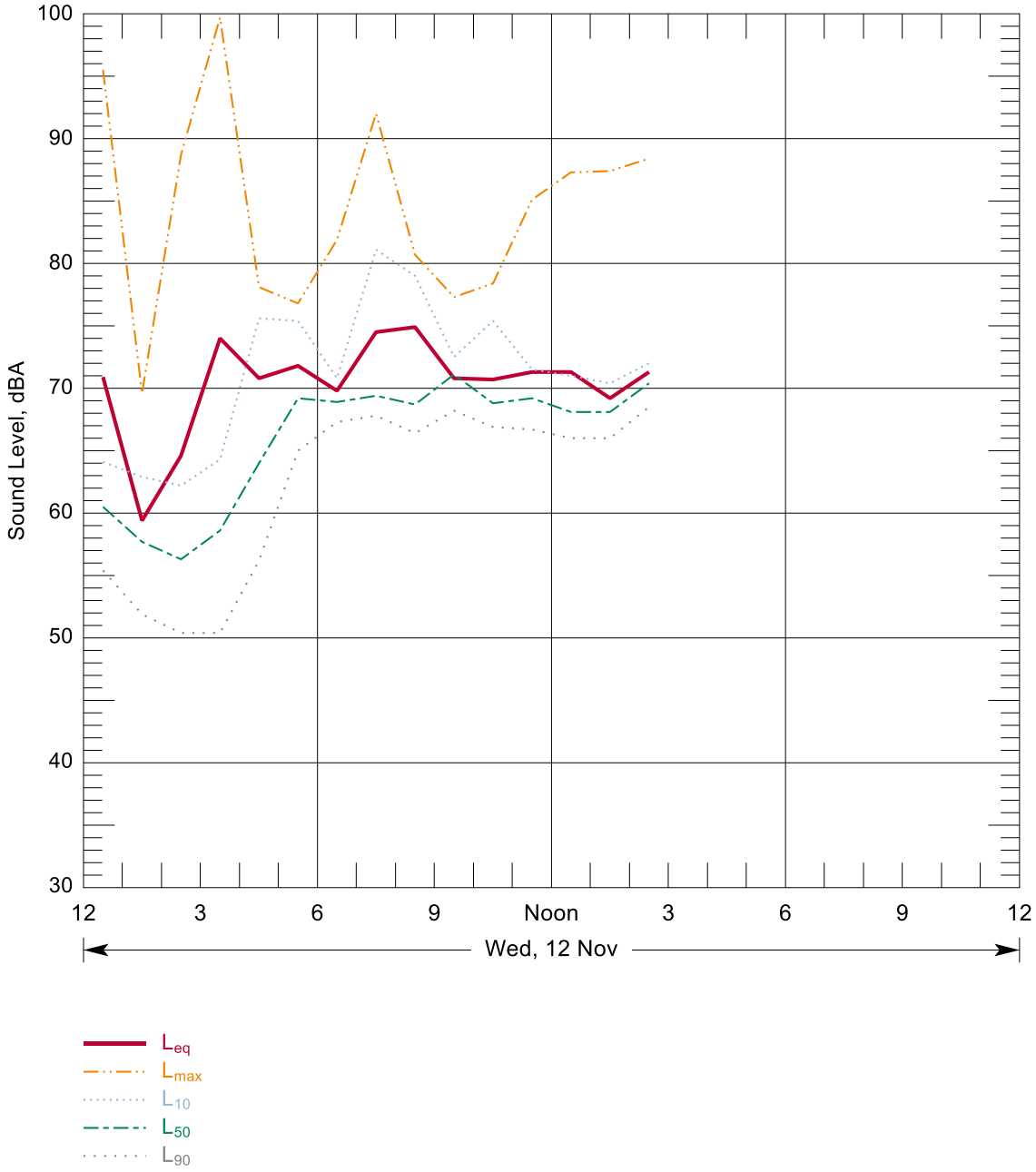
Source: Wilson Ihrig 2016

Figure B-33: Hourly Summary of Noise Levels Measured at N83 on 19 May, 2016



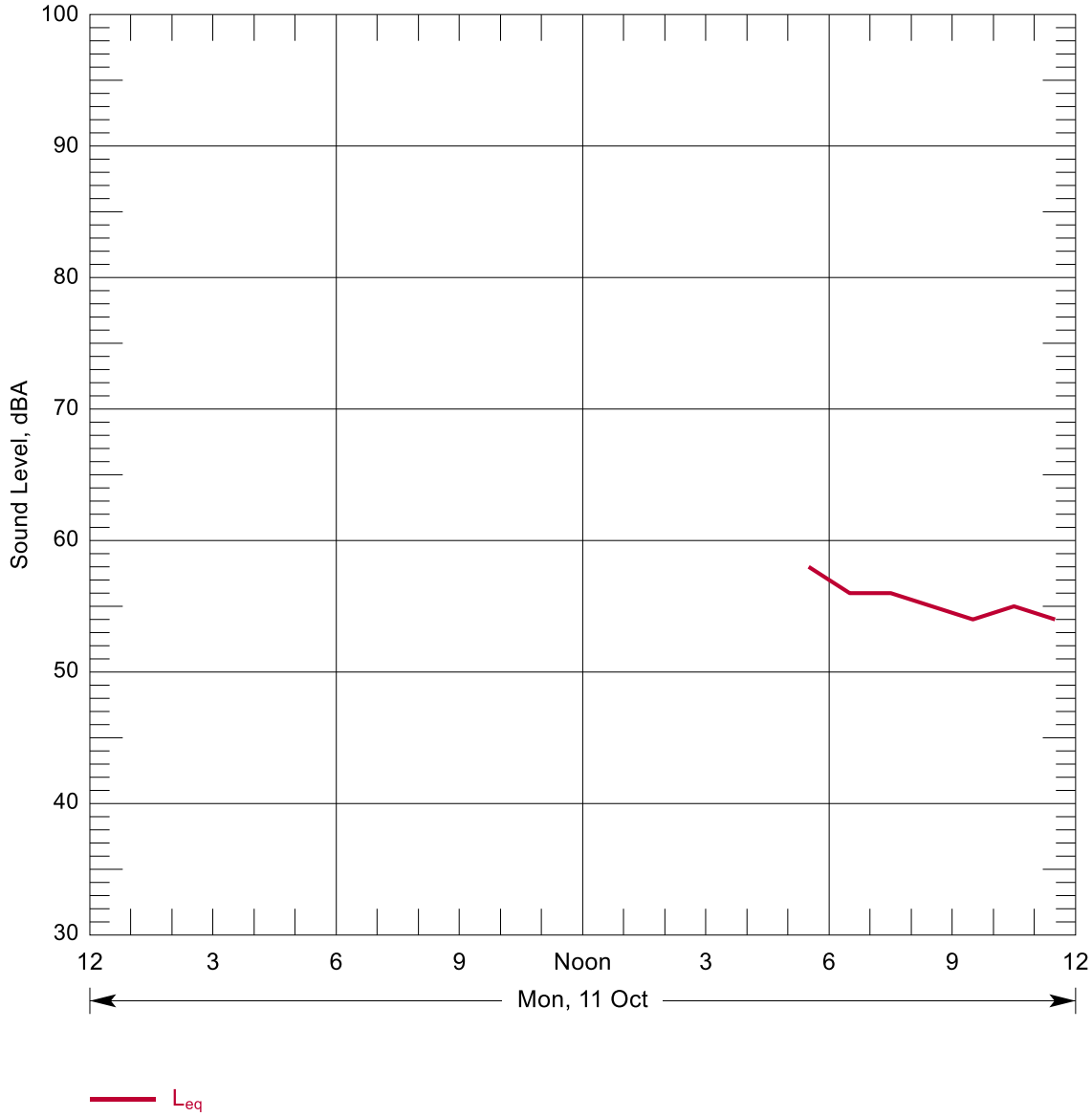
Source: Wilson Ihrig 2014

Figure B-34: Hourly Summary of Noise Levels Measured at N84 on 11 Nov, 2014



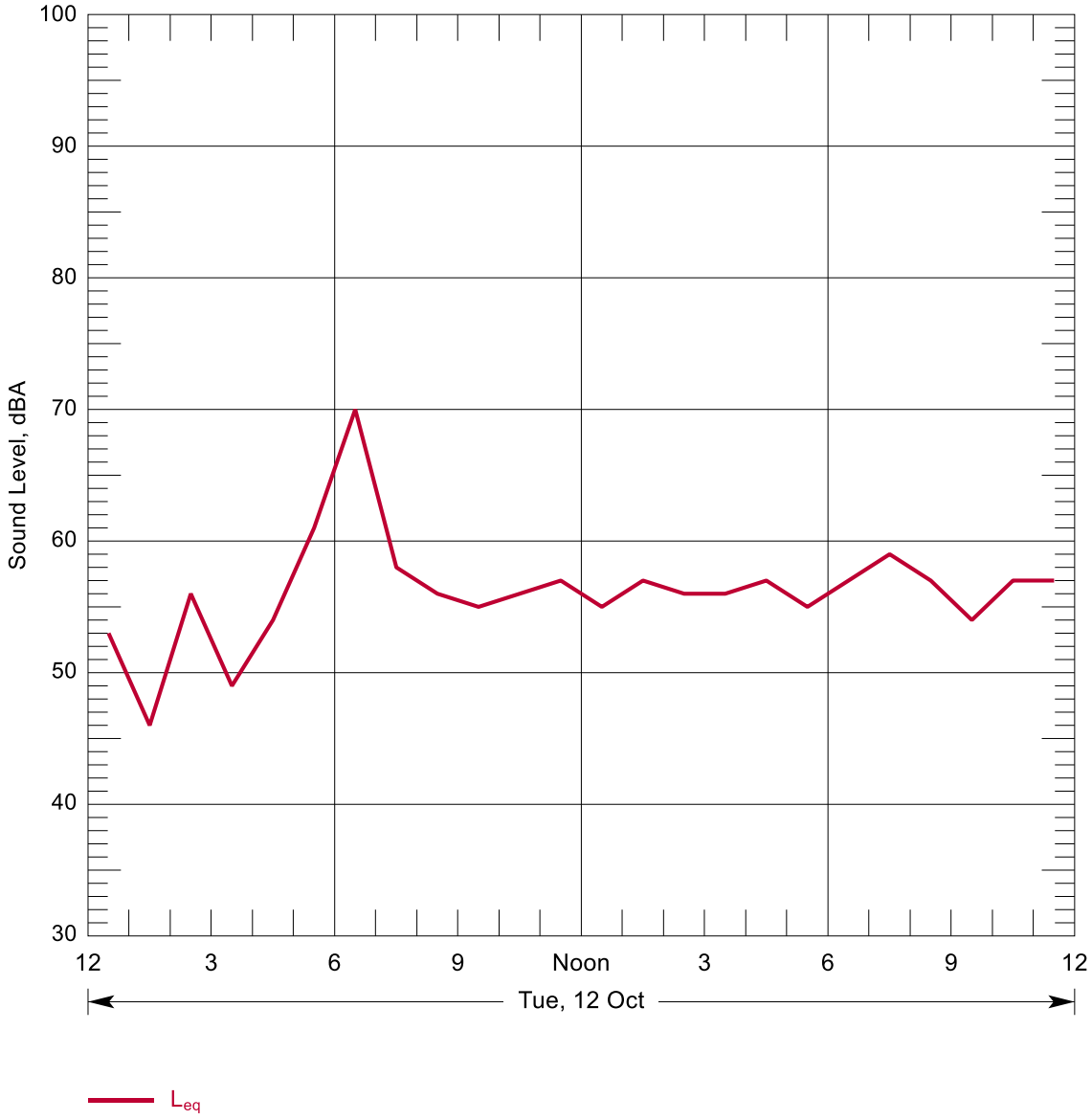
Source: Wilson Ihrig 2014

Figure B-35: Hourly Summary of Noise Levels Measured at N84 on 12 Nov, 2014



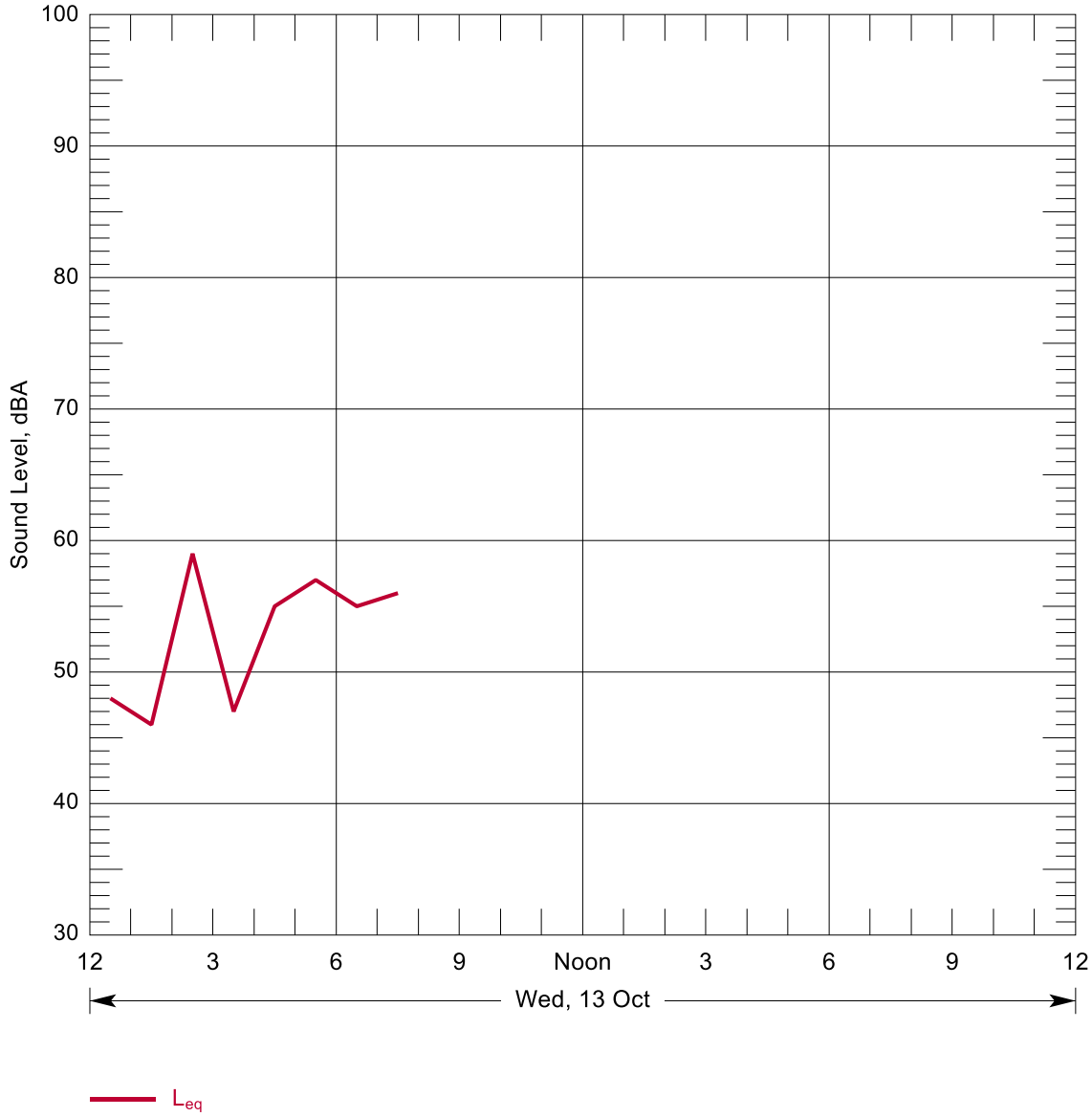
Source: Parsons Transportation 2010

Figure B-36: Hourly Summary of Noise Levels Measured at N85 on 11 Oct, 2010



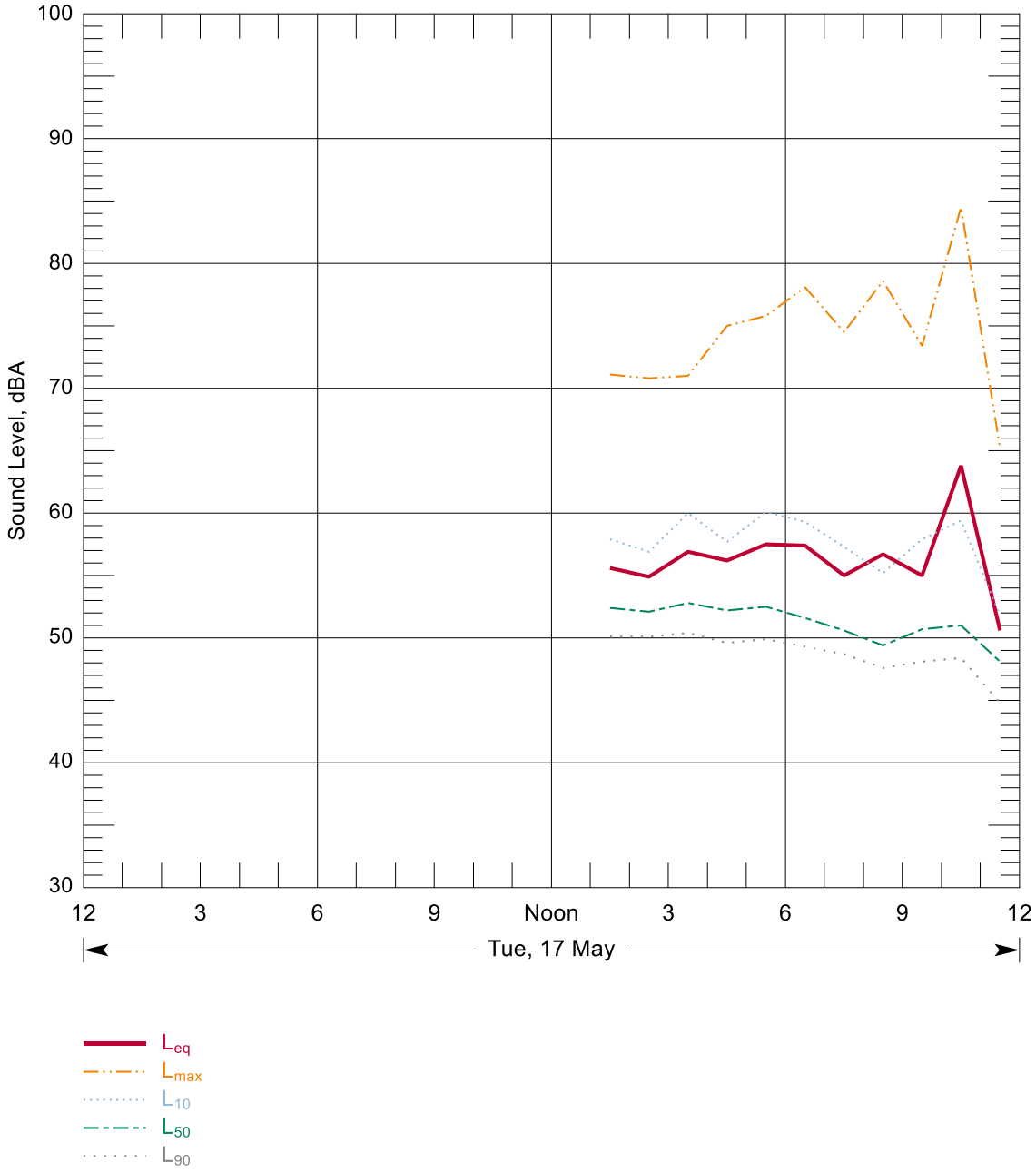
Source: Parsons Transportation 2010

Figure B-37: Hourly Summary of Noise Levels Measured at N85 on 12 Oct, 2010



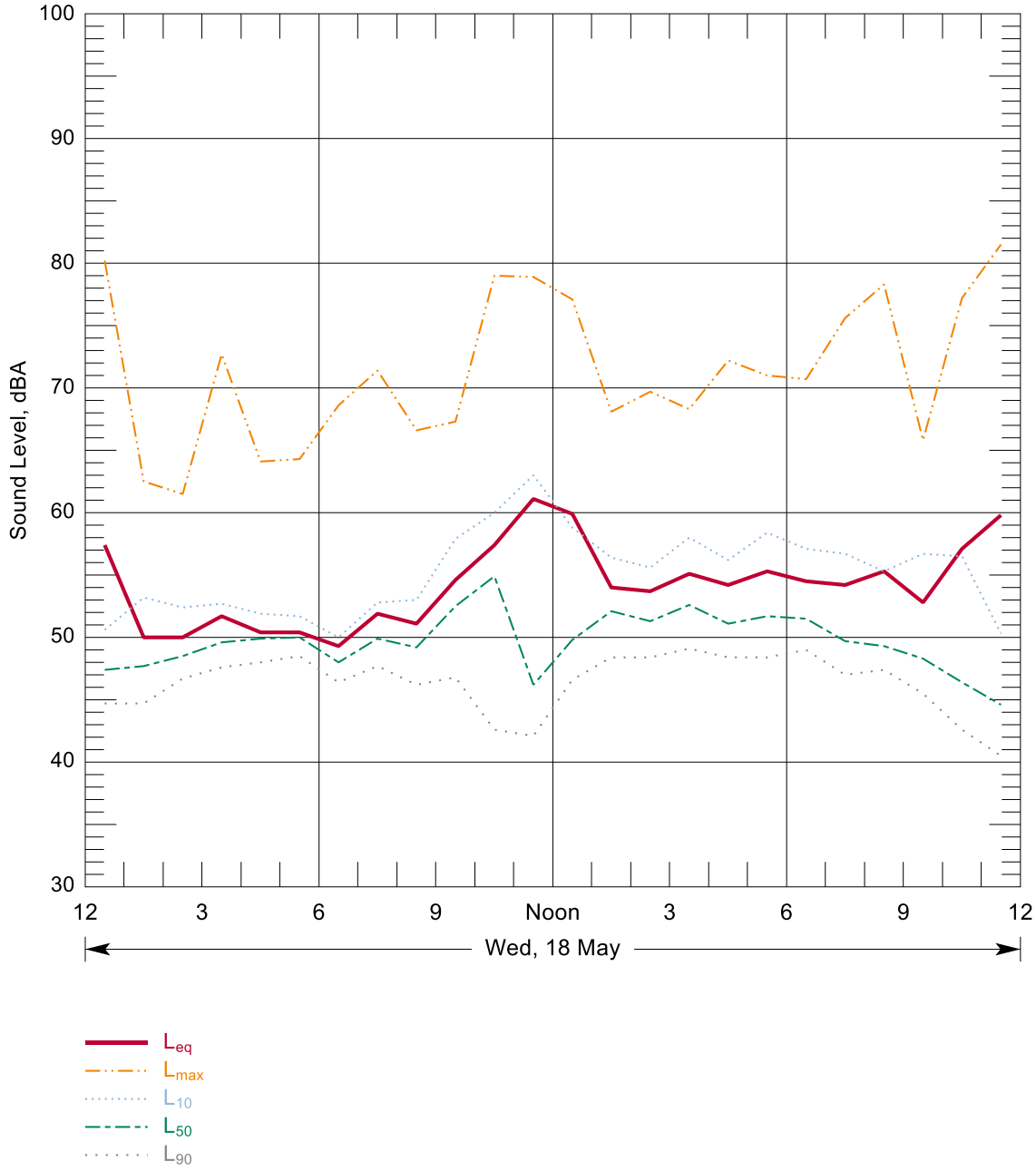
Source: Parsons Transportation 2010

Figure B-38: Hourly Summary of Noise Levels Measured at N85 on 13 Oct, 2010



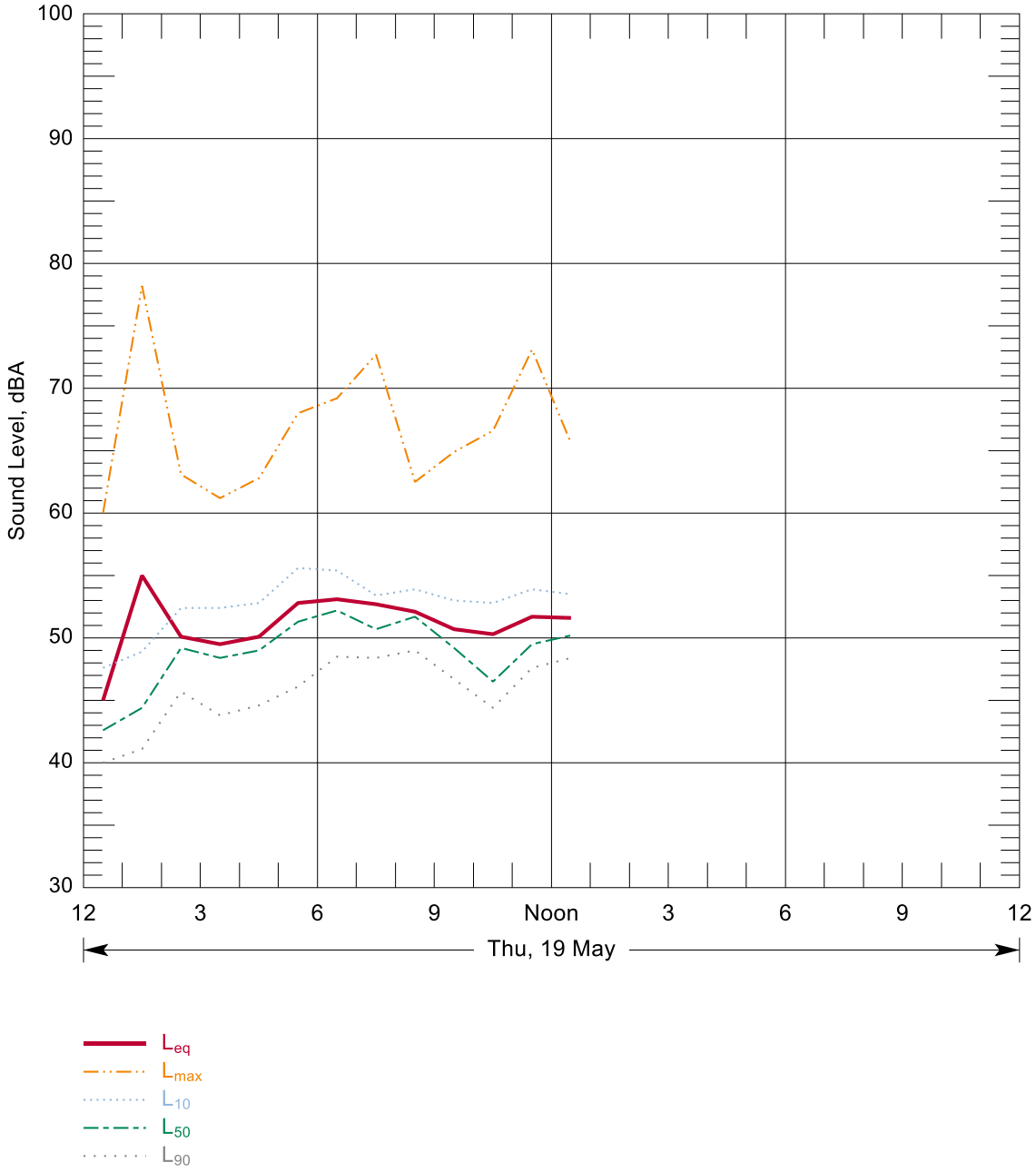
Source: Wilson Ihrig 2016

Figure B-39: Hourly Summary of Noise Levels Measured at N86 on 17 May, 2016



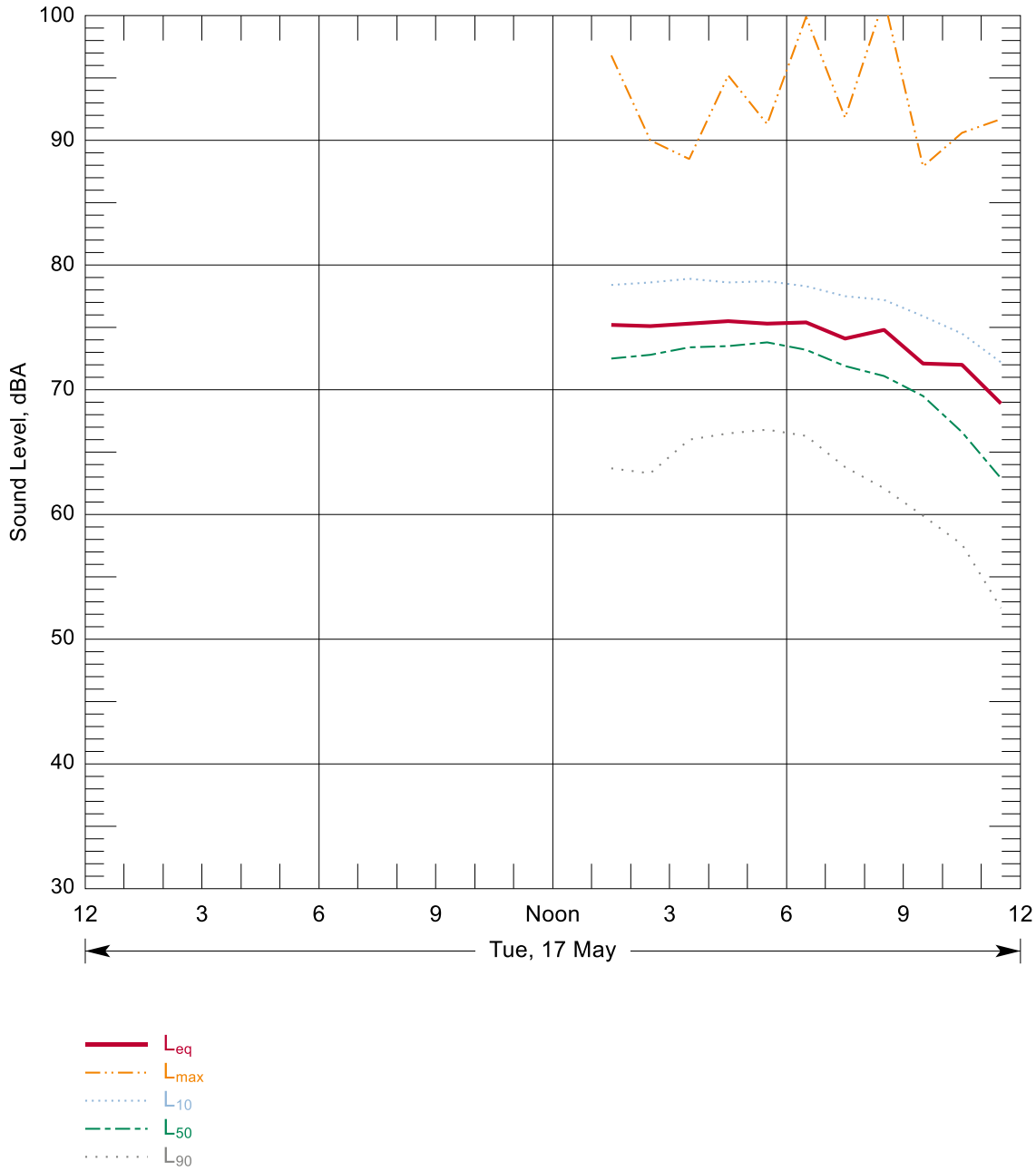
Source: Wilson Ihrig 2016

Figure B-40: Hourly Summary of Noise Levels Measured at N86 on 18 May, 2016



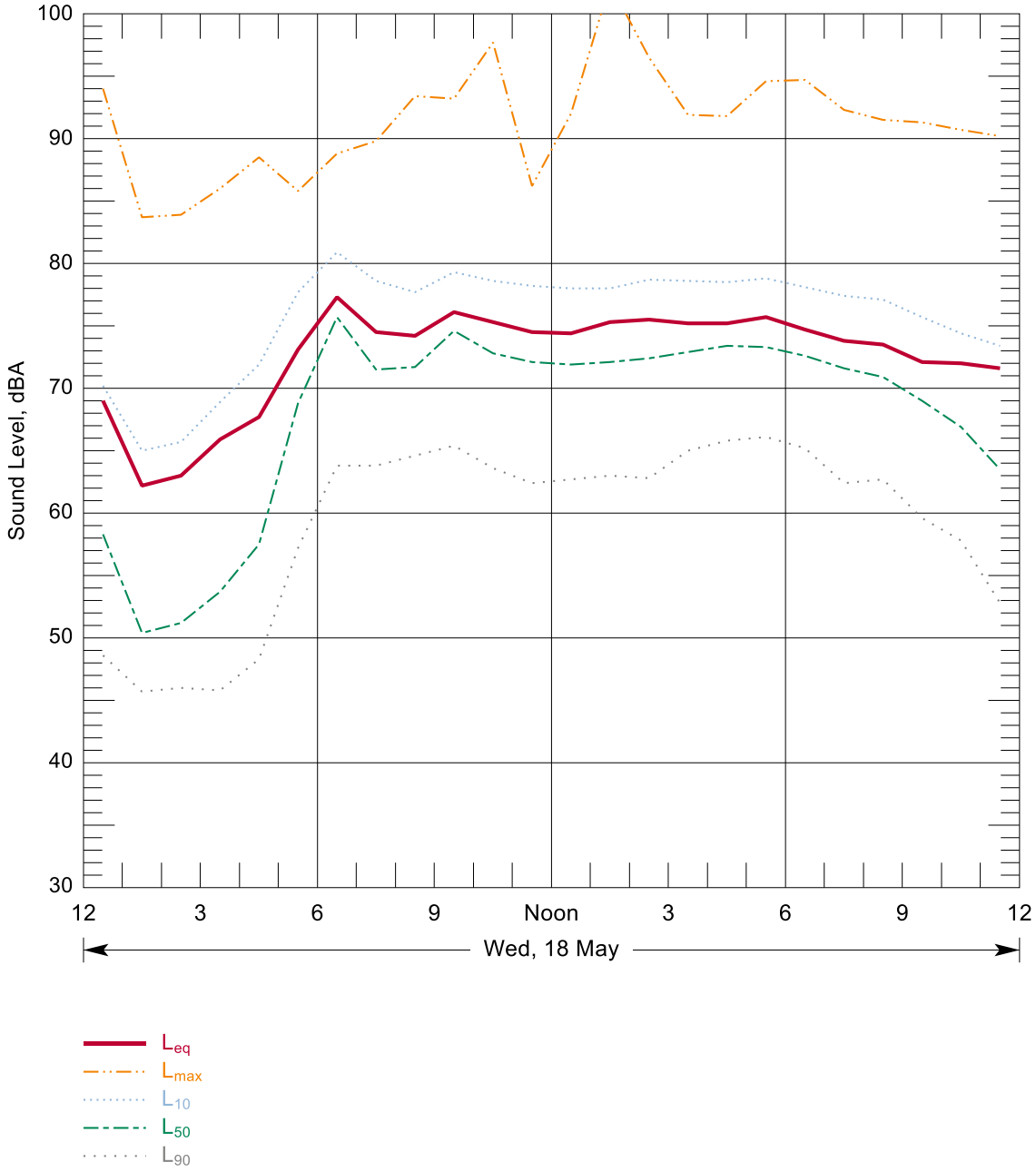
Source: Wilson Ihrig 2016

Figure B-41: Hourly Summary of Noise Levels Measured at N86 on 19 May, 2016



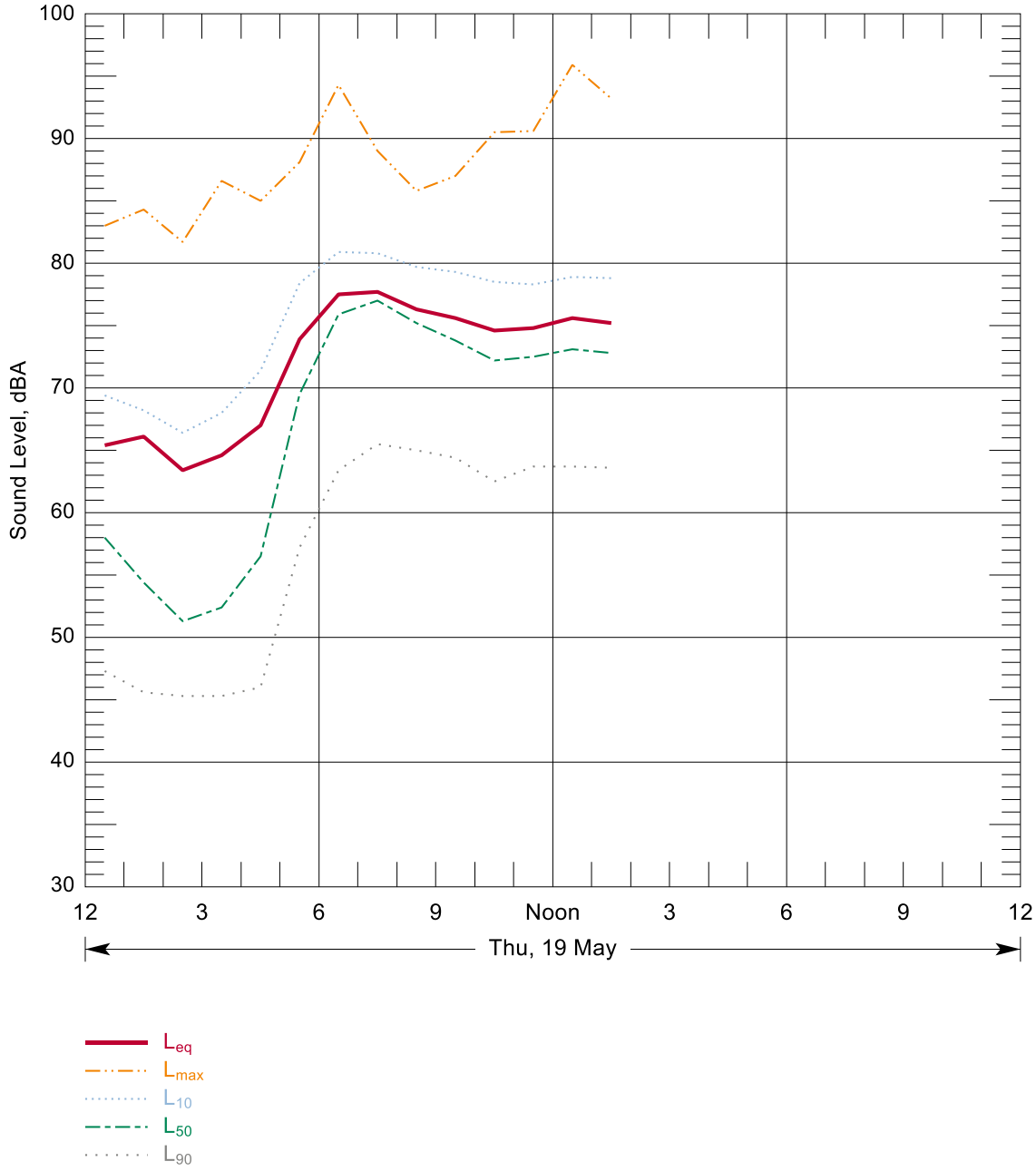
Source: Wilson Ihrig 2016

Figure B-42: Hourly Summary of Noise Levels Measured at N87 on 17 May, 2016



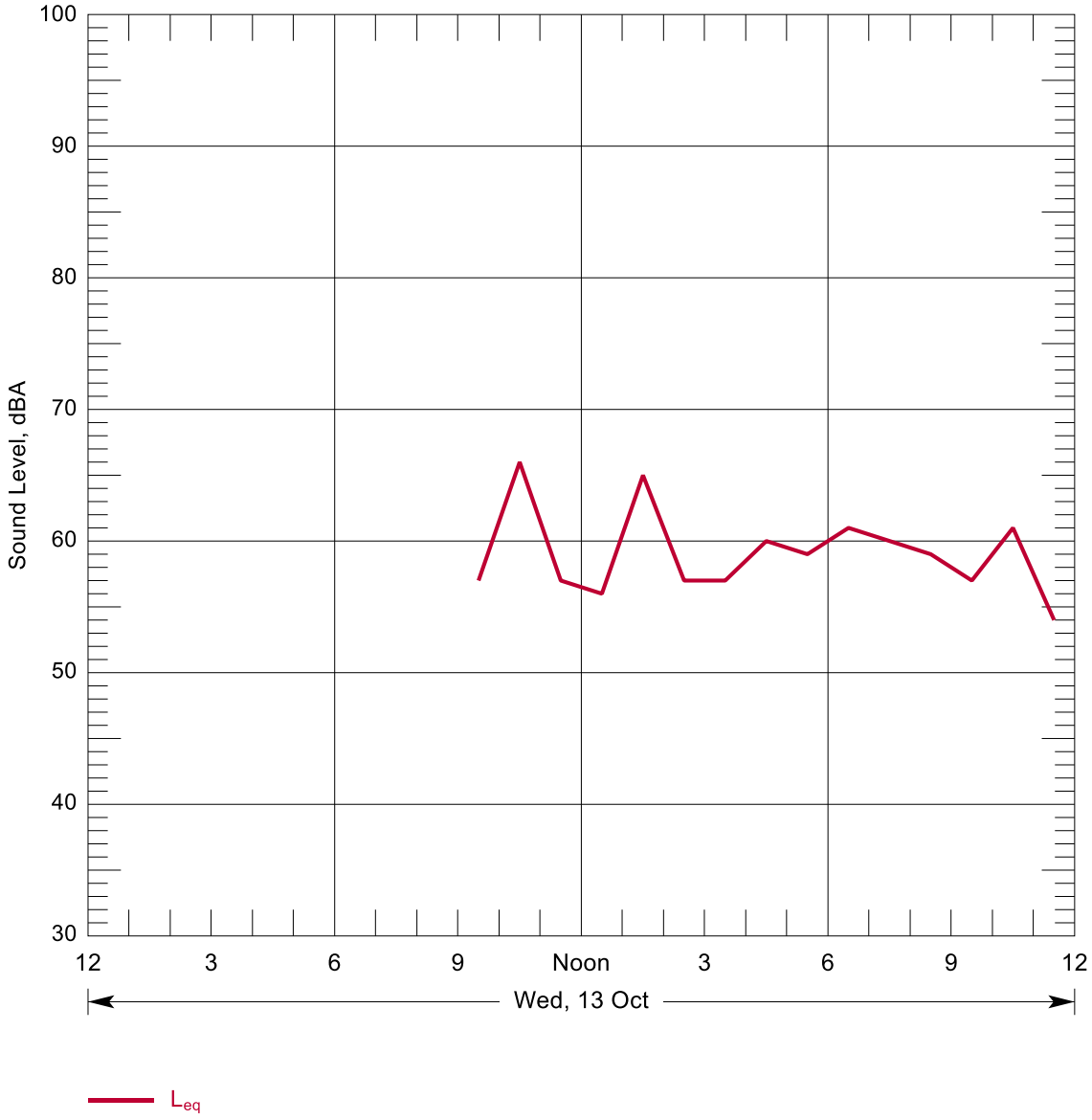
Source: Wilson Ihrig 2016

Figure B-43: Hourly Summary of Noise Levels Measured at N87 on 18 May, 2016



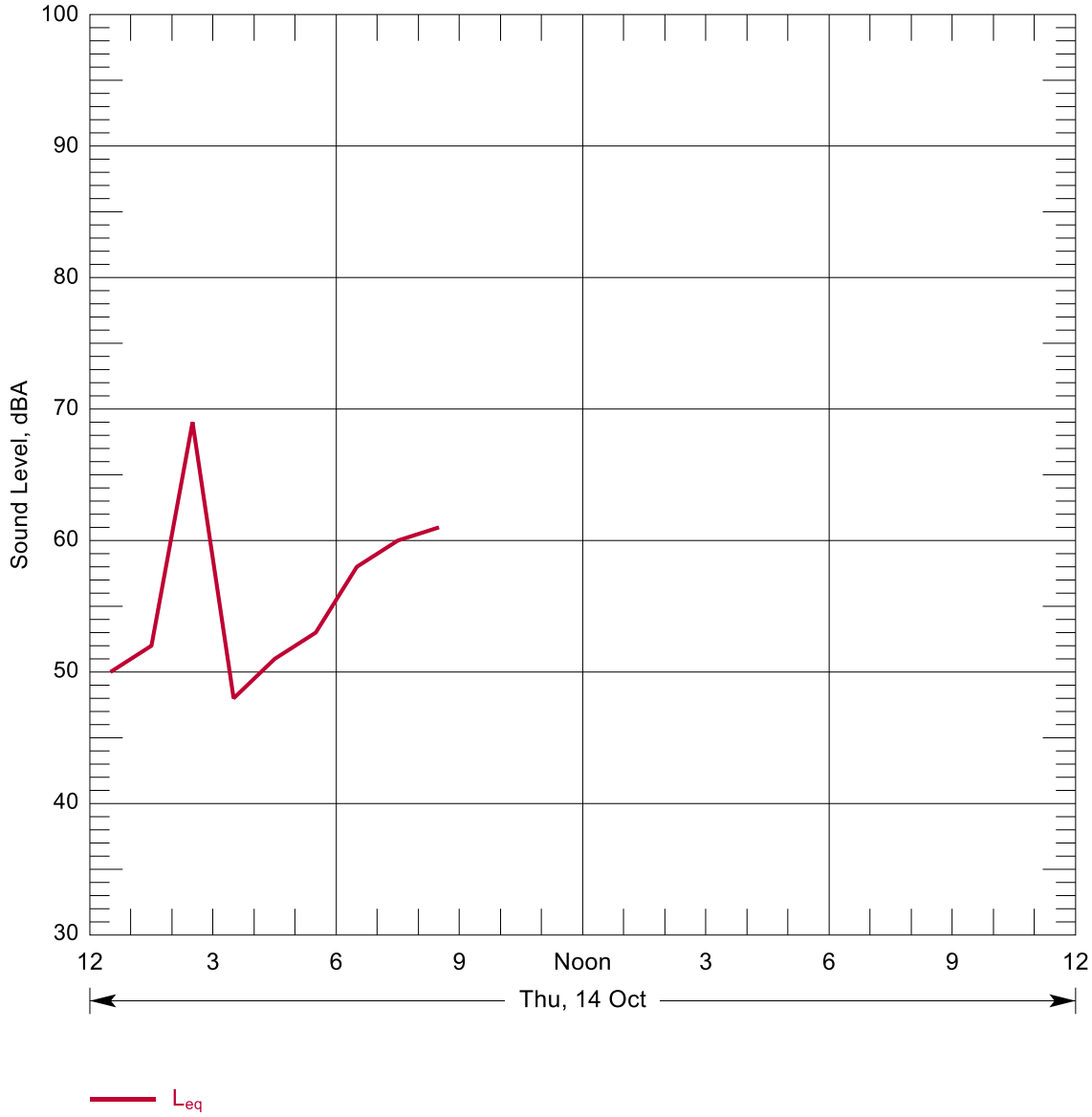
Source: Wilson Ihrig 2016

Figure B-44: Hourly Summary of Noise Levels Measured at N87 on 19 May, 2016



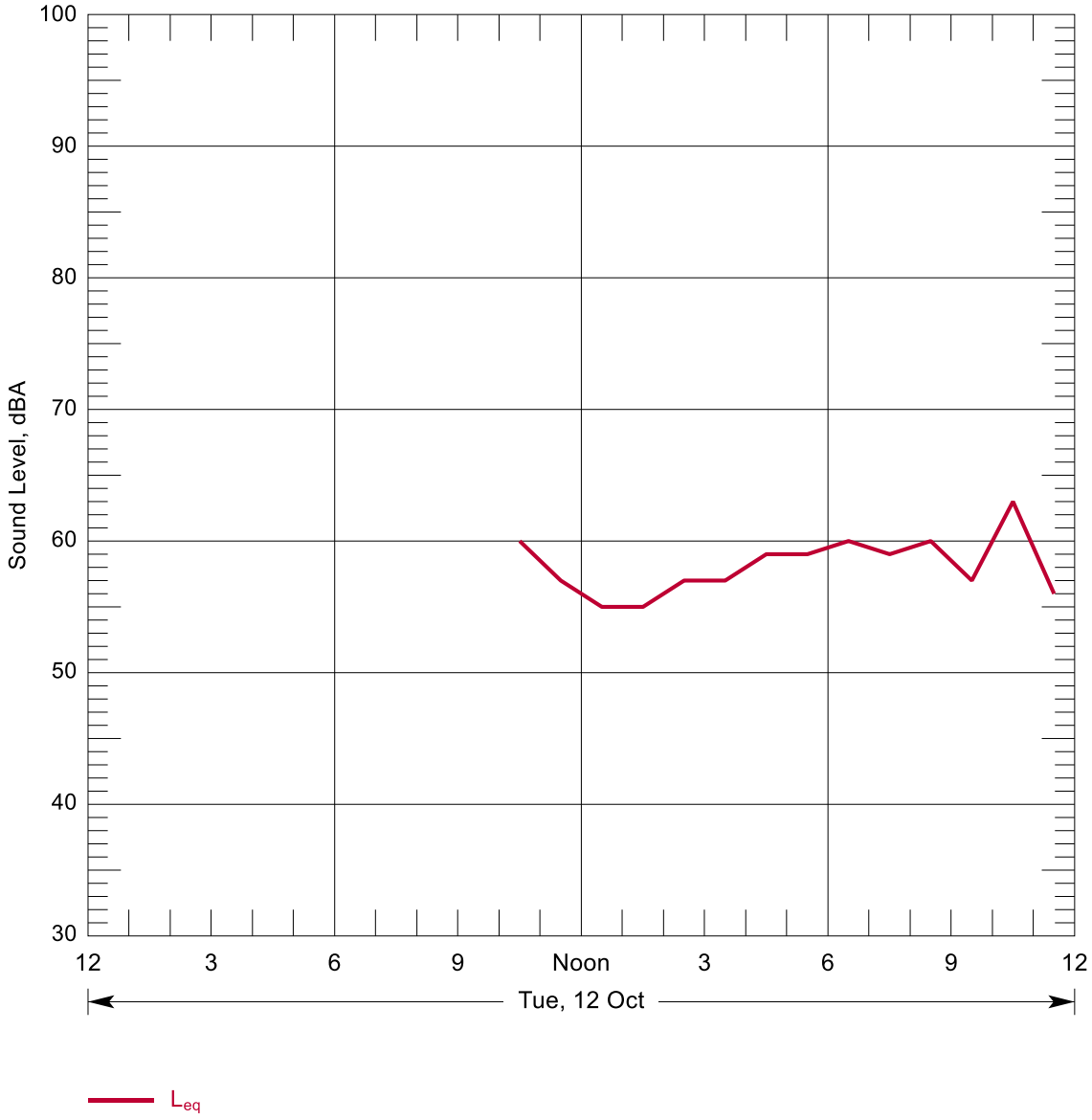
Source: Parsons Transportation 2010

Figure B-45: Hourly Summary of Noise Levels Measured at N88 on 13 Oct, 2010



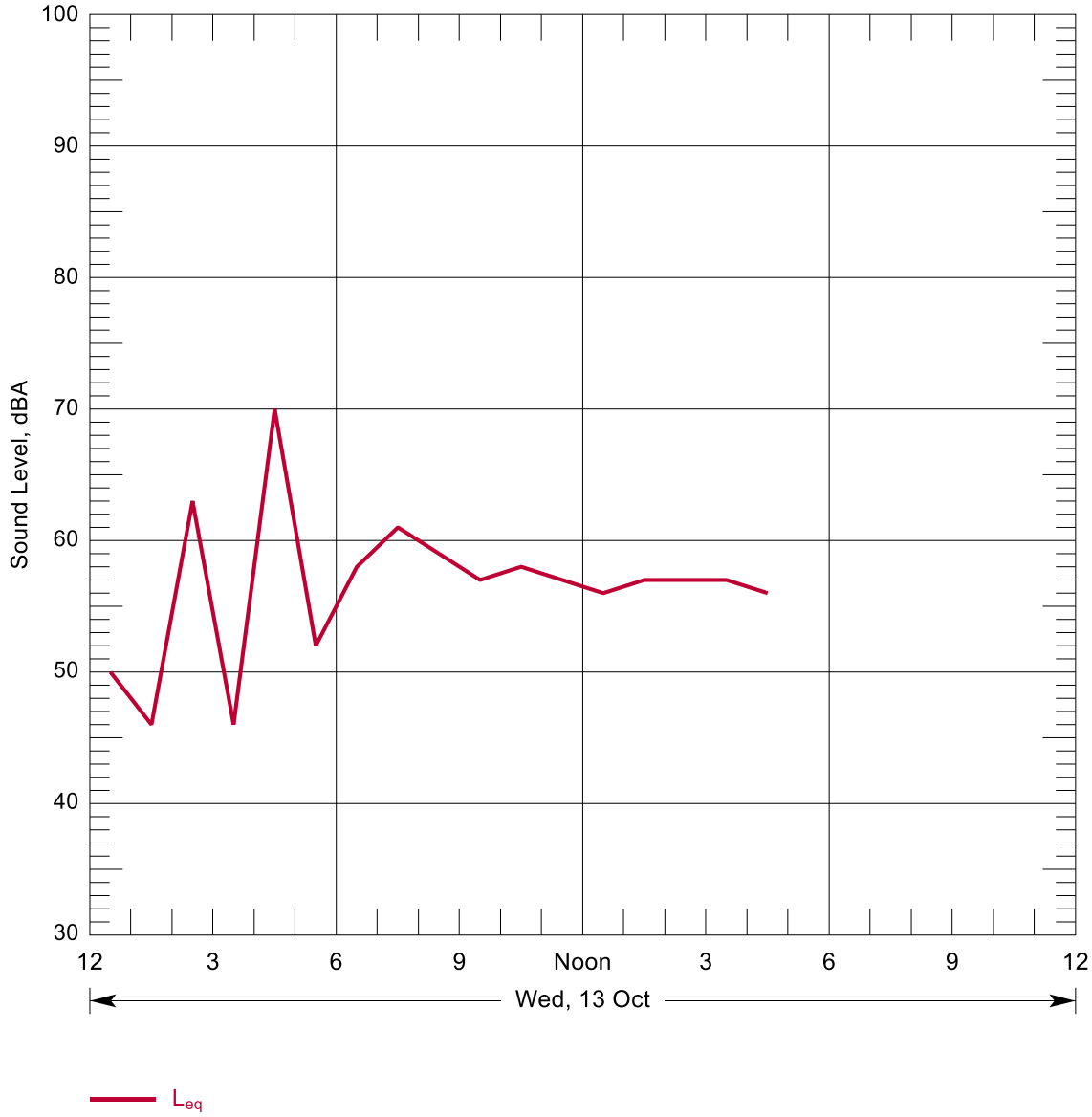
Source: Parsons Transportation 2010

Figure B-46: Hourly Summary of Noise Levels Measured at N88 on 14 Oct, 2010



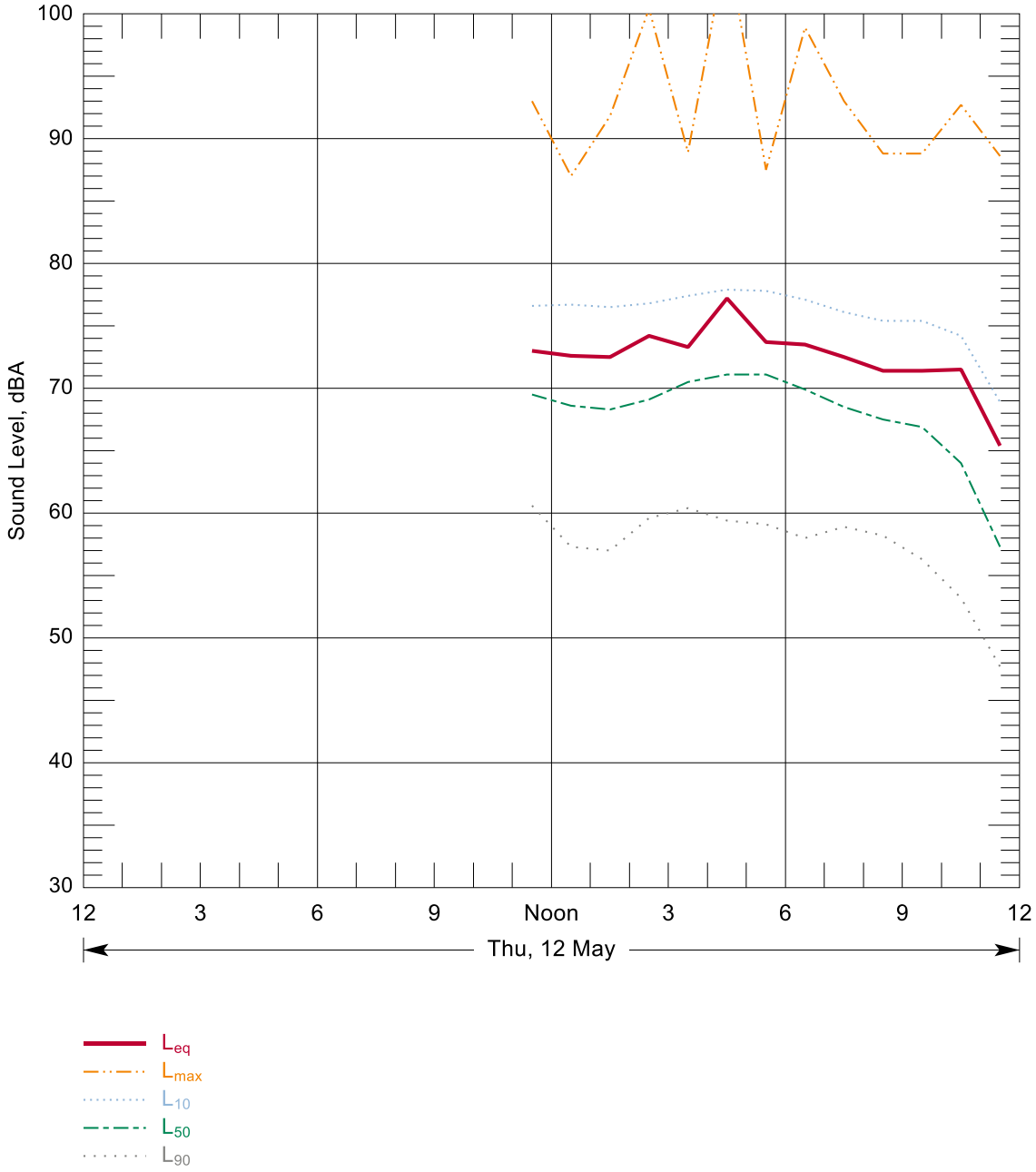
Source: Parsons Transportation 2010

Figure B-47: Hourly Summary of Noise Levels Measured at N89 on 12 Oct, 2010



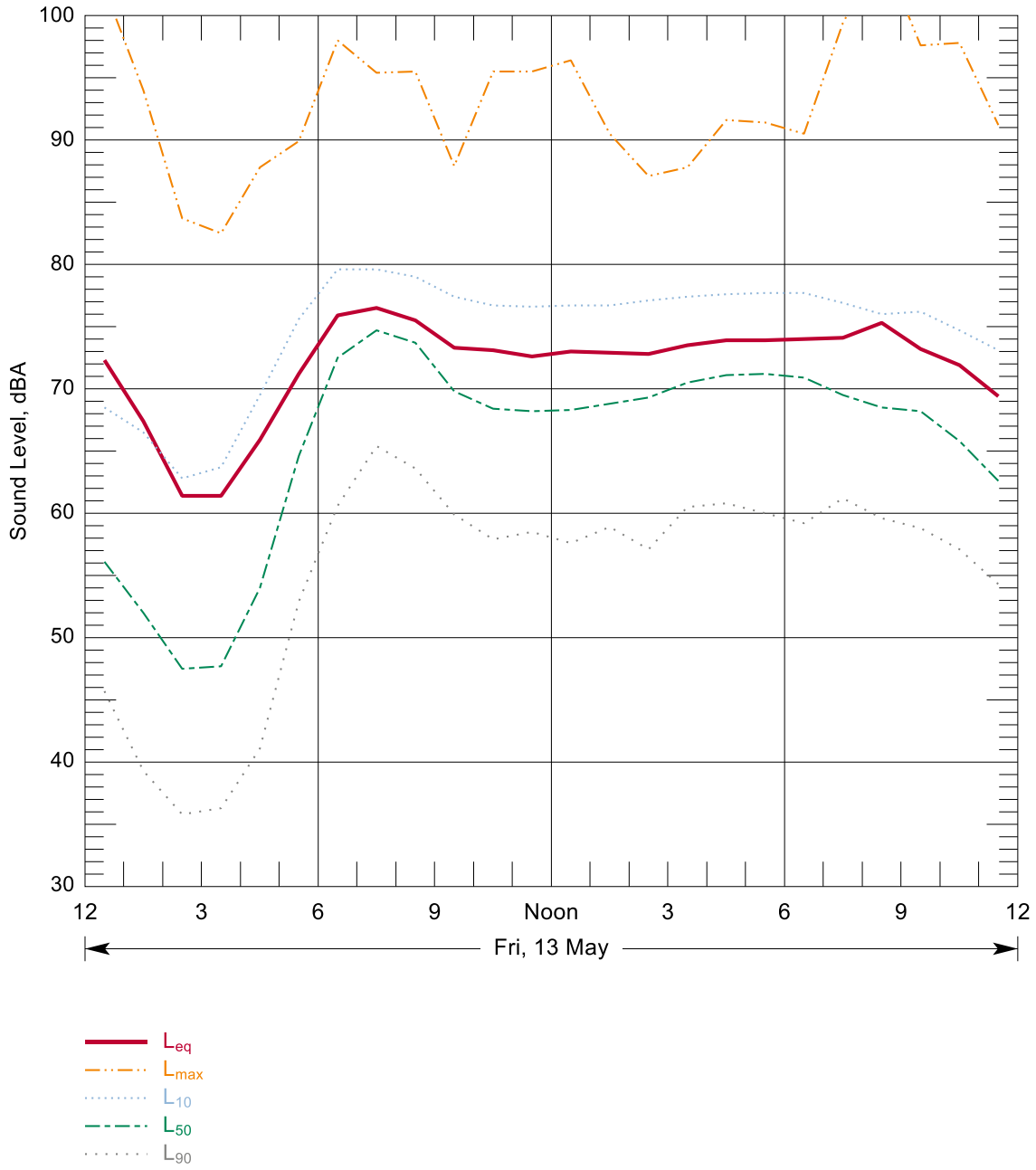
Source: Parsons Transportation 2010

Figure B-48: Hourly Summary of Noise Levels Measured at N89 on 13 Oct, 2010



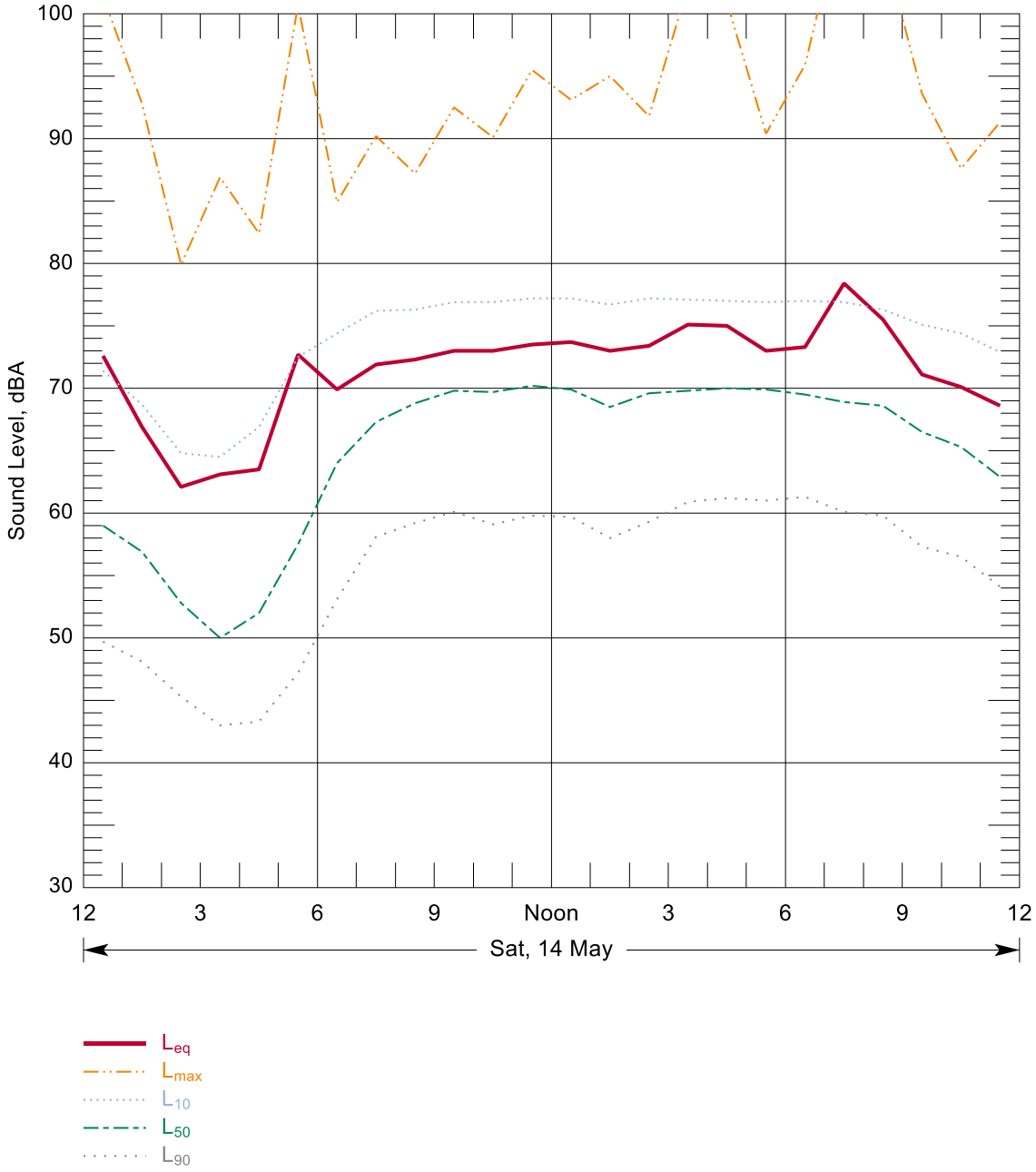
Source: Wilson Ihrig 2016

Figure B-49: Hourly Summary of Noise Levels Measured at N90 on 12 May, 2016



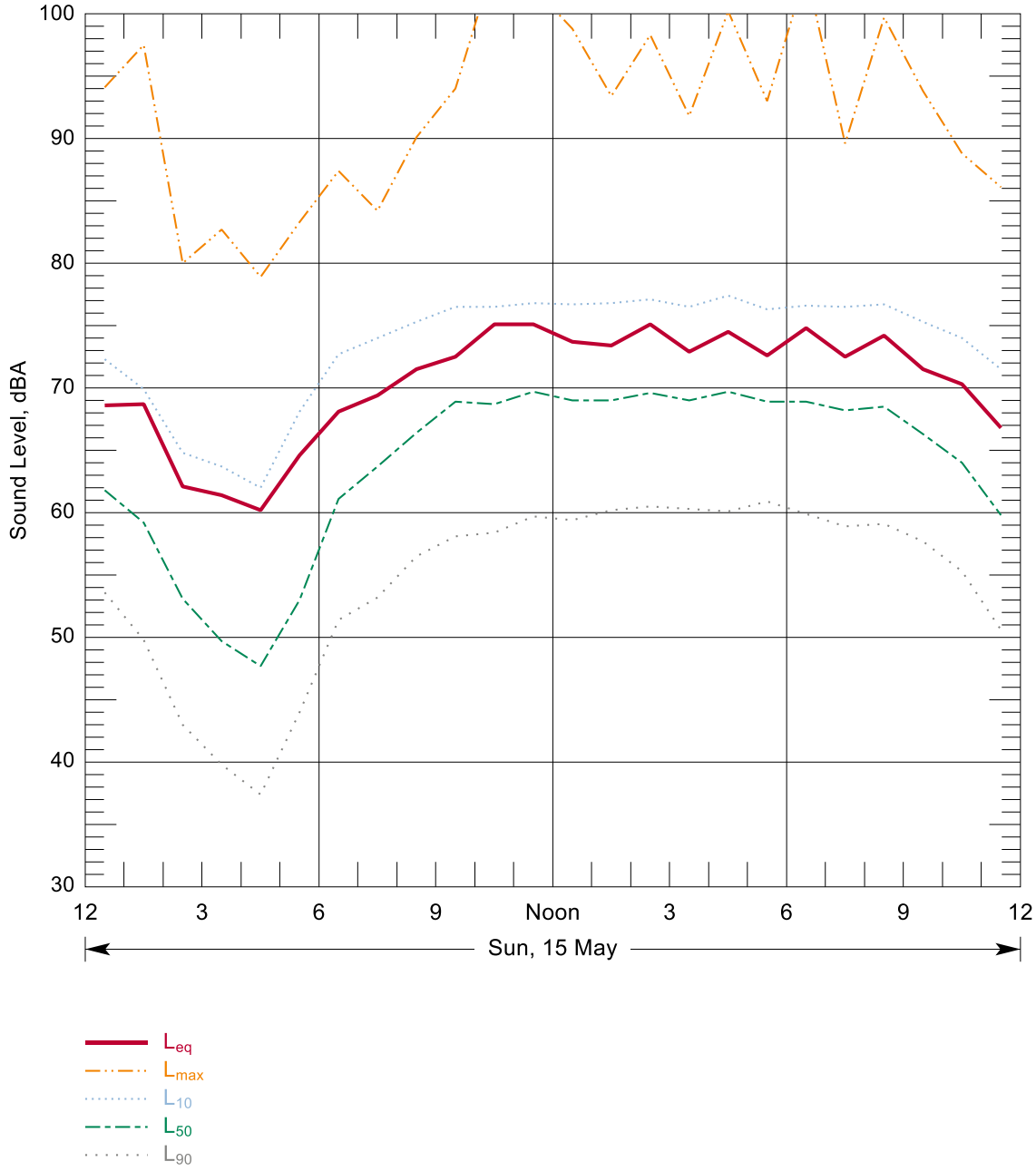
Source: Wilson Ihrig 2016

Figure B-50: Hourly Summary of Noise Levels Measured at N90 on 13 May, 2016



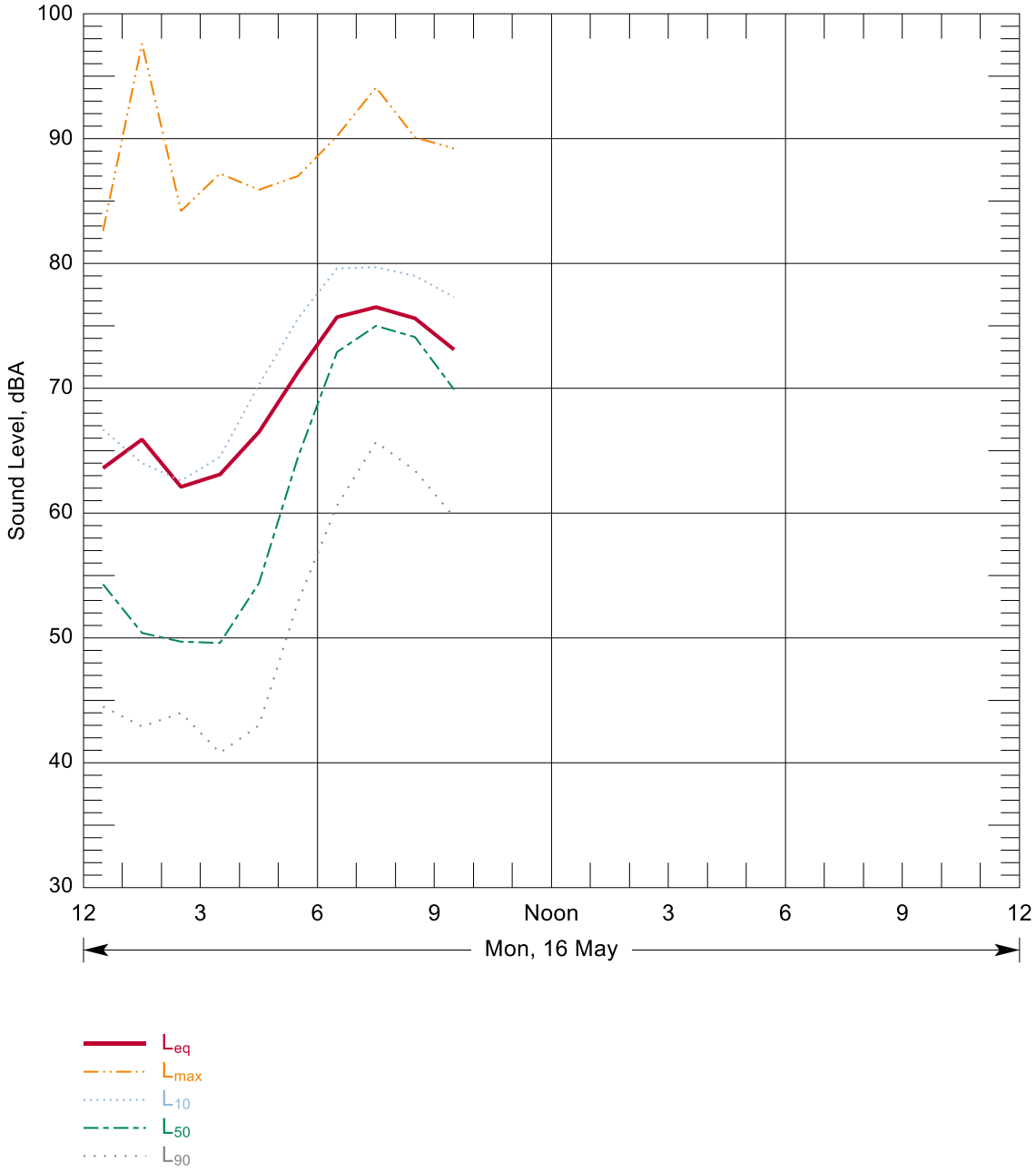
Source: Wilson Ihrig 2016

Figure B-51: Hourly Summary of Noise Levels Measured at N90 on 14 May, 2016



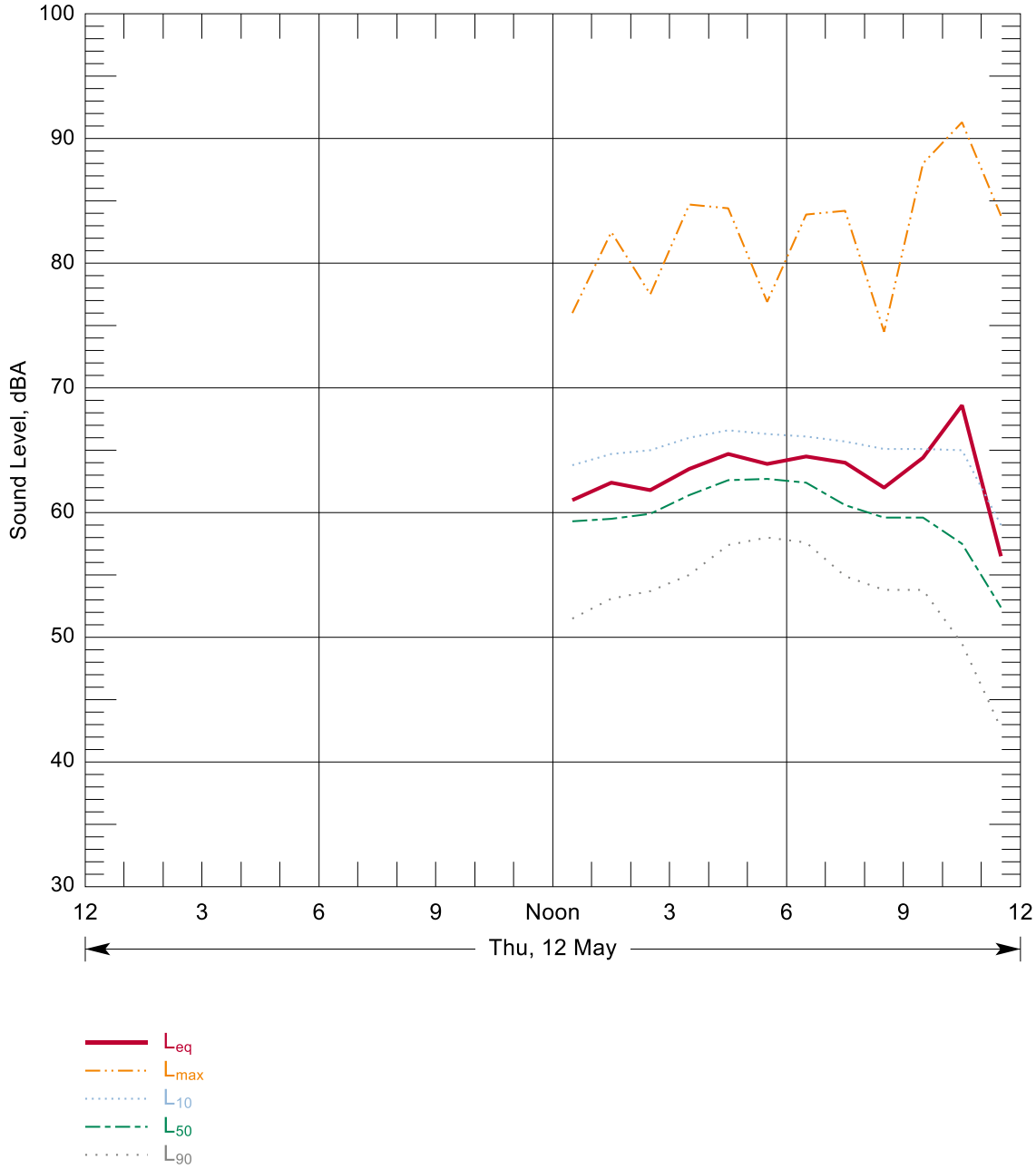
Source: Wilson Ihrig 2016

Figure B-52: Hourly Summary of Noise Levels Measured at N90 on 15 May, 2016



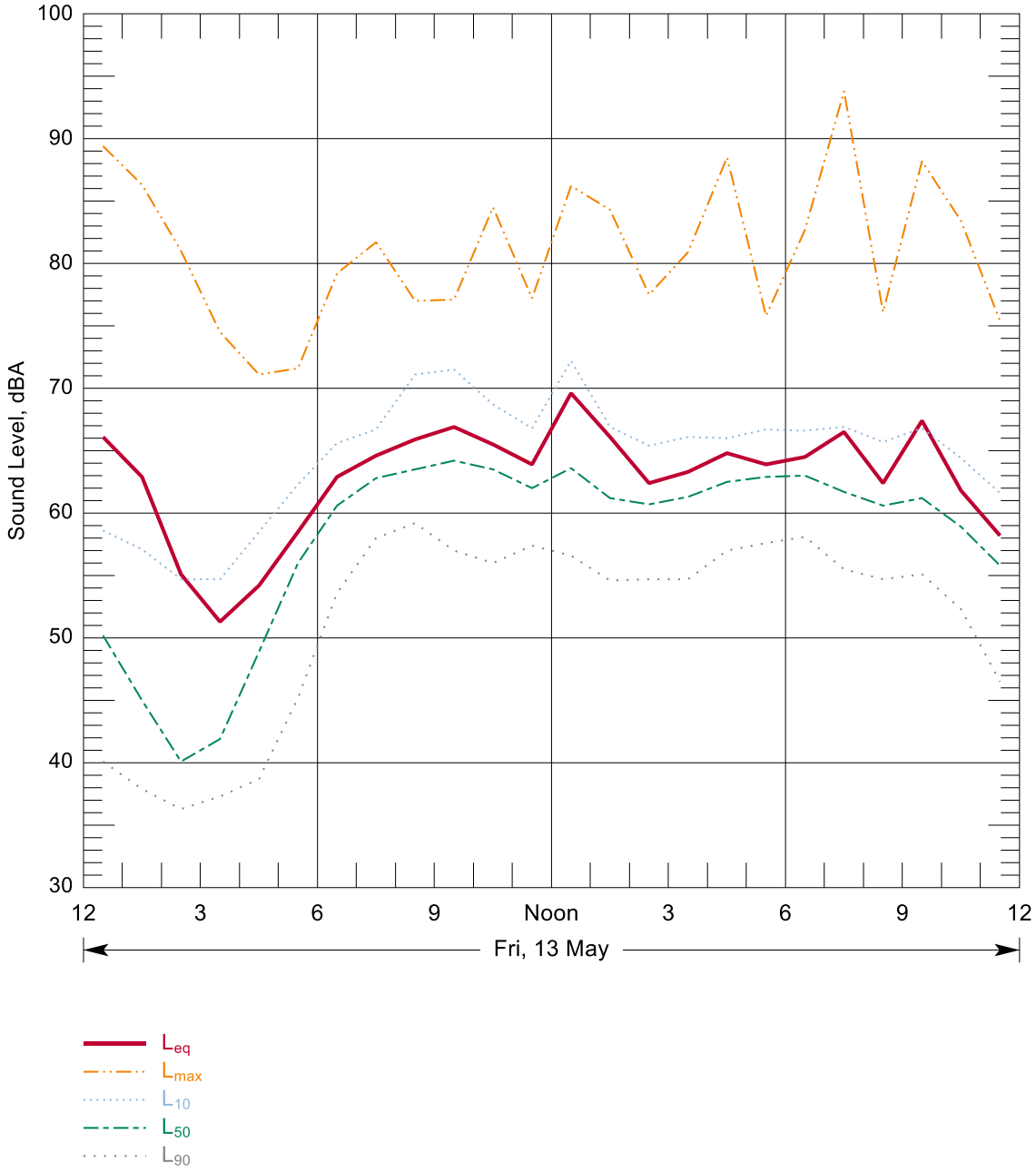
Source: Wilson Ihrig 2016

Figure B-53: Hourly Summary of Noise Levels Measured at N90 on 16 May, 2016



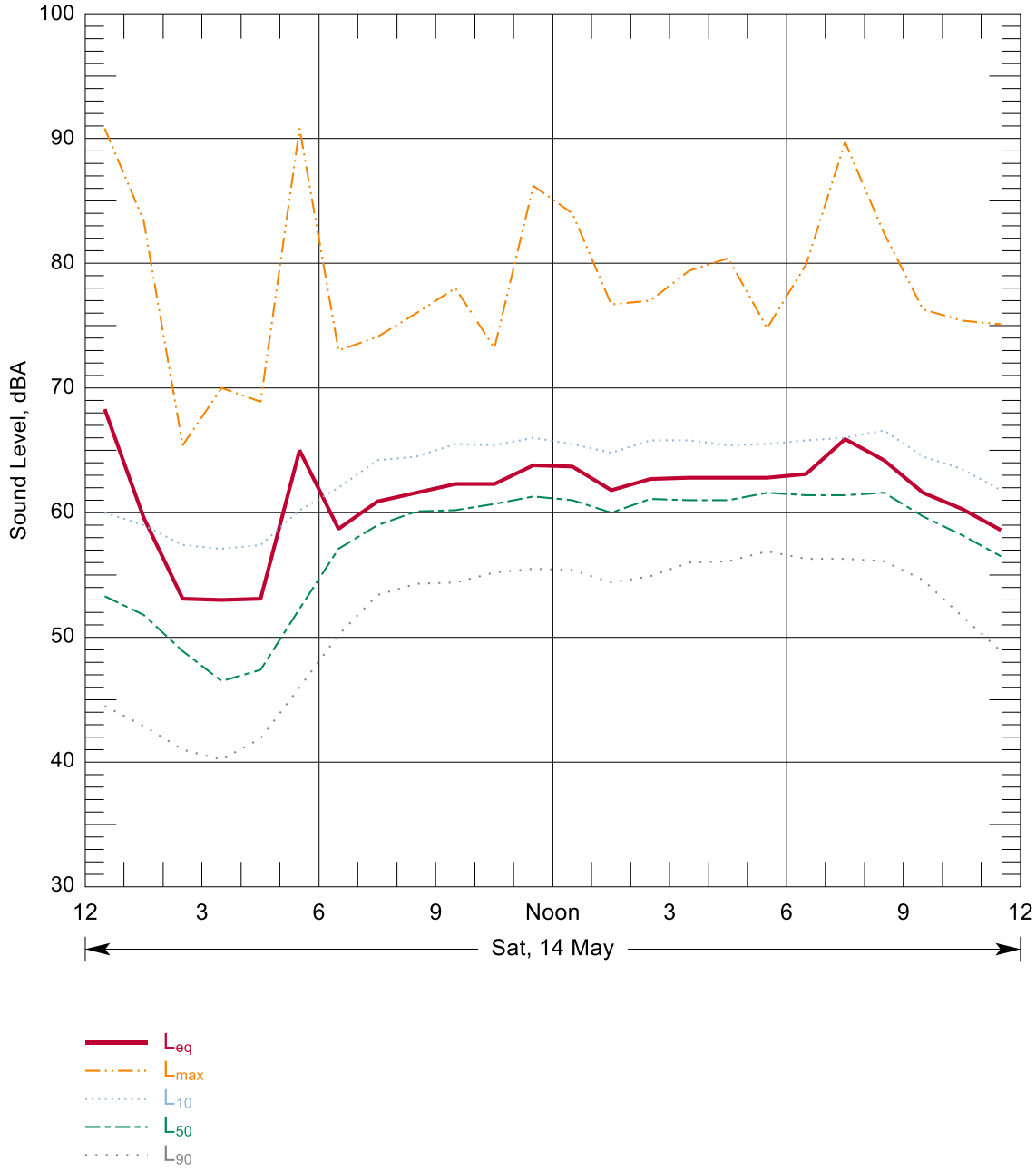
Source: Wilson Ihrig 2016

Figure B-54: Hourly Summary of Noise Levels Measured at N91 on 12 May, 2016



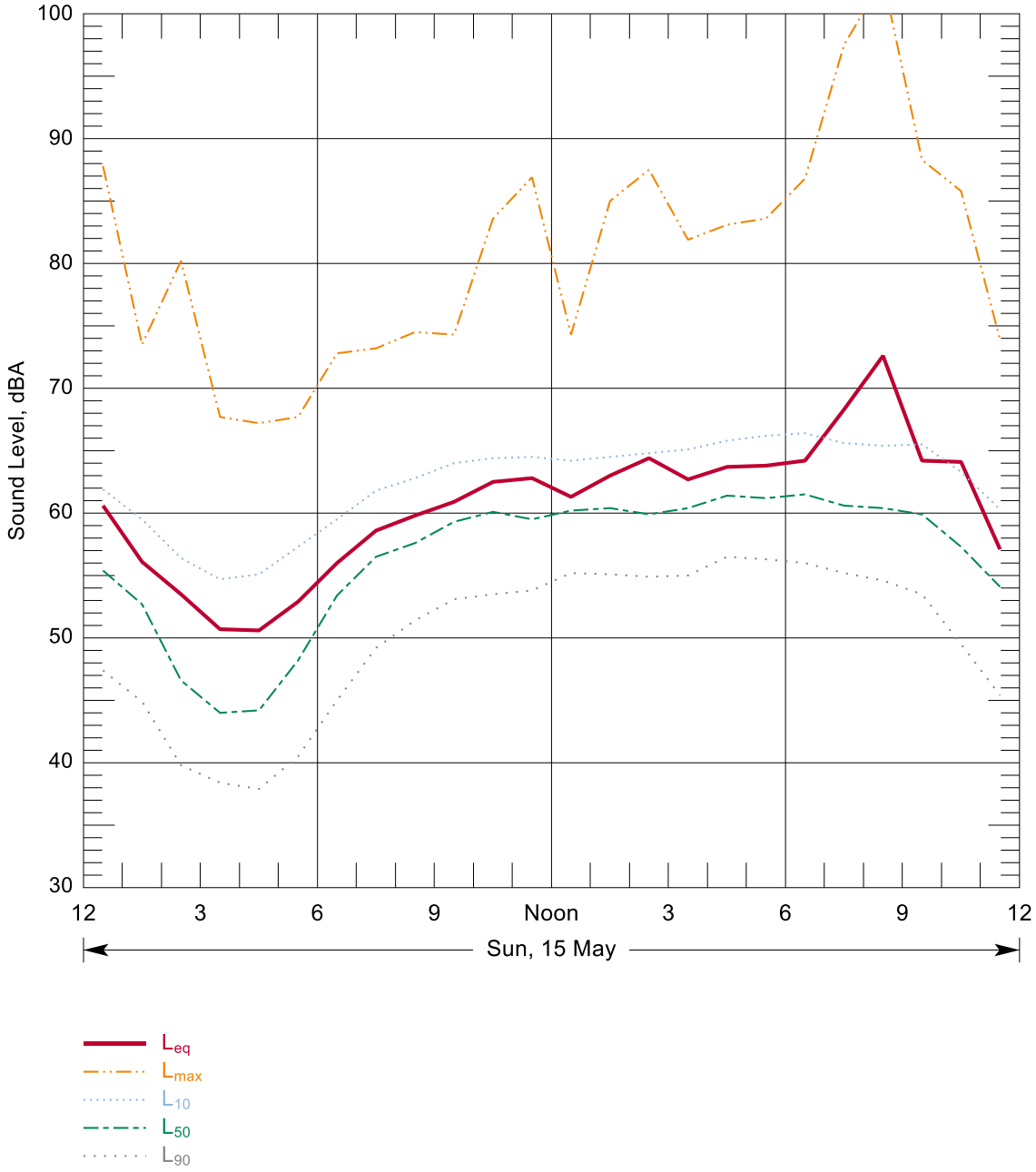
Source: Wilson Ihrig 2016

Figure B-55: Hourly Summary of Noise Levels Measured at N91 on 13 May, 2016



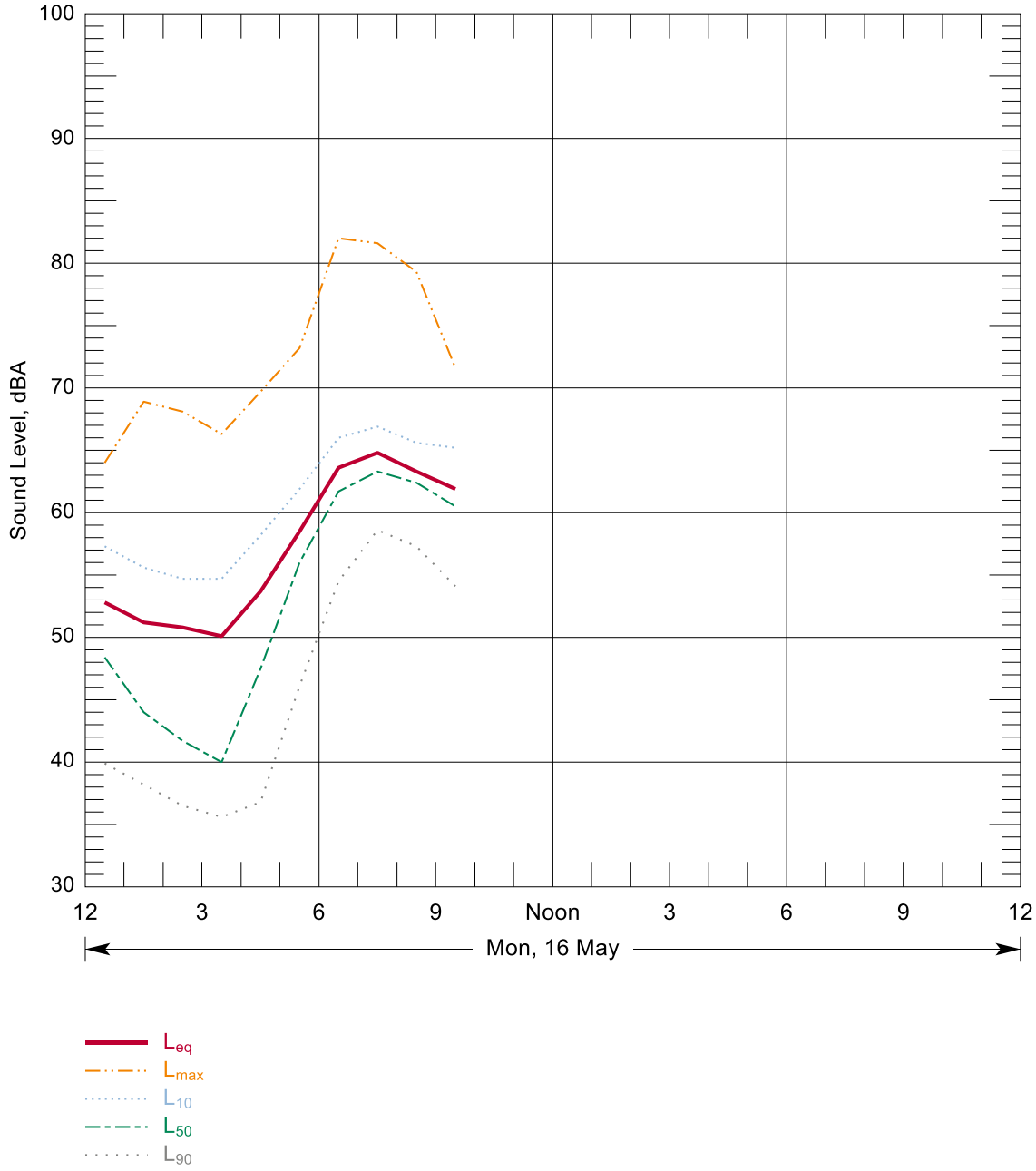
Source: Wilson Ihrig 2016

Figure B-56: Hourly Summary of Noise Levels Measured at N91 on 14 May, 2016



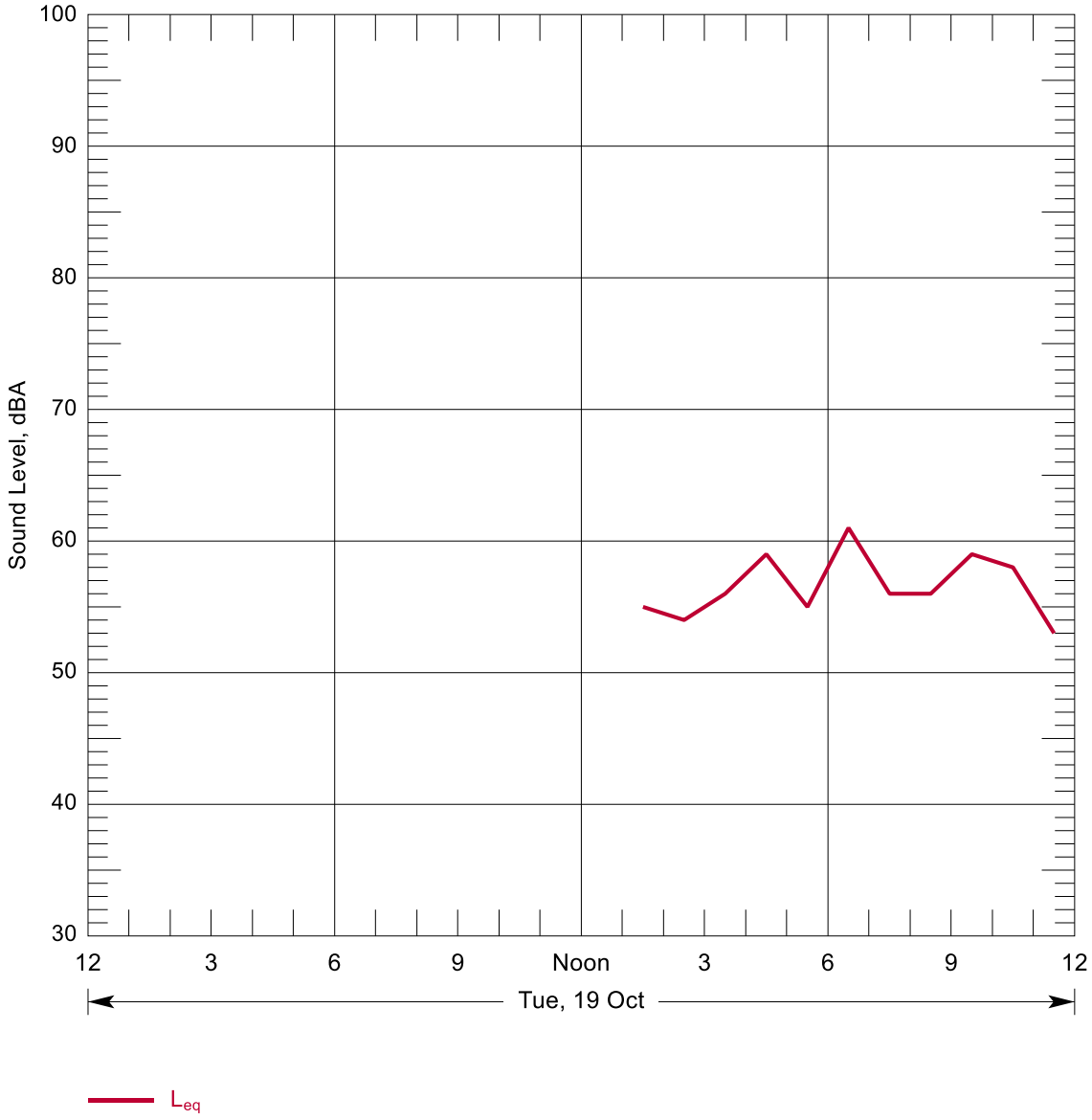
Source: Wilson Ihrig 2016

Figure B-57: Hourly Summary of Noise Levels Measured at N91 on 15 May, 2016



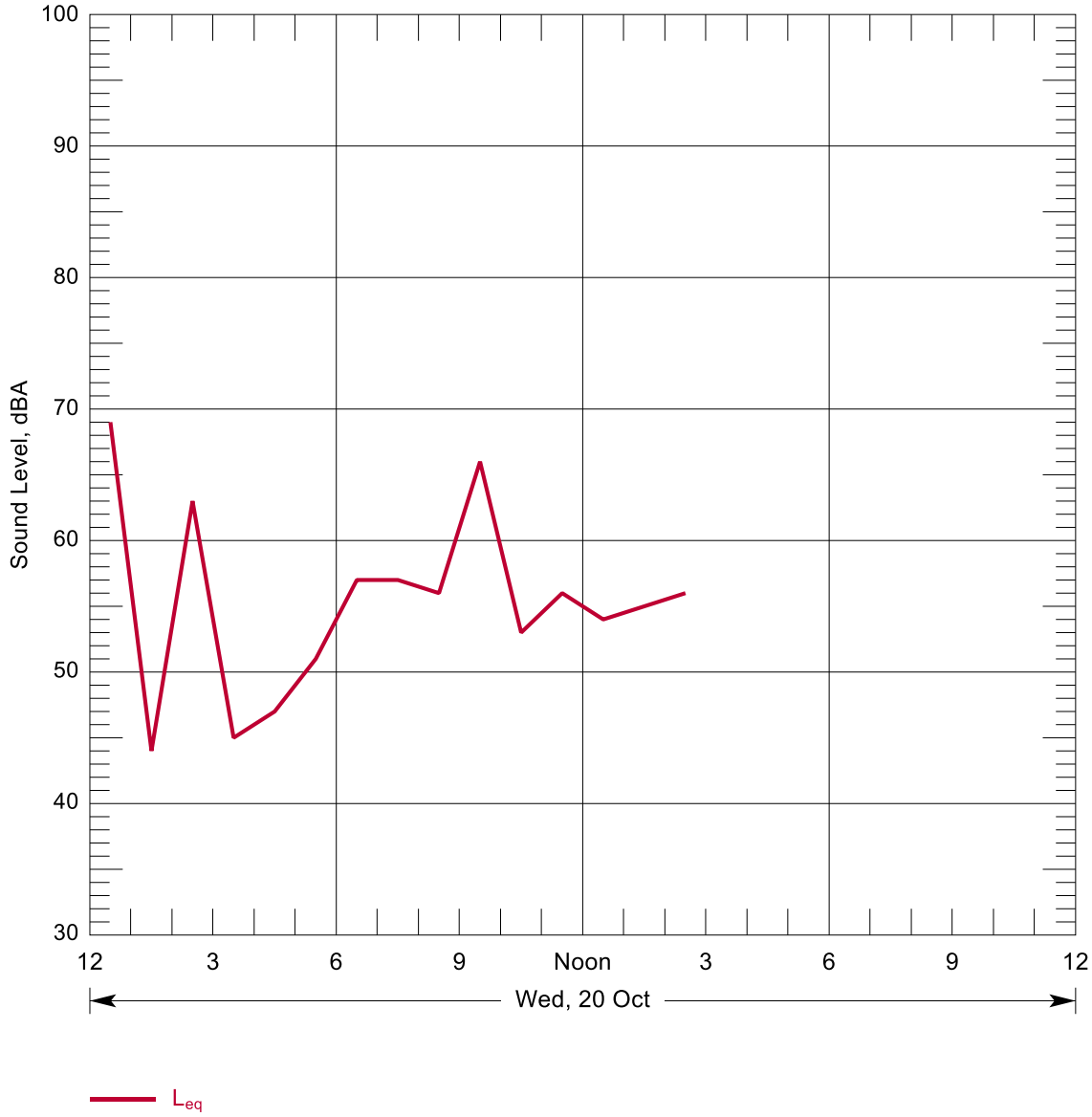
Source: Wilson Ihrig 2016

Figure B-58: Hourly Summary of Noise Levels Measured at N91 on 16 May, 2016



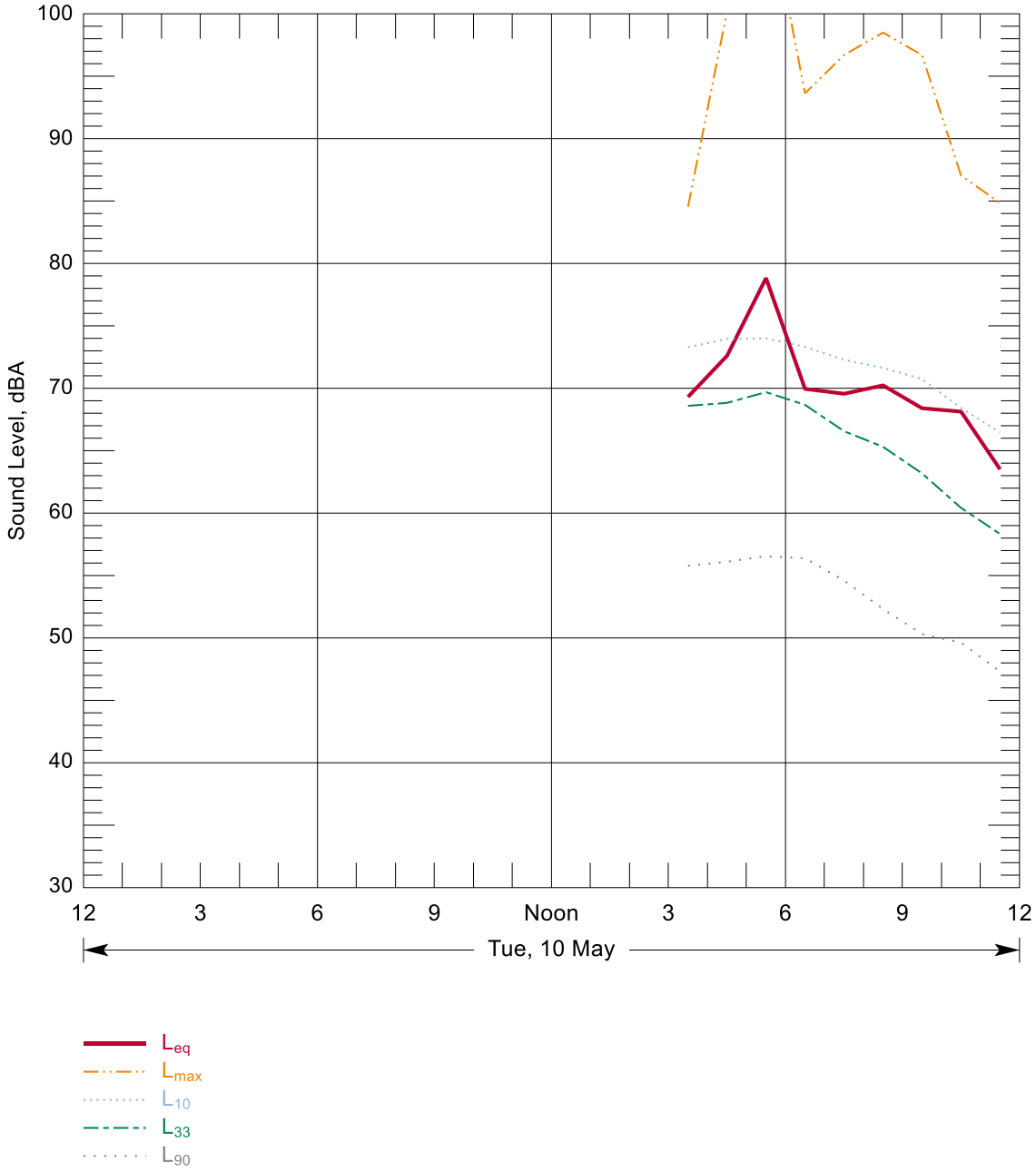
Source: Parsons Transportation 2010

Figure B-59: Hourly Summary of Noise Levels Measured at N92 on 19 Oct, 2010



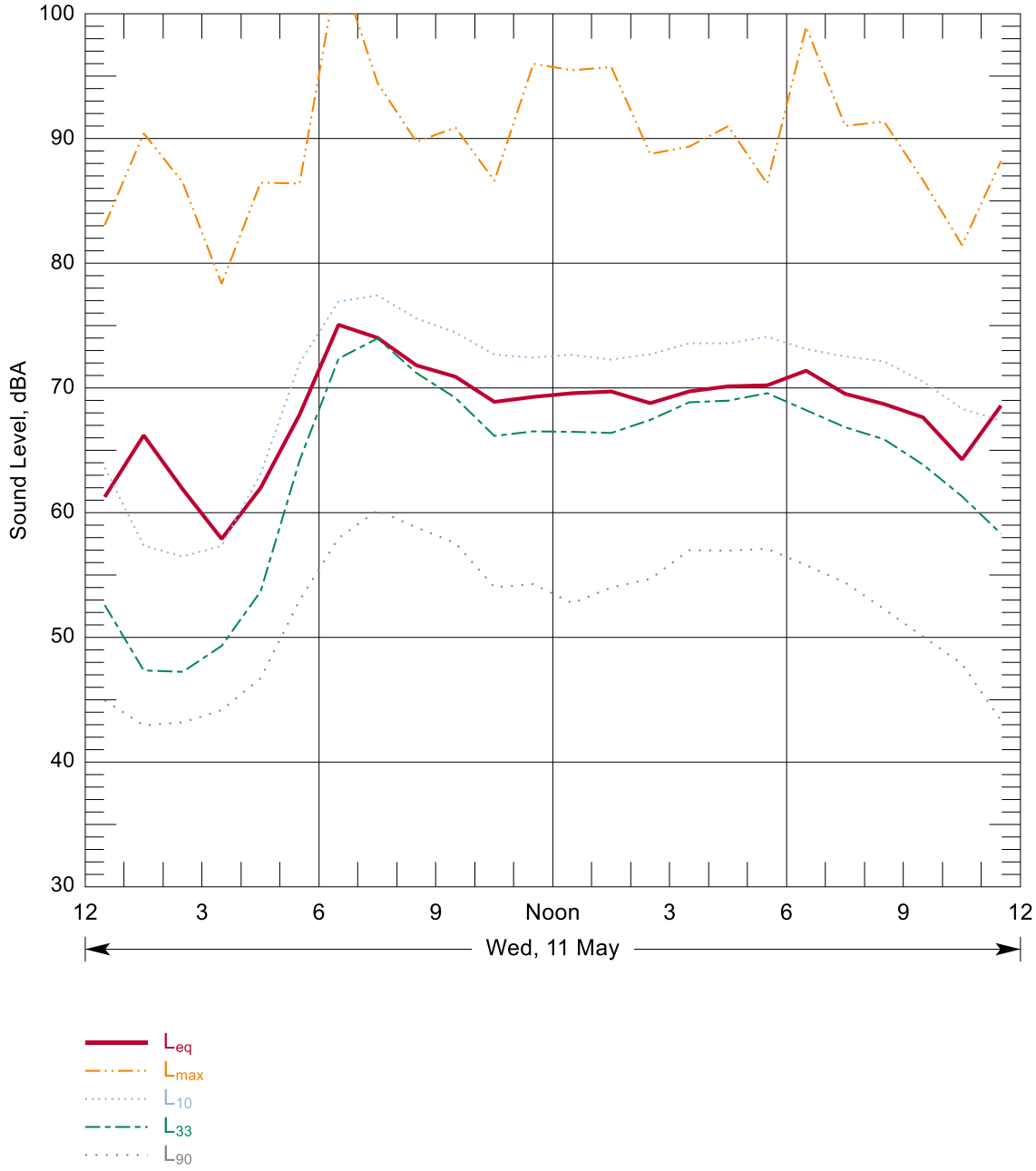
Source: Parsons Transportation 2010

Figure B-60: Hourly Summary of Noise Levels Measured at N92 on 20 Oct, 2010



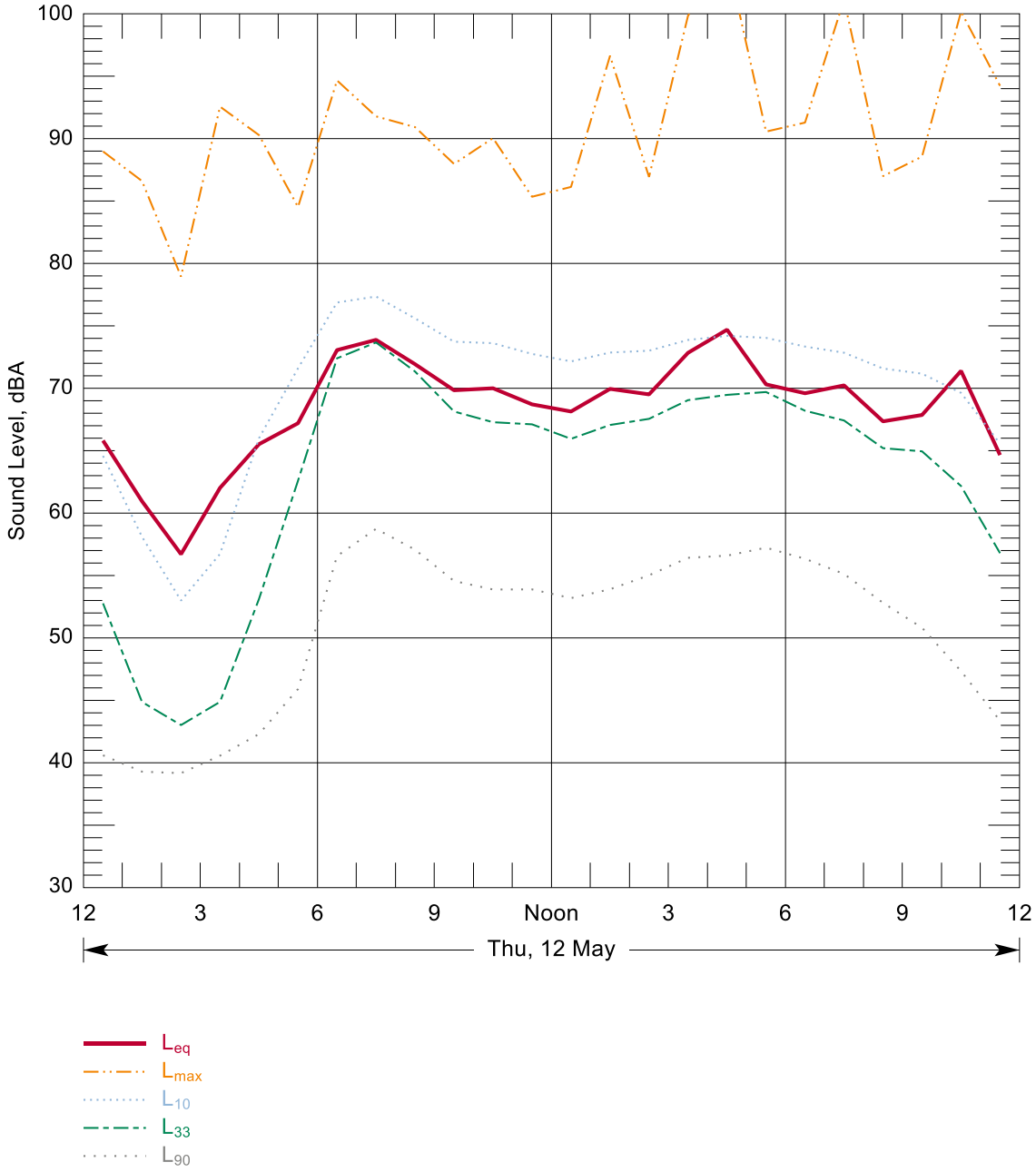
Source: Wilson Ihrig 2016

Figure B-61: Hourly Summary of Noise Levels Measured at N93 on 10 May, 2016



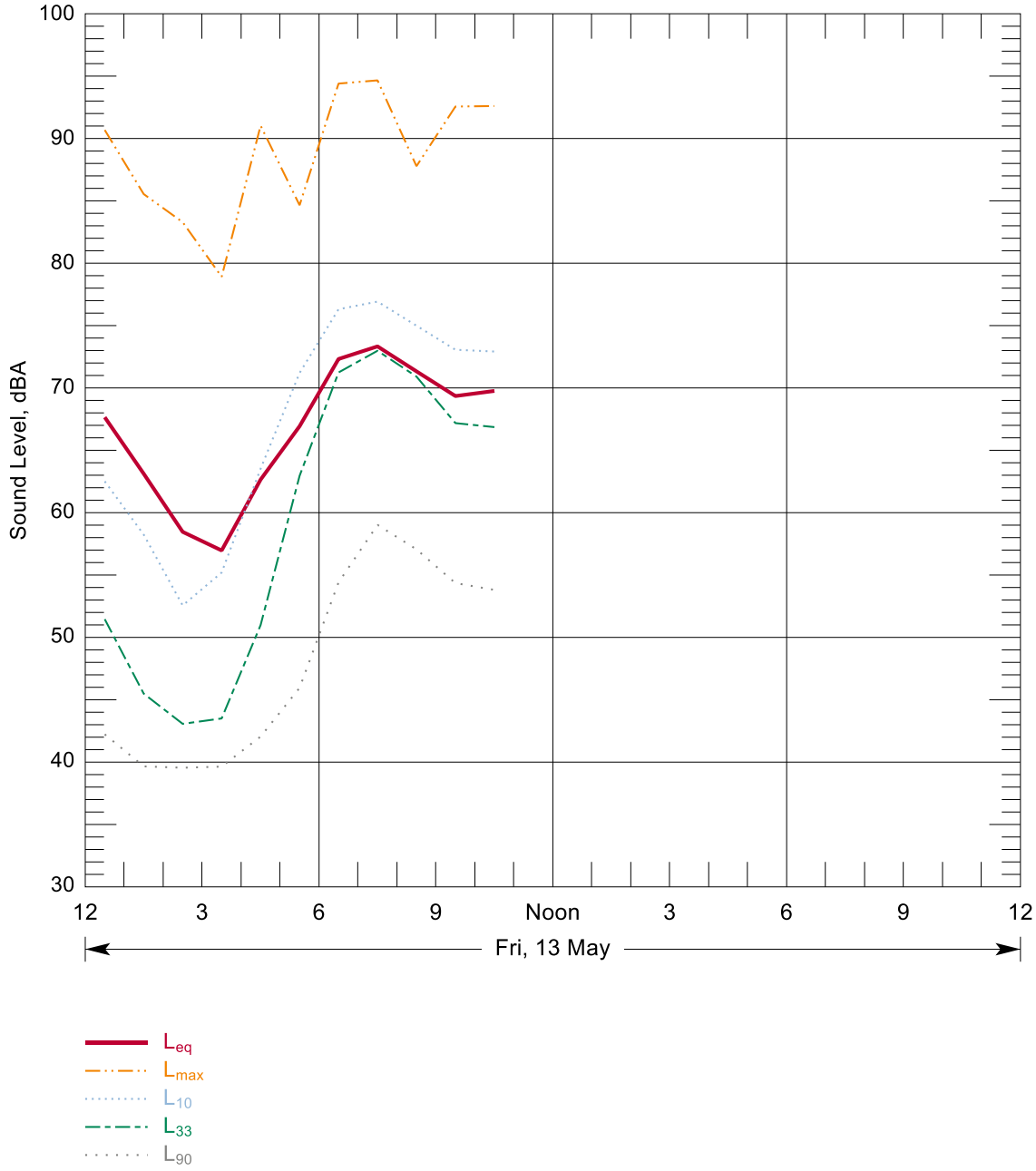
Source: Wilson Ihrig 2016

Figure B-62: Hourly Summary of Noise Levels Measured at N93 on 11 May, 2016



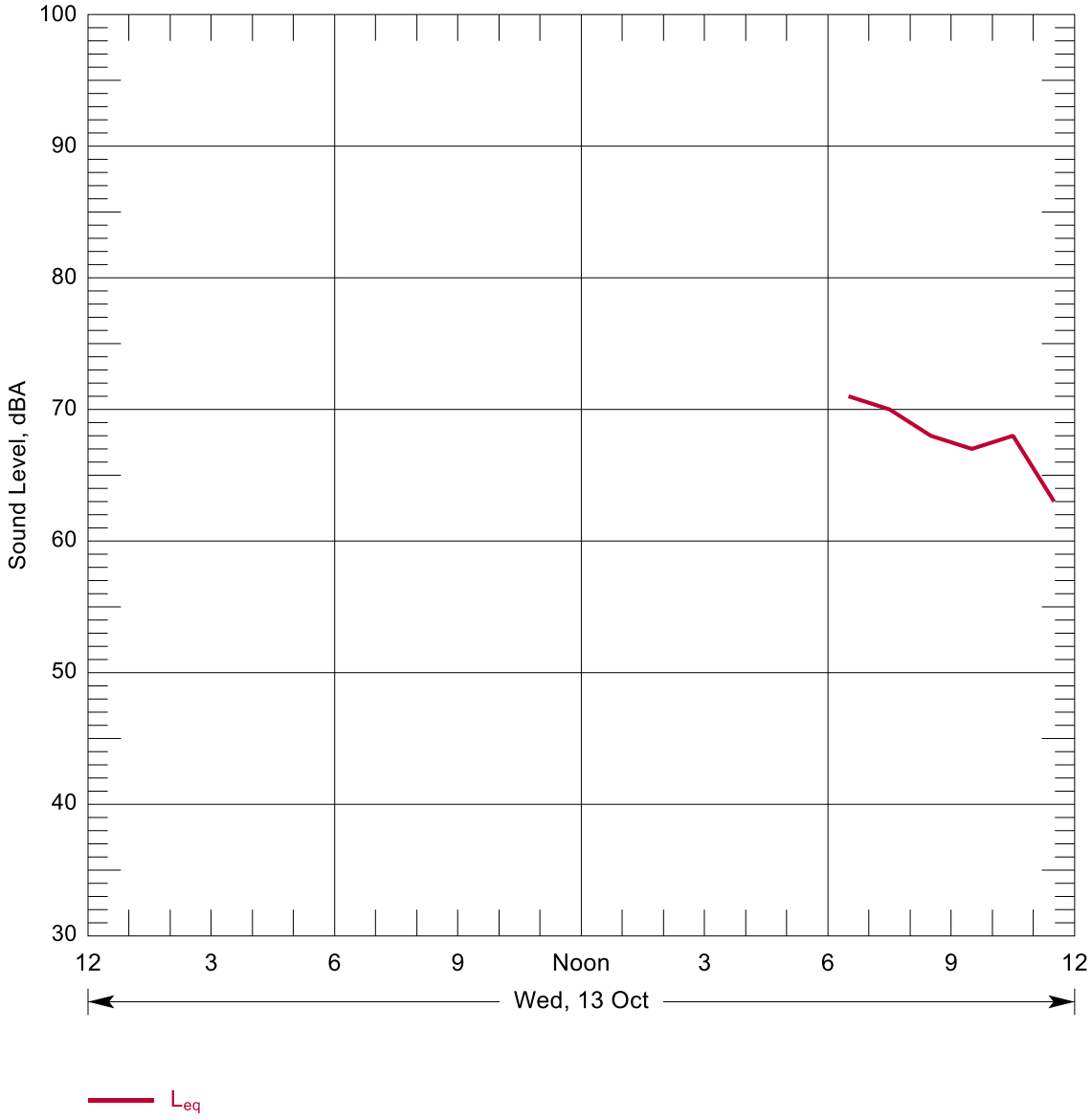
Source: Wilson Ihrig 2016

Figure B-63: Hourly Summary of Noise Levels Measured at N93 on 12 May, 2016



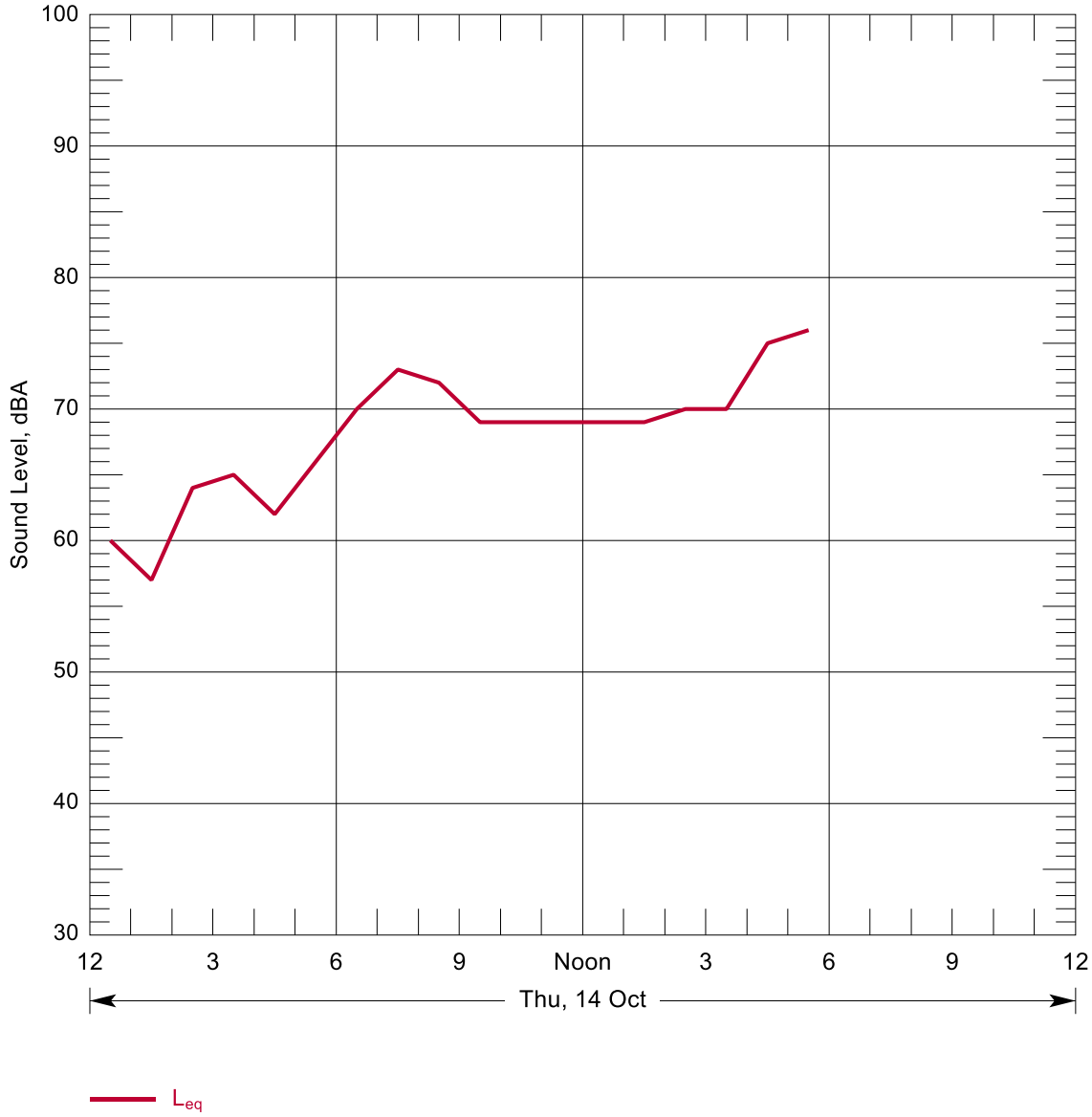
Source: Wilson Ihrig 2016

Figure B-64: Hourly Summary of Noise Levels Measured at N93 on 13 May, 2016



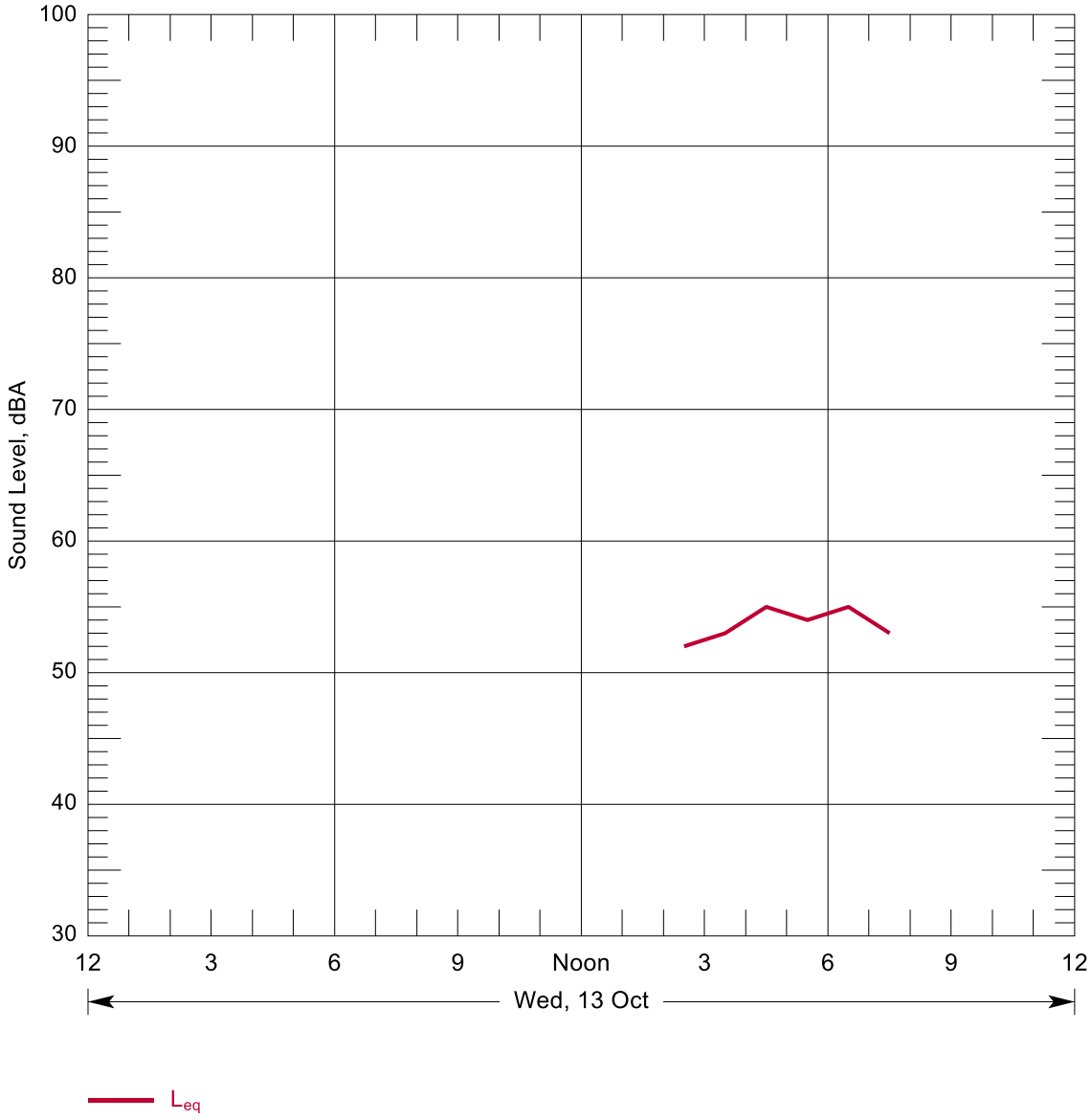
Source: Parsons Transportation 2010

Figure B-65: Hourly Summary of Noise Levels Measured at N94 on 13 Oct, 2010



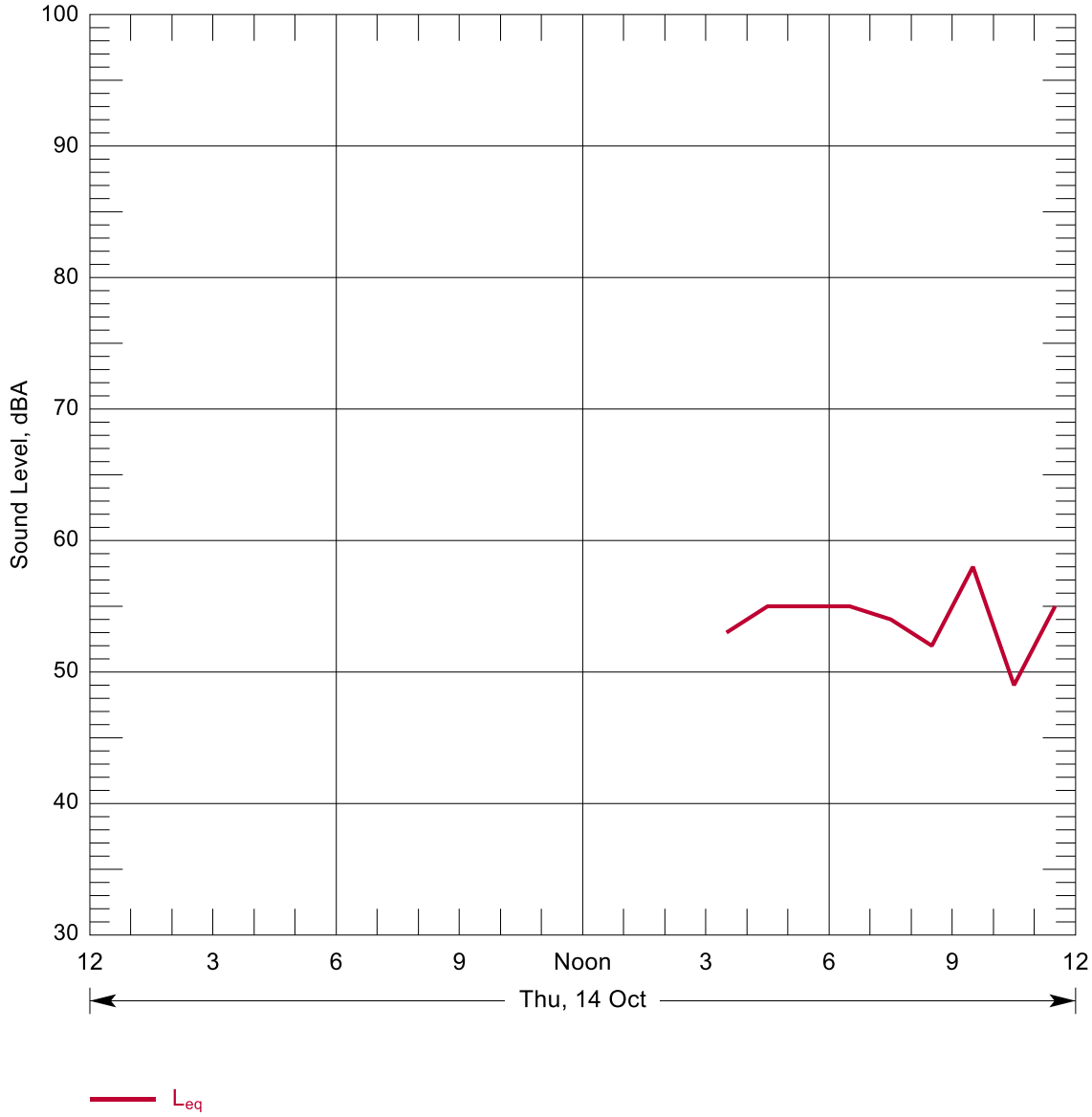
Source: Parsons Transportation 2010

Figure B-66: Hourly Summary of Noise Levels Measured at N94 on 14 Oct, 2010



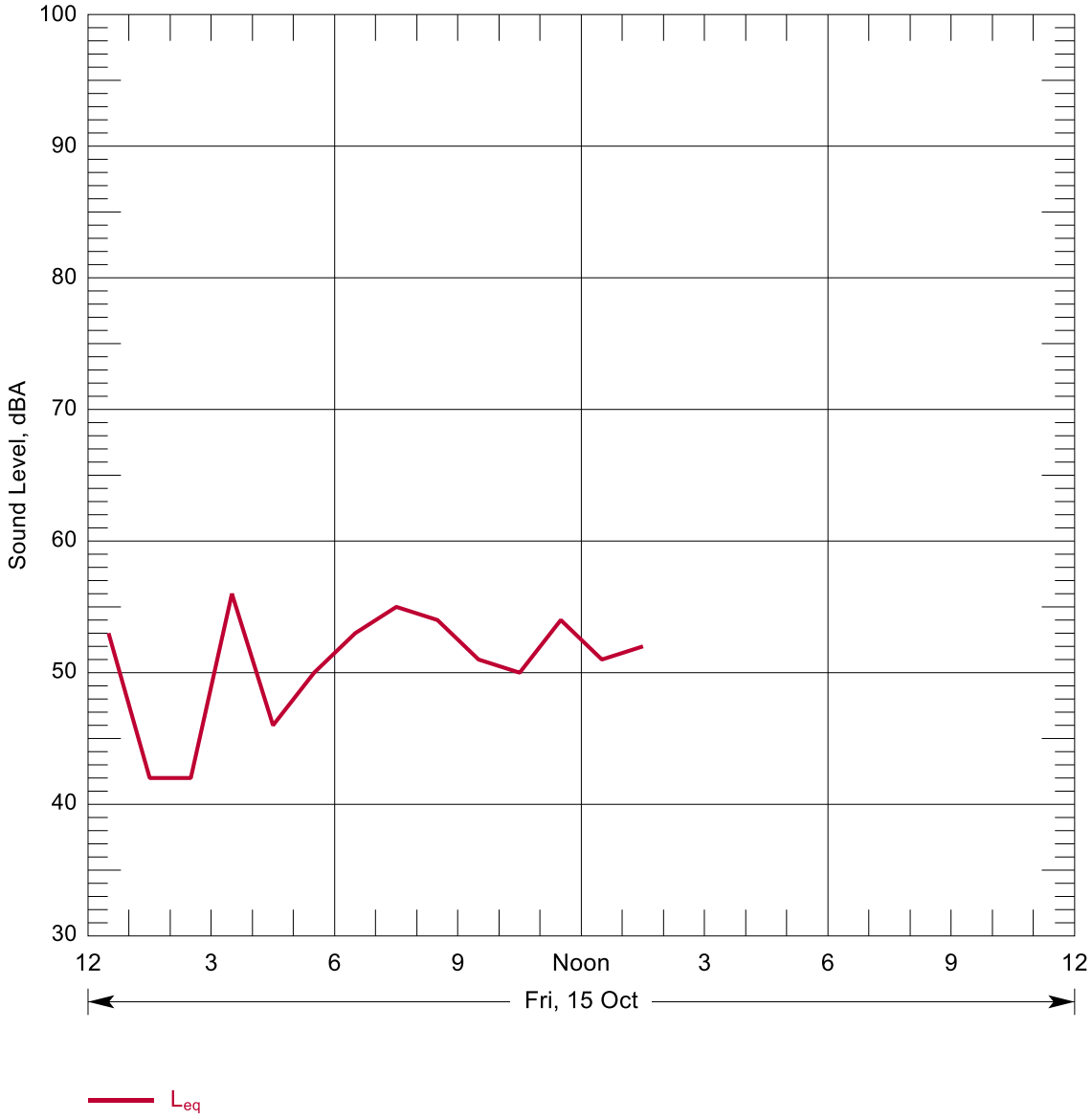
Source: Parsons Transportation 2010

Figure B-67: Hourly Summary of Noise Levels Measured at N95 on 13 Oct, 2010



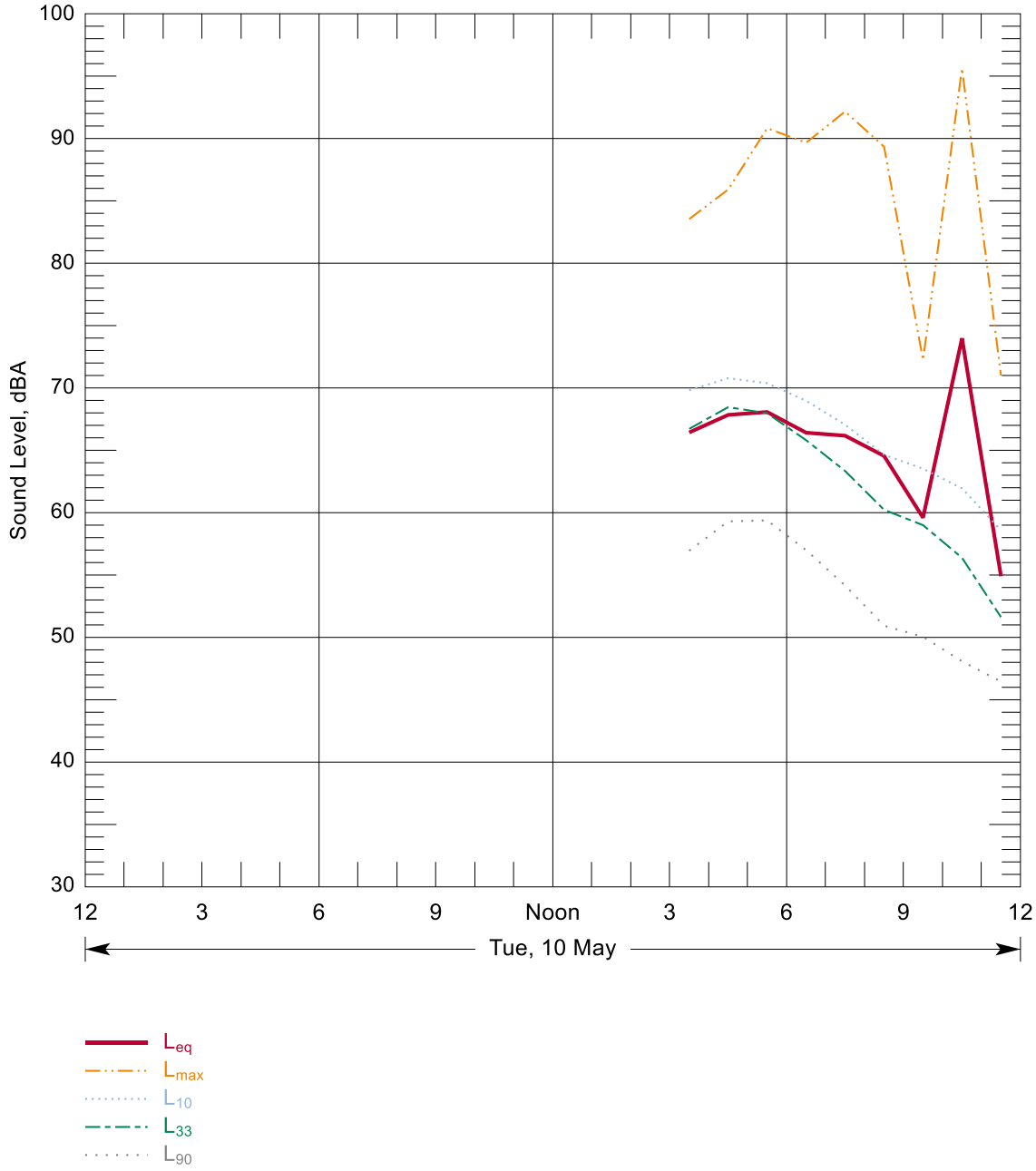
Source: Parsons Transportation 2010

Figure B-68: Hourly Summary of Noise Levels Measured at N95 on 14 Oct, 2010



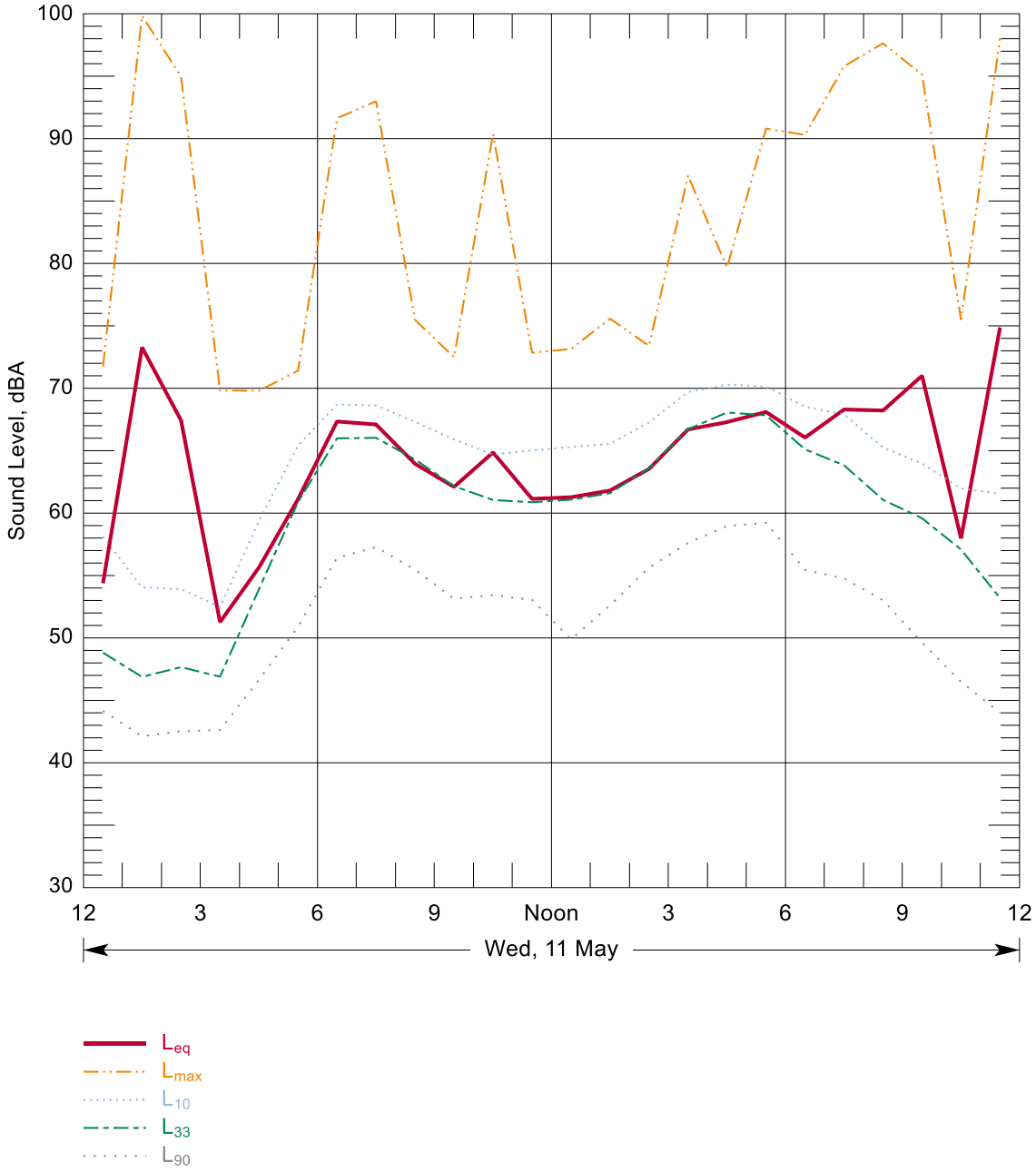
Source: Parsons Transportation 2010

Figure B-69: Hourly Summary of Noise Levels Measured at N95 on 15 Oct, 2010



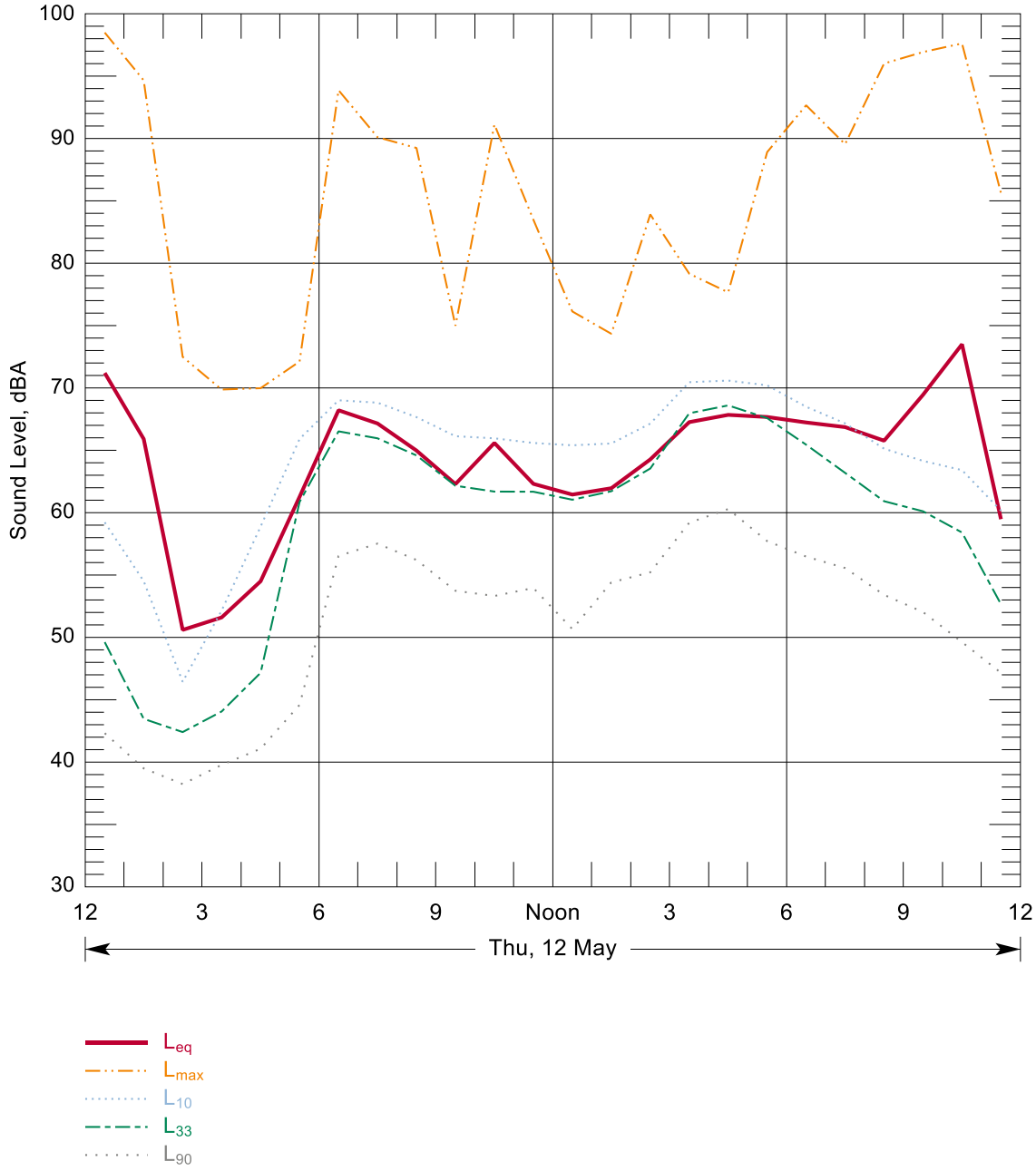
Source: Wilson Ihrig 2016

Figure B-70: Hourly Summary of Noise Levels Measured at N96 on 10 May, 2016



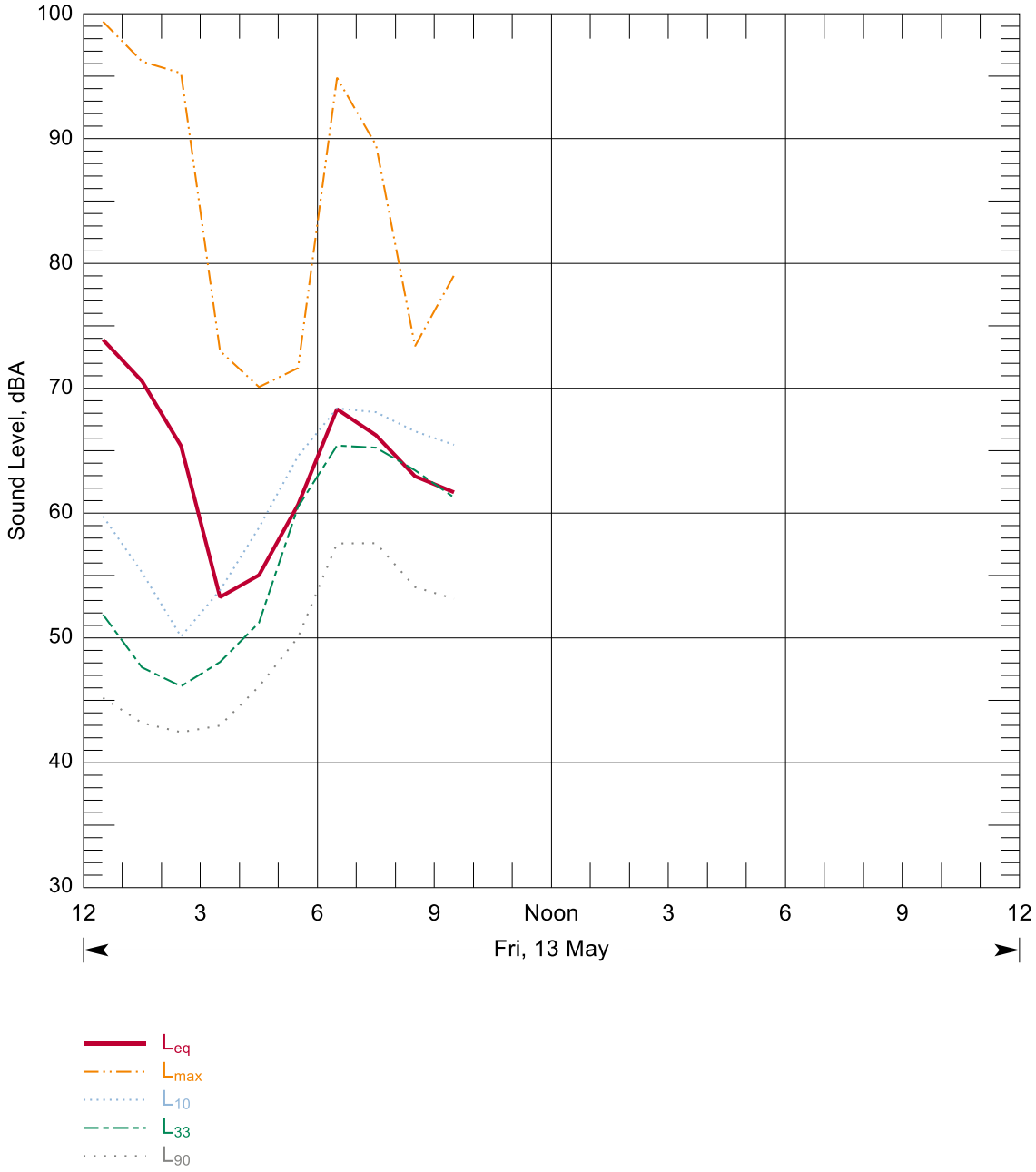
Source: Wilson Ihrig 2016

Figure B-71: Hourly Summary of Noise Levels Measured at N96 on 11 May, 2016



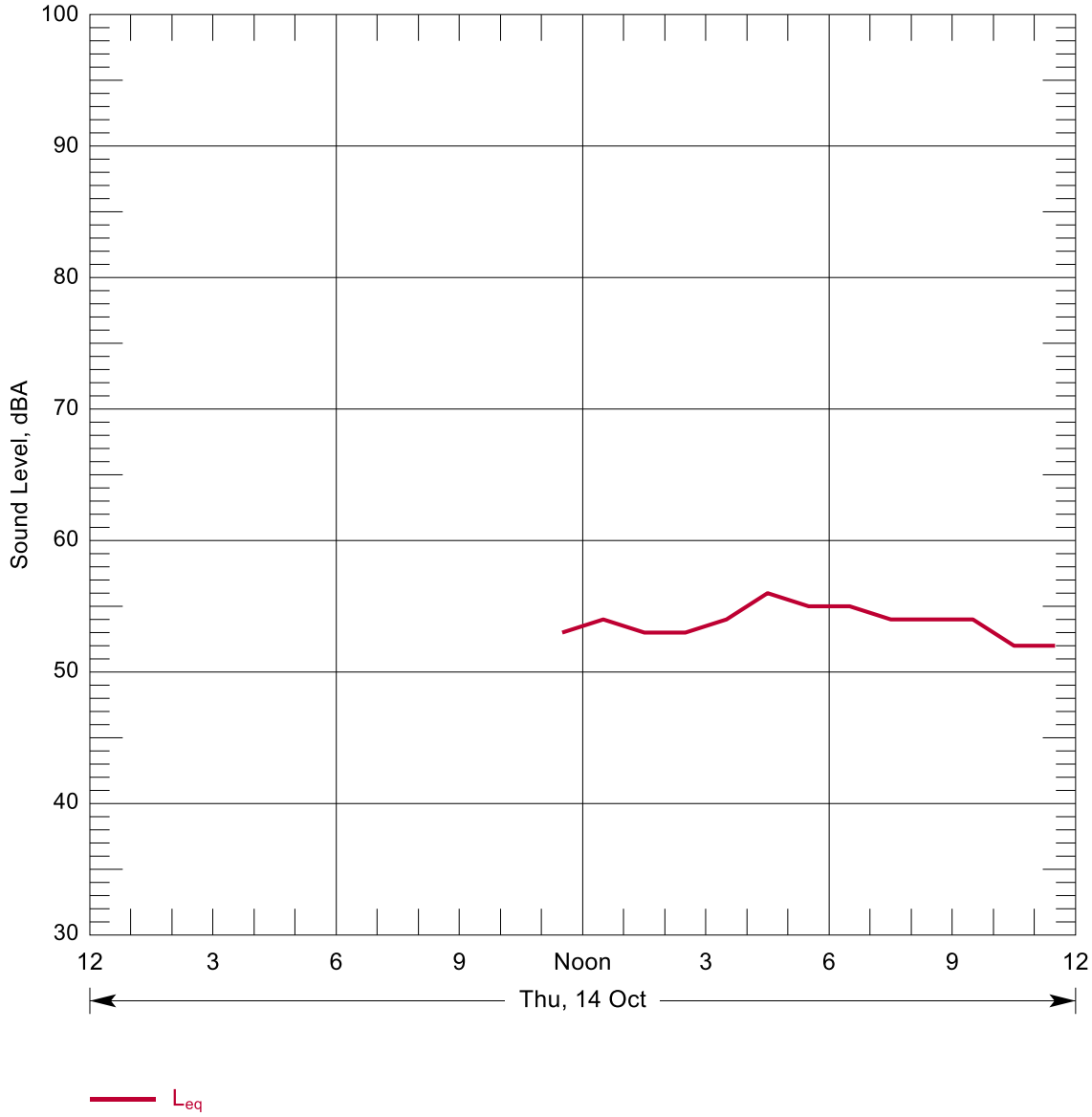
Source: Wilson Ihrig 2016

Figure B-72: Hourly Summary of Noise Levels Measured at N96 on 12 May, 2016



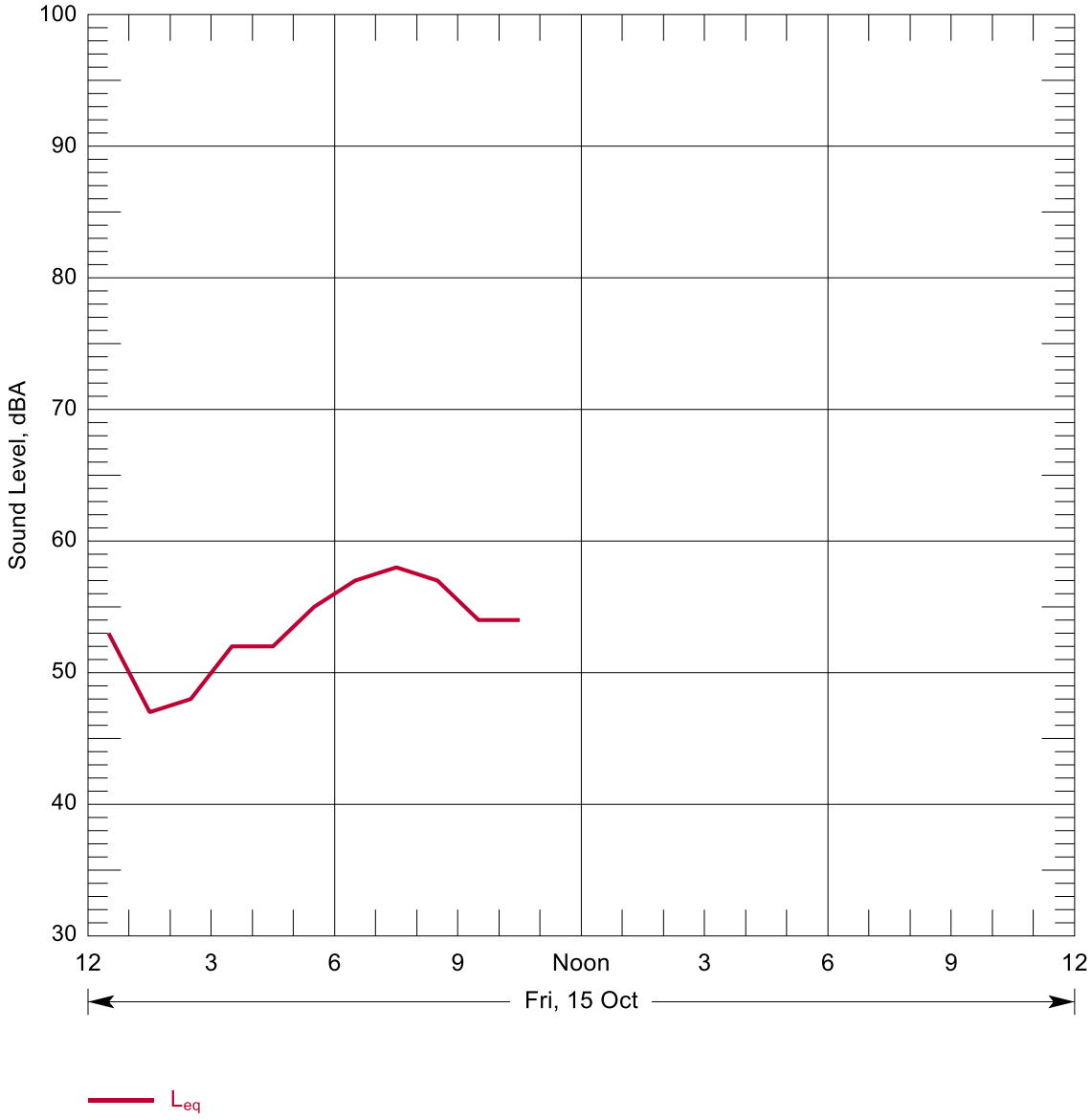
Source: Wilson Ihrig 2016

Figure B-73: Hourly Summary of Noise Levels Measured at N96 on 13 May, 2016



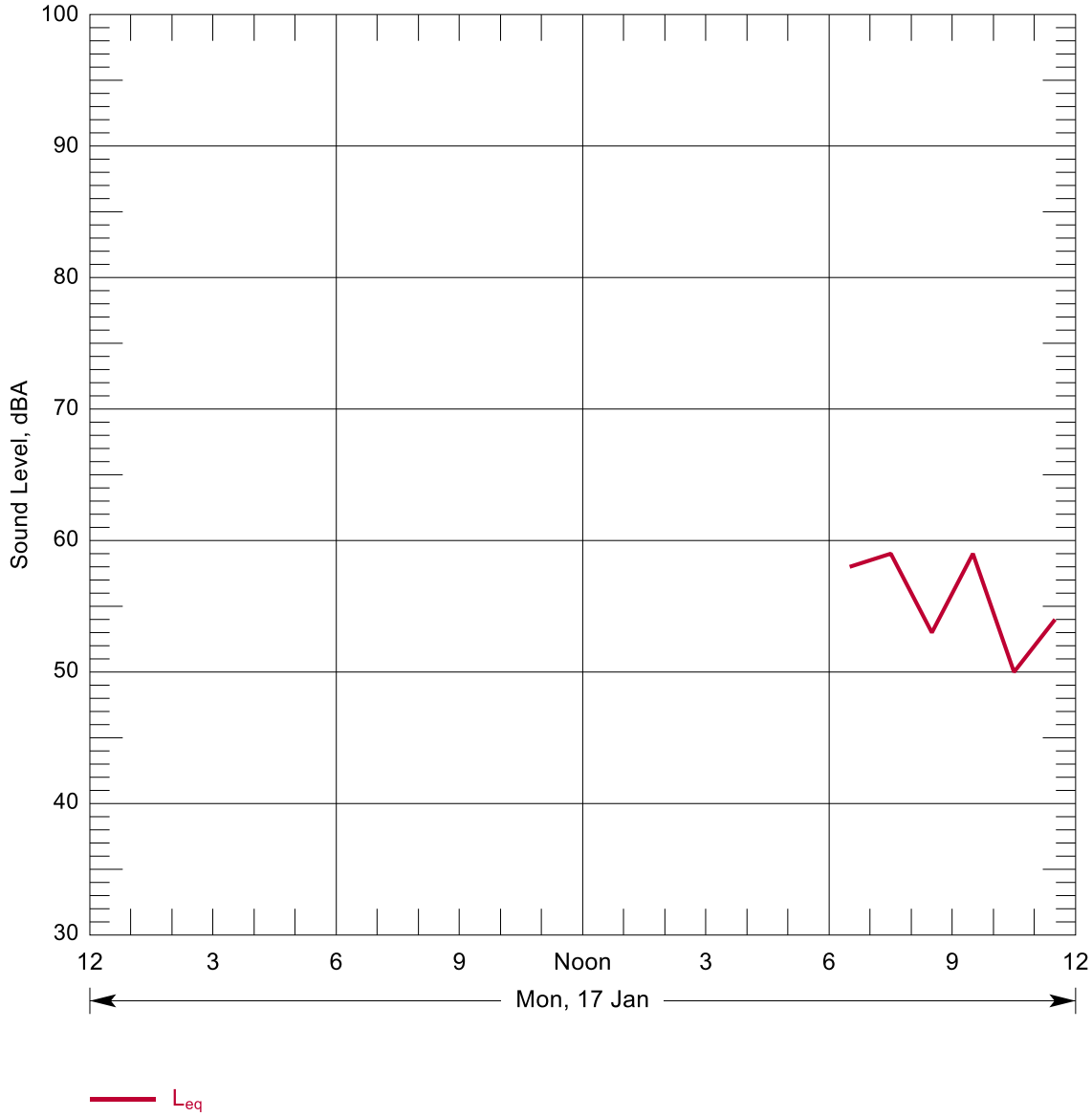
Source: Parsons Transportation 2010

Figure B-74: Hourly Summary of Noise Levels Measured at N97 on 14 Oct, 2010



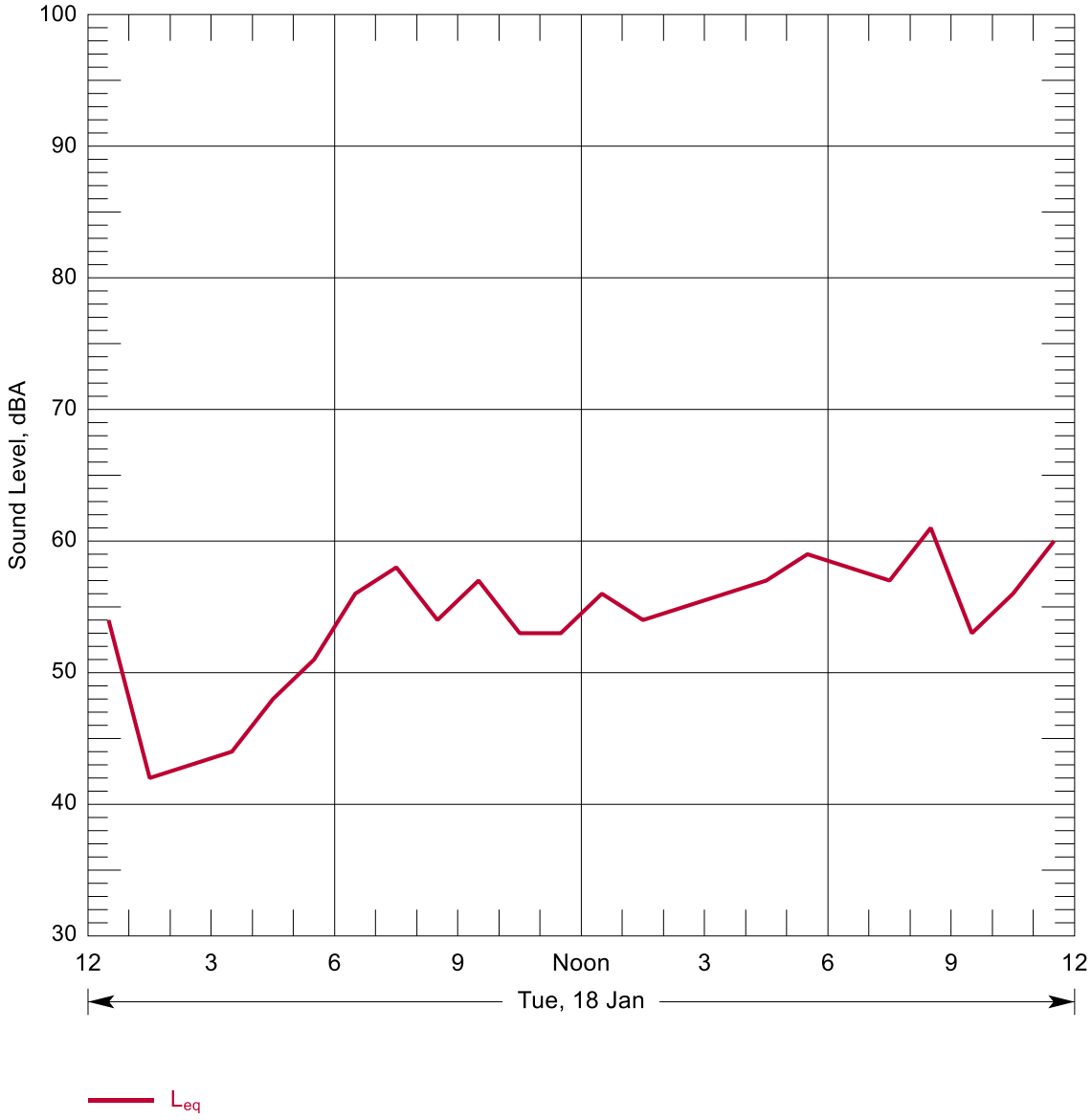
Source: Parsons Transportation 2010

Figure B-75: Hourly Summary of Noise Levels Measured at N97 on 15 Oct, 2010



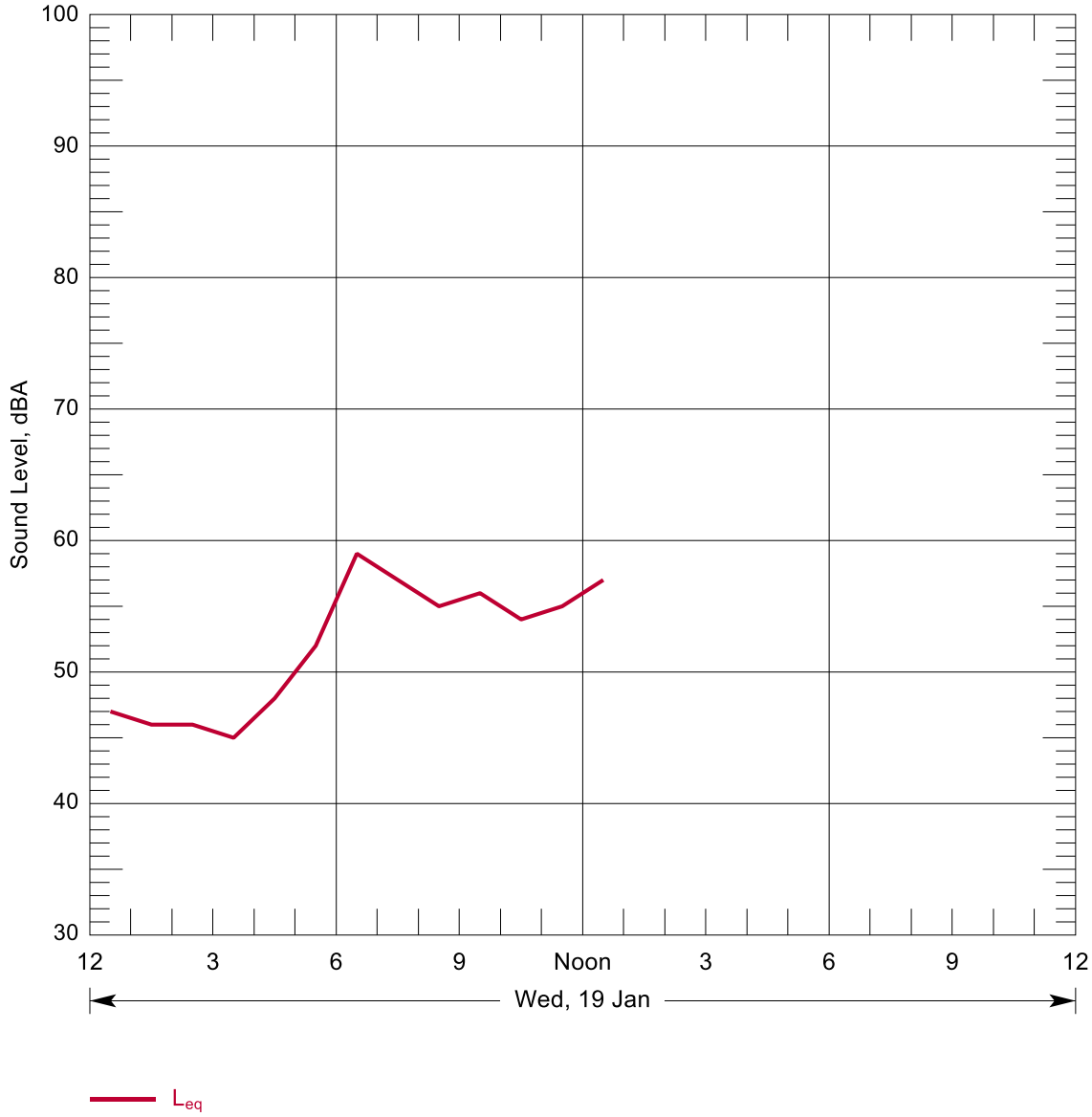
Source: Parsons Transportation 2010

Figure B-76: Hourly Summary of Noise Levels Measured at N98 on 17 Jan, 2011



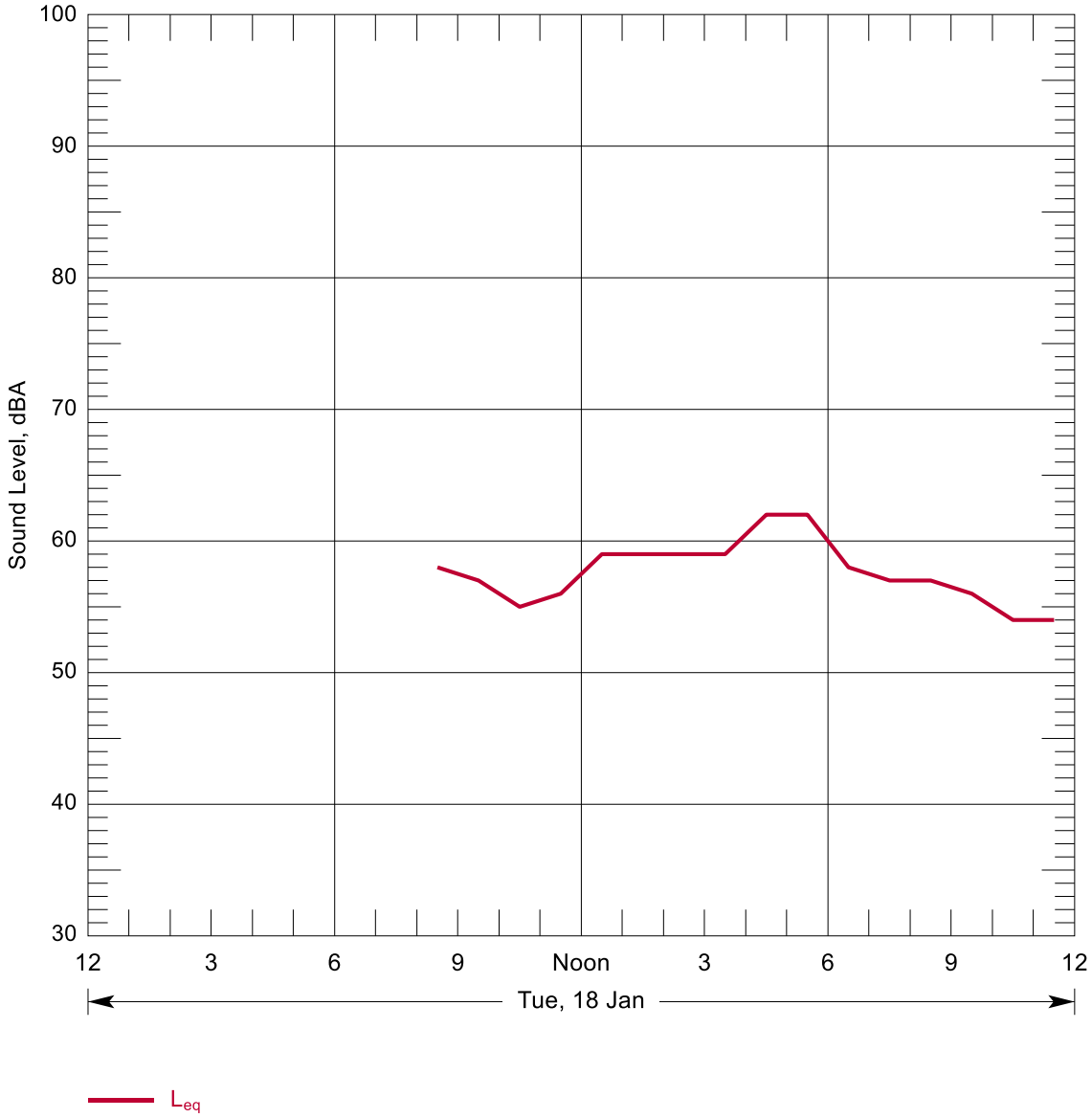
Source: Parsons Transportation 2010

Figure B-77: Hourly Summary of Noise Levels Measured at N98 on 18 Jan, 2011



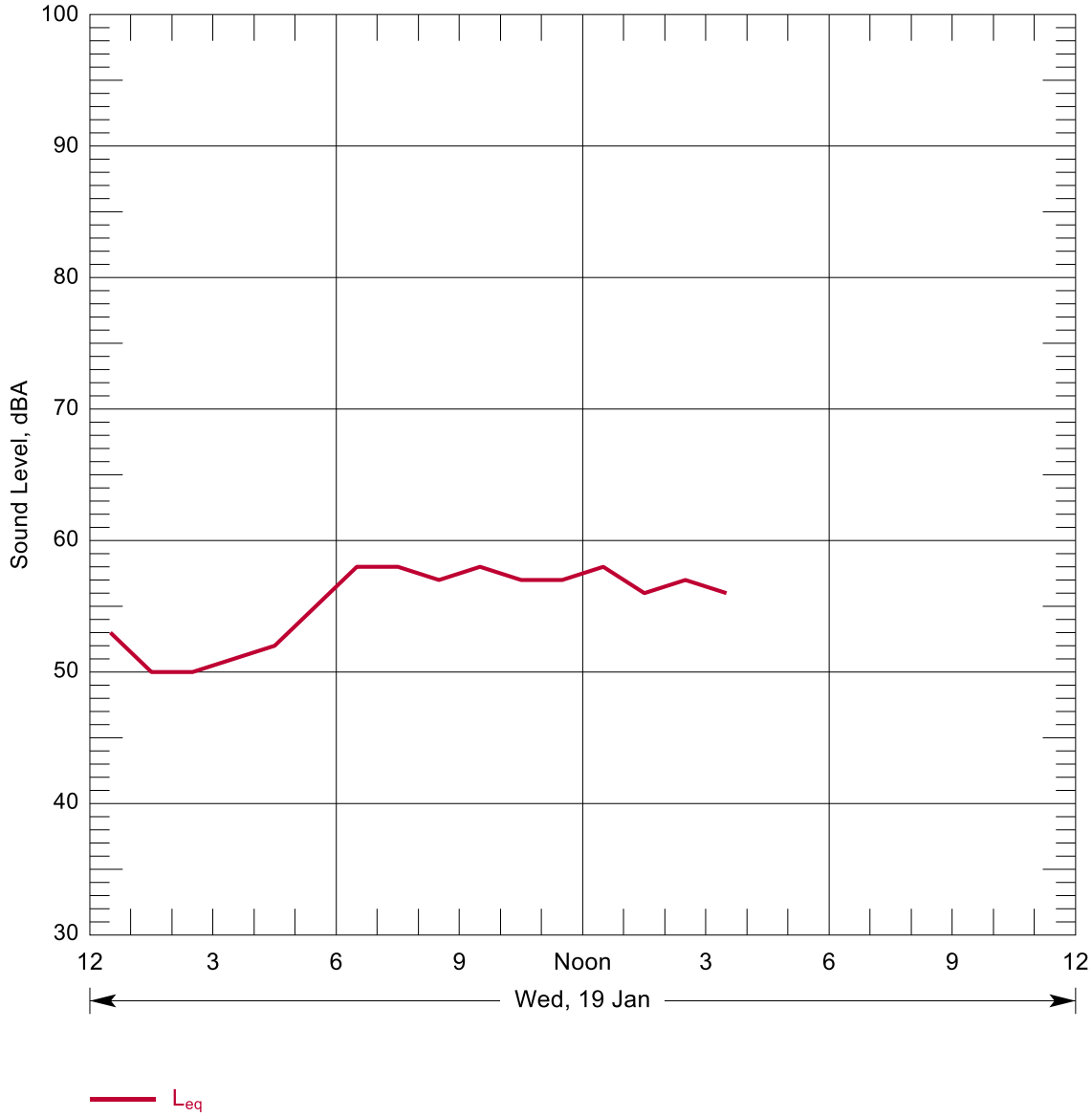
Source: Parsons Transportation 2010

Figure B-78: Hourly Summary of Noise Levels Measured at N98 on 19 Jan, 2011



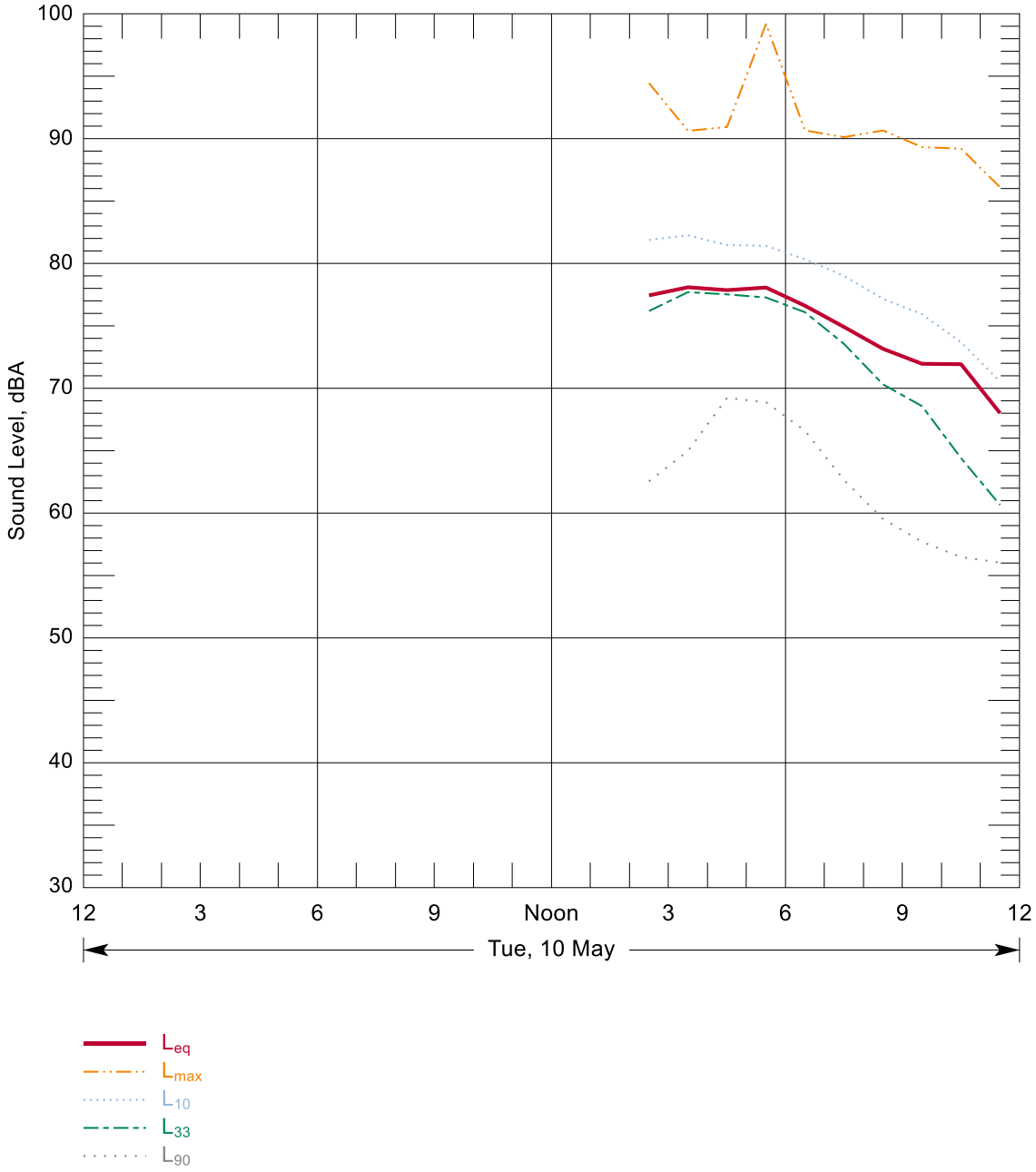
Source: Parsons Transportation 2010

Figure B-79: Hourly Summary of Noise Levels Measured at N99 on 18 Jan, 2011



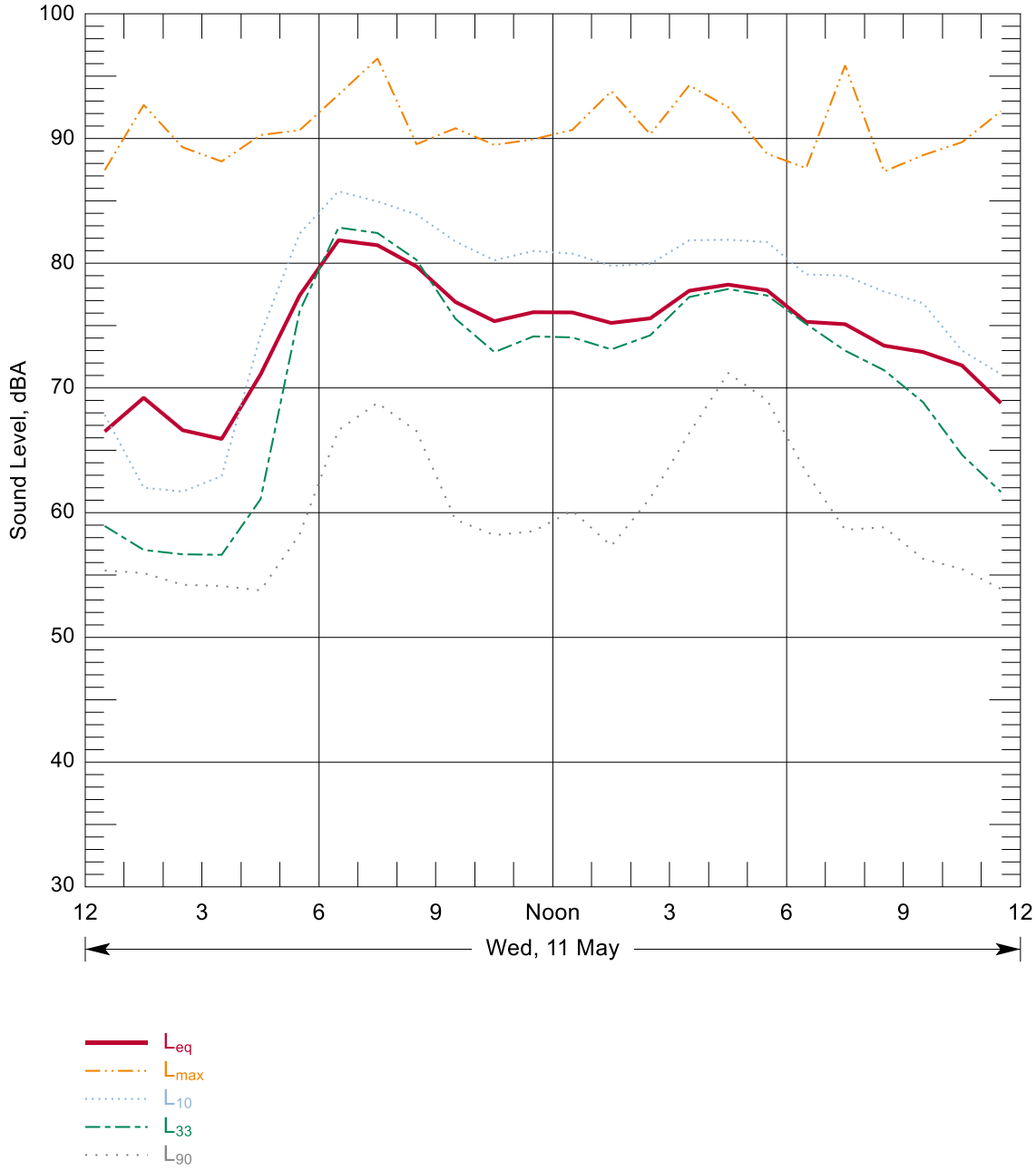
Source: Parsons Transportation 2010

Figure B-80: Hourly Summary of Noise Levels Measured at N99 on 19 Jan, 2011



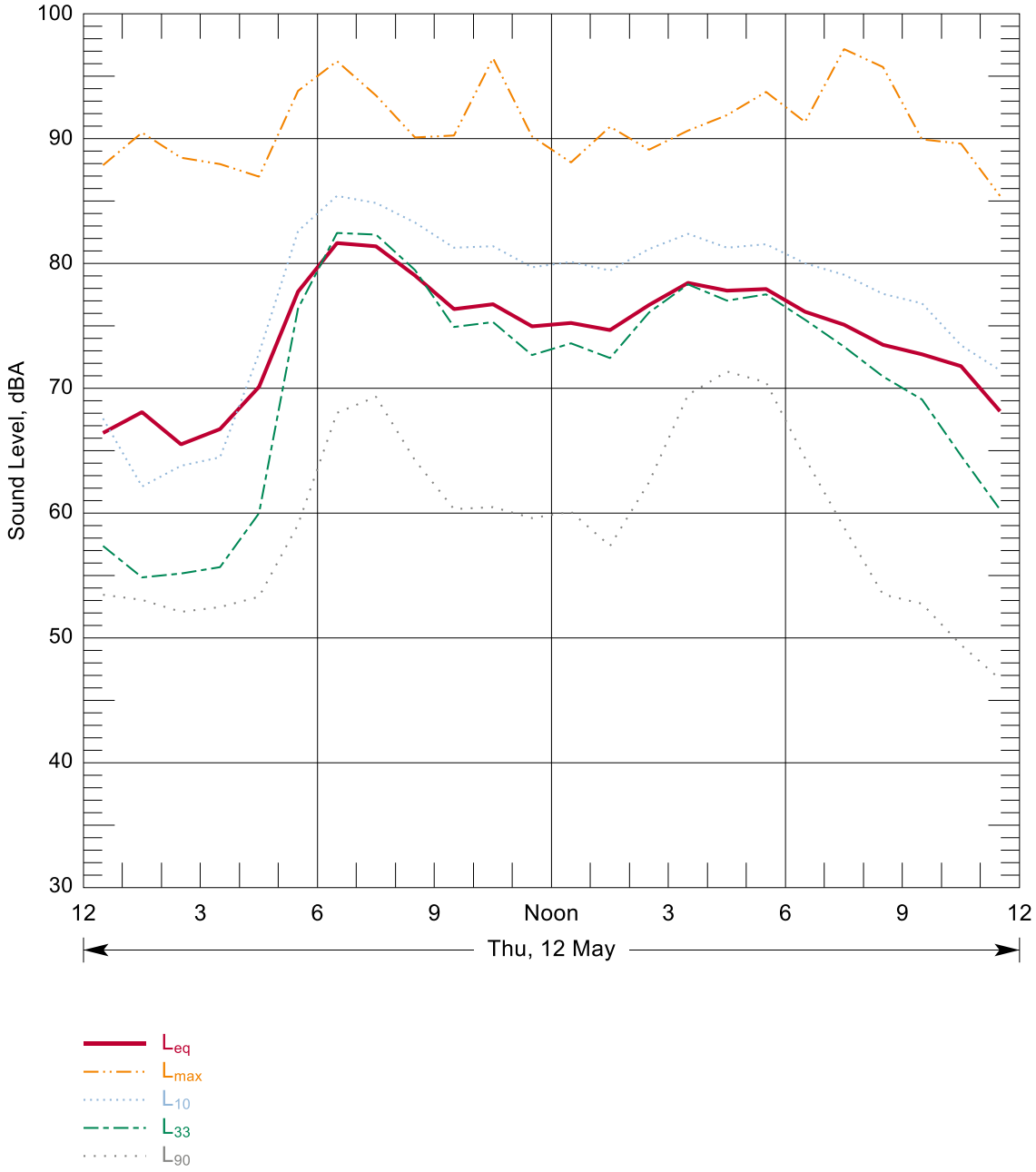
Source: Wilson Ihrig 2016

Figure B-81: Hourly Summary of Noise Levels Measured at N100 on 10 May, 2016



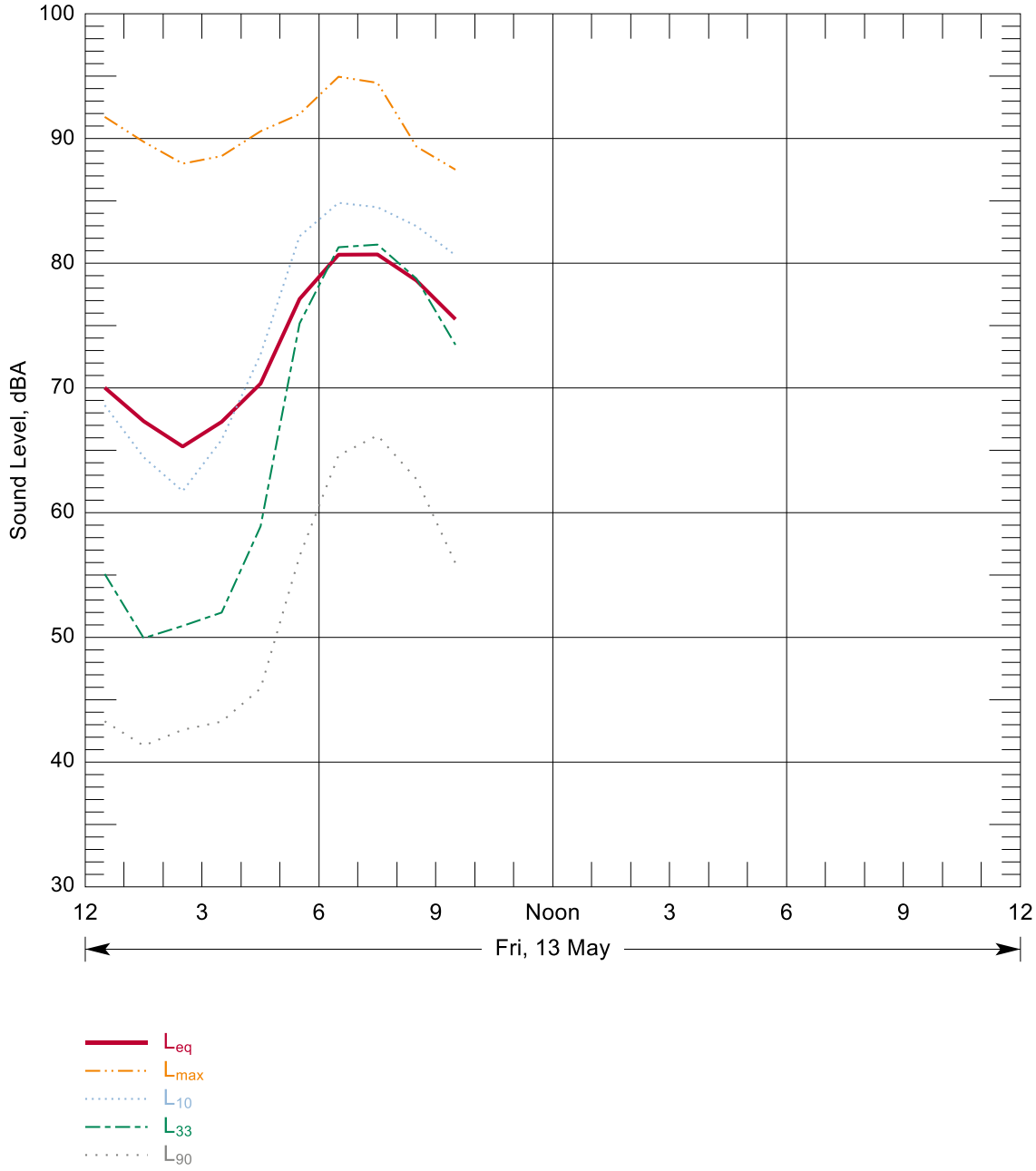
Source: Wilson Ihrig 2016

Figure B-82: Hourly Summary of Noise Levels Measured at N100 on 11 May, 2016



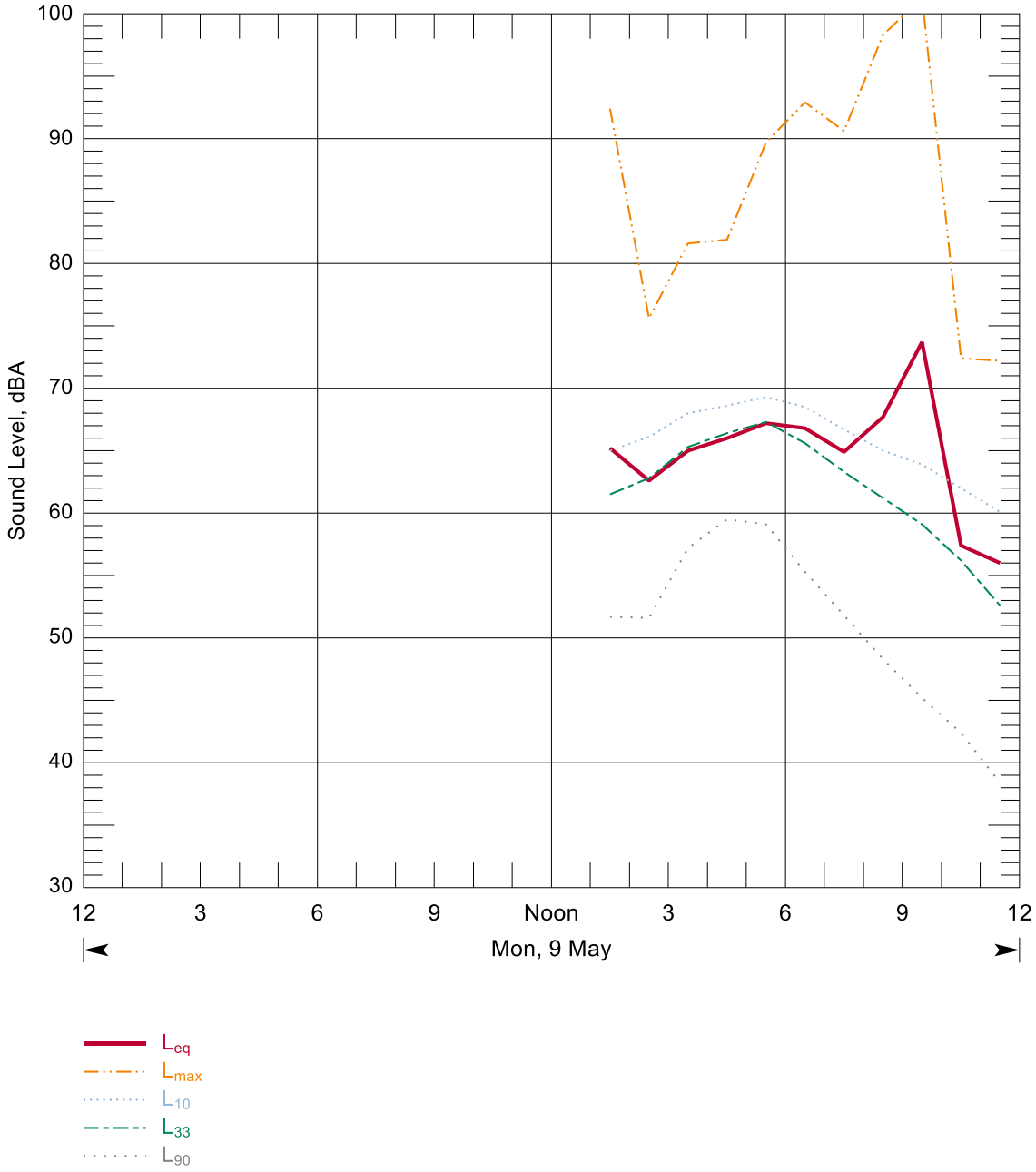
Source: Wilson Ihrig 2016

Figure B-83: Hourly Summary of Noise Levels Measured at N100 on 12 May, 2016



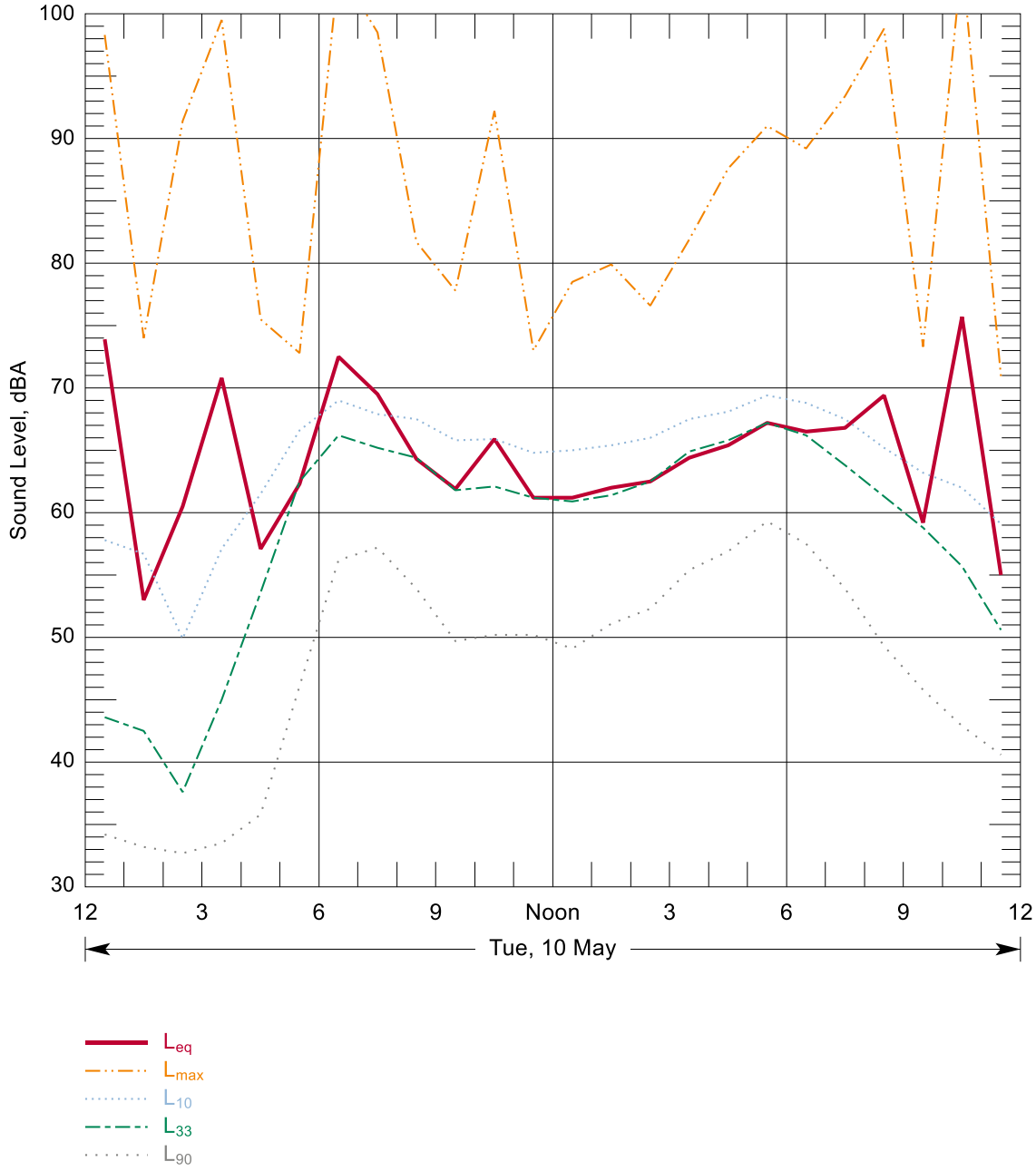
Source: Wilson Ihrig 2016

Figure B-84: Hourly Summary of Noise Levels Measured at N100 on 13 May, 2016



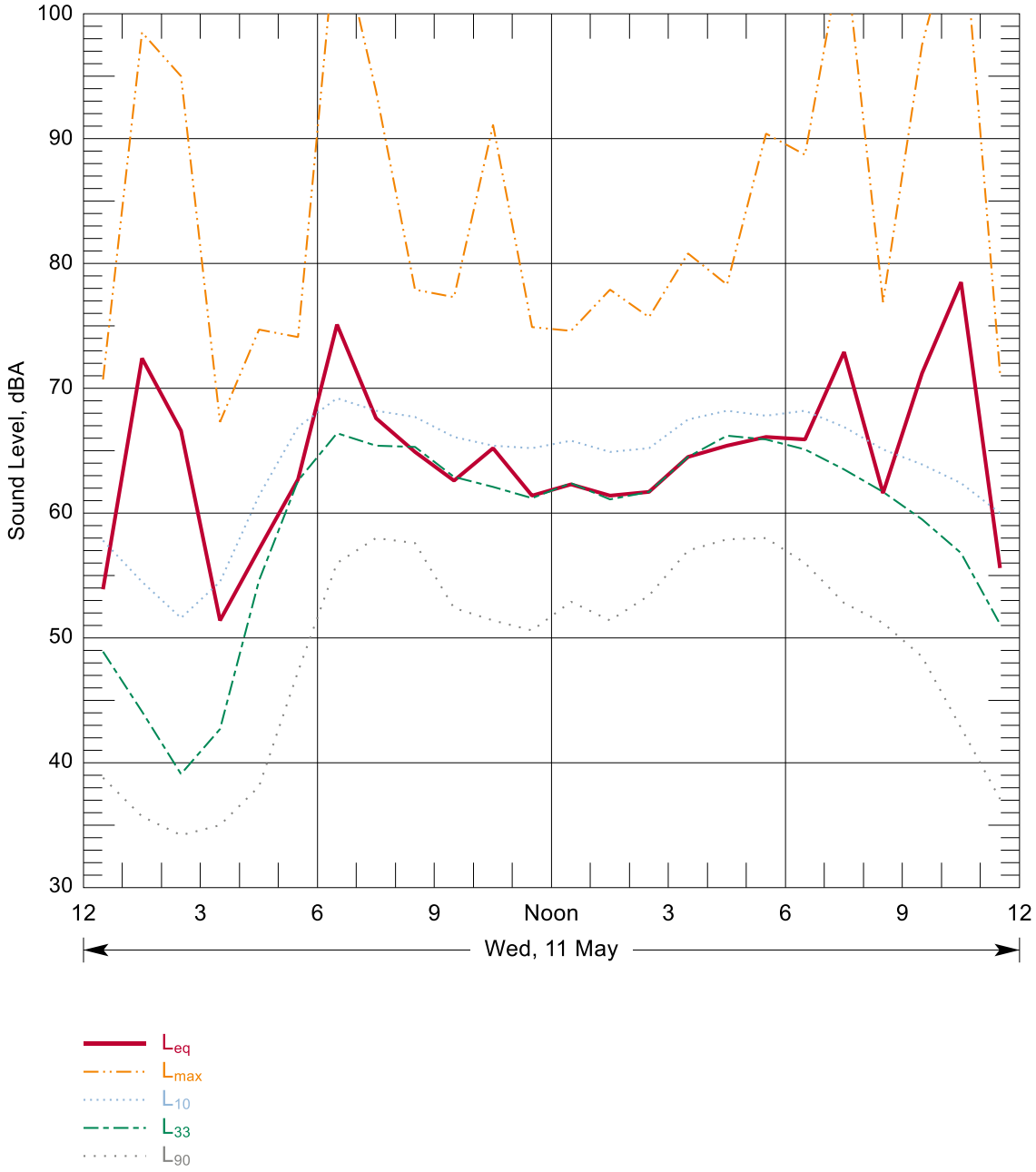
Source: Wilson Ihrig 2016

Figure B-85: Hourly Summary of Noise Levels Measured at N101 on 09 May, 2016



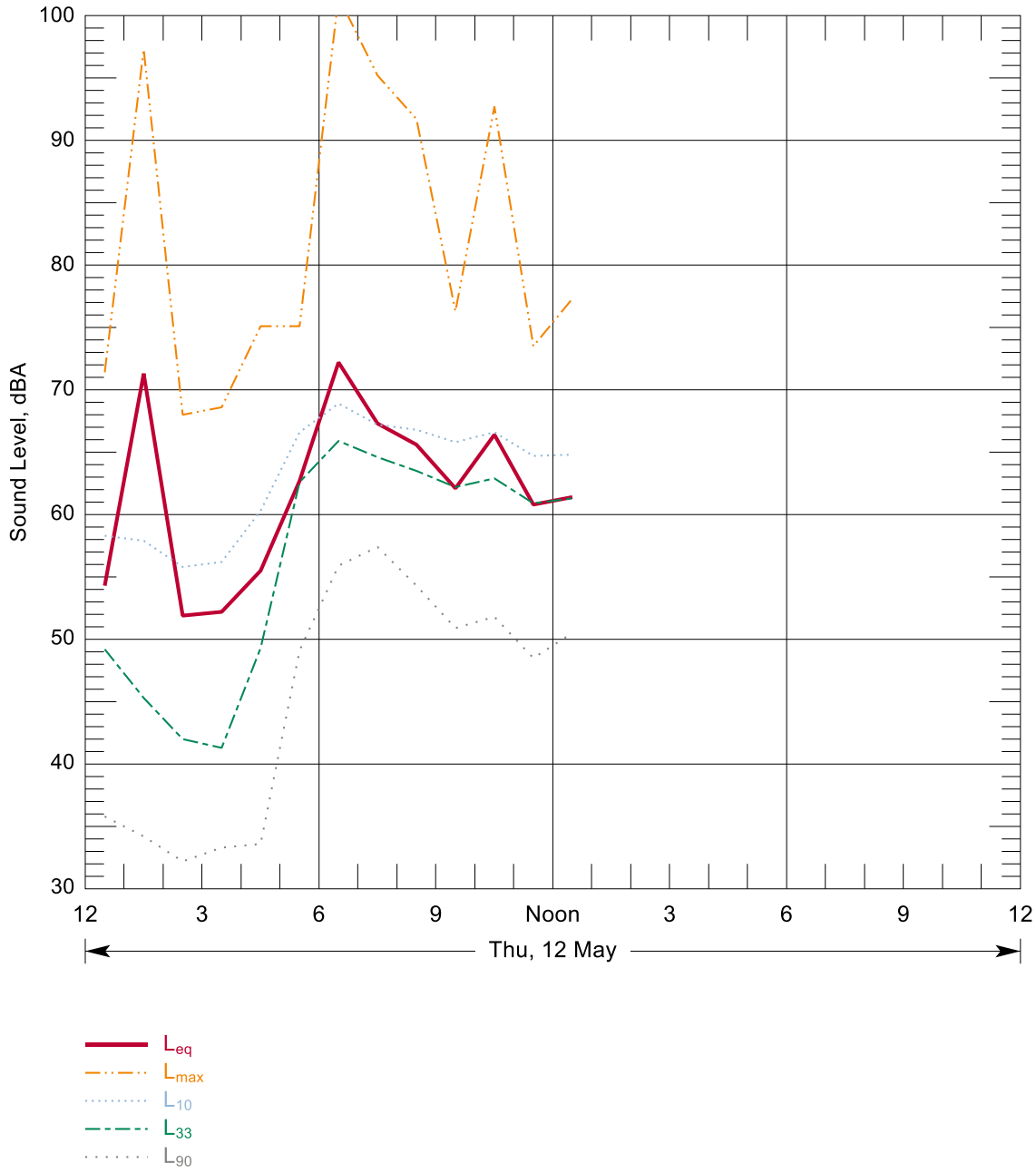
Source: Wilson Ihrig 2016

Figure B-86: Hourly Summary of Noise Levels Measured at N101 on 10 May, 2016



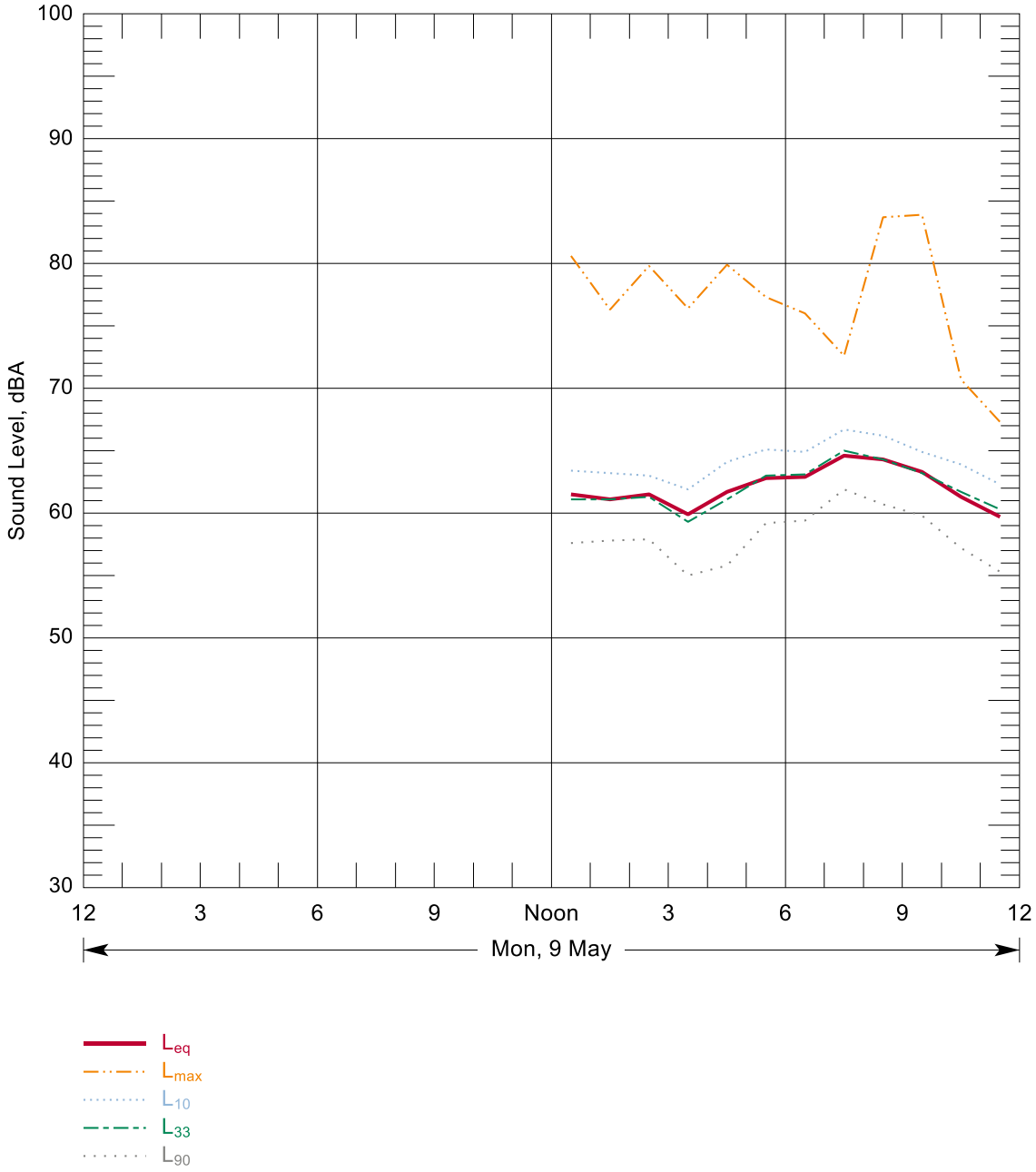
Source: Wilson Ihrig 2016

Figure B-87: Hourly Summary of Noise Levels Measured at N101 on 11 May, 2016



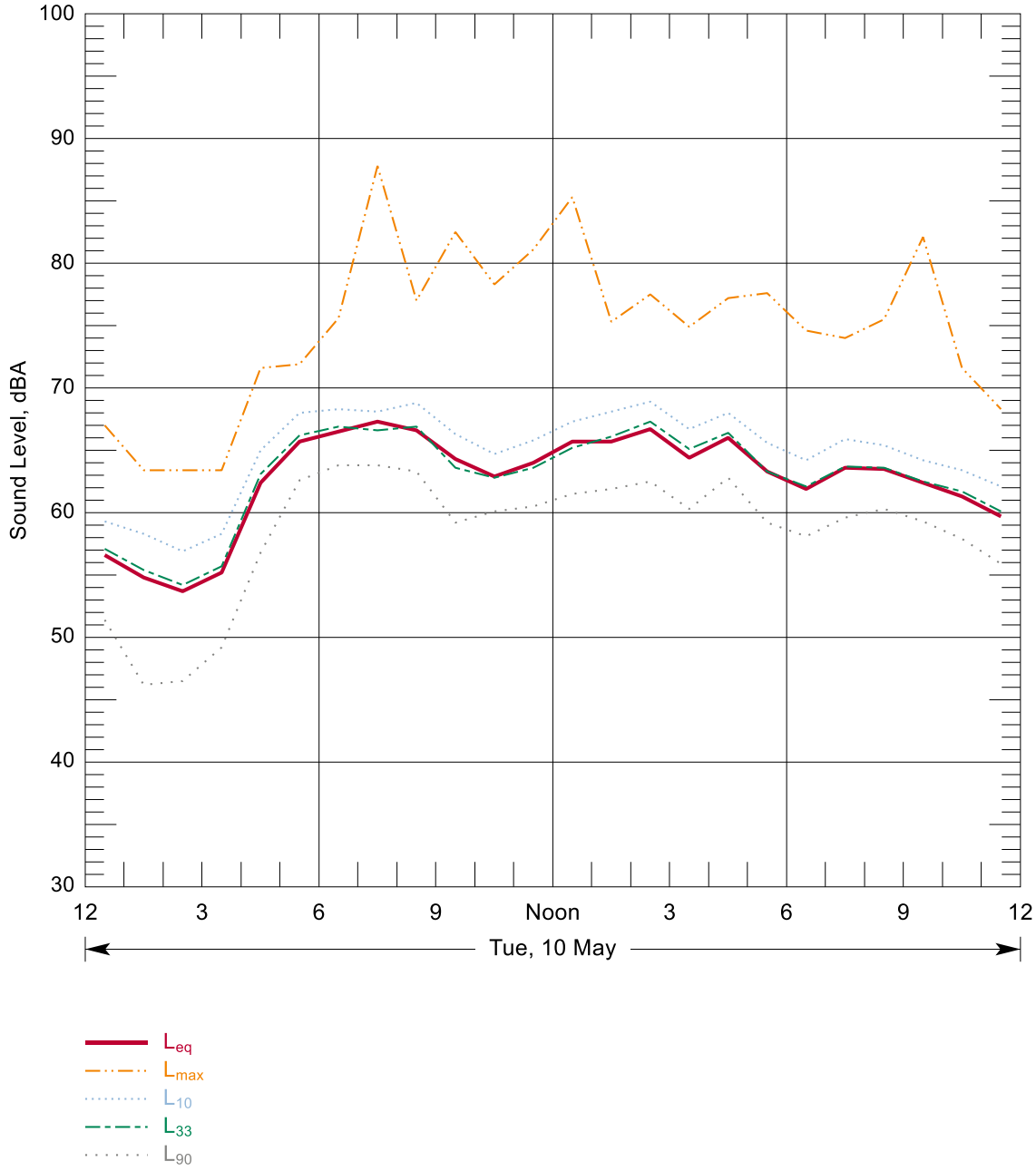
Source: Wilson Ihrig 2016

Figure B-88: Hourly Summary of Noise Levels Measured at N101 on 12 May, 2016



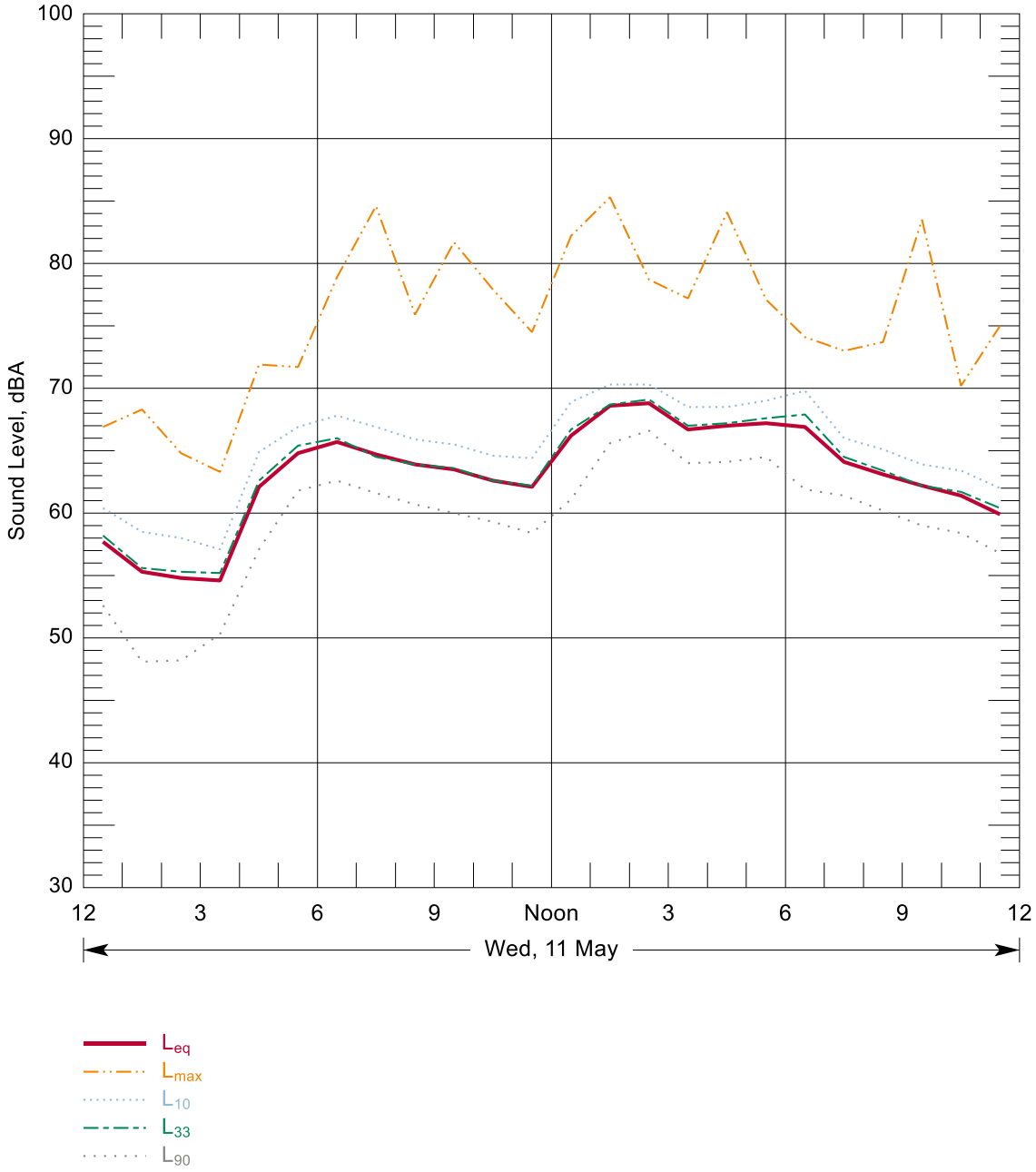
Source: Wilson Ihrig 2016

Figure B-89: Hourly Summary of Noise Levels Measured at N102 on 09 May, 2016



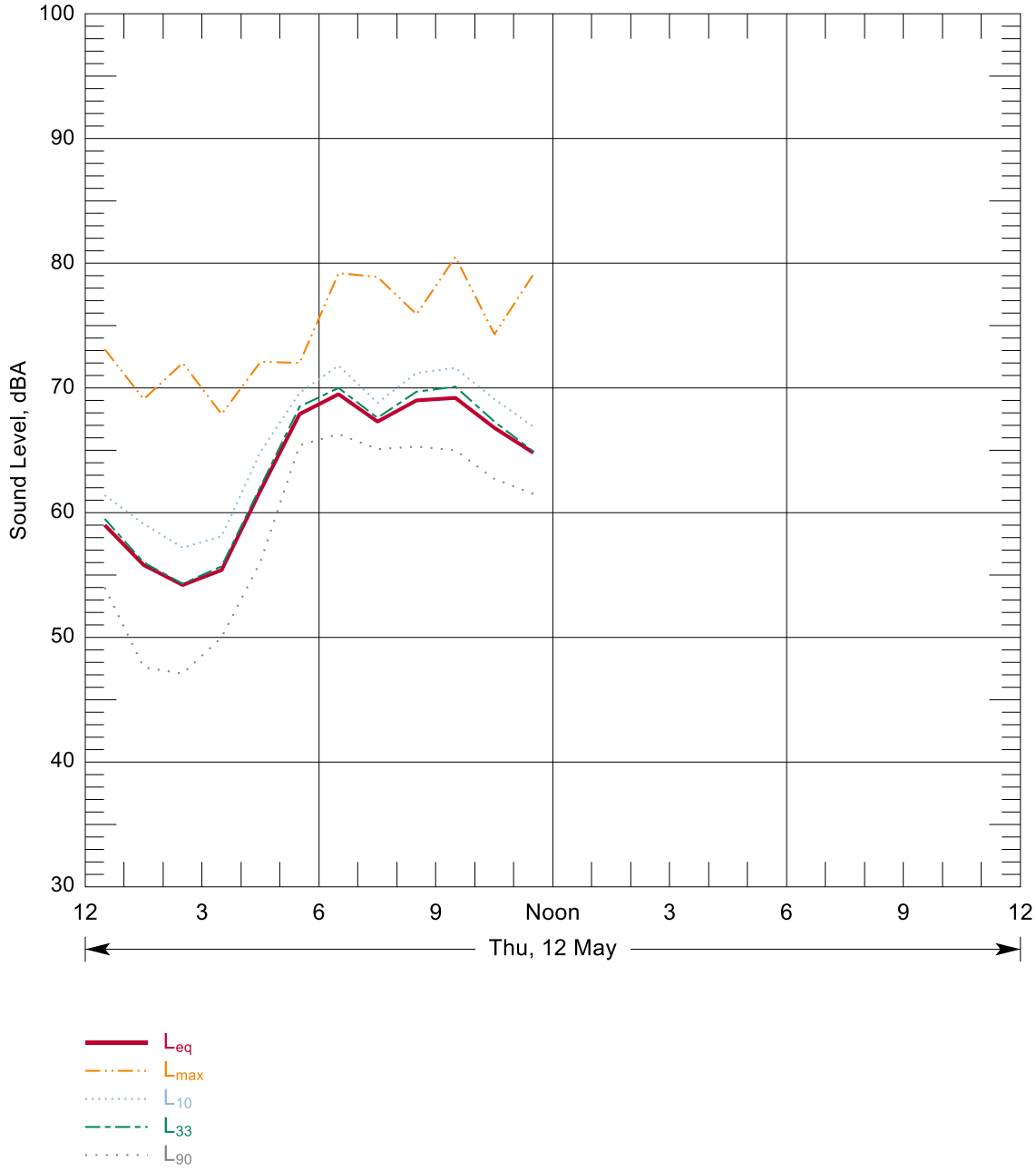
Source: Wilson Ihrig 2016

Figure B-90: Hourly Summary of Noise Levels Measured at N102 on 10 May, 2016



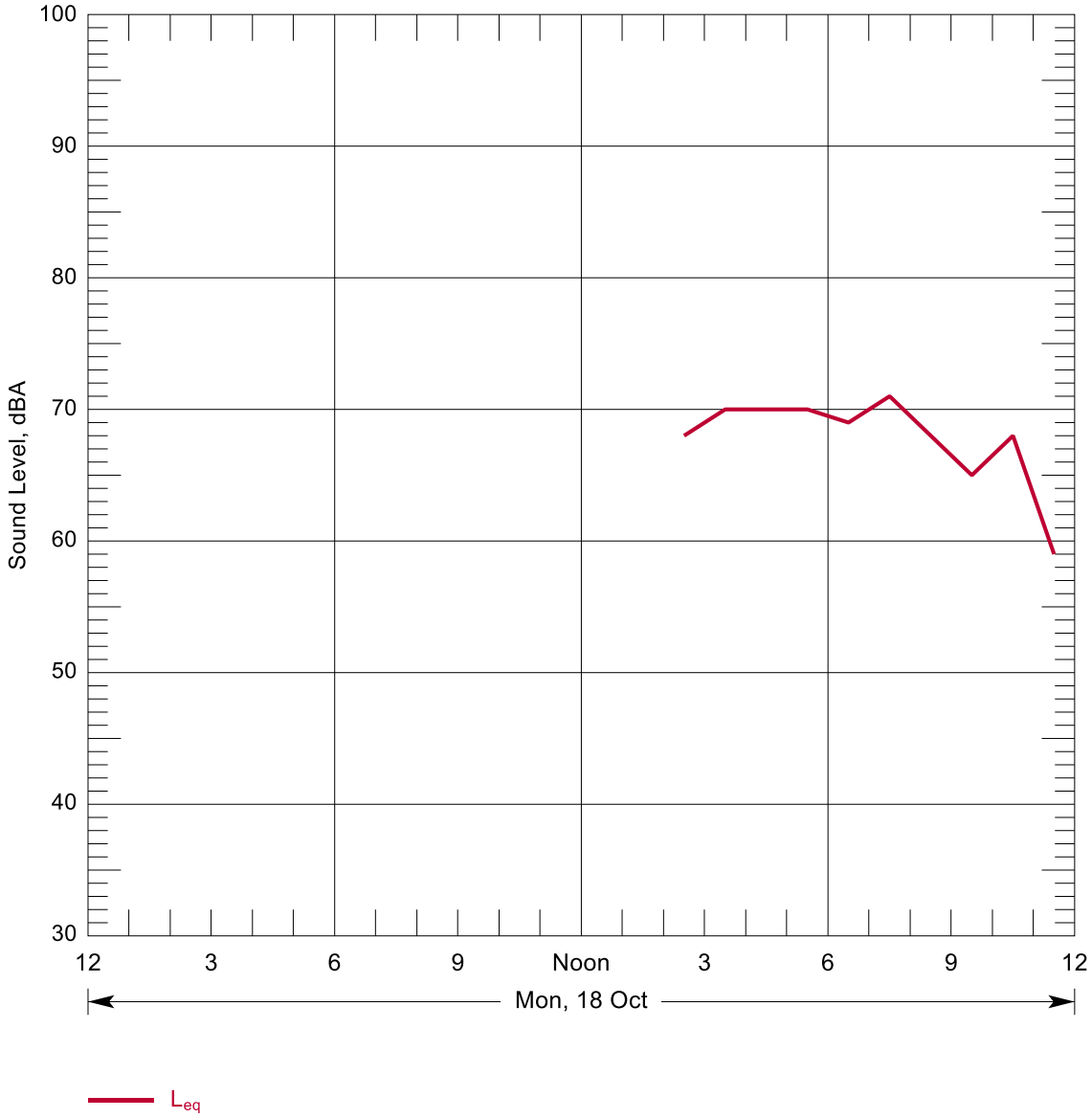
Source: Wilson Ihrig 2016

Figure B-91: Hourly Summary of Noise Levels Measured at N102 on 11 May, 2016



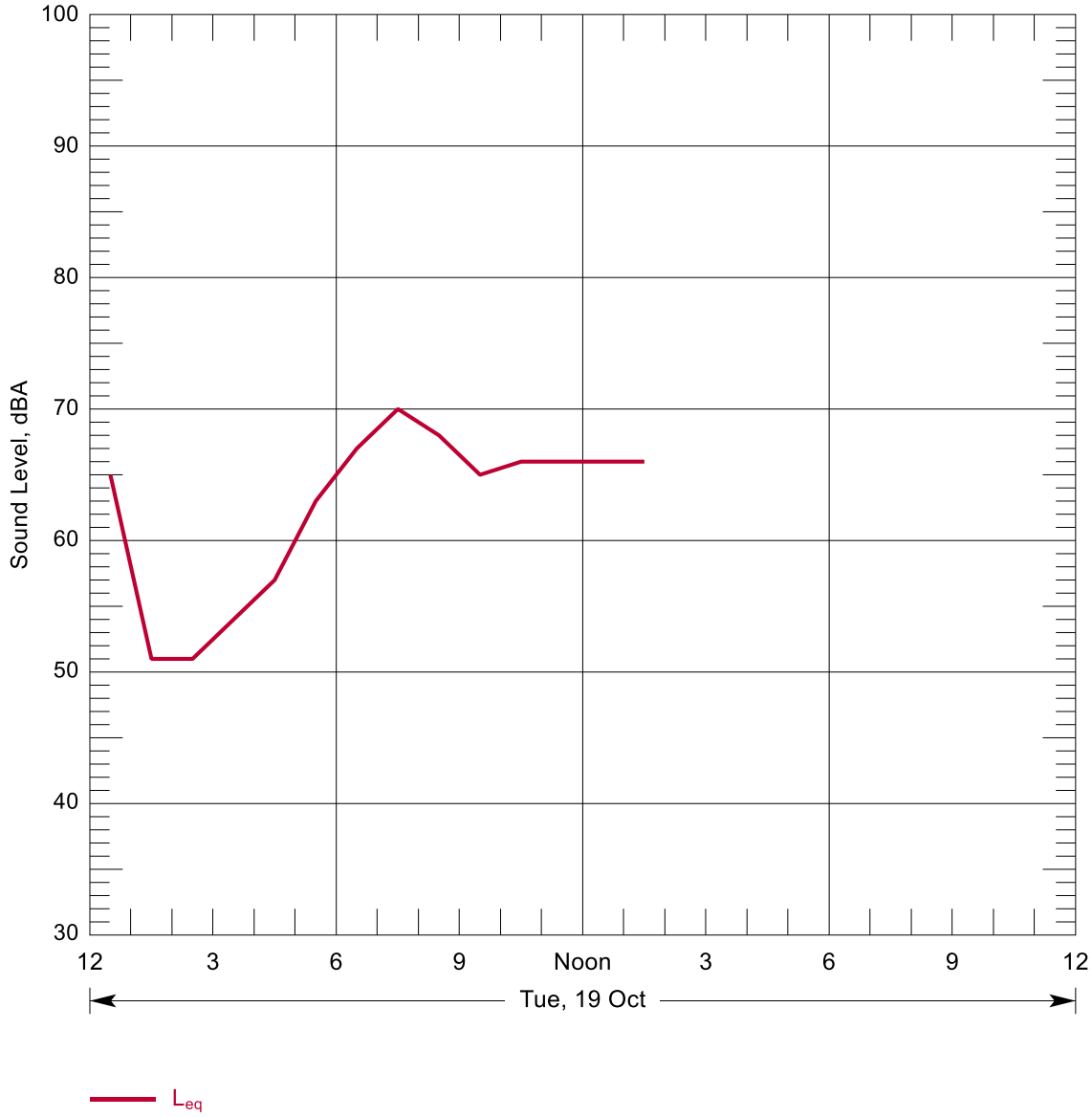
Source: Wilson Ihrig 2016

Figure B-92: Hourly Summary of Noise Levels Measured at N102 on 12 May, 2016



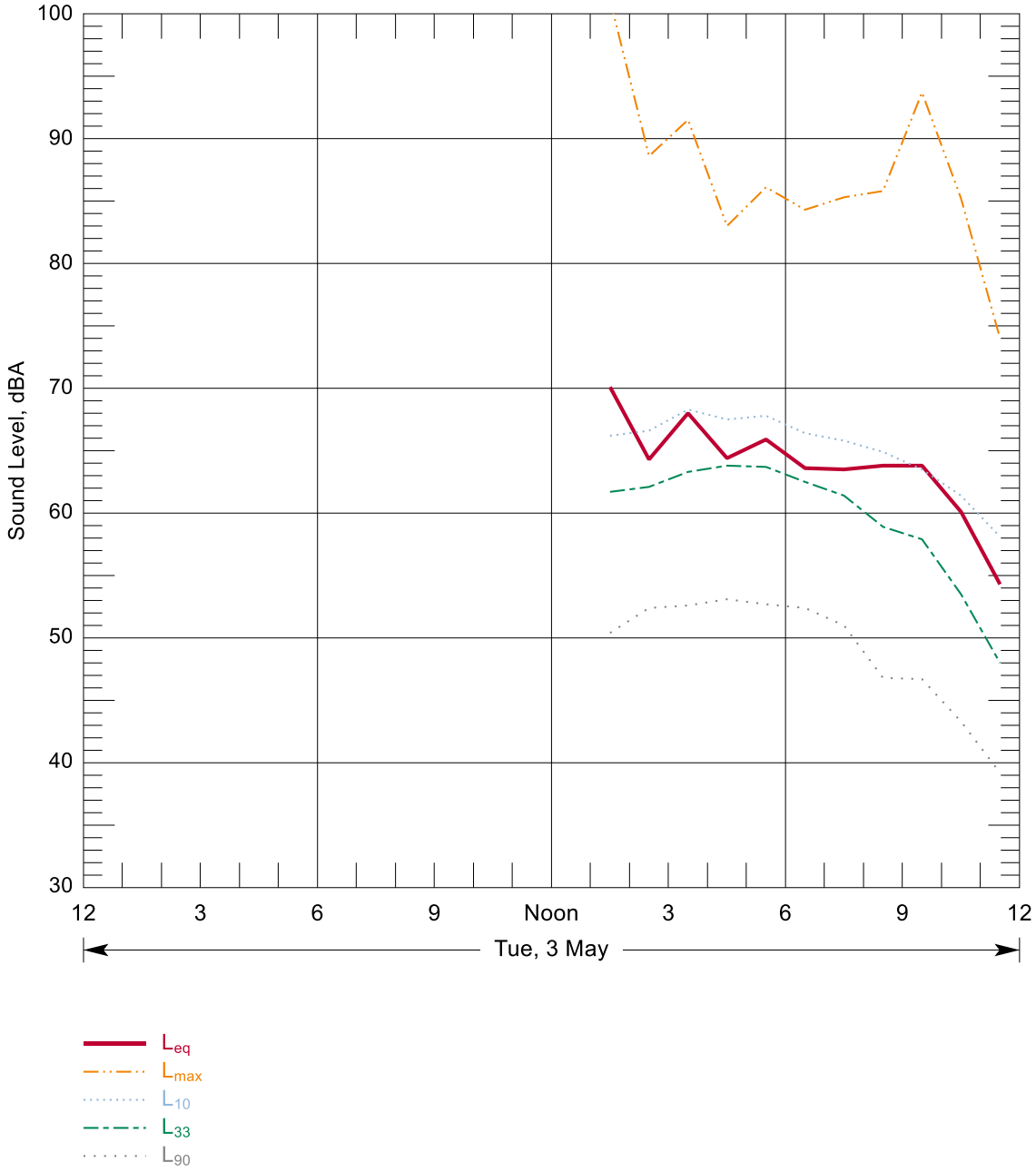
Source: Parsons Transportation 2010

Figure B-93: Hourly Summary of Noise Levels Measured at N103 on 18 Oct, 2010



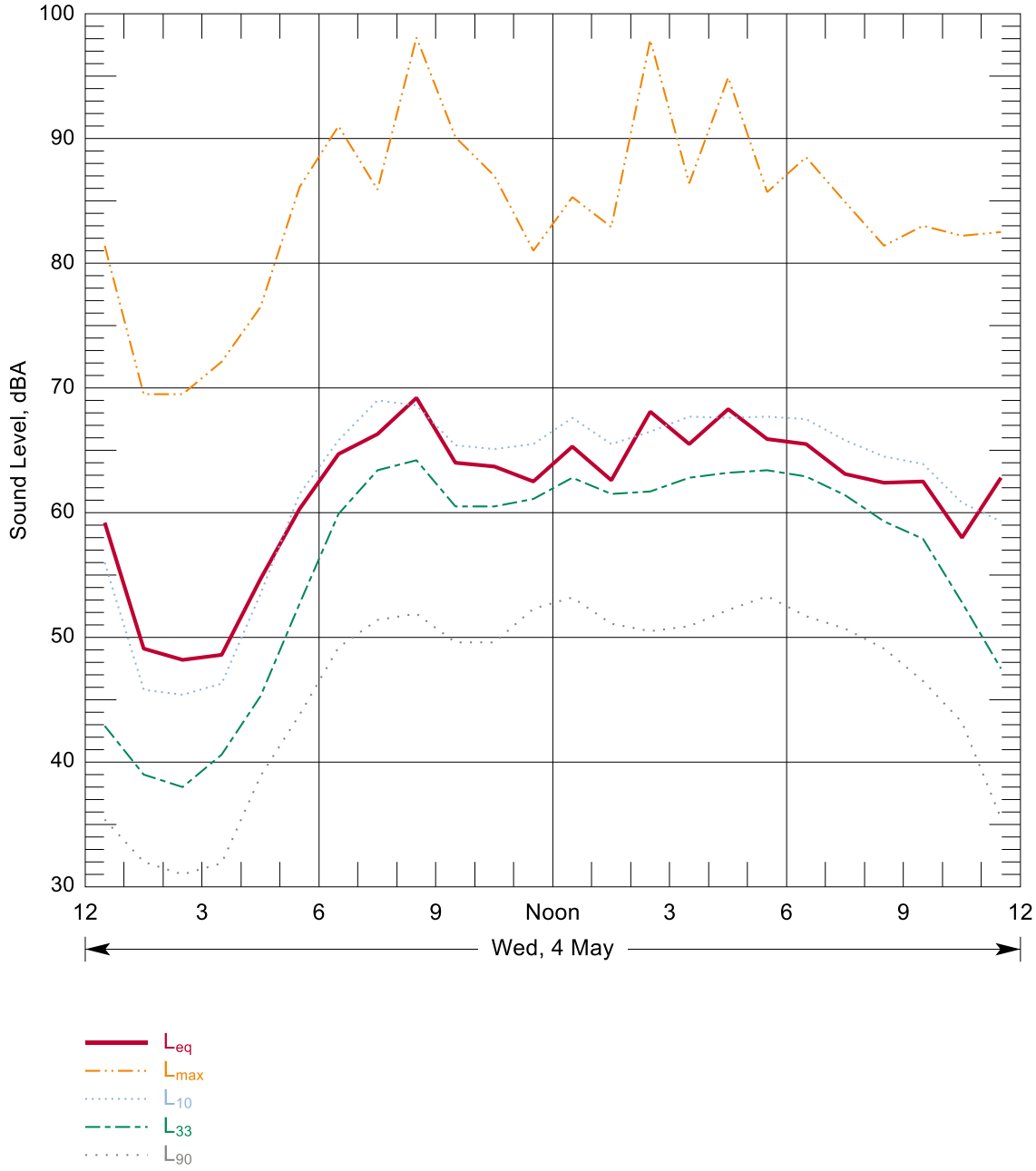
Source: Parsons Transportation 2010

Figure B-94: Hourly Summary of Noise Levels Measured at N103 on 19 Oct, 2010



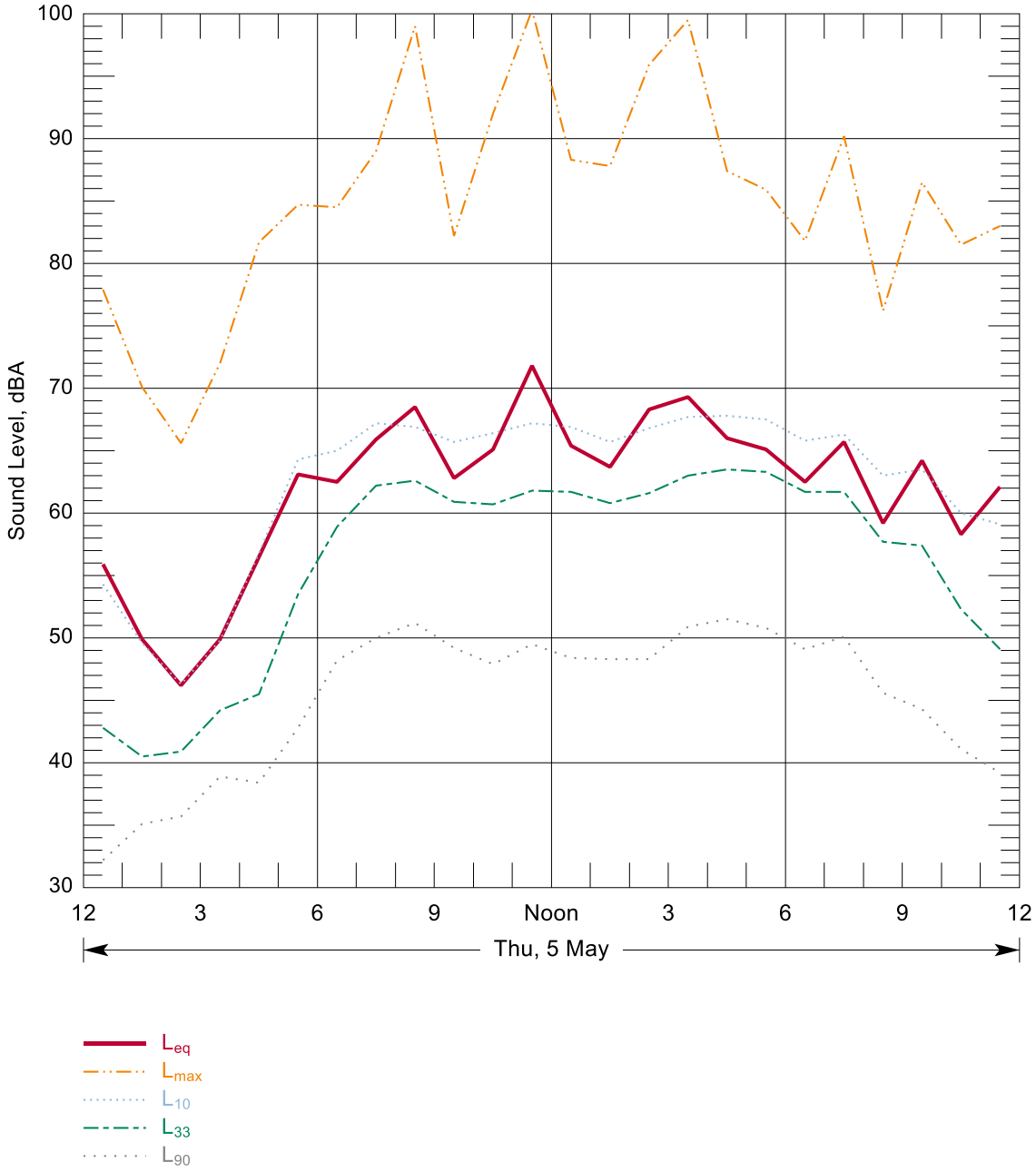
Source: Wilson Ihrig 2016

Figure B-95: Hourly Summary of Noise Levels Measured at N104 on 03 May, 2016



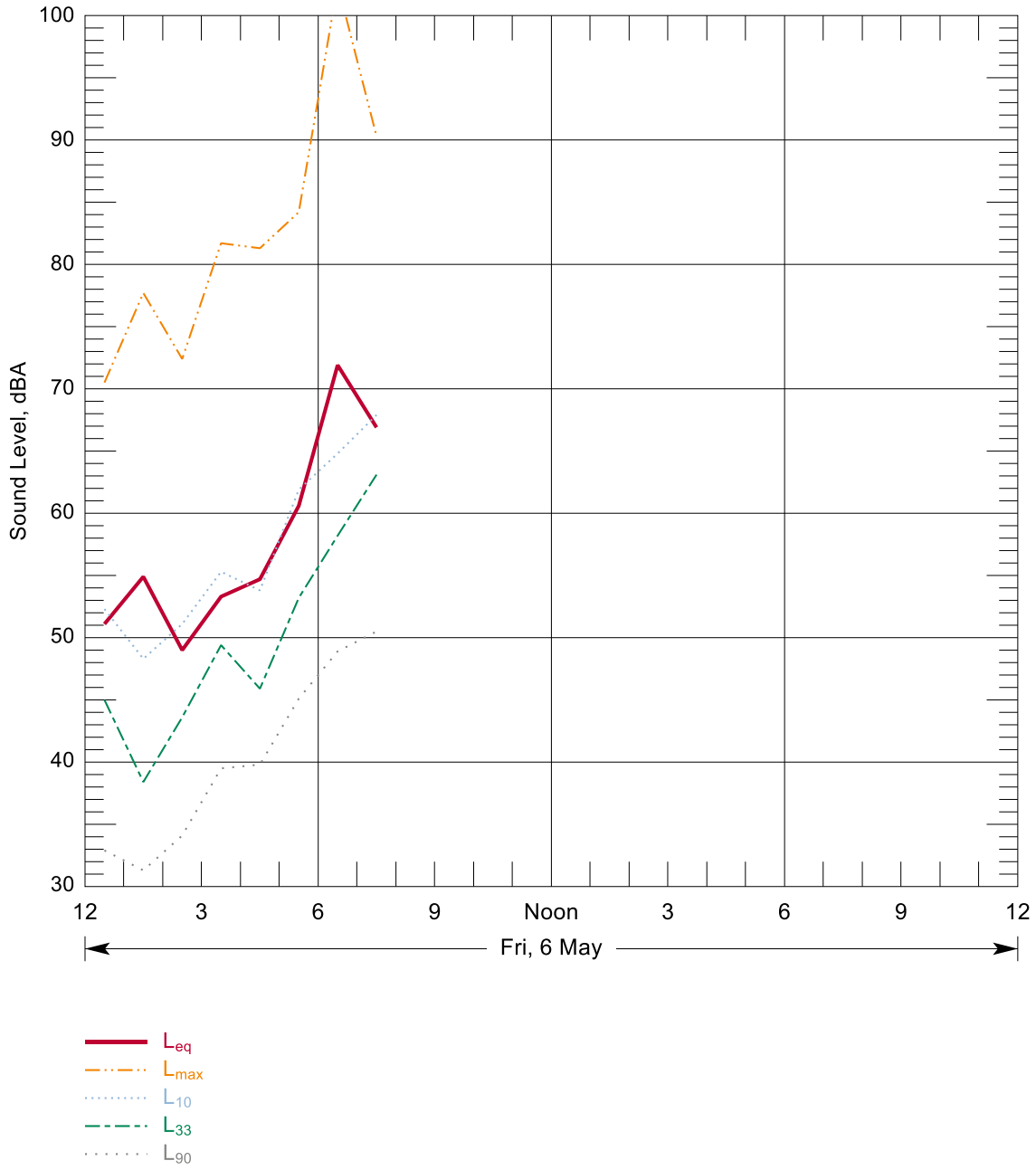
Source: Wilson Ihrig 2016

Figure B-96: Hourly Summary of Noise Levels Measured at N104 on 04 May, 2016



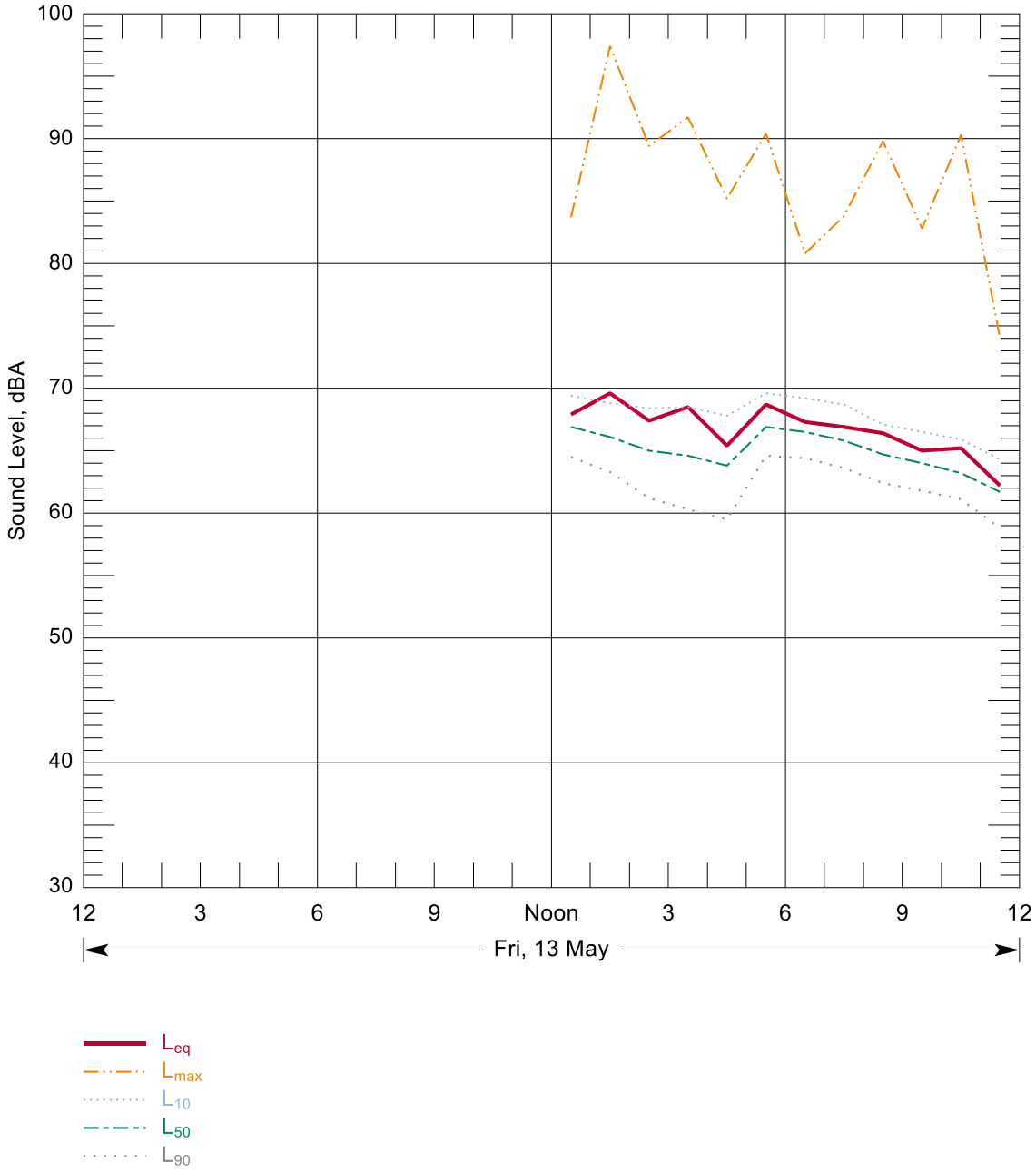
Source: Wilson Ihrig 2016

Figure B-97: Hourly Summary of Noise Levels Measured at N104 on 05 May, 2016



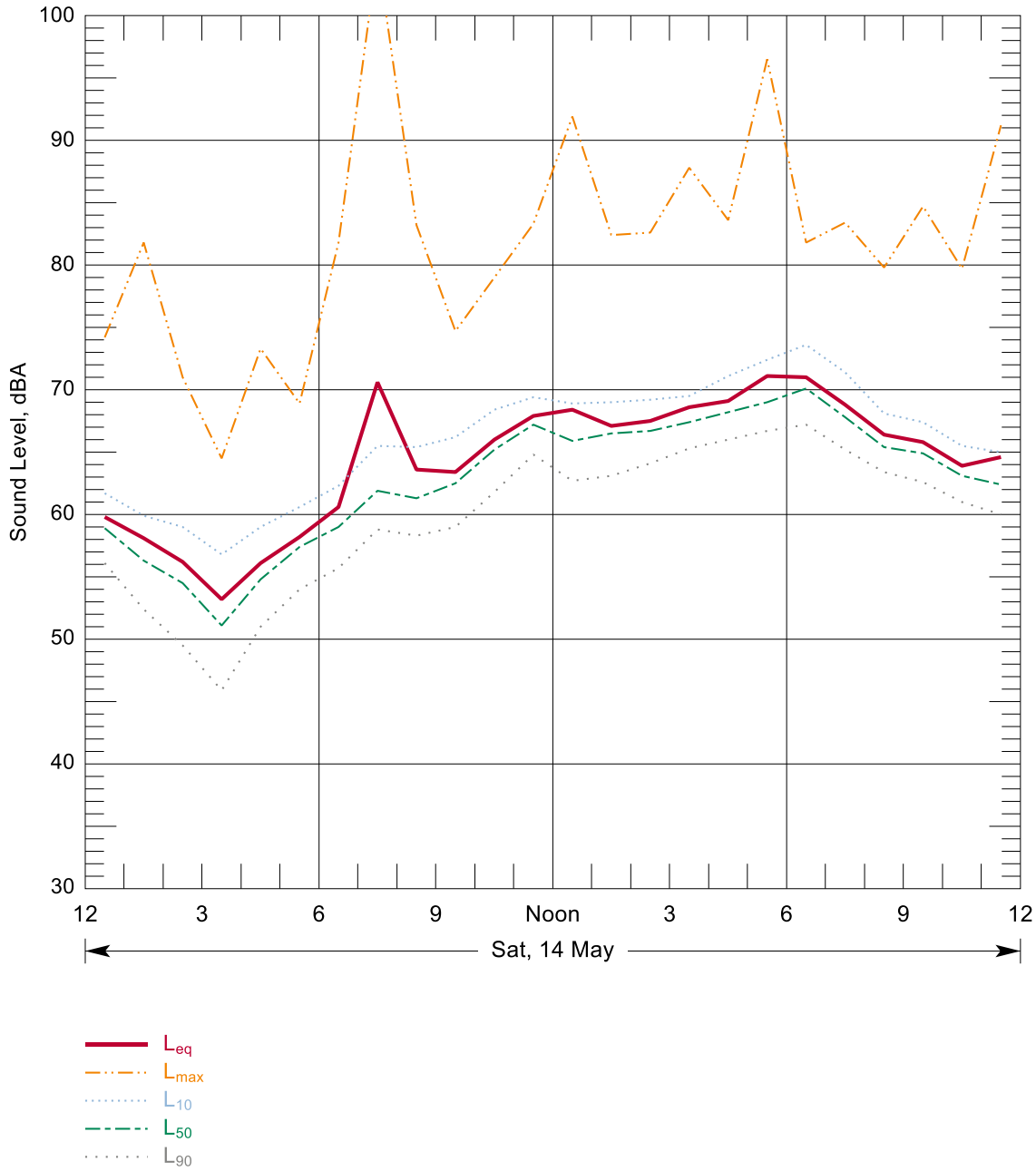
Source: Wilson Ihrig 2016

Figure B-98: Hourly Summary of Noise Levels Measured at N104 on 06 May, 2016



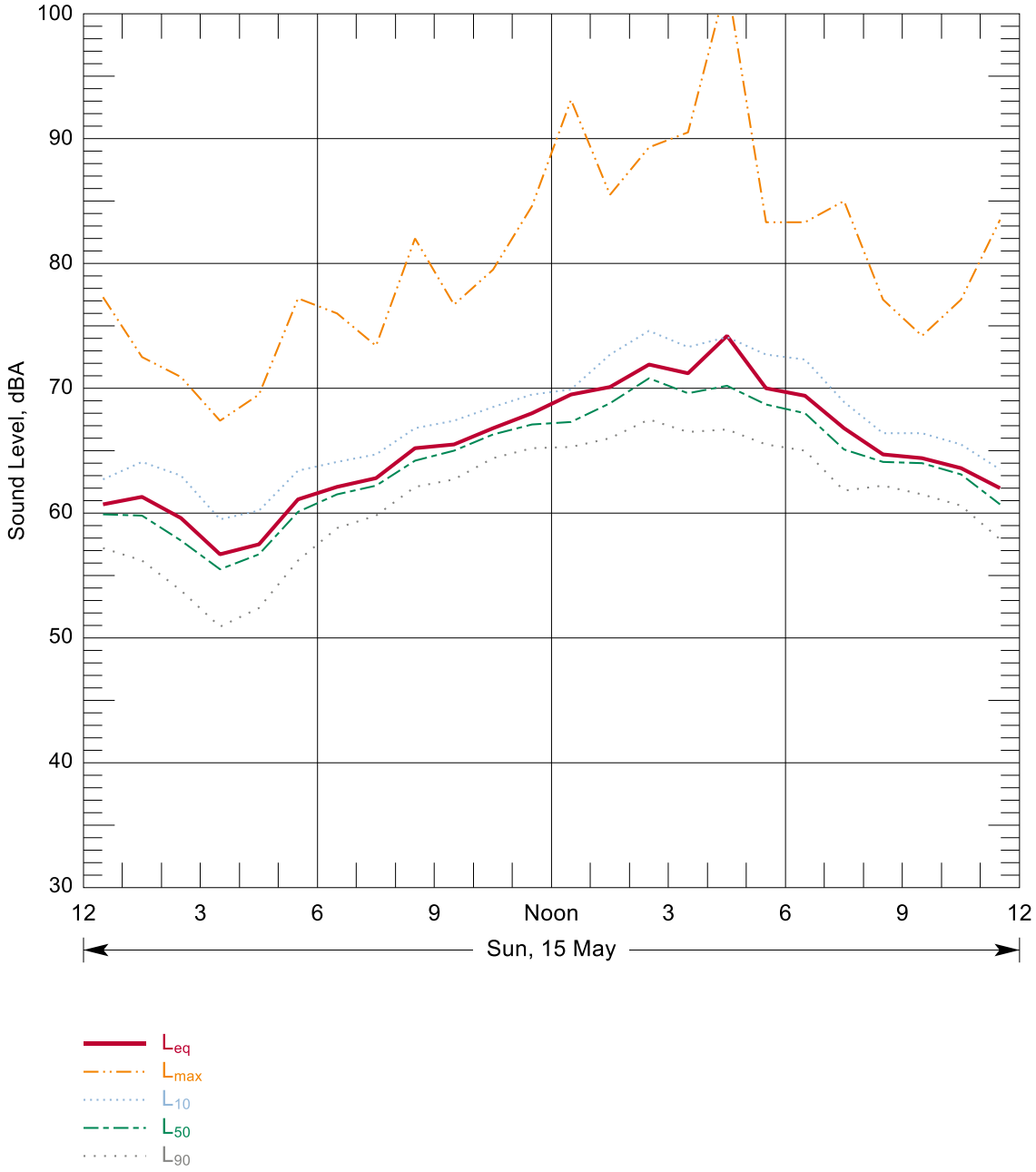
Source: Wilson Ihrig 2016

Figure B-99: Hourly Summary of Noise Levels Measured at N105 on 13 May, 2016



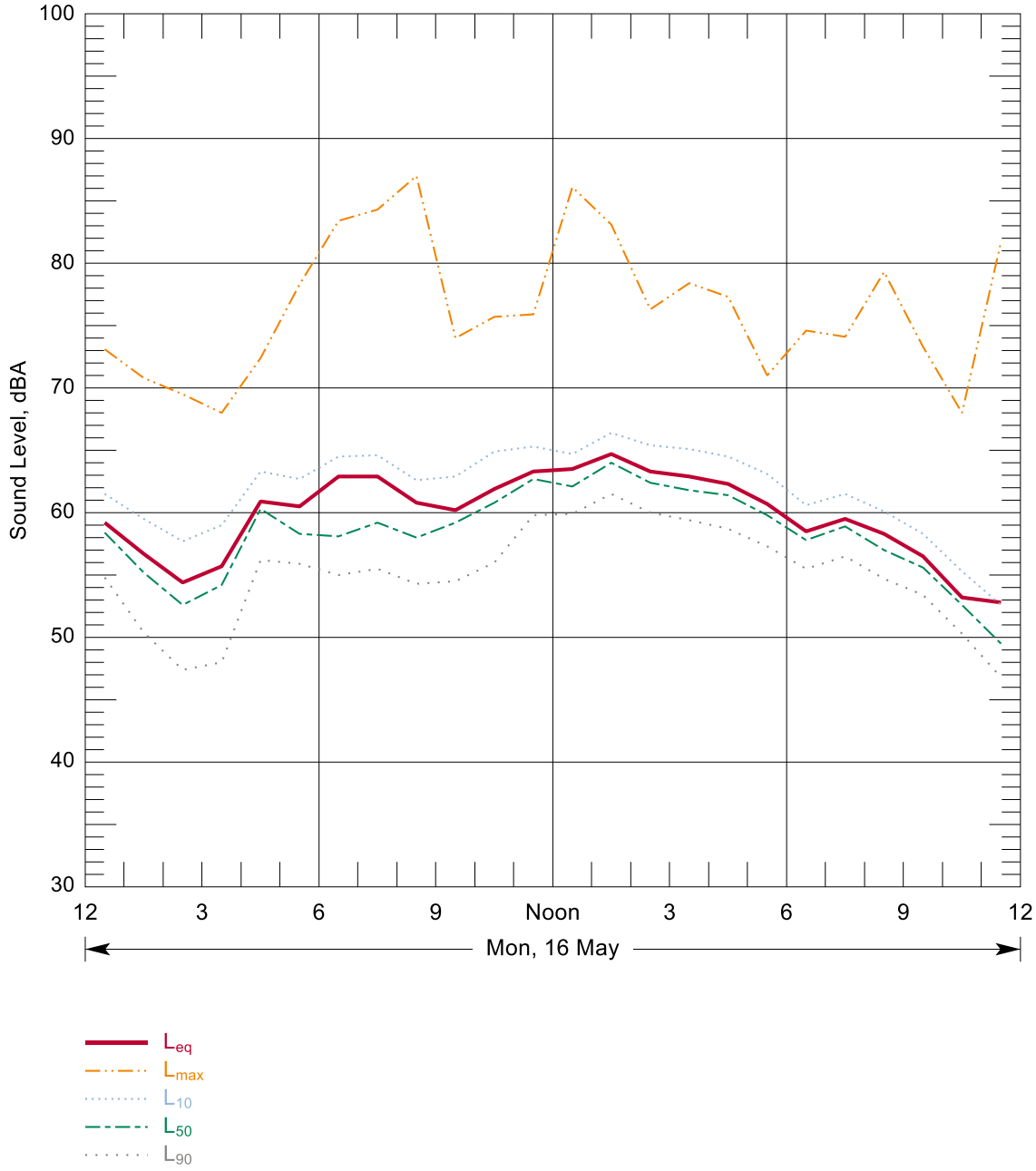
Source: Wilson Ihrig 2016

Figure B-100: Hourly Summary of Noise Levels Measured at N105 on 14 May, 2016



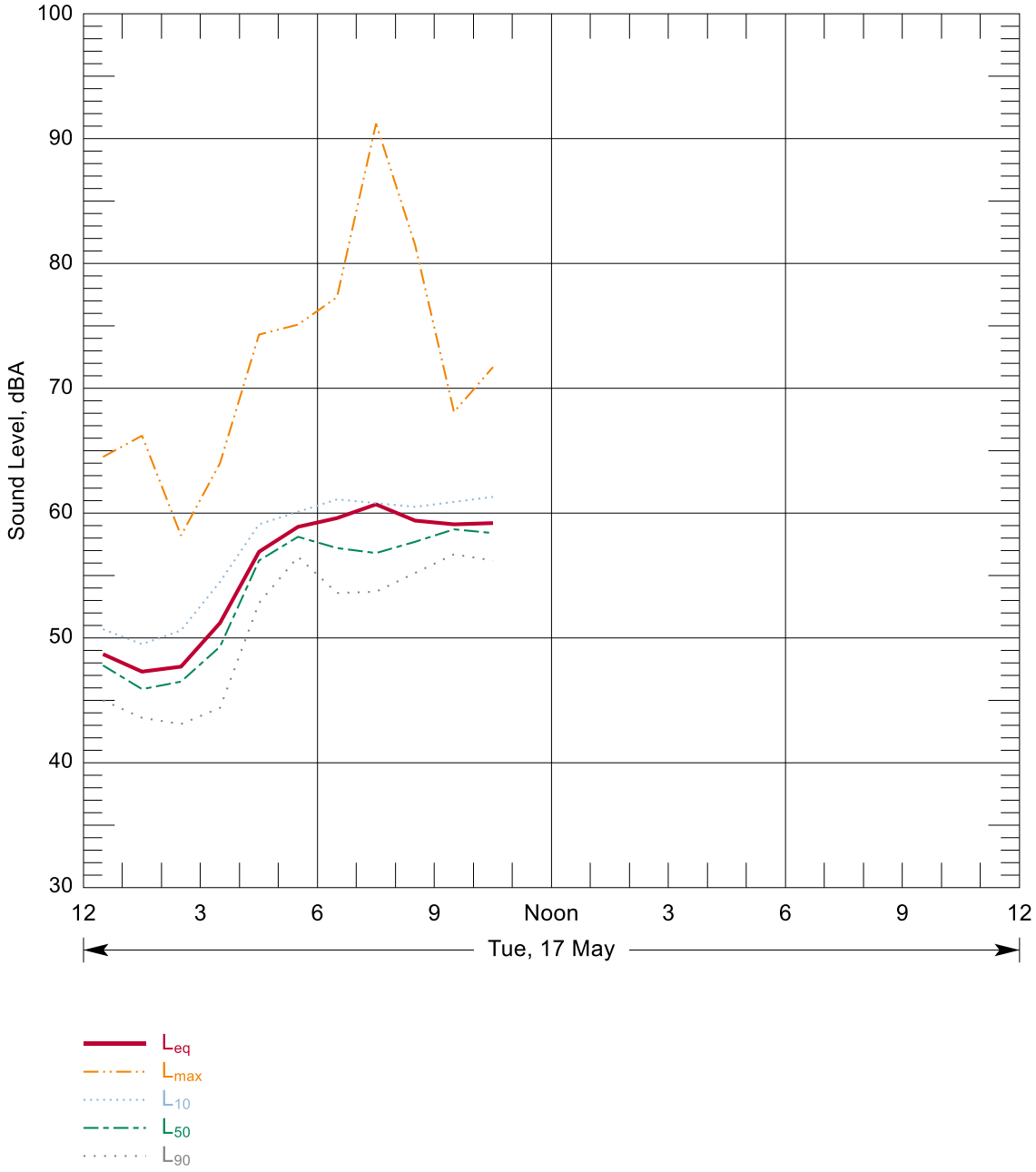
Source: Wilson Ihrig 2016

Figure B-101: Hourly Summary of Noise Levels Measured at N105 on 15 May, 2016



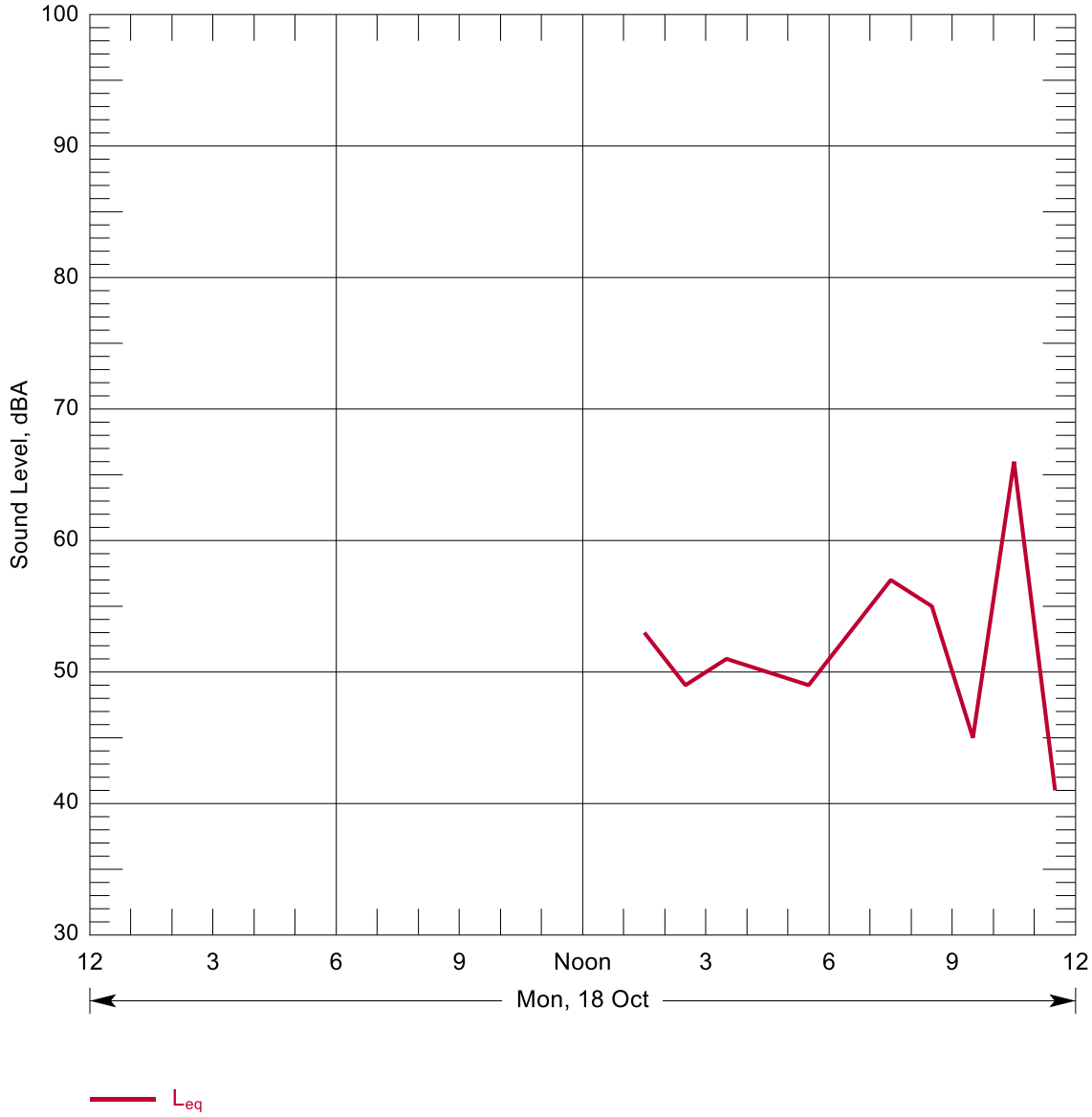
Source: Wilson Ihrig 2016

Figure B-102: Hourly Summary of Noise Levels Measured at N105 on 16 May, 2016



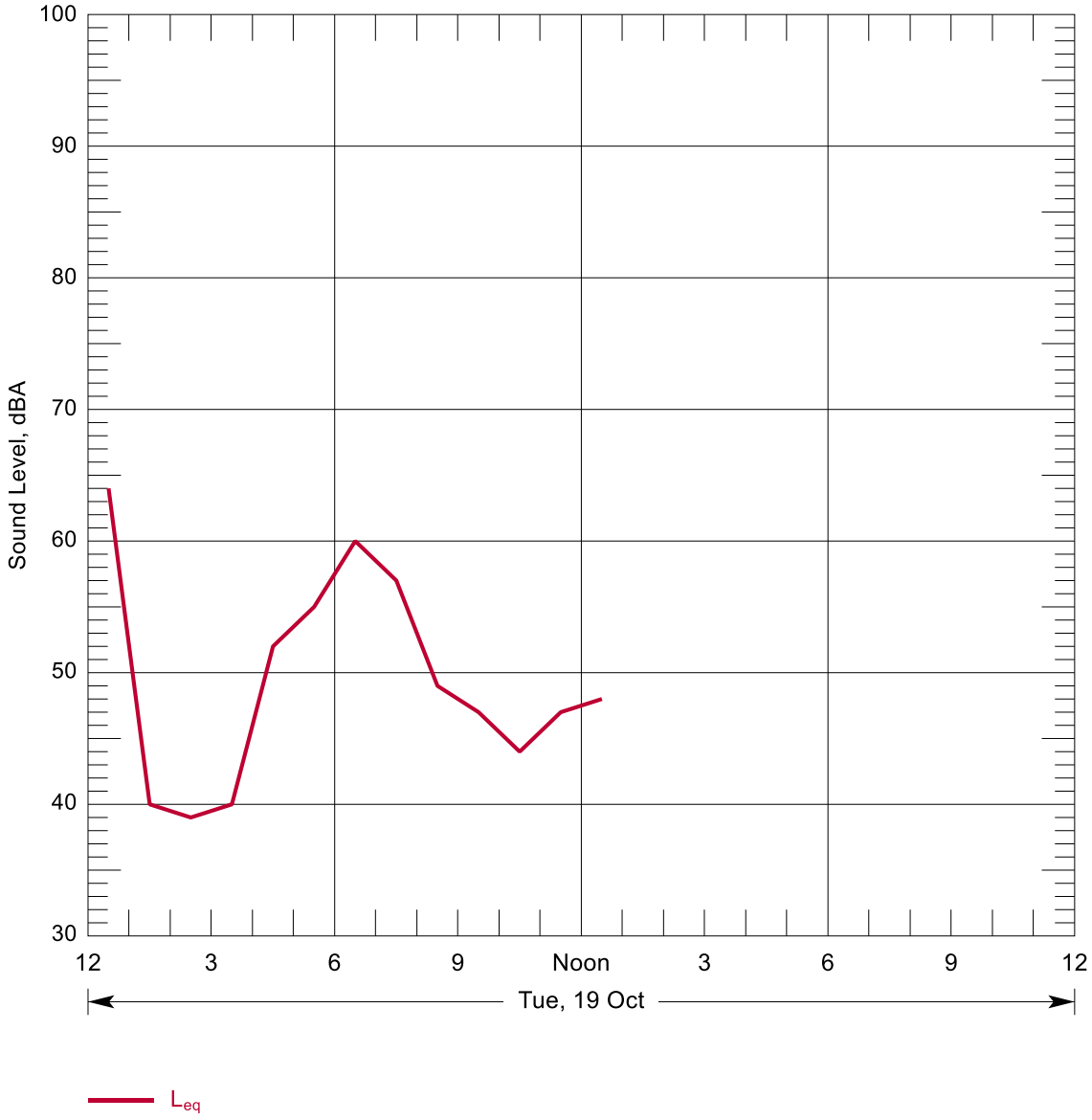
Source: Wilson Ihrig 2016

Figure B-103: Hourly Summary of Noise Levels Measured at N105 on 17 May, 2016



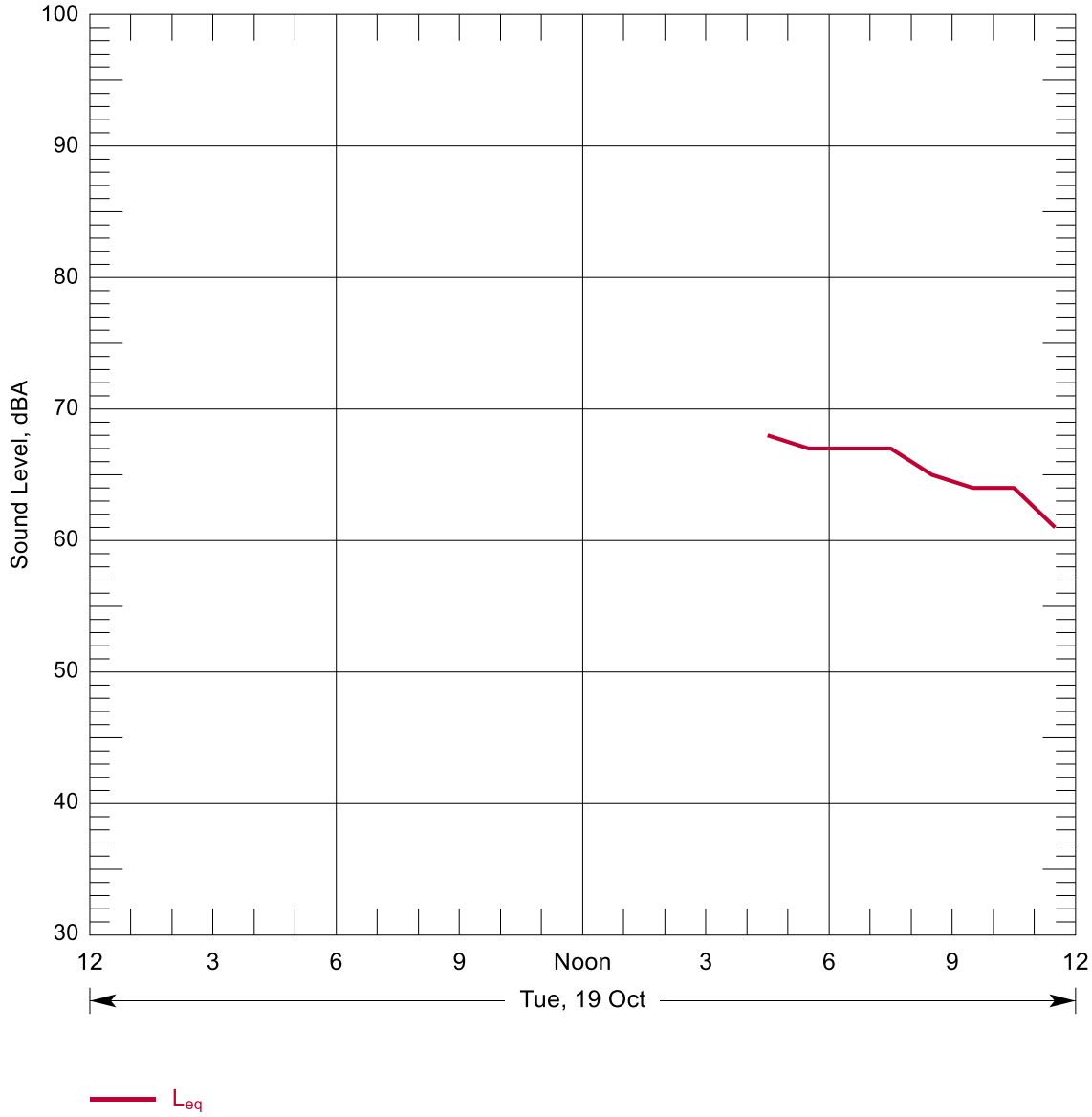
Source: Parsons Transportation 2010

Figure B-104: Hourly Summary of Noise Levels Measured at N106 on 18 Oct, 2010



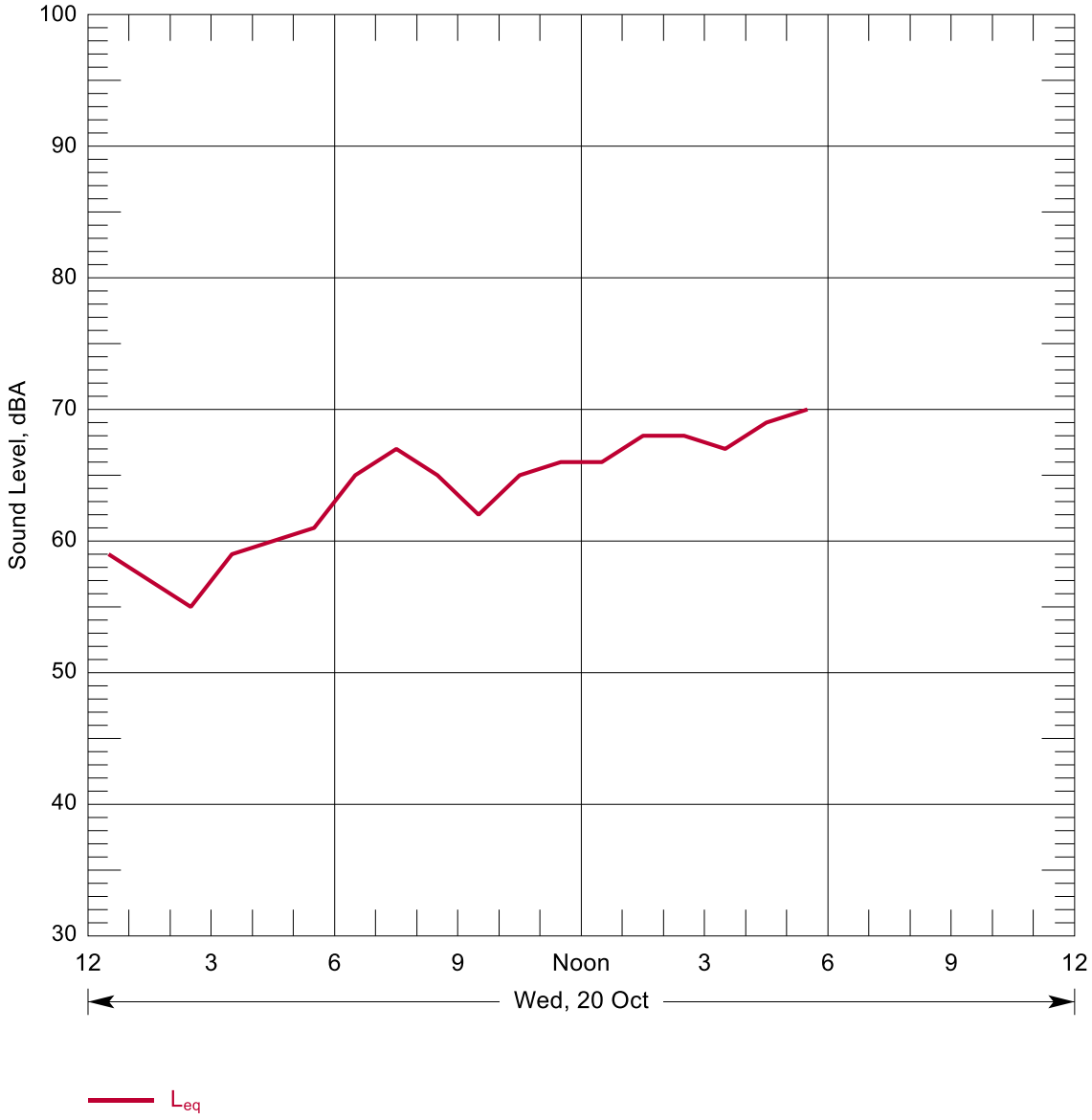
Source: Parsons Transportation 2010

Figure B-105: Hourly Summary of Noise Levels Measured at N106 on 19 Oct, 2010



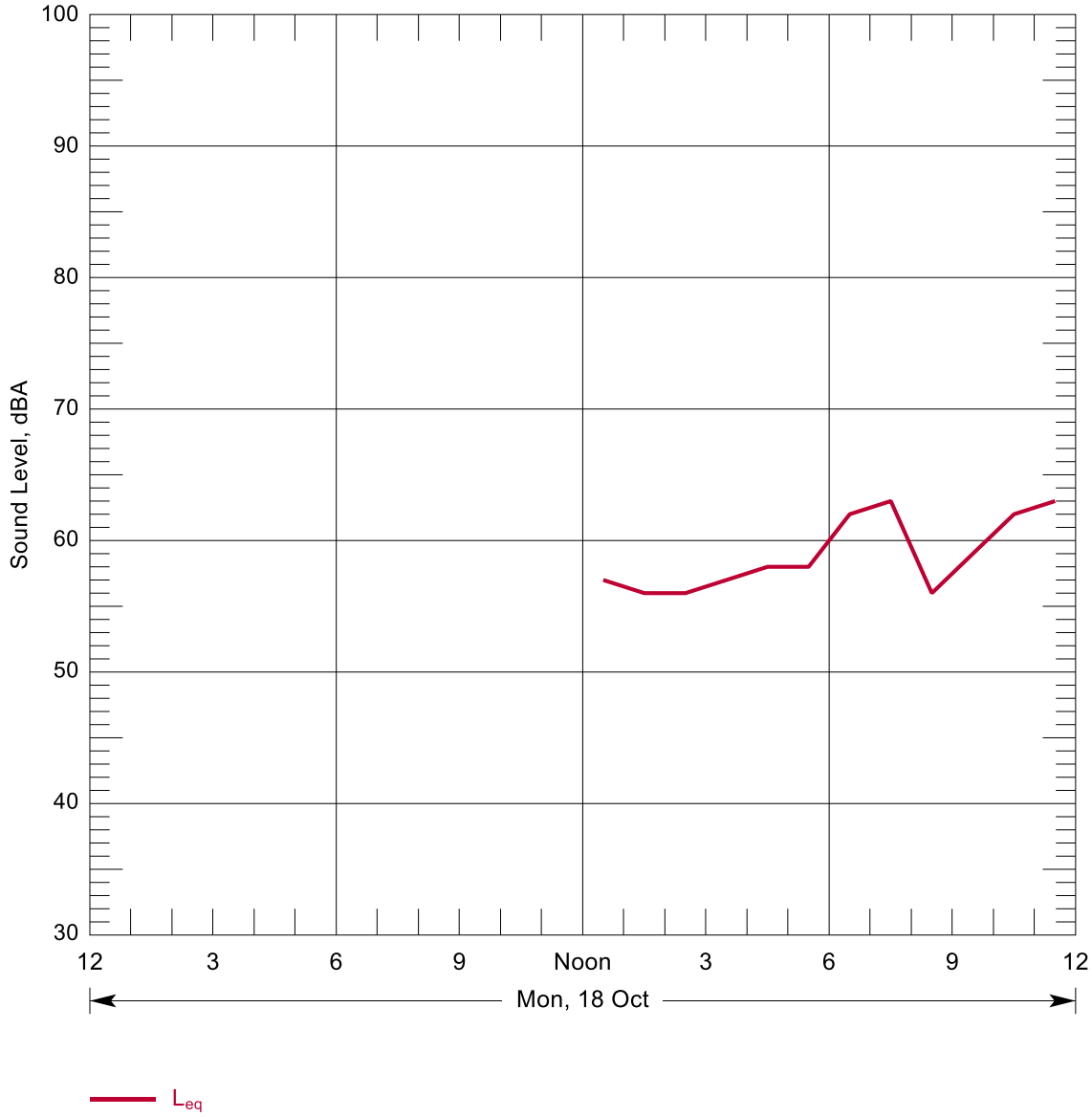
Source: Parsons Transportation 2010

Figure B-106: Hourly Summary of Noise Levels Measured at N107 on 19 Oct, 2010



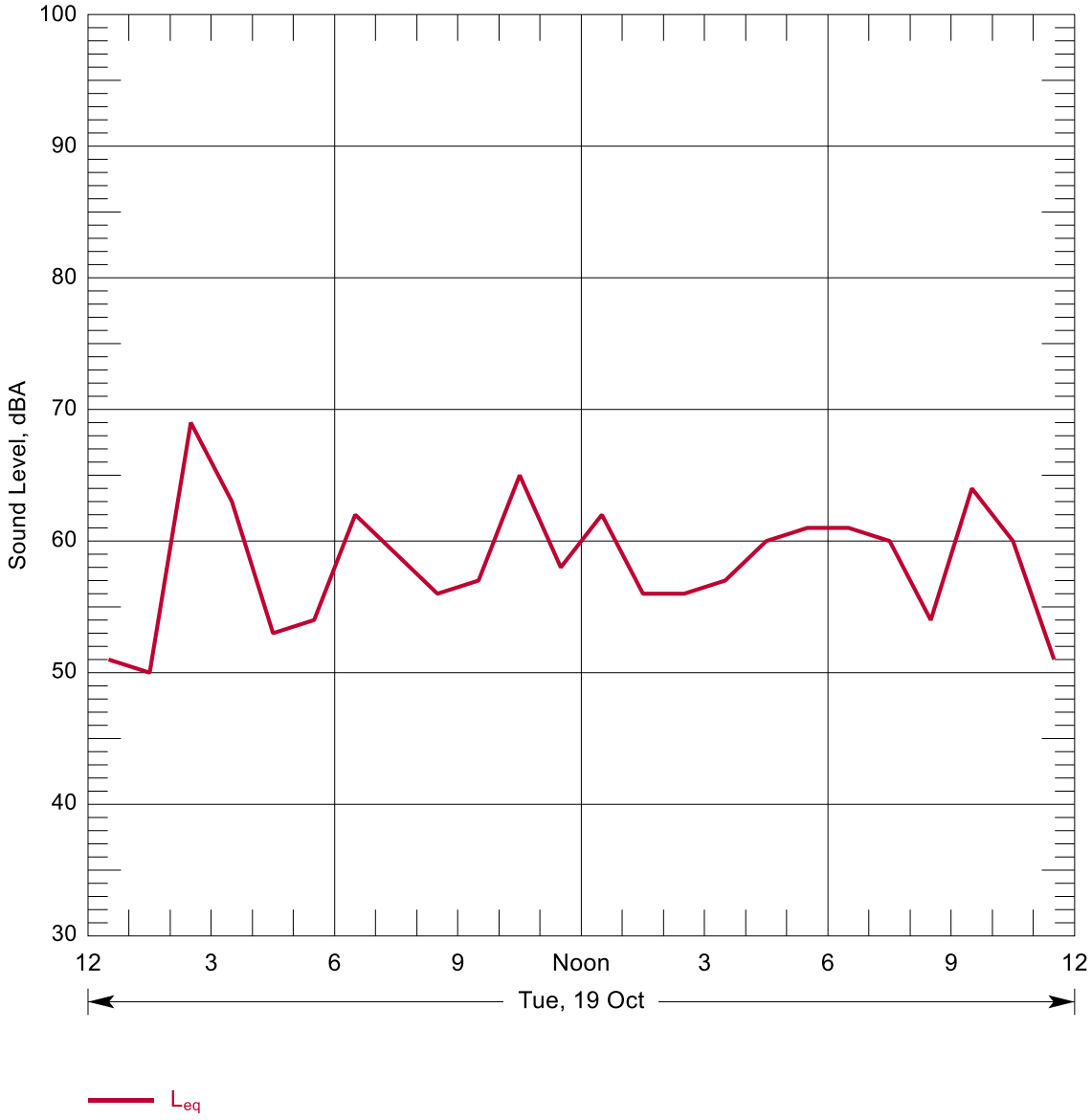
Source: Parsons Transportation 2010

Figure B-107: Hourly Summary of Noise Levels Measured at N107 on 20 Oct, 2010



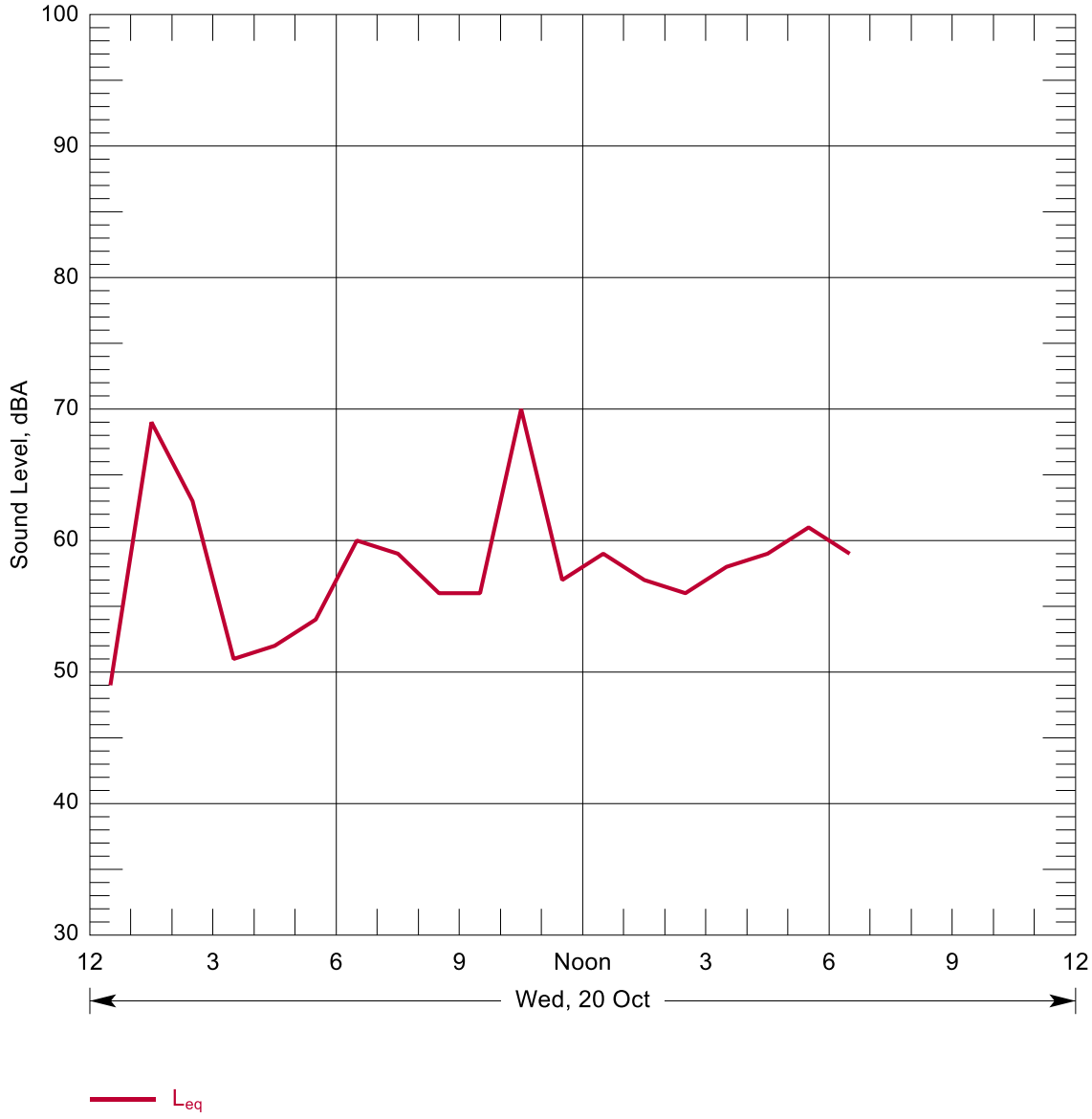
Source: Parsons Transportation 2010

Figure B-108: Hourly Summary of Noise Levels Measured at N108 on 18 Oct, 2010



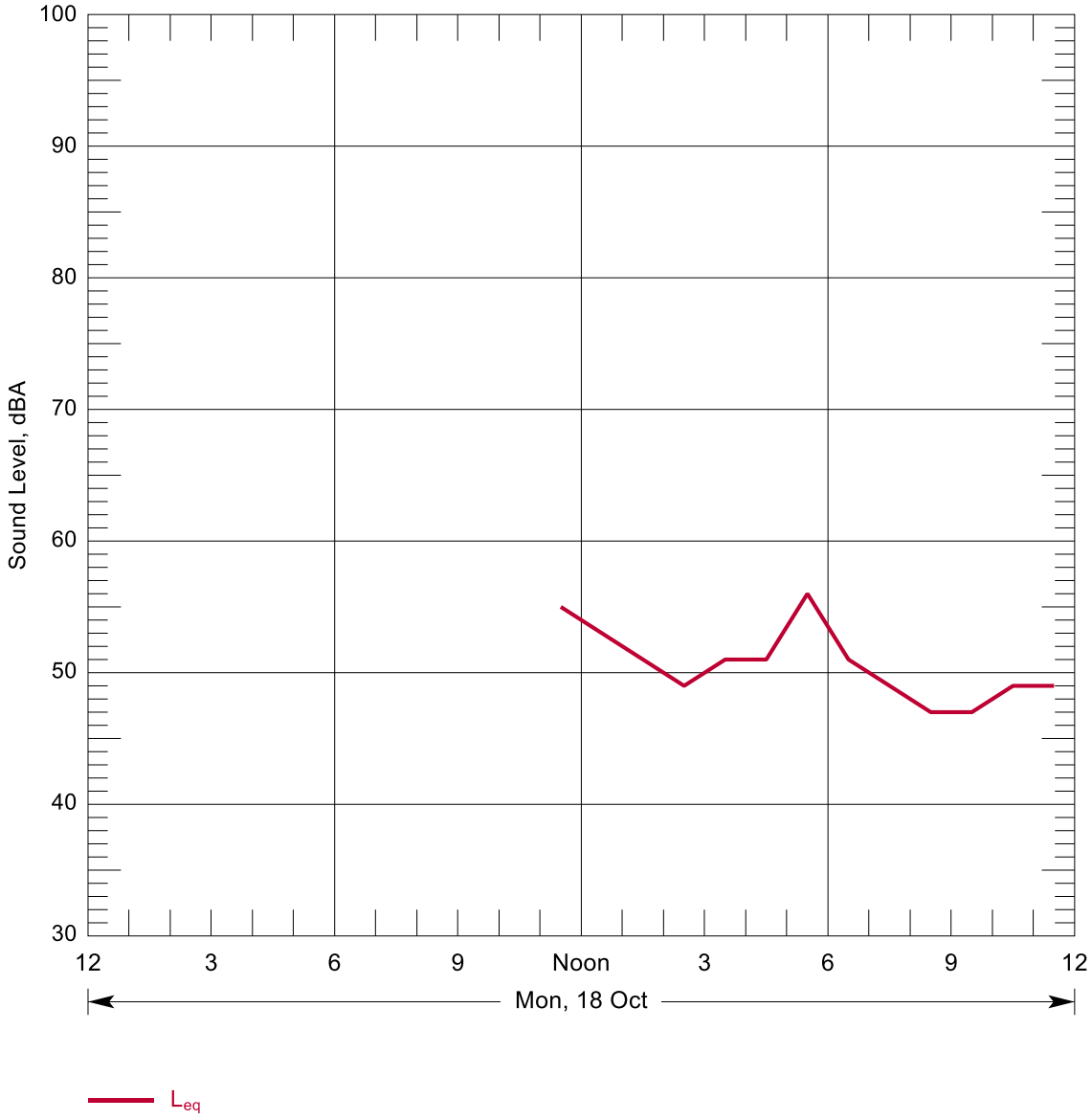
Source: Parsons Transportation 2010

Figure B-109: Hourly Summary of Noise Levels Measured at N108 on 19 Oct, 2010



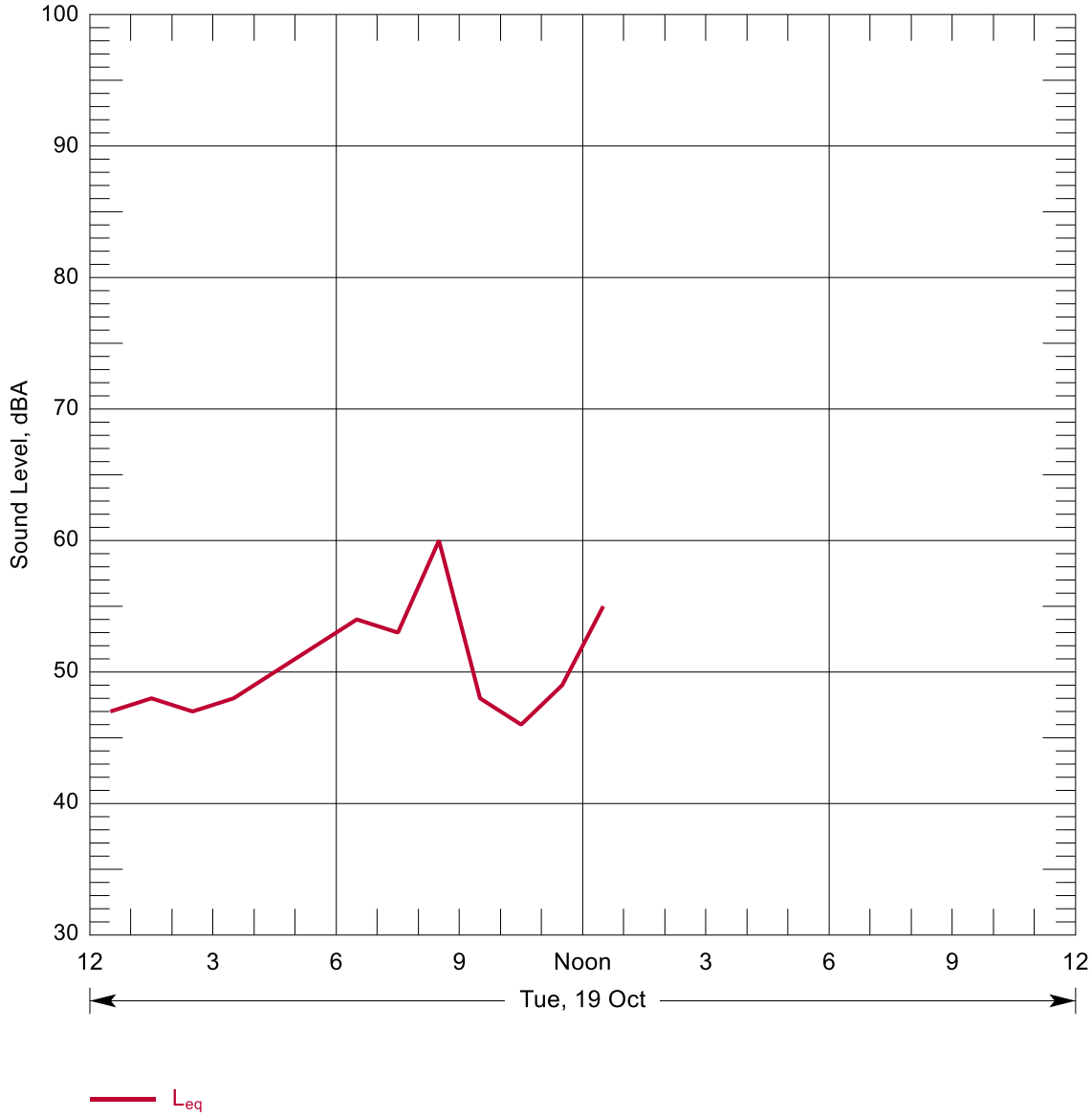
Source: Parsons Transportation 2010

Figure B-110: Hourly Summary of Noise Levels Measured at N108 on 20 Oct, 2010



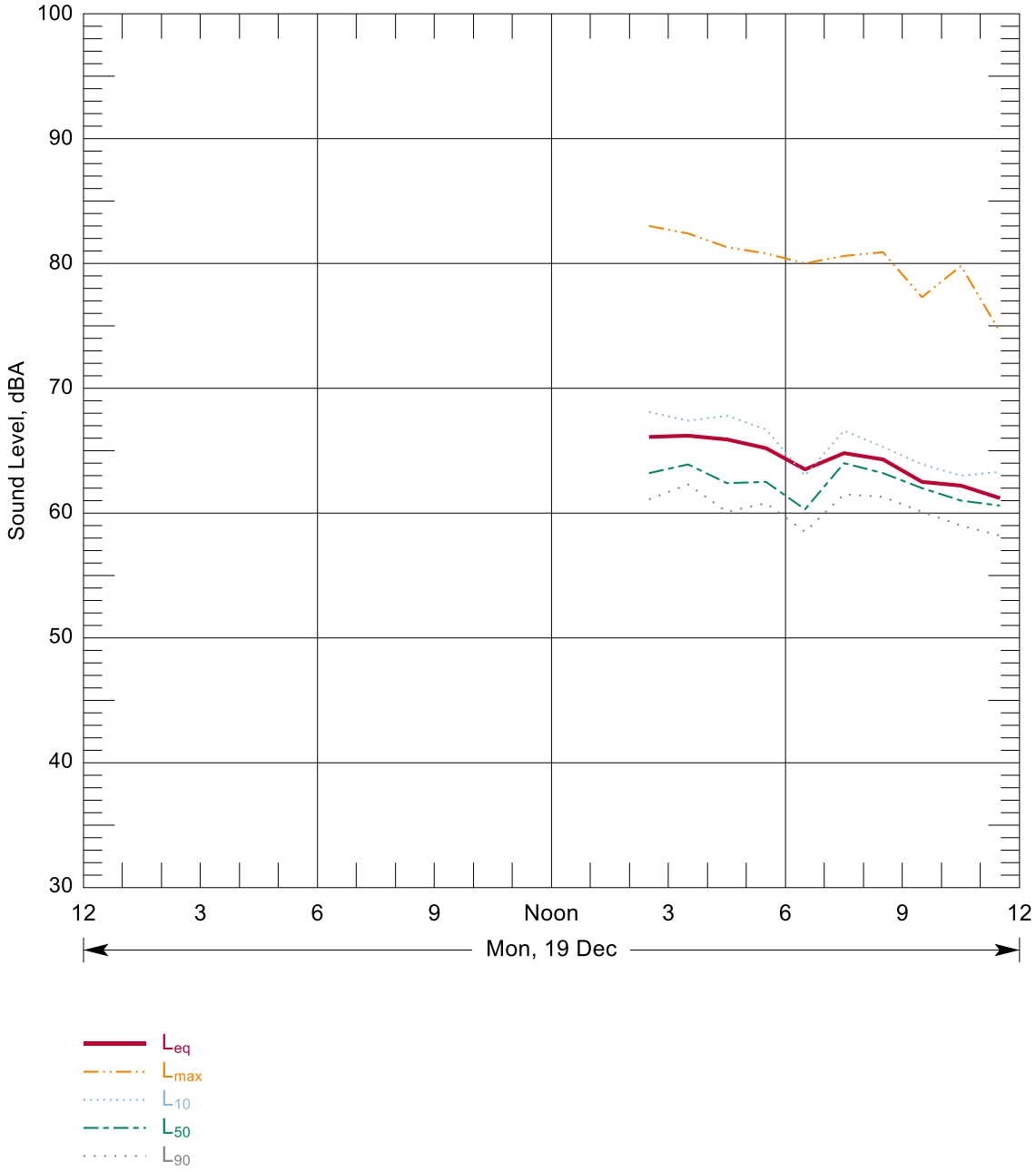
Source: Parsons Transportation 2010

Figure B-111: Hourly Summary of Noise Levels Measured at N109 on 18 Oct, 2010



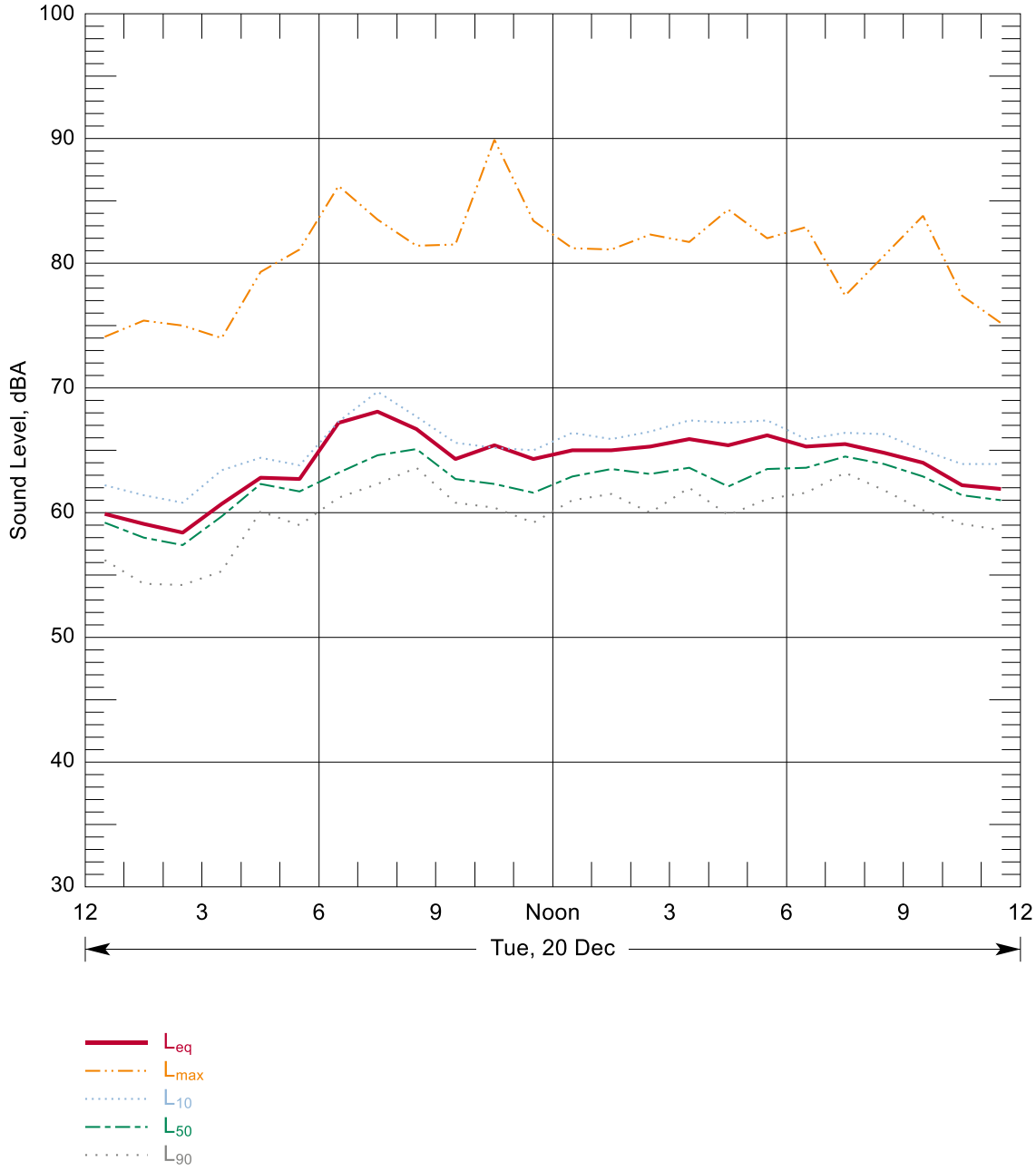
Source: Parsons Transportation 2010

Figure B-112: Hourly Summary of Noise Levels Measured at N109 on 19 Oct, 2010



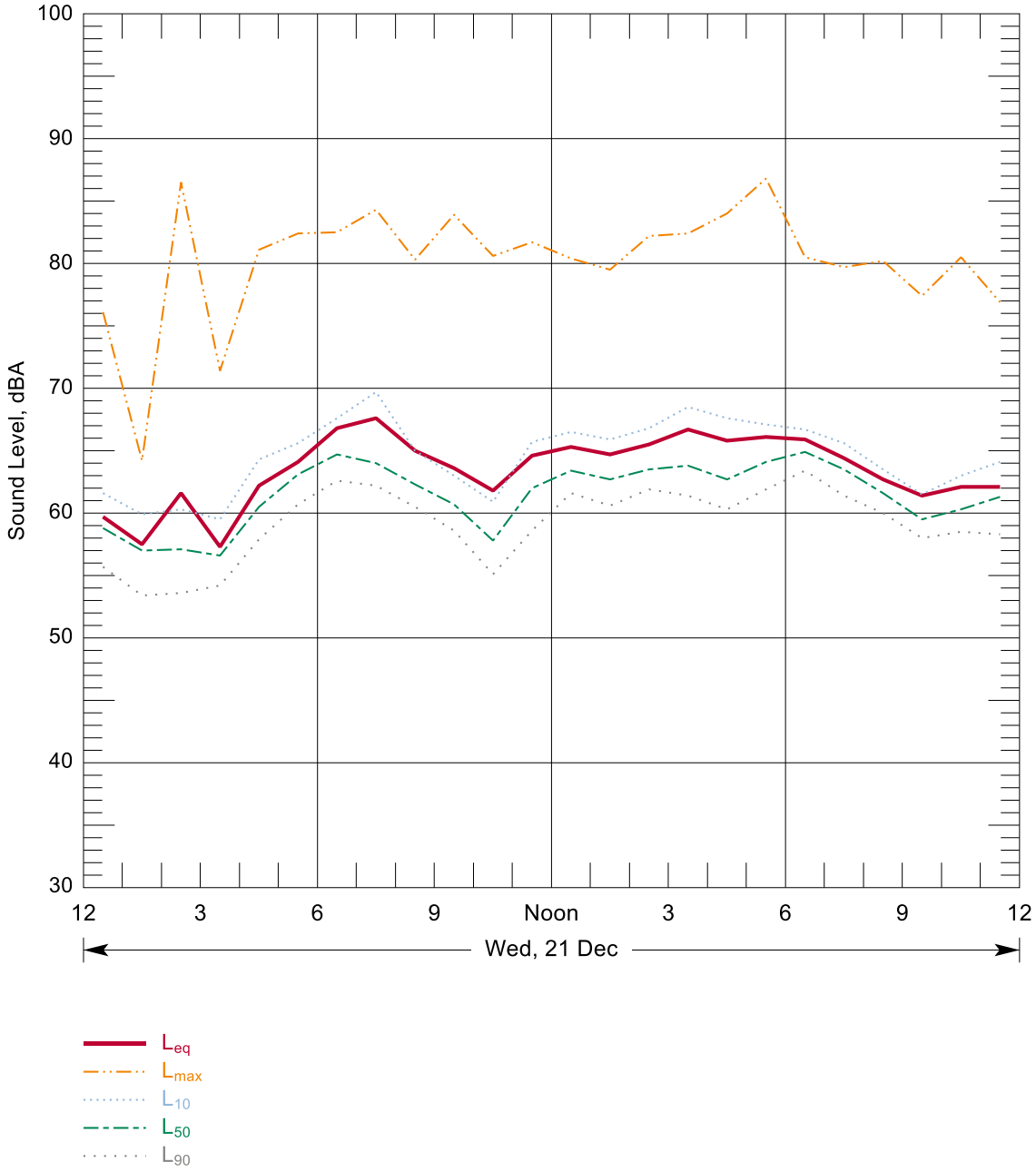
Source: Wilson Ihrig 2016

Figure B-113: Hourly Summary of Noise Levels Measured at N110 on 19 Dec, 2016



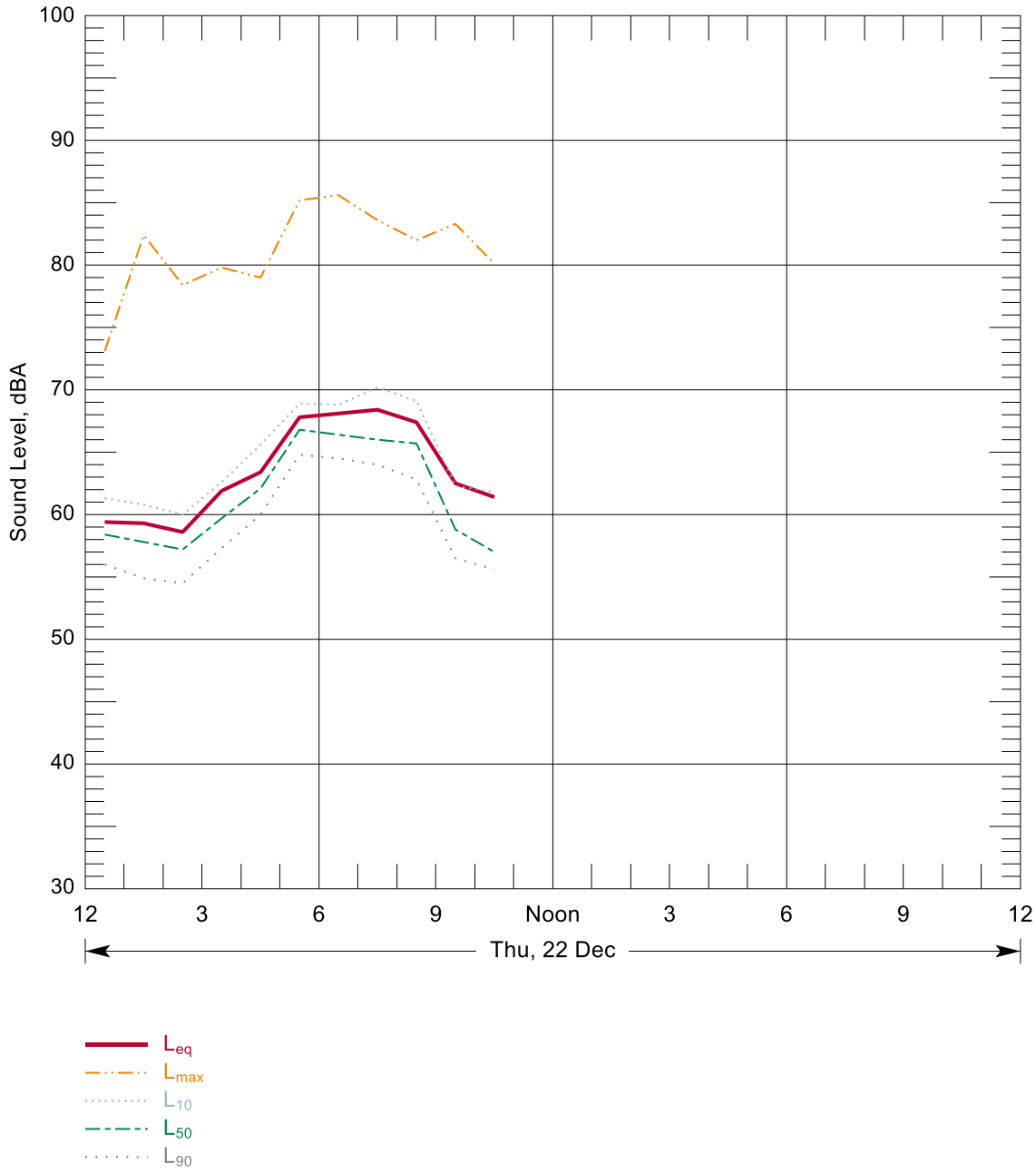
Source: Wilson Ihrig 2016

Figure B-114: Hourly Summary of Noise Levels Measured at N110 on 20 Dec, 2016



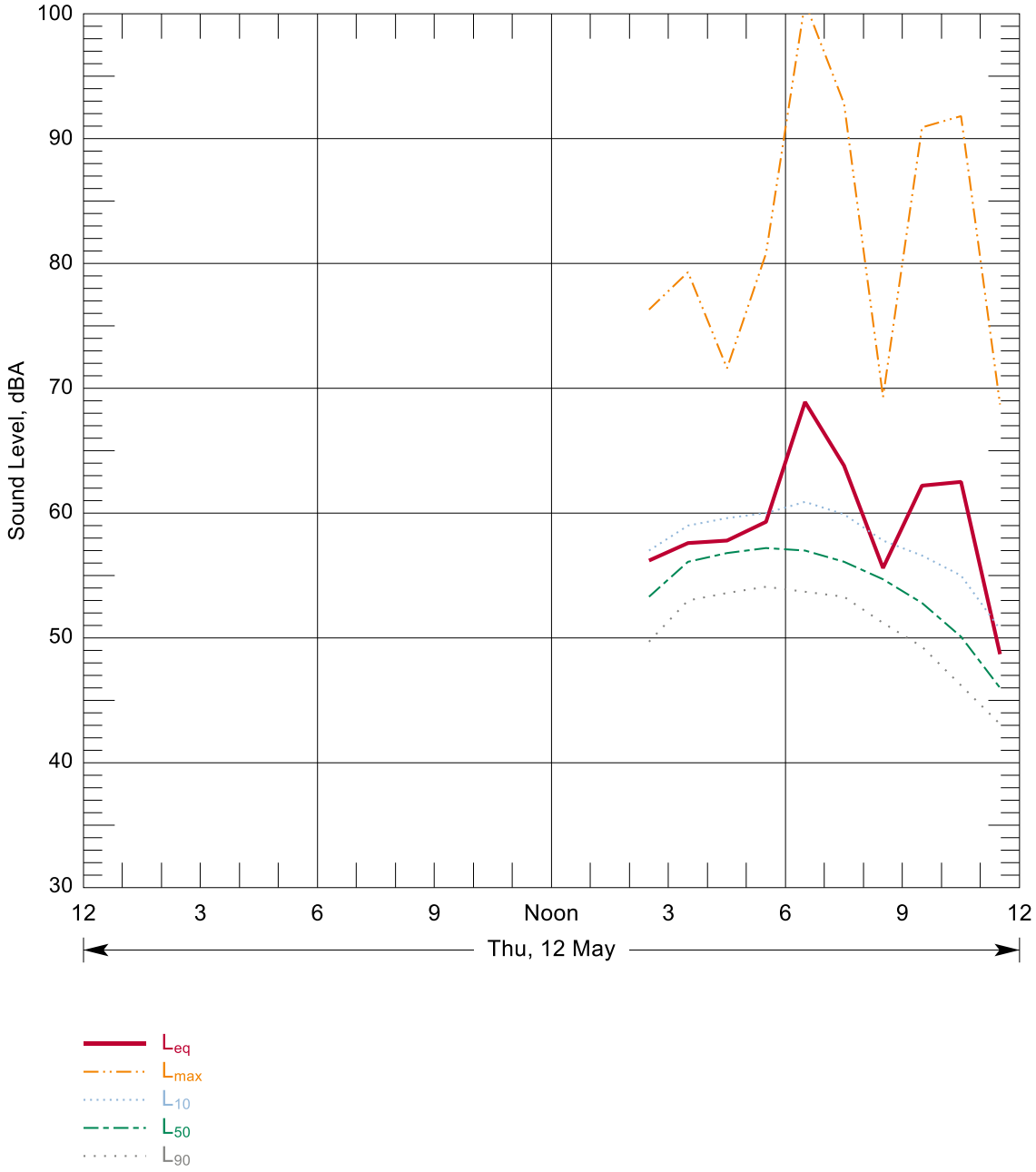
Source: Wilson Ihrig 2016

Figure B-115: Hourly Summary of Noise Levels Measured at N110 on 21 Dec, 2016



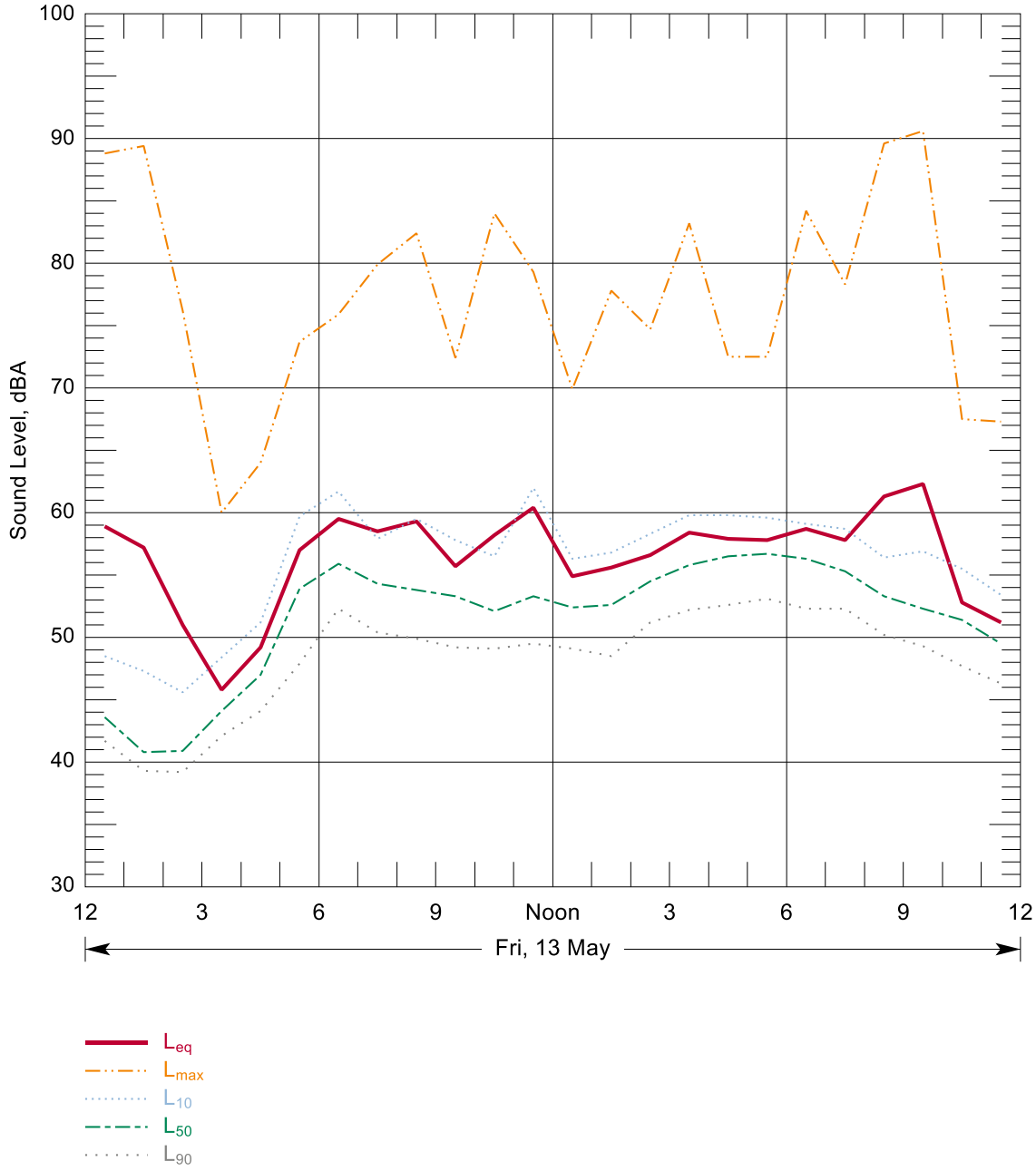
Source: Wilson Ihrig 2016

Figure B-116: Hourly Summary of Noise Levels Measured at N110 on 22 Dec, 2016



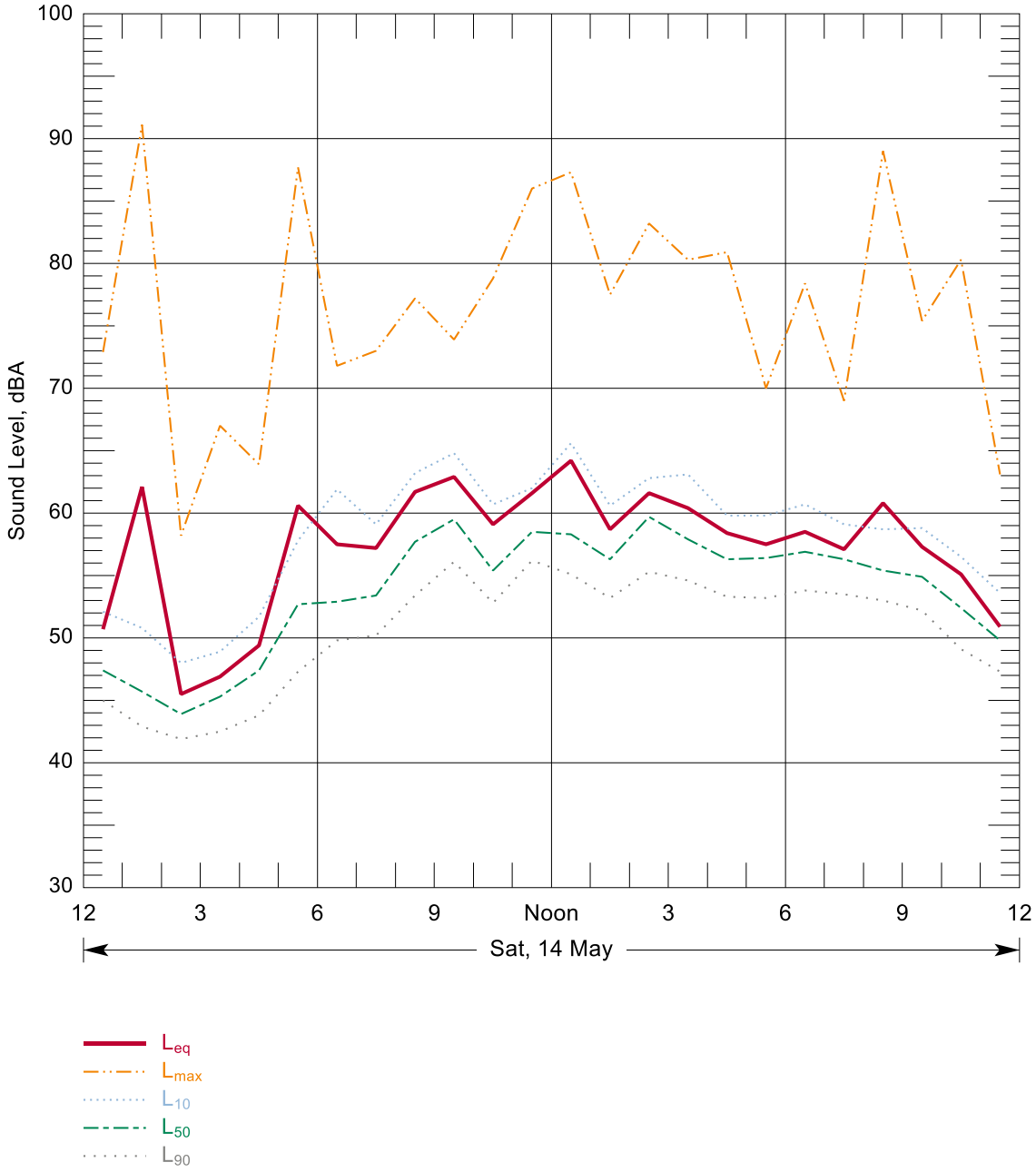
Source: Wilson Ihrig 2016

Figure B-117: Hourly Summary of Noise Levels Measured at N111 on 12 May, 2016



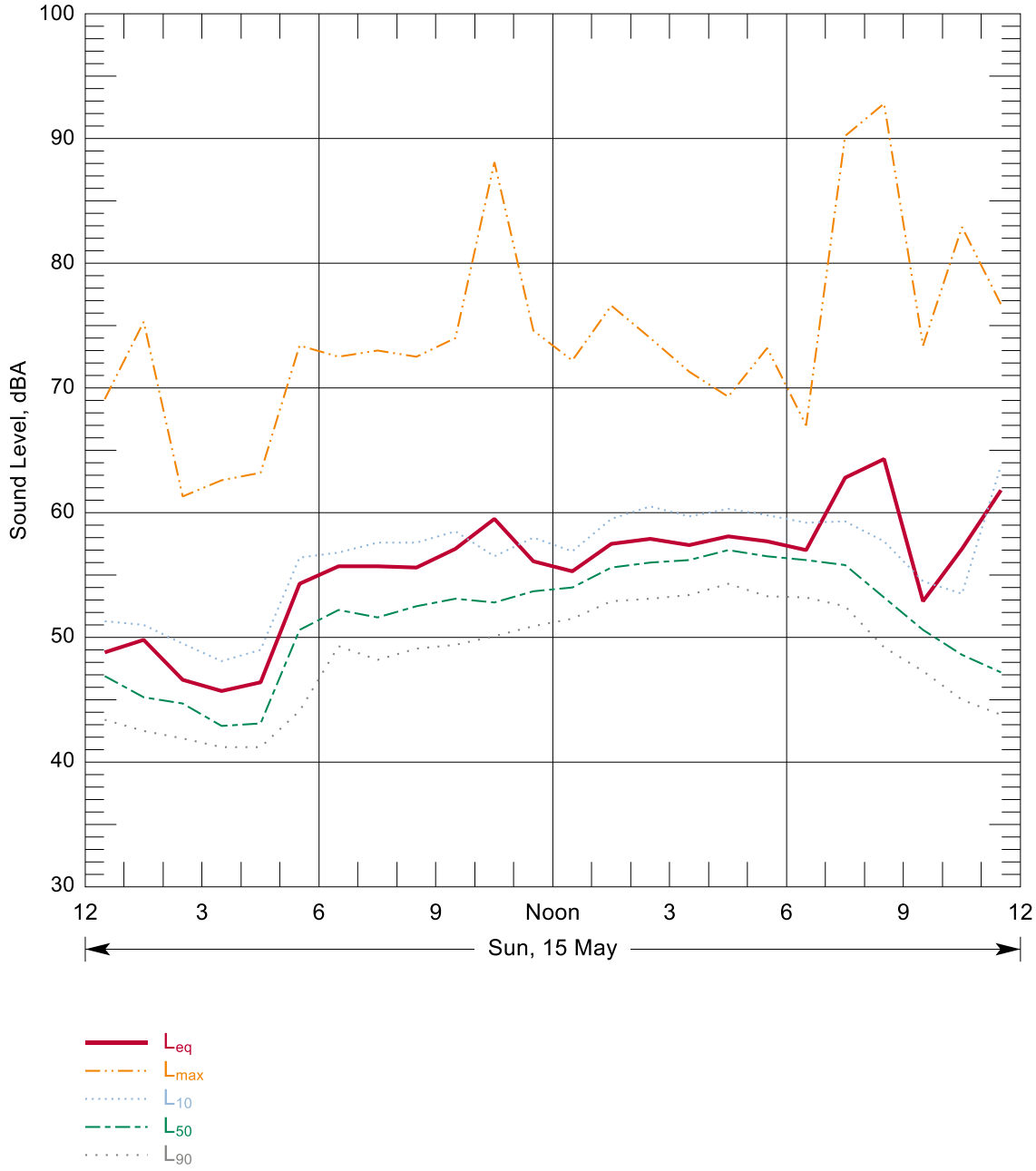
Source: Wilson Ihrig 2016

Figure B-118: Hourly Summary of Noise Levels Measured at N111 on 13 May, 2016



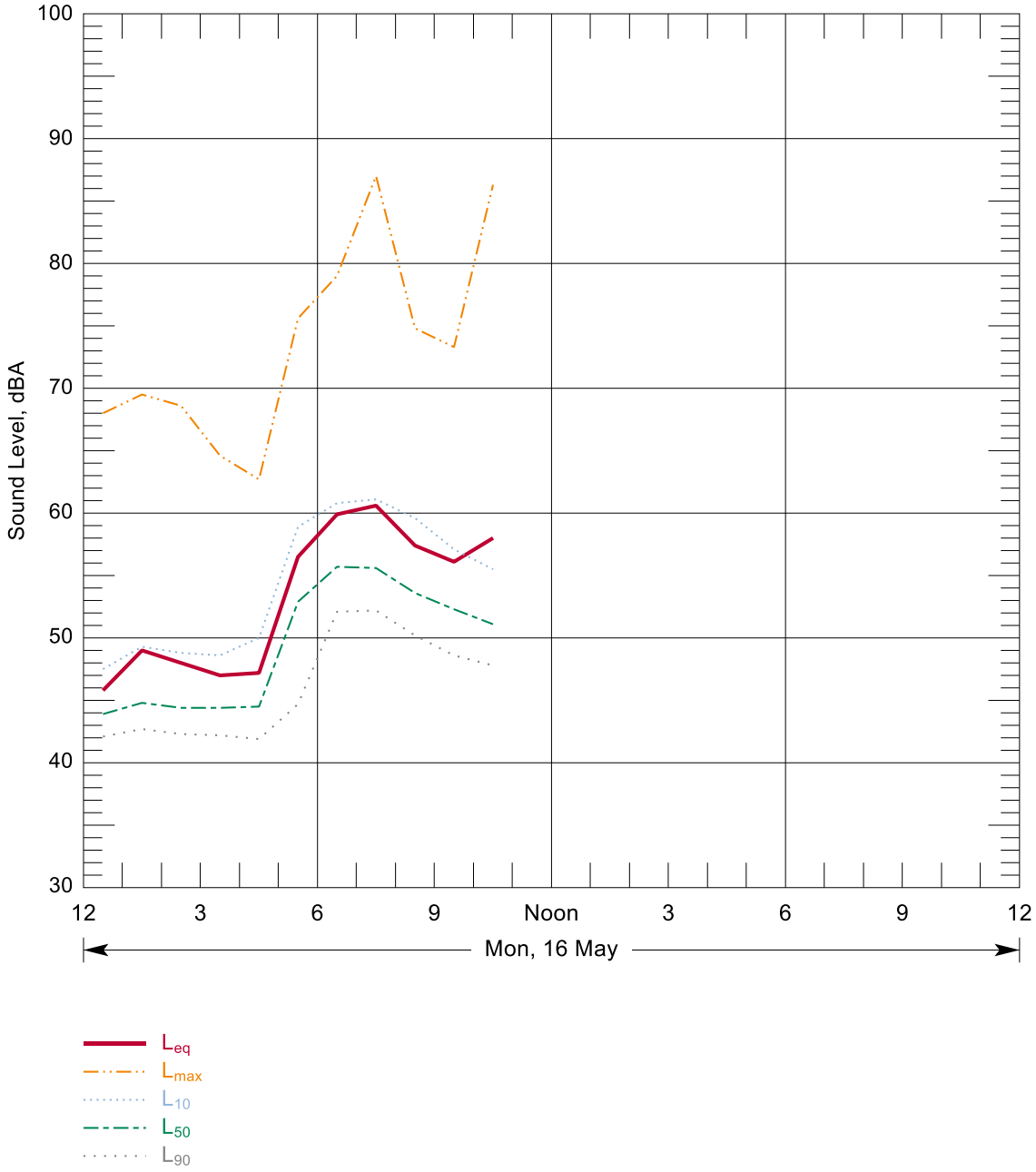
Source: Wilson Ihrig 2016

Figure B-119: Hourly Summary of Noise Levels Measured at N111 on 14 May, 2016



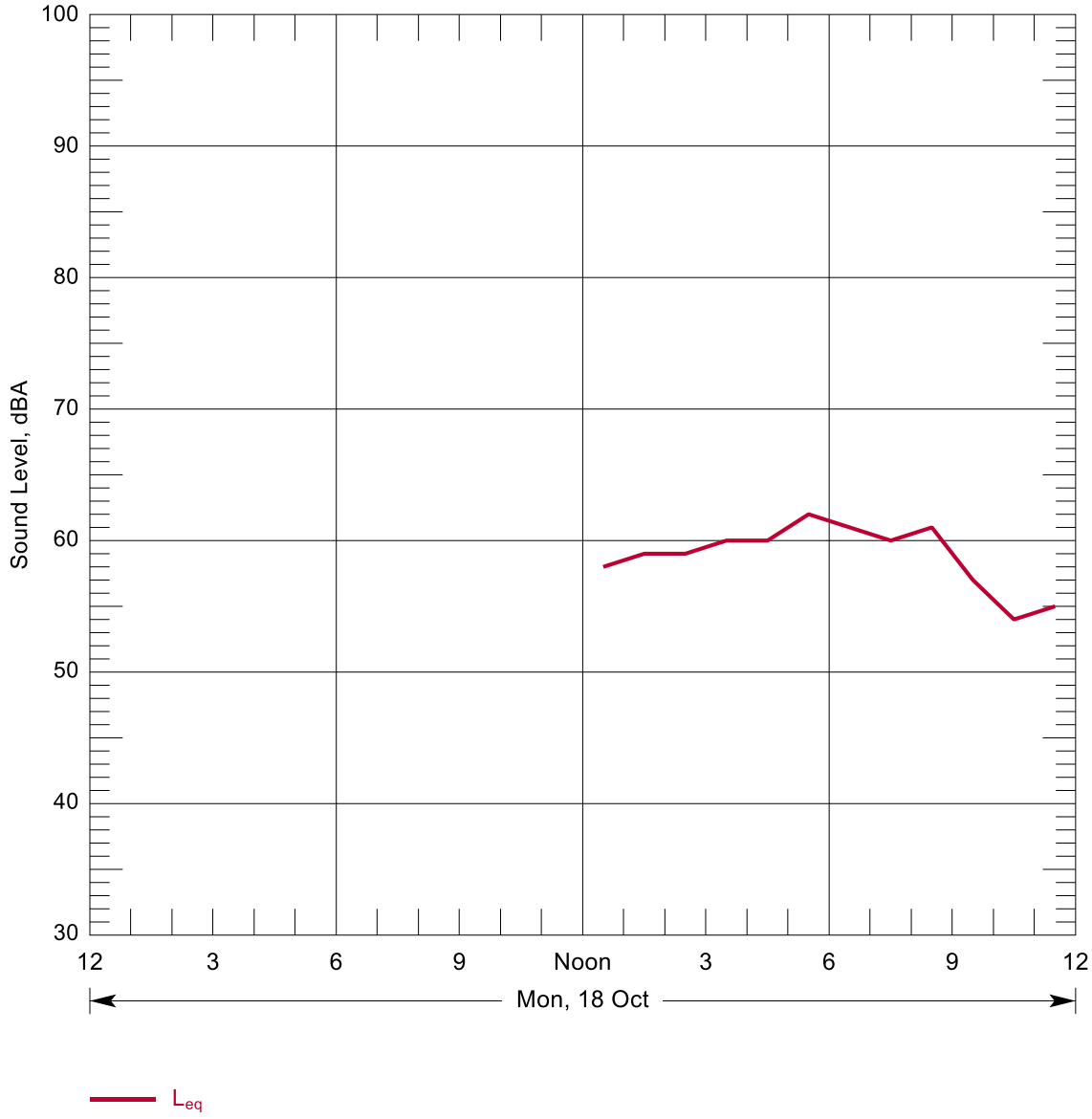
Source: Wilson Ihrig 2016

Figure B-120: Hourly Summary of Noise Levels Measured at N111 on 15 May, 2016



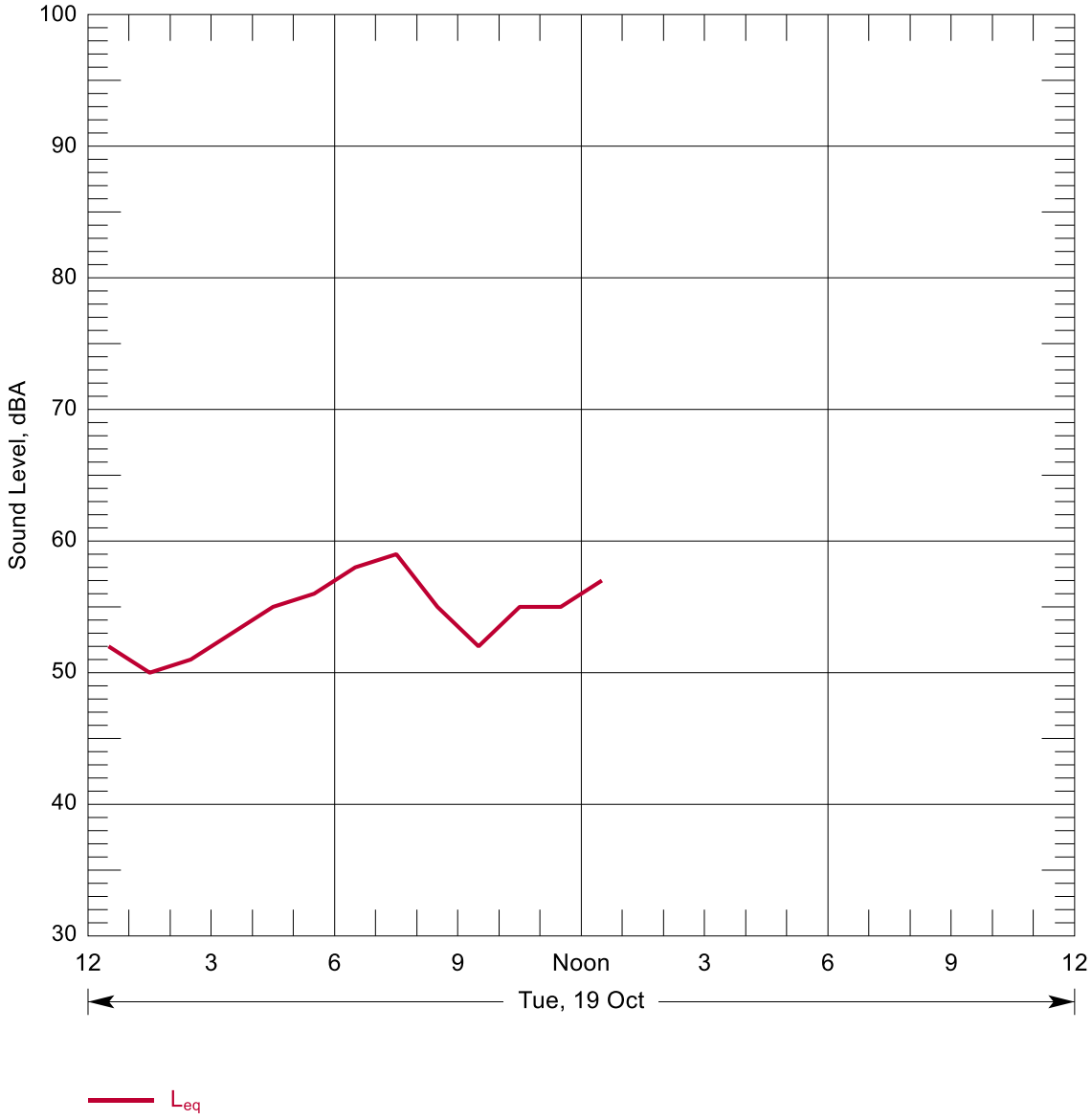
Source: Wilson Ihrig 2016

Figure B-121: Hourly Summary of Noise Levels Measured at N111 on 16 May, 2016



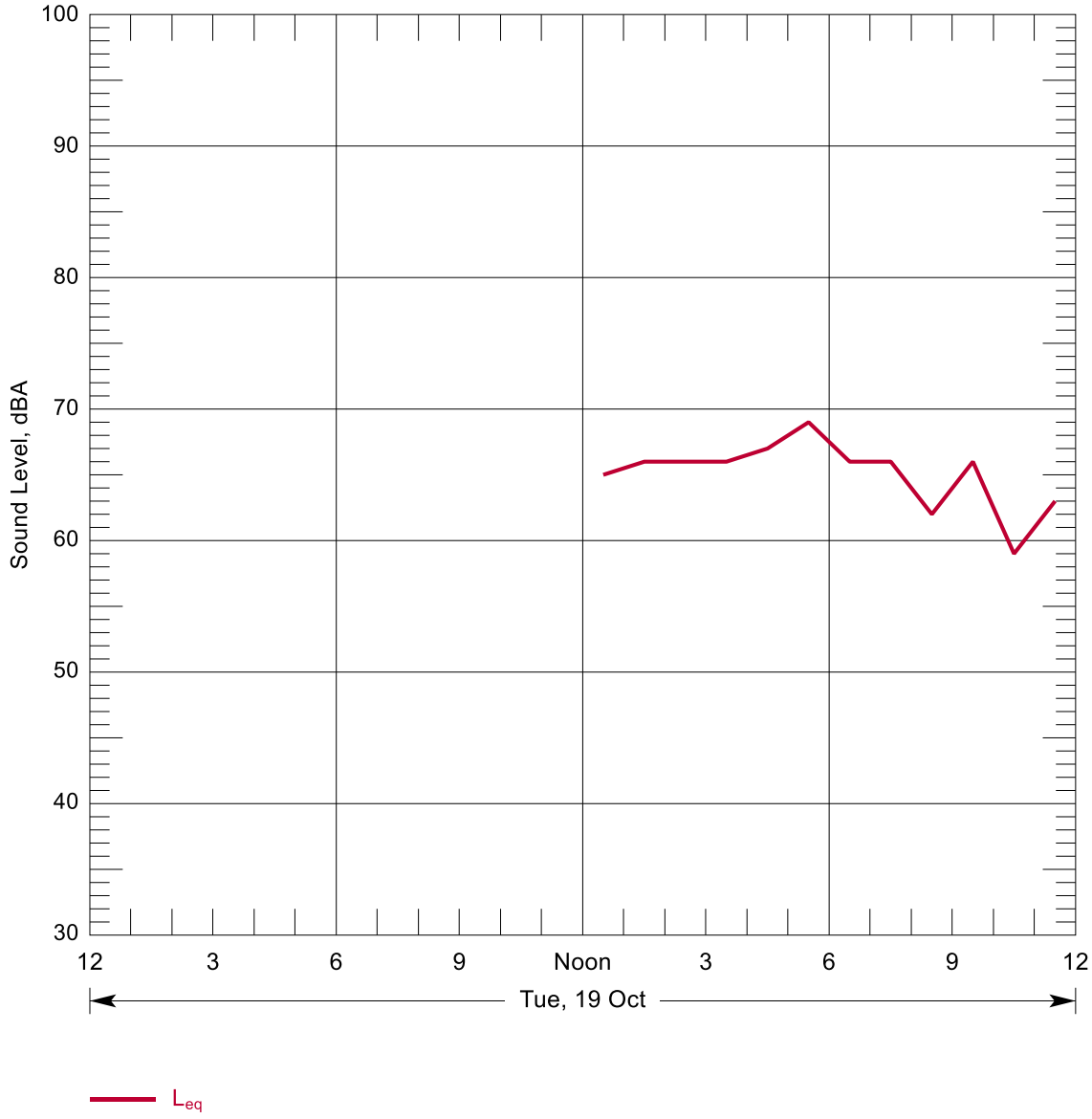
Source: Parsons Transportation 2010

Figure B-122: Hourly Summary of Noise Levels Measured at N112 on 18 Oct, 2010



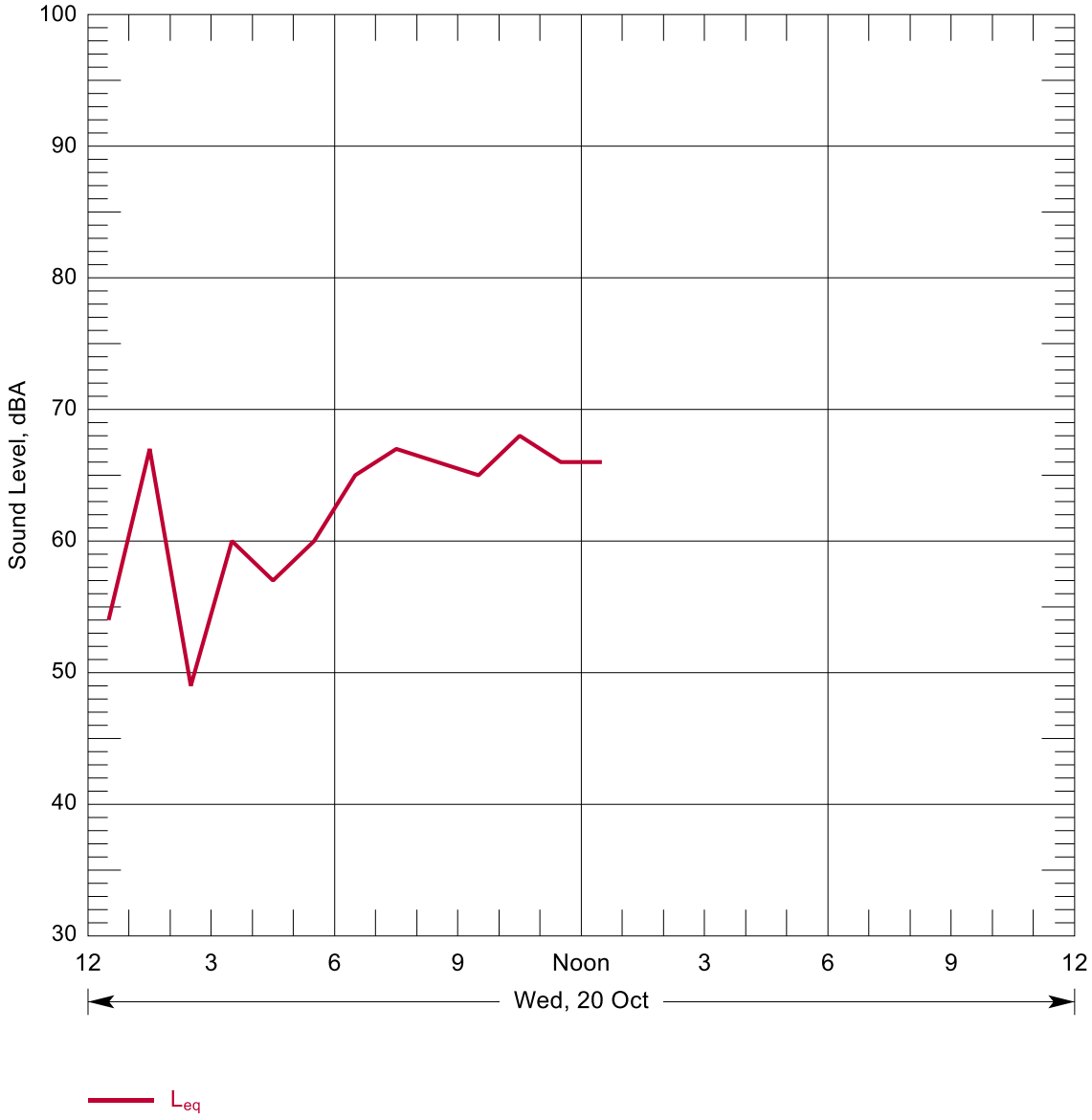
Source: Parsons Transportation 2010

Figure B-123: Hourly Summary of Noise Levels Measured at N112 on 19 Oct, 2010



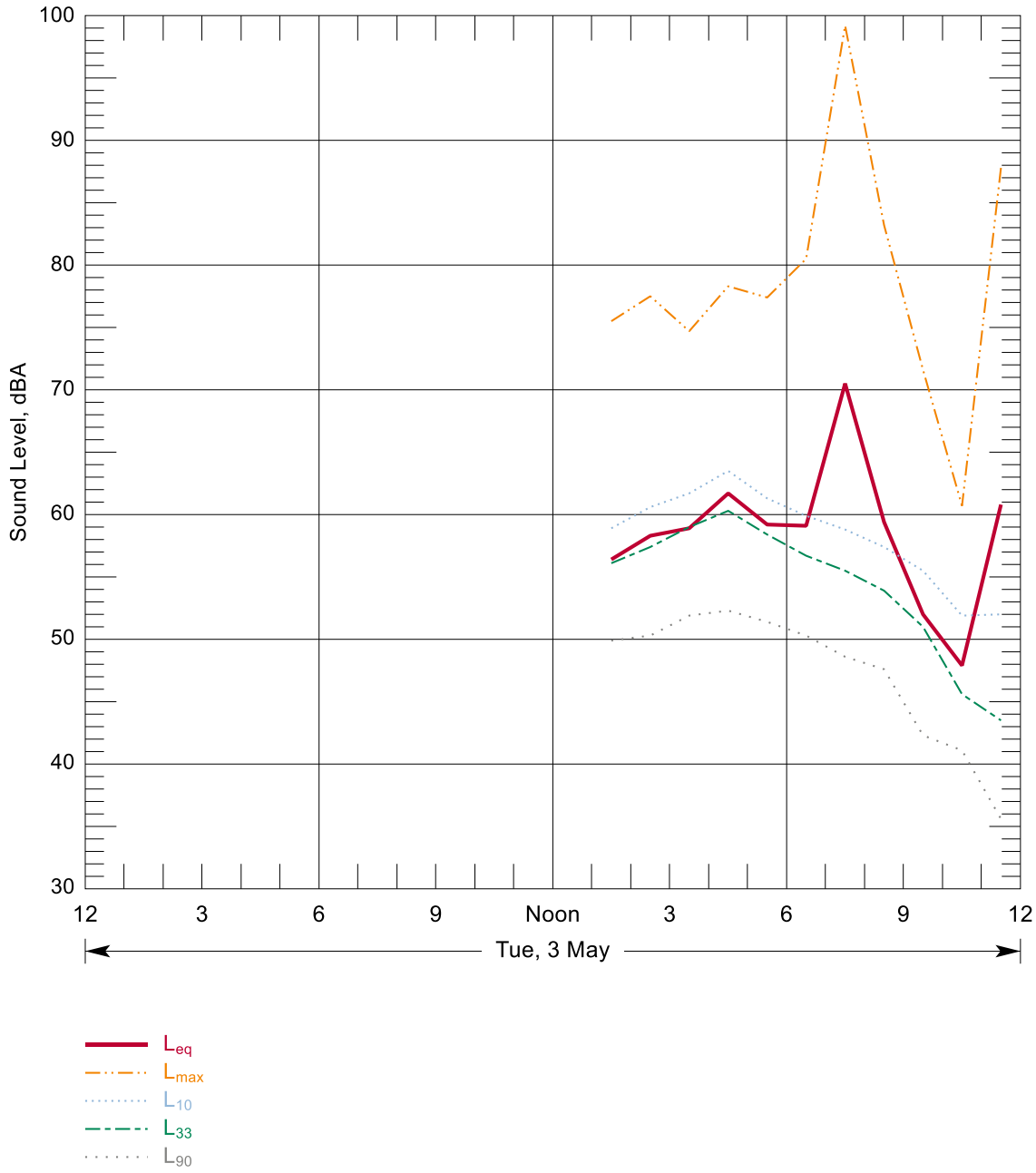
Source: Parsons Transportation 2010

Figure B-124: Hourly Summary of Noise Levels Measured at N113 on 19 Oct, 2010



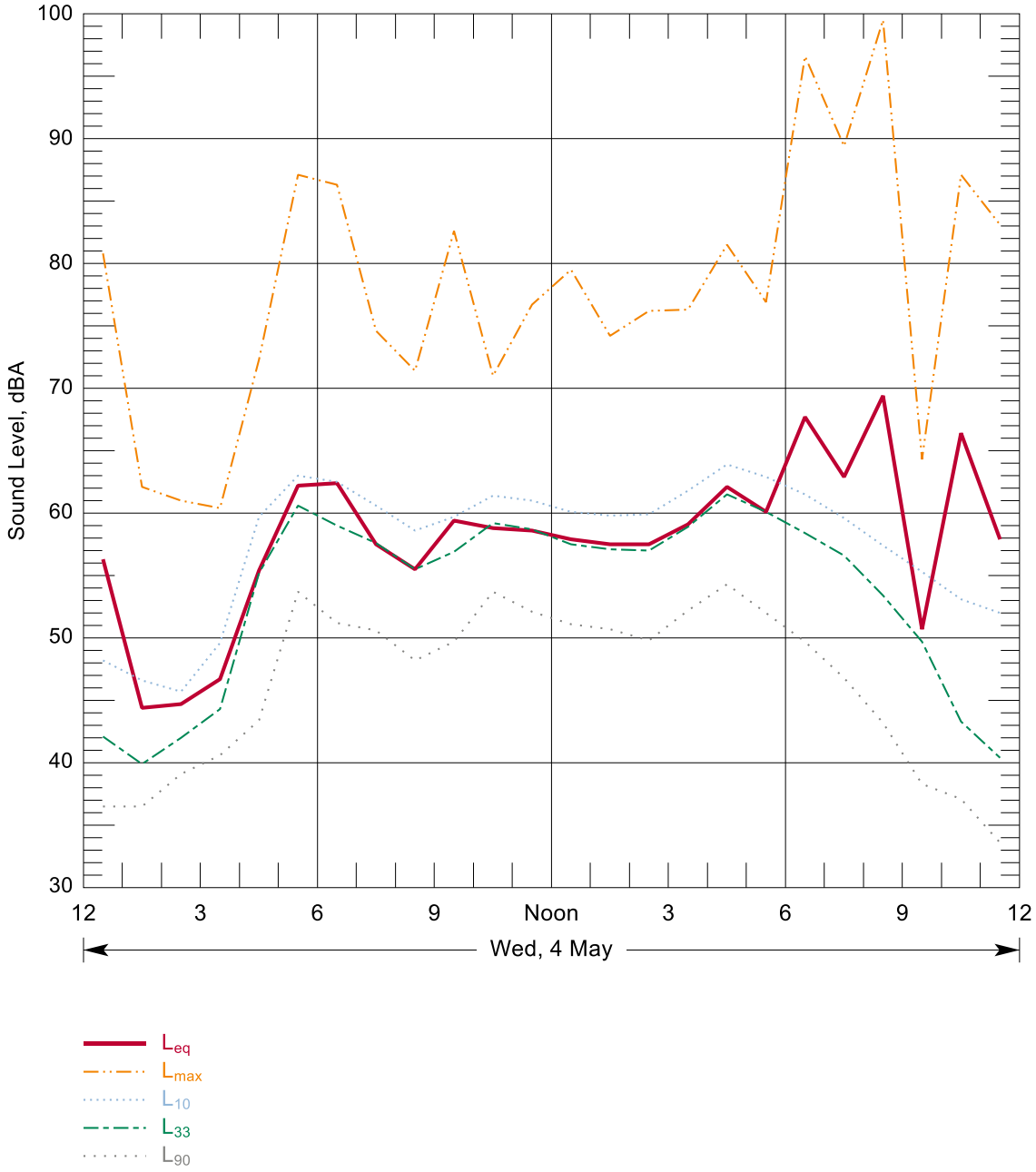
Source:

Figure B-125: Hourly Summary of Noise Levels Measured at N113 on 20 Oct, 2010



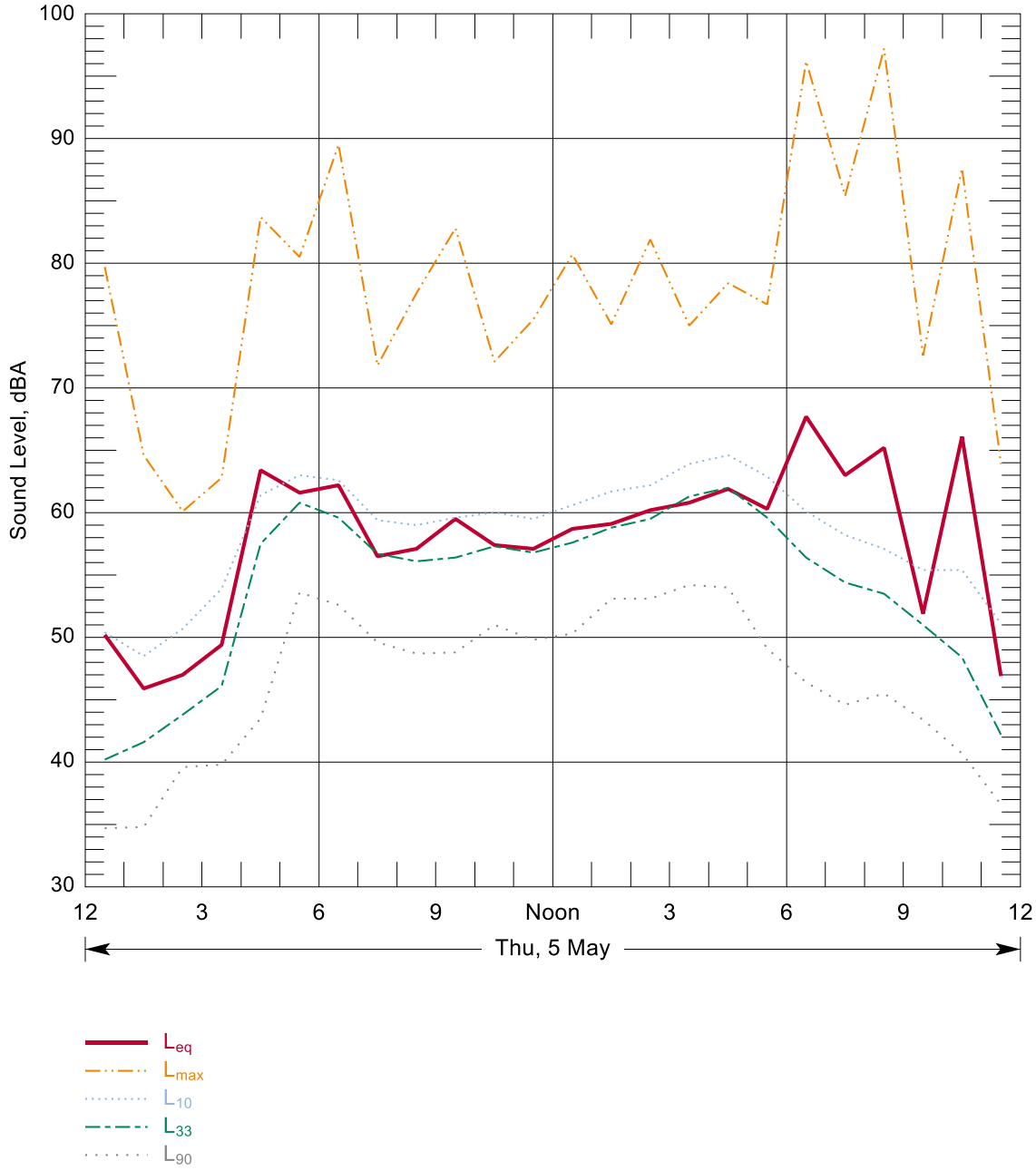
Source: Parsons Transportation 2010

Figure B-126: Hourly Summary of Noise Levels Measured at N114 on 03 May, 2016



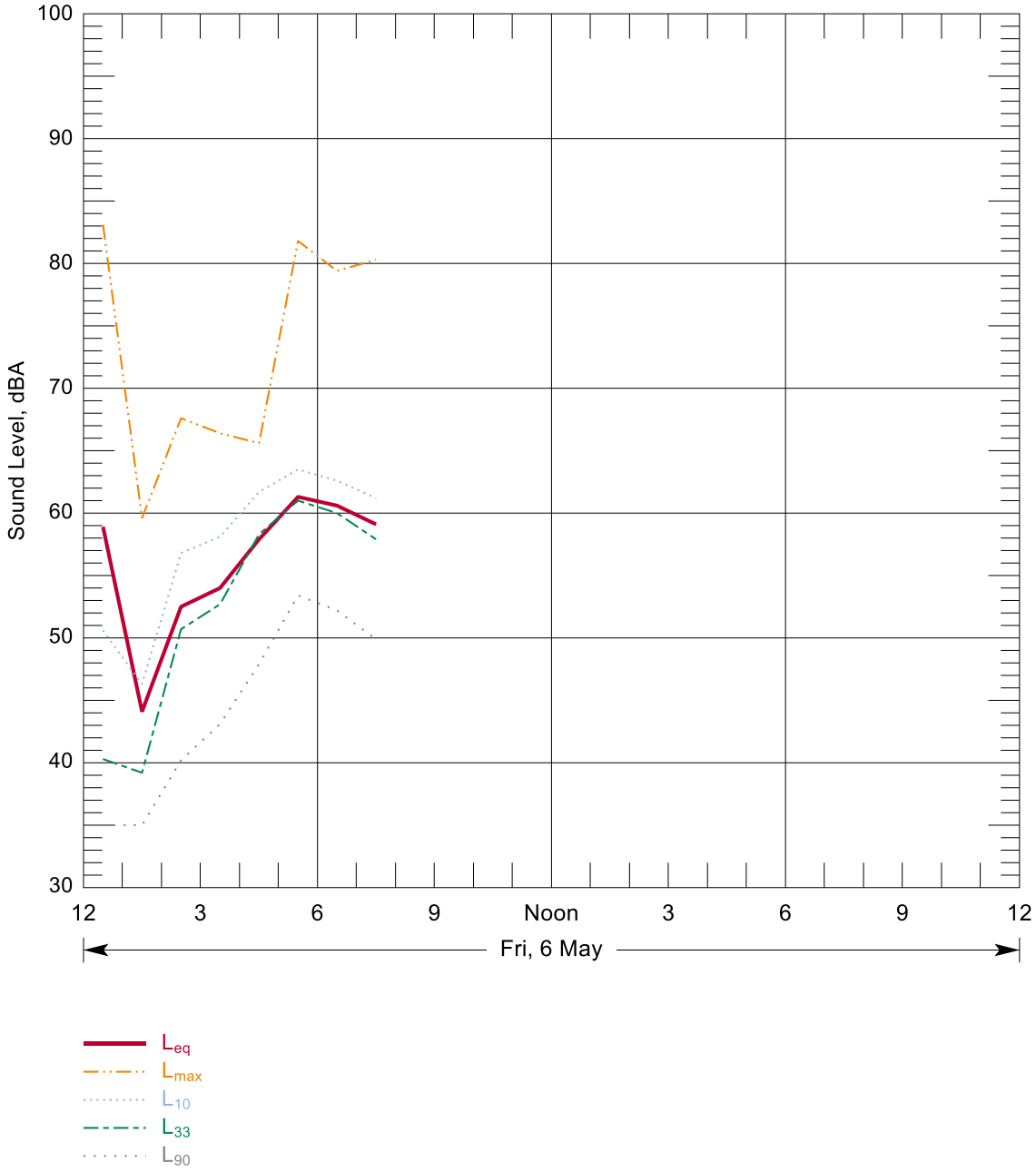
Source: Wilson Ihrig 2016

Figure B-127: Hourly Summary of Noise Levels Measured at N114 on 04 May, 2016



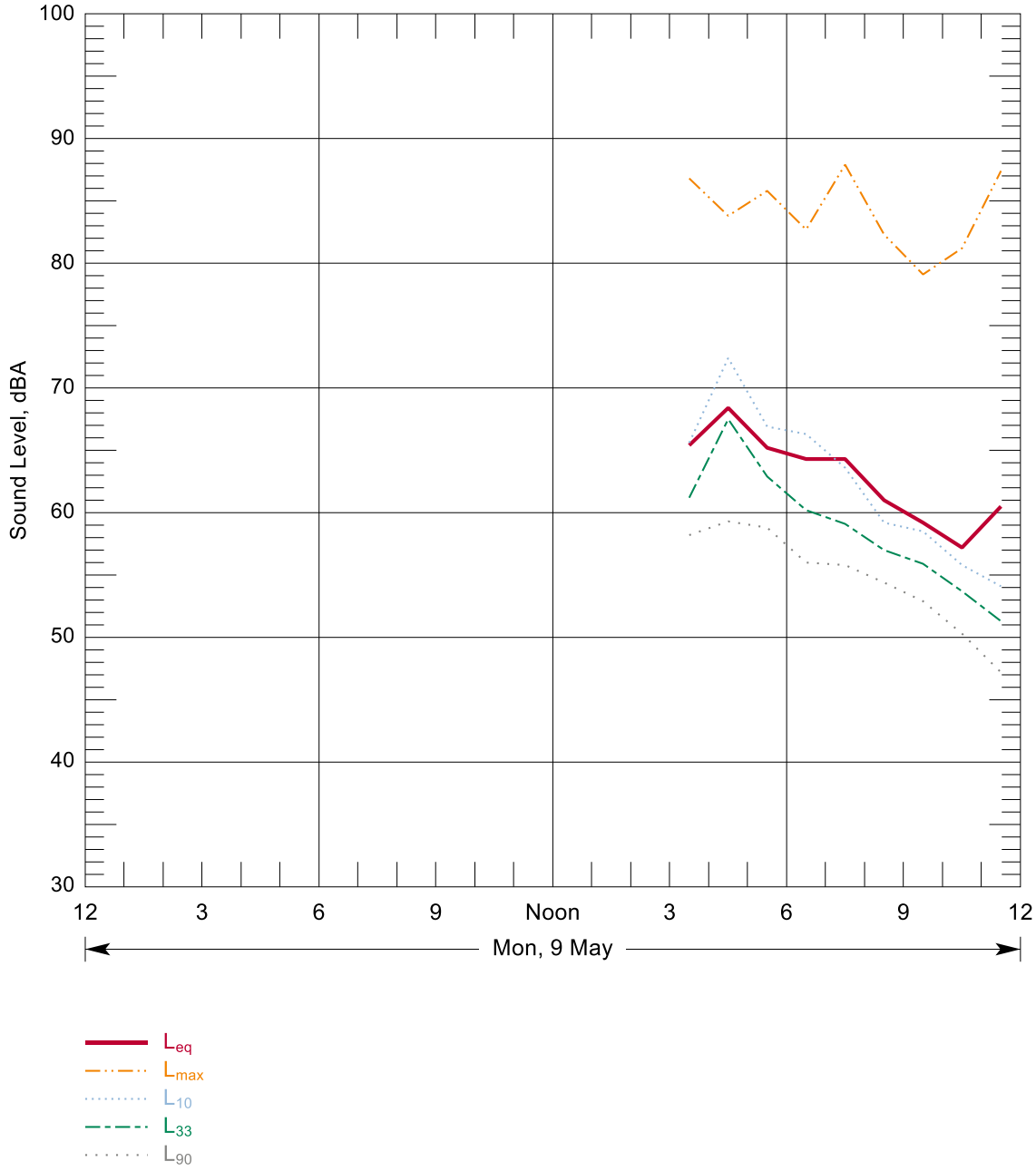
Source: Wilson Ihrig 2016

Figure B-128: Hourly Summary of Noise Levels Measured at N114 on 05 May, 2016



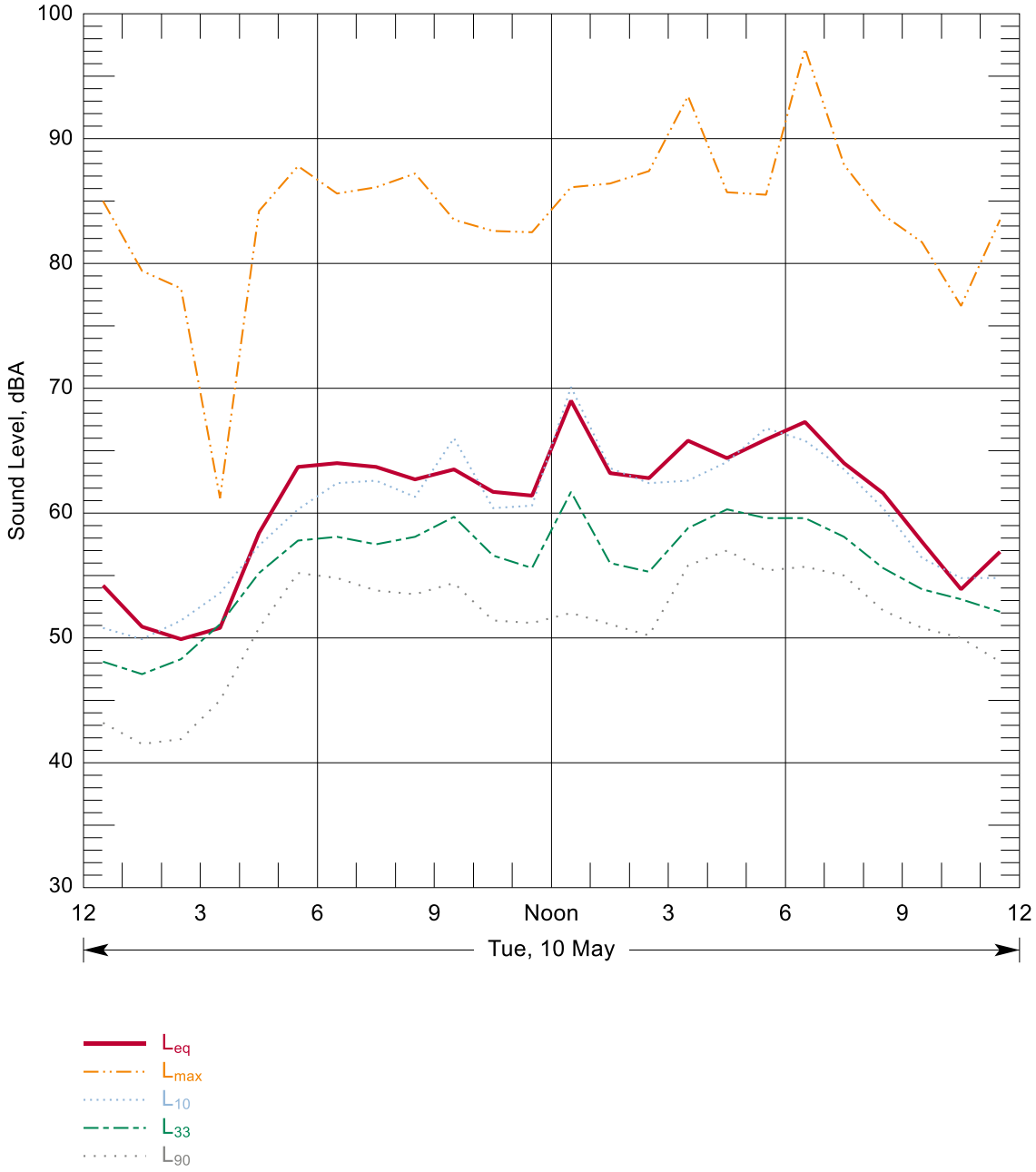
Source: Wilson Ihrig 2016

Figure B-129: Hourly Summary of Noise Levels Measured at N114 on 06 May, 2016



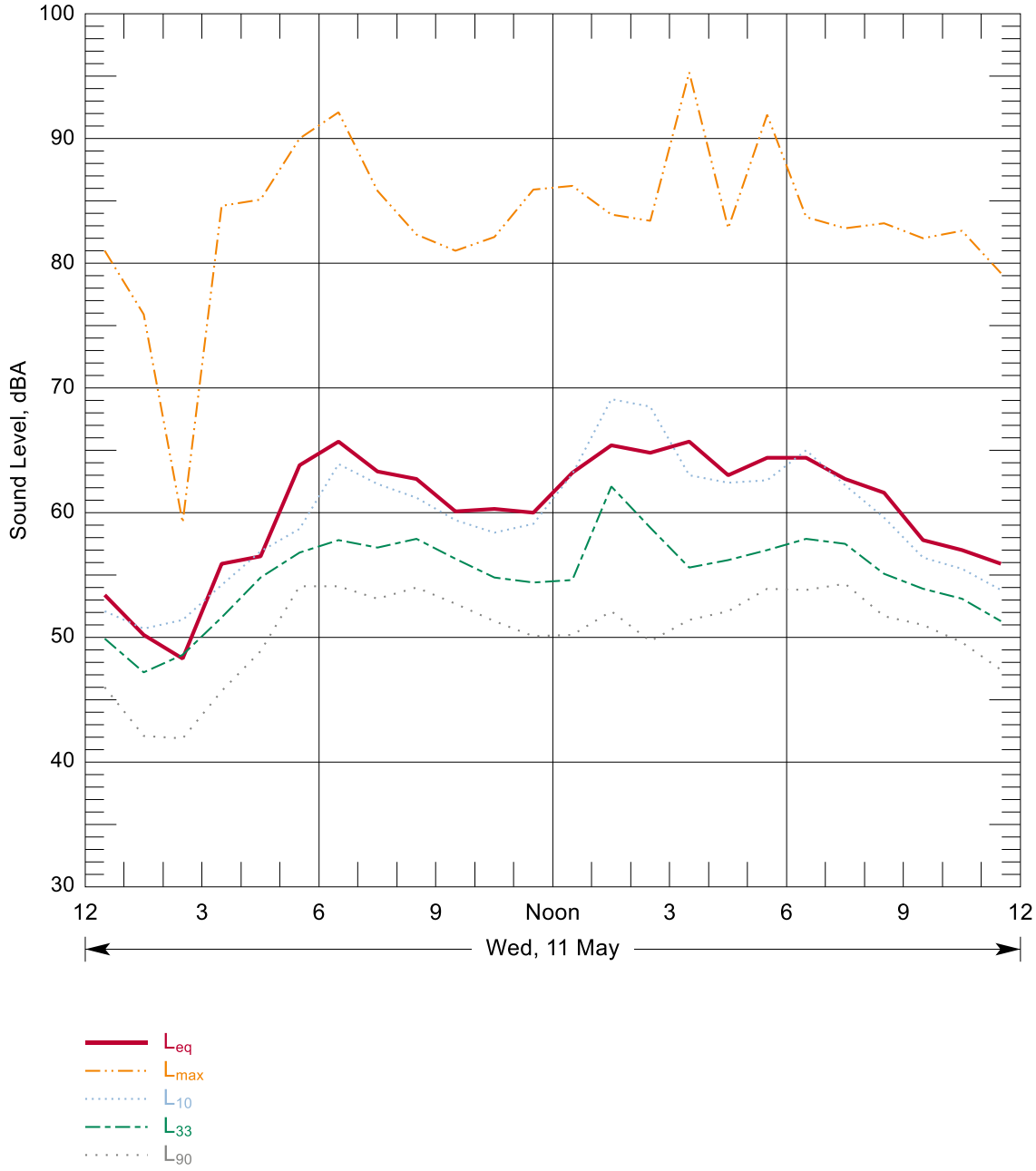
Source: Wilson Ihrig 2016

Figure B-130: Hourly Summary of Noise Levels Measured at N115 on 09 May, 2016



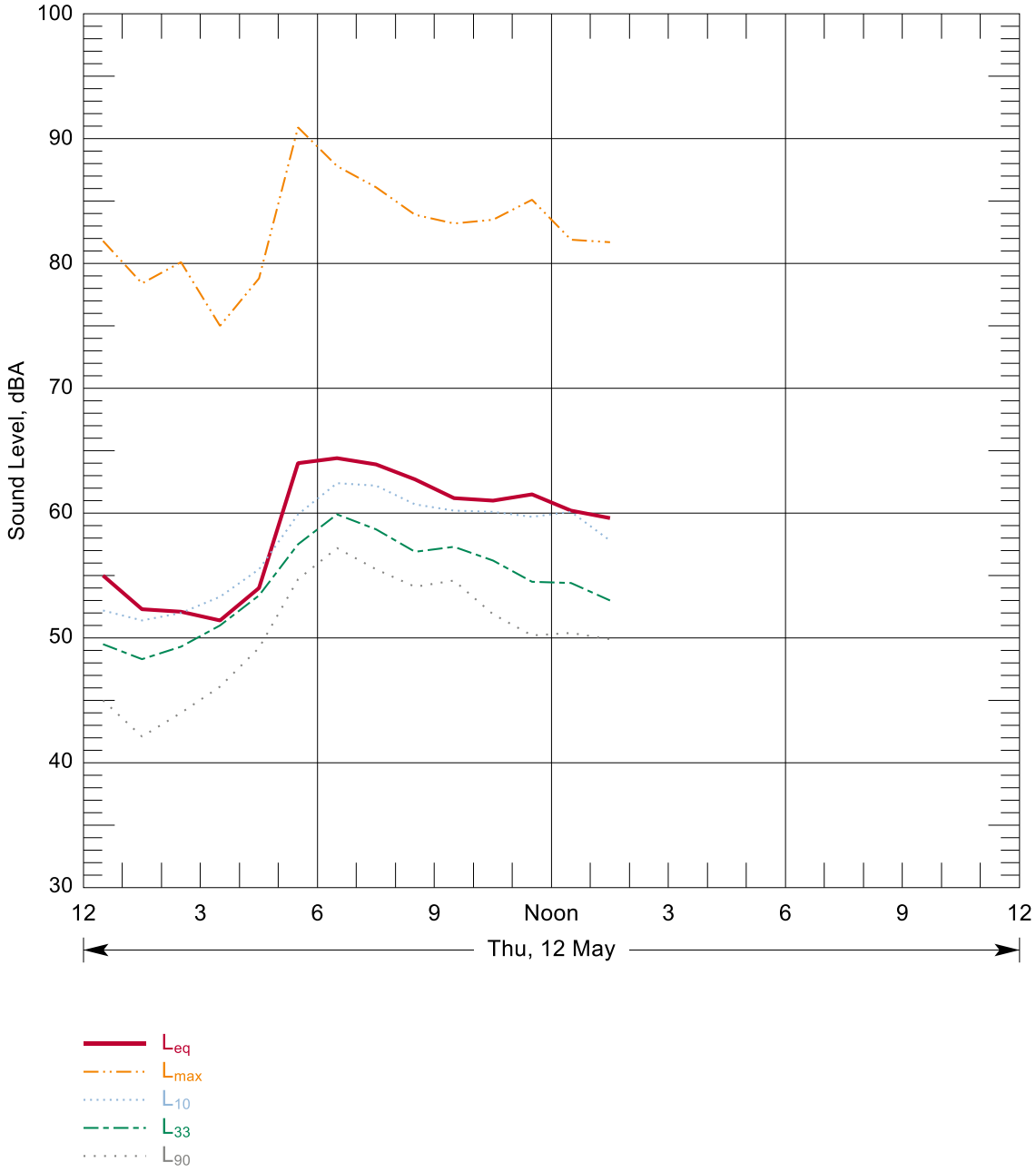
Source: Wilson Ihrig 2016

Figure B-131: Hourly Summary of Noise Levels Measured at N115 on 10 May, 2016



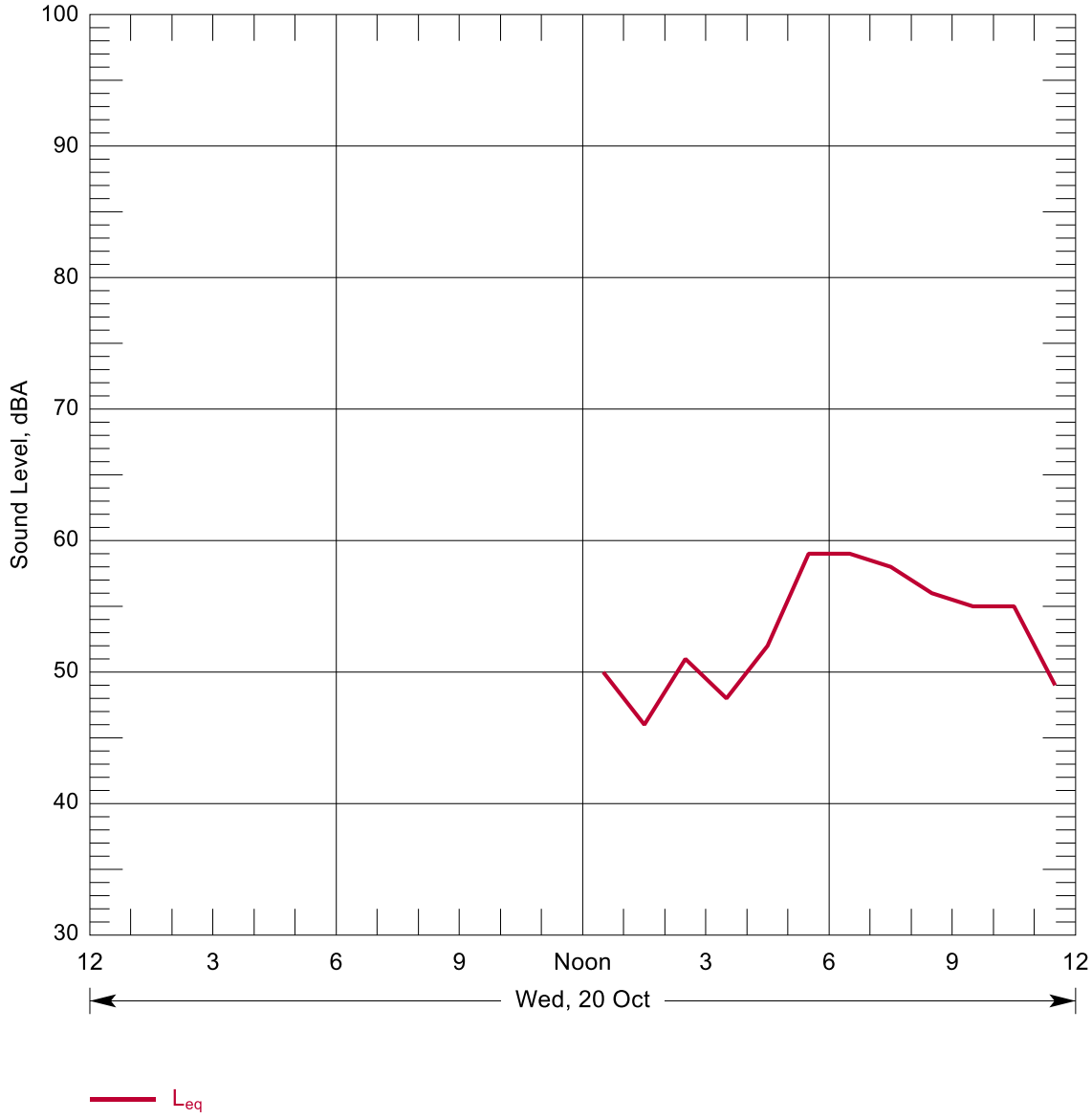
Source: Wilson Ihrig 2016

Figure B-132: Hourly Summary of Noise Levels Measured at N115 on 11 May, 2016



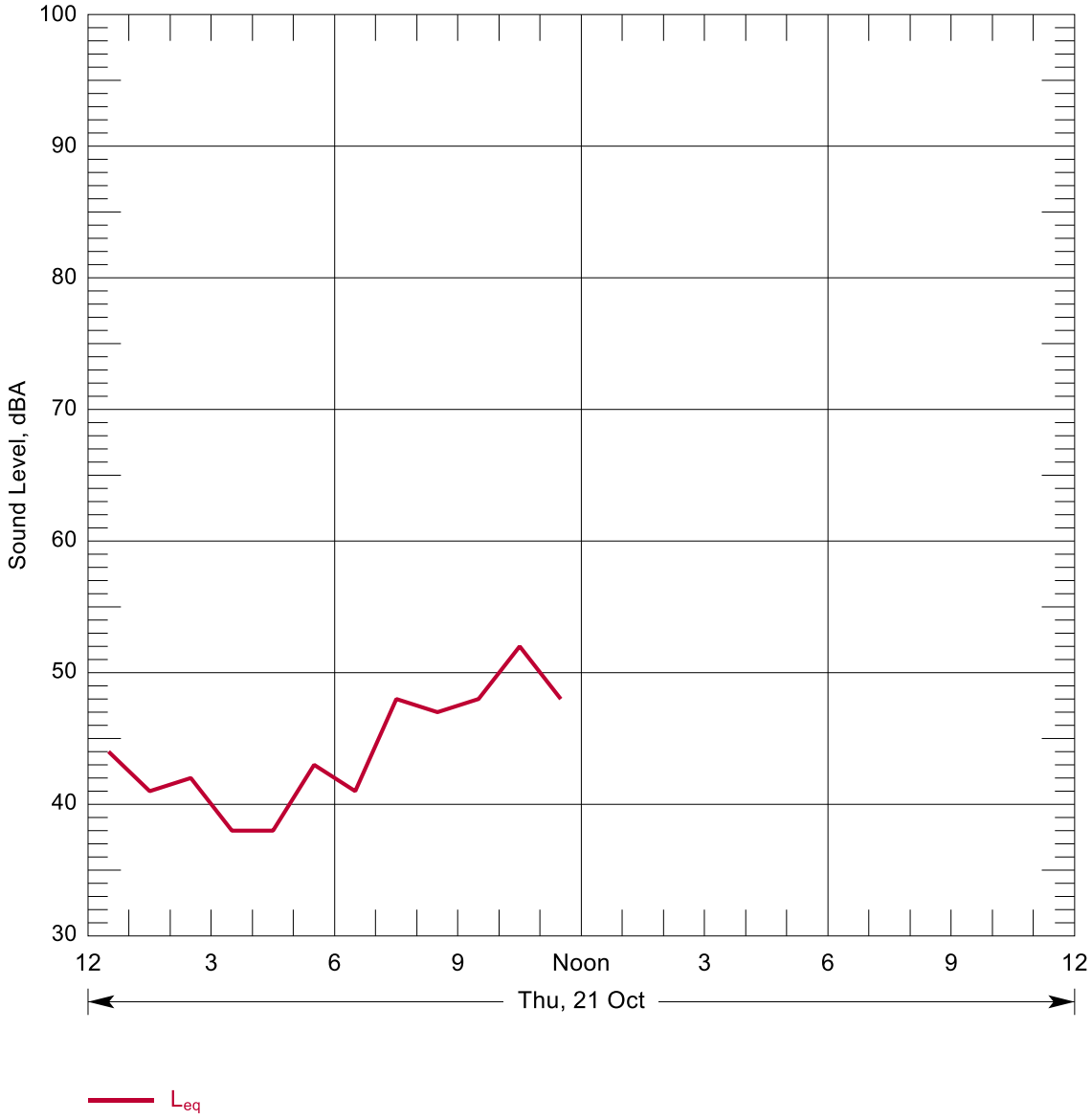
Source: Wilson Ihrig 2016

Figure B-133: Hourly Summary of Noise Levels Measured at N115 on 12 May, 2016



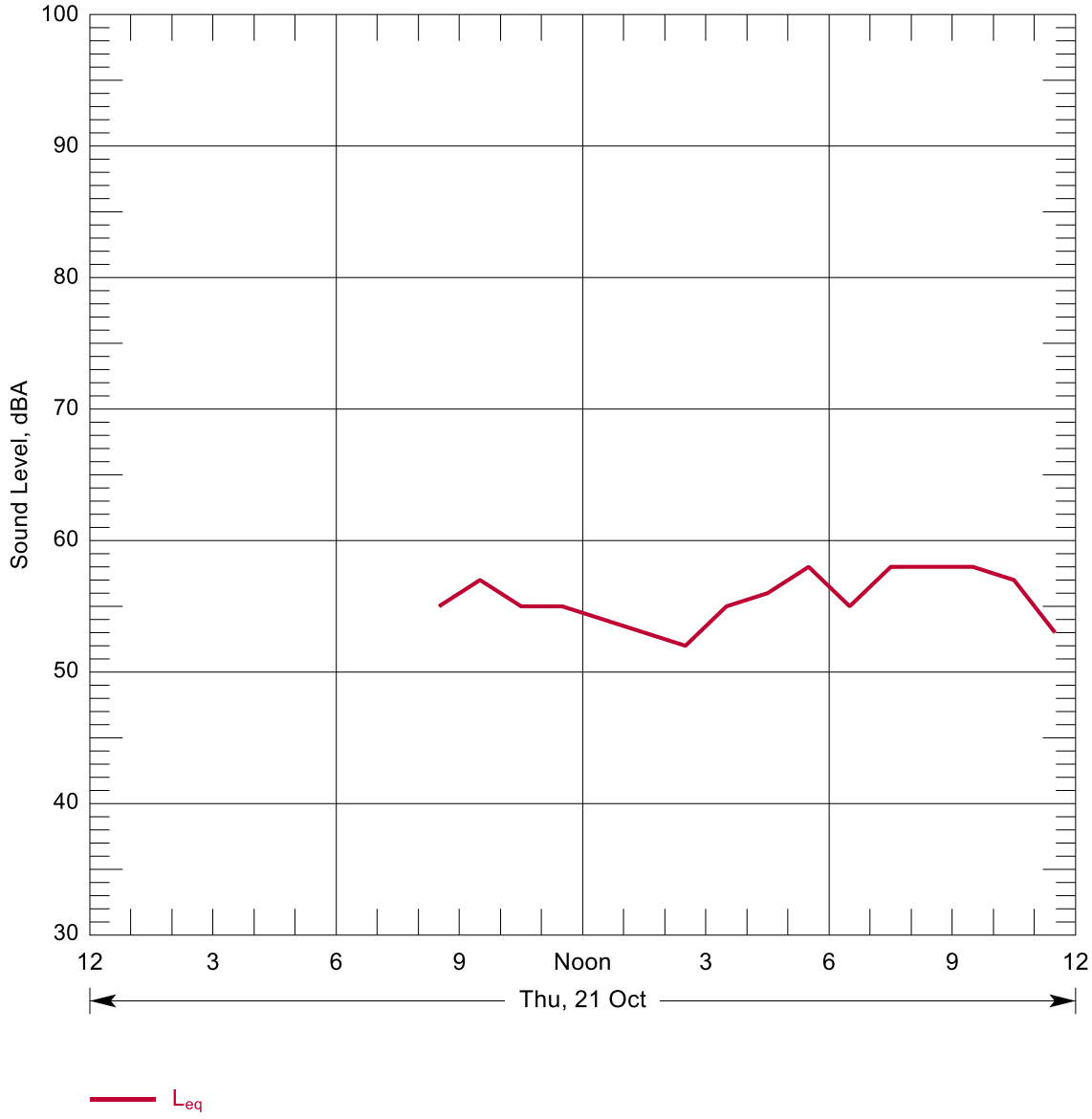
Source: Parsons Transportation 2010

Figure B-134: Hourly Summary of Noise Levels Measured at N116 on 20 Oct, 2010



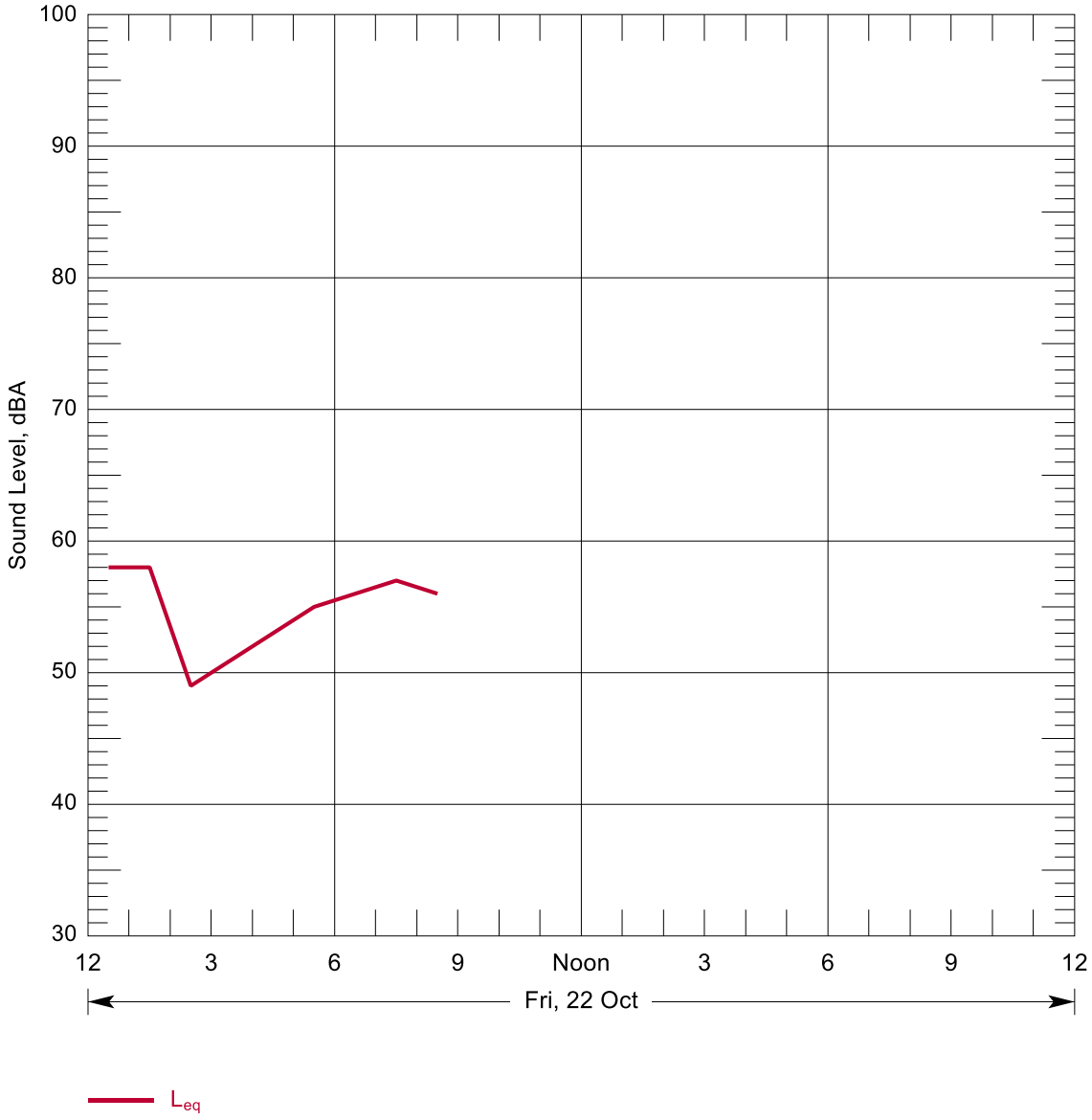
Source: Parsons Transportation 2010

Figure B-135: Hourly Summary of Noise Levels Measured at N116 on 21 Oct, 2010



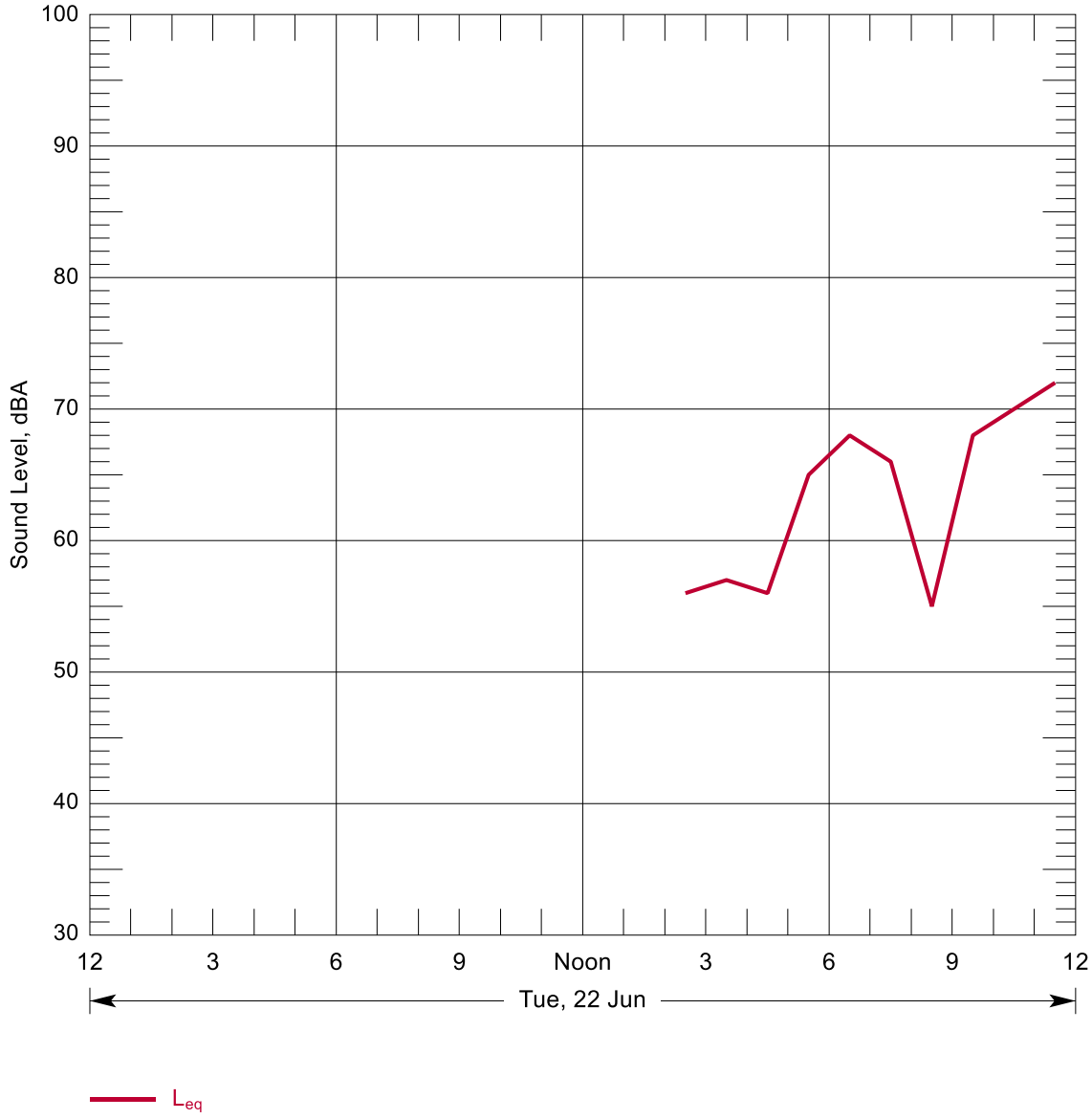
Source: Parsons Transportation 2010

Figure B-136: Hourly Summary of Noise Levels Measured at N117 on 21 Oct, 2010



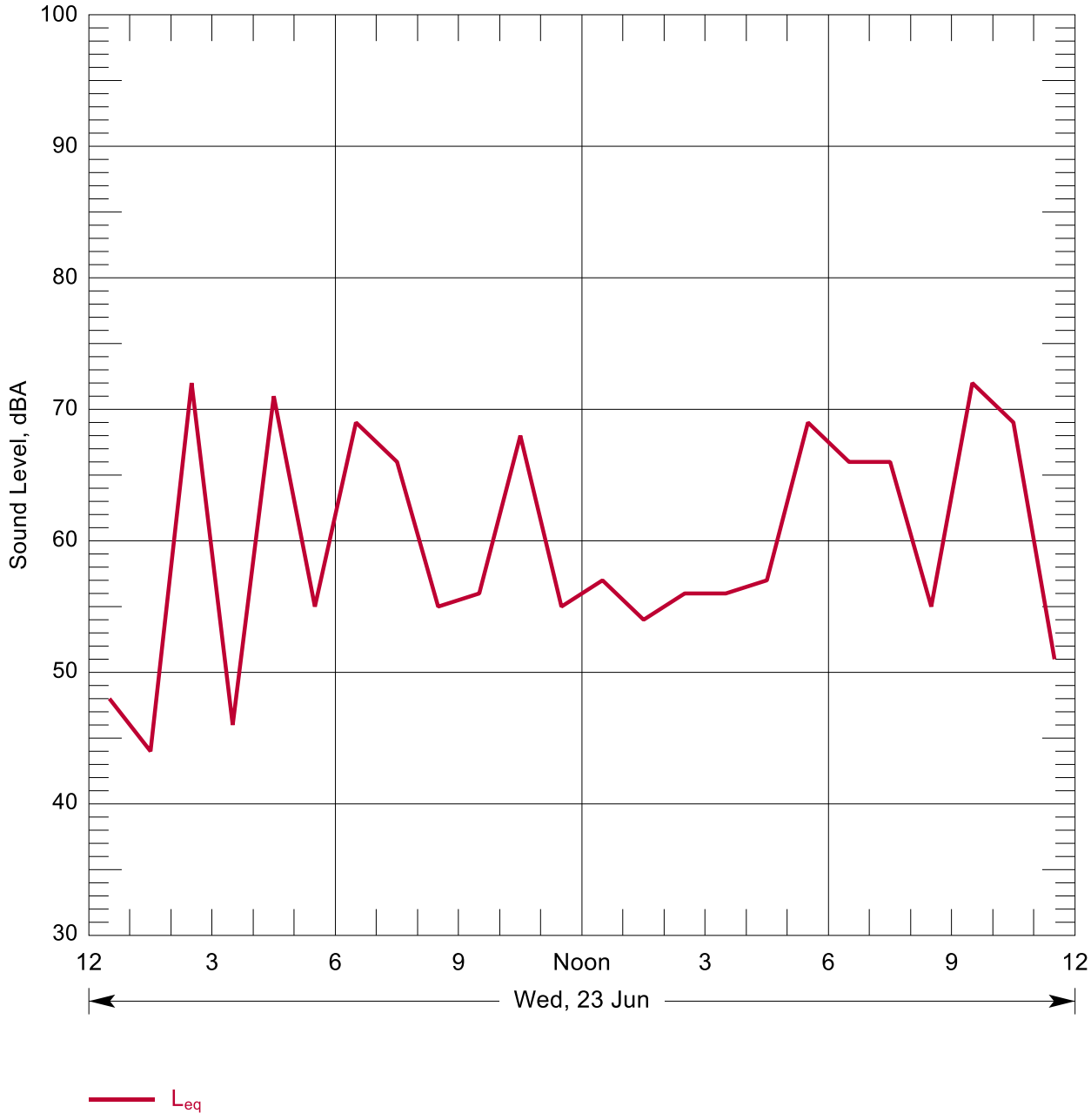
Source: Parsons Transportation 2010

Figure B-137: Hourly Summary of Noise Levels Measured at N117 on 22 Oct, 2010



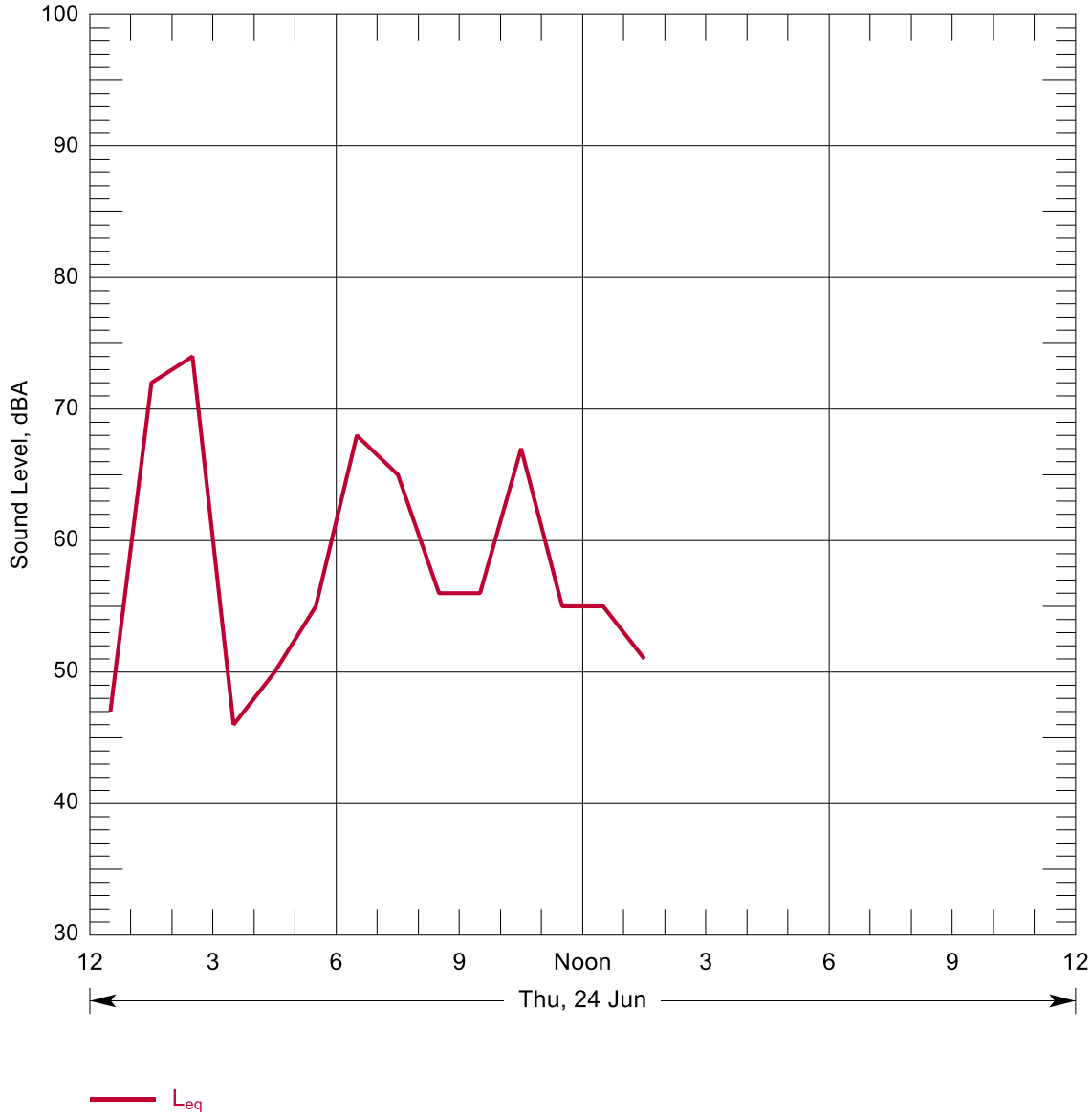
Source: Parsons Transportation 2010

Figure B-138: Hourly Summary of Noise Levels Measured at N118 on 22 Jun, 2010



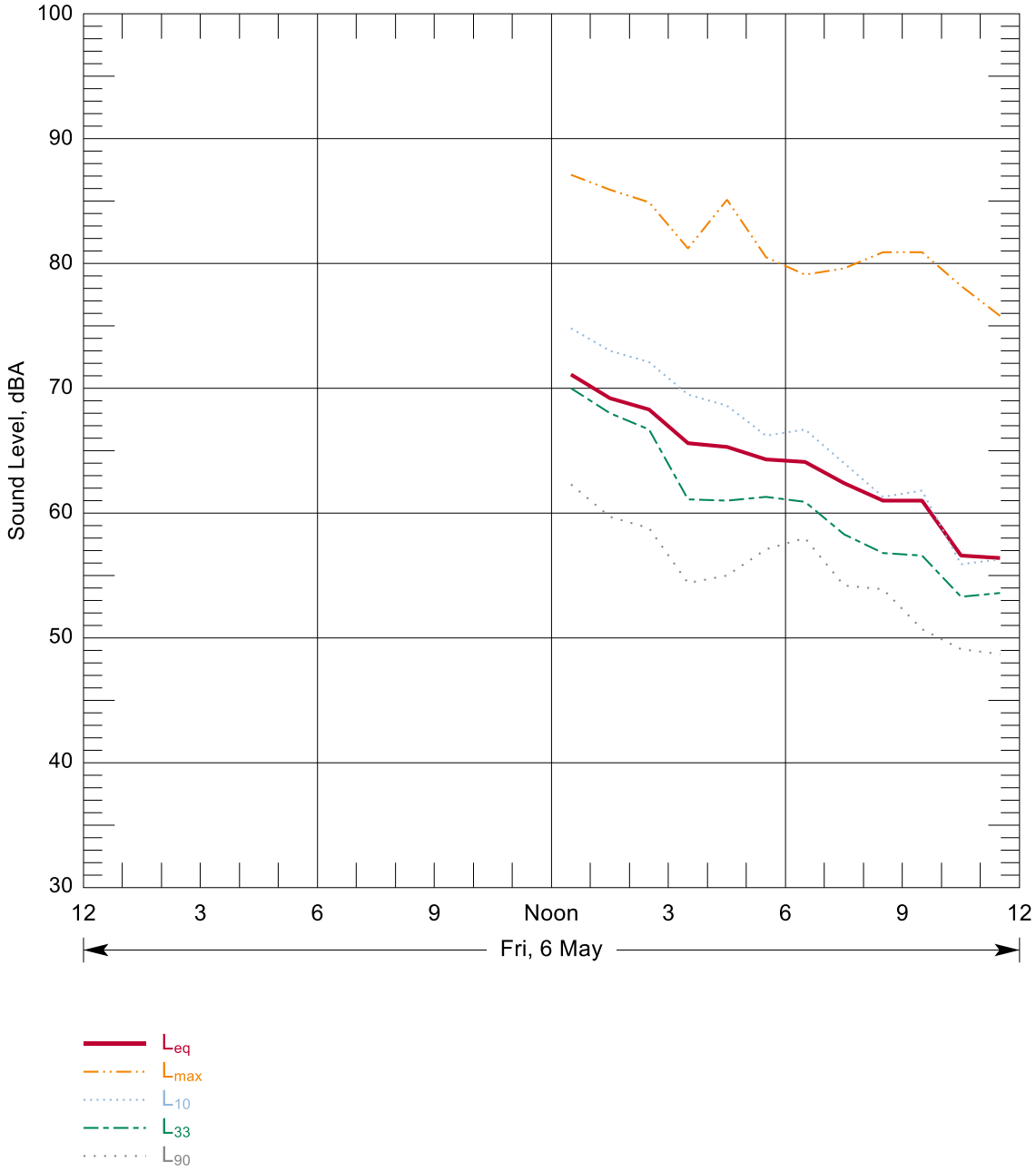
Source: Parsons Transportation 2010

Figure B-139: Hourly Summary of Noise Levels Measured at N118 on 23 Jun, 2010



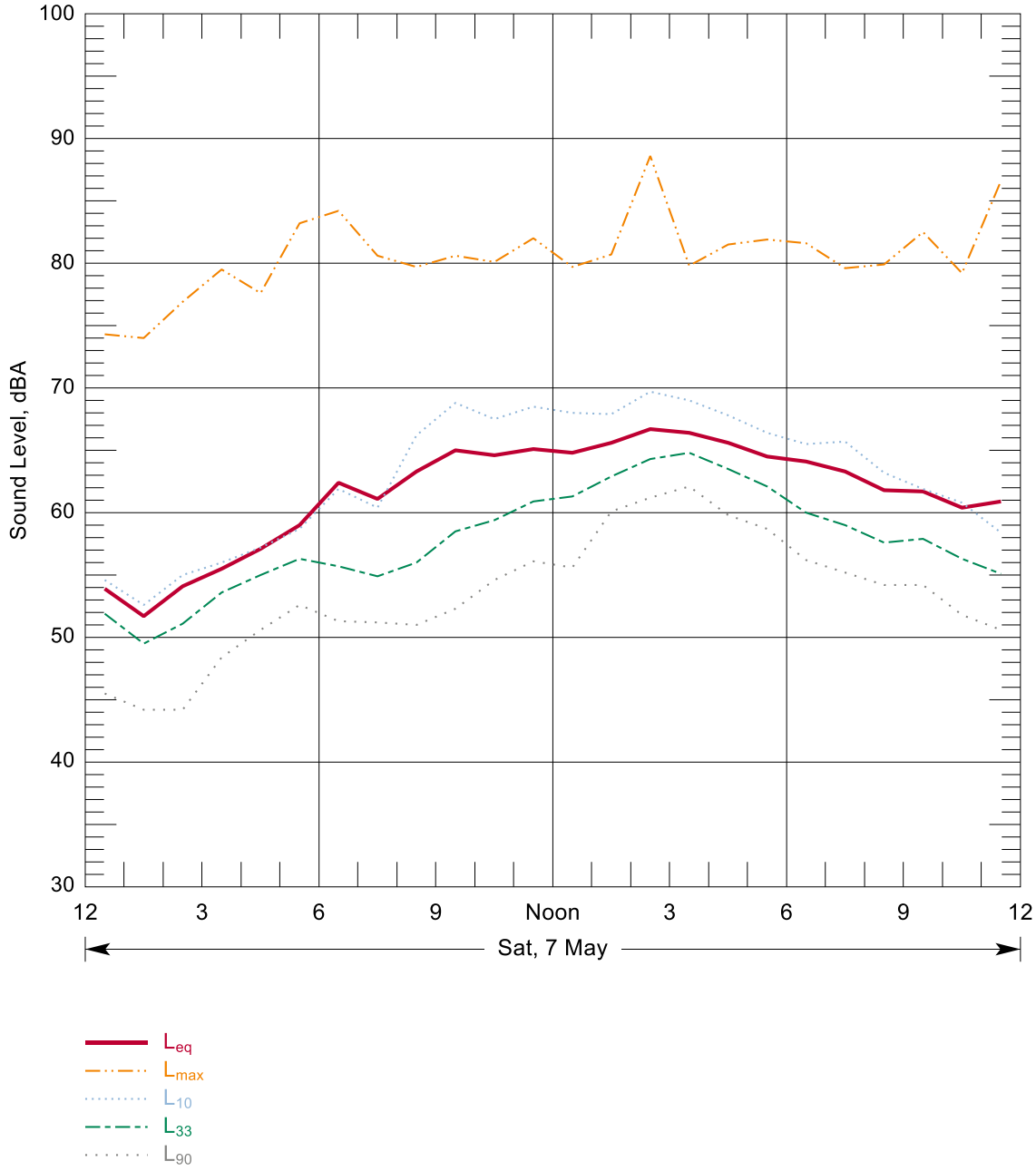
Source: Parsons Transportation 2010

Figure B-140: Hourly Summary of Noise Levels Measured at N118 on 24 Jun, 2010



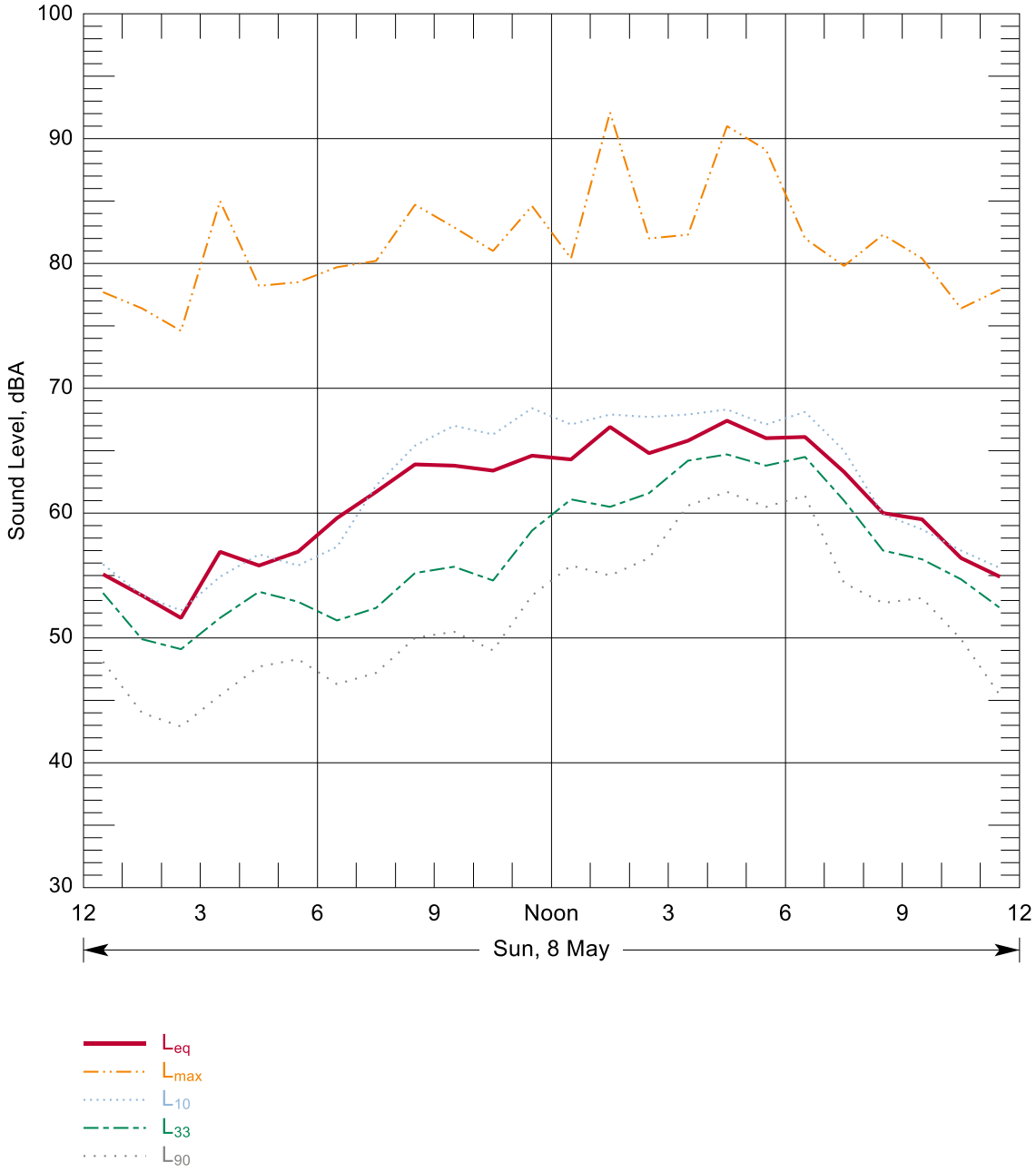
Source: Wilson Ihrig 2016

Figure B-141: Hourly Summary of Noise Levels Measured at N119 on 06 May, 2016



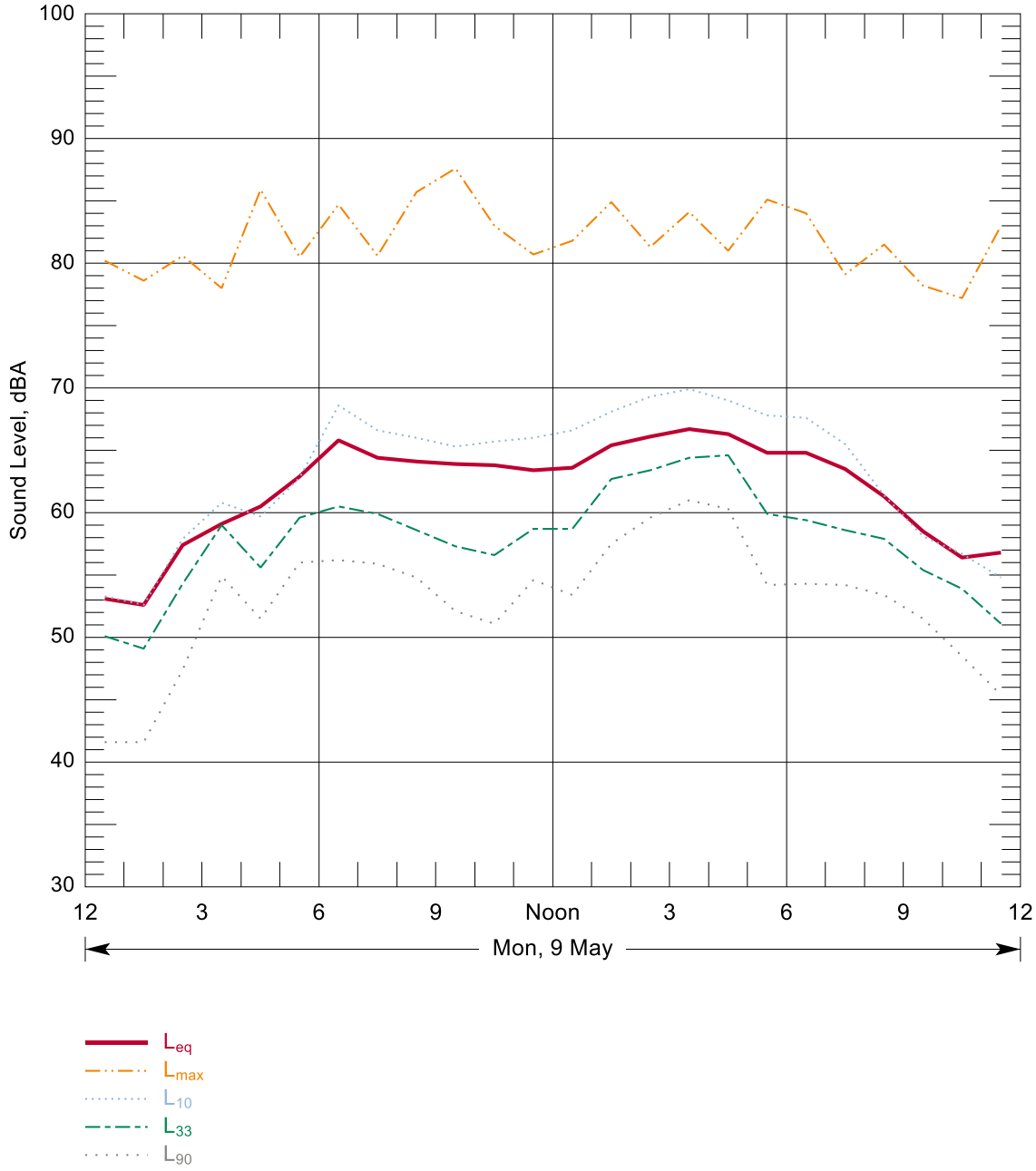
Source: Wilson Ihrig 2016

Figure B-142: Hourly Summary of Noise Levels Measured at N119 on 07 May, 2016



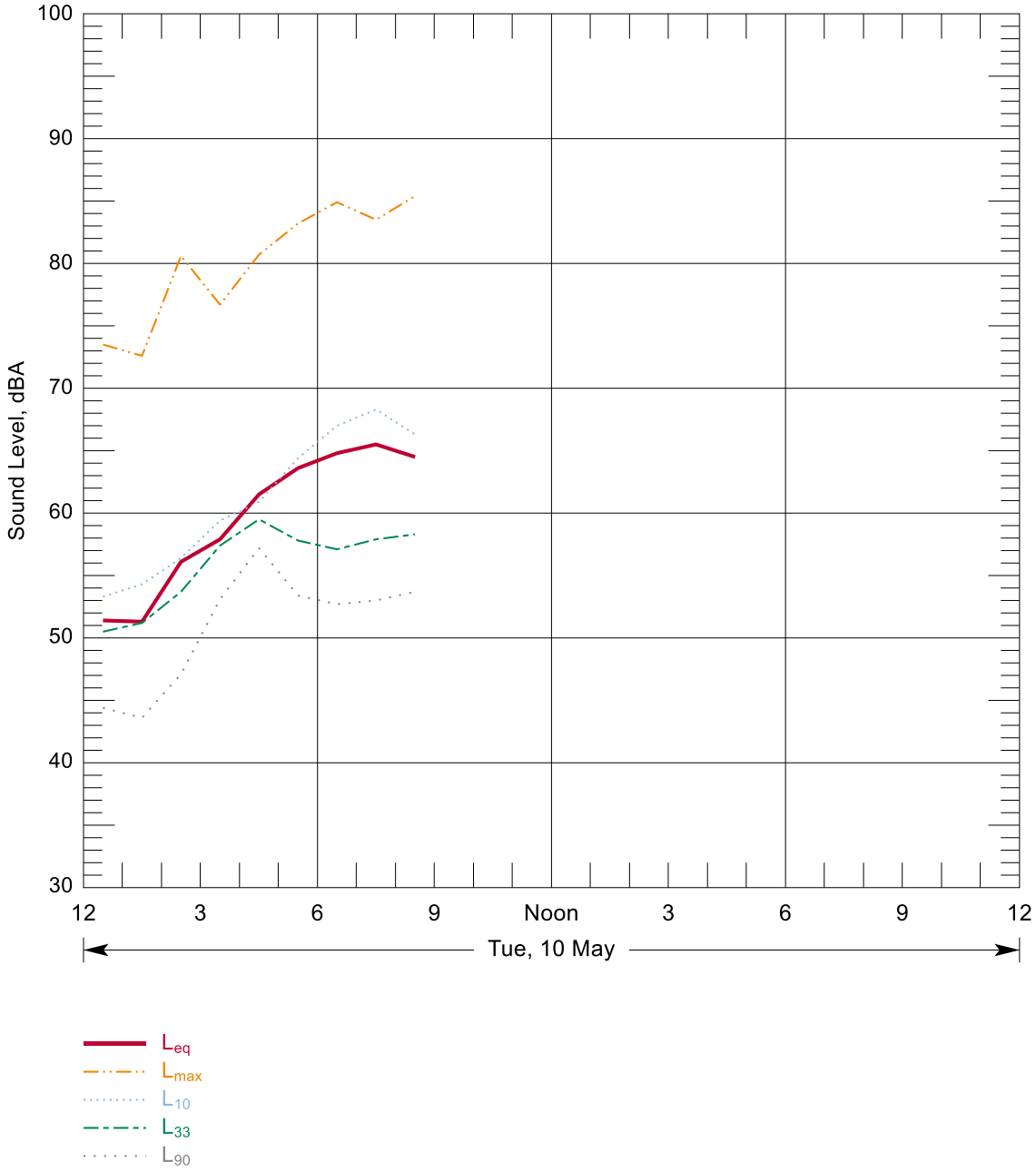
Source: Wilson Ihrig 2016

Figure B-143: Hourly Summary of Noise Levels Measured at N119 on 08 May, 2016



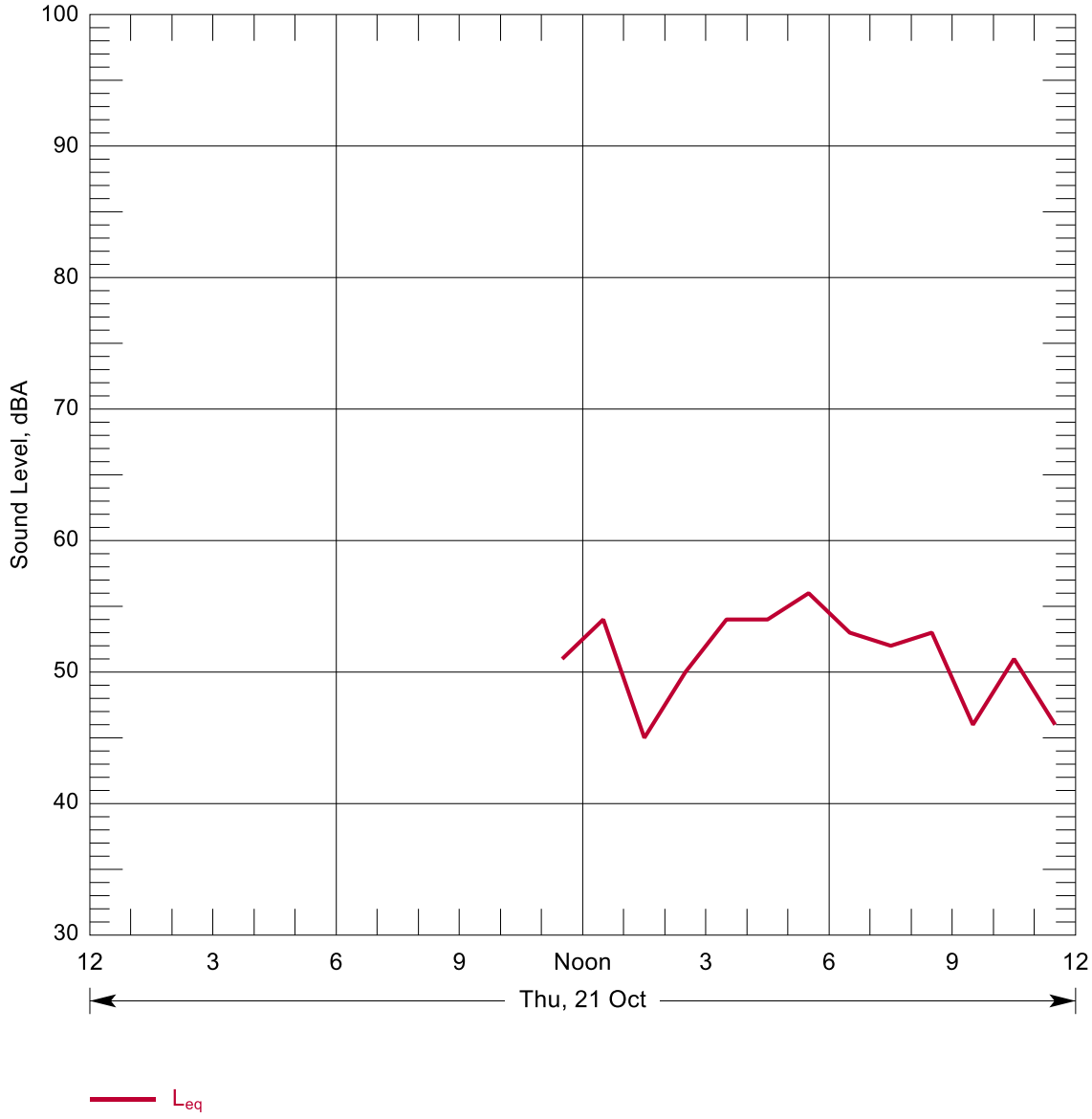
Source: Wilson Ihrig 2016

Figure B-144: Hourly Summary of Noise Levels Measured at N119 on 09 May, 2016



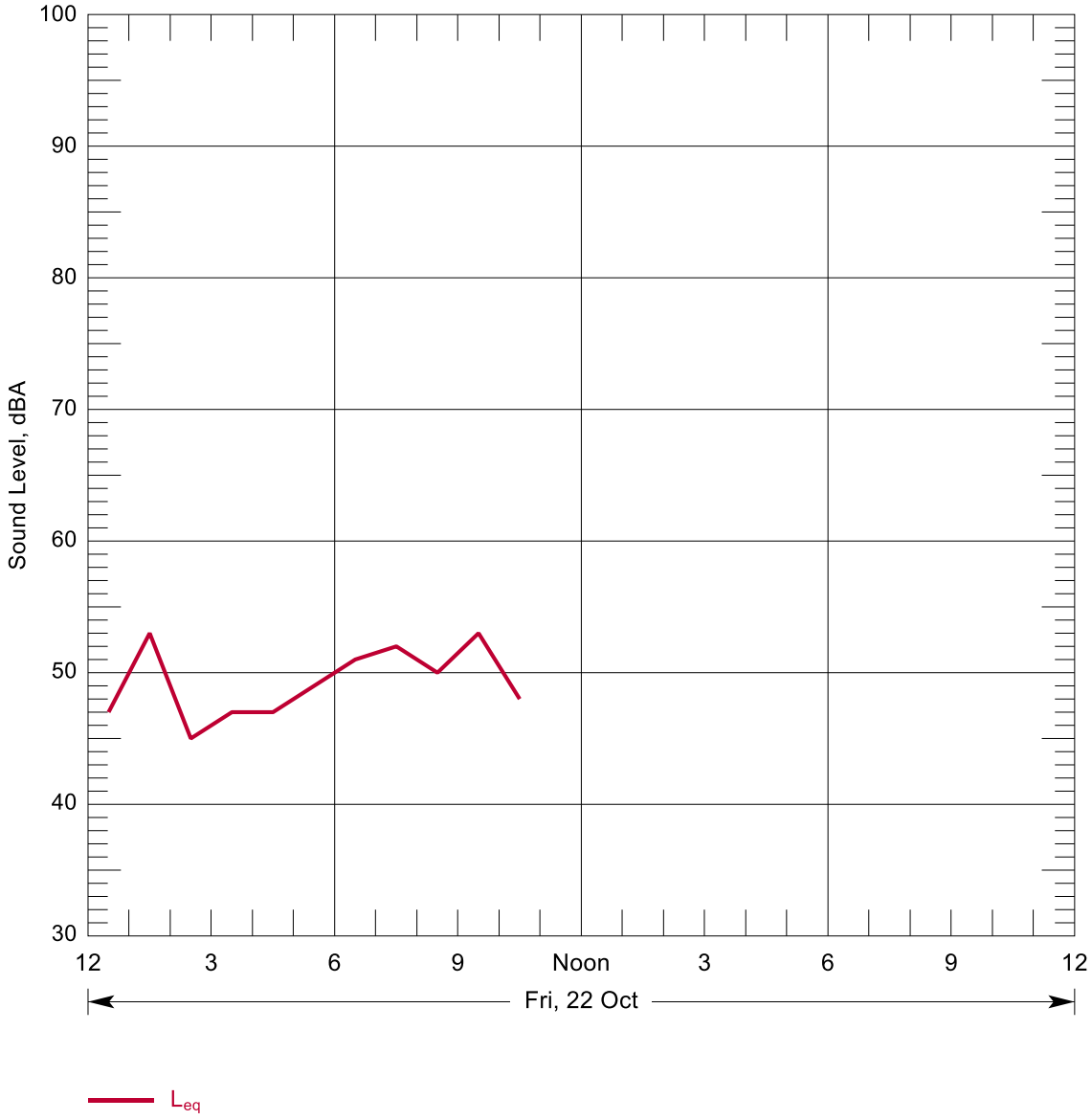
Source: Wilson Ihrig 2016

Figure B-145: Hourly Summary of Noise Levels Measured at N119 on 10 May, 2016



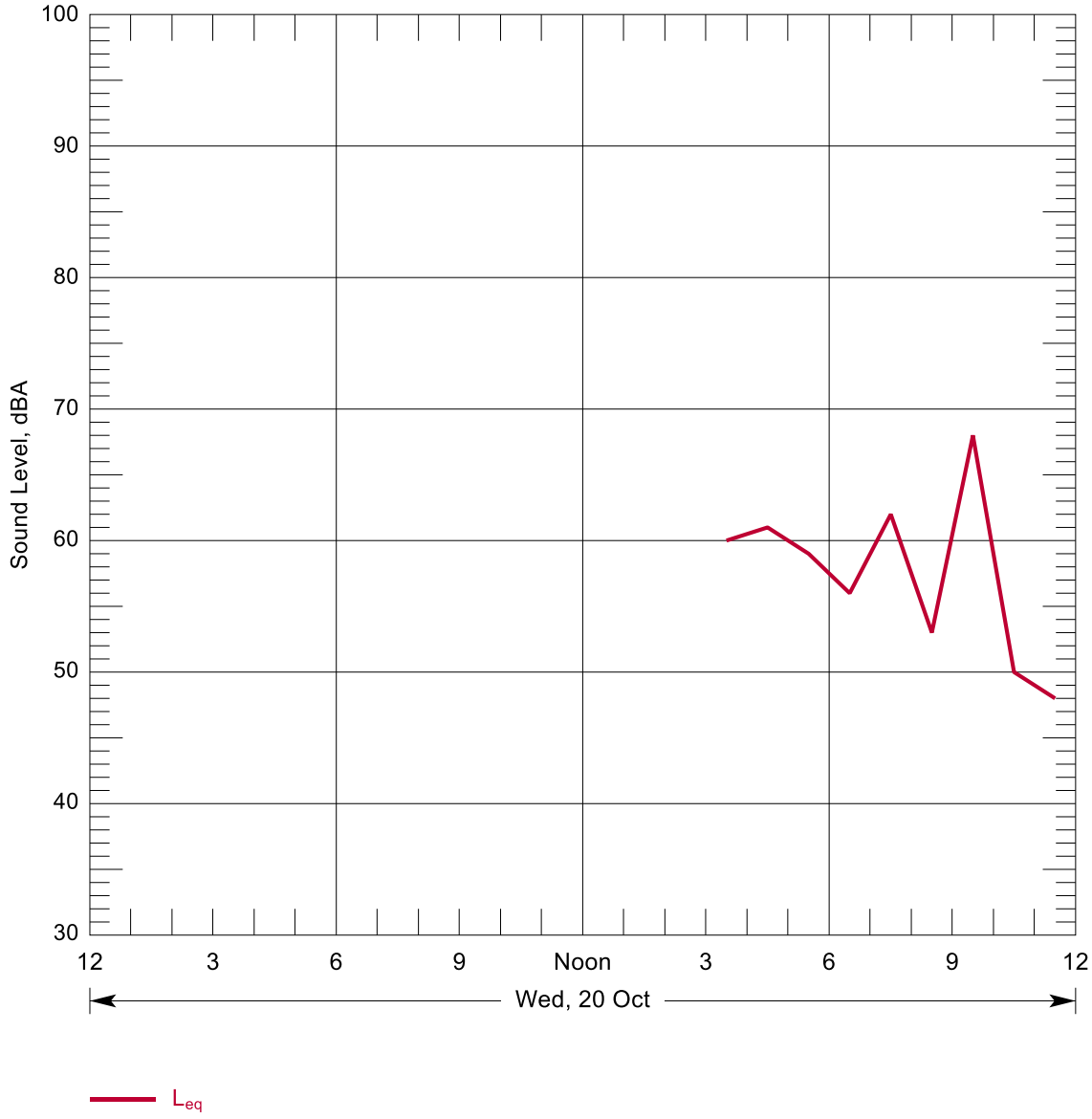
Source: Parsons Transportation 2010

Figure B-146: Hourly Summary of Noise Levels Measured at N120 on 21 Oct, 2010



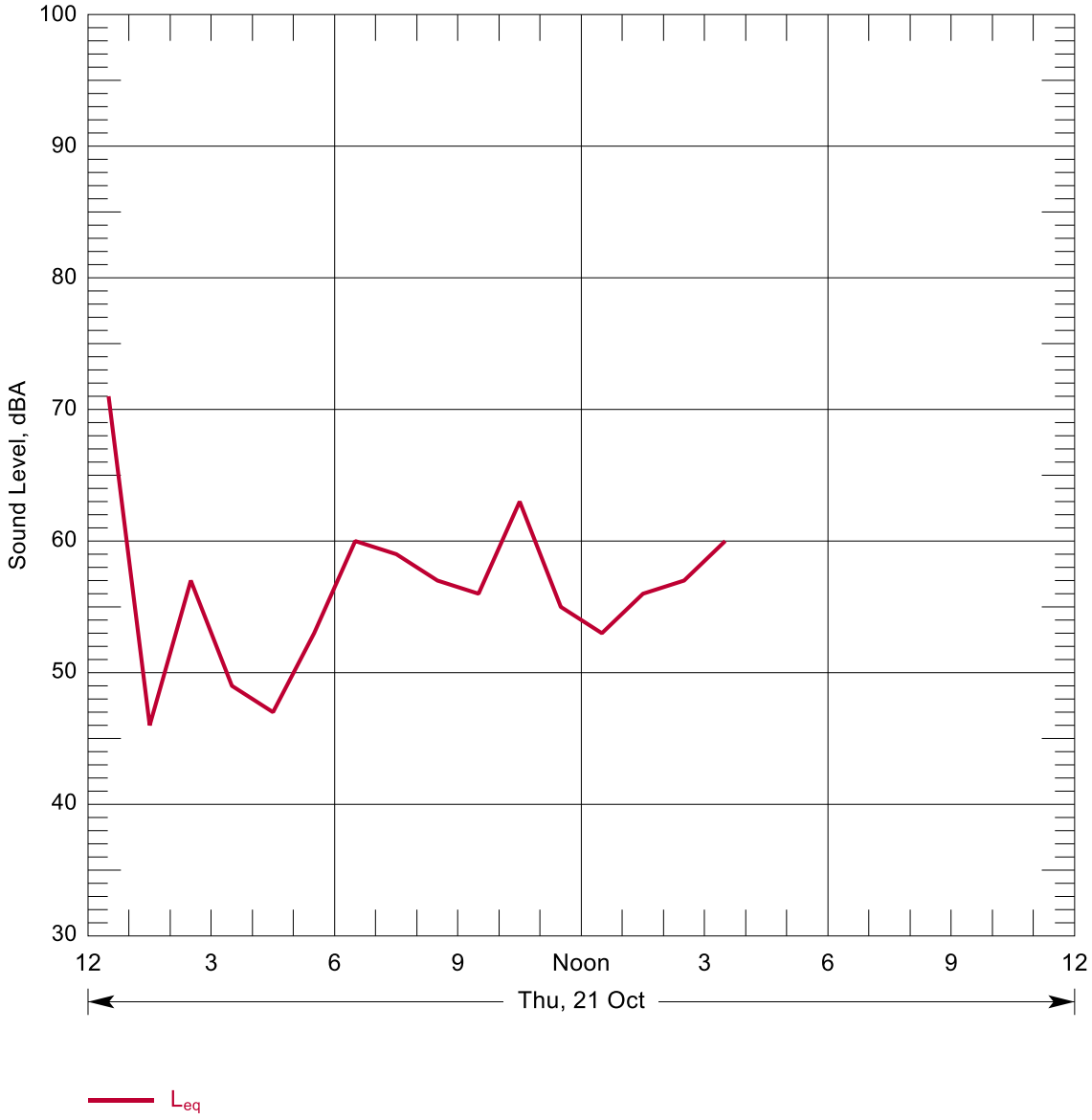
Source: Parsons Transportation 2010

Figure B-147: Hourly Summary of Noise Levels Measured at N120 on 22 Oct, 2010



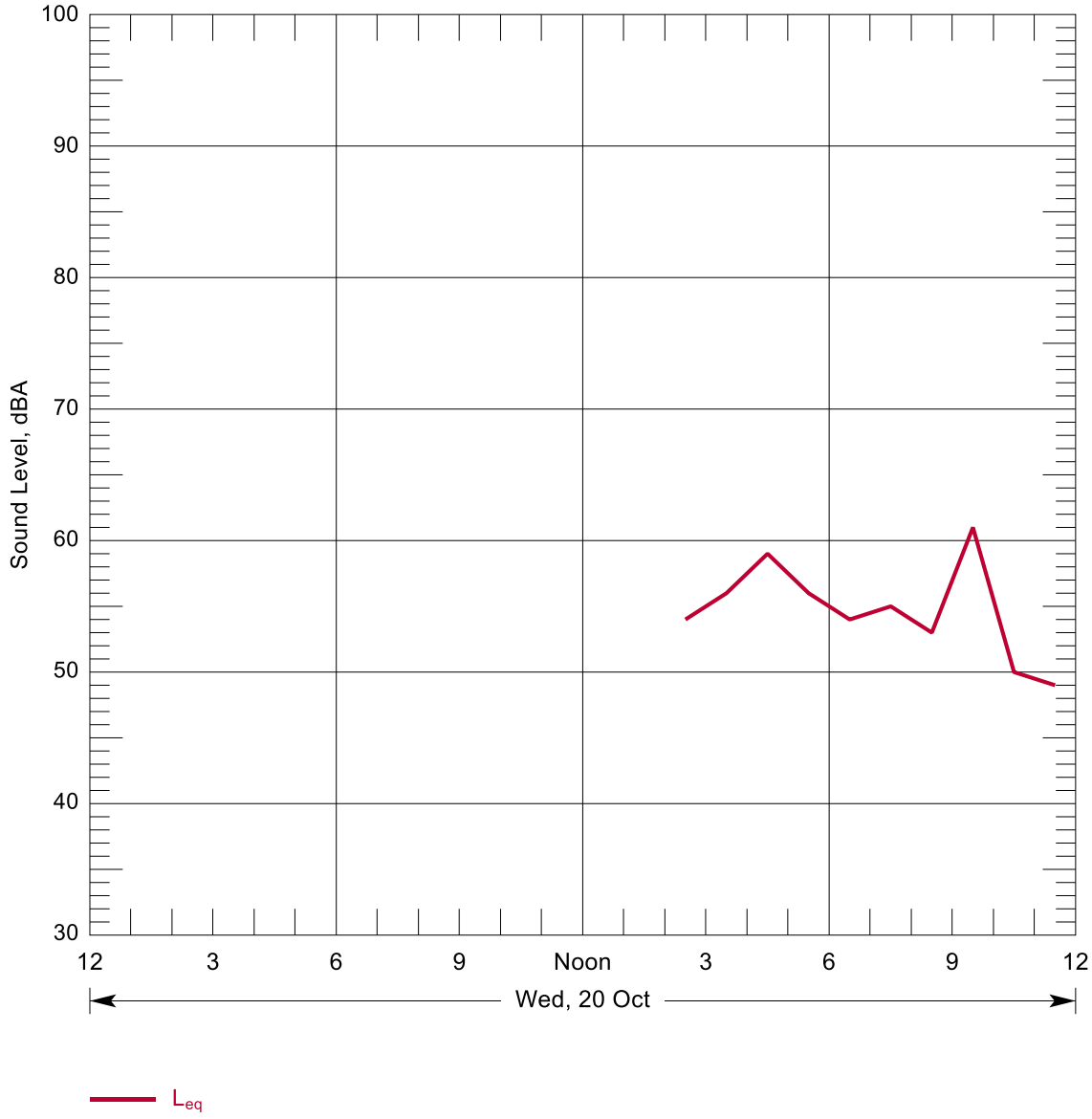
Source: Parsons Transportation 2010

Figure B-148: Hourly Summary of Noise Levels Measured at N121 on 20 Oct, 2010



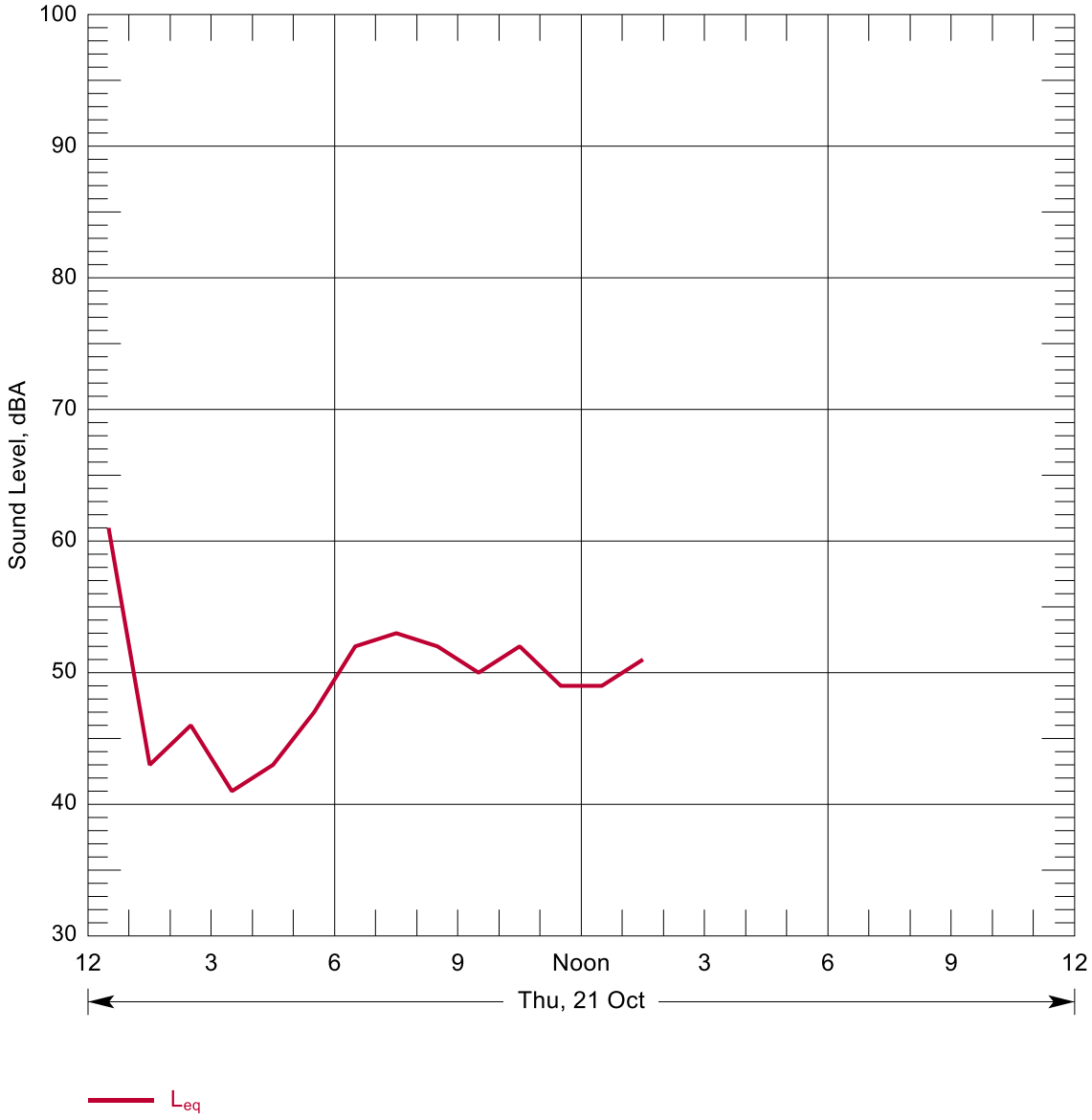
Source: Parsons Transportation 2010

Figure B-149: Hourly Summary of Noise Levels Measured at N121 on 21 Oct, 2010



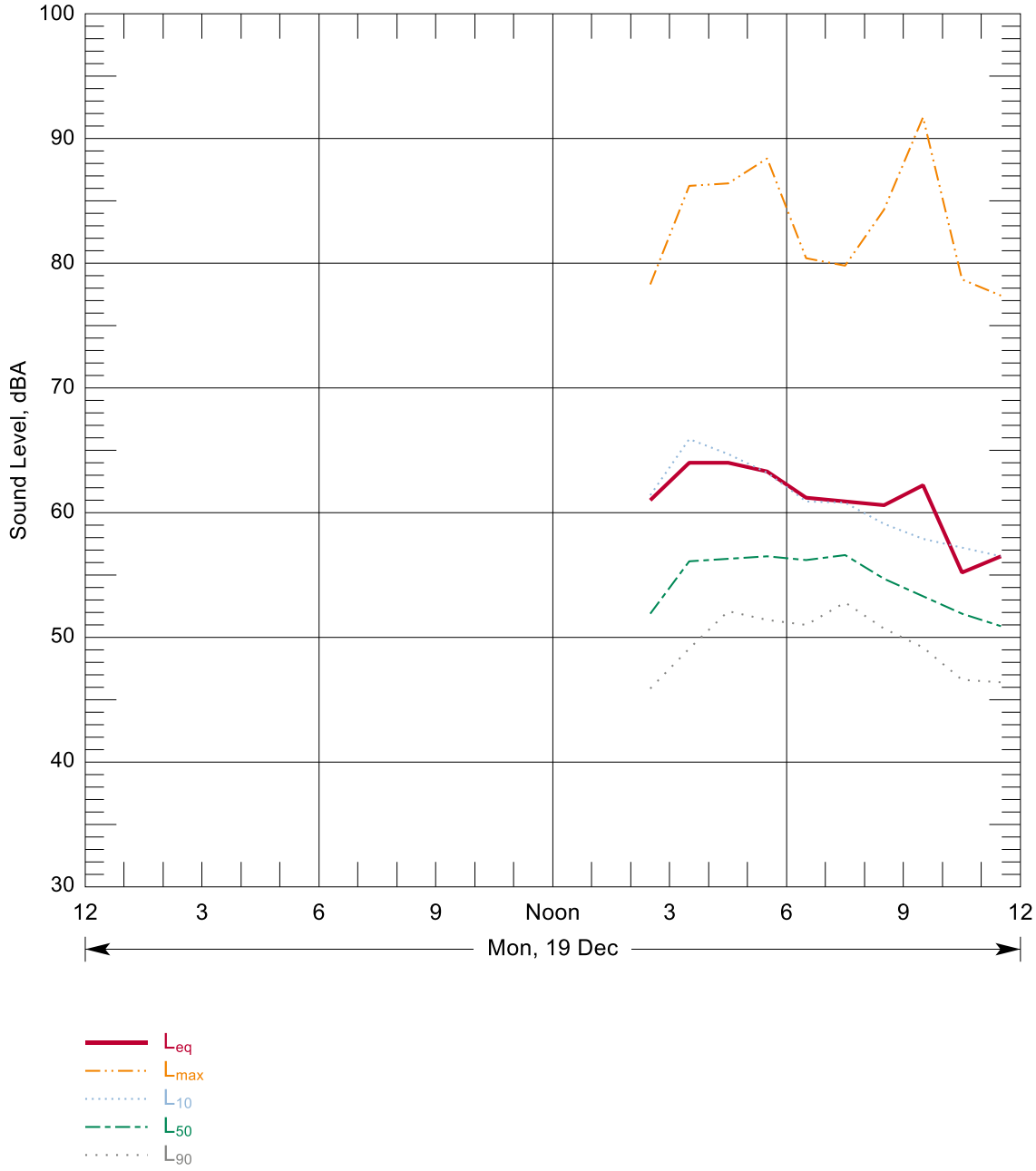
Source: Parsons Transportation 2010

Figure B-150: Hourly Summary of Noise Levels Measured at N122 on 20 Oct, 2010



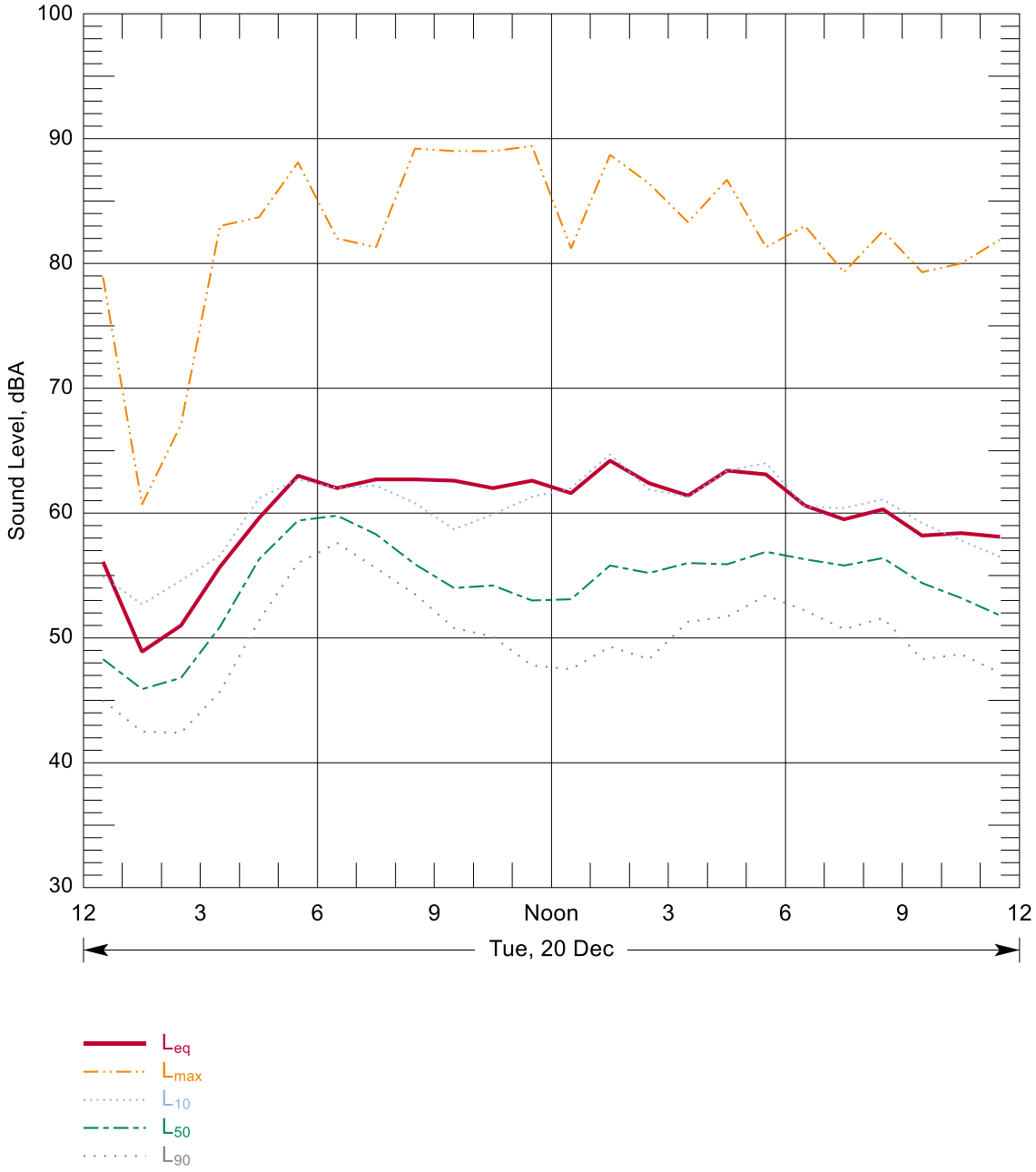
Source: Parsons Transportation 2010

Figure B-151: Hourly Summary of Noise Levels Measured at N122 on 21 Oct, 2010



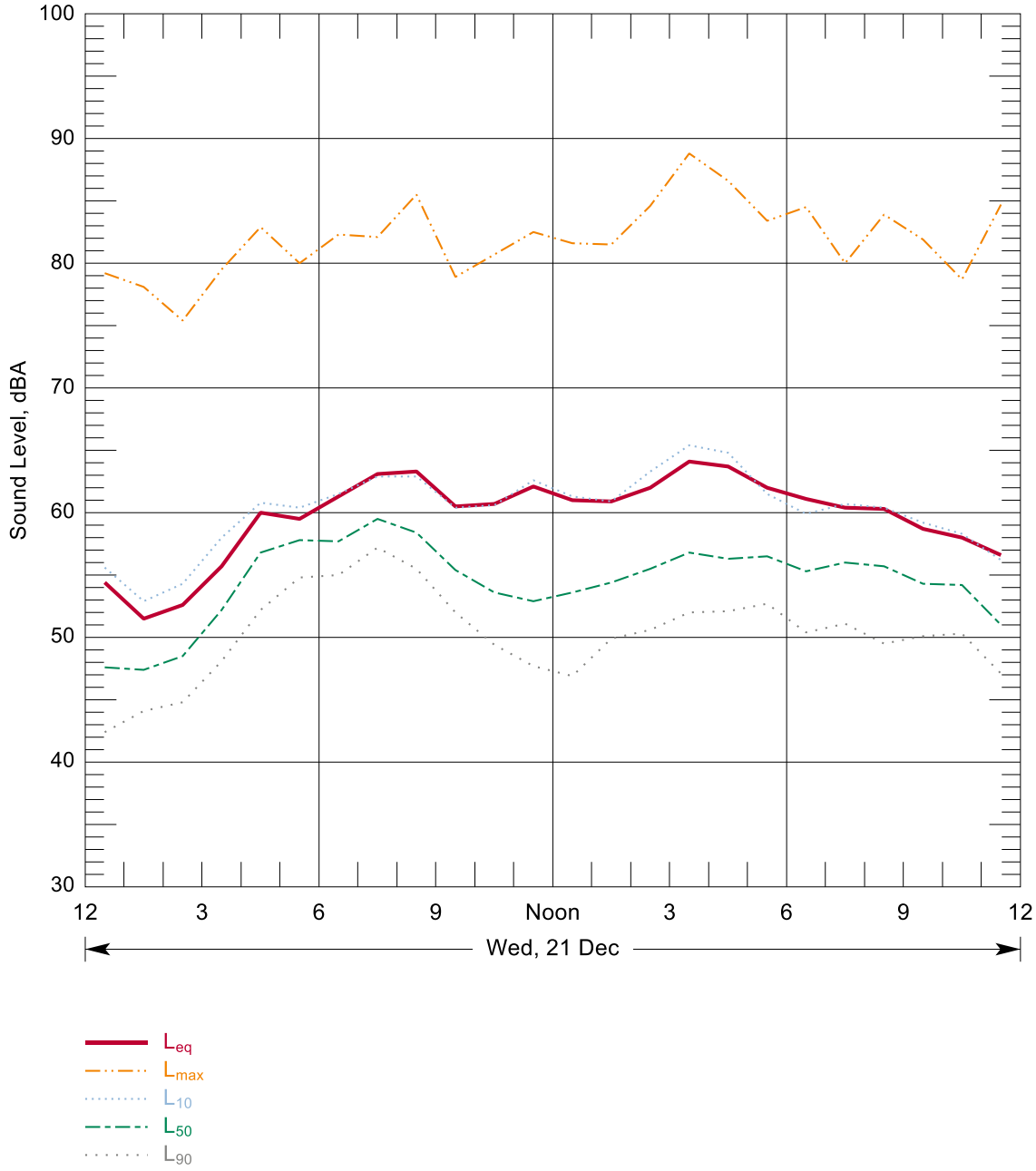
Source: Wilson Ihrig 2016

Figure B-152: Hourly Summary of Noise Levels Measured at N123 on 19 Dec, 2016



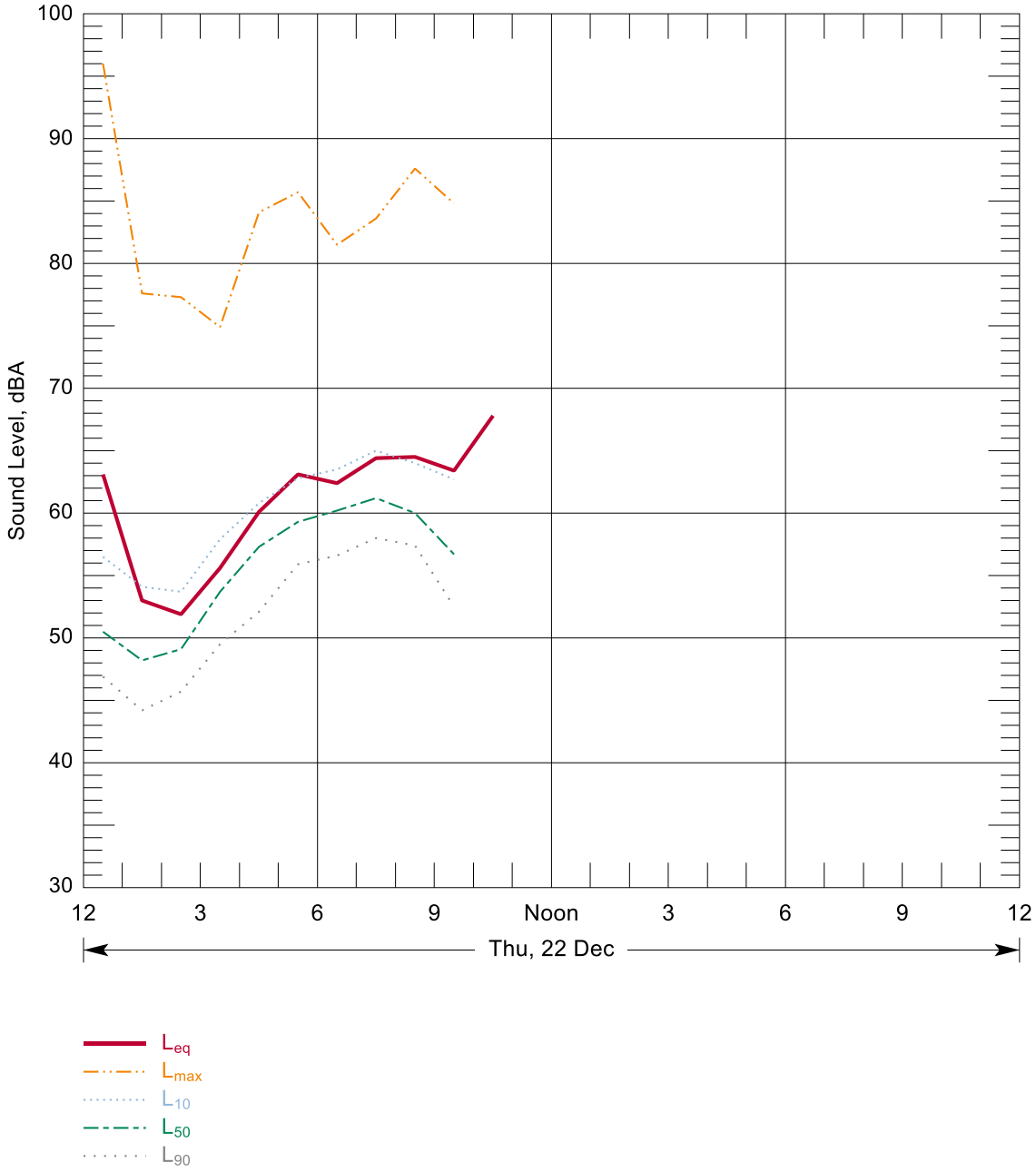
Source: Wilson Ihrig 2016

Figure B-153: Hourly Summary of Noise Levels Measured at N123 on 20 Dec, 2016



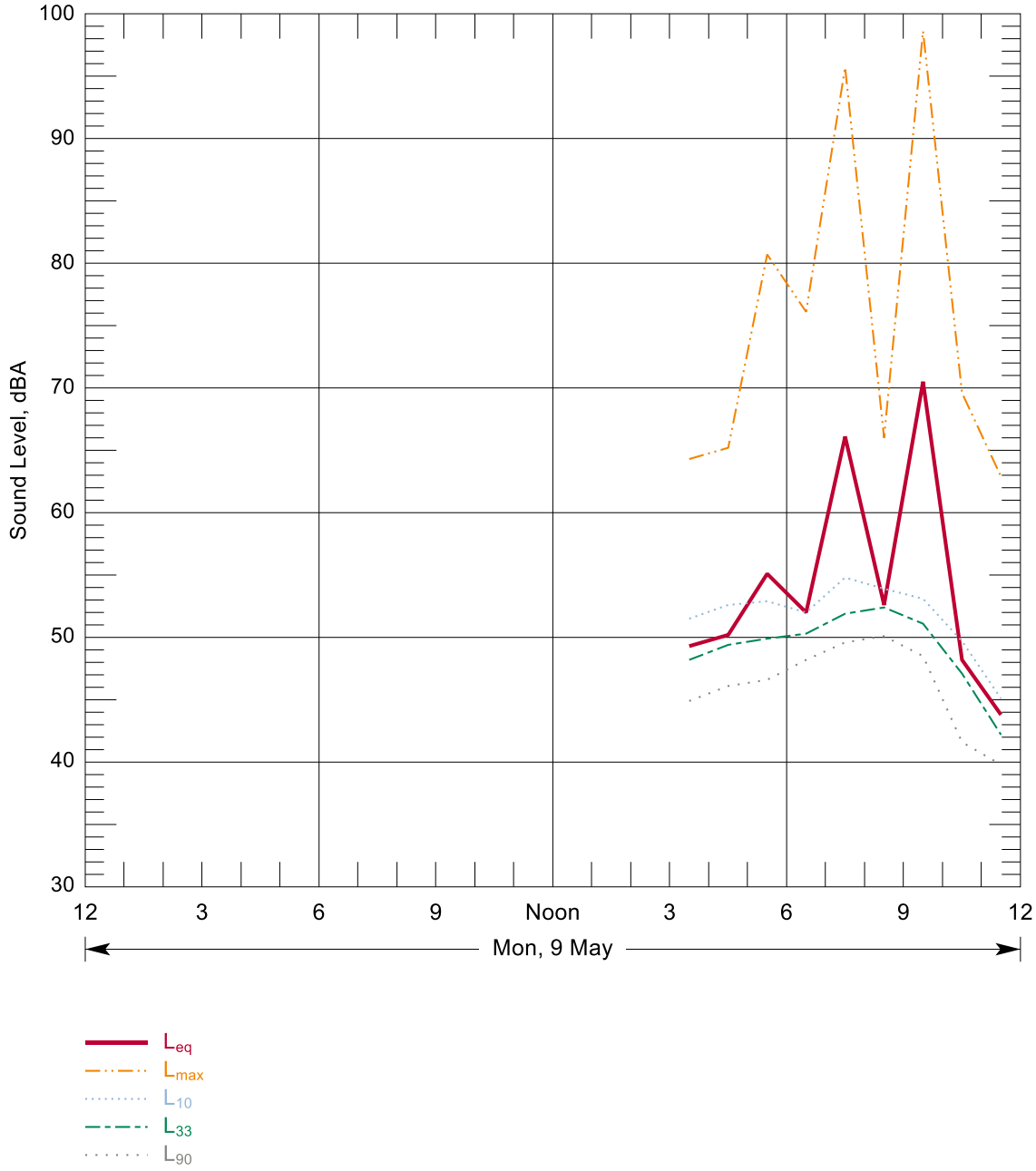
Source: Wilson Ihrig 2016

Figure B-154: Hourly Summary of Noise Levels Measured at N123 on 21 Dec, 2016



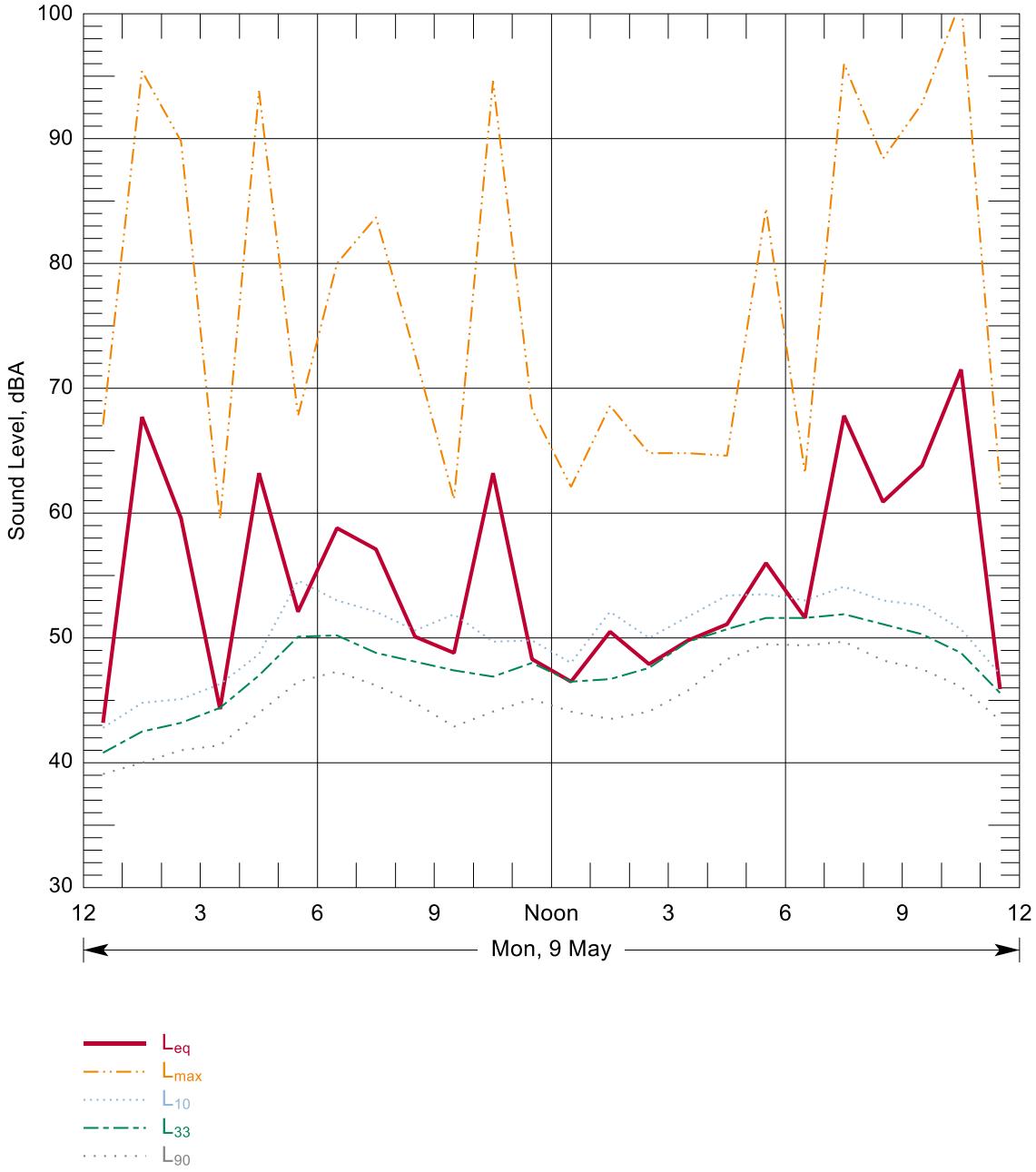
Source: Wilson Ihrig 2016

Figure B-155: Hourly Summary of Noise Levels Measured at N123 on 22 Dec, 2016



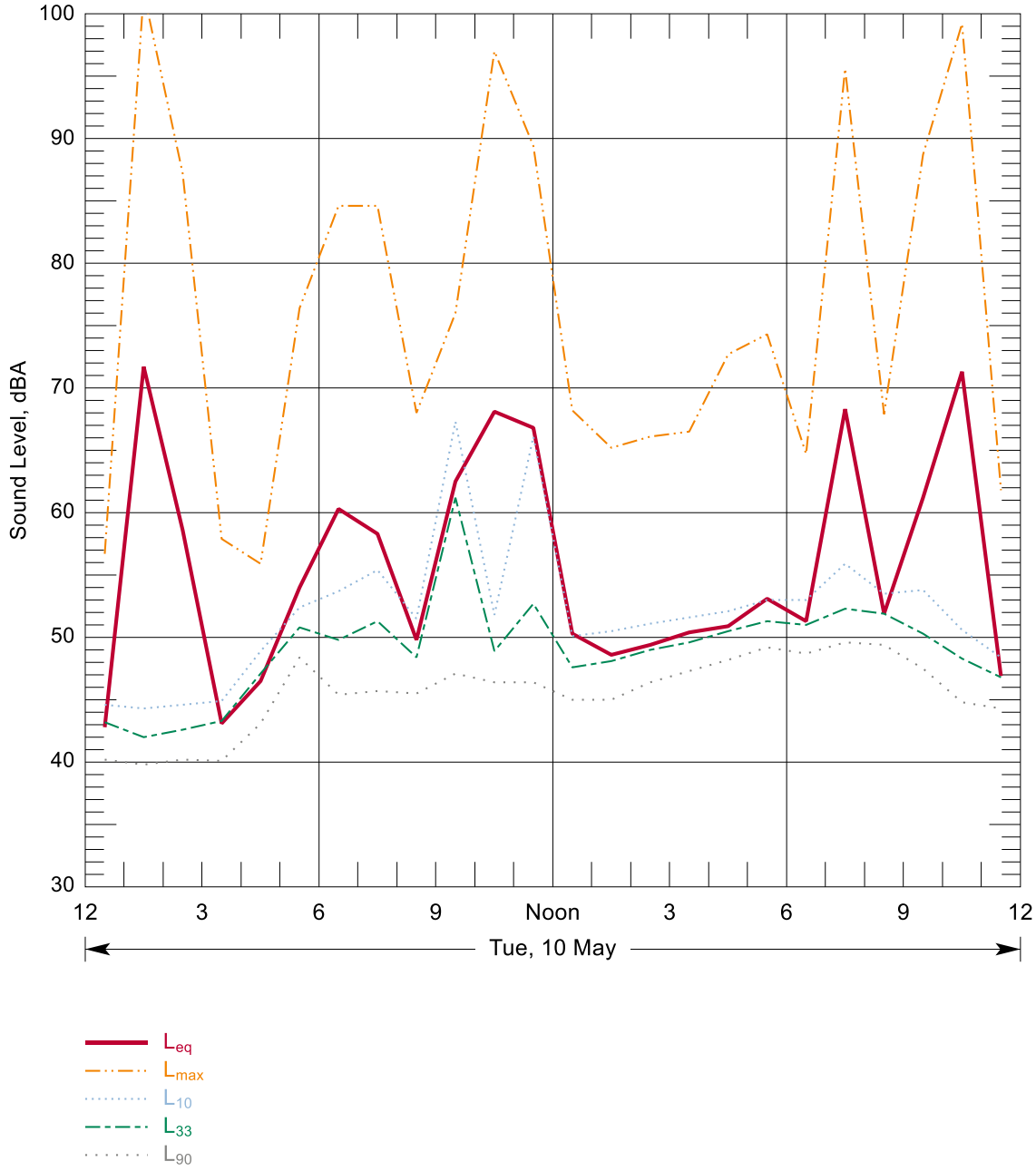
Source: Wilson Ihrig 2016

Figure B-156: Hourly Summary of Noise Levels Measured at N124 on 09 May, 2016



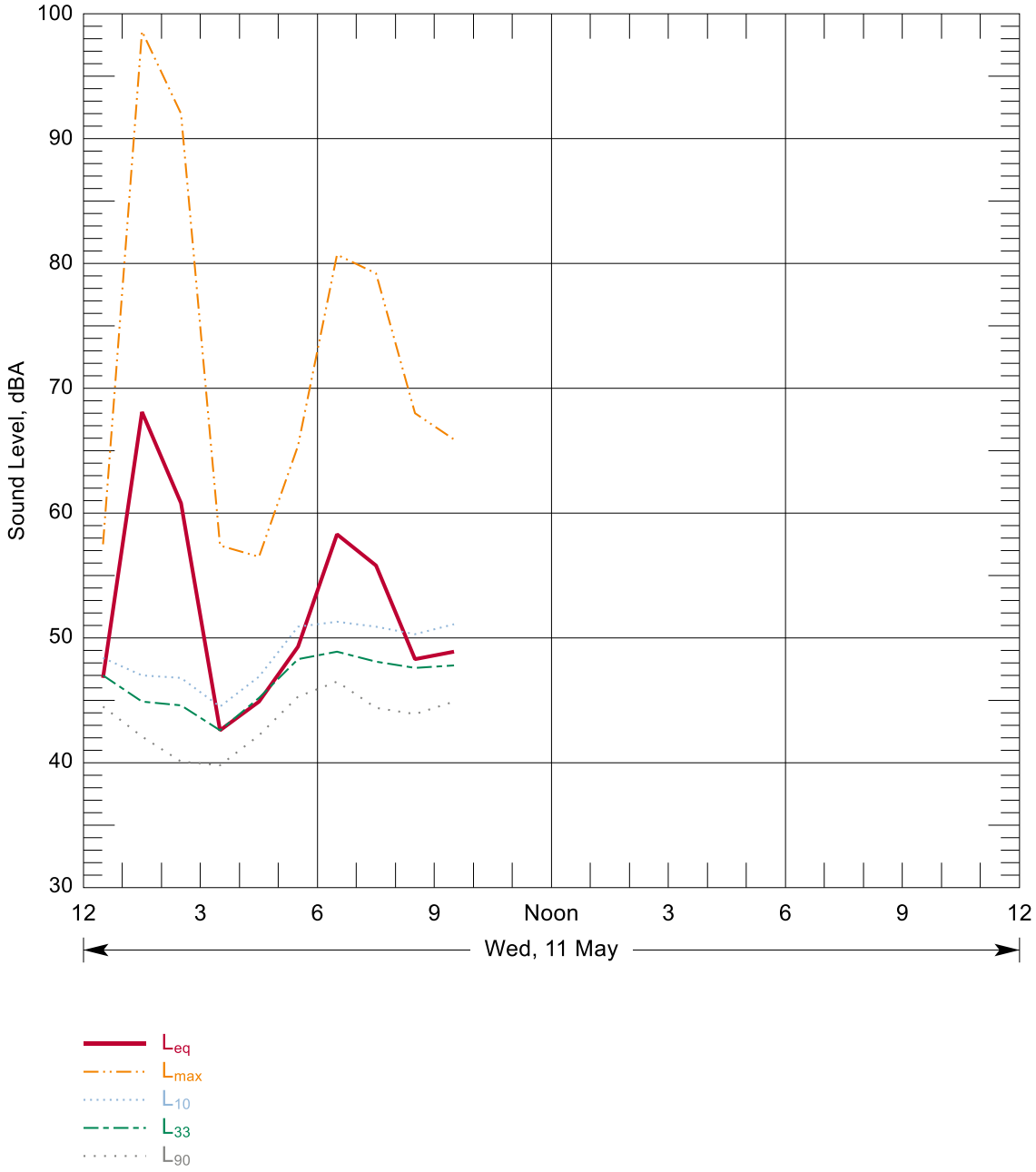
Source: Wilson Ihrig 2016

Figure B-157: Hourly Summary of Noise Levels Measured at N124 on 09 May, 2016



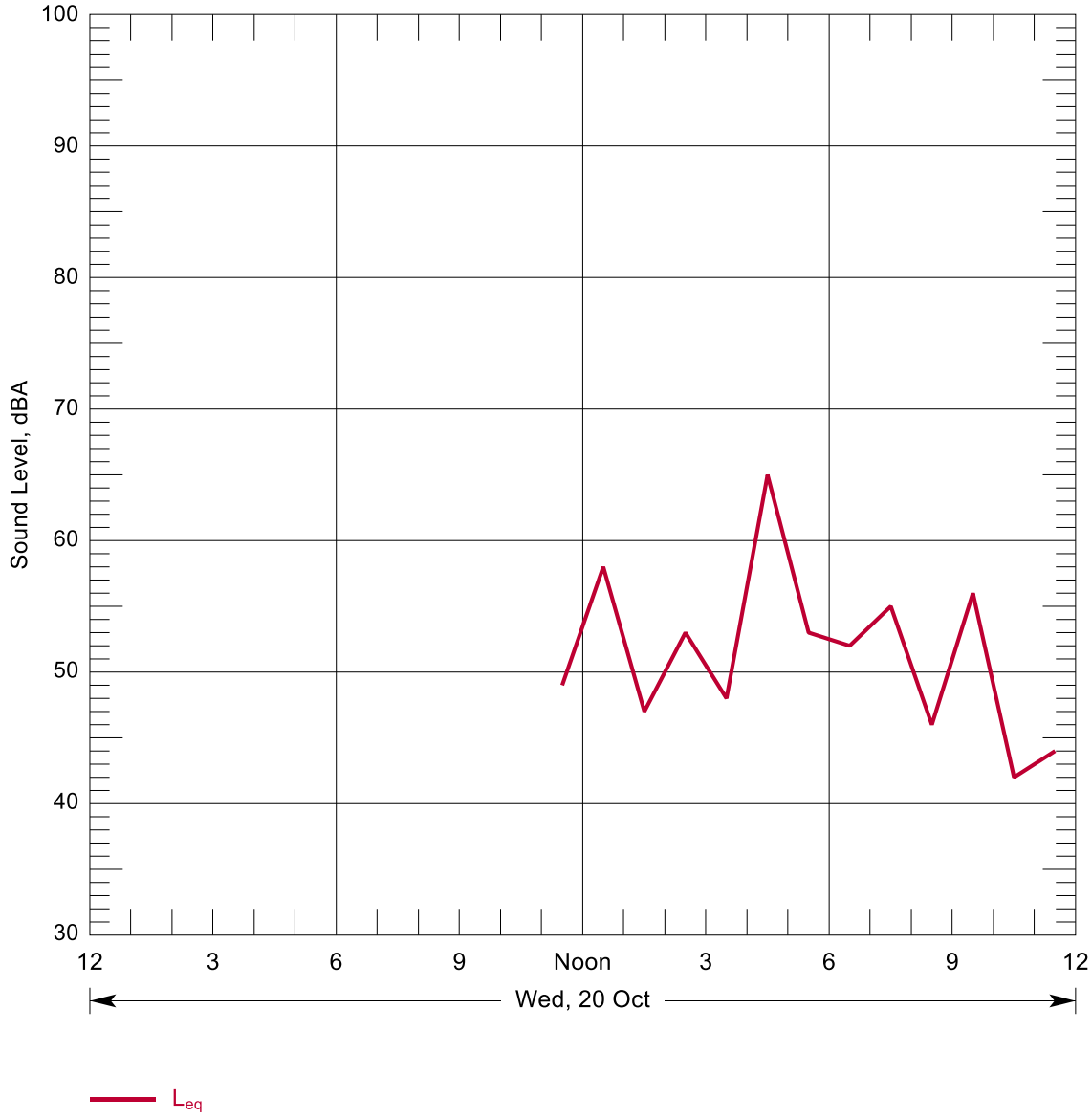
Source: Wilson Ihrig 2016

Figure B-158: Hourly Summary of Noise Levels Measured at N124 on 10 May, 2016



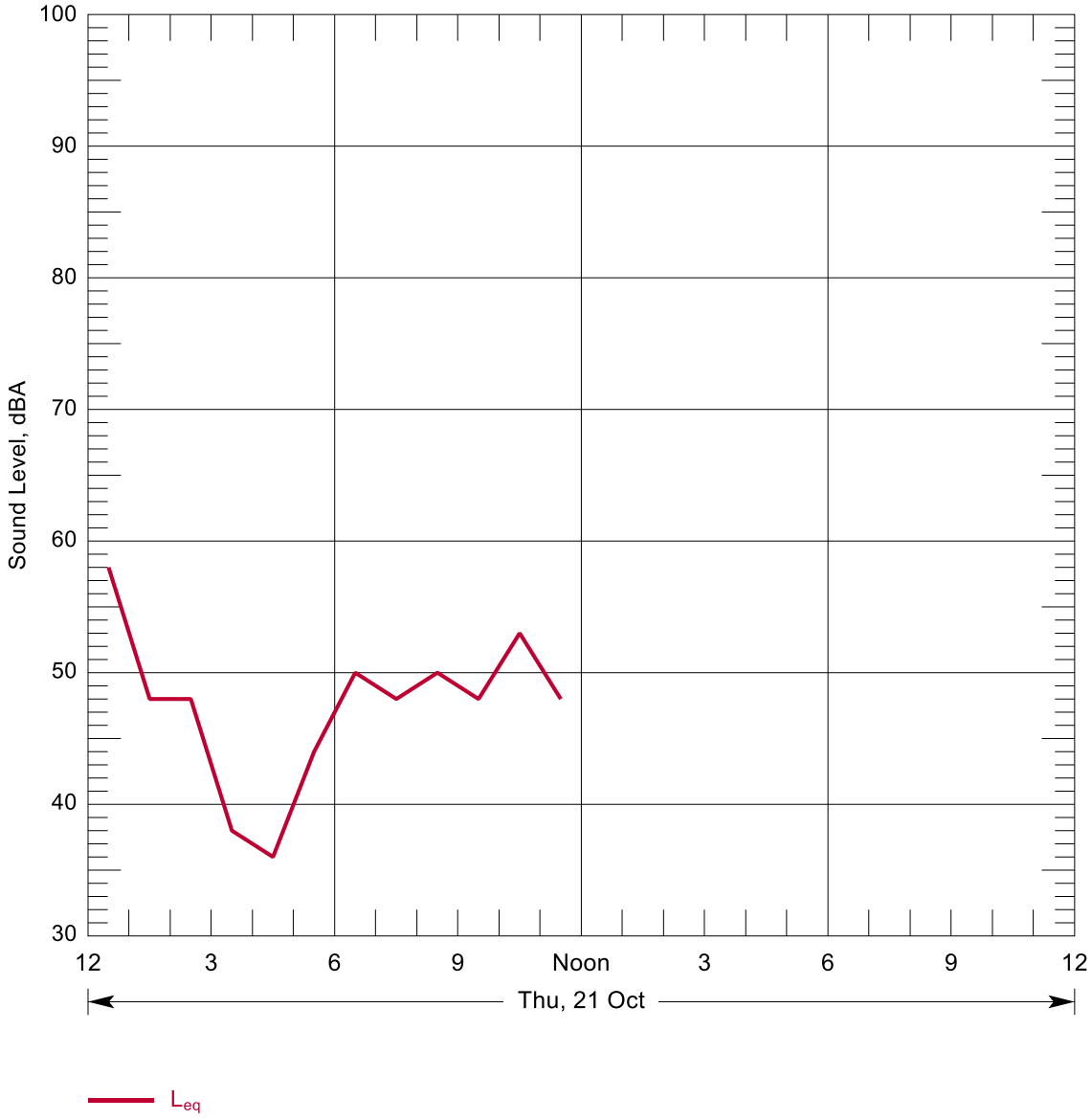
Source: Wilson Ihrig 2016

Figure B-159: Hourly Summary of Noise Levels Measured at N124 on 11 May, 2016



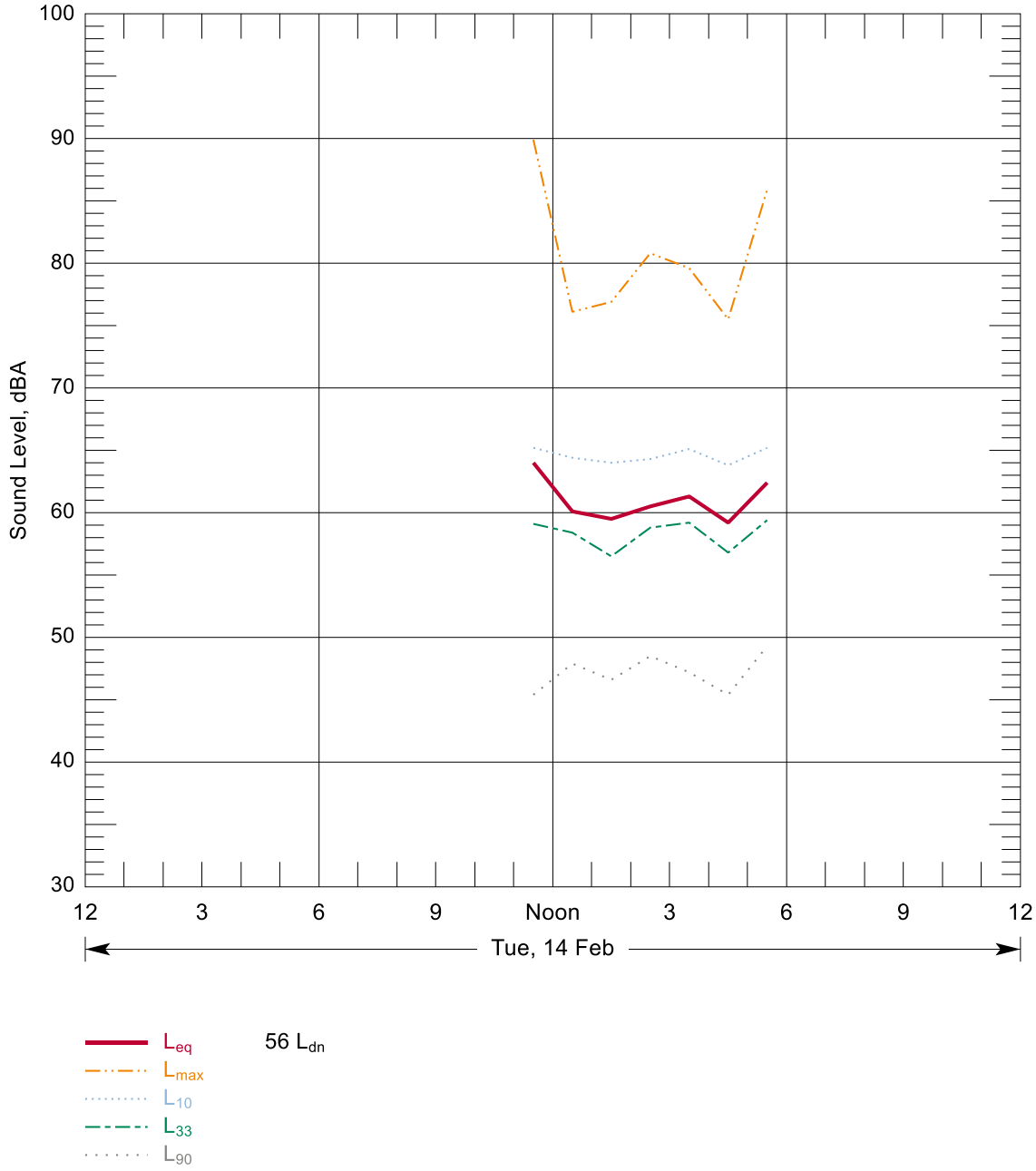
Source: Parsons Transportation 2010

Figure B-160: Hourly Summary of Noise Levels Measured at N125 on 20 Oct, 2010



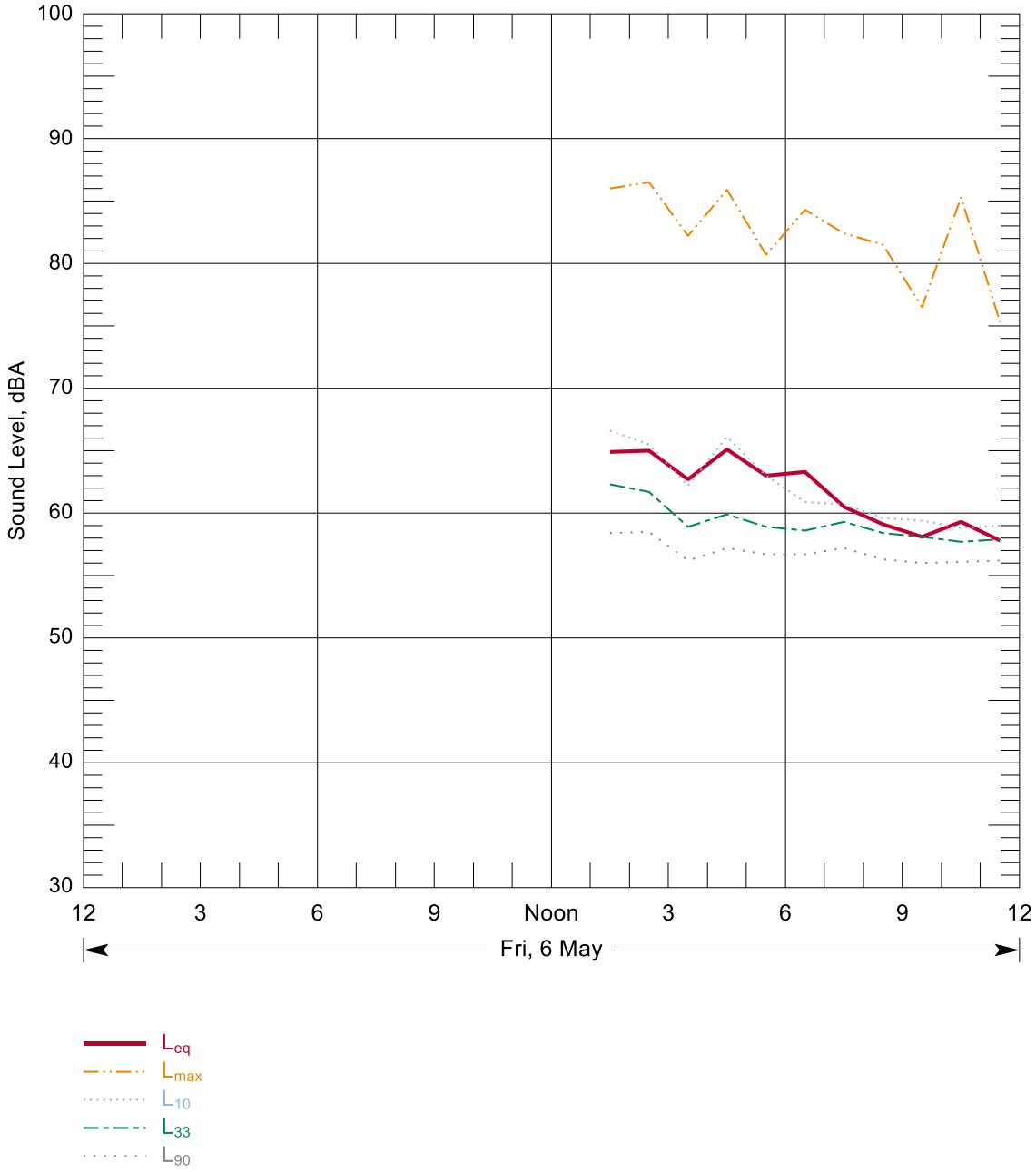
Source: Parsons Transportation 2010

Figure B-161: Hourly Summary of Noise Levels Measured at N125 on 21 Oct, 2010



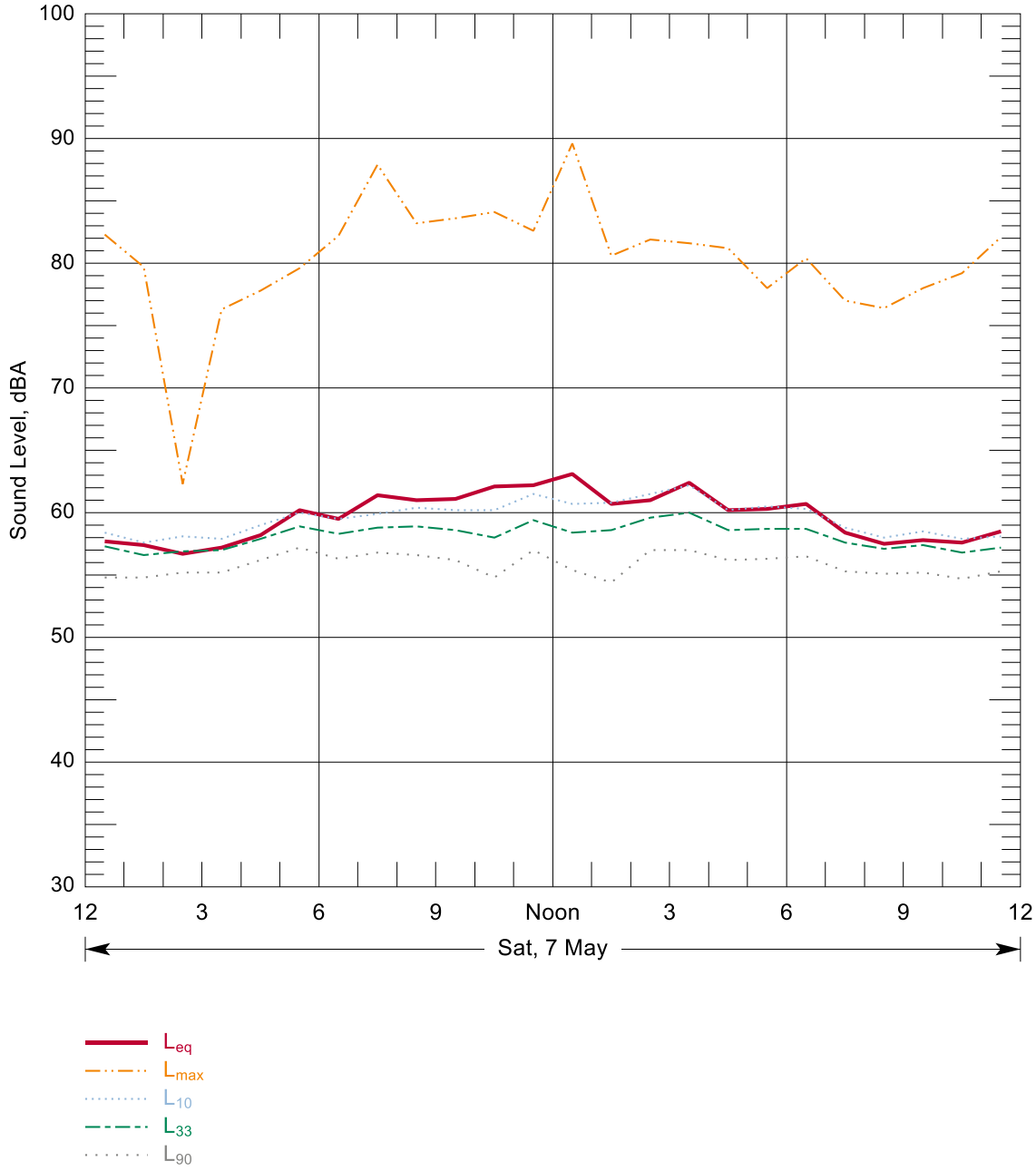
Source: Wilson Ihrig 2017

Figure B-162: Hourly Summary of Noise Levels Measured at N126 on 14 Feb, 2017



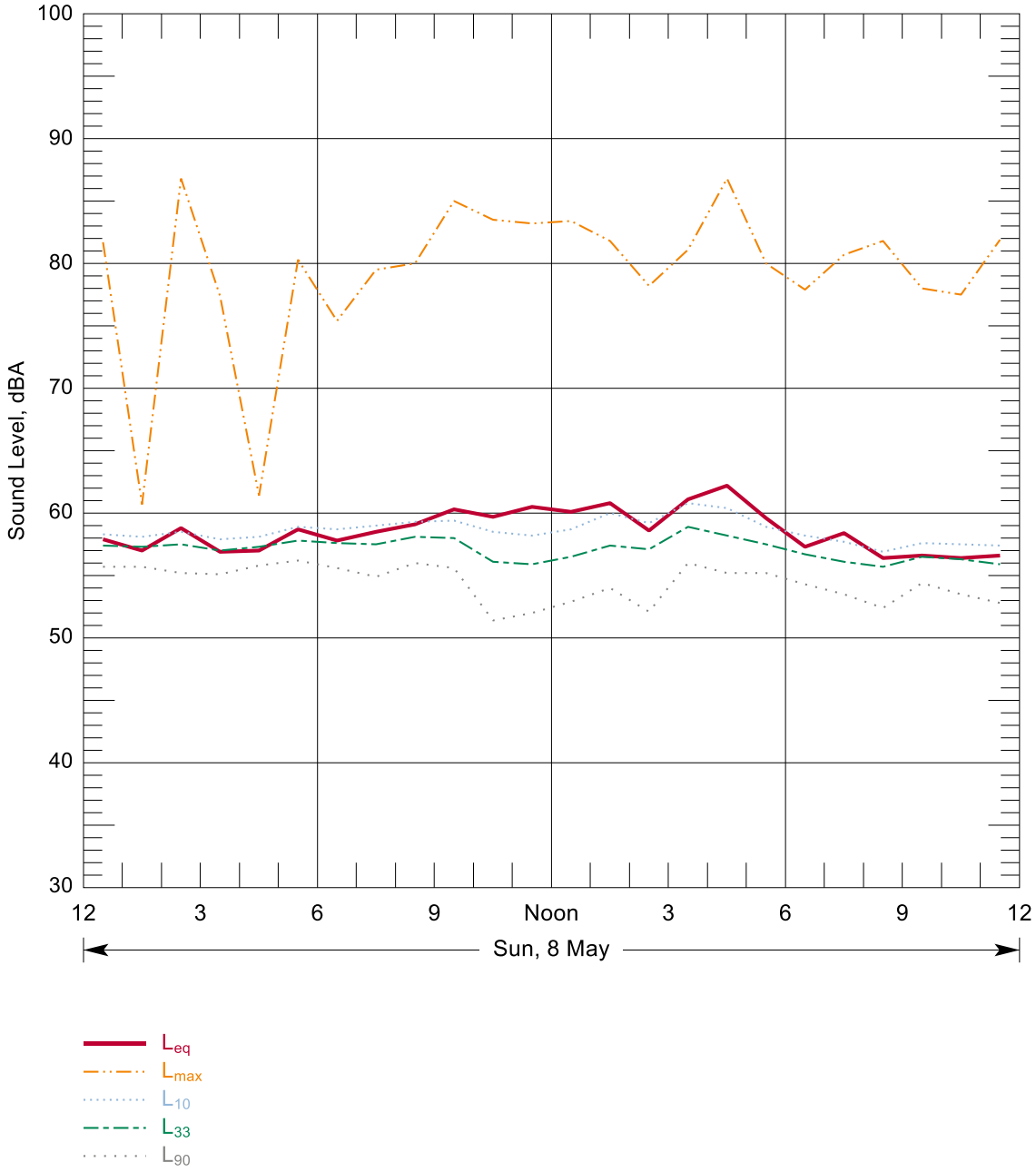
Source: Wilson Ihrig 2016

Figure B-163: Hourly Summary of Noise Levels Measured at N127 on 06 May, 2016



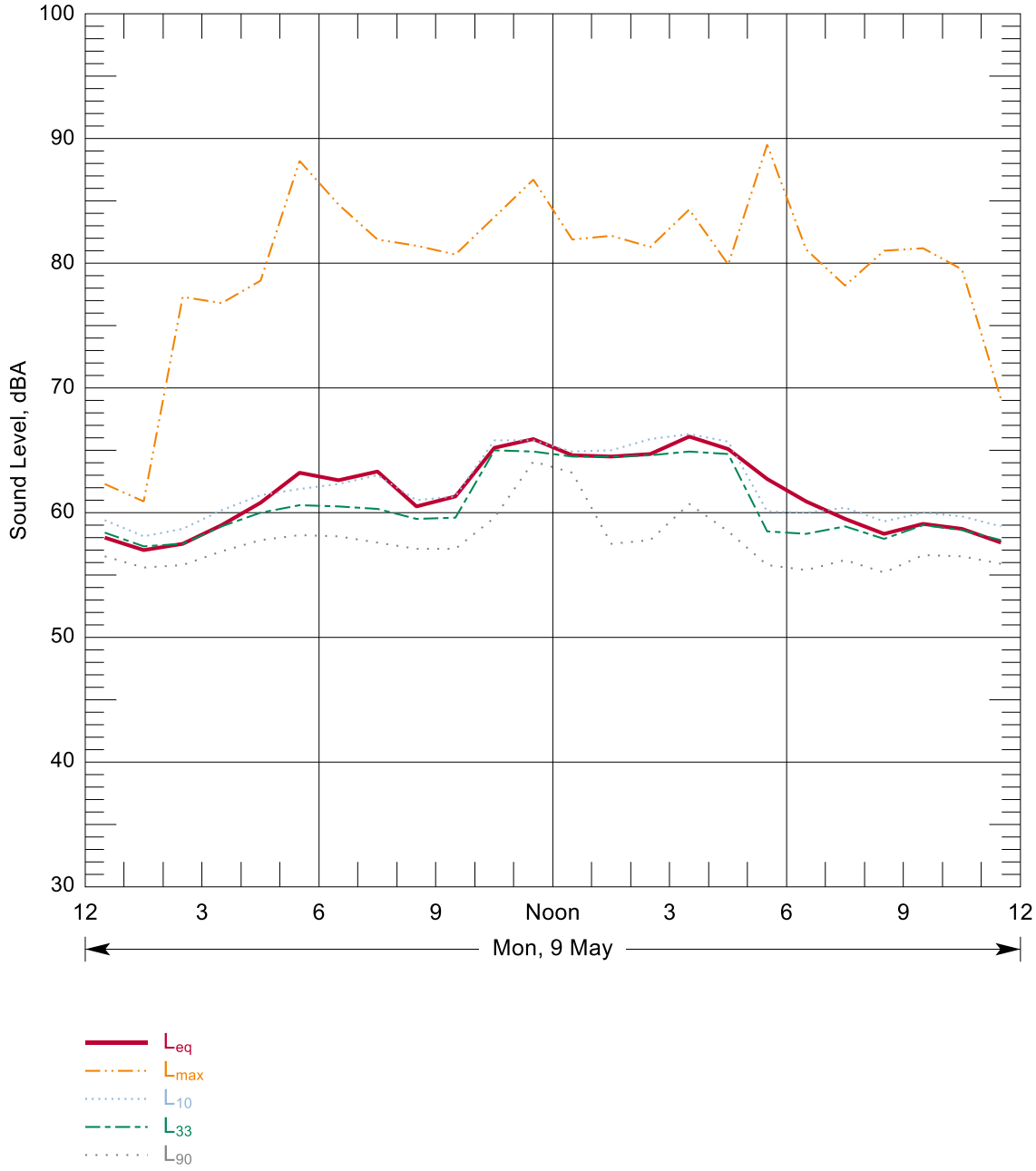
Source: Wilson Ihrig 2016

Figure B-164: Hourly Summary of Noise Levels Measured at N127 on 07 May, 2016



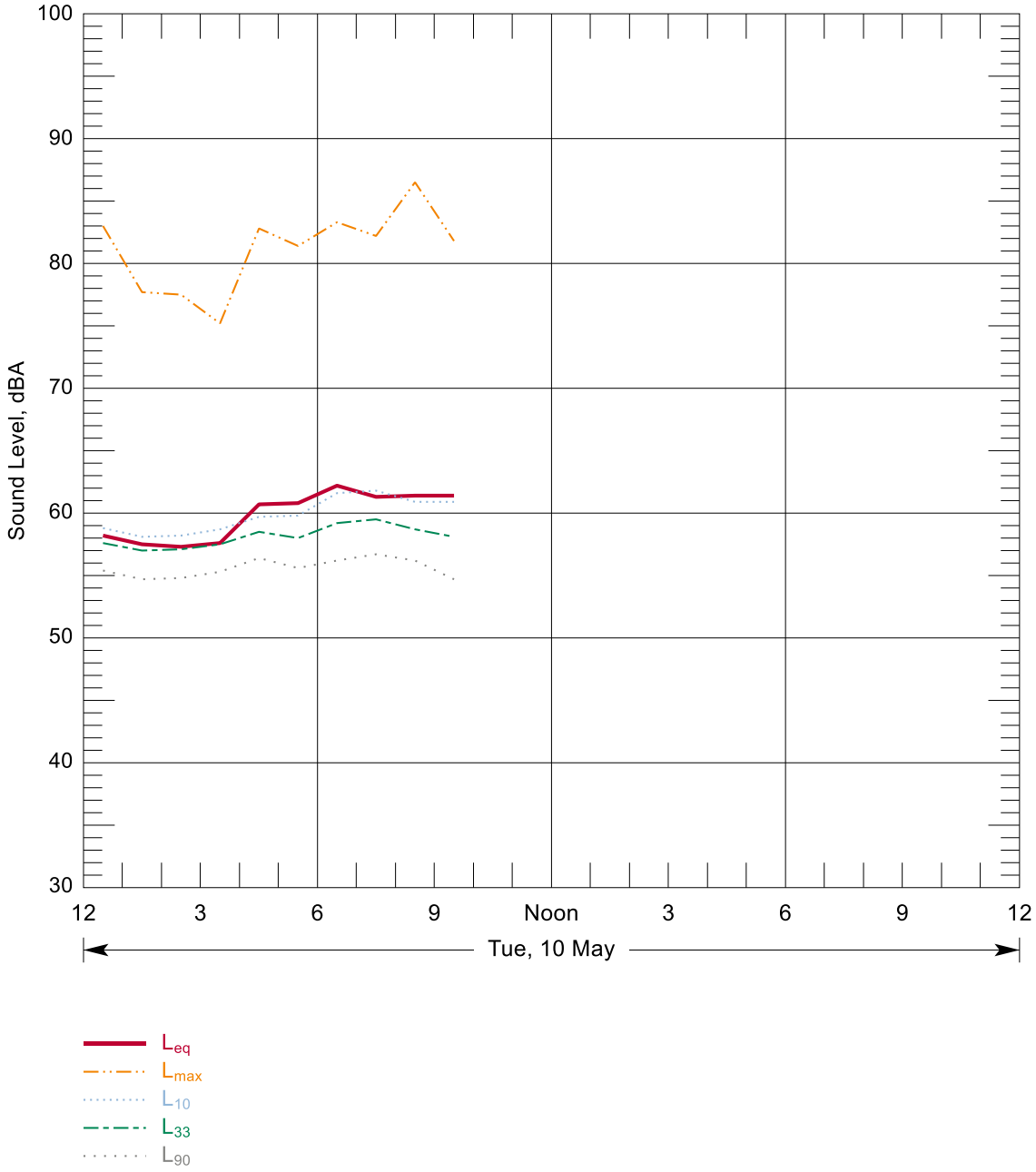
Source: Wilson Ihrig 2016

Figure B-165: Hourly Summary of Noise Levels Measured at N127 on 08 May, 2016



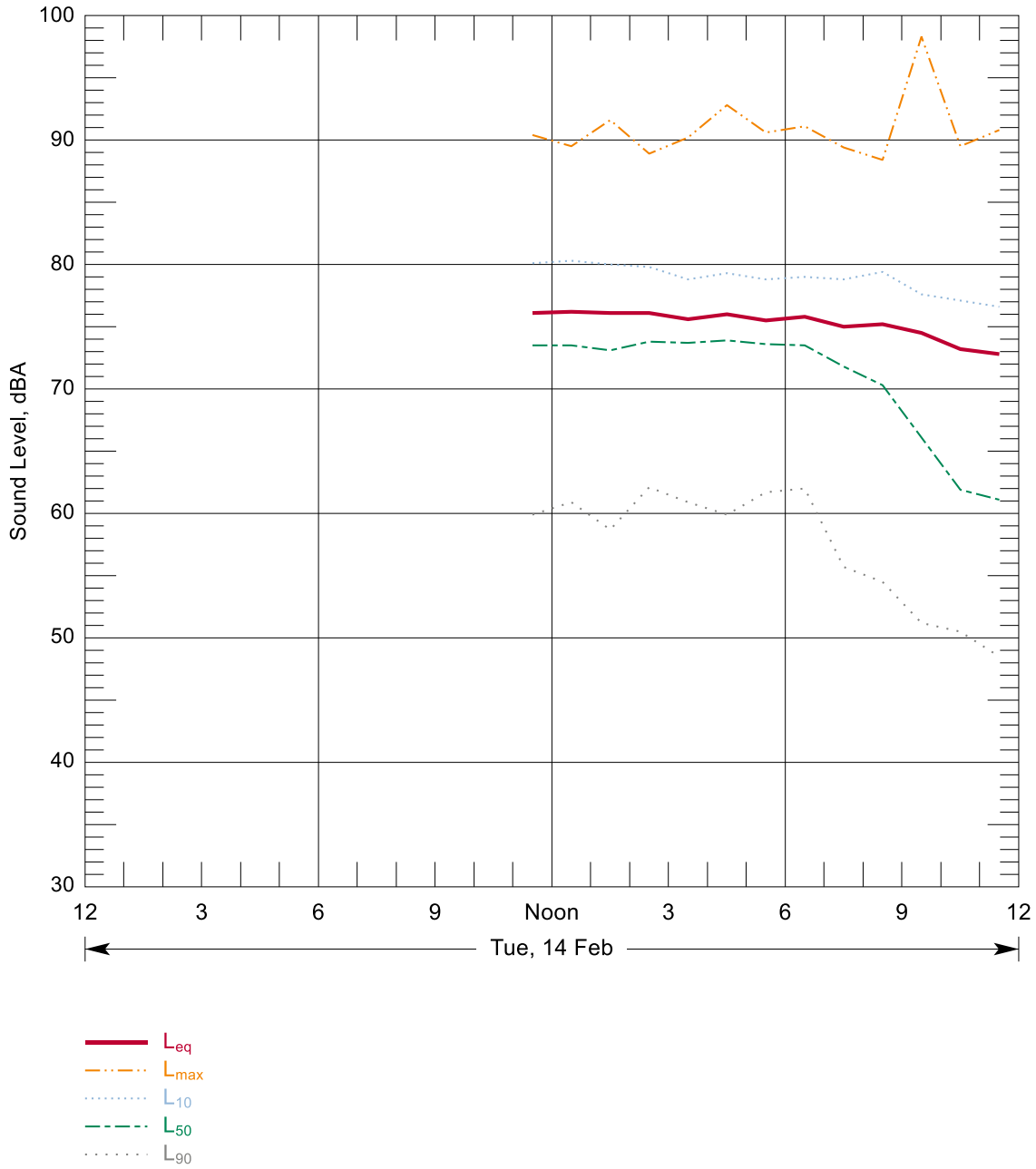
Source: Wilson Ihrig 2016

Figure B-166: Hourly Summary of Noise Levels Measured at N127 on 09 May, 2016



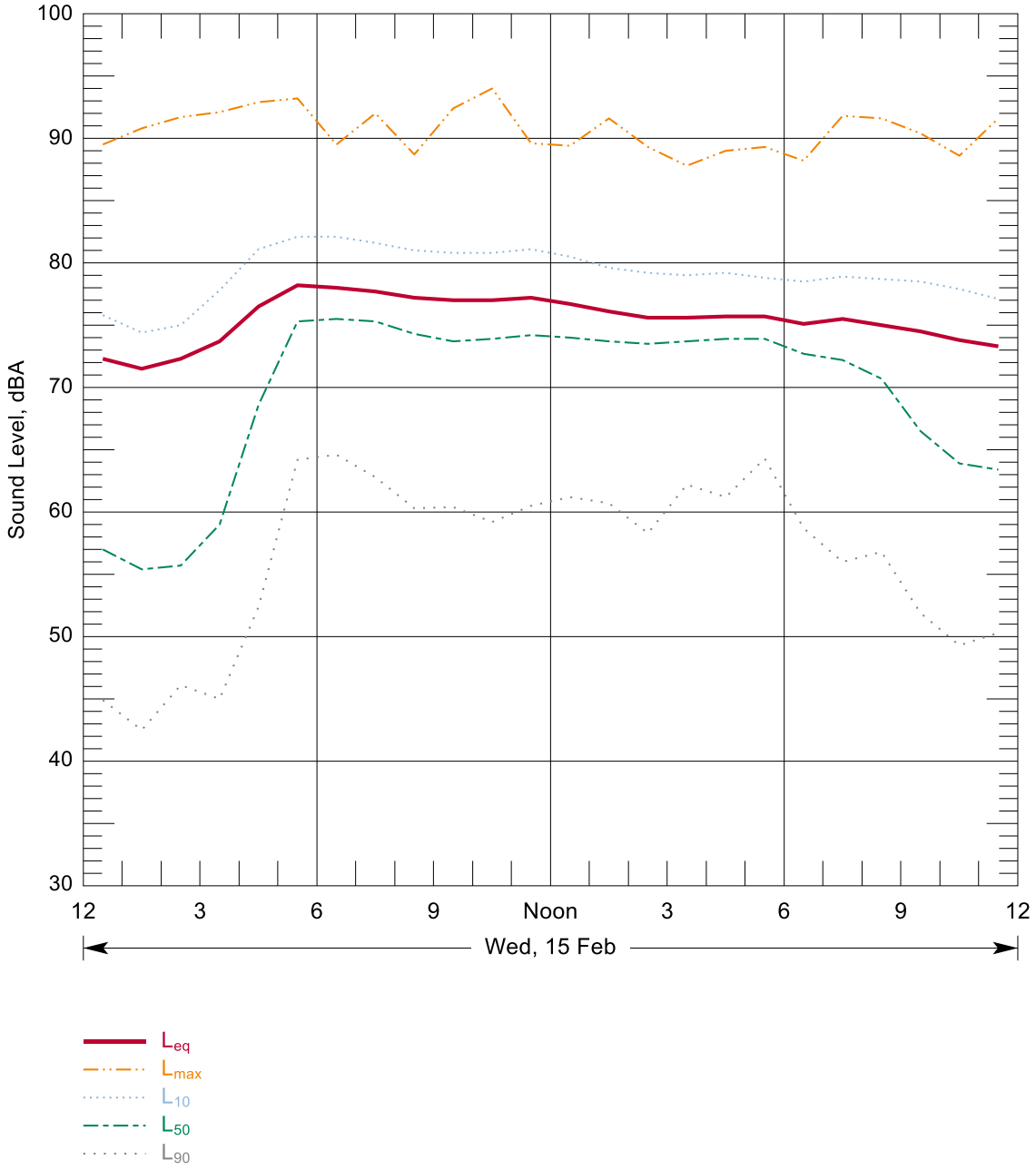
Source: Wilson Ihrig 2016

Figure B-167: Hourly Summary of Noise Levels Measured at N127 on 10 May, 2016



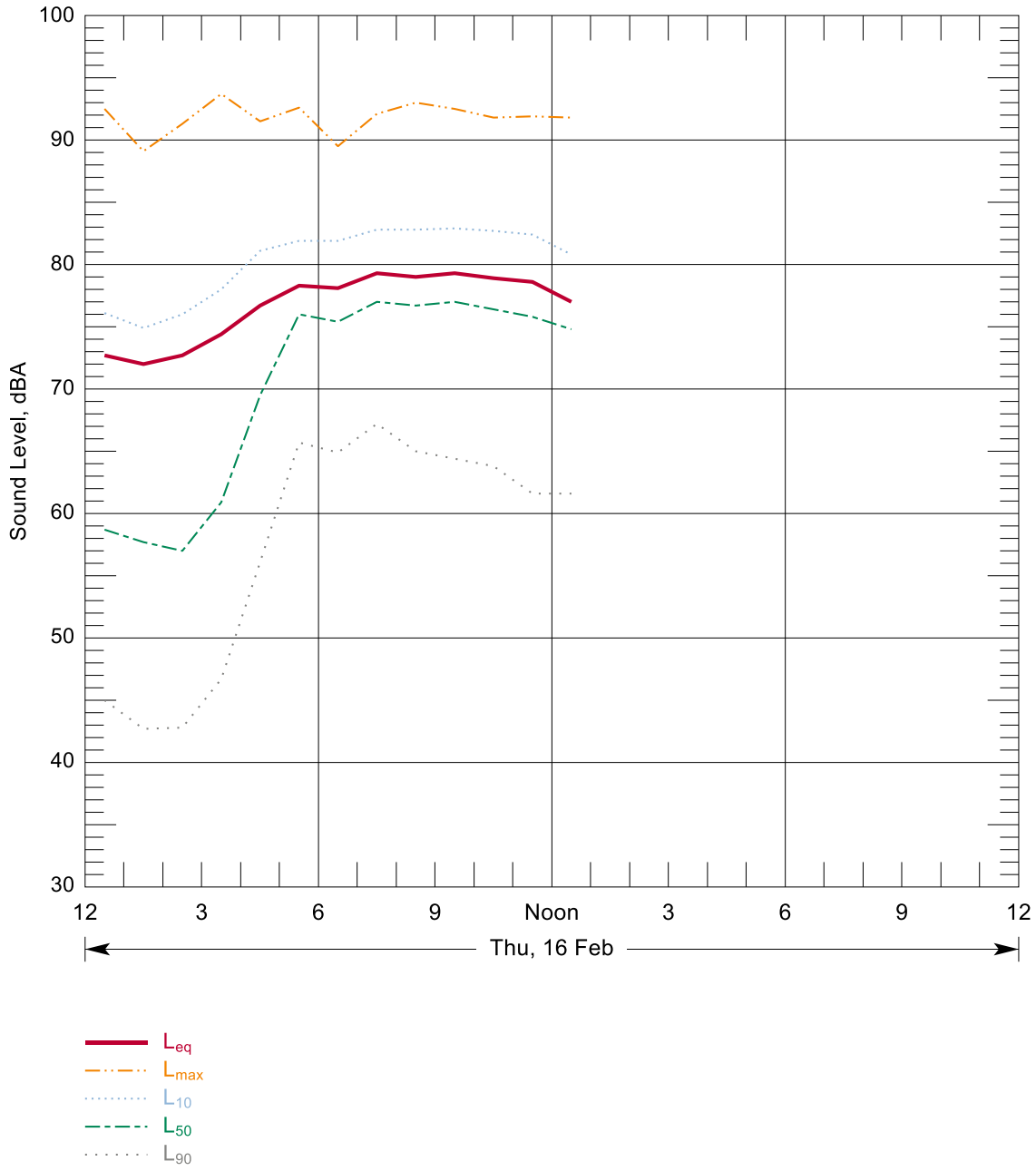
Source: Wilson Ihrig 2017

Figure B-168: Hourly Summary of Noise Levels Measured at N128 on 14 Feb, 2017



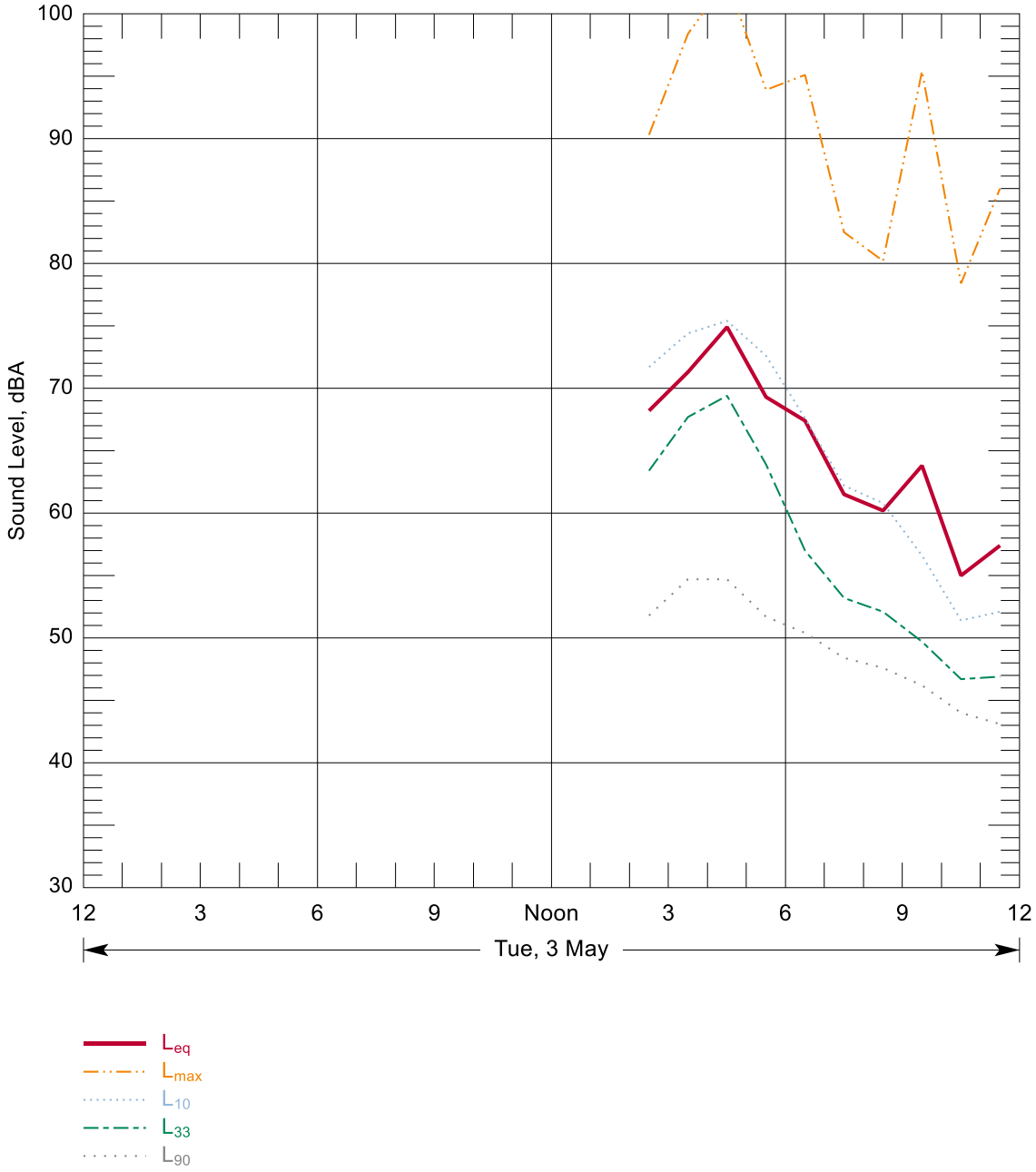
Source: Wilson Ihrig 2017

Figure B-169: Hourly Summary of Noise Levels Measured at N128 on 15 Feb, 2017



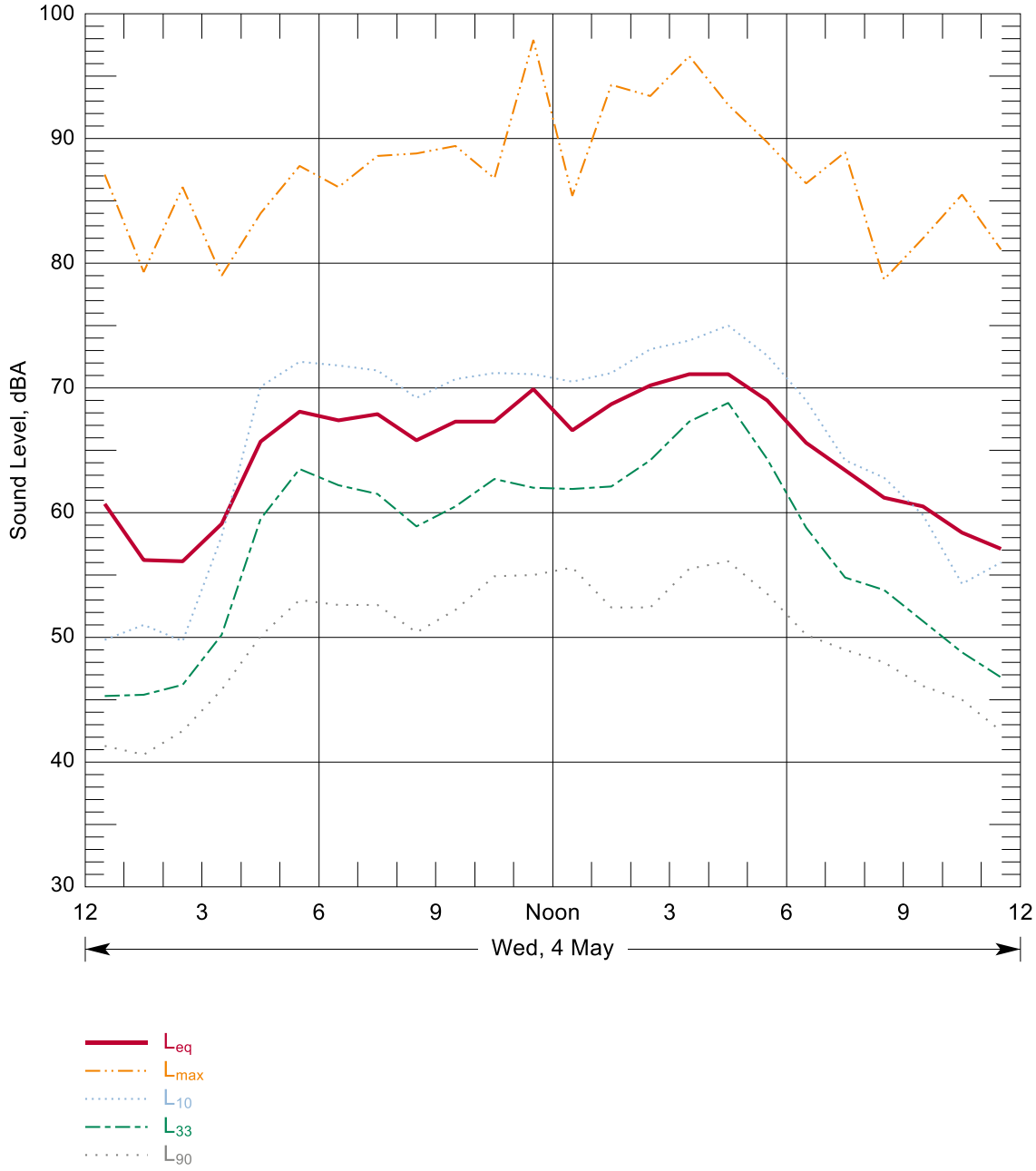
Source: Wilson Ihrig 2017

Figure B-170: Hourly Summary of Noise Levels Measured at N128 on 16 Feb, 2017



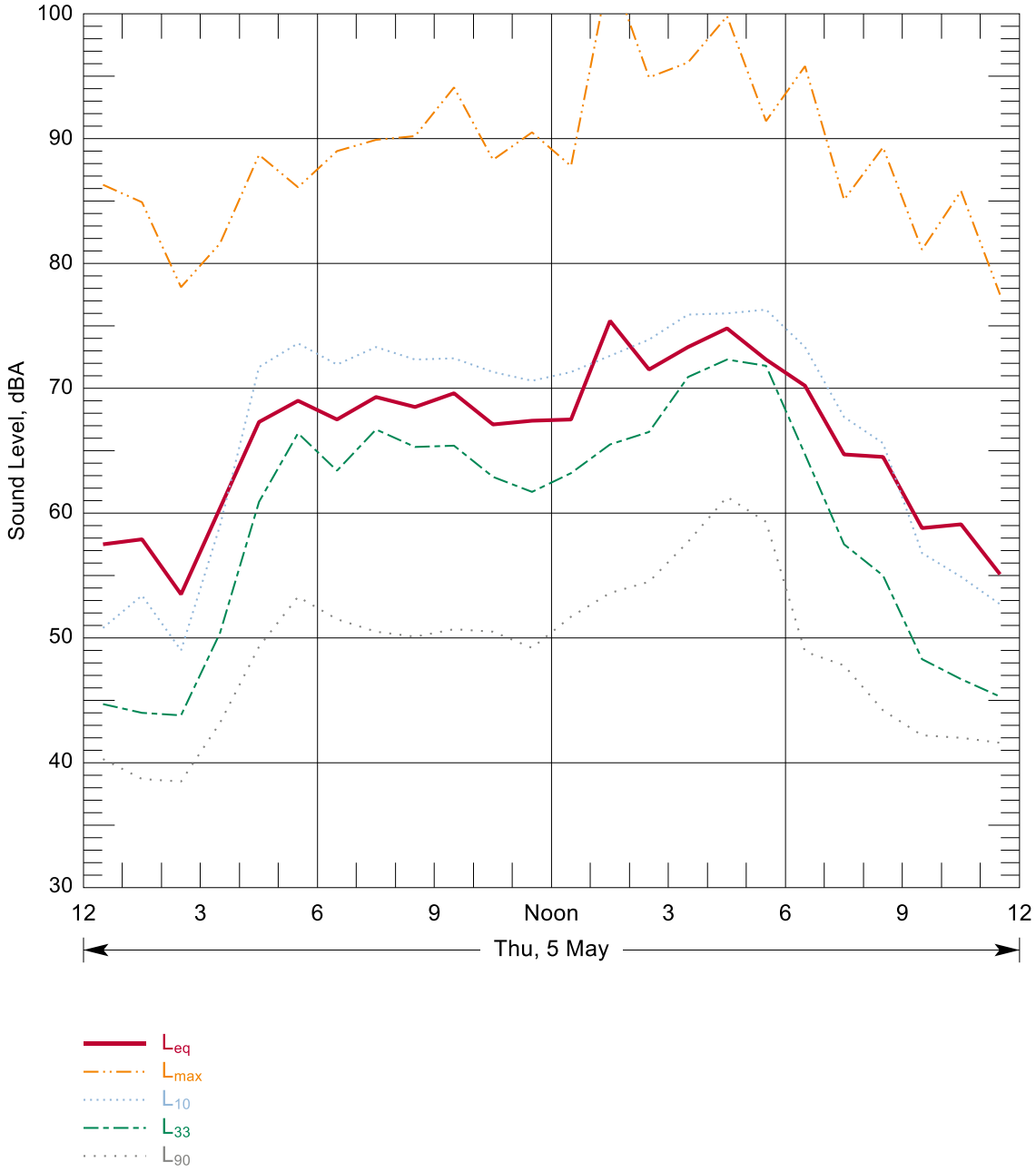
Source: Wilson Ihrig 2016

Figure B-171: Hourly Summary of Noise Levels Measured at N129 on 03 May, 2016



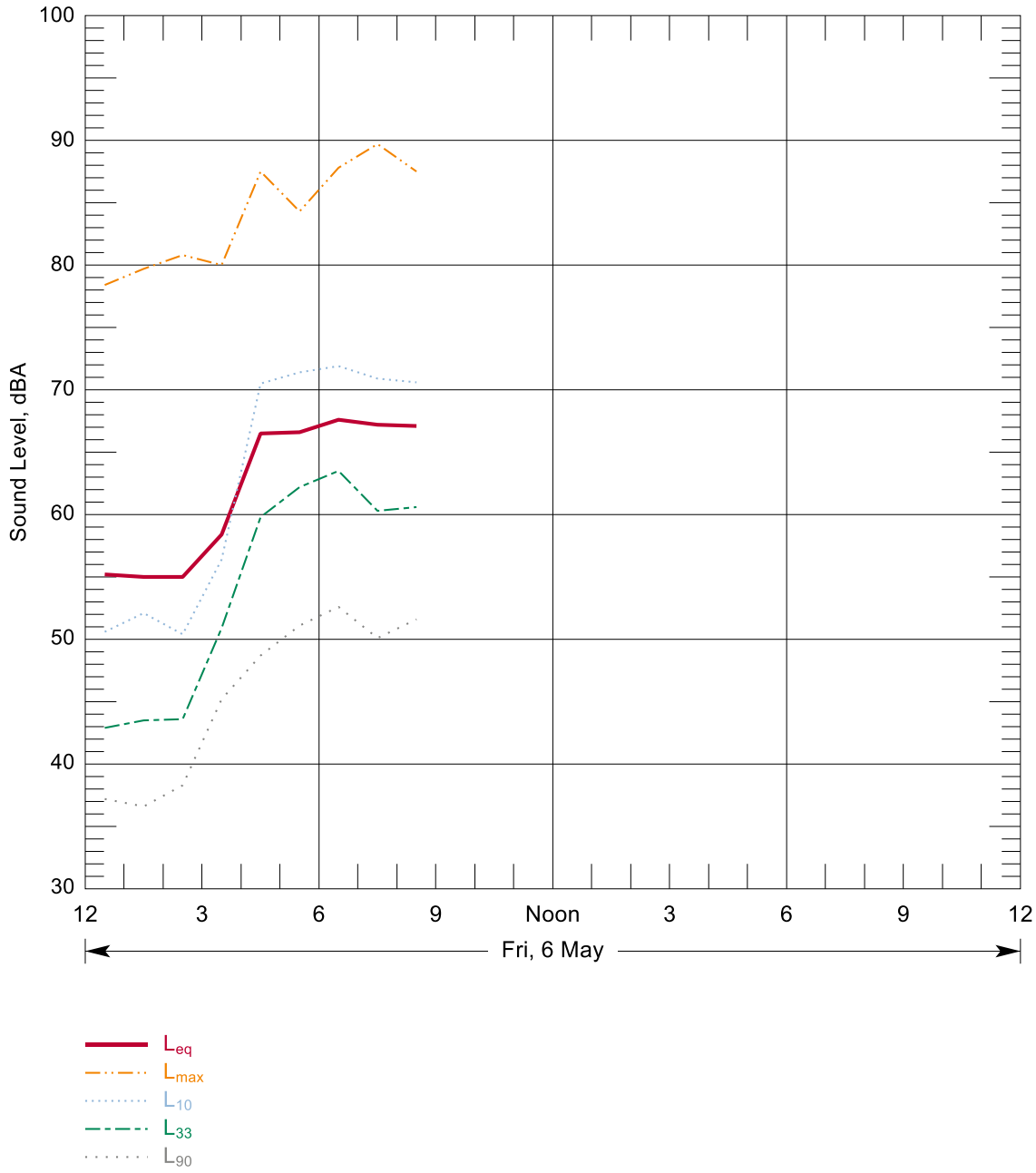
Source: Wilson Ihrig 2016

Figure B-172: Hourly Summary of Noise Levels Measured at N129 on 04 May, 2016



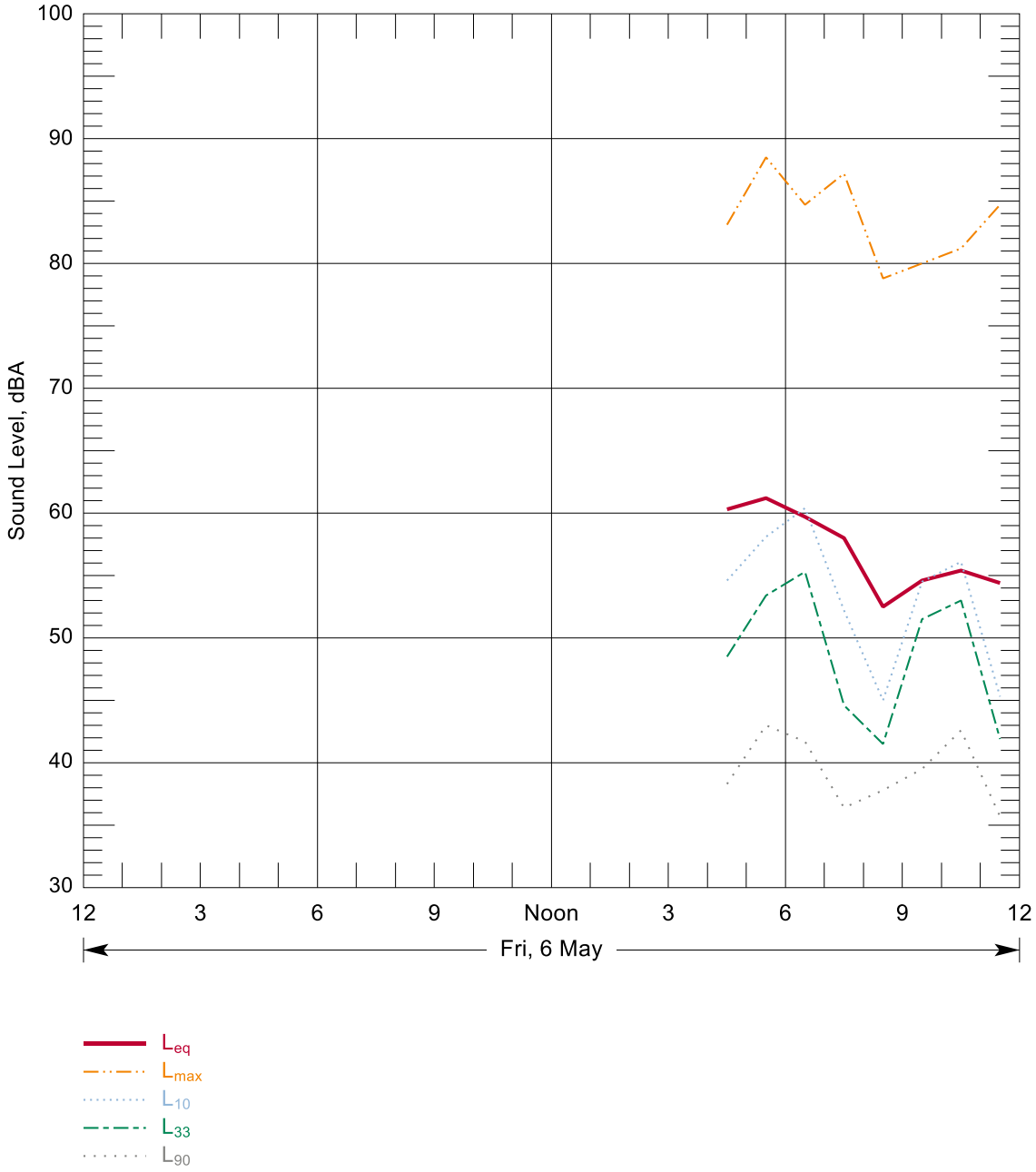
Source: Wilson Ihrig 2016

Figure B-173: Hourly Summary of Noise Levels Measured at N129 on 05 May, 2016



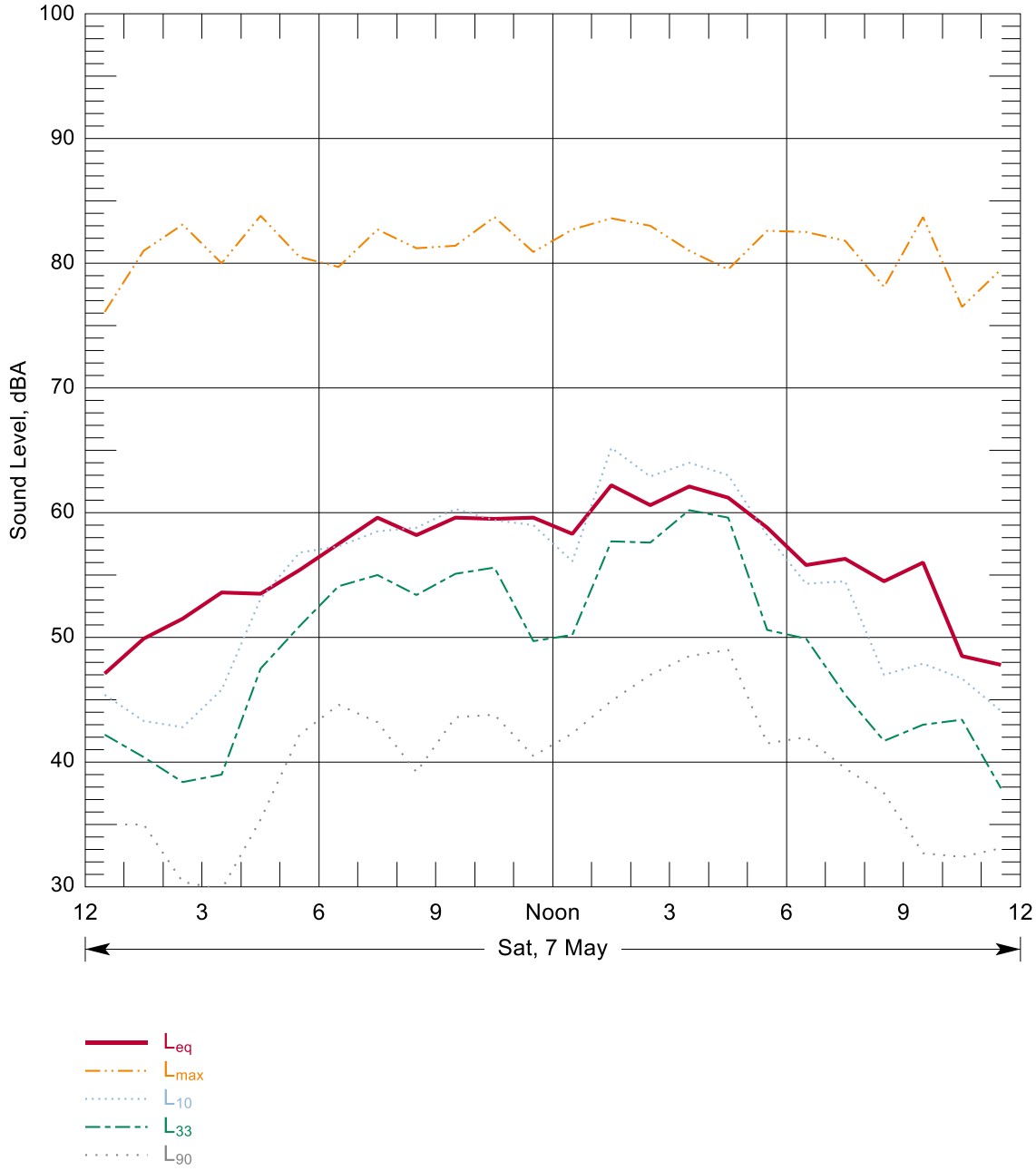
Source: Wilson Ihrig 2016

Figure B-174: Hourly Summary of Noise Levels Measured at N129 on 06 May, 2016



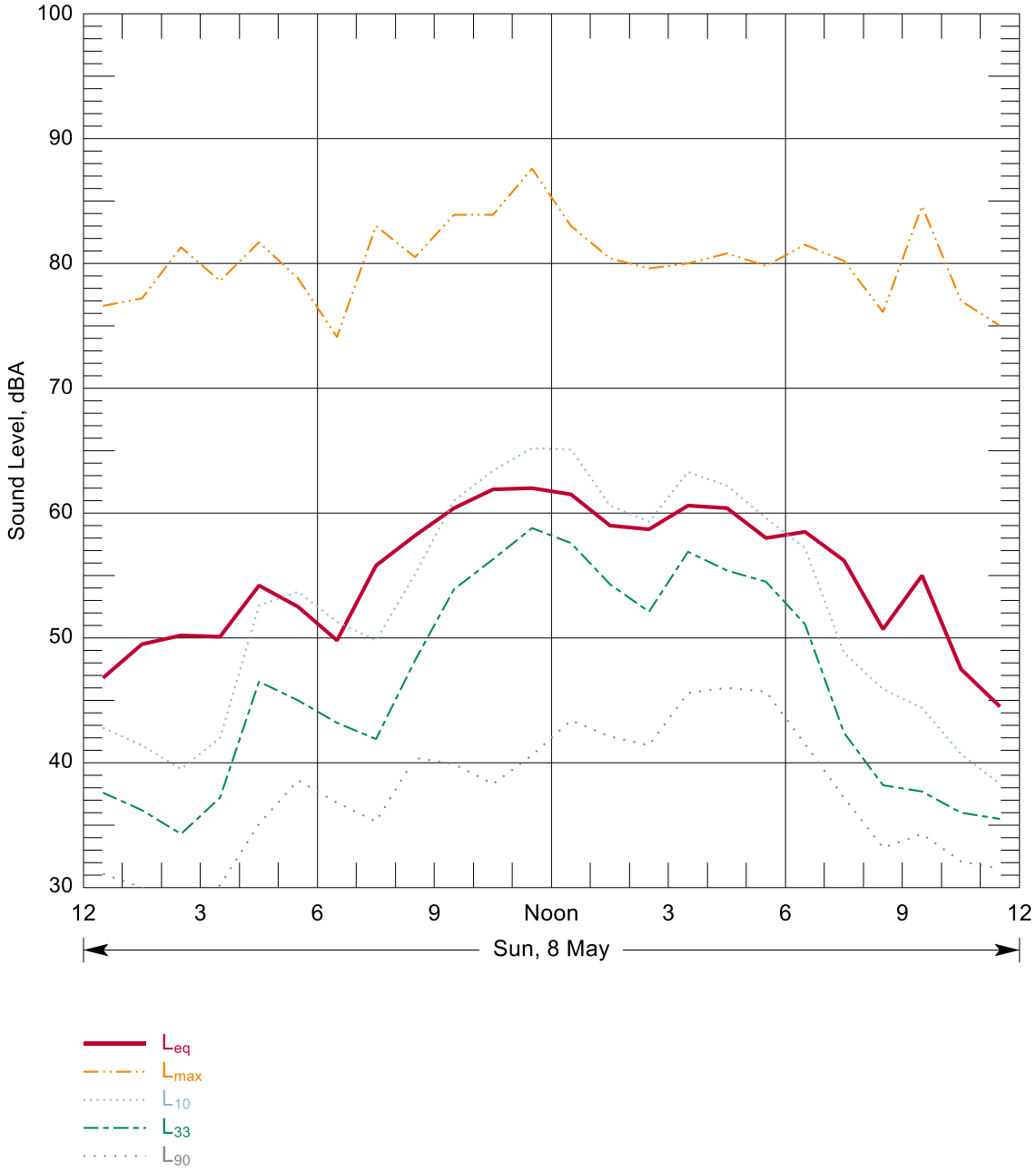
Source: Wilson Ihrig 2016

Figure B-175: Hourly Summary of Noise Levels Measured at N130 on 06 May, 2016



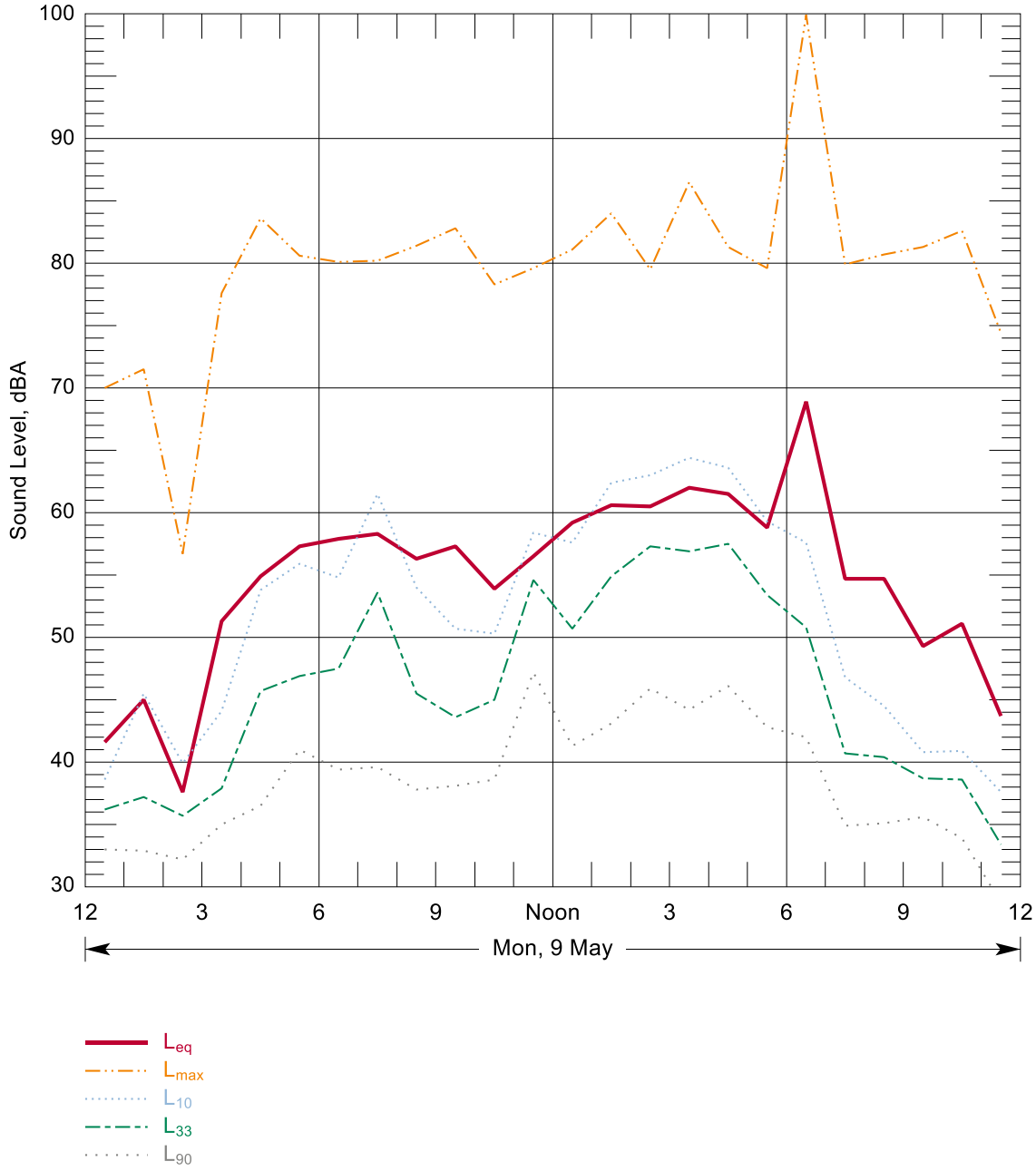
Source: Wilson Ihrig 2016

Figure B-176: Hourly Summary of Noise Levels Measured at N130 on 07 May, 2016



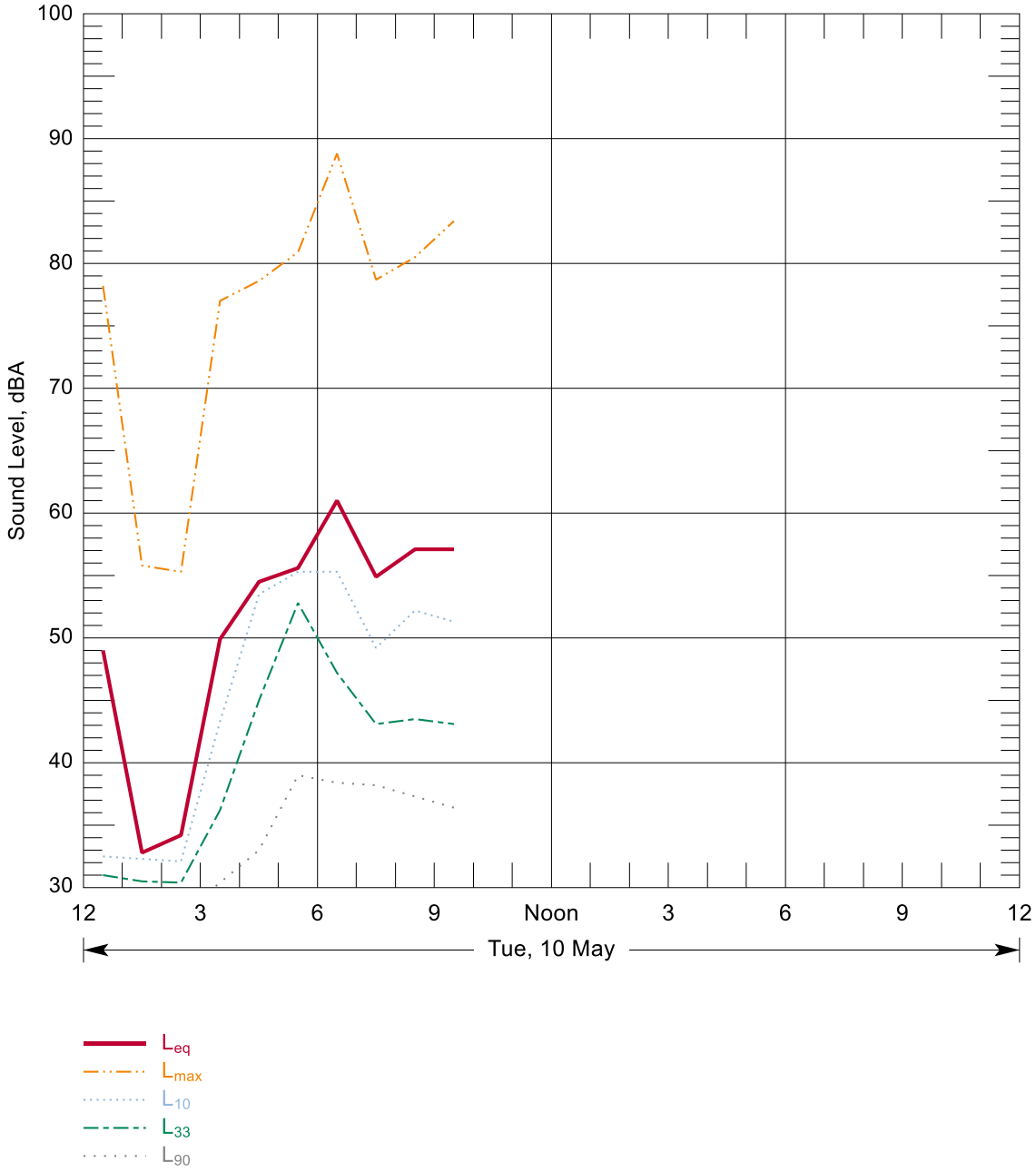
Source: Wilson Ihrig 2016

Figure B-177: Hourly Summary of Noise Levels Measured at N130 on 08 May, 2016



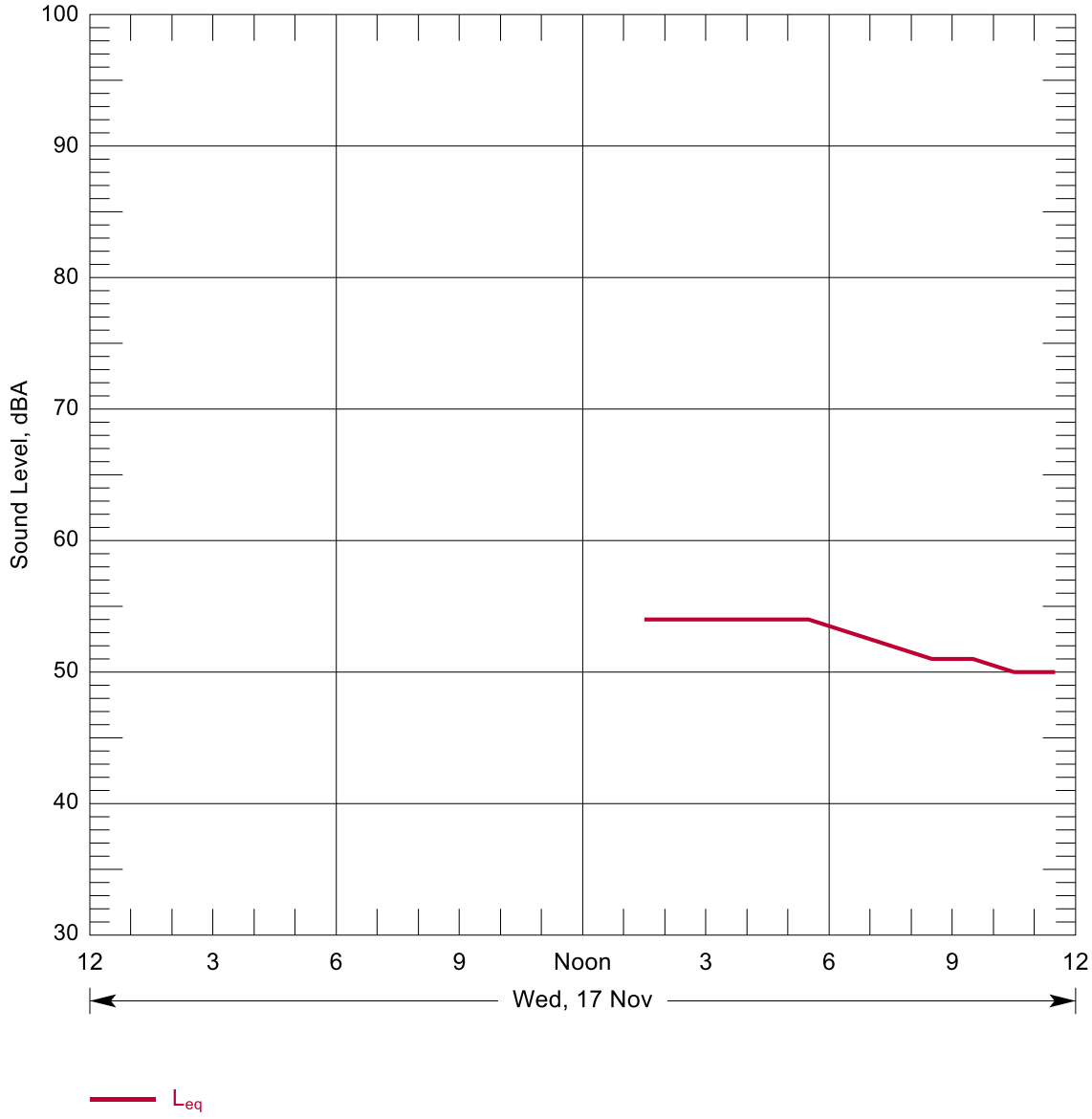
Source: Wilson Ihrig 2016

Figure B-178: Hourly Summary of Noise Levels Measured at N130 on 09 May, 2016



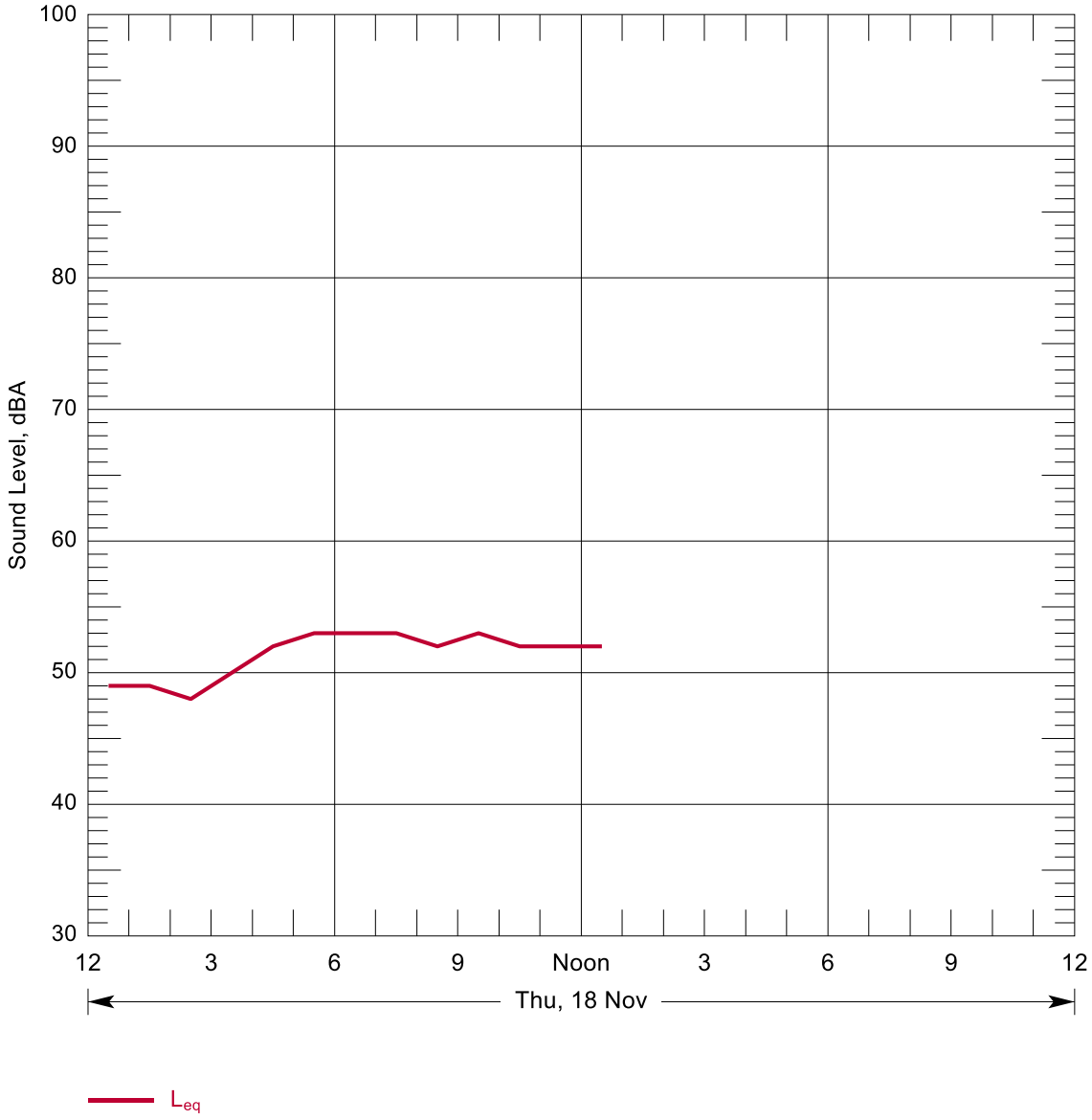
Source: Wilson Ihrig 2016

Figure B-179: Hourly Summary of Noise Levels Measured at N130 on 10 May, 2016



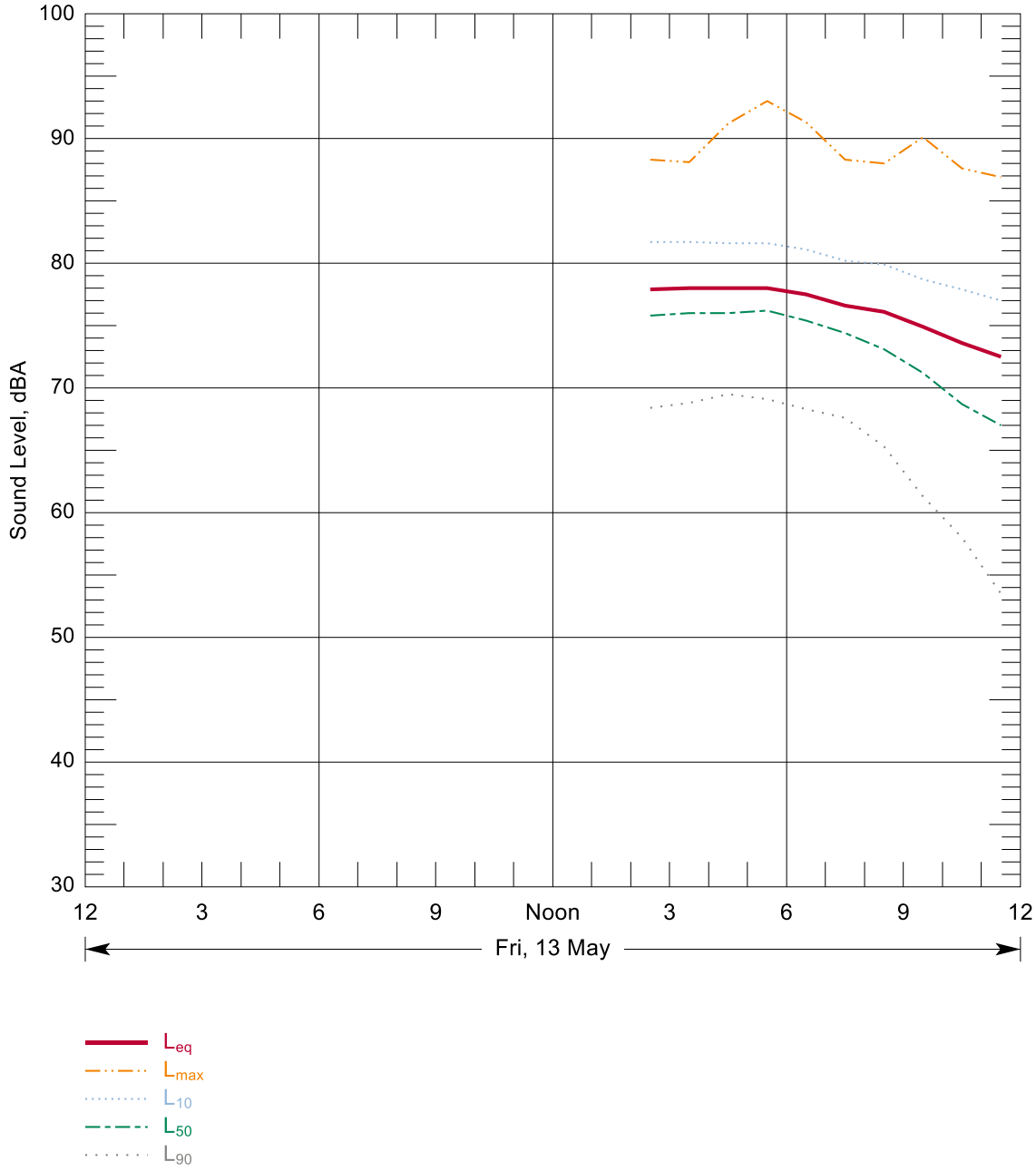
Source: Parsons Transportation 2010

Figure B-180: Hourly Summary of Noise Levels Measured at N131 on 17 Nov, 2010



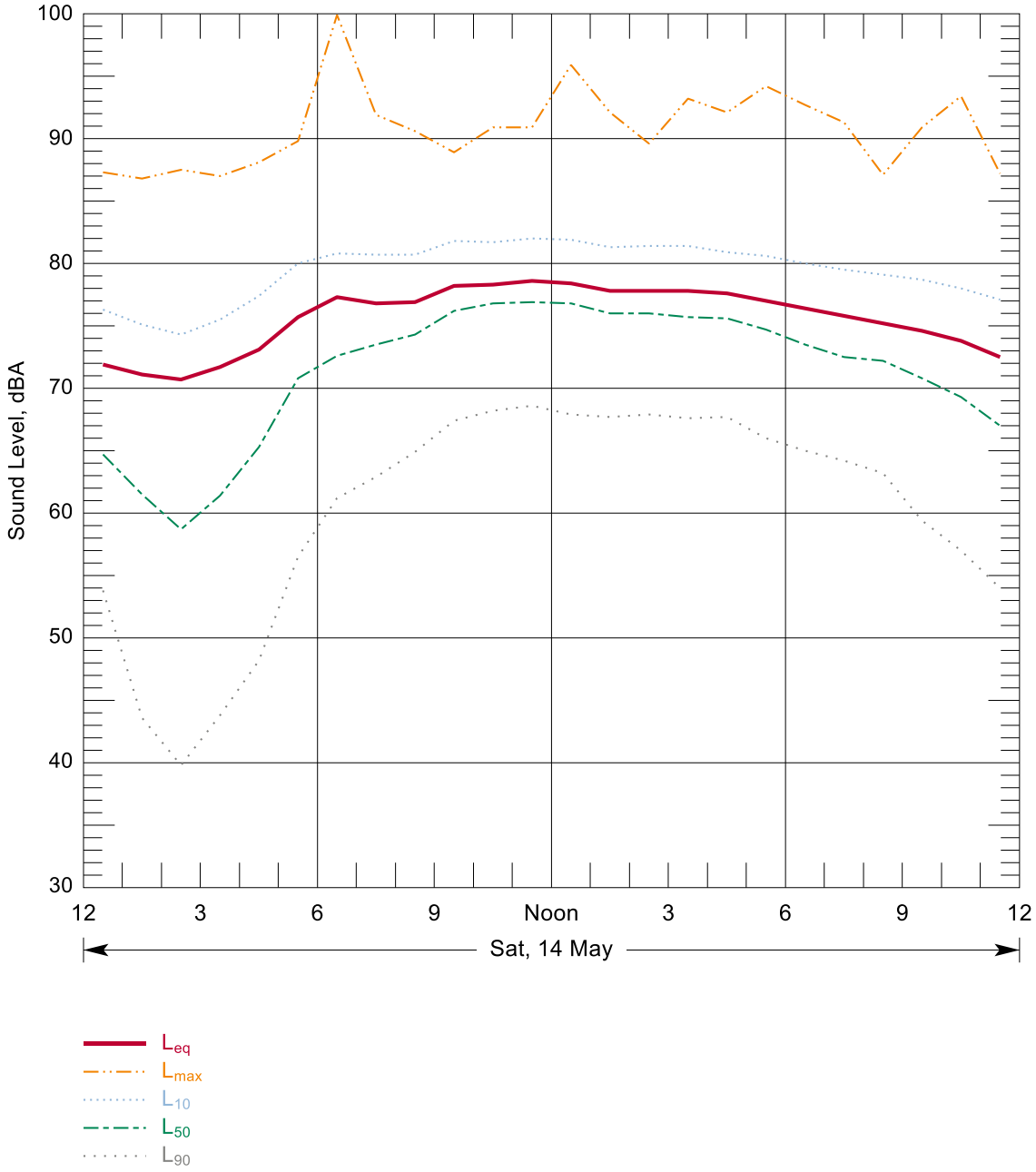
Source: Parsons Transportation 2010

Figure B-181: Hourly Summary of Noise Levels Measured at N131 on 18 Nov, 2010



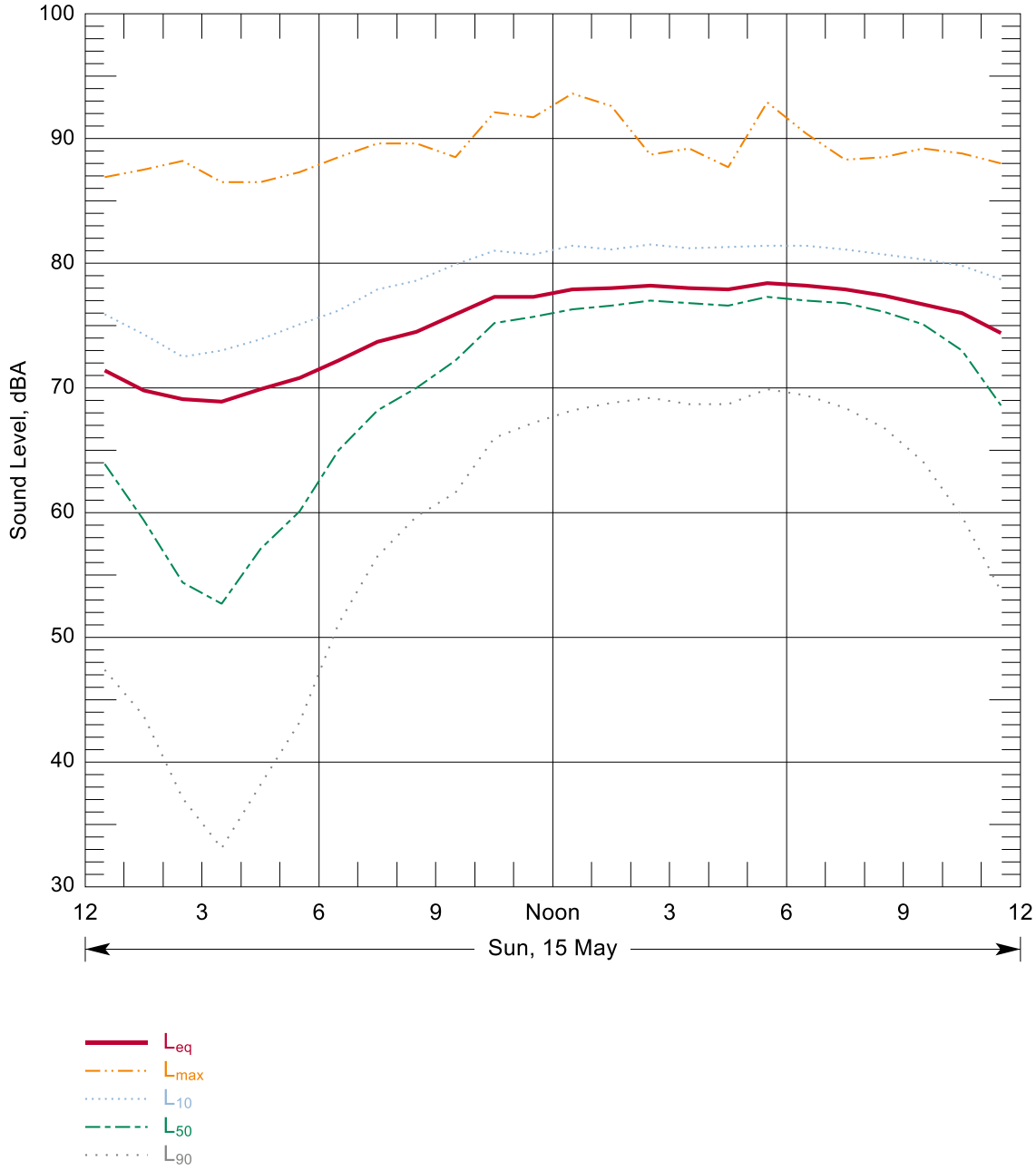
Source: Wilson Ihrig 2016

Figure B-182: Hourly Summary of Noise Levels Measured at N132 on 13 May, 2016



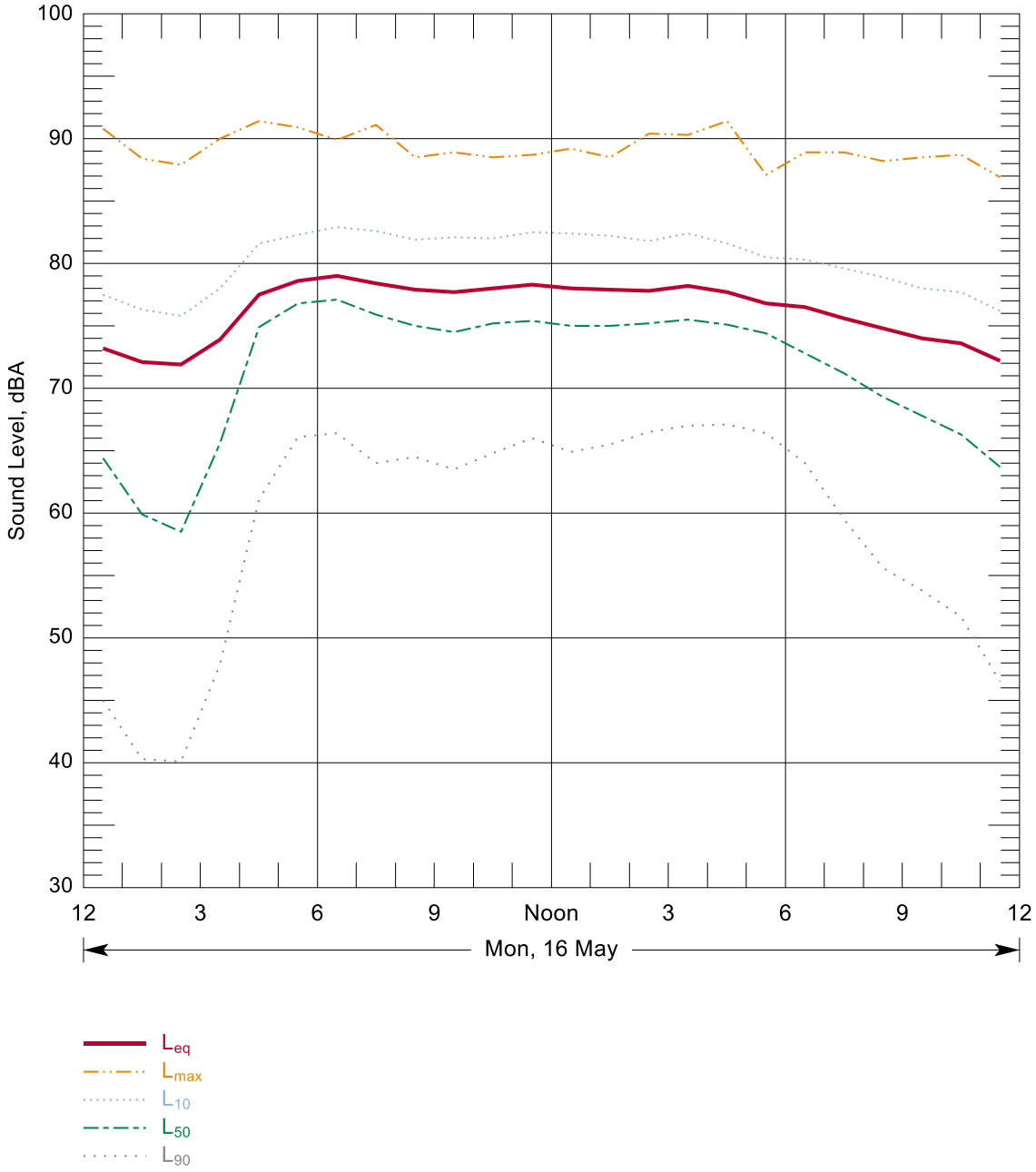
Source: Wilson Ihrig 2016

Figure B-183: Hourly Summary of Noise Levels Measured at N132 on 14 May, 2016



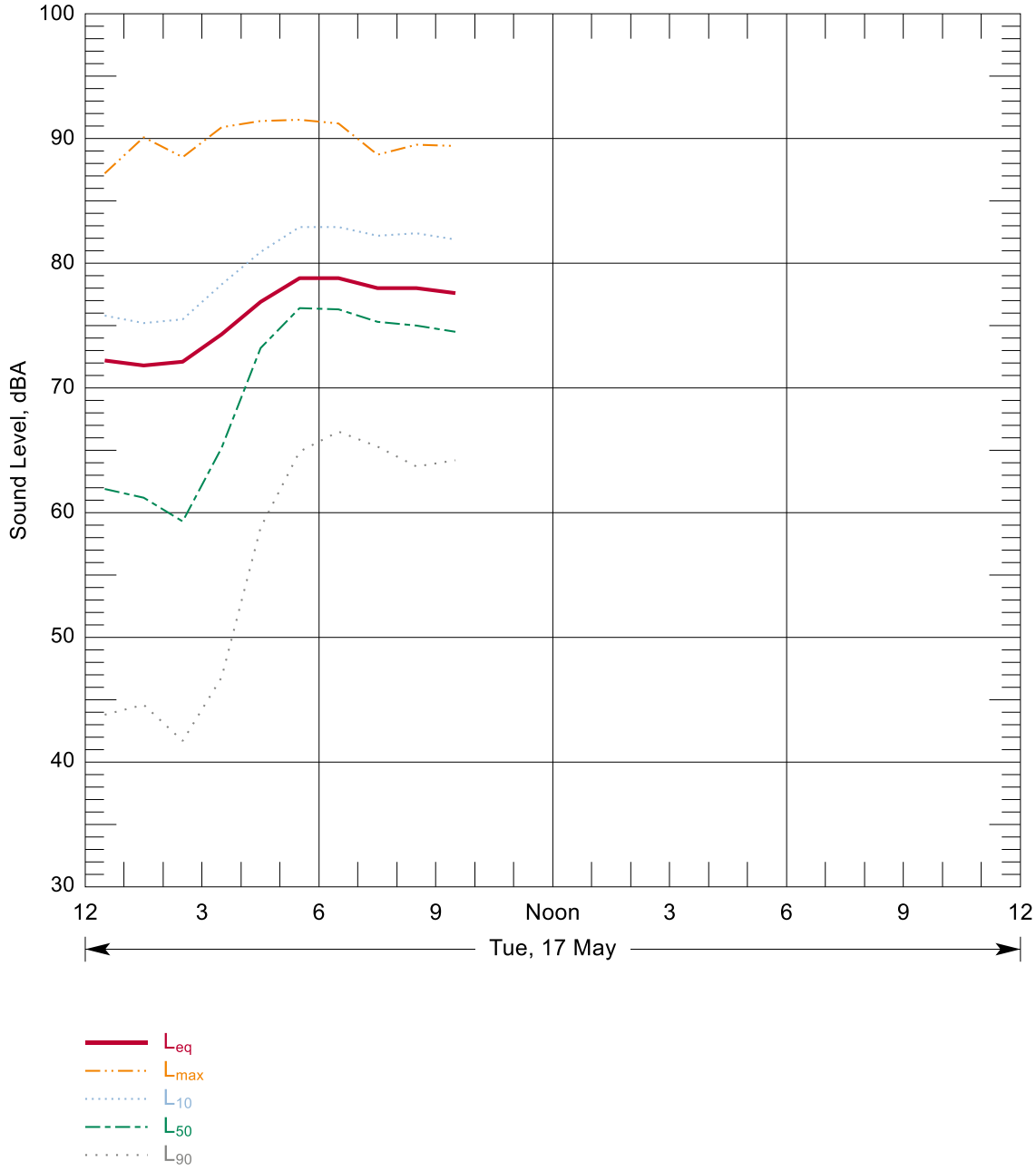
Source: Wilson Ihrig 2016

Figure B-184: Hourly Summary of Noise Levels Measured at N132 on 15 May, 2016



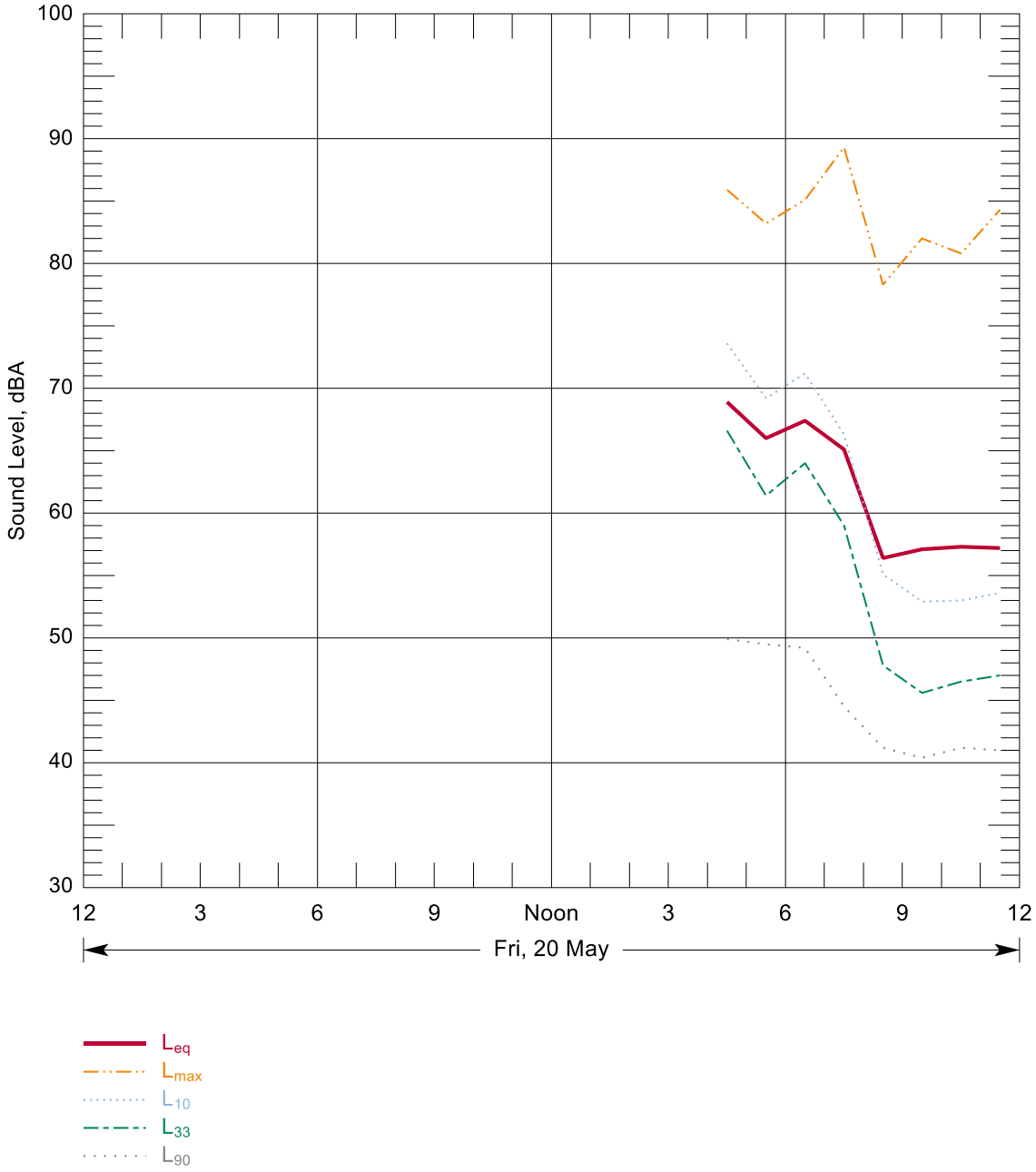
Source: Wilson Ihrig 2016

Figure B-185: Hourly Summary of Noise Levels Measured at N132 on 16 May, 2016



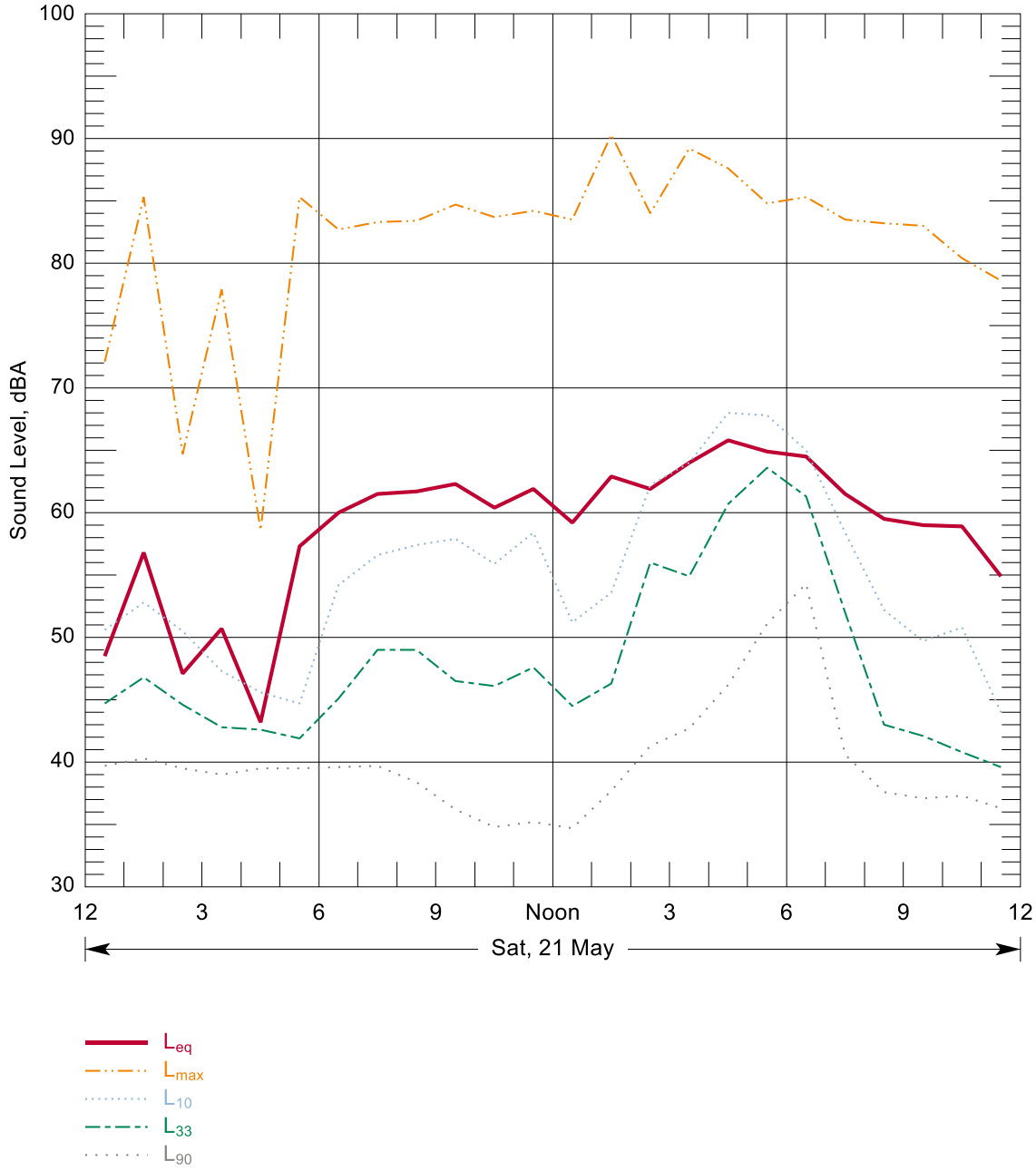
Source: Wilson Ihrig 2016

Figure B-186: Hourly Summary of Noise Levels Measured at N132 on 17 May, 2016



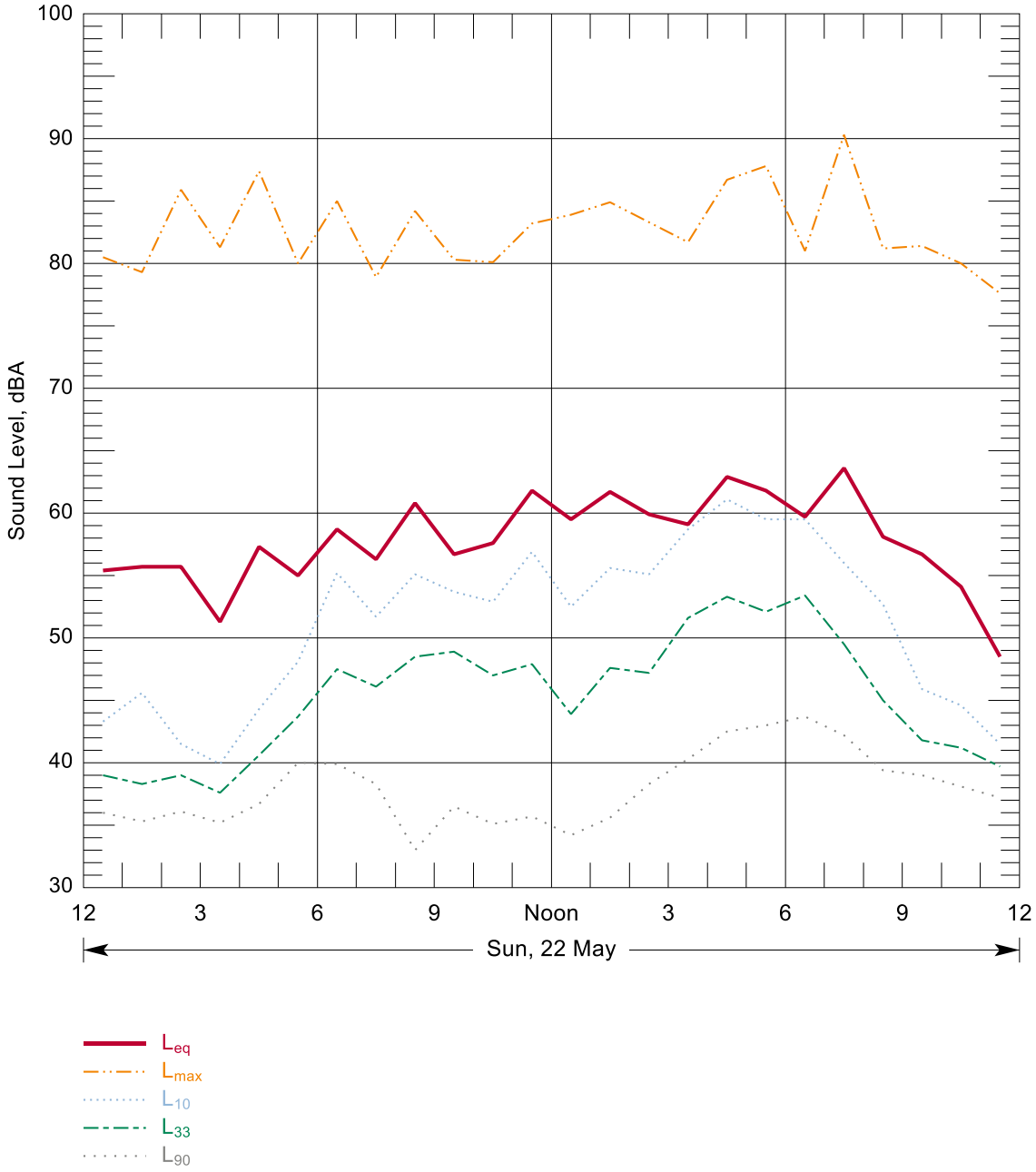
Source: Wilson Ihrig 2016

Figure B-187: Hourly Summary of Noise Levels Measured at N133 on 20 May, 2016



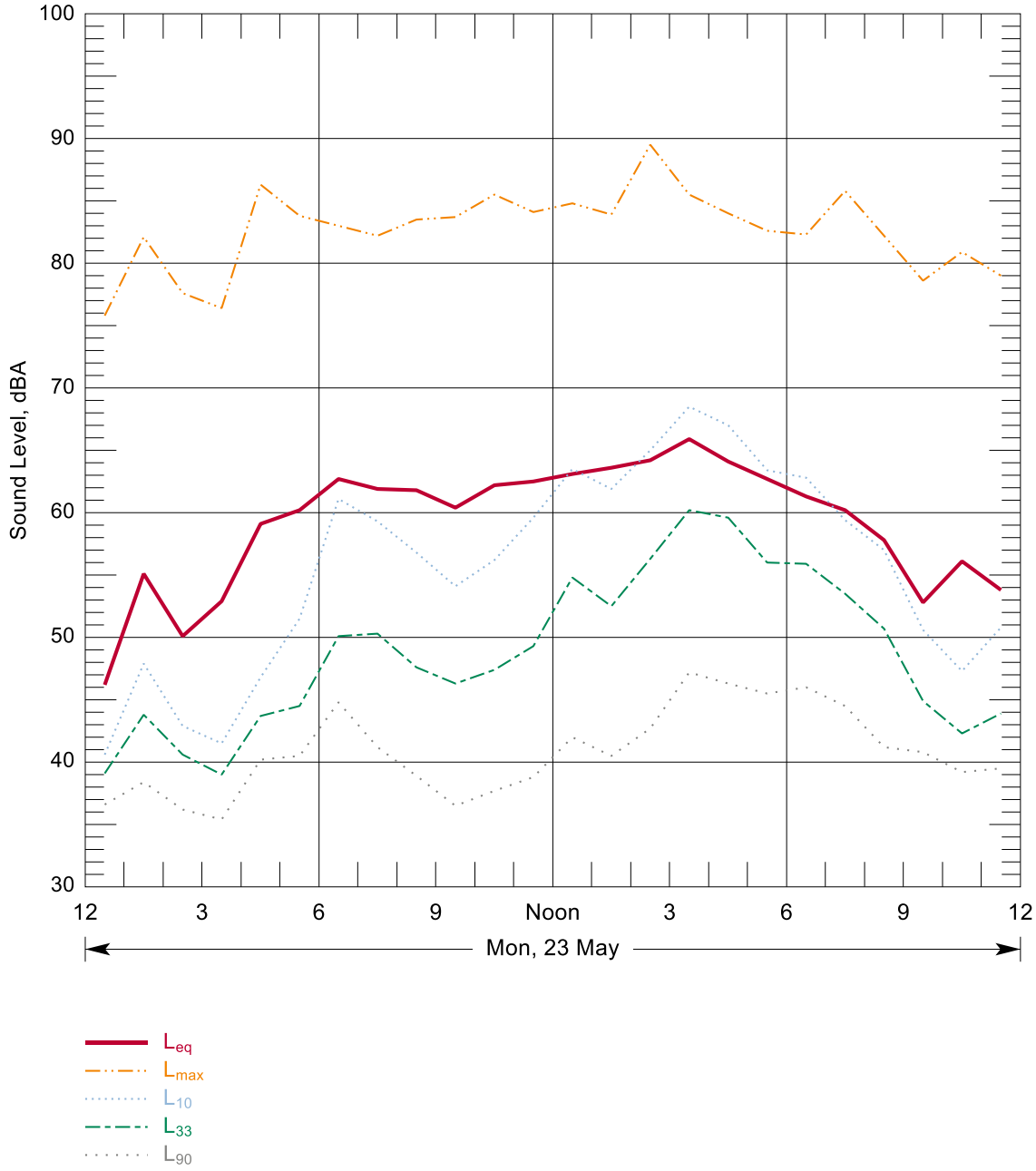
Source: Wilson Ihrig 2016

Figure B-188: Hourly Summary of Noise Levels Measured at N133 on 21 May, 2016



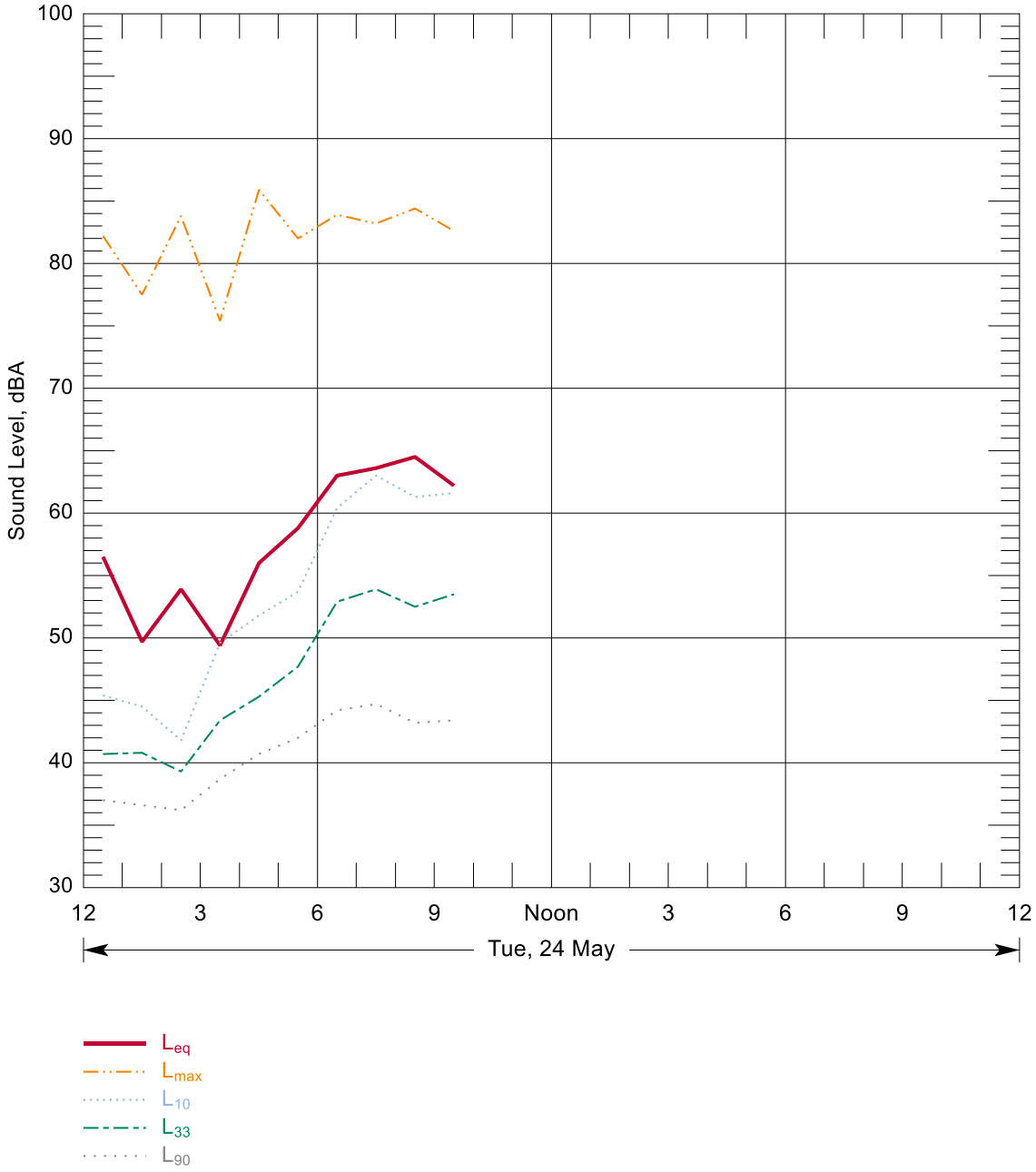
Source: Wilson Ihrig 2016

Figure B-189: Hourly Summary of Noise Levels Measured at N133 on 22 May, 2016



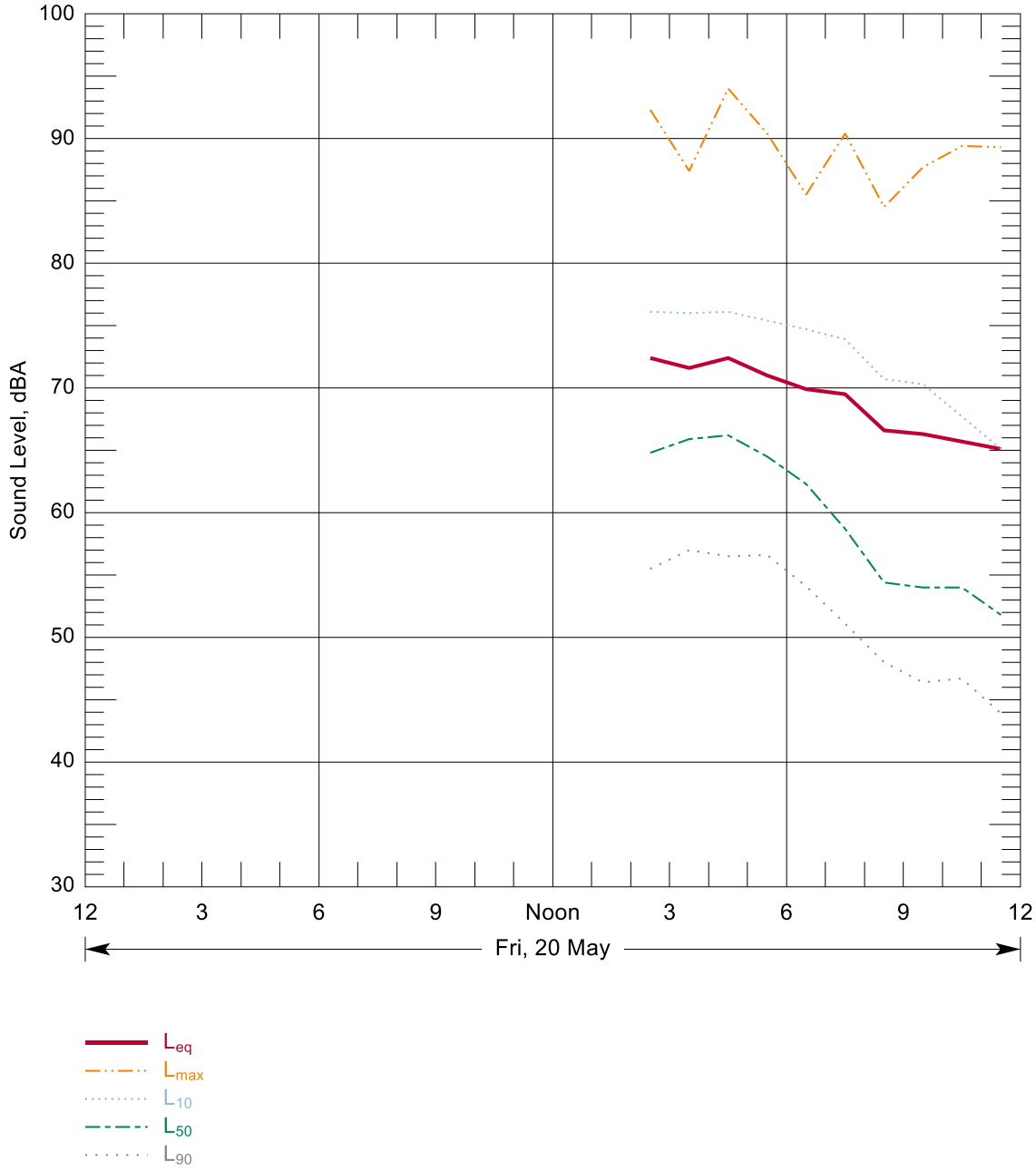
Source: Wilson Ihrig 2016

Figure B-190: Hourly Summary of Noise Levels Measured at N133 on 23 May, 2016



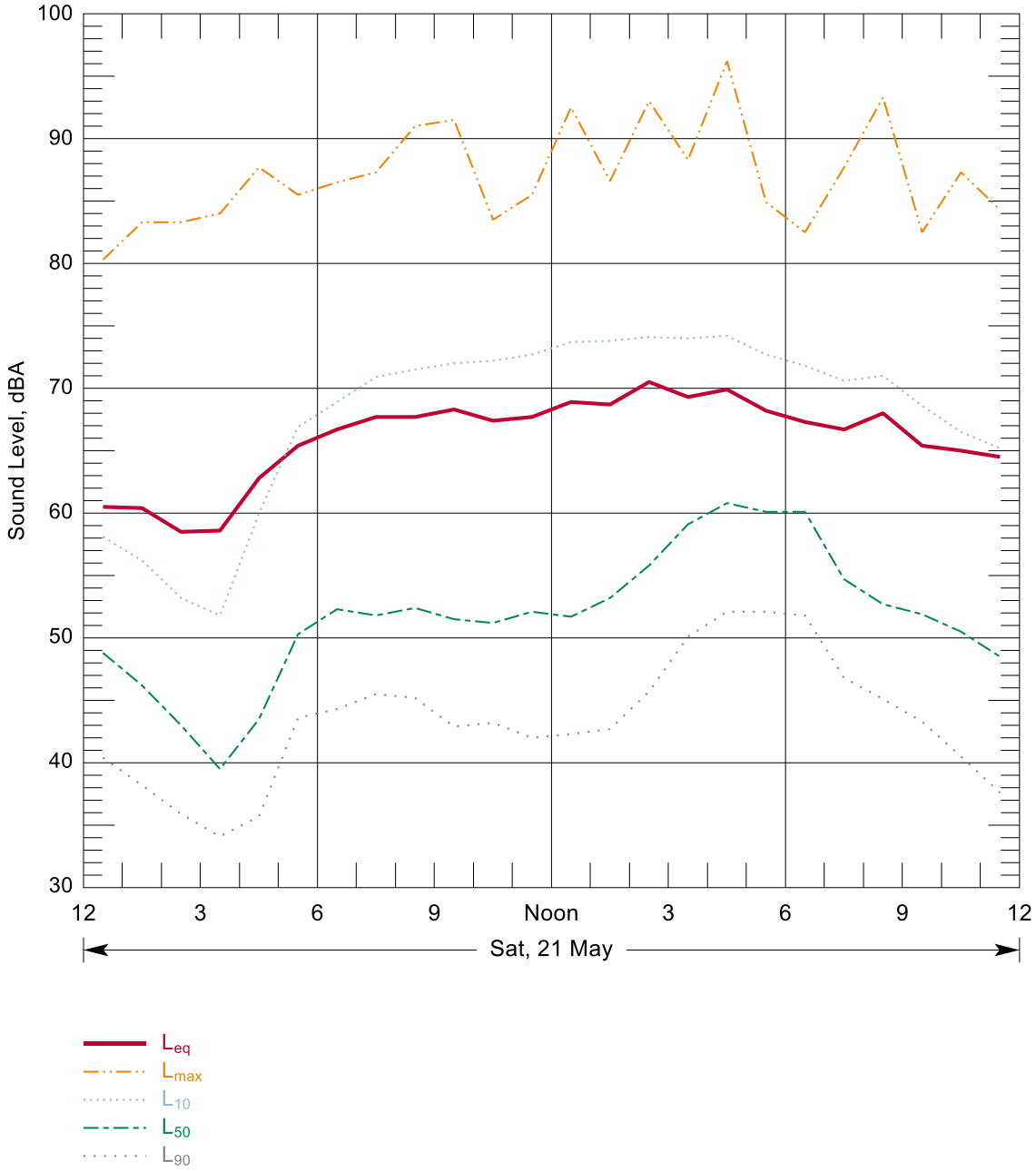
Source: Wilson Ihrig 2016

Figure B-191: Hourly Summary of Noise Levels Measured at N133 on 24 May, 2016



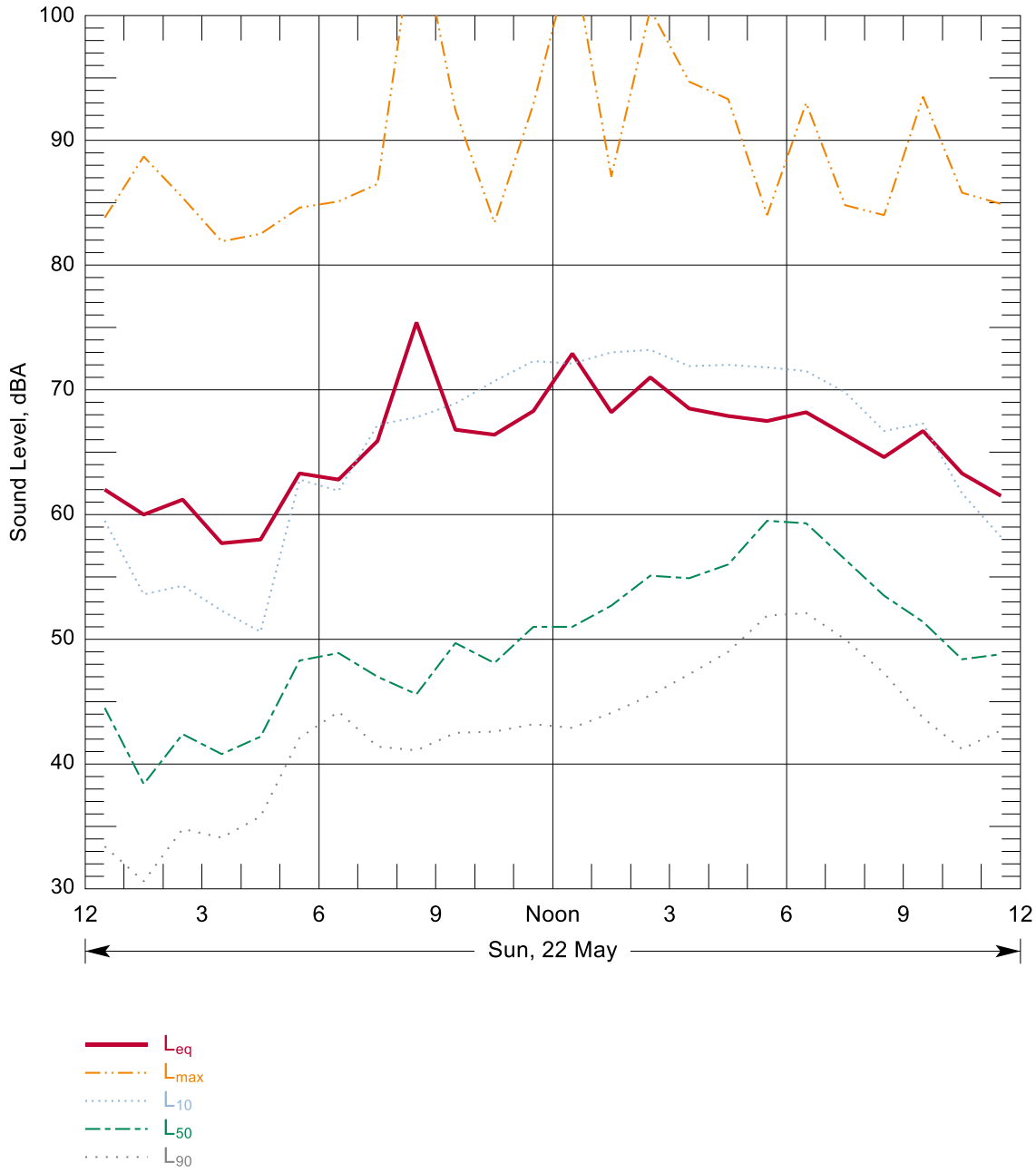
Source: Wilson Ihrig 2016

Figure B-192: Hourly Summary of Noise Levels Measured at N134 on 20 May, 2016



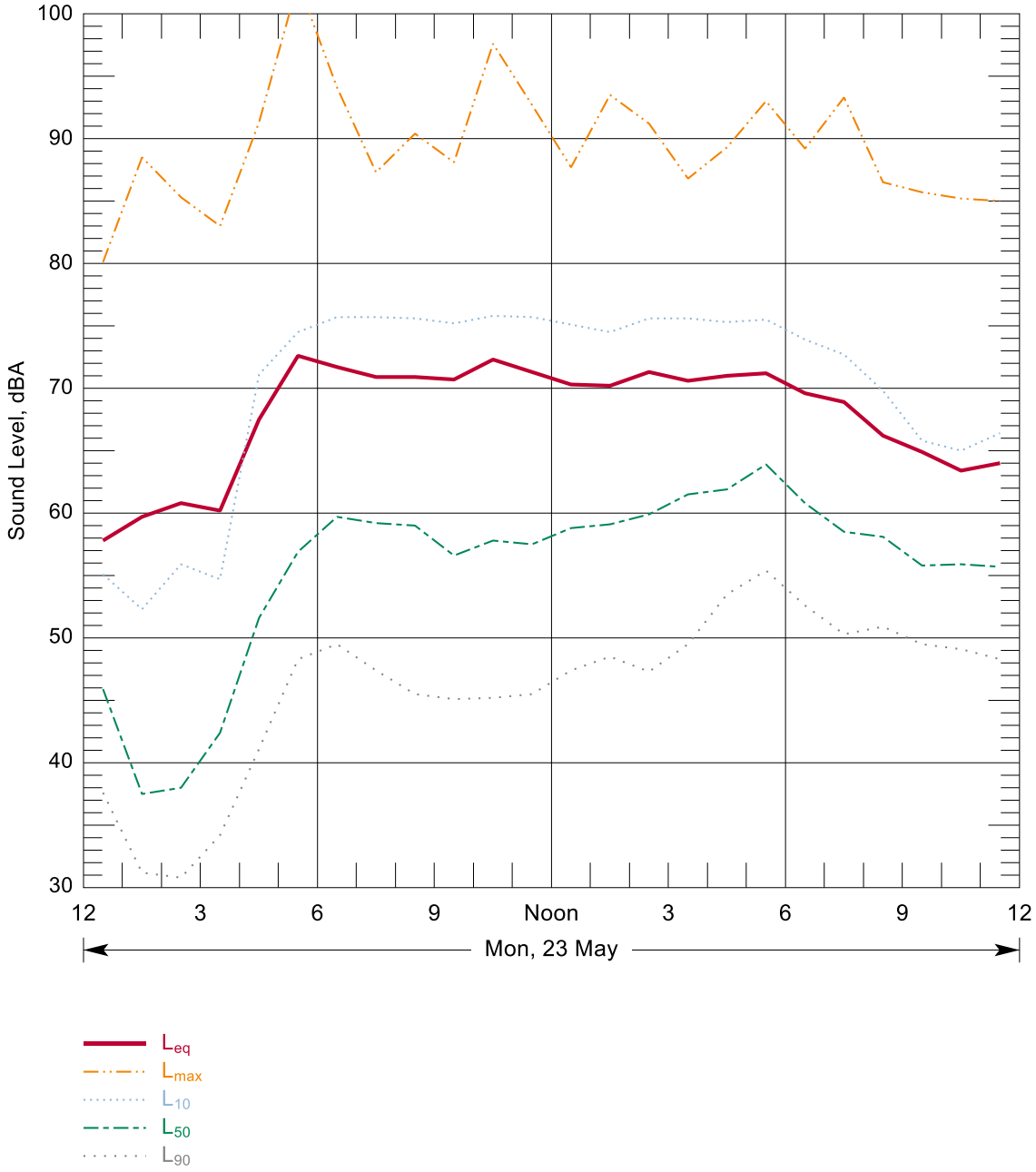
Source: Wilson Ihrig 2016

Figure B-193: Hourly Summary of Noise Levels Measured at N134 on 21 May, 2016



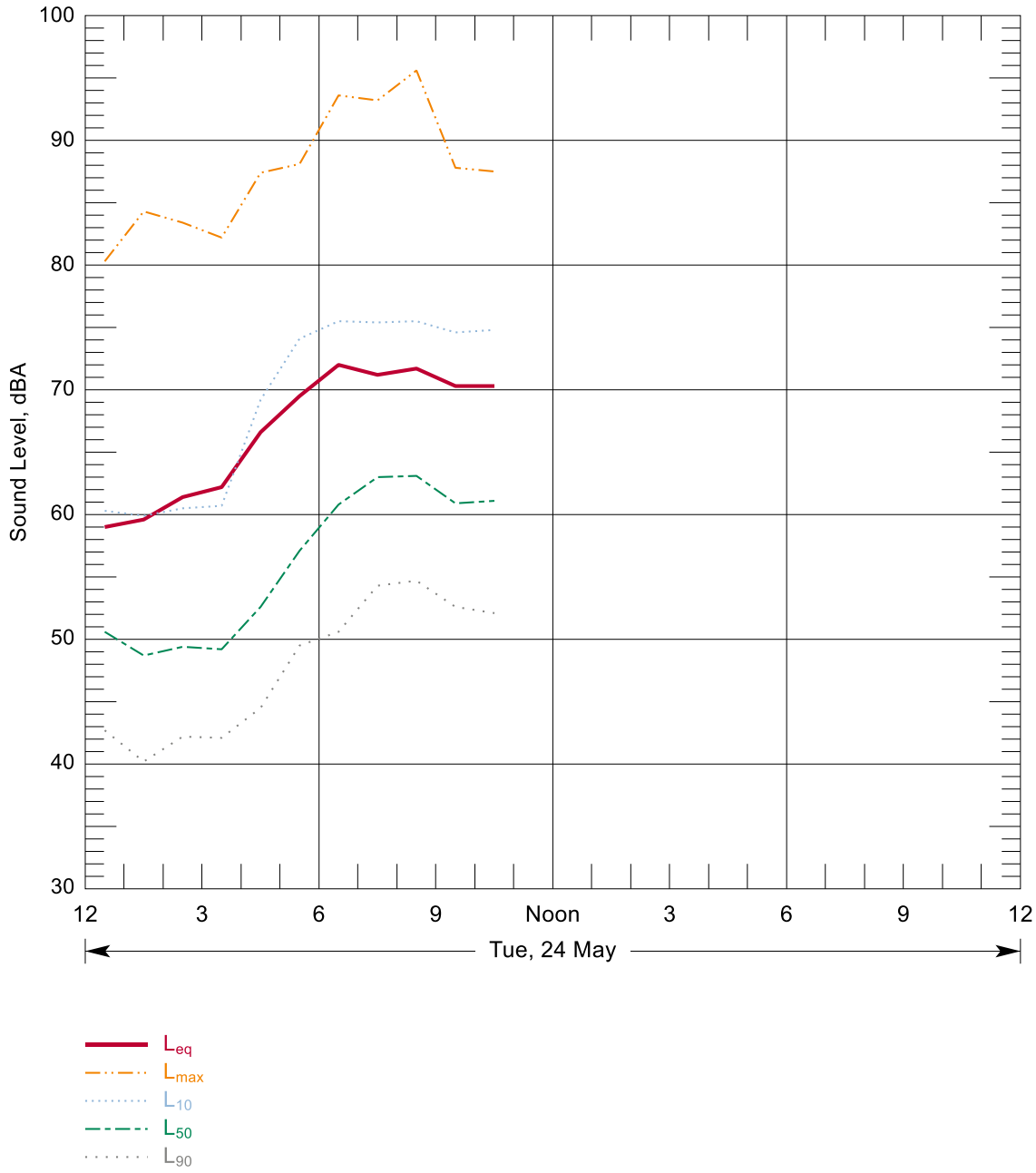
Source: Wilson Ihrig 2016

Figure B-194: Hourly Summary of Noise Levels Measured at N134 on 22 May, 2016



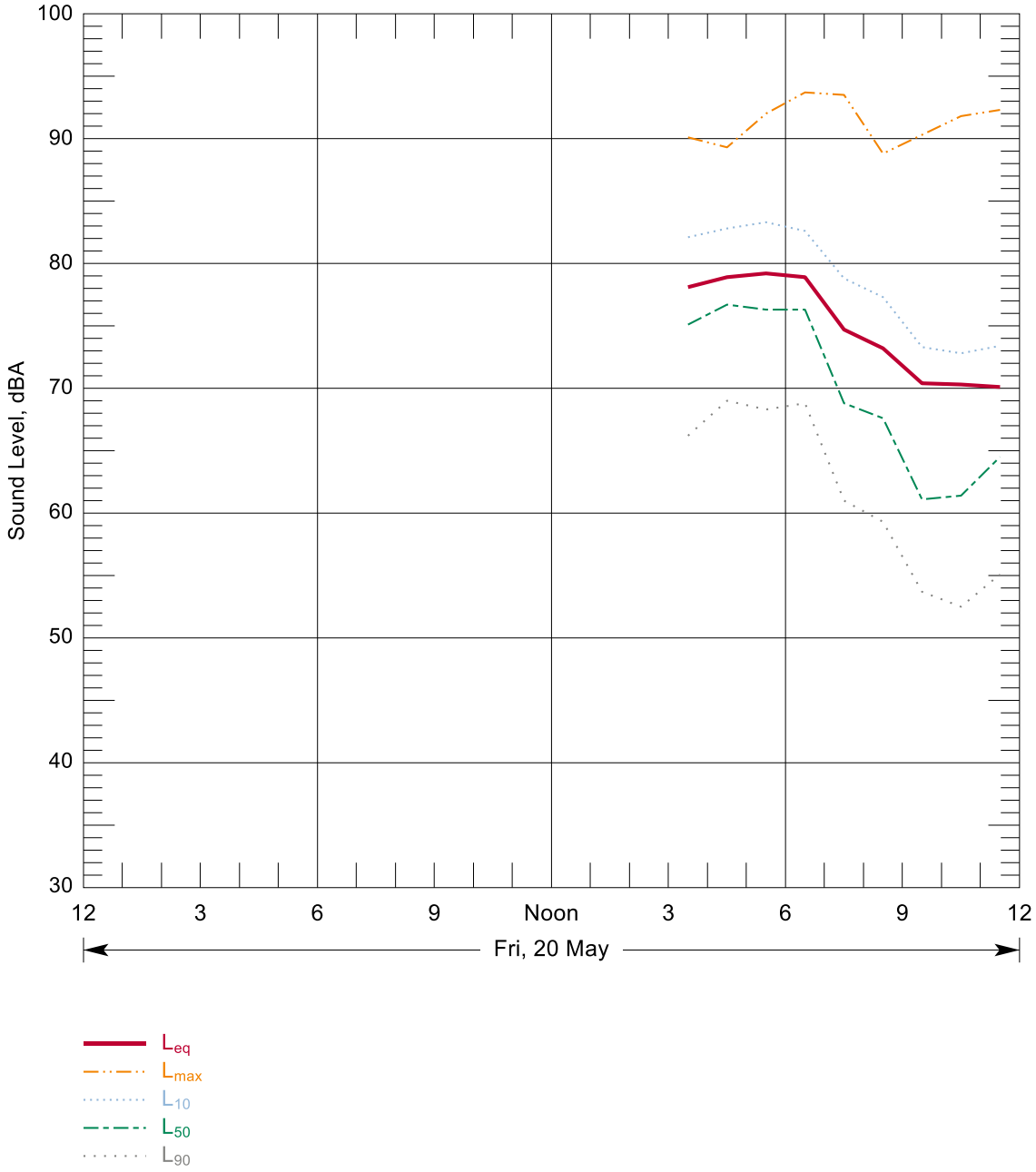
Source: Wilson Ihrig 2016

Figure B-195: Hourly Summary of Noise Levels Measured at N134 on 23 May, 2016



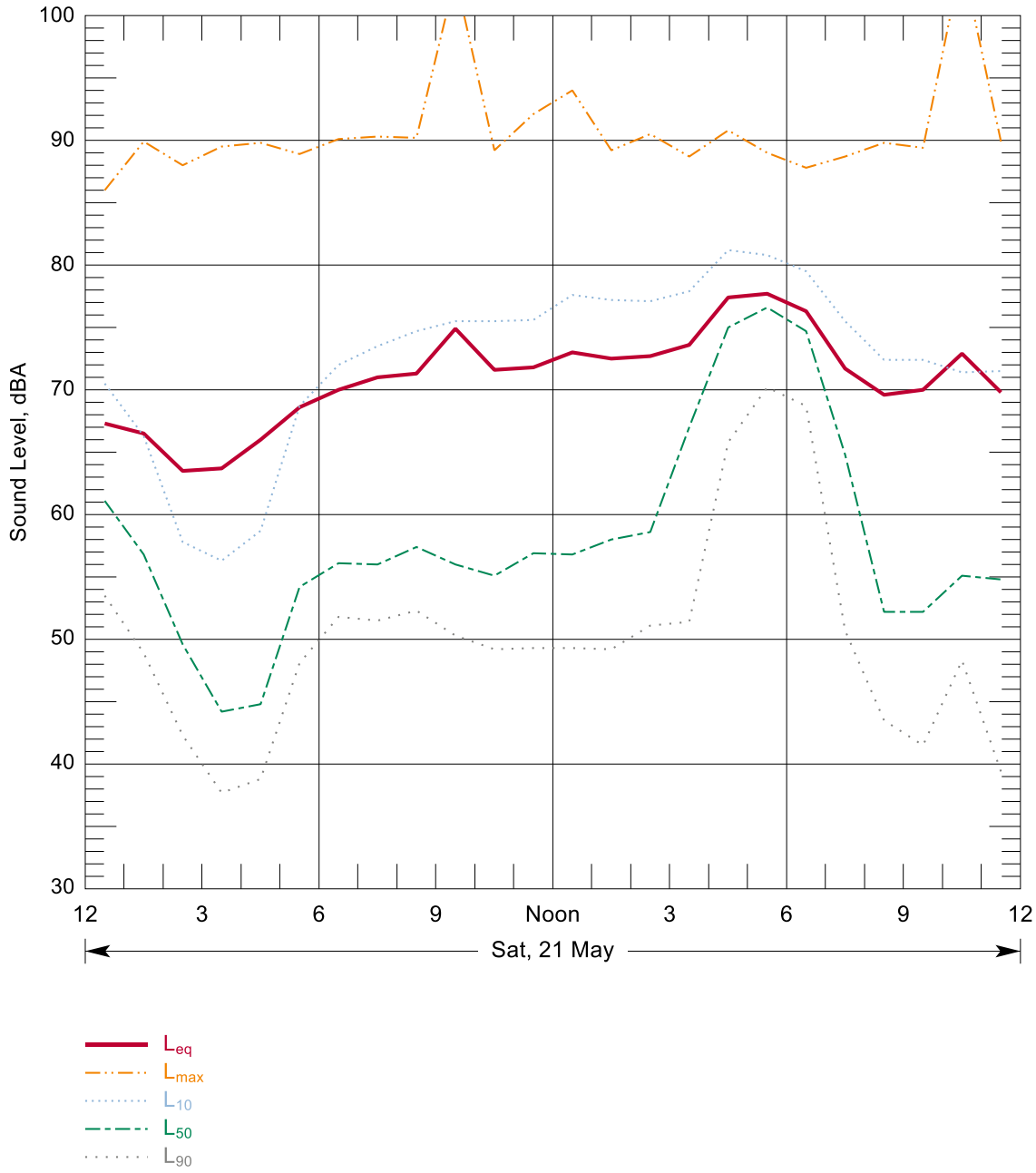
Source: Wilson Ihrig 2016

Figure B-196: Hourly Summary of Noise Levels Measured at N134 on 24 May, 2016



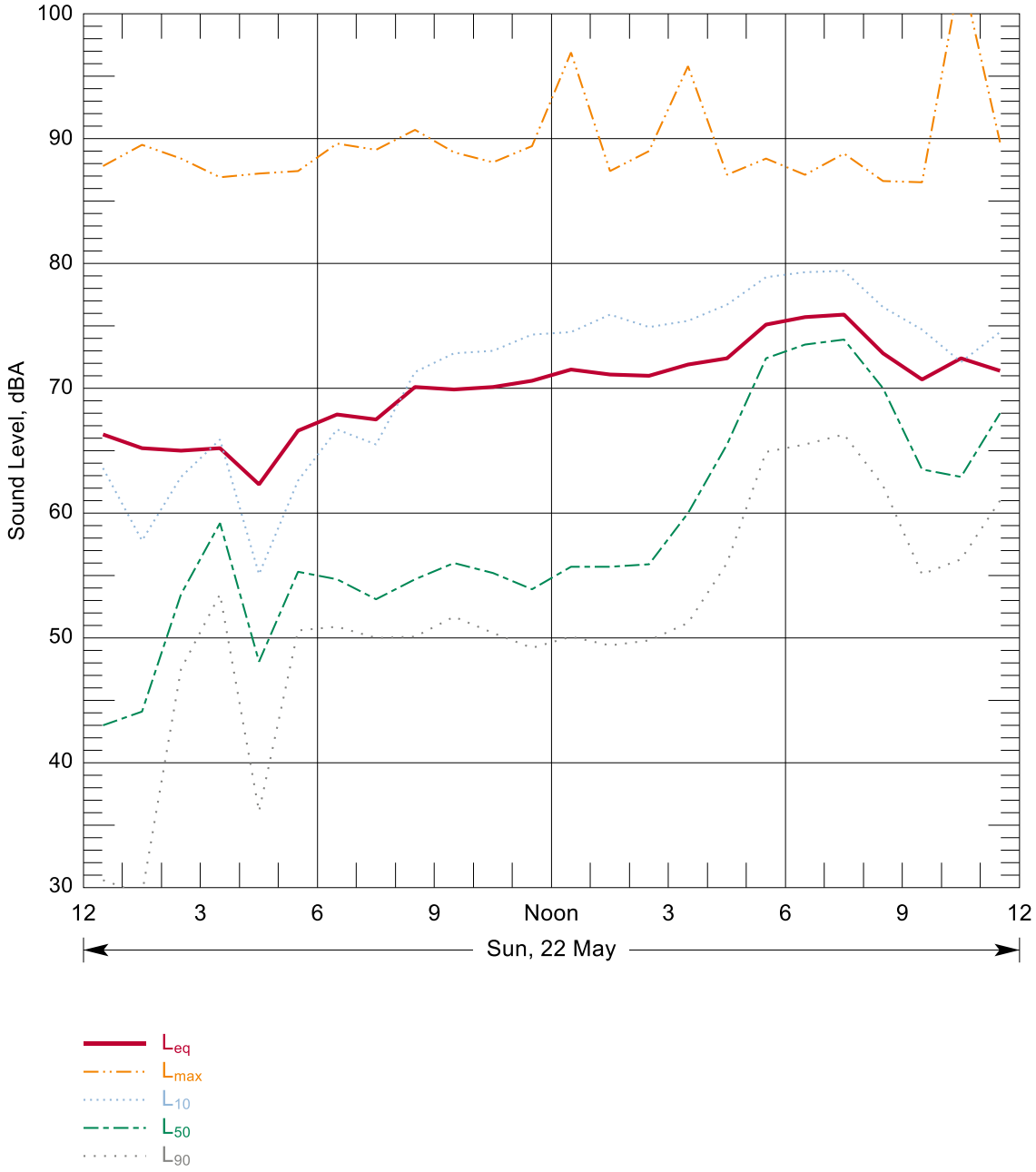
Source: Wilson Ihrig 2016

Figure B-197: Hourly Summary of Noise Levels Measured at N135 on 20 May, 2016



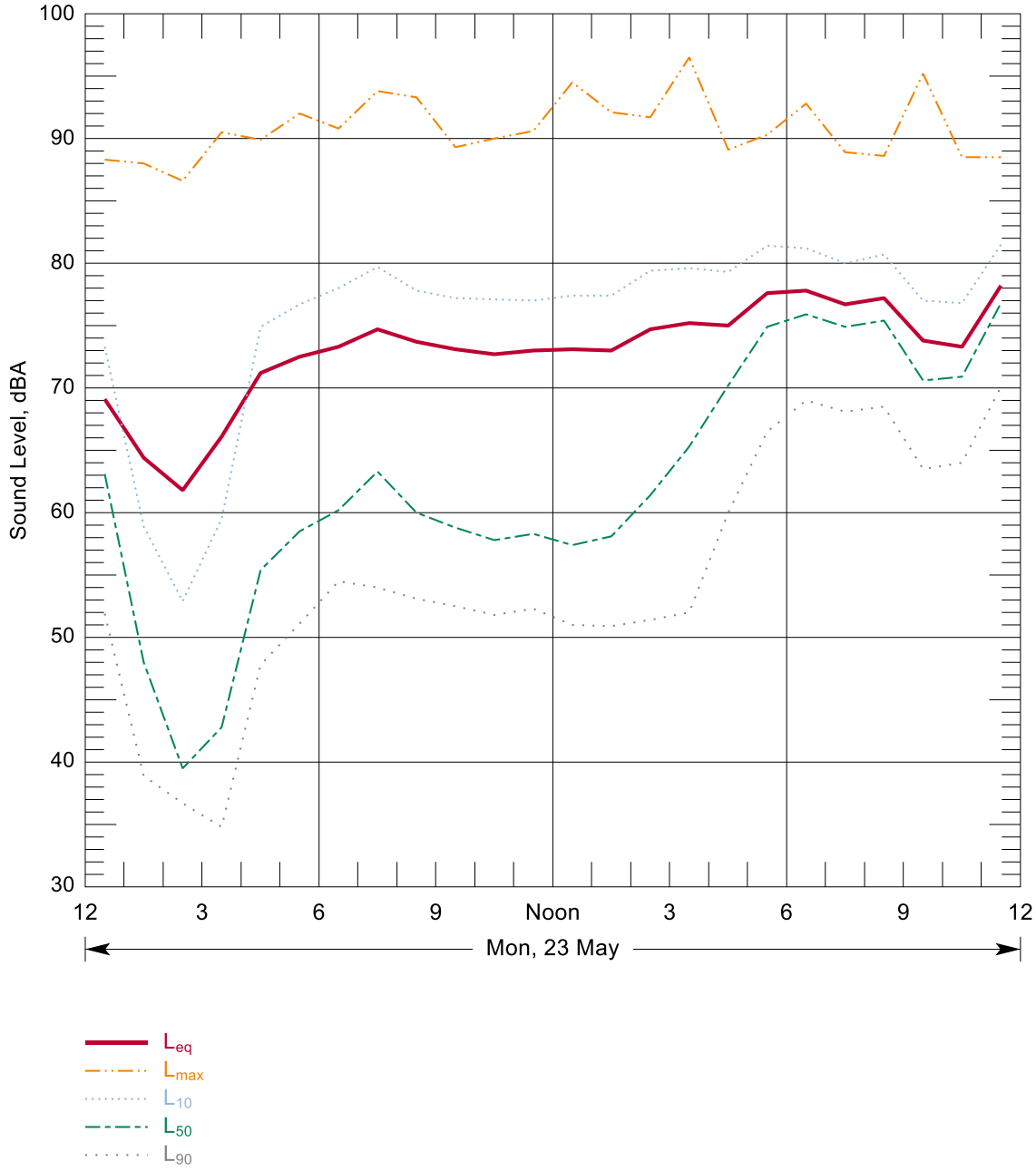
Source: Wilson Ihrig 2016

Figure B-198: Hourly Summary of Noise Levels Measured at N135 on 21 May, 2016



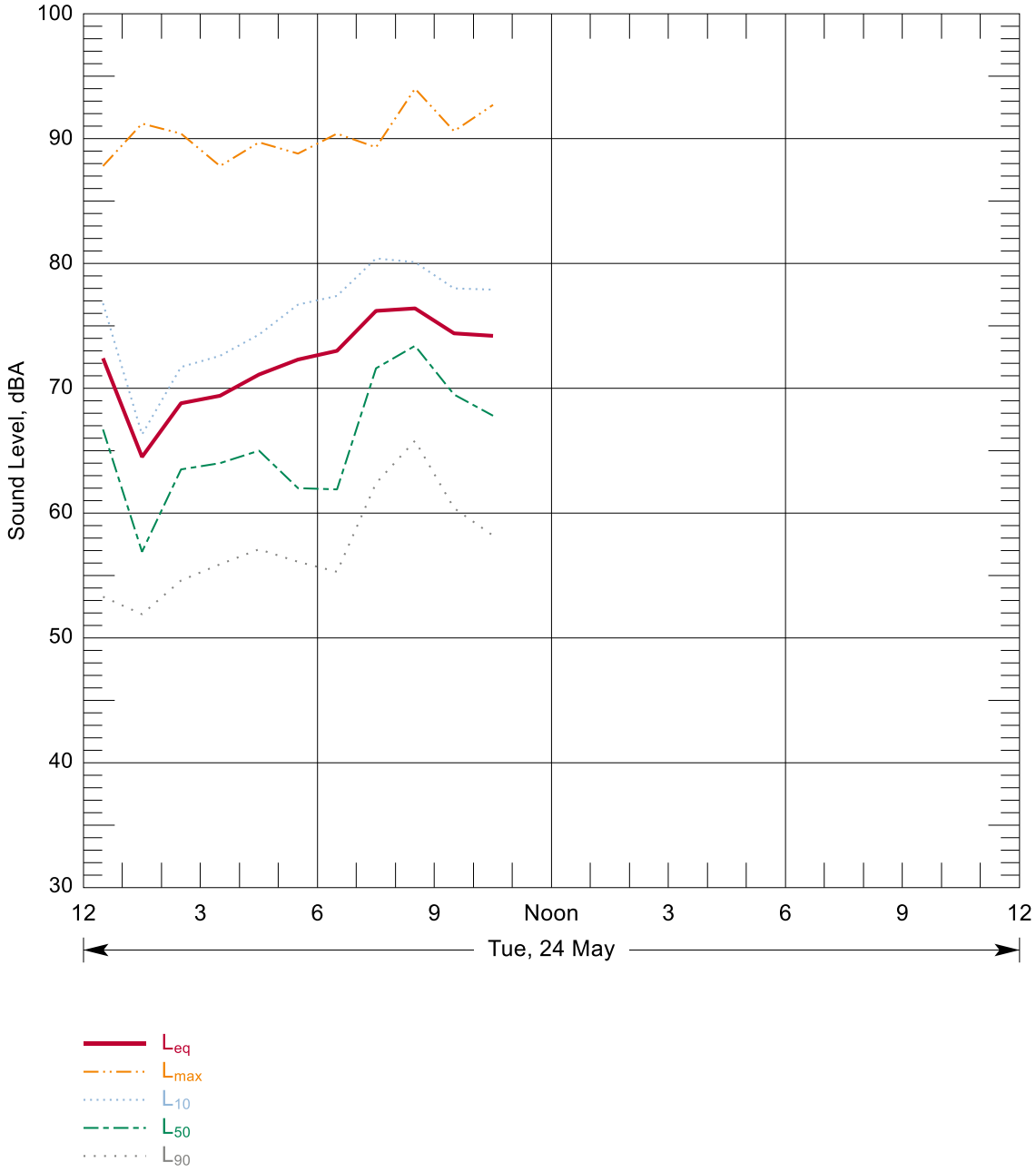
Source: Wilson Ihrig 2016

Figure B-199: Hourly Summary of Noise Levels Measured at N135 on 22 May, 2016



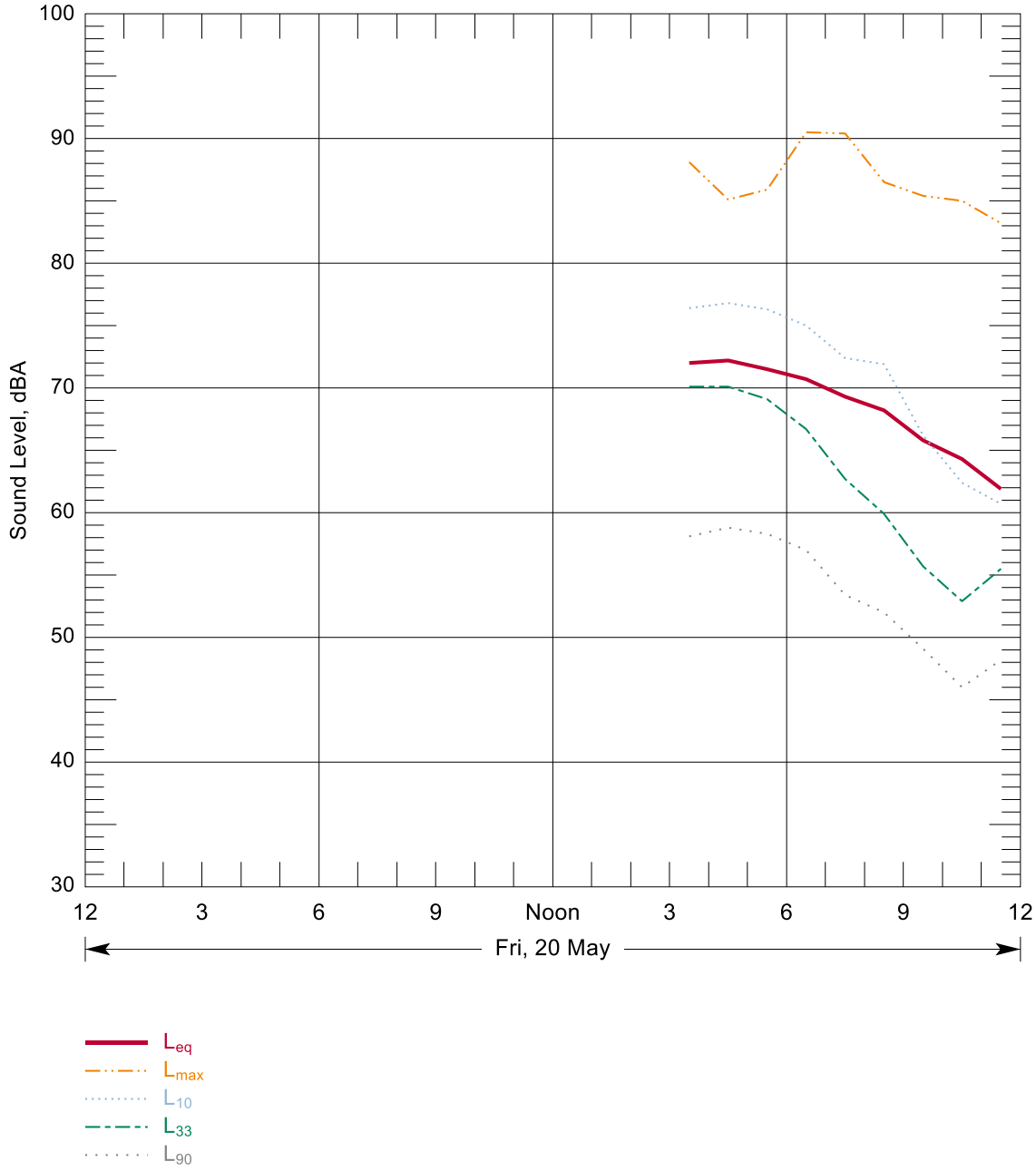
Source: Wilson Ihrig 2016

Figure B-200: Hourly Summary of Noise Levels Measured at N135 on 23 May, 2016



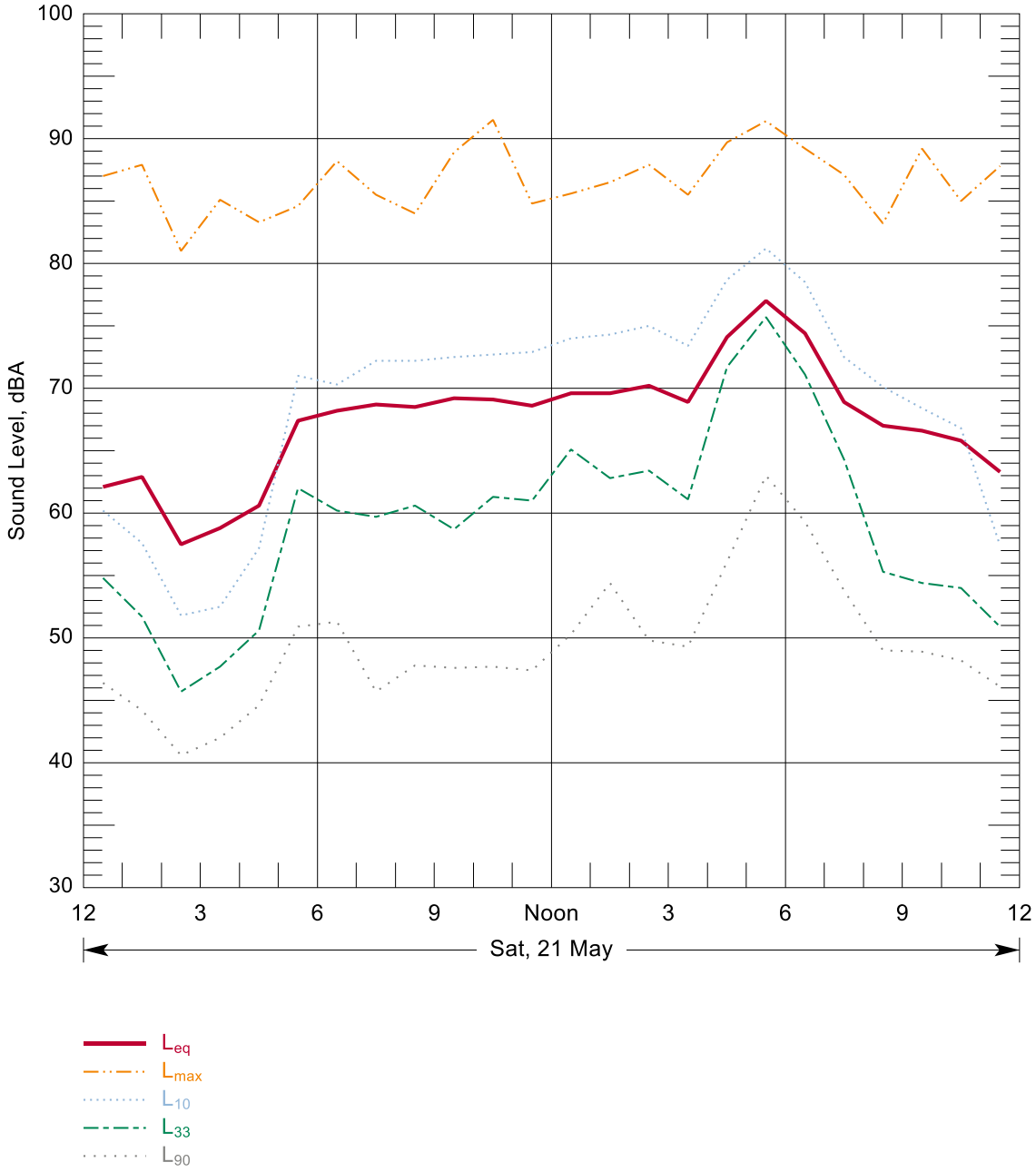
Source: Wilson Ihrig 2016

Figure B-201: Hourly Summary of Noise Levels Measured at N135 on 24 May, 2016



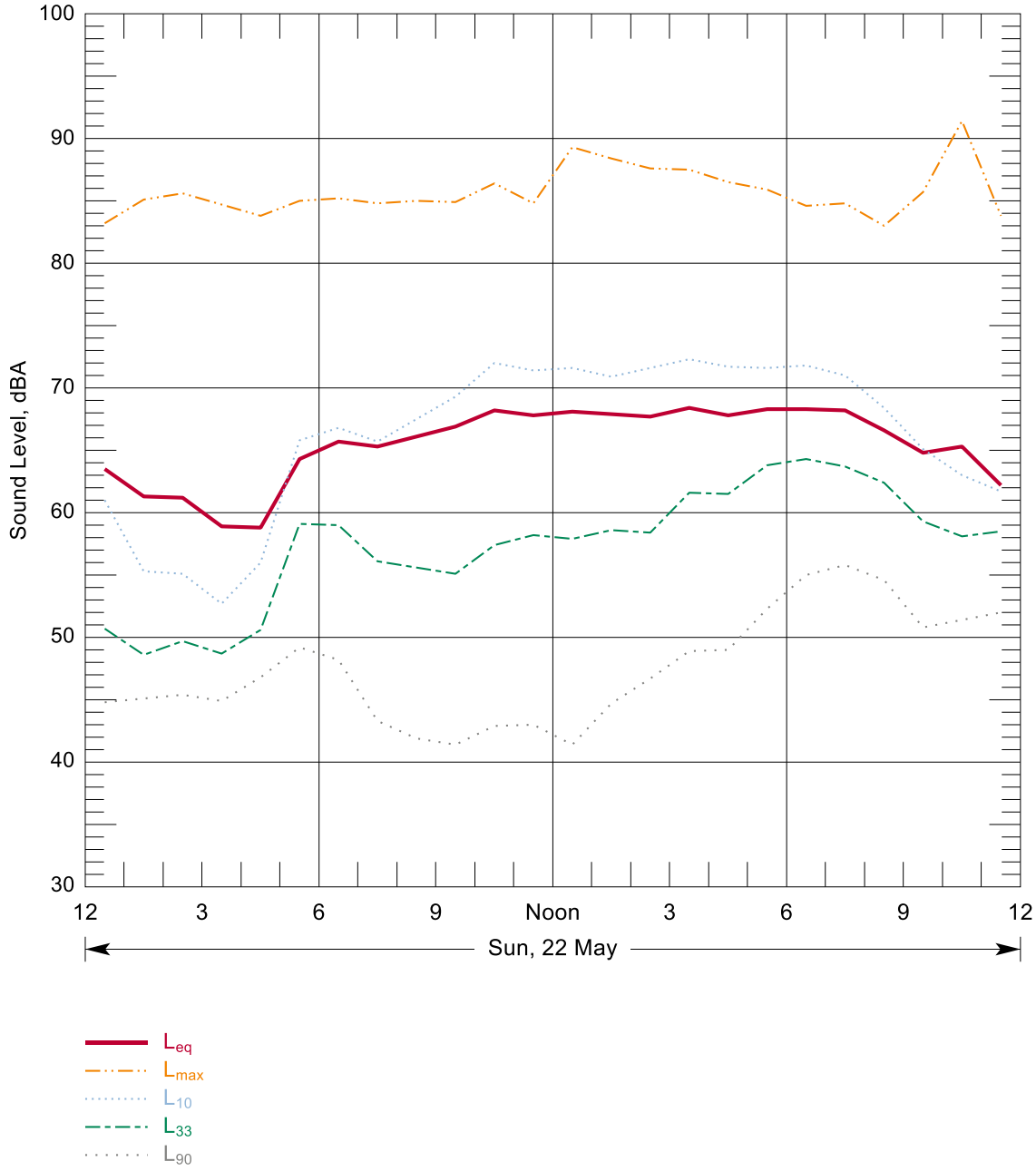
Source: Wilson Ihrig 2016

B-202: Hourly Summary of Noise Levels Measured at N136 on 20 May, 2016



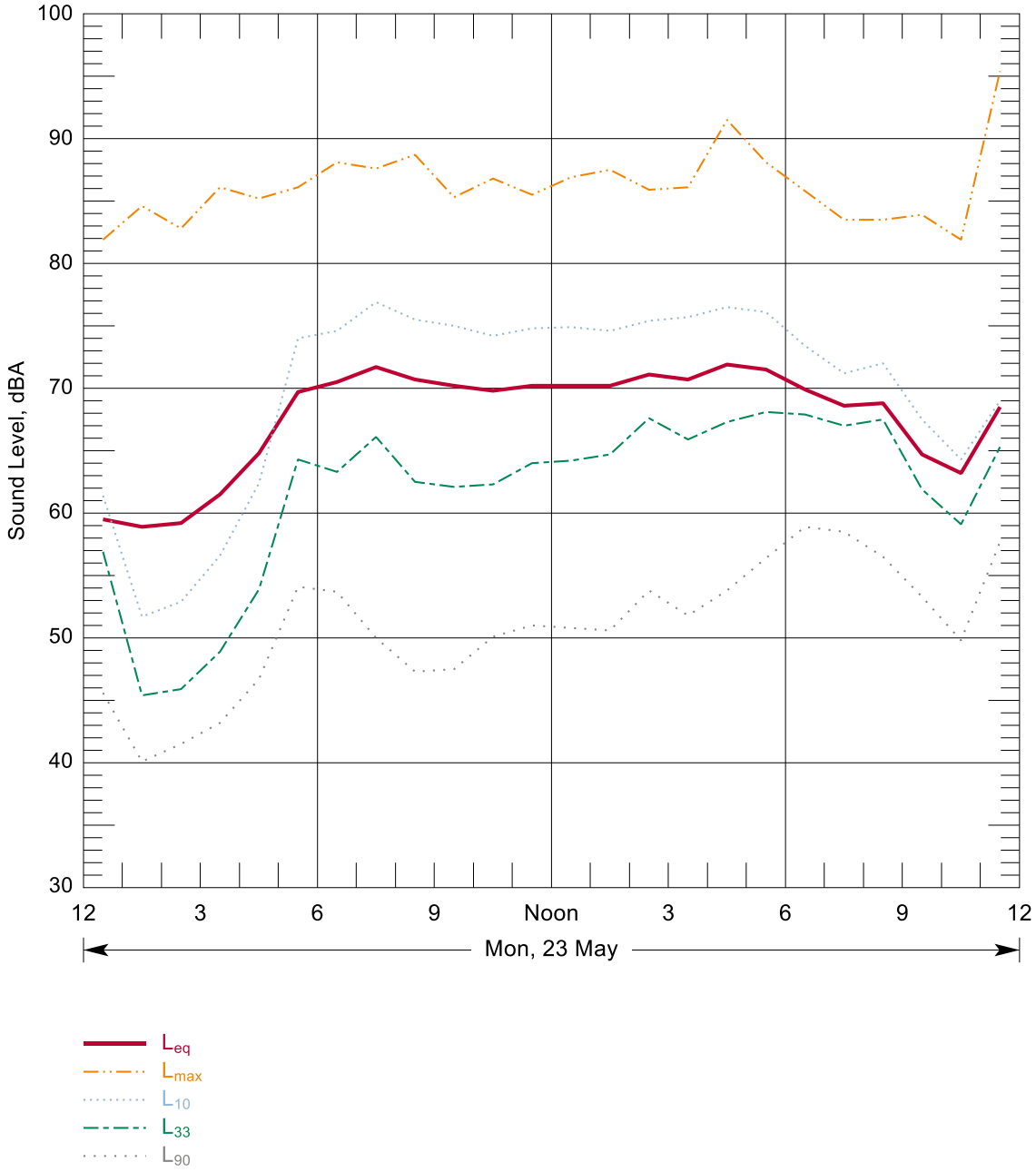
Source: Wilson Ihrig 2016

Figure B-203: Hourly Summary of Noise Levels Measured at N136 on 21 May, 2016



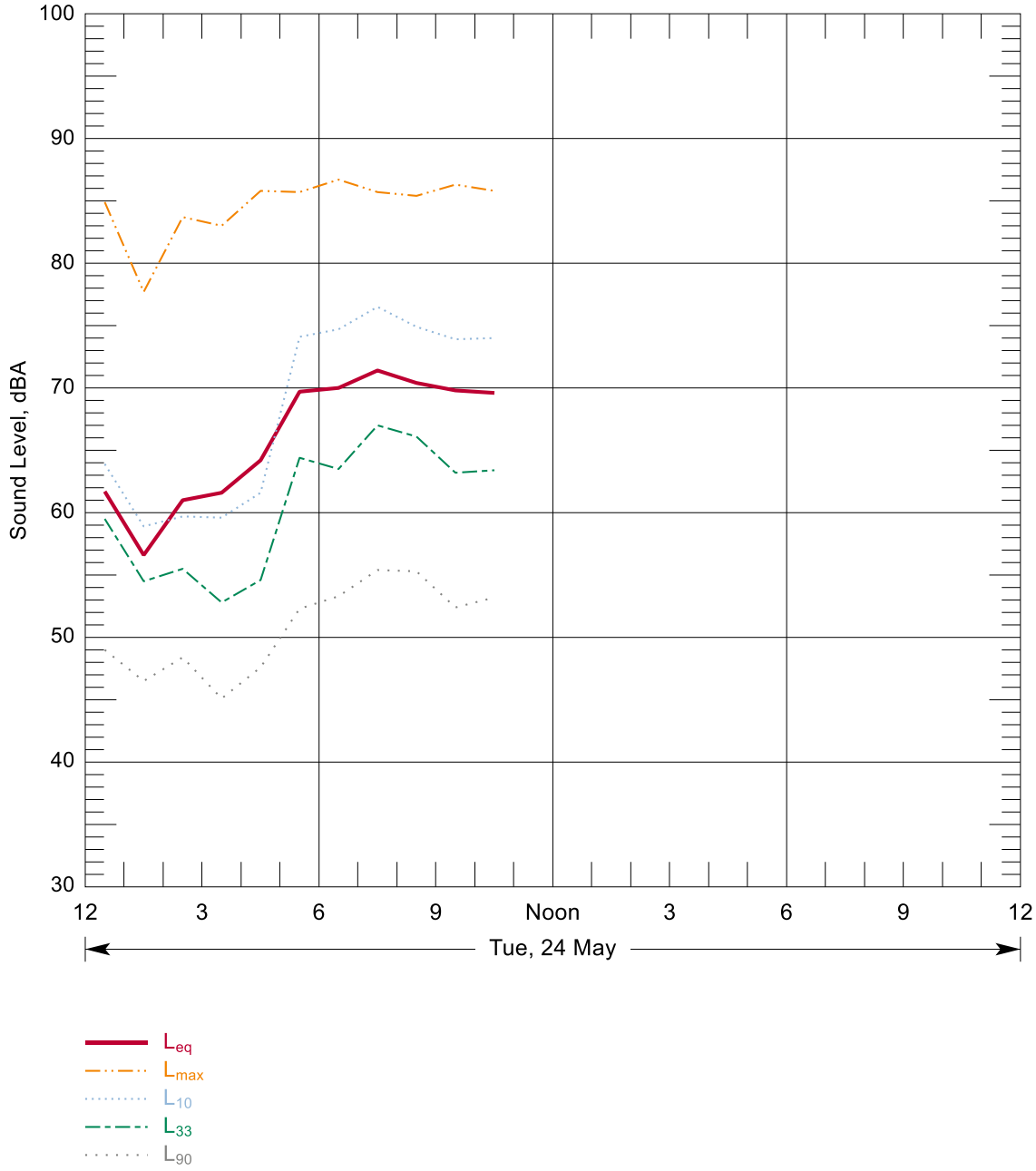
Source: Wilson Ihrig 2016

Figure B-204: Hourly Summary of Noise Levels Measured at N136 on 22 May, 2016



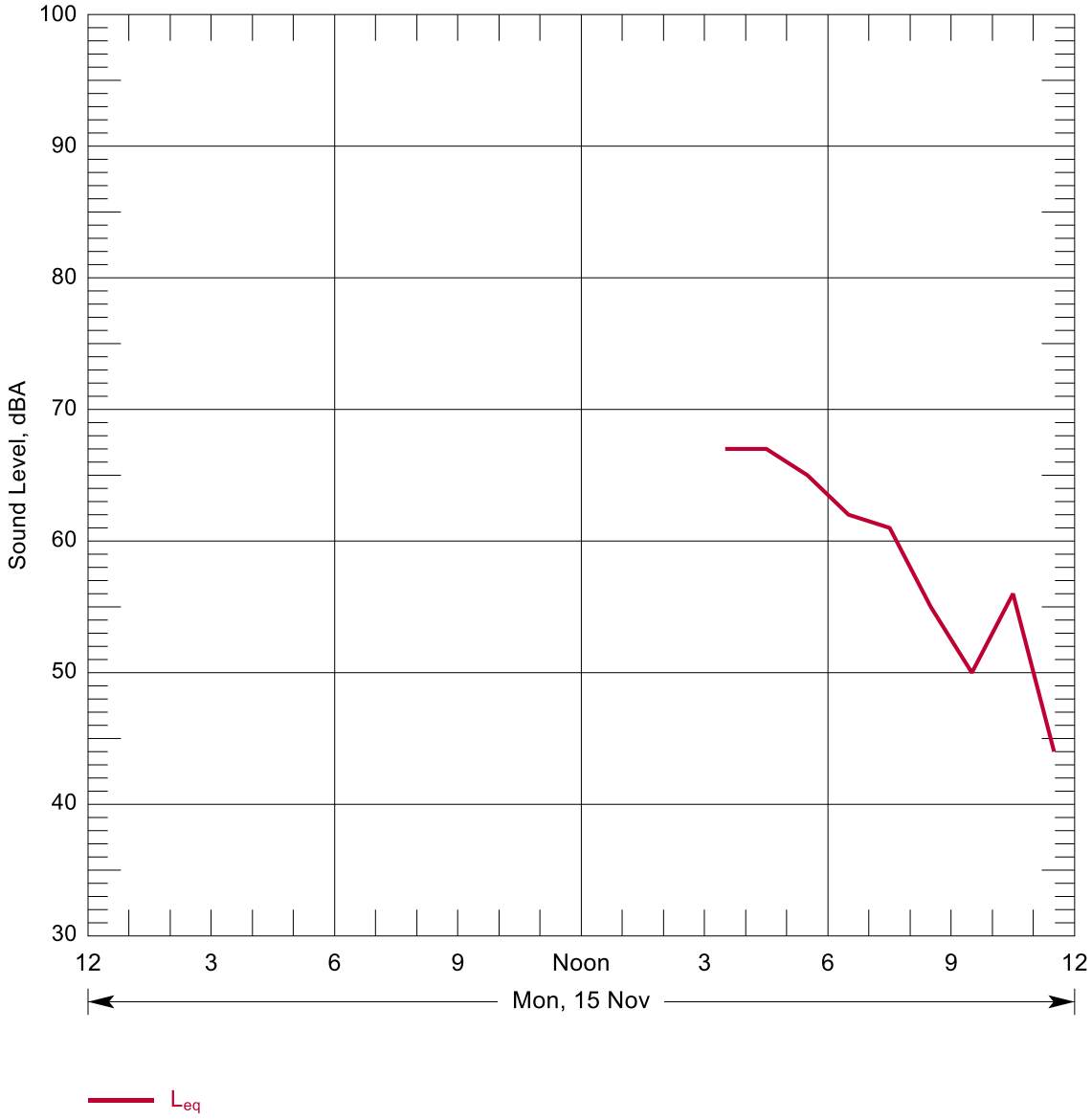
Source: Wilson Ihrig 2016

Figure B-205: Hourly Summary of Noise Levels Measured at N136 on 23 May, 2016



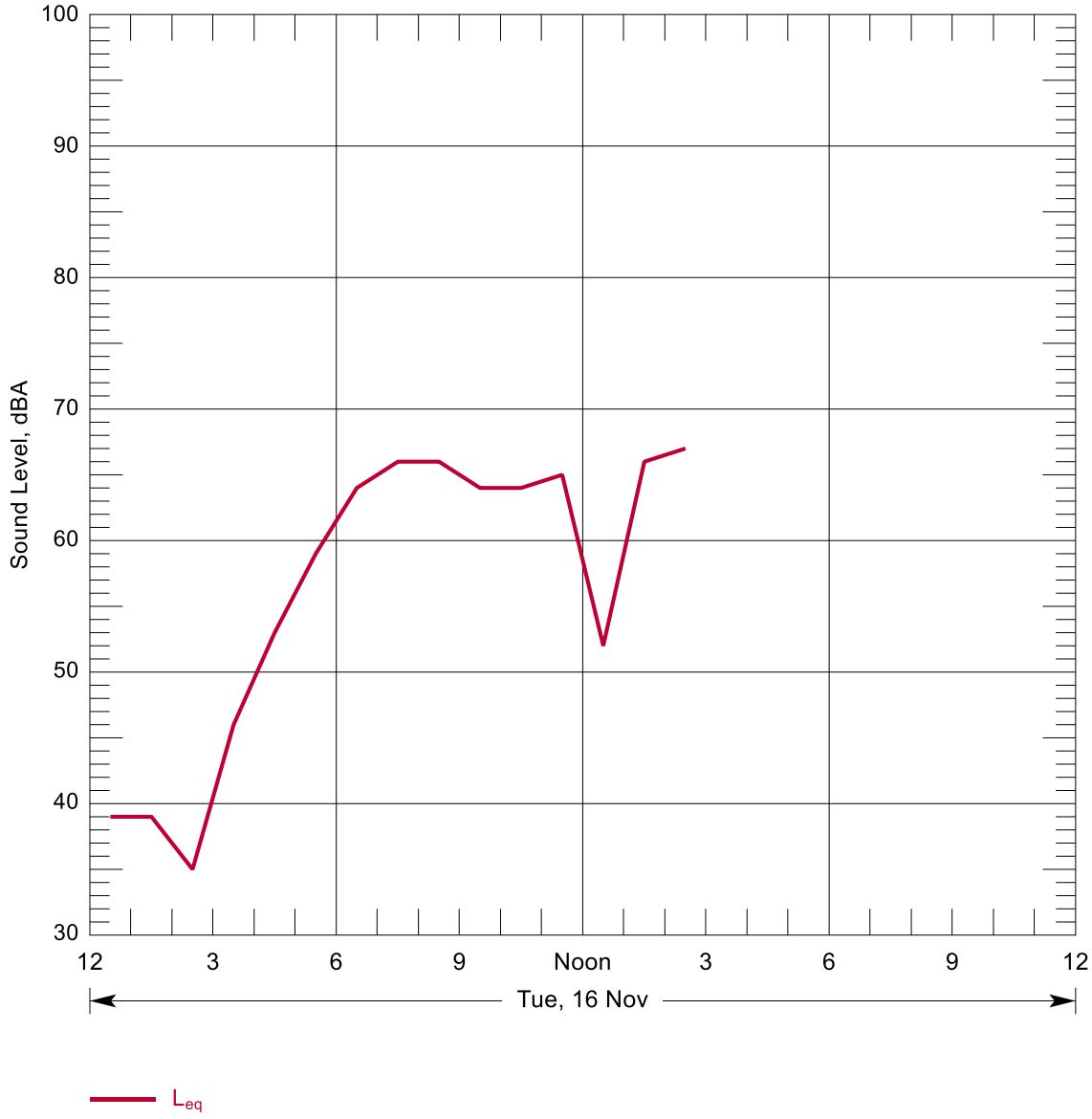
Source: Wilson Ihrig 2016

Figure B-206: Hourly Summary of Noise Levels Measured at N136 on 24 May, 2016



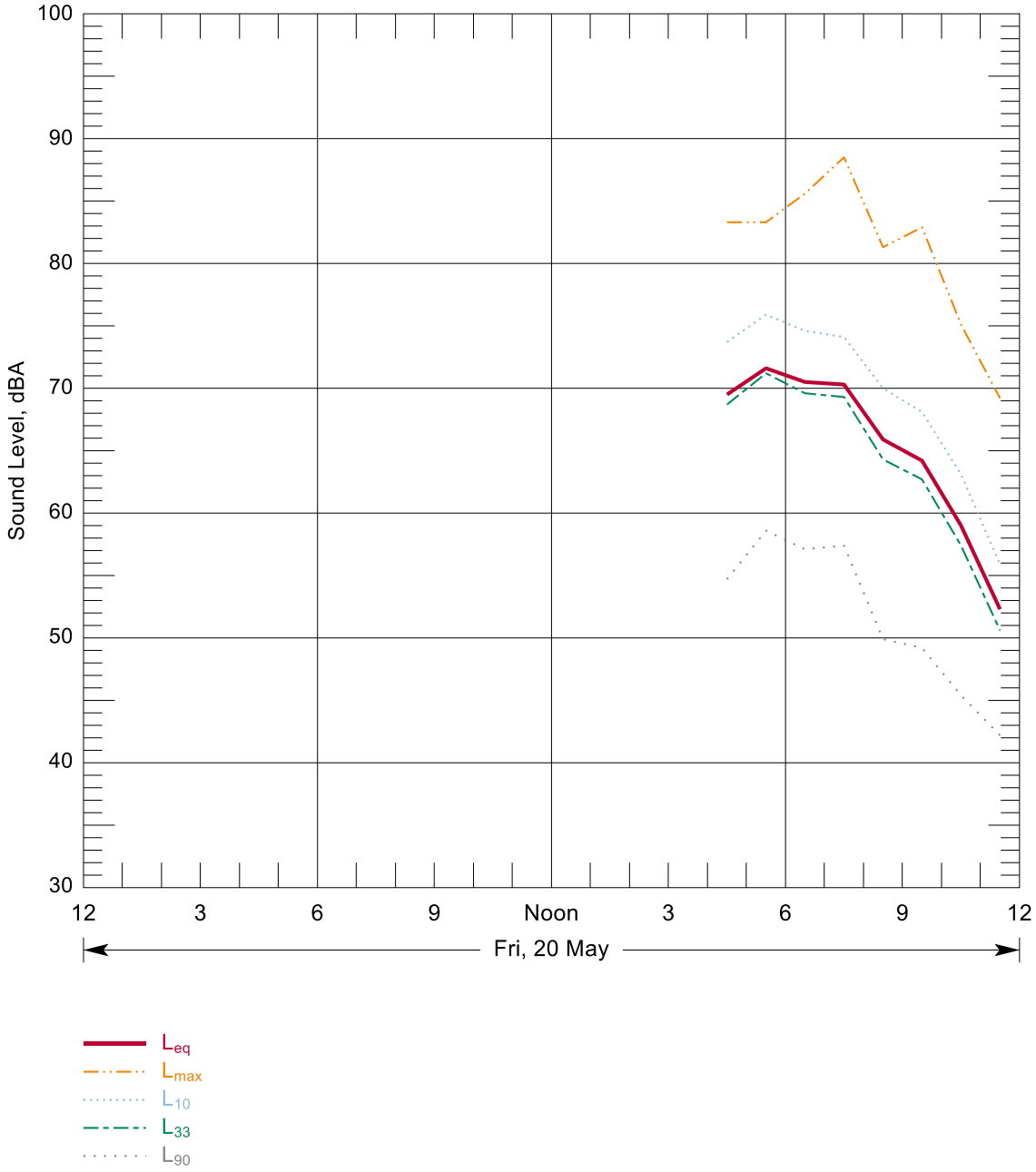
Source: Parsons Transportation 2010

Figure B-207: Hourly Summary of Noise Levels Measured at N137 on 15 Nov, 2010



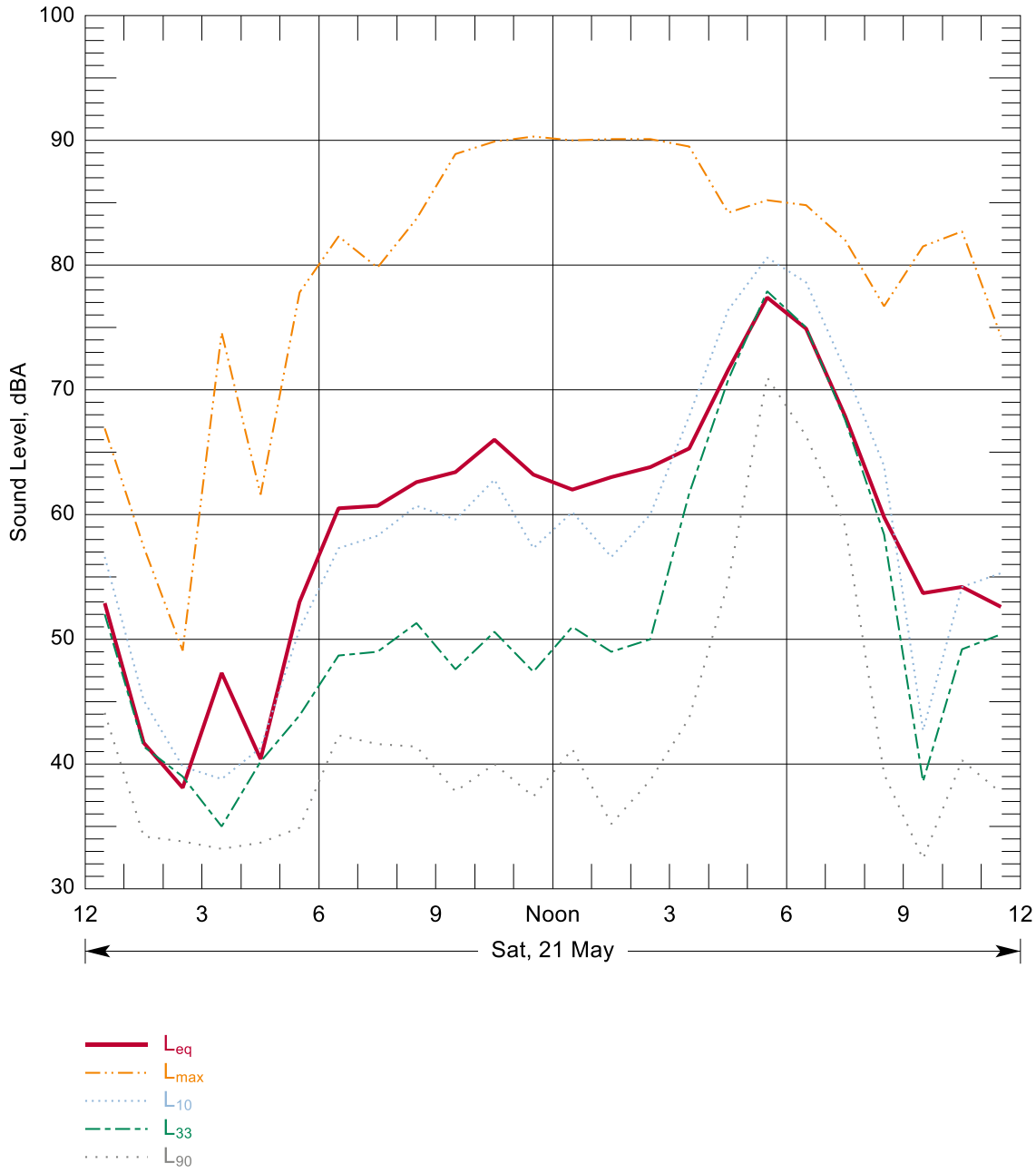
Source:

Figure B-208: Hourly Summary of Noise Levels Measured at N137 on 16 Nov, 2010



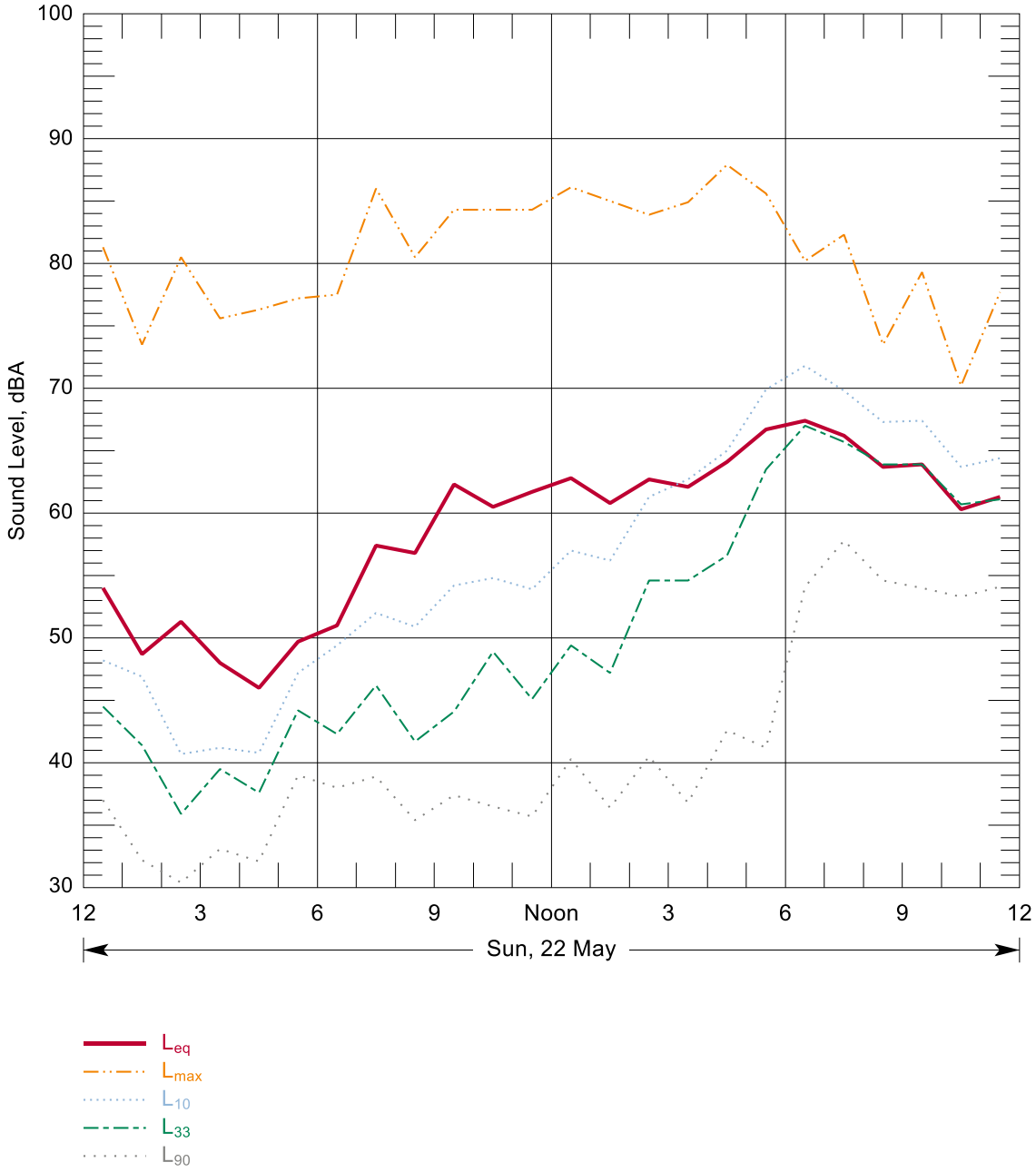
Source: Wilson Ihrig 2016

Figure B-209: Hourly Summary of Noise Levels Measured at N138 on 20 May, 2016



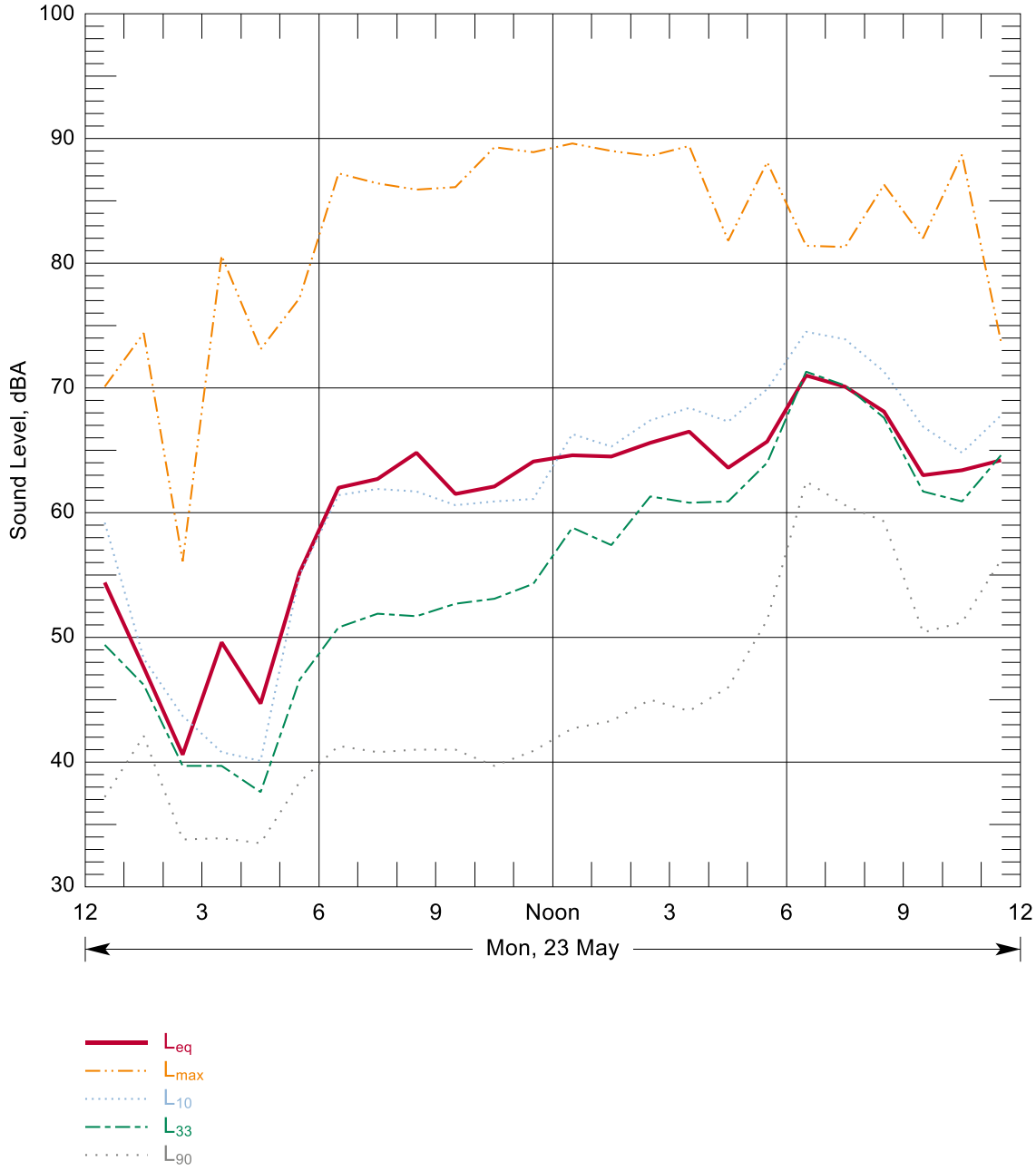
Source: Wilson Ihrig 2016

Figure B-210: Hourly Summary of Noise Levels Measured at N138 on 21 May, 2016



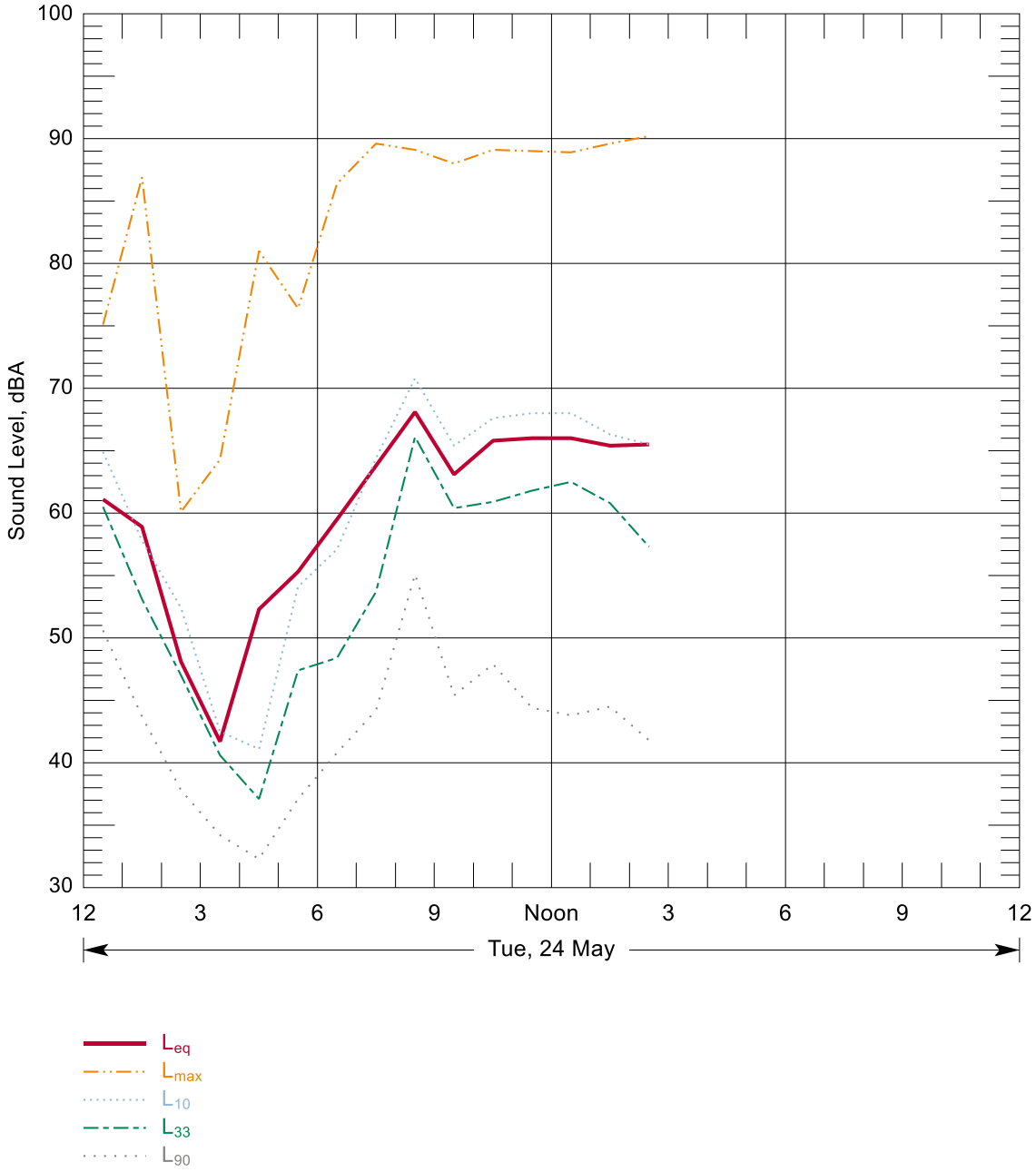
Source: Wilson Ihrig 2016

Figure B-211: Hourly Summary of Noise Levels Measured at N138 on 22 May, 2016



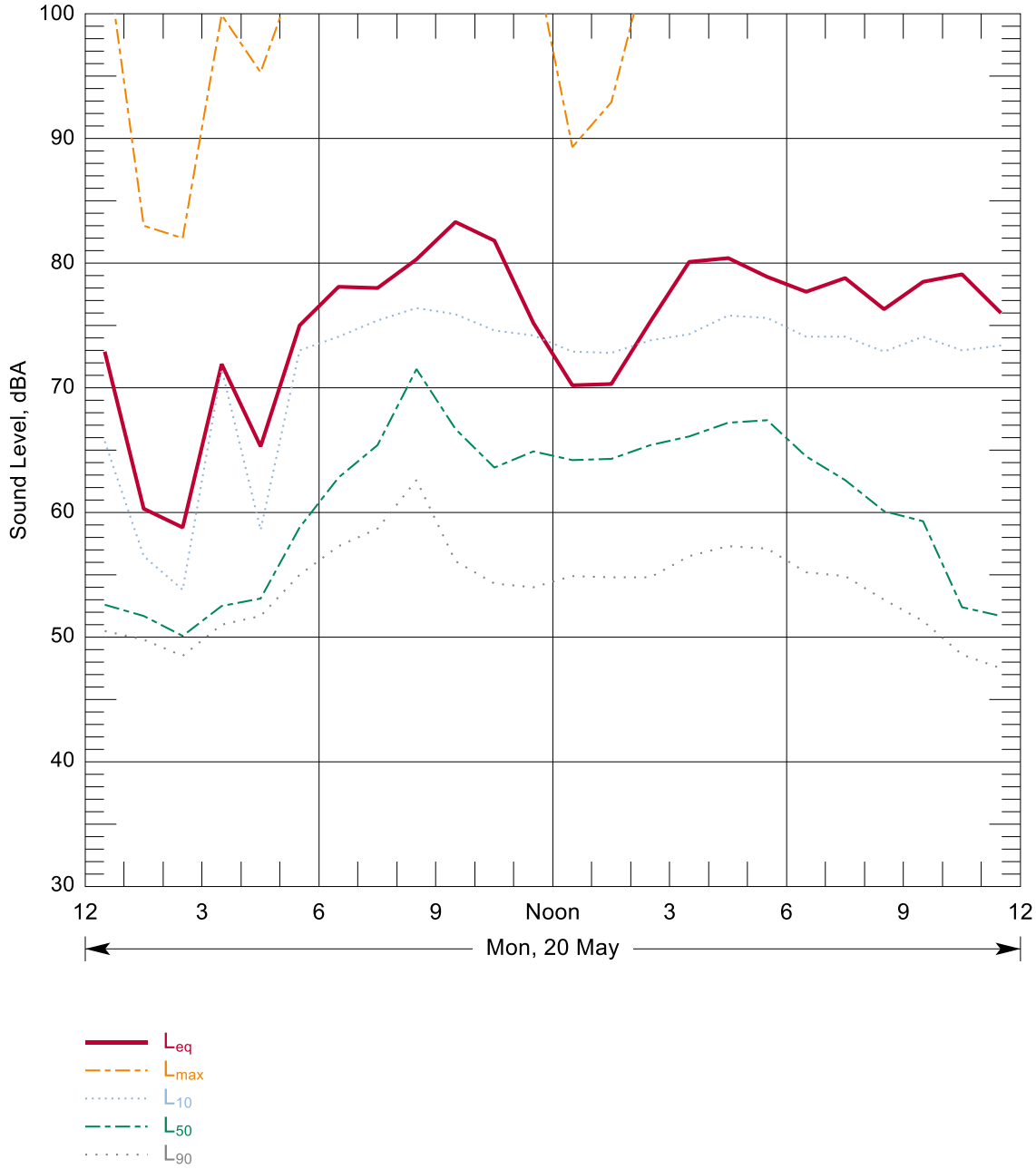
Source: Wilson Ihrig 2016

Figure B-212: Hourly Summary of Noise Levels Measured at N138 on 23 May, 2016



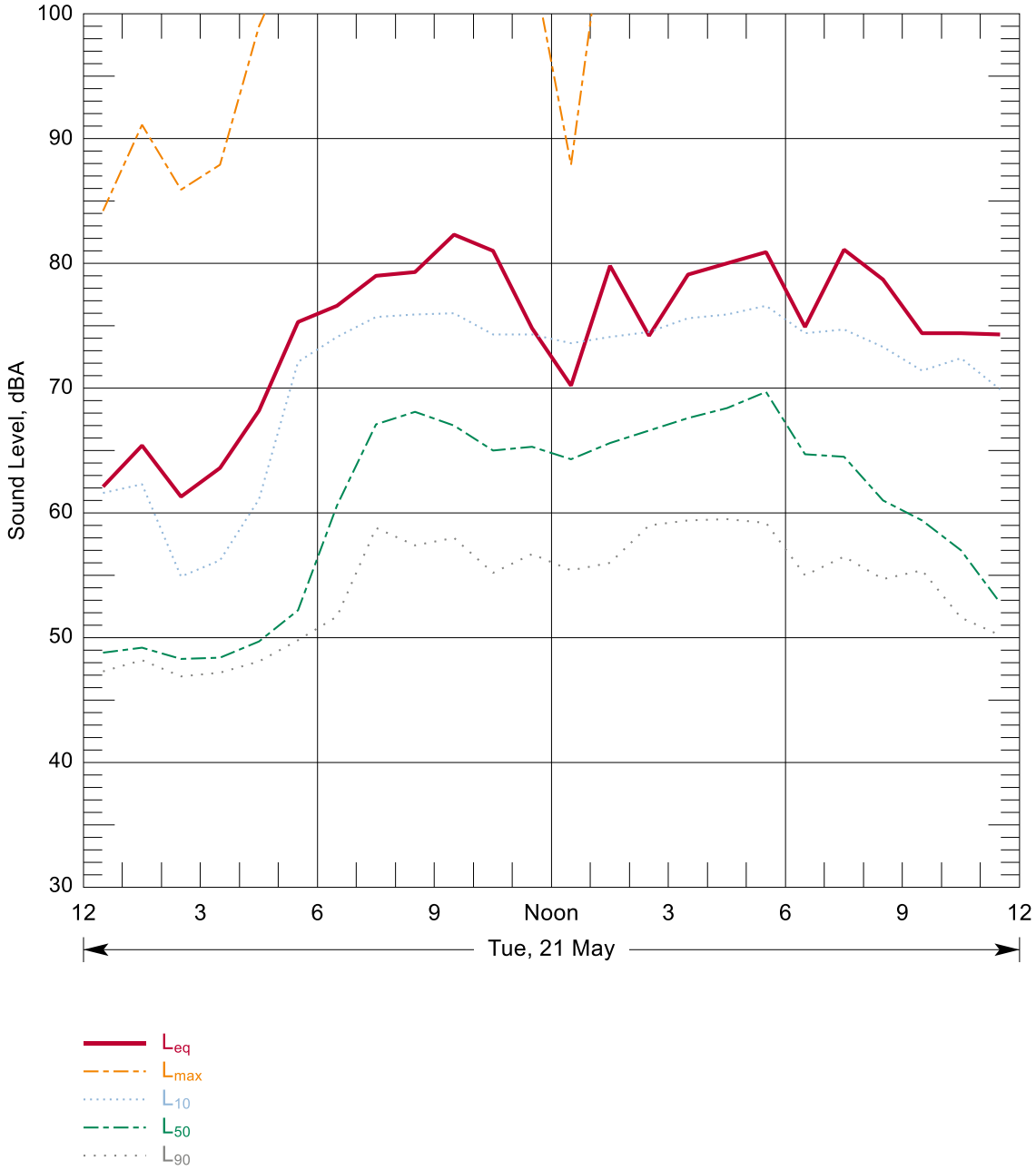
Source: Wilson Ihrig 2016

Figure B-213: Hourly Summary of Noise Levels Measured at N138 on 24 May, 2016



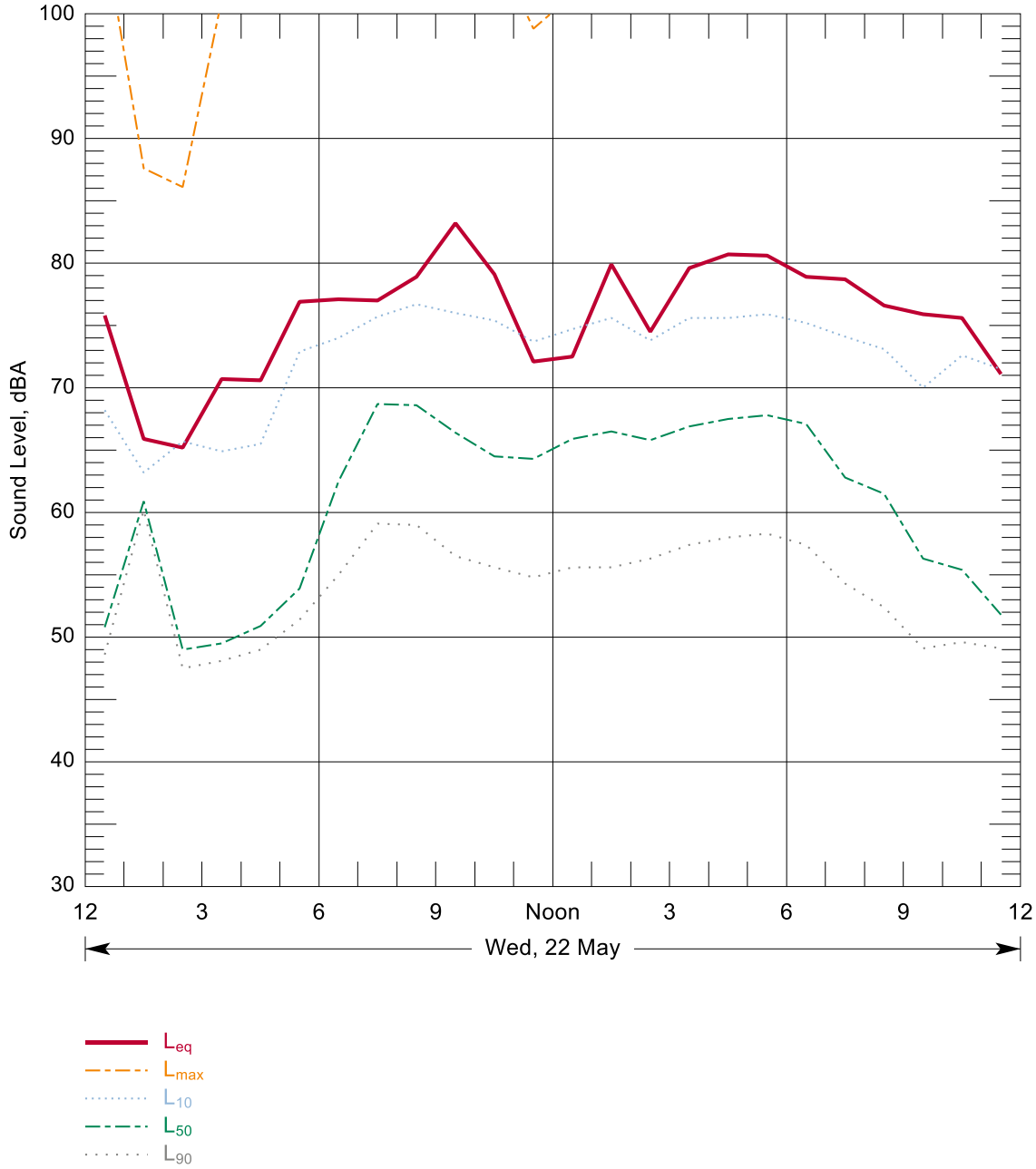
Source: Wilson Ihrig 2013

Figure B-214: Hourly Summary of Noise Levels Measured at N139 on 20 May, 2013



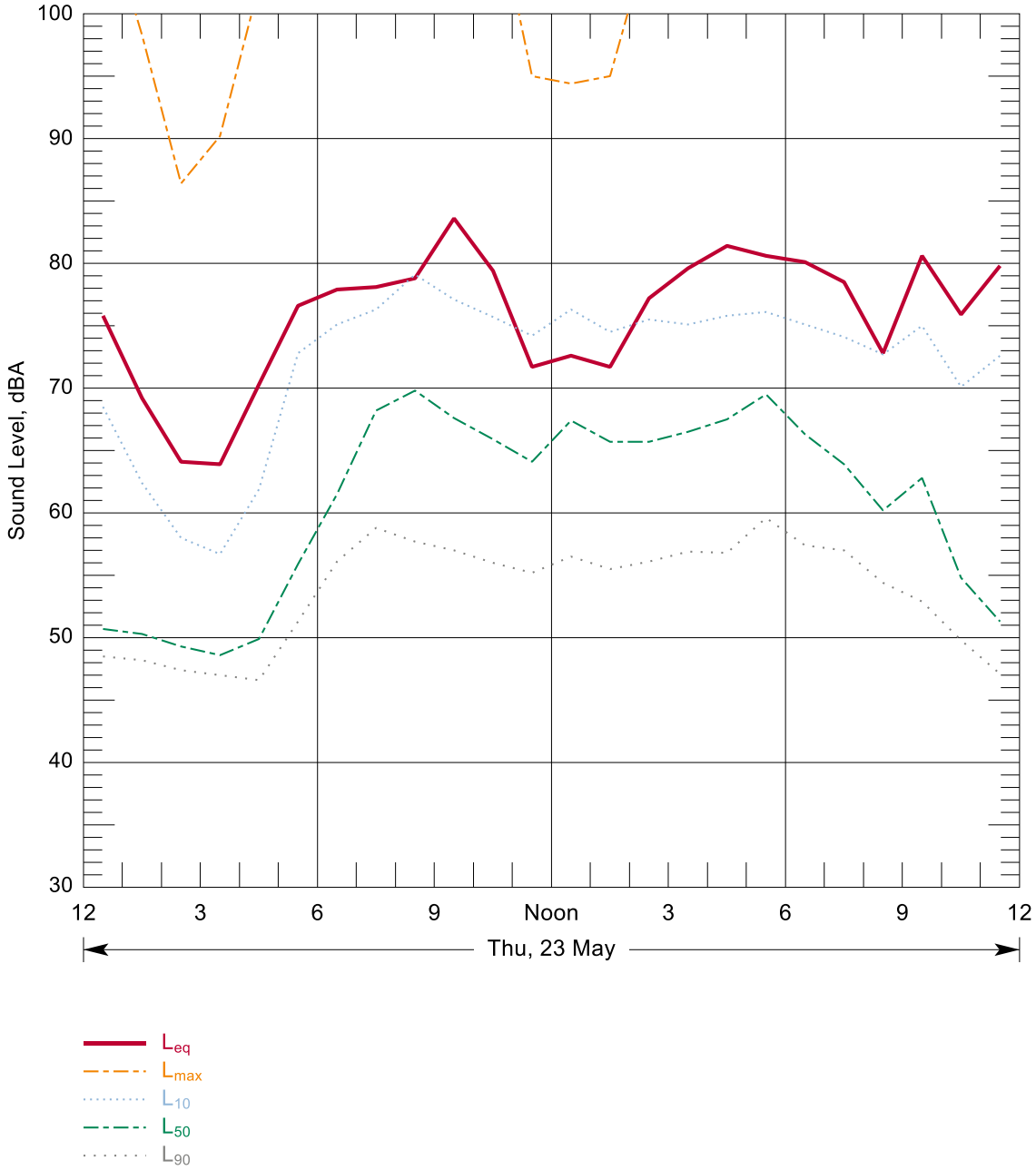
Source: Wilson Ihrig 2013

Figure B-215: Hourly Summary of Noise Levels Measured at N139 on 21 May, 2013



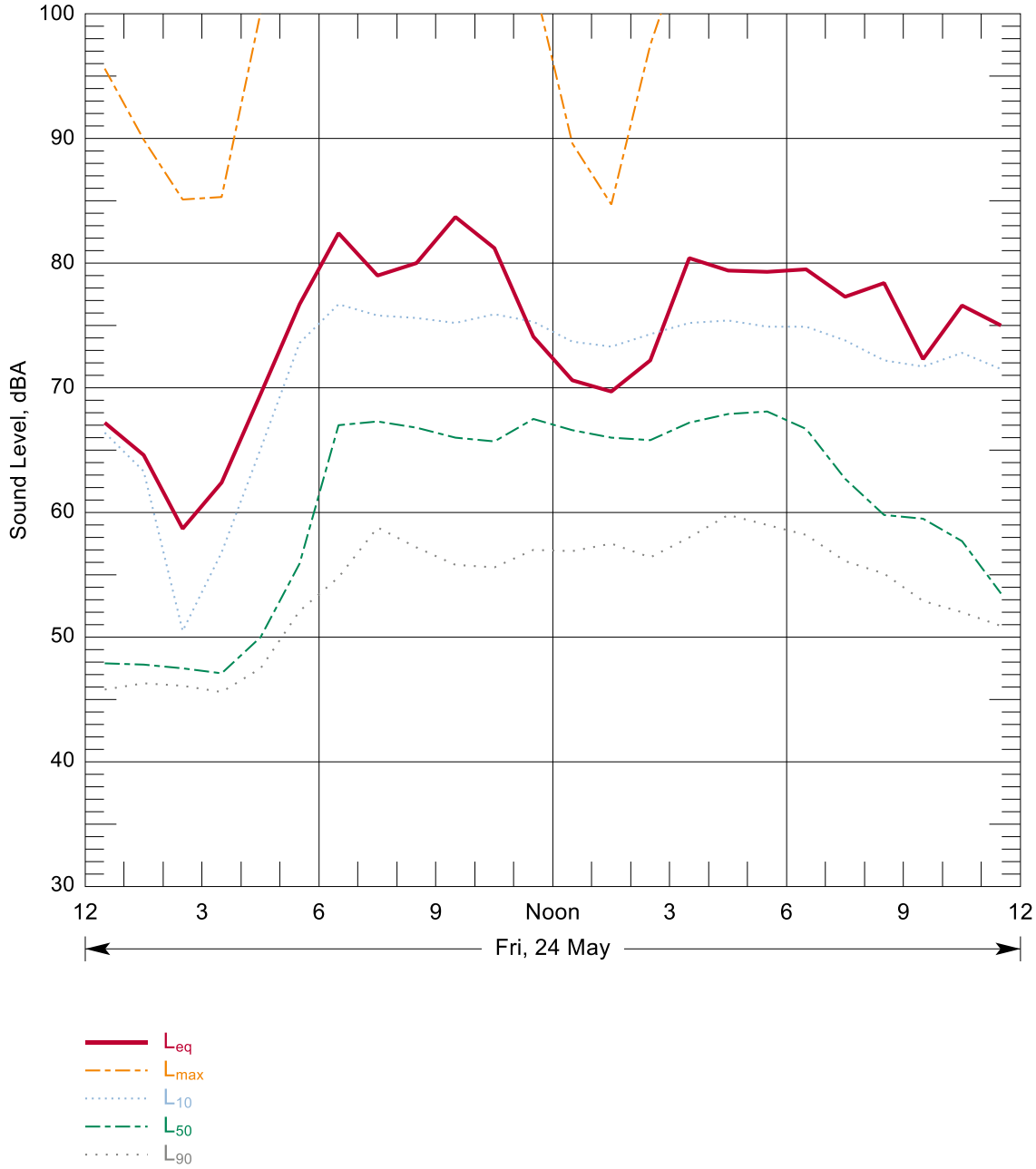
Source: Wilson Ihrig 2013

Figure B-216: Hourly Summary of Noise Levels Measured at N139 on 22 May, 2013



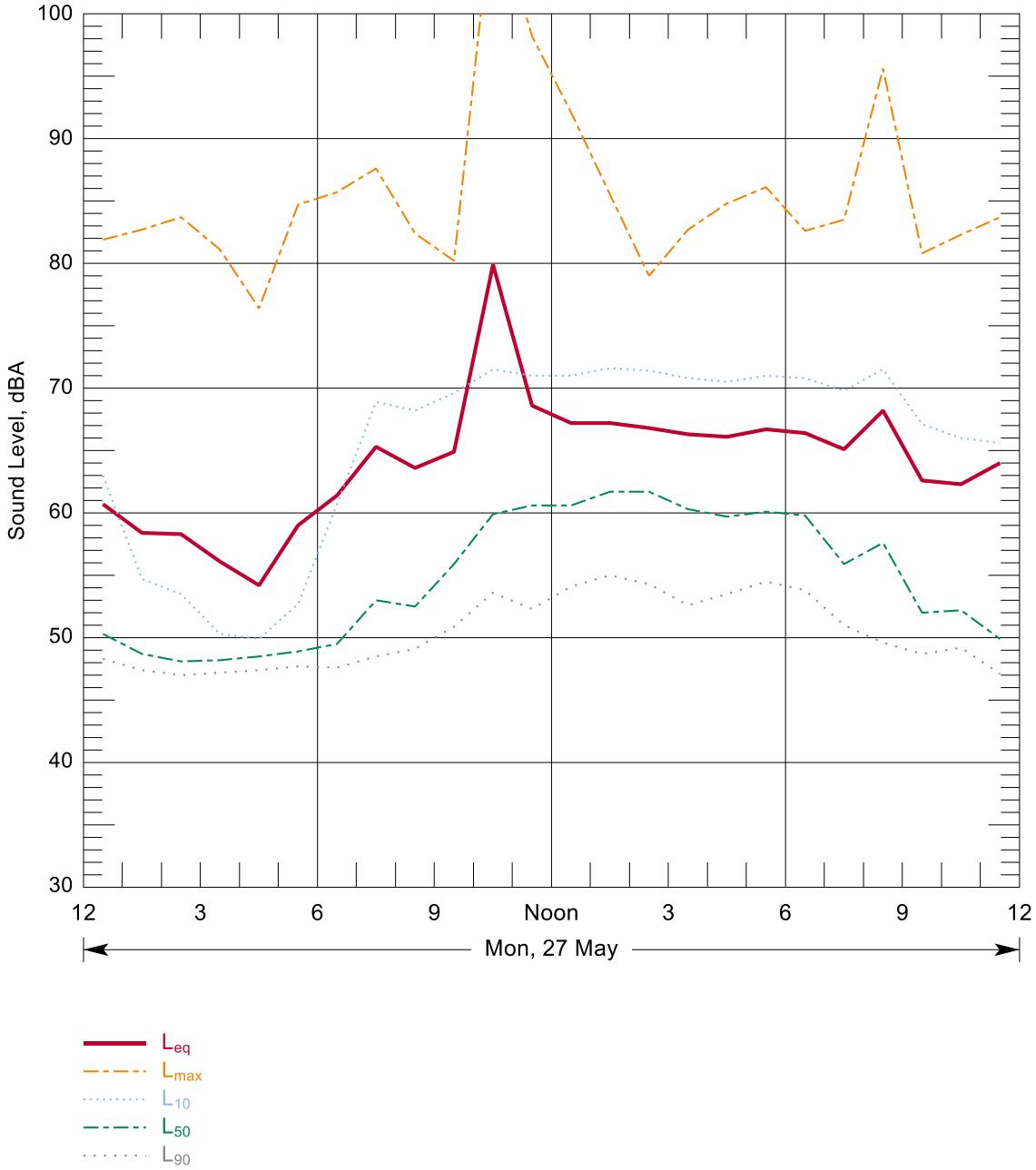
Source: Wilson Ihrig 2013

Figure B-217: Hourly Summary of Noise Levels Measured at N139 on 23 May, 2013



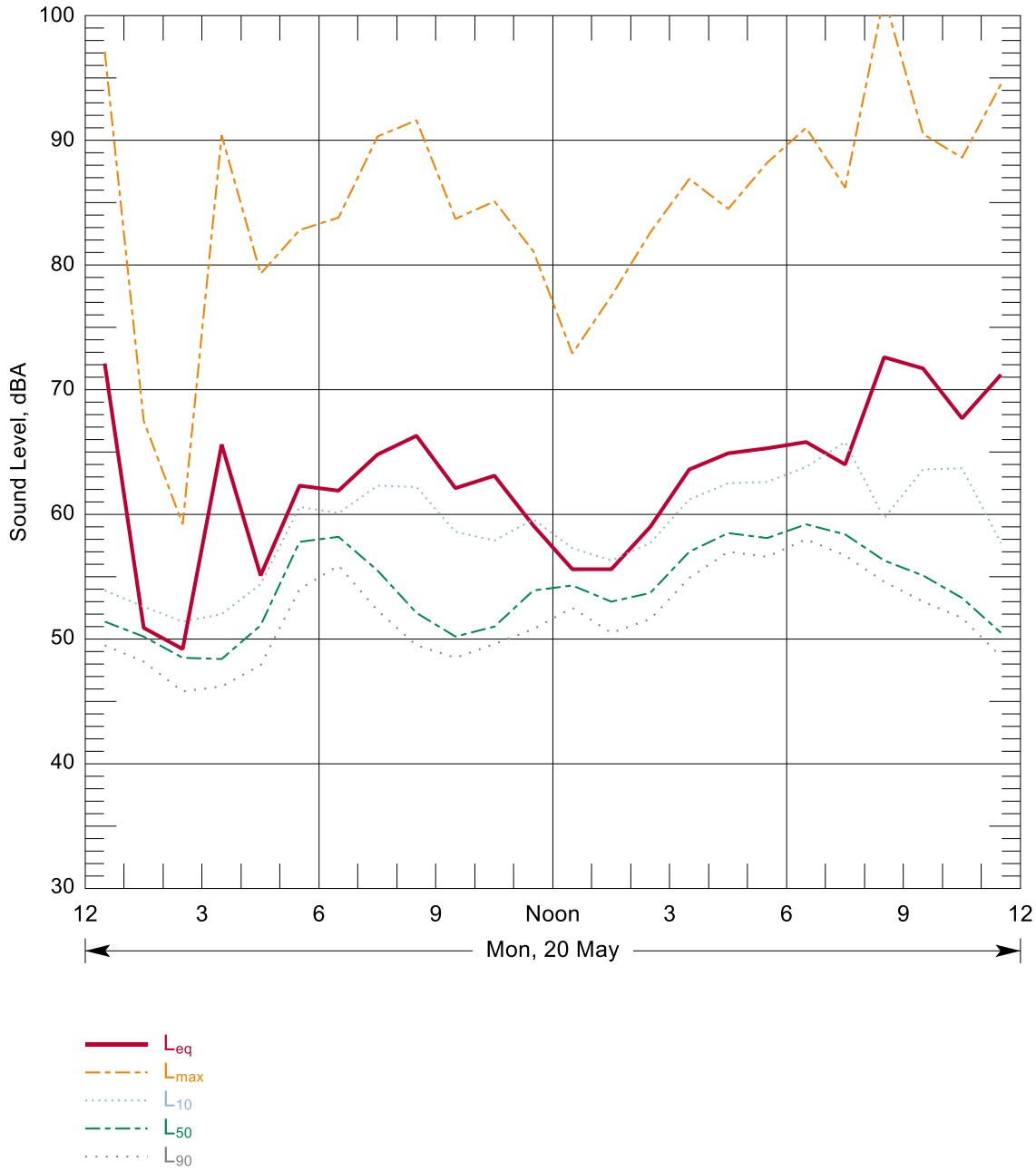
Source: Wilson Ihrig 2013

Figure B-218: Hourly Summary of Noise Levels Measured at N139 on 24 May, 2013



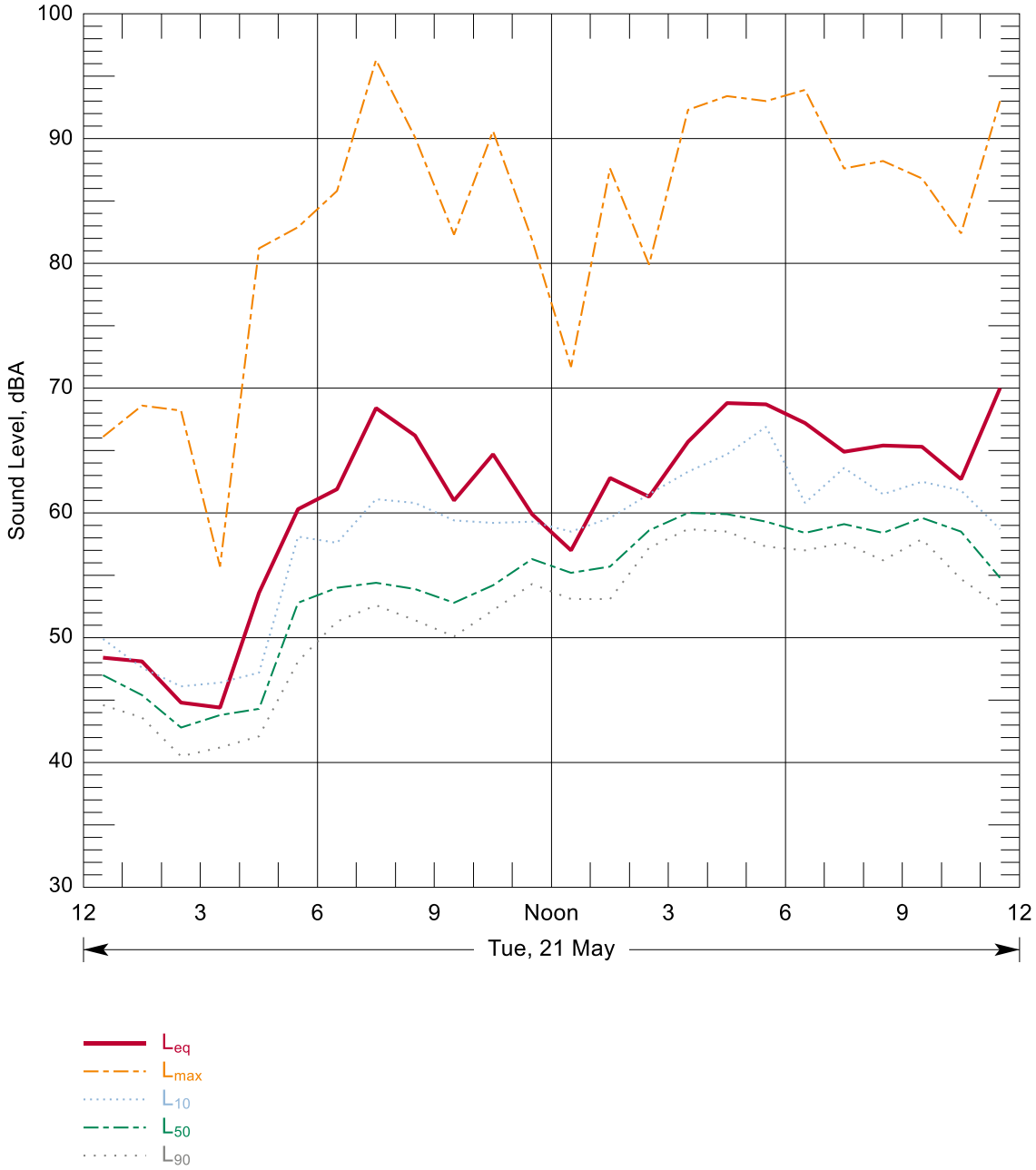
Source: Wilson Ihrig 2013

Figure B-219: Hourly Summary of Noise Levels Measured at N139 on 27 May, 2013



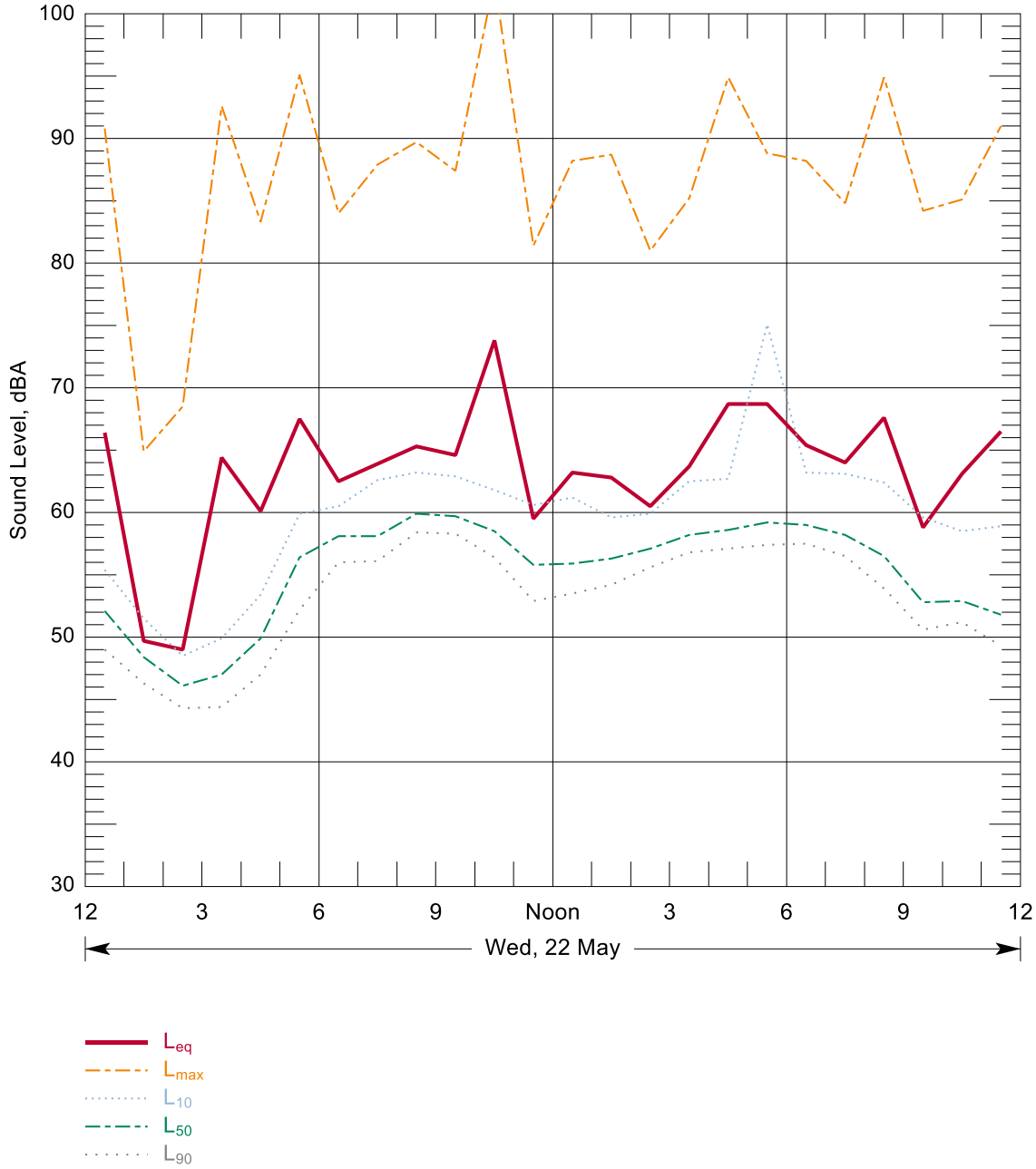
Source: Wilson Ihrig 2013

Figure B-220: Hourly Summary of Noise Levels Measured at N140 on 20 May, 2013



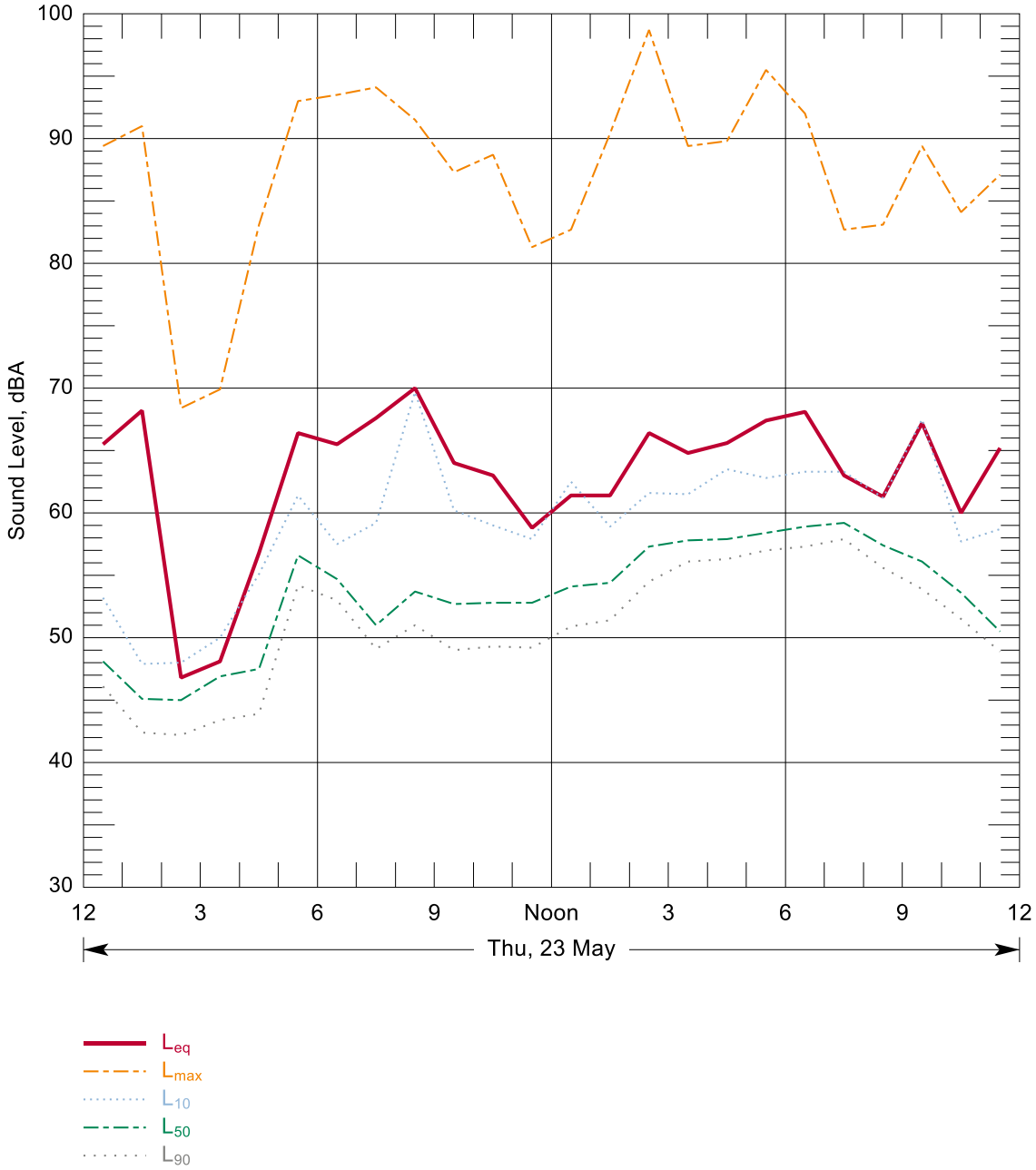
Source: Wilson Ihrig 2013

Figure B-221: Hourly Summary of Noise Levels Measured at N140 on 21 May, 2013



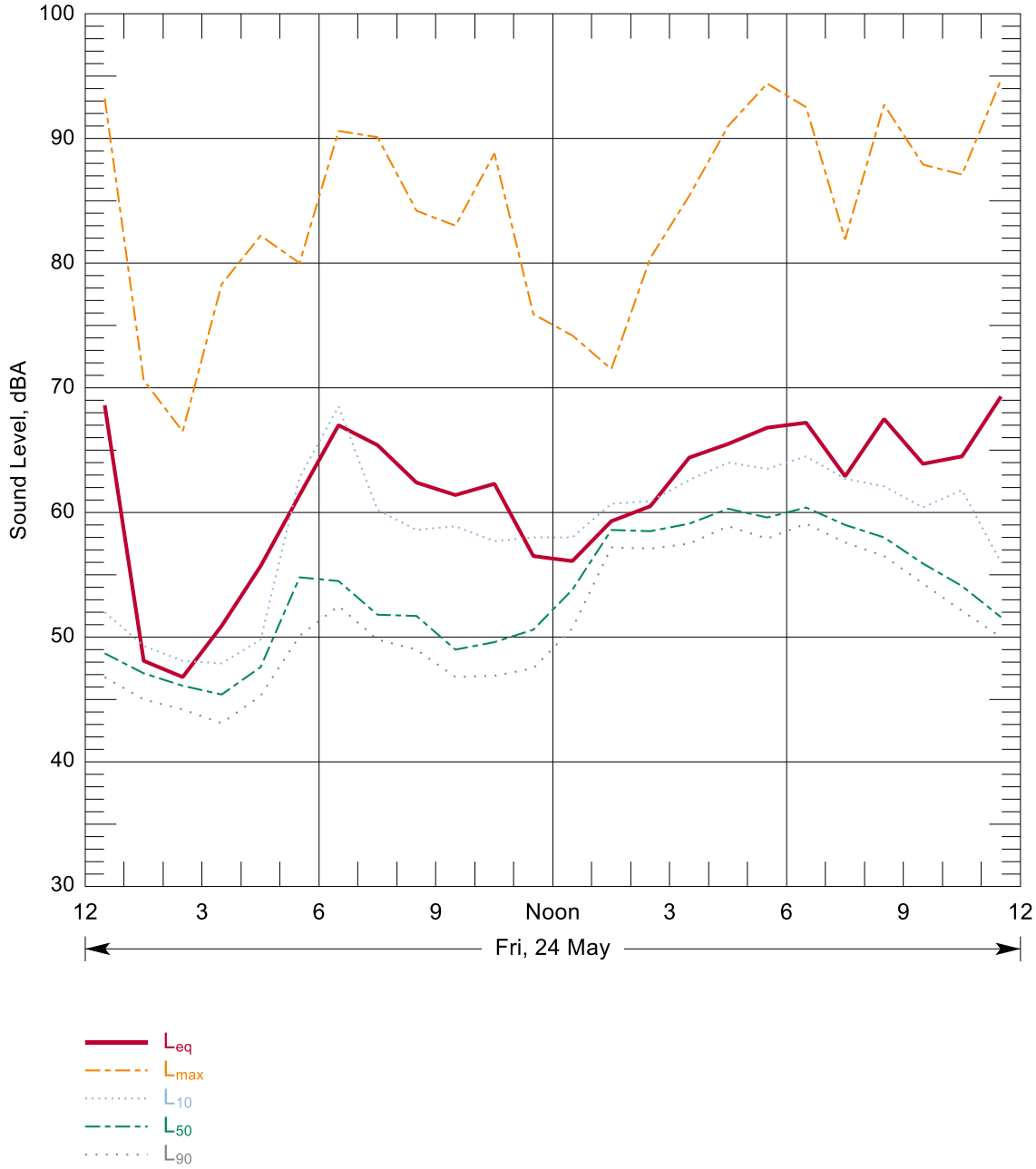
Source: Wilson Ihrig 2013

Figure B-222: Hourly Summary of Noise Levels Measured at N140 on 22 May, 2013



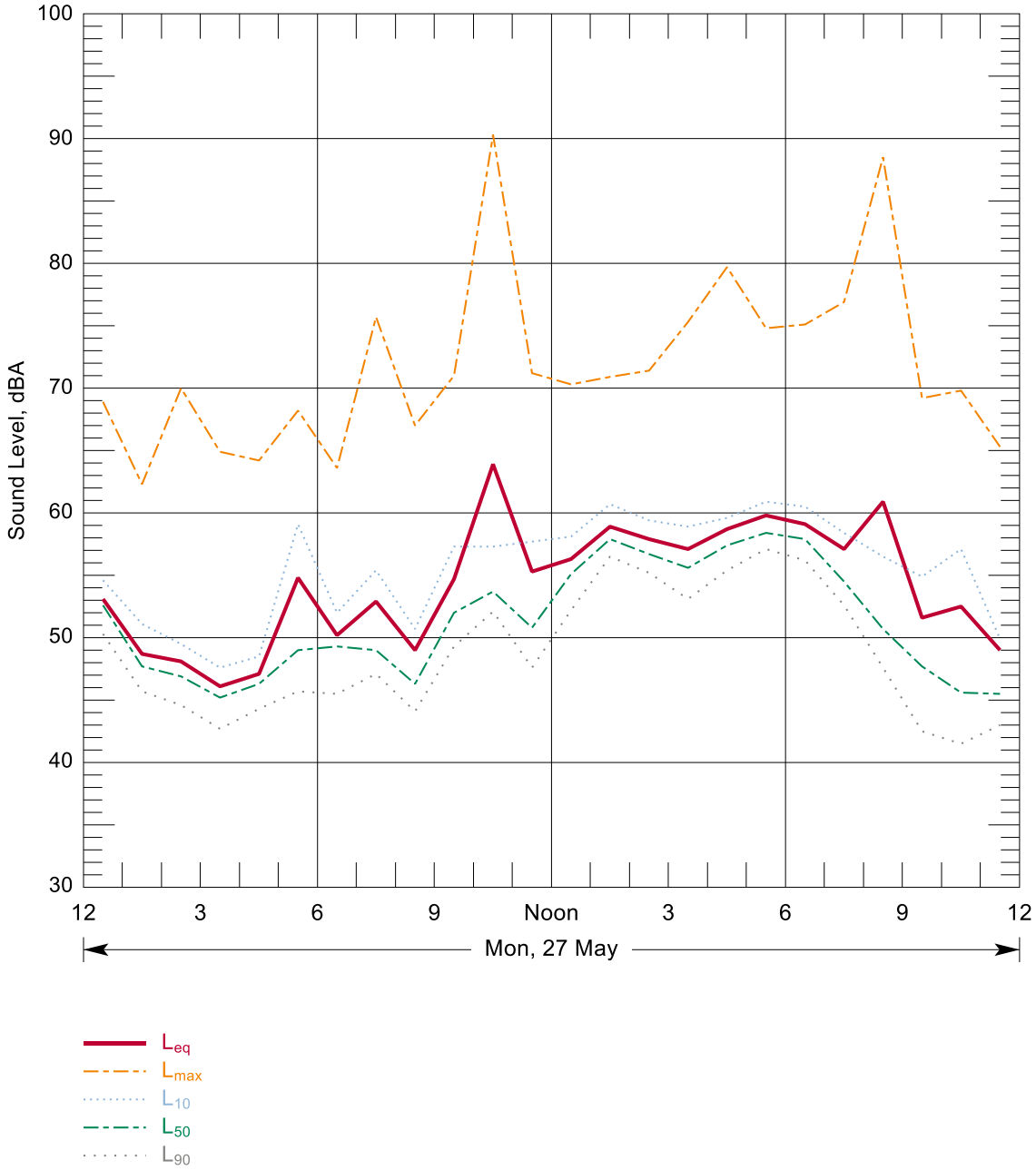
Source: Wilson Ihrig 2013

Figure B-223: Hourly Summary of Noise Levels Measured at N140 on 23 May, 2013



Source: Wilson Ihrig 2013

Figure B-224: Hourly Summary of Noise Levels Measured at N140 on 24 May, 2013



Source: Wilson Ihrig 2013

Figure B-225: Hourly Summary of Noise Levels Measured at N140 on 27 May, 2013

References

Parsons Transportation. 2010. Noise Measurements conducted for the San Jose to Merced Project Extent. June 22 2010 through January 18, 2011.

Wilson Ihrig. 2009. Noise Measurements conducted for the San Jose to Merced Project Extent. October 16, 2009.

———. 2010. Noise Measurements conducted for the San Jose to Merced Project Extent. March 5 2009.

———. Noise Measurements conducted for the San Jose to Merced Project Extent. November 11, 2014.

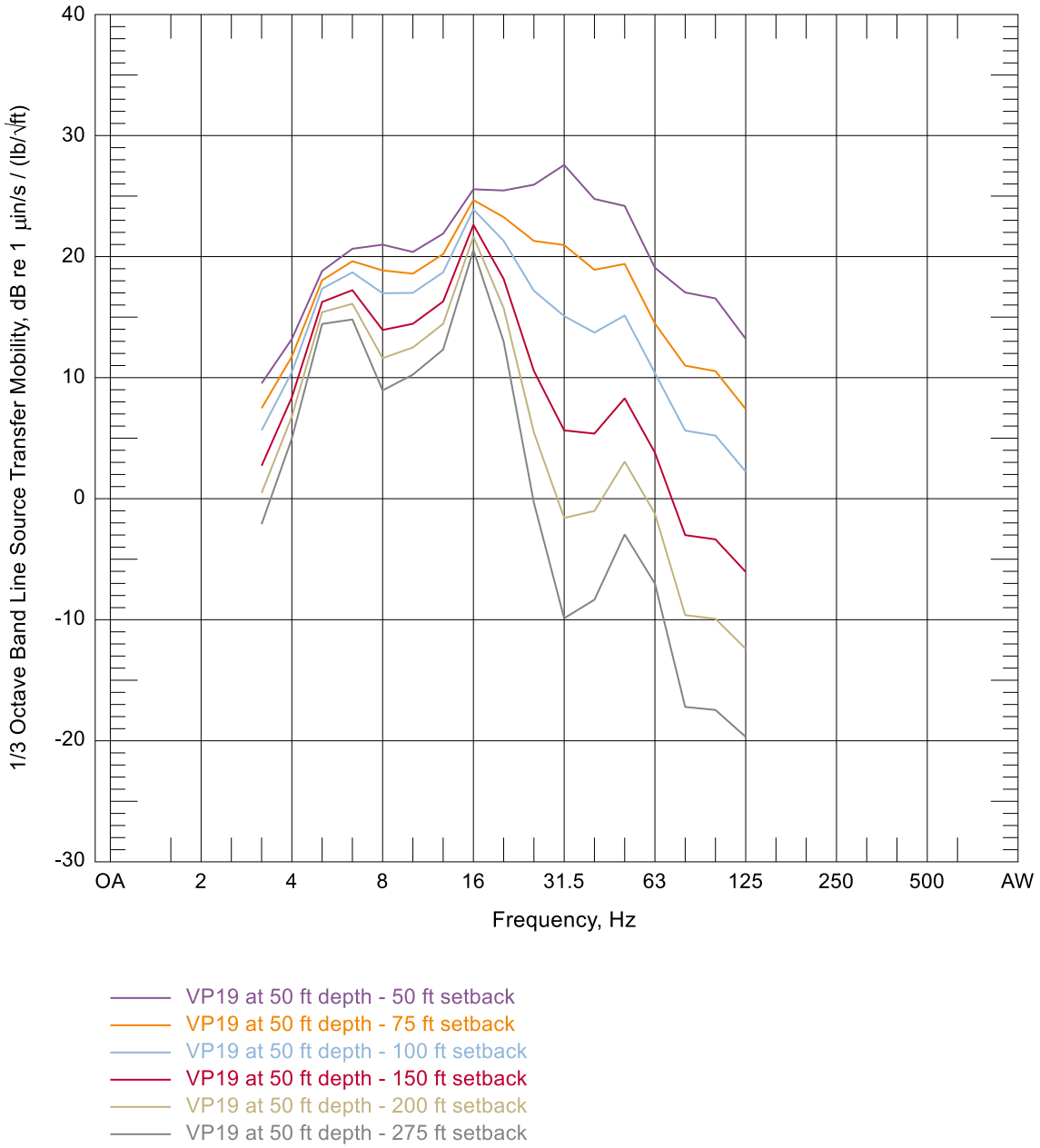
———. 2016. Noise Measurements conducted for the San Jose to Merced Project Extent. May 3, 2016 through February 14, 2017.

APPENDIX C: VIBRATION PROPAGATION MEASUREMENT DATA

Table C-1 Line Source Response Coefficients for Borehole Impact Site VP19 – 50 ft Depth

Frequency (Hz)	A	B	C
3.15	45.6	-19.5	0
4	38.7	-13.8	0
5	32.4	-7.3	0
6.3	38.7	-9.8	0
8	58.3	-20.2	0
10	51.8	-17.0	0
12.5	51.6	-16.0	0
16	41.1	-8.4	0
20	64.1	-20.9	0
25	107.4	-44.0	0
31.5	143.6	-62.7	0
40	127.3	-55.5	0
50	108.3	-45.5	0
63	99.9	-43.7	0
80	123.1	-57.4	0
100	121.9	-57.0	0
125	115.1	-55.1	0

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$
Where: A, B, C = Polynomial coefficients
d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-1 Line Source Response for Borehole Impact Site VP19 – 50 ft Depth

Table C-2 Line Source Response Coefficients for Borehole Impact Site VP19 – 60 ft Depth

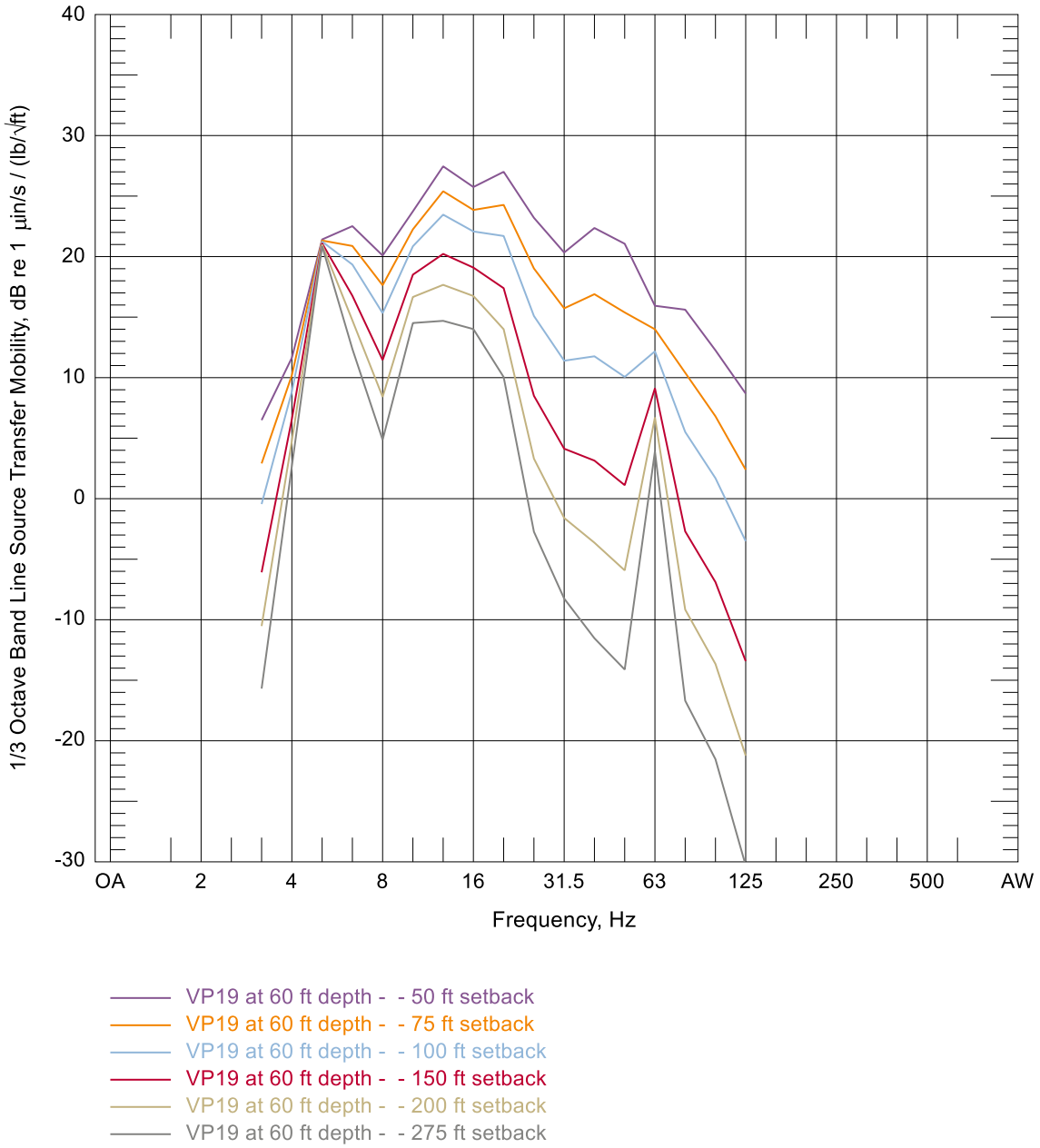
Frequency (Hz)	A	B	C
3.15	81.9	-39.8	0
4	42.1	-16.1	0
5	23.3	-1.0	0
6.3	57.0	-18.2	0
8	71.8	-27.3	0
10	55.1	-16.6	0
12.5	70.8	-22.9	0
16	65.7	-21.1	0
20	84.6	-30.5	0
25	111.4	-46.6	0
31.5	117.5	-51.3	0
40	137.6	-60.9	0
50	140.6	-63.2	0
63	56.8	-21.6	0
80	125.4	-58.0	0
100	127.1	-60.7	0
125	141.2	-70.0	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-2 Line Source Response for Borehole Impact Site VP19 – 60 ft Depth

Table C-3 Line Source Response Coefficients for Borehole Impact Site VP19 – 71 ft Depth

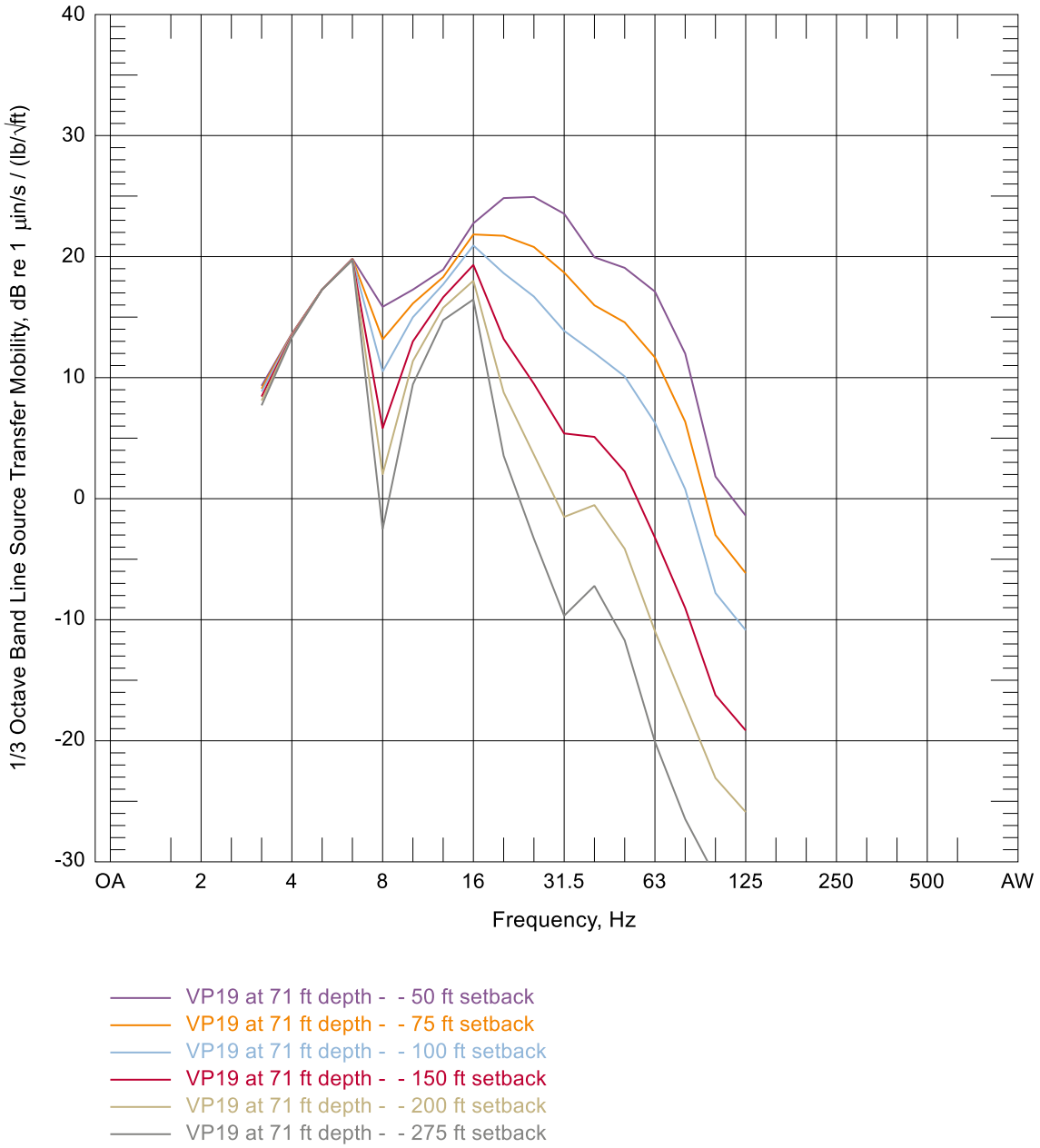
Frequency (Hz)	A	B	C
3.15	15.3	-4.2	0
4	12.6	-0.9	0
5	14.5	-0.1	0
6.3	17.6	-0.4	0
8	85.0	-35.8	0
10	51.1	-17.8	0
12.5	37.3	-10.2	0
16	50.3	-14.7	0
20	104.9	-41.4	0
25	134.3	-56.4	0
31.5	151.3	-65.9	0
40	125.6	-54.5	0
50	135.2	-59.9	0
63	157.5	-72.4	0
80	157.5	-75.1	0
100	127.1	-64.6	0
125	123.7	-64.5	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-3 Line Source Response for Borehole Impact Site VP19 – 71 ft Depth

Table C-4 Line Source Response Coefficients for Surface Impact Site VP20

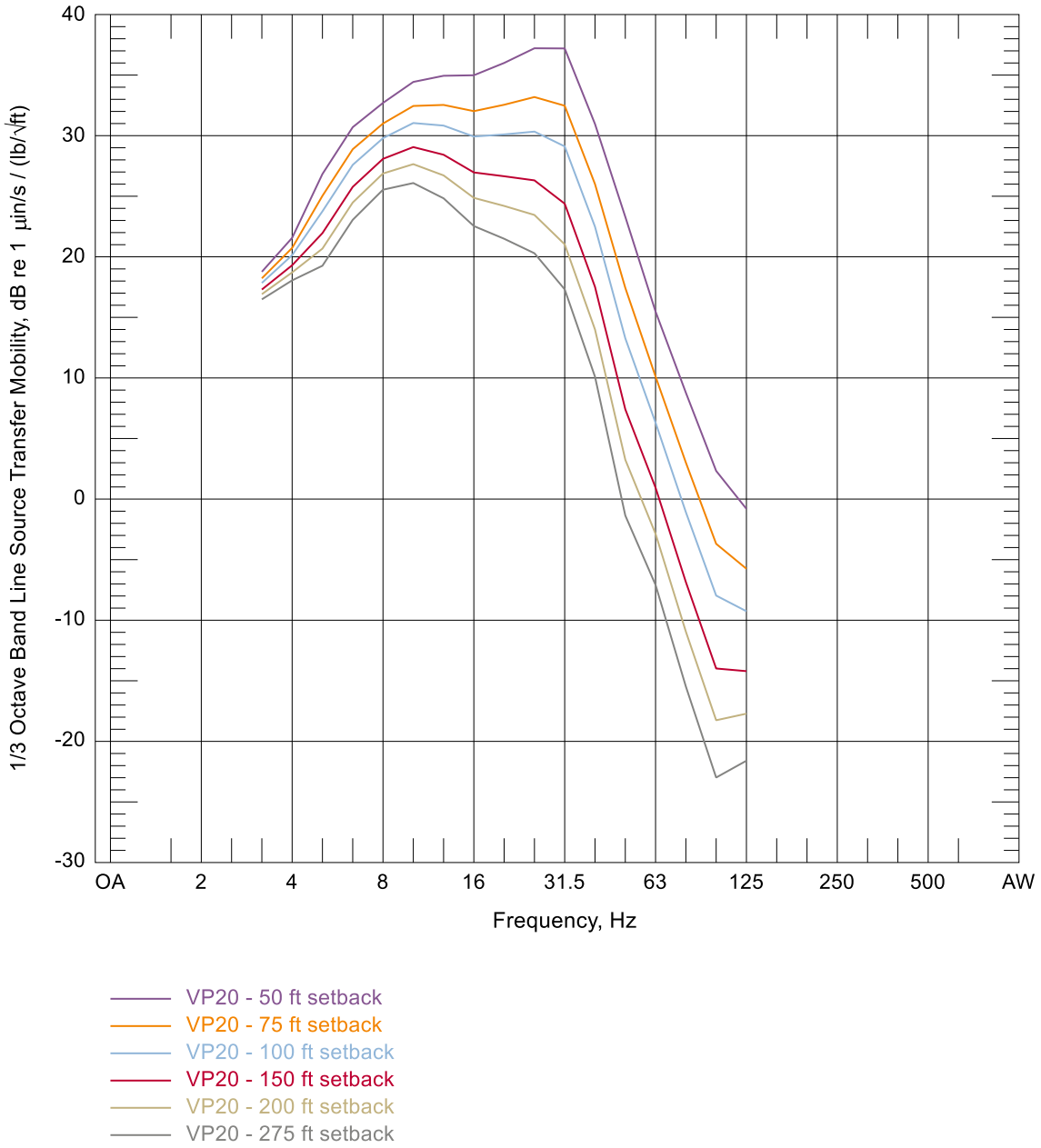
Frequency (Hz)	A	B	C
3.15	24.0	-3.1	0
4	29.6	-4.7	0
5	44.2	-10.2	0
6.3	48.2	-10.3	0
8	49.2	-9.7	0
10	53.6	-11.3	0
12.5	58.2	-13.7	0
16	63.5	-16.8	0
20	69.3	-19.6	0
25	76.0	-22.9	0
31.5	82.8	-26.9	0
40	78.8	-28.2	0
50	79.9	-33.3	0
63	67.3	-30.5	0
80	64.4	-32.8	0
100	60.4	-34.2	0
125	46.9	-28.1	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-4 Line Source Response for Surface Impact Site VP20

Table C-5 Line Source Response Coefficients for Surface Impact Site VP21

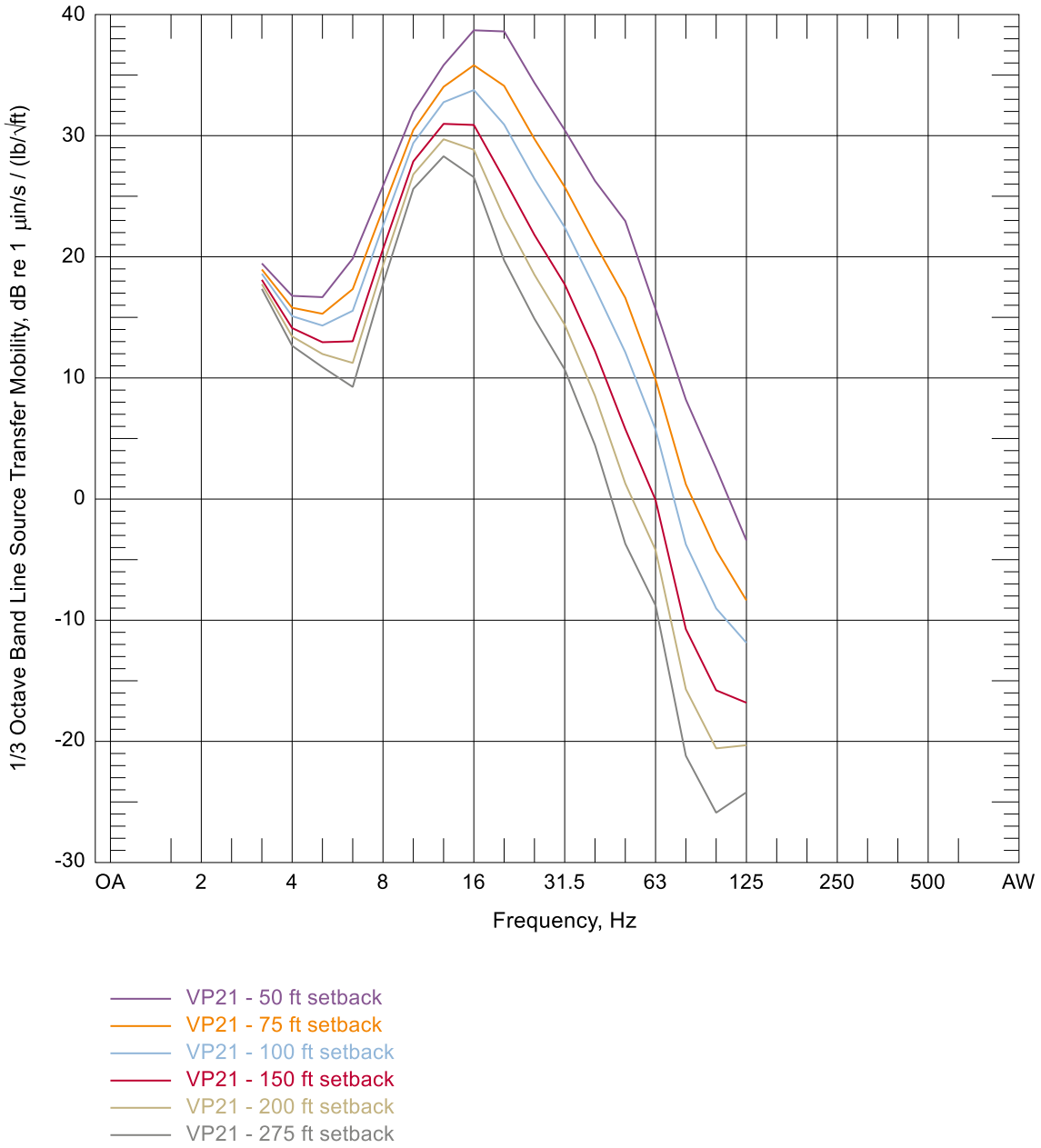
Frequency (Hz)	A	B	C
3.15	24.3	-2.8	0
4	26.2	-5.6	0
5	29.9	-7.8	0
6.3	44.2	-14.3	0
8	44.4	-10.9	0
10	46.6	-8.6	0
12.5	53.1	-10.2	0
16	66.5	-16.4	0
20	82.0	-25.5	0
25	79.1	-26.3	0
31.5	75.8	-26.7	0
40	76.3	-29.5	0
50	84.1	-36.0	0
63	71.8	-33.0	0
80	75.7	-39.7	0
100	67.8	-38.4	0
125	44.3	-28.1	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-5 Line Source Response for Surface Impact Site VP21

Table C-6 Line Source Response Coefficients for Surface Impact Site VP22

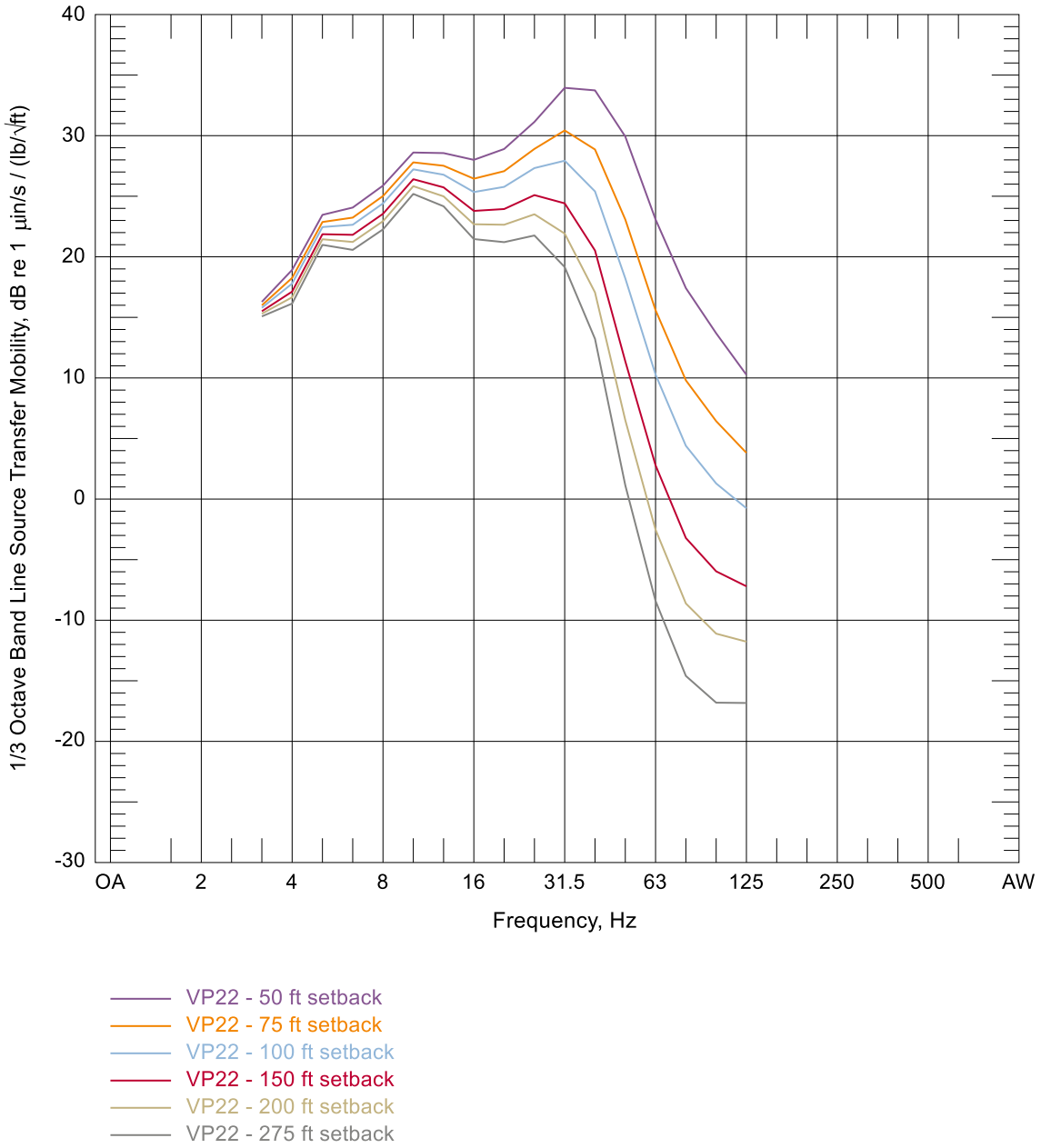
Frequency (Hz)	A	B	C
3.15	19.0	-1.6	0
4	25.3	-3.8	0
5	29.1	-3.3	0
6.3	32.1	-4.7	0
8	34.2	-4.9	0
10	36.4	-4.6	0
12.5	38.6	-5.9	0
16	43.0	-8.8	0
20	46.5	-10.4	0
25	52.7	-12.7	0
31.5	67.9	-20.0	0
40	80.8	-27.7	0
50	96.0	-38.9	0
63	95.3	-42.5	0
80	90.9	-43.2	0
100	83.7	-41.2	0
125	72.4	-36.6	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-6 Line Source Response for Surface Impact Site VP22

Table C-7 Line Source Response Coefficients for Surface Impact Site VP23

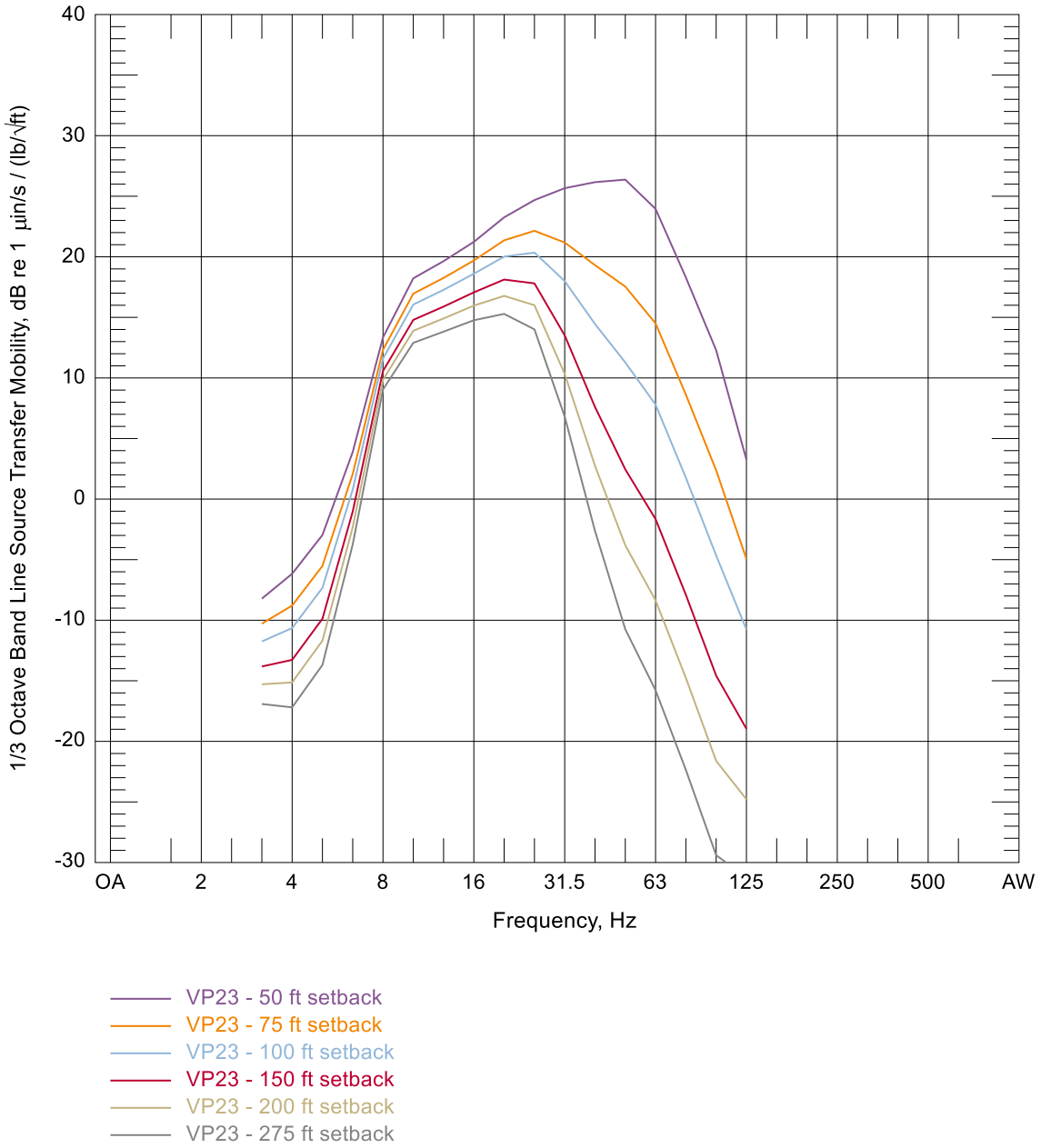
Frequency (Hz)	A	B	C
3.15	11.7	-11.7	0
4	19.1	-14.9	0
5	21.6	-14.5	0
6.3	21.4	-10.3	0
8	23.2	-5.8	0
10	30.4	-7.2	0
12.5	33.0	-7.9	0
16	36.1	-8.7	0
20	41.5	-10.8	0
25	49.2	-14.4	0
31.5	68.9	-25.5	0
40	92.2	-38.9	0
50	111.6	-50.1	0
63	115.1	-53.7	0
80	111.6	-54.9	0
100	108.0	-56.3	0
125	82.4	-46.6	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-7 Line Source Response for Surface Impact Site VP23

Table C-8 Line Source Response Coefficients for Surface Impact Site VP24

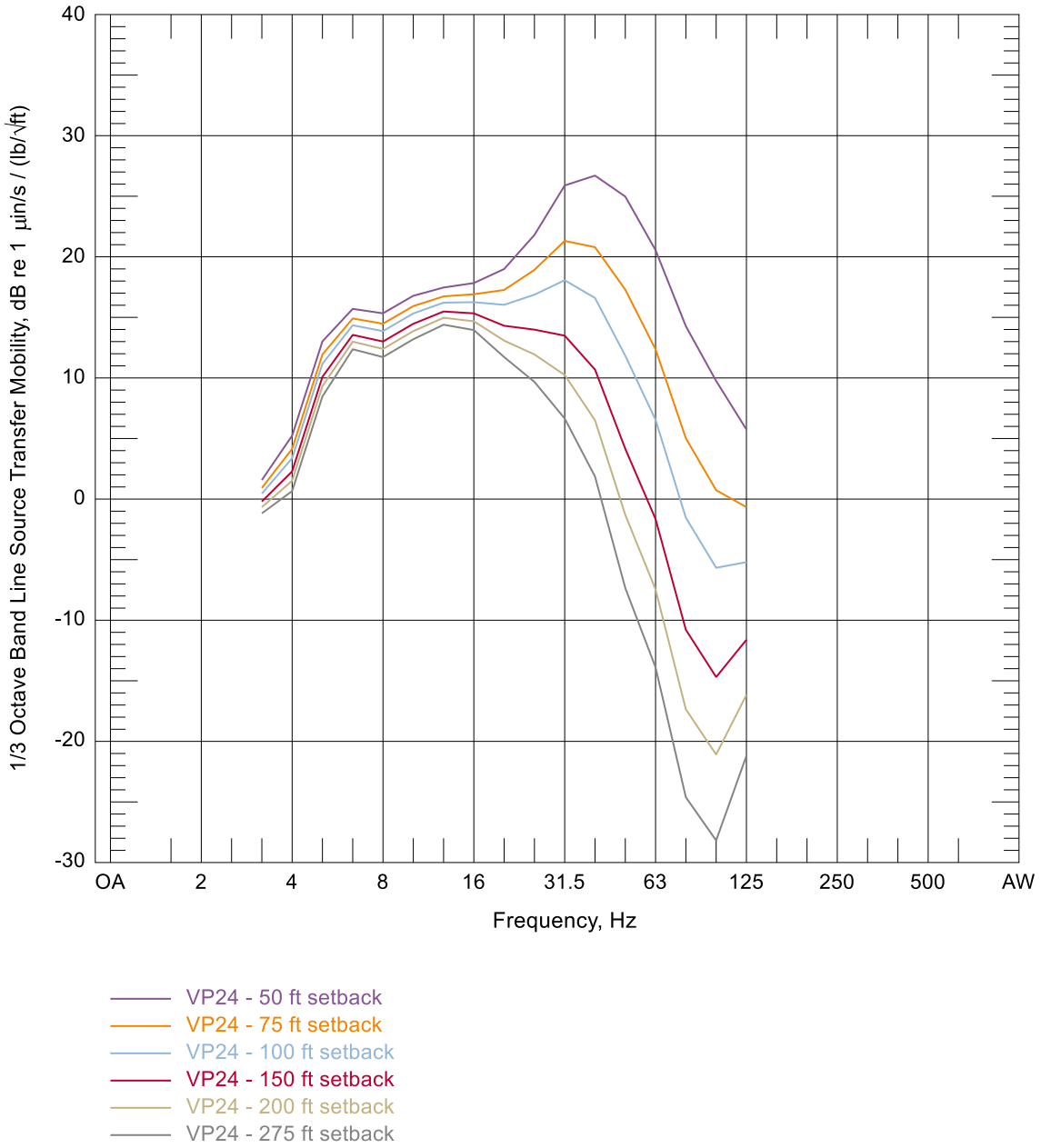
Frequency (Hz)	A	B	C
3.15	7.9	-3.7	0
4	15.7	-6.2	0
5	23.5	-6.1	0
6.3	23.4	-4.5	0
8	23.6	-4.9	0
10	25.0	-4.8	0
12.5	24.5	-4.1	0
16	26.7	-5.2	0
20	35.7	-9.8	0
25	49.6	-16.4	0
31.5	70.0	-26.0	0
40	83.7	-33.6	0
50	99.1	-43.6	0
63	99.6	-46.5	0
80	103.5	-52.5	0
100	96.8	-51.2	0
125	67.6	-36.4	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-8 Line Source Response for Surface Impact Site VP24

Table C-9 Line Source Response Coefficients for Surface Impact Site VP25

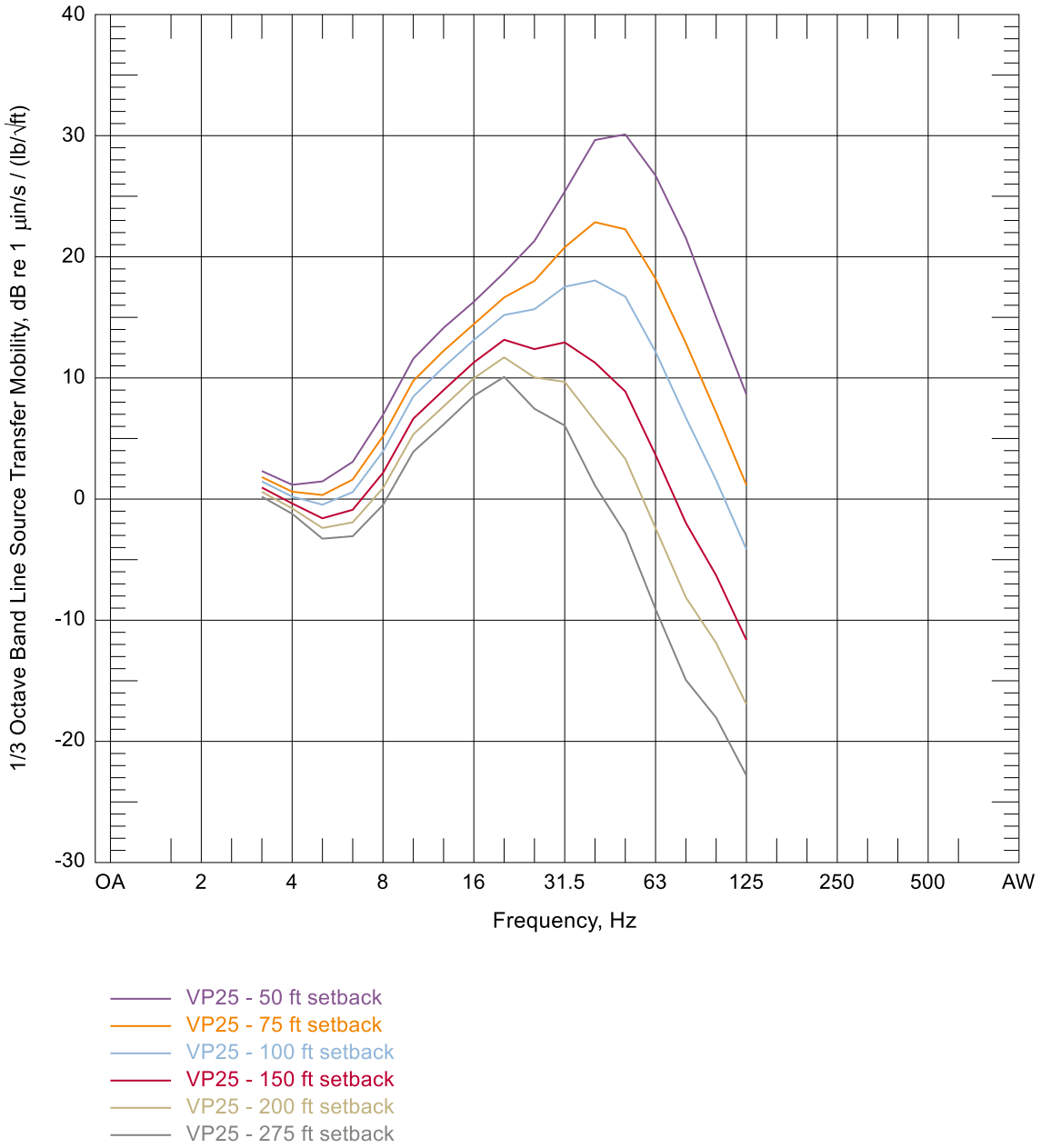
Frequency (Hz)	A	B	C
3.15	7.2	-2.9	0
4	6.7	-3.2	0
5	12.3	-6.4	0
6.3	17.2	-8.3	0
8	24.0	-10.0	0
10	29.2	-10.4	0
12.5	32.4	-10.8	0
16	34.1	-10.5	0
20	38.4	-11.6	0
25	53.1	-18.7	0
31.5	69.7	-26.1	0
40	95.1	-38.5	0
50	105.6	-44.5	0
63	108.9	-48.4	0
80	105.3	-49.3	0
100	90.8	-44.6	0
125	80.8	-42.5	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-9 Line Source Response for Surface Impact Site VP25

Table C-10 Line Source Response Coefficients for Surface Impact Site VP26

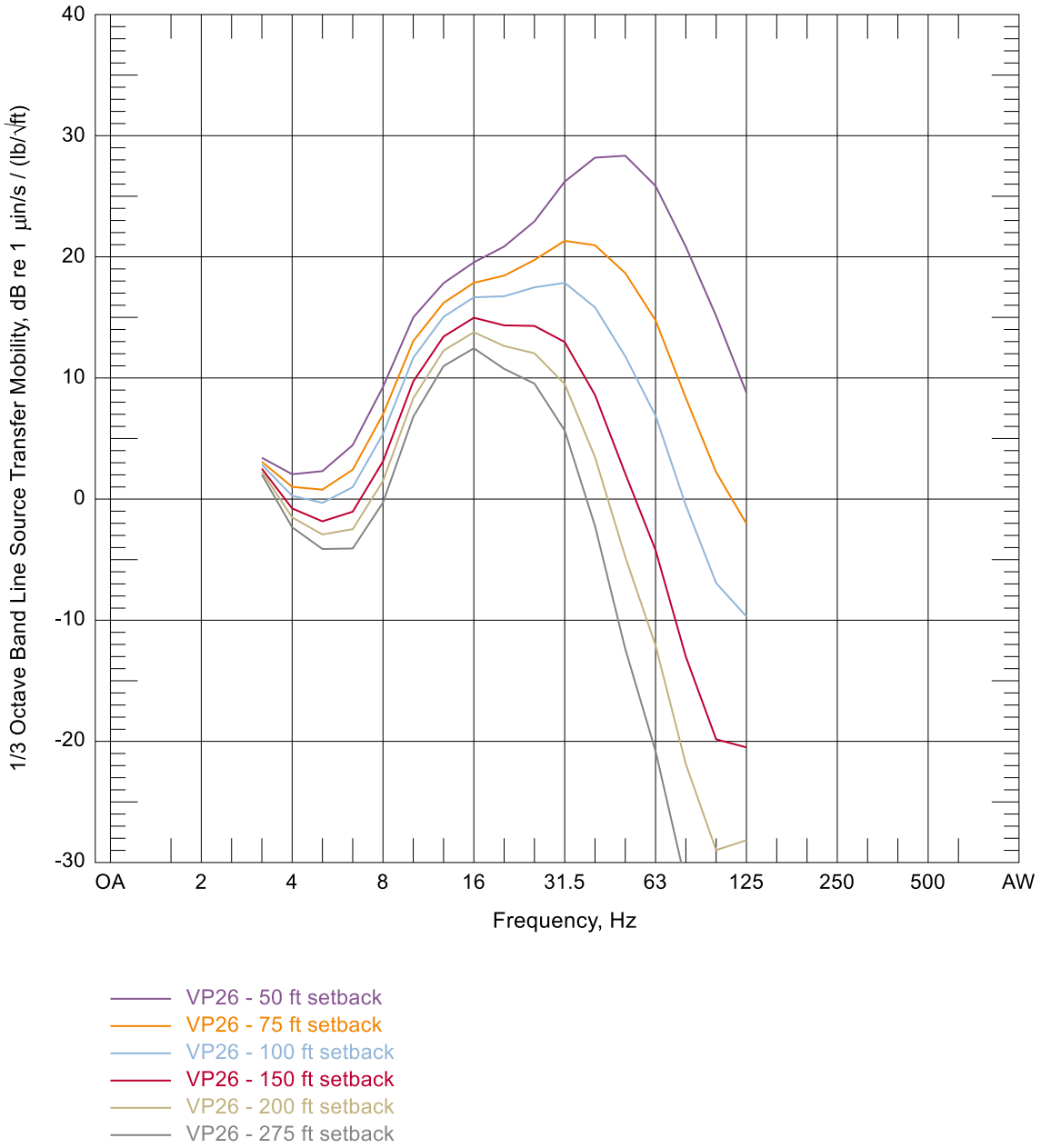
Frequency (Hz)	A	B	C
3.15	6.6	-1.9	0
4	12.1	-5.9	0
5	17.1	-8.7	0
6.3	24.1	-11.5	0
8	31.2	-12.9	0
10	33.8	-11.1	0
12.5	33.5	-9.2	0
16	35.8	-9.6	0
20	44.0	-13.6	0
25	53.6	-18.1	0
31.5	73.4	-27.8	0
40	97.9	-41.1	0
50	121.8	-55.0	0
63	132.9	-63.0	0
80	141.3	-70.9	0
100	139.5	-73.2	0
125	113.0	-61.4	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-10 Line Source Response for Surface Impact Site VP26

Table C-11 Line Source Response Coefficients for Surface Impact Site VP27

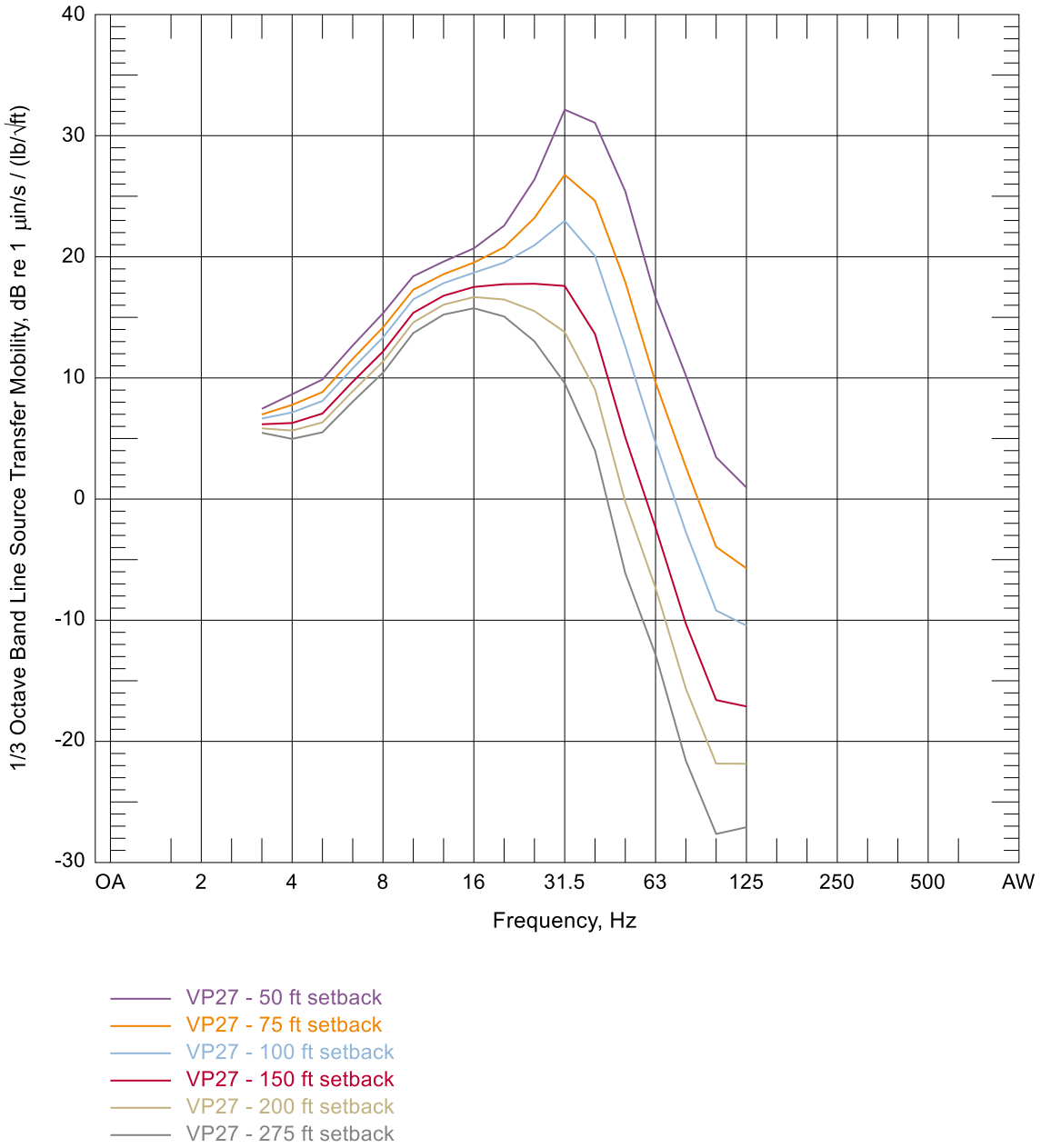
Frequency (Hz)	A	B	C
3.15	12.0	-2.7	0
4	17.1	-5.0	0
5	19.9	-5.9	0
6.3	23.3	-6.3	0
8	26.6	-6.6	0
10	29.2	-6.3	0
12.5	29.6	-5.9	0
16	32.0	-6.7	0
20	39.8	-10.1	0
25	57.0	-18.0	0
31.5	83.9	-30.5	0
40	93.1	-36.5	0
50	97.7	-42.6	0
63	84.3	-39.8	0
80	83.2	-43.0	0
100	74.8	-42.0	0
125	65.3	-37.9	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-11 Line Source Response for Surface Impact Site VP27

Table C-12 Line Source Response Coefficients for Surface Impact Site VP28

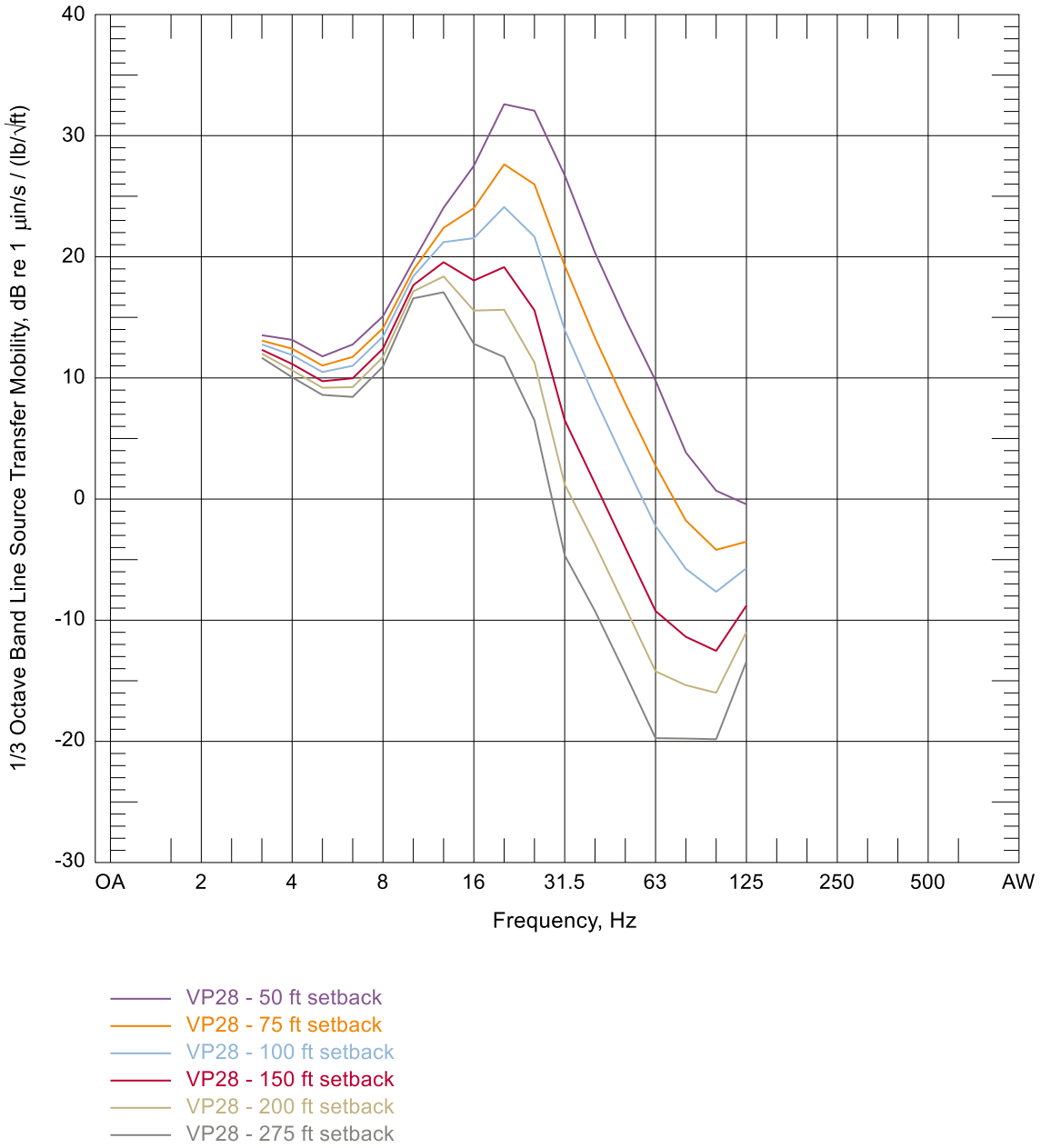
Frequency (Hz)	A	B	C
3.15	17.8	-2.5	0
4	20.2	-4.2	0
5	19.1	-4.3	0
6.3	22.7	-5.9	0
8	24.6	-5.6	0
10	26.7	-4.2	0
12.5	40.1	-9.4	0
16	61.2	-19.8	0
20	80.5	-28.2	0
25	90.7	-34.5	0
31.5	98.7	-42.4	0
40	88.2	-40.0	0
50	82.1	-39.5	0
63	77.5	-39.9	0
80	58.1	-31.9	0
100	47.8	-27.7	0
125	29.3	-17.5	0

Source: Wilson Ihrig, 2017

[1] $LSR(d) = A + B * Log(d) + C * Log^2(d)$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)



Source: Wilson Ihrig, 2017

Figure C-12 Line Source Response for Surface Impact Site VP28

APPENDIX 3.4-B: NOISE AND VIBRATION MITIGATION GUIDELINES

Memorandum

DATE: March 8, 2018

TO: Regional Consultants (RCs) and Engineering and Environmental Consultants (EECs)

FROM: Bryan Porter and Rob Greene

CC: Scott Rothenberg and Vera Bezdicek

SUBJECT: Updated Noise Mitigation Guidance; Cost for Benefited Residence

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Consistent with an approach used by the California Department of Transportation (Caltrans), the Authority in 2011 adopted criteria to determine the reasonableness of building noise barriers to mitigate severe noise impacts associated with operation of the train. In that guidance, the Authority specified it would build a barrier if the cost range was within $55,000 (2010$) per benefited residence. This amount was consistent with the 2010 Caltrans allowance. Based on the annual construction price index, Caltrans has recently updated its policy (February 2018) and increased the cost allowance to $95,000 (2018$). For continued consistency with Caltrans, the Authority's Noise Mitigation Guidelines have been updated. In addition, the guidelines have been amended to read that the "reasonable allowance for the noise barriers will be calculated using the Caltrans base cost allowance in effect at the time of implementation of the noise mitigation measure." This version supersedes earlier guidance first issued in 2011 and revised in April 2017.

Should you have any questions, please contact Bryan Porter at Bryan.Porter@hsr.ca.gov or Rob Greene at Rob.Greene@wsp.com.

Attachment:
Authority Noise Mitigation Guidelines (Rev. 03/2018)

DRAFT

Attachment

Noise Mitigation Guidelines (Rev. 03/2018)

In general, noise mitigation must be considered when impacts are identified. Mitigation guidelines for the three impact categories identified by FRA are as follows:

- No Impact: No mitigation required.
- Moderate Impact: Mitigation may be considered at the discretion of the Authority, and implementation would be subject to reasonable project-specific factors related to effectiveness, cost, density, and proximity of sensitive receivers.
- Severe Impact: Consideration of mitigation is required if impacts cannot be avoided. The Authority will take steps to reduce noise substantially through mitigation measures that are reasonable, physically feasible, practical, and cost-effective.

Mitigation of Severe Noise Impacts

The Authority will examine alternatives to avoid, minimize, or mitigate severe noise impacts. If severe noise impacts cannot be avoided, then the Authority will take steps to reduce severe noise substantially through mitigation measures that are reasonable, physically feasible, practical, and cost-effective. The following criteria will be used for evaluating the reasonableness of noise barriers as mitigation for severe noise impacts:

- Calculations and Computations for barrier geometry as stated in the FRA High Speed Noise and Vibration assessment, Table 5-3.
- Increase over existing noise levels.
- Number of noise sensitive sites affected.
- The minimum number of affected sites should be at least 10, and the length of a noise barrier should be at least 800 feet.
- Barrier heights up to a maximum of 14 feet will be considered. Mitigation options for areas that require barriers over 14 feet will be studied on a case-by-case basis.
- The "reasonable allowance" for the noise barriers is calculated using the Caltrans base cost allowance for the current year, which is published at http://www.dot.ca.gov/hq/env/noise/.
- The community should approve of implementation of the recommended noise barriers (75% of all affected parties).

Section 4(f) and Section 106 properties with severe or moderate noise impacts will require mitigation, will not be subject to these guidelines, and will be evaluated on a case-by-case basis.

Substantial Noise Reduction

A minimum outdoor noise reduction of 5 decibels (dB) using the applicable criterion for the property is considered substantial.

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Reasonable

Reasonableness implies that good judgment and common sense have been applied during the decision-making process. Reasonableness is determined on the basis of several factors regarding the individual circumstances and the specific needs of affected receivers.

Physically Feasible

Noise mitigation measure must be designed, constructed, installed, or implemented in compliance with structural requirements related to ground conditions, wind loading, seismic risk, safety considerations, accessibility, material maintainability and longevity, and applicable engineering design practices and technology. Noise mitigation measures must not result in an adverse environmental impact, such as significant visual intrusions, blocked views, or adverse effects to a historical site.

Sound barriers are the most common noise mitigation measure. The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers should be designed to be as low as possible to achieve a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit.

On aerial structures, the maximum sound barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure should still be designed to be as low as possible to achieve a substantial noise reduction.

Visual Effects

Noise mitigation measures must be designed, constructed, installed, and implemented in a manner that does not result in adverse impacts to the visual resources in the area. Sound barriers will consist of a solid barrier no more than 6 feet in height. Above 6 feet, the sound barrier will be made of transparent materials. For example, a 13-foot-high sound barrier would consist of 6 feet of solid material on the bottom topped by 7 feet of transparent material.

Cost Effectiveness

Two factors are required to determine cost effectiveness of mitigation by noise barriers: the unit construction cost and the number of benefited receptors.[1] The cost for constructing a noise barrier along the at-grade portion of the alignment is estimated to be $70.00 per square foot, and the cost to construct a noise barrier along the elevated portion of the alignment is $65.00 per square foot. The total cost of mitigation cannot exceed $95,000 per benefitted receiver. This cost is determined by dividing the total cost of the mitigation measure by the number of noise-sensitive buildings that receive a substantial (i.e., 5 dBA or greater) outdoor noise reduction. This calculation will generally limit the use of mitigation in rural areas that have few and/or isolated residential buildings. If the density of residential dwellings is insufficient to make the measure cost-effective, then other noise abatement measures, such as sound insulation, will be considered on a case-by-case basis. If sound insulation is identified as an alternative mitigation measure, the treatment must provide a substantial increase in noise reduction (i.e., 5 dBA or greater) between the outside and inside noise levels for interior habitable rooms.

[1] The unit construction cost for high-speed rail barriers is based on an evaluation of the special design requirements established by the California High-Speed Rail Authority policy regarding noise barrier mitigation. The typical base cost for transportation noise abatement screen-wall type barriers is available from the Federal Highway Administration's (FHWA) national inventory of noise barriers, Caltrans, qualified barrier manufacturers, and construction cost historical databases. These sources in (2016/2017 dollars) were used to estimate probable costs per square foot for typical high-speed rail noise barriers that incorporate opaque and transparent materials. The estimate of probable costs for barriers having special requirements (e.g., special foundations, highly curved sections, higher than standard height, etc.) should be evaluated on an individual basis.

Mitigation Parameters

- Prior to operation of the HST the Authority will install sound barriers where they can achieve between 5 and 15 dB of noise reduction, depending on their height and location relative to the tracks. The primary requirements for an effective sound barrier are that the barrier must (1) be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of 4 pounds per square foot, and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers (examples are shown in Figure 3.4-14). Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barriers style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses. For example, sound barriers could be solid or transparent, and made of various colors, materials, and surface treatments.

- The Authority will work with the communities to identify how the use and height of sound barriers would be determined using jointly developed performance criteria. Other solutions may result in higher numbers of residual impacts than reported herein. Options may be to reduce the height of sound barriers and combine barriers with sound insulation or to accept higher noise thresholds than the FRA's current noise thresholds.

- If sound walls are not proposed or do not reduce sound levels to below a severe impact level, building sound insulation can be installed. Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a mitigation measure that can be provided when the use of sound barriers is not feasible in providing a reasonable level (5 to 7 dB) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dB) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened. Performance criteria would be established to balance existing noise events and ambient roadway noise conditions as factors for determining mitigation measures.

- If sound walls or sound installation is not effective, the Authority can acquire easements on properties severely affected by noise. Another option for mitigating noise impacts is for the authority to acquire easements on residences likely to be impacted by HST operations in which the homeowners would accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.

- The decision to include mitigation assessments may depend on factors such as the number of noise-sensitive sites affected, the relative increase in noise levels, the sensitivity at affected land uses, the effectiveness of mitigation measures, community views, costs versus benefits, design limitations, whether sensitive use is solely indoors, and safety. For example, where land-use activity is solely indoors, an interior Ldn criterion of 45 decibels A-weighted (dBA) from project sources is recommended to determine whether building sound insulation improvements should be considered for mitigation.

Such mitigation measures should be included in the Authority's Division of Real Property appraisals as a cost to cure through physical modifications to the improvement or the purchase of sound easements, as appropriate.

FTA / FRA Construction Noise Mitigation

1. <u>Design considerations and project layout:</u>

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- Construct noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
- Route truck traffic away from residential streets, if possible. Select streets with the fewest homes, if no alternatives are available.
- Site equipment on the construction lot as far away from noise-sensitive sites as possible.
- Construct walled enclosures around especially noisy activities or around clusters of noisy equipment. For example, shields can be used around pavement breakers and loaded vinyl curtains can be draped under elevated structures.

2. Sequence of operations:

- Combine noisy operations so they occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operations were performed separately.
- Avoid nighttime activities. Sensitivity to noise increases during the nighttime hours in residential neighborhoods.

3. Alternative construction methods:

- Avoid impact pile driving where possible in noise-sensitive areas. Drilled piles or the use of a sonic or vibratory pile driver are quieter alternatives where the geological conditions permit their use.
- Use specially quieted equipment, such as quieted and enclosed air compressors, and mufflers on all engines.
- Select quieter demolition methods, where possible. For example, sawing bridge decks into sections that can be loaded onto trucks results in lower cumulative noise levels than impact demolition by pavement breakers.
- The environmental assessment should include a description of one or more mitigation approach for each affected location.

FTA / FRA Construction Vibration Mitigation

1. Design considerations and project layout:

- Route heavily loaded trucks away from residential streets, if possible. Select streets with fewest homes, if no alternatives are available.
- Operate earthmoving equipment on the construction lot as far away from vibration-sensitive sites as possible.

2. Sequence of operations:

- Phase demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period. Unlike noise, the total vibration level produced could be significantly less when each vibration source operates separately.
- Avoid nighttime activities. People are more aware of vibration in their homes during the nighttime hours.

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3. Alternative construction methods:

    - Avoid impact pile driving where possible in vibration-sensitive areas. Drilled piles or the use of a sonic or vibratory pile driver causes lower vibration levels where the geological conditions permit their use.

    - Select demolition methods not involving impact, where possible. For example, sawing bridge decks into sections that can be loaded onto trucks results in lower vibration levels than impact demolition by pavement breakers, and milling generates lower vibration levels than excavation using clam shell or chisel drops.

    - Avoid vibratory rollers and packers near sensitive areas.

Construction Noise and Vibration Mitigation Guidelines

All construction activities in this report were analyzed in terms of their noise impacts in regards to FRA recommended guidelines. Local jurisdictions provide construction noise exempt times where the FRA guidelines are followed. A majority of construction will be conducted during these construction noise exempt times, but when construction is conducted outside of the construction noise exempt times, construction noise must abide by local noise standards. Proper mitigation may be necessary in order to avoid noise impacts at nearby noise-sensitive receivers.

Pile driving activities conducted during the grade separation and elevated track structure construction phases would be the loudest noise generating activity during construction of the high speed train corridor. As previously mentioned, residences within a distance of 410 feet of grade separation construction activities that include pile driving, or within 430 feet of elevated track structure construction activities that include pile driving, would be exposed to noise levels greater than the 80 dBA Leq threshold.

- Piles that are required for structure along the HST corridor and which would be located within 500 feet of a noise sensitive receiver should be installed using the drilling and casing method.

If the drilling and casing method were used, maximum noise levels associated with construction activities would drop by 11 dB, and the distances to the 80 dBA Leq contour would decrease from 410 feet to 180 feet for grade separation construction activities, and decrease from 430 feet to 220 feet for elevated track structure construction activities. Another method to mitigate noise related to pile driving is the use of an augur to install the piles instead of a pile driver which would reduce noise levels substantially. If pile driving is necessary, limit the time of day the activity can occur.

The most effective way to minimize the impact of construction noise during the development of the project is to enforce the time restrictions for the hours of construction as listed in local noise ordinances. It is important for the design engineer to plan the order of operations during construction so that the noise levels resulting from construction operations will not exceed local noise ordinances or those recommended by the FRA. To avoid unnecessary annoyance from construction noise, the following best practices for construction noise control should also be considered for inclusion in construction contract documents:

- All noise-producing project equipment and vehicles using internal combustion engines shall be equipped with mufflers and air-inlet silencers, where appropriate, in good operating condition that meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.

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- All mobile or fixed noise-producing equipment used on the project, which is regulated for noise output by a local, state, or federal agency, shall comply with such regulation while in the course of project activity.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receivers.
- Material stockpiles should be used to block line of site to nearby noise-sensitive receivers when possible.
- Locating fixed noise-generating equipment as far from noise-sensitive land uses as is practical.
- Limit the loudest construction activities, such as concrete breaking and jack hammering, to the middle of the day when the sensitivity to such noises will be minimal. Noise-producing signals, including horns, whistles, alarms, and bells shall be used for safety warning purposes only.
- No project-related public address or music system shall be audible at any adjacent receiver.
- If complaints arise, the contractor shall initiate a construction noise monitoring plan to ensure the construction noise levels at the nearest noise-sensitive land uses are within the limits of the noise ordinance.
- Avoid nighttime construction in residential neighborhoods.
- During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background level, or switch off back-up alarms and replace with spotters.
- Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents.
- Implement noise-deadening measures for truck loading and operations.
- Minimize the use of generators to power equipment.
- Grade surface irregularities on construction sites.
- Use of temporary noise barriers shall be considered where project activities and equipment are unavoidably close to noise-sensitive receivers.
- Use of on-site trailers and containers as temporary barriers between any fixed construction noise source and nearby sensitive receivers.
- All workers involved with the construction of this project must be protected from excessive noise exposure as mandated by the Occupational Safety and Health Administration (OSHA), which has regulated worker noise exposure to a time-weighted-average of 90 dBA over an 8 hour work shift. Areas where levels exceed 85 dBA must be designated and labeled as high-noise-level areas where hearing protection is required.

Construction Vibration Mitigation

After locating potential vibration impacts due to construction with the use of the procedure outlined above, mitigation may be necessary to ensure that there will be no vibration impacts at sensitive receivers. Changes in the design and project layout, changes in the sequence of operations, and using alternative construction methods are all available vibration mitigation options.

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When the engineers design the project and the layout of the project, heavily loaded trucks can be re-routed away from residential streets and onto streets with fewer homes. Earthmoving equipment on the construction lot should also be operated as far as possible from sensitive receivers. Changes in the sequence of operations can also mitigate vibration impacts at sensitive receivers. Construction activities that cause high levels of vibration should be staggered so that multiple sources of vibration are not occurring at once. Nighttime construction activities should also be avoided. Alternative construction methods are also an acceptable vibration mitigation option. If pile driving does occur, impact pile driving should be avoided near vibration-sensitive areas. A sonic or vibratory pile driver will generate lower vibration levels at sensitive receivers. Demolition methods not involving impacts should be used when possible. The utilization of vibratory rollers and packers should be avoided near vibration-sensitive receivers.

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APPENDIX 3.4-C: NOISE IMPACT LOCATIONS

2040 PLUS PROJECT NOISE IMPACTS

Figure C-1 2040 Plus Project Noise Impacts—Alternative 1

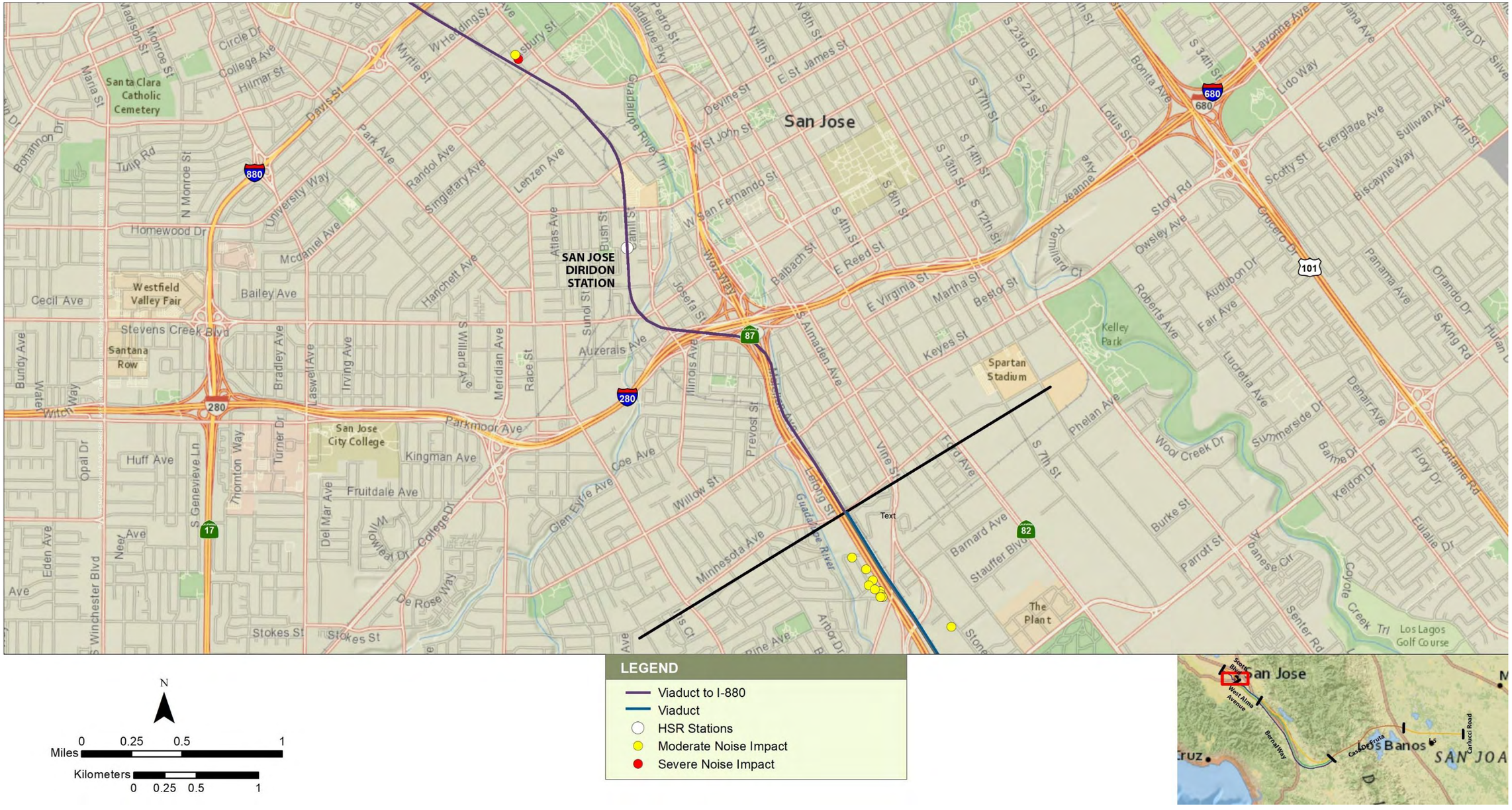


Figure C-2 2040 Plus Project Noise Impacts—Alternative 1

Figure C-3 2040 Plus Project Noise Impacts—Alternative 1

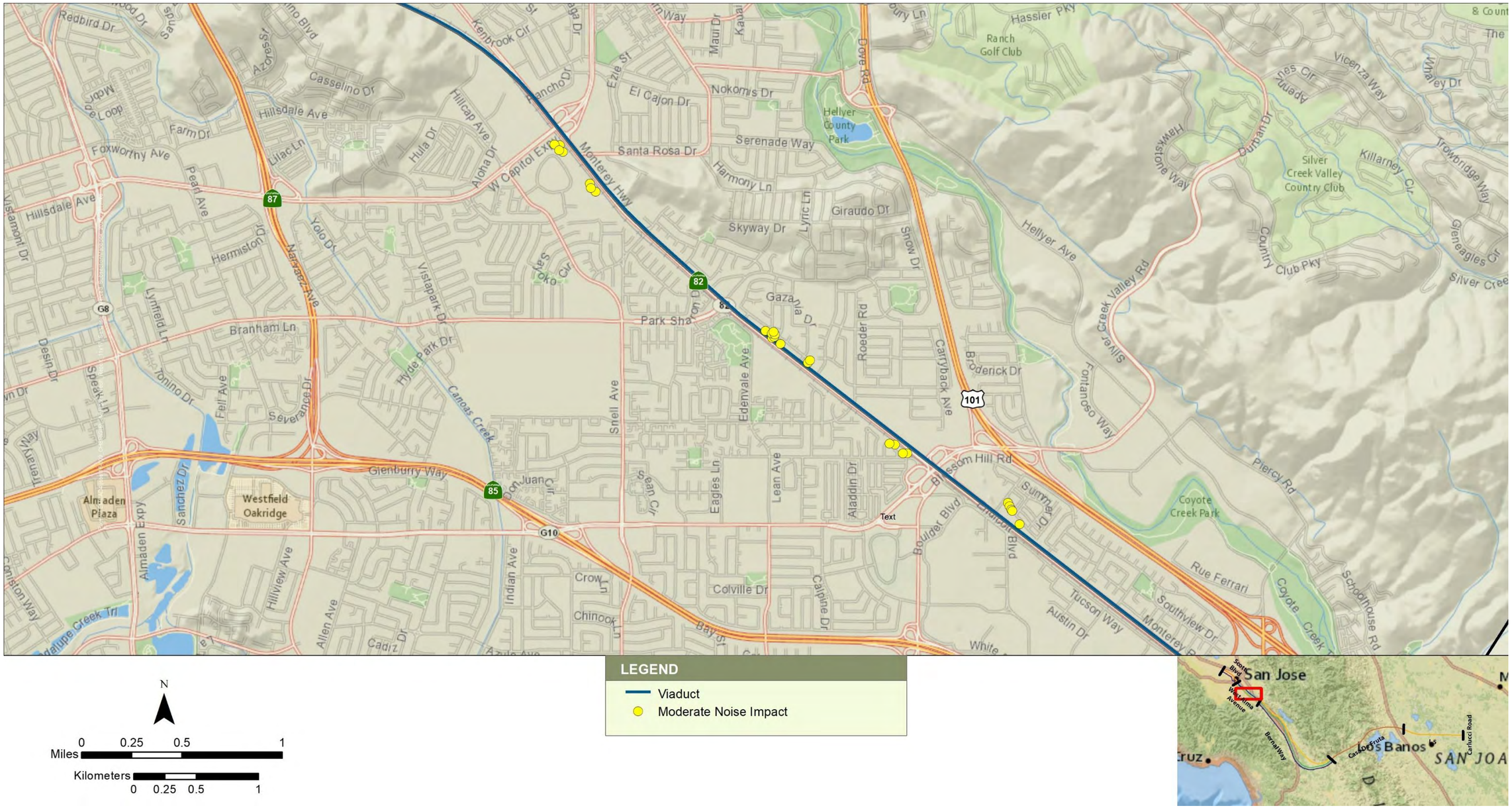


Figure C-4 2040 Plus Project Noise Impacts—Alternative 1

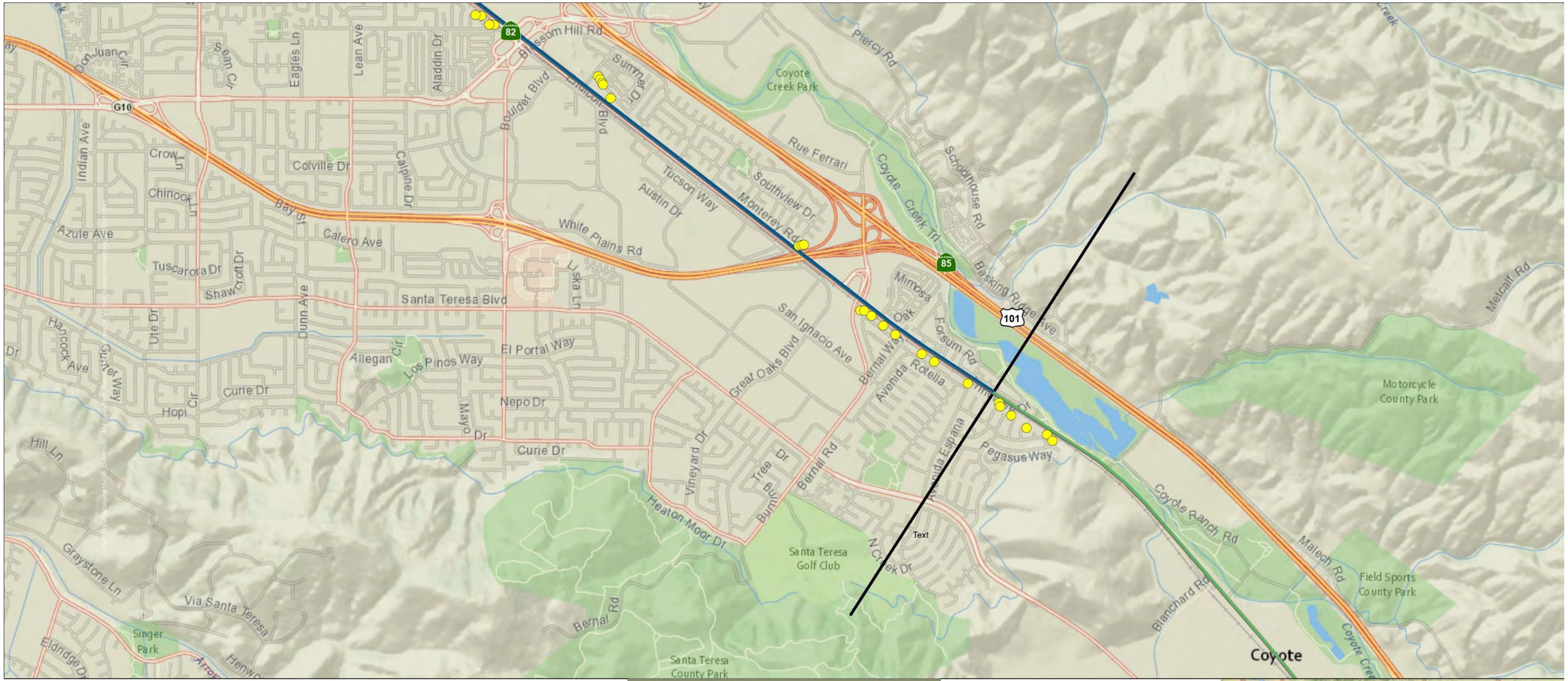


Figure C-5 2040 Plus Project Noise Impacts—Alternative 1

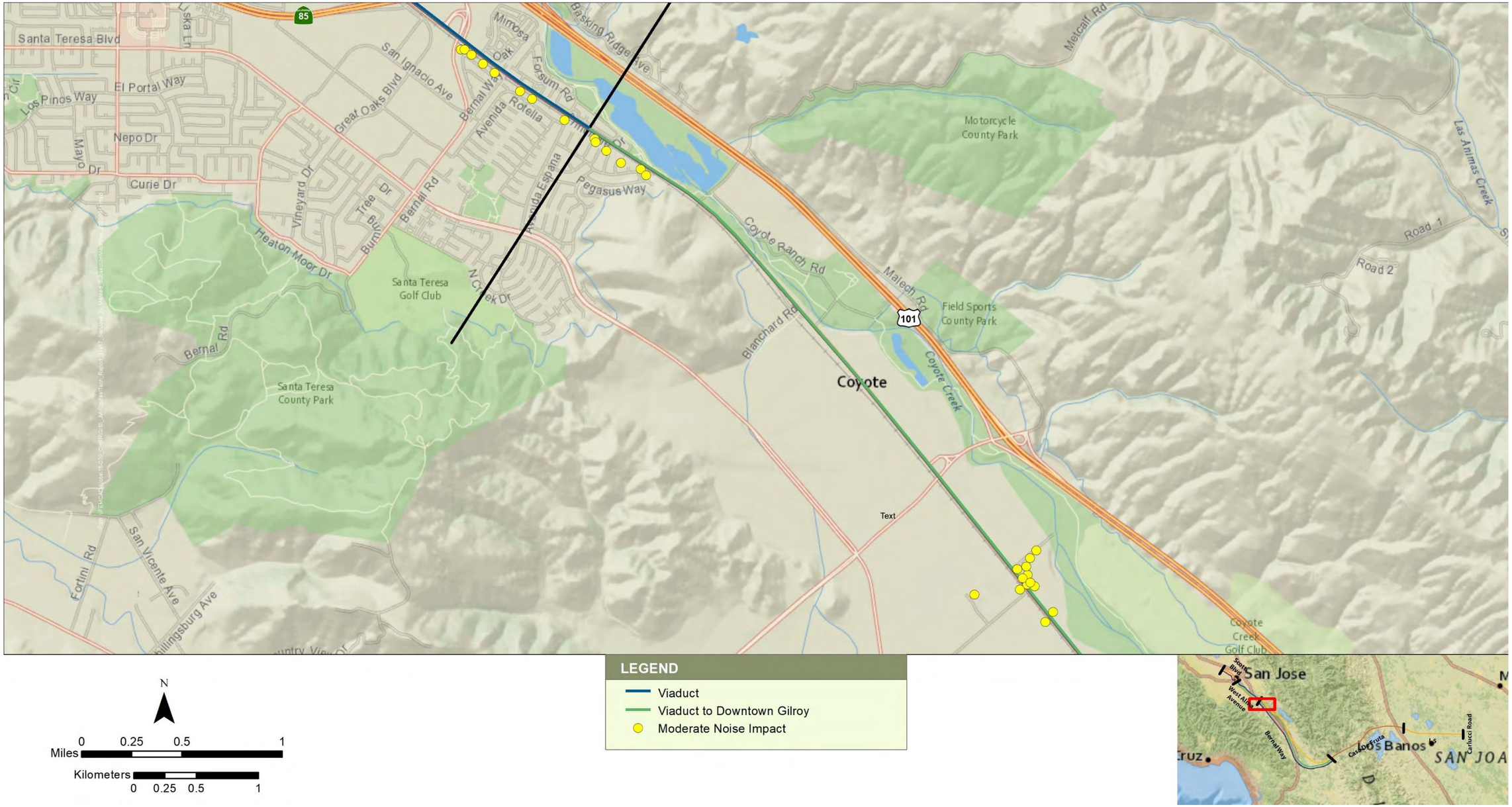


Figure C-6 2040 Plus Project Noise Impacts—Alternative 1

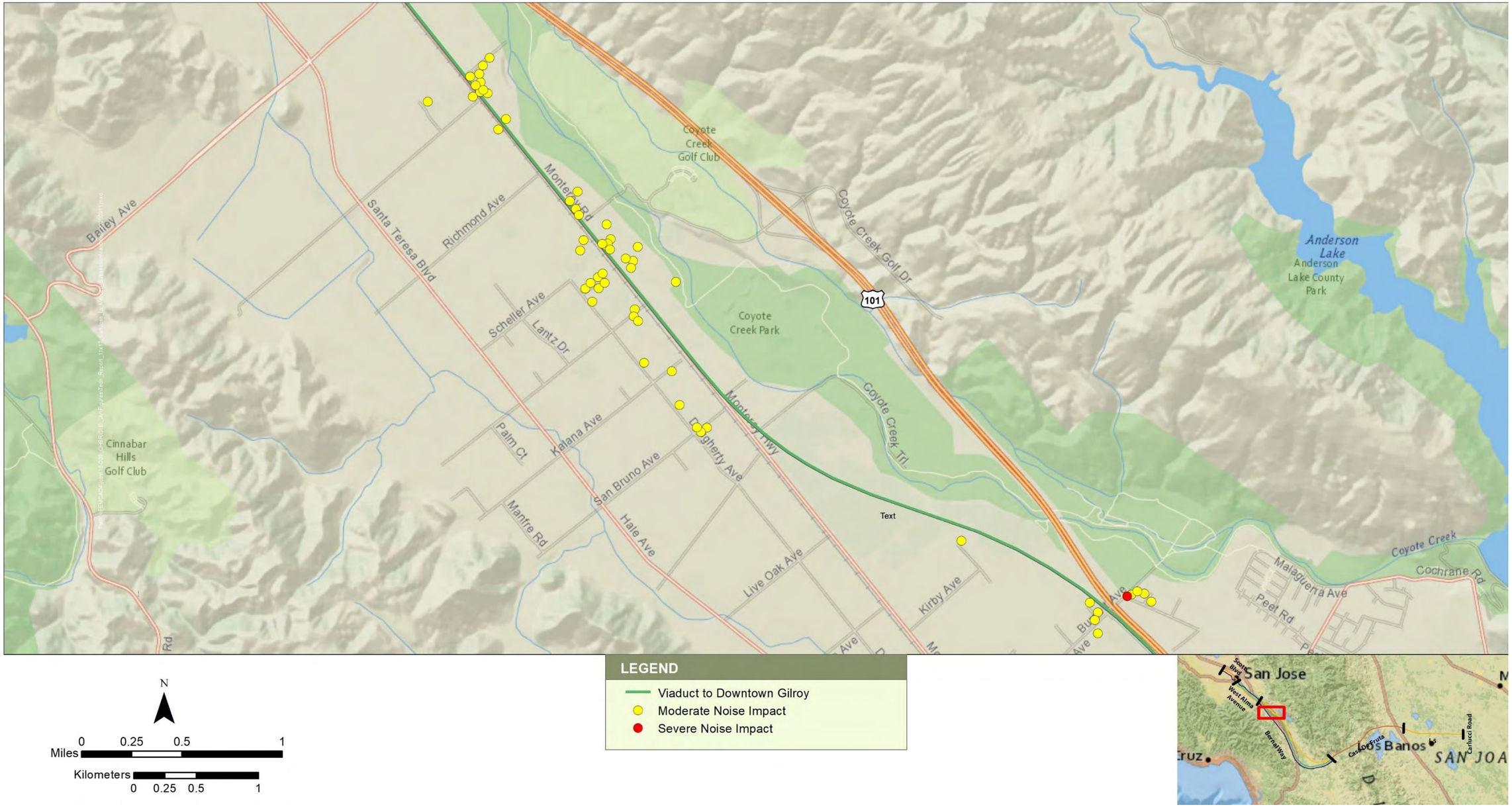


Figure C-7 2040 Plus Project Noise Impacts—Alternative 1

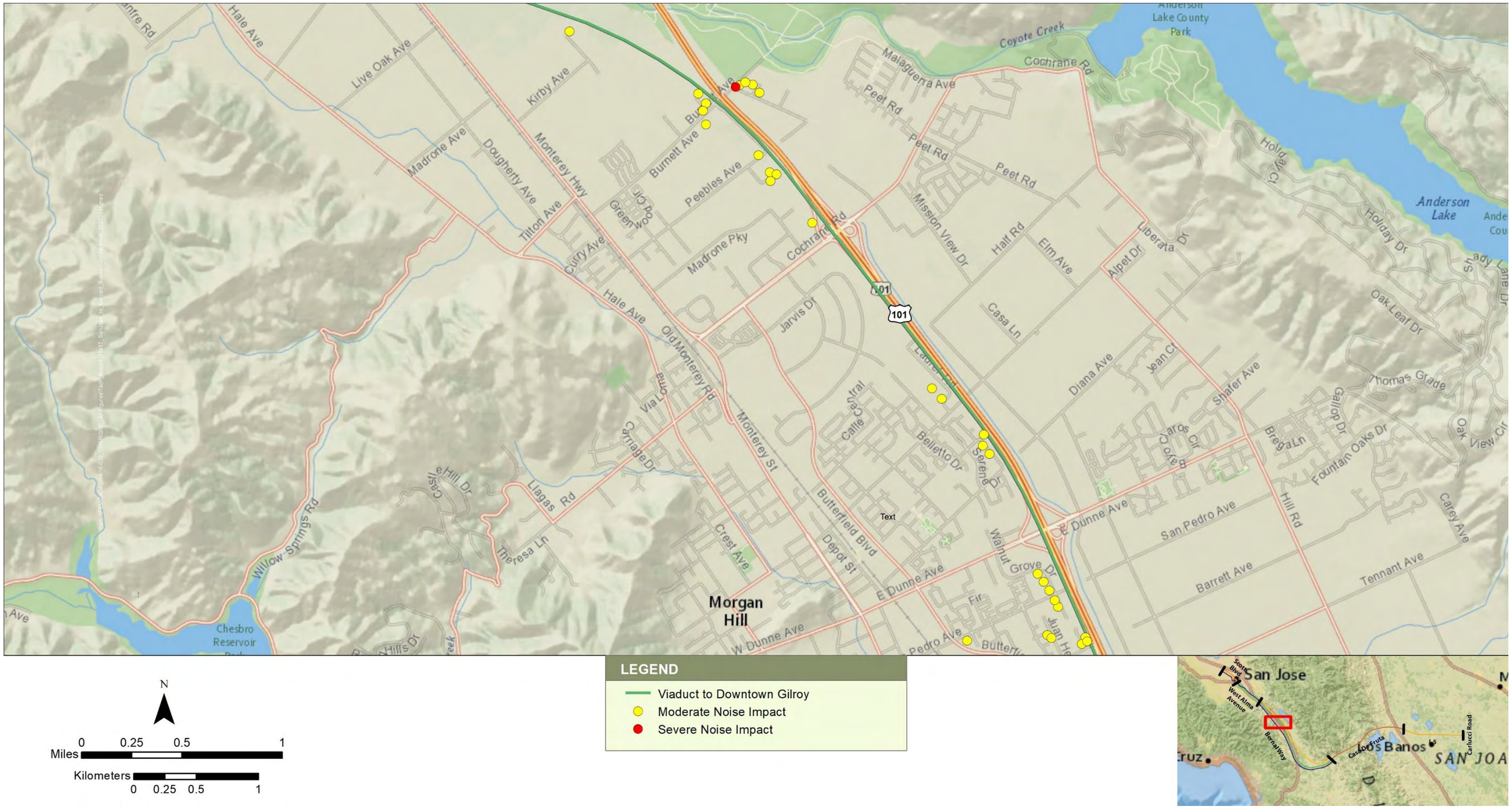


Figure C-8 2040 Plus Project Noise Impacts—Alternative 1

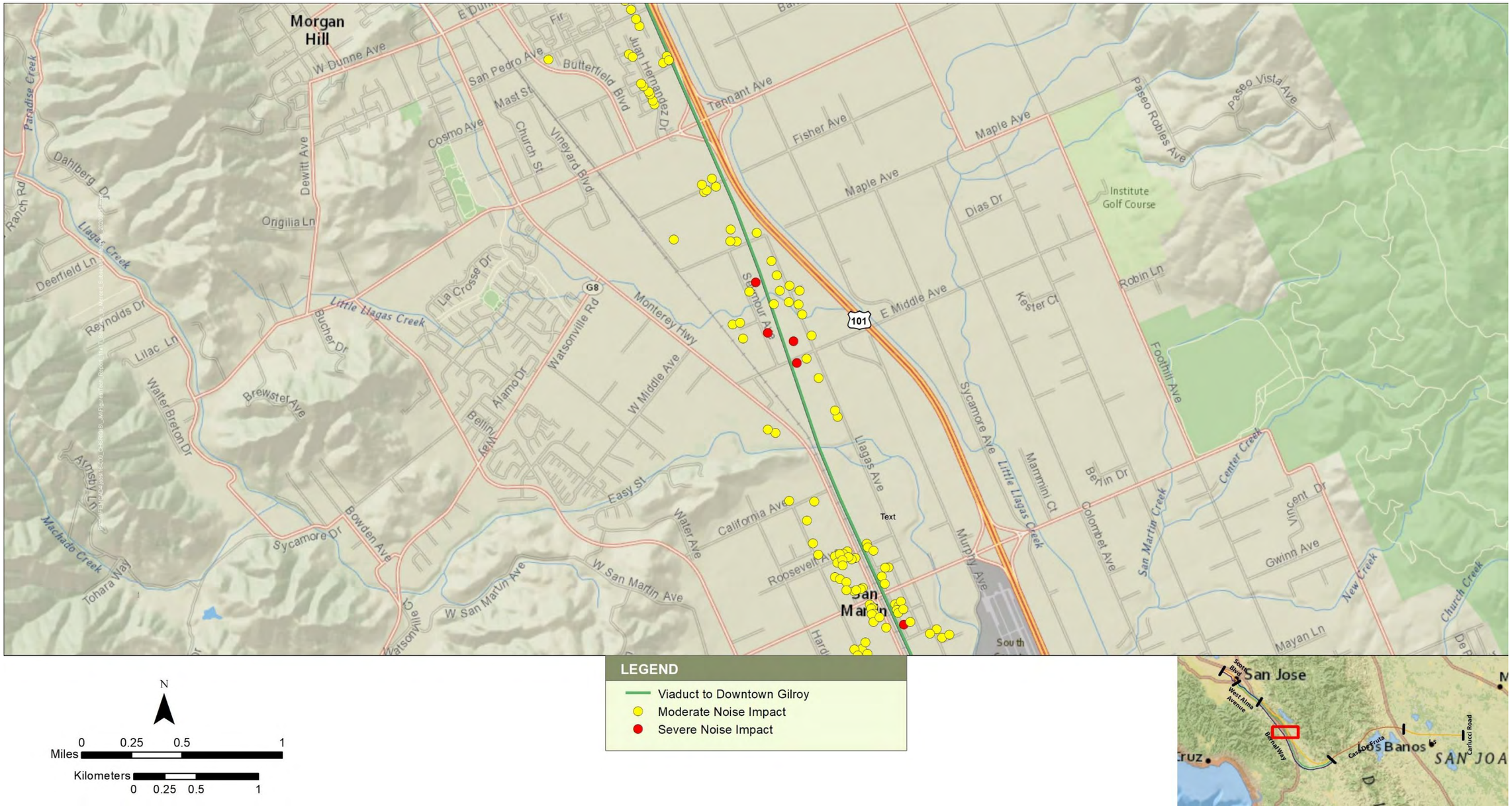


Figure C-9 2040 Plus Project Noise Impacts—Alternative 1

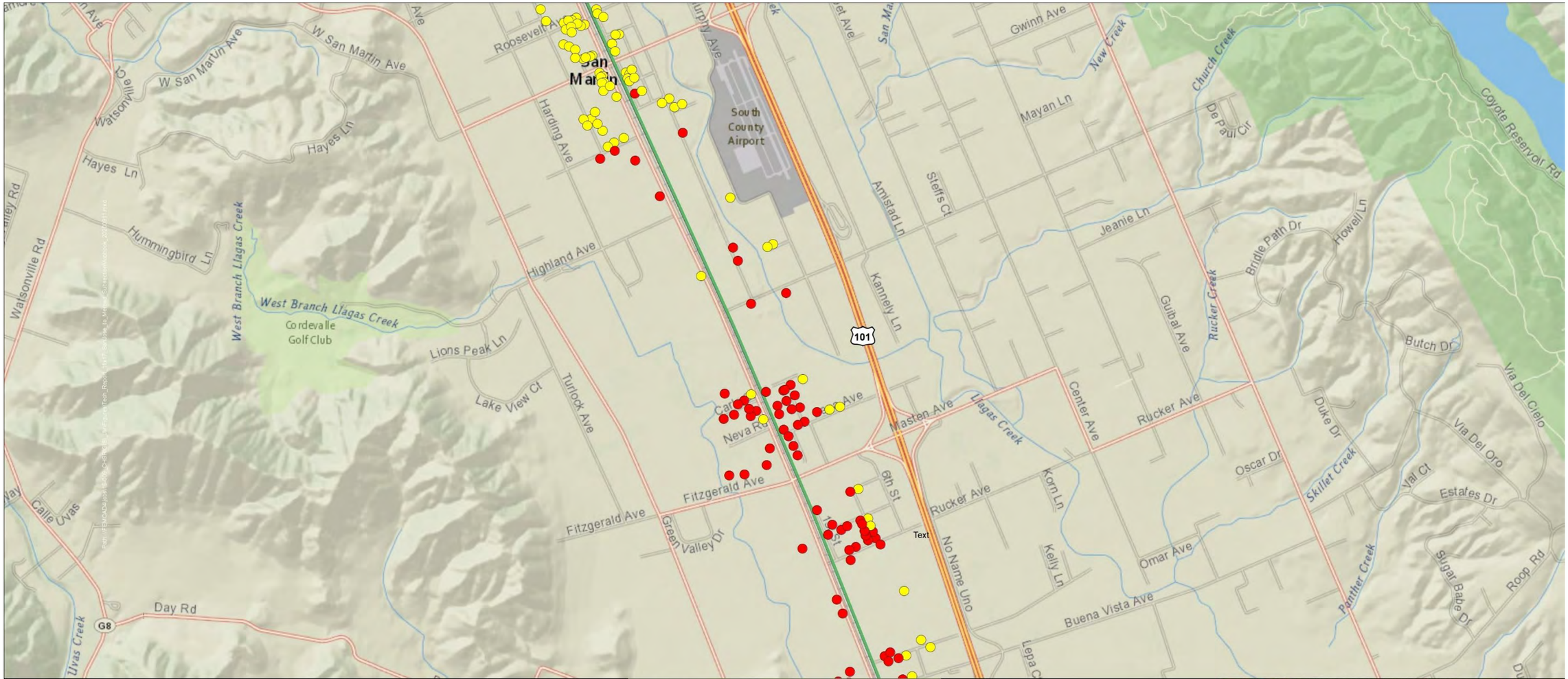


Figure C-10 2040 Plus Project Noise Impacts—Alternative 1

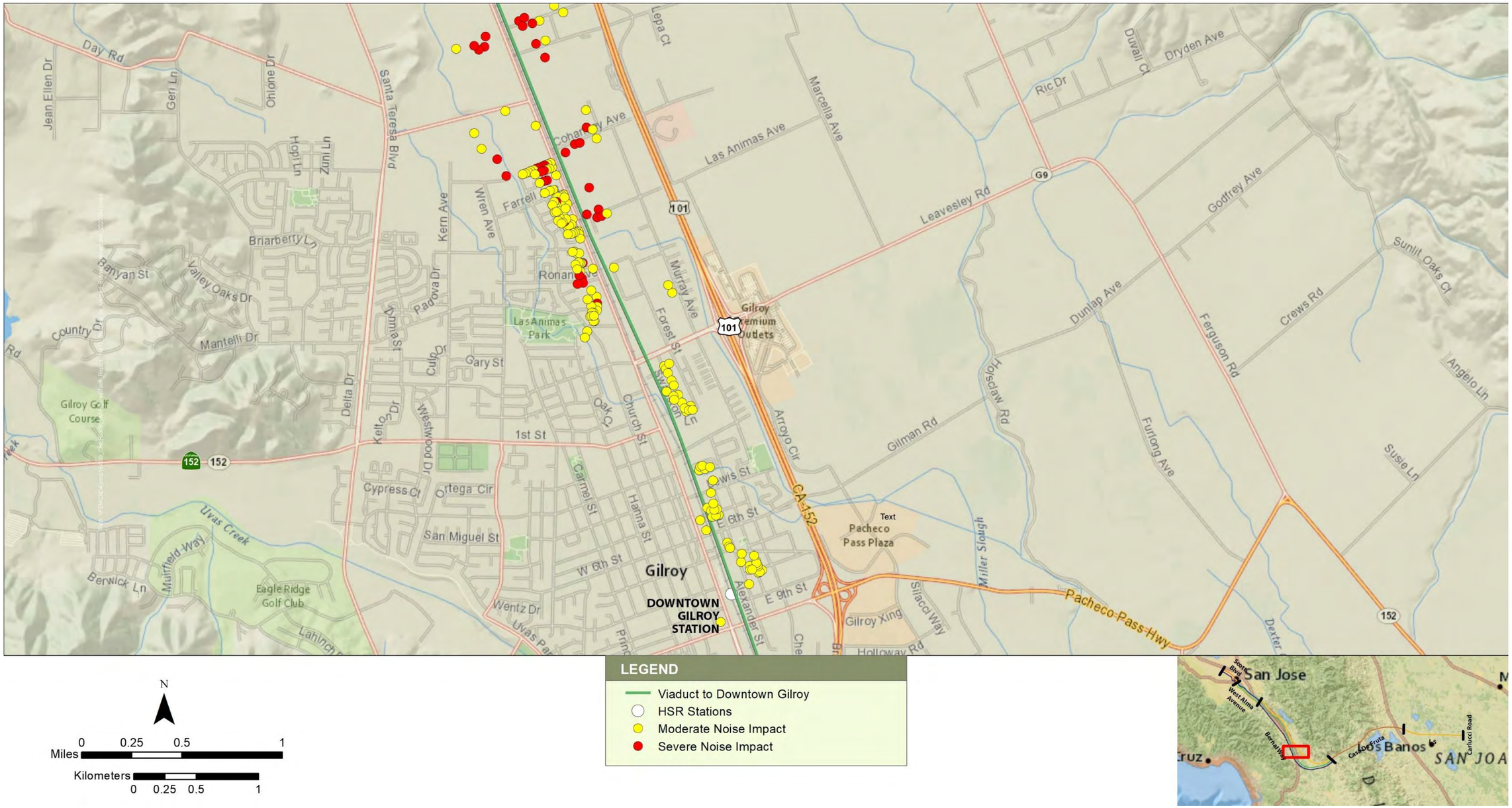


Figure C-11 2040 Plus Project Noise Impacts—Alternative 1

Figure C-12 2040 Plus Project Noise Impacts—Alternative 1 without the Tunnel Design Variant

Figure C-13 2040 Plus Project Noise Impacts—Alternative 1 with the Tunnel Design Variant

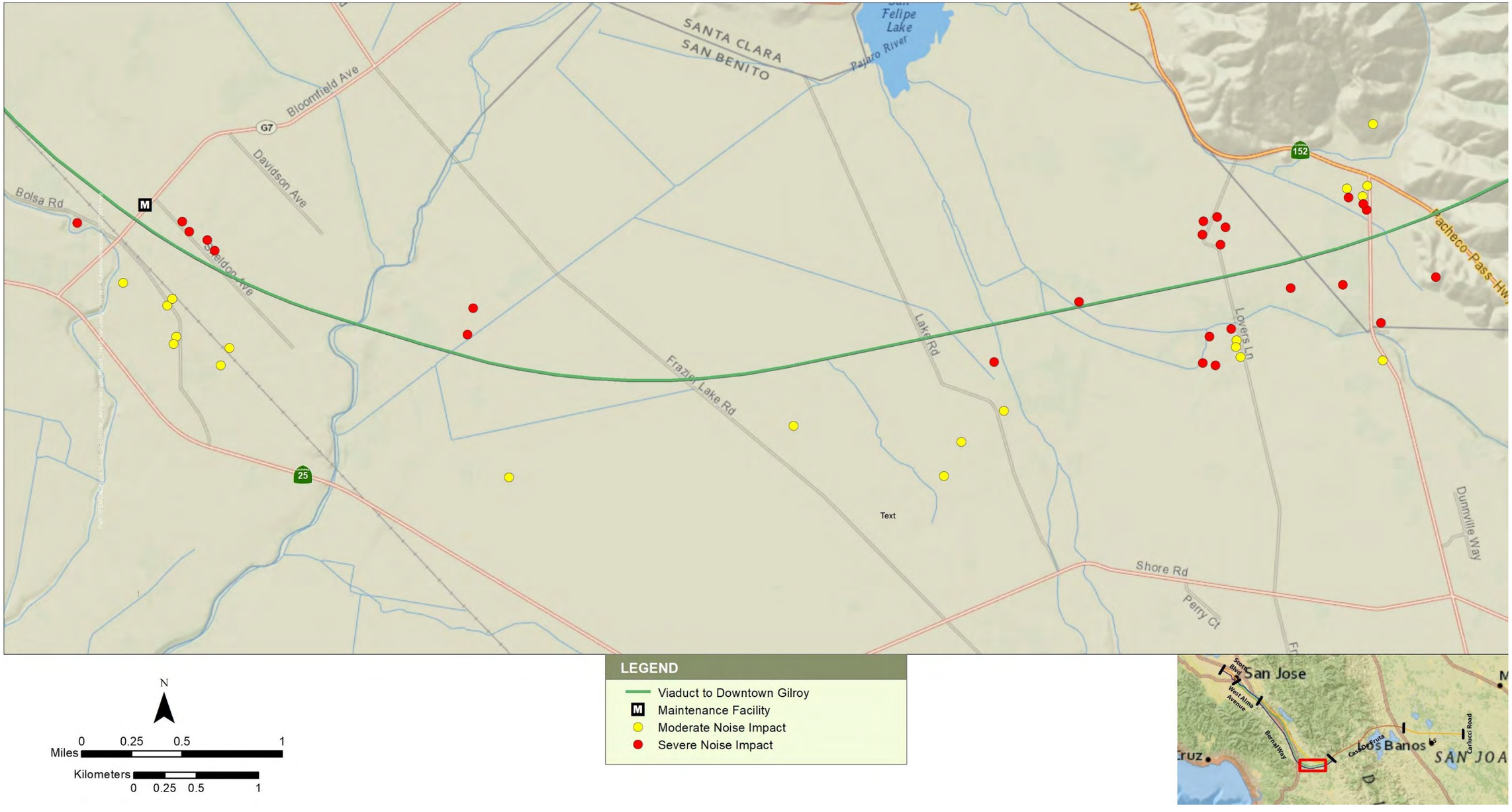


Figure C-14 2040 Plus Project Noise Impacts—Alternative 1 without the Tunnel Design Variant

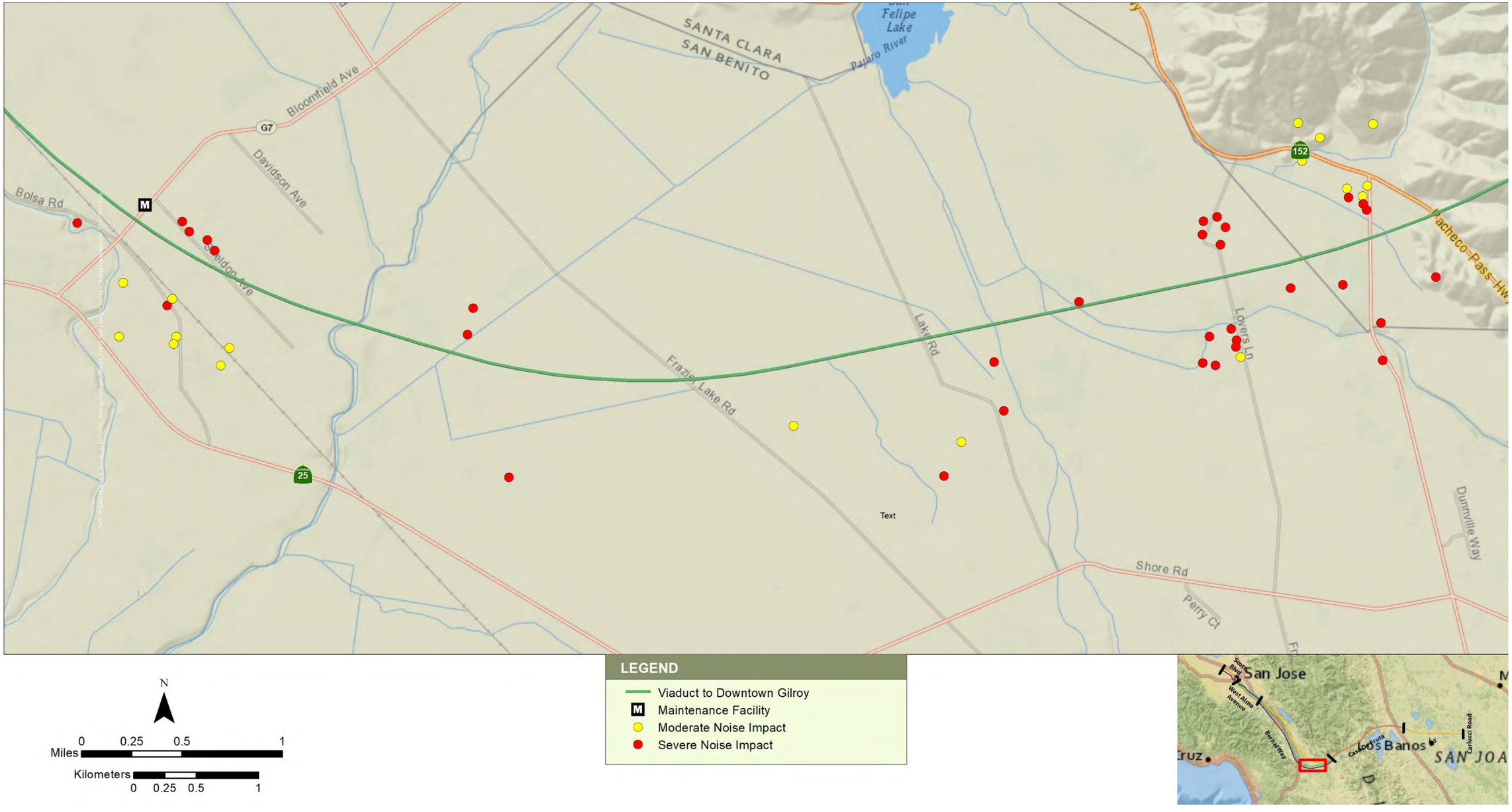


Figure C-15 2040 Plus Project Noise Impacts—Alternative 1 with the Tunnel Design Variant

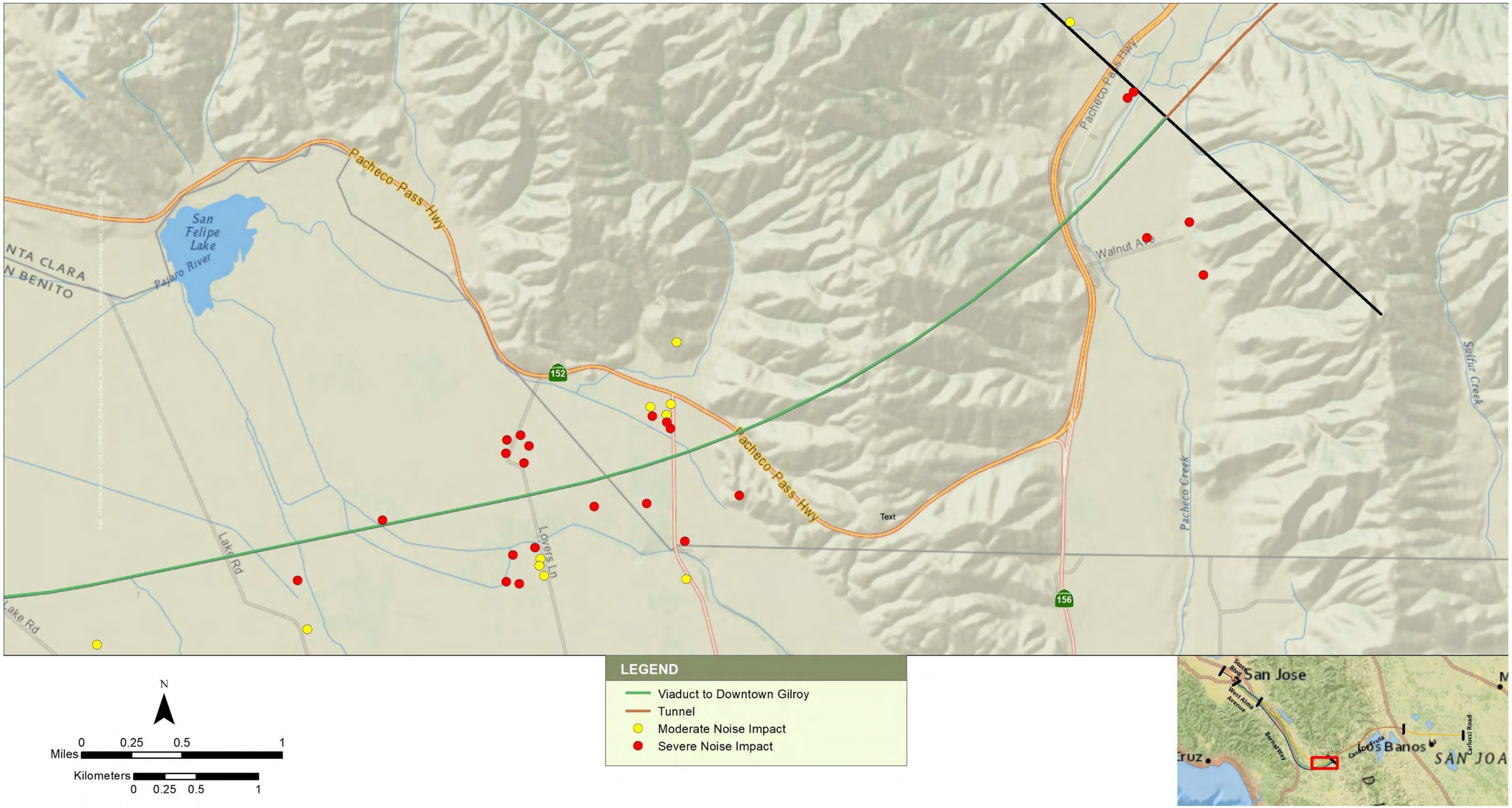


Figure C-16 2040 Plus Project Noise Impacts—Alternative 1 without the Tunnel Design Variant

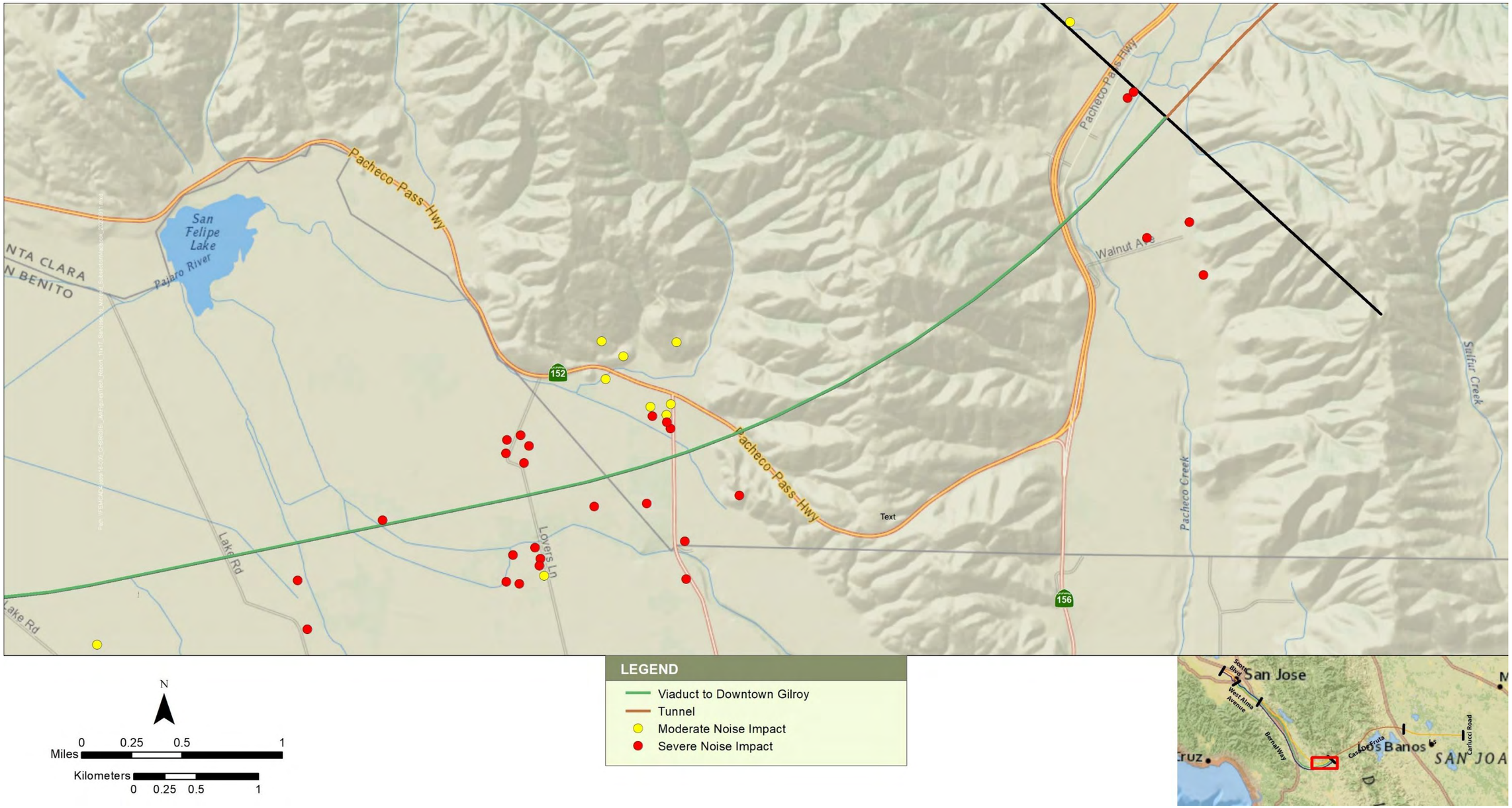


Figure C-17 2040 Plus Project Noise Impacts—Alternative 1 with the Tunnel Design Variant

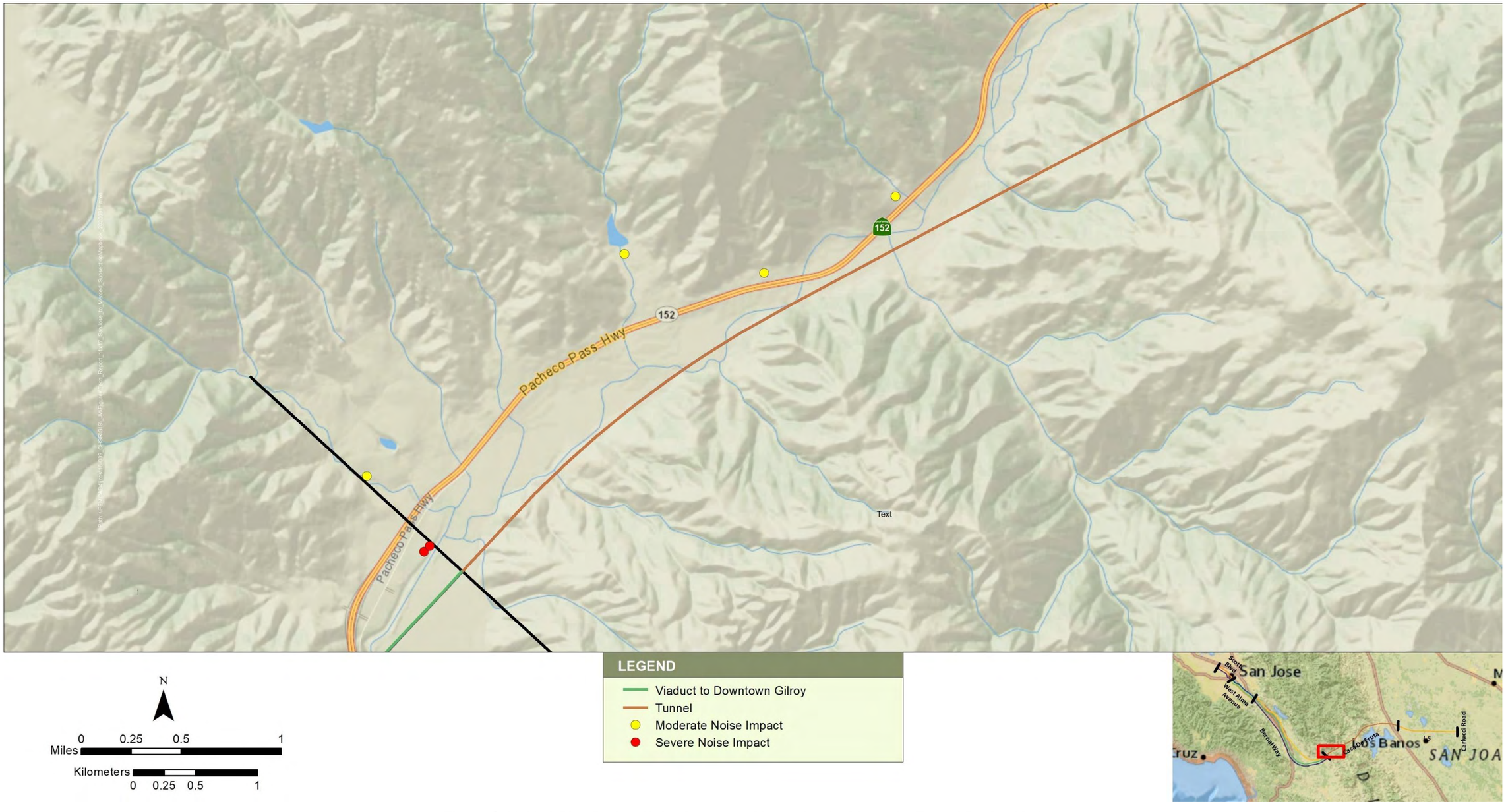


Figure C-18 2040 Plus Project Noise Impacts—Alternative 1 without the Tunnel Design Variant

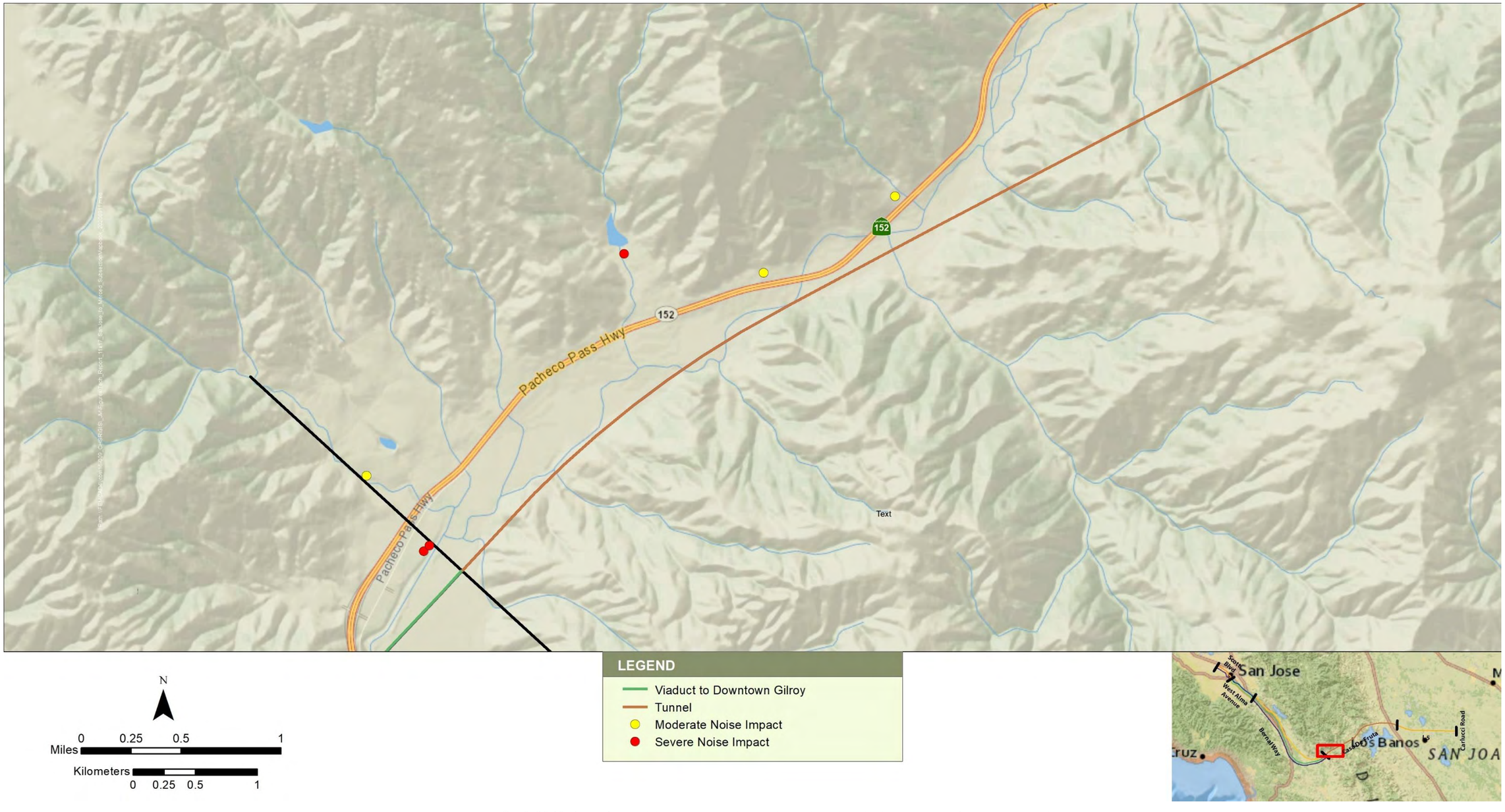


Figure C-19 2040 Plus Project Noise Impacts—Alternative 1 with the Tunnel Design Variant

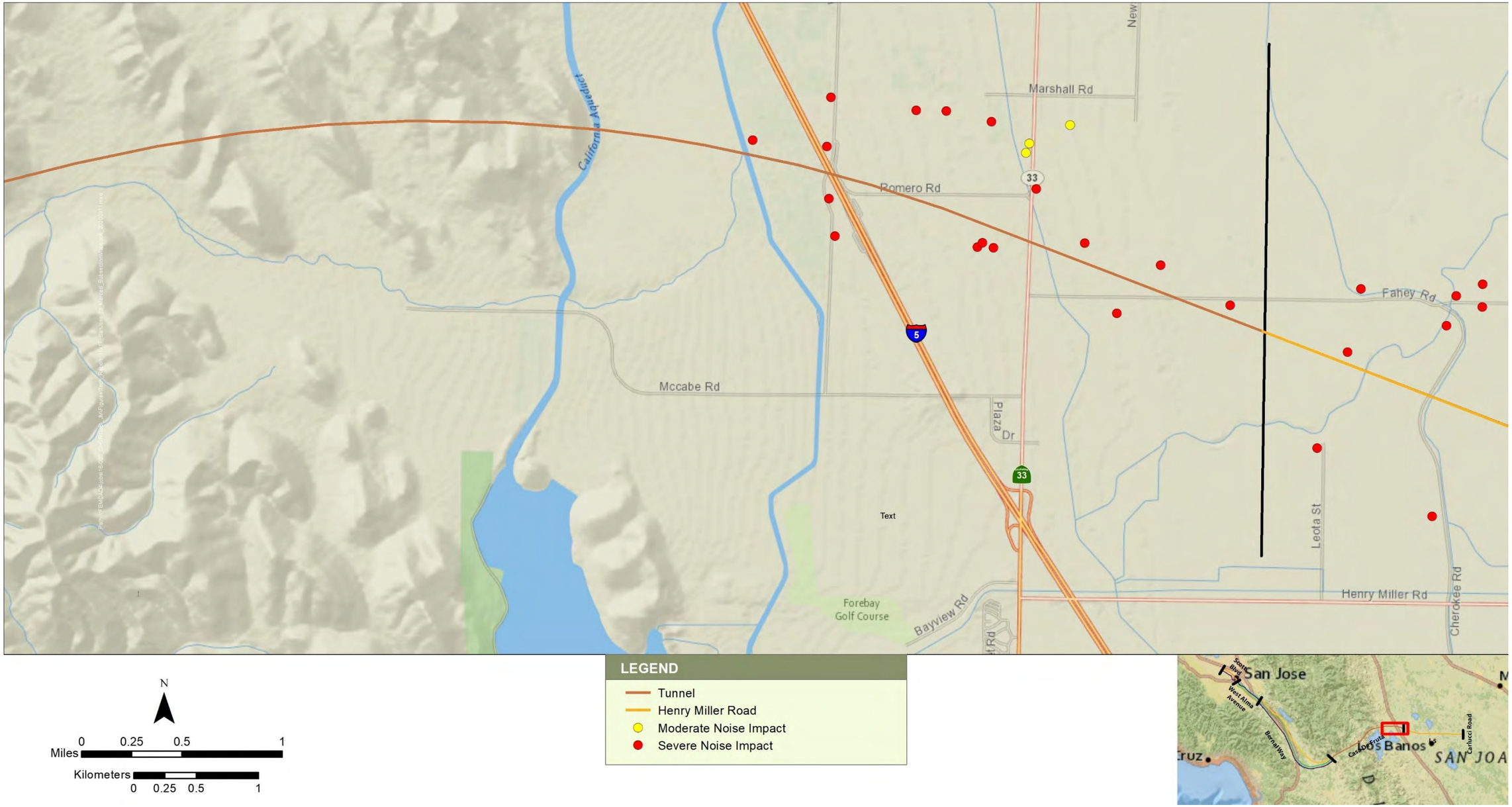


Figure C-20 2040 Plus Project Noise Impacts—Alternatives 1, 2, 3, and 4 without the Tunnel Design Variant

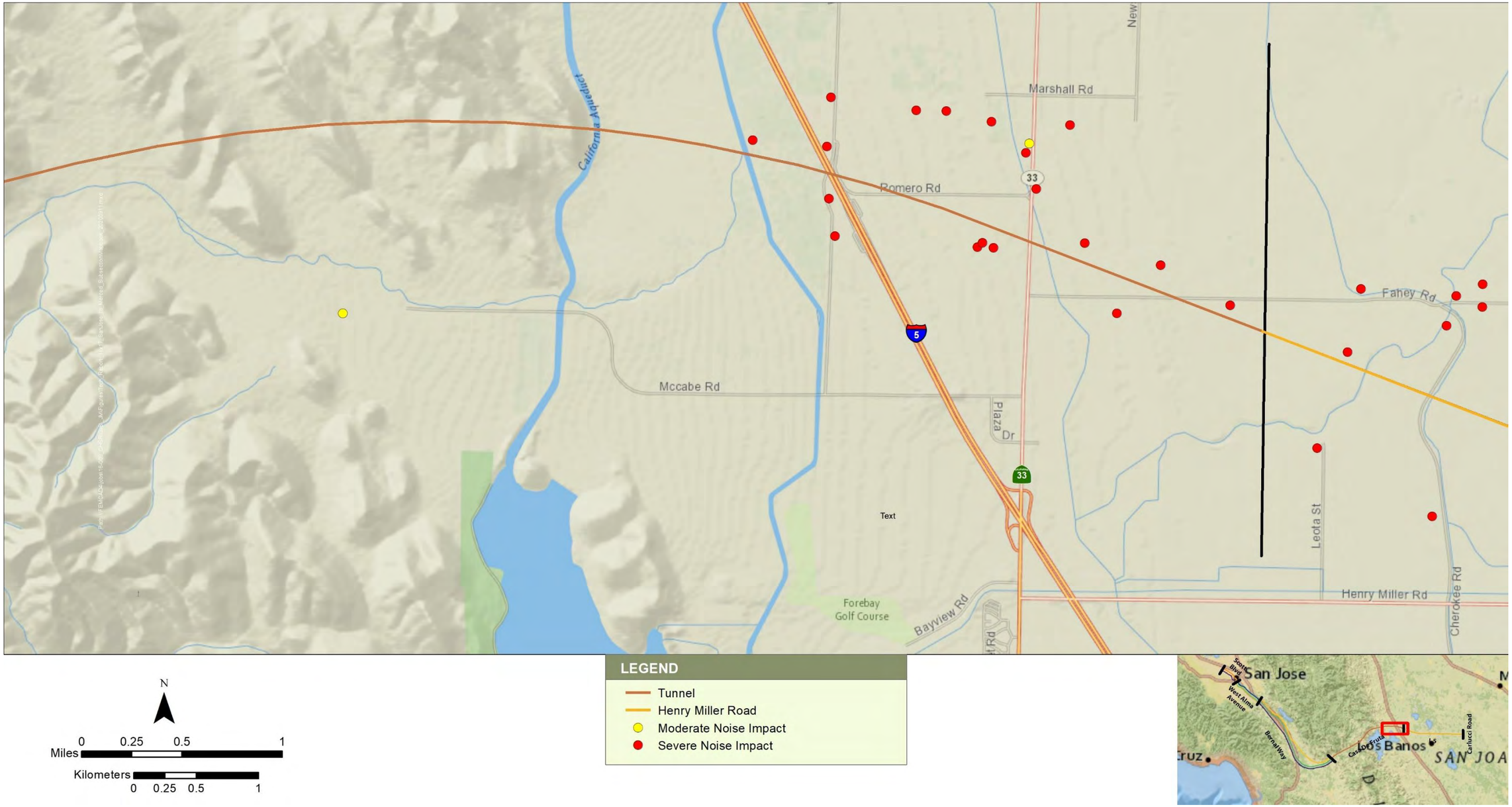


Figure C-21 2040 Plus Project Noise Impacts— Alternatives 1, 2, 3, and 4 with the Tunnel Design Variant

Figure C-22 2040 Plus Project Noise Impacts— Alternatives 1, 2, 3, and 4

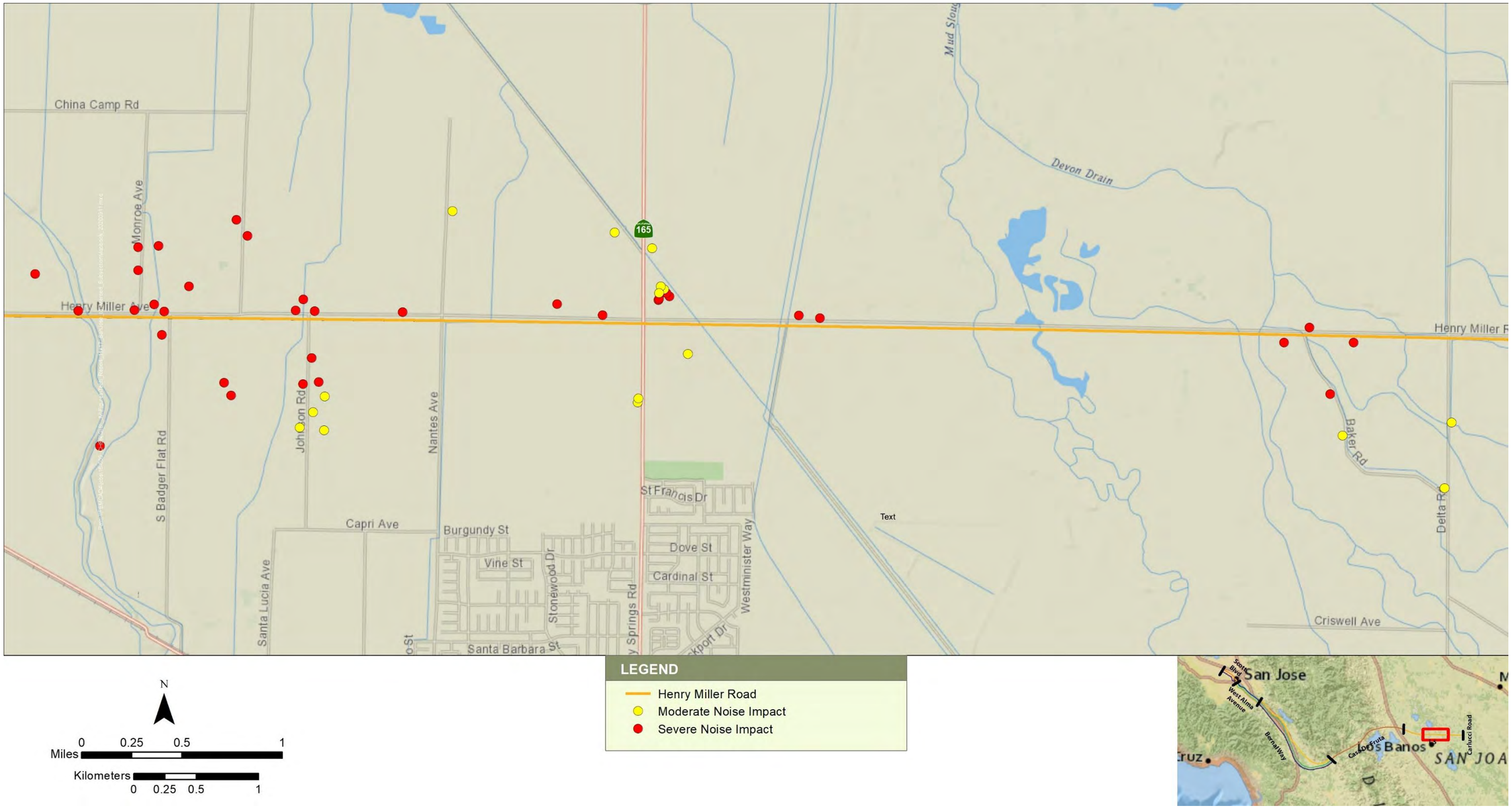


Figure C-23 2040 Plus Project Noise Impacts— Alternatives 1, 2, 3, and 4

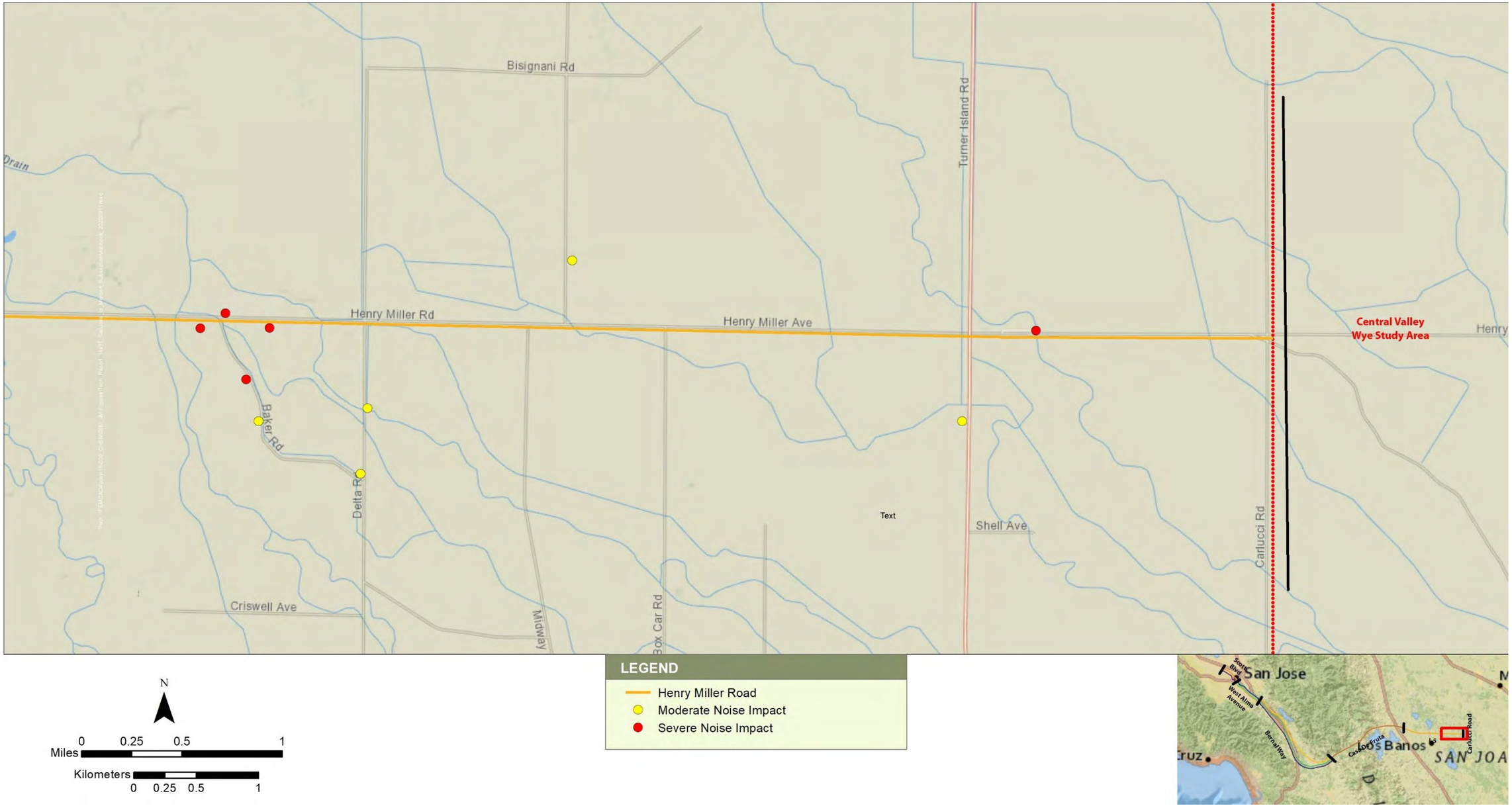


Figure C-24 2040 Plus Project Noise Impacts— Alternatives 1, 2, 3, and 4

Figure C-25 2040 Plus Project Noise Impacts—Alternative 2

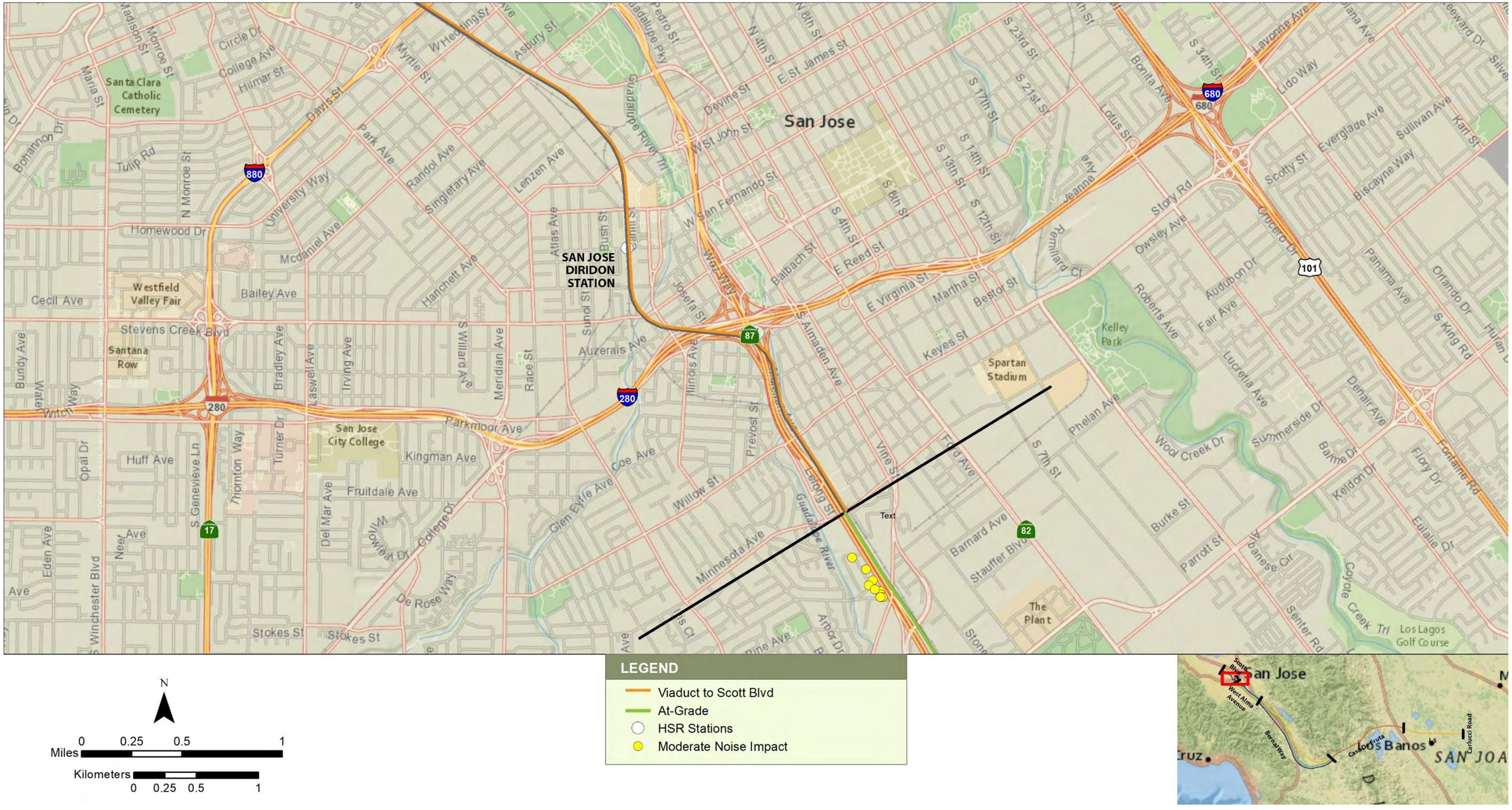
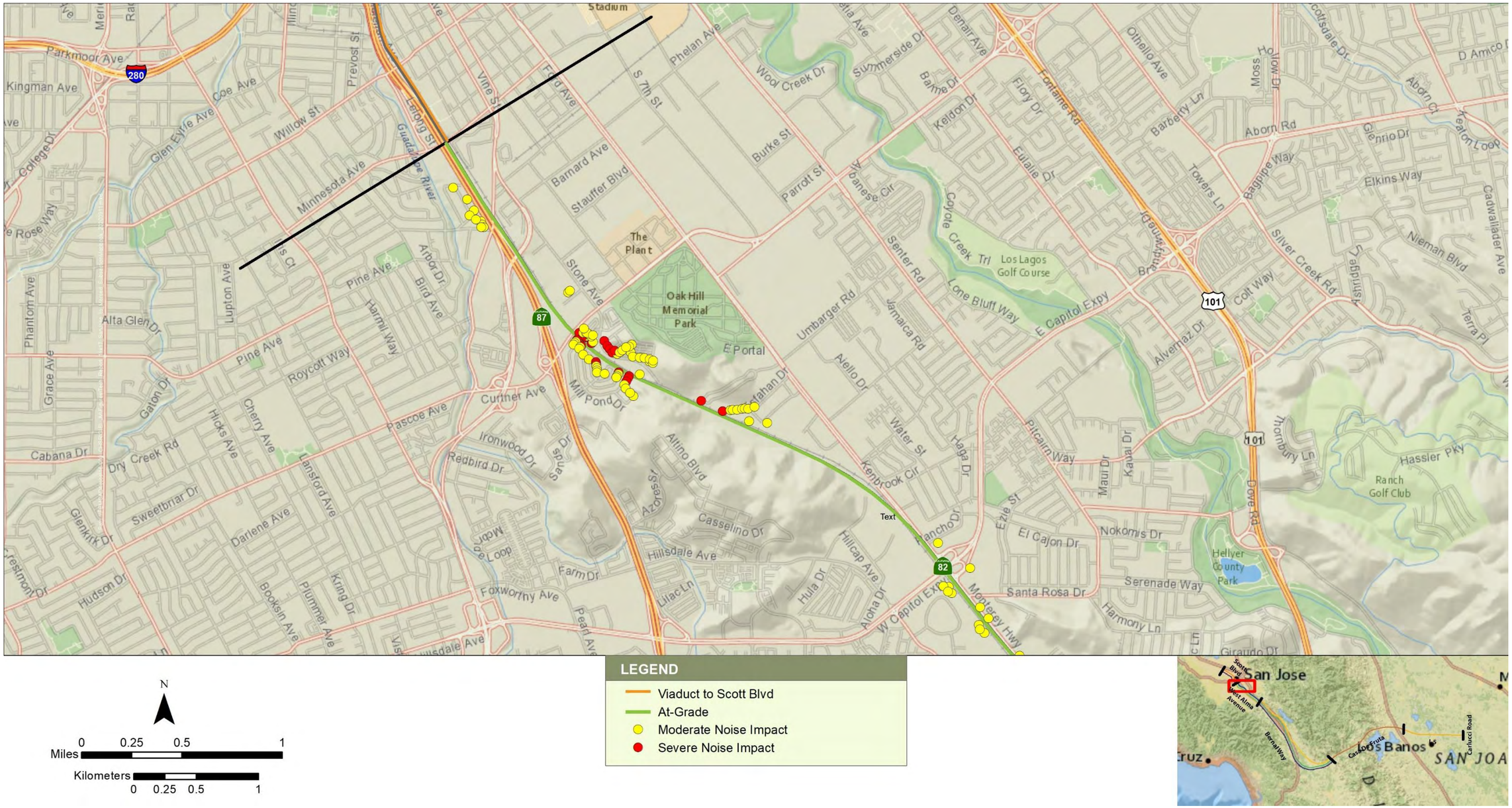


Figure C-26 2040 Plus Project Noise Impacts—Alternative 2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S 7th St
Phelan Ave
Stadium
Barnard Ave
Stauffer Blvd
Burke St
Parrot St
Wool Creek Dr
Summerside Dr
Denair Ave
Othello Ave
Barberry Ln
Moss Hollow Dr
Aborn Rd
Aborn Ct
Aborn Loop
Fontaine Rd
Flory Dr
Keldon Dr
Barbe Dr
Eulalie Dr
Towers Ln
Bagpipe Way
Elkins Way
Silver Creek Rd
Nieman Blvd
Cadwallader Ave
Terra Pl
Colt Way
Ashbridge Ln
Alvernaz Dr
Thornbury Ln
Hassler Pky
Ranch Golf Club
Pitcairn Way
Maui Dr
Kauai Dr
Dove Dr
Ezie St
El Cajon Dr
Nokomis Dr
Serenade Way
Santa Rosa Dr
Harmony Ln
Hellyer County Park
Giraudo Dr
Monterey Hwy
W Capitol Expy
Aloha Dr
Hula Dr
Hillcap Ave
Hillsdale Ave
Casselino Dr
Lilac Ln
Foxworthy Ave
Farm Dr
Pearl Ave
Moore Loop
Darlene Ave
Booksin Ave
Plummer Ave
King Dr
Hudson Dr
Fremont Dr
Glenkirk Dr
Sweetbriar Dr
Dry Creek Rd
Cabana Dr
Hicks Ave
Cherry Ave
Lansford Ave
Pascoe Ave
Curtner Ave
Ironwood Dr
Redbird Dr
Seds Dr
Mill Pond Dr
Stone Ave
The Plant
Oak Hill Memorial Park
E Portal
Alello Dr
Graham Dr
Umbarger Rd
Jamaica Rd
Santer Rd
Coyote Creek Trl
Los Lagos Golf Course
Lone Bluff Way
E Capitol Expy
Pine Ave
Roycott Way
Harmil Way
Arbor Dr
Bird Ave
Lupton Ave
Alta Glen Dr
Phantom Ave
Grace Ave
Gaton Dr
Rose Way
Azores St
Altino Blvd
Text
Kembrook Cir
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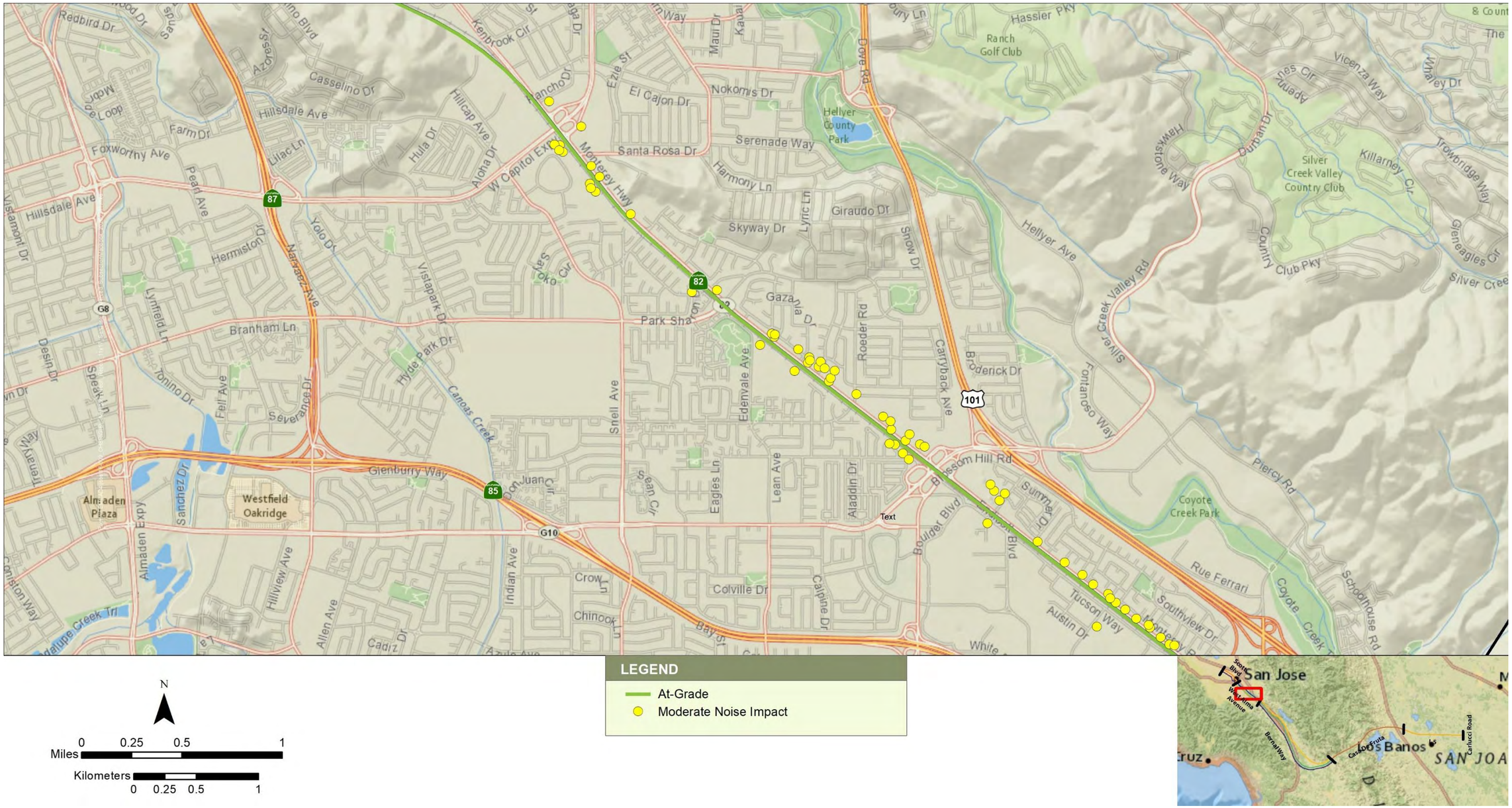


Figure C-28 2040 Plus Project Noise Impacts—Alternative 2

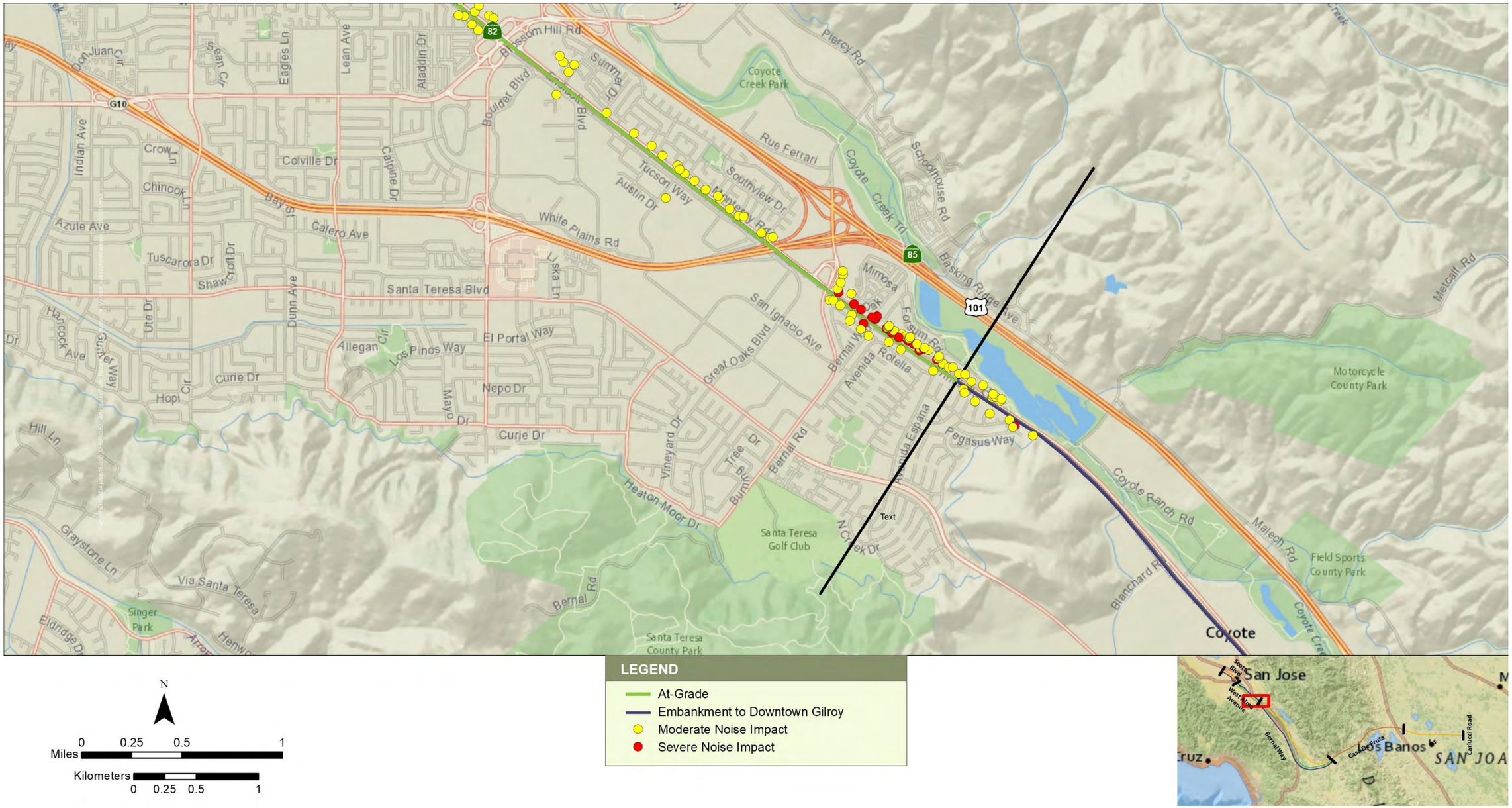


Figure C-29 2040 Plus Project Noise Impacts—Alternative 2

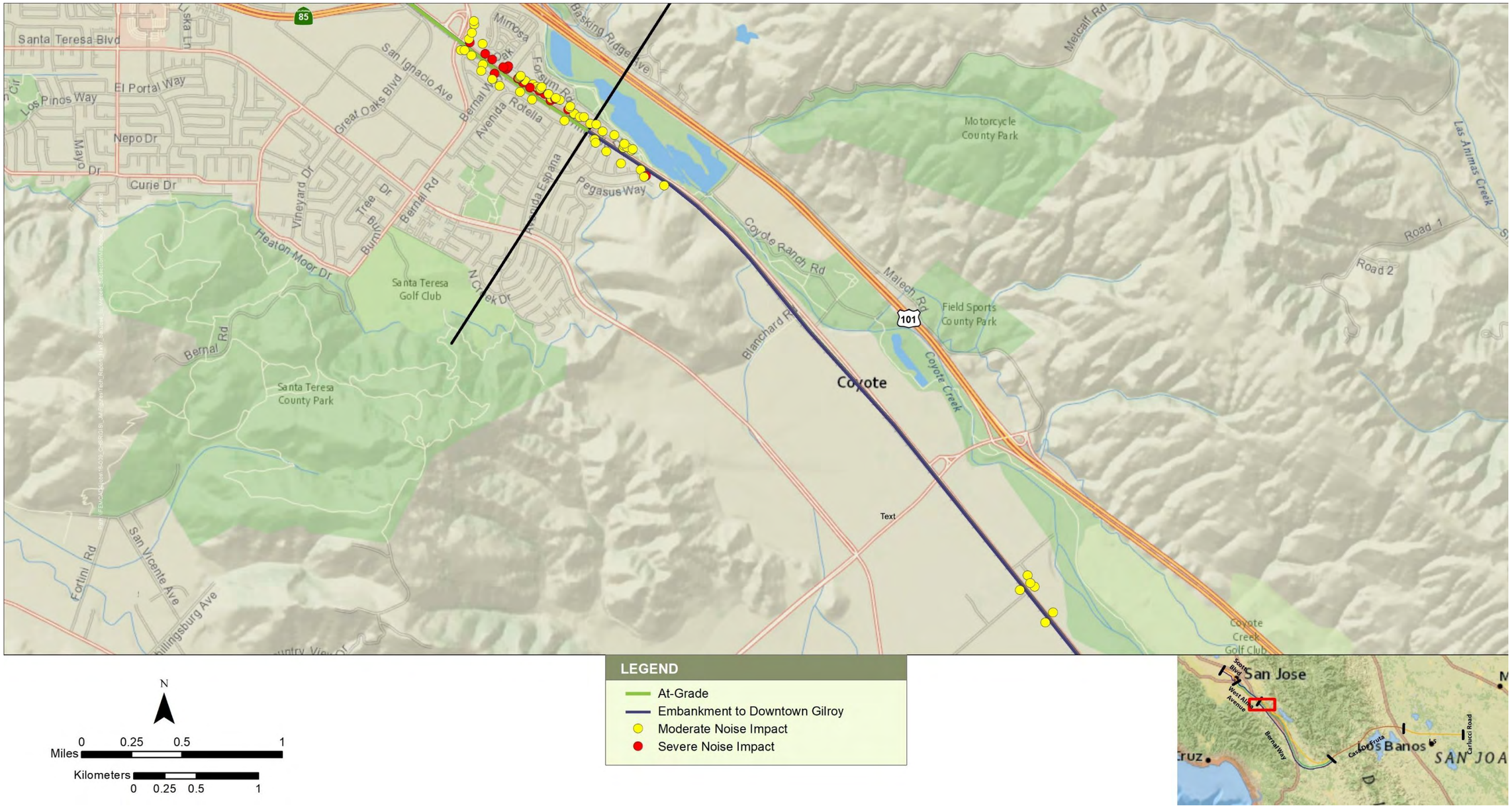


Figure C-30 2040 Plus Project Noise Impacts—Alternative 2

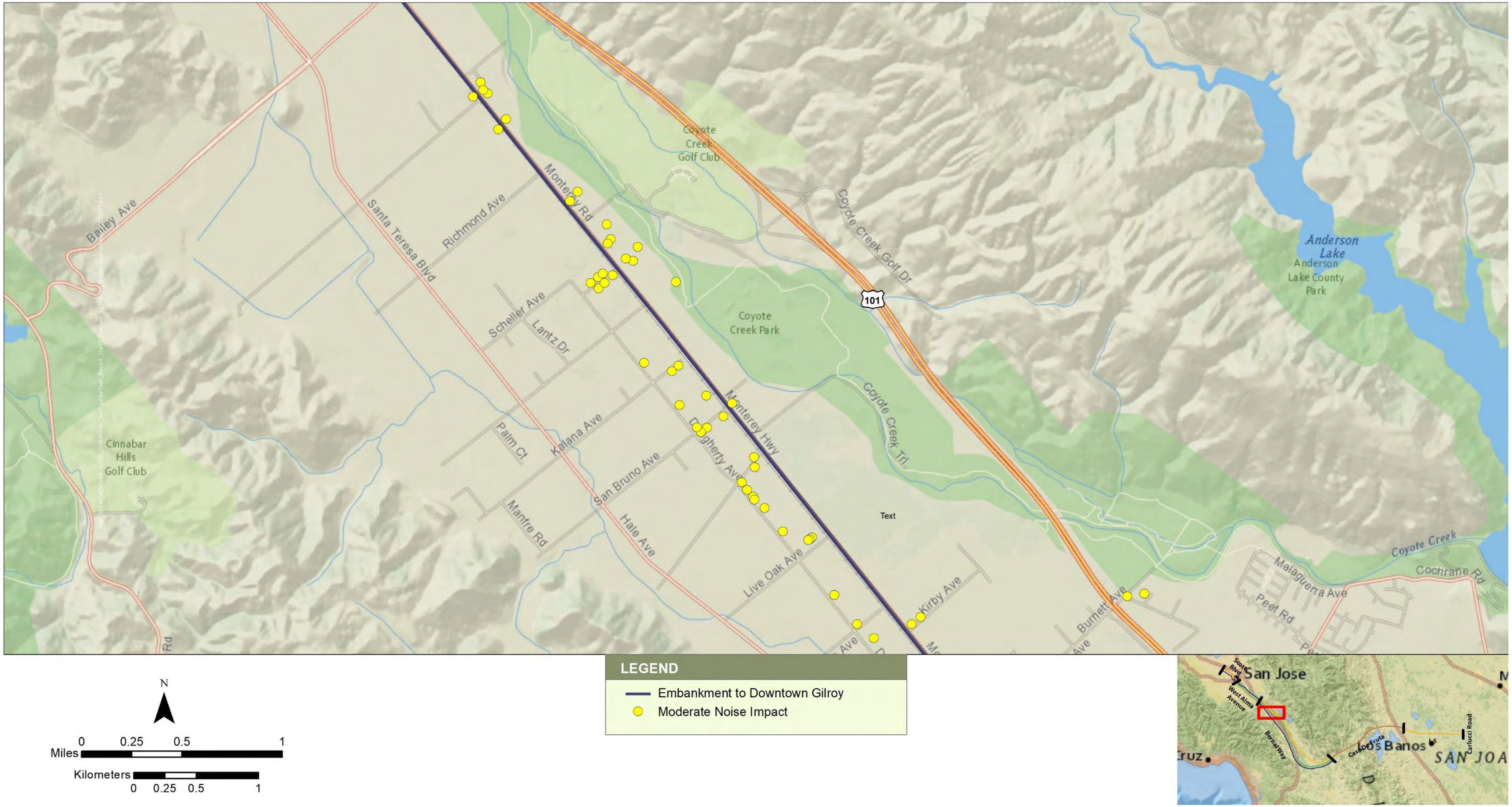


Figure C-31 2040 Plus Project Noise Impacts—Alternative 2

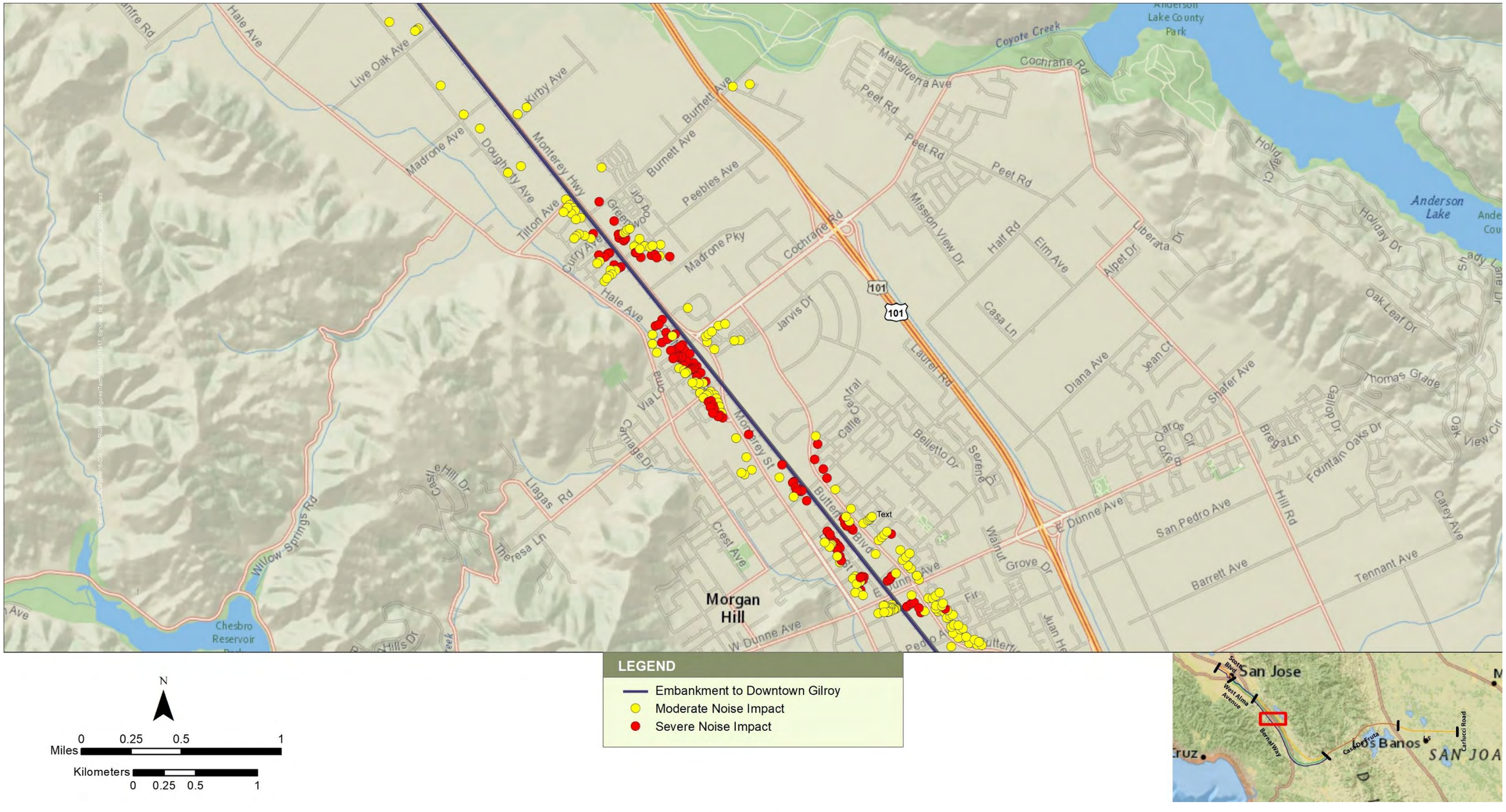


Figure C-32 2040 Plus Project Noise Impacts—Alternative 2

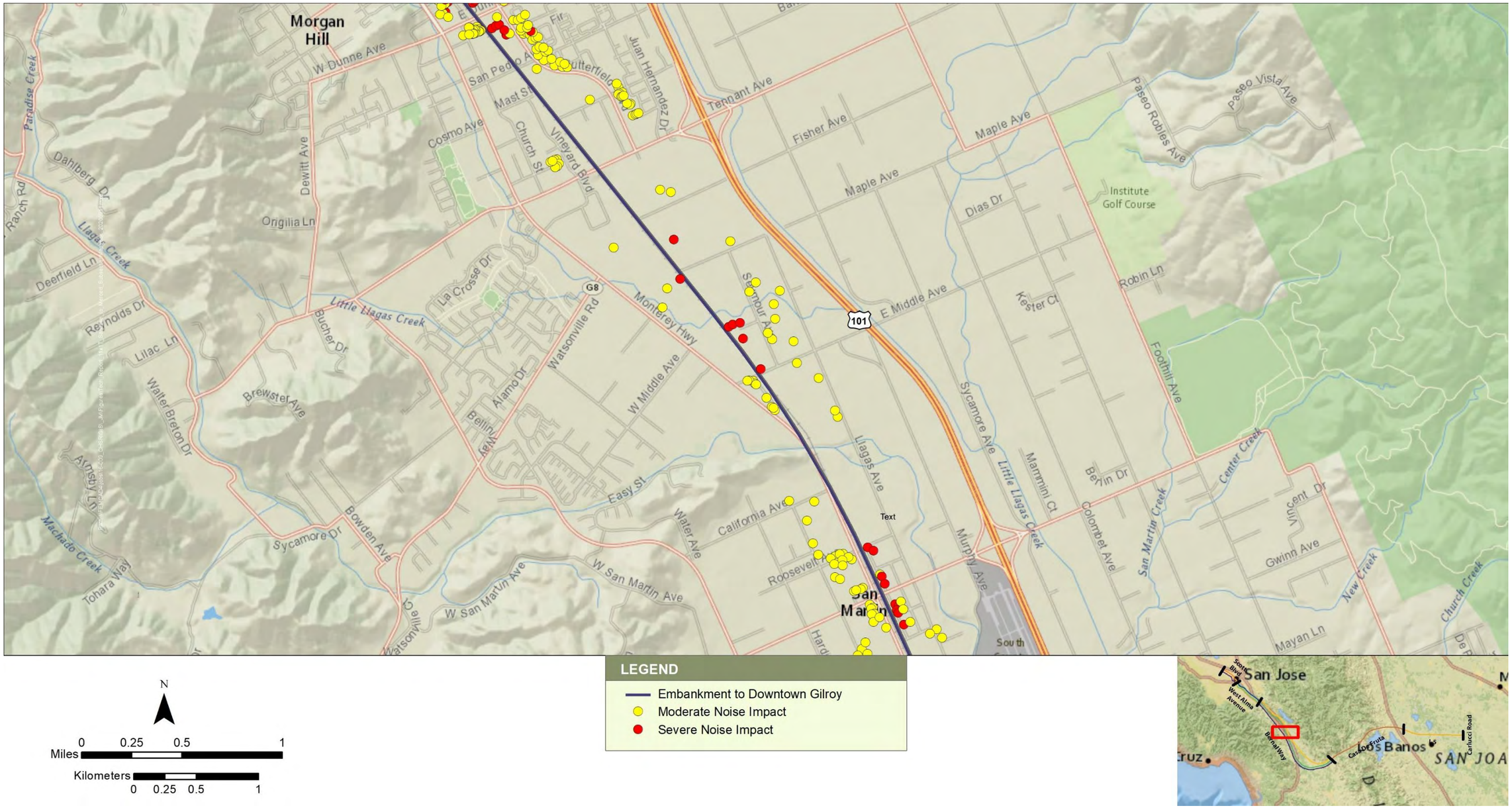


Figure C-33 2040 Plus Project Noise Impacts—Alternative 2

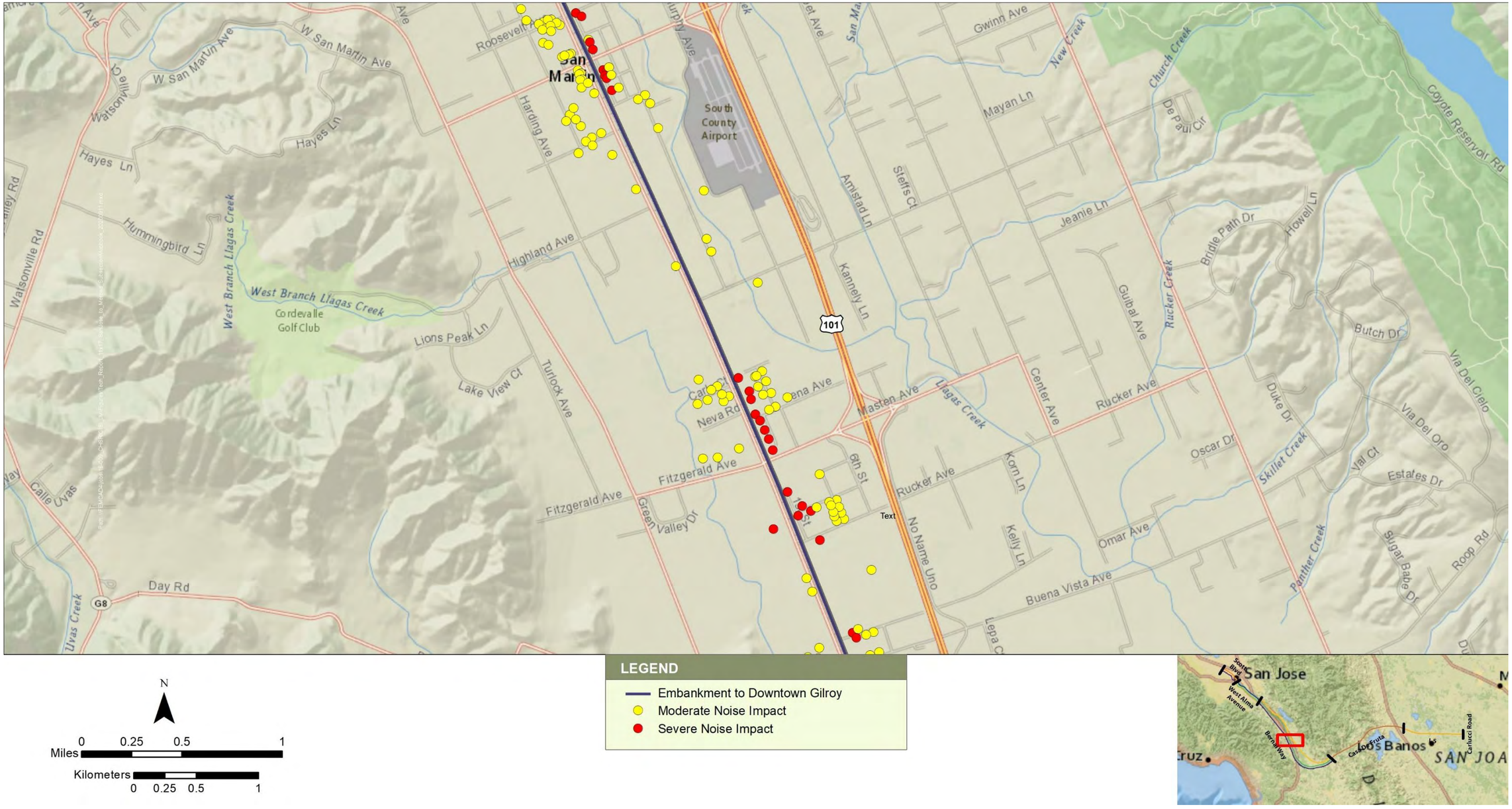


Figure C-34 2040 Plus Project Noise Impacts—Alternative 2

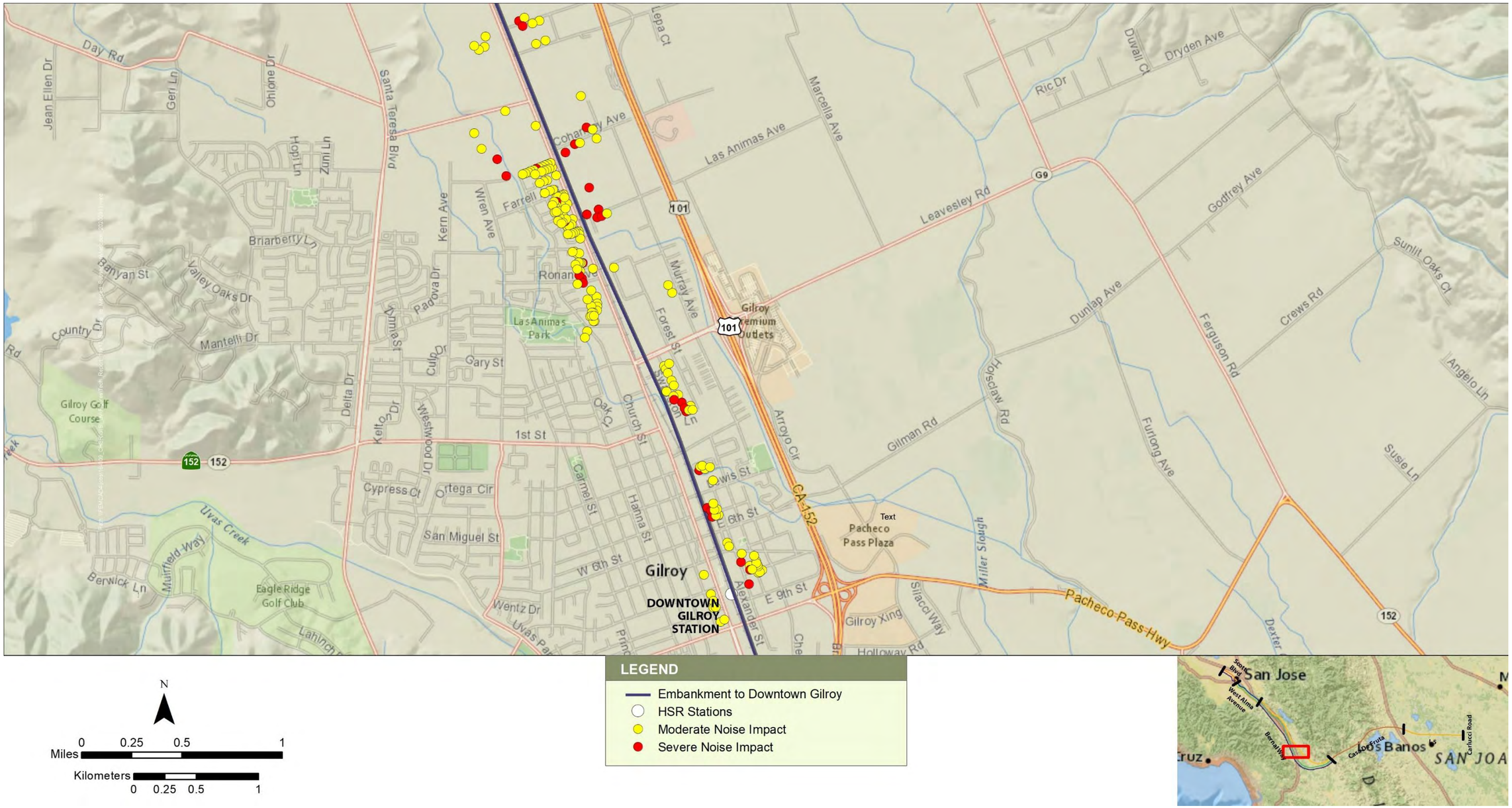


Figure C-35 2040 Plus Project Noise Impacts—Alternative 2

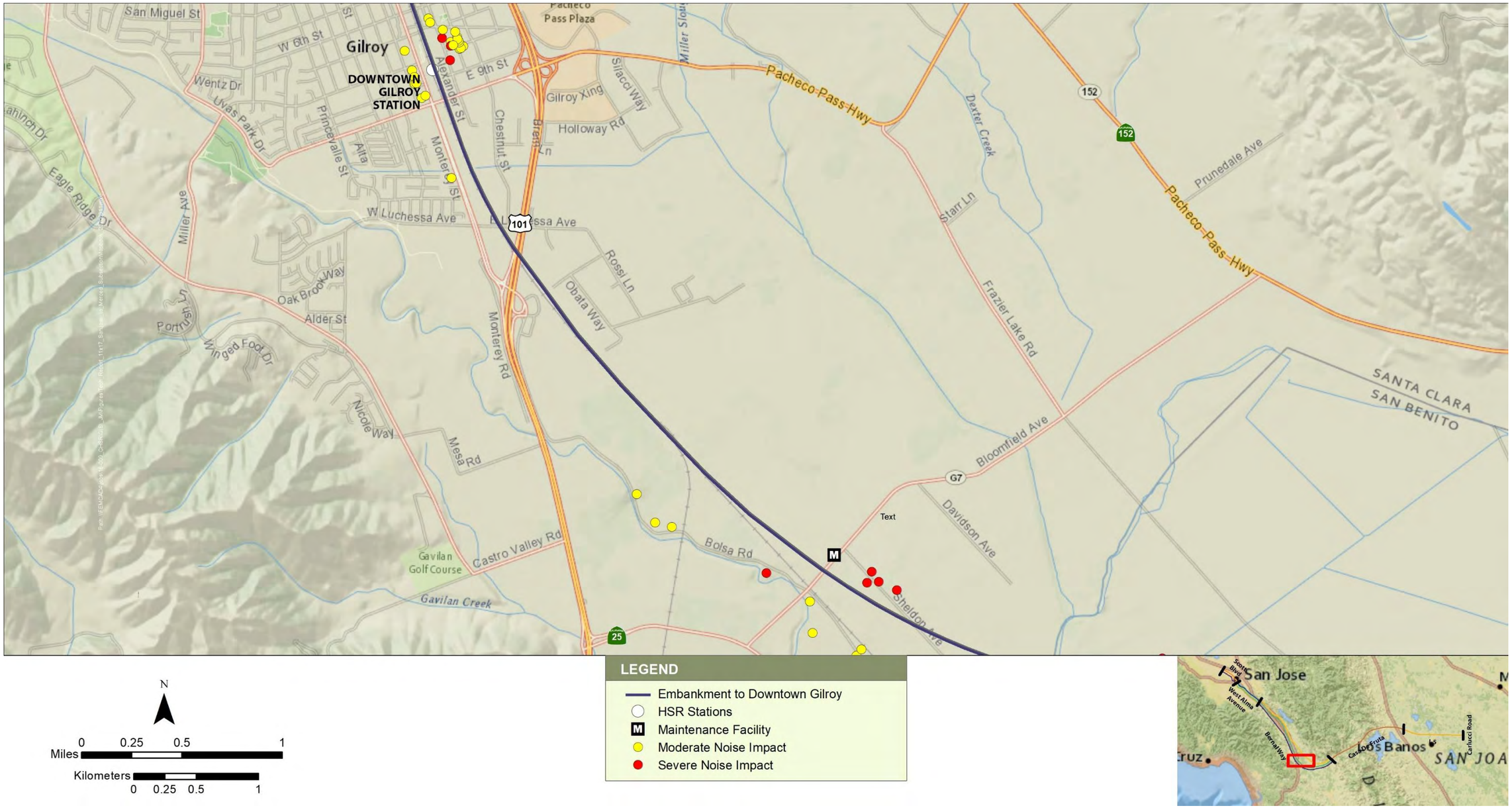


Figure C-36 2040 Plus Project Noise Impacts—Alternative 2 without the Tunnel Design Variant

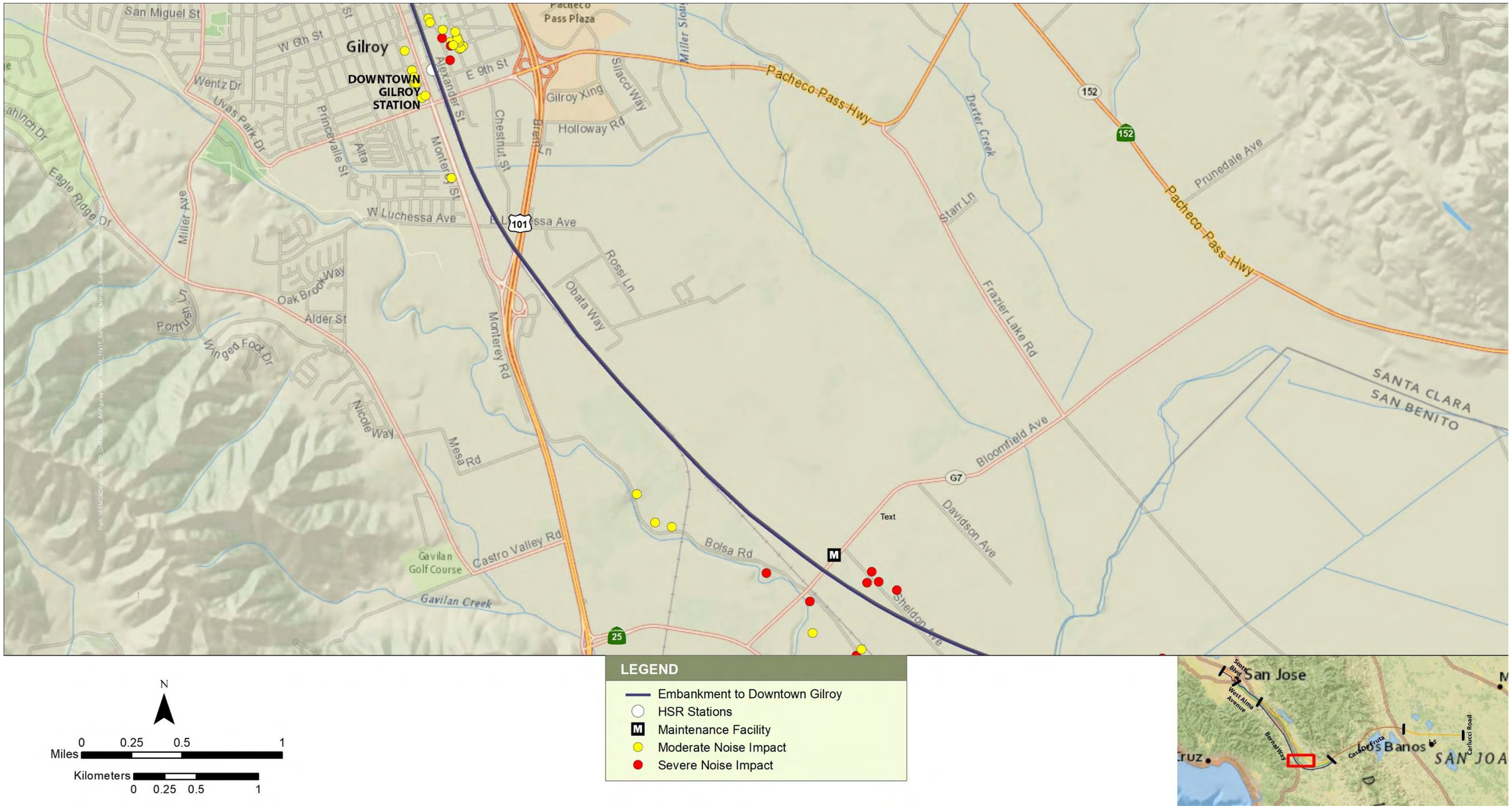


Figure C-37 2040 Plus Project Noise Impacts—Alternative 2 with the Tunnel Design Variant

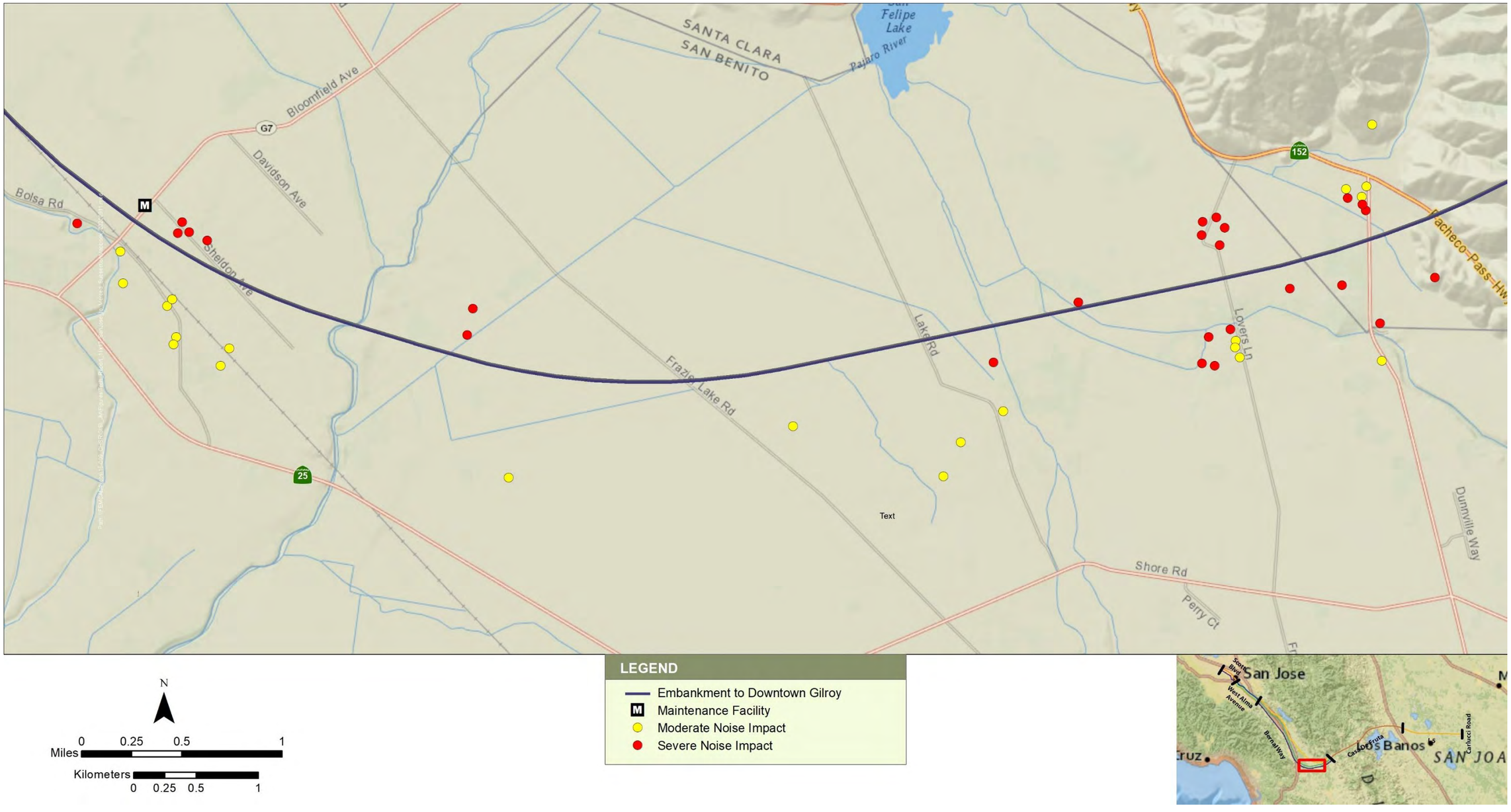


Figure C-38 2040 Plus Project Noise Impacts—Alternative 2 without the Tunnel Design Variant

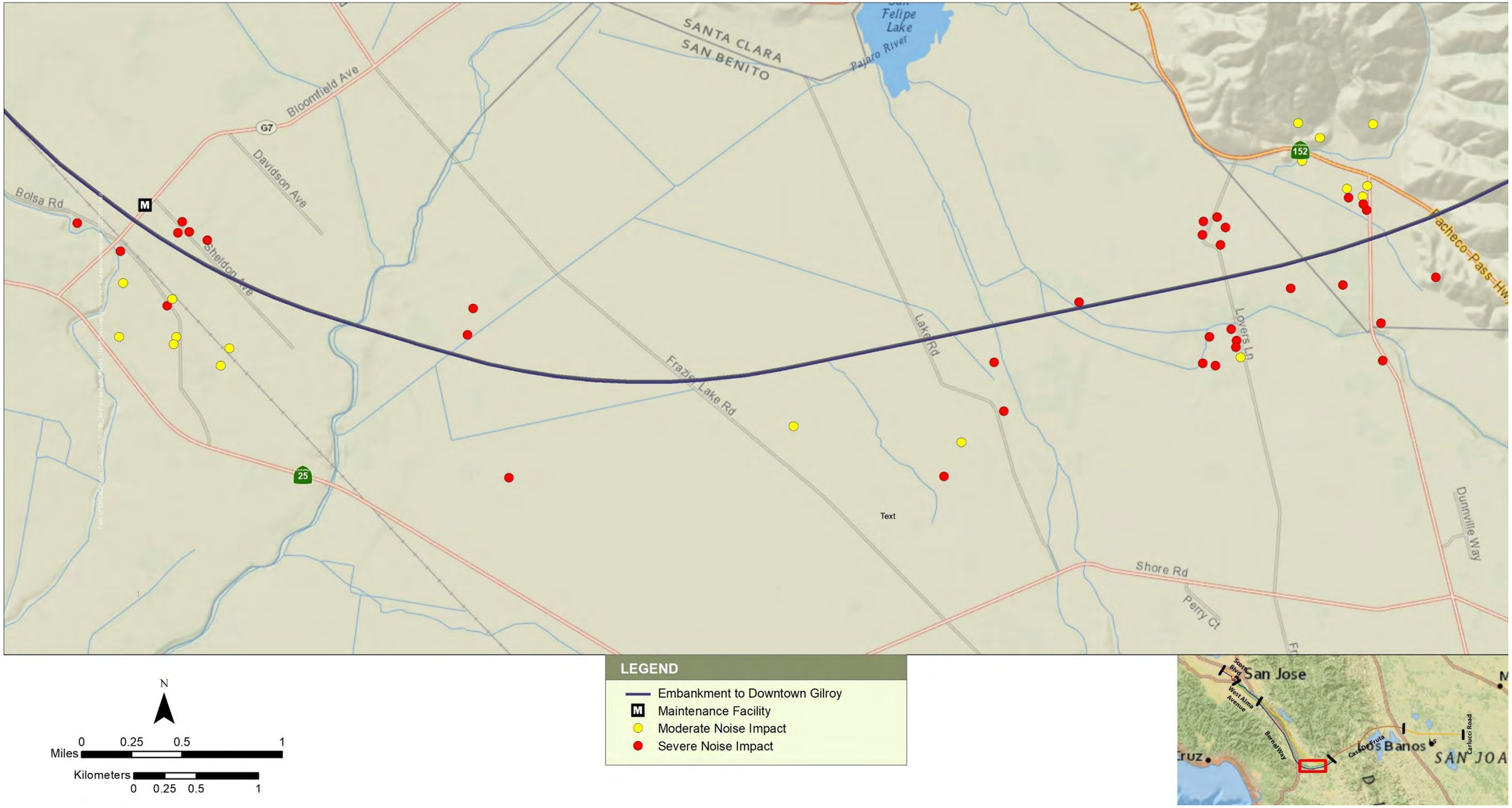


Figure C-39 2040 Plus Project Noise Impacts—Alternative 2 with the Tunnel Design Variant

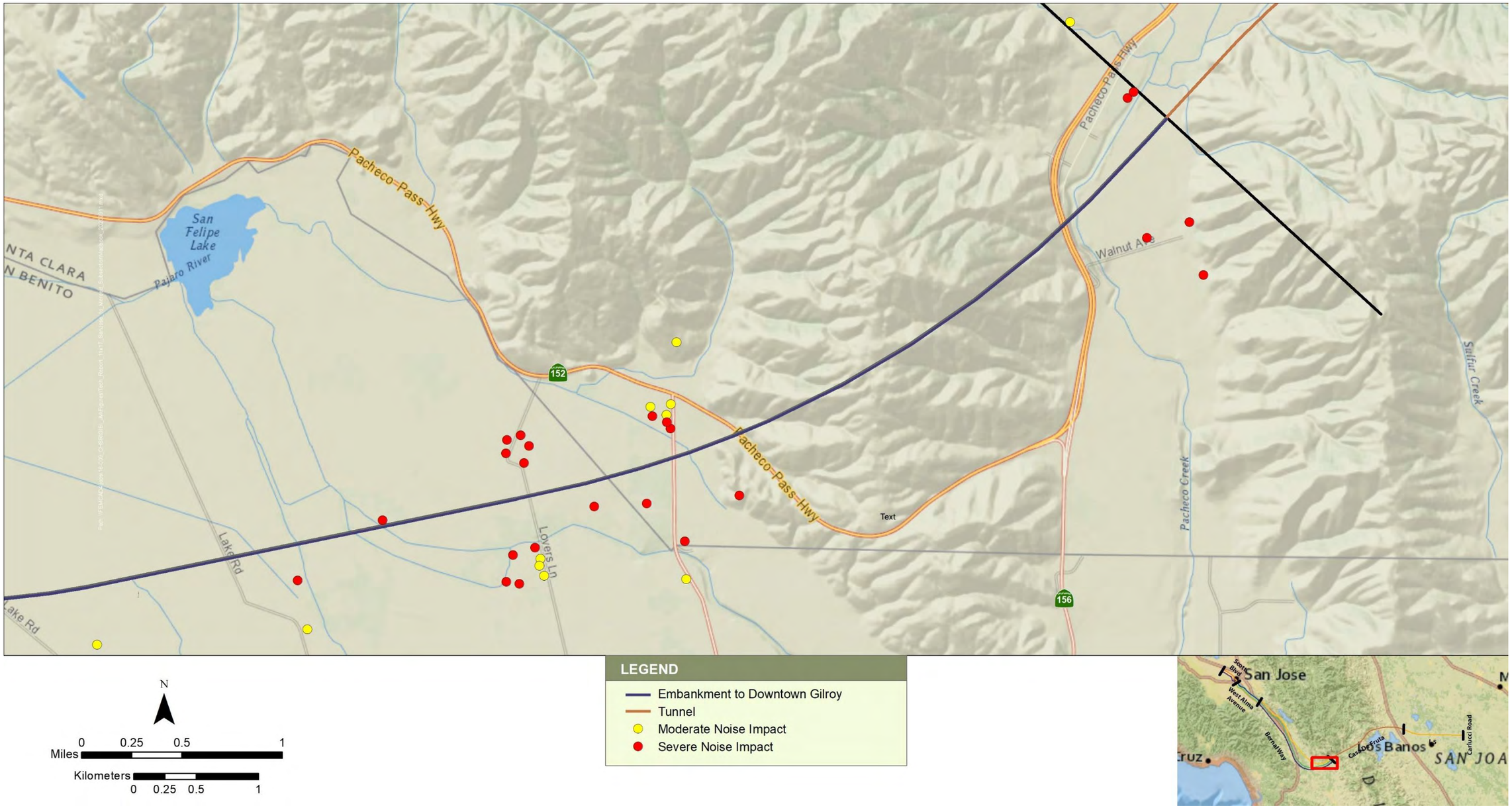


Figure C-40 2040 Plus Project Noise Impacts—Alternative 2 without the Tunnel Design Variant

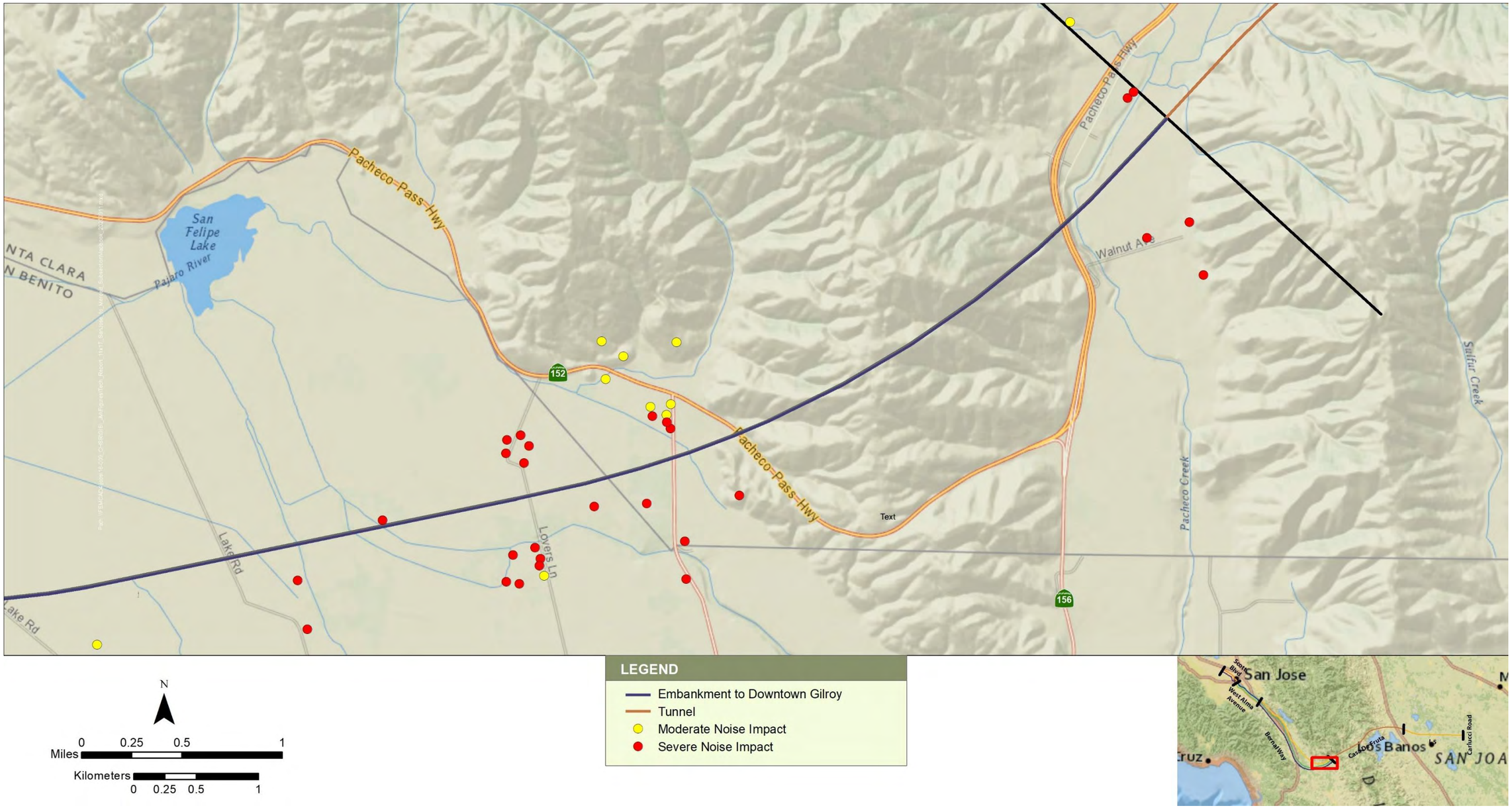


Figure C-41 2040 Plus Project Noise Impacts—Alternative 2 with the Tunnel Design Variant

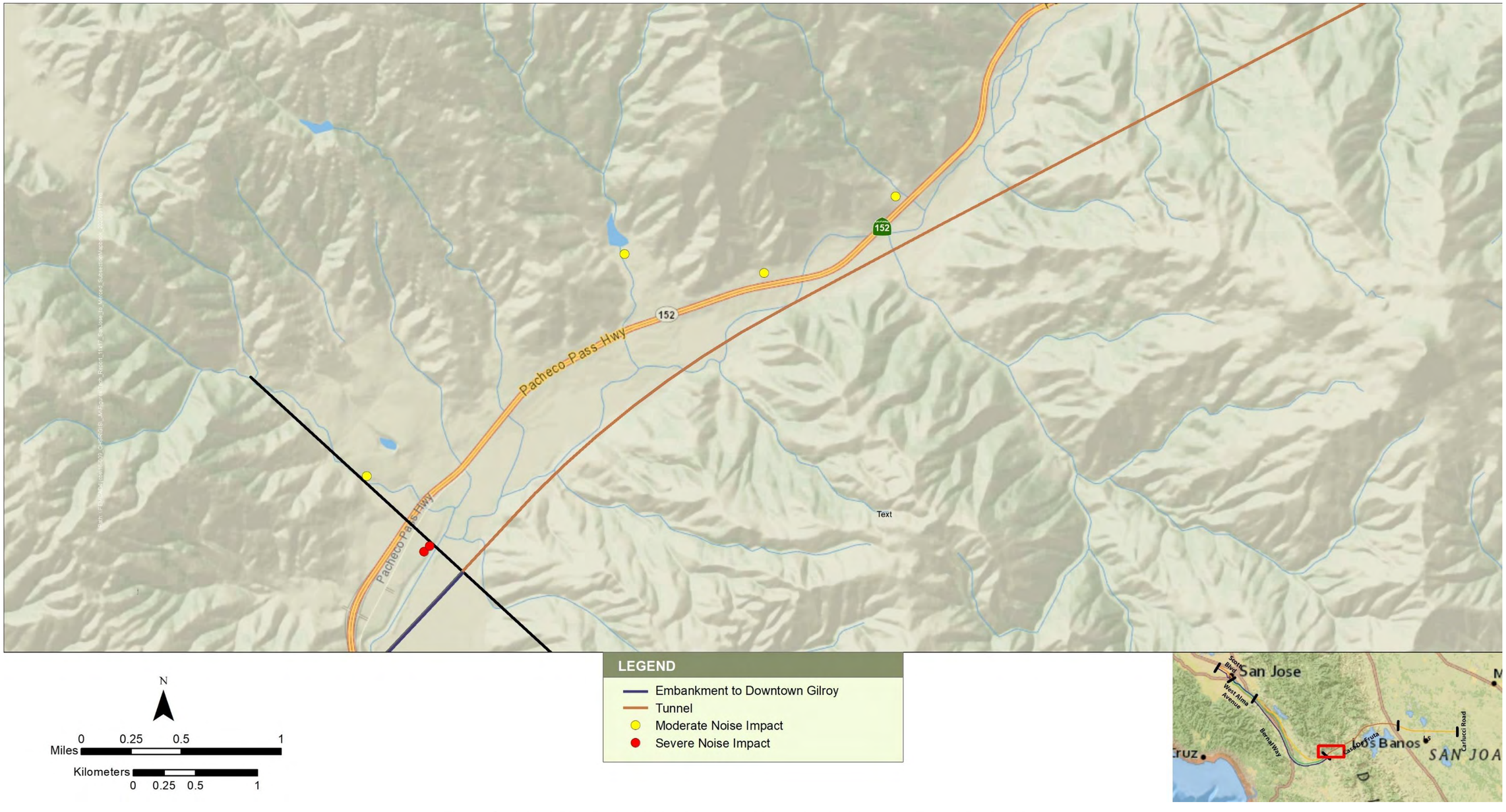


Figure C-42 2040 Plus Project Noise Impacts—Alternative 2 without the Tunnel Design Variant

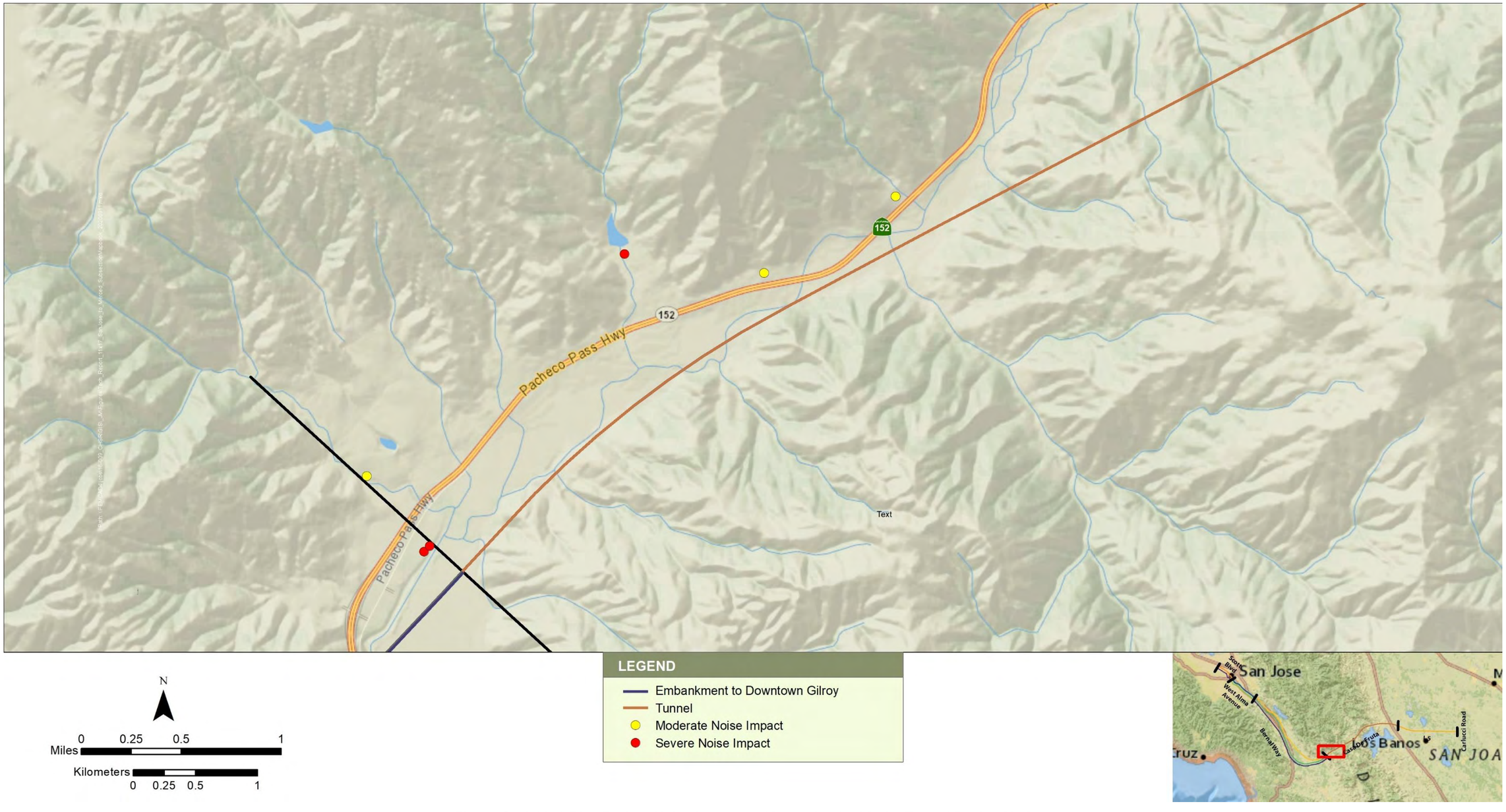


Figure C-43 2040 Plus Project Noise Impacts—Alternative 2 with the Tunnel Design Variant

Figure C-44 2040 Plus Project Noise Impacts—Alternative 3

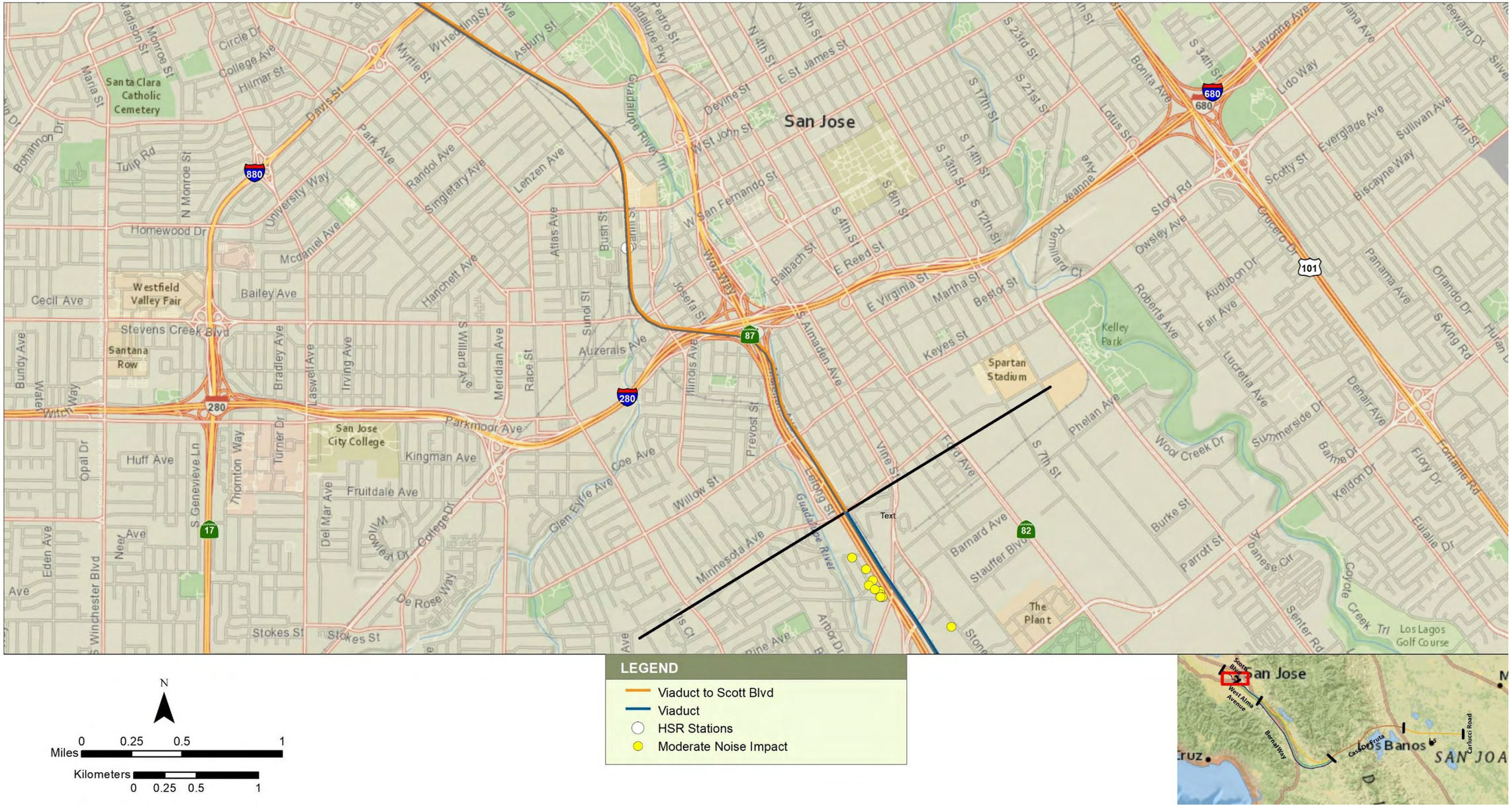


Figure C-45 2040 Plus Project Noise Impacts—Alternative 3

Figure C-46 2040 Plus Project Noise Impacts—Alternative 3

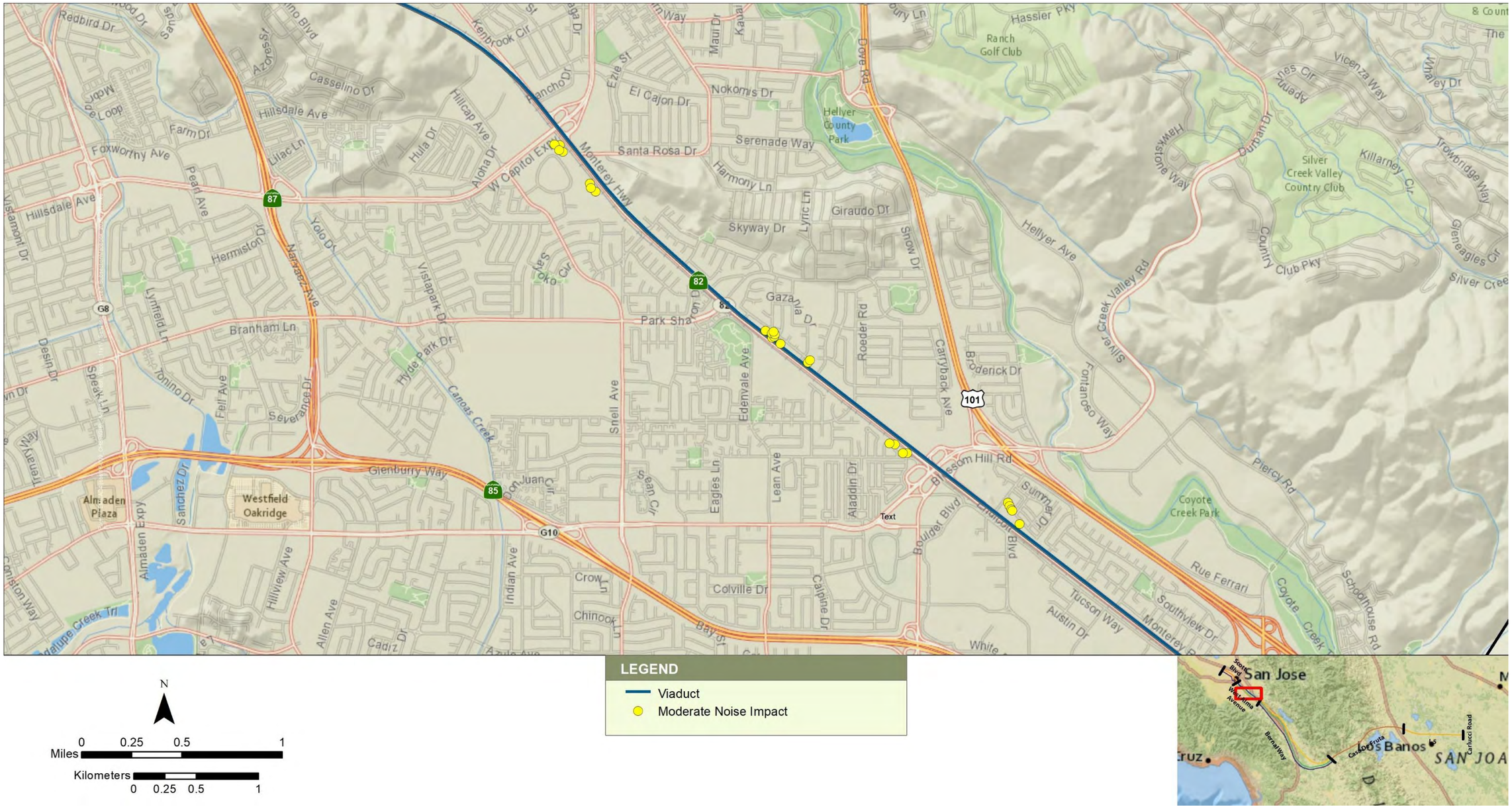


Figure C-47 2040 Plus Project Noise Impacts—Alternative 3

Figure C-48 2040 Plus Project Noise Impacts—Alternative 3

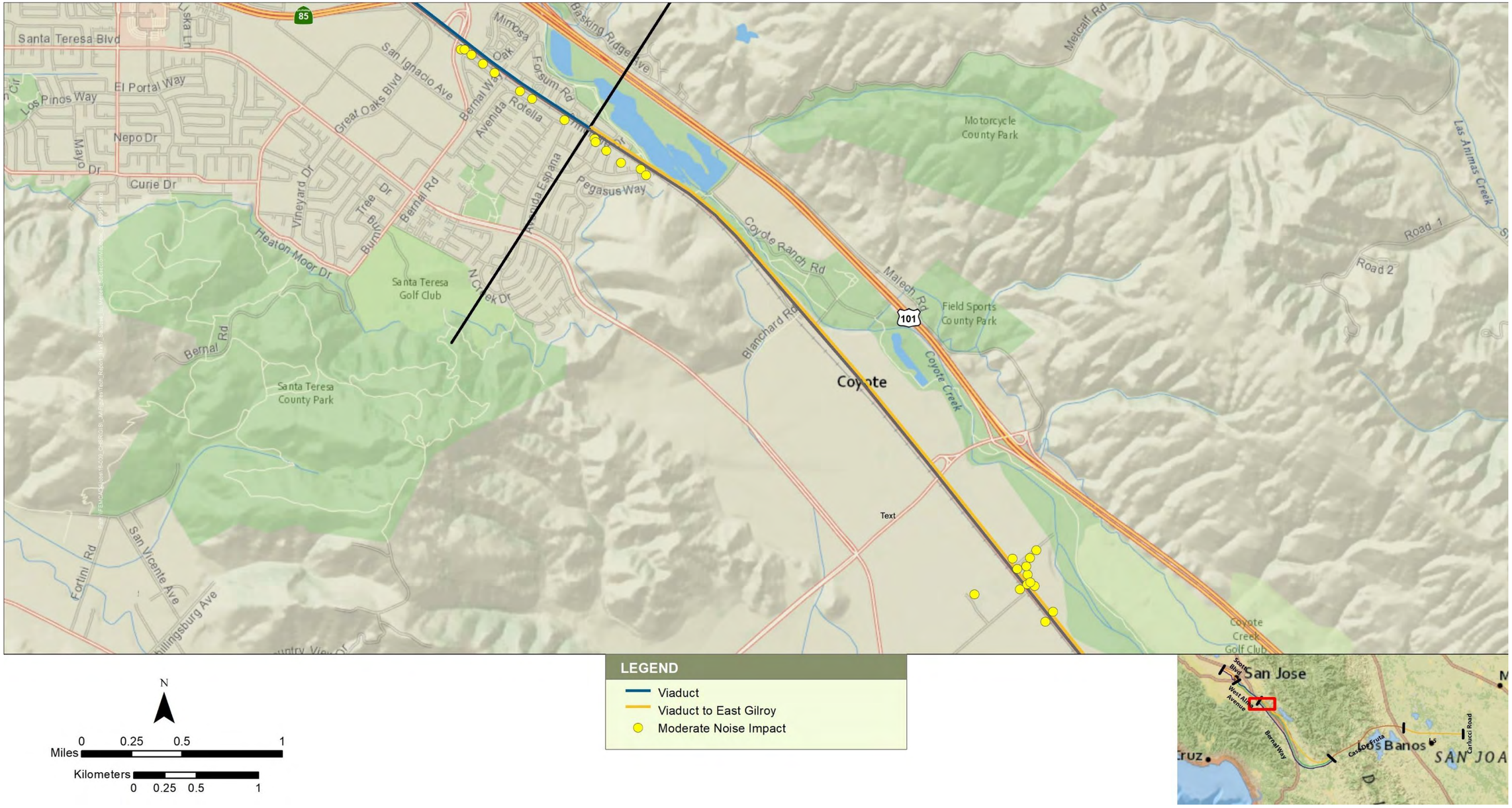


Figure C-49 2040 Plus Project Noise Impacts—Alternative 3

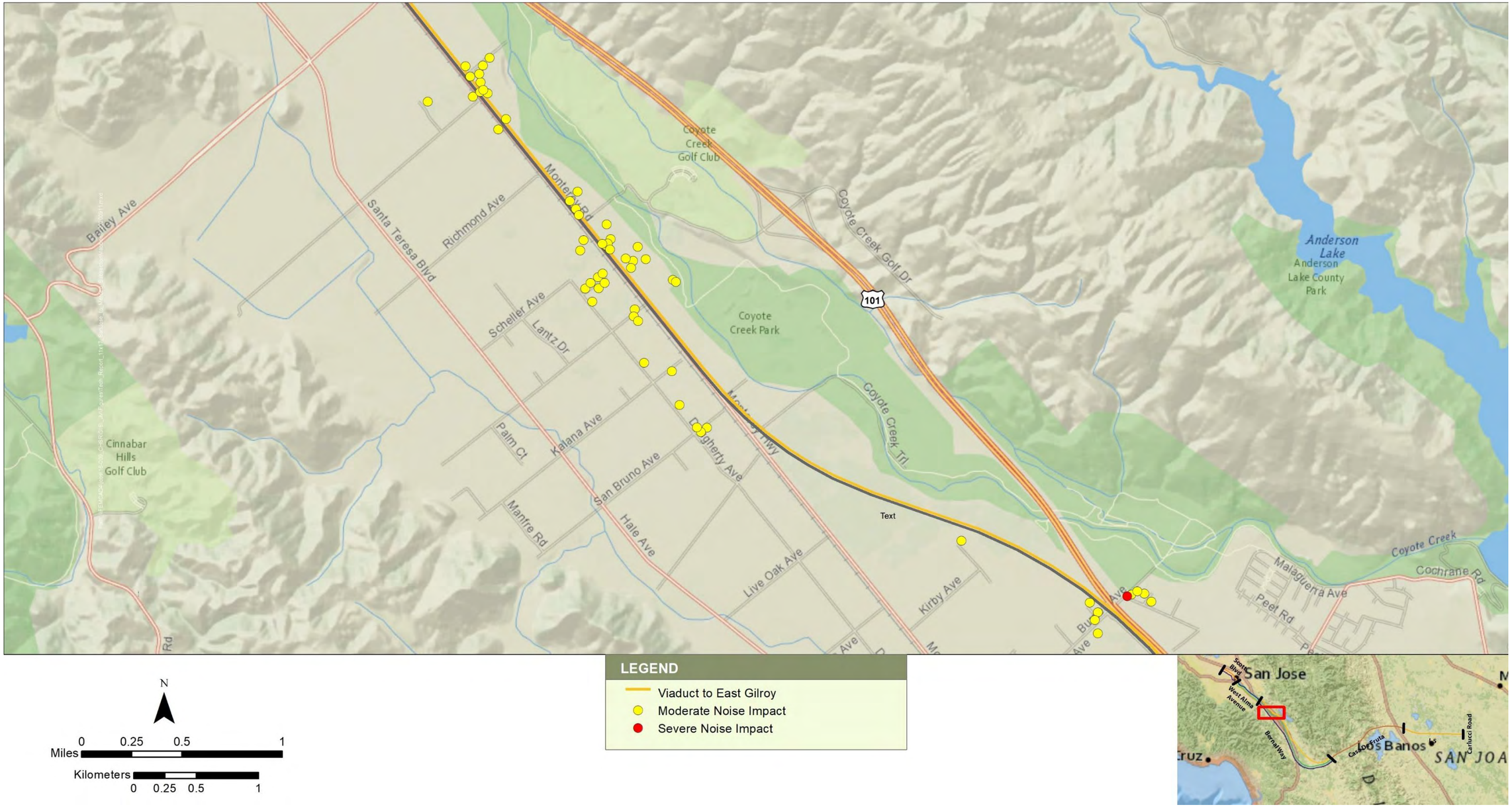


Figure C-50 2040 Plus Project Noise Impacts—Alternative 3

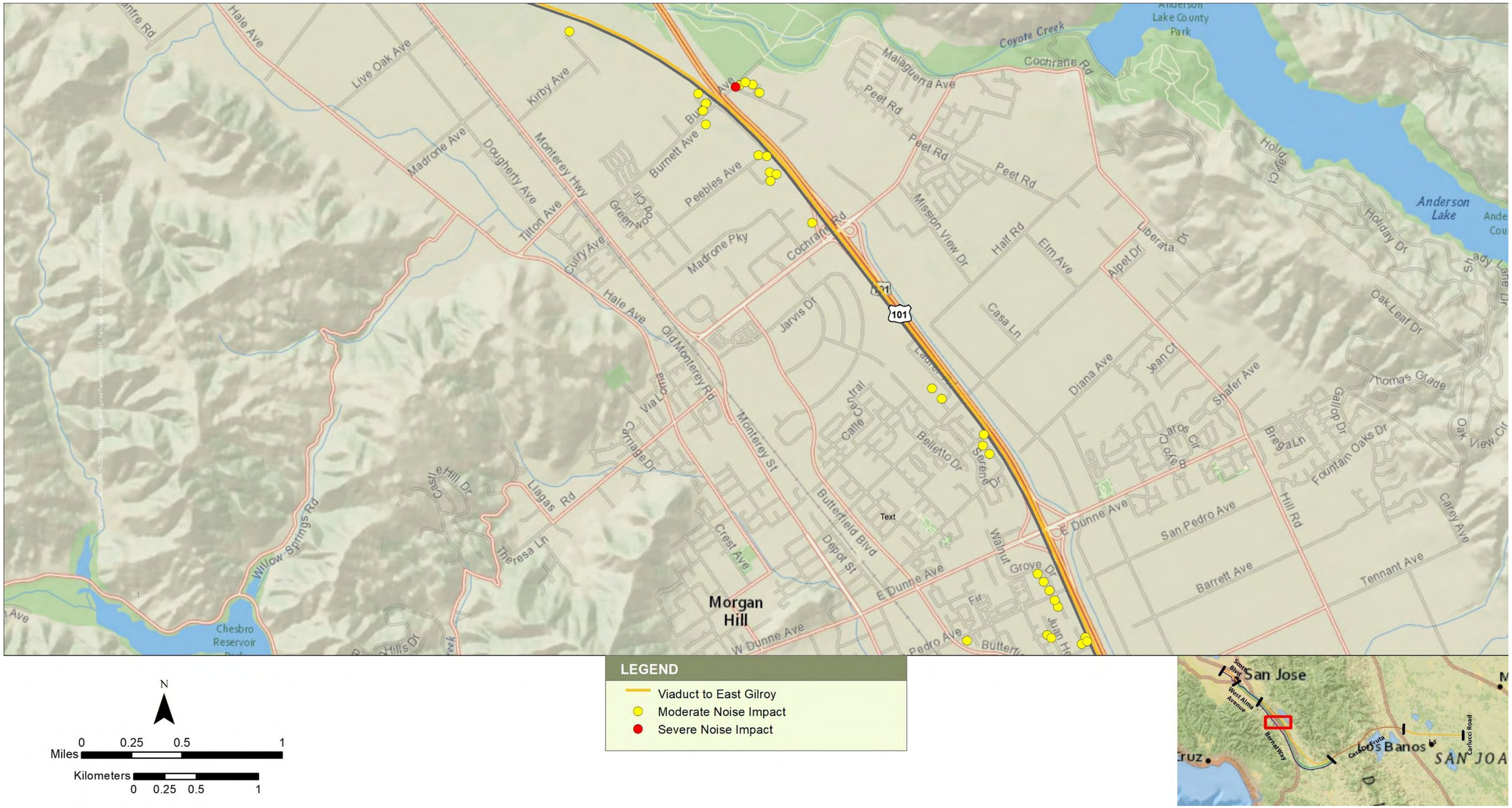


Figure C-51 2040 Plus Project Noise Impacts—Alternative 3

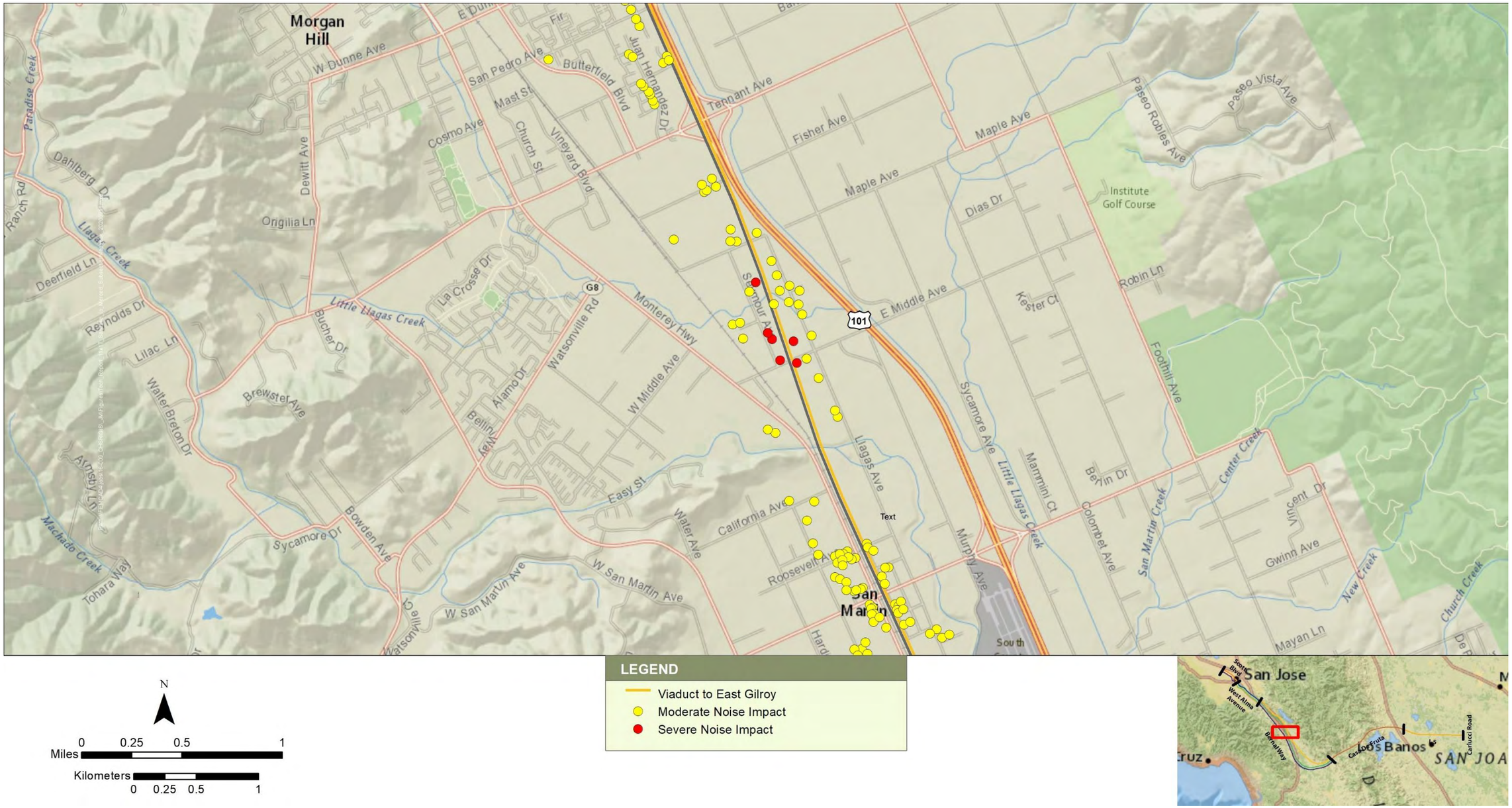
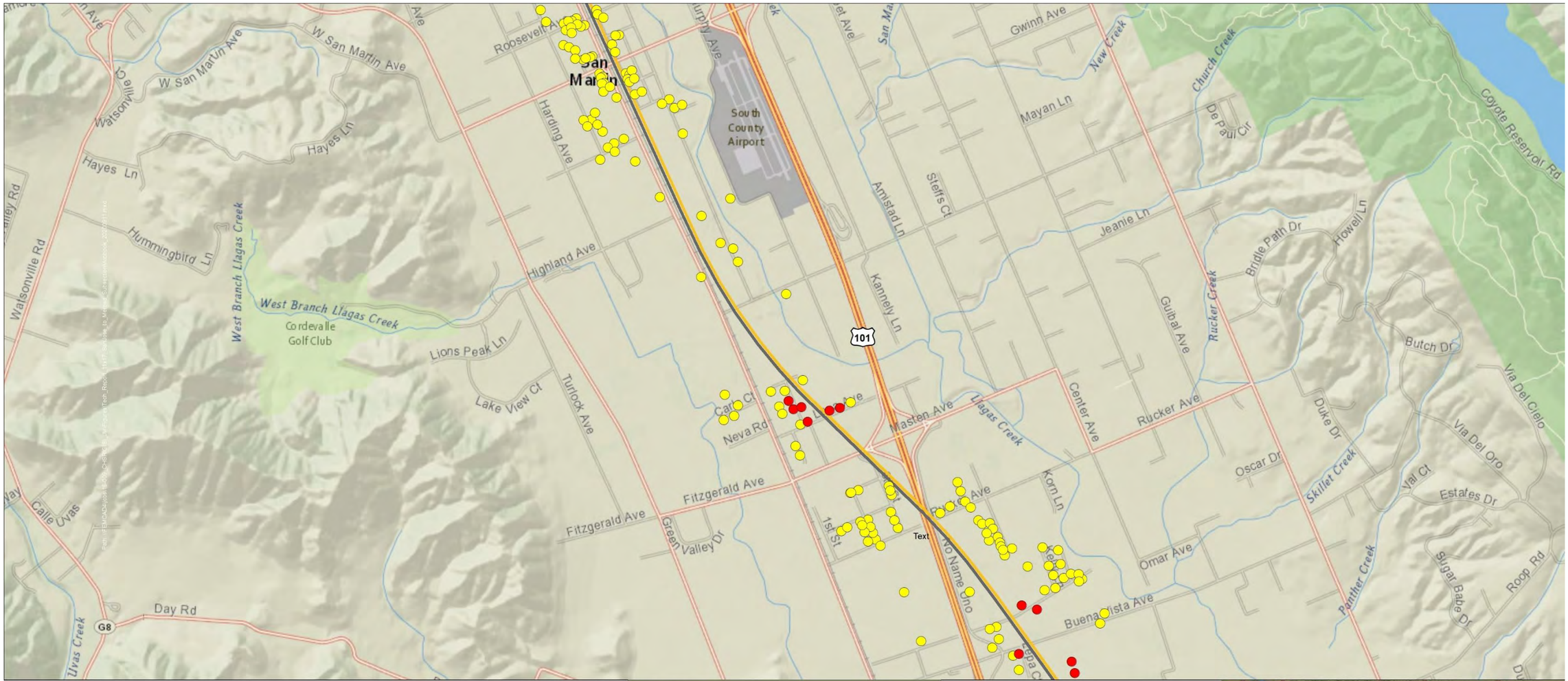
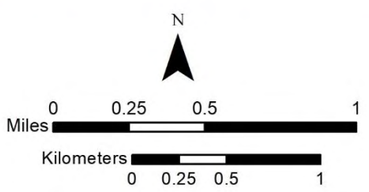
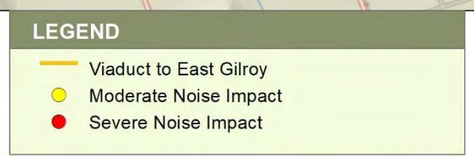


Figure C-52 2040 Plus Project Noise Impacts—Alternative 3







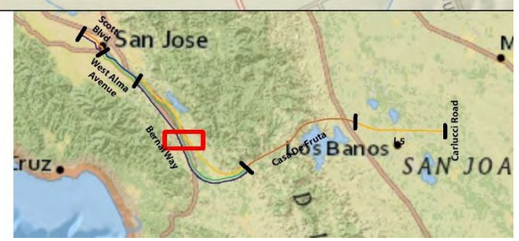


Figure C-53 2040 Plus Project Noise Impacts—Alternative 3

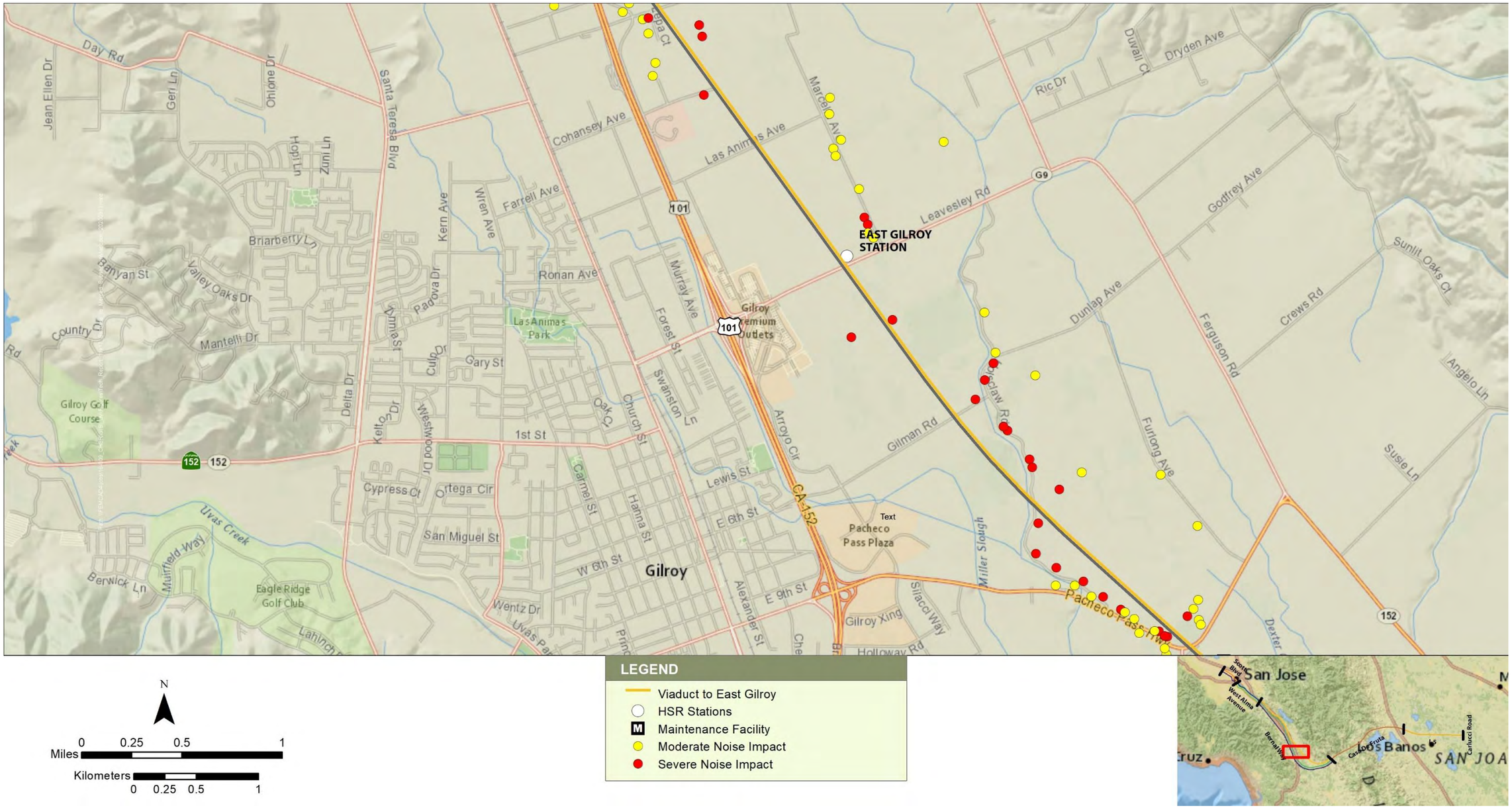


Figure C-54 2040 Plus Project Noise Impacts—Alternative 3 without the Tunnel Design Variant

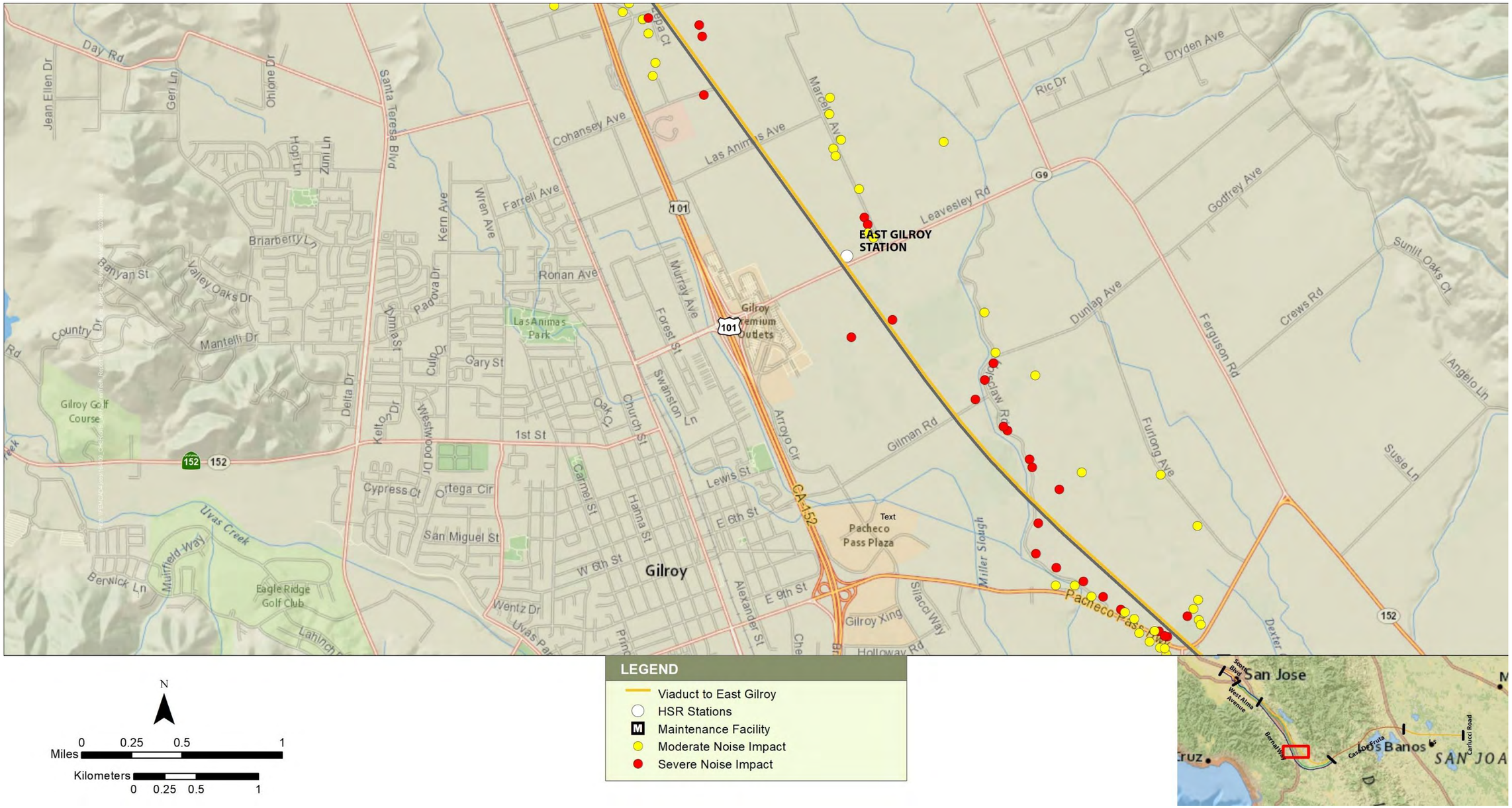


Figure C-55 2040 Plus Project Noise Impacts—Alternative 3 with the Tunnel Design Variant

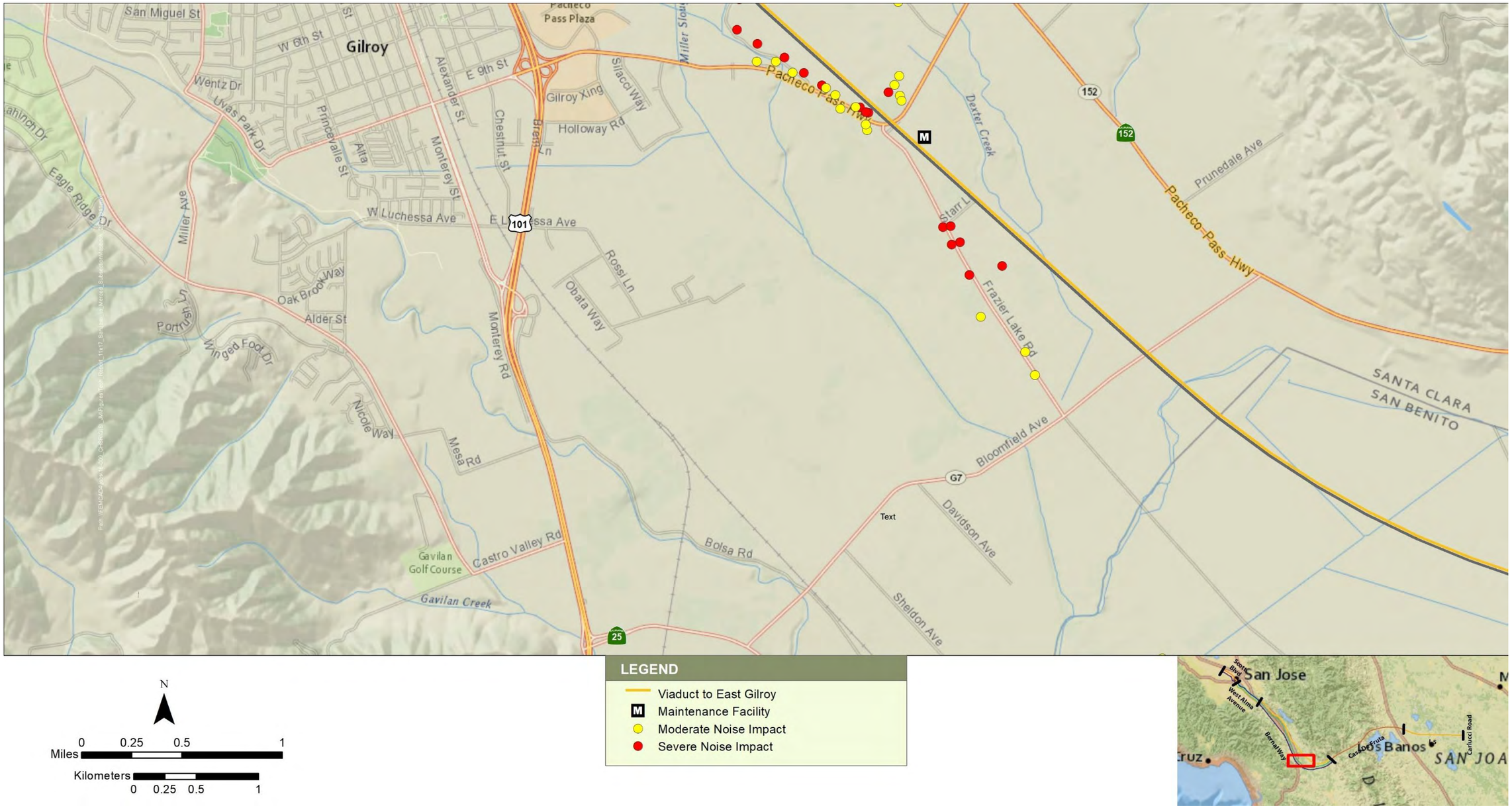


Figure C-56 2040 Plus Project Noise Impacts—Alternative 3 without the Tunnel Design Variant

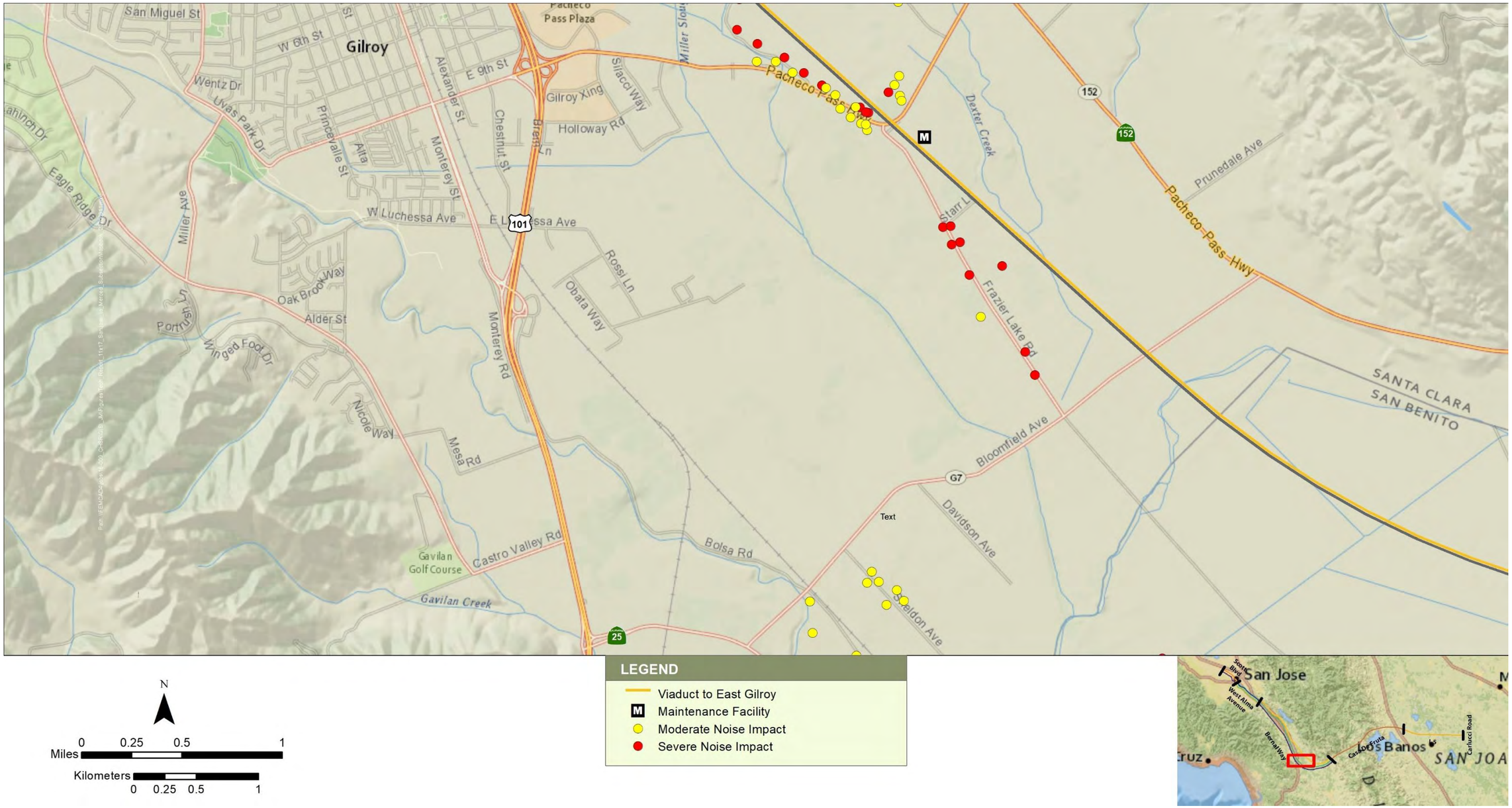


Figure C-57 2040 Plus Project Noise Impacts—Alternative 3 with the Tunnel Design Variant

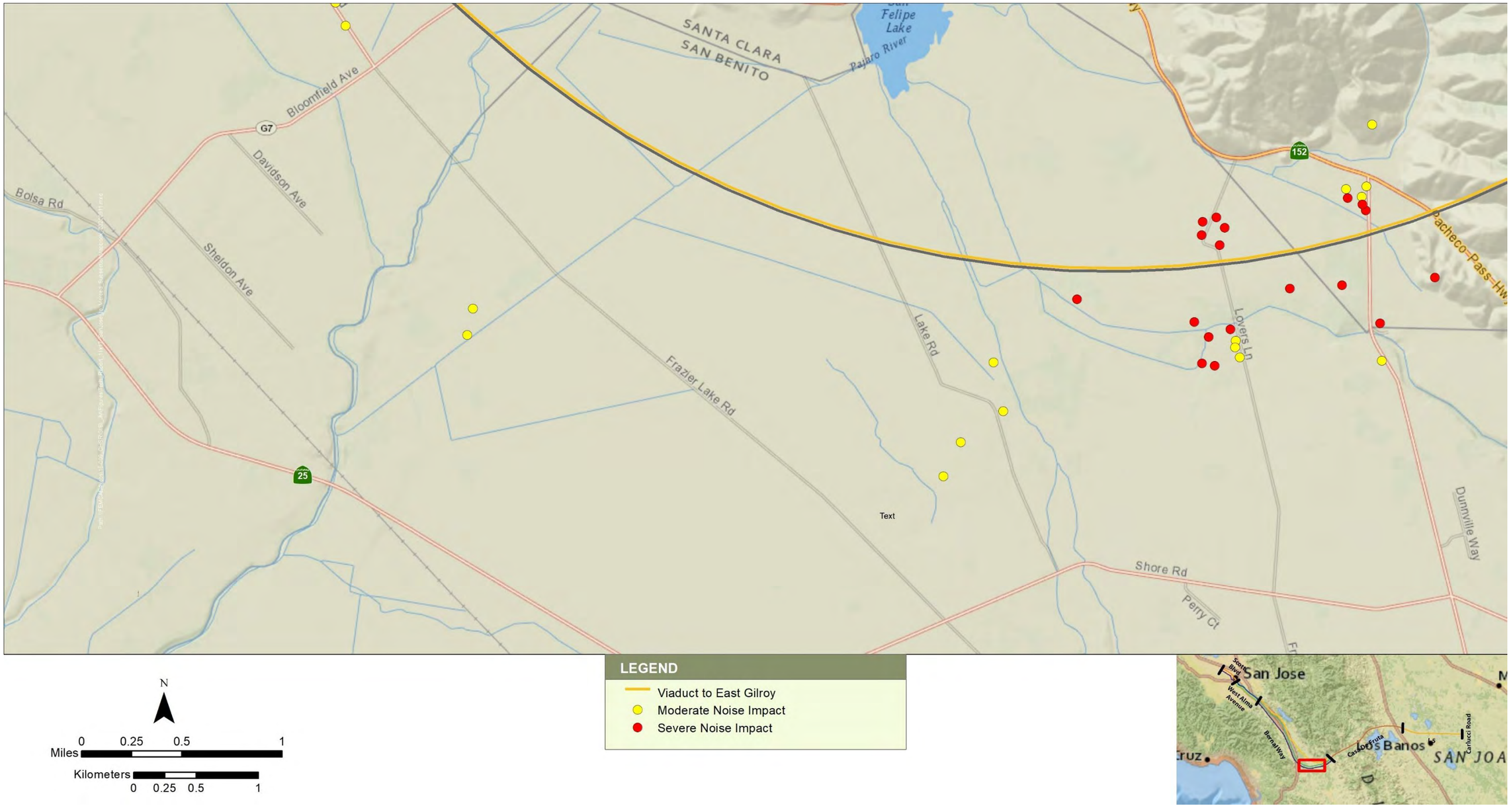


Figure C-58 2040 Plus Project Noise Impacts—Alternative 3 without the Tunnel Design Variant

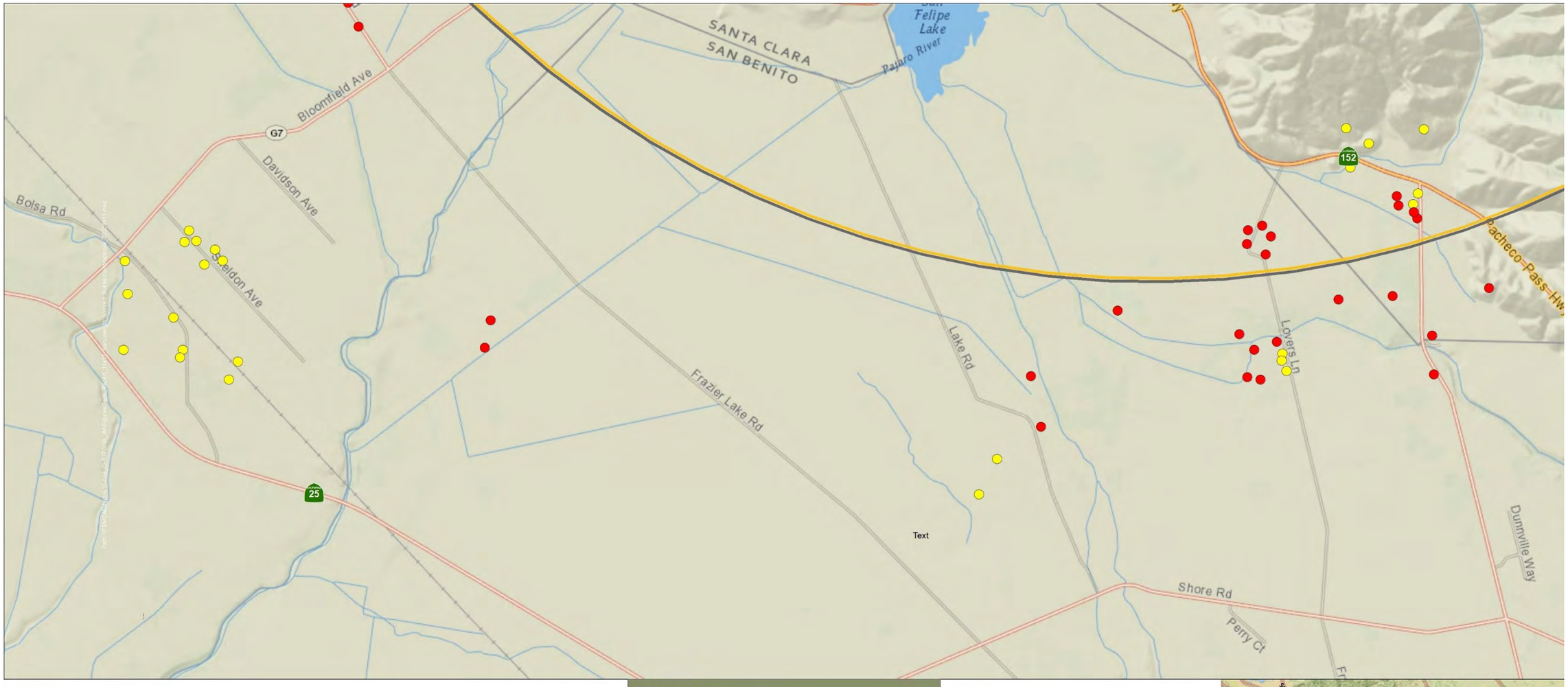


Figure C-59 2040 Plus Project Noise Impacts—Alternative 3 with the Tunnel Design Variant

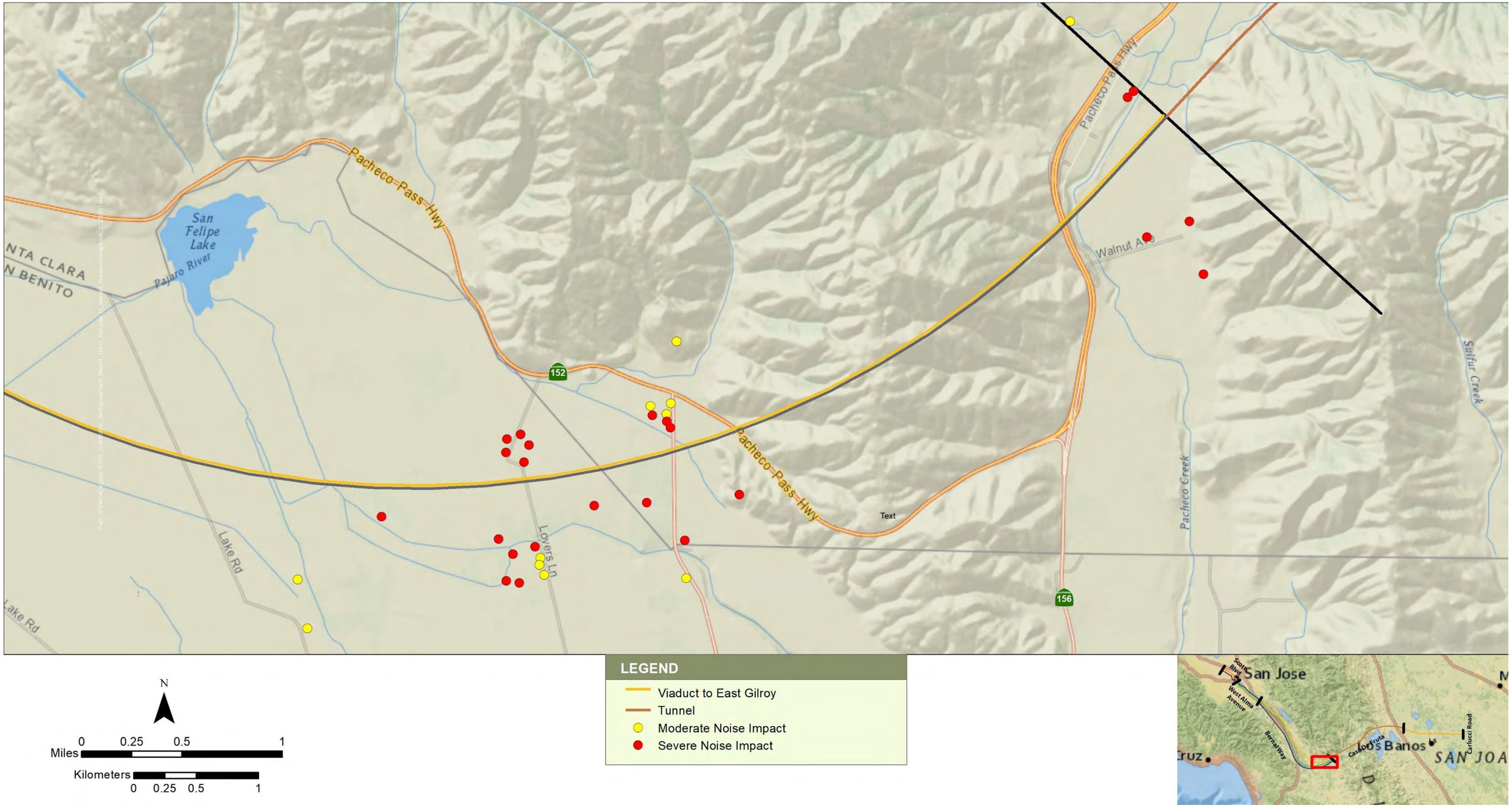


Figure C-60 2040 Plus Project Noise Impacts—Alternative 3 without the Tunnel Design Variant

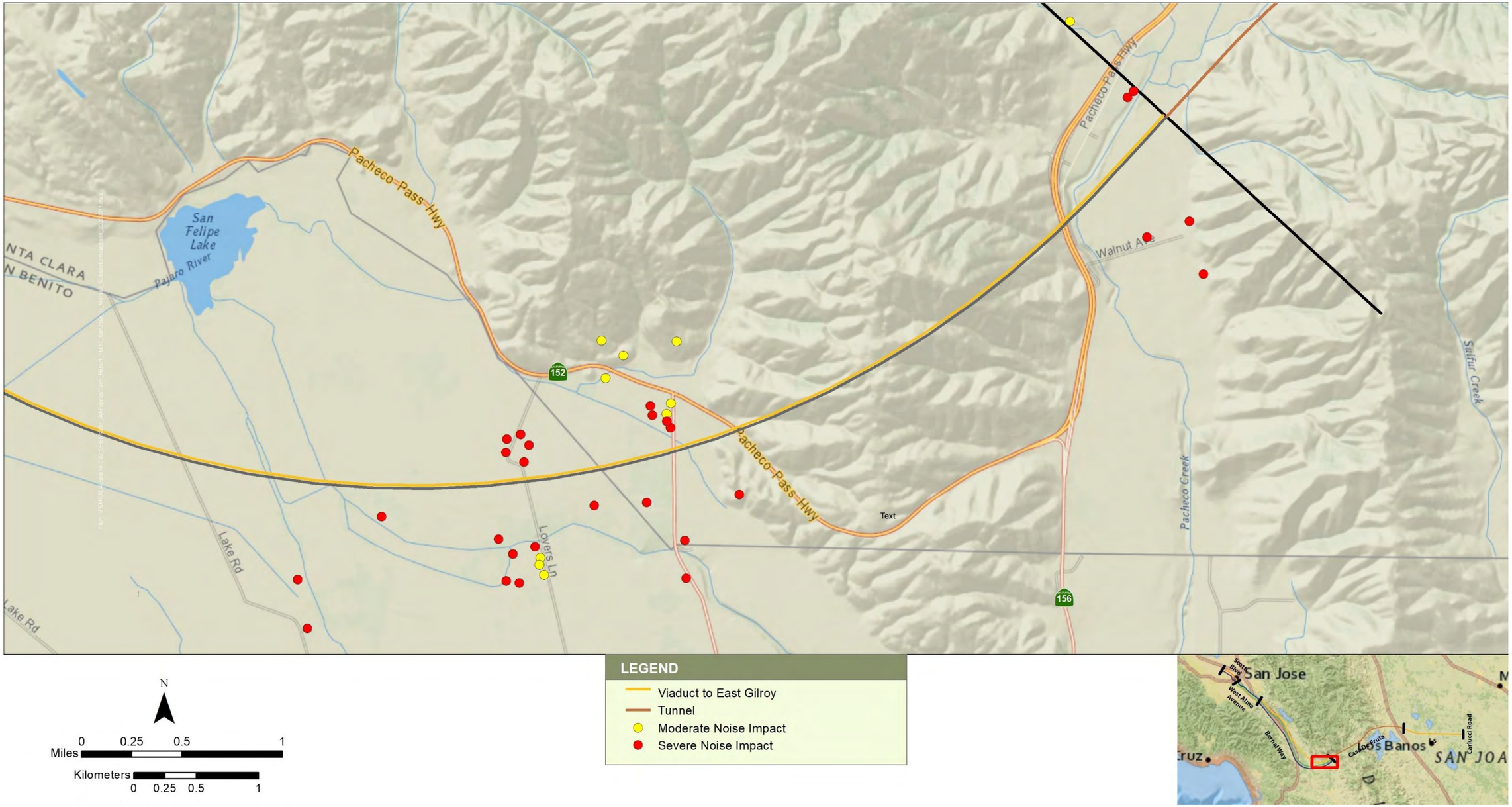


Figure C-61 2040 Plus Project Noise Impacts—Alternative 3 with the Tunnel Design Variant

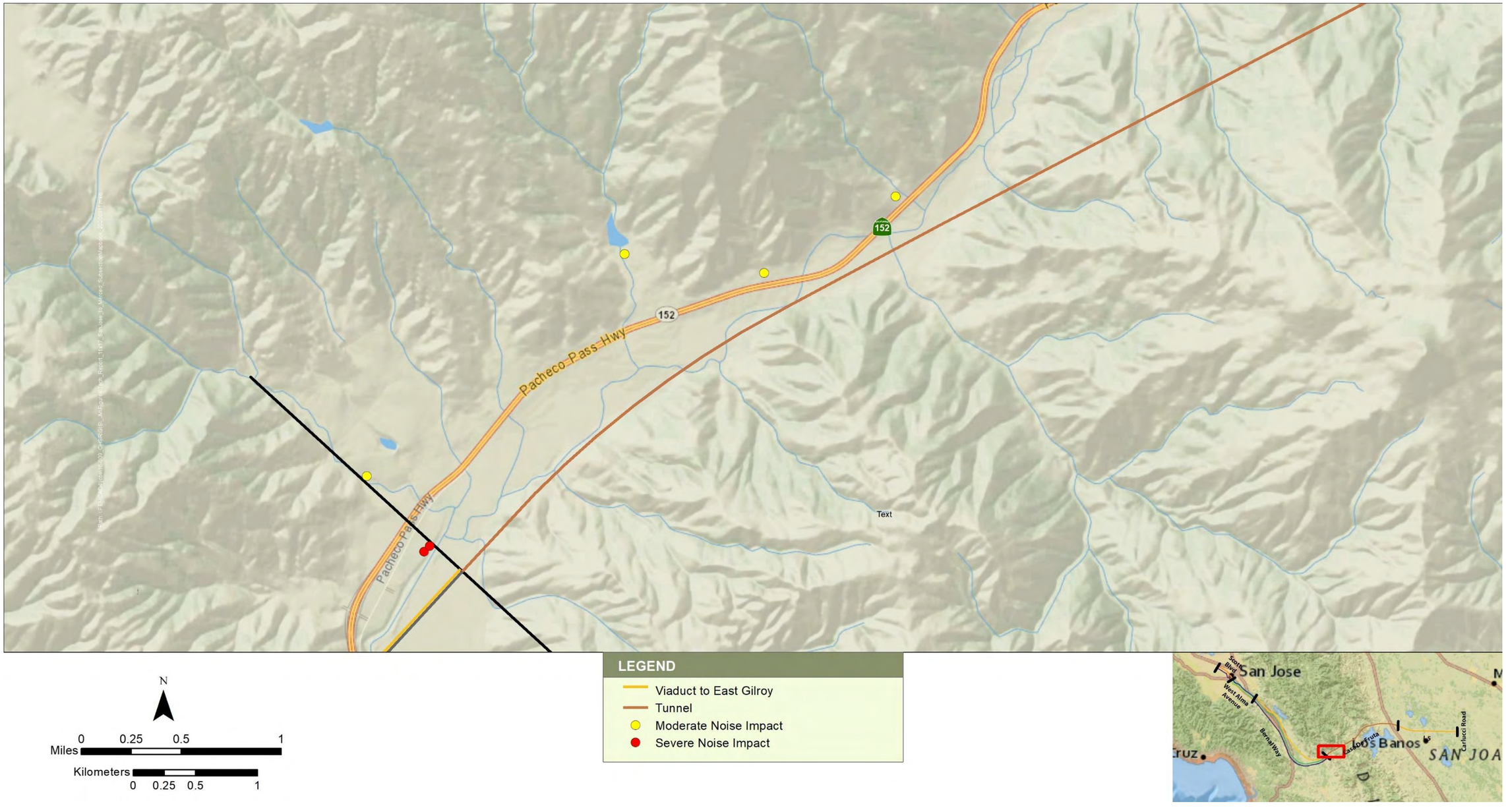


Figure C-62 2040 Plus Project Noise Impacts—Alternative 3 without the Tunnel Design Variant

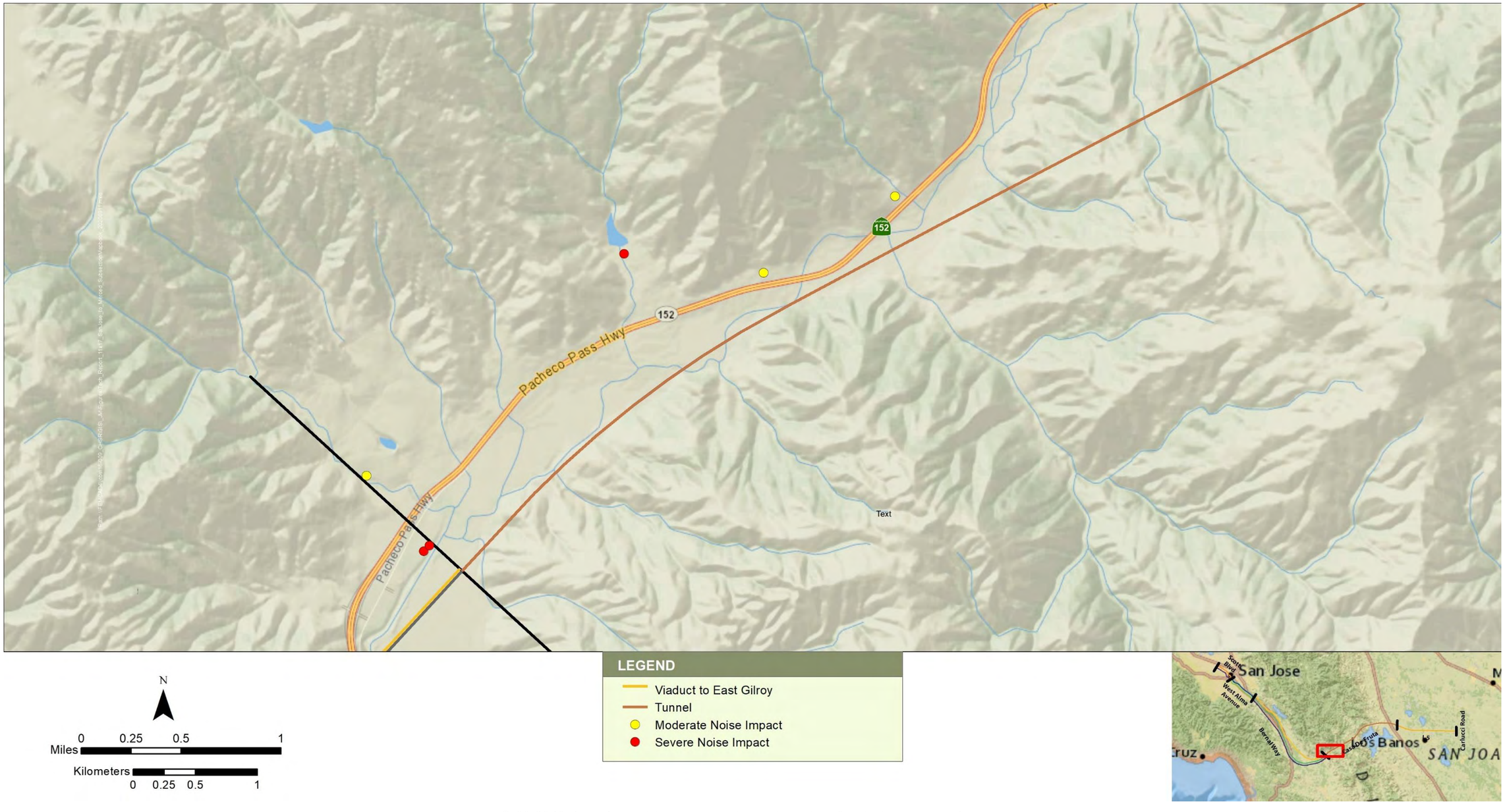


Figure C-63 2040 Plus Project Noise Impacts—Alternative 3 with the Tunnel Design Variant

Santa Clara
San Jose
Norman Y Mineta San Jose Int'l
Santa Clara University
Santa Clara Catholic Cemetery
San Jose Municipal Golf Course
Watson Park
Overfelt Gardens
Coyote Creek
Guadalupe Pky
Guadalupe River Trl
Airport Blvd
Ewert Rd
Gateway Pl
Onel Dr
Terminal Ave
San Juan Ave
Commercial St
E Younger Ave
E Hedding St
W Hedding St
W Mission St
E Empire St
E St James St
W St John St
Reed St
Richard Ave
Robert Ave
Memorex Dr
Brokaw Rd
Aviation Ave
Arnold Ave
Ruff Dr
Bray Ave
Anna Dr
Butte St
Walsh Ave
Mead Ave
Karen Dr
Tulip Rd
Park Ave
Myrtle St
Davis St
Devine St
Charles St
E Gish Rd
Oakland Rd
Mabury Rd
N King Rd
Las Plumas Ave
Lenfest Rd
Luby Dr
Pacheco Dr
Rinehart Dr
Bonita Ave
Balboa Ave
Stowe Ave
Alum Rock
Scott Blvd
Lafayette St
Main St
Lincoln St
Fremont St
Franklin St
Jackson St
Madison St
Monroe St
Circle Dr
College Ave
Hillmar St
Maria St
Robin Dr
Bohannon Dr
Los Olivos Dr
Bucher Ave
Fairlane Ave
Kiely Blvd
Central Park
Graham Ln
Bowe Ave
Wade Ave
Francis Ave
Augusta Pl
Quinn Ave
Gail Dr
South Dr
Saratoga Creek
Alfred St
Olcott St
Guadalupe Mine
N 1st St
Bering Dr
Rogers Ave
Junction Ave
Ridder Park Dr
B Ln
Targate Ct
Lundy Ave
Junesong Way
Ensign Way
N Jackson Ave
Ribsi Cir
Mabury Rd
Coyote Creek
Commercial St
E Younger Ave
E Hedding St
N 10th St
N 12th St
N 16th St
N 19th St
N 21st St
Vestal St
West Ct
N 6th St
N 5th St
N 3rd St
N 4th St
N 8th St
N 27th St
N 33rd St
N 34th St
S 28th St
S 23rd St
S 21st St
S 17th St
S 14th St
S 15th
S 34th St
Louis St
Sonora Ave
Ruff Dr
Guadalupe Pky
San Pedro St
Text
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Townsend Ave
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N Jackson Ave
Mabury Rd
Pacheco Dr
Rinehart Dr
Luby Dr
Overfelt Gardens
Las Plumas Ave
Lenfest Rd
N King Rd
Coyote Creek
Commercial St
Charles St
E Gish Rd
Oakland Rd
B Ln
Ridder Park Dr
Junction Ave
Rogers Ave
Bering Dr
N 1st St
Guadalupe Mine
Onel Dr
Gateway Pl
Airport Blvd
Ewert Rd
Terminal Ave
Guadalupe Pky
San Juan Ave
Arnold Ave
Ruff Dr
Aviation Ave
Brokaw Rd
Reed St
Lafayette St
Main St
Memorex Dr
Robert Ave
Richard Ave
Walsh Ave
Mead Ave
Bray Ave
Anna Dr
Butte St
Fremont St
Franklin St
Jackson St
Madison St
Monroe St
Circle Dr
College Ave
Hillmar St
Maria St
Robin Dr
Bohannon Dr
Los Olivos Dr
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Fairlane Ave
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Graham Ln
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Francis Ave
Augusta Pl
Quinn Ave
Gail Dr
South Dr
Saratoga Creek
Alfred St
Olcott St
Scott Blvd
Long St
Lincoln St
Chapel Dr
Karen Dr
Tulip Rd
Park Ave
Myrtle St
Davis St
Devine St
Charles St
E Gish Rd
Oakland Rd
Mabury Rd
N King Rd
Las Plumas Ave
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Pacheco Dr
Rinehart Dr
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West Ct
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N 5th St
N 3rd St
N 4th St
N 8th St
N 27th St
N 33rd St
N 34th St
S 28th St
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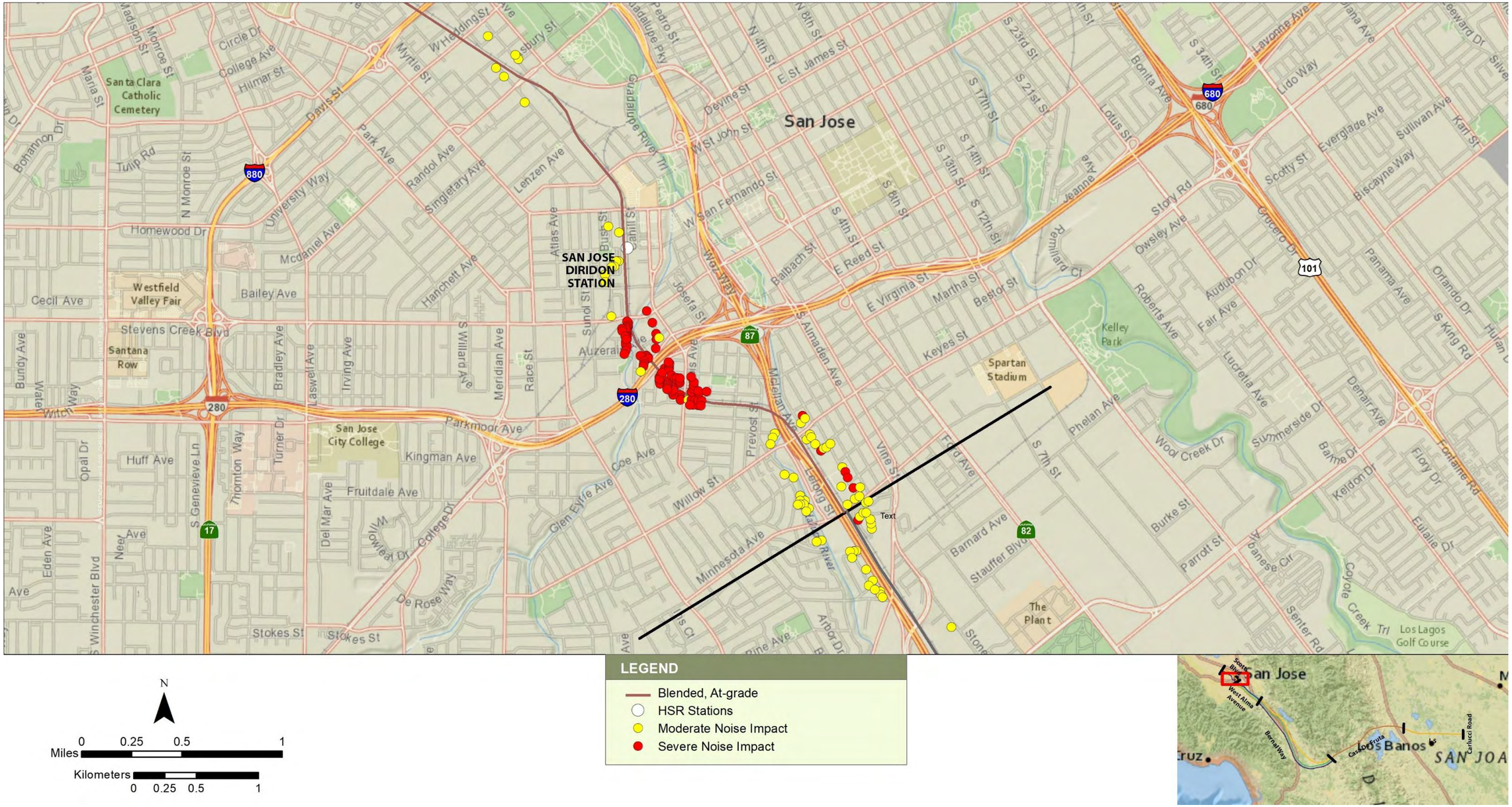


Figure C-65 2040 Plus Project Noise Impacts—Alternative 4

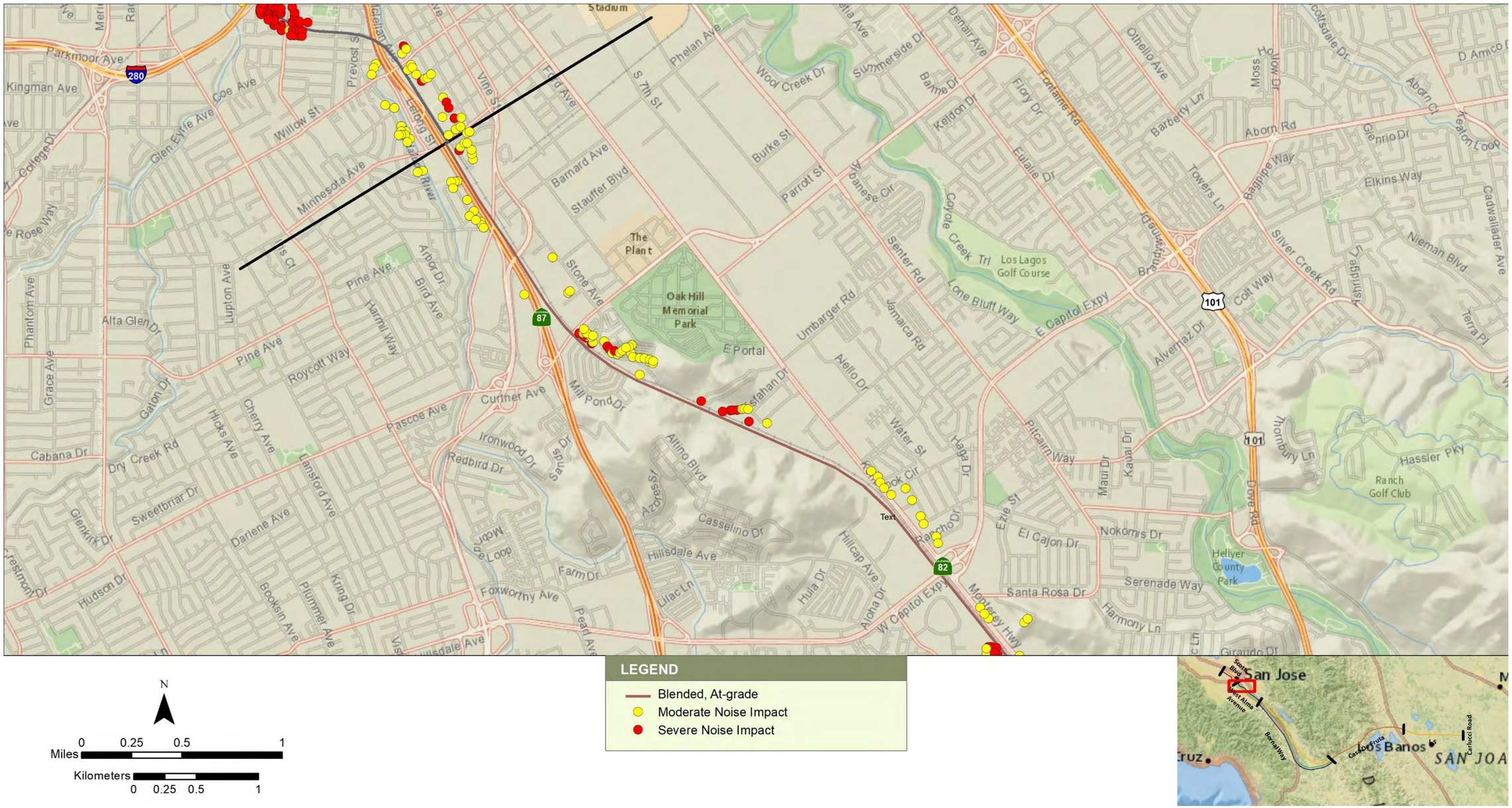


Figure C-66 2040 Plus Project Noise Impacts—Alternative 4

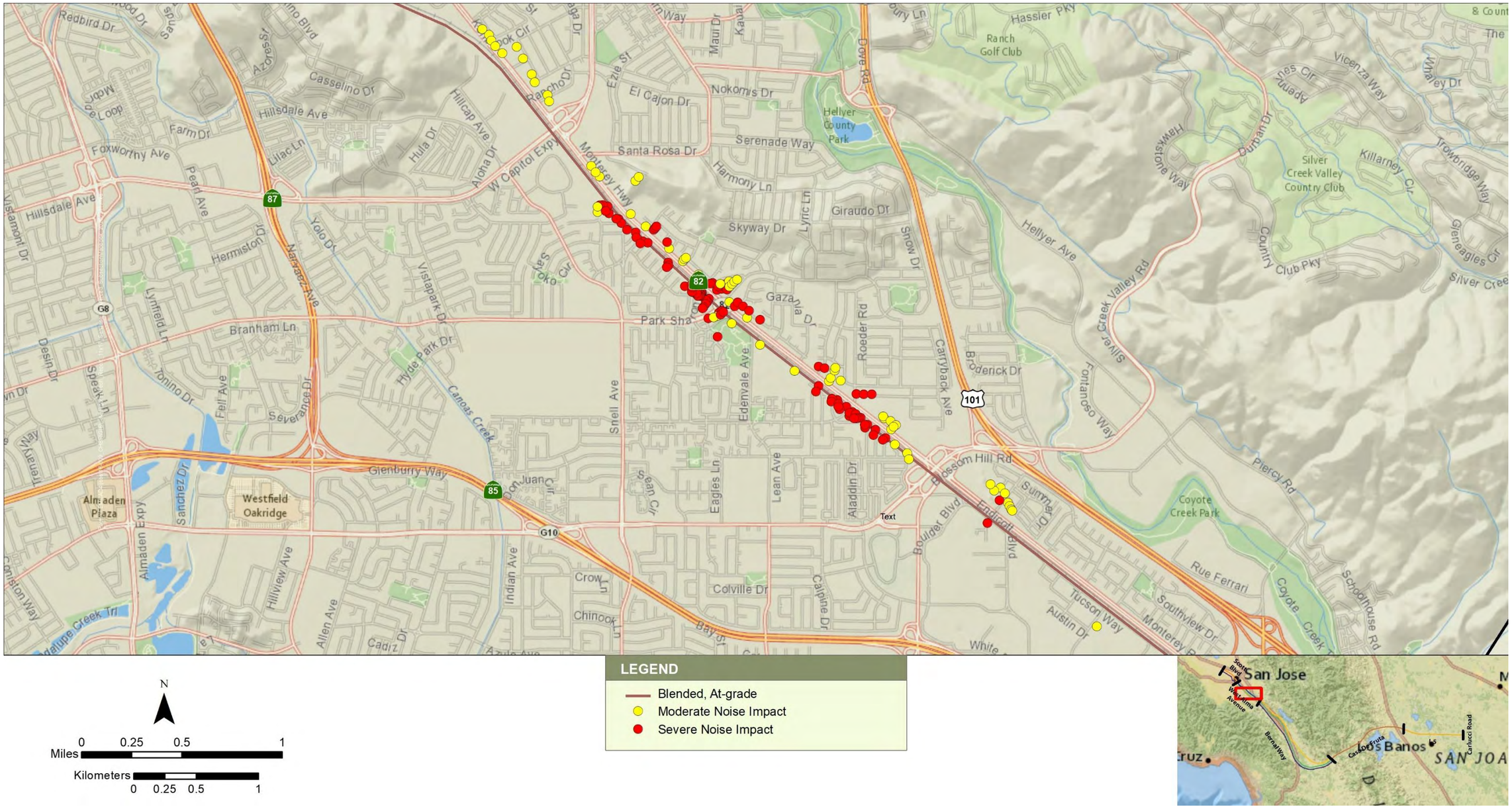
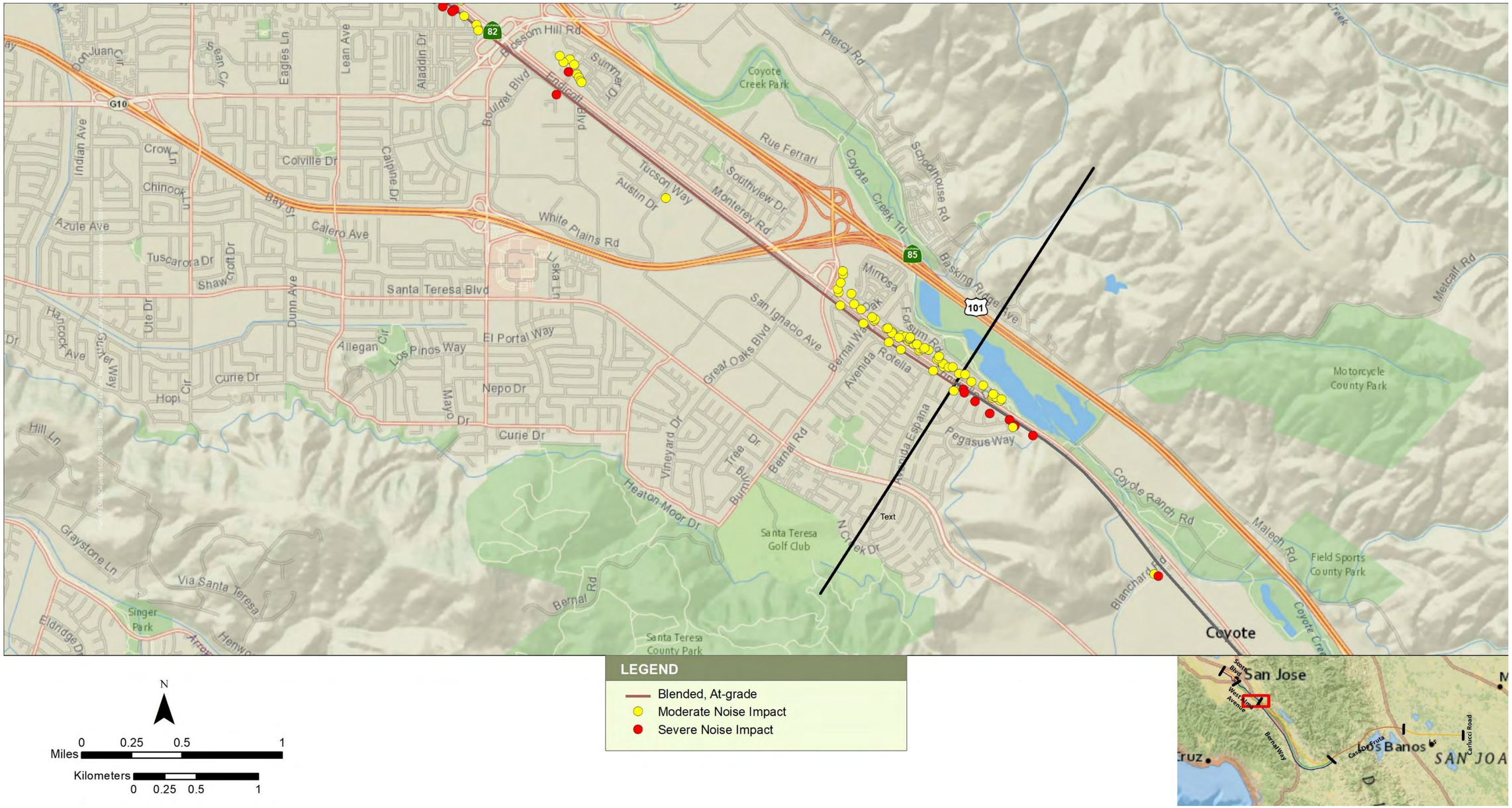


Figure C-67 2040 Plus Project Noise Impacts—Alternative 4



N

0 0.25 0.5 1
Miles

Kilometers
0 0.25 0.5 1

LEGEND

- Blended, At-grade
- Moderate Noise Impact
- Severe Noise Impact

Figure C-68 2040 Plus Project Noise Impacts—Alternative 4

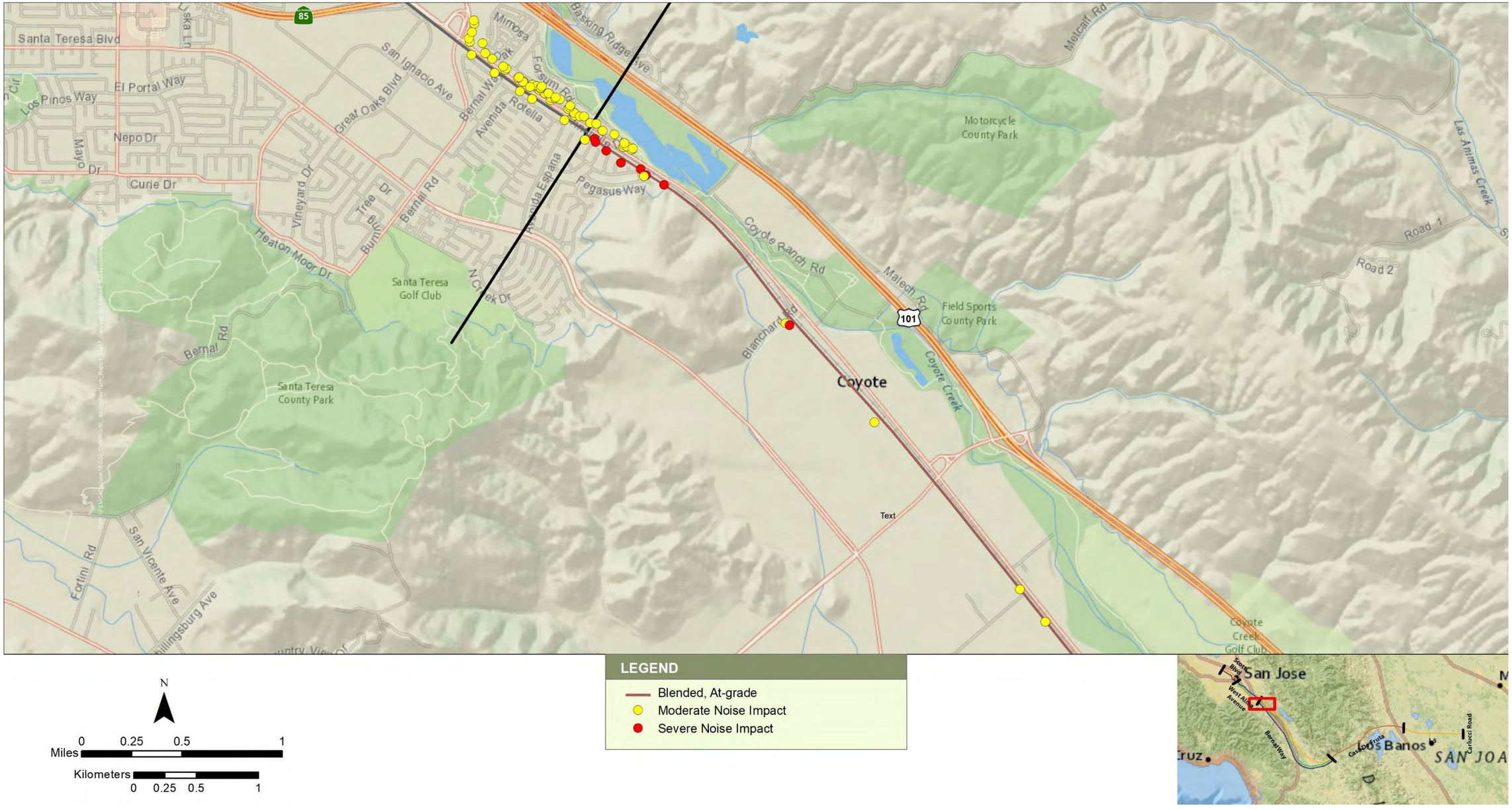


Figure C-69 2040 Plus Project Noise Impacts—Alternative 4

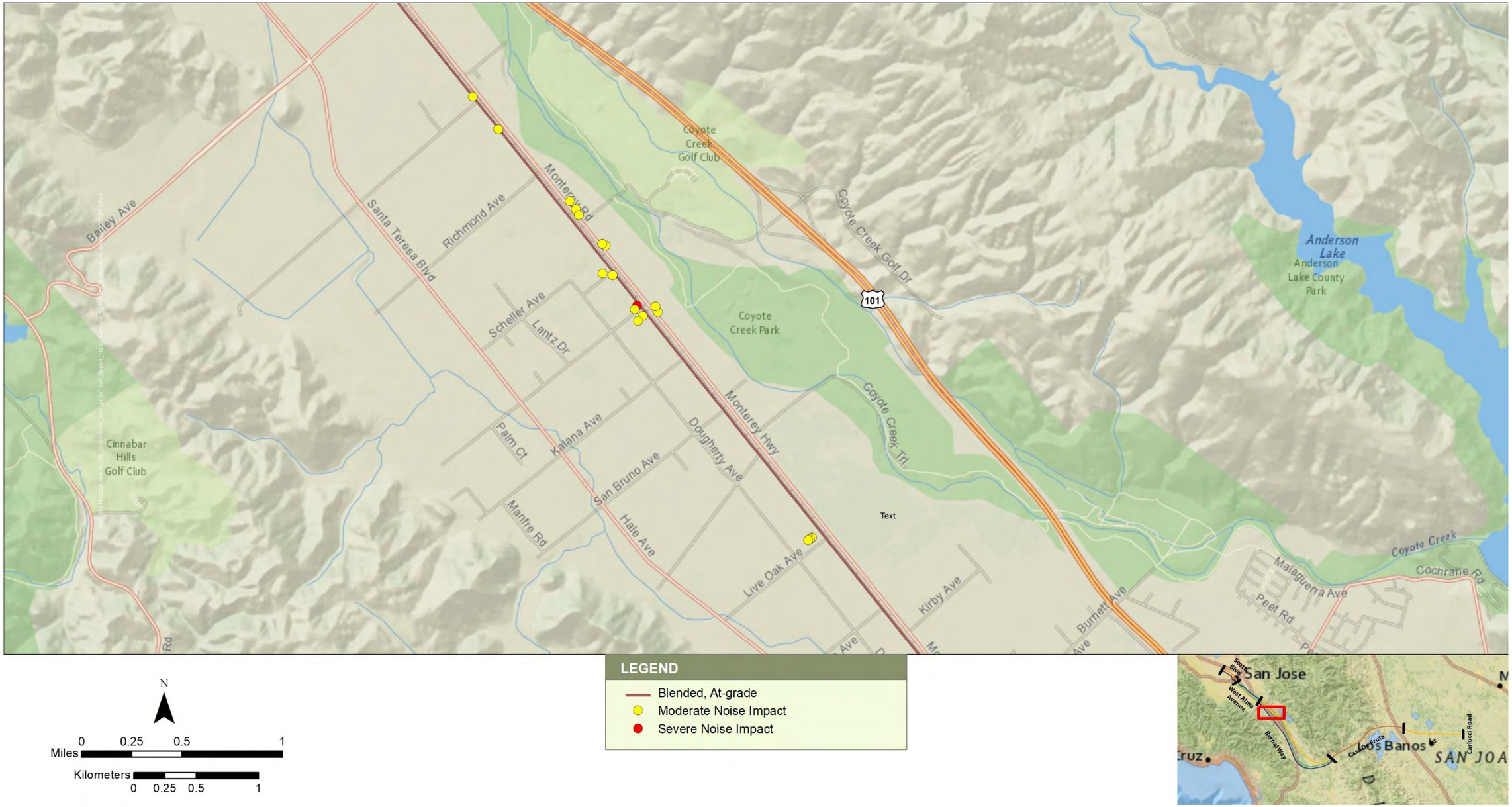


Figure C-70 2040 Plus Project Noise Impacts—Alternative 4

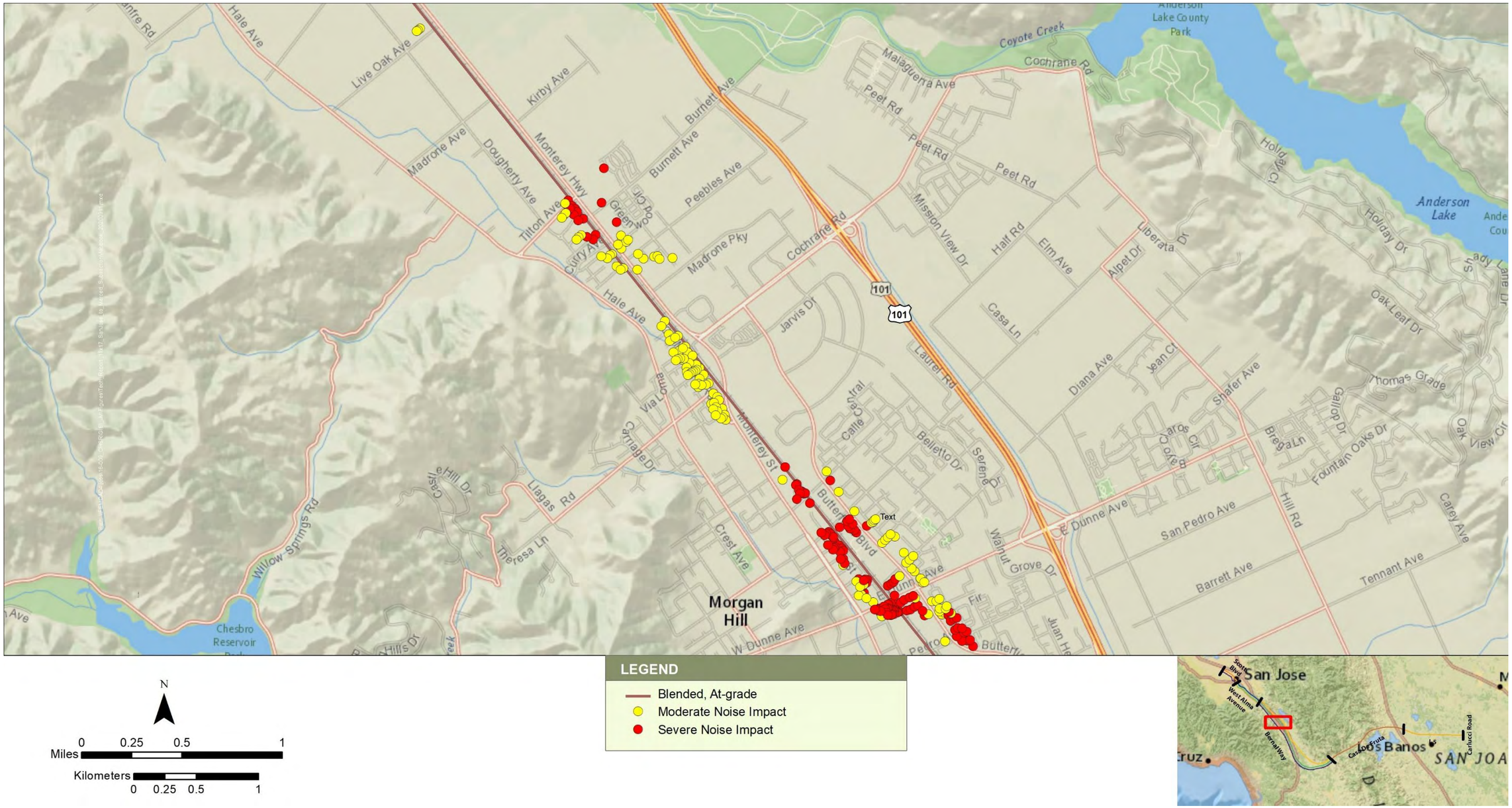


Figure C-71 2040 Plus Project Noise Impacts—Alternative 4

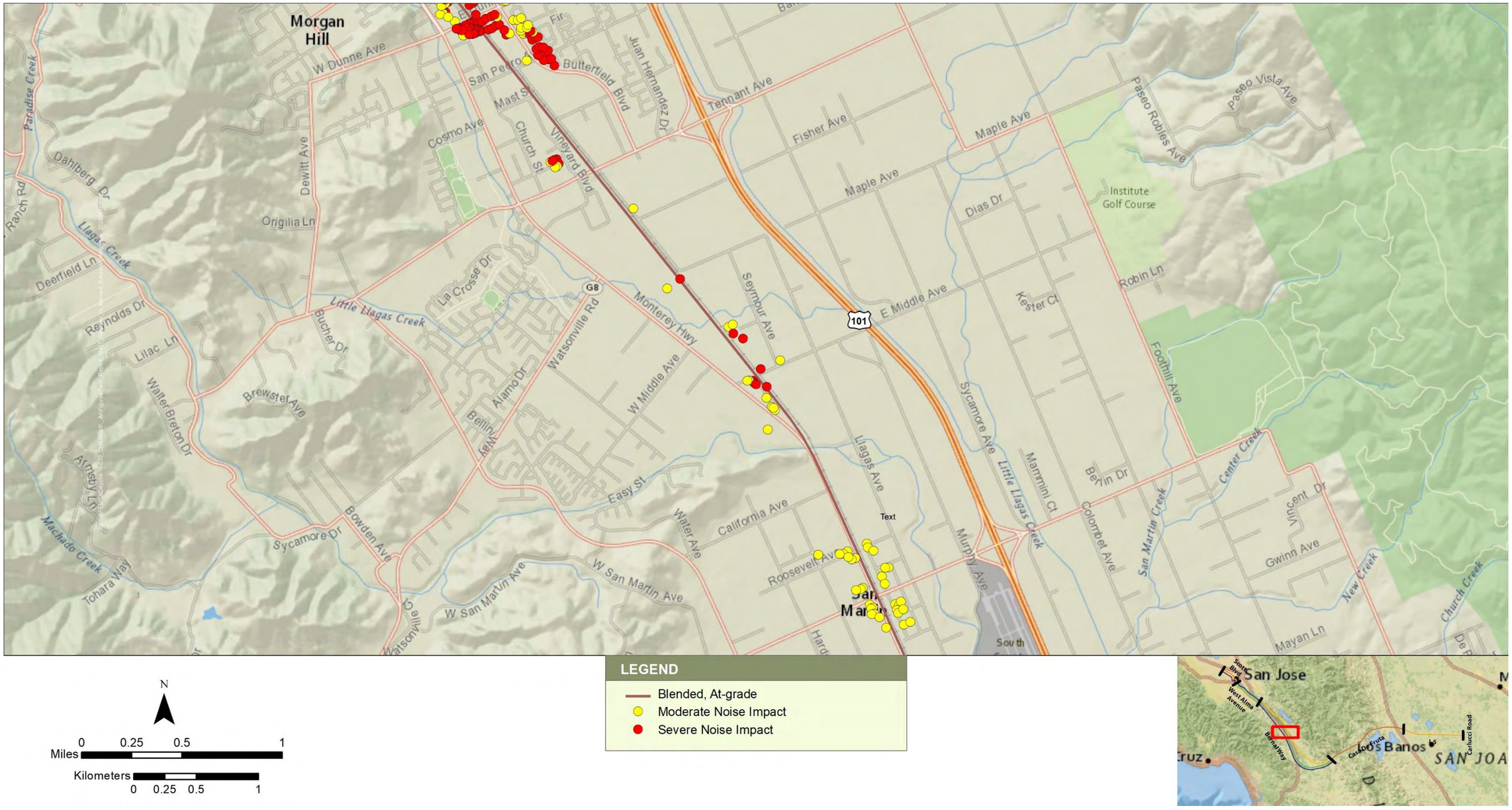
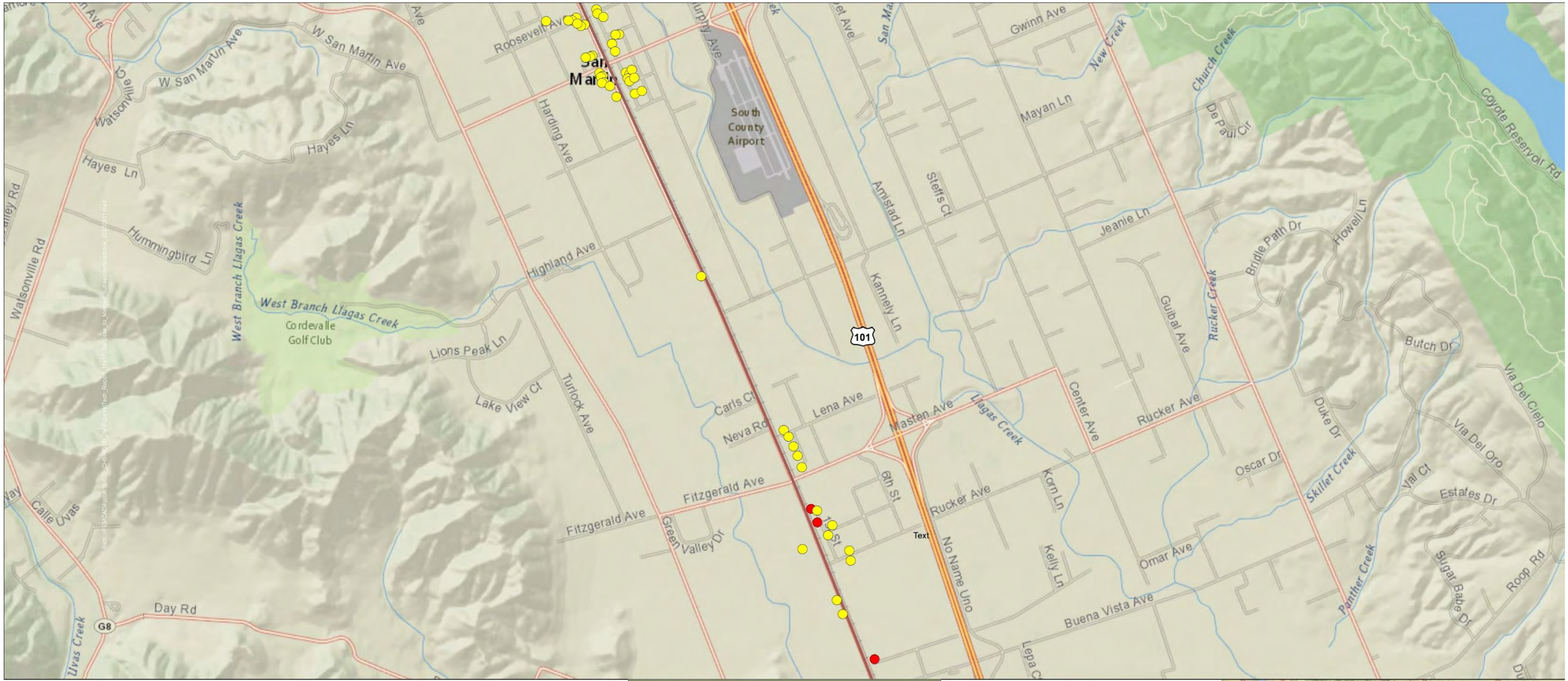
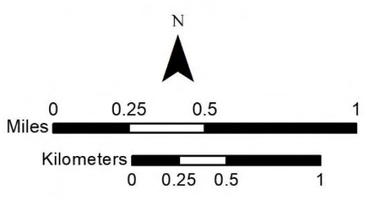
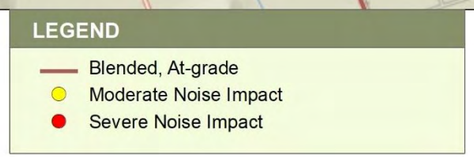


Figure C-72 2040 Plus Project Noise Impacts—Alternative 4







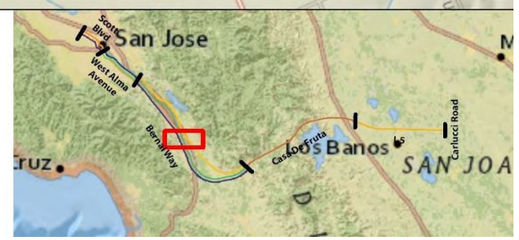


Figure C-73 2040 Plus Project Noise Impacts—Alternative 4

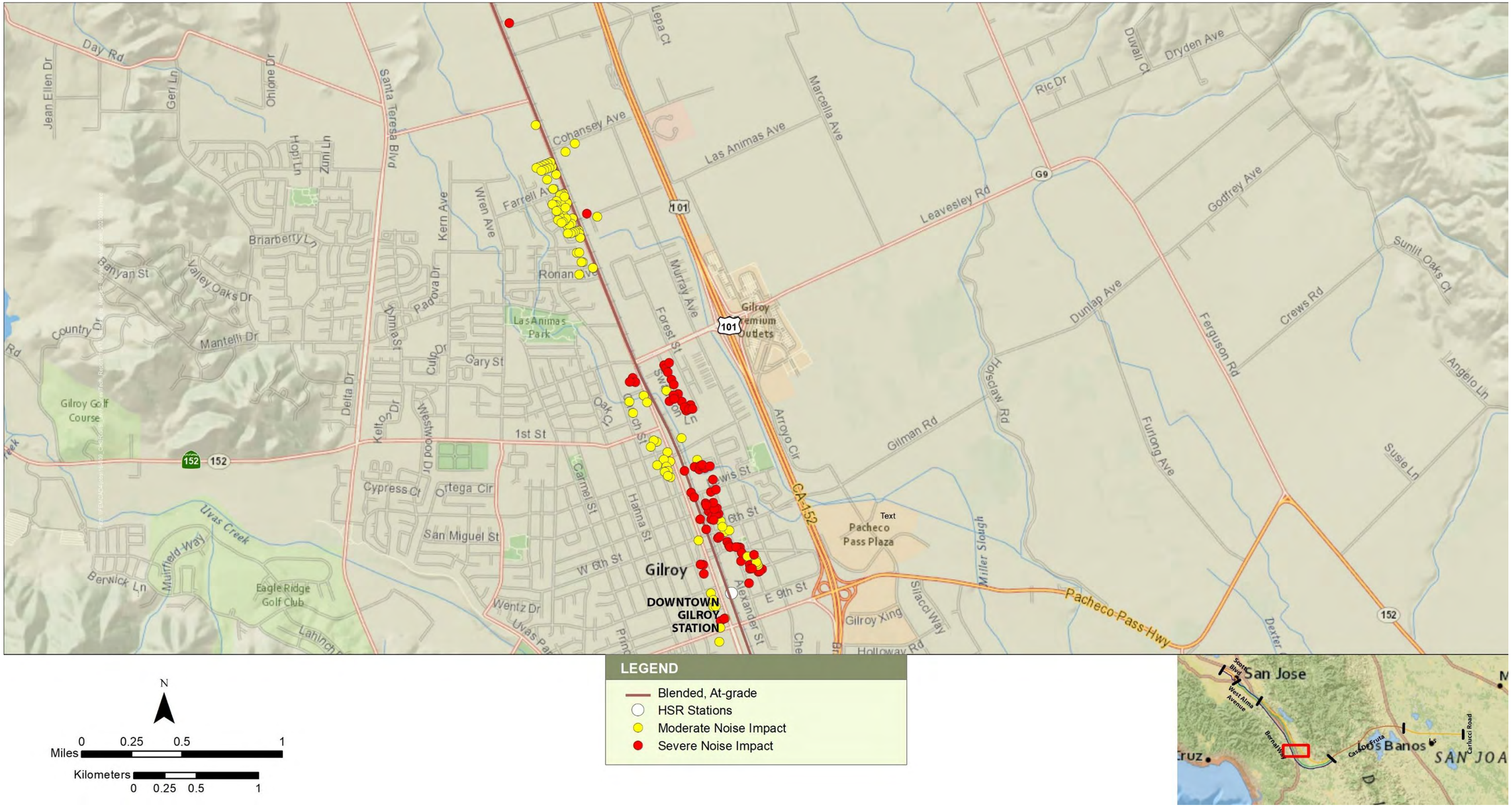


Figure C-74 2040 Plus Project Noise Impacts—Alternative 4

Figure C-75 2040 Plus Project Noise Impacts—Alternative 4 without the Tunnel Design Variant

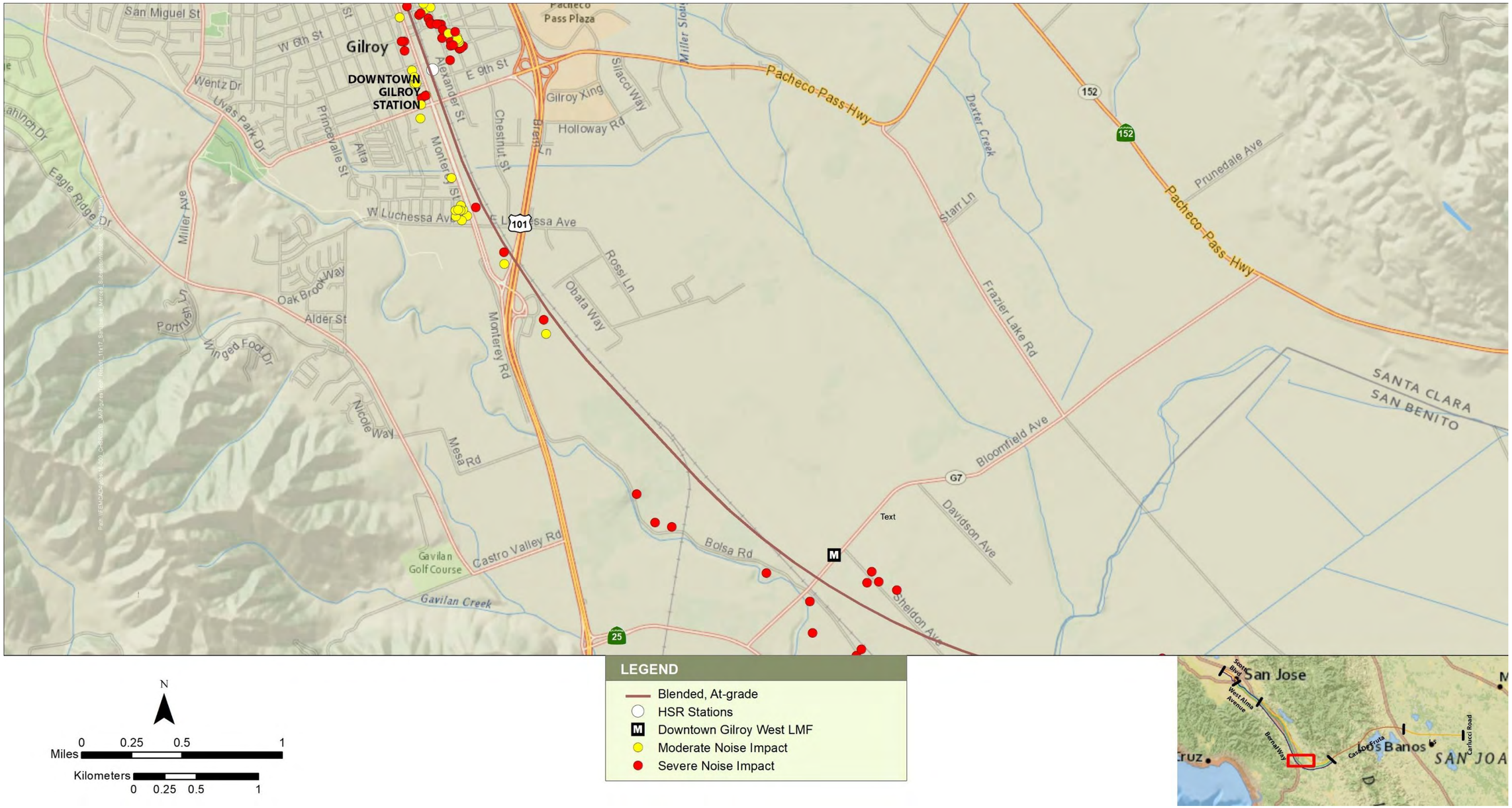


Figure C-76 2040 Plus Project Noise Impacts—Alternative 4 with the Tunnel Design Variant

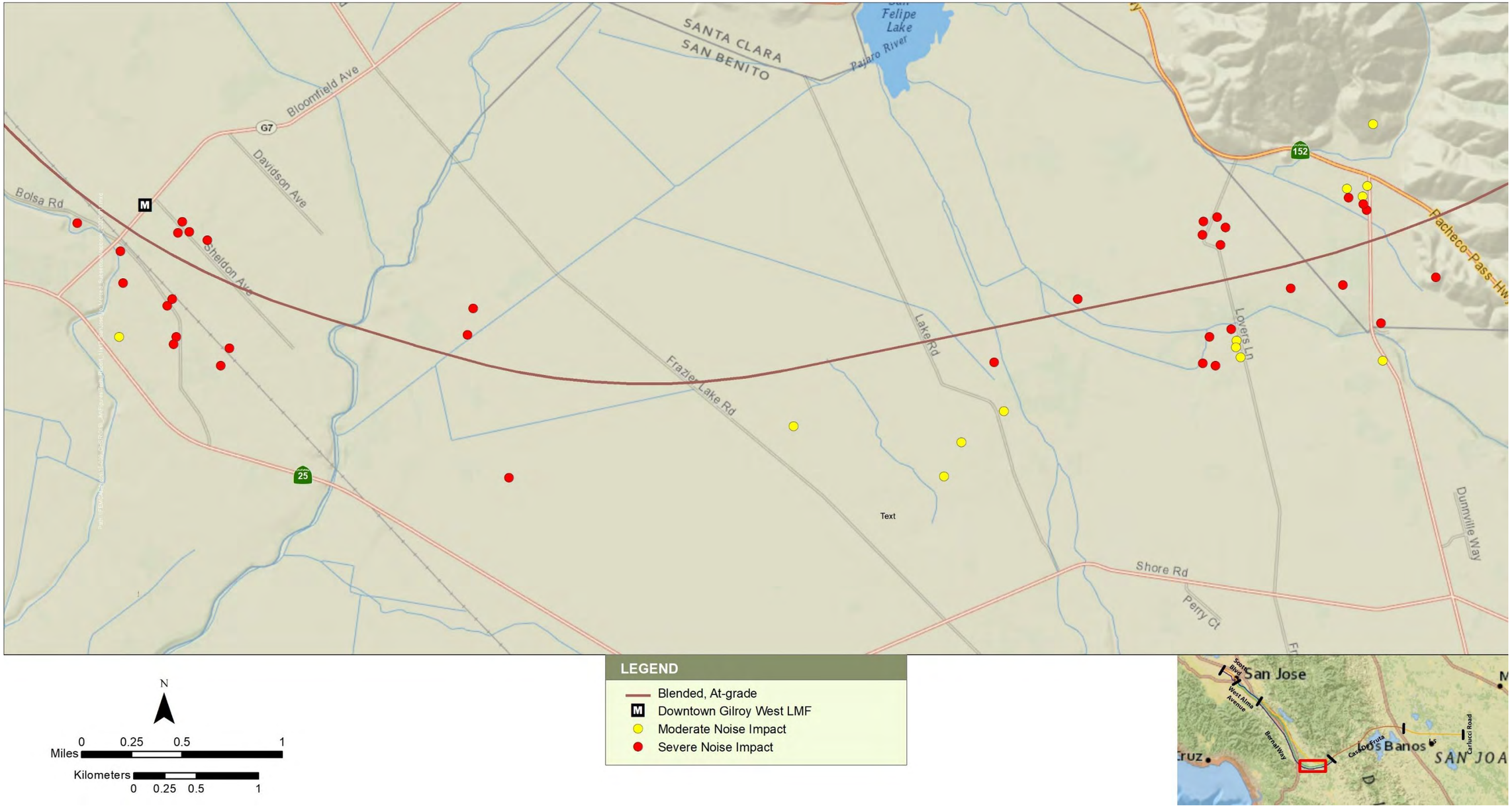


Figure C-77 2040 Plus Project Noise Impacts—Alternative 4 without the Tunnel Design Variant

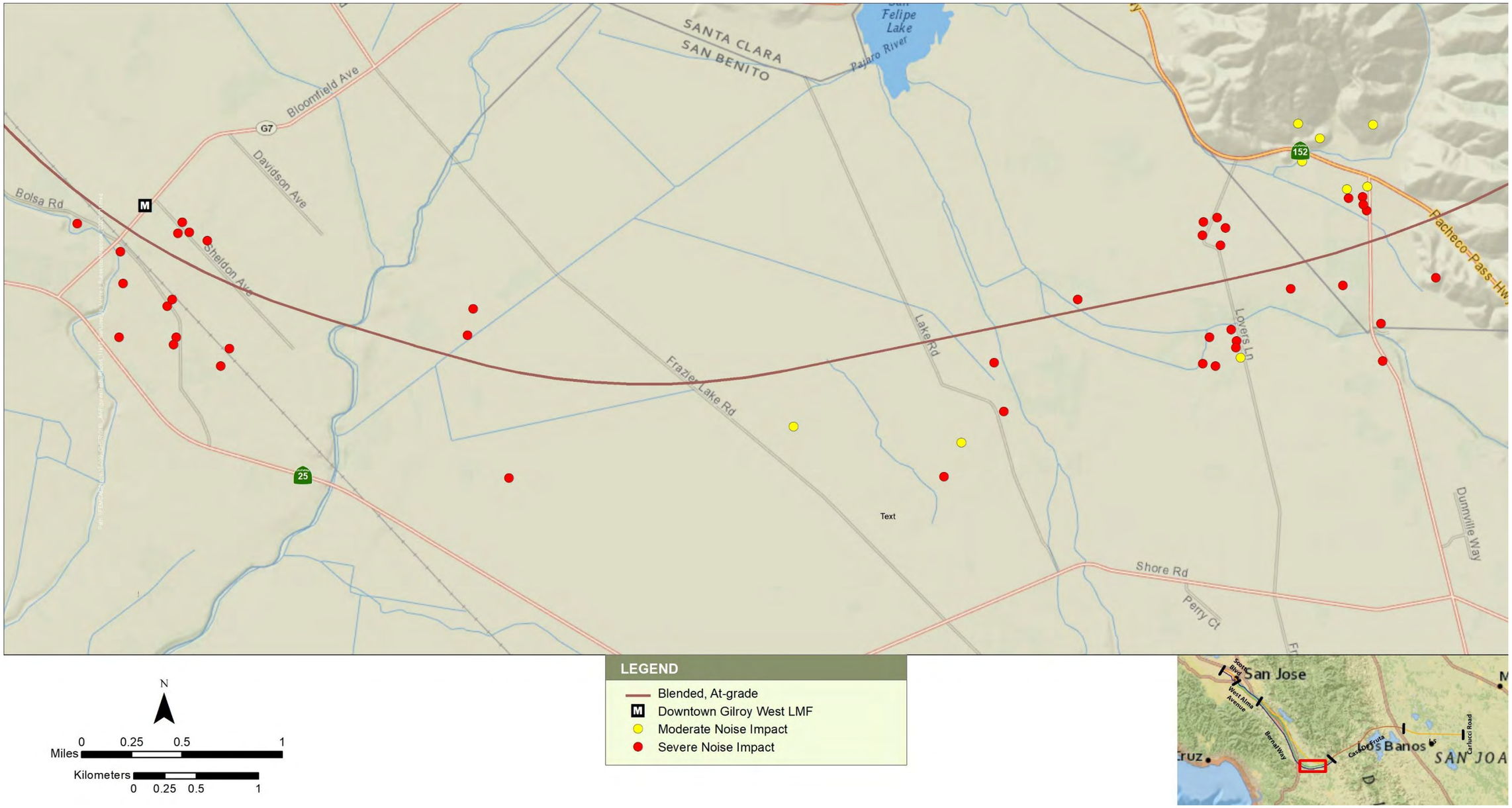


Figure C-78 2040 Plus Project Noise Impacts—Alternative 4 with the Tunnel Design Variant

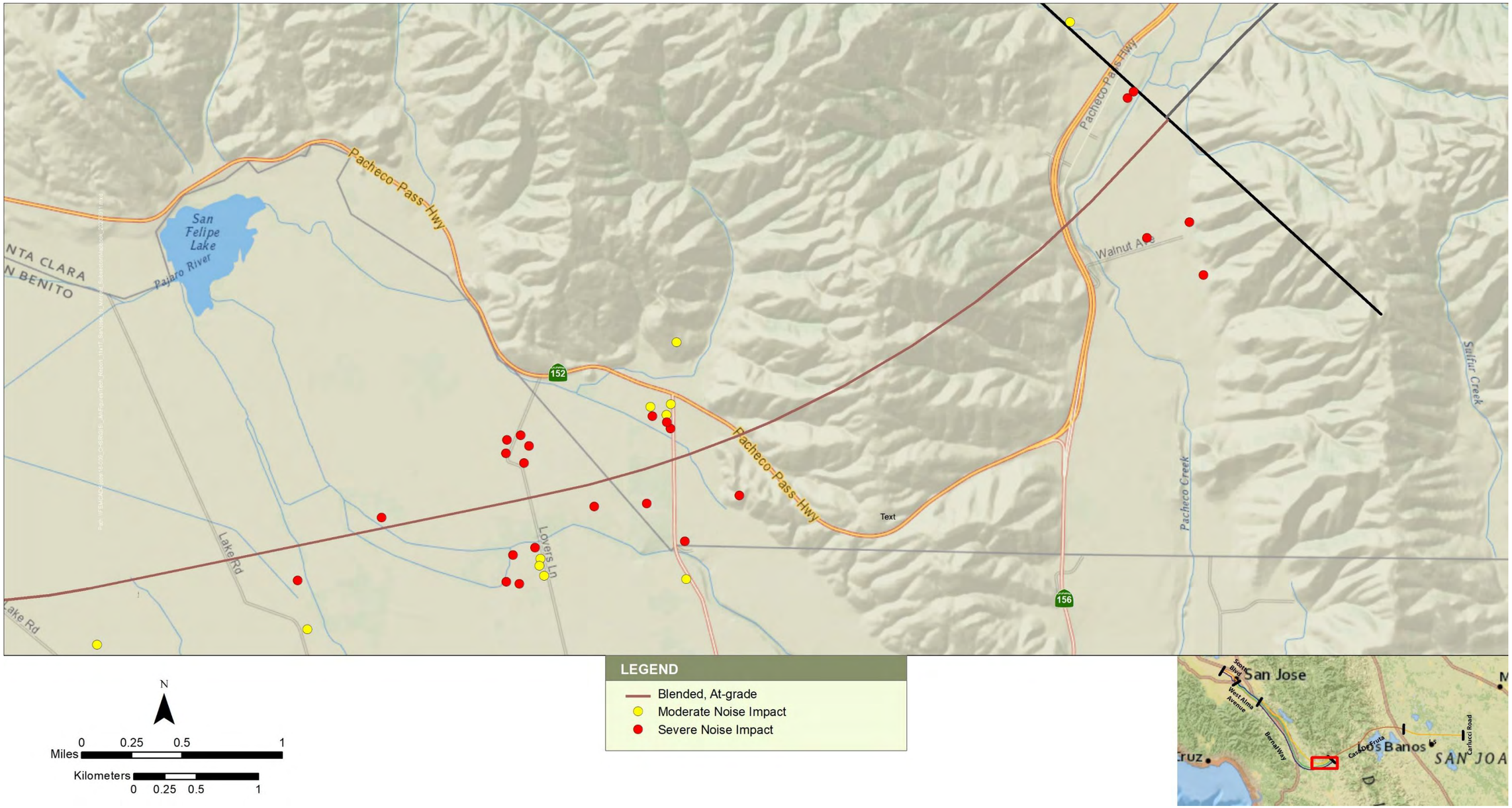


Figure C-79 2040 Plus Project Noise Impacts—Alternative 4 without the Tunnel Design Variant

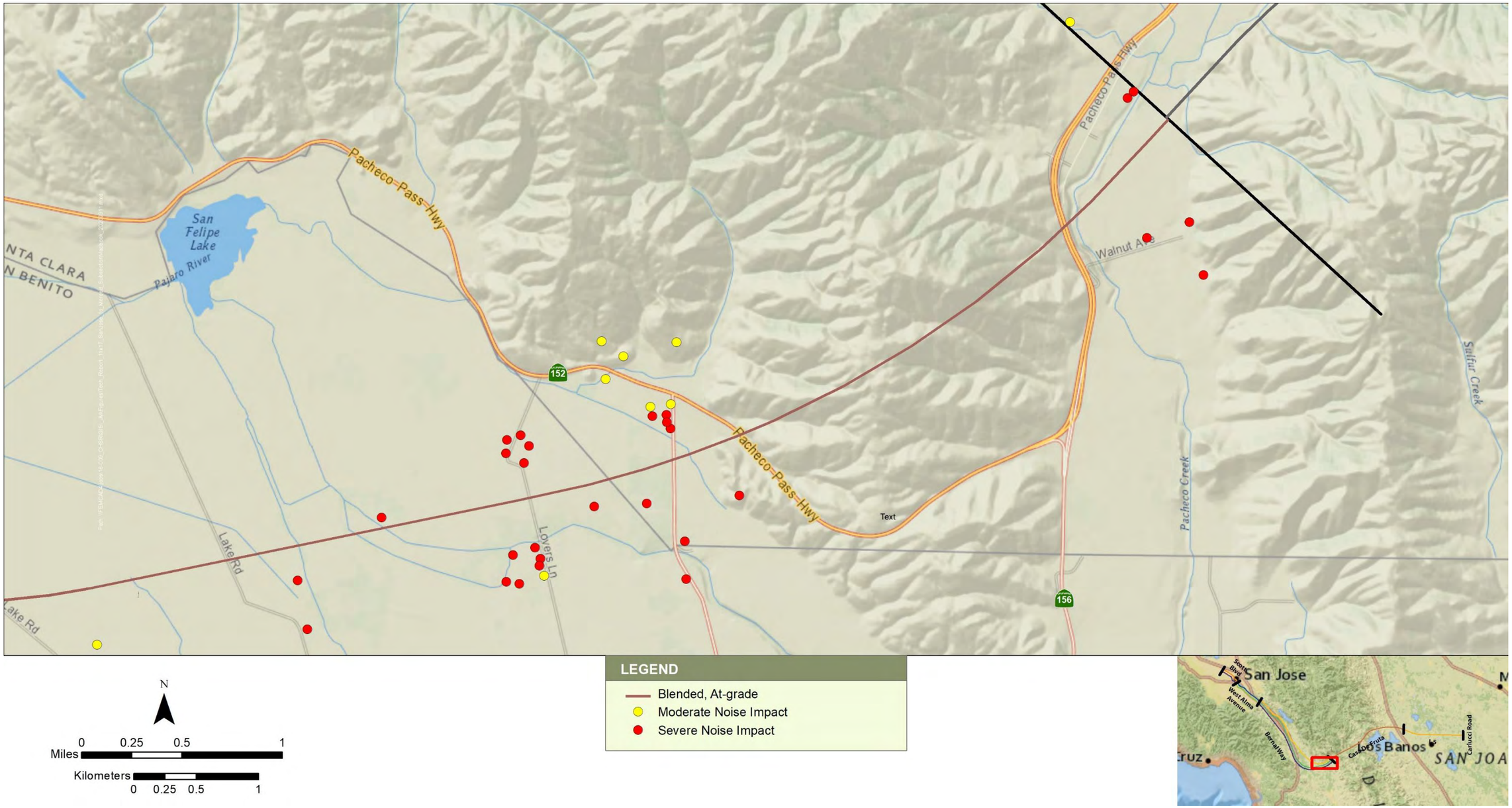


Figure C-80 2040 Plus Project Noise Impacts—Alternative 4 with the Tunnel Design Variant

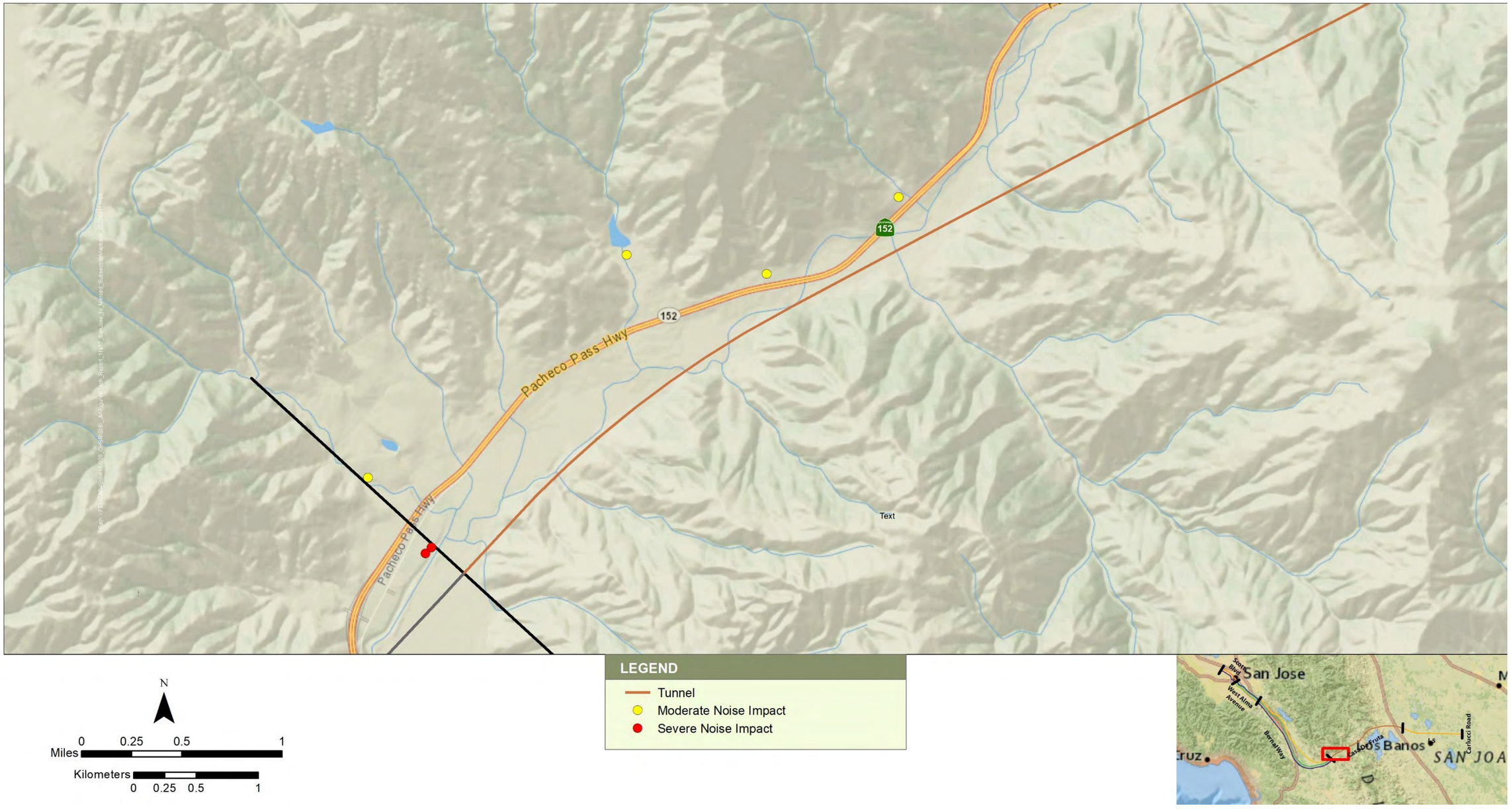


Figure C-81 2040 Plus Project Noise Impacts—Alternative 4 without the Tunnel Design Variant

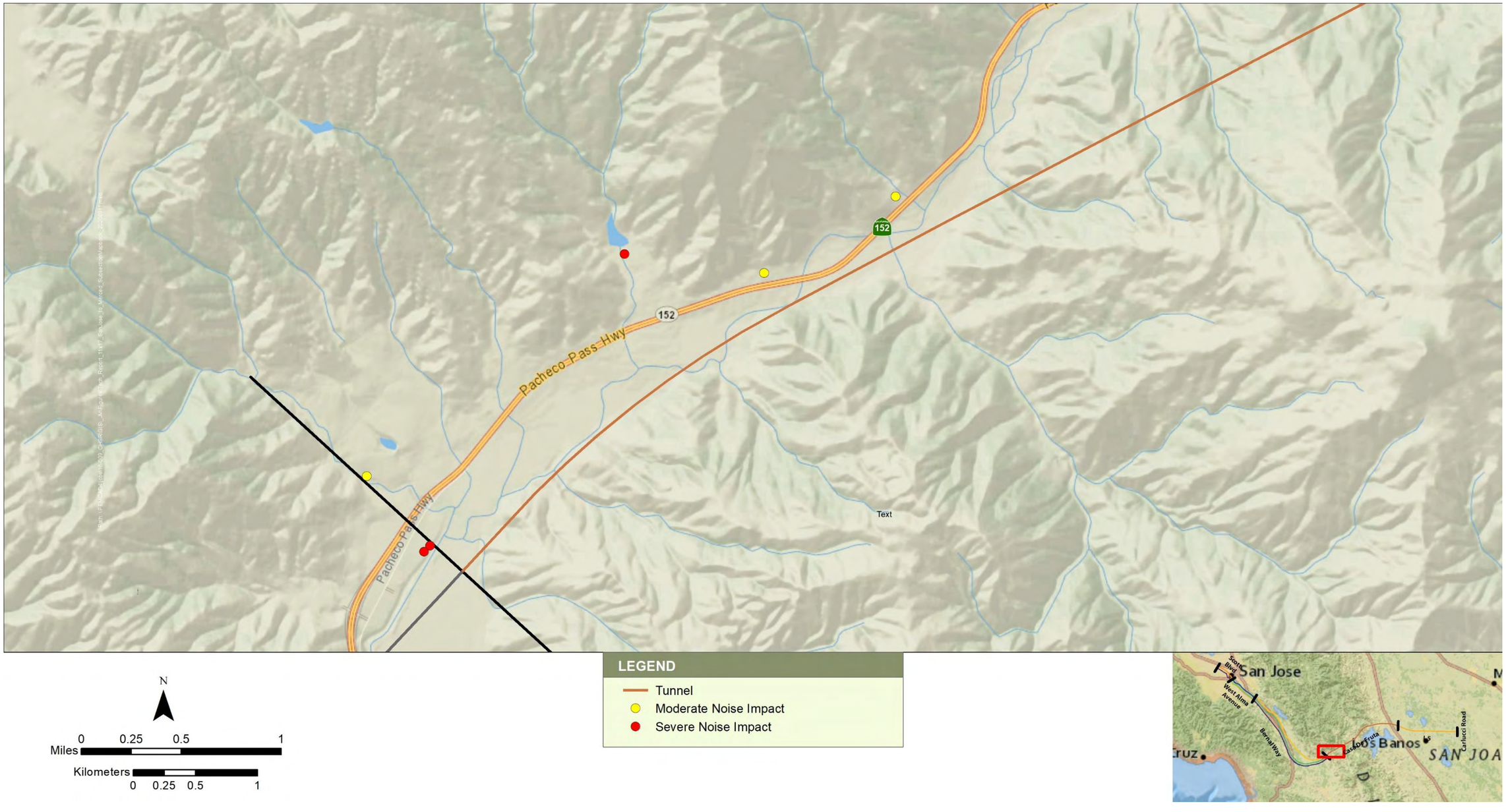


Figure C-82 2040 Plus Project Noise Impacts—Alternative 4 with the Tunnel Design Variant

2040 PLUS PROJECT PROPOSED NOISE BARRIERS AND RESIDUAL NOISE IMPACTS

Figure C-83 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 1

Figure C-84 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 1

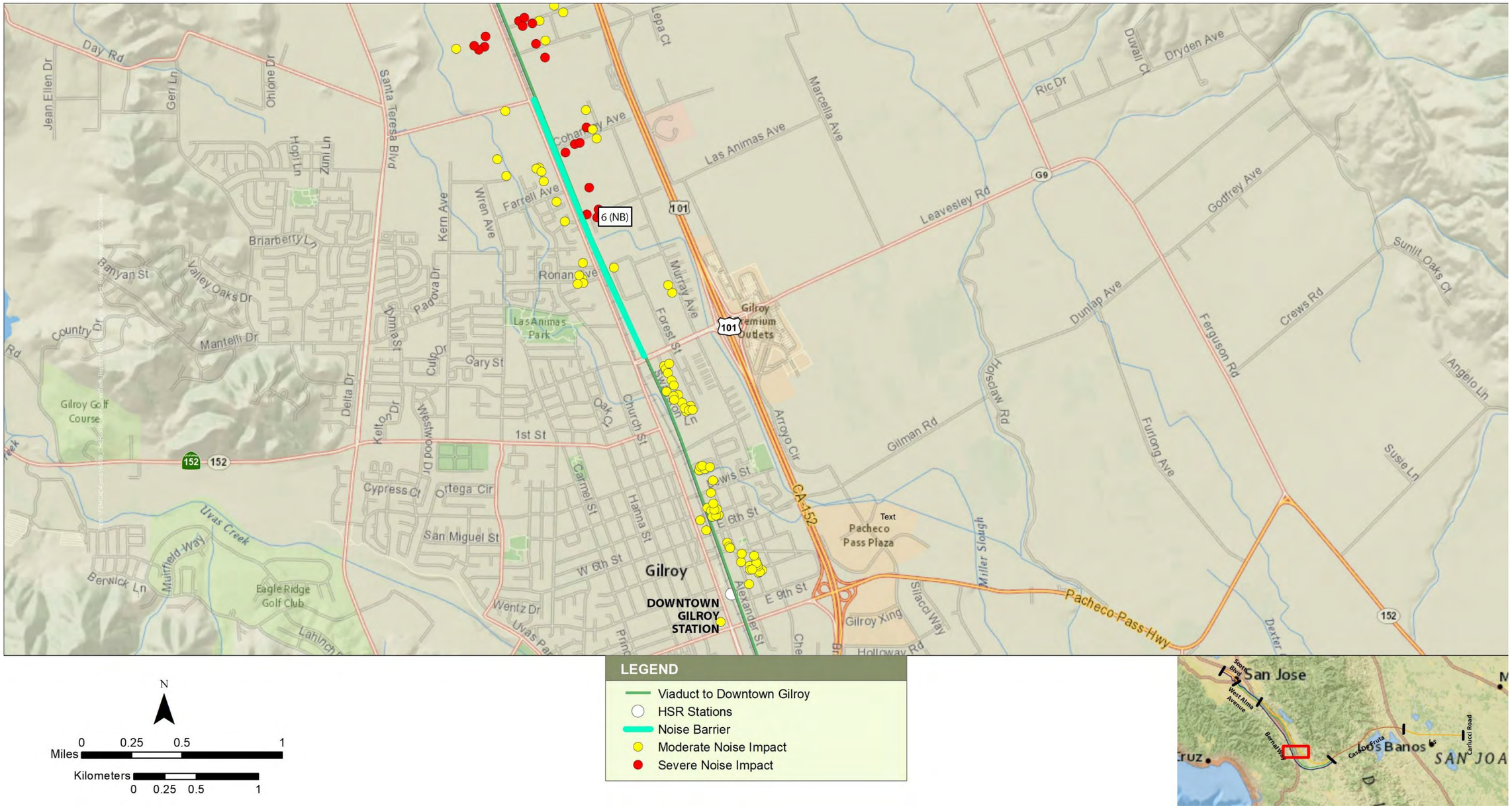


Figure C-85 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 1

Figure C-86 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 2

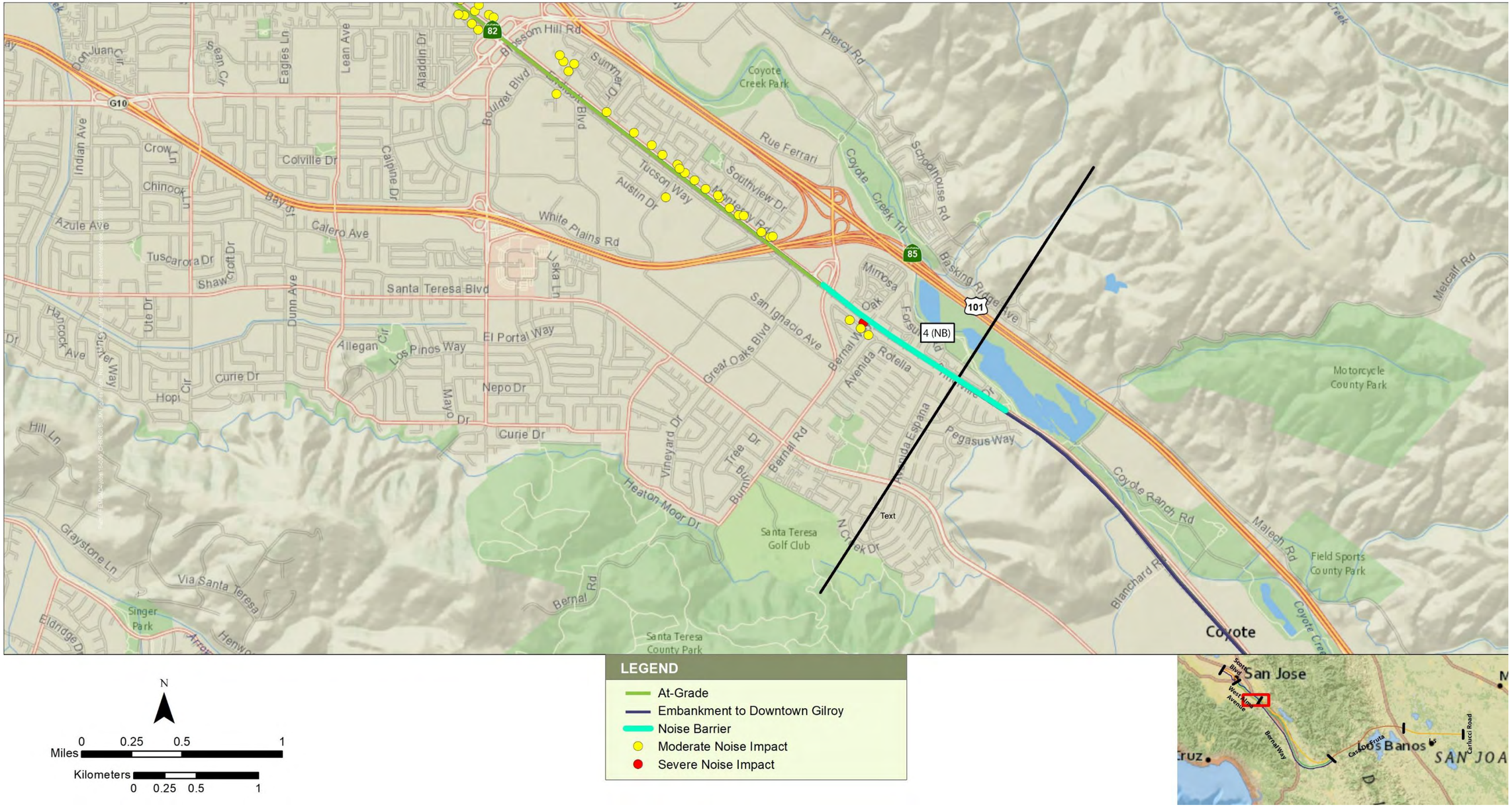


Figure C-87 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 2

Figure C-88 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 2

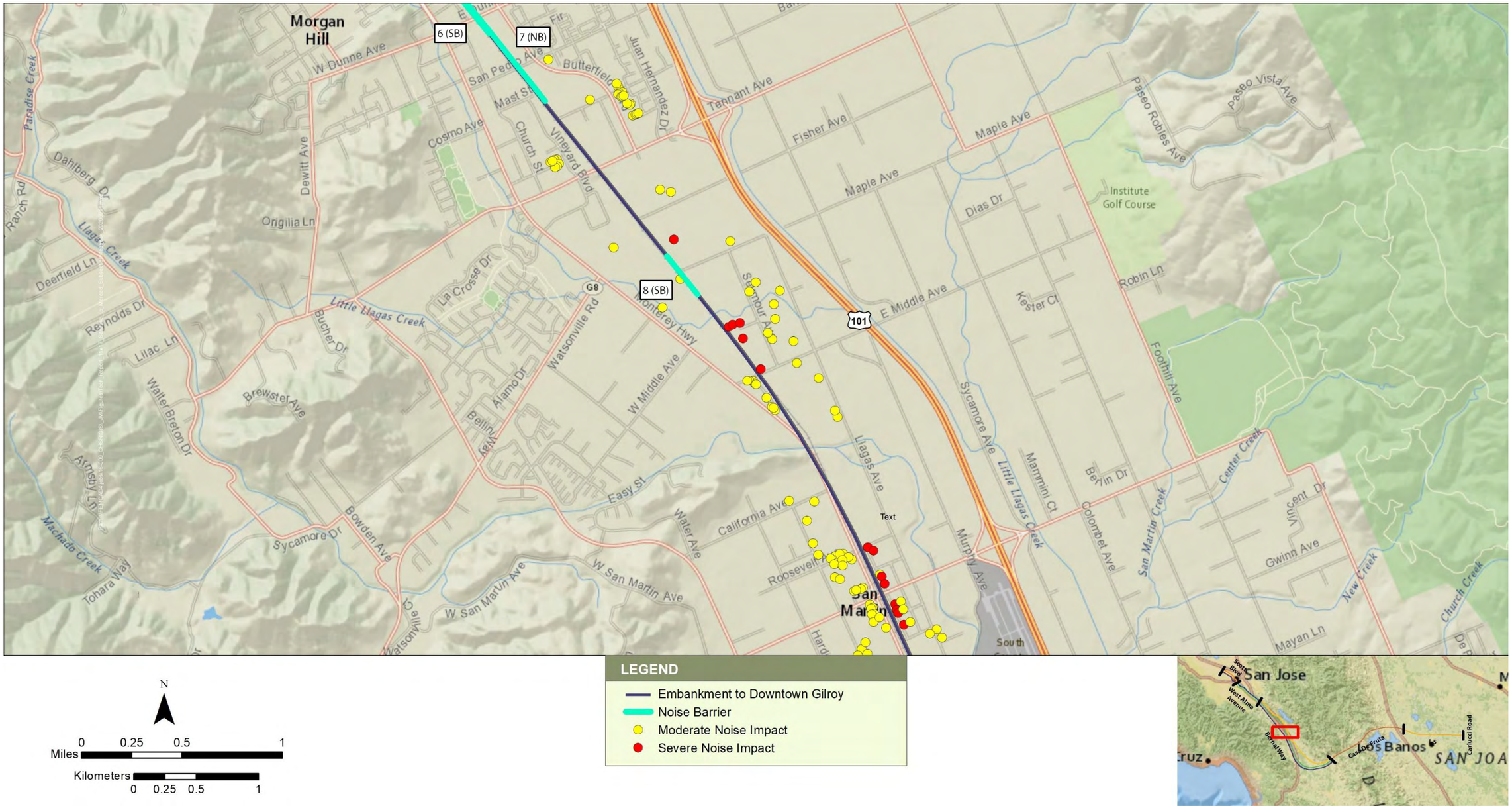


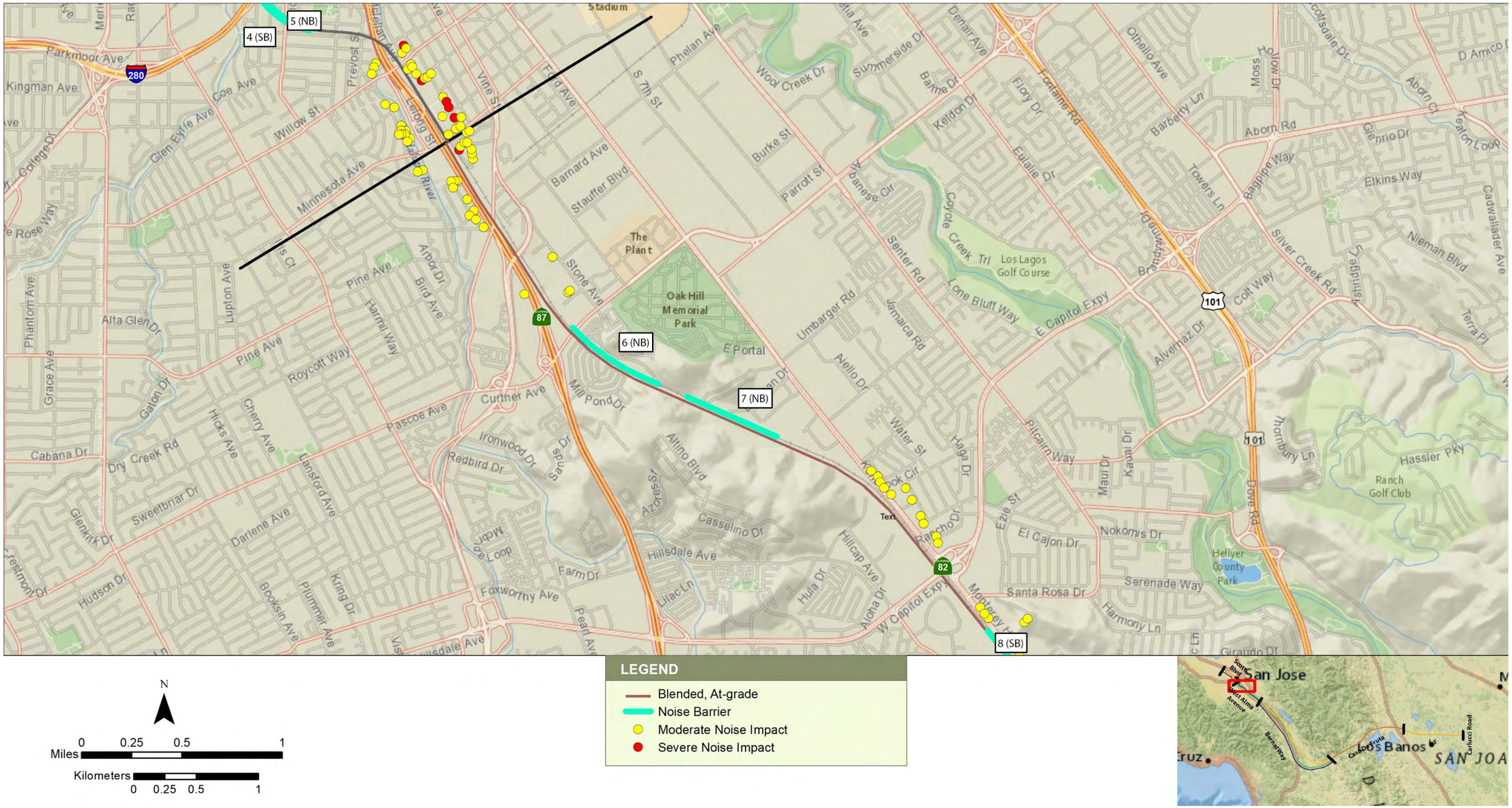
Figure C-89 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 2

Figure C-90 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 2

1 (NB)
2 (SB)
3 (NB)
Text
The Plant
Oak Hill Memorial Park
E Portal
Los Lagos Golf Course
Ranch Golf Club
Hellyer County Park
Parkmoor Ave
Kingman Ave
Coe Ave
Willow St
Minnesota Ave
Glen Eyrie Ave
College Dr
Prevost St
Vine St
Ford Ave
Phelan Ave
S 7th St
Burke St
Parrot St
Barnard Ave
Stauffer Blvd
Stone Ave
Guadalupe River
Lelong St
Pine Ave
Arbor Dr
Bird Ave
Lupton Ave
Alta Glen Dr
Phantom Ave
Grace Ave
Roycott Way
Harmil Way
Galon Dr
Curtner Ave
Pascoe Ave
Ironwood Dr
Redbird Dr
Cabana Dr
Dry Creek Rd
Hicks Ave
Cherry Ave
Lansford Ave
Sweetbriar Dr
Glenkirk Dr
Darlene Ave
Hudson Dr
Crestmont Dr
Booksin Ave
Plummer Ave
King Dr
Foxworthy Ave
Farm Dr
Pearl Ave
Hillsdale Ave
Lilac Ln
Casselino Dr
Azores St
Allino Blvd
Hula Dr
Hillcap Ave
Aloha Dr
Kenbrook Cir
Water St
Haga Dr
Umbarger Rd
Aiello Dr
Jamaica Rd
Santer Rd
Coyote Creek Trl
Lone Bluff Way
E Capitol Expy
W Capitol Expy
Monterey Hwy
Fontaine Rd
Eulalie Dr
Keldon Dr
Barne Dr
Flory Dr
Summerside Dr
Denair Ave
Wool Creek Dr
Othello Ave
Barberry Ln
Towers Ln
Aborn Rd
Bagpipe Way
Elkins Way
Silver Creek Rd
Colt Way
Alvernaz Dr
Pitcairn Way
Maui Dr
Kauai Dr
Thornbury Ln
Hassler Pky
Nokomis Dr
El Cajon Dr
Ezie St
Santa Rosa Dr
Serenade Way
Harmony Ln
Giraudo Dr
Nieman Blvd
Terra Pl
Cadwallader Ave
Aborn Ct
Heaton Loop
Moss Hollow Dr
Scottsdale Dr
D Amico Dr
Enrio Dr
Ashridge Ln
Bramhall Ave
Moorpark Ave
Saratoga Ave
Blossom Hill Rd
Los Gatos Creek Trl
Los Gatos Creek Park
Lincoln Ave
Meridian Ave
Almaden Expy
Camden Ave
Curtner Ave
Capitol Expy
Capitol Ave
Story Rd
McKee Rd
Alum Rock Ave
Jackson Ave
Mt Hamilton Rd
Quimby Rd
Aborn Rd
Silver Creek Valley Rd
Yerba Buena Rd
Penitencia Creek Rd
Piedmont Rd
Mt Pleasant Rd
Hillcrest Rd
Kirk Rd
Cherry Blossom Ln
Cherry Orchard Dr
Cherry Flat Rd
Cherry Ln
Cherry Hill Dr
Cherry Chase Dr
Cherry Glen Dr
Cherry Oak Dr
Cherry Wood Dr
Cherry Tree Ln
Cherry Blossom Dr
Cherry Creek Dr
Cherry Hills Dr
Cherry Ridge Dr
Cherry Valley Dr
Cherry Knoll Dr
Cherry Meadow Dr
Cherry Park Dr
Cherry Rose Dr
Cherry Vale Dr
Cherry Wood Ln
Cherry Creek Ln
Cherry Hill Ln
Cherry Oak Ln
Cherry Tree Ln
Cherry Blossom Ln
Cherry Creek Ln
Cherry Hills Ln
Cherry Ridge Ln
Cherry Valley Ln
Cherry Knoll Ln
Cherry Meadow Ln
Cherry Park Ln
Cherry Rose Ln
Cherry Vale Ln

Figure C-92 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

Figure C-93 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4



N

0 0.25 0.5 1
Miles

Kilometers
0 0.25 0.5 1

LEGEND

- Blended, At-grade
- Noise Barrier
- Moderate Noise Impact
- Severe Noise Impact

Figure C-94 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

Figure C-95 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

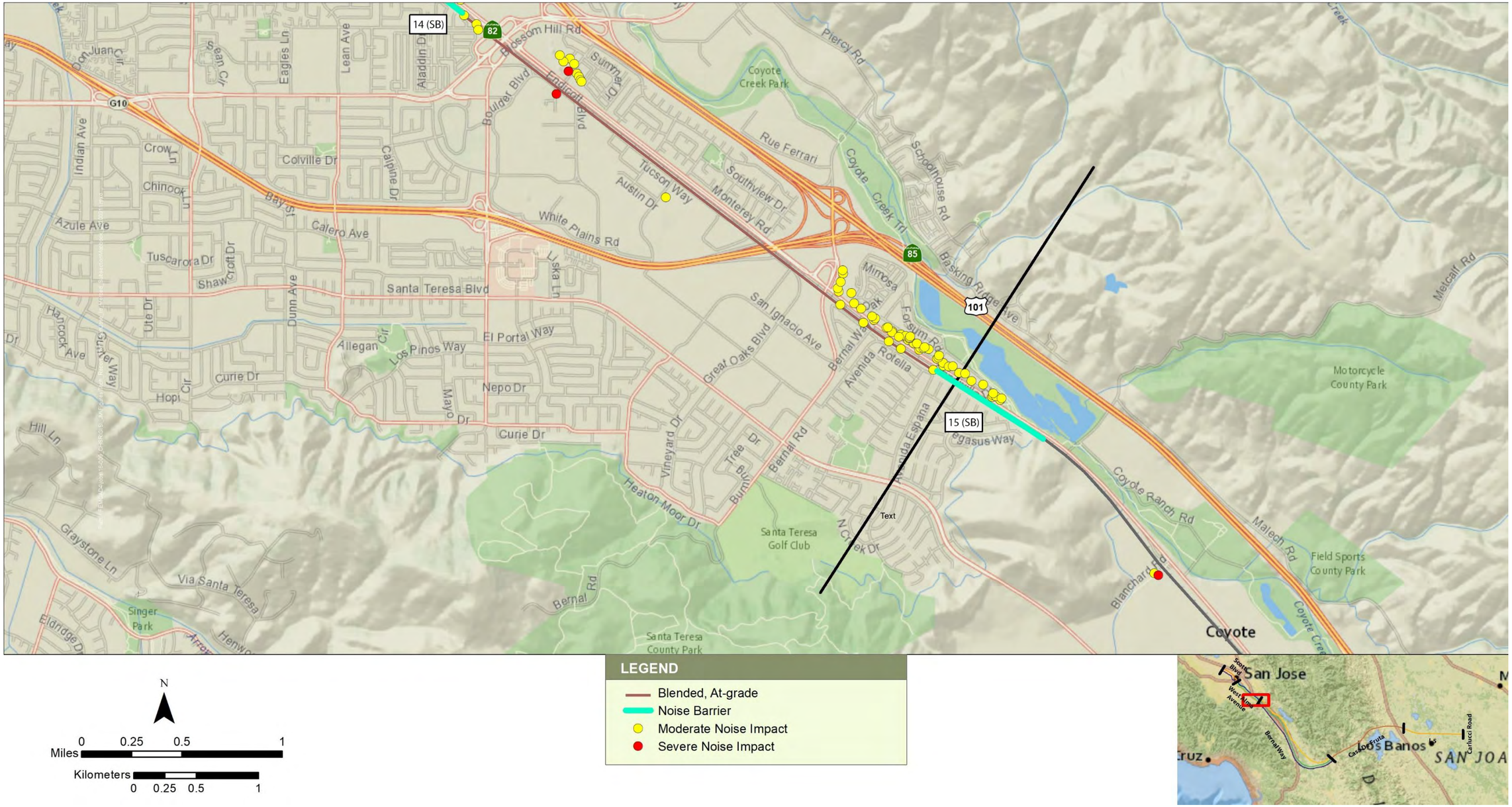


Figure C-96 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

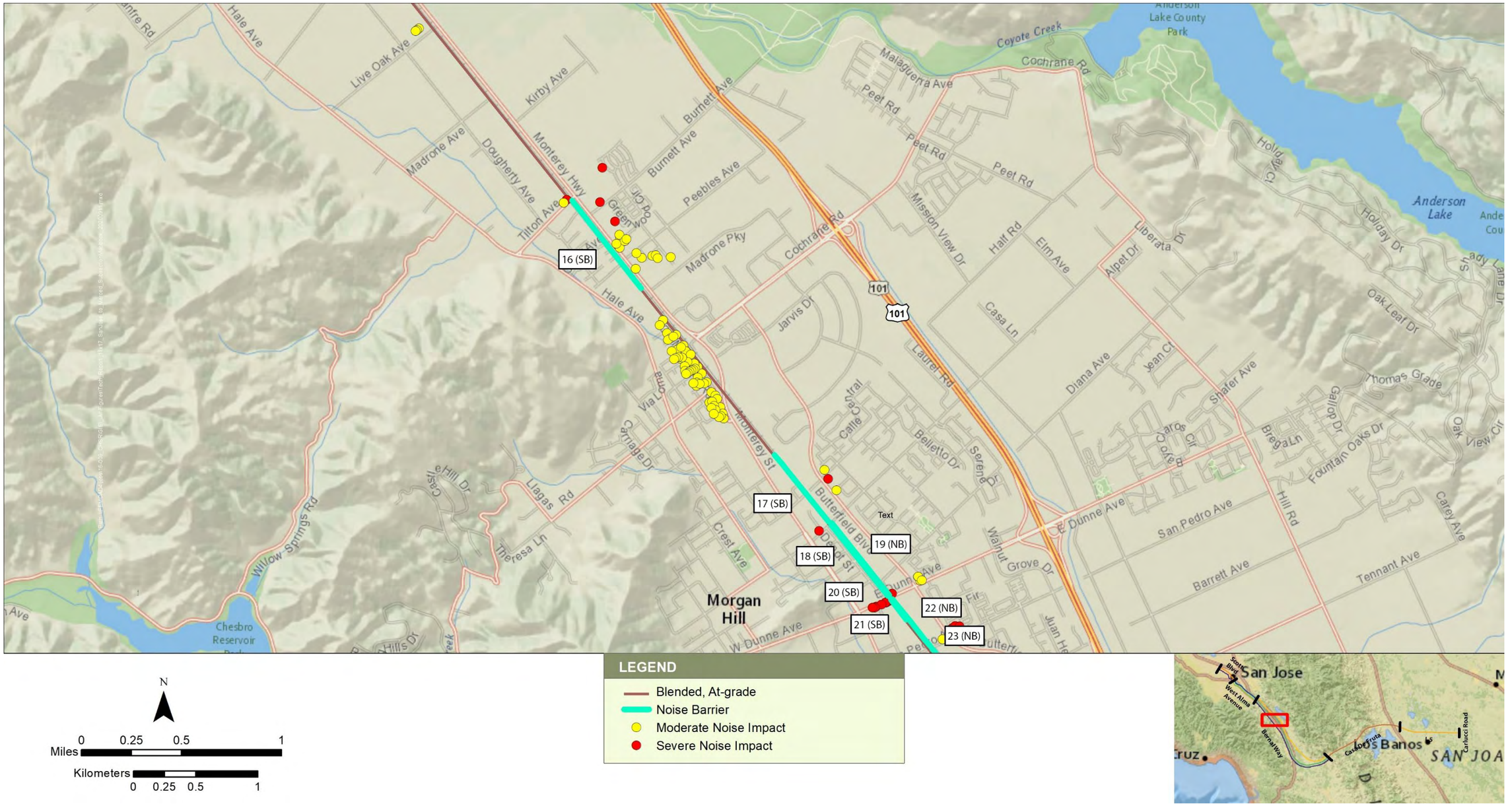


Figure C-97 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

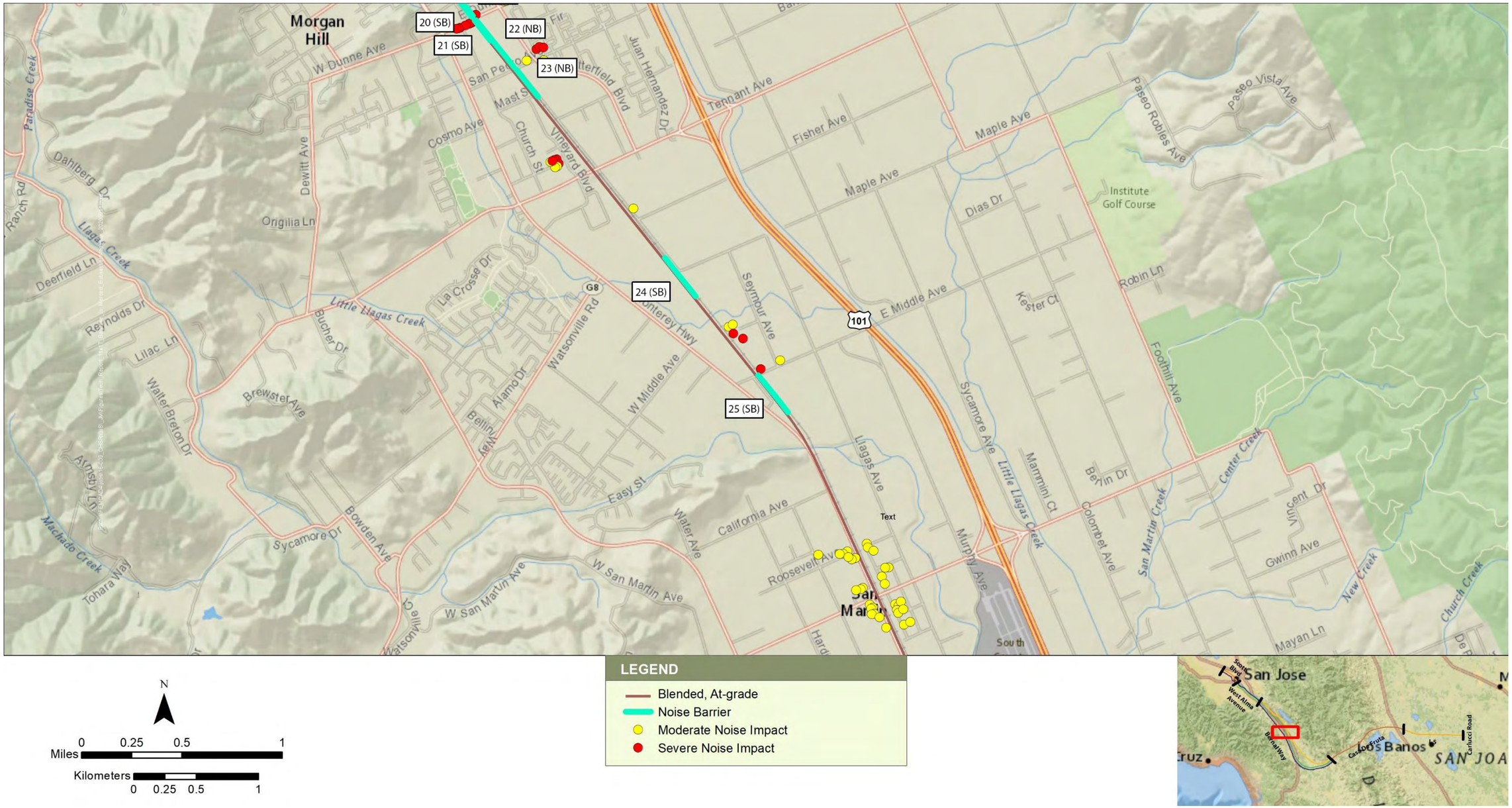


Figure C-98 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

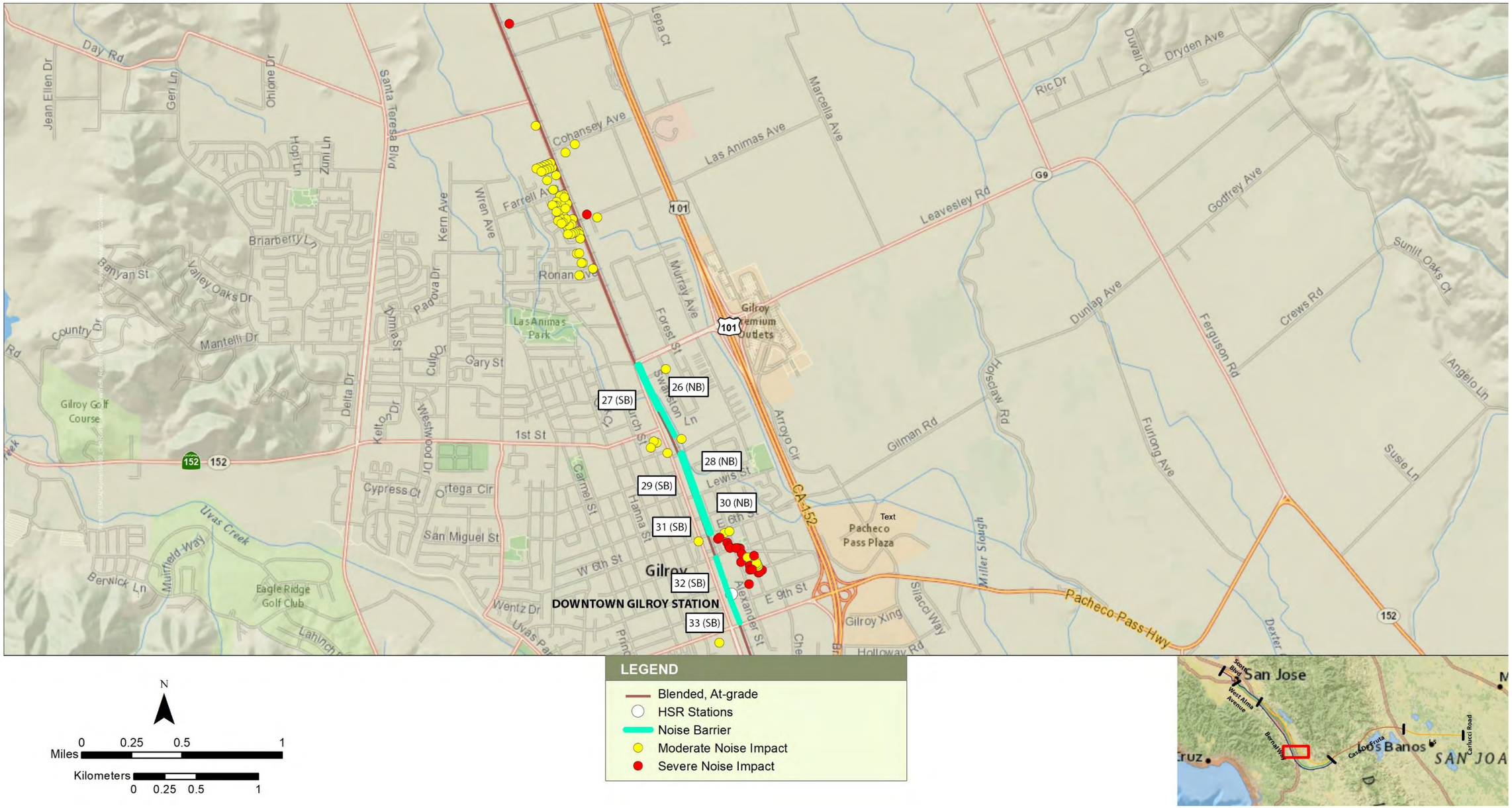


Figure C-99 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

2040 PLUS PROJECT PROPOSED NOISE BARRIERS WITH QUIET ZONES AND RESIDUAL NOISE IMPACTS

Santa Clara
Norman Y Mineta San Jose Int'l
San Jose
Santa Clara University
Santa Clara Catholic Cemetery
Watson Park
Overfelt Gardens
San Jose Municipal Golf Course
Central Park
Guadalupe Pky
Guadalupe River Trl
Coyote Creek
Saratoga Creek
Walsh Ave
Richard Ave
Memorex Dr
Reed St
Bray Ave
Anna Dr
Karen Dr
Ewert Rd
Airport Blvd
Gateway Pl
Onel Dr
Terminal Ave
Commercial St
E Younger Ave
E Hedding St
W Mission St
E Empire St
W St John St
E St James St
Las Plumas Ave
Lenfest Rd
N King Rd
Mabury Rd
Luby Dr
Rinehart Dr
Pacheco Dr
Jurisong Way
N Jackson Ave
Oakland Rd
E Gish Rd
Charles St
Arnold Ave
Ruff Dr
Stowe Ave
Balboa Ave
Alum Rock
Scott Blvd
Lafayette St
Brokaw Rd
Aviation Ave
Fremont St
Lincoln St
Franklin St
Jackson St
Madison St
Monroe St
Circle Dr
College Ave
Hillmar St
Myrtle St
Davis St
Park Ave
Tulip Rd
Bohannon Dr
Maria St
Robin Dr
Los Olivos Dr
Karen Dr
Fairlane Ave
Kiely Blvd
Graham Ln
Long St
Bowe Ave
Wade Ave
Francis Ave
Augusta Pl
Quinn Ave
Mead Ave
Butte St
Hello Way
Alfred St
Olcott St
Junction Ave
Rogers Ave
Bering Dr
N 1st St
Guadalupe Rd
Ridder Park Dr
B Ln
Targate Ct
Lundy Ave
Ensign Way
Townsend Ave
Ribisi Cir
Mabury Rd
Coyote Creek
Overfelt Gardens
Luby Dr
Las Plumas Ave
Lenfest Rd
N King Rd
Pacheco Dr
Rinehart Dr
Jurisong Way
N Jackson Ave
Oakland Rd
E Gish Rd
Charles St
Commercial St
Terminal Ave
Arnold Ave
San Juan Ave
Guadalupe Pky
Airport Blvd
Ewert Rd
Gateway Pl
Onel Dr
Guadalupe Rd
N 1st St
Bering Dr
Rogers Ave
Junction Ave

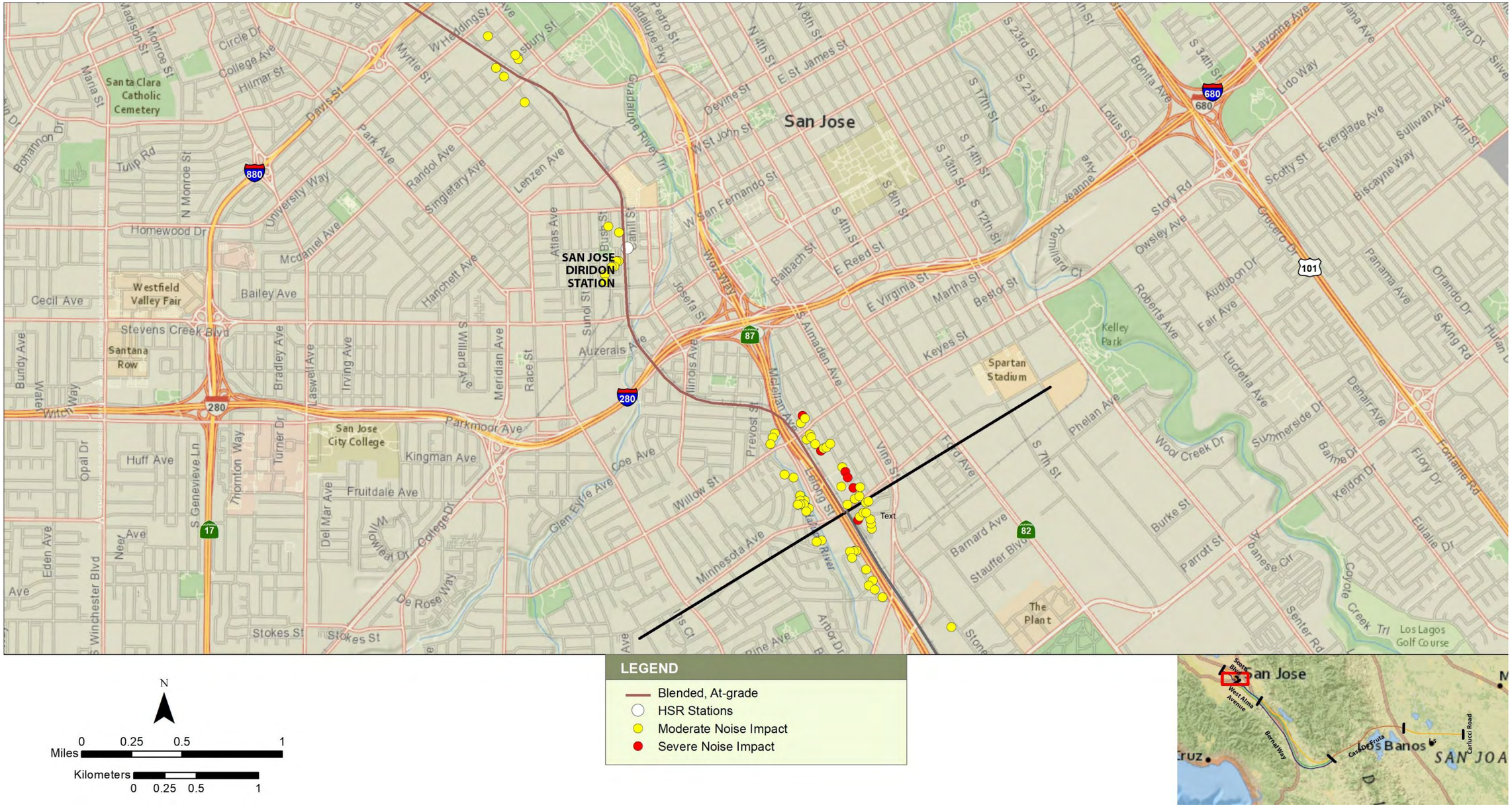


Figure C-101 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

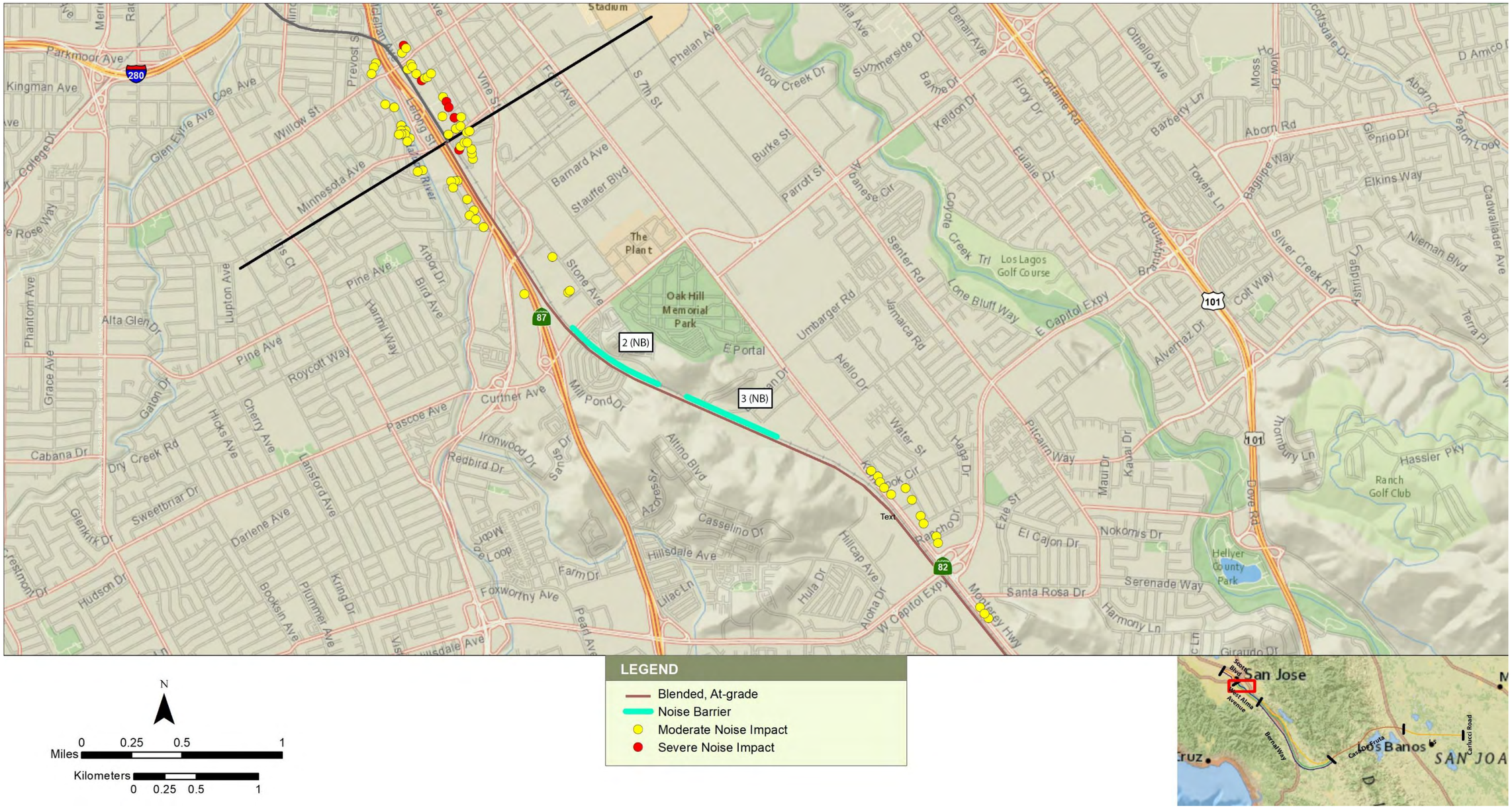


Figure C-102 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

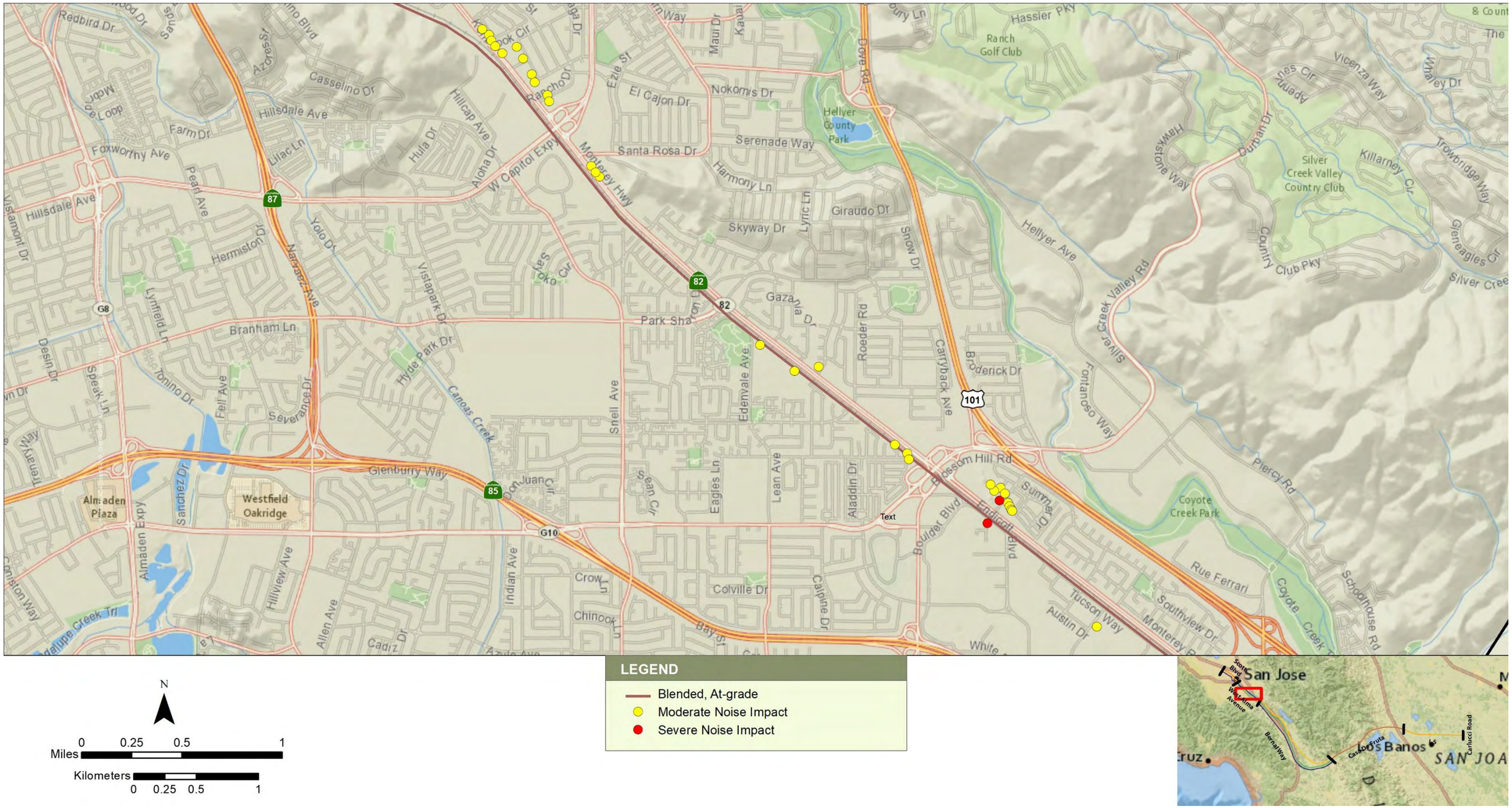


Figure C-103 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

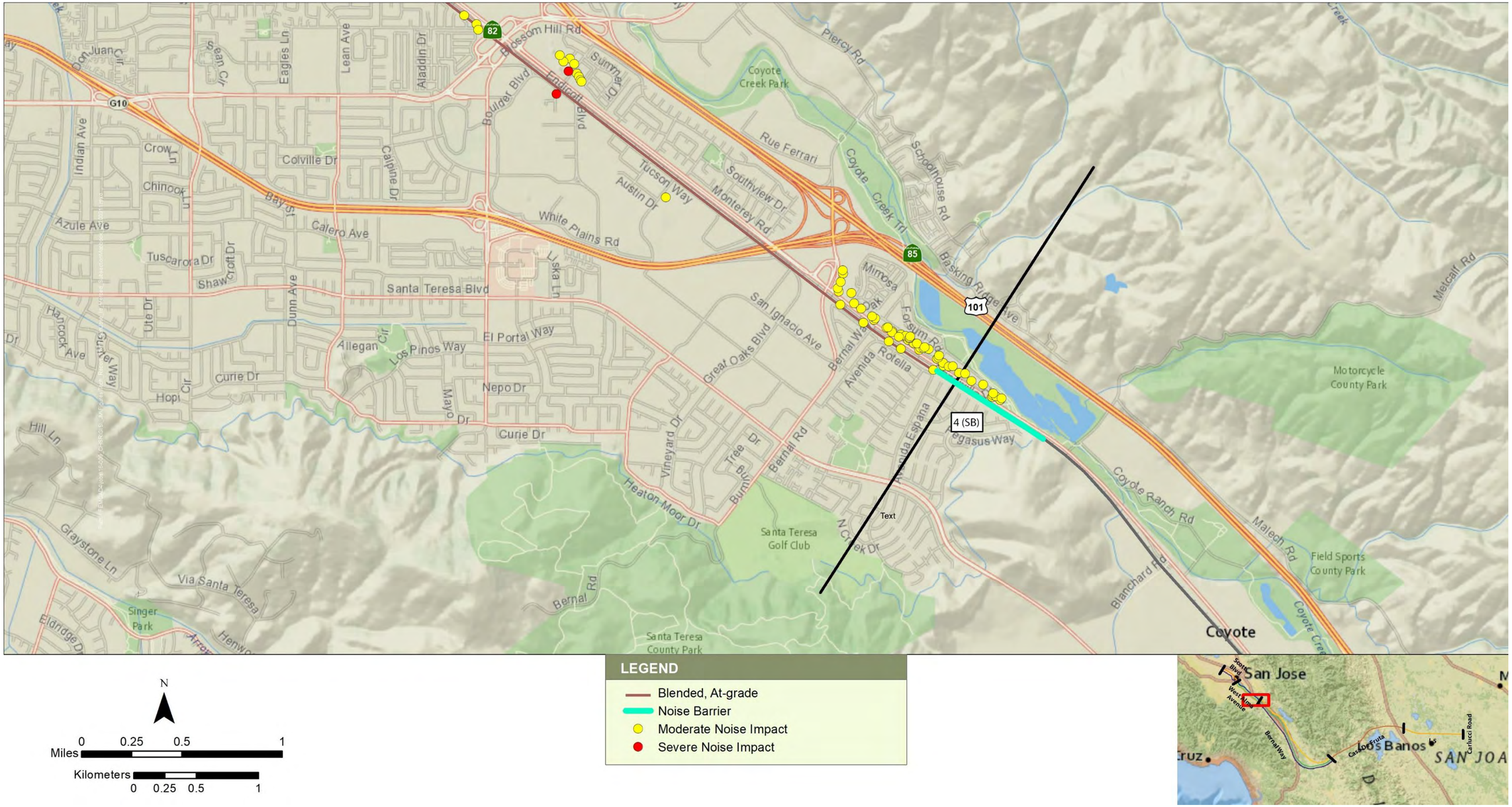


Figure C-104 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

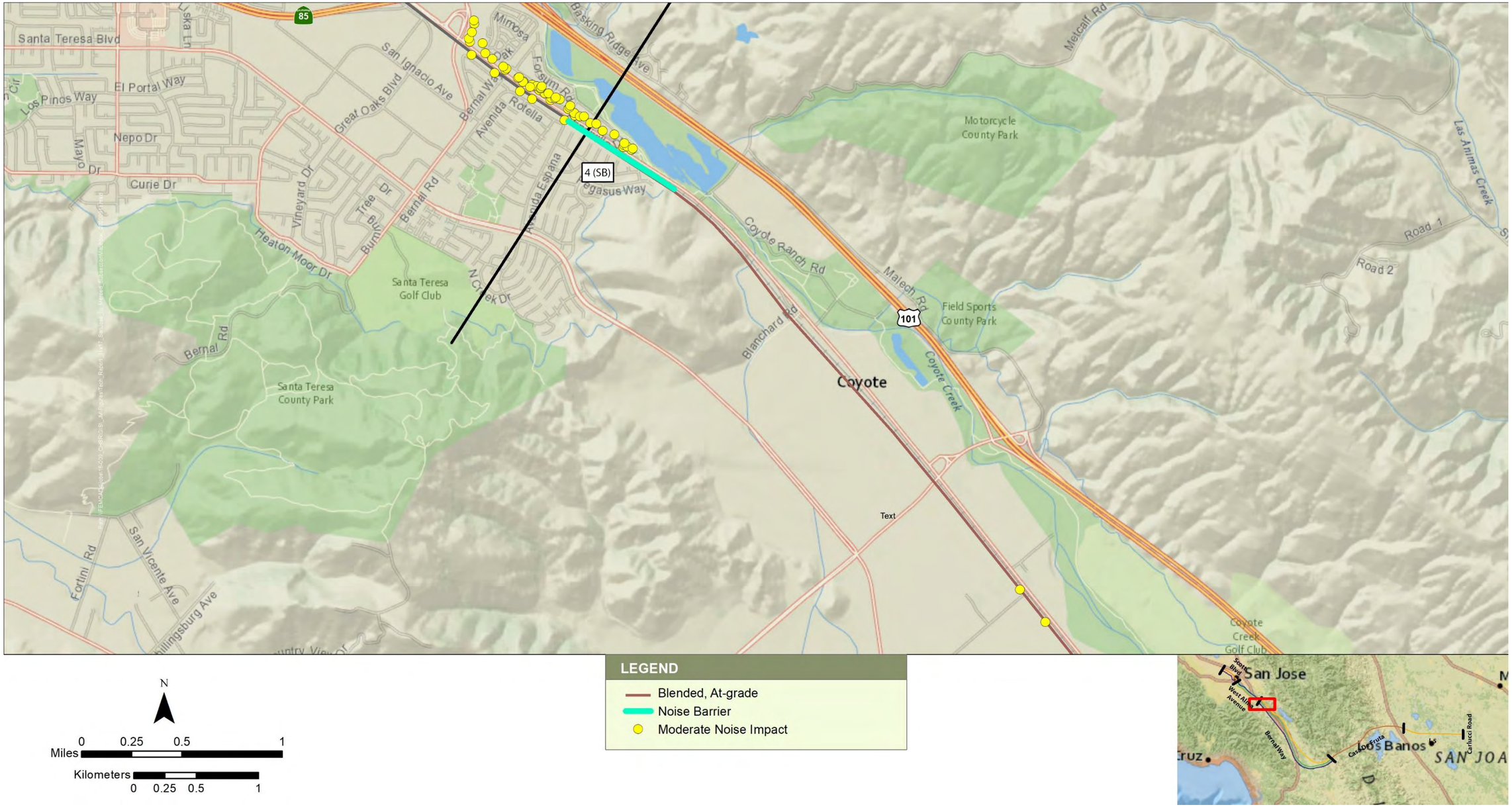


Figure C-105 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

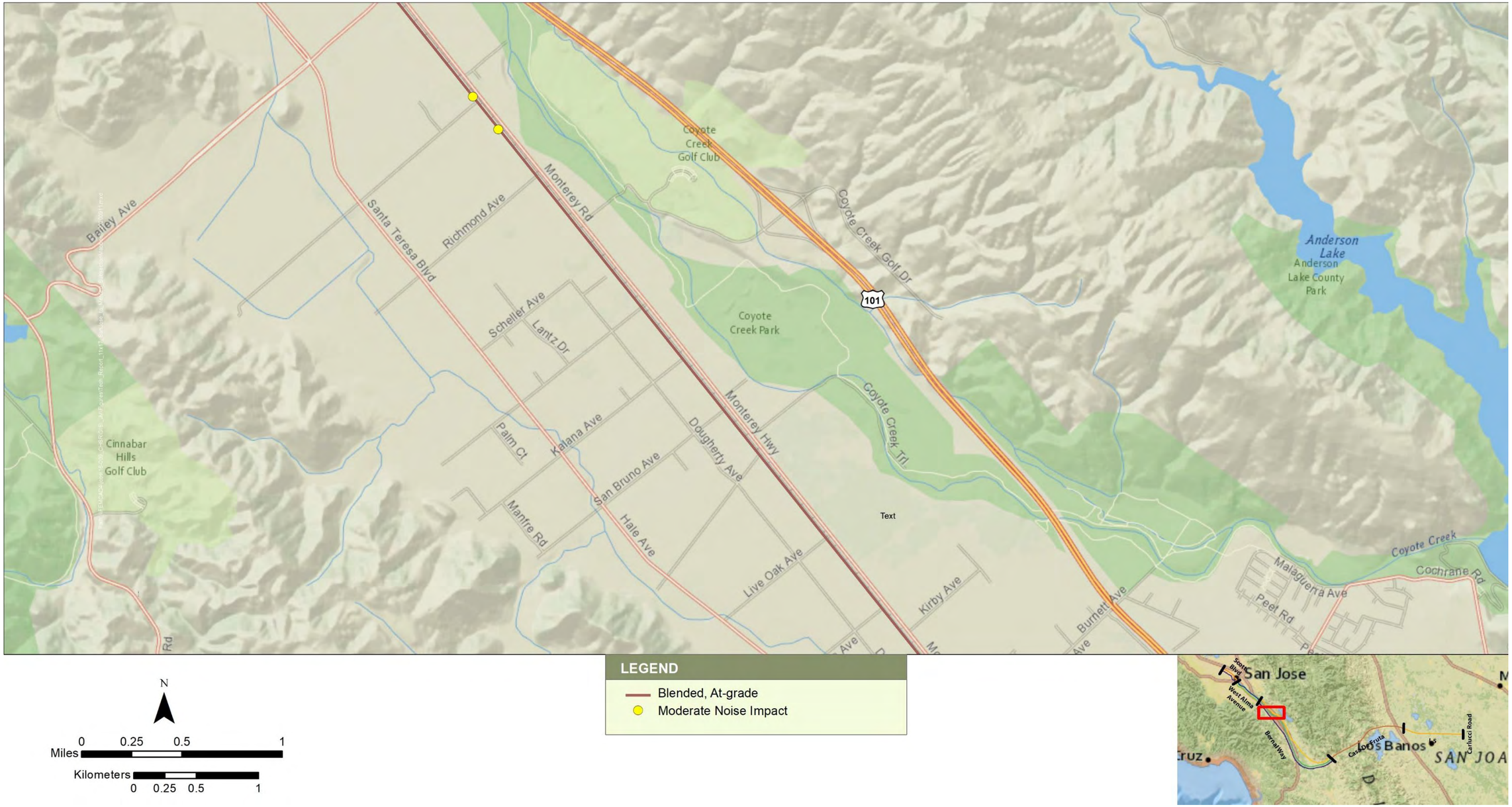


Figure C-106 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

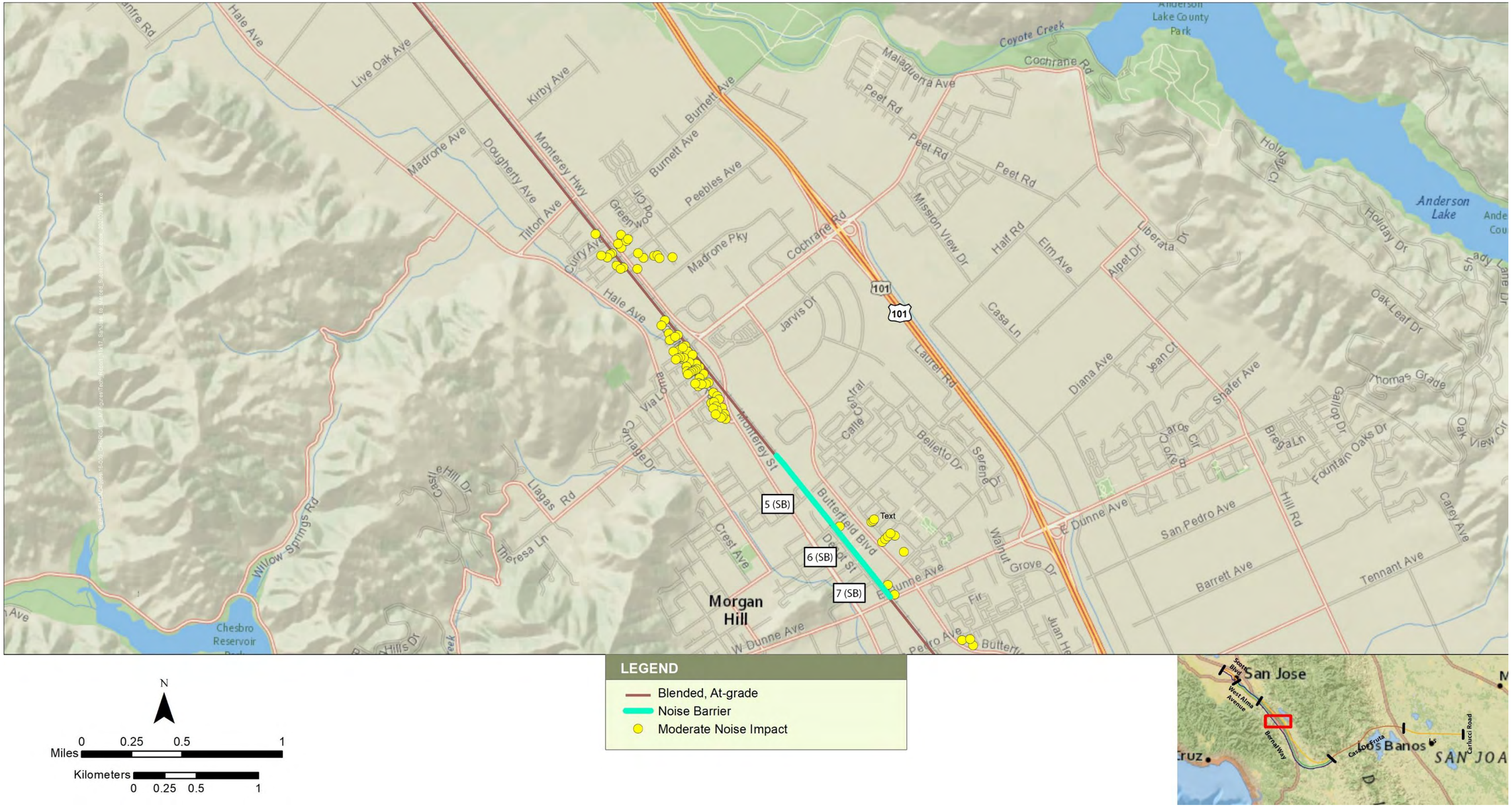


Figure C-107 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

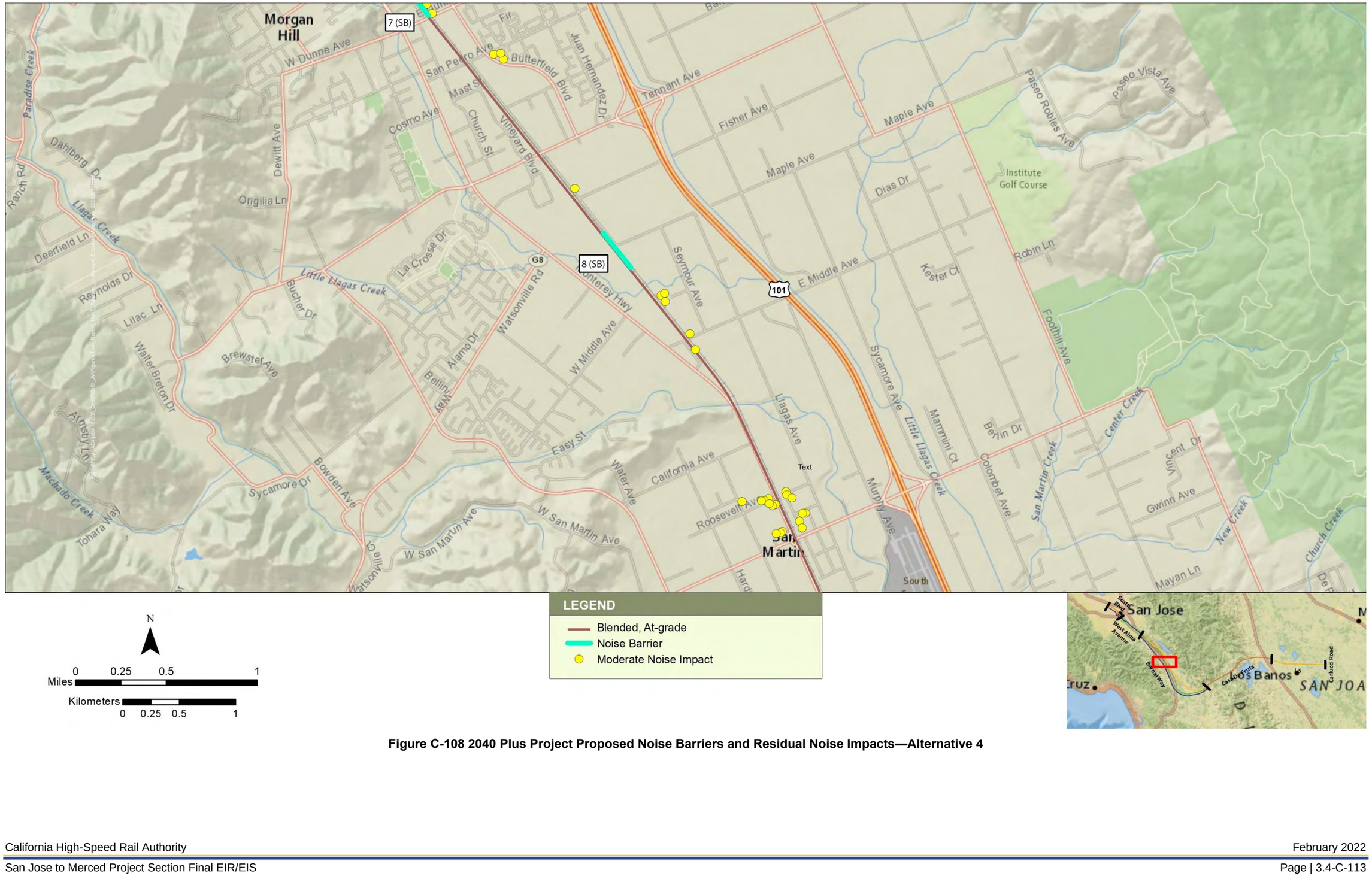


Figure C-108 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

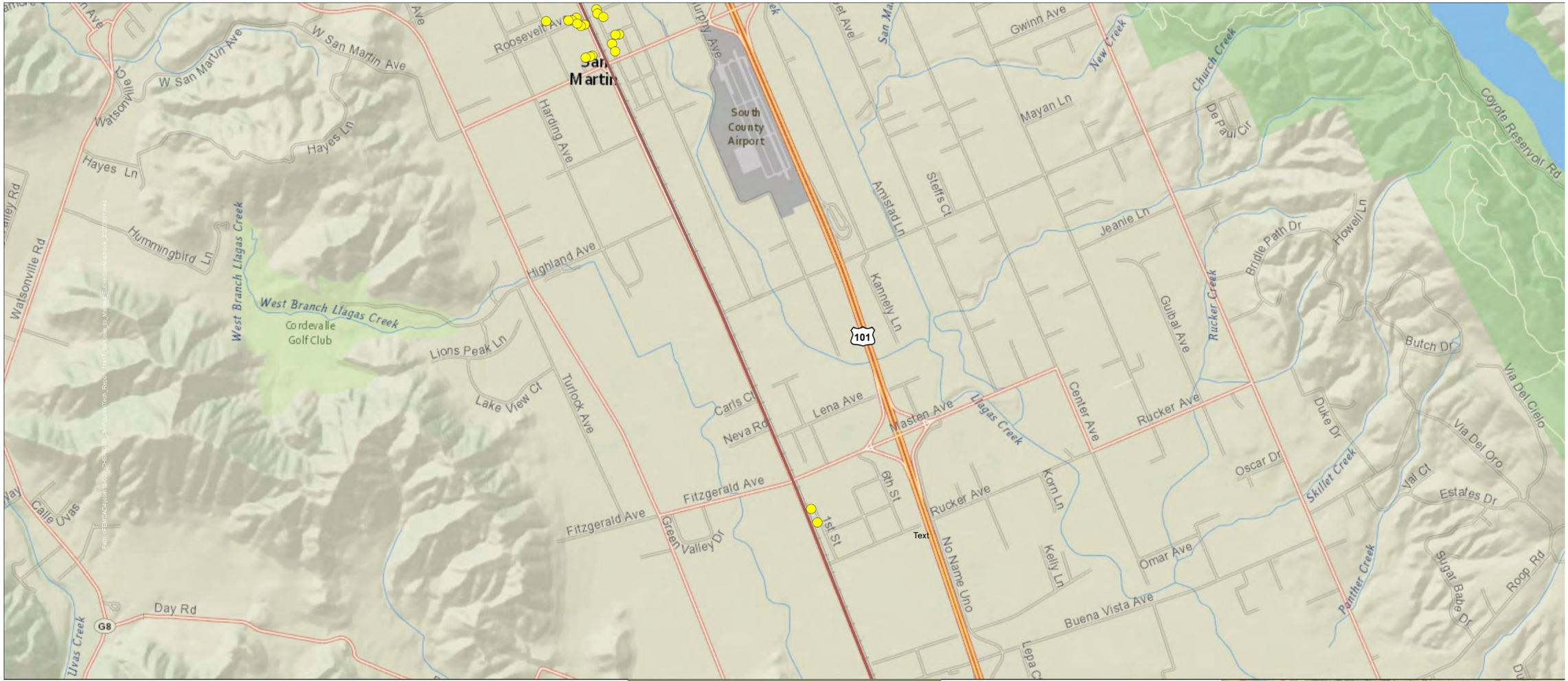


Figure C-109 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

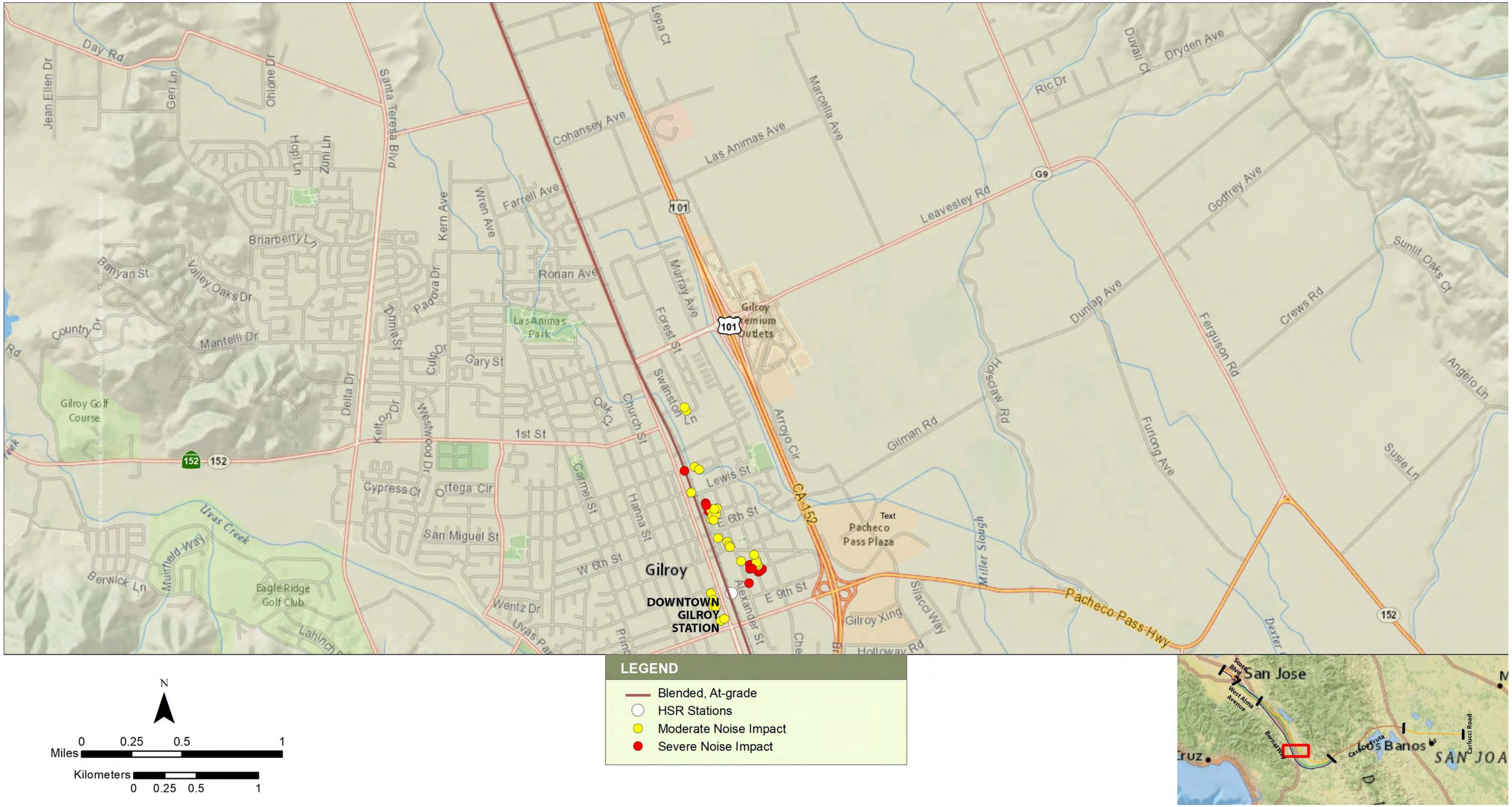


Figure C-110 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4

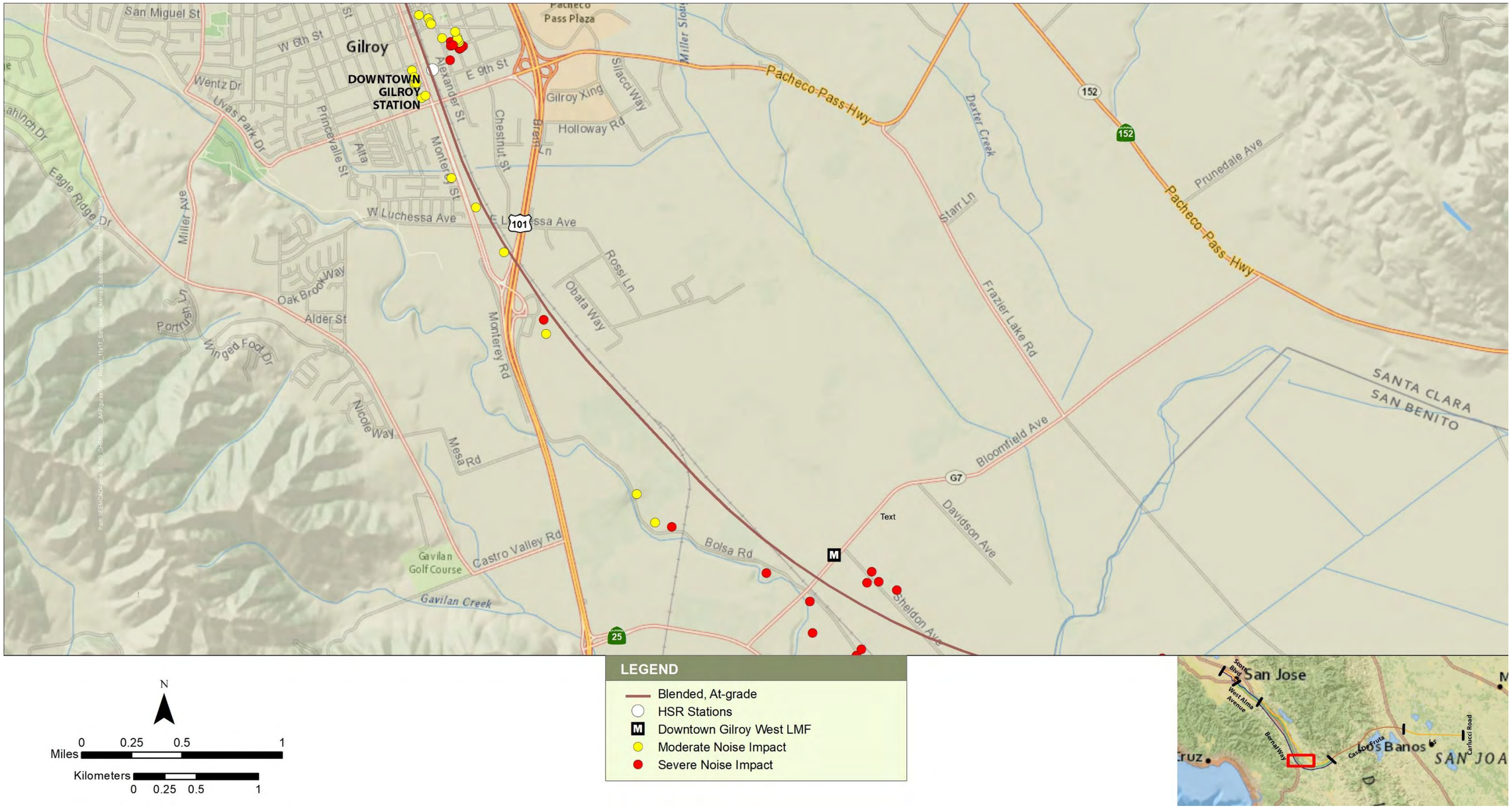


Figure C-111 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4 without the Tunnel Design Variant

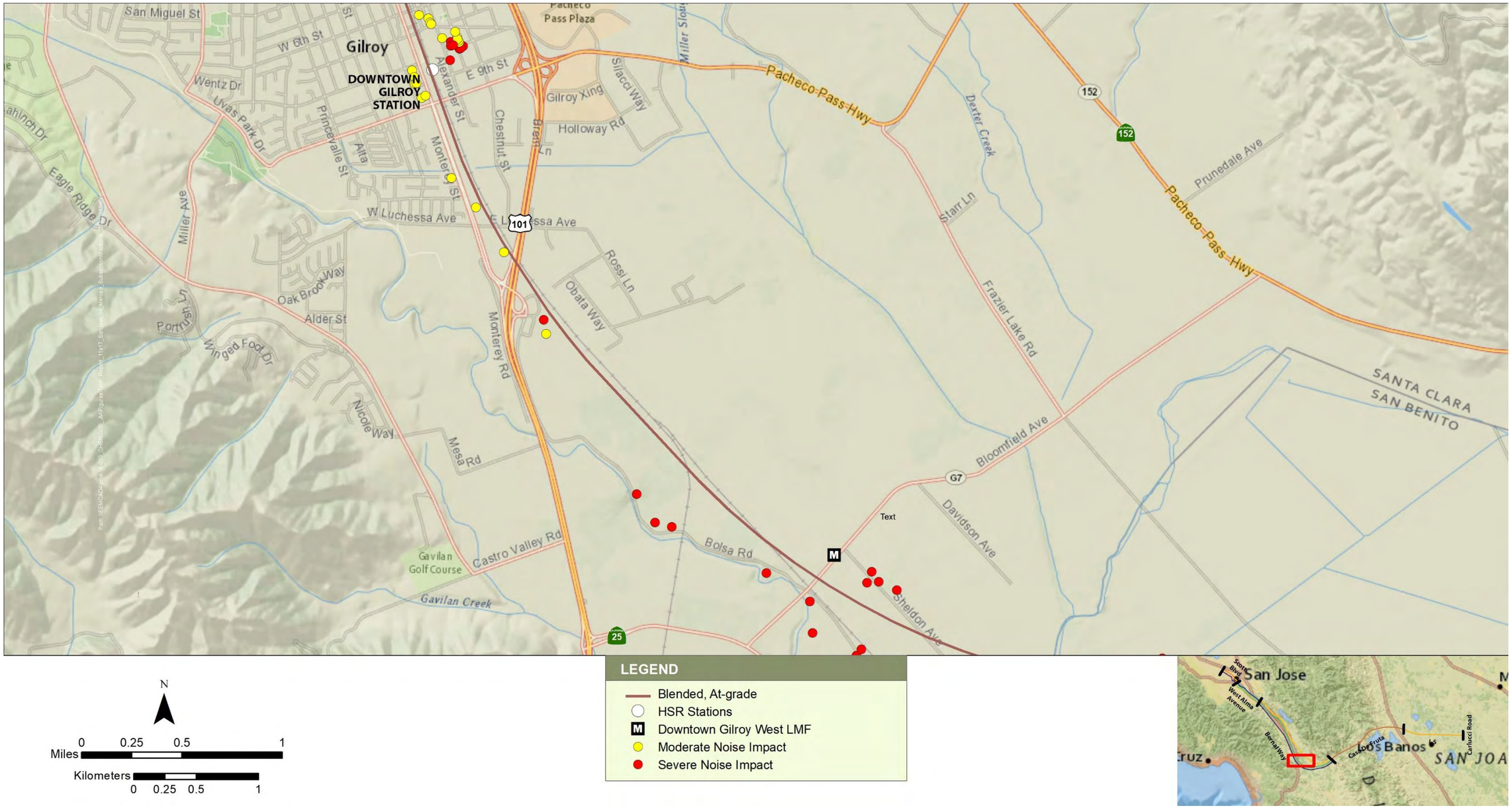


Figure C-112 2040 Plus Project Proposed Noise Barriers and Residual Noise Impacts—Alternative 4 with the Tunnel Design Variant

APPENDIX 3.5-A: PRECONSTRUCTION ELECTROMAGNETIC MEASUREMENT SURVEY ALONG THE SAN JOSE TO MERCED PROJECT SECTION

CONTENTS

APPENDIX 3.5-A: PRECONSTRUCTION ELECTROMAGNETIC MEASUREMENT SURVEY ALONG THE SAN JOSE TO MERCED PROJECT SECTION 3.5-A-1
Introduction 3.5-A-4
Test Procedures and Equipment 3.5-A-5
Overview of the Measurement Results 3.5-A-5
Magnetic Fields 3.5-A-5
Electric Fields 3.5-A-6
Individual Site Observations 3.5-A-9
Site 1 (Newhall Street / Newhall Drive) 3.5-A-9
Site 2 (Montgomery Street / Otterson Street) 3.5-A-9
Site 3 (Communications Hill Boulevard / Curtner Avenue) 3.5-A-10
Site 4 (Great Oaks Parkway / Las Colinas Road) 3.5-A-10
Site 5 (Metcalf Road / Coyote Ranch Road) 3.5-A-10
Site 6 (Railroad Avenue / Barrett Avenue) 3.5-A-10
Site 7 (Monterey Highway / Las Animas Avenue) 3.5-A-10
Site 8 (State Route 152 / Casa de Fruta Parkway) 3.5-A-10
Site 9 (Santa Nella Avenue / Fahey Road) 3.5-A-10
Site 10 (Henry Miller Road / Carlucci Road) 3.5-A-10
Site Photographs and Measurement Data 3.5-A-10

Figures

Figure 1 Average Measured AC Magnetic Field Strengths 3.5-A-6
Figure 2 Maximum Electric Field Strengths by Frequency Band 3.5-A-7
Figure 3 Variation in Measured Maximum Electric Field Strengths 3.5-A-8
Figure 4 Maximum Measured Electric Field Strengths 3.5-A-9
Figure 5(a) Location 1: Newhall Street / Newhall Drive, San Jose 3.5-A-11
Figure 5(b) Location 1: Measurement Location and Site Views 3.5-A-12
Figure 5(c) Location 1: Local EMF Sources 3.5-A-13
Figure 5(d) Location 1: AC and DC Magnetic Field Measurement Results 3.5-A-14
Figure 5(e) Location 1: Measured Environmental RF Levels 3.5-A-15
Figure 5(f) Location 1: Measured Environmental RF Levels 3.5-A-16
Figure 5(g) Location 1: Measured Environmental RF Levels 3.5-A-17
Figure 5(h) Location 1: Measured Environmental RF Levels 3.5-A-18
Figure 6(a) Location 2: Montgomery Street / Otterson Street, San Jose 3.5-A-19
Figure 6(b) Location 2: Measurement Location and Site Views 3.5-A-20
Figure 6(c) Location 2: Local EMF Sources 3.5-A-21
Figure 6(d) Location 2: AC and DC Magnetic Field Measurement Results 3.5-A-22
Figure 6(e) Location 2: Measured Environmental RF Levels 3.5-A-23
Figure 6(f) Location 2: Measured Environmental RF Levels 3.5-A-24
Figure 6(g) Location 2: Measured Environmental RF Levels 3.5-A-25
Figure 6(h) Location 2: Measured Environmental RF Levels 3.5-A-26

Figure 7(a) Location 3: Communications Hill Boulevard/Monte Vista Drive, San Jose 3.5-A-27
Figure 7(b) Location 3: Measurement Location and Site Views 3.5-A-28
Figure 7(c) Location 3: Local EMF Sources 3.5-A-29
Figure 7(d) Location 3: Measured DC and AC Magnetic Field Strengths 3.5-A-30
Figure 7(e) Location 3: Measured Environmental RF Levels Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4 ..... 3.5-A-31
Figure 7(f) Location 3: Measured Environmental RF Levels Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation . 3.5-A-32
Figure 7(g) Location 3: Measured Environmental RF Levels Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation . 3.5-A-33
Figure 7(h) Location 3: Measured Environmental RF Levels Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation . 3.5-A-34
Figure 8(a) Location 4: Great Oaks Parkway/Las Colinas Road, San Jose 3.5-A-35
Figure 8(b) Location 4: Measurement Location and Site Views 3.5-A-36
Figure 8(c) Location 4: Local EMF Sources 3.5-A-37
Figure 8(d) Location 4: AC and DC Magnetic Field Measurement Results 3.5-A-38
Figure 8(e) Location 4: Measured Environmental RF Levels Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4 ..... 3.5-A-39
Figure 8(f) Location 4: Measured Environmental RF Levels 3.5-A-40
Figure 8(g) Location 4: Measured Environmental RF Levels 3.5-A-41
Figure 8(h) Location 4: Measured Environmental RF Levels 3.5-A-42
Figure 9(a) Location 5: Metcalf Energy Center, San Jose 3.5-A-43
Figure 9(b) Location 5: Measurement Location and Site Views 3.5-A-44
Figure 9(c) Location 5: Local EMF Sources 3.5-A-45
Figure 9(d) Location 5: AC and DC Magnetic Field Measurement Results 3.5-A-46
Figure 9(e) Location 5: Measured Environmental RF Levels 3.5-A-47
Figure 9(f) Location 5: Measured Environmental RF Levels 3.5-A-48
Figure 9(g) Location 5: Measured Environmental RF Levels 3.5-A-49
Figure 9(h) Location 5: Measured Environmental RF Levels 3.5-A-50
Figure 10(a) Location 6: Railroad Avenue/Barrett Avenue, Morgan Hill 3.5-A-51
Figure 10(b) Location 6: Measurement Location and Site Views 3.5-A-52
Figure 10(c) Location 6: Local EMF Sources 3.5-A-53
Figure 10(d) Location 6: AC and DC Magnetic Field Measurement Results 3.5-A-54
Figure 10(e) Location 6: Measured Environmental RF Levels 3.5-A-55
Figure 10(f) Location 6: Measured Environmental RF Levels 3.5-A-56
Figure 10(g) Location 6: Measured Environmental RF Levels 3.5-A-57
Figure 10(h) Location 6: Measured Environmental RF Levels 3.5-A-58
Figure 11(a) Location 7: Monterey Highway/Las Animas Avenue, Gilroy 3.5-A-59
Figure 11(b) Location 7: Measurement Location and Site Views 3.5-A-60
Figure 11(c) Location 7: Local EMF Sources 3.5-A-61
Figure 11(d) Location 7: AC and DC Magnetic Field Measurement Results 3.5-A-62

Figure 11(e) Location 7: Measured Environmental RF Levels 3.5-A-63
Figure 11(f) Location 7: Measured Environmental RF Levels 3.5-A-64
Figure 11(g) Location 7: Measured Environmental RF Levels 3.5-A-65
Figure 11(h) Location 7: Measured Environmental RF Levels 3.5-A-66
Figure 12(a) Location 8: SR 152/Casa de Fruta Parkway, Hollister 3.5-A-67
Figure 12(b) Location 8: Measurement Location and Site Views 3.5-A-68
Figure 12(c) Location 8: AC and DC Magnetic Field Measurement Results 3.5-A-69
Figure 12(d) Location 8: Measured Environmental RF Levels 3.5-A-70
Figure 12(e) Location 8: Measured Environmental RF Levels 3.5-A-71
Figure 12(f) Location 8: Measured Environmental RF Levels 3.5-A-72
Figure 12(h) Location 8: Measured Environmental RF Levels 3.5-A-73
Figure 13(a) Location 9: Santa Nella Avenue/Fahey Road, Santa Nella 3.5-A-74
Figure 13(b) Location 9: Measurement Location and Site Views 3.5-A-75
Figure 13(c) Location 9: Local EMF Sources 3.5-A-76
Figure 13(d) Location 9: AC and DC Magnetic Field Measurement Results 3.5-A-77
Figure 13(e) Location 9: Measured Environmental RF Levels 3.5-A-78
Figure 13(f) Location 9: Measured Environmental RF Levels 3.5-A-79
Figure 13(g) Location 9: Measured Environmental RF Levels 3.5-A-80
Figure 13(h) Location 9: Measured Environmental RF Levels 3.5-A-81
Figure 14(a) Location 10: Henry Miller Road/Carlucci Road, Dos Palos 3.5-A-82
Figure 14(b) Location 10: Measurement Location and Site Views 3.5-A-83
Figure 14(c) Location 10: Local EMF sources 3.5-A-84
Figure 14(d) Location 10: AC and DC Magnetic Field Measurement Results 3.5-A-85
Figure 14(e) Location 10: Measured Environmental RF Levels 3.5-A-86
Figure 14(f) Location 10: Measured Environmental RF Levels 3.5-A-87
Figure 14(g) Location 10: Measured Environmental RF Levels 3.5-A-88
Figure 14(h) Location 10: Measured Environmental RF Levels 3.5-A-89

Introduction

This appendix documents measurement results from a preconstruction electromagnetic survey of locations along the San Jose to Carlucci project extent corridor. The purpose of the survey was to: (1) provide a baseline characterization of the existing electromagnetic environment, (2) allow comparisons with the expected electromagnetic footprint from the planned California High-Speed Rail (HSR) system, and (3) provide guidance for electromagnetic compatibility (EMC) requirements by defining the typical electromagnetic environment that the HSR system must operate in without interference.

Land uses, existing facilities, and infrastructure along the alignment were reviewed, with a list of approximately 30 candidate sites evaluated. This review concentrated on identifying potentially electromagnetic interference (EMI)-sensitive facilities, as well as existing electromagnetic field (EMF) sources such as power generation, power distribution, and communications facilities. The selection criteria, taken from Technical Memorandum (TM) 3.4.11, Measurement Procedure for Assessment of CHSTP Alignment EMI Footprint, favored providing a balanced coverage of:

- The geographic extent of the segment
- High-emission sites
- Low-emission sites
- Sites with high-sensitivity receptors

A final group consisting of 10 sites was selected based upon the above considerations and to provide representative coverage of land uses. Two types of measurements were performed at each location. The first involved measurement of radiated electric fields from 10 kilohertz (kHz) to 6 gigahertz (GHz), meant to characterize the radio-frequency (RF) environment. These electric field strengths were measured using an RF spectrum analyzer and calibrated antennas. Expected sources of RF signals included:

- Cell towers (cellular telephone)
- Broadcast towers (radio and television broadcasts)
- Airport radars and aircraft communications equipment
- General high-frequency and very-high-frequency fixed and mobile communications systems (e.g., police, fire, emergency medical technician, utilities, and government)
- Local wireless (wireless fidelity [WiFi] and Worldwide Interoperability for Microwave Access [WiMAX])

The second part of the test procedure involved measurements of background direct current (DC) and power frequency magnetic fields along the alignment. These magnetic fields were recorded using a three-axis fluxgate sensor with a waveform recording data acquisition system. Expected sources of DC and low-frequency magnetic fields included:

- The geomagnetic field
- High-voltage transmission lines
- Electric distribution lines
- Traction power distribution facilities
- Geomagnetic perturbations due to passing vehicles and trains

The facilities most sensitive to shifts in the DC (geomagnetic perturbations) and alternating current (AC) magnetic fields are:

- High technology semiconductor (e.g., electron microscopes [transmission electron microscopes/scanning electron microscopes], electron-beam lithography, ion-writing systems, focused ion-beam systems)
- High technology biology (e.g., nuclear magnetic resonance, magnetic resonance imaging [MRI], electron microscopes)

- Medical imaging (e.g., computed tomography [CT] scanners, MRI systems)
- University/research (instrumentation for chemistry, physics, electrical engineering, and similar systems to those mentioned for high technology and medical facilities).

Test Procedures and Equipment

Analysts characterized the RF environment along the project extent by measuring the prevailing electric field strength at each of the 10 test sites, over the frequency range from 10 kHz to 6 GHz. The RF and magnetic field measurements were performed between July 18, 2016, and July 22, 2016. Measurements were made using a vertical monopole antenna (AH Systems SAS-550-1) for the frequency range from 10 kHz to 30 MHz and a broadband bilogical antenna (AH Systems SAS-521-7) for the frequency range from 25 MHz to 6 GHz, connected to an Anritsu MS2721B Spectrum Analyzer. Measurements were made in eight contiguous frequency bands and recorded per Section 6.4 of TM 3.4.11. Where practical, the RF antennas were located approximately 50 feet from the proposed alignment.

Electric field measurement files from the spectrum analyzer include both min-hold and max-hold levels as a function of frequency across each of the measurement bands, and a complete file set will be preserved for each measurement location. Reported results include the low-frequency measurements with the omni-directional vertical monopole, plus measurements with the bilogical antenna in both horizontal and vertical positions, first facing the proposed alignment, and then in the direction that exhibited the maximum signal strength in each measurement band.

The magnetic field measurements characterized the prevailing background magnetic field levels, as well as the temporal variations caused by the passing of trains on the existing right-of-way. Measurements were made at two positions at each site, separated by approximately 30 feet. The magnetic field measurements were performed using a pair of three-axis 5 gauss Bartington fluxgate sensors (bandwidth DC to 3 kHz), connected to a National Instruments data acquisition system. Magnetic field waveforms were recorded so that DC and full frequency information is available over the entire sensor bandwidth.

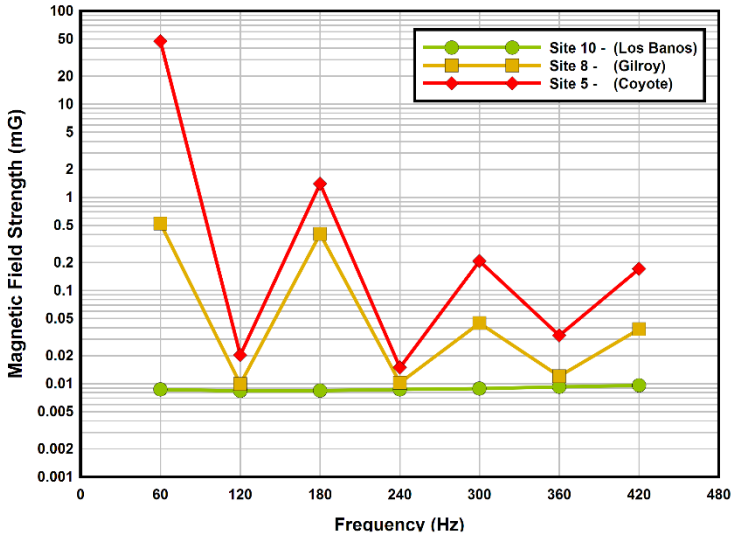
Overview of the Measurement Results

Magnetic Fields

The measured DC magnetic field strengths ranged from 388 milligauss (mG) to 488 mG across the 10 measurement sites. At individual sites, the difference in DC field strength between the two sensors ranged from 15 to 46 mG. These differentials typically are the result of the influence from passing vehicles or nearby steel objects.

AC magnetic field strengths at the 10 sites varied over a range of more than three orders of magnitude, from 0.009 mG to 47 mG. The levels depend almost entirely on a site's proximity to power lines (medium-voltage distribution and high-voltage transmission lines) and other electrical system infrastructure. Such a wide range in observed magnetic field strengths is expected, given the variable levels of development along the project extent.

Figure 1 provides an illustration of the measured AC magnetic field strengths for three representative measurement sites: rural (Los Banos, Site 10), suburban (Gilroy, Site 8), and in close proximity to high-voltage transmission lines (Coyote, Site 5). These sites encompass the full range of observed 60 hertz (Hz) magnetic field levels, with Site 10 the lowest, Site 5 the highest, and Site 6 representing the median level. Levels are plotted for the 60 Hz fundamental.



JANUARY 2019

Figure 1 Average Measured AC Magnetic Field Strengths

Electric Fields

Because of the very broad range of frequencies of interest, the electric field measurements at each site were divided into eight overlapping frequency bands to provide adequate frequency resolution in each band. Table 1 summarizes the maximum magnitude of the measured electric field values by frequency band for each site. The maximum electric fields strengths in bands B0 through B4 varied considerably across sites. Except for band B2 (the AM broadcast band), levels spanned a 30 decibel (dB) range. Even greater variation was seen at higher frequencies (bands B5 through B7), reflecting stronger differences in spectrum usage along the project alignment. Measured maximum levels in these bands varied by up to 45 dB. Variations of this magnitude are not unexpected when encompassing the range of urban, suburban, and rural settings found in the project extent.

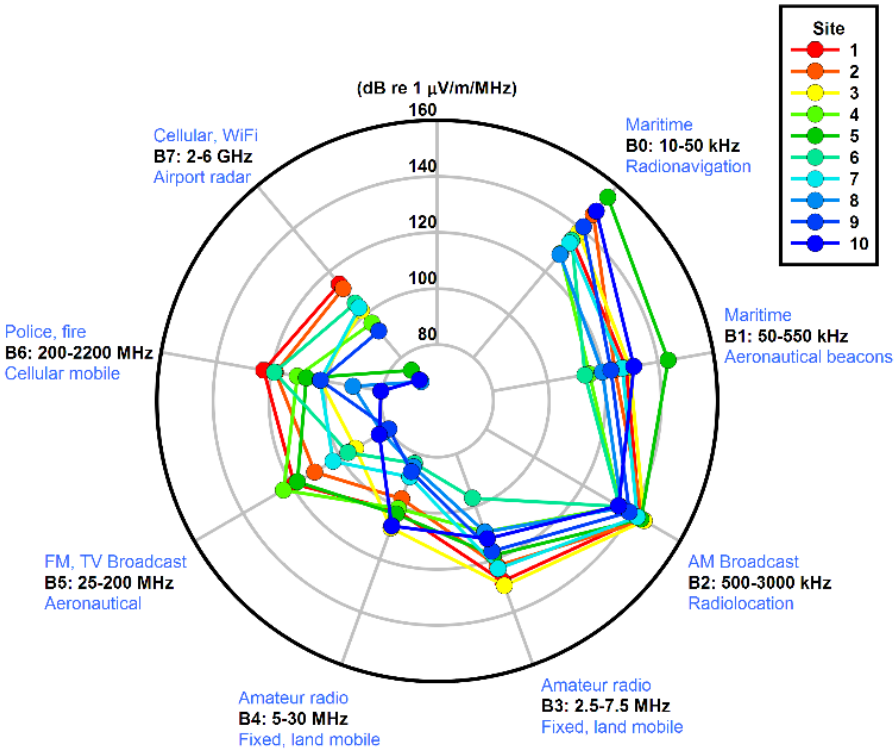
Table 1 Maximum Measured Electric Field Strengths by Frequency Band

Measurement Site	B0 10-50 kHz	B1 50-550 KHz	B2 .50-3.0 MHz	B3 2.5-7.5 MHz	B4 5.0-30 MHz	B5 25-200 MHz	B6 0.20-2.2 GHz	B7 2.0-6.0 GHz
San Jose Diridon Station Approach Subsection								
1 – San Jose (urban)	135.1	128.4	143.5	128.4	101.7	119.0	122.9	114.4
2 – San Jose (urban)	146.7	124.4	145.0	122.5	97.1	110.6	118.7	112.3
Monterey Corridor Subsection								
3 – San Jose (urban)	138.5	129.8	145.3	130.0	108.2	93.7	102.4	102.2
4 – San Jose (urban)	128.6	115.1	135.2	109.6	100.8	123.5	110.7	96.3
Morgan Hill and Gilroy Subsection								
5 – Coyote (rural)	154.8	143.7	144.0	118.6	102.8	117.6	107.4	74.3
6 – Morgan Hill (rural)	134.7	113.5	135.1	96.9	83.7	96.8	119.0	105.5
7 – Gilroy (suburban)	133.5	127.1	142.5	123.6	88.8	102.9	102.4	103.5

Measurement Site	B0 10-50 kHz	B1 50-550 KHz	B2 .50-3.0 MHz	B3 2.5-7.5 MHz	B4 5.0-30 MHz	B5 25-200 MHz	B6 0.20-2.2 GHz	B7 2.0-6.0 GHz
Pacheco Pass Subsection								
8 – Hollister (rural)	128.1	119.8	136.1	109.8	84.9	82.7	90.6	68.9
San Joaquin Valley Subsection								
9 - Santa Nella (rural)	141.1	122.9	139.1	117.0	86.9	80.0	102.3	92.5
10 –Los Banos (rural)	148.4	131.3	134.7	112.3	107.4	83.9	80.4	69.8

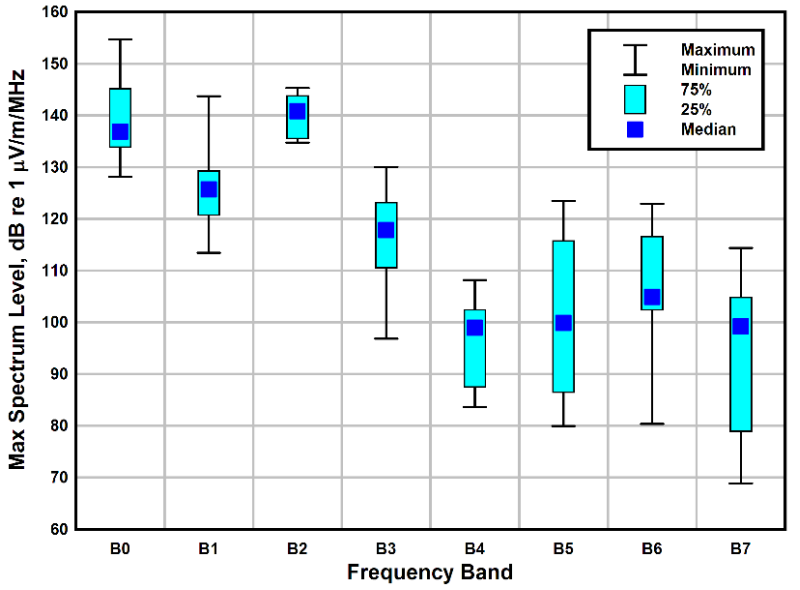
Field strength values are in decibel (dB), referenced to 1 microvolt meter/MHz.
GHz = gigahertz
KHz = kilohertz
MHz = megahertz

Figure 2 graphically shows the maximum measured electric field strengths by frequency band for the 10 measurement sites. Typical spectrum uses in each frequency band are also indicated in Figure A3.5-2. Increasing distance from the plot origin indicates higher field strength. Figure 3 shows the variance in RF field strengths across the measurement sites by frequency band. Standard deviations ranged from 4.5 dB in band B2 to as great as 17 dB in band B7.



JANUARY 2019

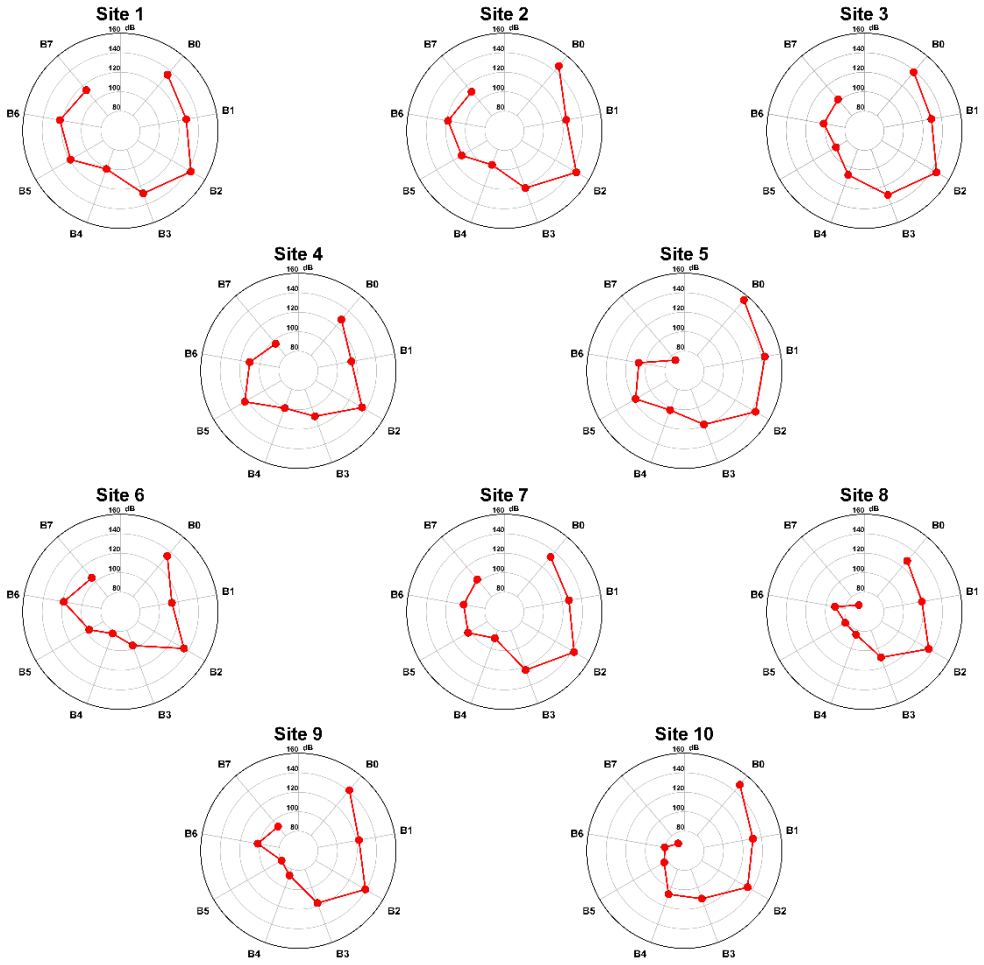
Figure 2 Maximum Electric Field Strengths by Frequency Band



JANUARY 2019

Figure 3 Variation in Measured Maximum Electric Field Strengths

The 10 panels in Figure A3.5-4 graphically show the tabulated electric field strength values from Table A3.5-1.



JANUARY 2019

Figure 4 Maximum Measured Electric Field Strengths

Individual Site Observations

The following discussion very briefly summarizes the EMF measurements conducted at each site. Complete measurement results are plotted and tabulated in the following section.

Site 1 (Newhall Street / Newhall Drive)

This measurement site was near Avaya Stadium. DC magnetic fields were quiet at this location. AC magnetic fields were due to overhead distribution lines. Magnetic fields show some variation due to varying load currents on the power lines, including a step change near the middle.

Site 2 (Montgomery Street / Otterson Street)

This location was South of Diridon Station adjacent to the Pacific Gas and Electric Company (PG&E) Distribution Substation. DC magnetic fields were relatively constant with very small variations. The first sensor had a total magnitude comparable to expected ambient, but the second was lower, indicating influence from nearby steel objects. Multiple trains moved along the alignment, but on the opposite side of the substation, they were sufficiently distant for the DC fluctuations to be quite small. AC magnetic fields in the 10-20 mG range are produced by the substation bus conductors and the power lines connected to the substation.

Site 3 (Communications Hill Boulevard / Curtner Avenue)

Measurements were made near Communications Hill, in a park adjacent to the project extent alignment. Both DC and AC magnetic fields were relatively quiet. DC magnetic fields were comparable in magnitude to the expected geomagnetic ambient level, with a few small variations due to pedestrians in the park passing very near the sensors (e.g., cell phones, strollers). There were no nearby power lines or underground circuits.

Site 4 (Great Oaks Parkway / Las Colinas Road)

This measurement site is immediately adjacent to tracks along Great Oak Parkway. DC magnetic field magnitudes were at expected ambient levels, with many small variations due to passing vehicles on Great Oak Parkway. AC magnetic fields were from overhead distribution lines on the opposite site of the tracks.

Site 5 (Metcalf Road / Coyote Ranch Road)

Measurements were made in front of PG&E Station. Spikes in DC magnetic fields were from passing vehicles along the adjacent road. AC fields were predominantly from the overhead transmission lines—four circuits on two sets of steel lattice towers—with magnitudes of nearly 50 mG at both sensors.

Site 6 (Railroad Avenue / Barrett Avenue)

This measurement site is in Morgan Hill, along Railroad Avenue, across from tracks. The DC magnetic fields were relatively constant with a few spikes due to passing vehicles. AC magnetic fields were less than 1 mG, with overhead distribution lines on the opposite side of the street along the tracks.

Site 7 (Monterey Highway / Las Animas Avenue)

This measurement site is in Gilroy on a cul-de-sac off Las Animas Avenue. This is a quiet area with constant DC magnetic fields and very low AC fields. Adjacent fields are used for livestock grazing. An overhead distribution line runs along the tracks.

Site 8 (State Route 152 / Casa de Fruta Parkway)

This measurement site is on Casa de Fruta Parkway, adjacent to State Route (SR) 152. This is a quiet area with virtually no DC magnetic field variations and essentially zero AC magnetic fields. There were no nearby AC power lines or sources.

Site 9 (Santa Nella Avenue / Fahey Road)

This measurement site is an agricultural area along Santa Nella Road. There were small DC field variations due to vehicles on SR 33. AC fields were in the 1-2 mG range due to distribution lines. AC fields showed variation over time.

Site 10 (Henry Miller Road / Carlucci Road)

Measurements were taken in an agricultural area northeast of Los Banos along Henry Miller Road. DC magnetic field spikes were due to passing trucks. AC fields were quite low. There was a distribution line to the south side of the sensor positions. A shift of the AC fields occurred for several minutes followed by a quick transient, most likely due to a load change on the distribution line such as running of pumps for irrigation.

Site Photographs and Measurement Data

The remainder of this appendix contains photographs and measurement results from each site.

JANUARY 2020

Figure 5(a) Location 1: Newhall Street / Newhall Drive, San Jose

Industrial/commercial area near the existing rail alignment, Avaya Stadium, and San Jose International airport (Lat 37.347447°, -121.923012°)

JANUARY 2019

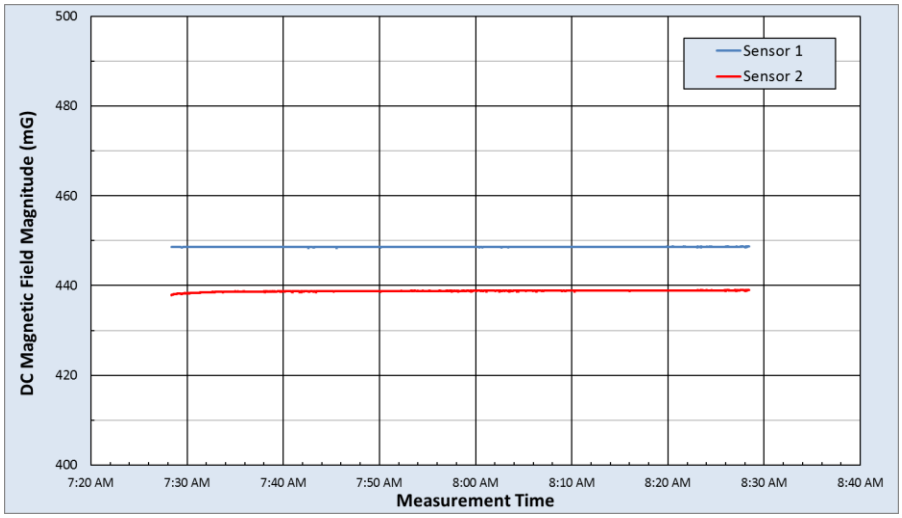
Figure 5(b) Location 1: Measurement Location and Site Views

Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

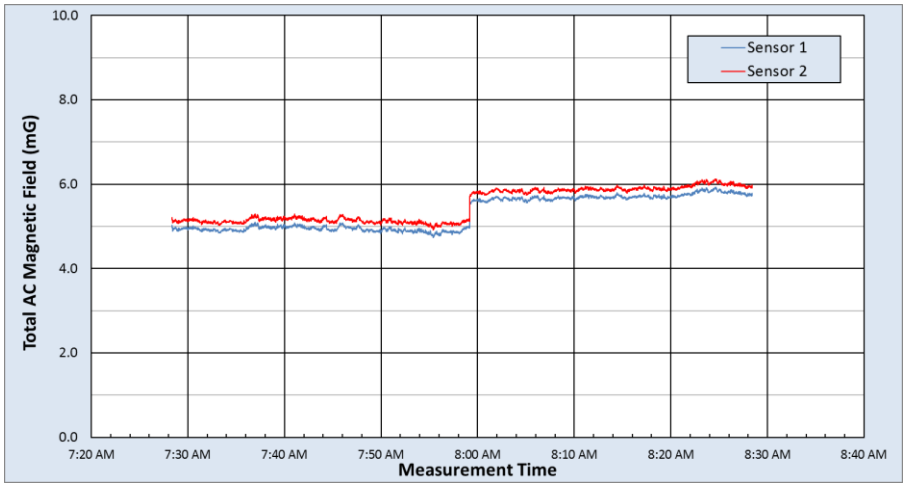
JANUARY 2019

Figure 5(c) Location 1: Local EMF Sources

Nearby emitters include cell towers, distribution lines parallel and perpendicular to the alignment, and a small electrical substation. Photos depict visible close-proximity emitters. Other emissions sources may exist, but are not visible from the site.



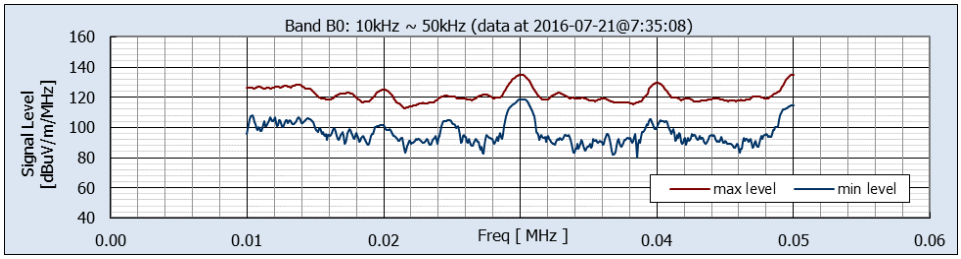
DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	242.1	249.6	378.0	361.2	448.7	439.0
Median	241.8	249.4	377.9	361.0	448.6	438.8
Min	241.7	249.2	377.6	360.0	448.5	437.9
Range	0.4	0.5	0.4	1.3	0.2	1.1
Std Dev	0.1	0.1	0.0	0.2	0.0	0.2

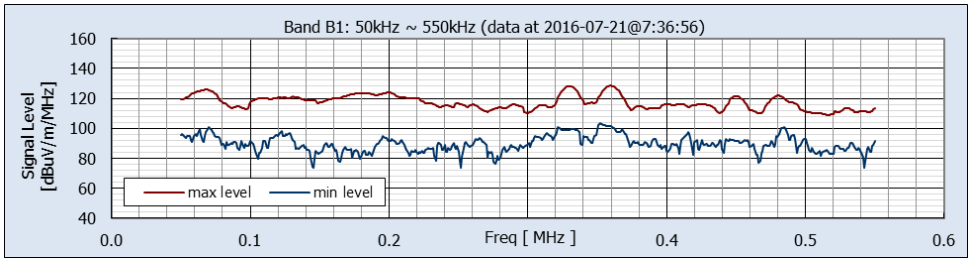


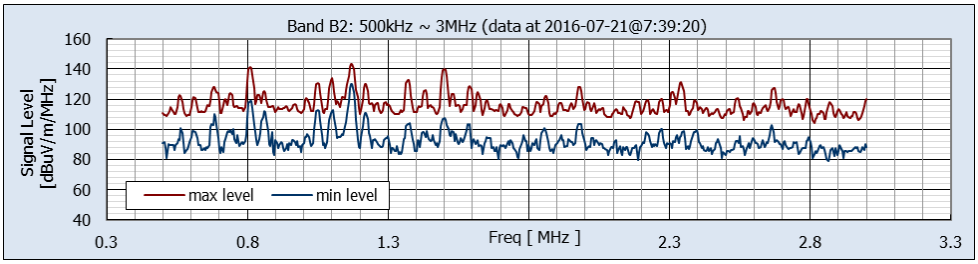
rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	5.910	6.109	0.023	0.034	0.110	0.116	0.019	0.058	0.494	0.543	0.021	0.027	0.098	0.099	5.925	6.127
Median	5.018	5.214	0.011	0.013	0.090	0.094	0.009	0.011	0.439	0.481	0.009	0.011	0.028	0.032	5.041	5.241
Min	4.709	4.891	0.002	0.003	0.068	0.071	0.002	0.003	0.364	0.388	0.002	0.002	0.008	0.008	4.733	4.920
Range	1.201	1.218	0.021	0.030	0.042	0.045	0.018	0.056	0.130	0.155	0.019	0.025	0.090	0.092	1.192	1.207
Std Dev	0.396	0.394	0.003	0.004	0.008	0.006	0.003	0.006	0.023	0.028	0.003	0.003	0.022	0.022	0.393	0.390

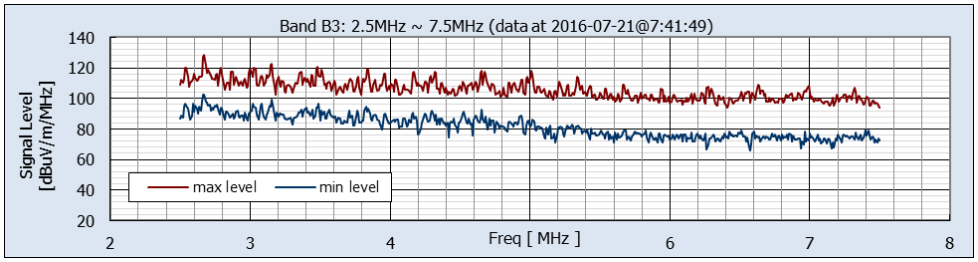
JANUARY 2019

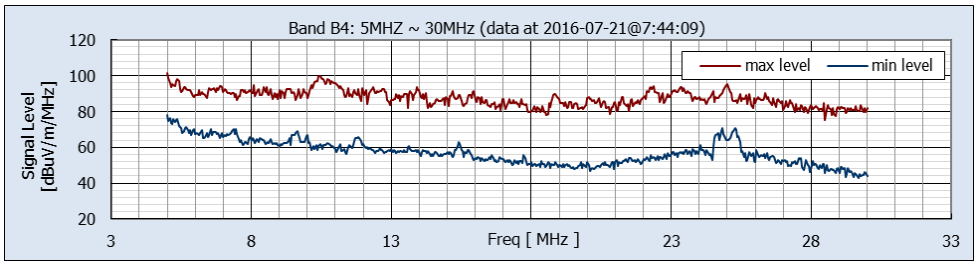
Figure 5(d) Location 1: AC and DC Magnetic Field Measurement Results









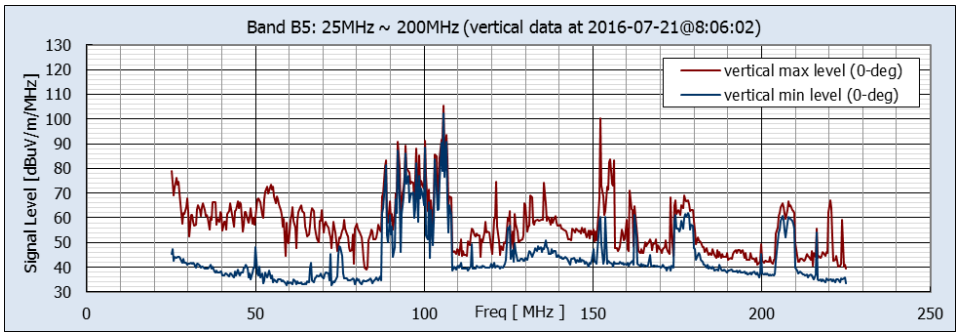


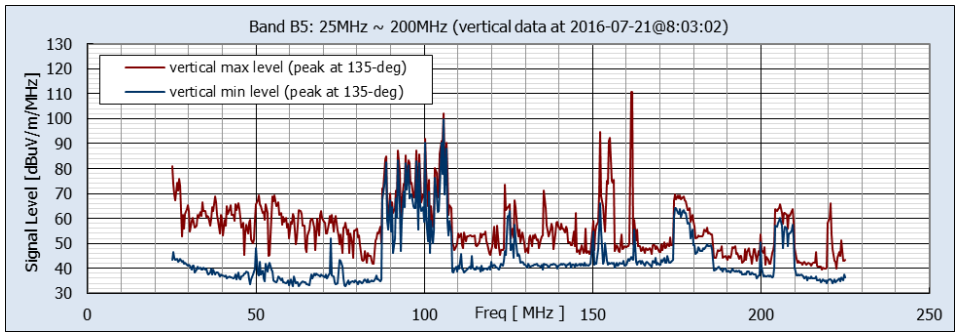
Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	118.8	0.0301	135.1	0.0500
B1	0.05 ~ 0.55	103.8	0.3518	128.4	0.3600
B2	0.50 ~ 3.00	130.1	1.1682	143.5	1.1682
B3	2.5 ~ 7.5	102.3	2.6636	128.4	2.6727
B4	5 ~ 30	77.8	5.0000	101.7	5.0000

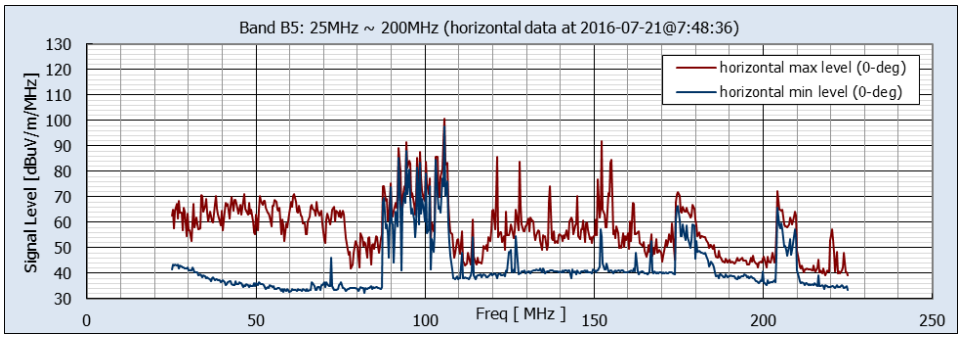
JANUARY 2019

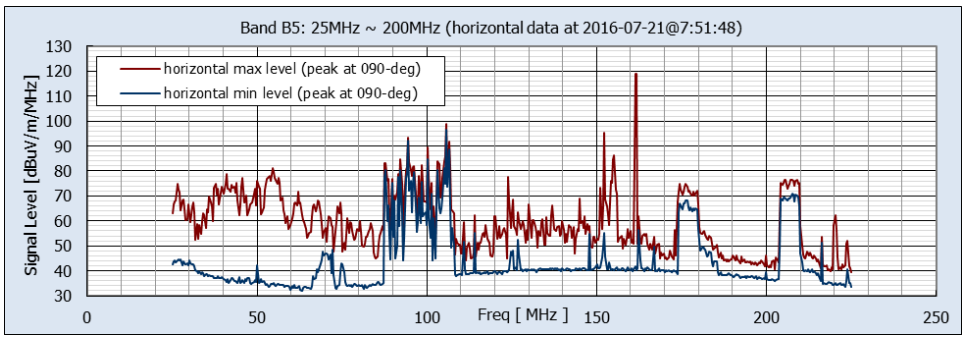
Figure 5(e) Location 1: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	102.1	105.727	110.6	161.727	97.7	105.727	119.0	161.727

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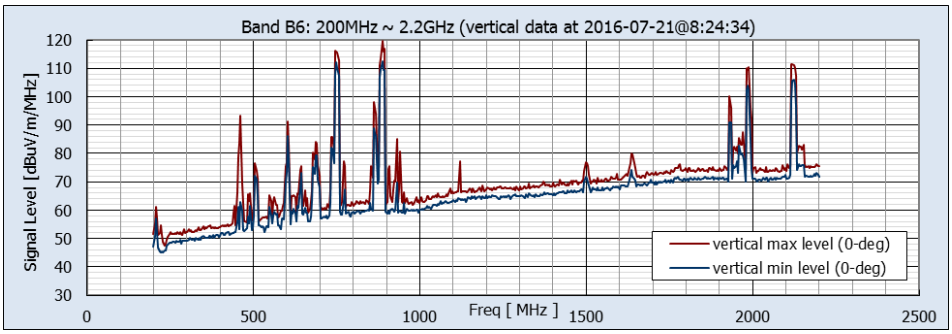
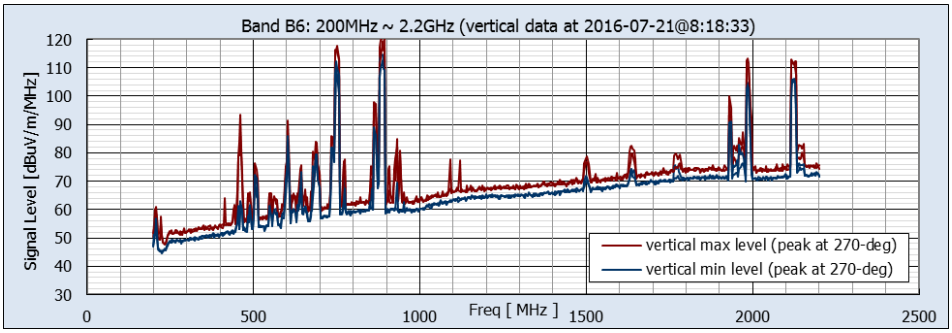
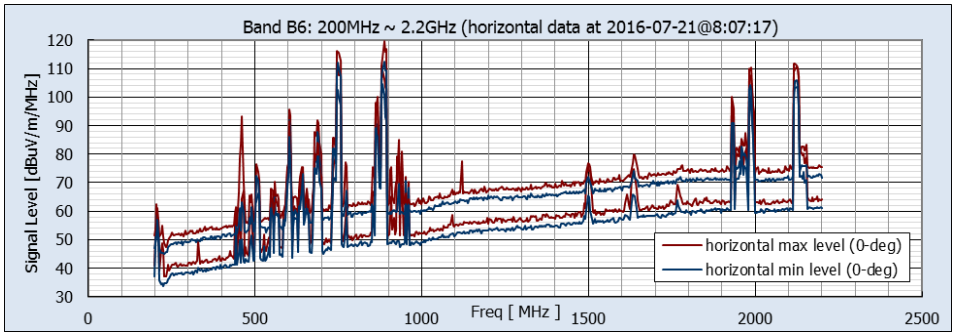
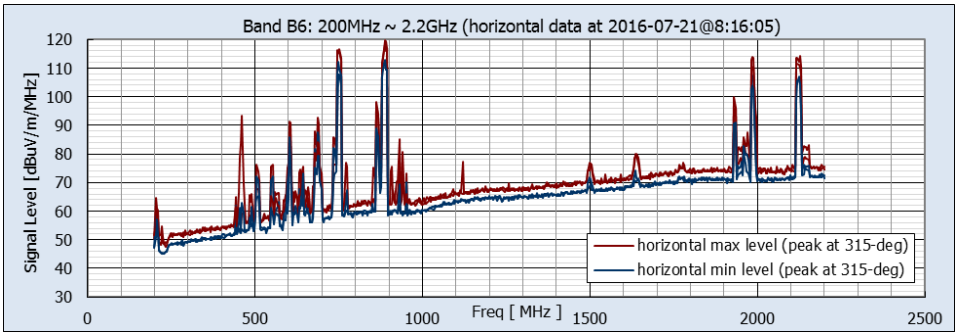
Figure 5(f) Location 1: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq.	Vertical				Horizontal			
Band	Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	114.6	887.273	122.9	890.909	113.0	887.273	119.3	890.909

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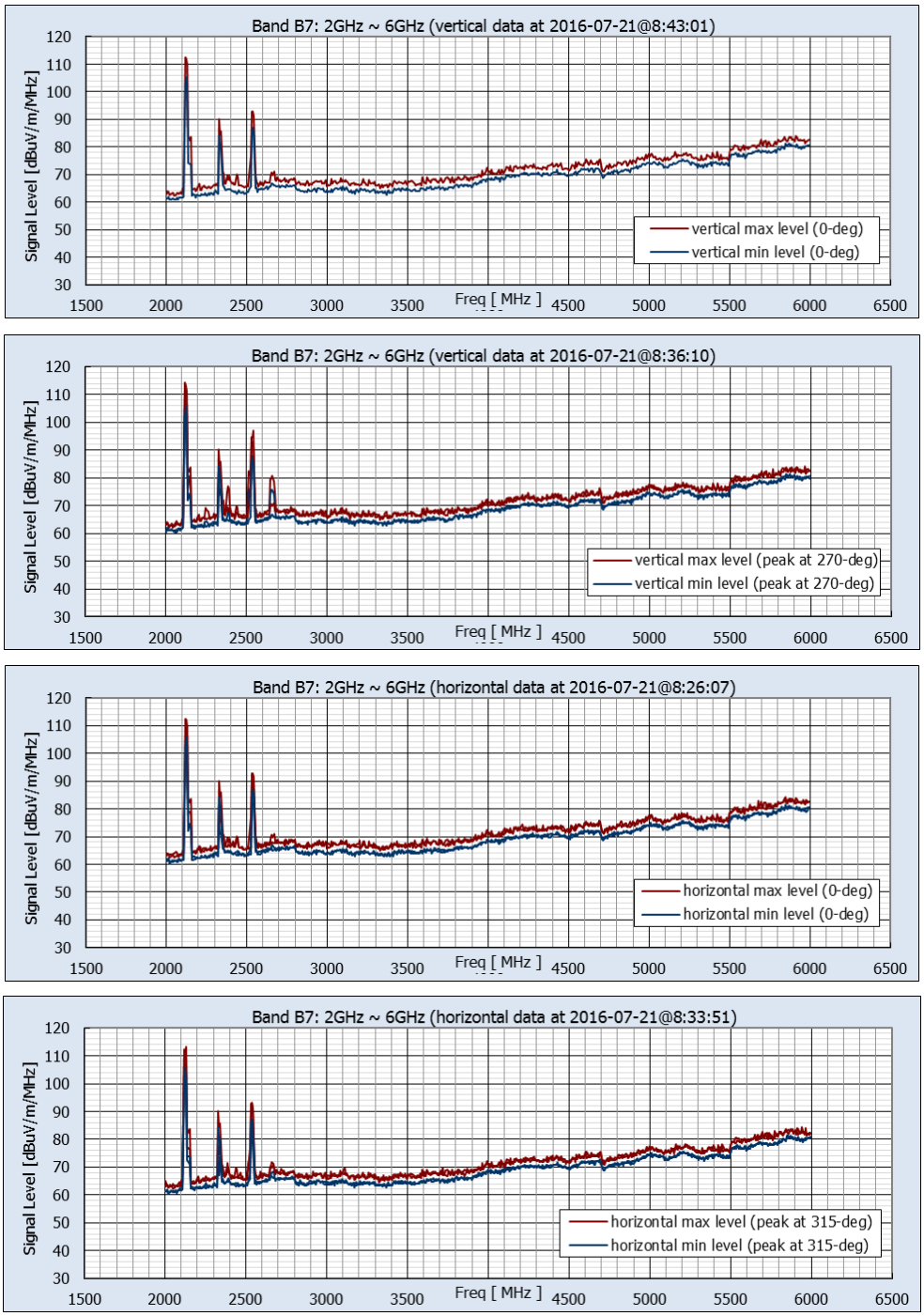
Figure 5(g) Location 1: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation



Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	107.6	2116.364	114.4	2116.364	107.2	2123.636	113.3	2130.909

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Figure 5(h) Location 1: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

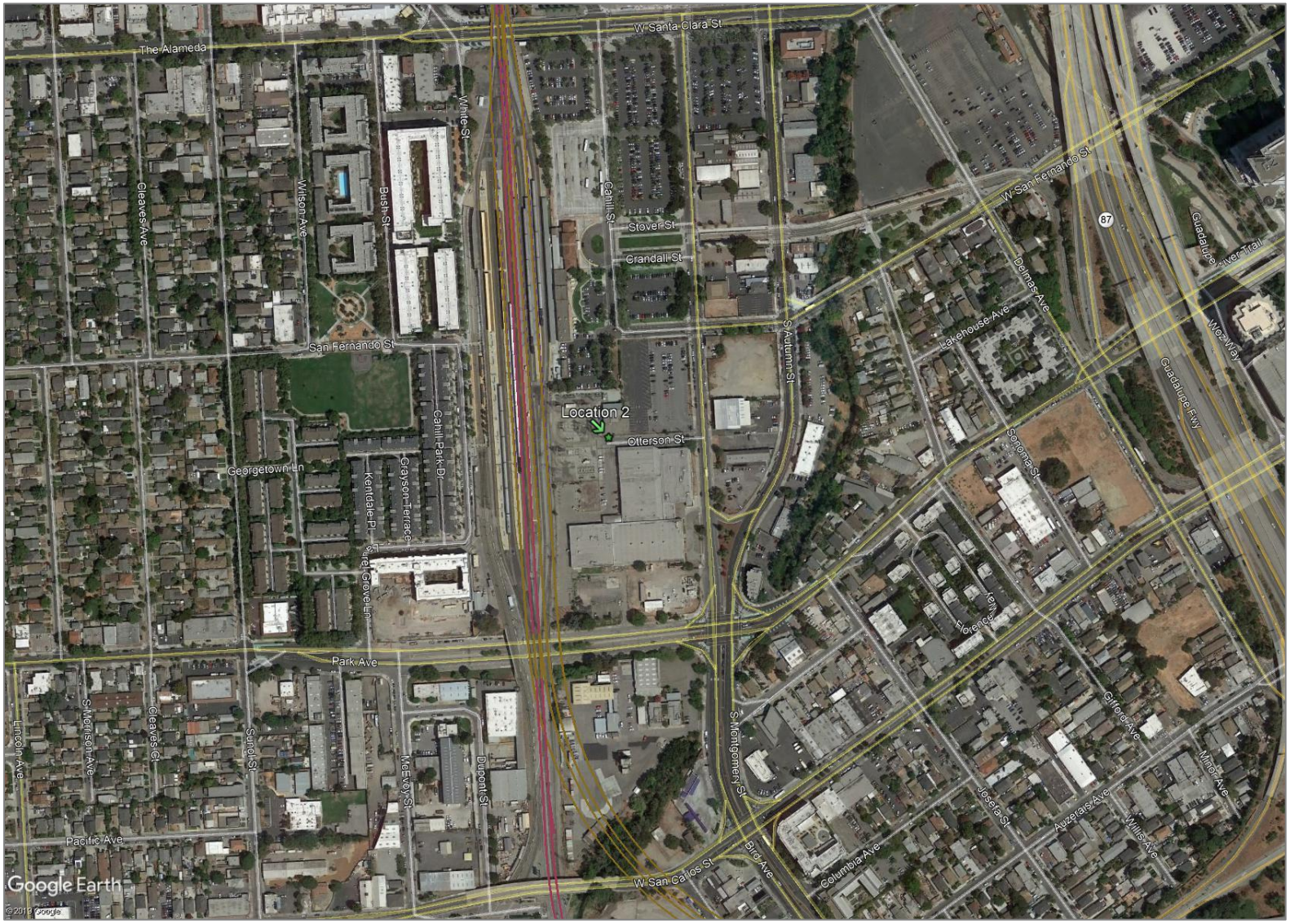

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Figure 6(a) Location 2: Montgomery Street / Otterson Street, San Jose

Industrial/commercial setting between San Jose Diridon Station and the PG&E substation (Lat 37.328142°, Lon -121.902140°)

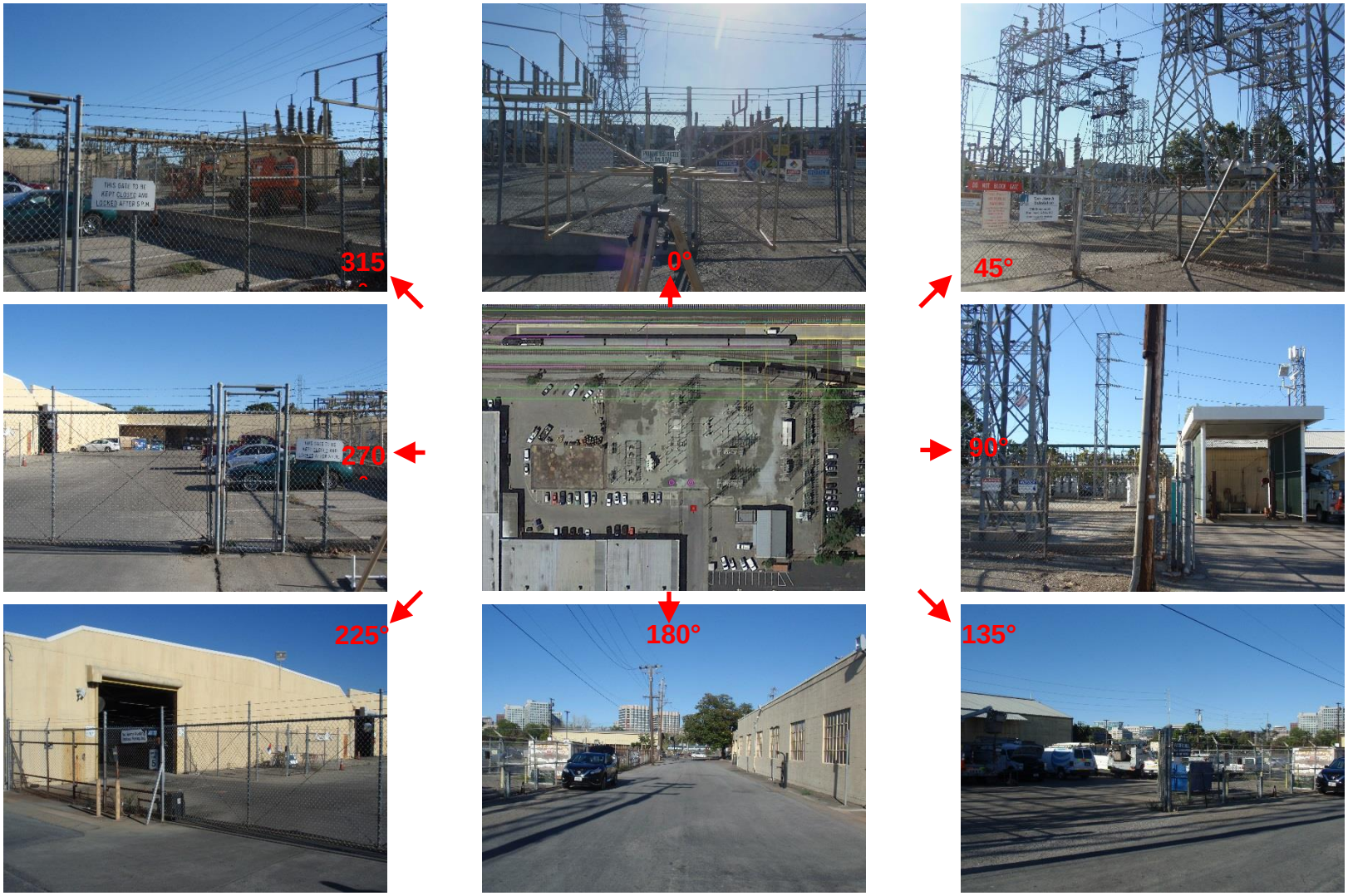

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Figure 6(b) Location 2: Measurement Location and Site Views

Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

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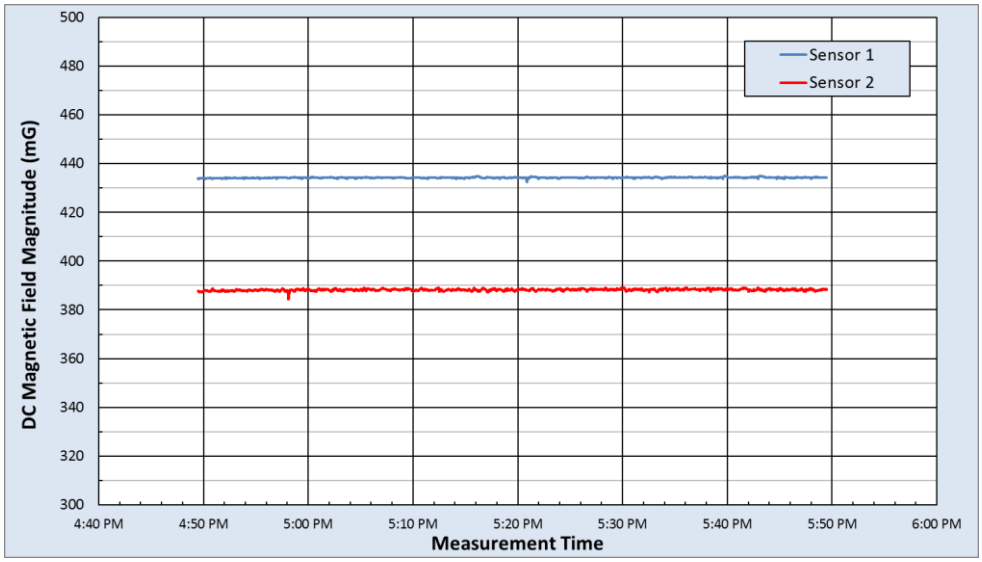
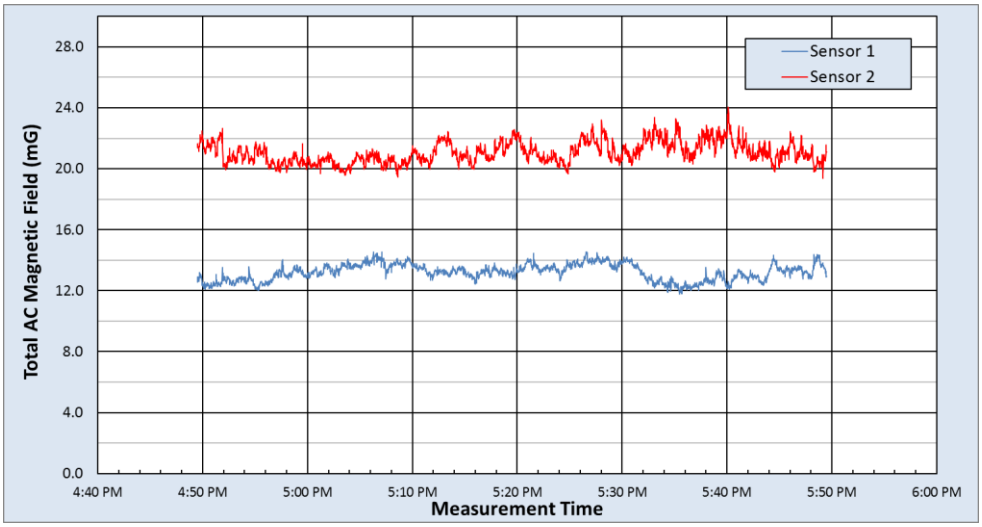
Figure 6(c) Location 2: Local EMF Sources

Nearby emitters include high-voltage transmission lines and substation equipment, distribution lines, and cellular communications. Photos depict visible close-proximity emitters. Other emissions sources may exist, but are not visible from the site.



DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	289.7	222.9	325.5	319.5	434.9	389.1
Median	288.9	222.2	324.1	318.4	434.2	388.2
Min	288.2	221.0	322.3	314.1	432.5	384.4
Range	1.5	1.9	3.2	5.5	2.4	4.7
Std Dev	0.2	0.4	0.3	0.5	0.2	0.4



rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	14.402	23.718	0.107	0.229	2.078	4.397	0.073	0.092	0.699	0.727	0.076	0.244	0.314	0.488	14.556	24.043
Median	13.072	20.533	0.037	0.083	2.004	4.079	0.015	0.033	0.629	0.550	0.018	0.090	0.275	0.380	13.241	20.946
Min	11.594	18.948	0.007	0.010	1.937	3.729	0.003	0.006	0.576	0.381	0.005	0.019	0.231	0.303	11.791	19.387
Range	2.808	4.770	0.100	0.219	0.141	0.668	0.070	0.087	0.122	0.347	0.071	0.225	0.082	0.185	2.765	4.656
Std Dev	0.552	0.719	0.013	0.038	0.023	0.086	0.006	0.014	0.017	0.058	0.006	0.030	0.010	0.024	0.543	0.706

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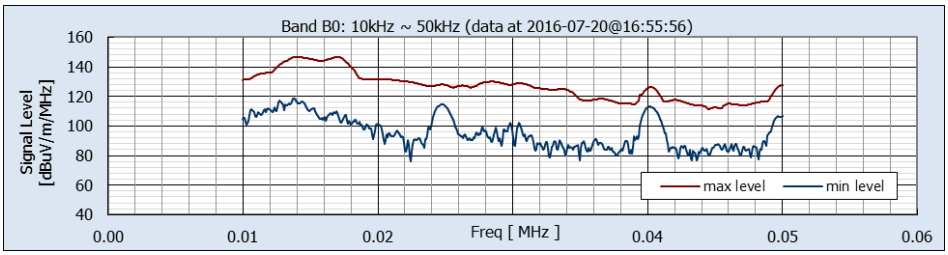
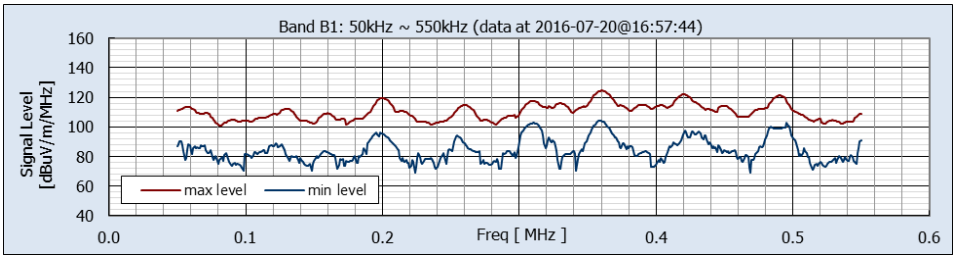
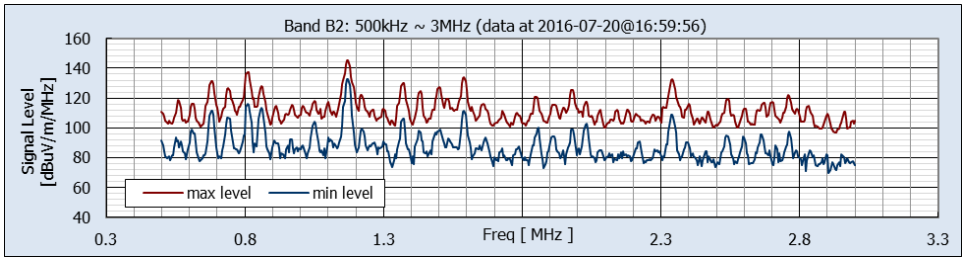
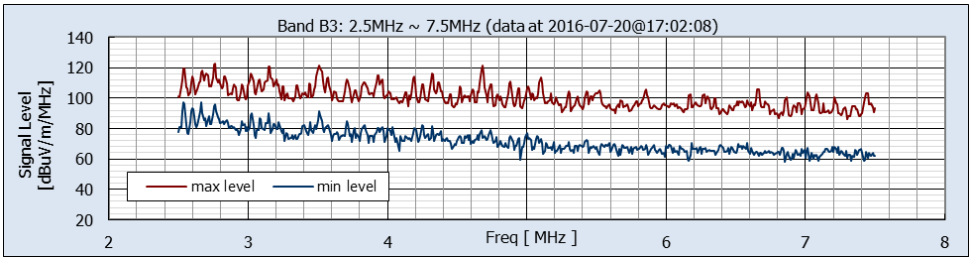
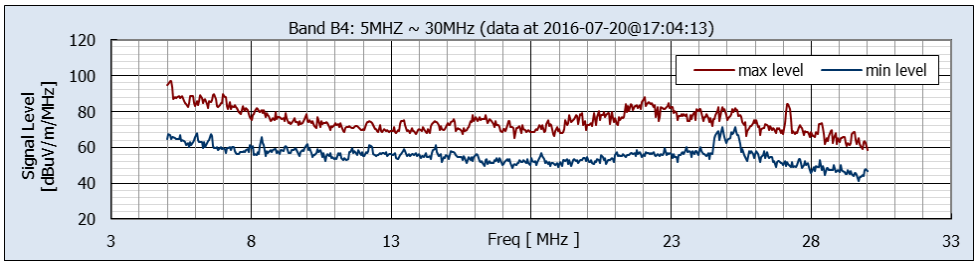
Figure 6(d) Location 2: AC and DC Magnetic Field Measurement Results











Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	118.7	0.0138	146.7	0.0170
B1	0.05 ~ 0.55	104.0	0.3591	124.4	0.3600
B2	0.50 ~ 3.00	132.7	1.1727	145.0	1.1682
B3	2.5 ~ 7.5	97.5	2.5364	122.5	2.7636
B4	5 ~ 30	71.2	25.2727	97.1	5.0909

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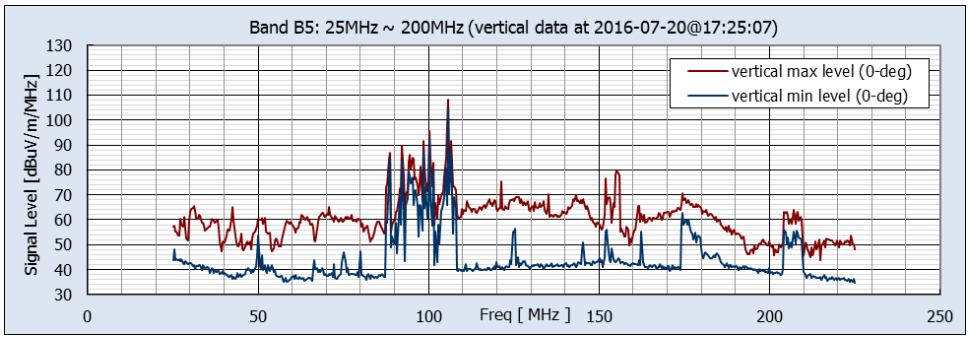
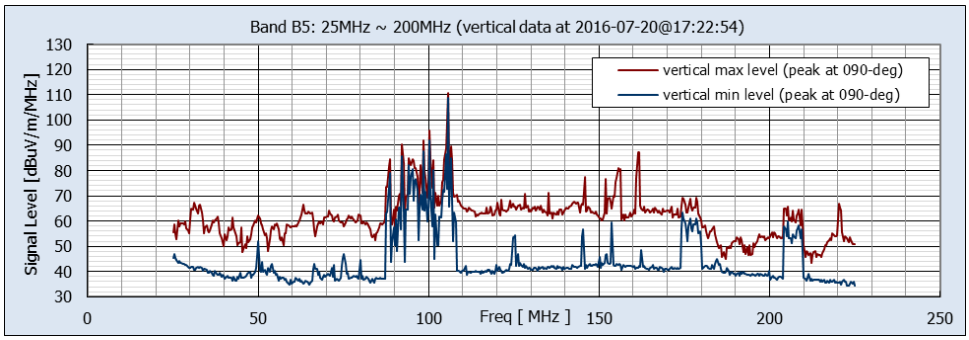
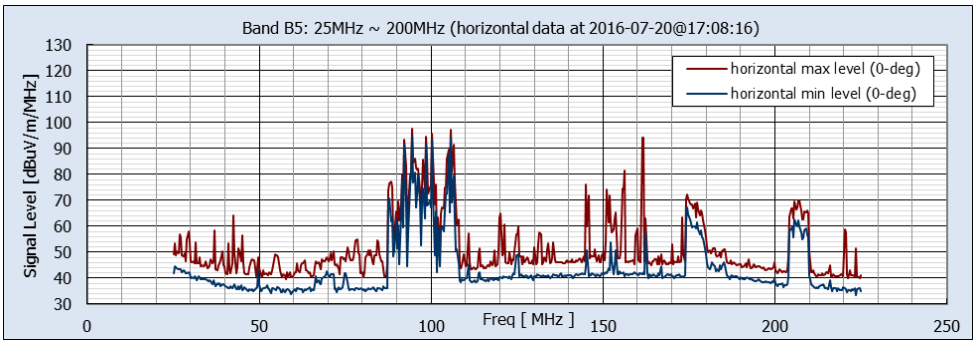
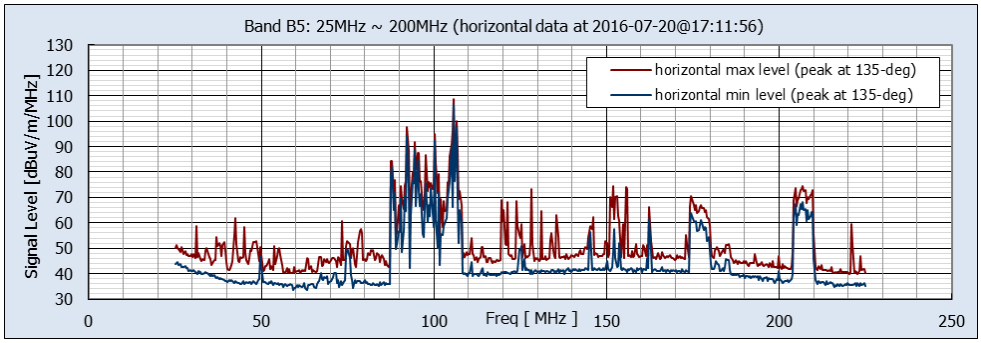
Figure 6(e) Location 2: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	108.5	105.727	110.6	105.727	106.3	105.727	108.6	105.727

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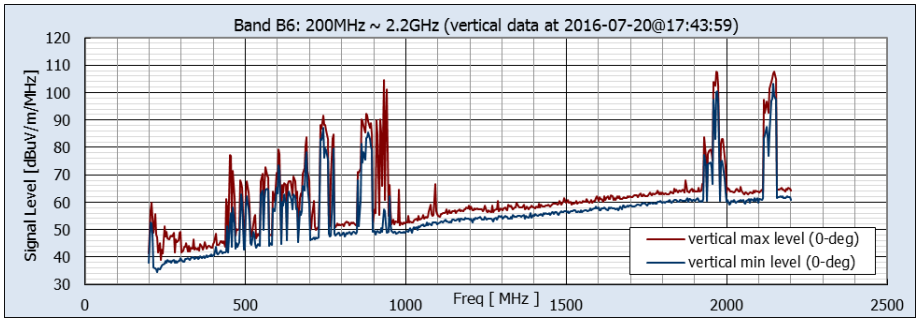
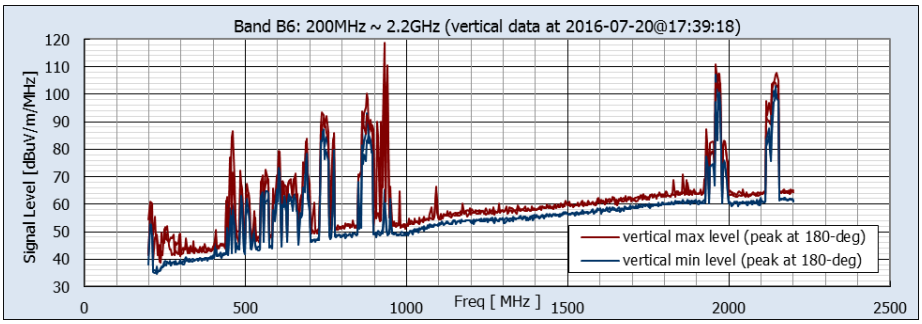
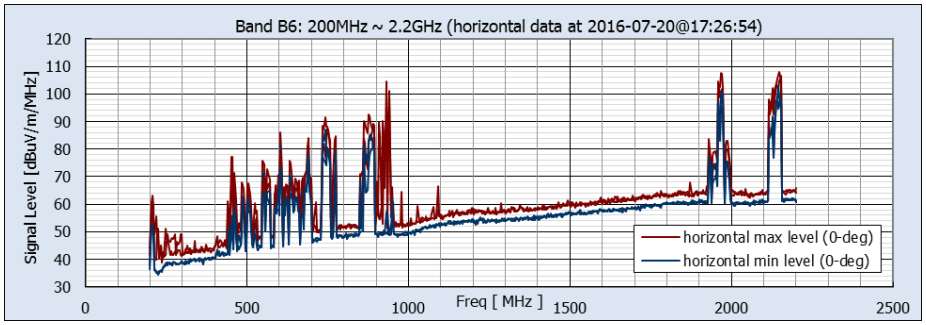
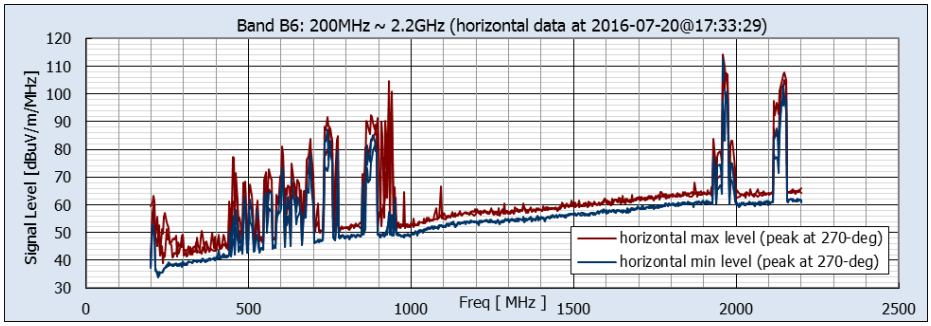
Figure 6(f) Location 2: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	107.1	1960.000	118.7	930.909	112.7	1960.000	114.2	1960.000

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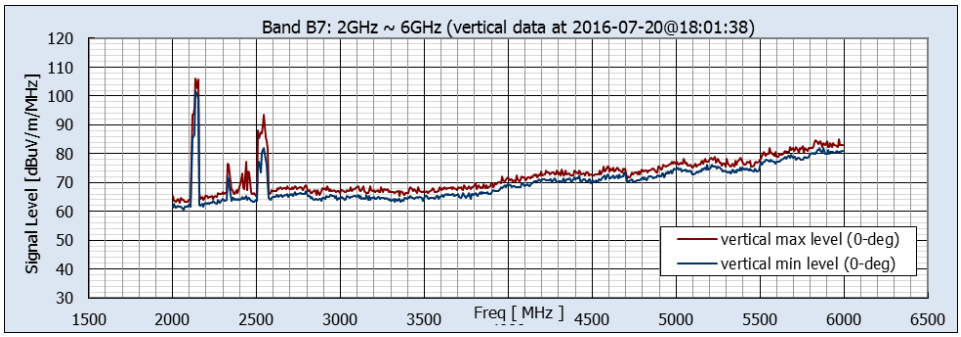
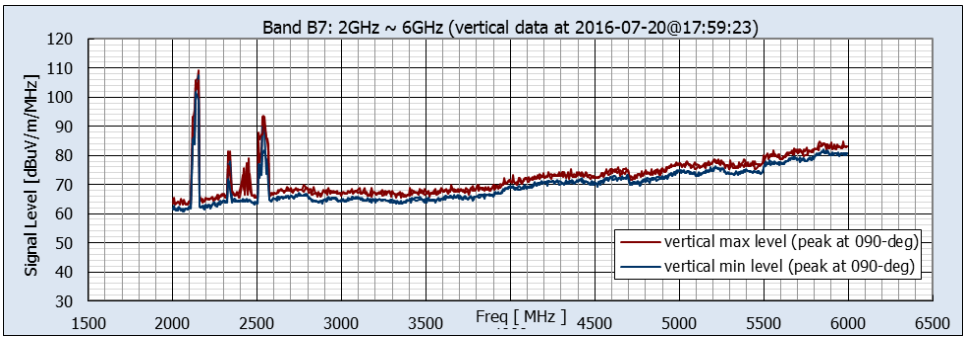
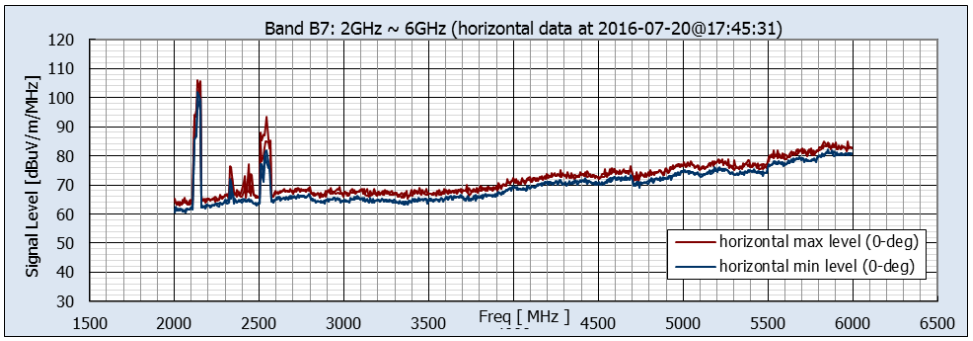
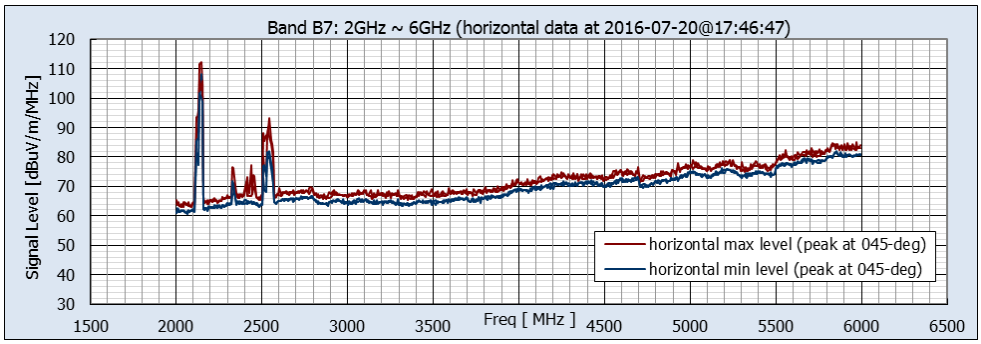
Figure 6(g) Location 2: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq.	Vertical				Horizontal			
Band	Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	107.4	2152.727	109.2	2152.727	108.3	2145.455	112.3	2145.455

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Figure 6(h) Location 2: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

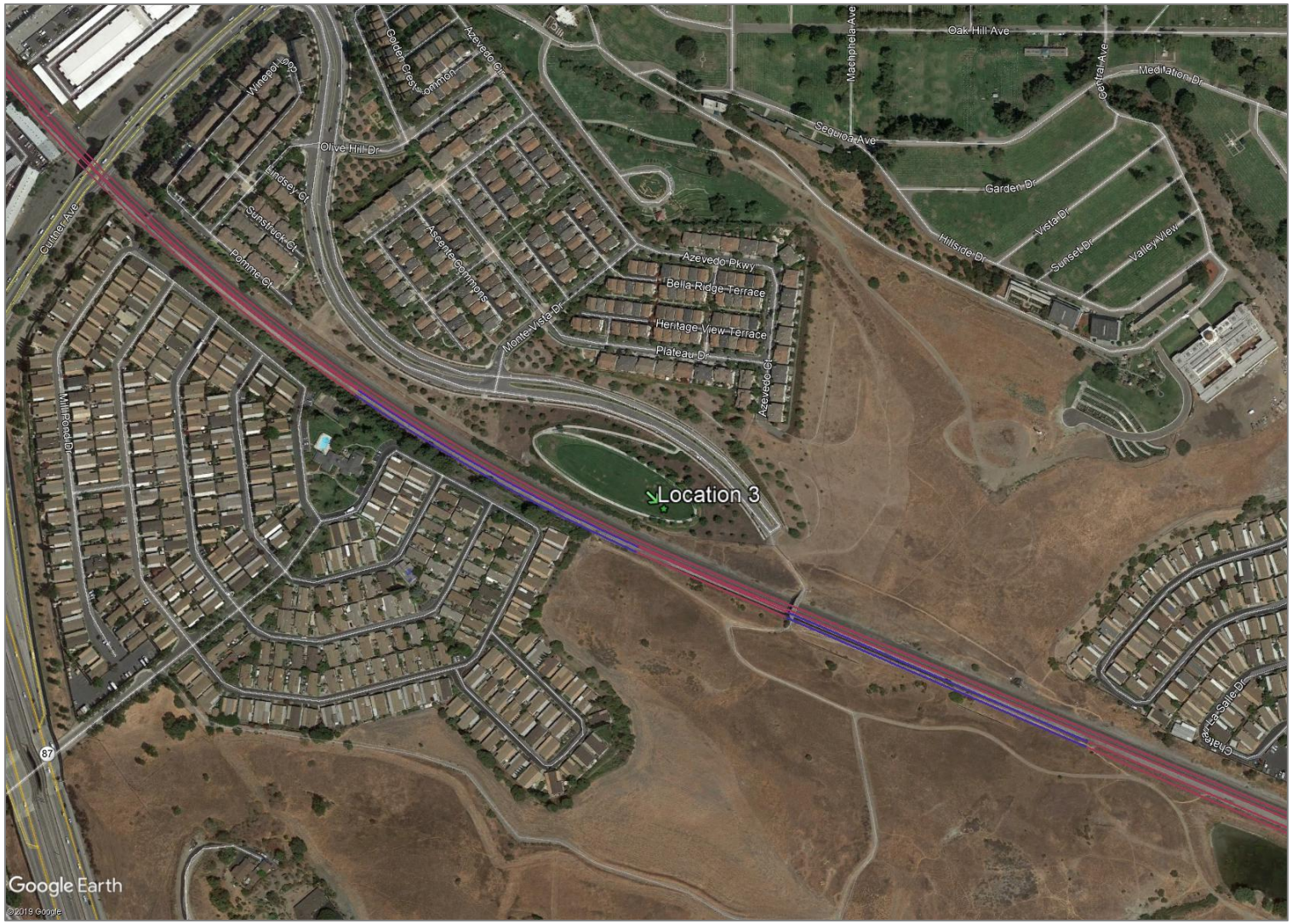

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Figure 7(a) Location 3: Communications Hill Boulevard/Monte Vista Drive, San Jose

Suburban setting near the existing rail alignment, with significant RF emitters (Lat 37.293722°, Lon -121.865194°)

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Figure 7(b) Location 3: Measurement Location and Site Views

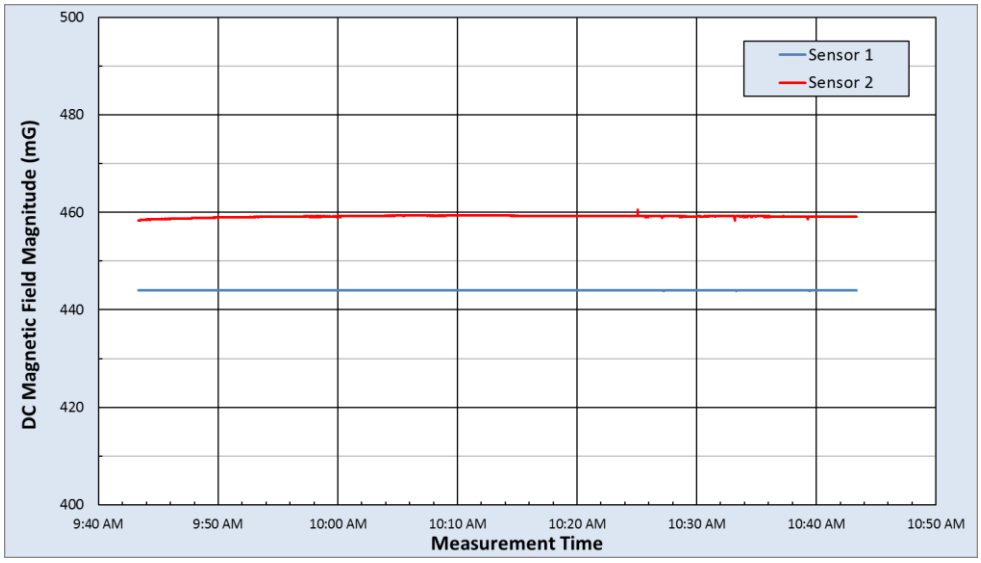
Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

JANUARY 2019

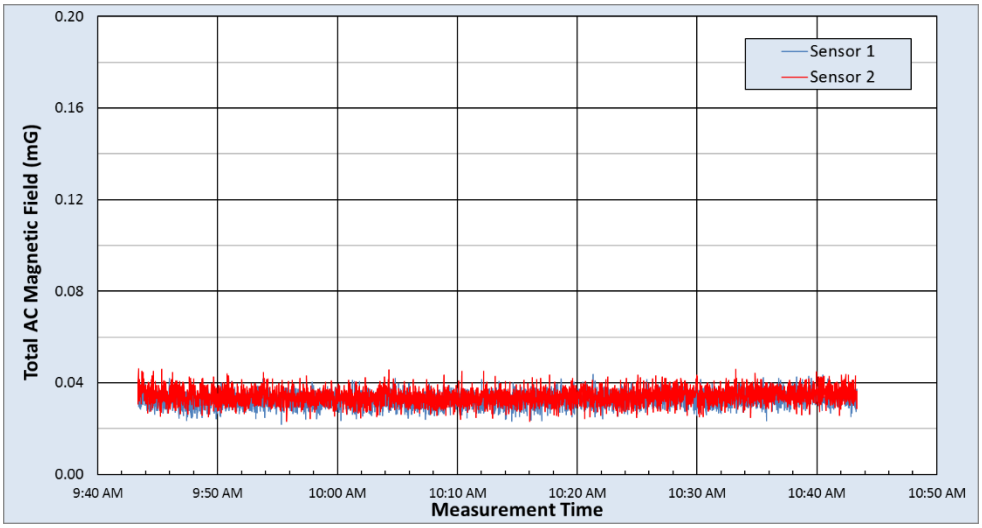
Figure 7(c) Location 3: Local EMF Sources

Nearby emitters include microwave towers, railway communications, and fixed land communications.

Photos depict visible close-proximity emitters. Other emissions sources may exist that are not readily visible from the site.



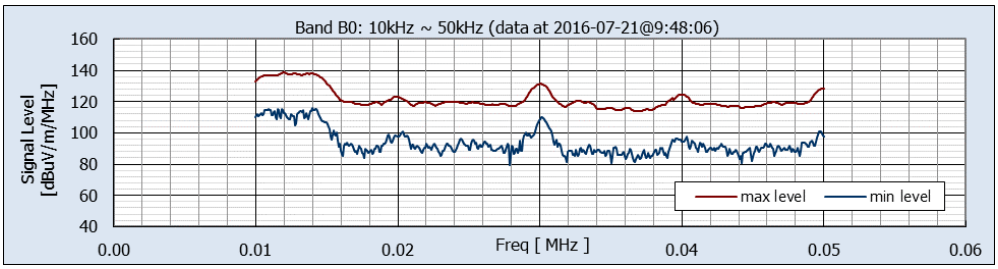
DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	248.0	202.6	368.6	413.8	444.1	460.6
Median	247.7	201.2	368.5	412.9	444.0	459.2
Min	247.4	198.7	368.3	411.7	443.8	458.3
Range	0.5	3.9	0.3	2.2	0.2	2.3
Std Dev	0.1	0.8	0.1	0.3	0.0	0.2

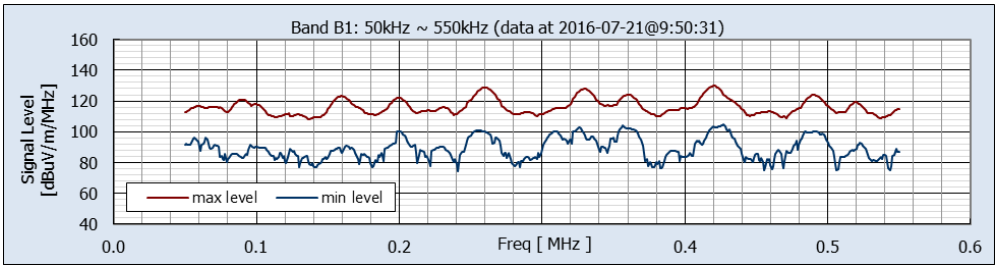


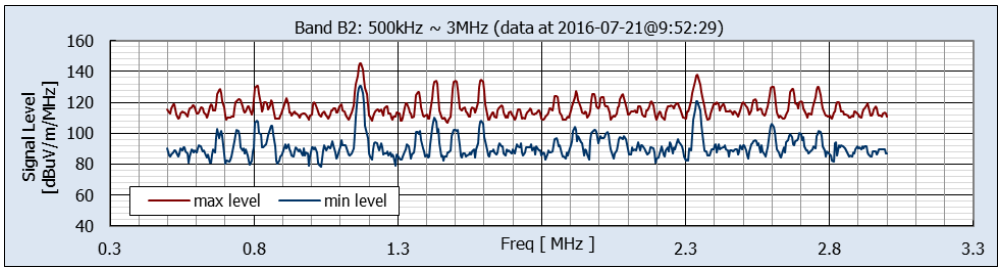
rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	0.028	0.030	0.019	0.020	0.031	0.032	0.020	0.028	0.022	0.026	0.020	0.022	0.021	0.024	0.044	0.046
Median	0.016	0.016	0.008	0.008	0.020	0.020	0.008	0.009	0.009	0.010	0.009	0.009	0.009	0.010	0.033	0.034
Min	0.004	0.004	0.002	0.002	0.008	0.007	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.003	0.022	0.023
Range	0.024	0.027	0.018	0.018	0.023	0.024	0.018	0.026	0.020	0.024	0.018	0.021	0.020	0.021	0.022	0.023
Std Dev	0.003	0.004	0.002	0.003	0.003	0.004	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003

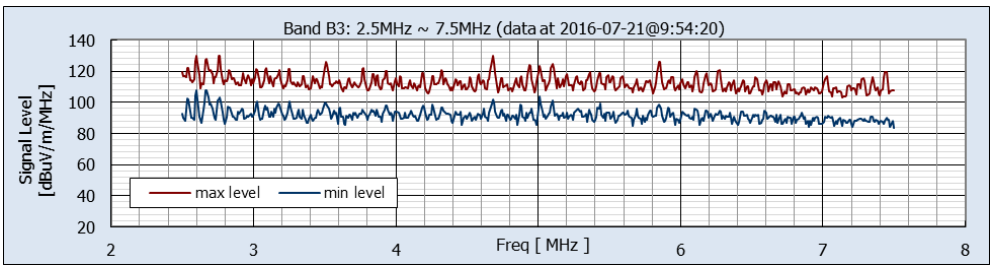
JANUARY 2019

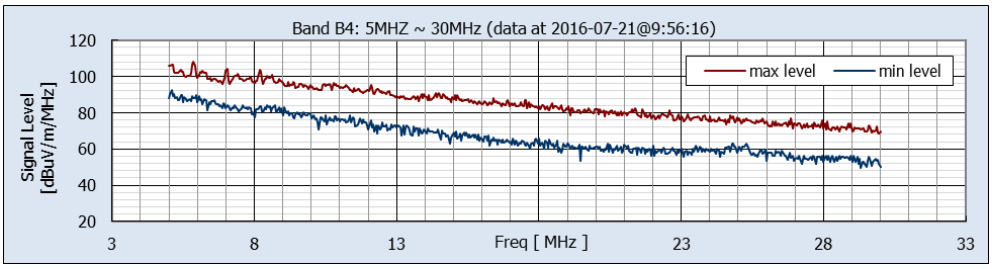
Figure 7(d) Location 3: Measured DC and AC Magnetic Field Strengths











Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	115.7	0.0140	138.5	0.0120
B1	0.05 ~ 0.55	104.6	0.4273	129.8	0.4200
B2	0.50 ~ 3.00	130.5	1.1682	145.3	1.1682
B3	2.5 ~ 7.5	107.7	2.6727	130.0	2.7636
B4	5 ~ 30	92.4	5.0909	108.2	5.8636

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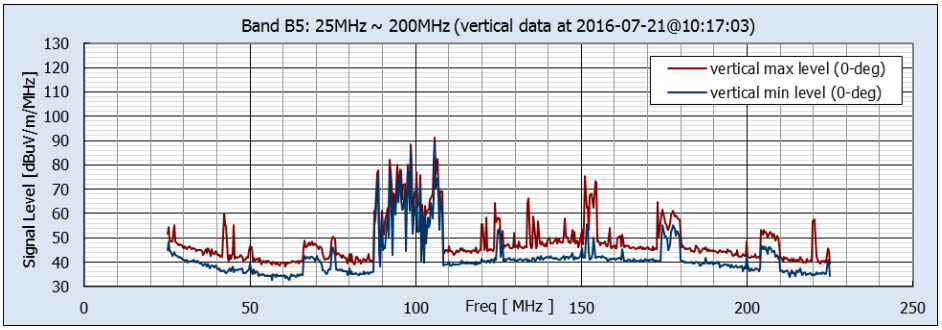
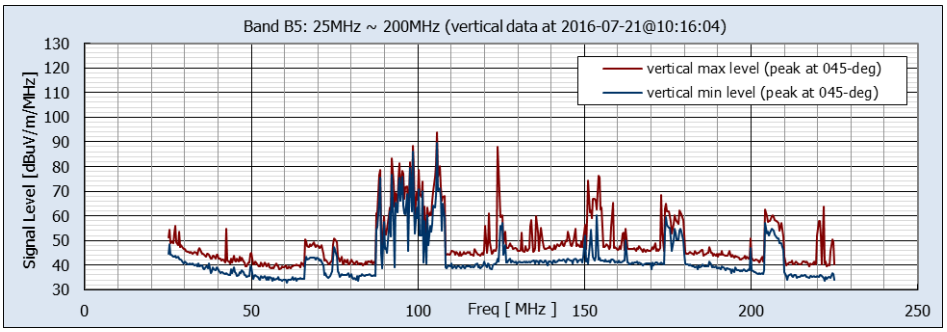
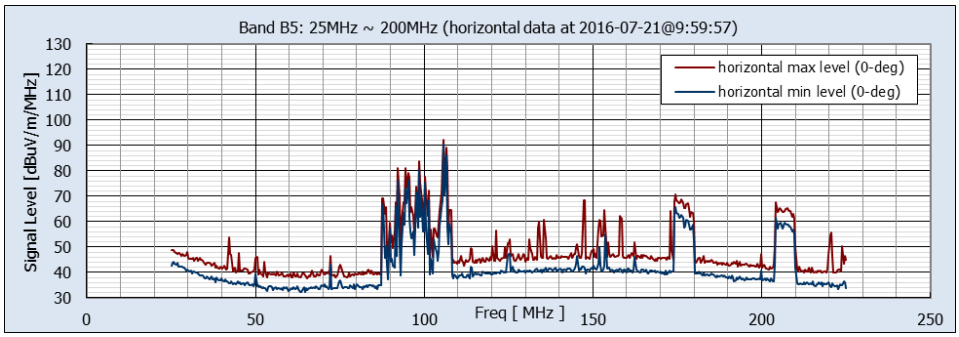
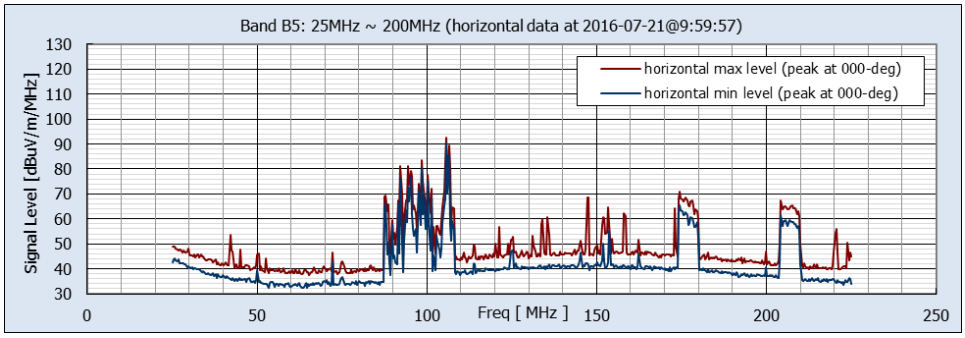
Figure 7(e) Location 3: Measured Environmental RF Levels
Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	89.6	105.727	93.7	105.727	90.5	105.727	92.4	105.727

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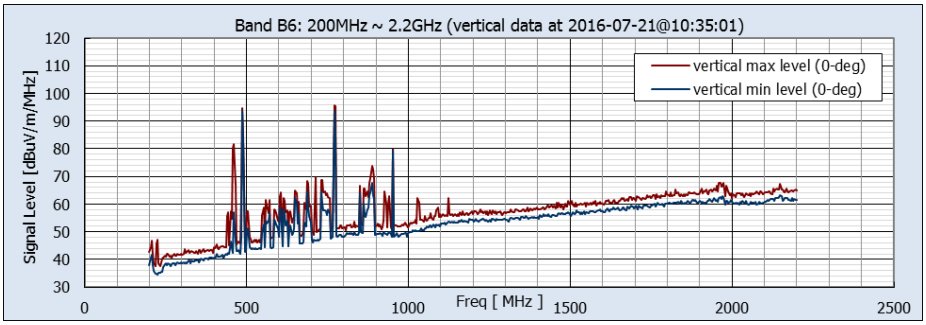
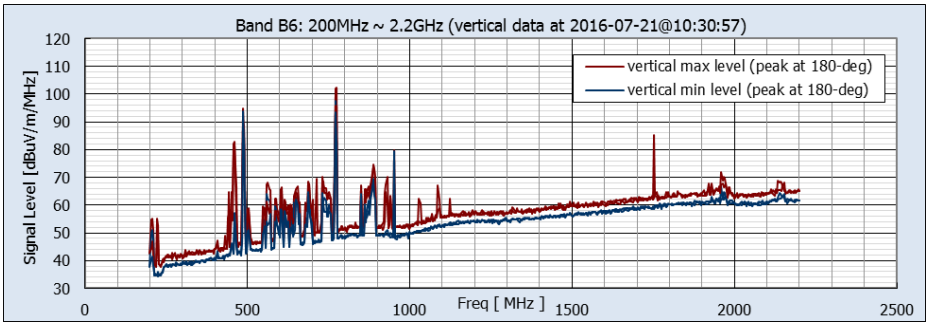
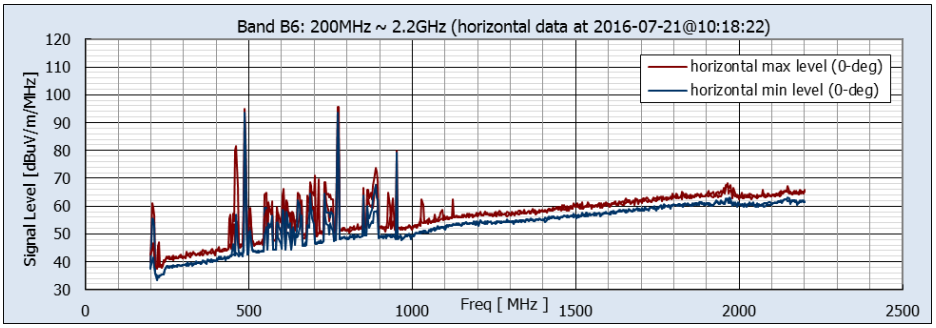
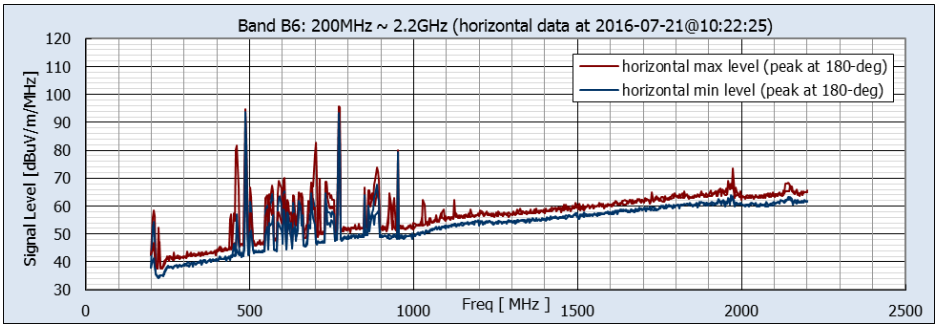
Figure 7(f) Location 3: Measured Environmental RF Levels Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	97.4	770.909	102.4	774.545	79.8	774.545	87.2	774.545

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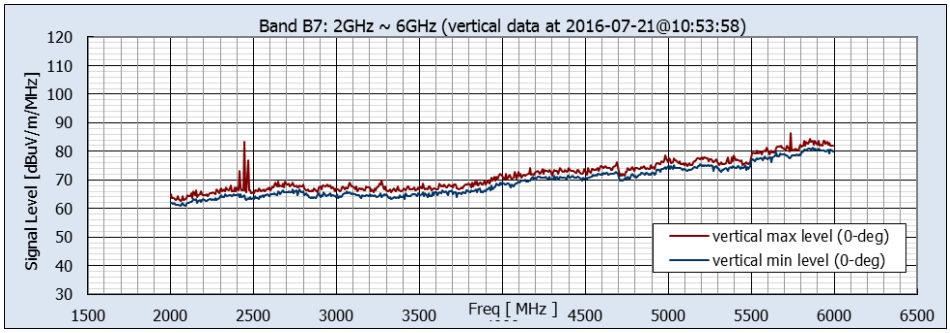
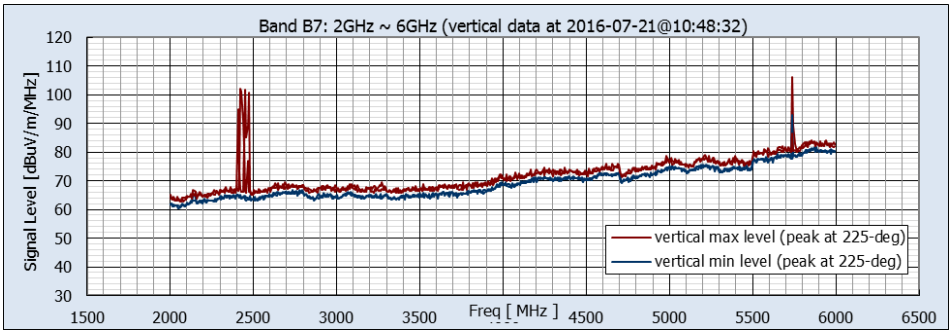
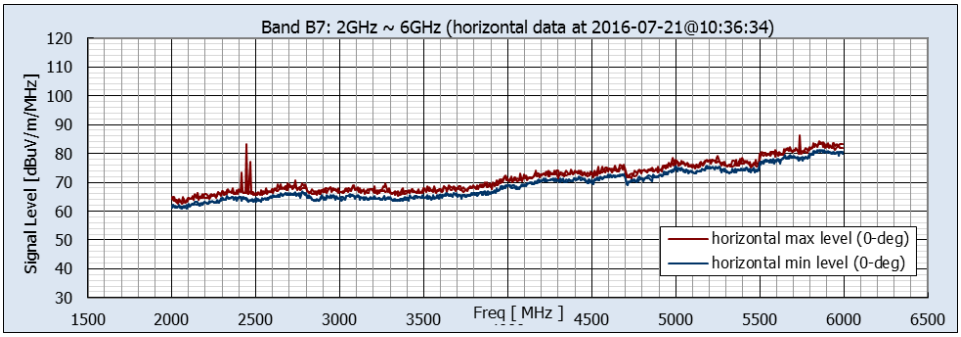
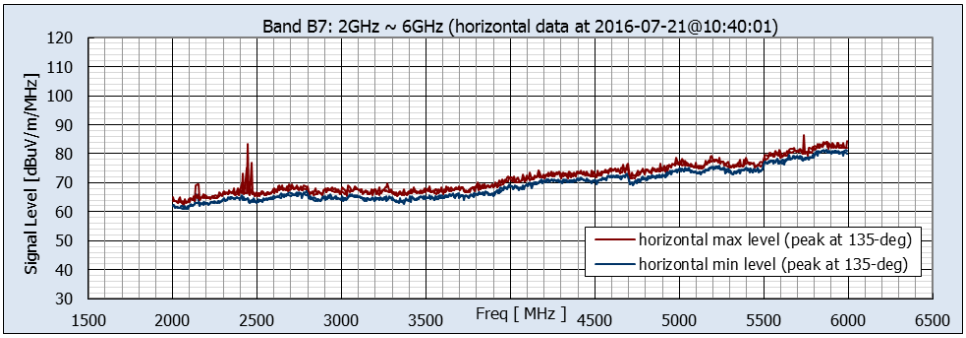
Figure 7(g) Location 3: Measured Environmental RF Levels Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	66.3	2712.727	102.2	2421.818	66.8	2690.909	75.1	2436.364

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Figure 7(h) Location 3: Measured Environmental RF Levels Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

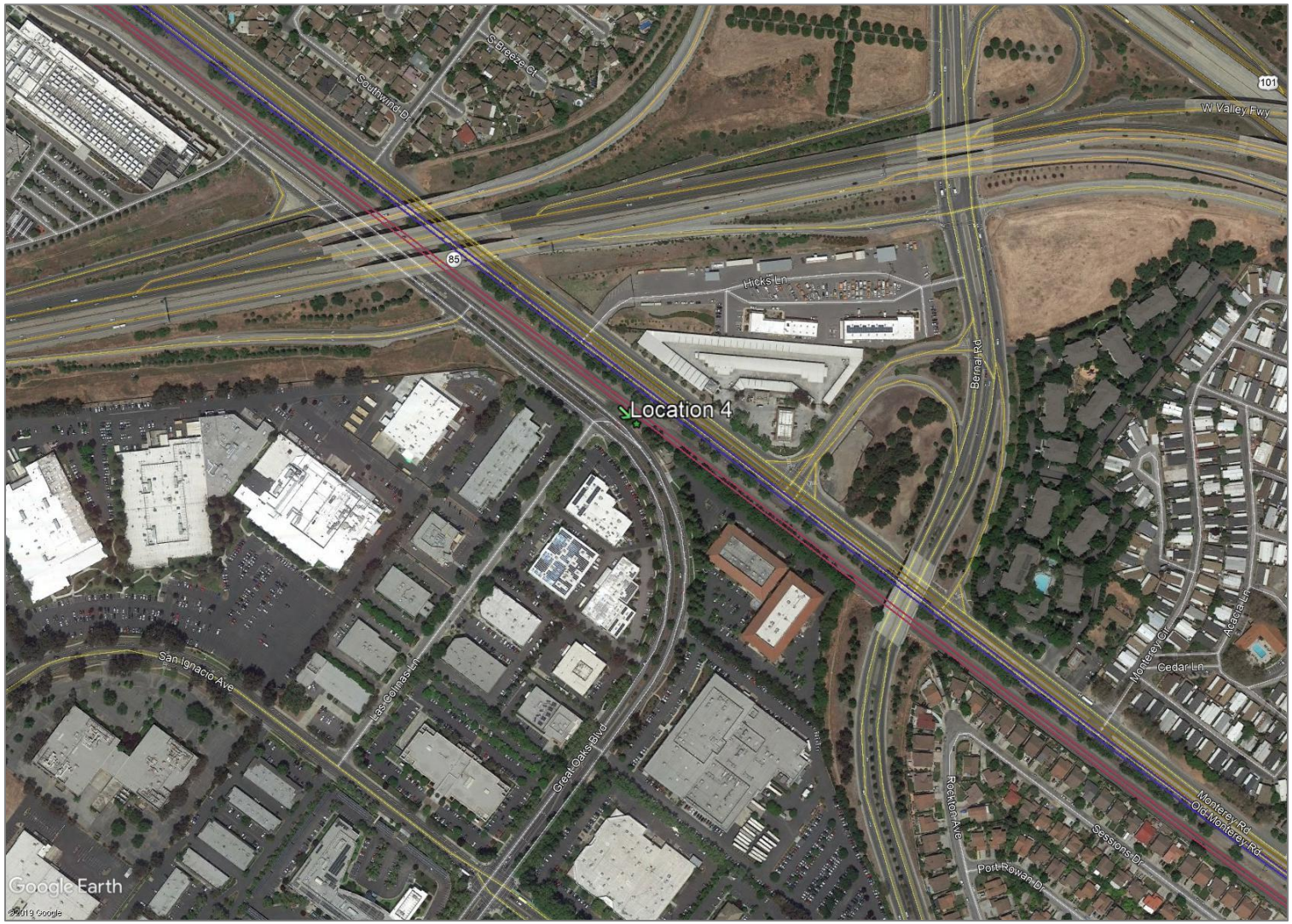

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Figure 8(a) Location 4: Great Oaks Parkway/Las Colinas Road, San Jose

Adjacent to high technology office park and near the existing rail; no visible RF emitters (Lat 37.239322°, Lon -121.776080°)

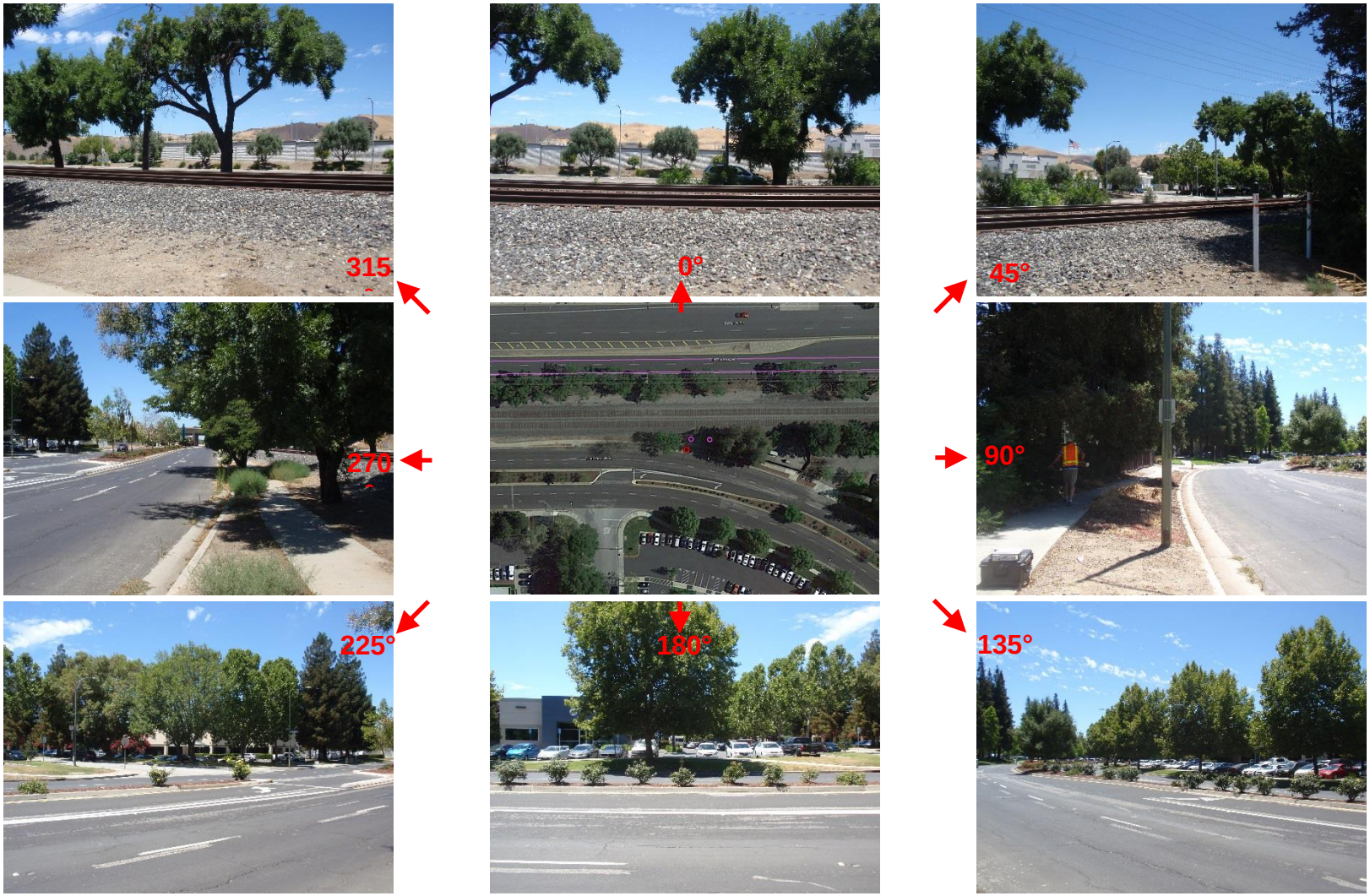

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Figure 8(b) Location 4: Measurement Location and Site Views

Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

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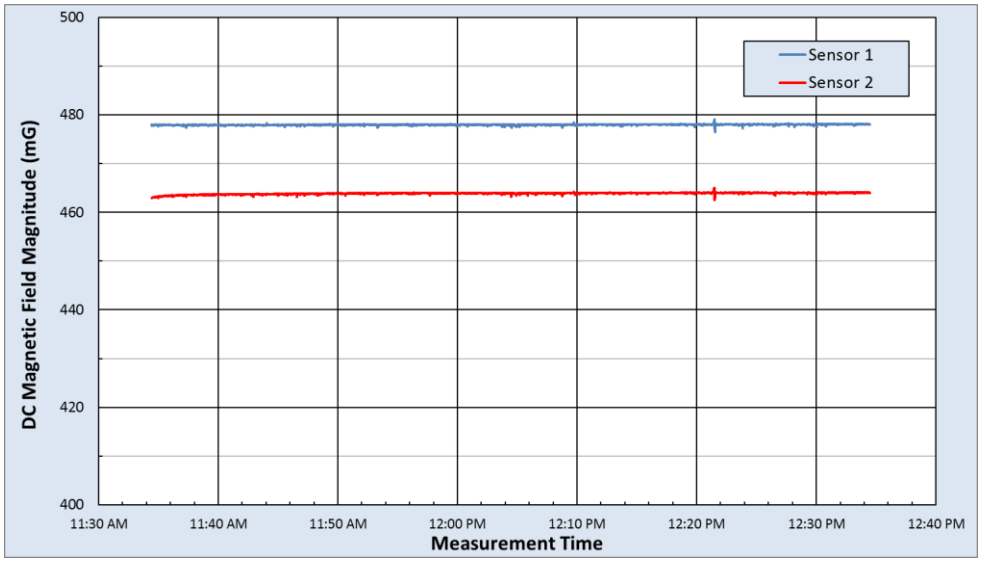
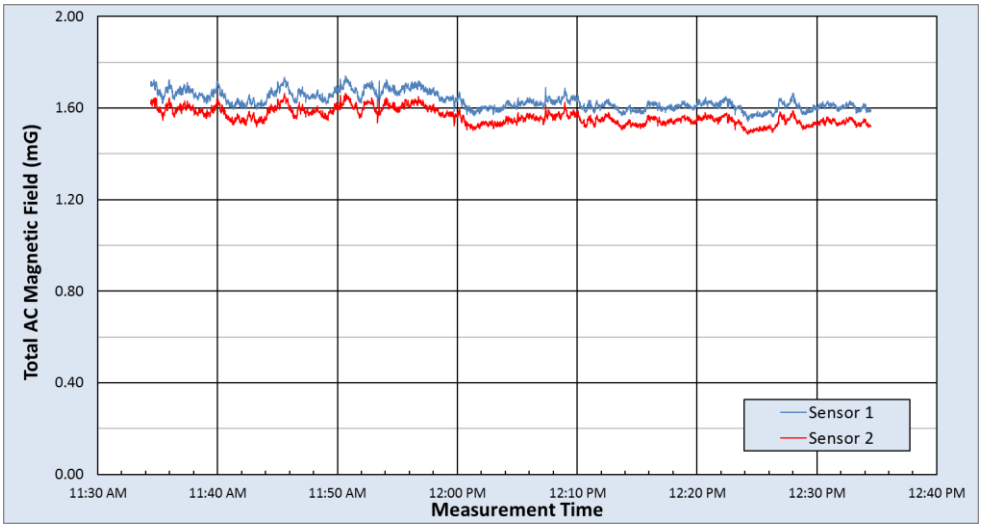
Figure 8(c) Location 4: Local EMF Sources

Nearby emitters included a single local distribution line.

Photos depict visible close-proximity emitters. Other emissions sources may exist, but are not visible from the site.



DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	245.1	254.0	412.4	389.9	479.1	465.0
Median	242.4	251.9	411.9	389.6	478.0	463.9
Min	240.0	249.6	411.1	388.4	476.4	462.6
Range	5.1	4.4	1.3	1.5	2.7	2.4
Std Dev	0.2	0.1	0.1	0.2	0.1	0.2



rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	0.990	0.916	0.023	0.024	1.488	1.443	0.025	0.027	0.162	0.155	0.030	0.029	0.075	0.072	1.740	1.664
Median	0.722	0.657	0.011	0.011	1.446	1.402	0.012	0.012	0.135	0.127	0.015	0.015	0.059	0.057	1.624	1.558
Min	0.557	0.507	0.002	0.002	1.381	1.340	0.003	0.002	0.107	0.094	0.004	0.004	0.044	0.043	1.541	1.485
Range	0.433	0.409	0.021	0.021	0.107	0.104	0.022	0.025	0.056	0.061	0.026	0.025	0.032	0.029	0.199	0.179
Std Dev	0.097	0.093	0.003	0.003	0.020	0.020	0.004	0.004	0.009	0.009	0.004	0.004	0.004	0.004	0.037	0.034

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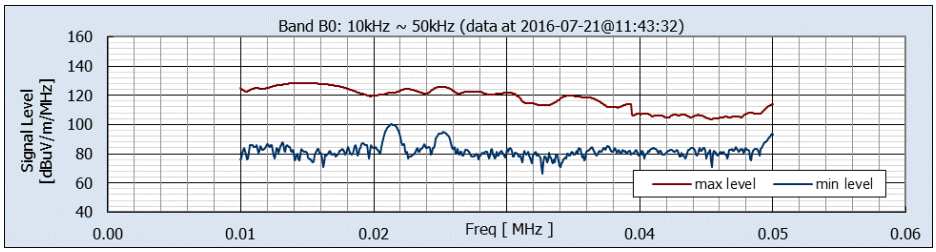
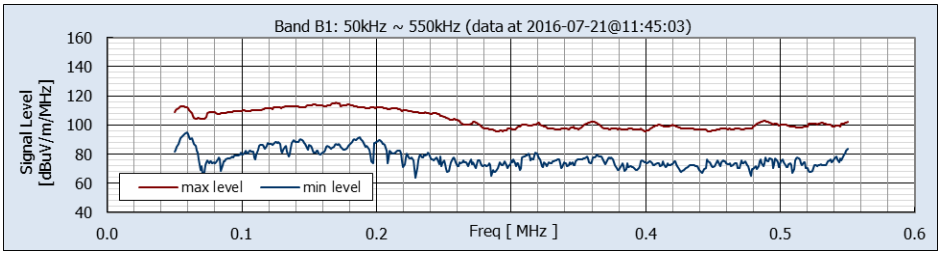
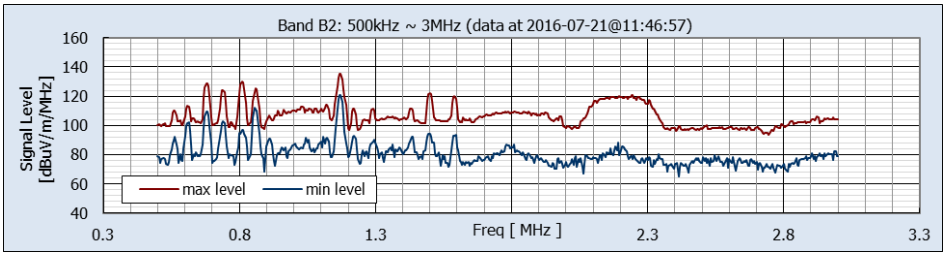
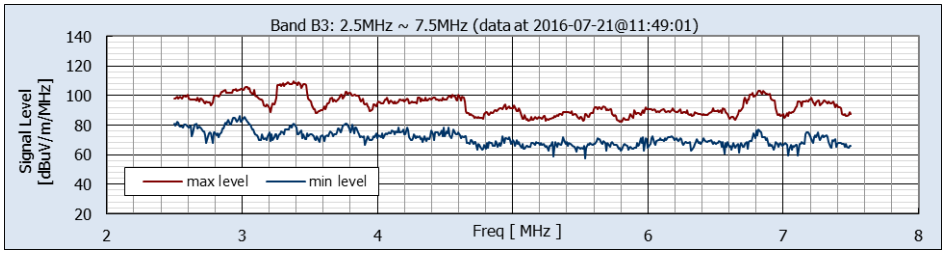
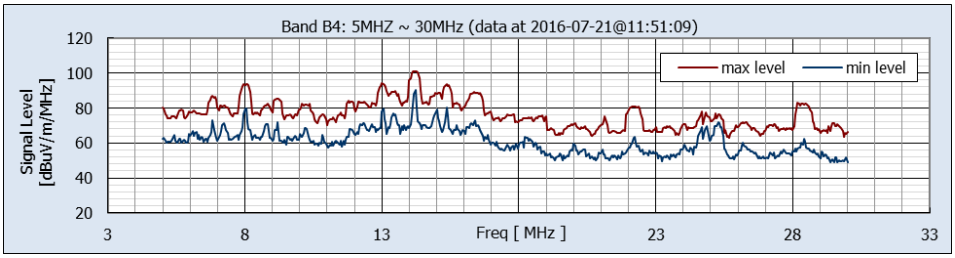
Figure 8(d) Location 4: AC and DC Magnetic Field Measurement Results











Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	100.1	0.0213	128.6	0.0146
B1	0.05 ~ 0.55	94.7	0.0591	115.1	0.1700
B2	0.50 ~ 3.00	120.8	1.1682	135.2	1.1727
B3	2.5 ~ 7.5	86.1	2.9818	109.6	3.3818
B4	5 ~ 30	90.4	14.2273	100.8	14.2273

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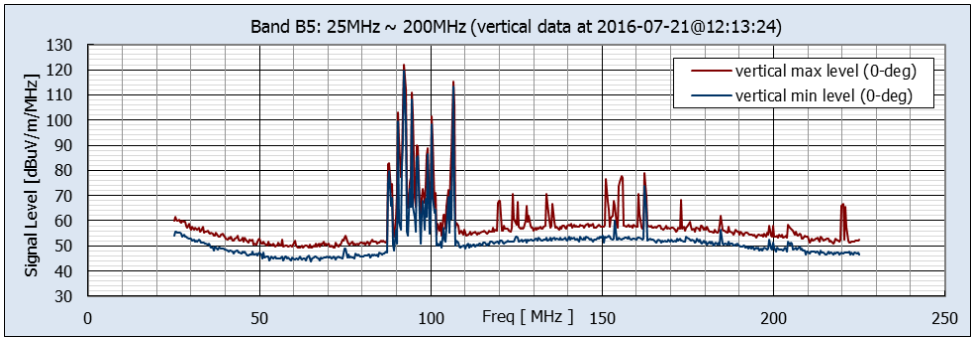
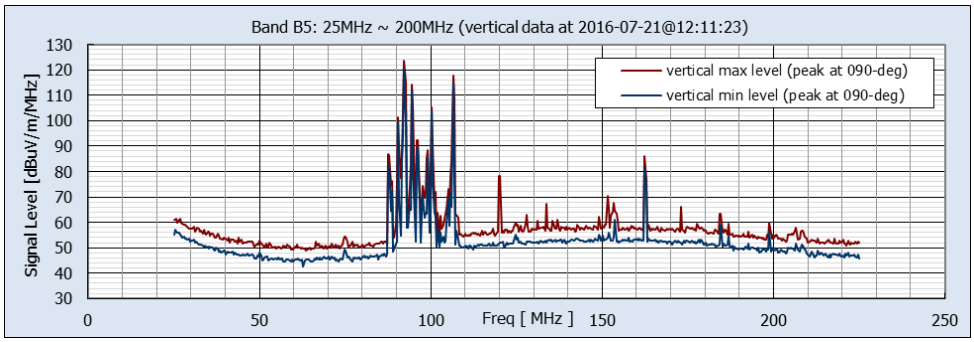
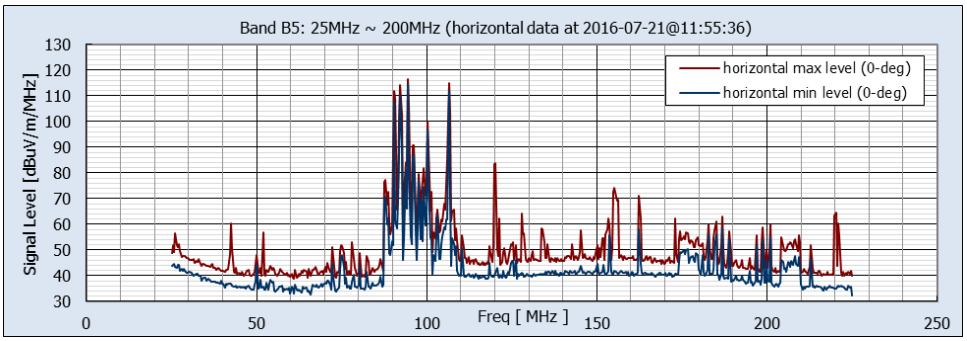
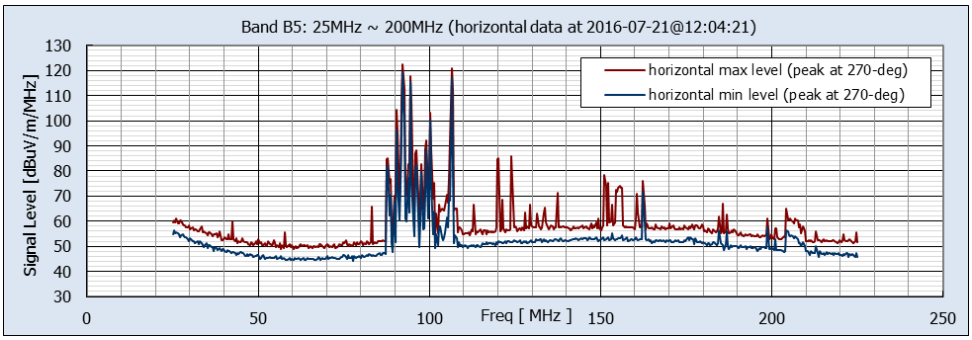
Figure 8(e) Location 4: Measured Environmental RF Levels
Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	120.5	92.273	123.5	92.273	119.5	92.273	122.5	92.273

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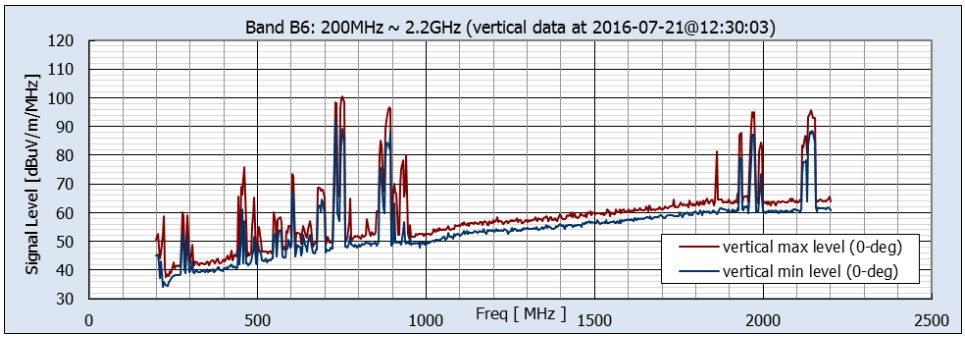
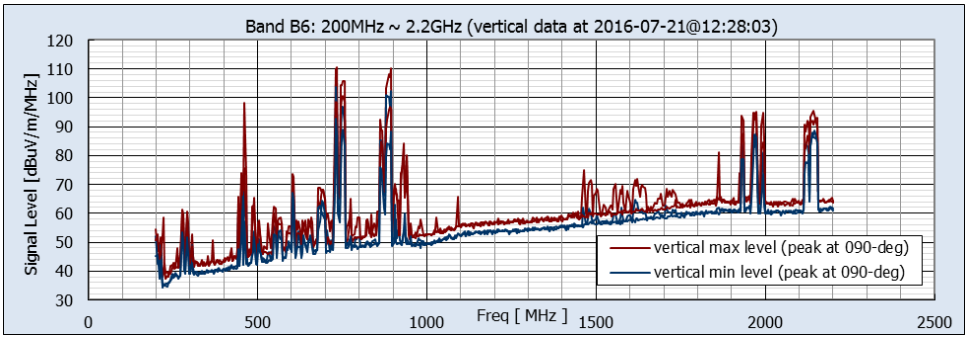
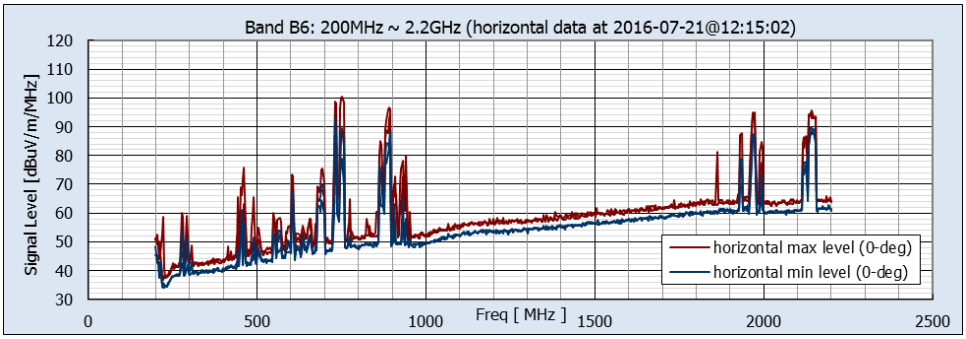
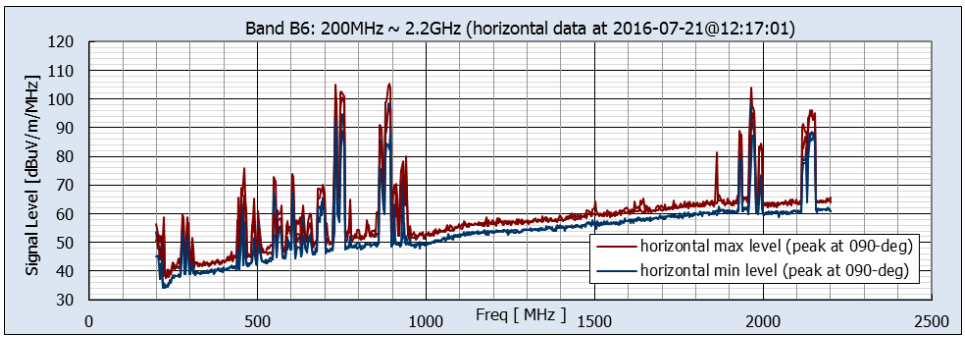
Figure 8(f) Location 4: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq.	Vertical				Horizontal			
Band	Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	103.7	730.909	110.7	734.545	98.5	887.273	105.4	890.909

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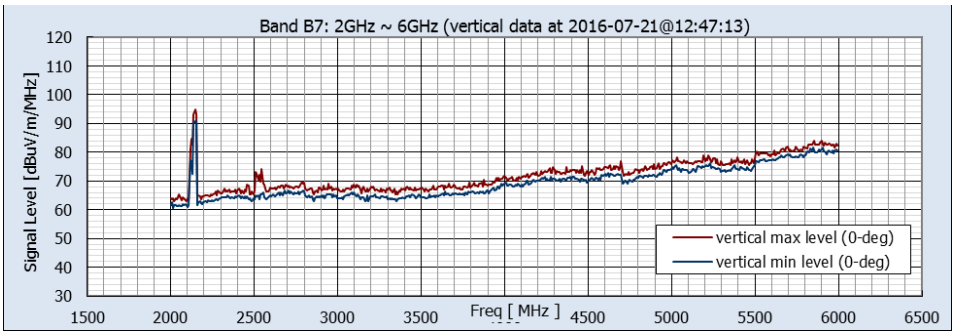
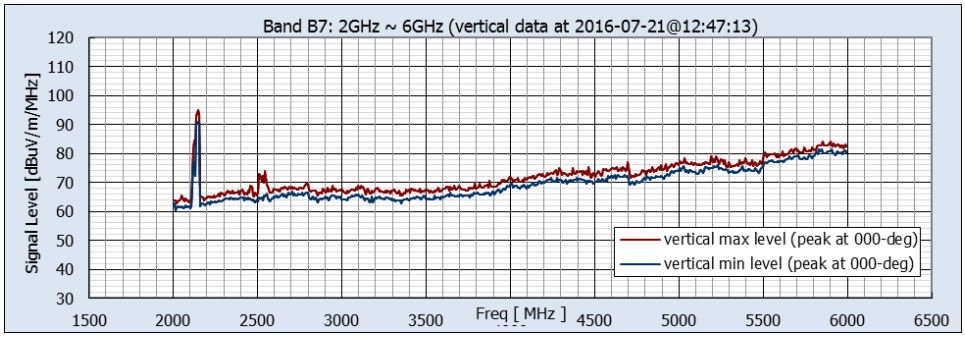
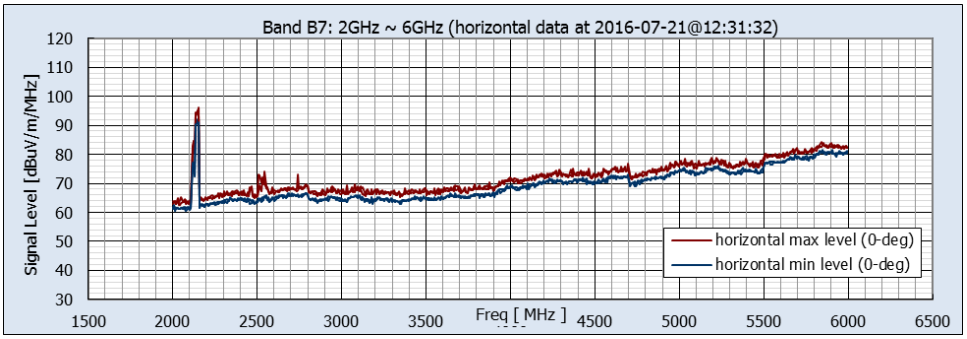
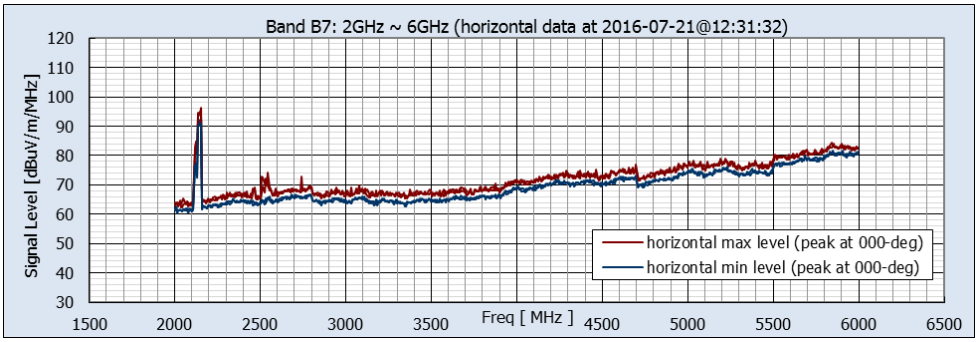
Figure 8(g) Location 4: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	90.9	2152.727	95.0	2145.455	92.2	2152.727	96.3	2152.727

JANUARY 2019

Figure 8(h) Location 4: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

JANUARY 2020

Figure 9(a) Location 5: Metcalf Energy Center, San Jose

Adjacent to the PG&E Metcalf Substation (Lat 37.223022°, Lon -121.744592°)

JANUARY 2019

Figure 9(b) Location 5: Measurement Location and Site Views

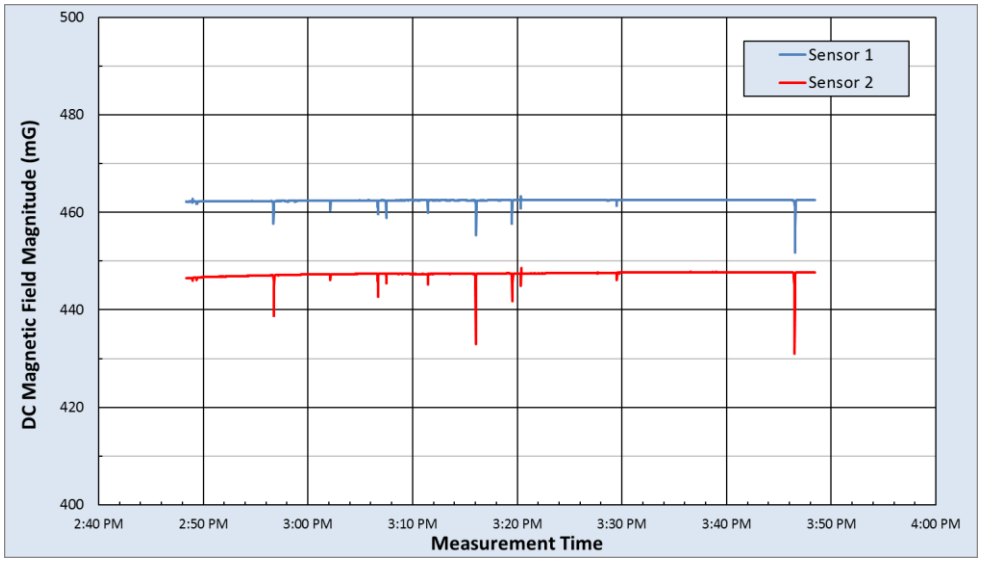
Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

JANUARY 2019

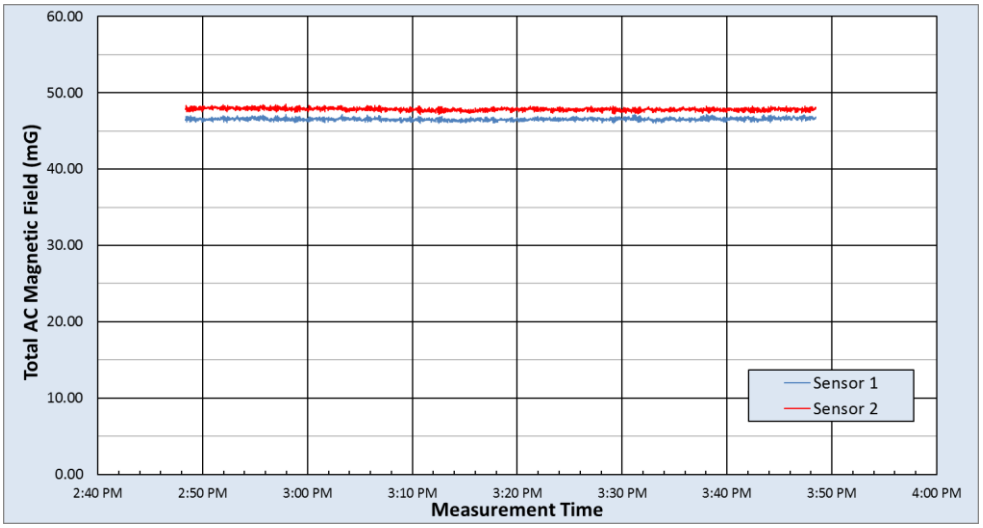
Figure 9(c) Location 5: Local EMF Sources

Immediately adjacent to the PG&E Substation. Nearby emitters include high-voltage transmission lines and substation equipment

Photos depict visible close-proximity emitters. Other emissions sources are assumed to exist, but are not visible from the site.



DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	244.0	241.9	398.1	381.9	463.3	448.6
Median	235.8	234.1	397.8	381.4	462.5	447.4
Min	232.0	228.3	382.4	358.9	451.8	431.1
Range	12.0	13.5	15.7	23.0	11.5	17.6
Std Dev	0.3	0.4	0.4	0.7	0.3	0.6



rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	47.175	48.472	0.075	0.105	1.282	1.630	0.074	0.070	0.248	0.255	0.087	0.089	0.232	0.223	47.192	48.499
Median	46.512	47.805	0.017	0.023	1.226	1.578	0.016	0.014	0.200	0.215	0.034	0.032	0.175	0.167	46.529	47.832
Min	46.002	47.107	0.003	0.005	1.186	1.543	0.003	0.003	0.163	0.184	0.014	0.010	0.150	0.140	46.019	47.135
Range	1.173	1.364	0.072	0.100	0.096	0.086	0.071	0.067	0.085	0.072	0.072	0.079	0.082	0.083	1.173	1.364
Std Dev	0.174	0.189	0.007	0.009	0.018	0.015	0.005	0.005	0.006	0.007	0.007	0.007	0.007	0.007	0.174	0.189

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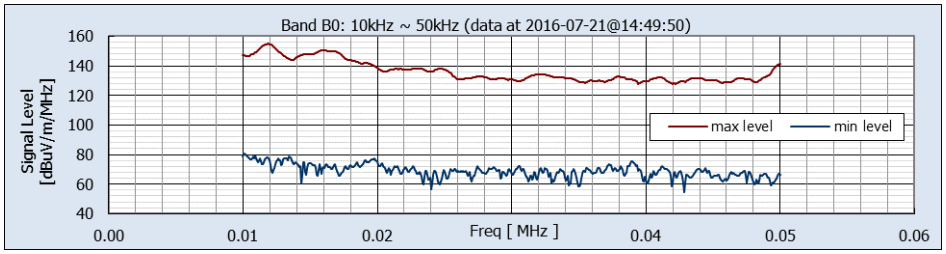
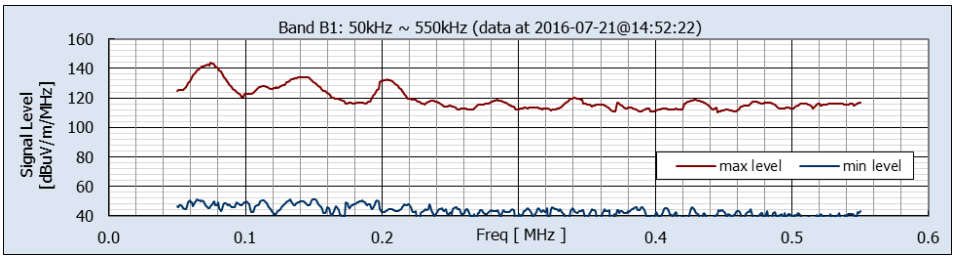
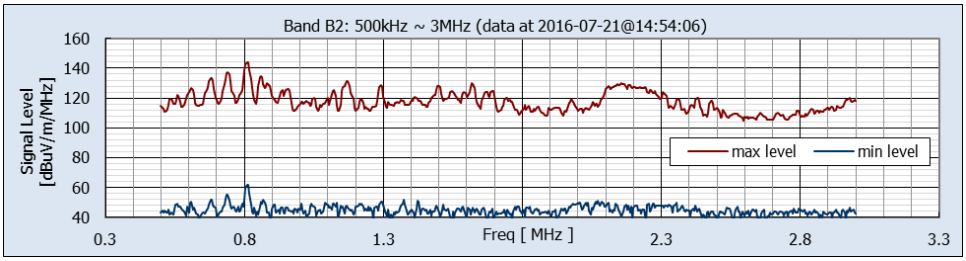
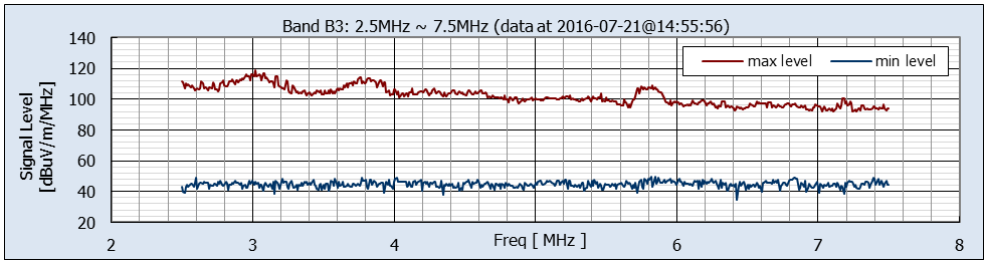
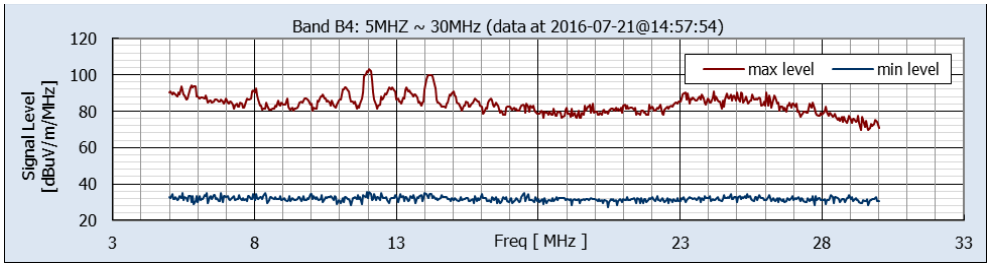
Figure 9(d) Location 5: AC and DC Magnetic Field Measurement Results











Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	81.0	0.0101	154.8	0.0118
B1	0.05 ~ 0.55	51.5	0.1327	143.7	0.0745
B2	0.50 ~ 3.00	61.6	0.8091	144.0	0.8091
B3	2.5 ~ 7.5	49.8	5.8182	118.6	3.0182
B4	5 ~ 30	35.6	12.0455	102.8	12.0455

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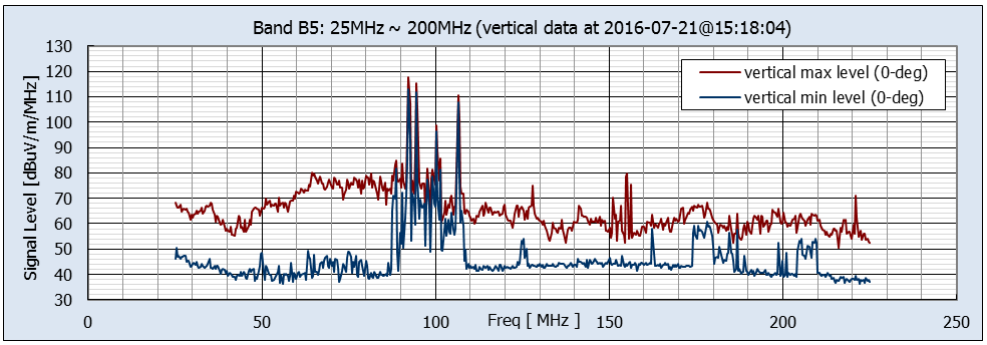
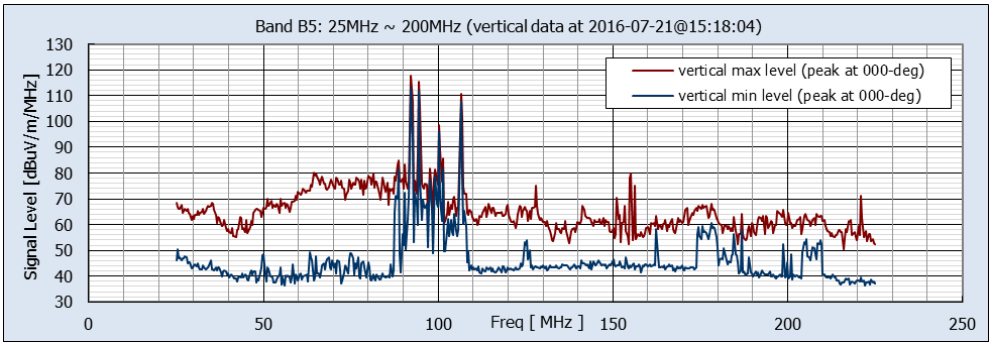
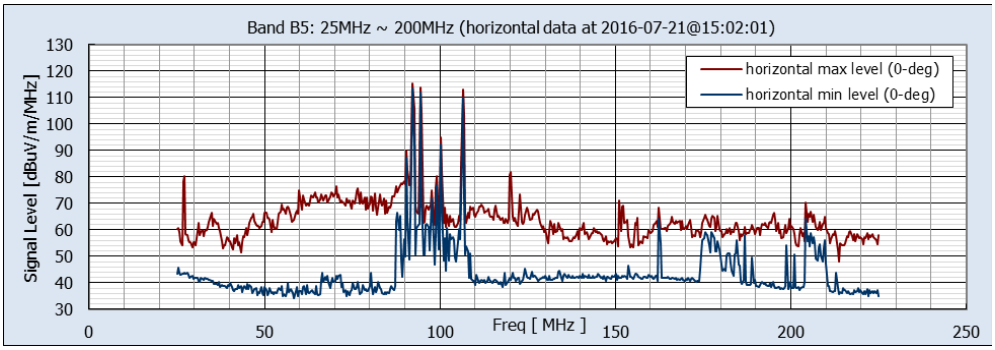
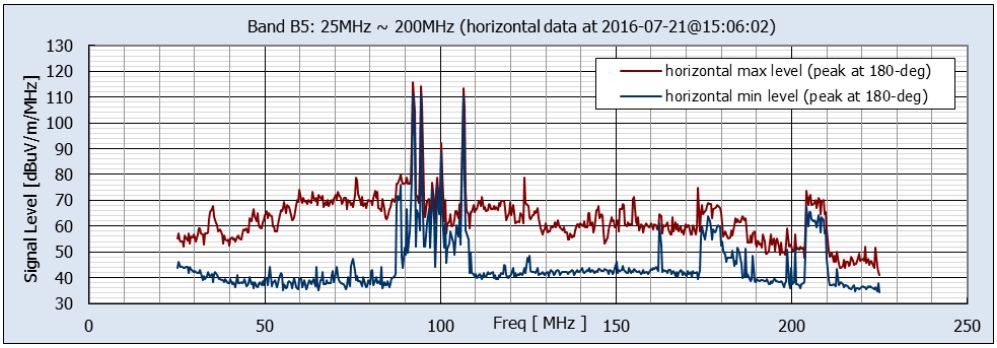
Figure 9(e) Location 5: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	113.0	92.273	117.6	92.273	113.4	92.273	115.9	92.273

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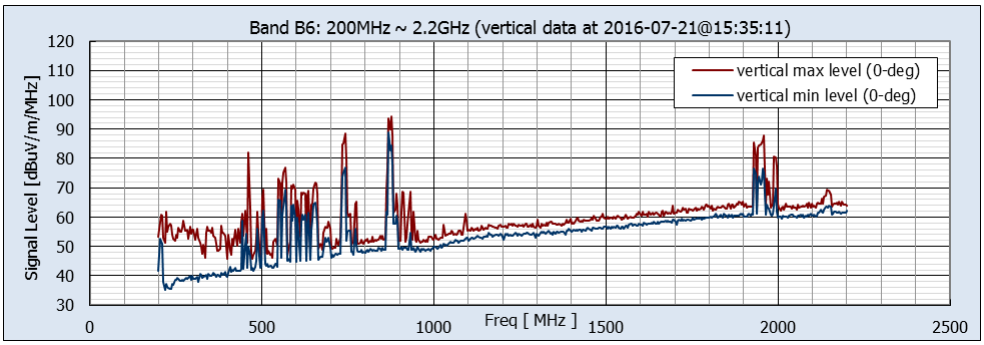
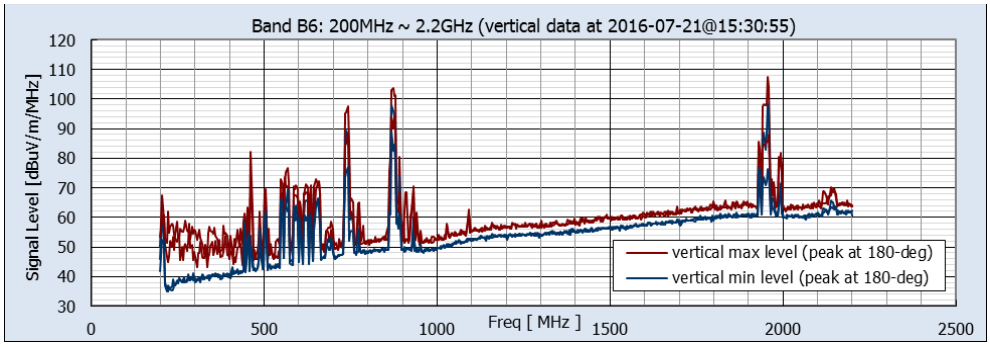
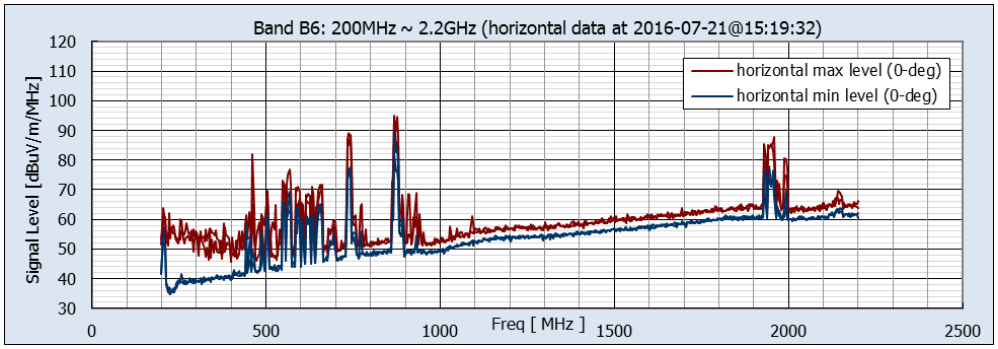
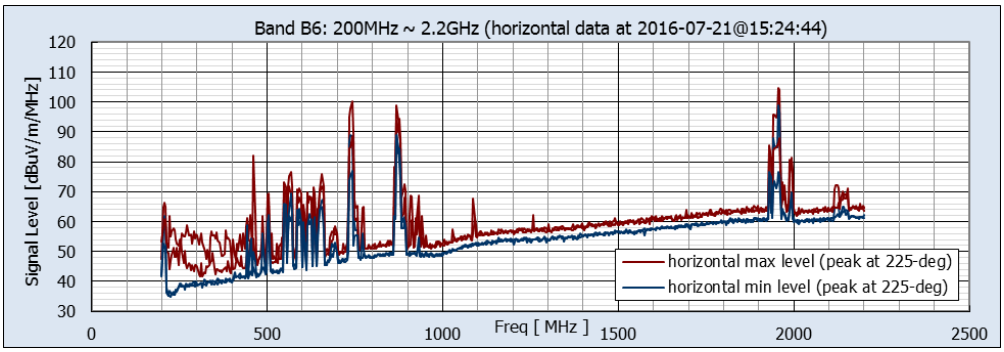
Figure 9(f) Location 5: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	98.4	1956.364	107.4	1956.364	98.8	1956.364	104.5	1956.364

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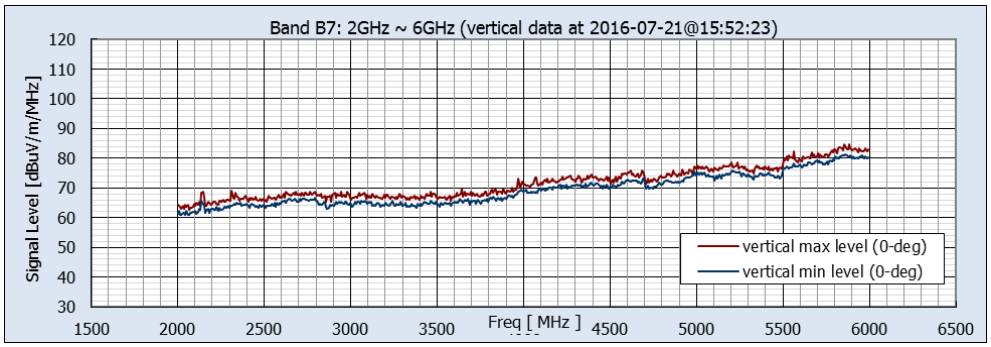
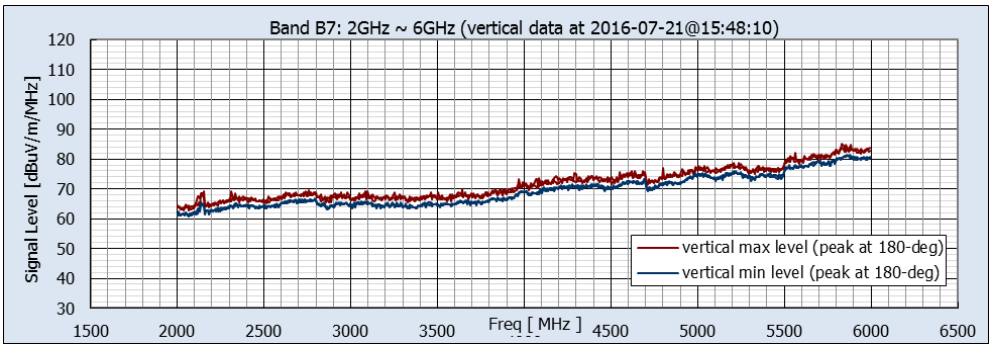
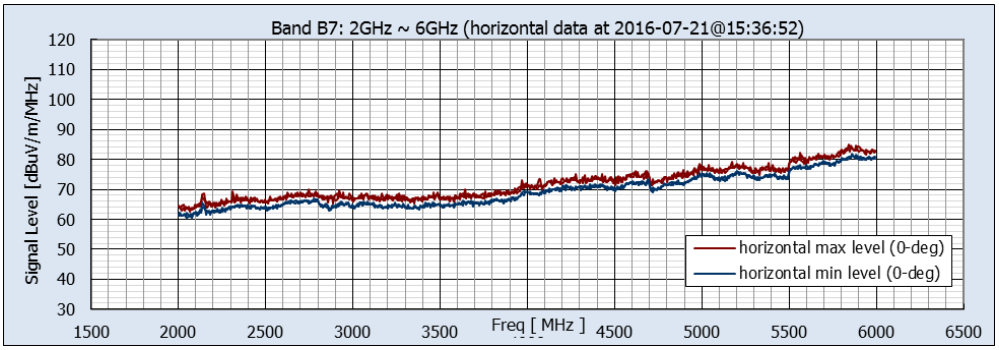
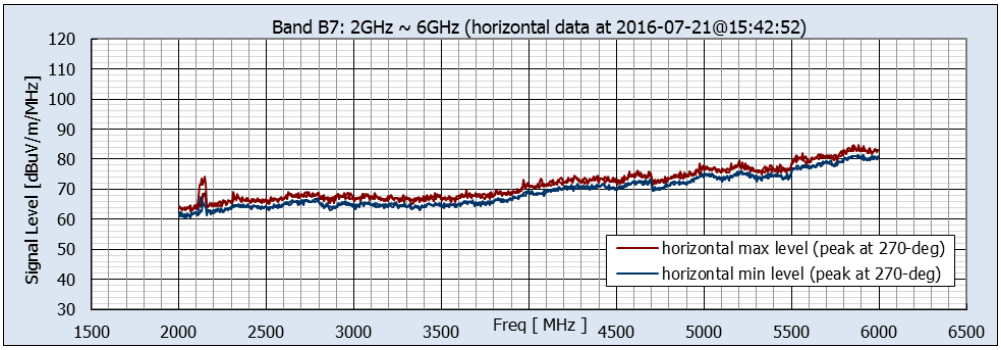
Figure 9(g) Location 5: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	66.4	2720.000	69.2	2312.727	68.8	2145.455	74.3	2145.455

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Figure 9(h) Location 5: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

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Figure 10(a) Location 6: Railroad Avenue/Barrett Avenue, Morgan Hill

Commercial area across from Morgan Hill Police Department, (Lat 37.118225°, Lon -121.638550°)

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Figure 10(b) Location 6: Measurement Location and Site Views

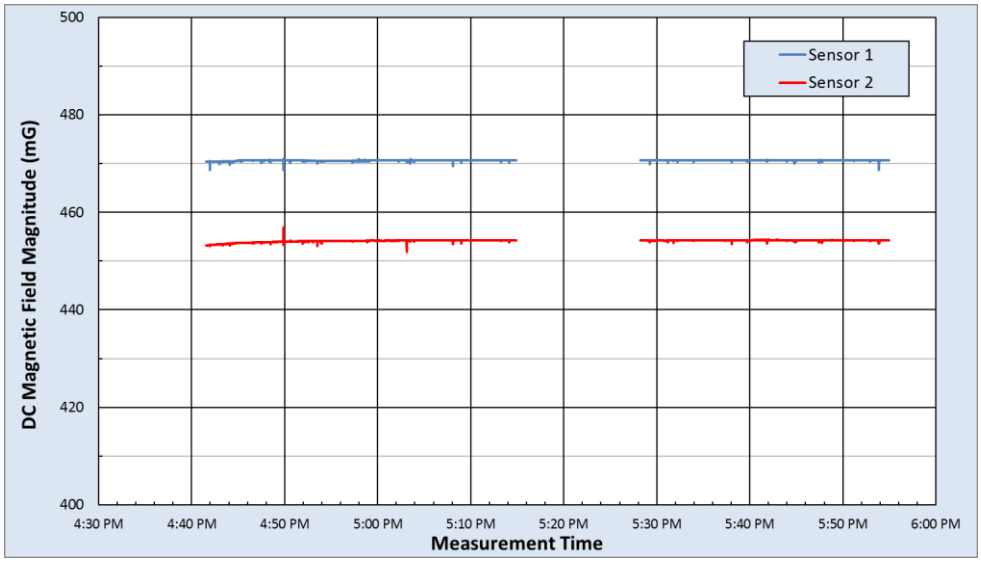
Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

JANUARY 2019
JANUARY 2020

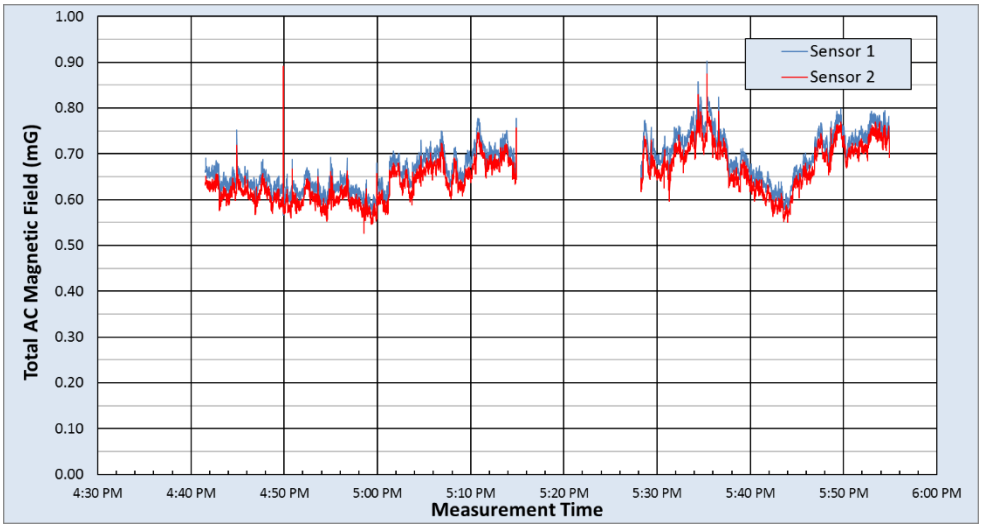
Figure 10(c) Location 6: Local EMF Sources

Nearby emitters include cell towers, fixed land communications, and distribution lines parallel to the alignment.

Photos depict visible close-proximity emitters. Other emissions sources may exist that are not readily visible from the site.



DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	221.7	239.2	416.6	393.8	470.9	456.9
Median	219.5	227.1	416.3	393.3	470.6	454.2
Min	216.6	226.0	413.9	389.3	468.8	451.8
Range	5.1	13.2	2.7	4.5	2.1	5.1
Std Dev	0.2	0.3	0.1	0.2	0.1	0.2



rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	0.808	0.786	0.065	0.206	0.469	0.476	0.068	0.105	0.107	0.102	0.075	0.072	0.094	0.092	0.902	0.891
Median	0.528	0.516	0.010	0.010	0.417	0.389	0.010	0.010	0.046	0.044	0.012	0.012	0.041	0.036	0.673	0.647
Min	0.359	0.354	0.003	0.002	0.375	0.345	0.001	0.002	0.028	0.023	0.003	0.002	0.025	0.019	0.554	0.526
Range	0.449	0.432	0.062	0.204	0.094	0.131	0.066	0.104	0.079	0.078	0.073	0.070	0.069	0.073	0.348	0.365
Std Dev	0.067	0.065	0.006	0.006	0.012	0.013	0.007	0.007	0.008	0.008	0.010	0.009	0.009	0.009	0.053	0.052

JANUARY 2019
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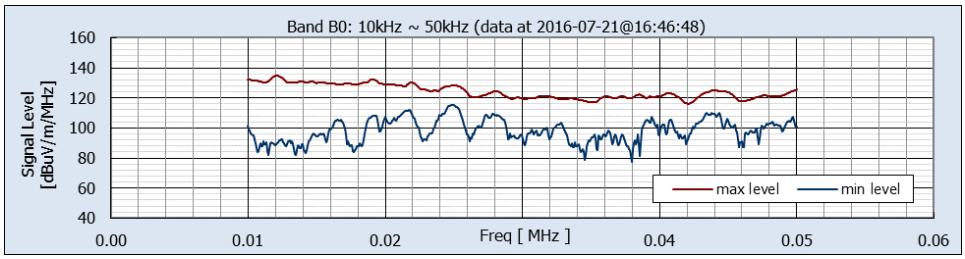
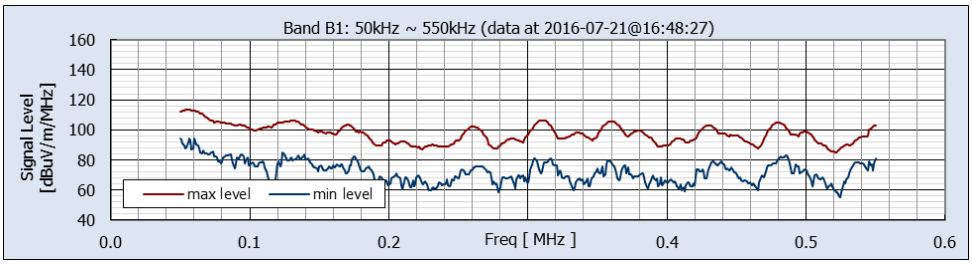
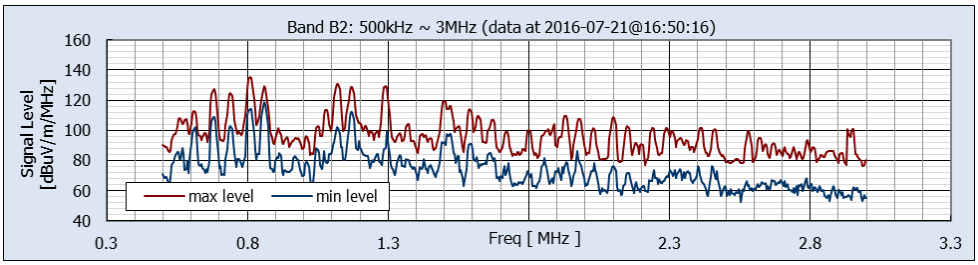
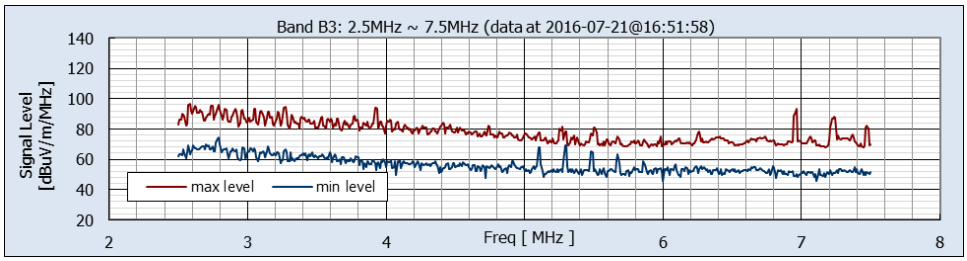
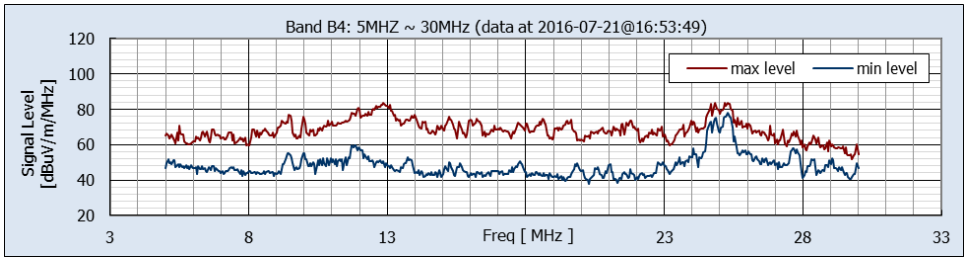
Figure 10(d) Location 6: AC and DC Magnetic Field Measurement Results











Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	115.2	0.0248	134.7	0.0120
B1	0.05 ~ 0.55	94.2	0.0564	113.5	0.0555
B2	0.50 ~ 3.00	118.6	0.8591	135.1	0.8091
B3	2.5 ~ 7.5	74.7	2.7909	96.9	2.5818
B4	5 ~ 30	78.0	25.2727	83.7	12.8636

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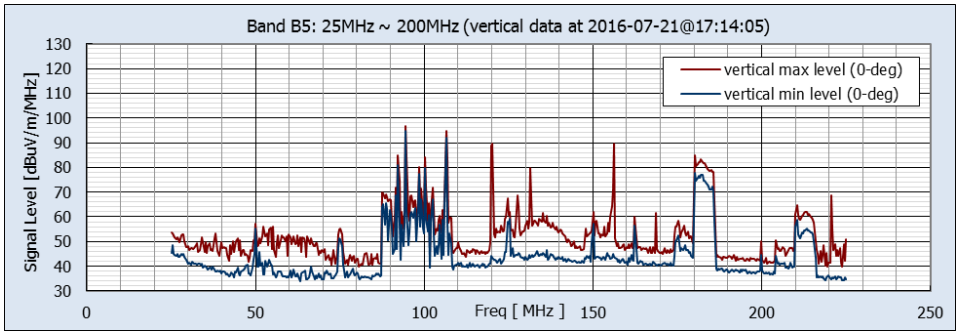
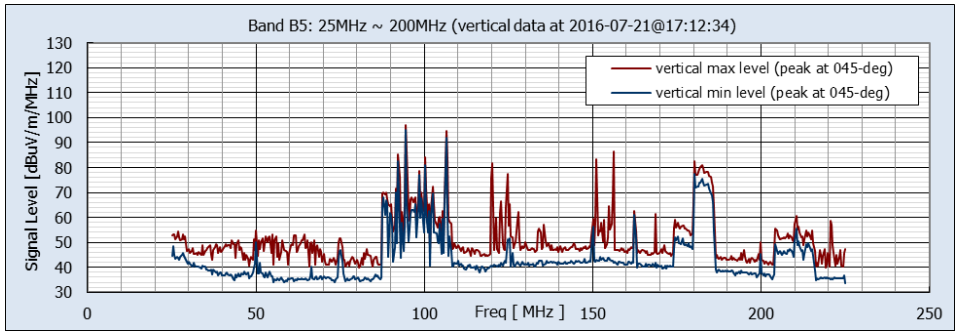
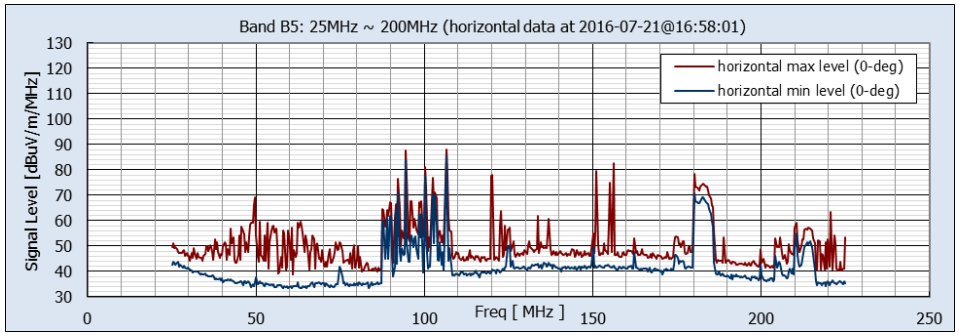
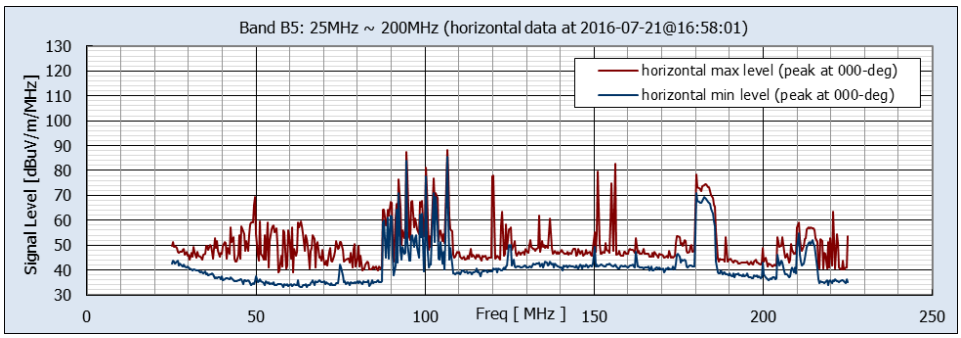
Figure 10(e) Location 6: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	95.1	94.455	96.8	94.455	85.4	106.455	88.1	106.455

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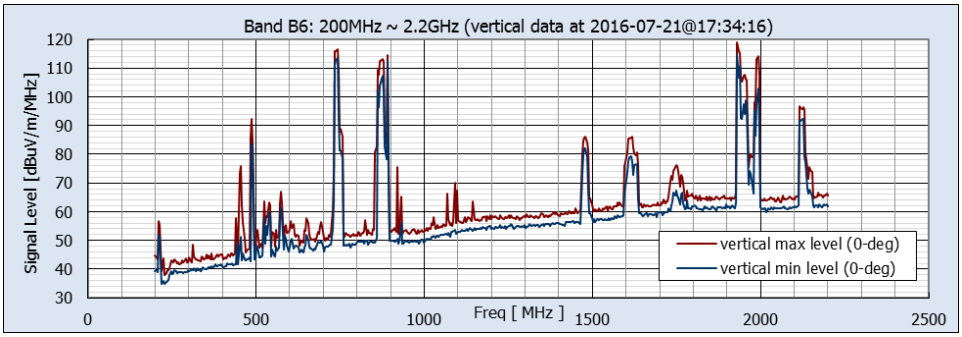
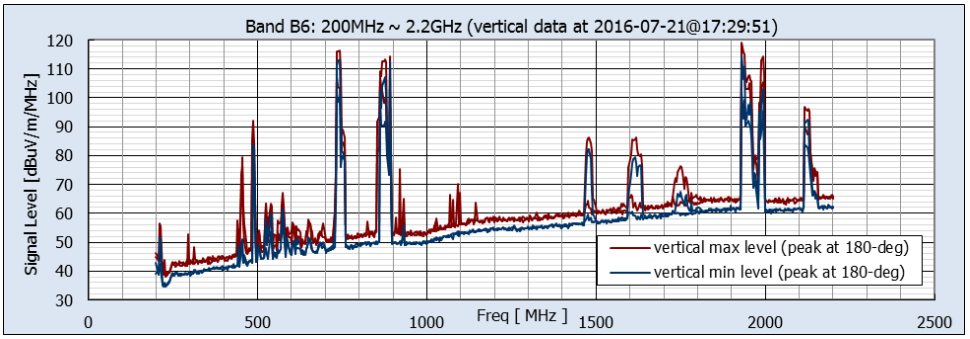
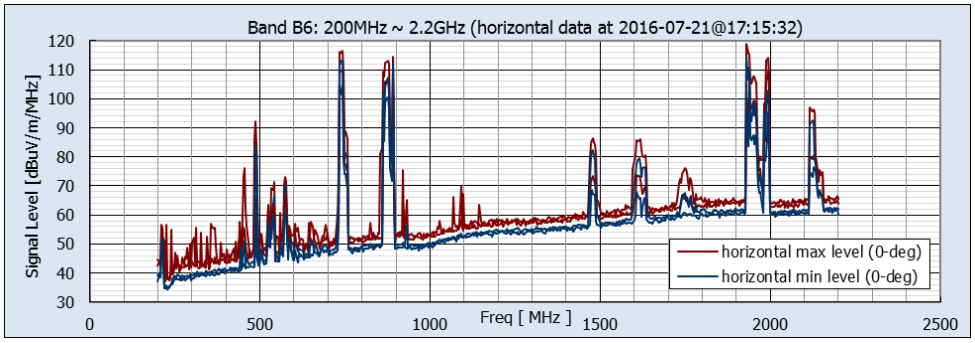
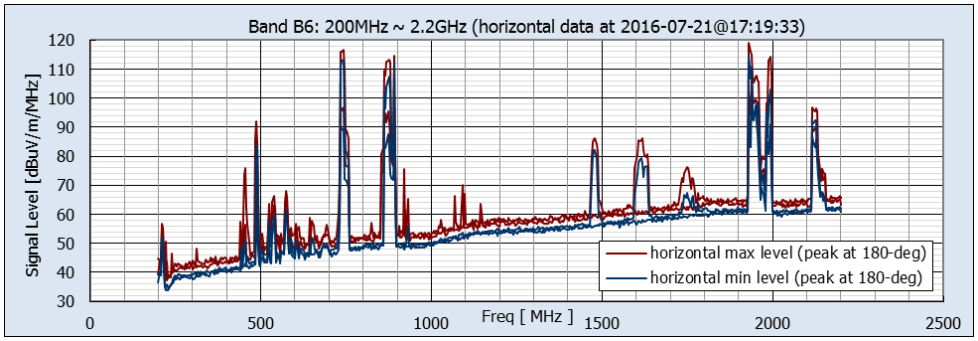
Figure 10(f) Location 6: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	114.6	1930.909	119.0	1930.909	106.8	890.909	110.1	741.818

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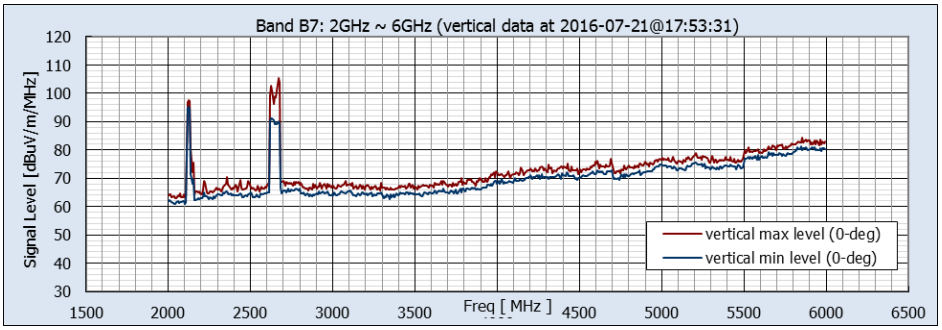
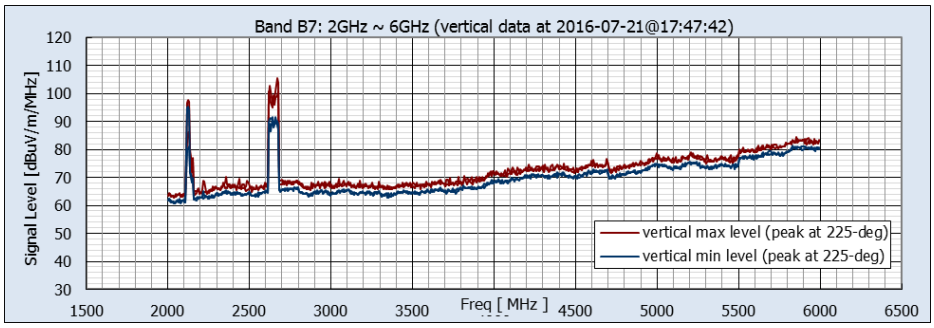
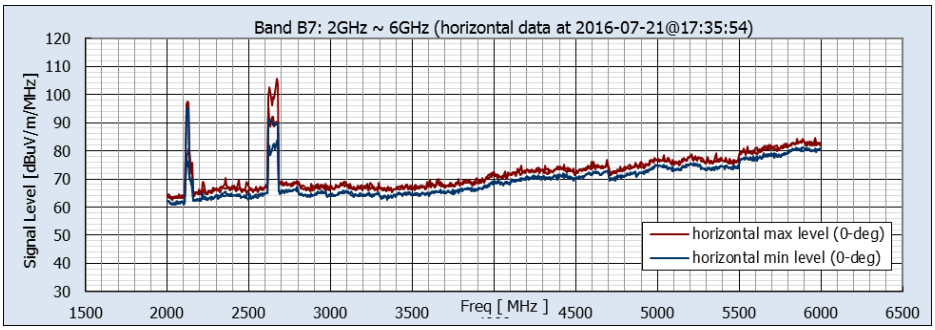
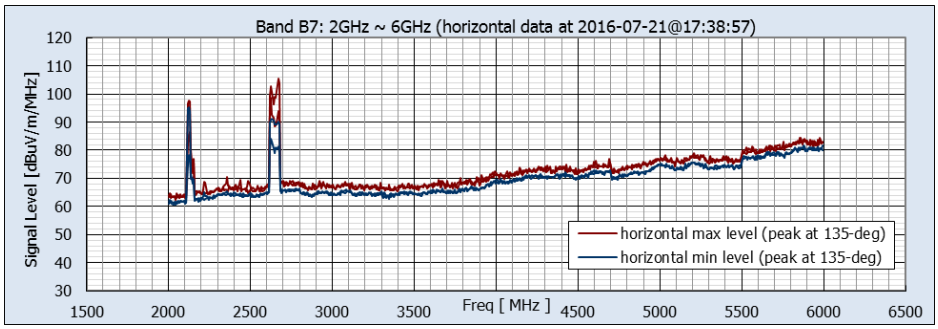
Figure 10(g) Location 6: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq.	Vertical				Horizontal			
Band	Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	95.3	2123.636	105.5	2669.091	84.1	2625.455	98.7	2625.455

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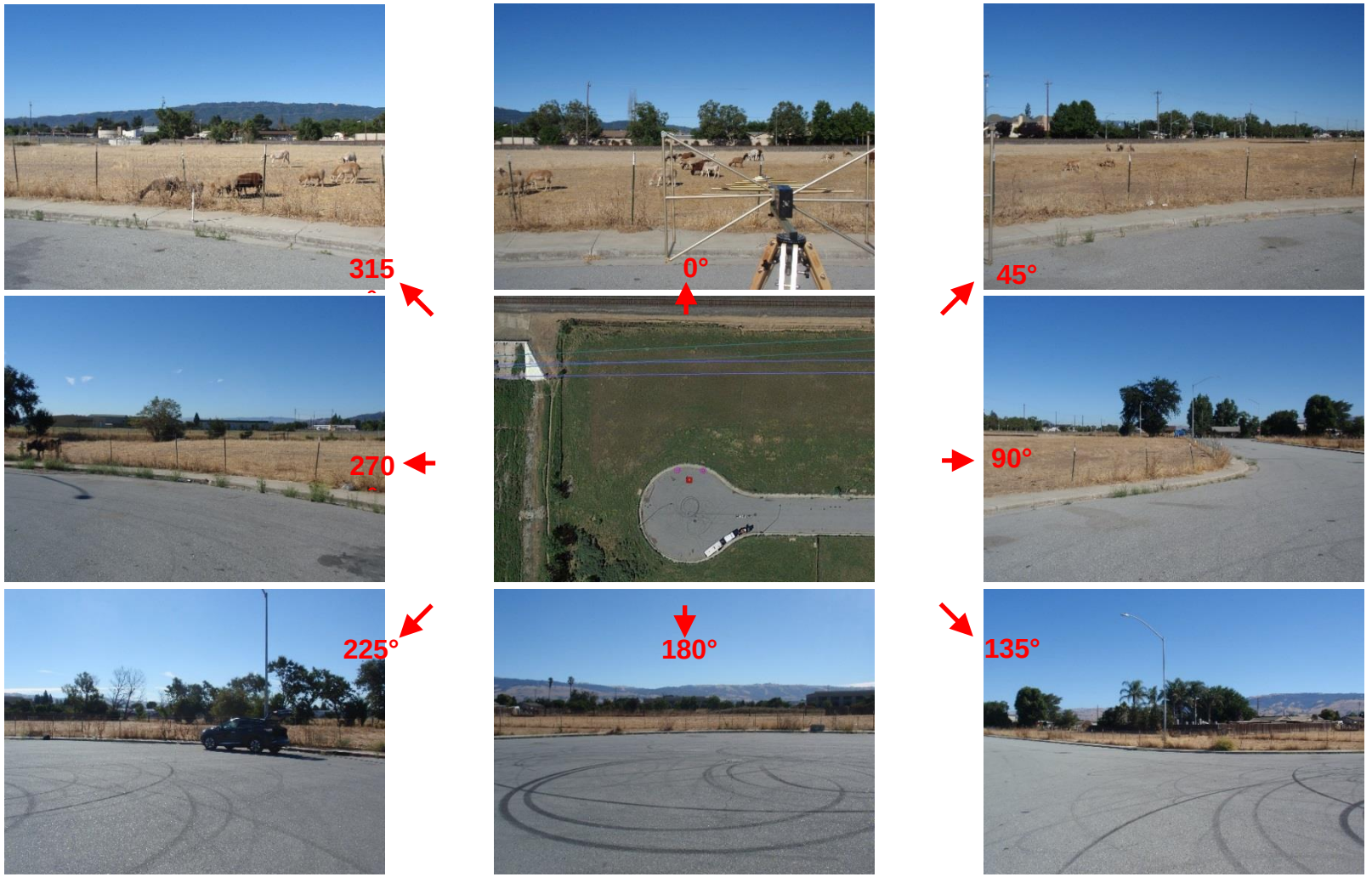
Figure 10(h) Location 6: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

JANUARY 2020

Figure 11(a) Location 7: Monterey Highway/Las Animas Avenue, Gilroy

Suburban setting, with relatively few local RF emitters (Lat 37.028851°, Lon -121.578510°)



JANUARY 2019

Figure 11(b) Location 7: Measurement Location and Site Views

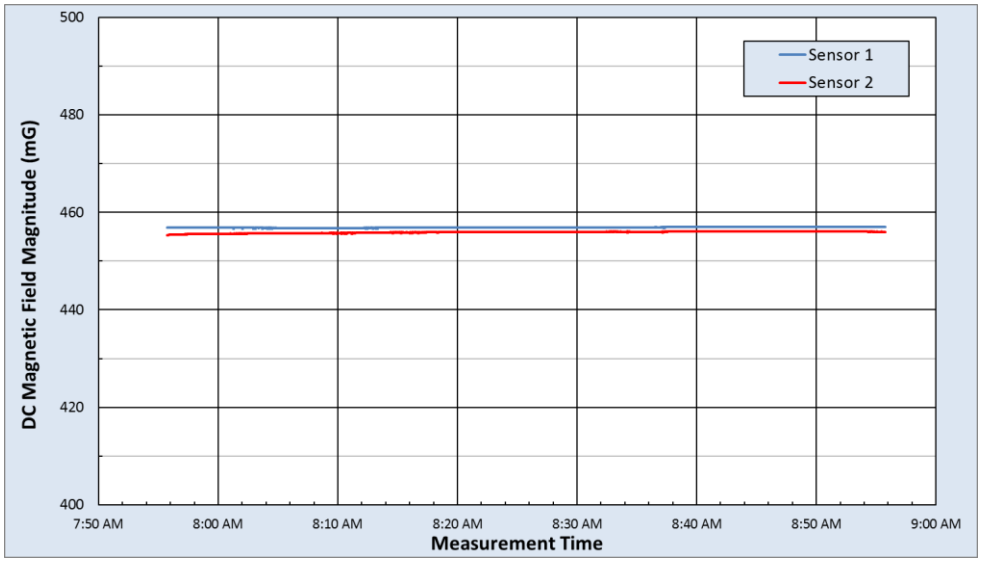
Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

JANUARY 2019

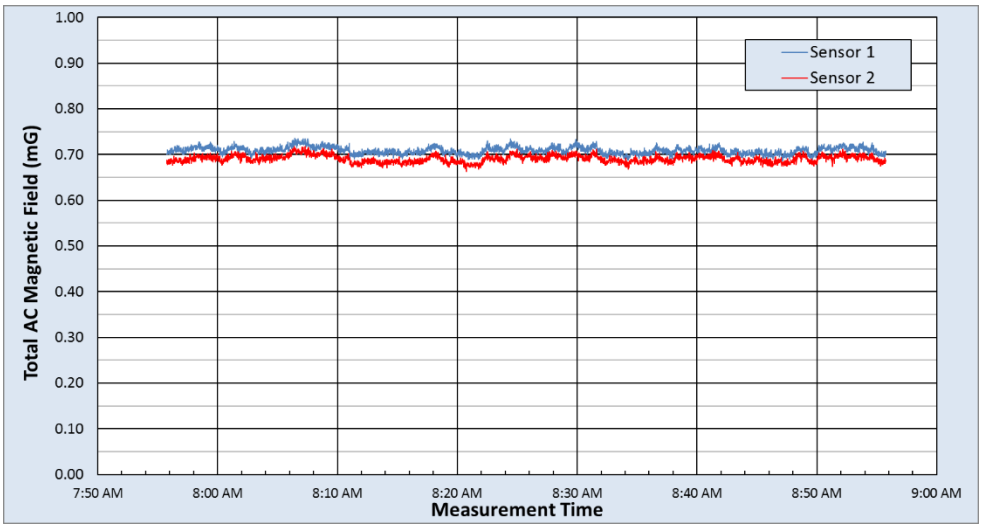
Figure 11(c) Location 7: Local EMF Sources

Nearby emitters include microwave towers, railway communications, and distribution lines parallel to the alignment.

Photos depict visible close-proximity emitters. Other emissions sources may exist that are not readily visible from the site.



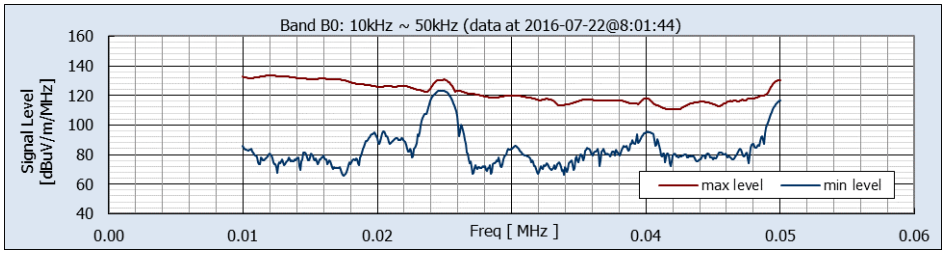
DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	230.3	226.2	395.5	396.6	457.0	456.1
Median	230.0	225.3	394.8	396.3	456.9	456.0
Min	228.8	224.0	394.5	396.0	456.8	455.3
Range	1.6	2.2	1.0	0.6	0.2	0.8
Std Dev	0.2	0.5	0.1	0.2	0.1	0.2

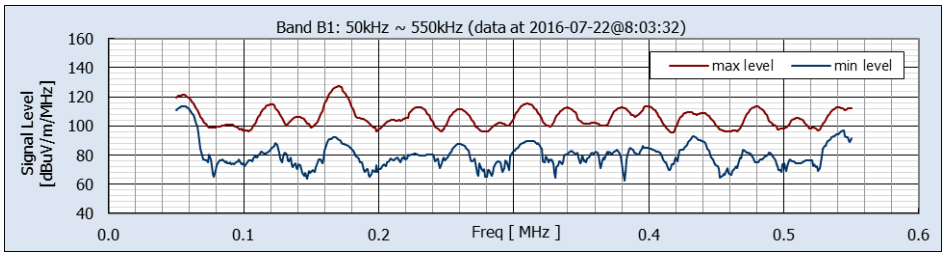


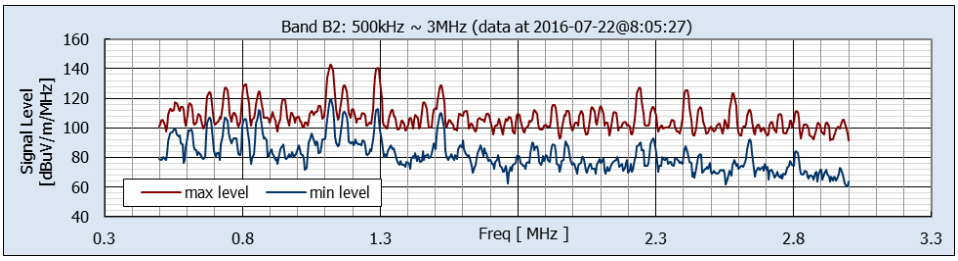
rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	0.222	0.225	0.021	0.022	0.713	0.694	0.020	0.021	0.063	0.057	0.019	0.023	0.027	0.030	0.735	0.717
Median	0.135	0.139	0.008	0.009	0.694	0.674	0.009	0.009	0.045	0.043	0.010	0.010	0.014	0.014	0.709	0.691
Min	0.057	0.061	0.002	0.001	0.673	0.651	0.001	0.002	0.030	0.027	0.002	0.002	0.002	0.003	0.687	0.664
Range	0.165	0.164	0.019	0.021	0.041	0.043	0.019	0.020	0.032	0.030	0.017	0.021	0.025	0.027	0.048	0.052
Std Dev	0.025	0.026	0.003	0.003	0.006	0.006	0.003	0.003	0.004	0.004	0.003	0.003	0.004	0.004	0.008	0.008

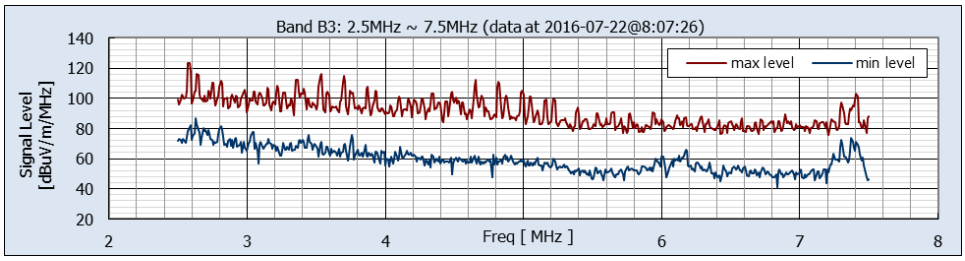
JANUARY 2019

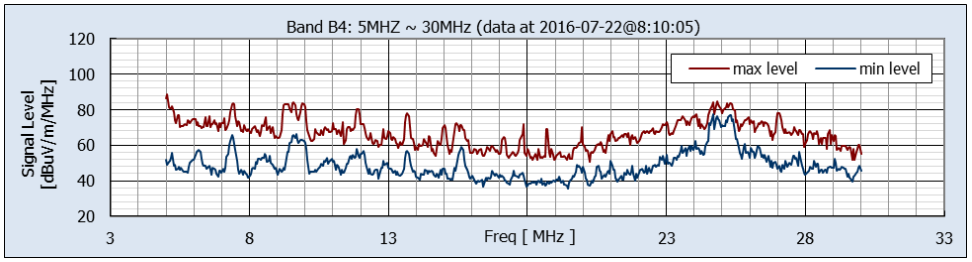
Figure 11(d) Location 7: AC and DC Magnetic Field Measurement Results











Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	123.3	0.0248	133.5	0.0120
B1	0.05 ~ 0.55	113.5	0.0555	127.1	0.1709
B2	0.50 ~ 3.00	119.4	1.1182	142.5	1.1182
B3	2.5 ~ 7.5	86.6	2.6273	123.6	2.5818
B4	5 ~ 30	77.2	24.6818	88.8	5.0455

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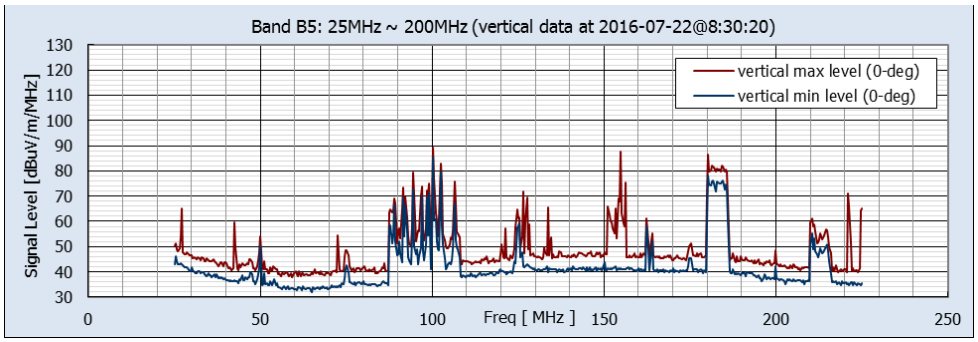
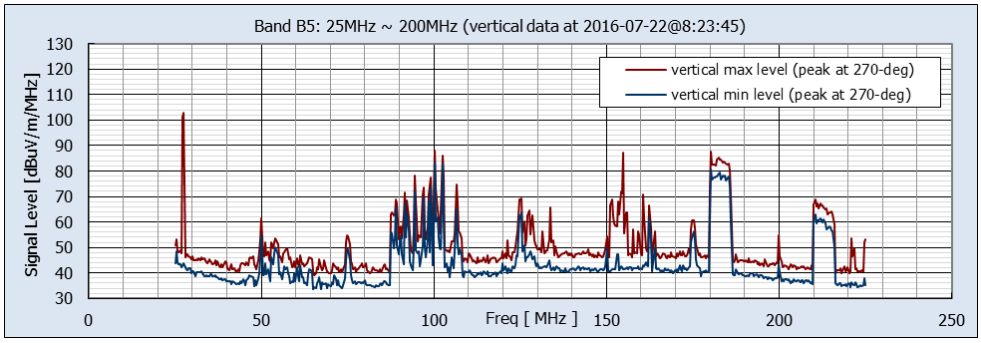
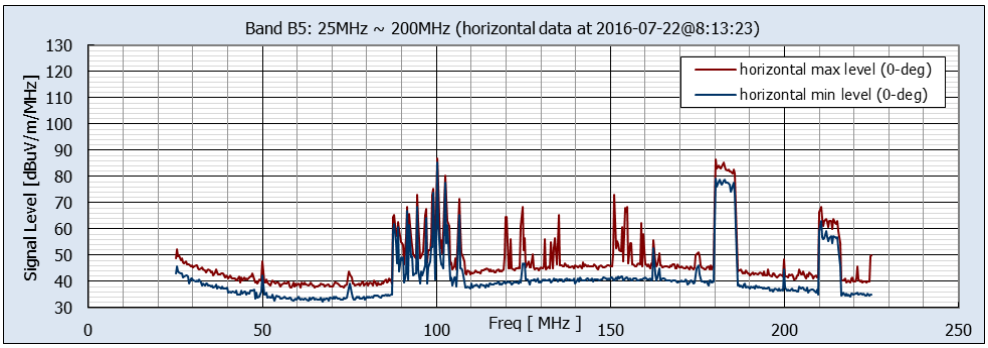
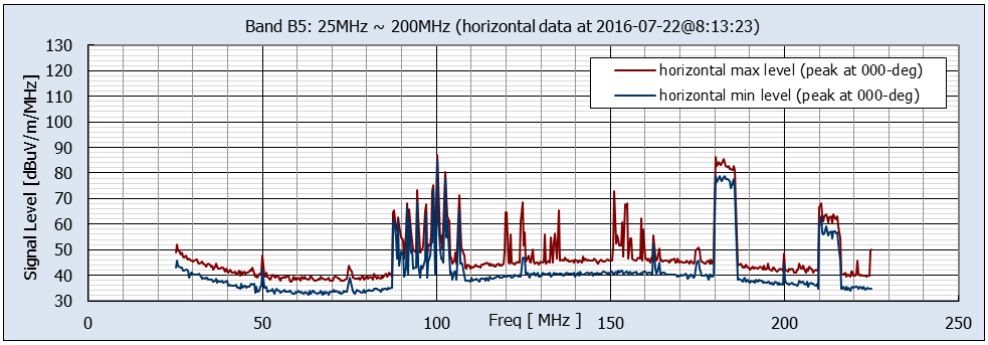
Figure 11(e) Location 7: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	85.1	100.273	102.9	27.545	85.2	100.273	86.9	100.273

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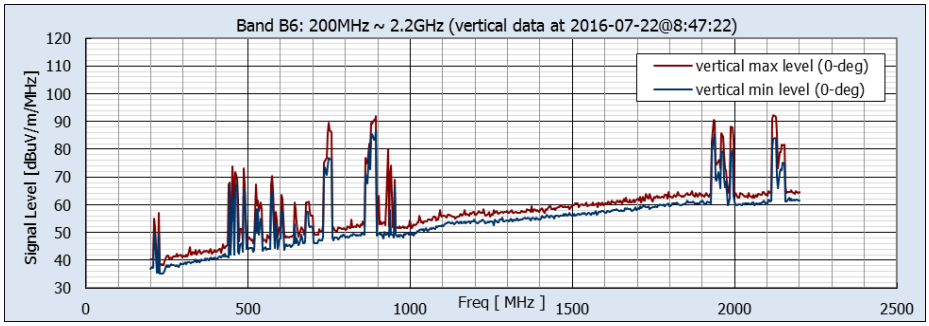
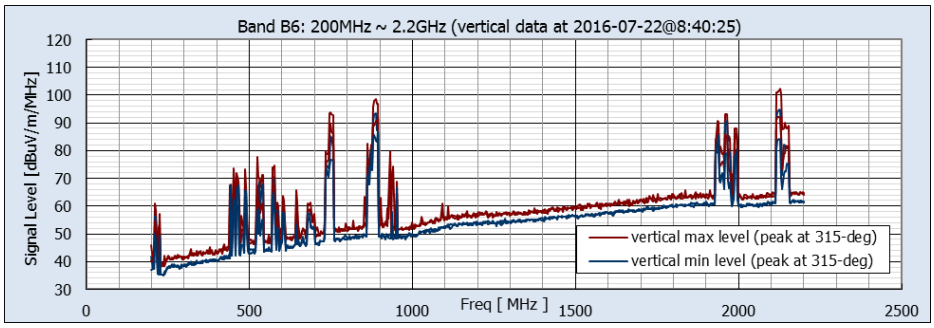
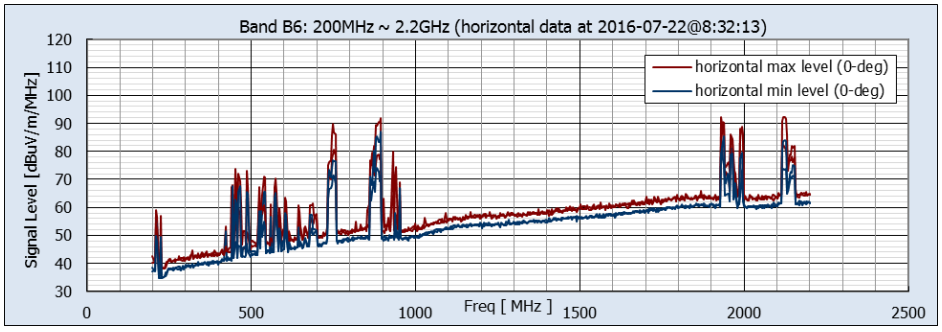
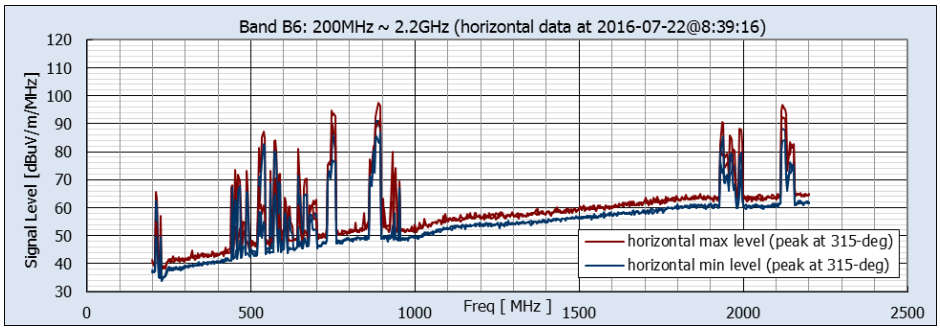
Figure 11(f) Location 7: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq.	Vertical				Horizontal			
Band	Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	94.9	2123.636	102.4	2127.273	90.9	883.636	97.5	887.273

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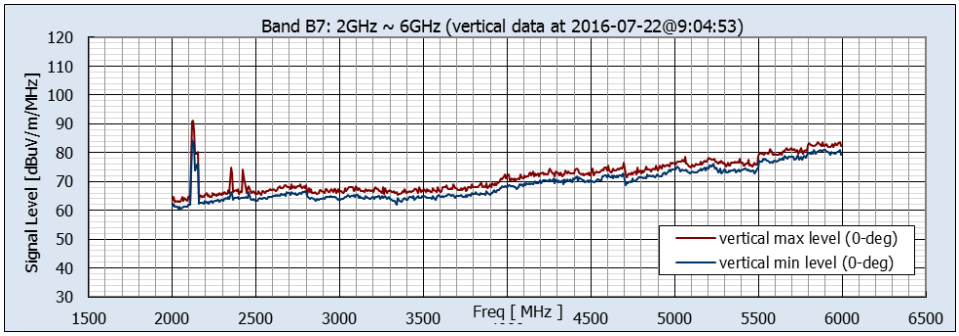
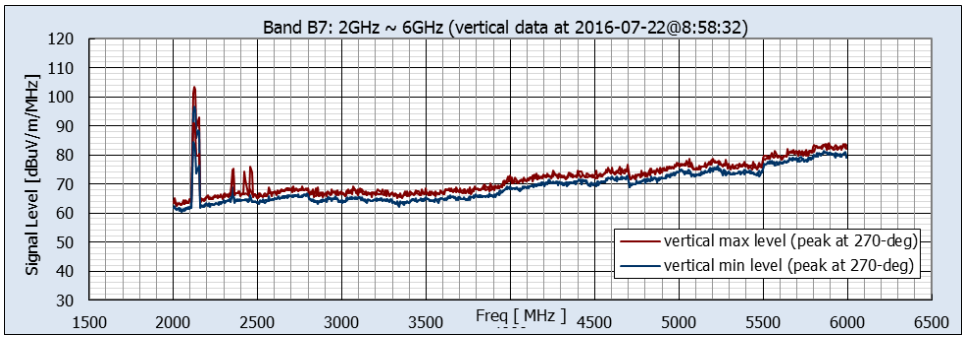
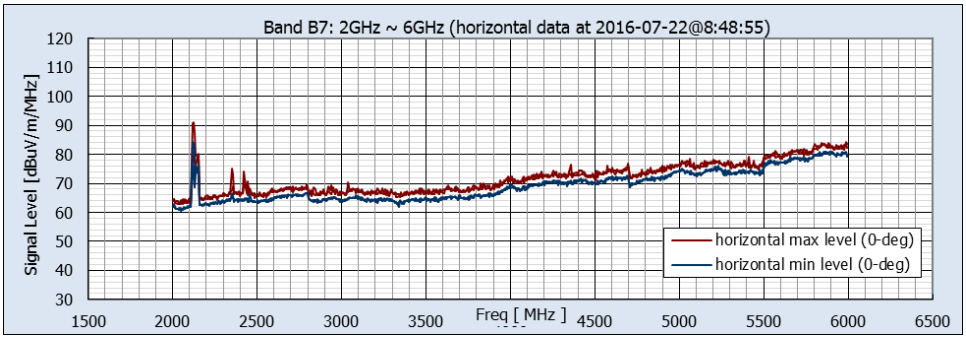
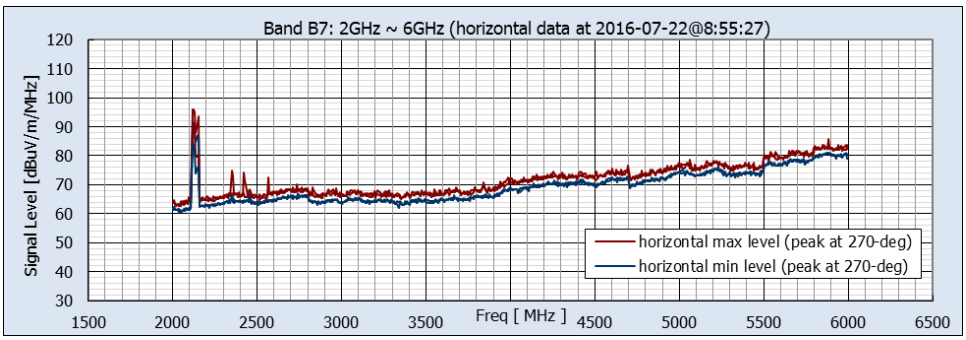
Figure 11(g) Location 7: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq.	Vertical				Horizontal			
Band	Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	96.8	2123.636	103.5	2123.636	91.6	2123.636	95.9	2116.364

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Figure 11(h) Location 7: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

JANUARY 2020

Figure 12(a) Location 8: SR 152/Casa de Fruta Parkway, Hollister

Rural setting adjacent to Casa de Fruta, no visible RF emitters (Lat 36.985247°, Lon -121.383899°)

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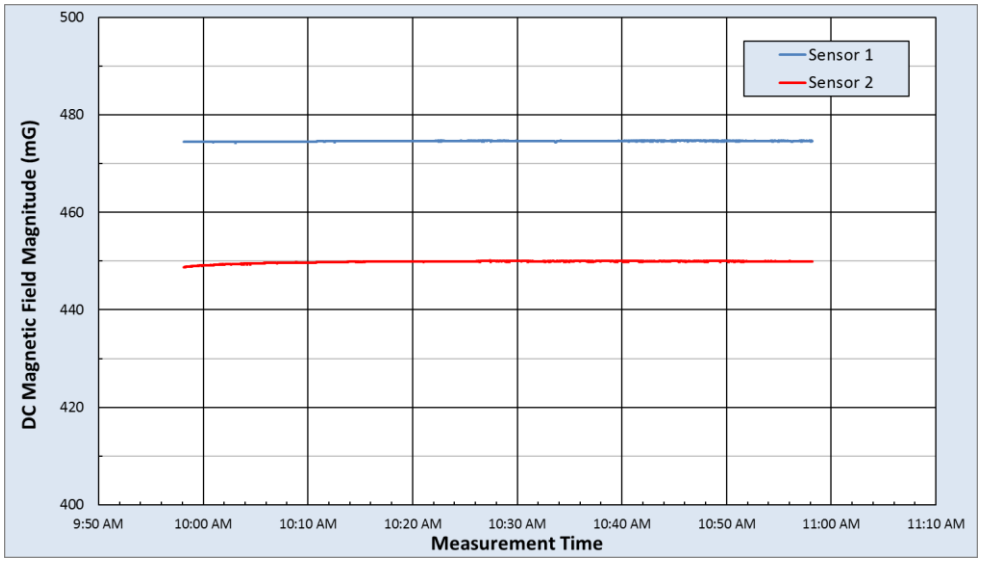
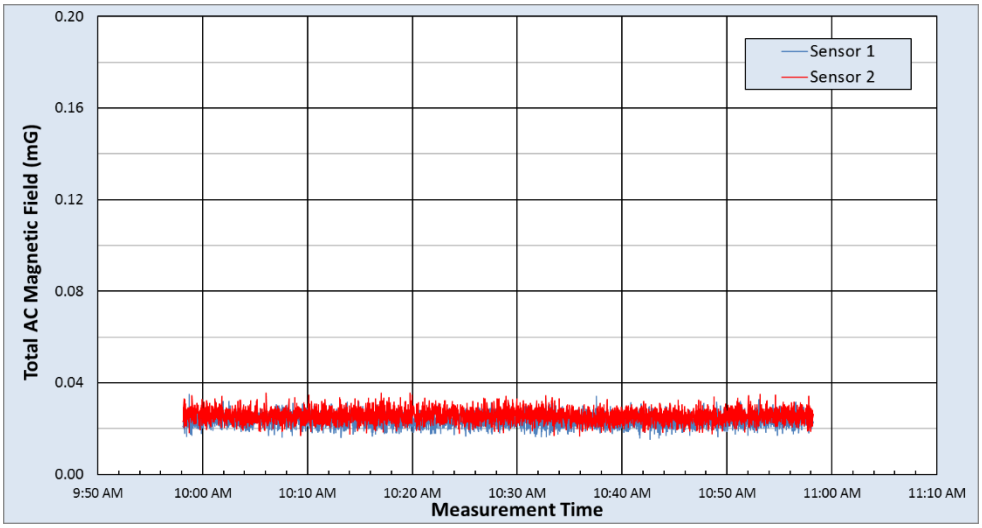
Figure 12(b) Location 8: Measurement Location and Site Views

Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.



DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	227.4	212.4	417.2	396.9	474.8	450.1
Median	226.8	212.2	416.9	396.8	474.6	449.9
Min	226.2	211.2	416.5	395.9	474.4	448.8
Range	1.1	1.2	0.7	0.9	0.4	1.4
Std Dev	0.2	0.2	0.1	0.2	0.1	0.2



rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	0.018	0.023	0.019	0.021	0.019	0.018	0.020	0.020	0.018	0.021	0.020	0.022	0.023	0.027	0.035	0.035
Median	0.008	0.009	0.008	0.009	0.008	0.009	0.008	0.009	0.009	0.009	0.009	0.010	0.009	0.010	0.024	0.026
Min	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.015	0.017
Range	0.016	0.021	0.017	0.019	0.018	0.017	0.019	0.019	0.016	0.019	0.019	0.020	0.021	0.025	0.019	0.019
Std Dev	0.002	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003

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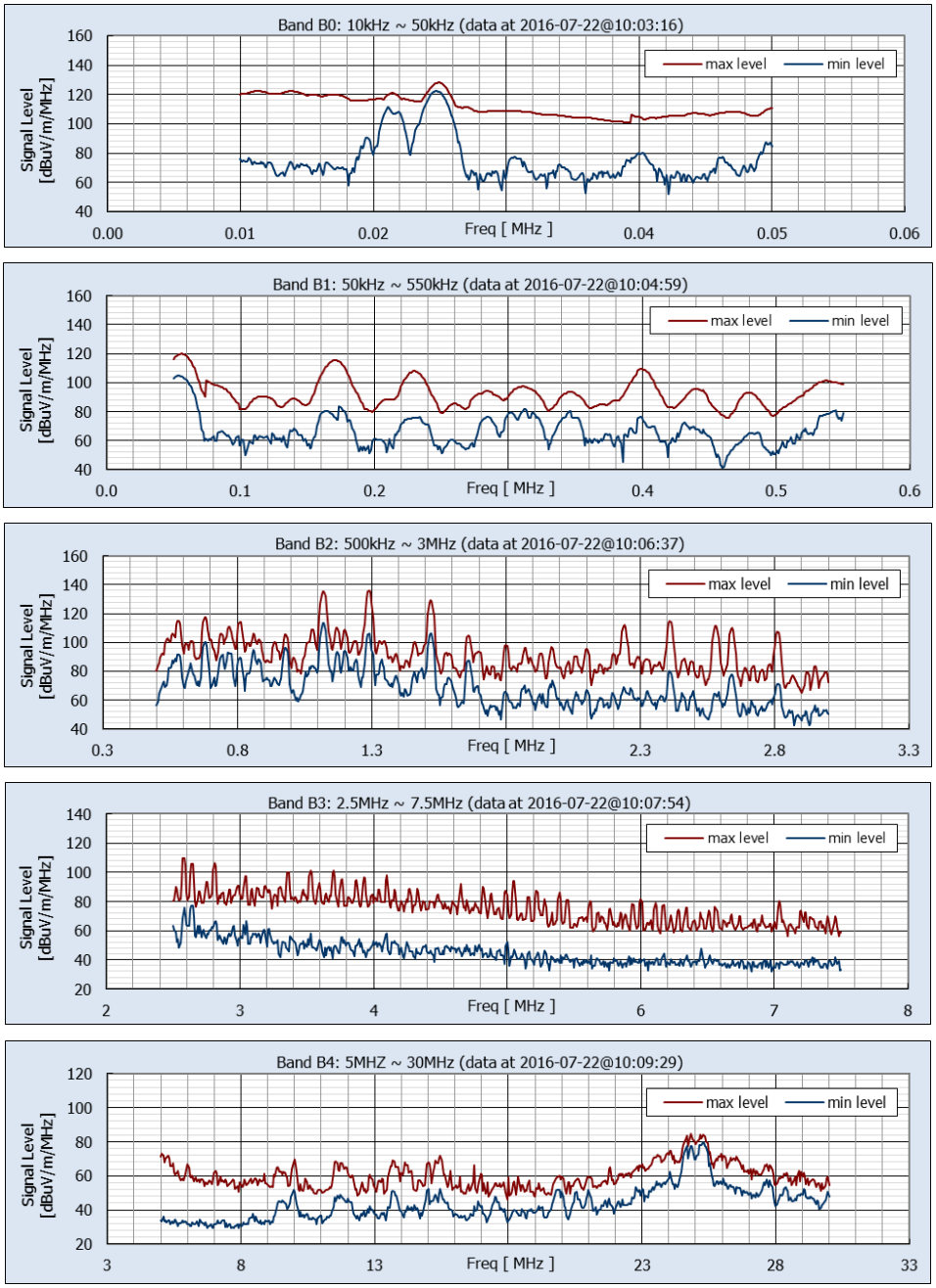
Figure 12(c) Location 8: AC and DC Magnetic Field Measurement Results

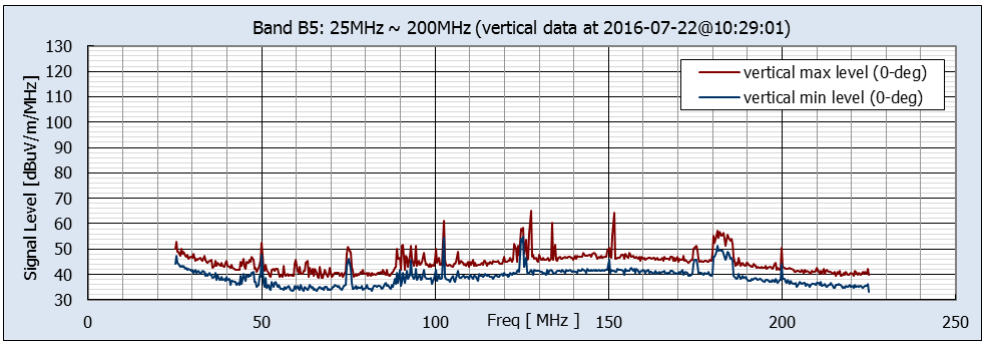


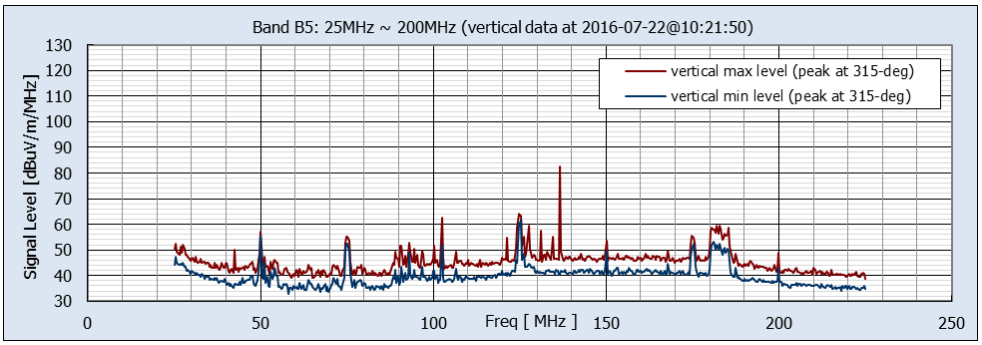
Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	122.1	0.0248	128.1	0.0249
B1	0.05 ~ 0.55	104.7	0.0536	119.8	0.0564
B2	0.50 ~ 3.00	113.6	1.1182	136.1	1.2909
B3	2.5 ~ 7.5	77.0	2.6364	109.8	2.5818
B4	5 ~ 30	79.8	25.2727	84.9	24.8182

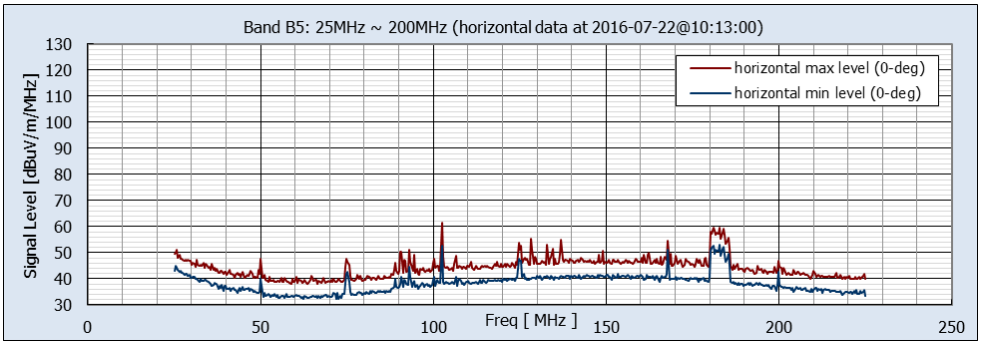
JANUARY 2019

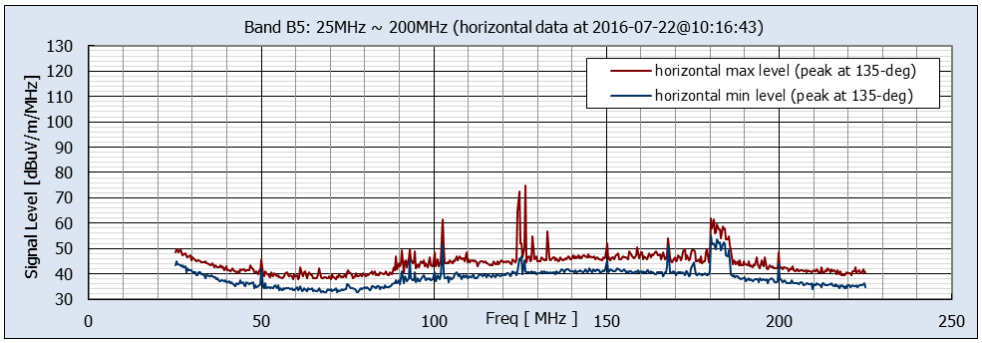
Figure 12(d) Location 8: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	61.6	125.364	82.7	136.636	55.3	180.273	74.7	126.455

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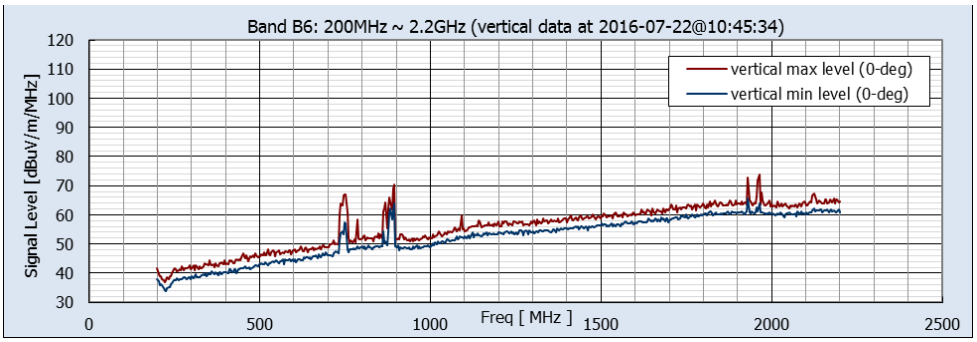
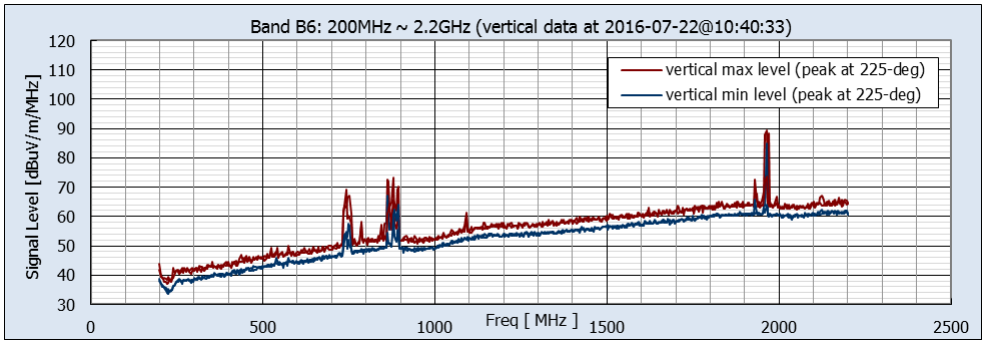
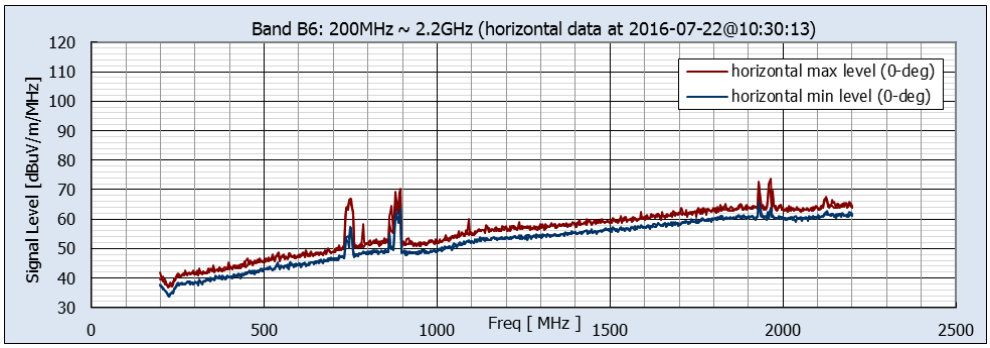
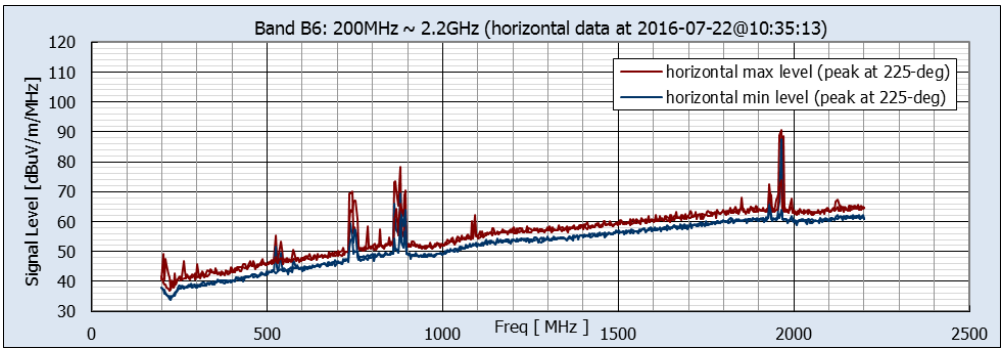
Figure 12(e) Location 8: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq. Range (MHz)	Vertical				Horizontal			
Band		Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	84.9	1963.636	89.4	1963.636	87.4	1963.636	90.6	1963.636

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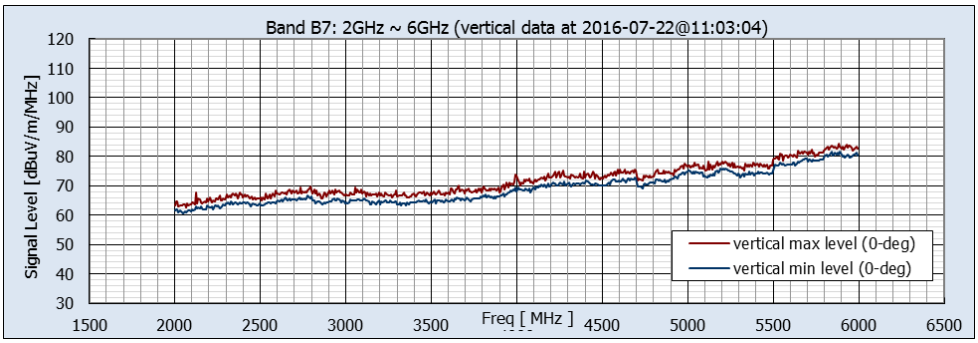
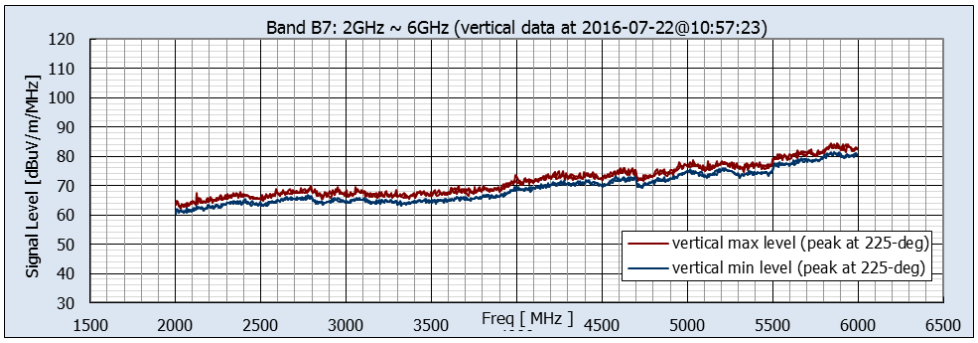
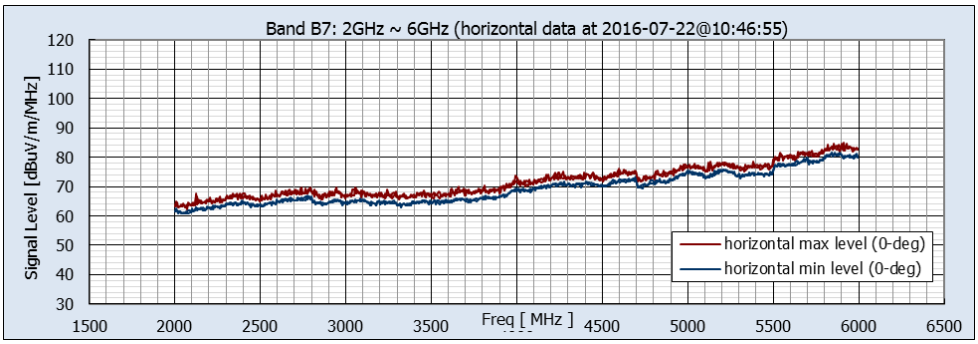
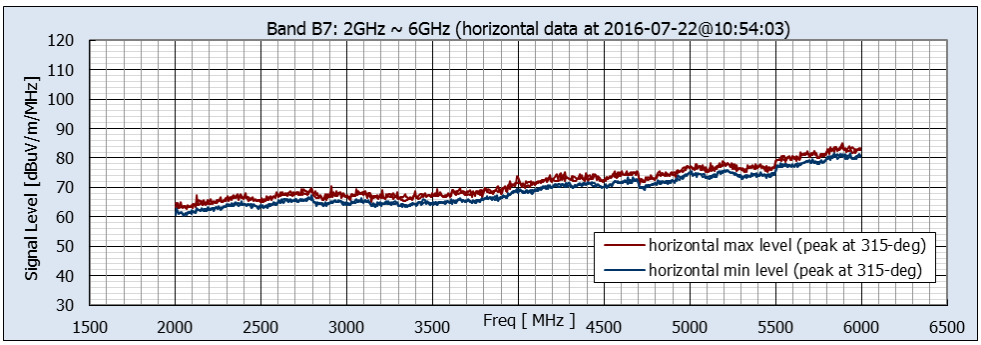
Figure 12(f) Location 8: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	66.2	2654.545	68.8	2669.091	66.2	2720.000	68.9	2705.455

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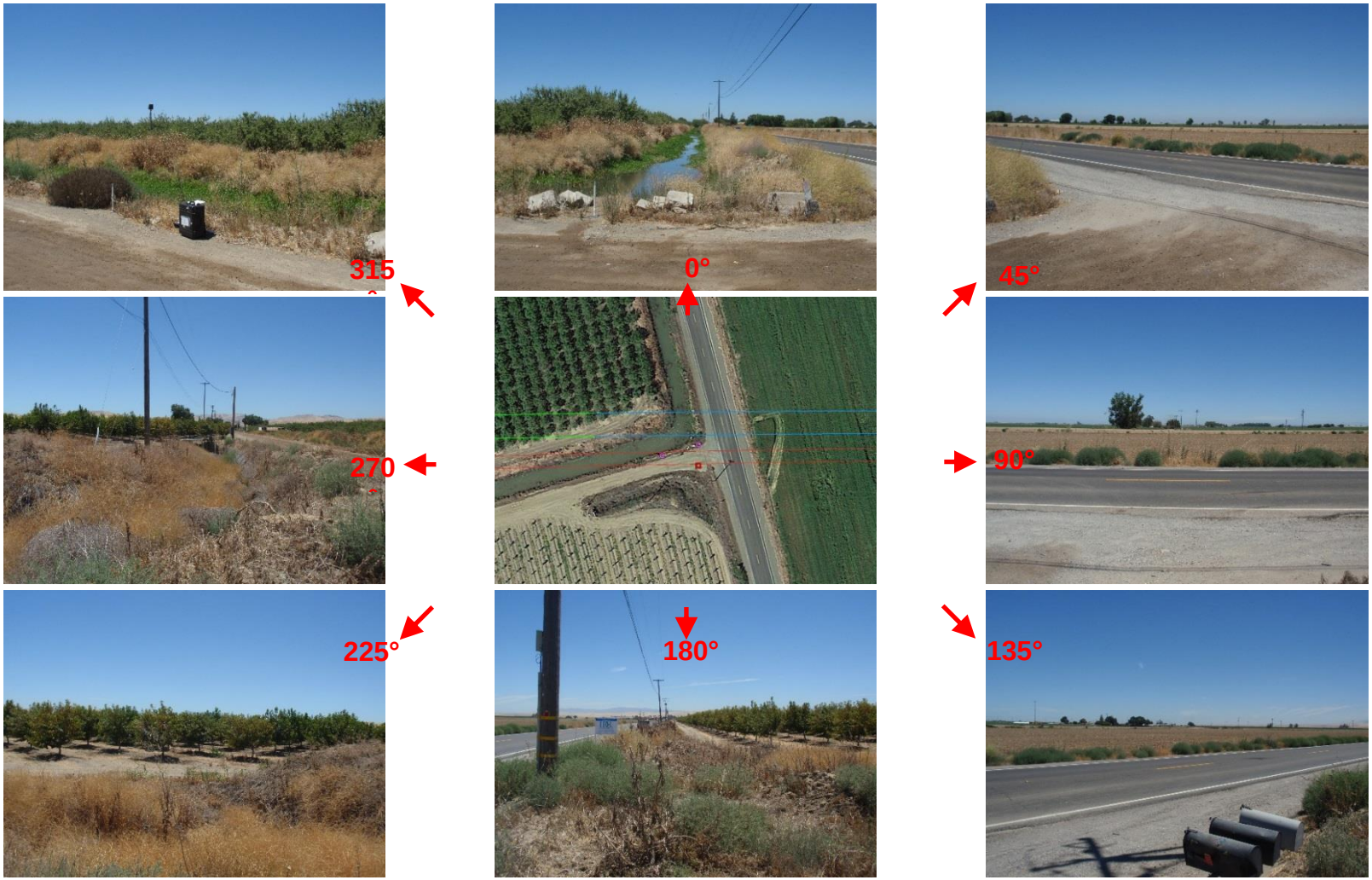
Figure 12(h) Location 8: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

JANUARY 2020

Figure 13(a) Location 9: Santa Nella Avenue/Fahey Road, Santa Nella

Rural setting with no visible RF sources (Lat 37.126085°, Lon -121.015302°)



JANUARY 2019

Figure 13(b) Location 9: Measurement Location and Site Views

Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

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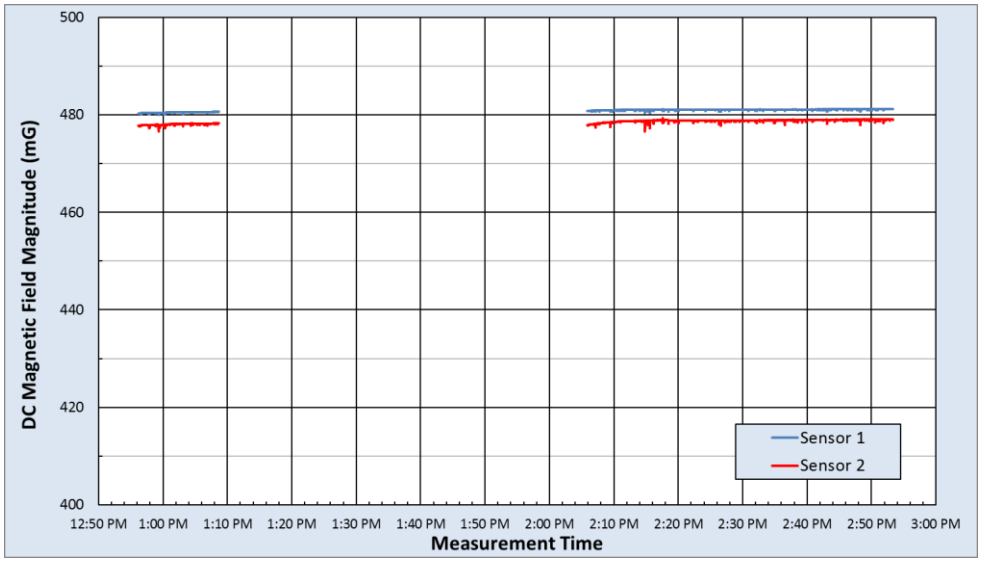
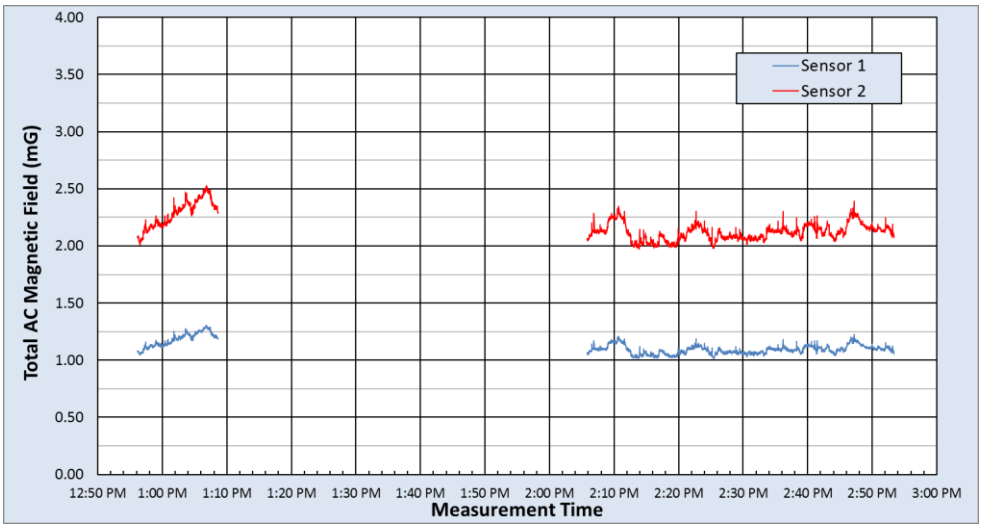
Figure 13(c) Location 9: Local EMF Sources

Nearby emitters include distribution lines perpendicular and parallel to the alignment.

Photos depict visible close-proximity emitters. Other emissions sources may exist, but are not visible from the site.



DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	237.7	274.5	418.8	394.3	481.2	479.4
Median	237.0	273.0	418.6	393.4	481.0	478.8
Min	235.7	271.5	417.8	391.0	480.0	476.6
Range	2.0	2.9	1.0	3.3	1.2	2.8
Std Dev	0.3	0.3	0.2	0.6	0.2	0.4



rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	1.304	2.526	0.052	0.050	0.054	0.061	0.061	0.060	0.095	0.135	0.069	0.064	0.108	0.139	1.306	2.529
Median	1.096	2.127	0.010	0.010	0.018	0.026	0.010	0.010	0.046	0.092	0.011	0.011	0.056	0.103	1.098	2.131
Min	1.012	1.968	0.002	0.002	0.004	0.005	0.002	0.003	0.026	0.054	0.002	0.003	0.031	0.072	1.015	1.974
Range	0.293	0.558	0.050	0.048	0.050	0.056	0.059	0.057	0.069	0.081	0.067	0.061	0.077	0.067	0.291	0.555
Std Dev	0.057	0.108	0.003	0.003	0.005	0.009	0.004	0.004	0.006	0.010	0.004	0.004	0.007	0.010	0.057	0.107

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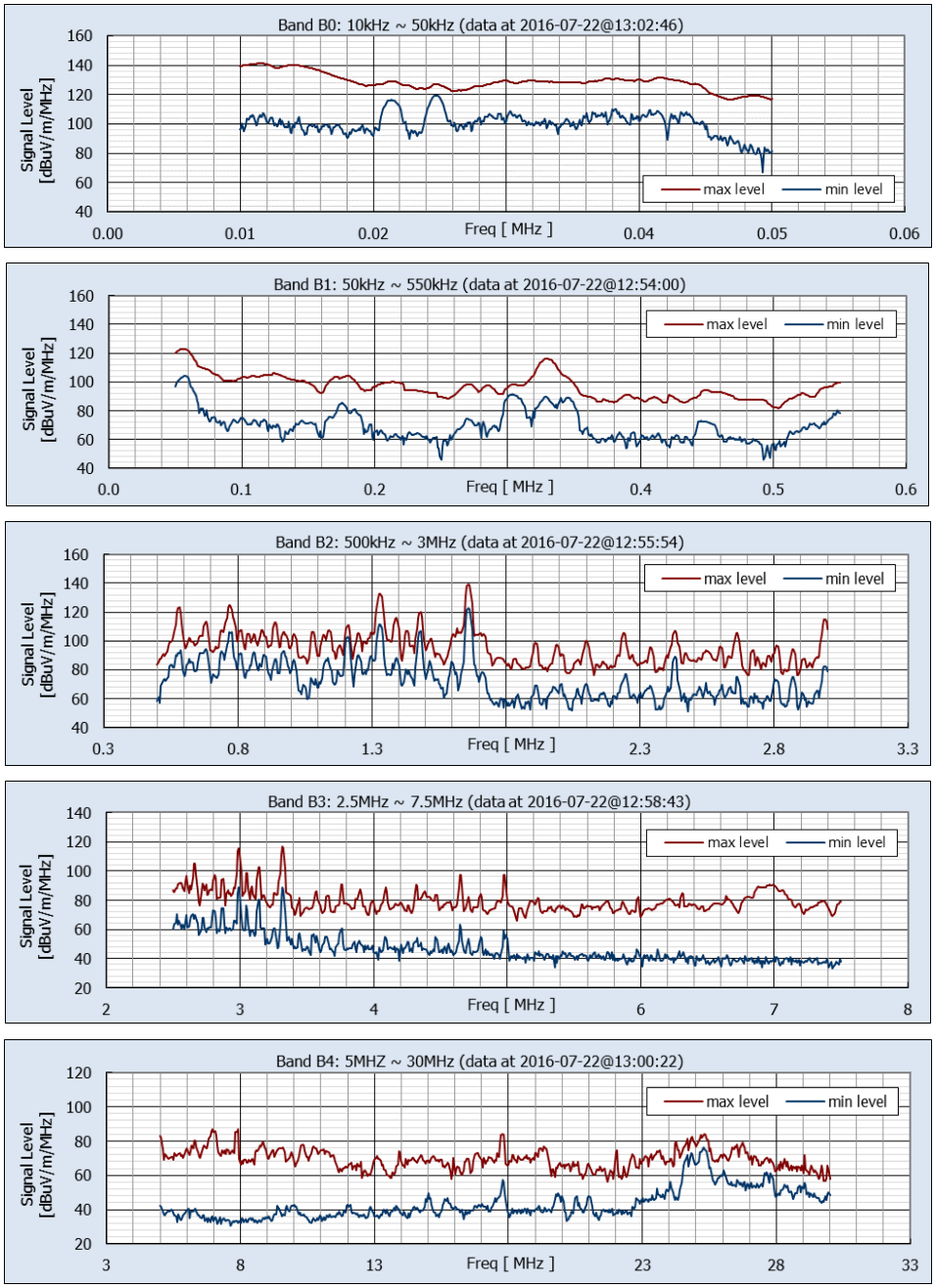
Figure 13(d) Location 9: AC and DC Magnetic Field Measurement Results



Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	119.4	0.0248	141.1	0.0115
B1	0.05 ~ 0.55	104.0	0.0573	122.9	0.0564
B2	0.50 ~ 3.00	122.5	1.6591	139.1	1.6591
B3	2.5 ~ 7.5	88.8	3.3182	117.0	3.3182
B4	5 ~ 30	76.1	25.2727	86.9	7.9091

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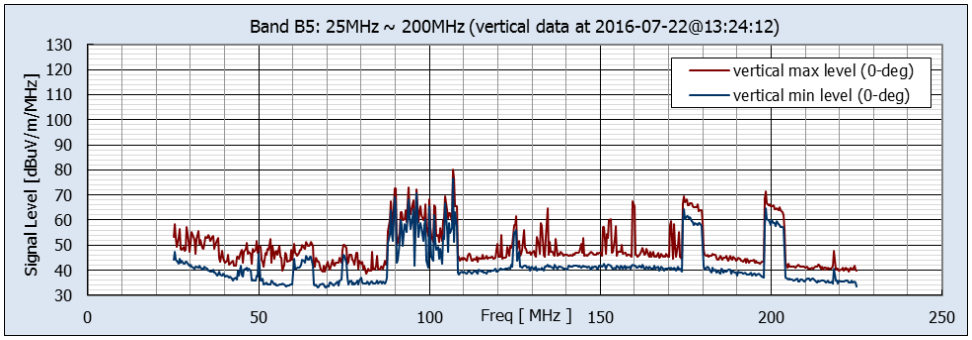
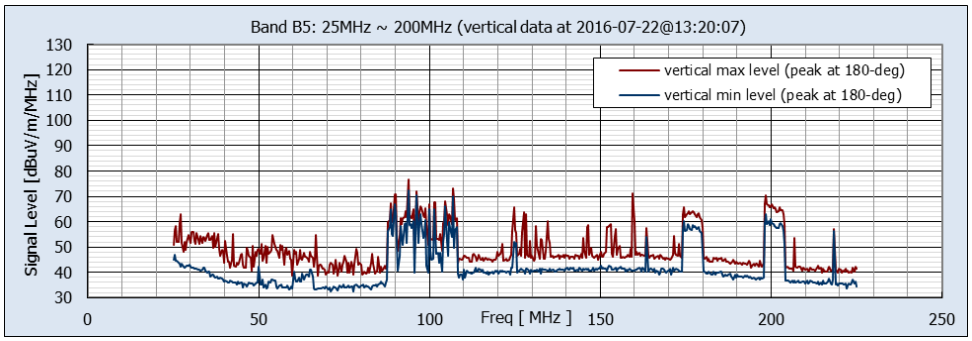
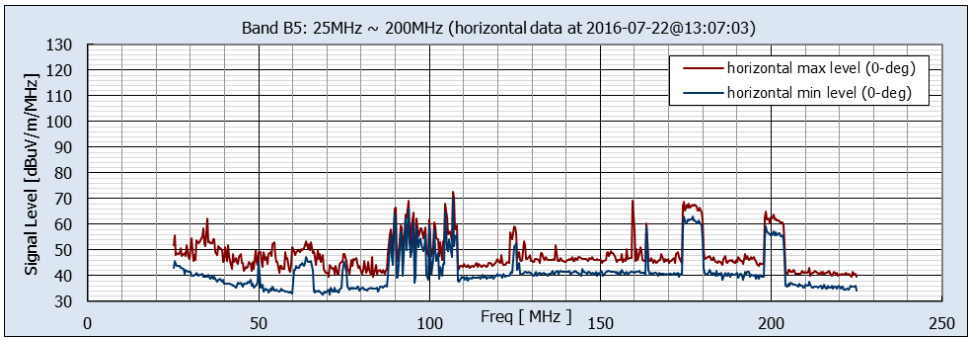
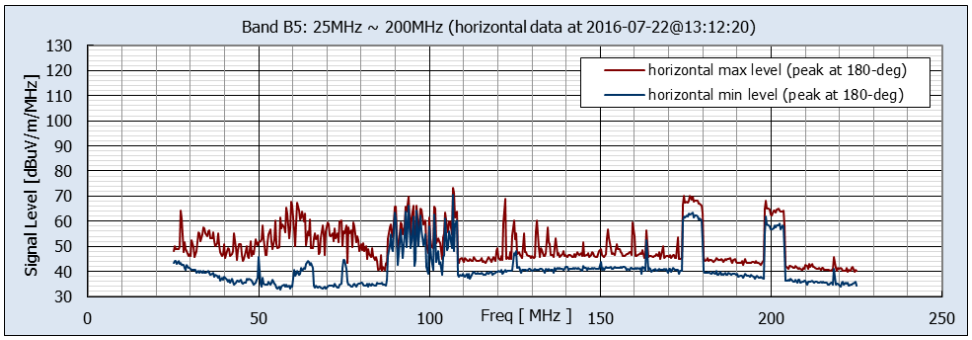
Figure 13(e) Location 9: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4









Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	76.7	106.818	80.0	106.818	70.6	106.818	73.4	106.818

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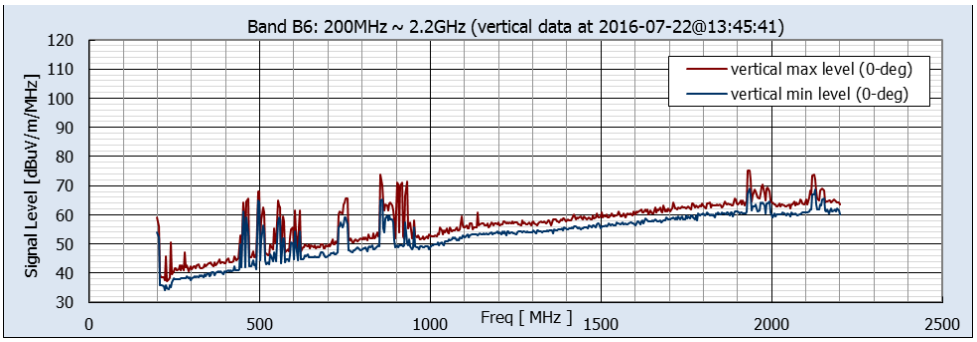
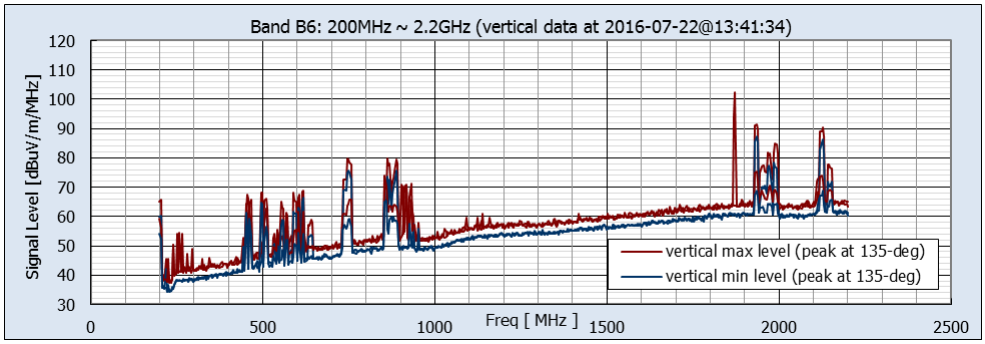
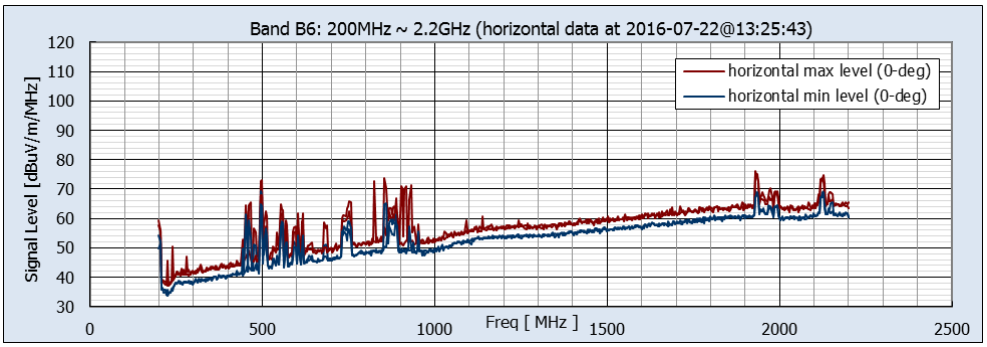
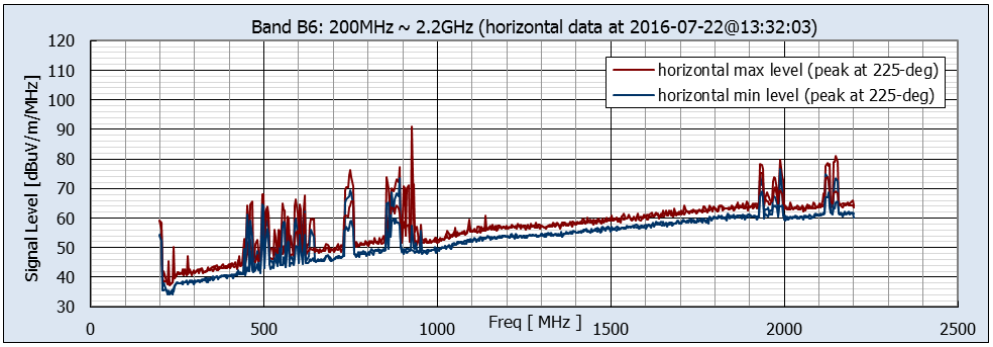
Figure 13(f) Location 9: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
	Freq. Range (MHz)	Vertical				Horizontal			
Band		Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	87.2	1934.545	102.3	1872.727	76.7	1989.091	91.1	927.273

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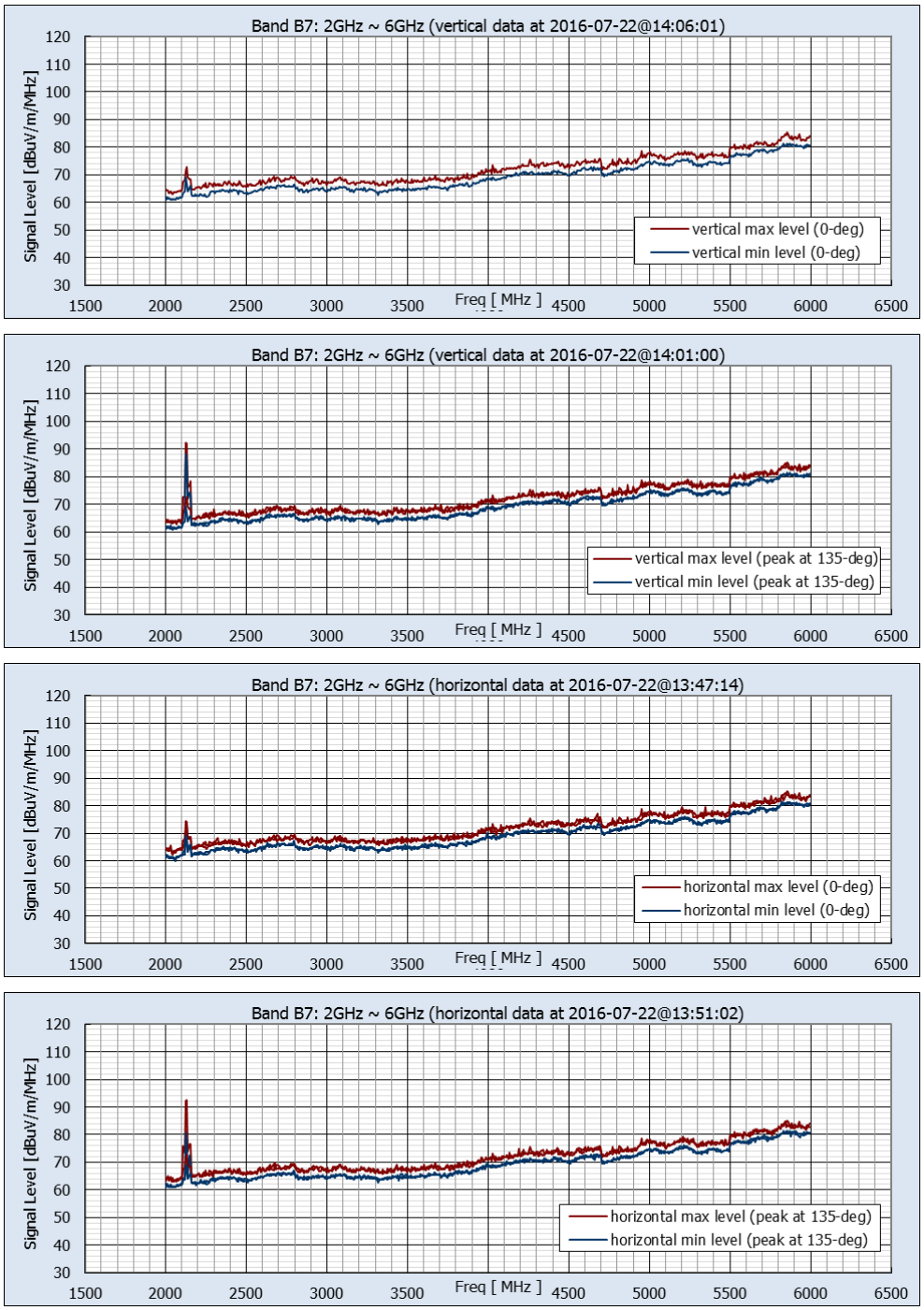
Figure 13(g) Location 9: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation



Maximum Levels									
	Freq.	Vertical				Horizontal			
Band	Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	88.2	2123.636	92.3	2123.636	80.6	2123.636	92.5	2130.909

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Figure 13(h) Location 9: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

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Figure 14(a) Location 10: Henry Miller Road/Carlucci Road, Dos Palos

Rural setting, with one cell tower approximately 3.5 miles distant (Lat 37.097787°, Lon -120.680892°)

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Figure 14(b) Location 10: Measurement Location and Site Views

Photos depicting the site from the perspective of the RF measurement location. In the center is a satellite view, indicating the alignment (green line) and measurement points (red = RF, magenta = magnetometers). The satellite view is rotated so that the image at 0° faces the alignment.

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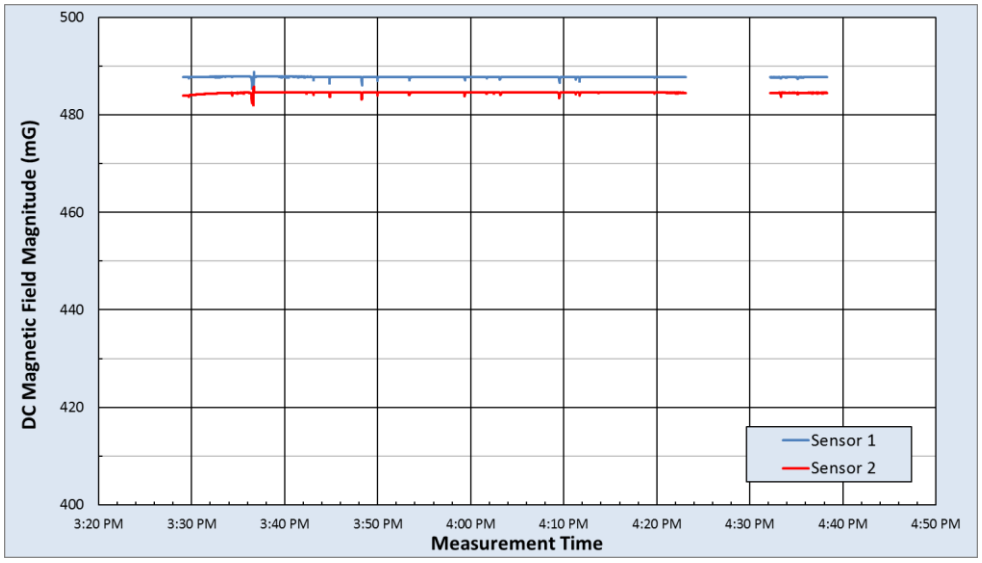
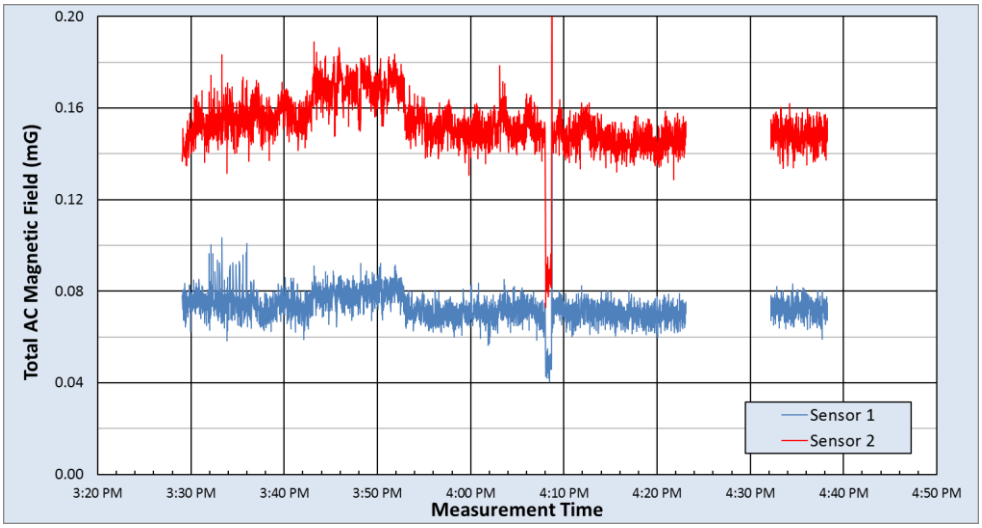
Figure 14(c) Location 10: Local EMF sources

Nearby emitters include distribution lines parallel and perpendicular to the alignment and a distant (3.5 mi) cell tower.

Photos depict visible close-proximity emitters. Other emissions sources may exist that are not readily visible from the site.



DC Magnetic Field Measurement Statistics						
	B Horizontal (mG)		B Vertical (mG)		B Total (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	238.2	263.4	427.8	409.3	488.8	485.7
Median	234.7	260.0	427.6	408.9	487.8	484.6
Min	229.9	256.1	425.6	406.9	485.2	482.1
Range	8.3	7.4	2.2	2.5	3.6	3.6
Std Dev	0.2	0.3	0.1	0.3	0.1	0.1



rms AC Magnetic Field Measurement Statistics																
	Fund 60Hz (mG)		2nd (mG)		3rd (mG)		4th (mG)		5th (mG)		6th (mG)		7th (mG)		Total AC (mG)	
	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2	Sensor 1	Sensor 2
Max	0.156	0.361	0.058	0.058	0.055	0.059	0.056	0.059	0.065	0.070	0.068	0.068	0.071	0.065	0.158	0.363
Median	0.067	0.148	0.009	0.009	0.010	0.011	0.010	0.010	0.013	0.022	0.010	0.010	0.011	0.014	0.073	0.152
Min	0.032	0.065	0.001	0.002	0.002	0.003	0.002	0.002	0.002	0.009	0.001	0.002	0.002	0.003	0.041	0.073
Range	0.124	0.297	0.057	0.056	0.053	0.056	0.054	0.057	0.063	0.061	0.067	0.066	0.070	0.062	0.117	0.290
Std Dev	0.006	0.013	0.003	0.003	0.003	0.004	0.003	0.003	0.004	0.005	0.004	0.004	0.004	0.004	0.006	0.013

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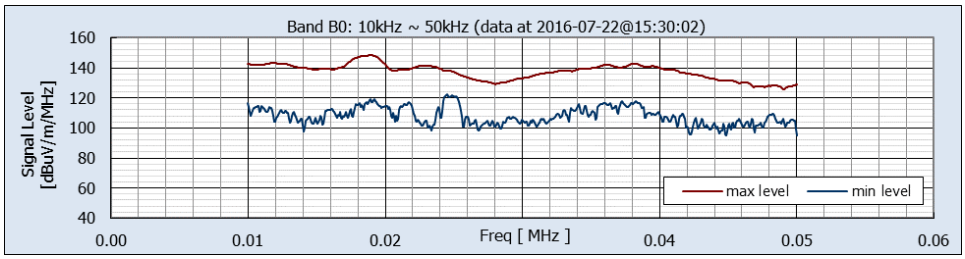
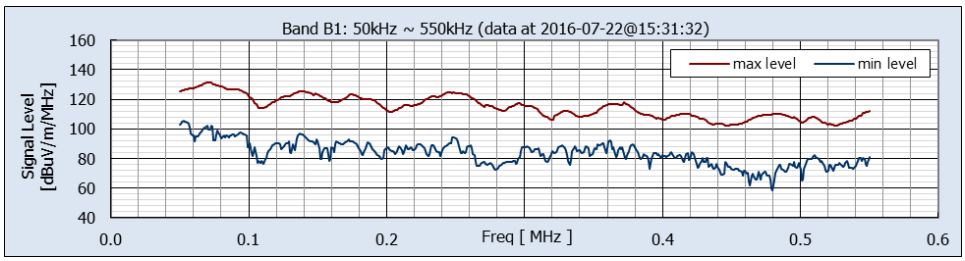
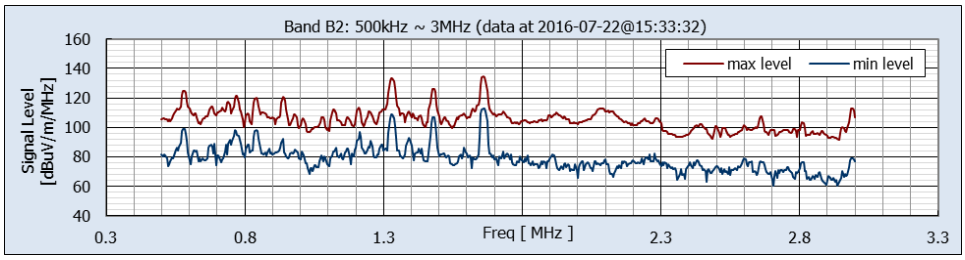
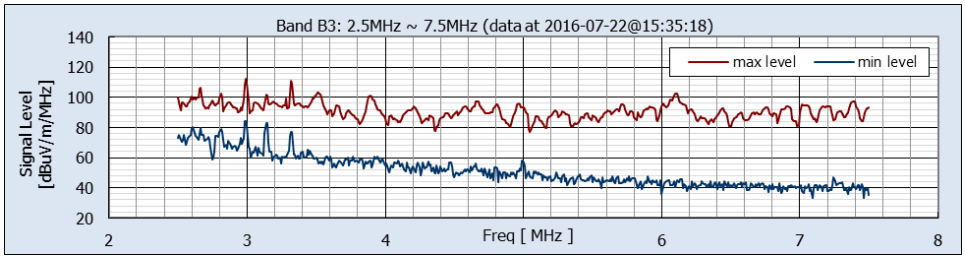
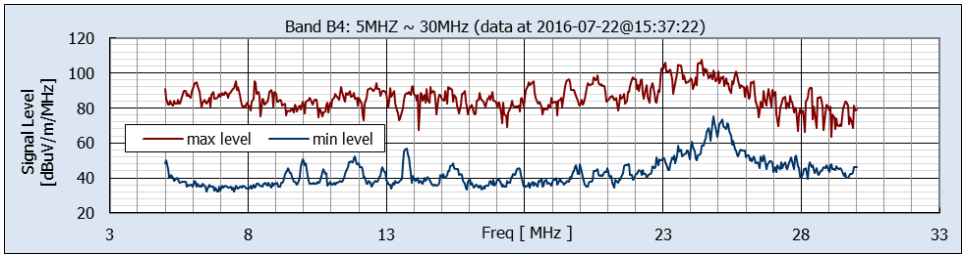
Figure 14(d) Location 10: AC and DC Magnetic Field Measurement Results











Maximum Levels					
Band number	Freq. Range (MHz)	Pk Min-Hold (dB uV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dB uV/m/MHz)	@ Freq. (MHz)
B0	0.01 ~ 0.05	122.3	0.0245	148.4	0.0189
B1	0.05 ~ 0.55	105.2	0.0527	131.3	0.0718
B2	0.50 ~ 3.00	112.8	1.6591	134.7	1.6591
B3	2.5 ~ 7.5	84.4	2.9909	112.3	2.9909
B4	5 ~ 30	75.1	24.8182	107.4	24.4091

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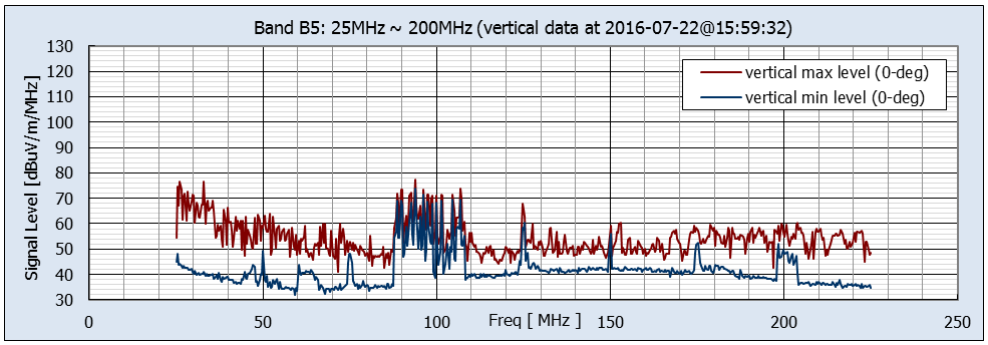
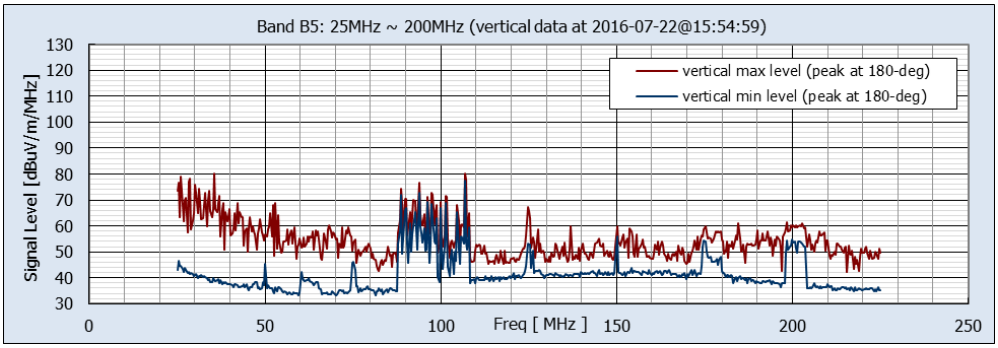
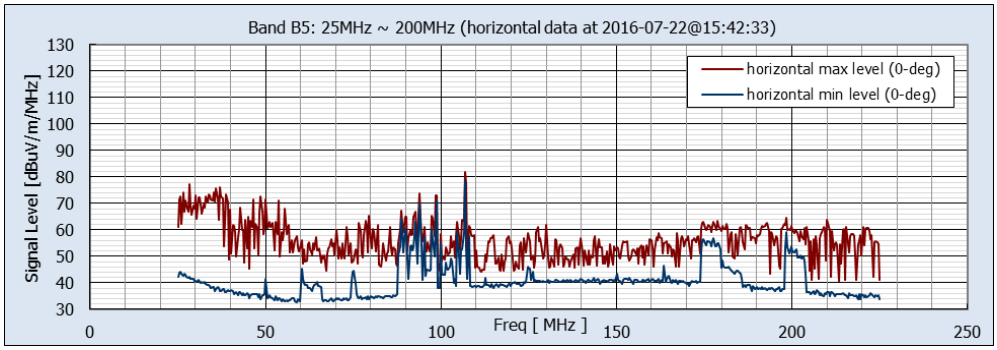
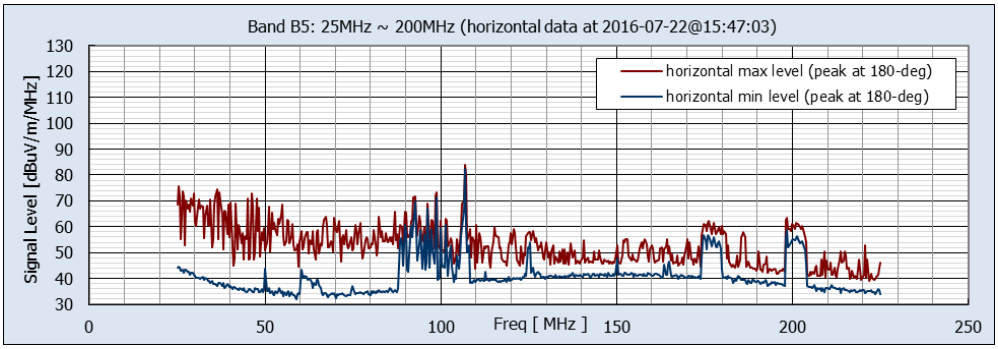
Figure 14(e) Location 10: Measured Environmental RF Levels

Non-Directional Data from Vertically Oriented Monopole Antenna, Bands 0-4







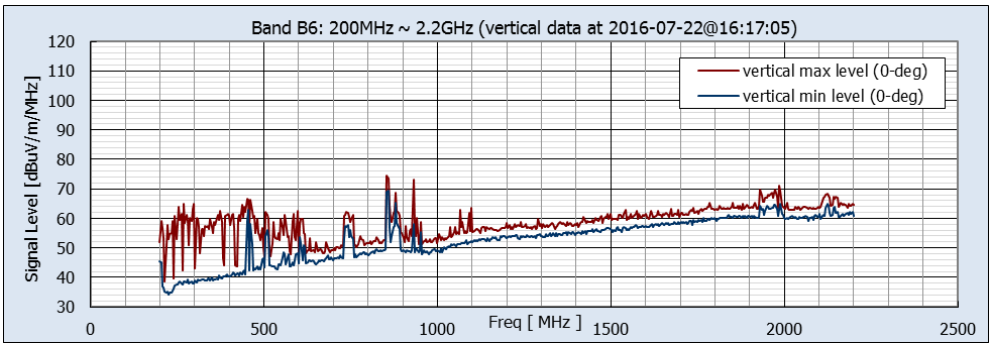


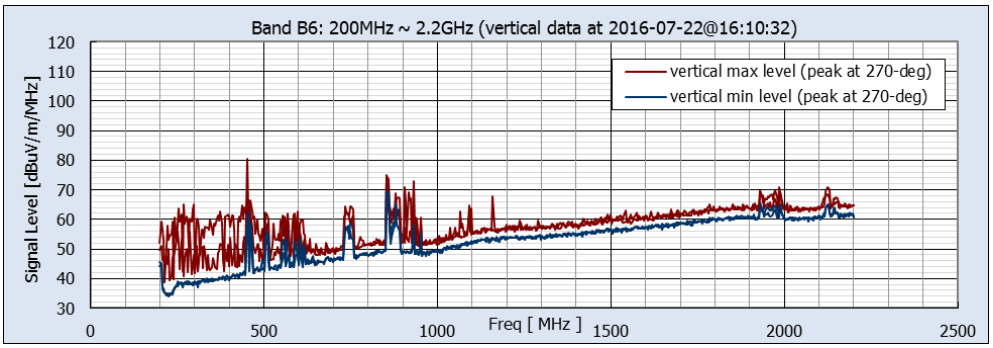
Maximum Levels									
		Vertical				Horizontal			
Band number	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B5	25 ~ 200	77.3	106.818	80.1	106.818	82.4	106.818	83.9	106.818

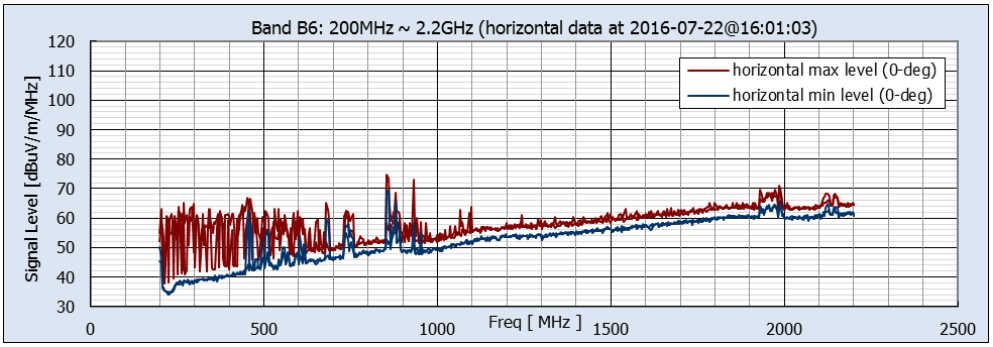
JANUARY 2019

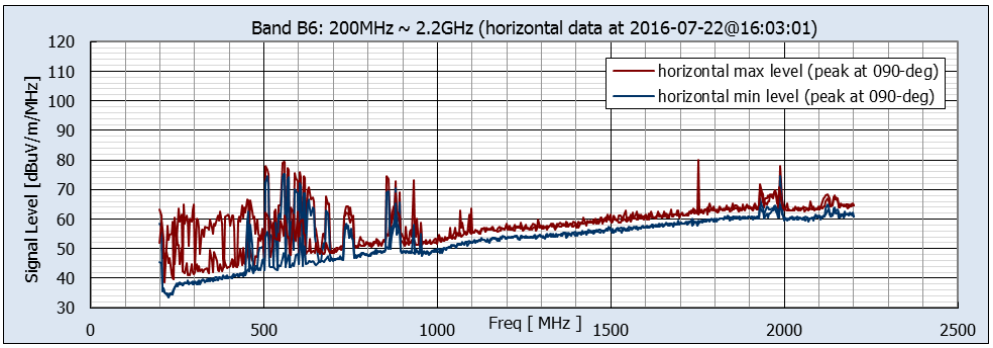
Figure 14(f) Location 10: Measured Environmental RF Levels

Band 5 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation









Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B6	200 ~ 2200	73.6	854.545	80.4	450.909	75.4	556.364	80.2	1752.727

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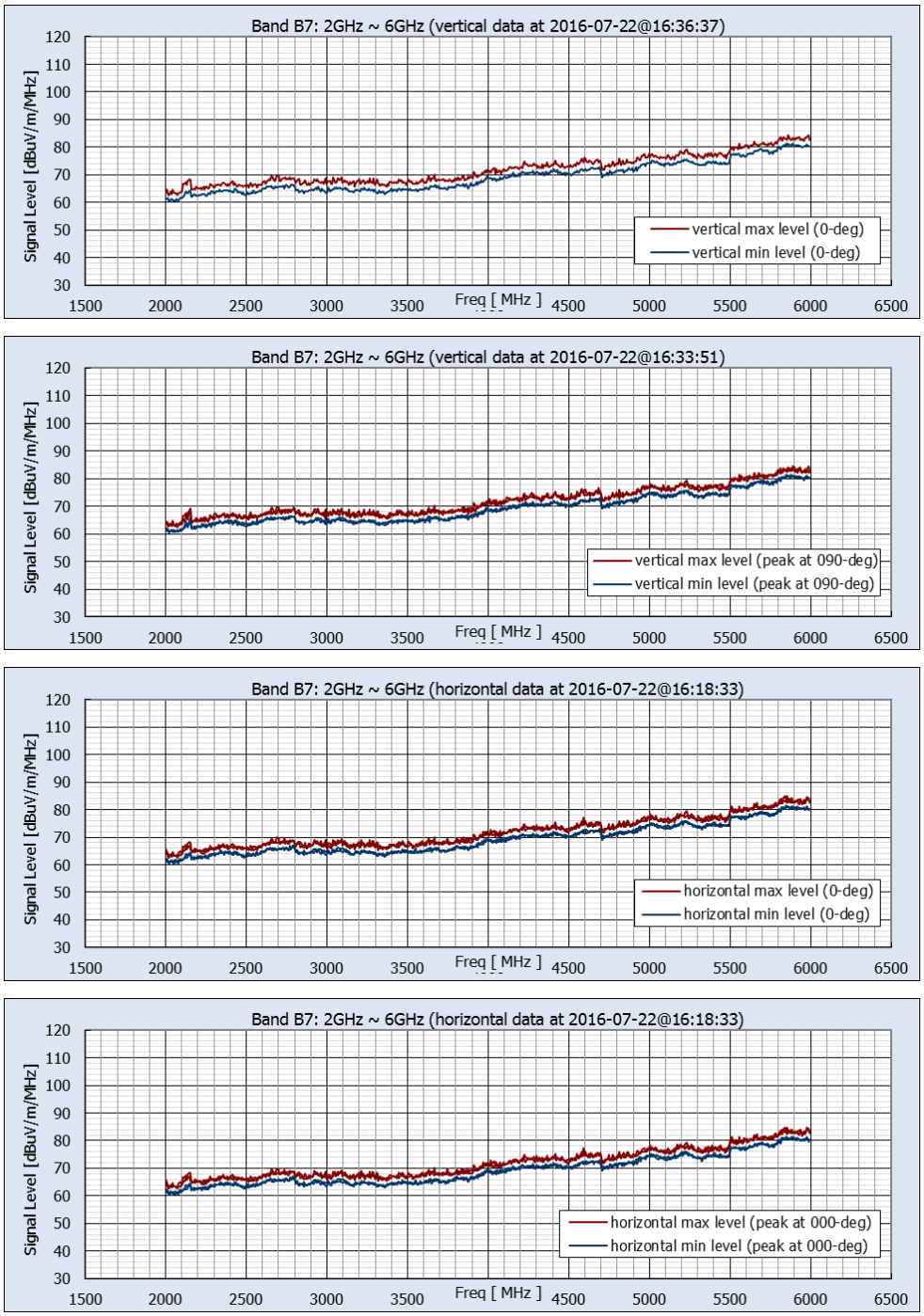
Figure 14(g) Location 10: Measured Environmental RF Levels

Band 6 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation



Maximum Levels									
		Vertical				Horizontal			
Band	Freq. Range (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Min-Hold (dBuV/m/MHz)	@ Freq. (MHz)	Pk Max-Hold (dBuV/m/MHz)	@ Freq. (MHz)
B7	2000~6000	66.1	2727.273	69.8	2690.909	66.3	2647.273	68.5	2698.182

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Figure 14(h) Location 10: Measured Environmental RF Levels

Band 7 Vertical and Horizontal Components, Facing Alignment (0-deg) and at Peak Orientation

APPENDIX 3.6-A: PUBLIC UTILITIES AND ENERGY FACILITIES

APPENDIX 3.6-A: PUBLIC UTILITIES AND ENERGY FACILITIES

Since publication of the Draft Environmental Impact Report/Environmental Impact Statement, the following substantive changes have been made to this appendix:

- This appendix was updated to reflect missing major utility lines within the public utilities resource study area and to reflect the relocation of the Diana Well under Alternatives 2 and 4.

Table 1a Existing Major Utilities and Energy Facilities within the Public Utilities Resource Study Area under Alternative 1

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
San Jose Diridon Station Approach					
Potable Water	Santa Clara Valley Water District	2410+14	Transverse	Emory Street	Protect in Place
Fiber Optic	Level 3 Communication	2478+50 to 2481+15	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	2478+50 to 2481+15	Longitudinal	n/a	Relocate
Transmission Tower	PG&E	0052+00	n/a	n/a	Protect in Place
Electric OH	PG&E	0052+00 to 0066+00	Longitudinal and Transverse	West San Carlos Street	Relocate
Fiber Optic	Sprint/MCI	0052+91 to 0055+55	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication	0052+91 to 0057+50	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication	0057+50	Transverse	Park Avenue	Relocate
Fiber Optic	Level 3 Communication/ AboveNet	0057+50	Transverse	Park Avenue	Relocate
Fiber Optic	Level 3 Communication	0057+90	Transverse	Park Avenue	Protect in Place
AT&T Legacy Fiber Optic Cables	AT&T/ Pacific Bell	0058+50	Transverse	Park Avenue	Protect in Place
Fiber Optic	Level 3 Communication/ AboveNet/Time Warner	0058+70	Transverse	Park Avenue	Protect in Place
Sanitary	City of San Jose	0058+90	Transverse	Park Avenue	Relocate
Transmission Tower	PG&E	0059+70	n/a	Park Avenue	Relocate
Fiber Optic	Sprint/MCI	0134+00 to 0150+00	Longitudinal	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Monterey Corridor Subsection					
Fiber Optic	Sprint/MCI	0150+00 to 0196+00	Longitudinal	n/a	Relocate
Storm	City of San Jose	0159+00	Transverse	n/a	Protect in Place
Sanitary	City of San Jose	0172+50	Transverse	Almaden Road	Protect in Place
Fiber Optic	QWEST/WTG	0189+65 to 0250+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	0196+00 to 0224+00	Longitudinal	Curtner Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	0208+20	Transverse	Curtner Avenue	Relocate
Natural Gas	PG&E	0208+90	Transverse	Curtner Avenue	Relocate
Sanitary	City of San Jose	0211+_60	Transverse	Curtner Avenue	Protect in Place
Fiber Optic	Sprint/MCI	0224+00 to 0250+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	0250+00 to 0285+00	Longitudinal	n/a	Relocate
Fiber Optic	QWEST/WTG	0250+00 to 0285+00	Longitudinal	n/a	Relocate
Electric OH	PG&E	0266+50	Transverse	n/a	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Storm	City of San Jose	0297+60	Transverse	Monterey Highway	Relocate
Sanitary	City of San Jose	0297+80	Transverse	Monterey Highway	Protect in Place
Potable Water	San Jose Water Company	0298+00	Transverse	Monterey Highway	Protect in Place
Sanitary	City of San Jose	0299+00 to 0458+75	Longitudinal	Monterey Highway	Relocate
Fiber Optic	Sprint/MCI	0301+00 to 0313+00	Longitudinal	n/a	Relocate
Fiber Optic	QWEST/WTG	0301+00 to 0313+00	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication/ AT&T/ AboveNet	0301+00 to 0321+00	Longitudinal and Transverse	n/a	Relocate
Fiber Optic	AT&T/MCI/MFN	0301+00 to 0321+50	Longitudinal	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T	0302+00 to 0321+00	Longitudinal	Monterey Highway	Relocate
Fiber Optic	AT&T	0303+00 to 0321+00	Longitudinal	n/a	Relocate
Electric OH	PG&E	0334+00	Transverse	Senter Road	Relocate
Potable Water	Santa Clara Valley Water District	0363+30	Transverse	Skyway Drive	Protect in Place
Morgan Hill and Gilroy Subsection					
Storm	City of San Jose	0390+30	Transverse	Branham Lane	Relocate
Sanitary	City of San Jose	0392+15	Transverse	Branham Lane	Protect in Place
Fiber Optic	AT&T	0450+00 to 0510+00	Longitudinal	Monterey Road	Relocate
Natural Gas	PG&E	0480+00	Transverse	Ford Road	Protect in Place
Fiber Optic	AT&T	0510+00 to 0603+93	Longitudinal	Monterey Road	Relocate
Storm	City of San Jose	0510+10	Transverse	n/a	Relocate
Telecomm OH	Unknown	0642+65 to 0705+30	Longitudinal	Monterey Road	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	0645+54	Transverse	Metcalf Road	Relocate
Electric OH	PG&E	0717+33	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1308+66	Transverse	Roosevelt Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1322+56	Transverse	Roosevelt Avenue	Relocate
Potable Water	Santa Clara Valley Water District	0636+85 to 0645 +00	Longitudinal and Transverse	Metcalf Road	Protect in Place
Electric OH	PG&E	0657+00	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0657+50	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0658+00	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0663+00	Transverse	Monterey Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	0663+30	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0663+85	Transverse	Monterey Road	Protect in Place
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	0664+00	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0664+45	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0664+70	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0665+20	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0665+ 45	Transverse	Monterey Road	Relocate
Natural Gas	CPN Pipeline Company	0682+70	Transverse	Blanchard Road	Relocate
Fiber Optic	QWEST/WTG	0700+00 to 0728+00	Longitudinal	n/a	Relocate
Natural Gas	PG&E	0717+85	Transverse	n/a	Protect in Place
Electric & Telecomm OH on Joint Pole	Verizon	0861+45 to 0896+00	Longitudinal and Transverse	Monterey Road	Relocate
Natural Gas	PG&E	0861+50	Transverse	n/a	Protect in Place
Electric & Telecomm OH on Joint Pole	Unknown	0880+15	Transverse	Ogier Avenue	Relocate
Electric OH	PG&E	0892+60	Transverse	Barnhart Avenue	Protect in Place
Electric OH	PG&E	0892+75	Transverse	Barnhart Avenue	Protect in Place
Electric OH	Unknown	0892+80	Transverse	Barnhart Avenue	Relocate
Electric OH	PG&E	0893+35	Transverse	Barnhart Avenue	Protect in Place
Electric OH	PG&E	0893+60	Transverse	Barnhart Avenue	Protect in Place
Electric or Telecomm OH	Unknown	0918+00	Transverse	n/a	Relocate
Electric or Telecomm OH	Unknown	0945+20	Transverse	n/a	Relocate
Electric or Telecomm OH	Unknown	0950+70	Transverse	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Telecomm	Verizon	0997+90	Transverse	Burnett Avenue	Relocate
Telecomm	Verizon	1016+20	Transverse	Peebles Avenue	Protect in Place
Natural Gas	PG&E	1043+10	Transverse	Cochrane Road	Protect in Place
Telecomm	Verizon	1044+35	Transverse	Cochrane Road	Protect in Place
Telecomm	Verizon	1078+70	Transverse	Half/Laurel Road	Protect in Place
Electric OH	Unknown	1098+00	Transverse	East Main Avenue	Relocate
Telecomm	Verizon	1098+75	Transverse	East Main Avenue	Relocate
Natural Gas	PG&E	1119+50	Transverse	Diana Avenue	Protect in Place
Telecomm	Verizon	1119+60	Transverse	Diana Avenue	Protect in Place
Electric OH	Unknown	1120+00	Transverse	Diana Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1156+00	Transverse	San Pedro Avenue	Relocate
Electric OH	Unknown	1172+15	Transverse	Barrett Avenue	Relocate
Potable Water	City of Morgan Hill	1172+45	Transverse	Barrett Avenue	Protect in Place
Potable Water	City of Morgan Hill	1188+70	Transverse	Tennant Avenue	Protect in Place
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	Unknown	1223+25	Transverse	Maple Avenue	Relocate
Electric OH	Unknown	1256+30	Transverse	Middle Avenue	Relocate
Fiber Optic	QWEST/WTG	1290+00 to 1344+00	Longitudinal	n/a	Relocate
Telecommunication Indoor Facility	Level 3 Communication/ AboveNet	1334+00	n/a	n/a	Relocate
Pacheco Pass Subsection					
Electric & Telecomm OH on Joint Pole	Verizon	1486+00	Transverse	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	Verizon	1498+85	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1510+00	Transverse	Masten Avenue	Relocate
Electric & Telecomm OH on Joint Pole	PG&E/ Verizon	1526+20	Transverse	Santa Clara Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1533+00	Transverse	Masten/ Rucker Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1561+10	Transverse	Denio Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1595+50	Transverse	Cohansey Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1654+73	Transverse	Leavesley Road	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1660+30	Transverse	Casey Lane	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1765+80	Transverse	Luchessa Avenue	Relocate
Electric & Telecomm OH on Joint Pole	n/a	2044+46	Transverse	Frazier Lake Road	Relocate
Electric OH	PG&E	1568+50	Transverse	Buena Vista Avenue	Relocate
Electric OH	PG&E	1569+00	Transverse	Buena Vista Avenue	Relocate
Electric OH	PG&E	1580+90	Transverse	Day Road	Relocate
Electric OH	PG&E	1581+10	Transverse	Day Road	Relocate
Electric OH	Unknown	1607+09	Transverse	Farrell Avenue	Relocate
Electric OH	Unknown	1693+81	Longitudinal and Transverse	Lewis Street/ Old Gilroy Street	Relocate
Electric OH	Unknown	1699+90	Transverse	Martin Street	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	1723+66	Transverse	East 9th Street	Relocate
Electric OH	PG&E	1802+57 to 1810+00	Longitudinal	n/a	Relocate
Electric OH	PG&E	1803+03	Transverse	Southside Drive	Relocate
Electric OH	PG&E	1838+60	Transverse	Carnadero avenue	Relocate
Electric OH	PG&E	1838+75	Transverse	Carnadero Avenue	Relocate
Electric OH	PG&E	1870+47	Transverse	n/a	Remove
Electric OH	PG&E	2094+00	Transverse	n/a	Relocate
Fiber Optic	Level 3 Communication/ AboveNet	1426+00 to 1497+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	1703+00 to 1761+00	Longitudinal	Loof Avenue/Lewis Street/ East 6th Street	Relocate
Fiber Optic	Level 3 Communication/ AboveNet	1725+00 to 1725+00	Longitudinal	East 10th Street	Relocate
Fiber Optic	Level 3 Communication/ AboveNet	1725+00 to 1770+00	Longitudinal	Luchessa Avenue	Protect in Place
Fiber Optic	Sprint/MCI	1781+00 to 1796+50	Longitudinal	n/a	Relocate
Natural Gas	PG&E	2107+75	Transverse	Lake Road	Protect in Place
Natural Gas	PG&E	1464+40	Transverse	Church Avenue	Relocate
Potable Water	City of Gilroy	1628+50 to 1640+00	Longitudinal and Transverse	n/a	Relocate
Potable Water	City of Gilroy	1640+00	Transverse	n/a	Relocate
San Joaquin Subsection					
Potable Water	City of Gilroy	1655+10	Transverse	Leavesley Road	Relocate
Potable Water	City of Gilroy	1680+90	Transverse	Loof Avenue	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Potable Water	City of Gilroy	1693+63 to 1700+71	Longitudinal	Railroad Street	Relocate
Potable Water	City of Gilroy	1704+40	Transverse	East 6th Street	Protect in Place
Potable Water	City of Gilroy	1709+26	Transverse	Old Gilroy Street	Remove
Potable Water	City of Gilroy	1729+50	Transverse	East 10th Street	Protect in Place
Potable Water	City of Gilroy	1766+50	Transverse	Luchessa Avenue	Relocate
Potable Water	City of Gilroy	1802+35	Transverse	Southside Drive	Remove
Recycled Water	Santa Clara Valley Water District	1749+35	Transverse	n/a	Protect in Place
Sanitary	City of Gilroy	1655+70	Transverse	Leavesley Road	Relocate
Storm	City of Gilroy	1671+80	Transverse	n/a	Protect in Place
Telecomm OH	Verizon	1568+00	Transverse	Buena Vista Avenue	Relocate
Telecomm	Verizon	1615+20	Transverse	Las Animas Avenue	Protect in Place
Transmission Tower	PG&E	1581+00	n/a	Day Road	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
West Branch Llagas Creek Box Culvert	City of Gilroy	1621+60	Transverse	n/a	Extend
Electric & Telecomm OH on Joint Pole	Unknown	2188+94	Transverse	Lovers Land	Relocate
Electric & Telecomm OH on Joint Pole	PG&E & Unknown	2228+14	Transverse	San Felipe Road	Relocate
Electric OH	PG&E	2372+38	Transverse	n/a	Relocate
Natural Gas	PG&E	2193+10	Transverse	n/a	Protect in Place
Potable Water	Department of Water Resources	2220+00 to 2231+00	Longitudinal	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	2287+50	Transverse	n/a	Protect in Place
Electric OH	n/a	4046+79	Transverse	n/a	Relocate
Electric OH	PG&E	4251+64	Transverse	n/a	Relocate
Gas	Shell	4285+00	Transverse	Delta Mendota Canal	Abandon
Irrigation Ditch	n/a	4366+26	Transverse	Santa Nella Road/ SR-33	Relocate
Electric & Telecomm OH on Joint Pole	n/a	4366+50	Transverse	Santa Nella Road/ SR-33	Relocate
Electric OH	n/a	4372+43	Transverse	CCID Main Canal	Relocate
Irrigation Ditch	n/a	4372+52	Transverse	CCID Main Canal	Relocate
Electric OH	n/a	4372+52 to 4375+50	Longitudinal	n/a	Relocate
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	3270+50 to 3305+00	Longitudinal and Transverse	n/a	Relocate
Electric OH	PG&E	3666+00	Transverse	SR-152	Protect in Place
Electric OH	PG&E	3686+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4098+83	Transverse	SR-152	Relocate
Electric OH	PG&E	4177+80	Transverse	n/a	Protect in Place
Electric OH	PG&E	4178+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4178+70	Transverse	n/a	Protect in Place
Electric OH	PG&E	4179+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+00	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4182+50	Transverse	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	4183+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4183+60	Transverse	n/a	Protect in Place
Crude Oil	Shell	4207+50	Transverse	n/a	Protect in Place
Crude Oil	ConocoPhillips	4247+25	Transverse	n/a	Protect in Place
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Crude Oil	Chevron	4267+20	Transverse	n/a	Protect in Place
Irrigation Ditch	Henry Miller Reclamation District	4416+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4438+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4438+30	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4455+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4462+56	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4463+81	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation	4512+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation	4512+41	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation	4532+40	Transverse	n/a	New
Electric OH	PG&E	4568+13	Transverse	n/a	Relocate
Electric OH	PG&E	4595+34	Transverse	Ingomar Grade	Relocate
Oil	Chevron	4595+68	Transverse	Ingomar Grade	Abandon
Electric & Telecomm OH on Joint Pole	PG&E	4597+20	Transverse	Ingomar Grade	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	4615+00 to 4642+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4622+22	Transverse	Volta Road	Relocate
Irrigation District	Henry Miller Reclamation District	4622+42	Transverse	Volta Road	New
Irrigation District	Henry Miller Reclamation District	4623+50	Transverse	Volta Road	New
Irrigation District	Henry Miller Reclamation District	4639+70	Transverse	Henry Miller Road	New
Irrigation District	Henry Miller Reclamation District	4645+77 to 4648+93	Longitudinal	Henry Miller Road	New
Irrigation District	Henry Miller Reclamation District	4647+50 to 4648+50	Longitudinal	Henry Miller Road	New
Irrigation District	Henry Miller Reclamation District	4657+50 to 4681+50	Longitudinal	Henry Miller Road	Relocate
Irrigation District	Henry Miller Reclamation District	4657+54	Transverse	n/a	New
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	4657+81	Transverse	n/a	Relocate
Telecomm OH	PG&E	4660+00 to 4681+00	Longitudinal	n/a	Relocate
PG&E Electric OH	PG&E	4664+50 to 4717+00	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4671+77 to 4674+38	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4698+66	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4698+66 to 4703+00	Longitudinal	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	4739+50	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4742+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4757+30	Transverse	n/a	Relocate
Telecom OH	Unknown	4761+31	Transverse	Badger Flat Road	Relocate
Electric OH	PG&E	4761+86	Transverse	Badger Flat Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4762+00 to 4766+30	Transverse	n/a	Relocate
Electric OH	PG&E	4780+28	Transverse	Wilson Road	Relocate
Electric & Telecomm OH on Joint Pole	PG&E	4798+51	Transverse	Johnson Road	Relocate
Irrigation District	Henry Miller Reclamation District	4815+38	Transverse	n/a	New
Irrigation District	Henry Miller Reclamation District	4818+90	Transverse	n/a	New
Irrigation District	Henry Miller Reclamation District	4833+00	Transverse	Nantes Avenue	New
Irrigation District	Henry Miller Reclamation District	4833+50	Transverse	Nantes Avenue	Realign
Irrigation District	Henry Miller Reclamation District	4833+50 to 4856+20	Longitudinal	Henry Miller Road	Relocate
Irrigation District	Henry Miller Reclamation District	4839+90	Transverse	n/a	Realign
Irrigation District	Henry Miller Reclamation District	4856+20	Transverse	SR 165/Mercey Springs Road	Realign
Electric OH	PG&E	4856+42	Transverse	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	PG&E	4882+50 to 4888+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4886+00	Transverse	SR 165/Mercey Springs Road	Relocate
Telecomm OH	Unknown	4886+55	Transverse	SR 165/Mercey Springs Road	Relocate
Santa Fe Canal (San Luis Irrigation Drain)	Grassland Water District	4901+50	Transverse	n/a	New
San Luis Canal	Grassland Water District	4924+50	Transverse	n/a	New
San Luis Drain No.1	Grassland Water District	4925+25	Transverse	n/a	New
Porter/Blake Bypass Canal	Grassland Water District	4926+50	Transverse	n/a	Realign
Electric OH	PG&E	4966+39	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5006+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5031+88	Transverse	n/a	Relocate
Electric OH	PG&E	5032+24	Transverse	n/a	Relocate
Electric OH	PG&E	5055+82	Transverse	n/a	Relocate
Electric OH	PG&E	5060+1	Transverse	Baker Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5063+12	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5071+84	Transverse	n/a	New
Electric & Telecomm OH on Joint Pole	PG&E	5095+00 to 5102+30	Longitudinal	Henry Miller Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	PG&E	5097+97	Transverse	Delta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5098+00	Transverse	Delta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5111+24	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5123+92	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5142+50	Transverse	Midway Road	New
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30	Transverse	n/a	Extend
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above1	Existing Roadway Crossing	Disposition
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30 to 5159+00	Longitudinal	n/a	Relocate
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5159+00 to 5164+00	Longitudinal	n/a	Relocate
Dambrosia Branch #1 Canal	Henry Miller Reclamation District	5169+15	Transverse	n/a	New
Electric OH	PG&E	5177+75	Transverse	Box Car Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5180+75	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5181+07	Transverse	n/a	New
Irrigation Canal	Henry Miller Reclamation District	5195+00 to 5221+00	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5207+80	Transverse	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	5221+15	Transverse	n/a	Relocate
Delta Canal & Seepage Drain	Henry Miller Reclamation District	5221+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5222+15	Transverse	n/a	New
East Delta Canal	Henry Miller Reclamation District	5229+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5229+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5229+50 to 5243+50	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5243+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
Storage Tank	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
County Road Ditch	Henry Miller Reclamation District	5256+50	Transverse	Turner Island Road	Relocate
Willis Branch	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Willis Branch Pump Station Facility	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Electric OH	PG&E	5257+17	Transverse	Turner Island Road	Relocate
Belmont Drain	Henry Miller Reclamation District	5261+50 to 5263+00	Longitudinal	Turner Island Road	New

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	5286+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5299+00	Transverse	n/a	New
Delta Canal No.1	Henry Miller Reclamation District	5310+00	Transverse	n/a	New
PG&E Electric OH	PG&E	5319+00 to 5335+50	Longitudinal	n/a	Relocate
Copper Cable	Verizon	5320+00 to 5335+50	Longitudinal	Henry Miller Road	Relocate
West San Juan Drain	Henry Miller Reclamation District	5321+68	Transverse	n/a	New
San Juan No.1	Henry Miller Reclamation District	5334+00	Transverse	Carlucci Road	New
Copper Cable	Verizon	5335+40	Transverse	Carlucci Road	Relocate
West San Juan Drain	Henry Miller Reclamation District	5335+50	Transverse	Carlucci Road	New
PG&E Electric OH	PG&E	5336+20	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5358+00	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	Relocate
Irrigation Canal	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	New
San Juan No.1	Henry Miller Reclamation District	5360+00	Longitudinal and Transverse	Carlucci Road	New

Source: Authority 2017
n/a = not applicable
PG&E = Pacific Gas & Electric Company
CCID = Central California Irrigation District
[1] Longitudinal is defined as a facility located parallel to and within the proposed HSR right-of-way. A transverse facility is one that passes from one side of the proposed HSR right-of-way to the other side of the right-of-way. The designation of "Above" is used for transmission towers that extend above the HSR alignment.

Table 1b Existing Major Utilities and Energy Facilities within the Public Utilities Resource Study Area under Alternative 2

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
San Jose Diridon Station Approach					
Potable Water	Santa Clara Valley Water District	2409+80	Transverse	Emory Street	Protect in Place
Fiber Optic	Level 3 Communication	2478+50 to 2481+15	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	2478+50 to 2481+15	Longitudinal	n/a	Relocate
Transmission Tower	PG&E	0052+00	n/a	n/a	Protect in Place
Electric OH	PG&E	0052+00 to 0066+00	Longitudinal and Transverse	West San Carlos Street	Relocate
Fiber Optic	Sprint/MCI	0052+91 to 0055+55	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication	0052+91 to 0057+50	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication	0057+50	Transverse	Park Avenue	Relocate
Fiber Optic	Level 3 Communication/ AboveNet	0057+50	Transverse	Park Avenue	Relocate
Fiber Optic	Level 3 Communication	0057+90	Transverse	Park Avenue	Protect in Place
AT&T Legacy Fiber Optic Cables	AT&T/ Pacific Bell	0058+50	Transverse	Park Avenue	Protect in Place
Fiber Optic	Level 3 Communication/ AboveNet/Time Warner	0058+70	Transverse	Park Avenue	Protect in Place
Sanitary	City of San Jose	0058+90	Transverse	Park Avenue	Relocate
Transmission Tower	PG&E	0059+70	n/a	Park Avenue	Relocate
Fiber Optic	Sprint/MCI	0134+00 to 0150+00	Longitudinal	n/a	Protect in Place
Monterey Corridor Subsection					
Fiber Optic	Sprint/MCI	0150+00 to 0196+00	Longitudinal	n/a	Relocate
Storm	City of San Jose	0159+00	Transverse	n/a	Protect in Place
Sanitary	City of San Jose	0172+50	Transverse	Almaden Road	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	QWEST/WTG	0189+65 to 0250+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	0196+00 to 0224+00	Longitudinal	Curtner Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	0208+20	Transverse	Curtner Avenue	Relocate
Natural Gas	PG&E	0208+90	Transverse	Curtner Avenue	Relocate
Sanitary	City of San Jose	0211+_60	Transverse	Curtner Avenue	Protect in Place
Fiber Optic	Sprint/MCI	0224+00 to 0250+00	Longitudinal	n/a	Relocate
Fiber Optic	QWEST/WTG	0250+00 to 0286+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	0250+00 to 0286+50	Longitudinal	n/a	Relocate
Electric OH	PG&E	0267+65	Transverse	n/a	Relocate
Fiber Optic	AT&T/MCI/MFN	0290+00 to 0544+10	Longitudinal	n/a	Relocate
Sanitary	City of San Jose	0291+00 to 0311+30	Longitudinal	Monterey Highway	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T	0291+00 to 0546+60	Longitudinal	Monterey Road	Relocate
Potable Water	San Jose Water Company	0298+50	Transverse	Monterey Highway	Protect in Place
Storm	City of San Jose	0298+50	Transverse	Monterey Highway	Relocate
Fiber Optic	AT&T	0298+50 to 0604+94	Longitudinal	Monterey Road	Relocate
Sanitary	City of San Jose	0298+70	Transverse	Monterey Highway	Protect in Place
Fiber Optic	Sprint/MCI	0302+00 to 0319+00	Longitudinal and Transverse	n/a	Relocate
Fiber Optic	QWEST/WTG	0302+50 to 0319+00	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communications/AT&T/AboveNet	0305+00 to 0319+00	Longitudinal	n/a	Relocate
Sanitary	City of San Jose	0311+30 to 0339+25	Longitudinal	Monterey Highway	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	0334+50	Transverse	Senter Road	Relocate
Electric OH	PG&E	0334+50 to 0345+50	Longitudinal	Monterey Highway	Relocate
Sanitary	City of San Jose	0339+25 to 0380+00	Longitudinal	Monterey Highway/ Branham Lane	Relocate
Pump Station (SS)	n/a	0342+00	n/a	Grade Separation-Monterey Road	New
Fiber Optic	Level 3 Communications/AboveNet	0361+50 to 0364+50	Longitudinal	Skyway Drive	Relocate
Fiber Optic	QWEST/WTG	0362+00 to 364+00	Longitudinal	Skyway Drive	Relocate
Fiber Optic	Sprint/MCI	0362+00 to 365+00	Longitudinal	Skyway Drive	Relocate
Pump Station (SD)	n/a	0363+00	n/a	Grade Separation-Skyway Drive	New
Potable Water	Santa Clara Valley Water District	0363+30	Transverse	Skyway Drive	Relocate
Sanitary	City of San Jose	0380+00 to 0428+25	Longitudinal	Monterey Highway	Relocate
Fiber Optic	Sprint/MCI	0388+60 to 0392+20	Longitudinal	Branham Lane	Relocate
Pump Station (SD)	n/a	0289+00	n/a	Grade Separation-Branham Lane	New
Fiber Optic	Level 3 Communications/AboveNet	0389+00 to 0391+50	Longitudinal	Branham Lane	Relocate
Fiber Optic	QWEST/WTG	0389+00 to 0392+00	Longitudinal	Branham Lane	Relocate
Pump Station (SS)	n/a	0390+50	n/a	Grade Separation-Branham Lane	New
Storm	City of San Jose	0391+20	Transverse	Branham Lane	Relocate
Storm	City of San Jose	0391+20 to 0415+00	Longitudinal	Monterey Highway	Relocate
Sanitary	City of San Jose	0393+25	Transverse	Branham Lane	Relocate
Sanitary	City of San Jose	0428+25 to 0460+00	Longitudinal	Monterey Highway	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	Level 3 Communications/AboveNet	0432+50 to 0435+50	Longitudinal	Chynoweth Avenue	Relocate
Fiber Optic	QWEST/WTG	0432+50 to 0435+60	Longitudinal	Chynoweth Avenue	Relocate
Fiber Optic	Sprint/MCI	0432+50 to 0436+00	Longitudinal	Chynoweth Avenue	Relocate
Pump Station (SD)	n/a	0433+50	n/a	Grade Separation-Chynoweth Avenue	New
Pump Station (SS)	n/a	0433+50	n/a	Grade Separation-Chynoweth Avenue	New
Electric OH	PG&E	0455+00 to 0605+00	Longitudinal	Monterey Road	Relocate
Natural Gas	PG&E	0481+20	Transverse	Ford Road	Relocate
Storm	City of San Jose	0511+10	Transverse	n/a	Protect in Place
Fiber Optic	AT&T	0542+50 to 0592+50	Longitudinal	Monterey Road	Relocate
Natural Gas	PG&E	0464+50 to 0480+20	Longitudinal	n/a	Relocate
Electric OH	Electric OH	0807+28	Transverse	n/a	Relocate
Electric OH	Electric OH	0811+30	Transverse	n/a	Relocate
Morgan Hill and Gilroy Subsection					
Electric OH	Electric OH	1015+00	Transverse	n/a	Relocate
Electric OH	Unknown	1034+30	Transverse	n/a	Relocate
Electric OH	Unknown	1039+11	Transverse	n/a	Relocate
Telecomm OH	Unknown	1080+41	Transverse	Burnett Avenue	Relocate
Pump Station (SD)	n/a	1105+00	n/a	Grade Separation-Madrone Parkway	New
Electric OH	Electric OH	987+00	Transverse	n/a	Relocate
Fiber Optic	PG&E	0605+00 to 1147+00	Longitudinal	Monterey Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	QWEST/WTG	0694+18 to 0720+00	Longitudinal	n/a	Protect in Place
Fiber Optic	Level 3 Communications/AboveNet	0694+18 to 0728+00	Longitudinal	n/a	Protect in Place
Fiber Optic	QWEST/WTG	0720+00 to 0740+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	0722+00 to 0768+00	Longitudinal	n/a	Relocate
Potable Water	Santa Clara Valley Water District	0726+00 to 0727+00	Longitudinal and Transverse	Monterey Road	Protect in Place
Fiber Optic	Level 3 Communications/AboveNet	0728+00 to 768+50	Longitudinal	n/a	Relocate
Fiber Optic	QWEST/WTG	0740+00 to 0768+00	Longitudinal	n/a	Relocate
Electric OH	PG&E	0747+20	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0747+70	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0748+15	Transverse	Monterey Road	Protect in Place
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	0752+60	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0752+90	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0753+45	Longitudinal	Monterey Road	Protect in Place
Electric OH	PG&E	0753+60	Longitudinal	Monterey Road	Protect in Place
Electric OH	PG&E	0754+05	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0754+30	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0754+80	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0755+10	Transverse	Monterey Road	Protect in Place
Fiber Optic	QWEST/WTG	0768+00 to 0784+00	Longitudinal	n/a	Protect in Place
Natural Gas	CPN Pipeline Company	0771+00	Transverse	Blanchard Road	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Natural Gas	PG&E	0807+75	Transverse	n/a	Protect in Place
Fiber Optic	Sprint/MCI	0825+00 to 0866+00	Longitudinal	n/a	Relocate
Fiber Optic	QWEST/WTG	0922+00 to 0950+00	Longitudinal	Palm Avenue	Protect in Place
Fiber Optic	Level 3 Communications/AboveNet	0937+00 to 0940+00	Longitudinal	Palm Avenue	Protect in Place
Natural Gas	PG&E	0951+50	Transverse	Coyote Creek Golf Drive	Protect in Place
Electric OH & Telecomm OH on Joint Pole	Unknown	0970+15	Transverse	Ogier Avenue	Relocate
Electric OH	PG&E	0982+30	Transverse	Barnhart Avenue	Relocate
Electric OH	PG&E	0982+50	Transverse	Barnhart Avenue	Relocate
Transmission Tower	PG&E	0982+50	n/a	Barnhart Avenue	Relocate
Electric OH	Unknown	0982+55	Transverse	Barnhart Avenue	Relocate
Electric OH	PG&E	0983+10	Transverse	Barnhart Avenue	Relocate
Electric OH	PG&E	0983+35	Transverse	Barnhart Avenue	Relocate
Transmission Tower	PG&E	0983+50	n/a	Barnhart Avenue	Relocate
Fiber Optic	QWEST/WTG	1006+00 to 1034+00	Longitudinal	Live Oak Avenue	Protect in Place
Electric OH	Unknown	1006+40	Transverse	n/a	Relocate
Fiber Optic	Sprint/MCI	1015+00 to 1017+00	Longitudinal	n/a	Protect in Place
Fiber Optic	Level 3 Communications/AboveNet	1015+00 to 1017+00	Longitudinal	Live Oak Avenue	Protect in Place
Electric OH	Unknown	1034+30	Transverse	n/a	Relocate
Storm	City of Morgan Hill	1094+80	Transverse	Peebles Avenue	Protect in Place
Fiber Optic	Level 3 Communications/AboveNet	1104+00 to 1107+00	Longitudinal	Madrone Parkway	Protect in Place
Fiber Optic	Sprint/MCI	1104+00 to 1107+00	Longitudinal	Madrone Parkway	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	QWEST/WTG	1104+00 to 1107+00	Longitudinal	Madrone Parkway	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Storm	City of Morgan Hill	1114+20	Transverse	n/a	Protect in Place
Storm	City of Morgan Hill	1154+00 to 1162+00	Longitudinal	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1172+70	Transverse	East Central Avenue	Relocate
Pump Station (SS)	n/a	1173+50	n/a	East Central Avenue	New
Pump Station (Drainage)	n/a	1182+00	n/a	Grade Separation-Main Avenue	New
Fiber Optic	QWEST/WTG	1182+00 to 1185+00	Longitudinal	Main Avenue	Relocate
Fiber Optic	Sprint/MCI	1182+00 to 1185+00	Longitudinal	Main Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1182+00 to 1185+00	Longitudinal	Main Avenue	Relocate
Pump Station (SS)	n/a	1184+00	n/a	Grade Separation-Main Avenue	New
Natural Gas	PG&E	1203+50	Transverse	Diana Avenue	Protect in Place
Drinking Water Well	City of Morgan Hill	1204+00	Longitudinal	Diana Avenue	Relocate
Fiber optic	Sprint/MCI	1207+00 to 1210+00	Longitudinal	East Dunne Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1207+00 to 1212+00	Longitudinal	East Dunne Avenue	Relocate
Fiber Optic	Verizon	1208+30	Transverse	East Dunne Avenue	Relocate
Fiber Optic	Verizon	1208+30 to 1226+00	Longitudinal	n/a	Relocate
Pump Station (SD)	n/a	1209+00	n/a	Grade Separation-East Dunne Avenue	New
Fiber Optic	Level 3 Communications/AboveNet	1224+00 to 1227+00	Longitudinal	San Pedro Avenue	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Sanitary	City of Morgan Hill	1225+00 to 1260+00	Longitudinal	Railroad Avenue/ Tennant Avenue	Relocate
Electric OH	Unknown	1225+00 to 1328+45	Longitudinal and Transverse	Railroad Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1225+80	Transverse	San Pedro Avenue	Relocate
Fiber Optic	Verizon	1226+00 to 1245+00	Longitudinal	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1364+00	Transverse	California Avenue	Relocate
Fiber Optic	Sprint/MCI	1258+00 to 1261+00	Longitudinal	Tennant Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1258+00 to 1261+00	Longitudinal	Tennant Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1328+00 to 1397+30	Longitudinal	n/a	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T	1328+50 to 1363+70	Longitudinal	Monterey Road	Relocate
Fiber Optic	QWEST/WTG	1328+50 to 1397+00	Longitudinal and Transverse	n/a	Relocate
Fiber Optic	Sprint/MCI	1328+50 to 1397+00	Longitudinal	n/a	Relocate
Fiber Optic	AT&T	1363+70	Transverse	California Avenue	Protect in Place
Fiber Optic	AT&T	1364+00	Transverse	California Avenue	Protect in Place
Pump Station (SD)	n/a	1227+00	n/a	Grade Separation- San Pedro Avenue	New
Pump Station (SD)	n/a	1259+00	n/a	Grade Separation- Tennant Avenue	New

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Pump Station (SD)	n/a	1367+50	n/a	Grade Separation-West San Martin Avenue	New
Pump Station (SS)	n/a	1259+00	n/a	Grade Separation-Tennant Avenue	New
Sanitary	City of Morgan Hill	1330+00 to 1363+60	Longitudinal	Monterey Road	Relocate
Telecomm OH	Verizon	1276+30	Transverse	Fisher Avenue	Relocate
Telecommunication Indoor Facility	Level 3 Communications/AboveNet	1406+50	n/a	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	0951+30 to 1104+00	Longitudinal and Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1328+00 to 1336+00	Longitudinal and Transverse	East Middle Avenue	Relocate
Electric OH	Unknown	1334+00 to 1395+00	Longitudinal	Monterey Road	Relocate
Fiber Optic	AT&T	1387+00 to 1389+00	Longitudinal	West San Martin Avenue	Relocate
Sanitary	City of Morgan Hill	1330+00 to 1363+60	Longitudinal and Transverse	Monterey Road/ California Avenue	Relocate
Telecomm	Verizon	1173+00 to 1182+70	Longitudinal	Main Avenue	Relocate
Telecomm	Verizon	1182+70	Transverse	Main Avenue	Relocate
Telecomm OH	Verizon	1243+00 to 1258+10	Longitudinal	Tennant Avenue	Relocate
Telecomm OH	Verizon	1260+00	Transverse	Tennant Avenue	Relocate
Telecom OH	Verizon	1260+00 to 1295+00	Longitudinal	Butterfield Boulevard	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1462+50 to 1467+00	Longitudinal	Church Avenue	Relocate
Electric OH	Unknown	1502+00 to 1529+00	Longitudinal	Monterey Highway	Relocate
Telecomm OH	Verizon	1504+00 to 1534+50	Longitudinal	Monterey Highway	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T	1504+00 to 1535+00	Longitudinal	Monterey Highway	Relocate
Electric & Telecomm OH on Joint Pole	Unknown & Verizon	1521+20 to 1526+30	Longitudinal and Transverse	1st Street	Relocate
Electric OH	Unknown	1568+50	Transverse	Buena Vista Avenue	Relocate
Electric OH	Unknown	1568+50 to 1572+00	Longitudinal	Buena Vista Avenue	Relocate
Pump Station (Drainage)	n/a	1570+00	n/a	Grade Separation-Monterey Road at Buena Vista Avenue	New
Fiber Optic	QWEST/WTG	1593+00 to 1597+00	Longitudinal	Cohansey Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1593+00 to 1597+00	Longitudinal	Cohansey Avenue	Relocate
Fiber Optic	Sprint/MCI	1593+1597+00	Longitudinal	Cohansey Avenue	Relocate
Pump Station (Drainage)	n/a	1656+50	n/a	Grade Separation-Leavesley Road	New
Pump Station (Drainage)	n/a	1659+25	n/a	Grade Separation-Casey Street	New
Storm	City of Gilroy	1671+79	Transverse	b/a	Extend
Electric & Telecomm OH on Joint Pole	Unknown	1681+00	Transverse	Loof Avenue	Relocate
Electric OH	Unknown	1693+81	Transverse	Lewis Street	Relocate
Telecomm OH	Unknown	1699+41	Transverse	Martin Street	Relocate
Potable Water	City of Gilroy	1709+24	Transverse	Old Gilroy Street	Abandon
Pump Station (Drainage)	n/a	1711+50	n/a	Grade Separation-East 7th Street	New
Electric OH	Unknown	1723+66	Transverse	East 9th Street	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Potable Water	City of Gilroy	1723+92	Transverse	East 9th Street	Relocate
Pump Station (Drainage for Track)	n/a	1776+50	n/a	US 101 Highway	New
Fiber Optic	Sprint/MCI	1781+00 to 1810+00	Longitudinal	UPRR	Relocate
Electric OH	Unknown	1802+50 to 1810+00	Longitudinal	n/a	Relocate
Electric OH	Unknown	1803+03	Transverse	n/a	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1426+00 to 1486+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	1463+00 to 1465+00	Longitudinal	n/a	Protect in Place
Fiber Optic	QWEST/WTG	1463+00 to 1465+00	Longitudinal	Church Avenue	Protect in Place
Natural Gas	PG&E	1464+10	Transverse	Church Avenue	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	Verizon	1486+00	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1498+85	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1510+10	Transverse	Masten Avenue	Relocate
Fiber Optic	Sprint/MCI	1514+00 to 1517+00	Longitudinal	Masten Avenue	Relocate
Fiber Optic	QWEST/WTG	1514+00 to 1517+00	Longitudinal	Masten Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1514+00 to 1518+00	Longitudinal	Masten Avenue	Relocate
Pump Station (Drainage)	n/a	1517+00	n/a	Grade Separation-Masten Avenue	New
Fiber Optic	Sprint/MCI	1532+00 to 1535+00	Longitudinal	Rucker Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1532+00 to 15235+00	Longitudinal	Rucker Avenue	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Pump Station (Drainage)	n/a	1533+00	n/a	Grade Separation- Rucker Avenue	New
Electric & Telecomm OH on Joint Pole	Verizon	1533+00	Transverse	Rucker Avenue	Relocate
Fiber Optic	QWEST/WTG	1533+00 to 1535+00	Longitudinal	Rucker Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1561+10	Transverse	Denio Avenue	Relocate
Telecomm OH	Verizon	1567+50	Transverse	Buena Vista Avenue	Relocate
Fiber Optic	Sprint/MCI	1568+00 to 1573+00	Longitudinal	Buena Vista Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1568+00 to 1573+00	Longitudinal	Buena Vista Avenue	Relocate
Fiber Optic	QWEST/WTG	1569+00 to 1572+00	Longitudinal	Buena Vista Avenue	Relocate
Pump Station (Drainage)	n/a	1571+00	n/a	Grade Separation- Buena Vista Avenue	New
Electric OH	PG&E	1580+70	Transverse	Day Road	Relocate
Transmission Tower	PG&E	1580+85	n/a	Day Road	Relocate
Electric OH	PG&E	1580+95	Transverse	Day Road	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1595+50	Transverse	Cohansey Avenue	Relocate
Fiber Optic	QWEST/WTG	1598+00 to 1601+00	Longitudinal	Las Animas Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1598+00 to 1601+00	Longitudinal	Las Animas Avenue	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Pump Station (SD)	n/a	1598+50	n/a	Grade Separation- Las Animas Avenue & Monterey Road	New
Fiber Optic	Sprint/MCI	1599+00 to 1601+00	Longitudinal	Las Animas Avenue	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Telecomm	Verizon	1615+00	Transverse	Las Animas Avenue	Protect in Place
Fiber Optic	Level 3 Communications/AboveNet	1654+00 to 1657+00	Longitudinal	Leavesley Road	Relocate
Potable Water	City of Gilroy	1655+00	Transverse	Leavesley Road	Protect in Place
Fiber Optic	Sprint/MCI	1655+00 to 1657+00	Longitudinal	Leavesley Road	Relocate
Sanitary	City of Gilroy	1655+70	Transverse	Leavesley Road	Relocate
Pump Station (SS)	n/a	1656+50	n/a	Grade Separation-Leavesley Road	New
Electric & Telecomm OH on Joint Pole	Verizon	1660+30	Transverse	Casey Lane	Relocate
Fiber Optic	Sprint/MCI	1680+00 to 1683+00	Longitudinal	Loof Avenue	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1680+00 to 1683+00	Longitudinal	Loof Avenue	Relocate
Pump Station (Drainage)	n/a	1681+00	n/a	Grade Separation-Loof Avenue	New
Potable Water	City of Gilroy	1681+68	Transverse	Loof Avenue	Relocate
Fiber Optic	Sprint/MCI	1692+00 to 1695+00	Longitudinal	Lewis Street	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1692+00 to 1695+00	Longitudinal	Lewis Street	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1694+00	Longitudinal and Transverse	Lewis Street/Old Gilroy Street	Protect in Place
Pump Station (SD)	n/a	1694+50	n/a	Grade Separation-Lewis Street	New
Fiber Optic	Sprint/MCI	1695+00 to 1703+00	Longitudinal	n/a	Protect in Place
Electric OH	Unknown	1699+90	Transverse	Martin Street	Relocate
Fiber Optic	Sprint/MCI	1703+00 to 1765+00	Longitudinal	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	Level 3 Communications/AboveNet	1703+50 to 1750+00	Longitudinal	East 6th Street/East 7th Street/East 9th Street/ East 10th Street	Relocate
Potable Water	City of Gilroy	1704+40	Transverse	East 6th Street	Relocate
Pump Station (SD)	n/a	1705+00	n/a	Grade Separation- East 6th Street	New
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Pump Station (SD)	n/a	1710+50	n/a	Grade Separation- Old Gilroy Street	New
Pump Station (SD)	n/a	1723+00	n/a	Grade Separation-9th Street	New
Pump Station (SD)	n/a	1729+00	n/a	Grade Separation- 10th street	New
Potable Water	City of Gilroy	1729+50	Transverse	East 10th Street	Relocate
Recycled Water	Santa Clara Valley Water District	1749+35	Transverse	n/a	Protect in Place
Fiber Optic	Level 3 Communications/AboveNet	1750+00 to 1764+00	Longitudinal	n/a	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1765+80	Transverse	Luchessa Avenue	Relocate
Potable Water	City of Gilroy	1766+30	Transverse	Luchessa Avenue	Relocate
Potable Water	City of Gilroy	1802+35	Transverse	n/a	Remove
Electric OH	PG&E	1838+60	Transverse	Carnadero Avenue	Relocate
Electric OH	PG&E	1838+75	Transverse	Carnadero Avenue	Relocate
Telecomm OH	Verizon	1890+75	Transverse	Bloomfield Avenue	Relocate
Natural Gas	PG&E	2107+75	Transverse	Lake Road	Protect in Place
Electric & Telecomm OH on Joint Pole	Unknown	2188+94	Transverse	Lovers Land	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	PG&E & Unknown	2228+14	Transverse	San Felipe Road	Relocate
Electric OH	PG&E	2372+38	Transverse	n/a	Relocate
Natural Gas	PG&E	2193+10	Transverse	n/a	Protect in Place
Potable Water	Department of Water Resources	2220+00 to 2231+00	Longitudinal	n/a	Protect in Place
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	2287+50	Transverse	n/a	Protect in Place
Electric OH	n/a	4046+79	Transverse	n/a	Relocate
Electric OH	PG&E	4251+64	Transverse	n/a	Relocate
Gas	Shell	4285+00	Transverse	Delta Mendota Canal	Abandon
Irrigation Ditch	n/a	4366+26	Transverse	Santa Nella Road/ SR-33	Relocate
Electric & Telecomm OH on Joint Pole	n/a	4366+50	Transverse	Santa Nella Road/ SR-33	Relocate
Electric OH	n/a	4372+43	Transverse	CCID Main Canal	Relocate
Irrigation Ditch	n/a	4372+52	Transverse	CCID Main Canal	Relocate
Electric OH	n/a	4372+52 to 4375+50	Longitudinal	n/a	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	3270+50 to 3305+00	Longitudinal and Transverse	n/a	Relocate
Electric OH	PG&E	3666+00	Transverse	SR-152	Protect in Place
Electric OH	PG&E	3686+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4098+83	Transverse	SR-152	Relocate
Electric OH	PG&E	4177+80	Transverse	n/a	Protect in Place
Electric OH	PG&E	4178+30	Transverse	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	4178+70	Transverse	n/a	Protect in Place
Electric OH	PG&E	4179+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+00	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4182+50	Transverse	n/a	Relocate
Pacheco Pass Subsection					
Electric OH	PG&E	4183+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4183+60	Transverse	n/a	Protect in Place
Crude Oil	Shell	4207+50	Transverse	n/a	Protect in Place
Crude Oil	ConocoPhillips	4247+25	Transverse	n/a	Protect in Place
Crude Oil	Chevron	4267+20	Transverse	n/a	Protect in Place
Irrigation Ditch	Henry Miller Reclamation District	4416+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4438+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4438+30	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4455+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4462+56	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4463+81	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation	4512+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation	4512+41	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation	4532+40	Transverse	n/a	New
Electric OH	PG&E	4568+13	Transverse	n/a	Relocate
Electric OH	PG&E	4595+34	Transverse	Ingomar Grade	Relocate
Oil	Chevron	4595+68	Transverse	Ingomar Grade	Abandon

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	PG&E	4597+20	Transverse	Ingomar Grade	Relocate
Electric OH	PG&E	4615+00 to 4642+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4622+22	Transverse	Volta Road	Relocate
Irrigation District	Henry Miller Reclamation District	4622+42	Transverse	Volta Road	New
Irrigation District	Henry Miller Reclamation District	4623+50	Transverse	Volta Road	New
Irrigation District	Henry Miller Reclamation District	4639+70	Transverse	Henry Miller Road	New
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
San Joaquin Subsection					
Irrigation District	Henry Miller Reclamation District	4645+77 to 4648+93	Longitudinal	Henry Miller Road	New
Irrigation District	Henry Miller Reclamation District	4647+50 to 4648+50	Longitudinal	Henry Miller Road	New
Irrigation District	Henry Miller Reclamation District	4657+50 to 4681+50	Longitudinal	Henry Miller Road	Relocate
Irrigation District	Henry Miller Reclamation District	4657+54	Transverse	n/a	New
Electric OH	PG&E	4657+81	Transverse	n/a	Relocate
Telecomm OH	PG&E	4660+00 to 4681+00	Longitudinal	n/a	Relocate
PG&E Electric OH	PG&E	4664+50 to 4717+00	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4671+77 to 4674+38	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4698+66	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4698+66 to 4703+00	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4739+50	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4742+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4757+30	Transverse	n/a	Relocate
Telecom OH	Unknown	4761+31	Transverse	Badger Flat Road	Relocate
Electric OH	PG&E	4761+86	Transverse	Badger Flat Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	4762+00 to 4766+30	Transverse	n/a	Relocate
Electric OH	PG&E	4780+28	Transverse	Wilson Road	Relocate
Electric & Telecomm OH on Joint Pole	PG&E	4798+51	Transverse	Johnson Road	Relocate
Irrigation District	Henry Miller Reclamation District	4815+38	Transverse	n/a	New
Irrigation District	Henry Miller Reclamation District	4818+90	Transverse	n/a	New
Irrigation District	Henry Miller Reclamation District	4833+00	Transverse	Nantes Avenue	New
Irrigation District	Henry Miller Reclamation District	4833+50	Transverse	Nantes Avenue	Realign
Irrigation District	Henry Miller Reclamation District	4833+50 to 4856+20	Longitudinal	Henry Miller Road	Relocate
Irrigation District	Henry Miller Reclamation District	4839+90	Transverse	n/a	Realign
Irrigation District	Henry Miller Reclamation District	4856+20	Transverse	SR 165/Mercey Springs Road	Realign
Electric OH	PG&E	4856+42	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	PG&E	4882+50 to 4888+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4886+00	Transverse	SR 165/Mercey Springs Road	Relocate
Telecomm OH	Unknown	4886+55	Transverse	SR 165/Mercey Springs Road	Relocate
Santa Fe Canal (San Luis Irrigation Drain)	Grassland Water District	4901+50	Transverse	n/a	New
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
San Luis Canal	Grassland Water District	4924+50	Transverse	n/a	New
San Luis Drain No.1	Grassland Water District	4925+25	Transverse	n/a	New
Porter/Blake Bypass Canal	Grassland Water District	4926+50	Transverse	n/a	Realign

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	4966+39	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5006+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5031+88	Transverse	n/a	Relocate
Electric OH	PG&E	5032+24	Transverse	n/a	Relocate
Electric OH	PG&E	5055+82	Transverse	n/a	Relocate
Electric OH	PG&E	5060+1	Transverse	Baker Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5063+12	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5071+84	Transverse	n/a	New
Electric & Telecomm OH on Joint Pole	PG&E	5095+00 to 5102+30	Longitudinal	Henry Miller Road	Relocate
Electric & Telecomm OH on Joint Pole	PG&E	5097+97	Transverse	Delta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5098+00	Transverse	Delta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5111+24	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5123+92	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5142+50	Transverse	Midway Road	New
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30	Transverse	n/a	Extend
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30 to 5159+00	Longitudinal	n/a	Relocate
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5159+00 to 5164+00	Longitudinal	n/a	Relocate
Dambrosia Branch #1 Canal	Henry Miller Reclamation District	5169+15	Transverse	n/a	New
Electric OH	PG&E	5177+75	Transverse	Box Car Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5180+75	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5181+07	Transverse	n/a	New
Irrigation Canal	Henry Miller Reclamation District	5195+00 to 5221+00	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5207+80	Transverse	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	5221+15	Transverse	n/a	Relocate
Delta Canal & Seepage Drain	Henry Miller Reclamation District	5221+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5222+15	Transverse	n/a	New
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
East Delta Canal	Henry Miller Reclamation District	5229+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5229+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5229+50 to 5243+50	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5243+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
Storage Tank	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
County Road Ditch	Henry Miller Reclamation District	5256+50	Transverse	Turner Island Road	Relocate
Willis Branch	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Willis Branch Pump Station Facility	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Electric OH	PG&E	5257+17	Transverse	Turner Island Road	Relocate
Belmont Drain	Henry Miller Reclamation District	5261+50 to 5263+00	Longitudinal	Turner Island Road	New
Irrigation Ditch	Henry Miller Reclamation District	5286+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5299+00	Transverse	n/a	New
Delta Canal No.1	Henry Miller Reclamation District	5310+00	Transverse	n/a	New
PG&E Electric OH	PG&E	5319+00 to 5335+50	Longitudinal	n/a	Relocate
Copper Cable	Verizon	5320+00 to 5335+50	Longitudinal	Henry Miller Road	Relocate
West San Juan Drain	Henry Miller Reclamation District	5321+68	Transverse	n/a	New
San Juan No.1	Henry Miller Reclamation District	5334+00	Transverse	Carlucci Road	New
Copper Cable	Verizon	5335+40	Transverse	Carlucci Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
West San Juan Drain	Henry Miller Reclamation District	5335+50	Transverse	Carlucci Road	New
PG&E Electric OH	PG&E	5336+20	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5358+00	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	Relocate
Irrigation Canal	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	New
San Juan No.1	Henry Miller Reclamation District	5360+00	Longitudinal and Transverse	Carlucci Road	New

Source: Authority 2017
n/a = not applicable
PG&E = Pacific Gas & Electric Company
CCID = Central California Irrigation District
[1] Longitudinal is defined as a facility located parallel to and within the proposed HSR right-of-way. A transverse facility is one that passes from one side of the proposed HSR right-of-way to the other side of the right-of-way. The designation of "Above" is used for transmission towers that extend above the HSR alignment.

Table 1c Existing Major Utilities and Energy Facilities within the Public Utilities Resource Study Area under Alternative 3

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
San Jose Diridon Station Approach					
Potable Water	Santa Clara Valley Water District	2409+80	Transverse	Emory Street	Protect in Place
Fiber Optic	Level 3 Communication	2478+50 to 2481+15	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	2478+50 to 2481+15	Longitudinal	n/a	Relocate
Transmission Tower	PG&E	0052+00	n/a	n/a	Protect in Place
Electric OH	PG&E	0052+00 to 0066+00	Longitudinal and Transverse	West San Carlos Street	Relocate
Fiber Optic	Sprint/MCI	0052+91 to 0055+55	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication	0052+91 to 0057+50	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication	0057+50	Transverse	Park Avenue	Relocate
Fiber Optic	Level 3 Communication/ AboveNet	0057+50	Transverse	Park Avenue	Relocate
Fiber Optic	Level 3 Communication	0057+90	Transverse	Park Avenue	Protect in Place
AT&T Legacy Fiber Optic Cables	AT&T/ Pacific Bell	0058+50	Transverse	Park Avenue	Protect in Place
Fiber Optic	Level 3 Communication/ AboveNet/Time Warner	0058+70	Transverse	Park Avenue	Protect in Place
Sanitary	City of San Jose	0058+90	Transverse	Park Avenue	Relocate
Transmission Tower	PG&E	0059+70	n/a	Park Avenue	Relocate
Fiber Optic	Sprint/MCI	0134+00 to 0150+00	Longitudinal	n/a	Protect in Place
Monterey Corridor Subsection					
Fiber Optic	Sprint/MCI	0150+00 to 0196+00	Longitudinal	n/a	Relocate
Storm	City of San Jose	0159+00	Transverse	n/a	Protect in Place
Sanitary	City of San Jose	0172+50	Transverse	Almaden Road	Protect in Place
Fiber Optic	QWEST/WTG	0189+65 to 0250+00	Longitudinal	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	Sprint/MCI	0196+00 to 0224+00	Longitudinal	Curtner Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	0208+20	Transverse	Curtner Avenue	Relocate
Natural Gas	PG&E	0208+90	Transverse	Curtner Avenue	Relocate
Sanitary	City of San Jose	0211+_60	Transverse	Curtner Avenue	Protect in Place
Fiber Optic	Sprint/MCI	0224+00 to 0250+00	Longitudinal	n/a	Relocate
Fiber Optic	Sprint/MCI	0250+00 to 0285+00	Longitudinal	n/a	Relocate
Fiber Optic	QWEST/WTG	0250+00 to 0285+00	Longitudinal	n/a	Relocate
Electric OH	PG&E	0266+50	Transverse	n/a	Relocate
Storm	City of San Jose	0297+60	Transverse	Monterey Highway	Relocate
Sanitary	City of San Jose	0297+80	Transverse	Monterey Highway	Protect in Place
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Potable Water	San Jose Water Company	0298+00	Transverse	Monterey Highway	Protect in Place
Sanitary	City of San Jose	0299+00 to 0458+75	Longitudinal	Monterey Highway	Relocate
Fiber Optic	Sprint/MCI	0301+00 to 0313+00	Longitudinal	n/a	Relocate
Fiber Optic	QWEST/WTG	0301+00 to 0313+00	Longitudinal	n/a	Relocate
Fiber Optic	Level 3 Communication/ AT&T/ AboveNet	0301+00 to 0321+00	Longitudinal and Transverse	n/a	Relocate
Fiber Optic	AT&T/MCI/MFN	0301+00 to 0321+50	Longitudinal	n/a	Relocate
Fiber Optic	AT&T	0302+00 to 0321+00	Longitudinal	Monterey Highway	Relocate
Fiber Optic	AT&T	0303+00 to 0321+00	Longitudinal	n/a	Relocate
Electric OH	PG&E	0334+00	Transverse	Senter Road	Relocate
Potable Water	Santa Clara Valley Water District	0363+30	Transverse	Skyway Drive	Protect in Place
Storm	City of San Jose	0390+30	Transverse	Branham Lane	Relocate
Sanitary	City of San Jose	0392+15	Transverse	Branham Lane	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T	0450+00 to 0510+00	Longitudinal	Monterey Road	Relocate
Natural Gas	PG&E	0480+00	Transverse	Ford Road	Protect in Place
Fiber Optic	AT&T	0510+00 to 0603+93	Longitudinal	Monterey Road	Relocate
Storm	City of San Jose	0510+10	Transverse	n/a	Relocate
Telecomm OH	Unknown	0642+65 to 0705+30	Longitudinal	Monterey Road	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	0645+54	Transverse	Metcalf Road	Relocate
Electric OH	PG&E	0717+33	Transverse	n/a	Relocate
Morgan Hill and Gilroy Subsection					
Electric & Telecomm OH on Joint Pole	Unknown	1308+66	Transverse	Roosevelt Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Unknown	1322+56	Transverse	Roosevelt Avenue	Relocate
Potable Water	Santa Clara Valley Water District	0636+85 to 0645 +00	Longitudinal and Transverse	Metcalf Road	Protect in Place
Electric OH	PG&E	0657+00	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0657+50	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0658+00	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0663+00	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0663+30	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0663+85	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0664+00	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0664+45	Transverse	Monterey Road	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	0664+70	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0665+20	Transverse	Monterey Road	Relocate
Electric OH	PG&E	0665+ 45	Transverse	Monterey Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Natural Gas	CPN Pipeline Company	0682+70	Transverse	Blanchard Road	Relocate
Fiber Optic	QWEST/WTG	0700+00 to 0728+00	Longitudinal	n/a	Relocate
Natural Gas	PG&E	0717+85	Transverse	n/a	Protect in Place
Electric & Telecomm OH on Joint Pole	Verizon	0861+45 to 0896+00	Longitudinal and Transverse	Monterey Road	Relocate
Natural Gas	PG&E	0861+50	Transverse	n/a	Protect in Place
Electric & Telecomm OH on Joint Pole	Unknown	0880+15	Transverse	Ogier Avenue	Relocate
Electric OH	PG&E	0892+60	Transverse	Barnhart Avenue	Protect in Place
Electric OH	PG&E	0892+75	Transverse	Barnhart Avenue	Protect in Place
Electric OH	Unknown	0892+80	Transverse	Barnhart Avenue	Relocate
Electric OH	PG&E	0893+35	Transverse	Barnhart Avenue	Protect in Place
Electric OH	PG&E	0893+60	Transverse	Barnhart Avenue	Protect in Place
Electric or Telecomm OH	Unknown	0918+00	Transverse	n/a	Relocate
Electric or Telecomm OH	Unknown	0945+20	Transverse	n/a	Relocate
Electric or Telecomm OH	Unknown	0950+70	Transverse	n/a	Relocate
Telecomm	Verizon	0997+90	Transverse	Burnett Avenue	Relocate
Telecomm	Verizon	1016+20	Transverse	Peebles Avenue	Protect in Place
Natural Gas	PG&E	1043+10	Transverse	Cochrane Road	Protect in Place
Telecomm	Verizon	1044+35	Transverse	Cochrane Road	Protect in Place
Telecomm	Verizon	1078+70	Transverse	Half/Laurel Road	Protect in Place
Electric OH	Unknown	1098+00	Transverse	East Main Avenue	Relocate
Telecomm	Verizon	1098+75	Transverse	East Main Avenue	Relocate
Natural Gas	PG&E	1119+50	Transverse	Diana Avenue	Protect in Place
Telecomm	Verizon	1119+60	Transverse	Diana Avenue	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	Unknown	1120+00	Transverse	Diana Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1156+00	Transverse	San Pedro Avenue	Relocate
Electric OH	Unknown	1172+15	Transverse	Barrett Avenue	Relocate
Potable Water	City of Morgan Hill	1172+45	Transverse	Barrett Avenue	Protect in Place
Potable Water	City of Morgan Hill	1188+70	Transverse	Tennant Avenue	Protect in Place
Electric & Telecomm OH on Joint Pole	Unknown	1223+25	Transverse	Maple Avenue	Relocate
Electric OH	Unknown	1256+30	Transverse	Middle Avenue	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	QWEST/WTG	1290+00 to 1344+00	Longitudinal	n/a	Relocate
Telecommunication Indoor Facility	Level 3 Communication/ AboveNet	1334+00	n/a	n/a	Relocate
Electric OH	n/a	1464+18	Transverse	Lake Road	Relocate
Electric OH	n/a	1486+71	Transverse	n/a	Relocate
Electric OH	n/a	1525+52	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	n/a	1603+65	Transverse	Cohansey Avenue	Relocate
Electric & Telecomm OH on Joint Pole	n/a	1622+06	Transverse	Las Animas Avenue	Relocate
Electric & Telecomm OH on Joint Pole	n/a	1661+00	Transverse	Leavesley Road	Relocate
Electric OH	n/a	1681+00	Transverse	n/a	Relocate
Electric & Fiber Optic OH on Joint Pole	n/a	1710+61	Transverse	Gilman Road	Relocate
Electric & Telecomm OH on Joint Pole	n/a	1742+50	Transverse	Holsclaw Road	Relocate
Electric OH	n/a	1751+65	Transverse	n/a	Remove
Electric OH	n/a	1783+00	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	n/a	1796+00 to 1808+00	Longitudinal	Frazier Lake Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric & Telecomm OH on Joint Pole	n/a	1798+00	Transverse	SR 152	Relocate
Gas	PG&E	1804+50 to 1814+00	Longitudinal	Frazier Lake Road	Abandon
Electric OH	n/a	1824+32	Transverse	n/a	Relocate
Fiber Optic	Level 3 Communications/AboveNet	1426+00 to 1446+00	Longitudinal	n/a	Relocate
Natural Gas	PG&E	1464+10	Transverse	Church Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1500+30	Transverse	Lena Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1537+50	Transverse	Rucker Avenue	Relocate
Electric & Telecomm OH on Joint Pole	Verizon	1569+80	Transverse	Denio Avenue	Relocate
Electric OH	PG&E	1570+00	Transverse	Denio Avenue	Relocate
Electric &Telecomm OH on Joint Pole	Verizon/PG&E	1577+85	Transverse	Buena Vista Avenue	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Potable Water	Department of Water Resources	1795+00	Longitudinal	SR 152 Roadway	Protect in Place
Electric OH	n/a	1951+33	Transverse	n/a	Relocate
Electric OH	n/a	2023+05	Transverse	Lake Road	Relocate
Electric OH	n/a	2027+00	Transverse	Lake Road	Relocate
Natural Gas	PG&E	1897+70	Transverse	Bloomfield Avenue	Relocate
Natural Gas	PG&E	2028+00	Transverse	Lake Road	Protect in Place
Natural Gas	PG&E	2122+00	Transverse	n/a	Protect in Place
Potable Water	Department of Water Resources	2137+00 to 2156+00	Longitudinal	n/a	Protect in Place
Potable Water	Department of Water Resources	2156+00 to 2165+00	Longitudinal	San Felipe Road	Protect in Place
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	2287+50	Transverse	n/a	Protect in Place
Electric OH	n/a	4046+79	Transverse	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	4251+64	Transverse	n/a	Relocate
Gas	Shell	4285+00	Transverse	Delta Mendota Canal	Abandon
Irrigation Ditch	n/a	4366+26	Transverse	Santa Nella Road/ SR-33	Relocate
Electric & Telecomm OH on Joint Pole	n/a	4366+50	Transverse	Santa Nella Road/ SR-33	Relocate
Electric OH	n/a	4372+43	Transverse	CCID Main Canal	Relocate
Irrigation Ditch	n/a	4372+52	Transverse	CCID Main Canal	Relocate
Electric OH	n/a	4372+52 to 4375+50	Longitudinal	n/a	Relocate
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	3270+50 to 3305+00	Longitudinal and Transverse	n/a	Relocate
Electric OH	PG&E	3666+00	Transverse	SR-152	Protect in Place
Electric OH	PG&E	3686+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4098+83	Transverse	SR-152	Relocate
Electric OH	PG&E	4177+80	Transverse	n/a	Protect in Place
Electric OH	PG&E	4178+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4178+70	Transverse	n/a	Protect in Place
Electric OH	PG&E	4179+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+00	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4182+50	Transverse	n/a	Relocate
Electric OH	PG&E	4183+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4183+60	Transverse	n/a	Protect in Place
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Crude Oil	Shell	4207+50	Transverse	n/a	Protect in Place
Crude Oil	ConocoPhillips	4247+25	Transverse	n/a	Protect in Place
Pacheco Pass Subsection					
Crude Oil	Chevron	4267+20	Transverse	n/a	Protect in Place
Irrigation Ditch	Henry Miller Reclamation District	4416+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4438+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4438+30	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4455+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4462+56	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4463+81	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation	4512+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation	4512+41	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation	4532+40	Transverse	n/a	New
Electric OH	PG&E	4568+13	Transverse	n/a	Relocate
Electric OH	PG&E	4595+34	Transverse	Ingomar Grade	Relocate
Oil	Chevron	4595+68	Transverse	Ingomar Grade	Abandon
Electric & Telecomm OH on Joint Pole	PG&E	4597+20	Transverse	Ingomar Grade	Relocate
Electric OH	PG&E	4615+00 to 4642+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4622+22	Transverse	Volta Road	Relocate
Irrigation District	Henry Miller Reclamation District	4622+42	Transverse	Volta Road	New
Irrigation District	Henry Miller Reclamation District	4623+50	Transverse	Volta Road	New
Irrigation District	Henry Miller Reclamation District	4639+70	Transverse	Henry Miller Road	New
Irrigation District	Henry Miller Reclamation District	4645+77 to 4648+93	Longitudinal	Henry Miller Road	New
Irrigation District	Henry Miller Reclamation District	4647+50 to 4648+50	Longitudinal	Henry Miller Road	New

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation District	Henry Miller Reclamation District	4657+50 to 4681+50	Longitudinal	Henry Miller Road	Relocate
Irrigation District	Henry Miller Reclamation District	4657+54	Transverse	n/a	New
San Joaquin Subsection					
Electric OH	PG&E	4657+81	Transverse	n/a	Relocate
Telecomm OH	PG&E	4660+00 to 4681+00	Longitudinal	n/a	Relocate
PG&E Electric OH	PG&E	4664+50 to 4717+00	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4671+77 to 4674+38	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4698+66	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4698+66 to 4703+00	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4739+50	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4742+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4757+30	Transverse	n/a	Relocate
Telecom OH	Unknown	4761+31	Transverse	Badger Flat Road	Relocate
Electric OH	PG&E	4761+86	Transverse	Badger Flat Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4762+00 to 4766+30	Transverse	n/a	Relocate
Electric OH	PG&E	4780+28	Transverse	Wilson Road	Relocate
Electric & Telecomm OH on Joint Pole	PG&E	4798+51	Transverse	Johnson Road	Relocate
Irrigation District	Henry Miller Reclamation District	4815+38	Transverse	n/a	New
Irrigation District	Henry Miller Reclamation District	4818+90	Transverse	n/a	New
Irrigation District	Henry Miller Reclamation District	4833+00	Transverse	Nantes Avenue	New
Irrigation District	Henry Miller Reclamation District	4833+50	Transverse	Nantes Avenue	Realign
Irrigation District	Henry Miller Reclamation District	4833+50 to 4856+20	Longitudinal	Henry Miller Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation District	Henry Miller Reclamation District	4839+90	Transverse	n/a	Realign
Irrigation District	Henry Miller Reclamation District	4856+20	Transverse	SR 165/Mercey Springs Road	Realign
Electric OH	PG&E	4856+42	Transverse	n/a	Relocate
Electric & Telecomm OH on Joint Pole	PG&E	4882+50 to 4888+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4886+00	Transverse	SR 165/Mercey Springs Road	Relocate
Telecomm OH	Unknown	4886+55	Transverse	SR 165/Mercey Springs Road	Relocate
Santa Fe Canal (San Luis Irrigation Drain)	Grassland Water District	4901+50	Transverse	n/a	New
San Luis Canal	Grassland Water District	4924+50	Transverse	n/a	New
San Luis Drain No.1	Grassland Water District	4925+25	Transverse	n/a	New
Porter/Blake Bypass Canal	Grassland Water District	4926+50	Transverse	n/a	Realign
Electric OH	PG&E	4966+39	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5006+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5031+88	Transverse	n/a	Relocate
Electric OH	PG&E	5032+24	Transverse	n/a	Relocate
Electric OH	PG&E	5055+82	Transverse	n/a	Relocate
Electric OH	PG&E	5060+1	Transverse	Baker Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5063+12	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5071+84	Transverse	n/a	New
Electric & Telecomm OH on Joint Pole	PG&E	5095+00 to 5102+30	Longitudinal	Henry Miller Road	Relocate
Electric & Telecomm OH on Joint Pole	PG&E	5097+97	Transverse	Delta Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	5098+00	Transverse	Delta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5111+24	Transverse	n/a	New
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	5123+92	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5142+50	Transverse	Midway Road	New
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30	Transverse	n/a	Extend
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30 to 5159+00	Longitudinal	n/a	Relocate
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5159+00 to 5164+00	Longitudinal	n/a	Relocate
Dambrosia Branch #1 Canal	Henry Miller Reclamation District	5169+15	Transverse	n/a	New
Electric OH	PG&E	5177+75	Transverse	Box Car Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5180+75	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5181+07	Transverse	n/a	New
Irrigation Canal	Henry Miller Reclamation District	5195+00 to 5221+00	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5207+80	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5221+15	Transverse	n/a	Relocate
Delta Canal & Seepage Drain	Henry Miller Reclamation District	5221+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5222+15	Transverse	n/a	New
East Delta Canal	Henry Miller Reclamation District	5229+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5229+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5229+50 to 5243+50	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5243+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Storage Tank	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
County Road Ditch	Henry Miller Reclamation District	5256+50	Transverse	Turner Island Road	Relocate
Willis Branch	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Willis Branch Pump Station Facility	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Electric OH	PG&E	5257+17	Transverse	Turner Island Road	Relocate
Belmont Drain	Henry Miller Reclamation District	5261+50 to 5263+00	Longitudinal	Turner Island Road	New
Irrigation Ditch	Henry Miller Reclamation District	5286+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5299+00	Transverse	n/a	New
Delta Canal No.1	Henry Miller Reclamation District	5310+00	Transverse	n/a	New
PG&E Electric OH	PG&E	5319+00 to 5335+50	Longitudinal	n/a	Relocate
Copper Cable	Verizon	5320+00 to 5335+50	Longitudinal	Henry Miller Road	Relocate
West San Juan Drain	Henry Miller Reclamation District	5321+68	Transverse	n/a	New
San Juan No.1	Henry Miller Reclamation District	5334+00	Transverse	Carlucci Road	New
Copper Cable	Verizon	5335+40	Transverse	Carlucci Road	Relocate
West San Juan Drain	Henry Miller Reclamation District	5335+50	Transverse	Carlucci Road	New
PG&E Electric OH	PG&E	5336+20	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5358+00	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	Relocate
Irrigation Canal	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	New
San Juan No.1	Henry Miller Reclamation District	5360+00	Longitudinal and Transverse	Carlucci Road	New

Source: Authority 2017
n/a = not applicable
PG&E = Pacific Gas & Electric Company
CCID = Central California Irrigation District
[1] Longitudinal is defined as a facility located parallel to and within the proposed HSR right-of-way. A transverse facility is one that passes from one side of the proposed HSR right-of-way to the other side of the right-of-way. The designation of "Above" is used for transmission towers that extend above the HSR alignment.

Table 1d Existing Major Utilities and Energy Facilities within the Public Utilities Resource Study Area under Alternative 4

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
San Jose Diridon Station Approach					
Electric OH	PG&E	2873+82	Transverse	Scott Boulevard	Protect in Place
Electric OH	PG&E	2873+91 to 2885+34	Longitudinal	n/a	Protect in Place
Electric OH	PG&E	2887+57	Transverse	n/a	Protect in Place
Sanitary Sewer	Unknown	2887+74	Transverse	n/a	Protect in Place
Potable Water	Unknown	2898+85	Transverse	Main Street	Protect in Place
Storm Drain	Unknown	2900+21	Transverse	Main Street	Protect in Place
Electric OH	PG&E	2912+63	Transverse	Main Street	Protect in Place
Storm Drain	Unknown	2912+78	Transverse	Main Street	Protect in Place
Storm Drain	Unknown	2913+46	Transverse	Main Street	Protect in Place
Storm Drain	Unknown	2918+00	Transverse	n/a	Protect in Place
Sanitary Sewer	Unknown	2926+24	Transverse	Grant Street	Protect in Place
Recycled Water	Unknown	2926+29	Transverse	Grant Street	Protect in Place
Fiber Optic	Unknown	2925+33	Transverse	Grant Street	Protect in Place
Sanitary Sewer	Unknown	2930+76	Transverse	De La Cruz Boulevard	Protect in Place
Storm Drain	Unknown	2930+81	Transverse	De La Cruz Boulevard	Protect in Place
Storm Drain	Unknown	2931+08	Transverse	De La Cruz Boulevard	Protect in Place
Potable Water	Unknown	2932+03	Transverse	n/a	Protect in Place
Electric OH	Unknown	2932+26	Transverse	n/a	Protect in Place
Electric OH	Unknown	2932+48	Transverse	n/a	Protect in Place
Electric OH	PG&E	2934+70	Transverse	n/a	Protect in Place
Electric UG	PG&E	2934+78	Transverse	n/a	Protect in Place
Fiber Optic	Unknown	2934+95	Transverse	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric UG	Unknown	2945+74	Transverse	Brokaw Road/ Benton Street	Protect in Place
Fiber Optic	Unknown	2988+57 to 3034+00	Longitudinal	n/a	Protect in Place
Electric OH	Unknown	2992+98	Transverse	Newhall Street	Protect in Place
Potable Water	Unknown	2993+16	Transverse	Newhall Street	Protect in Place
Sanitary Sewer	Unknown	2996+56	Transverse	n/a	Protect in Place
Sanitary Sewer	Unknown	2997+61	Transverse	n/a	Protect in Place
Storm Drain	Unknown	2997+64	Transverse	n/a	Protect in Place
Sanitary Sewer	City of San Jose	3007+28	Transverse	McKendrie Street	Protect in Place
Storm Drain	City of San Jose	3007+40	Transverse	McKendrie Street	Protect in Place
Electric OH	Unknown	3007+49	Transverse	n/a	Protect in Place
Storm Drain	Unknown	3011+95	Transverse	West Hedding Street	Protect in Place
Potable Water	Unknown	3011+97	Transverse	West Hedding Street	Protect in Place
Sanitary Sewer	Unknown	3012+08	Transverse	West Hedding Street	Protect in Place
Fiber Optic	Unknown	3017+00 to 3021+50	Longitudinal and Transverse	Stockton Avenue/ College Park Station	Relocate
Fiber Optic	Unknown	3018+13	Transverse	Stockton Avenue/ College Park Station	Protect in Place
Electric OH	PG&E	3018+36	Transverse	Stockton Ave/College Park Station	Protect in Place
Electric OH & Telecomm OH on Joint Pole	PG&E & Unknown	3018+48	Transverse	Stockton Avenue/ College Park Station	Protect in Place
Fiber Optic	Unknown	3019+00 to 3022+00	Longitudinal	Stockton Avenue/College Park Station	Relocate
Fiber Optic	Unknown	3019+33	Transverse	Stockton Avenue/College Park Station	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Potable Water	Santa Clara Valley Water District	3022+23	Transverse	Emory Street	Protect in Place
Potable Water	Cal Water	3022+32	Transverse	Emory Street	Protect in Place
Gas	PG&E	3022+38	Transverse	Emory Street	Protect in Place
Gas	PG&E	3022+55	Transverse	Emory Street	Protect in Place
Electric OH & Telecomm OH on Joint Pole	PG&E and Unknown	3022+63	Transverse	Emory Street	Protect in Place
Electric OH	PG&E	3030+30 to 3033+00	Longitudinal	West Taylor Street	Relocate
Fiber Optic	Unknown	3031+00 to 3042+00	Longitudinal	n/a	Relocate
Storm Drain	City of San Jose	3032+29	Transverse	West Taylor Street	Relocate
Storm Drain	City of San Jose	3032+39	Transverse	West Taylor Street	Relocate
Storm Drain Pump Station	City of San Jose	3032+39	Transverse	West Taylor Street	Relocate
Electric OH	City of San Jose	3032+47	Transverse	West Taylor Street	Protect in Place
Storm Drain	City of San Jose	3032+53	Transverse	West Taylor Street	Relocate
Electric OH	City of San Jose	3032+58	Transverse	West Taylor Street	Protect in Place
Electric OH	PG&E	3032+73	Transverse	West Taylor Street	Relocate
Electric OH	PG&E	3030+50 to 3036+40	Longitudinal	West Taylor Street	Relocate
Transmission Pole	PG&E	3033+00	Transverse	West Taylor Street	Relocate
Electric OH	PG&E	3033+00	Transverse	West Taylor Street	Relocate
Electric OH	PG&E	3033+00 to 3036+40	Longitudinal	West Taylor Street	Relocate
Fiber Optic	Unknown	3034+29	Transverse	n/a	Protect in Place
Sanitary Sewer	City of San Jose	3044+43	Transverse	n/a	Protect in Place
Potable Water	City of San Jose	3046+37	Transverse	n/a	Protect in Place
Potable Water	City of San Jose	3046+45	Transverse	n/a	Protect in Place
Storm Drain	City of San Jose	3046+53	Transverse	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Sanitary Sewer	City of San Jose	3046+61	Transverse	n/a	Protect in Place
Gas	Unknown	3046+69	Transverse	n/a	Protect in Place
Potable Water	City of San Jose	3046+80	Transverse	n/a	Protect in Place
Oil	Unknown	3046+90	Transverse	n/a	Protect in Place
Telecomm UG	Unknown	3046+90	Transverse	n/a	Protect in Place
Oil	Unknown	3046+91	Transverse	n/a	Protect in Place
Electric UG	Unknown	3047+24	Transverse	n/a	Protect in Place
Electric UG	Unknown	3047+38	Transverse	n/a	Protect in Place
Telecomm UG	Unknown	3047+55	Transverse	n/a	Protect in Place
Telecomm UG	Unknown	3047+70	Transverse	n/a	Protect in Place
Electric UG	Unknown	3049+80	Transverse	n/a	Protect in Place
Fiber Optic	Unknown	3050+50 to 3053+50	Longitudinal	Lenzen Avenue	Relocate
Electric UG	Unknown	3050+50 to 3053+50	Longitudinal	Lenzen Avenue	Relocate
Electric OH	Unknown	3050+75	Transverse	Lenzen Avenue	Protect in Place
Electric UG	Unknown	3050+77	Transverse	Lenzen Avenue	Protect in Place
Telecomm UG	Unknown	3050+80	Transverse	Lenzen Avenue	Protect in Place
Gas	Unknown	3050+82	Transverse	Lenzen Avenue	Protect in Place
Potable Water	City of San Jose	3051+18	Transverse	Lenzen Avenue	Protect in Place
Gas	PG&E	3057+33	Transverse	Cinnabar	Protect in Place
Fiber Optic	Unknown	3057+40	Transverse	Cinnabar Street	Protect in place
Electric UG	PG&E	3057+41	Transverse	Cinnabar Street	Protect in Place
Potable Water	City of San Jose	3057+50	Transverse	Cinnabar Street	Protect in Place
Gas	PG&E	3057+53	Transverse	Cinnabar Street	Protect in Place
Storm Drain	City of San Jose	3057+60	Transverse	Cinnabar Street	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Sanitary Sewer	City of San Jose	3057+65	Transverse	Cinnabar Street	Protect in Place
Fiber Optic	Unknown	3065+66 to 3124+00	Longitudinal	n/a	Relocate
Fiber Optic	Unknown	3065+73	Transverse	West Julian Street	Protect in Place
Sanitary Sewer	City of San Jose	3065+81	Transverse	West Julian Street	Protect in Place
Storm Drain	City of San Jose	3065+89	Transverse	West Julian Street	Protect in Place
Potable Water	Unknown	3066+12	Transverse	West Julian Street	Protect in Place
Fiber Optic	Unknown	3066+16	Transverse	West Julian Street	Protect in Place
Electric UG	PG&E	3066+17	Transverse	West Julian Street	Protect in Place
Fiber Optic	Level 3 Communication	3066+17 to 3096+91	Longitudinal	Park Road	Relocate
Electric OH & Telecomm OH on Joint Pole	PG&E & Unknown	3066+23	Transverse	West Julian Street	Protect in Place
Sanitary Sewer	City of San Jose	3066+50	Transverse	West Julian Street	Protect in Place
Potable Water	Unknown	3077+19	Transverse	West Santa Clara Street	Protect in Place
Storm Drain	City of San Jose	3077+25	Transverse	West Santa Clara Street	Protect in Place
Sanitary Sewer	City of San Jose	3077+63	Transverse	West Santa Clara Street	Protect in Place
Fiber Optic	Unknown	3077+67	Transverse	West Santa Clara Street	Protect in Place
Storm Drain	City of San Jose	3077+70	Transverse	West Santa Clara Street	Protect in Place
Fiber Optic	Level 3 Communication	3096+80 to 3108+66	Longitudinal	Park Road	Protect in Place
Fiber Optic	Level 3 Communication/ AboveNet	3096+86	Transverse	Park Road	Protect in Place
Fiber Optic	Level 3 Communication	3097+28	Transverse	Park Road	Protect in Place
Fiber Optic	AT&T	3097+92	Transverse	Park Road	Protect in Place
Fiber Optic	Level 3 Communication/ AboveNet/Time Warner	3097+92	Transverse	Park Road	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Storm Drain	City of San Jose	3098+59	Transverse	Park Road	Protect in Place
Sanitary Sewer	City of San Jose	3098+73	Transverse	Park Road	Protect in Place
Electric OH	PG&E	3108+74	Transverse	West San Carlos Street	Protect in Place
Electric OH & Telecomm OH on Joint Pole	PG&E	3114+23	Transverse	Auzerais Avenue	Relocate
Electric OH	PG&E	3122+37	Transverse	West Virginia Street	Relocate
Storm Drain	City of San Jose	3129+50 to 3130+50	Longitudinal	Bird Avenue	Protect in Place
Electric OH & Telecomm OH on Joint Pole	Unknown	3143+86	Transverse	Delmas Avenue	Relocate
Storm Drain Pump Station	City of San Jose	3144+42	Transverse	Delmas Avenue	Relocate
Storm Drain Pump Station	City of San Jose	3146+17	Transverse	Willow Street	Relocate
Storm Drain Pump Station	City of San Jose	3164+17	Transverse	Willow Street	Relocate
Storm Drain	City of San Jose	3187+92	Transverse	West Alma Avenue	Relocate
Storm Drain Pump Station	City of San Jose	3187+92	Transverse	West Alma Avenue	Relocate
Monterey Corridor					
Storm Drain	City of San Jose	3197+98	Transverse	n/a	Protect in Place
Sanitary Sewer	City of San Jose	3209+97	Transverse	Almaden Road	Relocate
Storm Drain Pump Station	City of San Jose	3210+00	Transverse	Almaden Road	Relocate
Storm Drain	City of San Jose	3211+00	Transverse	Almaden Road	Relocate
Electric OH & Telecomm OH on Joint Pole	Unknown	3246+64	Transverse	Curtner Avenue	Relocate
Natural Gas	PG&E	3247+40	Transverse	Curtner Avenue	Protect in Place
Sanitary Sewer	City of San Jose	3250+26	Transverse	Curtner Avenue	Protect in Place
Electric OH	PG&E	3305+84	Transverse	n/a	Relocate
Fiber Optic	Level 3 Communication/ AT&T/AboveNet	All	Longitudinal	Monterey Road/ Highway	Relocate
Fiber Optic	QWEST/WTG	All	Longitudinal	Monterey Road/ Highway	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T	All	Longitudinal	Monterey Road/ Highway	Relocate
Fiber Optic	AT&T/MCI/MFN	All	Longitudinal	Monterey Road/Highway	Relocate
Fiber Optic	AT&T	All	Longitudinal	Monterey Road/Highway	Relocate
Fiber Optic	Level 3 Communication/ AboveNet	All	Longitudinal	Monterey Road/Highway	Relocate
Fiber Optic	Sprint/MCI	All	Longitudinal	Monterey Road/Highway	Relocate
Storm Drain	City of San Jose	0337+31	Transverse	Monterey Road	Extend Casing as Needed
Sanitary Sewer	City of San Jose	0337+41	Transverse	Monterey Road	Extend Casing as Needed
Potable Water	San Jose Water Company	0337+67	Transverse	Monterey Road	Extend Casing as Needed
Electric OH	PG&E	0384+43	Transverse	n/a	Relocate
Potable Water	Santa Clara Valley Water District	0401+88	Transverse	Skyway Drive	Protect in Place
Storm Drain	City of San Jose	0429+83	Transverse	Branham Lane	Protect in Place
Sanitary Sewer	City of San Jose	0432+50	Transverse	Branham Lane	Protect in Place
Electric OH	PG&E	0494+72	Transverse	Hayes Avenue	Relocate
Sanitary Sewer	City of San Jose	0497+58	Transverse	Endicott Boulevard	Protect in Place
Electric OH	PG&E	0549+92	Transverse	Flintwell Way	Relocate
Electric OH	PG&E	0550+04	Transverse	Flintwell Way	Relocate
Storm Drain	City of San Jose	0550+26	Transverse	Flintwell Way	Protect in Place
Electric OH	PG&E	0574+19	Transverse	n/a	Relocate
Fiber Optic	Level 3 Communications/ AboveNet	0575+32	Transverse	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T/MCI/MFN	0582+86	Transverse	n/a	Protect in Place
Fiber Optic	AT&T	0583+19	Transverse	n/a	Protect in Place
Morgan Hill to Gilroy					
Potable Water	Santa Clara Valley Water District	0676+62	Transverse	Metcalf Road	Protect in Place
Electric OH	PG&E	0696+71	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0696+79	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0697+26	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0701+92	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0702+22	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0702+76	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0702+94	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0703+36	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0703+58	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0704+10	Transverse	Monterey Road	Protect in Place
Electric OH	PG&E	0704+35	Transverse	Monterey Road	Protect in Place
Natural Gas	CPN Pipeline Company	0720+44	Transverse	Blanchard Road	Protect in Place
Track Drainage Pump Station	CA High-Speed Rail	0723+76	Transverse	n/a	New
Track Drainage Pump Station	CA High-Speed Rail	0749+76	Transverse	n/a	New
Groundwater Pump Station	City of San Jose/San Jose Municipal Water System	755+00	Longitudinal/ Transverse	Bailey Avenue	Relocate
Electric OH	Unknown	0756+95	Transverse	n/a	Relocate
Natural Gas	PG&E	0757+37	Transverse	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Groundwater Pump Station	City of San Jose/San Jose Municipal Water System	765+00	Longitudinal/ Transverse	Bailey Avenue	Relocate
Storm Drain	City of San Jose	0764+19 to 0776+75	Longitudinal	n/a	Relocate
Drainage Facility	City of San Jose	0764+73	Transverse	n/a	Relocate
Groundwater Pump Station	City of San Jose/San Jose Municipal Water System	770+00	Longitudinal/ Transverse	Bailey Avenue	Relocate
Drainage Facility	City of San Jose	0770+77	Transverse	n/a	Relocate
Drainage Facility	City of San Jose	0776+75	Transverse	n/a	Relocate
Electric OH	Unknown	0782+61	Transverse	Bailey Avenue	Relocate
Track Drainage Pump Station	CA High-Speed Rail	0843+00	Transverse	n/a	New
Electric OH	Unknown	0864+13	Transverse	n/a	Relocate
Electric OH	Unknown	0869+54	Transverse	n/a	Relocate
Track Drainage Pump Station	CA High-Speed Rail	0888+27	Transverse	n/a	New
Electric OH	PG&E	0930+83	Transverse	Barnhart Avenue	Protect in Place
Electric OH	PG&E	0932+00	Transverse	Barnhart Avenue	Protect in Place
Electric OH	PG&E	0932+56	Transverse	Barnhart Avenue	Protect in Place
Electric OH	PG&E	0932+84	Transverse	Barnhart Avenue	Protect in Place
Electric OH & Telecomm OH on Joint Pole	Unknown & Verizon	0936+78	Transverse	Miramonte Avenue	Relocate
Electric OH	PG&E	0955+82	Transverse	n/a	Relocate
Track Drainage Pump Station	CA High-Speed Rail	0966+19	Transverse	n/a	New
Potable Water	Unknown	1006+84	Transverse	n/a	Protect in Place
Telecomm UG	Verizon	1029+91	Transverse	Burnett Avenue	Protect in Place
Storm Drain	City of Morgan Hill	1063+36	Transverse	Cochrane Circle	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Fiber Optic	AT&T	1064+08	Transverse	n/a	Protect in Place
Fiber Optic	AT&T	1064+08 to 1075+86	Longitudinal	Old Monterey Road	Relocate
Electric OH	PG&E	1064+76	Transverse	n/a	Relocate
Storm Drain Pump Station	City of Morgan Hill	1087+18	Transverse	Monterey Road	Relocate
Storm Drain Pump Station	City of Morgan Hill	1111+85 to 1152+54	Longitudinal	n/a	Relocate
Sanitary Sewer	City of Morgan Hill	1111+85 to 1153+00	Longitudinal	n/a	Relocate
Electric OH & Telecomm OH on Joint Pole	Unknown	1122+36	Transverse	East Central Avenue	Relocate
Telecomm UG	Verizon	1132+37	Transverse	Main Avenue	Protect in Place
Telecomm UG	Verizon	1153+00	Transverse	Diana Avenue	Protect in Place
Natural Gas	PG&E	1153+23	Transverse	Diana Avenue	Remove
Electric OH	PG&E	1153+28	Transverse	Diana Avenue	Relocate
Drinking Water Well	City of Morgan Hill	1153+50	Longitudinal	Diana Avenue	Relocate
Fiber Optic	Verizon	1157+59	Transverse	East Dunne Avenue	Protect in Place
Sanitary Sewer	City of Morgan Hill	1158+50 to 1209+29	Longitudinal	Railroad Avenue	Relocate
Electric OH	Unknown	1174+00 to 1235+00	Longitudinal	Railroad Avenue	Relocate
Electric OH & Telecomm OH on Joint Pole	Unknown	1175+15	Transverse	San Pedro Avenue	Relocate
Electric OH & Telecomm OH on Joint Pole	Unknown	1184+23	Transverse	n/a	Relocate
Telecomm UG	Verizon	1207+31 to 1210+77	Longitudinal	Tennant Avenue	Relocate
Sanitary Sewer	Unknown	1209+15	Transverse	Tennant Avenue	Protect in Place
Telecomm UG	Verizon	1209+43	Transverse	Tennant Avenue	Protect in Place
Electric OH	PG&E	1209+51	Transverse	Tennant Avenue	Relocate
Track Drainage Pump Station	CA High-Speed Rail	1275+83	Transverse	n/a	New
Electric OH	PG&E	1277+93	Transverse	East Middle Avenue	Relocate
Electric OH & Telecomm OH on Joint Pole	Unknown	1330+83	Transverse	East Middle Avenue	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH & Telecomm OH on Joint Pole	Unknown	1344+88	Transverse	East San Martin Avenue	Relocate
Track Drainage Pump Station	CA High-Speed Rail	1360+00	Transverse	n/a	New
Electric OH & Telecomm OH on Joint Pole	Unknown	1413+96	Transverse	Church Avenue	Relocate
Natural Gas	PG&E	1414+03	Transverse	Church Avenue	Protect in Place
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1435+23	Transverse	n/a	Relocate
Telecomm OH	Verizon	1440+70	Transverse	n/a	Relocate
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1448+41	Transverse	n/a	Relocate
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1460+27	Transverse	Masten Avenue	Relocate
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1476+00	Transverse	n/a	Relocate
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1483+19	Transverse	Rucker Avenue	Relocate
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1510+61	Transverse	Denio Avenue	Relocate
Telecomm OH	Verizon	1517+60	Transverse	Buena Vista Avenue	Relocate
Electric OH	PG&E	1518+65	Transverse	Buena Vista Avenue	Relocate
Electric OH	PG&E	1519+54	Transverse	Buena Vista Avenue	Relocate
Electric OH	PG&E	1530+26	Transverse	Day Road	Relocate (Raise)
Electric OH	PG&E	1530+44	Transverse	Day Road	Relocate (Raise)
Electric OH	PG&E	1530+54	Transverse	Day Road	Relocate
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1545+03	Transverse	Cohansey Avenue	Relocate
Electric OH	PG&E	1556+76	Transverse	Farrell Avenue	Relocate
Potable Water	City of Gilroy	1564+73	Transverse	Las Animas Road	Protect in Place
Telecomm UG	Verizon	1564+82	Transverse	Las Animas Avenue	Protect in Place
Telecomm UG	Unknown	1566+57	Transverse	Las Animas Avenue	Protect in Place
Potable Water	City of Gilroy	1604+95	Transverse	Leavesley Road	Protect in Place
Sanitary Sewer	City of Gilroy	1605+02	Transverse	Leavesley Road	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1609+59	Transverse	Casey Lane	Relocate
Potable Water	Unknown	1609+86	Transverse	Casey Lane	Protect in Place
Potable Water	Unknown	1631+53	Transverse	Loof Avenue	Relocate
Potable Water	Unknown	1643+23	Transverse	Lewis Street	Protect in Place
Electric OH	Unknown	1643+46	Transverse	Lewis Street	Relocate
Telecomm UG	Verizon	1648+26	Transverse	Martin Street	Protect in Place
Telecomm OH	Verizon	1649+00	Transverse	Martin Street	Relocate
Potable Water	Unknown	1649+14	Transverse	Martin Street	Protect in Place
Electric OH	Unknown	1649+39	Transverse	Martin Street	Relocate
Potable Water	City of Gilroy	1654+23	Transverse	East 6th Street	Protect in Place
Storm Drain	City of Gilroy	1655+25	Transverse	n/a	Relocate
Electric OH	PG&E	1673+28	Transverse	East 9th Street	Relocate
Potable Water	Unknown	1673+52	Transverse	East 9th Street	Remove
Potable Water	City of Gilroy	1679+31	Transverse	East 10th Street	Relocate
Drainage Channel	City of Gilroy	1698+37	Transverse	Princevalle Channel	Extend
Recycled Water	Santa Clara Valley Water District	1698+60	Transverse	Princevalle Channel	Protect in Place
Electric OH & Telecomm OH on Joint Pole	PG&E & Verizon	1715+00	Transverse	Luchessa Avenue	Relocate
Potable Water	City of Gilroy	1715+13	Transverse	Luchessa Avenue	Protect in Place
Sanitary Sewer	City of Gilroy	1715+62	Transverse	Luchessa Avenue	Protect in Place
Electric OH & Telecomm OH on Joint Pole	Unknown	1788+73	Transverse	Carnadero Avenue	Remove
Fiber Optic	Level 3 Communications/ AboveNet	1794+45	Transverse	n/a	Protect in Place
Fiber Optic	Sprint/MCI	1796+91	Transverse	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	1798+78	Transverse	n/a	Relocate (Raise)
Electric OH	PG&E	1798+94	Transverse	n/a	Relocate (Raise)
Electric OH	Unknown	1824+65	Transverse	n/a	Relocate
Telecomm OH	Verizon	1841+42	Transverse	Bloomfield Avenue	Relocate
Electric OH & Telecomm OH on Joint Pole	Unknown	1841+81	Transverse	Bloomfield Avenue	Relocate
Electric OH	Unknown	1865+62	Transverse	n/a	Relocate
Electric OH & Telecomm OH on Joint Pole	Unknown	1871+66	Transverse	Sheldon Avenue	Remove
Irrigation Ditch	Unknown	1884+31	Transverse	n/a	Realign
Irrigation Ditch	Unknown	1890+28	Transverse	n/a	Realign
Electric & Telecomm OH on Joint Pole	Unknown	2188+94	Transverse	Lovers Lane	Relocate
Electric & Telecomm OH on Joint Pole	PG&E & Unknown	2228+14	Transverse	San Felipe Road	Relocate
Electric OH	PG&E	2372+38	Transverse	n/a	Relocate
Natural Gas	PG&E	2193+10	Transverse	n/a	Protect in Place
Potable Water	Department of Water Resources	2220+00 to 2231+00	Longitudinal	n/a	Protect in Place
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	2287+50	Transverse	n/a	Protect in Place
Electric & Telecomm OH on Joint Pole	n/a	2044+46	Transverse	Frazier Lake Road	Relocate
Electric OH	PG&E	2094+00	Transverse	n/a	Relocate
Natural Gas	PG&E	2107+75	Transverse	Lake Road	Protect in Place
Pacheco Pass Subsection					
Electric OH	n/a	4046+79	Transverse	n/a	Relocate
Electric OH	PG&E	4251+64	Transverse	n/a	Relocate
Gas	Shell	4285+00	Transverse	Delta Mendota Canal	Abandon

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	n/a	4366+26	Transverse	Santa Nella Road/ SR-33	Relocate
Electric & Telcom OH on Joint Pole	n/a	4366+50	Transverse	Santa Nella Road/ SR-33	Relocate
Electric OH	n/a	4372+43	Transverse	CCID Main Canal	Relocate
Irrigation Ditch	n/a	4372+52	Transverse	CCID Main Canal	Relocate
Electric OH	n/a	4372+52 to 4375+50	Longitudinal	n/a	Relocate
Potable Water	U.S. Department of the Interior, Bureau of Reclamation	3270+50 to 3305+00	Longitudinal and Transverse	n/a	Relocate
Electric OH	PG&E	3666+00	Transverse	SR-152	Protect in Place
Electric OH	PG&E	3686+20	Transverse	n/a	Protect in Place
Electric OH	PG&E	4098+83	Transverse	SR-152	Relocate
Electric OH	PG&E	4177+80	Transverse	n/a	Protect in Place
Electric OH	PG&E	4178+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4178+70	Transverse	n/a	Protect in Place
Electric OH	PG&E	4179+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+00	Transverse	n/a	Protect in Place
Electric OH	PG&E	4180+50	Transverse	n/a	Protect in Place
Electric OH	PG&E	4182+50	Transverse	n/a	Relocate
San Joaquin Subsection					
Electric OH	PG&E	4183+30	Transverse	n/a	Protect in Place
Electric OH	PG&E	4183+60	Transverse	n/a	Protect in Place
Crude Oil	Shell	4207+50	Transverse	n/a	Protect in Place
Crude Oil	ConocoPhillips	4247+25	Transverse	n/a	Protect in Place
Crude Oil	Chevron	4267+20	Transverse	n/a	Protect in Place

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	4416+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4438+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4438+30	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4455+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4462+56	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4463+81	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4512+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4512+41	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4532+40	Transverse	n/a	New
Electric OH	PG&E	4568+13	Transverse	n/a	Relocate
Electric OH	PG&E	4595+34	Transverse	Ingomar Grade	Relocate
Oil	Chevron	4595+68	Transverse	Ingomar Grade	Abandon
Electric & Telcom OH on Joint Pole	PG&E	4597+20	Transverse	Ingomar Grade	Relocate
Electric OH	PG&E	4615+00 to 4642+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4622+22	Transverse	Volta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4622+42	Transverse	Volta Road	New
Irrigation Ditch	Henry Miller Reclamation District	4623+50	Transverse	Volta Road	New

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	4639+70	Transverse	Henry Miller Road	New
Irrigation Ditch	Henry Miller Reclamation District	4645+77 to 4648+93	Longitudinal	Henry Miller Road	New
Irrigation Ditch	Henry Miller Reclamation District	4647+50 to 4648+50	Longitudinal	Henry Miller Road	New
Irrigation Ditch	Henry Miller Reclamation District	4657+50 to 4681+50	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4657+54	Transverse	n/a	New
Electric OH	PG&E	4657+81	Transverse	n/a	Relocate
Telecomm OH	PG&E	4660+00 to 4681+00	Longitudinal	n/a	Relocate
PG&E Electric OH	PG&E	4664+50 to 4717+00	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4671+77 to 4703+00	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4698+66	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4698+66 to 4703+00	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4739+50	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4742+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4757+30	Transverse	n/a	Relocate
Telecomm OH	Unknown	4761+34	Transverse	Badger Flat Road	Relocate
Electric OH	PG&E	4761+86	Transverse	Badger Flat Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	4762+00 to 4766+30	Longitudinal	n/a	Relocate
Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Electric OH	PG&E	4780+28	Transverse	Wilson Road	Relocate
Electric & Telecom OH on Joint Pole	PG&E	4798+51	Transverse	Johnson Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4815+38	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4818+90	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	4833+00	Transverse	Nantes Avenue	New
Irrigation Ditch	Henry Miller Reclamation District	4833+50	Transverse	Nantes Avenue	Realign
Irrigation Ditch	Henry Miller Reclamation District	4833+50 to 4856+20	Longitudinal	Henry Miller Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	4839+90	Transverse	n/a	Realign
Irrigation Ditch	Henry Miller Reclamation District	4856+20	Transverse	SR 165/ Mercey Springs Road	Realign
Electric OH	PG&E	4856+42	Transverse	n/a	Relocate
Electric & Telecom OH on Joint Pole	PG&E	4882+50 to 4888+00	Longitudinal	Henry Miller Road	Relocate
Electric OH	PG&E	4886+00	Transverse	SR 165/Mercey Springs Road	Relocate
Telecomm OH	Unknown	4886+55	Transverse	SR 165/Mercey Springs Road	Relocate
Santa Fe Canal (San Luis Irrigation Drain)	Grassland Water District	4901+50	Transverse	n/a	New

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
San Luis Canal	Grassland Water District	4924+50	Transverse	n/a	New
San Luis Drain No.1	Grassland Water District	4925+25	Transverse	n/a	New
Porter/Blake Bypass Canal	Grassland Water District	4926+50	Transverse	n/a	Realign
Electric OH	PG&E	4966+39	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5006+00	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5031+88	Transverse	n/a	Relocate
Electric OH	PG&E	5032+24	Transverse	n/a	Relocate
Electric OH	PG&E	5055+82	Transverse	n/a	Relocate
Electric OH	PG&E	5060+13	Transverse	Baker Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5063+12	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5071+84	Transverse	n/a	New
Electric & Telecom OH on Joint Pole	PG&E	5095+00 to 5102+30	Longitudinal	Henry Miller Road	Relocate
Electric & Telecom OH on Joint Pole	PG&E	5097+97	Transverse	Delta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5098+00	Transverse	Delta Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5111+24	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5123+92	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5142+50	Transverse	Midway Road	New

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30	Transverse	n/a	Extend Culvert
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5154+30 to 5159+00	Longitudinal	n/a	Relocate
West Delta Irrigation Canal & Drain	Henry Miller Reclamation District	5159+00 to 5164+00	Longitudinal	n/a	Relocate
Dambrosia Branch #1 Canal	Henry Miller Reclamation District	5169+15	Transverse	n/a	New
Electric OH	PG&E	5177+75	Transverse	Box Car Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5180+75	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5181+07	Transverse	n/a	New
Irrigation Canal	Henry Miller Reclamation District	5195+00 to 5221+00	Longitudinal	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5207+80	Transverse	n/a	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5221+15	Transverse	n/a	Relocate
Delta Canal & Seepage Drain	Henry Miller Reclamation District	5221+50	Transverse	n/a	New RCB Culvert
Irrigation Ditch	Henry Miller Reclamation District	5222+15	Transverse	n/a	New
East Delta Canal	Henry Miller Reclamation District	5229+00	Transverse	n/a	New RCB Culvert
Irrigation Ditch	Henry Miller Reclamation District	5229+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5229+50 to 5243+50	Longitudinal	n/a	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
Irrigation Ditch	Henry Miller Reclamation District	5243+50	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
Storage Tank	Henry Miller Reclamation District	5256+00	Transverse	Turner Island Road	Relocate
County Road Ditch	Henry Miller Reclamation District	5256+50	Transverse	Turner Island Road	Relocate
Willis Branch	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Willis Branch Pump Station Facility	Henry Miller Reclamation District	5257+00	Transverse	Turner Island Road	Relocate
Electric OH	PG&E	5257+17	Transverse	Turner Island Road	Relocate
Belmont Drain	Henry Miller Reclamation District	5261+50 to 5263+00	Longitudinal	Turner Island Road	New RCB Culvert
Irrigation Ditch	Henry Miller Reclamation District	5286+00	Transverse	n/a	New
Irrigation Ditch	Henry Miller Reclamation District	5299+00	Transverse	n/a	New
Delta Canal No.1	Henry Miller Reclamation District	5310+00	Transverse	n/a	New RCB Culvert
PG&E Electric OH	PG&E	5319+00 to 5335+50	Longitudinal	n/a	Relocate
Copper Cable	Verizon	5320+00 to 5335+50	Longitudinal	Henry Miller Road	Relocate
West San Juan Drain	Henry Miller Reclamation District	5321+68	Transverse	n/a	New RCB Culvert
San Juan No.1	Henry Miller Reclamation District	5334+00	Transverse	Carlucci Road	New RCB Culvert
Copper Cable	Verizon	5335+40	Transverse	Carlucci Road	Relocate

Utility Type	Provider (Owner)	Stationing	Longitudinal/ Transverse/ Above[1]	Existing Roadway Crossing	Disposition
West San Juan Drain	Henry Miller Reclamation District	5335+50	Transverse	Carlucci Road	New RCB Culvert
PG&E Electric OH	PG&E	5336+20	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5358+00	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	Relocate
Irrigation Ditch	Henry Miller Reclamation District	5360+00	Transverse	Carlucci Road	New
San Juan No.1	Henry Miller Reclamation District	5360+00	Longitudinal and Transverse	Carlucci Road	New RCB Culvert

Source: HNTB 2018c; HNTB 2018d
n/a = not applicable
PG&E = Pacific Gas & Electric Company
CCID = Central California Irrigation District
[1] Longitudinal is defined as a facility located parallel to and within the proposed HSR right-of-way. A transverse facility is one that passes from one side of the proposed HSR right-of-way to the other side of the right-of-way. The designation of "Above" is used for transmission towers that extend above the HSR alignment.

References

HNTB 2018c. Draft_PEPD-AppA-Qty-v6.xls.

HNTB 2018d. Utility Conflict Matrix (Alt 4)

APPENDIX 3.6-B: EXISTING PLUS PROJECT CONDITIONS ENERGY ANALYSIS

METHODOLOGY

Per California Environmental Quality Act (CEQA) requirements, an environmental impact report (EIR) must include a description of the existing physical environmental conditions in the vicinity of the project. Those conditions, in turn, "will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant" (CEQA Guidelines Cal. Code Regs., tit. 14, § 15125(a)).

For a project such as the high-speed rail (HSR) project that would not commence operation for almost 10 years and would not reach full operation for almost 25 years, use of only existing conditions as a baseline for energy impacts would be misleading. It is more likely that existing background traffic volumes (and background roadway changes from other programmed traffic improvement projects) and vehicle emission factors would change between today and 2040 than it is that existing conditions would remain unchanged over the next 25 years. For example, regional transportation plans (RTP) include funded transportation projects that are programmed to be constructed by 2040. To ignore that these projects would be in place before the HSR project reaches maturity (i.e., the year at which HSR-related traffic emissions reach their maximum) and to evaluate the HSR project's energy impacts ignoring that these RTP improvements would change the underlying background conditions to which HSR project traffic would be added, would be misleading because it would represent a hypothetical comparison.

Therefore, the energy analysis uses a dual baseline approach. That is, the HSR system's energy impacts are evaluated both against existing conditions and against background (i.e., No Project) conditions as they are expected to be in 2040. This approach complies with CEQA (see Woodwark Park Homeowners Assn v. City of Fresno (2007), 150 Cal.App.4th 683, 707 and Sunnyvale West Neighborhood Assn. v. City of Sunnyvale (2010), 190 Cal.App.4th 1351). Results for both baselines are presented. The results comparing the project with the future expected baseline are presented in detail in the main text of the Appendix 3.6-D, Energy Analysis Memorandum. The results comparing the project with existing conditions are presented in the main text in summary format; details are presented in this attachment. This analysis informs the public of potential project impacts under both baselines, but focuses the analysis on the baseline analysis more likely to occur.

Using the methodologies described in the Appendix 3.6, the impacts of the proposed project have been evaluated and are discussed in the following sections.

Electrical Requirements of the HSR

The electrical demand for the propulsion of the trains, the operation of the trains at terminal stations, and in storage depots and maintenance facilities etc., has been conservatively estimated by the project's engineers. As shown in Table 1, this electrical demand is equivalent to an increase in energy use of approximately 172,495 million British thermal units (MMBtu) per year for the medium ridership scenario and 189,745 MMBtu per year for the high ridership scenario for all alternatives. This change is predicted to occur in both the Existing Plus Project conditions and the 2040 Plus Project conditions.

Table 1 Power Plant Energy Changes due to the Project

Scenario	Change in Energy due to HSR (MMBtu/year)
Medium Ridership	172,495
High Ridership	189,745

Source: HNTB 2017; Authority 2017
GWh = gigawatt hour
HSR = high-speed rail
MMBtu = million British thermal units

The HSR system's electrical requirements would be met through the state's electrical grid, and no one generation source for the electrical power requirements can be positively identified. Energy changes from power generation can therefore be predicted on a statewide level only.

On-Road Vehicle Travel

Estimated vehicle miles traveled (VMT) for the Existing and Existing Plus Project conditions are provided in Table 2. These values, together with associated average daily speed estimates, were developed on a county-by-county basis and then summed for the state as a whole. As shown, the HSR is predicted to reduce roadway VMT by over 3.4 billion miles annually statewide due to travelers choosing to use the HSR rather than drive for the medium ridership scenario, resulting in an energy reduction of 15.6 million MMBtu per year. Under the high ridership scenario, HSR would reduce roadway VMT by over 4.7 billion miles annually statewide, resulting in an energy reduction of 21 million MMBtu per year.

Table 2 Existing Plus Project On-Road Vehicle Energy Changes (2015)

County	Existing VMT	Existing Plus Project VMT	Change in VMT with HSR	Change in Energy with HSR (MMBtu/Year)
Medium Ridership Scenario				
Santa Clara	10,312,374,118	10,146,971,563	-165,402,555	-795,428
San Benito	620,032,419	497,463,094	-122,569,325	-583,615
Merced	1,239,904,084	1,095,973,335	-143,930,749	-668,410
Regional Total	**12,172,310,621**	**11,740,407,991**	**-431,902,630**	-2,047,452
Statewide Total	**205,015,920,154**	**201,584,933,649**	**-3,430,986,505**	-15,564,001
High Ridership Scenario				
Santa Clara	10,283,778,970	10,060,102,631	-223,676,339	-1,075,669
San Benito	613,186,473	444,285,228	-168,901,245	-804,224
Merced	1,217,771,426	1,023,513,300	-194,258,127	-902,129
Project Section Total	**12,114,736,869**	**11,527,901,159**	**-586,835,711**	-2,782,021
Statewide Total	**203,997,417,634**	**199,280,213,986**	**-4,717,203,648**	-21,398,682

Source: Authority 2017
VMT = vehicle miles traveled
HSR = high-speed rail
MMBtu = million British thermal units

Aircraft Travel

As shown in Table 3, the number of plane flights statewide is anticipated to decrease with the HSR due to travelers choosing to use the HSR rather than fly to their destination. An average fuel consumption rate was calculated for the aircraft based on the profile of aircraft currently servicing the San Francisco to Los Angeles corridor. The number of air trips removed due to the HSR was estimated using the travel demand modeling analysis conducted for the project. As shown in Table 3, the Existing Plus Project condition is estimated to reduce the number of statewide air trips by over 80,000 trips statewide, resulting in an energy reduction of approximately 9.6 million MMBtu per year for the medium ridership scenario and 9.2 million MMBtu per year for the high ridership scenario, as compared to the existing conditions.

Table 3 Aircraft Energy Changes due to HSR (2015)

Origin	Number of Flights Removed	Change in Energy due to HSR (MMBtu/Year)
Medium Ridership Scenario		
San Francisco Bay Area	-31,662	-3,798,621.8
Statewide Total	-80,137	-9,614,376.6
High Ridership Scenario		
San Francisco Bay Area	-30,303	-3,635,622.1
Statewide Total	-77,100	-9,250,003.0

Source: Authority 2017
MMBtu = million British thermal units

SUMMARY OF RESULTS

As, shown in Table 4, for the medium ridership scenario, the existing plus project scenario is estimated to reduce roadway energy by approximately 2 million MMBtu per year, reduce energy due to plane travel by approximately 3.8 million MMBtu per year, and increase electrical energy demand by approximately 172,495 MMBtu per year, resulting in an overall regional energy savings of approximately 5.7 million MMBtu per year over existing conditions. For the high ridership scenario, the Existing Plus Project conditions are estimated to reduce roadway energy by approximately 2.8 million MMBtu per year, reduce energy due to plane travel by approximately 3.6 million MMBtu per year, and increase electrical energy demand by approximately 189,745 MMBtu per year, resulting in an overall regional energy savings of approximately 6.2 million MMBtu per year over existing conditions.

The analysis conducted for the project estimated the changes in regional energy use anticipated with and without the HSR. The analysis estimated the energy changes from reduced on-road VMT, reduced intrastate plane travel, and increased electrical demand. Although the HSR system would result in an increase in electricity demand, it is predicted to reduce the energy demands from automobile and plane travel, resulting in an overall beneficial effect on statewide energy use.

Table 4 Estimated Regional Energy Changes due to Existing Plus Project compared to Existing Conditions (2015)

Project Element	Change in Energy due to HSR (MMBtu/Year)	
	Medium Ridership Scenario	High Ridership Scenario
Roadways (VMT)	-2,047,452.0	-2,782,021.4
Airplane Flights	-3,798,621.8	-3,635,622.1
Project Energy	172,495	189,745
Total	-5,673,578.4	-6,227,898.7

Source: Authority 2017
VMT = vehicle miles traveled
HSR = high-speed rail
MMBtu = million British thermal units

REFERENCES

California High Speed Rail Authority (Authority). 2017. *California High-Speed Rail Statewide Criteria Pollutant and GHG Analysis Memorandum*. Prepared by Alice Lovegrove and Eddie Tadross. March 14, 2017.

APPENDIX 3.6-C: WATER USE ASSESSMENT

APPENDIX 3.6-C WATER USE ASSESSMENT

This appendix presents an analysis and evaluation of anticipated water use requirements for both construction and operation of the California High-Speed Rail (HSR) System for the San Jose to Central Valley Wye Project Extent (project). This appendix also identifies current water use (most of which is agricultural) within the project footprints, and available water supply sources to meet the anticipated HSR water demand for construction.

Executive Summary

The project alternatives share termini at Scott Boulevard on the north and Henry Miller Road/Carlucci Road on the east. The alignments would cross urban and rural areas in unincorporated Santa Clara, San Benito, and Merced Counties. Volume 3 of the environmental impact report (EIR)/environmental impact statement (EIS) provides detailed design drawings that support the descriptions of the alternatives.

The project would be grade-separated, meaning that the HSR would cross roads, railroads, and other transport facilities using overpasses or underpasses, allowing it to operate independently of other modes of transportation. HSR rights-of-way would be fenced and access controlled to prohibit public or vehicle access. The project footprint for each alternative would consist of the permanent HSR right-of-way, station, and maintenance facility areas. Grade separations and traction power electrical facilities would require additional right-of-way.

Analysts estimated water demand for construction and operation of the project alternatives. Analysts then evaluated existing water use along each project alternative and compared the existing water use to the estimated demand for construction and operation of the alternatives. Existing water consumption was estimated based on the current land uses within the project footprint and a water consumption factor for each type of land use. This comparison indicated that construction and operation of the project alternatives would result in a net decrease in annual water consumption compared to the current use of the land. Construction demand for water would be an estimated 10 percent of the existing annual water use of the land within the right-of-way for Alternative 1, 9 percent for Alternative 2, 10 percent for Alternative 3, and 9 percent for Alternative 4.

The alternatives include HSR stations at San Jose and downtown Gilroy or east Gilroy, a maintenance of way facility (MOWF) south or east of Gilroy and a maintenance of way siding (MOWS) near Turner Island Road. Therefore there would be project-related demand for water for station and maintenance facility operations in addition to water demand for construction of the alignment, stations, and maintenance facilities. A portion of the land that would be permanently utilized for construction of the alignment in areas of Santa Clara, San Benito, and Merced Counties is currently in agricultural use and construction of the alternatives would permanently remove land from agricultural production. Additionally, temporary construction easements (TCE) would be required to support construction activities and would generally be located adjacent to active construction areas, temporarily removing additional agricultural lands from production. Once construction of the project is completed, agricultural lands affected by TCEs would be returned to agricultural use.

Background

The California High-Speed Rail Authority (Authority), a state governing board formed in 1996, has responsibility for planning, designing, constructing, and operating the California HSR System. Its mandate is to develop an HSR system that coordinates with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports. The California HSR System would provide intercity, high-speed service on more than 800 miles of tracks throughout California connecting the major population centers of Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles,

the Inland Empire, Orange County, and San Diego. The California HSR System would be implemented in two phases. Phase 1 would connect San Francisco to Los Angeles and Anaheim via the Pacheco Pass and the Central Valley. The sequence of system phasing would first connect the Silicon Valley to the San Joaquin Valley for initial operating section service in 2025. The San Jose to Merced Project Section (of which the San Jose to Central Valley Wye Project Extent is a part) would connect the San Francisco to San Jose Project Section on the north to the Merced to Fresno Project Section on the east. The project runs through portions of Santa Clara, San Benito, and Merced Counties. The project is divided into five subsections: San Jose Diridon Station Approach, which begins at Scott Boulevard; Monterey Corridor; Morgan Hill and Gilroy; Pacheco Pass; and San Joaquin Valley (which ends at Carlucci Road in an unincorporated area of Merced County).

Methodology

Analysts completed the following steps to estimate potential water needs required under the project alternatives and available water supplies:

1. Reviewed existing relevant information, reports, and documents to identify project features and activities that would require significant water usage during construction and operation.
2. Identified the expected land requirements (acreage) and land uses that would be permanently converted from use for construction of right-of-way, stations, and maintenance facilities for each alternative.
3. Developed water demand estimates for construction of the alignment, stations, and maintenance facilities for each alternative.
4. Developed water demand estimates for operation of stations and maintenance facilities.
5. Calculated the existing water use of the land for construction of the alternatives. Water use factors (acre-feet of water used per acre of land per year) were applied to each land use except for agricultural use; county-specific water use rates were developed from recent county-specific data and were applied to the amount of agricultural land for each county.
6. Identified available existing water supply and additional water supply sources, if needed, to provide the required water to each section feature, during both construction and operation.

The following subsections provide a more detailed description of the approach for each step.

Identification of Project Features with Significant Water Usage

During construction, water would be required for construction activities including preparation of cement, concrete work, earthwork and soil conditioning, fugitive dust suppression, landscaping, and operation of tunnel boring machines (TBM). Operation would require water for operation of stations and maintenance facilities. Radio towers, traction power substations, and switching and paralleling stations would be unmanned, remotely operated facilities with no dedicated water supply and no water use requirements. Water use factors and estimated existing water demand for permanently converted land for each alternative is summarized in Table 1.

Estimating Future Water Demand Requirement for the Project

Water demand estimates were developed for construction activities and for operations including two stations (San Jose Diridon Station and Downtown Gilroy or East Gilroy Station), one LMF/MOIF near Gilroy (South Gilroy or East Gilroy LMF/MOIF), and one MOWS near Turner Island Road. The process for estimating water demand for construction of each alternative included the following:

- Identification of the project footprint for each of the three project alternatives
- Identification of the different construction components associated with construction of the track, including:
  - Manufacturing concrete
  - Earthwork and soil conditioning
  - Dust suppression
  - Landscaping
  - TBM operation

Analysts developed water usage estimates for construction of the track, stations, maintenance facilities, and tunnels based on the anticipated project construction schedule.

Water Use Assessment

Existing Water Use and Water Supply Sources

Analysts evaluated existing land use information for each project alternative based on city and county general plan land use data. The predominant land use for each project alternative is agricultural (ranging from 37 percent to 46 percent) and parks, recreational, and open space (ranging from 46 percent to 48 percent). Other land uses are categorized as residential, commercial, industrial, public facilities, and transportation land for the purposes of this analysis. The land use factors to determine existing water use for land currently in residential, commercial, public facilities, parks, recreational, and open space, and transportation land uses are the same factors utilized in the Fresno Urban Water Management Plan (City of Fresno 2008). Analysts obtained water use for agricultural land in Santa Clara, San Benito, and Merced Counties from the California Department of Water Resources (California Department of Water Resources) (DWR 2005, 2006, 2007, 2008, 2009, 2010, 2017).

To determine water use for the agricultural areas, analysts obtained applied water rates (acre-feet of water per acre of land) and irrigated acres for each crop type were obtained from the DWR database (DWR 2017). Data tables were available for calendar years 1998 through 2010. In the table, water use varies from less than 1 acre-foot per acre per year for grain to 5.6 acre-feet per acre per year for rice. Acre-feet per acre per year for each crop type and the number of irrigated acres for each crop type for calendar years 2005 through 2010 were averaged to calculate the average acre-feet per acre per year for Santa Clara, San Benito, and Merced Counties. Analysts calculated the average water rate for all crops in these three counties for calendar years 2005 to 2010 as:

Acre-foot of water

An acre-foot of water is the volume equal to a sheet of water 1 acre in area and 1 foot in depth.

- Santa Clara County—2.8 acre-feet per acre per year
- San Benito County—1.9 acre-feet per acre per year
- Merced County—3.7 acre-feet per acre per year

Analysts applied the most recent available DWR water use data to the agricultural area for each county for each alternative. The rates then were used to calculate existing water use for the project footprint of each alternative in each county. The resulting existing water use for each alternative is shown in Table 1.

Table 1 Existing Water Use by Project Alternatives

Distance	Land Use	Acres[1]	Water Use Factor (acre-feet /year)	Annual Water Use (acre-feet/year)
Alternative 1				
89.6 Miles	Low/Medium Density Residential	49	3.2	155
	High Density Residential	4	3.2	14
	Mixed-Use	15	3.2	49
	Commercial	87	1.9	166
	Industrial	113	2.7	304
	Public Facilities	123	1.9	233
	Parks/ Recreation/Open Space	1,443	2.7	3,897
	Agricultural	1,133	N/A	N/A
	Santa Clara County	*267*	*2.8*	748
	San Benito County	*81*	*1.9*	153
	Merced County	*786*	*3.7*	2,907
	Transportation	29	2.7	77
	Total	**2,996**	**N/A**	**8,704**
Alternative 2				
89.3 Miles	Low/Medium Density Residential	106	3.2	340
	High Density Residential	7	3.2	22
	Mixed-Use	24	3.2	75
	Commercial	105	1.9	199
	Industrial	156	2.7	421
	Public Facilities	126	1.9	239
	Parks/ Recreation/Open Space	1,511	2.7	4,079
	Agricultural	1,235	N/A	N/A
	Santa Clara County	335	2.8	937
	San Benito County	114	1.9	217
	Merced County	786	3.7	2,907
	Transportation	32	2.7	87
	Total	**3,301**	**N/A**	**9,525**

Distance	Land Use	Acres[1]	Water Use Factor (acre-feet /year)	Annual Water Use (acre-feet/year)
Alternative 3				
88.1 Miles	Low/Medium Density Residential	51	3.2	164
	High Density Residential	4	3.2	14
	Mixed-Use	1	3.2	3
	Commercial	43	1.9	82
	Industrial	77	2.7	209
	Public Facilities	31	1.9	59
	Parks/ Recreation/Open Space	1,426	2.7	3,850
	Agricultural	1,418	N/A	N/A
	Santa Clara County	489	2.8	1,369
	San Benito County	143	1.9	272
	Merced County	786	3.7	2,907
	Transportation	32	2.7	87
	Total	**3,084**	**N/A**	**9,016**
Alternative 4				
88.9 Miles	Low/Medium Density Residential	86	3.2	276
	High Density Residential	4	3.2	13
	Mixed-Use	28	3.2	90
	Commercial	112	1.9	212
	Industrial	125	2.7	338
	Public Facilities	15	1.9	28
	Parks/ Recreation/Open Space	1,459	2.7	3,938
	Agricultural	1,145	N/A	N/A
	Santa Clara County	287	2.8	804
	San Benito County	72	1.9	137
	Merced County	786	3.7	2,907
	Transportation	28	2.7	76
	Total	**3,001**	N/A	8,817

Sources: City of Santa Clara 2010; City of San Jose 2011; County of Santa Clara 1994, 2016; City of Morgan Hill 2016; City of Gilroy 2002, 2005; County of Merced 2013; County of San Benito 2016; City of Fresno 2008; California Department of Water Resources 2005, 2006, 2007, 2008, 2009, 2010, 2017; HNTB 2018a.

[1] Acres of land use are calculated based on the permanent right-of-way for track alignment, stations, and maintenance facilities for each alternative.

The Santa Clara Valley Water District supplies water to all of Santa Clara County. Water demand in 2015 was 260,000 acre-feet per year. Water demand in 2040 is projected to be 435,100 acre-feet per year. Water is distributed in incorporated areas of Santa Clara County by the San Jose Water Company, San Jose Municipal Water System, City of Morgan Hill Water Division, and City of Gilroy Public Works. Local sources include natural groundwater recharge and surface water

supplies, including surface water rights held by the Santa Clara Valley Water District and the San Jose Water Company, and also use of recycled water within Santa Clara County. Residential water use is the primary water use in Santa Clara County. Many residents in rural and unincorporated areas of Santa Clara County rely on private groundwater wells for drinking water (SCVWD 2015).

The San Benito County Water District provides water to primarily agricultural customers in unincorporated areas of San Benito County. In 2015 the U.S. Department of the Interior, Bureau of Reclamation water allocation to the San Benito County Water District was 43,800 acre-feet of which 8,250 acre-feet was designated for municipal and industrial uses and 35,550 was designated for agricultural uses (County of San Benito 2016a).

Water is provided in unincorporated areas of Merced County by public water suppliers that obtain their water primarily from the Central Valley Project operated by U.S. Department of the Interior, Bureau of Reclamation, the California Aqueduct operated by the DWR, or from private groundwater wells that are also a major water supply source in unincorporated areas of Merced County. Consistent with the agricultural nature of Merced County, water is used primarily for agriculture in the Pacheco Pass and San Joaquin Valley Subsections. The water suppliers and acreage that each supplier covers in western Merced County are:

- San Luis/Delta-Mendota Water Authority—1,100,000 acres
- Henry Miller Reclamation District/San Luis Canal Company—45,000 acres
- Grassland Water District—51,537 acres
- Central California Irrigation District—143,000 acres
- Del Puerto Water District-- 52,800 acres (9,000 acres in Merced County)

The project alternatives are located in or near the service areas of these suppliers, which rely predominantly on surface water, as they extend through western Merced County. In addition, groundwater could be used for some construction-related activities. According to the U.S. Geological Survey (USGS) California Water Sciences Center, while surface water for agriculture is used when it is available (via the Central Valley Project), the San Joaquin Basin also relies heavily on groundwater. USGS estimates that groundwater accounts for approximately 33 percent of the annual supply of water used for both agricultural and urban purposes in the basin (USGS 2016). Existing agricultural water use for irrigation in Merced County was 1,374 million gallons per day (mgd) (1.5 million acre-feet per year) in 2010, including 981 mgd (1.1 million acre-feet per year) of surface water (71 percent) and 393 mgd (0.4 million acre-feet per year) of groundwater (29 percent) (USGS 2017). Existing groundwater use within the project footprint for irrigation in Merced County is estimated at 918 acre-feet per year for all project alternatives.

Annual water use for construction for each alternative is summarized in Table 2. Annual water use for construction would be approximately 868 acre-feet per year for Alternative 1, 842 acre-feet per year for Alternative 2, 912 acre-feet per year for Alternative 3, and 887 acre-feet for Alternative 4. These values represent between 9 and 10 percent of the current water usage.

Construction Water Use

The amount of water that would be used during construction was estimated for preparation of concrete, operation of TBMs, and concrete work, earthwork, dust control, and irrigation for reseeding and landscaping for the track alignments (Table 2).

Table 2 Concrete, Tunnel Boring, and Construction Water Use by Alternative and Activity

Length of Construction	Construction Activity	Water Use	
		Annual Construction Use (acre-feet/year)	Total 5-Year Construction Use Acre-Feet
Alternative 1			
89.6 miles	Concrete Batch Plants (Pacheco Tunnel)	17	83
	Concrete batch plants (Project Section)	57	285
	Tunnel boring[2]	366	1,829
	Construction water use[3]	428	2,141
	Total	**868**	**4,339**
Alternative 2			
89.3 miles	Concrete Batch Plants (Pacheco Tunnel)	17	83
	Concrete batch plants (Project Section)	60	300
	Tunnel boring[2]	366	1,829
	Construction water use[3]	399	1,993
	Total	**842**	**4,205**
Alternative 3			
88.1 miles	Concrete Batch Plants (Pacheco Tunnel)	17	83
	Concrete batch plants (Project Section)	61	304
	Tunnel boring[2]	366	1,829
	Construction water use[3]	468	2,339
	Total	**912**	**4,555**
Alternative 4			
88.9 miles	Concrete Batch Plants (Pacheco Tunnel)	17	83
	Concrete batch plants (Project Section)	51	253
	Tunnel boring[2]	366	1,829
	Construction water use[3]	453	2,261
	Total	**887**	**4,426**

Source: Authority 2017a; 2017b, 2017c HNTB 2018a

[1] Annualized water use is based on a total of 784 working days of tunnel boring machine operation.

[2] Construction water use includes water used for on-site concrete work, earthwork, dust control, and landscaping.

Analysts used industry construction standards to estimate the amount of concrete needed to construct track alignments and associated viaducts and bridges. These quantities were used to estimate the amount of concrete required for construction of elevated, at-grade, retained fill, and below-grade sections of track, bridges, and other structures required for each project alternative (HNTB 2018a). Analysts estimated the water needed for preparation of concrete at 31 gallons per cubic yard of concrete, and estimated the water use for construction including concrete work, earthwork, dust control, and irrigation based on the number of water trucks included in the on-site vehicle construction schedule for each project alternative.

Table 3 provides a comparison of annual existing water use and construction water use for the project alternatives. As shown, construction of any one of the project alternatives would result in a net decrease in annual water use for that portion of the project. Current annual water use is therefore greater than the annual water use would be required for project construction.

It is noted that construction water use is not continuous, because needs are sporadic and a function of the particular construction activities at the time. Water would be supplied to construction work sites by water tanker truck or by temporary pipeline. As a result, construction demand is frequently offset by a water supply system storage, so there would not be a noticeable drop in public utility water pressure or flow during construction-related activities. Also, the construction contractors could provide water storage on-site, and replacement water can be planned for periods of low demand. These activities would reduce potential surges in water demand to utility customers.

Table 3 Annual Construction Water Use Summary by Alternative

County	Annual Water Use (acre-feet per year)		
	Existing Use	Construction Use	Percent of Existing Use
Alternative 1			
Santa Clara County	4,043	494	12
San Benito County	1,729	22	1
Merced County	2,931	351	12
Total	**8,703**	**868**	**10**
Alternative 2			
Santa Clara County	4,799	477	10
San Benito County	1,811	21	1
Merced County	2,915	343	12
Total	**9,525**	**842**	**9**
Alternative 3			
Santa Clara County	4,241	512	12
San Benito County	1,844	31	1
Merced County	2,931	369	13
Total	**9,016**	**912**	**10**

County	Annual Water Use (acre-feet per year)		
	Existing Use	Construction Use	Percent of Existing Use
Alternative 4			
Santa Clara County	4,172	497	12
San Benito County	1,714	30	2
Merced County	2,931	361	12
Total	**8,817**	**887**	10

Sources: City of Santa Clara 2010; City of San Jose 2011; County of Santa Clara 1994, 2016; City of Morgan Hill 2016; City of Gilroy 2002, 2005; County of Merced 2013; County of San Benito 2016a, 2016b; City of Fresno 2008; California Department of Water Resources 2005, 2006, 2007, 2008, 2009, 2010 2017; and HNTB 2018a.

Operations Water Use

Water would also be required for operation of stations and maintenance facilities for the project alternatives. The San Jose Diridon Station would include restroom facilities and drinking water fountains. The estimated average potable water demand for the San Jose Diridon Station would be 24,200 gallons per day (gpd). Approximately two-thirds of this water use (16,025 gpd) would be anticipated for use within the station, while the remaining third (8,650 gpd) would be for outdoor use. Water consumption for operation of the Downtown Gilroy Station would be approximately 15,800 gpd based on the estimated station and grounds square footages. The East Gilroy Station would use approximately 15,350 gpd; an estimated 10.500 gpd would be used within the Downtown Gilroy station and 5,330 gpd would be used for outdoor use. For the East Gilroy Station approximately 10,200 gpd potable water would be used within the station and the remaining 5,200 gpd would be used outdoors. The total water consumption for both the San Jose Diridon Station and the Downtown Gilroy Station would be 40,000 gpd, and for the San Jose Diridon Station and the East Gilroy Station water consumption would be 39,500 gpd. Approximately two-thirds of the water for operation of the two stations would be potable water consumption.

Water consumption for operation of the MOWF and the MOWS would be required for personnel, including operation of drinking fountains, restrooms, kitchen/canteens, showers, and other potable uses. Potable water consumption would be approximately 84,000 gpd at the MOWF and 98,000 gpd at the MOWS, for a total of 182,000 gpd of potable water for both maintenance facilities. Water consumption would also be required for the MOWF and the MOWS for use by road and rail-mounted equipment including rail-grinding train runs and other maintenance activities. Water used for maintenance activities at the MOWF and the MOWS would not need to be of drinking water quality. Nonpotable water use is estimated as 1,000 gpd for operation of the MOWF and 1,000 gpd for operation of the MOWS (Authority 2017b, 2017c). Annual total water consumption for operation of the MOWF and the MOWS for potable and industrial uses would be 184,000 gpd, of which 182,000 gpd would be for potable uses and 2,000 gpd would be for nonpotable uses.

Conclusions

Construction of the project alternatives would result in net decrease in annual water consumption relative to existing water consumption within the project footprints. The decrease would be greatest under Alternative 2 (requiring 9 percent of existing use for construction), followed by Alternative 1 (requiring 10 percent of existing use), Alternative 3 (requiring 10 percent), and Alternative 4 (requiring 10 percent), as summarized in Table 3. Between 38 percent and 46 percent of the land that would be utilized for construction of the project alternatives is currently in

agricultural use. Per-acre water demand for agricultural land in Merced County was estimated at 3.7 acre-feet per year per acre of agricultural land, for San Benito County 1.9 acre-feet per year per acre, and for Santa Clara County 2.8 acre-feet per year per acre. Construction of the project would permanently remove the land from agricultural production, resulting in a reduction in water use for the converted land. Additionally, TCEs would be required to support construction activities along the project and would generally be located adjacent to active construction areas. These TCEs would temporarily remove additional agricultural lands from production, also resulting in a further temporary reduction in water consumption during the construction period. It is assumed that once construction of the project is completed, those agricultural lands affected by TCEs would be returned to agricultural use.

Water consumption for operation of the two stations would be approximately 40,000 gpd and for operation of the maintenance facilities in the project would be approximately 184,000 gpd for a total of 224,000 gpd (250 acre-feet per year). This is approximately 2.9 percent of existing water use for Alternative 1, 2.6 percent of existing water use for Alternative 2, 2.8 percent of existing water use for Alternative 3, and 2.8 percent of existing water use for Alternative 4. Construction and operation of the project would therefore reduce water consumption for all project alternatives.

References

DWR	California Department of Water Resources
SCVWD	Santa Clara County Water District
SLDMWA	San Luis and Delta-Mendota Water Authority
USGS	U.S. Geological Survey
WCP	Water Conservation Plan

California Department of Water Resources (DWR). 2005. Agricultural Land and Water Use Estimates. California Department of Water Resources, Land and Water Use, 2005. Available at: http://www.water.ca.gov/landwateruse/docs/annualdata/2005/Ag_County_2005.xls Accessed April 27, 2017.

———. 2006. Agricultural Land and Water Use Estimates. California Department of Water Resources, Land and Water Use, 2006. Available at: http://www.water.ca.gov/landwateruse/docs/annualdata/2006/Ag_County_2006.xls Accessed April 27, 2017.

———. 2007. Agricultural Land and Water Use Estimates. California Department of Water Resources, Land and Water Use, 2007. Available at:http://www.water.ca.gov/landwateruse/docs/annualdata/2007/Ag_County_2007.xls Accessed April 27, 2017.

———. 2008. Agricultural Land and Water Use Estimates. California Department of Water Resources, Land and Water Use, 2008. Available at: http://www.water.ca.gov/landwateruse/docs/annualdata/2008/Ag_County_2008.xls Accessed April 27, 2017.

———. 2009. Agricultural Land and Water Use Estimates. California Department of Water Resources, Land and Water Use, 2009. Available at: http://www.water.ca.gov/landwateruse/docs/annualdata/2009/Ag_County_2009.xls Accessed April 27, 2017.

———. 2010. Agricultural Land and Water Use Estimates. California Department of Water Resources, Land and Water Use, 2010. Available at: http://www.water.ca.gov/landwateruse/docs/annualdata/2010/Ag_County_2010.xls Accessed April 27, 2017.

———.2017. *Water Data Library.* Available at: http://www.water.ca.gov/waterdatalibrary/. Accessed June 20, 2017.

California High-Speed Rail Authority (Authority). 2017a. Personal Communication with James Tung on behalf of the California High-Speed Rail Authority. Email. May 3, 2017.

———.2017b. Email communication with James Deane, Design and Development Section Supervising Architect, on behalf of the California High-Speed Rail Authority. May 3, 2017.

———. 2017c. Email communication with Jonathan Scott, Director, Asset Management and Maintenance, on behalf of the California High-Speed Rail Authority. April 11, 2017.

City of Fresno. 2008. City of Fresno Urban Water Management Plan, Prepared for City of Fresno by West Yost Associates, August 2008. Available at: http://www.water.ca.gov/irwm/grants/docs/Archives/Prop1E/Submitted_Applications/P1E_Round1_SWFM/City%20of%20Fresno/Att3_SWF_WorkPlan_2of5.pdf. Accessed April 27, 2017.

City of Gilroy. 2002. Gilroy 2002–2020 General Plan. Available: http://www.cityofgilroy.org/274/2020-General-Plan. Accessed: May 9, 2016, March 23, 2017.

_____. 2005. Downtown Gilroy Specific Plan. Available: http://www.cityofgilroy.org/DocumentCenter/Home/View/1271. Accessed March 23, 2017.

City of Morgan Hill. 2016. Morgan Hill 2035 General Plan. Available: http://www.morgan-hill.ca.gov/75/General-Plan. Accessed on September 5, 2017.

City of San Jose. 2011. Envision: San José 2040 General Plan. Revised March 23, 2016. Available: https://www.sanjoseca.gov/DocumentCenter/Home/View/474. Accessed: June 3, 2016.

City of Santa Clara. 2010. City of Santa Clara 2010–2035 General Plan. Available: http://santaclaraca.gov/government/departments/community-development/planning-division/general-plan. Accessed on September 5, 2017.

County of San Benito. 2016a. San Benito County Annual Groundwater Report 2016, Prepared by TODD Groundwater for the San Benito County Water District, December 2016. Available at: https://www.sbcwd.com/AnnualGWReport.pdf Accessed April 26, 2017.

County of San Benito. 2016b. 2015 Hollister Urban Area Urban Water Management Plan, July 2016. Prepared by Todd Groundwater for the San Benito County Water District, Sunnyslope Water District, and City of Hollister. Available at: https://www.sbcwd.com/reports/2015%20Public%20Draft%20Urban%20Wtr%20Mgmt%20Plan.pdf Accessed April 26, 2017.

HNTB. 2018a. JM Construction Data -- AirQualityTRAppC_Construction_2018-12-05.xlsx

County of Merced. 2013. 2030 Merced County General Plan. Available: http://www.co.merced.ca.us/pdfs/planning/sudpmaps/Volta.pdf. Accessed: July 19, 2016, March 22, 2017

County of San Benito. 2015. San Benito County 2035 General Plan. Available: http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf. Accessed: May 16, 2016, March 22, 2017.

County of Santa Clara. 1994. Santa Clara County General Plan. Available: https://www.sccgov.org/sites/dpd/DocsForms/Documents/GP_Book_A.pdf. Accessed May 16, 2016, March 22, 2017.

———. 2016. Amendment to the Santa Clara County General Plan published November 2, 2016. https://www.sccgov.org/sites/dpd/PlansOrdinances/GP/Pages/GP.aspx (accessed April 2017).

Santa Clara Valley Water District (SCVWD). 2015. *Urban Water Management Plan.* May 2016. Available at: http://www.valleywater.org/uploadedFiles/Services/CleanReliableWater/WaterSupplyPlanning/Urban_Water_Managment_Plan/SCVWD%202015%20UWMP-Report%20Only.pdf Accessed April 27, 2017.

United States Geological Survey (USGS) 2017. USGS California Water Science Center, California Water Use, 2010. Available at: https://ca.water.usgs.gov/water_use/2010-california-water-use-data-usgs.xlsx; http://ca.water.usgs.gov/water_use/index.html, Accessed April 27, 2017.

APPENDIX 3.6-D: ENERGY ANALYSIS MEMORANDUM

Memorandum

DATE: Issued: November 16, 2016
Rev.#1: November 23, 2017
Rev.#2: March 27, 2017

TO: Authority and Regional Consultant Environmental Staff

FROM: Alice Lovegrove and Eddie Tadross, WSP Parsons Brinckerhoff

CC: Lisa Nungesser and Bryan Porter

SUBJECT: California High-Speed Rail Statewide Criteria Pollutant, GHG and Energy Analysis

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This revised version of the memo includes a discussion of statewide energy consumption for on-road vehicles, aircraft, and electrical energy that would change with future operation of the project. In addition, the statewide Excel spreadsheet summaries that accompany this memo have also been updated. Should you have any questions, please contact Alice Lovegrove at Lovegrove@pbworld.com or Eddie Tadross at Tadross@pbworld.com.

Overview

This memo describes the calculation of statewide criteria pollutant and greenhouse gas (GHG) emission levels associated with future operation of the California High-Speed Rail Project. This memo is meant to accompany Excel spreadsheet files with statewide summary emission data for the following high-speed rail (HSR) sections: San Francisco to San Jose, San Jose to Merced, Bakersfield to Palmdale, Palmdale to Burbank, Burbank to Los Angeles, and Los Angeles to Anaheim. An earlier analysis of emission levels for the Merced to Fresno and Fresno to Bakersfield HSR sections was completed several years ago.

The spreadsheets consist of multiple tables. The list below explains what is included as part of each spreadsheet file.

- MED - EX(2015) & EX+PROJ = Medium Alternative 2015 (Existing & Existing Plus Project)
- MED - 2029 NB&BD = Medium Alternative 2029 (No Build & Build)
- MED - 2040 NB&BD = Medium Alternative 2040 (No Build & Build)
- MED EXT - EX(2015) & EX+PROJ = Medium Extended Alternative 2015 (Existing & Existing Plus Project)
- MED EXT - 2029 NB&BD = Medium Extended Alternative 2029 (No Build & Build)
- MED EXT - 2040 NB&BD = Medium Extended Alternative 2040 (No Build & Build)
- HIGH - EX(2015) & EX+PROJ = High Alternative 2015 (Existing & Existing Plus Project)
- HIGH - 2029 NB&BD = High Alternative 2029 (No Build & Build)
- HIGH - 2040 NB&BD = High Alternative 2040 (No Build & Build)

Provided below is a description of the emission calculations. You can also use this text in preparing the air quality section for your HSR section environmental impact report/environmental impact statement (EIR/EIS).

Statewide and Regional Operational Emissions Calculations

The emission burden analysis of a project determines a project's overall impact on air quality levels. The project section would affect long-distance, city-to-city travel along freeways and highways throughout the state, as well as long-distance, city-to-city aircraft takeoffs and landings. The HSR system would also affect electrical demand throughout the state. Analysts calculated criteria pollutant and GHG operational emissions for three ridership scenarios: a medium ridership scenario of the Silicon Valley to Central Valley line (from San Jose to North of Bakersfield), a medium ridership scenario of an extended Silicon Valley to Central Valley line (from San Francisco to Bakersfield), and a high ridership scenario of the Silicon Valley to Central Valley line for Existing (2015) and Phase 1 of Statewide High-Speed Rail Build Out (2040) years. All applicable scenarios are based on the level of ridership as presented in the Authority's *2016 Business Plan* (Authority 2016). The tables in the effects analysis therefore present three values for operational emissions for each pollutant, corresponding to these three scenarios.

On-Road Vehicles

Analysts evaluated on-road vehicle emissions using average daily VMT estimates and associated average daily speed estimates for each affected county. Analysts estimated emission factors using the emission factors using the California Air Resources Board (CARB) emission factor program, EMission FACtors 2014 (EMFAC2014), which accounts for existing regulations that would reduce emissions, such as the Pavley Clean Car Standards. Parameters were set in the program for each individual county to reflect conditions within each county and statewide parameters to reflect travel through each county. The analysis was conducted for the following modeling years:

- Existing (Year 2015)
- Opening Year (Year 2029)
- Horizon Year (Year 2040)

To determine overall pollutant burdens generated by on-road vehicles, analysts multiplied the estimated VMT by the applicable pollutant's emission factors, which are based on speed, vehicle mix, and analysis year.

Aircraft

Analysts used the Federal Aviation Administration's Aviation Environmental Design Tool (AEDT) to estimate aircraft emissions. This tool estimates the emissions generated from specified numbers of landing and take-off cycles. Along with emissions from the aircraft themselves, emissions generated from associated ground maintenance requirements are included. Analysts calculated average aircraft emissions based on the profile of aircraft currently servicing the San Francisco to Los Angeles corridor. Analysts estimated the number of air trips removed attributable to the HSR using the results of the travel demand modeling analyses conducted for the project section, based on the ridership estimates presented in the California High-Speed Rail Authority's *2016 Business Plan* (Authority 2016).

Power Plants

Analysts conservatively estimated the electrical demands caused by propulsion of the trains and the trains at terminal stations and in storage depots and maintenance facilities as part of the project section design. Analysts derived average emission factors for each kilowatt-hour required from CARB statewide emission inventories of electrical and cogeneration facilities data along with USEPA eGRID2012 (released 10/2015) electrical generation data. The energy estimates used in this analysis for the propulsion of the HSR include the use of regenerative brake power.

The HSR system is currently analyzed as if it would be powered by the state's current electric grid. This is a conservative assumption because of the state requirement that an increasing fraction of electricity (50 percent by 2030) generated for the state's power portfolio come from renewable energy sources. As such, the emissions generated for the HSR system are expected to be lower in the future than the emissions estimated for this analysis. Furthermore, under the 2013 Policy Directive POLI-PLAN-03, the Authority has adopted a goal to purchase 100 percent of the HSR system's power from renewable energy sources.

Greenhouse Gas Analysis

As discussed in Section XX [of the EIR/EIS], Definition of Resource Study Area, the project section would reduce long-distance, city-to-city travel along freeways and highways throughout the state, as well as long-distance, city-to-city aircraft takeoffs and landings. The project section would also affect electricity demand throughout the state. These elements would affect GHG emissions in both the statewide and regional study areas. The methodology for estimating GHG emissions associated with operations of the project section is discussed below.

On-road Vehicle Emissions

Analysts conducted the on-road vehicle GHG emission analysis using the same methods and RSAs as described for air quality emission calculations in Section X, On-Road Vehicles.

Aircraft Emissions

Analysts calculated aircraft emissions by using the fuel consumption factors and emission factors from the CARB's 2000–2014 *Greenhouse Gas Emissions Inventory Technical Support Document* and the accompanying technical support document. The emission factor includes both landing and take-off and cruise operations (formula: aircraft emissions per flight = fuel consumption × emission factor; aircraft emissions = flights removed × aircraft emissions per flight). Analysts calculated average aircraft GHG emissions based on the profile of intrastate aircraft currently servicing the San Francisco to Los Angeles corridor. Analysts estimated the number of air trips removed attributable to the project section through the travel demand modeling analysis conducted for the project section, based on the ridership estimates presented in the Authority's *2016 Business Plan* (Authority 2016).

Power Plant Emissions

The electrical demands due to propulsion of the trains, stations, storage depots and maintenance facilities were calculated as part of the project design. Average GHG emission factors for each kilowatt-hour required were derived from USEPA eGRID2012 electrical generation data. The energy estimates used in this analysis for the propulsion of the HSR include the use of regenerative brake power.

In addition, because of the state requirement that an increasing fraction (50 percent by 2030) of electricity generated for the state's power portfolio come from renewable energy sources, the emissions generated for the HSR system are expected to be lower in the future when compared to emissions estimated for this analysis.

Energy Analysis

As discussed in Section XX [of the EIR/EIS], Definition of Resource Study Area, the project section would reduce long-distance, city-to-city travel along freeways and highways throughout the state, as well as long-distance, city-to-city aircraft takeoffs and landings. The project section would also affect electricity demand throughout the state. These elements would affect energy in both the statewide and regional study areas. The methodology for estimating energy associated with operation of the project section is discussed below.

On-road Vehicle Energy Usage

Analysts conducted the on-road vehicle energy analysis using the same inputs and RSAs as described for air quality emission calculations in Section X, Energy rates were determined through the use of carbon balance equations as recommended by CARB.

Aircraft Energy Usage

Analysts calculated aircraft energy use by using the fuel consumption factors from the CARB's 2000–2014 *Greenhouse Gas Emissions Inventory Technical Support Document* and the accompanying technical support document. The energy use includes both landing and take-off and cruise operations (formula: aircraft energy per flight = fuel consumption × btu/gallon of fuel; aircraft energy = flights removed × aircraft energy per flight). Analysts calculated average aircraft energy based on the profile of intrastate aircraft currently servicing the San Francisco to Los Angeles corridor. Analysts estimated the number of air trips removed attributable to the project section through the travel demand modeling analysis conducted for the project section, based on the ridership estimates presented in the Authority's *2016 Business Plan* (Authority 2016).

Energy Usage

The electrical demands due to propulsion of the trains, stations, storage depots and maintenance facilities were calculated as part of the project design. Analysts estimated the energy use based on the ridership estimates and train operating characteristics as presented in the Authority's *2016 Business Plan* (Authority 2016).

APPENDIX 3.7-A: SPECIAL-STATUS SPECIES SUBJECT TO PROJECT IMPACTS

Since publication of the Draft Environmental Impact Report/Environmental Impact Statement, the following substantive changes have been made to this appendix:

- Table 2 was updated to address the California Fish and Game Commission's designation of the southern California/Central Coast population of mountain lion under the California Endangered Species Act and the monarch butterfly's status as a candidate for listing under the federal Endangered Species Act.

Table 1 Special-Status Plant Species Potentially Subject to Project Impacts

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Alkali milkvetch *Astragalus tener* var. *tener*	–/–/1B.2	Playas, on adobe clay in valley and foothill grassland, vernal pools on alkaline soils; 1-60 meters	Nine CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Bent-flowered fiddleneck *Amsinckia lunaris*	–/–/1B.2	Coastal bluff scrub, valley and foothill grasslands, cismontane woodlands; 3-500 meters	Two CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Big-scale balsamroot *Balsamorhiza macrolepis*	–/–/1B.2	Sometimes on serpentine soils in chaparral, cismontane woodland, valley and foothill grassland; 90-1,555 meters	Six CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Monterey Corridor Subsection.
Brittlescale *Atriplex depressa*	–/–/1B.2	Alkaline clay soils in chenopod scrub, playas, valley and foothill grasslands; 1-320 meters	Two CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
California alkali grass *Puccinellia simplex*	–/–/1B.2	Alkaline, vernally mesic; sinks, flats, and lake margins in chenopod scrub, meadows and seeps, valley and foothill grasslands, and vernal pools; 2-930 meters	Seven CNDDB specific extant occurrence polygons in regional RSA; two overlap with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	–/–/1B.1	Grasslands on alkaline hills; below 455 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for all subsections.

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Chaparral ragwort *Senecio aphanactis*	–/–/2B.2	Oak woodland, coastal scrub, chaparral, open sandy or rocky areas, on alkaline soils; 15-800 meters	Three CNDDB specific extant occurrence polygons in regional RSA; two overlap with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass Subsection.
Colusa grass *Neostapfia colusana*	FT/SE/1B.1	Adobe soils of large vernal pools; 5-200 meters	38 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	–/–/1B.1	Alkaline soils in annual grassland, on lower slopes, flats, and swales, sometimes on saline soils; below 230 meters	Six CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Jose Diridon Station Approach and Monterey Corridor Subsections.
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	–/–/1B.1	Coastal salt marshes and swamps, grasslands, vernal pools, alkali sinks, playas, in alkaline soils; 1-1,220 meters	Three CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Coyote ceanothus *Ceanothus ferrisiae*	FE/–/1B.1	Serpentine soils in chaparral, coastal scrub, and valley and foothill grassland; 120-460 meters	Seven CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy Subsection.
Delta button-celery *Eryngium racemosum*	–/SE/1B.1	Riparian scrub in seasonally inundated depressions on clay soils; 3-30 meters	18 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Fragrant fritillary *Fritillaria liliacea*	–/–/1B.2	Adobe soils of interior foothills, coastal prairie, coastal scrub, valley and foothill grassland, often on serpentinite; 3-410 meters	14 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Monterey Corridor and Morgan Hill and Gilroy Subsections.
Greene's tuctoria *Tuctoria greenei*	FE/SR/1B.1	Dry vernal pools; 30-1,070 meters	Six CNDDB specific extant occurrence polygons in the regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Hairless popcornflower *Plagiobothrys glaber*	–/–/1A	Alkaline meadows and seeps, coastal salt marsh and swamps; 15-180 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy Subsection.
Hairy Orcutt grass *Orcuttia pilosa*	FE/SE/1B.1	Vernal pools; 46-200 meters	One CNDDB specific extant occurrence polygon in the regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Hall's bush-mallow *Malacothamnus hallii*	–/–/1B.2	Chaparral and coastal scrub; 10-760 meters	28 CNDDB specific extant occurrence polygons in regional RSA; four overlap with special-status plant study area. Modeled habitat present in special-status plant study area for Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections.
Heartscale *Atriplex cordulata* var. *cordulata*	–/–/1B.2	Saline or alkaline areas in chenopod scrub, meadows and seeps, sandy soils in valley and foothill grassland; below 560 meters	14 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Hispid salty bird's-beak *Chloropyron molle* ssp. *hispidum*	–/–/1B.1	Meadow and seeps, valley and foothill grassland, playa, on alkaline soils; 1-155 meters	28 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for all subsections.
Hoover's cryptantha *Cryptantha hooveri*	–/–/1A	Coarse, sandy soil in valley and foothill grassland; 9-150 meters	One CNDDB specific extant occurrence polygon in regional RSA does not overlap with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass and San Joaquin Valley Subsections.
Hoover's spurge *Euphorbia hooveri*	FT/–/1B.2	Below the high-water mark of large northern hardpan and volcanic vernal pools; 25-250 meters	One occurrence polygon in regional RSA does not overlap with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Hoover's button-celery *Eryngium aristulatum* var. *hooveri*	–/–/1B.1	Vernal pools; 3-45 meters	Three CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy Subsection.

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Hospital Canyon larkspur *Delphinium californicum* ssp. *interius*	–/–/1B.2	Openings in chaparral, mesic cismontane woodland, on moist slopes and ravines; 195-1,095 meters	10 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Indian Valley bush-mallow *Malacothamnus aboriginum*	–/–/1B.2	Granitic rocky areas in chaparral and oak woodland, often in burned areas; 150-1,700 meters	Two CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy Subsection.
Legenere *Legenere limosa*	–/–/1B.1	Deep, seasonally wet habitats such as vernal pools, ditches, marsh edges, and river banks; below 880 meters	One CNDDB specific extant occurrence polygons in regional RSA does not overlap with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Lemmon's jewelflower *Caulanthus lemmonii*	–/–/1B.2	Dry, exposed slopes in grasslands and pinyon-juniper woodland; 80-1,220 meters	Four CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass Subsection.
Lesser saltscale *Atriplex minuscula*	–/–/1B.1	Sandy alkaline soils in chenopod scrub, playas, valley and foothill grassland; 15-200 meters	Five CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Lime Ridge navarretia *Navarretia gowenii*	–/–/1B.1	Chaparral; 180-305 meters	One CNDDB specific extant occurrence polygons in regional RSA does not overlap with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass Subsection.
Little mousetail *Myosurus minimus* ssp. *apus*	–/–/3.1	Valley and foothill grassland, alkaline vernal pools; 20-640 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Loma Prieta hoita *Hoita strobilina*	–/–/1B.1	On mesic usually serpentinite substrates in chaparral, cismontane woodland, and riparian woodland; 30-860 meters	25 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy Subsection.

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Lost Hills crownscale *Atriplex coronata* var. *vallicola*	–/–/1B.2	Alkaline soils in chenopod scrub, valley and foothill grassland, vernal pools; 50-635 meters	Two CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass and San Joaquin Valley Subsections.
Metcalf Canyon jewelflower *Streptanthus albidus ssp. albidus*	FE/–/1B.1	Valley and foothill grassland, on serpentinite; 45-800 meters	33 CNDDB specific extant occurrence polygons in the regional RSA; one overlaps with special-status plant study area at Communication Hill in the Monterey Corridor Subsection. Modeled habitat present in the special-status plant study area for Monterey Corridor and Morgan Hill and Gilroy Subsections.
Most beautiful jewelflower *Streptanthus albidus* ssp. *peramoenus*	–/–/1B.2	On serpentinite outcrops in chaparral, cismontane woodland, valley and foothill grassland, on ridges and slopes; 95-1,000 meters	49 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Monterey Corridor and Morgan Hill and Gilroy Subsections.
Mount Diablo cottonweed *Micropus amphibolus*	–/–/3.2	Rocky sites in broadleafed upland forest, mixed evergreen forest, oak woodland, chaparral, valley and foothill grasslands; 45-825 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for Pacheco Pass Subsection.
Mount Hamilton fountain thistle *Cirsium fontinale* var. *campylon*	–/–/1B.2	Freshwater seeps and streams on serpentinite outcrops, chaparral, cismontane woodland, valley and foothill grassland; 100-890 meters	38 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Palmate-bracted bird's-beak *Chloropyron palmatum*	FE/SE/1B.1	Alkaline sites (wetlands) in grassland and chenopod scrub; 5-155 meters	No known occurrences in regional RSA. Modeled habitat present in San Joaquin Valley Subsection.
Pink creamsacs *Castilleja rubicundula* var. *rubicundula*	–/–/1B.2	Serpentine soils in chaparral openings, cismontane woodland, meadows and seeps, and valley and foothill grassland; 20-910 meters	No known occurrences in regional RSA. Modeled habitat present in the Morgan Hill and Gilroy Subsection.
Prostrate vernal pool navarretia *Navarretia prostrata*	–/–/1B.1	Vernal pools and mesic areas in coastal scrub and alkali grasslands; 15-1,210 meters	Nine CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Recurved larkspur *Delphinium recurvatum*	–/–/1B.2	Alkaline soils in valley and foothill grassland, saltbush scrub, cismontane woodland; 3-790 meters	Seven CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass and San Joaquin Valley Subsections.
Round-leaved filaree *California macrophylla*	–/–/1B.1	Cismontane woodland, valley and foothill grassland on clay soils; 15-1,200 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.
Saline clover *Trifolium hydrophilum*	–/–/1B.2	Salt marsh, mesic alkaline areas in valley and foothill grasslands, vernal pools, marshes and swamps; below 300 meters	Six CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Jose Diridon Station Approach, Monterey Corridor, and Morgan Hill and Gilroy Subsections.
San Antonio Hills monardella *Monardella antonina* ssp. *antonina*	–/–/3	Chaparral, oak woodland, open rocky slopes; 320-1,000 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
San Francisco collinsia *Collinsia multicolor*	–/–/1B.2	Closed-cone coniferous forest, coastal scrub; 30-250 meters	Four CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Jose Diridon Station Approach, Monterey Corridor, and Morgan Hill and Gilroy Subsections.
San Joaquin Orcutt grass *Orcuttia inaequalis*	FT/SE/1B.1	Vernal pools; 10-755 meters	20 CNDDB specific extant occurrence polygons in the regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
San Joaquin spearscale *Extriplex joaquinana*	–/–/1B.2	Alkaline soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland; 1-835 meters	Six CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and San Joaquin Valley Subsections.
Sanford's arrowhead *Sagittaria sanfordii*	–/–/1B.2	Freshwater marshes, sloughs, canals, and other slow-moving water habitats; below 650 meters	Eight CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass and San Joaquin Valley Subsections.

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Santa Clara Valley dudleya *Dudleya abramsii ssp. setchellii*	FE/–/1B.1	On rocky serpentinite sites in cismontane woodland, valley and foothill grassland; 60-455 meters	55 CNDDB specific extant occurrence polygons in the regional RSA; one overlaps with special-status plant study area north of Dana Rock Park (CNDDB occurrence 12) in Monterey Corridor Subsection. Modeled habitat present in the special-status plant study area for Monterey Corridor and Morgan Hill and Gilroy Subsections.
Shining navarretia *Navarretia nigelliformis* ssp. *radians*	–/–/1B.2	Mesic areas with heavy clay soils, in swales and clay flats, in oak woodland, grassland; 76-1,000 meters	34 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Pacheco Pass Subsection.
Showy golden madia *Madia radiata*	–/–/1B.1	Oak woodland, valley and foothill grassland, slopes; 25-1,215 meters	One CNDDB specific extant occurrence polygons in regional RSA does not overlap with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Slender-leaved pondweed *Stuckenia filiformis* ssp. *alpina*	–/–/2B.2	Freshwater marsh, shallow emergent wetlands and freshwater lakes, drainage channels; 300-2,150 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Smooth lessingia *Lessingia micradenia* var. *glabrata*	–/–/1B.2	On serpentinite in chaparral, oak woodland, often on roadsides; 120-420 meters	41 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections.
Tiburon paintbrush *Castilleja affinis* var. *neglecta*	FE/ST/1B.2	Serpentine grasslands; 60-400 meters	Two specific extant occurrence polygons in the regional RSA; none overlaps with special-status plant study area. Habitat was not modeled due to uncertainty of habitat parameters.
Two-fork clover *Trifolium amoenum*	FE/–/1B.1	Coastal bluff scrub, valley and foothill grasslands (sometimes serpentine); 5-415 meters	No known occurrences in regional RSA. Modeled habitat present in the Morgan Hill and Gilroy Subsection.
Vernal barley *Hordeum intercedens*	–/–/3.2	Coastal dunes, coastal scrub, vernal pools, saline streambeds, alkali flats, saline flats and depressions in valley and foothill grassland; 5-1,000 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.

Common Name *Scientific Name*	Status[1] Federal/State/CRPR	General Habitat Description	Occurrence in Regional RSA
Vernal pool smallscale *Atriplex persistens*	–/–/1B.2	Dry beds of vernal pools on alkaline soils; 10-115 meters	16 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.
Woodland woollythreads *Monolopia gracilens*	–/–/1B.2	Serpentinite soils in openings in broadleafed upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland; 100-1,200 meters	25 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Woolly-headed lessingia *Lessingia hololeuca*	–/–/3	Clay or serpentinite soils of broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland; 15-305 meters	No known occurrences in regional RSA. Modeled habitat present in special-status plant study area for Morgan Hill and Gilroy Subsection.
Wright's trichocoronis *Trichocoronis wrightii* var. *wrightii*	–/–/2B.1	On alkaline soils in floodplains, meadows and seeps, marshes and swamps, riparian forest, vernal pools; 5-435 meters	Two CNDDB specific extant occurrence polygons in regional RSA; one overlaps with special-status plant study area. Modeled habitat present in special-status plant study area for San Joaquin Valley Subsection.

[1] Species Status:
– = No status designation
Federal
FD = Delisted. Status to be monitored for 5 years.
FE = Listed as endangered under the federal Endangered Species Act.
FT = Listed as threatened under the federal Endangered Species Act.
State
SE = Listed as endangered under the California Endangered Species Act.
ST = Listed as threatened under the California Endangered Species Act.
SR = Listed as rare under the California Endangered Species Act.
SSC = California Species of Special Concern

CRPR (California Rare Plant Rank)
1A = Presumed extinct in California
1B = Rare, threatened, or endangered in California and elsewhere
2B = Rare, threatened, or endangered in California, but more common elsewhere
3 = More information needed about this plant (Review List).
.1: Seriously endangered in California
.2: Fairly endangered in California
.3: Not very endangered in California

Table 2 Special-Status Wildlife Species Potentially Subject to Project Impacts

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Invertebrates			
Monarch butterfly *Danaus plexippus*	C/–	Occurs throughout the United States and Canada where milkweed species (Asclepias spp.), their host plants, are present. Habitat includes breeding, migratory, and overwintering sites with both milkweed plants as well as other floral resources (nectar sources). Milkweed plants and other floral resources can be found in a variety of natural and manipulated landscapes. Overwintering sites occur in coastal California on groves of trees generally very close to the ocean or San Francisco Bay.	Only overwintering sites are currently tracked in CNDDB and none occur within the RSA. Numerous records from a variety of sources indicate that milkweed plants and monarch butterflies are present in the RSA.
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT(CH)/–	Occurs in serpentine grassland vegetation in Santa Clara and San Mateo Counties. Primary host plant is dwarf plantain (*Plantago erecta*); secondary host plants are purple owl's-clover (*Castilleja densiflora*) and exserted paintbrush (*Castilleja exserta*) Physical or biological features of critical habitat include annual or perennial grassland with little or no overstory that provide north–south and east–west slopes with a tilt of no more than 7 degrees for larval host plant survival during atypical weather; the primary host plant and at least one secondary host plant; adult nectar sources for feeding; soils derived from serpentine rock; and stable holes and cracks in the soil, and rock outcrops that provide shelter for larvae during summer diapause.	11 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with HSA at Tulare Hill in the Santa Clara Valley (CDFW 2016a). Modeled habitat present in HSA for Monterey Corridor and Morgan Hill and Gilroy Subsections. Designated critical habitat present in Morgan Hill and Gilroy Subsection; Tulare Hill Unit (Unit 6) overlaps with HSA at Monterey Road and Metcalf Road; San Marin Unit (Unit 12) includes several network upgrade sites.
Crotch bumble bee *Bombus crotchii*	–/SCE	Open grassland and scrub in the Mediterranean region of California from along the Pacific Coast through the Inner Coast ranges and Great Central Valley into the Sierra foothills and the western portion of the Mohave Desert. Nests underground. Little known about overwintering sites but likely overwinters in soft, disturbed soils or under leaf litter or other ground debris like other bumble bees. Feeds on nectar and pollen from a variety of flowering plants, primarily those in the plant families Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Boraginaceae.	One CNDDB specific occurrence polygon in regional RSA that does not overlap with HSA. One verified iNaturalist observation[2] in regional RSA west of Santa Teresa County Park in south San Jose that also does not overlap with HSA (2.5 miles outside project footprint). Modeled habitat present in HSA for all subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Conservancy fairy shrimp *Branchinecta conservatio*	FE(CH)/–	Found in large, deep, and turbid pools in the northern 2/3 of the Central Valley; inhabit pools located in swales formed by old, braided alluvium, filled by winter/spring rains, which last until June. Physical or biological features of critical habitat include topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in continuous, or intermittently, flowing surface water connecting depressional features with underlying restrictive soil layers that become inundated by winter rains and continuously hold water for a minimum of 19 days; sources of food (e.g., single-celled bacteria and algae) in the pools; and structure in the pools consisting of organic and inorganic materials (e.g., living and dead plants, rocks) that provide shelter.	13 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for San Joaquin Valley Subsection.
Longhorn fairy shrimp *Branchinecta longiantenna*	FE(CH)/–	Endemic to the eastern margin of the central Coast Range in vernal pool grassland. Inhabit small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales. Physical or biological features of critical habitat include topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in continuous, or intermittently, flowing surface water connecting depressional features with underlying restrictive soil layers that become inundated by winter rains and continuously hold water for a minimum of 23 days; sources of food (e.g., single-celled bacteria and algae) in the pools; and structure in the pools consisting of organic and inorganic materials (e.g., living and dead plants, rocks) that provide shelter.	Two specific extant occurrence polygons in regional RSA, associated with entire GEA; one overlaps with HSA. Modeled habitat present in HSA for San Joaquin Valley Subsection.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Vernal pool fairy shrimp *Branchinecta lynchi*	FT(CH)/–	Found in vernal pools, small clear-water sandstone depression pools, and grassy swales within annual grasslands throughout the central valley and central and south coast ranges. Physical or biological features of critical habitat include topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in continuous, or intermittently, flowing surface water connecting depressional features with underlying restrictive soil layers that become inundated by winter rains and continuously hold water for a minimum of 18 days; sources of food (e.g., single-celled bacteria and algae) in the pools; and structure in the pools consisting of organic and inorganic materials (e.g., living and dead plants, rocks) that provide shelter.	182 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for San Joaquin Valley Subsection.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE(CH)/–	Found in large vernal pools underlain by hardpan or in sandstone depressions; water in the vernal pools tends has very low alkalinity and conductivity. Physical or biological features of critical habitat include topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in continuous, or intermittently, flowing surface water connecting depressional features with underlying restrictive soil layers that become inundated by winter rains and continuously hold water for a minimum of 18 days; sources of food (e.g., single-celled bacteria and algae) in the pools; and structure in the pools consisting of organic and inorganic materials (e.g., living and dead plants, rocks) that provide shelter.	47 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT/–	Streamside and oak savannah habitats throughout the Central Valley. Host plant is the elderberry shrub for larval development and adult forage. Stems measuring greater than 1 inch diameter are considered suitable habitat. Species always found close to host plant. Larvae may remain in stems for as long as 2 years.	Five CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for Pacheco Pass and San Joaquin Valley Subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Fish			
Pacific lamprey *Entosphenus tridentatus*	–/SSC	In California, occurs along the coast and in coastal and estuarine streams from Los Angeles and Del Norte Counties and the rivers in the Central Valley. Upstream range limited by impassable barriers such as dams on major Central Valley rivers. Requires cold, clear water for spawning and incubation.	No CNDDB occurrences in regional RSA but known to occur in accessible reaches below dams in the Coyote Creek, Guadalupe River, Pajaro River, and San Joaquin River watersheds in the San Jose Diridon Station Approach, Monterey Corridor, and Morgan Hill and Gilroy Subsections.[3] Modeled habitat present in HSA for all subsections.
Steelhead – Central California Coast and South-Central California Coast DPSs *Oncorhynchus mykiss*	FT(CH)/–	Cold, clear water with clean gravel of appropriate size for spawning. Most spawning occurs in headwater streams. Steelhead migrate to the ocean to feed and grow until sexually mature. Physical or biological features of critical habitat include migration corridors to and from spawning areas that are free of barriers and maintain proper flow and water quality; freshwater spawning and rearing areas of high water quality and suitable substrate and forage; and estuarine and near-shore rearing areas of suitable water quality and forage.	Modeled habitat present in HSA for Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections. Designated critical habitat present in Morgan Hill and Gilroy and Pacheco Pass Subsections.
Chinook salmon – Central Valley Fall-/Late Fall-Run ESU[4] *Oncorhynchus tshawytscha*	EFH/SSC	Central Valley rivers and tributaries below impassable barriers. Adults enter rivers from San Francisco Estuary and move quickly to spawning grounds of cold, clear water with large gravel or cobble substrate. Peak spawning typically occurs October to November, but can continue through December and into January. Freshwater EFH for the Pacific salmon fishery (including chinook salmon) consists of four major components, 1) spawning and incubation; 2) juvenile rearing; 3) juvenile migration corridors; and 4) adult migration corridors and holding habitat.	San Joaquin River and its tributaries below impassable barriers. Designated freshwater EFH and modeled habitat present in Coyote Creek, Los Gatos Creek, and the Guadalupe River in the San Jose Diridon Station Approach, Monterey Corridor, and Morgan Hill and Gilroy Subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Amphibians			
California tiger salamander *Ambystoma californiense*	FT(CH)/ST	Annual grasslands and grassy understory of valley-foothill hardwood habitats (i.e., oak-savannah) with mammal burrows or other underground refugia. Requires vernal pools, small ponds, or lakes for breeding and mammal burrows or other underground refuges for cover during the dry season. Physical or biological features of critical habitat include: standing bodies of fresh water that become inundated during winter rains and typically hold water for a minimum of 12 weeks; upland habitat that contains small mammal burrows or other underground refugia; and upland dispersal habitat that allows for movement between occupied breeding sites.	261 CNDDB specific extant occurrence polygons in regional RSA; six overlap with HSA in Santa Clara Valley. Modeled habitat present in HSA for all subsections. Designated critical habitat present in Morgan Hill and Gilroy Subsection. Lions Peak Unit (Bay Area Geographic Region Units 10a and 10b) overlaps portion of PG&E Spring to Llagas and Green Valley to Llagas 115-kV power lines; San Felipe Unit (Bay Area Geographic Region Unit 12) overlaps with Tunnel 1.
California red-legged frog *Rana draytonii*	FT(CH)/SSC	Pools in marshes, streams, ponds, with emergent vegetation, and typically without predatory fish. In areas without year-round water or in colder temperatures, frogs require adequate hibernacula, such as small mammal burrows or moist leaf litter. Physical or biological features of critical habitat include standing bodies of fresh water that typically become inundated during winter rains and hold water for a minimum of 20 weeks; freshwater ponds and streams that may not hold water long enough to support the species' aquatic life cycle but that provide for shelter, foraging, predator avoidance, and aquatic dispersal of juveniles and adults; and upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile.	229 CNDDB specific extant occurrence polygons in regional RSA; five overlap with HSA: one at Ogier Ponds near Coyote Creek, one in Pacheco Creek near Casa de Fruta, two intermittent streams near Pacheco Pass, one at large pond northwest of San Luis Reservoir. Modeled habitat present in HSA for Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections. Designated critical habitat present in Morgan Hill and Gilroy and Pacheco Pass Subsections. Wilson Peak unit (Unit STC-2) overlaps with HSA at Tunnel 1 in Morgan Hill and Gilroy Subsection and between Casa de Fruta and San Luis Reservoir in Pacheco Pass Subsection.
Foothill yellow-legged frog *Rana boylii*	–/SCT;SSC	Foothills of the Sierra Nevada and Coast Range. Occurs in rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands. Cobble-sized substrate required for egg laying.	33 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Western spadefoot *Spea* (=*Scaphiopus*) *hammondii*	–/SSC	Open areas with sandy or gravelly soils in a variety of habitats within central valley, foothills, and south coast ranges. Breeds in vernal pools and other seasonal pools or swales.	48 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Reptiles			
Western pond turtle *Emys* (= *Clemmys* /*Actinemys*) marmorata	–/SSC	Inhabits ponds, marshes, rivers, streams, and irrigation ditches throughout the valley, foothills, and coast ranges of California. Needs basking sites such as partially submerged logs or rocks, and suitable upland habit (sandy banks or grassy open fields) for egg laying. Primarily in fresh water, may also enter brackish, or rarely saltwater.	134 CNDDB specific extant occurrence polygons in regional RSA; four overlap with HSA. Modeled habitat present in HSA for all subsections.
Blunt-nosed leopard lizard *Gambelia sila*	FE/SE;FP	Resident of sparsely vegetated grasslands, alkali flats, and washes within the San Joaquin valley. Prefers flat areas with open space for running, avoiding densely vegetated areas. Seek cover in mammal burrows, under shrubs or structures such as fence posts; do not excavate their own burrows. Semiarid grasslands, alkali flats, and washes.	Six CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA at eastern end of Pacheco Pass Subsection.
San Joaquin coachwhip *Masticophis flagellum ruddocki*	–/SSC	Open, dry, treeless areas, including grassland and saltbush scrub in western San Joaquin Valley. Takes refuge in rodent burrows, under shaded vegetation, and under surface objects.	19 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Northern California legless lizard *Anniella pulchra*	–/SSC	Semi-stabilized sand dunes, areas with sandy soil, and high moisture content, vegetated with oak or pine-oak woodland, chaparral; also wooded stream edges, and occasionally desert-scrub. Dunes with bush lupine and mock heather often indicate suitable conditions. Often found in leaf litter, under rocks, logs, and driftwood.	No known occurrences in regional RSA. Modeled habitat present in HSA for Morgan Hill and Gilroy and Pacheco Pass Subsections.
Coast (= Blainville's) horned lizard *Phrynosoma blainvillii*	–/SSC	Sandy or loose soils within grasslands, brushlands, woodlands, and open coniferous forest. Dietary specialists dependent on ants, as well as beetles and other seasonally abundant insects. Forage on the ground in open areas, usually between shrubs and often near an ant nest. Utilize small mammal burrows or burrow under surface objects during periods of extended inactivity or hibernation.	15 CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for Morgan Hill and Gilroy and Pacheco Pass Subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Giant garter snake *Thamnophis gigas*	FT/ST	Found in freshwater marshes and low-gradient streams. Prefers habitat with dense emergent vegetation, deep and shallow pools of water (which persist throughout the seasonal cycle of activity), open areas along water margins, and upland habitat with access to structures suitable for hibernation and escape from flooding. Has adapted to drainage canals and irrigation ditches within agricultural areas.	28 CNDDB specific extant occurrence polygons in regional RSA; two overlap with HSA at GEA (CNDDB occurrences 23 and 161). Modeled habitat present in HSA for Pacheco Pass and San Joaquin Valley Subsections.
Birds			
Short-eared owl *Asio flammeus*	–/SSC	Year-round resident in California. Nests on ground within coastal and inland prairies, grasslands, meadows, marshes, and farmlands with abundant rodent populations.	No known occurrences in regional RSA. Modeled habitat present in HSA for Pacheco Pass and San Joaquin Valley Subsections.
Grasshopper sparrow *Ammodramus savannarum*	–/SSC	Summer resident in California from March to September. Occurs in short- to middle-height, moderately open grasslands with scattered shrubs.	No known CNDDB occurrences in regional RSA, but multiple reports in eBird.[4] Modeled habitat present in HSA for Pacheco Pass and San Joaquin Valley Subsections.
Mountain plover *Charadrius montanus*	–/SSC	Winter visitor to California range. Roost and forage in short grasslands, freshly plowed fields, and bare ground with flat topography. Prefers fallow, grazed, or burned areas and alkali flats with burrowing rodents.	Five CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for Pacheco Pass and San Joaquin Valley Subsections.
Western snowy plover (interior population) *Charadrius alexandrinus nivosus*	– (interior population)/SSC	Year-round resident in California. Nests at inland lakes throughout northeastern, central, and southern California, including Mono Lake and Salton Sea. Feeds primarily on terrestrial and aquatic invertebrates.	Two CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA.
Western burrowing owl *Athene cunicularia*	–/SSC	Year-round resident in lowlands throughout much of California. Migrants from other parts of western North America may augment resident populations in winter. Found in open, dry, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Uses small mammal burrows for nesting and winter refuge. May also use rock piles and culverts as roost sites	94 CNDDB specific extant occurrence polygons in regional RSA; four overlap with HSA. Modeled habitat present in HSA for all subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Golden eagle *Aquila chrysaetos*	–/FP	Permanent resident and migrant throughout California range. Found in mountains and foothills. Nests on cliff edges or large trees in open areas. Needs open terrain for hunting: grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats.	Five CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for all subsections.
Bald eagle *Haliaeetus leucocephalus*	–/SE;FP	Mainly found in mountainous habitats near reservoirs, lakes, and rivers and builds nests in the upper canopy of large coniferous trees. Most nest within 1 mile of water.	Five CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA; San Luis Reservoir nest (CNDDB occurrence 365) 2.9 miles west of project footprint at Tunnel 2 east portal. Modeled habitat present in HSA for Morgan Hill and Gilroy and Pacheco Pass Subsections.
American peregrine falcon *Falco peregrinus anatum*	–/FP	Found year-round within California range in a variety of habitats, most with cliffs for nesting and open areas for foraging. Also uses large cities and nests on buildings.	Four CNDDB specific extant occurrence polygons in regional RSA; one overlaps with HSA. Modeled habitat present in HSA for all subsections.
Northern harrier *Circus cyaneus*	–/SSC	Occurs year-round within breeding range in California and may potentially winter in areas statewide. Breeds and forages in variety of open (treeless) habitats such as marshes, meadows, pastures, prairies, weedy borders of lakes, rivers, and streams, grasslands, some croplands, sagebrush flats, and desert sinks. Constructs nests on ground in open field or meadow in shrubby vegetation, usually near wet areas.	10 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with HSA. Modeled habitat present in HSA for all subsections.
White-tailed kite *Elanus leucurus*	–/FP	Found year-round within California range in grasslands, agricultural fields, oak woodlands, savannah, and riparian habitats in rural and urban areas. They are often found along tree-lined river valleys with adjacent open areas. Nest in trees.	Five CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for all subsections.
Swainson's hawk *Buteo swainsoni*	–/ST	South American migrant that breeds in Central Valley of California. Found in open country such as grassland, shrubland, and agricultural areas. Nests in riparian areas and oak woodlands as well as isolated and roadside trees close to grassland or agricultural foraging habitat.	193 CNDDB specific extant occurrence polygons in regional RSA; 8 overlap with HSA. Modeled habitat present in HSA for Monterey Corridor, Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
California condor *Gymnogyps californianus*	FE/SE;FP	Permanent resident of the semi-arid, rugged mountain ranges surrounding southern San Joaquin Valley. Nests in caves, crevices, behind rock slabs, or on large ledges on high sandstone cliffs.	No known occurrences in regional RSA; HSA study area within flying distance of Pinnacles Nat'l Park. Habitat not modeled for this species but Diablo Range could be used for foraging if the species' range expands.
Loggerhead shrike *Lanius ludovicianus*	–/SSC	Year-round throughout most of California range; some breeding populations may be migratory. Wintering individuals augment resident populations and occupy areas where none breed. Breeds and forages in open habitats interspersed with shrubs and small trees, including disturbed habitats. Nests placed in trees.	Three CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for all subsections.
Purple martin *Progne subis*	–/SSC	Summer resident and migrant in California. Uses wide variety of nesting substrates (e.g., tree cavities, bridges, utility poles, lava tubes, buildings); however, sites must have low canopy cover at nest height. Most tree nest sites located in upper slopes of hilly and mountainous terrain. Often found near large wetlands and other water bodies. Starlings are competitors and must be present in low densities or absent.	One CNDDB specific extant occurrence polygons in regional RSA does not overlap with HSA. Modeled habitat present in HSA for Pacheco Pass Subsection.
Olive-sided flycatcher *Contopus cooperi*	–/SSC	Summer resident and migrant in California primarily from mid-April through early October. Breeds in montane and northern coniferous forest, at edges and openings. Winters at forest edges and clearings with tall trees or snags.	No known occurrences in regional RSA. Modeled habitat present in HSA for Pacheco Pass Subsection.
Least Bell's vireo *Vireo bellii pusillus*	FE/SE	Summers within California range. Typically inhabits structurally diverse dense riparian woodlands/shrubs along water courses or near open water. Nests in shrub or low tree, usually about 3 feet above ground, in horizontal or down-sloping twig fork, typically near edge of thicket. Obligate riparian species during breeding season. Brown-headed cowbird severe threat.	Four CNDDB specific extant occurrence polygons in regional RSA; one overlaps with HSA near Gilroy (CNDDB occurrence 198). Modeled habitat present in HSA for all subsections. Modeled habitat present in HSA for Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.
Yellow warbler *Setophaga petechia*	–/SSC	Riparian vegetation in close proximity to water along streams and in wet meadows.	No known CNDDB occurrences in regional RSA, but multiple reports in eBird,[4] several of which are in the HSA for the San Jose Diridon Station approach, Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections. Modeled habitat is present in these subsections, as well.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Yellow-breasted chat *Icteria virens*	–/SSC	Summer resident and migrant in California, primarily from late March to late September. Nests locally in coastal mountains and Sierra Nevada foothills, east of the Cascades in northern California, along the Colorado river, and very locally inland in southern California. Occurs in early successional riparian habitat with a well-developed shrub layer and open canopy.	No known CNDDB occurrences in regional RSA, but multiple reports in eBird,[4] several of which are in the HSA for the Morgan Hill and Gilroy Subsection. Modeled habitat present in HSA for the San Jose Diridon Station approach, Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections.
Tricolored blackbird *Agelaius tricolor*	—/SCE;SSC	Almost endemic to California; permanent resident and migrant. Highly colonial species, most numerous in Central Valley and vicinity. Nests next to open water typically in freshwater marsh habitat where there is extensive emergent or riparian vegetation. Increasing percentage of breeding colonies has been reported in grain fields. Forages in grasslands, wetland habitats, and some agricultural areas.	129 CNDDB specific extant occurrence polygons in regional RSA; six overlap with HSA. Modeled habitat present in HSA for all subsections.
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	–/SSC	Mainly summer resident and migrant in California range; small numbers winter. Breeds in loose colonies in freshwater wetlands (e.g., marshes) with tall dense emergent vegetation adjacent to deep water, and along borders of lakes or ponds. Places its nest over water, attached to cattails and reeds. Forages in the wetlands and in surrounding grasslands and croplands. In winter large flocks forage in agricultural areas.	One CNDDB specific extant occurrence polygons in regional RSA does not overlap with HSA. Modeled habitat present in HSA for San Joaquin Valley Subsection.
Greater sandhill crane *Antigone canadensis tabida*	–/ST;FP	Migratory resident found in grassland, moist croplands, shallow lacustrine, and fresh emergent wetland habitats in the Sacramento and San Joaquin Valley. Breeding occurs in wetland and meadow habitat in Lassen, Modoc, Plumas, Shasta, Sierra, and Siskiyou counties.	No CNDDB occurrences in regional RSA, but multiple species-level reports in eBird,[4] including several locations in the HSA for the San Joaquin Valley Subsection. It is likely that at least some of the observed individuals belonged to the “greater” subspecies. Modeled habitat present in San Joaquin Valley Subsection.
Lesser sandhill crane *Antigone canadensis canadensis*	–/SSC	Winters and migrates through Central Valley and Imperial Valley, with main wintering concentrations in Merced County and Sacramento-San Joaquin River Delta. Forages on waste grains and other seeds in agricultural fields, pastures, and grassland. Does not breed in California.	No CNDDB occurrences in regional RSA, but multiple species-level reports in eBird,[4] including several locations in the HSA for the San Joaquin Valley Subsection. It is likely that most of the observed individuals belonged to the “lesser” subspecies. Modeled habitat present in San Joaquin Valley Subsection.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Mammals			
San Joaquin kit fox *Vulpes macrotis mutica*	FE/ST	Occurs in the San Joaquin Valley in annual grassland or grassy open stages with scattered shrubby vegetation; requires loose-textured sandy soils for burrowing; requires suitable prey base of small rodents, including kangaroo rats or California ground squirrels.	72 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with HSA. Modeled habitat present in HSA for Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections.
Fresno kangaroo rat *Dipodomys nitratoides exilis*	FE/SE	Restricted to native grasslands in Fresno County within the San Joaquin Valley; nearly level, light, friable soils in chenopod scrub and grassland communities.	No known occurrences in regional RSA. Modeled habitat present in HSA for San Joaquin Valley Subsection.
Mountain lion *Puma concolor*	–/SCT[5]	Occurs throughout most of California in grasslands, woodlands, and a variety of other habitats. Large ungulates, especially deer, are the primary prey; however, they are opportunistic predators feeding on a wide variety of other large and smaller prey.	The species is known to occur in the HSA. The Southern California/Central Coast ESU includes all areas in the HSA to the west of the Central Valley (generally those areas west of I-5).
American badger *Taxidea taxus*	–/SSC	Occurs throughout California in grasslands, savannas, and mountain meadows near timberline; requires friable soils and relatively open, uncultivated ground; requires suitable prey base of burrowing rodents such as gophers, ground squirrels, marmots, and kangaroo rats.	No known occurrences in regional RSA. Modeled habitat present in HSA for Pacheco Pass and San Joaquin Valley Subsections.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	–/SSC	Occurs in wooded habitats in San Francisco south through Santa Clara County.	Six CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass Subsections.
Ringtail *Bassariscus astutus*	–/FP	Occurs throughout California in dry, rocky, or mountainous areas with scattered oaks and conifers as well as riparian communities; requires hollow trees, logs, cavities in rocky areas, or other recesses for cover and breeding.	No known occurrences in regional RSA but species difficult to detect and therefore poorly represented in CNDDB.
Townsend's big-eared bat *Corynorhinus townsendii*	–/SSC	Found in a variety of habitats throughout California, most commonly in mesic sites, including coniferous forests, mixed mesophytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. Typically found in areas within caves and cave-like roosting habitat, such as mines, buildings, bridges and basal hollows in big old-growth trees.	15 CNDDB specific extant occurrence polygons in regional RSA; one overlaps with HSA. Modeled habitat present in HSA for all subsections.

Common Name *Scientific Name*	Status[1] Federal/State	Habitat	Occurrence in Regional RSA
Western mastiff bat *Eumops perotis californicus*	–/SSC	Roosts in crevices in cliff faces, high buildings, and tunnels; forages in arid, semi-arid habitat-coniferous and deciduous woodlands, coastal scrub, grasslands, and chaparral.	Six CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for all subsections.
Western red bat *Lasiurus blossevillii*	–/SSC	Occurs throughout California; roosts primarily in trees, typically adjacent to open fields or streams, which are protected above and open below for foraging; prefers habitat edges and mosaics with trees.	Six CNDDB specific extant occurrence polygons in regional RSA; none overlaps with HSA. Modeled habitat present in HSA for all subsections.

CNDDB = California Natural Diversity Database
DPS = distinct population segment
ESU = evolutionarily significant unit
GEA = Grasslands Ecological Area
HSA = habitat study area
I- = Interstate
RSA = regional study area

[1] Status:
Federal codes: – = no status designation; FE = listed as endangered under FESA; FT = listed as threatened under FESA; (CH) = designated critical habitat; EFH = designated essential fish habitat; C = candidate for listing
State codes: – = no status designation; SE = listed as endangered under CESA; ST = Listed as threatened under CESA; SCE = State candidate for listing as endangered under CESA; SCT = State candidate for listing as threatened under CESA; SSC = CDFW Species of Special Concern; FP = California Fully Protected Species

[2] Naturalist. 2019. Bombus crotchii *occurrence records from Santa Clara and San Joaquin Valleys*. Available: https://www.inaturalist.org. Accessed: October 8, 2019.

[3] Goodman, D.H. and S.B. Reid. 2012. *Pacific Lamprey (Entosphenus tridentatus) Assessment and Template for Conservation Measures in California*. U.S. Fish and Wildlife Service, Arcata, California. 117 pp.

[4] Sullivan, B.L., C.L. Wood, M.J. Iliff, R.E. Bonney, D. Fink, and S. Kelling. 2009. eBird: a citizen-based bird observation network in the biological sciences. *Biological Conservation* 142: 2282–2292.

[5] The candidate status applies to the Southern California/Central Coast Evolutionarily Significant Unit.

APPENDIX 3.7-B: SCIENTIFIC NOMENCLATURE

Table 1 Scientific Nomenclature of All Species Mentioned in Text

Common Name	*Scientific Name*
Plants	
Alkali milkvetch	*Astragalus tener* var. *tener*
Anderson's manzanita	*Arctostaphylos andersonii*
Arburua Ranch jewelflower	*Streptanthus insignis* ssp. *lyonii*
Arcuate bush-mallow	*Malacothamnus arcuatus*
Bent-flowered fiddleneck	*Amsinckia lunaris*
Big-scale balsamroot	*Balsamorhiza macrolepis*
Bristly sedge	*Carex comosa*
Brittlescale	*Atriplex depressa*
California alkali grass	*Puccinellia simplex*
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*
Chaparral harebell	*Campanula exigua*
Chaparral ragwort	*Senecio aphanactis*
Colusa grass	*Neostapfia colusana*
Congdon's tarplant	*Centromadia parryi* ssp. *congdonii*
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*
Coyote ceanothus	*Ceanothus ferrisiae*
Delta button-celery	*Eryngium racemosum*
Eucalyptus	*Eucalyptus* spp.
Fragrant fritillary	*Fritillaria liliacea*
Giant reed	*Arundo donax*
Greene's tuctoria	*Tuctoria greenei*
Hairless popcornflower	*Plagiobothrys glaber*
Hairy Orcutt grass	*Orcuttia pilosa*
Hall's bush-mallow	*Malacothamnus hallii*
Heartscale	*Atriplex cordulata* var. *cordulata*
Hispid salty bird's-beak	*Chloropyron molle* ssp. *hispidum*
Hooker's manzanita	*Arctostaphylos hookeri* ssp. *hookeri*
Hoover's cryptantha	*Cryptantha hooveri*
Hoover's spurge	*Euphorbia hooveri*
Hoover's button-celery	*Eryngium aristulatum* var. *hooveri*
Hospital Canyon larkspur	*Delphinium californicum* ssp. *interius*
Indian Valley bush-mallow	*Malacothamnus aboriginum*

Common Name	*Scientific Name*
Kings Mountain manzanita	*Arctostaphylos regismontana*
Legenere	*Legenere limosa*
Lemmon's jewelflower	*Caulanthus lemmonii*
Lesser saltscale	*Atriplex minuscula*
Lime Ridge navarretia	*Navarretia gowenii*
Little mousetail	*Myosurus minimus* ssp. *apus*
Loma Prieta hoita	*Hoita strobilina*
Lost Hills crownscale	*Atriplex coronata* var. *vallicola*
Marsh microseris	*Microseris paludosa*
Merced phacelia	*Phacelia ciliata* var. *opaca*
Metcalf Canyon jewelflower	*Streptanthus albidus ssp. albidus*
Most beautiful jewelflower	*Streptanthus albidus* ssp. *peramoenus*
Mount Diablo cottonweed	*Micropus amphibolus*
Mount Hamilton fountain thistle	*Cirsium fontinale* var. *campylon*
Mount Hamilton jewelflower	*Streptanthus callistus*
Pajaro manzanita	*Arctostaphylos pajaroensis*
Palmate-bracted bird's-beak	*Chloropyron palmatum*
Pink creamsacs	*Castilleja rubicundula* var. *rubicundula*
Pinnacles buckwheat	*Eriogonum nortonii*
Prostrate vernal pool navarretia	*Navarretia prostrata*
Recurved larkspur	*Delphinium recurvatum*
Rock sanicle	*Sanicula saxatilis*
Round-leaved filaree	*California macrophylla*
Saline clover	*Trifolium hydrophilum*
San Antonio Hills monardella	*Monardella antonina* ssp. *antonina*
San Francisco collinsia	*Collinsia multicolor*
San Joaquin Orcutt grass	*Orcuttia inaequalis*
San Joaquin spearscale	*Extriplex joaquinana*
Sanford's arrowhead	*Sagittaria sanfordii*
Santa Clara Valley dudleya	*Dudleya abramsii ssp. setchellii*
Santa Cruz clover	*Trifolium buckwestiorum*
Santa Cruz Mountains beardtongue	*Penstemon rattanii* var. *kleei*
Shining navarretia	*Navarretia nigelliformis* ssp. *radians*
Showy golden madia	*Madia radiata*
Slender-leaved pondweed	*Stuckenia filiformis* ssp. *alpina*

Common Name	*Scientific Name*
Smooth lessingia	*Lessingia micradenia* var. *glabrata*
Spiny-sepaled button-celery	*Eryngium spinosepalum*
Subtle orache	*Atriplex subtilis*
Succulent owl's-clover	*Castilleja campestris* var. *succulenta*
Tamarisk	*Tamarisk* sp.
Tiburon paintbrush	*Castilleja affinis* var. *neglecta*
Vernal barley	*Hordeum intercedens*
Vernal pool smallscale	*Atriplex persistens*
Western Heermann's buckwheat	*Eriogonum heermannii* var. *occidentale*
Woodland woollythreads	*Monolopia gracilens*
Woolly-headed lessingia	*Lessingia hololeuca*
Wright's trichocoronis	*Trichocoronis wrightii* var. *wrightii*
Invertebrates	
Bay checkerspot butterfly	*Euphydryas editha bayensis*
Conservancy fairy shrimp	*Branchinecta conservatio*
Longhorn fairy shrimp	*Branchinecta longiantenna*
Monarch butterfly	*Danaus plexippus*
Vernal pool fairy shrimp	*Branchinecta lynchi*
Vernal pool tadpole shrimp	*Lepidurus packardi*
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*
Fish	
Pacific lamprey	*Entosphenus tridentatus*
Steelhead – Central California Coast and South-Central California Coast DPSs	*Oncorhynchus mykiss*
Chinook salmon – Central Valley Fall-Run ESU[4]	*Oncorhynchus tshawytscha*
Amphibians	
Arboreal salamander	*Aneides lugubris*
California newt	*Taricha torosa*
California slender salamander	*Batrachoseps attenuatus*
Ensatina	*Ensatina eschscholtzii*
California tiger salamander	*Ambystoma californiense*
Sierran treefrog	*Pseudacris sierra*
California red-legged frog	*Rana draytonii*
Foothill yellow-legged frog	*Rana boylii*
Western toad	*Bufo boreas*

Common Name	*Scientific Name*
Western spadefoot	*Spea* (=*Scaphiopus*) *hammondii*
Reptiles	
Western pond turtle	*Emys* (= *Clemmys* /*Actinemys*) marmorata
Western fence lizard	*Sceloporus occidentalis*
Blunt-nosed leopard lizard	*Gambelia sila*
Northern California legless lizard	*Anniella pulchra*
Coast (= Blainville's) horned lizard	*Phrynosoma blainvillii*
Southern alligator lizard	*Elgaria multicarinata*
Northern rubber boa	*Charina bottae*
Common sharp-tailed snake	*Contia tenuis*
Ring-necked snake	*Diadophis punctatus*
San Joaquin whipsnake	*Masticophis flagellum ruddocki*
Striped racer	*Coluber lateralis*
Common garter snake	*Thamnophis sirtalis*
Giant garter snake	*Thamnophis gigas*
California kingsnake	*Lampropeltis californiae*
Gopher snake	*Pituophis catenifer*
Western rattlesnake	*Crotalus oreganus*
Birds	
Greater white-fronted goose	*Anser albifrons*
Snow goose	*Anser caerulescens*
Ross's goose	*Anser rossii*
Cackling goose	*Branta hutchinsii*
Canada goose	*Branta canadensis*
Tundra swan	*Cygnus columbianus*
Gadwall	*Mareca strepera*
Cinnamon teal	*Spatula cyanoptera*
Northern shoveler	*Spatula clypeata*
Green-winged teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
Northern pintail	*Anas acuta*
Redhead	*Aythya americana*
Canvasback	*Aythya valisineria*
Ring-necked duck	*Aythya collaris*
Greater scaup	*Aythya marila*

Common Name	*Scientific Name*
Bufflehead	*Bucephala albeola*
Ruddy duck	*Oxyura jamaicensis*
Western grebe	*Aechmophorus occidentalis*
Western yellow-billed cuckoo	*Coccyzus americanus*
White-throated swift	*Aeronautes saxatalis*
Anna's hummingbird	*Calypte anna*
Black rail	*Laterallus jamaicensis*
Virginia rail	*Rallus limicola*
Sora	*Porzana carolina*
Greater sandhill crane	*Antigone canadensis tabida*
Lesser sandhill crane	*Antigone canadensis canadensis*
American avocet	*Recurvirostra americana*
Western snowy plover (interior population)	*Charadrius alexandrinus nivosus*
Killdeer	*Charadrius vociferus*
Mountain plover	*Charadrius montanus*
Whimbrel	*Numenius phaeopus*
Dunlin	*Calidris alpina*
Least sandpiper	*Calidris minutilla*
Western sandpiper	*Calidris mauri*
Long-billed dowitcher	*Limnodromus scolopaceus*
Spotted sandpiper	*Actitis macularia*
Greater yellowlegs	*Tringa melanoleuca*
California gull	*Larus californicus*
Black tern	*Chlidonias niger*
Forster's tern	*Sterna forsteri*
Great blue heron	*Ardea herodis*
Great egret	*Ardea alba*
Snowy egret	*Egretta thula*
Little blue heron	*Egretta caerulea*
Cattle egret	*Bubulcus ibis*
Black-crowned night-heron	*Nycticorax nycticorax*
White-faced ibis	*Plegadis chihi*
California condor	*Gymnogyps californianus*
White-tailed kite	*Elanus leucurus*
Bald eagle	*Haliaeetus leucocephalus*

Common Name	*Scientific Name*
Northern harrier	*Circus cyaneus*
Cooper's hawk	*Accipiter cooperi*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Swainson's hawk	*Buteo swainsoni*
Golden eagle	*Aquila chrysaetos*
Great horned owl	*Bubo virigianaus*
Western burrowing owl	*Athene cunicularia*
Short-eared owl	*Asio flammeus*
Nuttall's woodpecker	*Picoirdes nuttallii*
Downy woodpecker	*Picoides pubescens*
American peregrine falcon	*Falco peregrinus anatum*
Olive-sided flycatcher	*Contopus cooperi*
Pacific-slope flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans*
Loggerhead shrike	*Lanius ludovicianus*
Least Bell's vireo	*Vireo bellii pusillus*
Hutton's vireo	*Vireo huttoni*
Warbling vireo	*Vireo gilvus*
California scrub-jay	*Aphelocoma californica*
American crow	*Corvus brachyrhynchos*
Purple martin	*Progne subis*
Cliff swallow	*Petrochelidon pyrrhonota*
Barn swallow	*Hirundo rustica*
Oak titmouse	*Baeolophus inornatus*
Bushtit	*Psaltriparus minimus*
White-breasted nuthatch	*Sitta carolinensis*
Marsh wren	*Cistothorus palustris*
Northern mockingbird	*Mimus polyglottos*
House finch	*Haemorhous mexicanus*
Spotted towhee	*Pipilo maculatus*
California towhee	*Melozone crissalis*
Grasshopper sparrow	*Ammodramus savannarum*
Song sparrow	*Melospiza melodia*
Yellow-breasted chat	*Icteria virens*

Common Name	*Scientific Name*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
Western meadowlark	*Sturnella neglecta*
Red-winged blackbird	*Agelaius phoeniceus*
Tricolored blackbird	*Agelaius tricolor*
Orange-crowned warbler	*Oreothlypis celata*
Common yellowthroat	*Geothlypis trichas*
Yellow warbler	*Setophaga petechia*
Black-headed grosbeak	*Pheucticus melanocephalus*
Mammals	
Virginia opossum	*Didelphis virginiana*
Big brown bat	*Eptesicus fuscus*
Townsend's big-eared bat	*Corynorhinus townsendii*
Hoary bat	*Lasiurus cinereus*
Western red bat	*Lasiurus blossevillii*
California myotis	*Myotis californicus*
Pallid bat	*Antrozous pallidus*
Western mastiff bat	*Eumops perotis californicus*
Mexican free-tailed bat	*Tadarida brasiliensis*
Western gray squirrel	*Sciurus griseus*
California ground squirrel	*Spermophilus beecheyi*
Merriam's chipmunk	*Tamias merriami*
Botta's pocket gopher	*Thomomys bottae*
Fresno kangaroo rat	*Dipodomys nitratoides exilis*
House mouse	*Mus musculus*
California vole	*Microtus californicus*
California deer mouse	*Peromyscus californicus*
Western harvest mouse	*Reithrodontomys megalotis*
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*
Gray fox	*Urocyon cinereoargenteus*
San Joaquin kit fox	*Vulpes macrotis mutica*
Coyote	*Canis latrans*
Northern raccoon	*Procyon lotor*
Ringtail	*Bassariscus astutus*
American badger	*Taxidea taxus*
Striped skunk	*Mephitis mephitis*

Common Name	*Scientific Name*
Bobcat	*Lynx rufus*
Mountain lion	*Puma concolor*
Mule deer	*Odocoileus hemionus*

APPENDIX 3.7-C: HSR GUIDEWAY ENCLOSURE FOR THE GRASSLANDS ECOLOGICAL AREA

Confidential/Internal Use

MEMORANDUM

Date: November 5, 2019

To: Gary Kennerley

From: Julian Bratina

CC: Dave Shpak

Subject: HSR Guideway Enclosure for the Grasslands Ecological Area

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Introduction

This memorandum summarizes the efforts by the Authority to develop, analyze and review conceptual design options for an acoustic guideway enclosure. An enclosure that surrounds the train operating envelope and OCS equipment would provide a greater reduction in noise, visual, and bird strike impacts than noise barriers and line markers where the alignment passes through an important complex of wetlands. The Authority Director of Environmental Services commissioned this analysis in response to a request from the Grassland Water District and other stakeholders in the Grasslands Ecological Area.

Background

During the program level route identification efforts, the Authority selected an alignment across the Grasslands Ecological Area (GEA), a complex of wetlands measuring approximately 95,000 hectares in the San Joaquin Valley, at the narrowest point to minimize the impact of high-speed rail (HSR) on the area. The results of these efforts were published in the Bay Area to Central Valley HST Final EIR/S 2008 environmental document. During this program environmental stage, CHSRA committed to place approximately 3.0 miles of guideway on an elevated structure centered on Mud Slough to minimize the impact on the GEA.

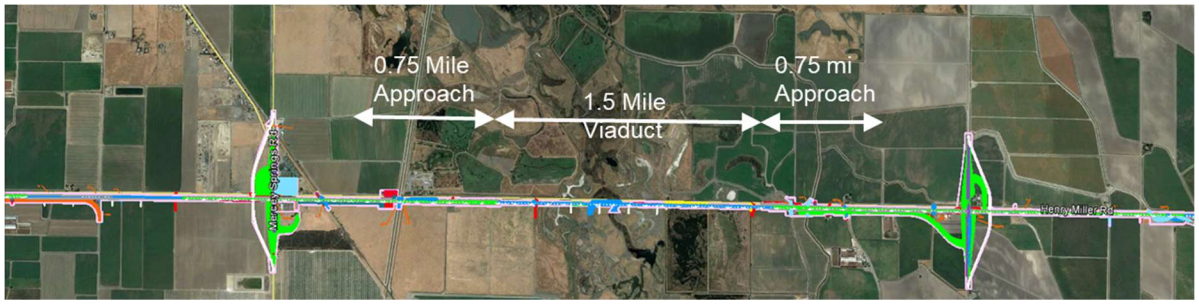


Figure 1: Extent of HSR guideway across Grasslands Ecological Area

The Authority has been working with stakeholders in the GEA to evaluate the environmental impact of this decision, and potential methods of mitigation. In December of 2018, the Authority received a letter from the GEA Working Group that requested consideration of an enclosure structure similar to that used in China's Shenzen-Maoming HSR program. This is a structure that would fully enclose the guideway and overhead contact system, to mitigate visual and acoustic impacts on waterfowl and shorebirds living in and moving across the adjacent habitat.

Figure 2: Chenzen-Maoming Guideway Enclosure

Coincidentally, preliminary results of the Authority's ongoing evaluation of impacts to waterfowl and shorebirds in the GEA Important Bird Area proximate to Mud Slough indicated potential for visual, noise, and bird-strike impacts. The Authority agreed to evaluate the enclosure concept, determine whether a similar structure would be suitable for the GEA crossing, and what the structure's potential impacts would be.

Analysis

1. Design Development

The Engineering team evaluated the tubular concept, and produced a similar design that would enclose the guideway and the full extents of the CHSRA operating envelope. The structure primarily consisted of steel w-flange beams rolled into a circular shape, bolted together with gusset plates, and supported on the concrete viaduct structure. A circular steel frame would support precast concrete panels mounted around the structure, with OCS brackets hung inside the structure, and longitudinally reinforced by steel struts. The design concepts were subjected to preliminary structural assessments, including wind loading, support of OCS equipment, the loading on the viaduct structure, and considered different material types for sound attenuation.

There were two primary objectives of the enclosure: (1) to avoid the visual and acoustic impacts on waterfowl and shorebirds, and (2) to prevent bird strikes. While a noise barrier would encourage birds to fly higher over the guideway, it would not prevent nesting, foraging, or roosting within the operating envelope of the train. Also, the OCS equipment would protrude above the noise barriers and attract perching, and create a deadly obstacle to avian flight paths. A permeable enclosure was explored to preclude avian access, but discarded due to its inability to reduce acoustic and visual impacts, and the unacceptable maintenance challenges.

After the design and performance analyses revealed considerable weight and cost, the engineering team designed an alternative concept with equivalent functionality that would minimize the structure's weight and complexity, and probable cost.

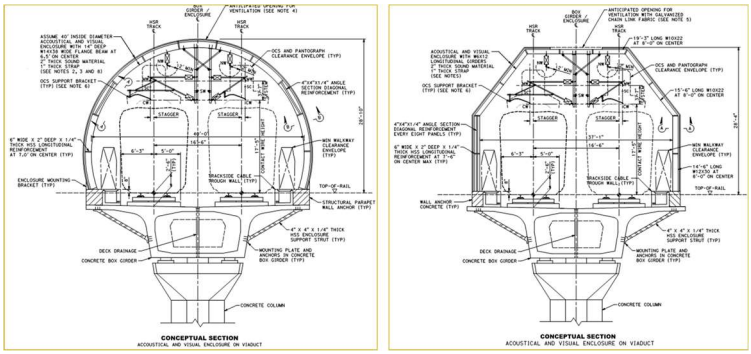


Figure 3: Tubular and Wall Panel Enclosure Concepts

2. Pressure Transient Analysis

A pressure transient (i.e. pneumatic) analysis was necessary to evaluate the impacts of the enclosure on HSR operations at full speed, the impacts to passenger comfort levels, and the impacts the train operation would have on the enclosure. In addition, the operation of a high-speed train within an enclosed space results in a pressure wave in front of and behind the train, that when exiting the enclosed space, would rapidly expand and could generate a loud percussive noise. To ensure the enclosure would not have a detrimental impact on the operation of the train and its surroundings, a preliminary pressure transient analysis was conducted.

The analysis looked at three scenarios: Two trains crossing in the enclosure, a single train passing through the enclosure, and the micro pressure waves at the exit portal. A one-dimensional analysis performed using the ThermoTun-Online software, commonly used for proof of concept, estimated the maximum pressure change to which train passengers and crew are subjected, the maximum/minimum pressures exerted on the enclosure structure, and the magnitude of the pressure wave at the enclosure portals.

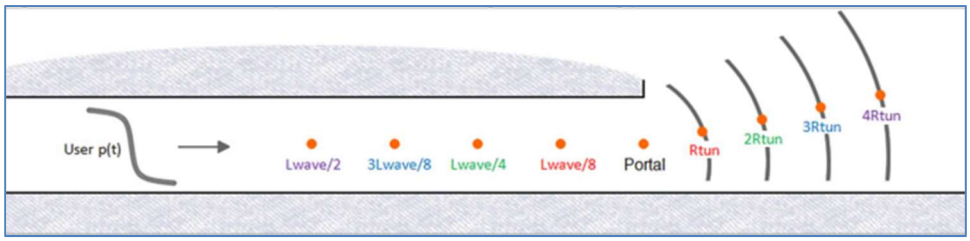


Figure 4: Illustration of the micro pressure waves analysis

To reduce the magnitude of the pressure wave within the enclosure, while minimizing the size of the structure, the designers proposed three openings to be located at the obvert of the enclosure. These openings, each 35% of the enclosure cross-sectional area and spaced out at quarter points along the length of the structure, reduced the estimated maximum pressure by 40% to stay within standard HSR operating parameters.

3. Noise Analysis

A noise analysis was necessary to evaluate the effectiveness of the structure and potential to attenuate noise impacts in the area. The analysis, using Cadna-A modeling software, also evaluated the performance of other structural noise mitigation options including; a noise barrier 14-ft above top of rail (TOR), a 17.5-ft noise barrier, and a 17.5-ft noise barrier with an angled cantilevered top edge (similar to the alternative enclosure concept) to provide a basis for functional comparison.

The acoustical model was used to evaluate the base condition and all four noise mitigation options to allow for direct comparison of results.

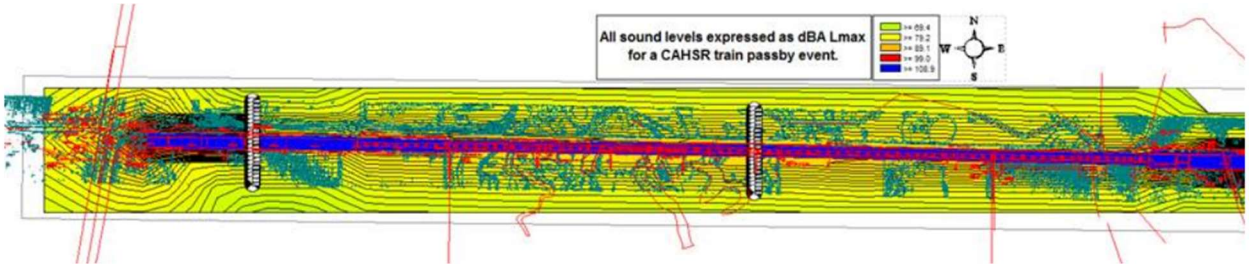


Figure 5: Isopleth Noise Contours

The level of noise reduction increases with the barrier height and extent of enclosure. However, higher levels of noise reduction provided by enclosure come at increasing costs of more complex structures. The results of the analysis showed that the permanent hearing damage criterion (140 dBA Lmax) would not be exceeded. However, temporary hearing damage, masking, and arousal criteria were exceeded and would require additional land based mitigation up to 300-ft from the track alignment.

4. Cost Estimates

A preliminary cost estimate was completed to evaluate the five options under review in the GEA: existing conditions (no mitigation), a noise barrier 14-ft above TOR, a noise barrier 17.5-ft above TOR, a tubular enclosure, and a wall panel enclosure. The cost estimates, supported by material quotes and reviewed by the Authority estimating department, included materials, labor, equipment, and viaduct

structural and foundation improvements. In addition to the capital cost estimates, a rough order of magnitude operations and maintenance (O&M) cost was calculated for the two enclosures as their complexity would result in higher maintenance costs. Land based compensatory mitigation costs were also estimated for each of the structural options. The potential to stack mitigation (i.e. consolidated mitigation for more than a single impact type) enabled an estimated low to high (i.e. separated mitigation for each impact type) range of mitigation costs.

Table 1: Concept level cost estimate

Structure Options	Noise Reduction	Capital Cost	Compensatory Mitigation Cost*	Total ROM Net Cost	ROM Additional O&M Cost (average annual)
None	0 dBA	N/A	$20.5 to 33M	$20.5 to 33M	N/A
Noise Barrier 14-ft>TOR	8 dBA	$36M	$12 to 19M	$48 to 55M	< $60K for 3 miles
Noise Barrier 17.5ft>TOR	10 dBA	$46M	$9.5 to 15M	$55.5 to 61M	
Wall Panel Enclosure	10+ dBA	$90M±	$9.5M to 15M	$100.5M to 106M	≈$60K ± for 3 miles
Tubular Enclosure	12 dBA	$119M	$7M to 11M	$126 to 130M	

*Stacked to Unstacked Mitigation

Conclusions

The results of the analysis showed that the two enclosures would support HSR operations and provide visual and acoustic mitigation at a greater level than a standard noise barrier mitigation measure. In addition, noise barriers lacked the ability to prevent bird strikes, and were therefore eliminated from consideration. The enclosures were deemed conceptually feasible, and due to the sensitivity of resources and stringent regulatory requirements, the Authority is proposing an enclosure as a mitigation measure for regulatory assurance, and technical efficiency. This approach requires further detailed design analysis, and engineering validation that is beyond the scope of preliminary engineering. Language for a proposed mitigation measure has been drafted for the Draft EIR/EIS to assure concept-level feasibility, performance, and efficacy:

- Enclose HSR guideway and OCS continuously for 3.4 miles, centered approximately at Mud Slough. The final recommendation of 3.4 miles is the result of iterative design refinement between engineering and environmental science teams.
- Construct using opaque, nonglare materials that provide a minimum of 10 dBA attenuation of sound generated by HSR operations, as measured immediately outside the enclosure.
- Design in compliance with all HSR design, operations, and maintenance requirements.
- Build in conjunction with installation of track and OCS; completed before HSR train operations begin.

- Consult with CDFW, USFWS, GWD, the owner(s) of private properties affected by the 3.4-mile HSR project footprint, and other stakeholders as part of final design of the guideway enclosure.
- Implement in conjunction with compensatory mitigation, if quantitative modeling of final enclosure design demonstrates residual noise of 77 dBA or more, measured outside the HSR right-of-way.

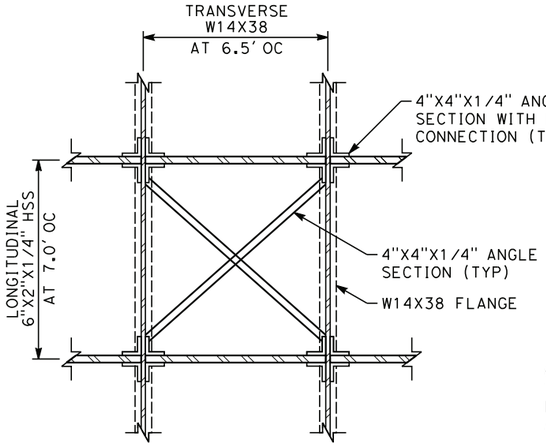
Appendices

1. Tubular Enclosure on Embankment
2. Tubular Enclosure on Viaduct
3. Wall Panel Enclosure on Viaduct
4. Pressure Transient Analysis Memo
5. Noise Analysis Memo
6. Cost Estimates

Appendix 1

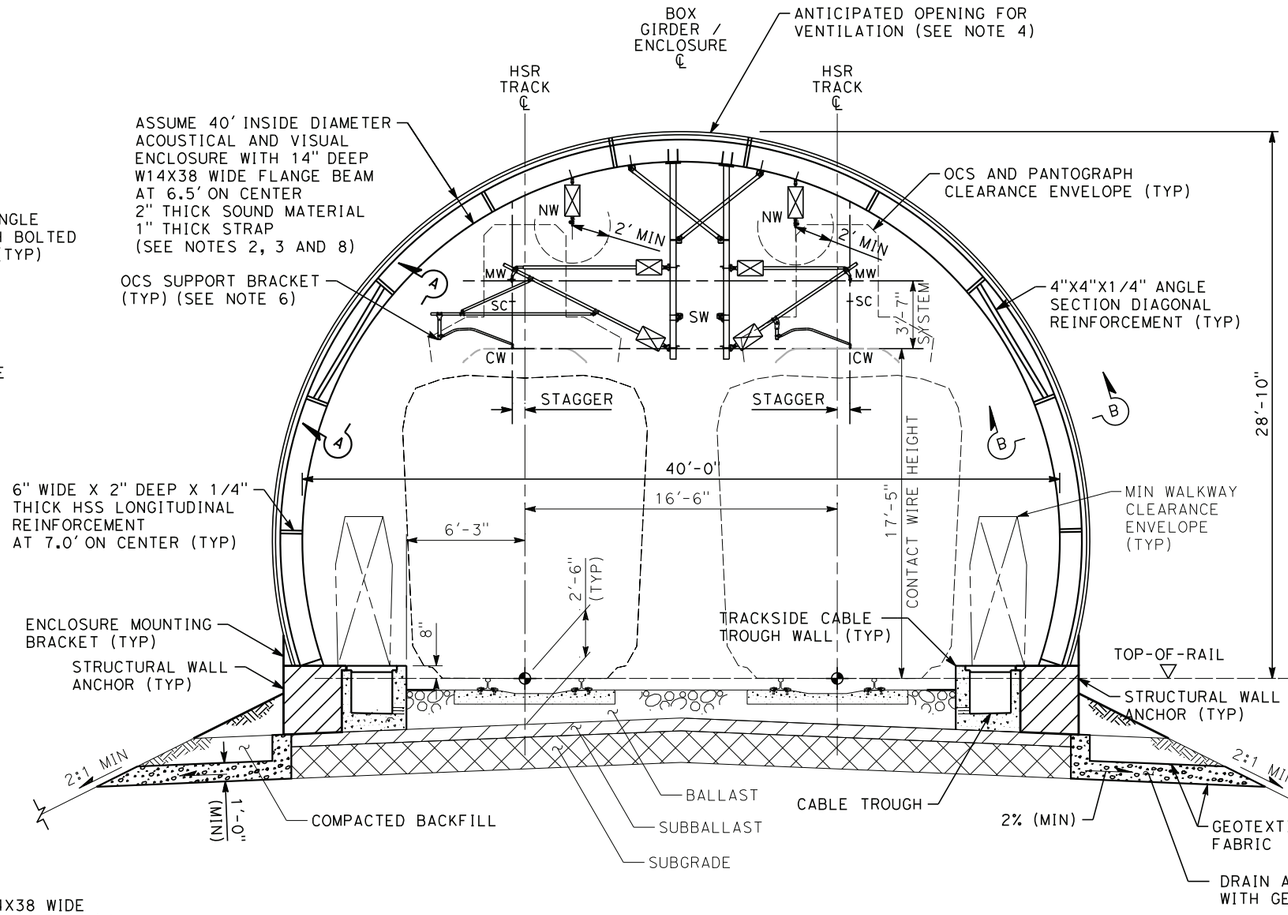
Tubular Enclosure on Embankment

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY NOT FOR CONSTRUCTION



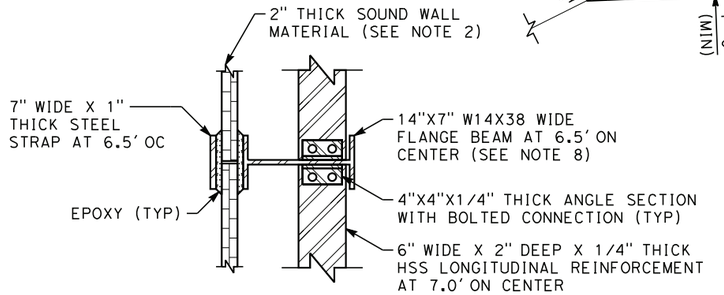
SECTION A-A

DIAGONAL REINFORCEMENT
ALL DIMENSIONS ARE ASSUMED
(SEE NOTES 2 AND 3)



CONCEPTUAL SECTION

ACOUSTICAL AND VISUAL ENCLOSURE ON EMBANKMENT



SECTION B-B

LONGITUDINAL SECTION
ALL DIMENSIONS ARE ASSUMED
(SEE NOTES 2 AND 3)

NOTES:

1. SEE TRACK, DRAINAGE AND OCS DIRECTIVE DRAWINGS FOR DETAILS NOT SHOWN.
2. ACOUSTICAL AND VISUAL ENCLOSURE MATERIALS TO BE DETERMINED.
3. ALL DIMENSIONS SHOWN ARE ASSUMPTIONS.
4. THE CONCEPTUAL CROSS SECTIONAL AREA INSIDE THE ENCLOSURE IS APPROXIMATELY 950 SQUARE FEET COMPARED TO A CONCEPTUAL TWO-TRACK TUNNEL OF 1,625 SQUARE FEET. AS A RESULT, OPENINGS MUST BE PROVIDED FOR AERODYNAMIC AND VENTILATION REASONS.
5. ALL BOLD FEATURES ARE NON-STANDARD ITEMS FOR HSR EMBANKMENTS.
6. THERE SHALL BE A SEPARATE OCS SUPPORT BRACKET FOR EACH TRACK AND ATTACHED TO THE WIDE FLANGE BEAMS.
7. PROVISIONS FOR EMERGENCY EGRESS, SUCH AS DOORS IN THE ENCLOSURE WALLS AND TELEPHONES, SHALL BE PROVIDED AS NECESSARY.
8. THERE SHALL BE TWO CLOSELY-SPACED WIDE FLANGE BEAMS WITH AN INTERMEDIATE EXPANSION JOINT AT A NOMINAL 110' SPACING.

LEGEND:

℄	CENTERLINE
CW	CONTACT WIRE
HSS	HOLLOW STRUCTURAL SECTION
MW	MESSENGER WIRE
NW	NEGATIVE FEEDER WIRE
OC	ON CENTER
SC	STITCH CABLE
SW	STATIC WIRE

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY NOT FOR CONSTRUCTION

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. GURA
DRAWN BY A. GURA
CHECKED BY J. BRATINA
IN CHARGE J. BRATINA
DATE 2/01/2019

CONCEPTUAL
FOR DISCUSSION
PURPOSES ONLY
NOT FOR CONSTRUCTION

CALIFORNIA HIGH-SPEED RAIL PROJECT
STRUCTURAL DIRECTIVE
TYPICAL CROSS SECTION
AT-GRADE EMBANKMENT
TWO TRACK BALLASTED
WITH ACOUSTICAL AND VISUAL ENCLOSURE

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Appendix 2

Tubular Enclosure on Viaduct

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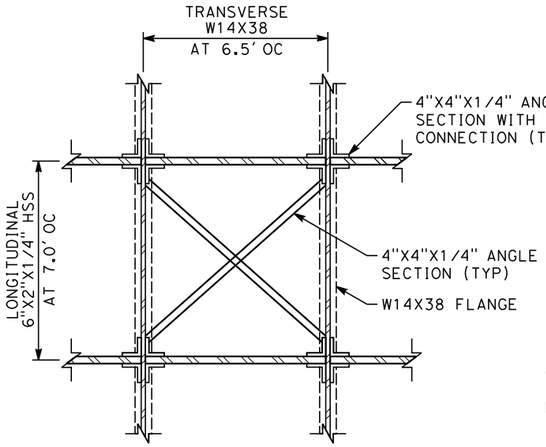
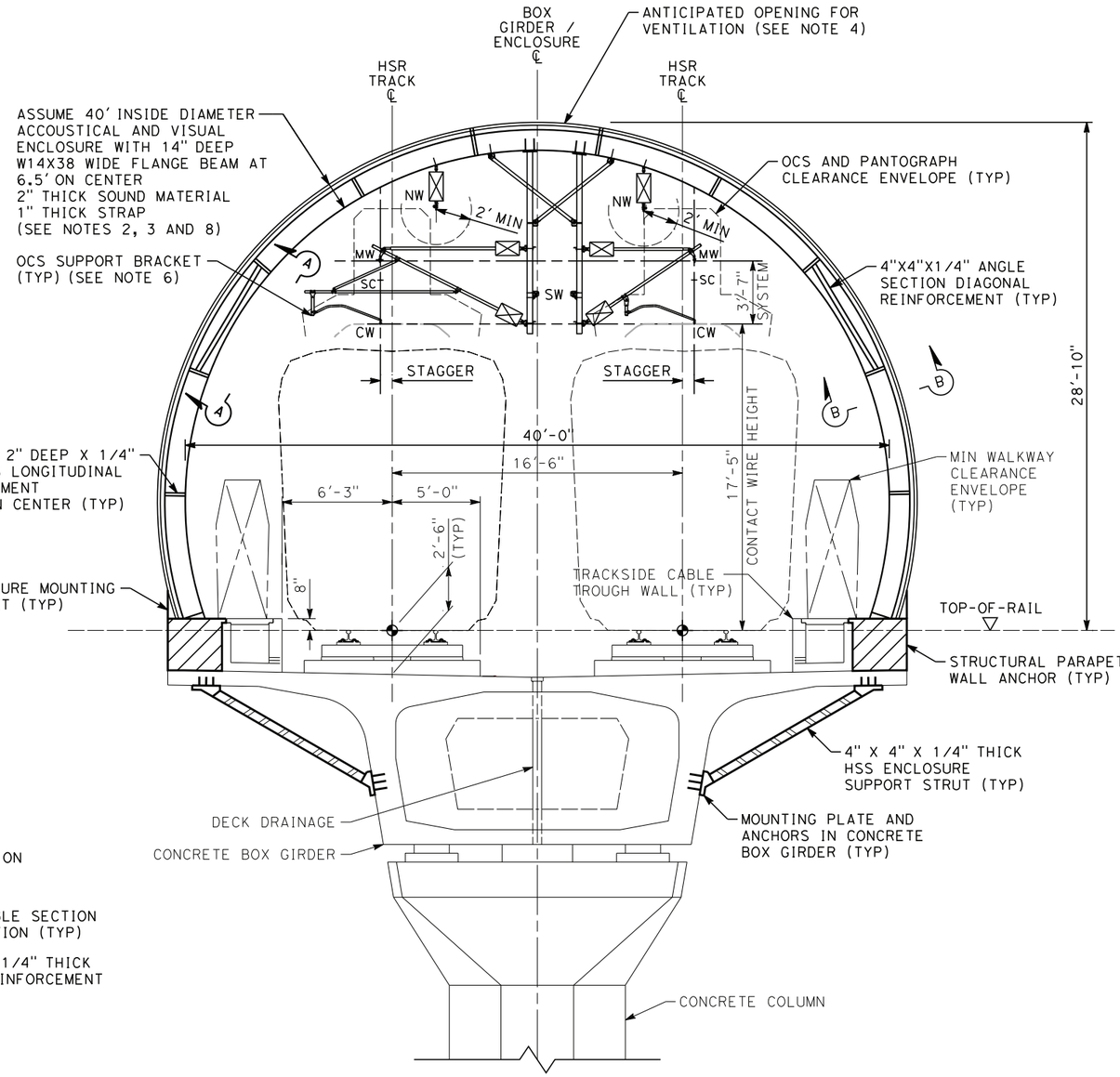


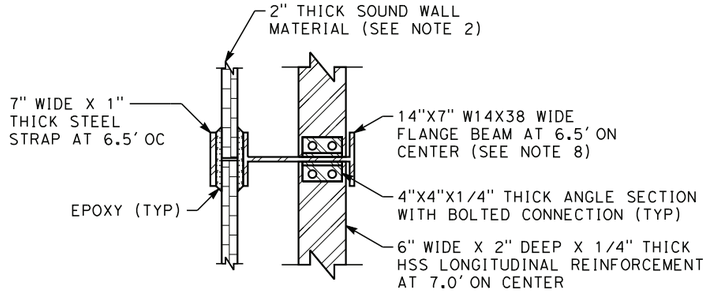
SECTION A-A

DIAGONAL REINFORCEMENT
ALL DIMENSIONS ARE ASSUMED
(SEE NOTES 2 AND 3)



CONCEPTUAL SECTION

ACCOUSTICAL AND VISUAL ENCLOSURE ON VIADUCT



SECTION B-B

LONGITUDINAL SECTION
ALL DIMENSIONS ARE ASSUMED
(SEE NOTES 2 AND 3)

NOTES:

1. SEE STRUCTURE AND OCS DIRECTIVE DRAWINGS FOR DETAILS NOT SHOWN.
2. ACCOUSTICAL AND VISUAL ENCLOSURE MATERIALS TO BE DETERMINED.
3. ALL DIMENSIONS SHOWN ARE ASSUMPTIONS.
4. THE CONCEPTUAL CROSS SECTIONAL AREA INSIDE THE ENCLOSURE IS APPROXIMATELY 950 SQUARE FEET COMPARED TO A CONCEPTUAL TWO-TRACK TUNNEL OF 1,625 SQUARE FEET. AS A RESULT, OPENINGS MUST BE PROVIDED FOR AERODYNAMIC AND VENTILATION REASONS.
5. ALL BOLD FEATURES ARE NON-STANDARD ITEMS FOR HSR STRUCTURES.
6. THERE SHALL BE A SEPARATE OCS SUPPORT BRACKET FOR EACH TRACK AND ATTACHED TO THE WIDE FLANGE BEAMS.
7. PROVISIONS FOR EMERGENCY EGRESS, SUCH AS DOORS IN THE ENCLOSURE WALLS AND TELEPHONES, SHALL BE PROVIDED AS NECESSARY.
8. THERE SHALL BE TWO CLOSELY-SPACED WIDE FLANGE BEAMS WITH AN INTERMEDIATE EXPANSION JOINT AT EVERY SUPPORT PIER.

LEGEND:

℄	CENTERLINE
CW	CONTACT WIRE
HSS	HOLLOW STRUCTURAL SECTION
MW	MESSENGER WIRE
NW	NEGATIVE FEEDER WIRE
OC	ON CENTER
SC	STITCH CABLE
SW	STATIC WIRE

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY NOT FOR CONSTRUCTION

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. GURA
DRAWN BY A. GURA
CHECKED BY J. BRATINA
IN CHARGE J. BRATINA
DATE 2/01/2019

CONCEPTUAL
FOR DISCUSSION
PURPOSES ONLY
NOT FOR CONSTRUCTION

CALIFORNIA HIGH-SPEED RAIL PROJECT
STRUCTURAL DIRECTIVE
TYPICAL CROSS SECTION
AERIAL STRUCTURE
TWO TRACK NON-BALLASTED
WITH ACCOUSTICAL AND VISUAL ENCLOSURE

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Appendix 3

Wall Panel Enclosure on Viaduct

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FOR DISCUSSION
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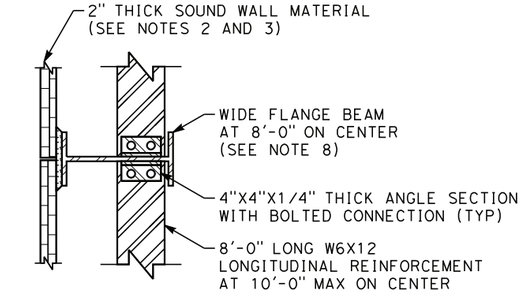
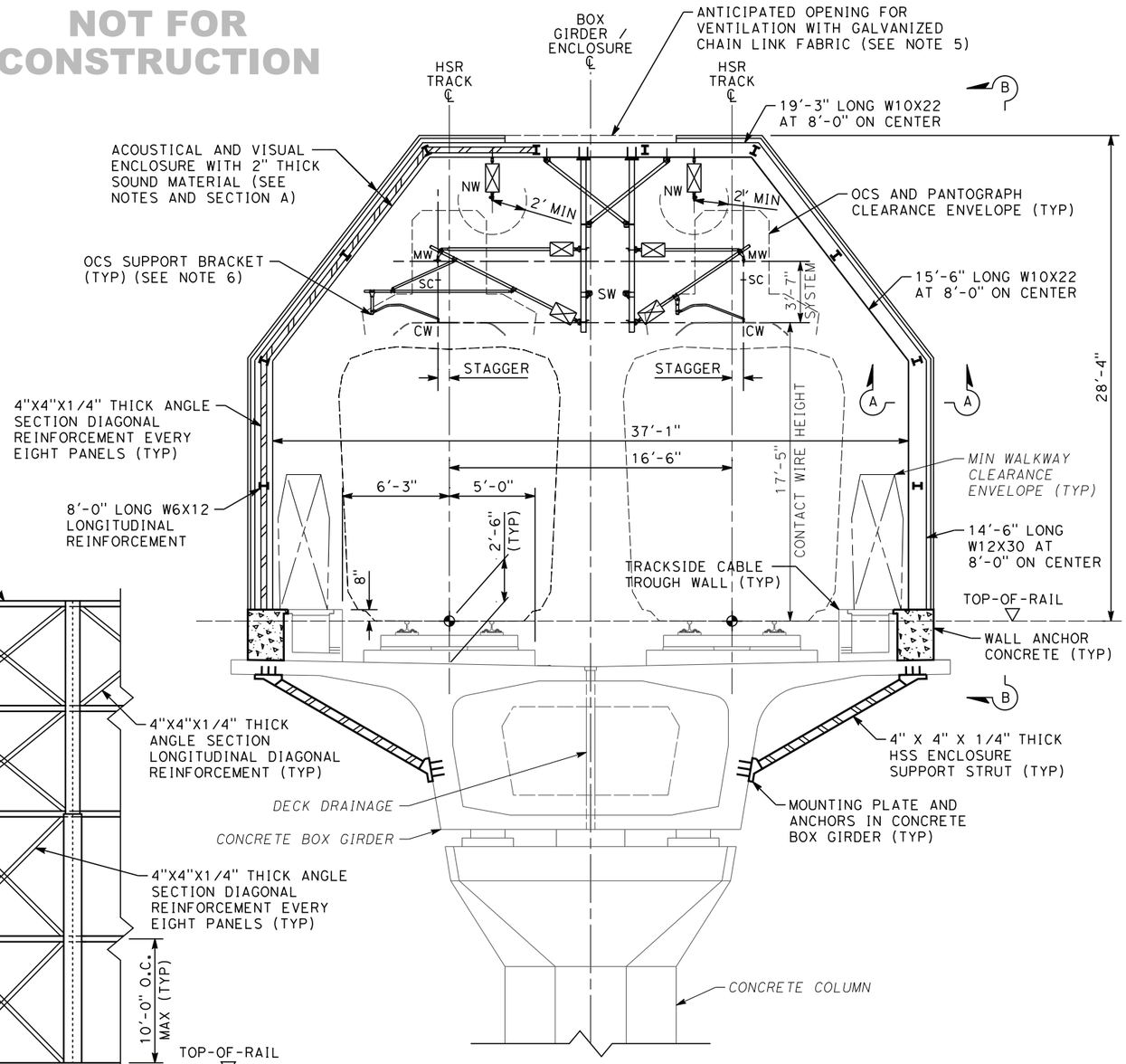
NOT FOR
CONSTRUCTION



SECTION A-A
LONGITUDINAL SECTION



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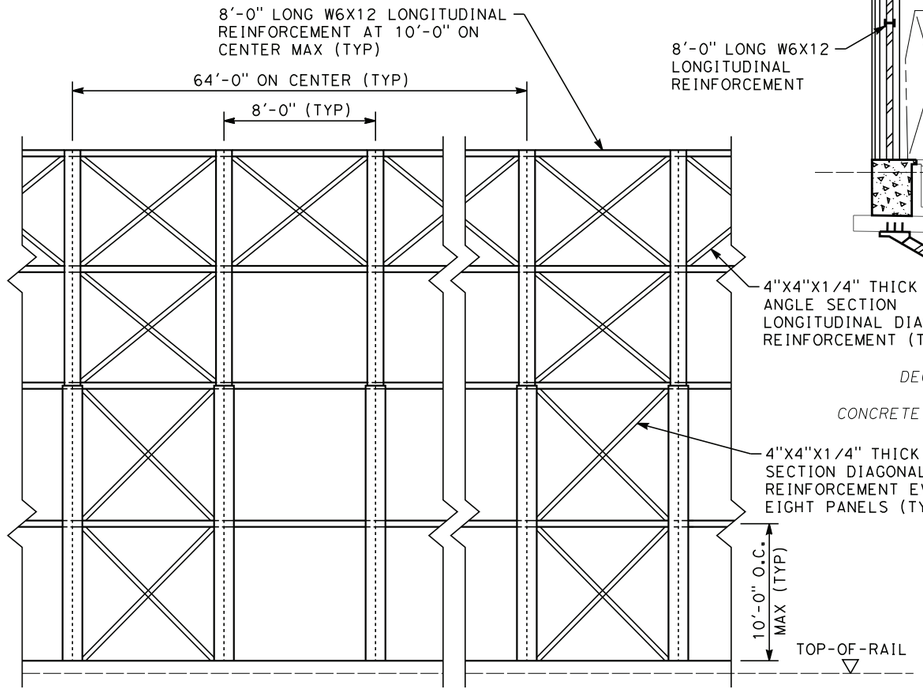

LONGITUDINAL ELEVATION B-B

NOTES:

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2. ACOUSTICAL AND VISUAL ENCLOSURE MATERIALS WITH WEIGHT OF NO MORE THAN FIVE POUNDS PER SQUARE FOOT TO BE DETERMINED.
3. ALL DIMENSIONS SHOWN ARE ASSUMPTIONS AND NOT BASED ON DETAILED DESIGN.
4. ALL BOLD FEATURES ARE NON-STANDARD ITEMS FOR HSR STRUCTURES.
5. THE CONCEPTUAL CROSS SECTIONAL AREA INSIDE THE ENCLOSURE IS APPROXIMATELY 930 SQUARE FEET COMPARED TO A CONCEPTUAL TWO-TRACK TUNNEL OF 1,625 SQUARE FEET. AS A RESULT, OPENINGS MUST BE PROVIDED FOR AERODYNAMIC AND VENTILATION REASONS.
6. THERE SHALL BE A SEPARATE OCS SUPPORT BRACKET FOR EACH TRACK AND ATTACHED TO THE WIDE FLANGE BEAMS.
7. PROVISIONS FOR EMERGENCY EGRESS, SUCH AS DOORS IN THE ENCLOSURE WALLS AND TELEPHONES, SHALL BE PROVIDED AS NECESSARY.
8. THERE SHALL BE TWO CLOSELY-SPACED WIDE FLANGE BEAMS WITH AN INTERMEDIATE EXPANSION JOINT AT EVERY SUPPORT PIER.

LEGEND:

℄	CENTERLINE
CW	CONTACT WIRE
HSR	HIGH-SPEED RAIL
HSS	HOLLOW STRUCTURAL SECTION
MW	MESSENGER WIRE
NW	NEGATIVE FEEDER WIRE
OC	ON CENTER
SC	STITCH CABLE
SW	STATIC WIRE

CONCEPTUAL
FOR DISCUSSION
PURPOSES ONLY
NOT FOR
CONSTRUCTION

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY K. PUGASAP
DRAWN BY A. GURA
CHECKED BY J. BRATINA
IN CHARGE J. BRATINA
DATE 8/26/2019

CONCEPTUAL
FOR DISCUSSION
PURPOSES ONLY
NOT FOR CONSTRUCTION

CALIFORNIA HIGH-SPEED RAIL PROJECT
STRUCTURAL DIRECTIVE
TYPICAL CROSS SECTION
AERIAL STRUCTURE
TWO TRACK NON-BALLASTED
WITH GUIDEWAY ENCLOSURE

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Appendix 4

Pressure Transient Analysis Memo

CALIFORNIA High-Speed Rail Authority

RDP Rail Delivery Partner

DRAFT

Memorandum

DRAFT FOR INTERNAL DISCUSSION ONLY

DATE: April 12, 2019

TO: Julian Bratina

FROM: Silas Li

CC: Brian Sutliff, Steve Klein

SUBJECT: Pressure Transient Analysis for An Acoustic Enclosure

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Introduction

This memorandum summarizes the pressure transient analysis at conceptual design level for a 3-mile long acoustic enclosure. There is an 0.75 mile approach embankment, then 1.5 mile viaduct over a wetland area, and then another 0.75 mile embankment section that would support the acoustic enclosure structure. The objective of the conceptual design is to verify the cross sectional area of the structure, the size of the proposed obvert openings, and the resulting magnitude of the pressure waves generated by high speed operations. Based on the results of the pressure transient analysis, information will be forwarded to the noise analysis team.

Three scenarios were identified for pressure transient analysis and are discussed below:

1. Two crossing trains in the acoustic enclosure
2. Single train in the acoustic enclosure
3. Micro pressure waves at the exit portal

A 1-dimensional (1D) analysis was performed using the ThermoTun-Online software [1] which is commonly used for proof of concept. The benefit of using 1D model is shorter simulation time. Performing 3D CFD (Computational Fluid Dynamics) analysis would take a few months, and exceed the project schedule of 4 weeks for proof of concept.

The ThermoTun-Online has some limitations. In particular, it cannot simulate 3-dimensional (3D) phenomena in detail and the effects of ceiling openings. It averages values over the tunnel cross-section and estimate these averages vary along the tunnel. The software cannot address multiple ceiling openings. Simulations were performed without ceiling openings. The quantity of openings and size were estimated based on a literature search and engineering judgement.

Assumptions

The following assumptions were made for the pressure transient analysis:

- Cross sections of the acoustic enclosure (tunnel) on viaduct and on embankment (Figures 1 and 2 below).
- Tunnel length = 4,828 m (3 miles)
- Cross-sectional area of tunnel = 88.2 m^2 (950 ft^2)
- Tunnel radius = 4.7 m (15.4 ft)
- Length of train = 400 m (1312 ft)
- Cross-sectional area of train = 11 m^2 (118 ft^2)
- Fanning friction coefficient = 0.008
- Loss coefficient, flow from open tunnel into annulus around train = 0.1
- Shape factor, flow from annulus around train into open tunnel = 0.5
- Speed of train = 354 kph (220 mph)
- Sealing time constant for leakage through coach bodies = 1 second
- Time of nose entry = 0 second (both trains)
- The medical health criteria is taken from TM 2.4.2 for basic high-speed train tunnel configuration.

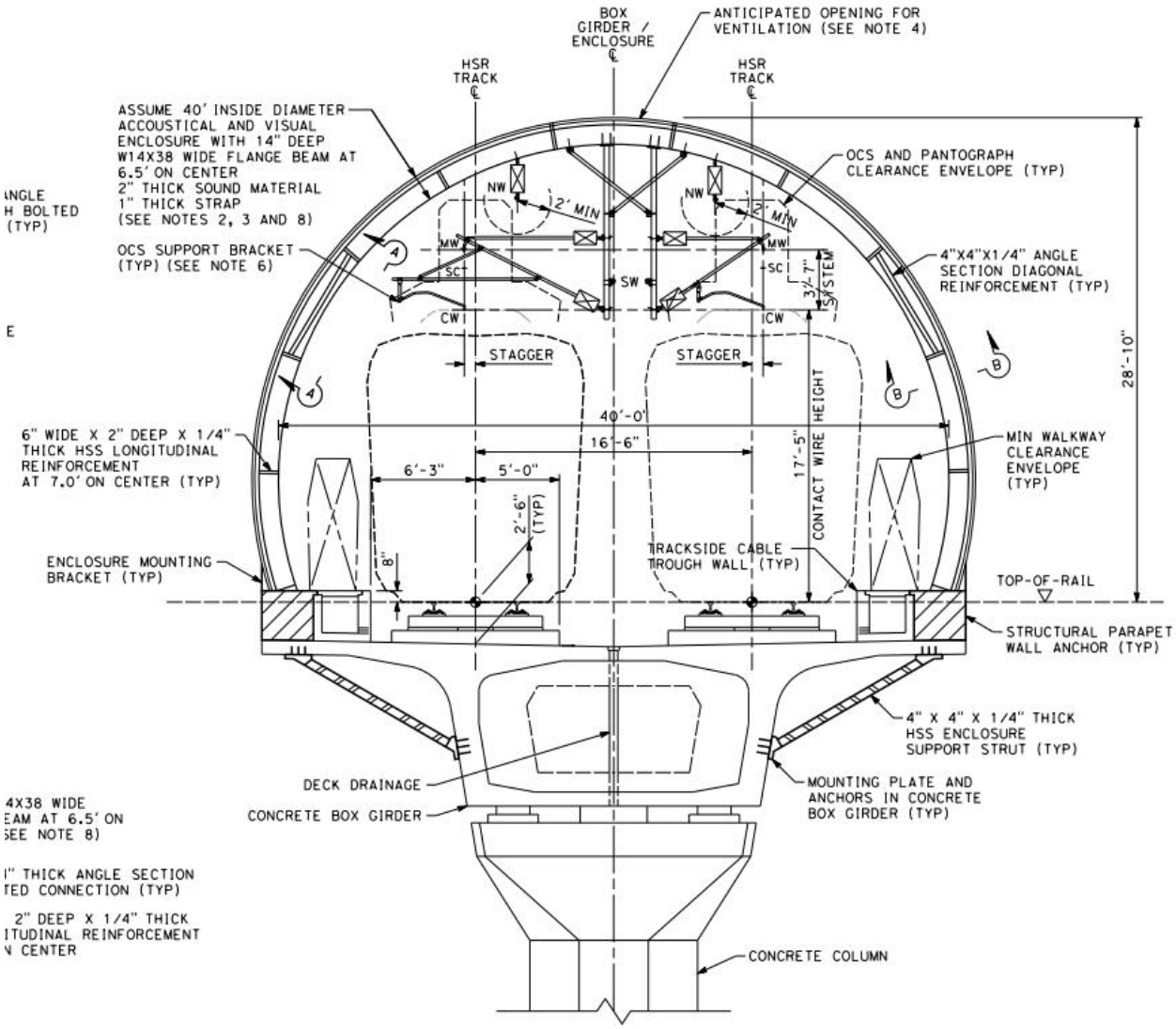

Figure 1: Acoustic Enclosure on Viaduct

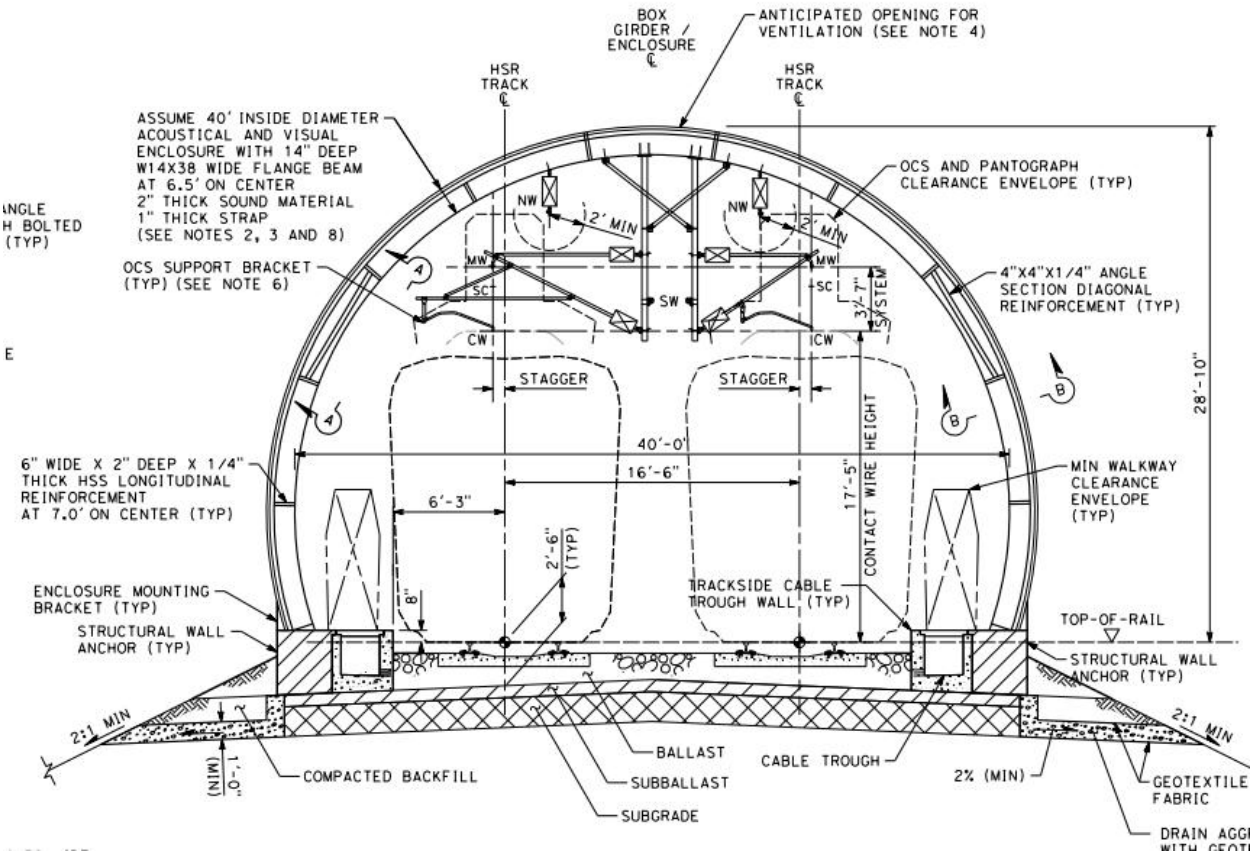

Figure 2: Acoustic Enclosure on Viaduct

Crossing Trains in Tunnel

Figure 3 below shows the output locations used in Figures 4 and 5 showing pressure results.

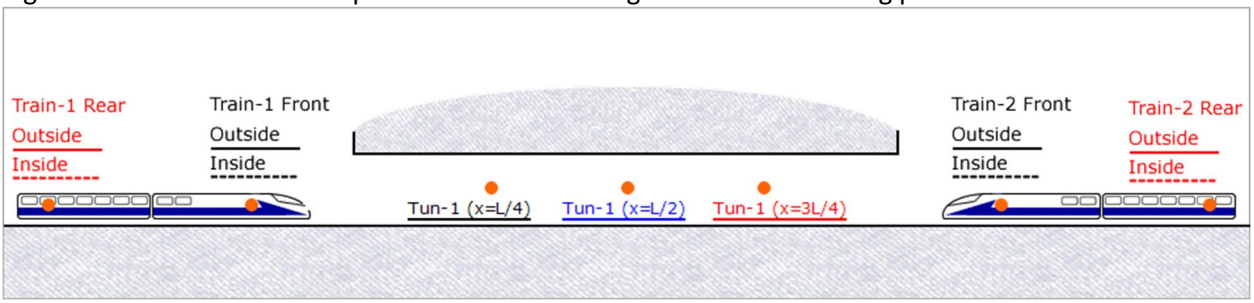

Figure 3: Crossing Trains in Tunnel

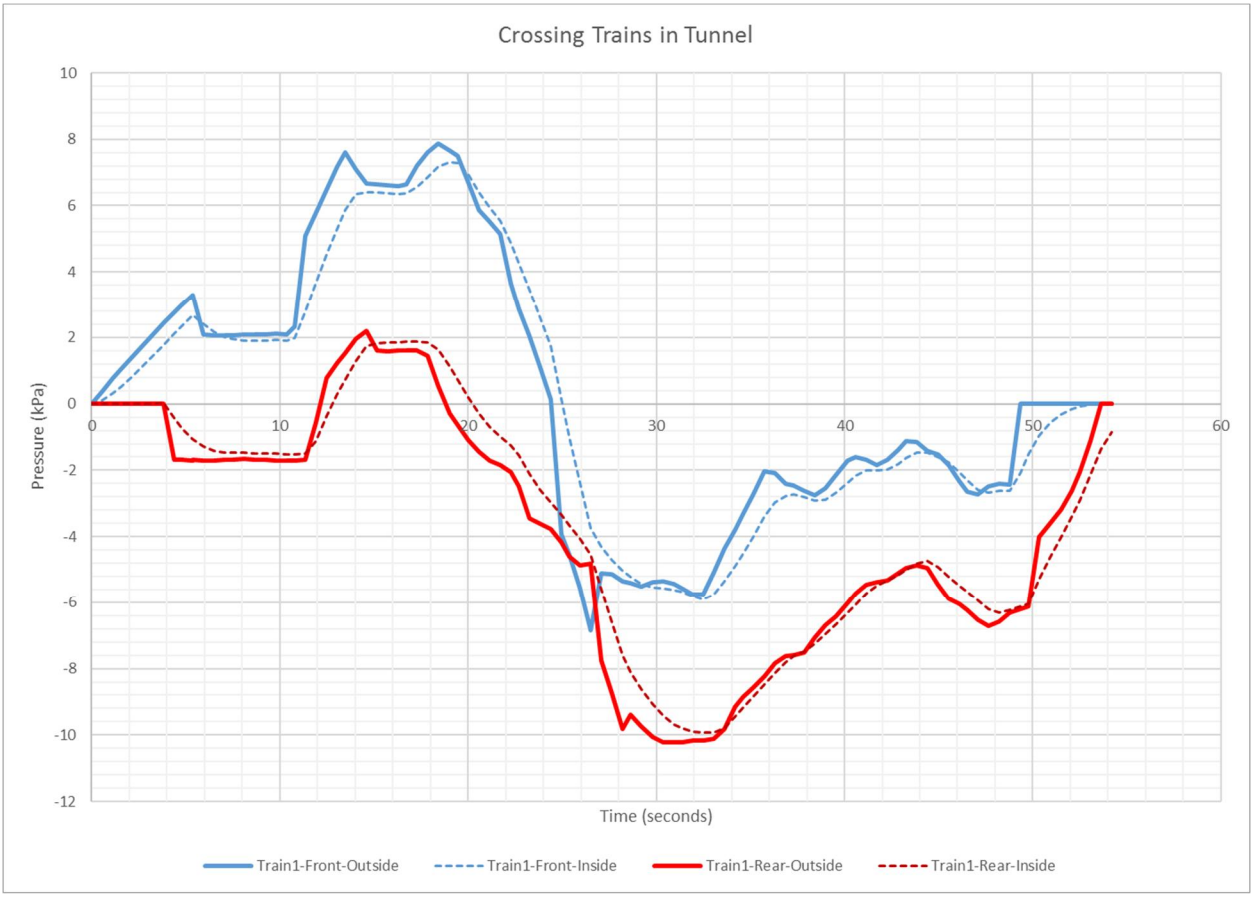

Figure 4: Pressure at the moving train

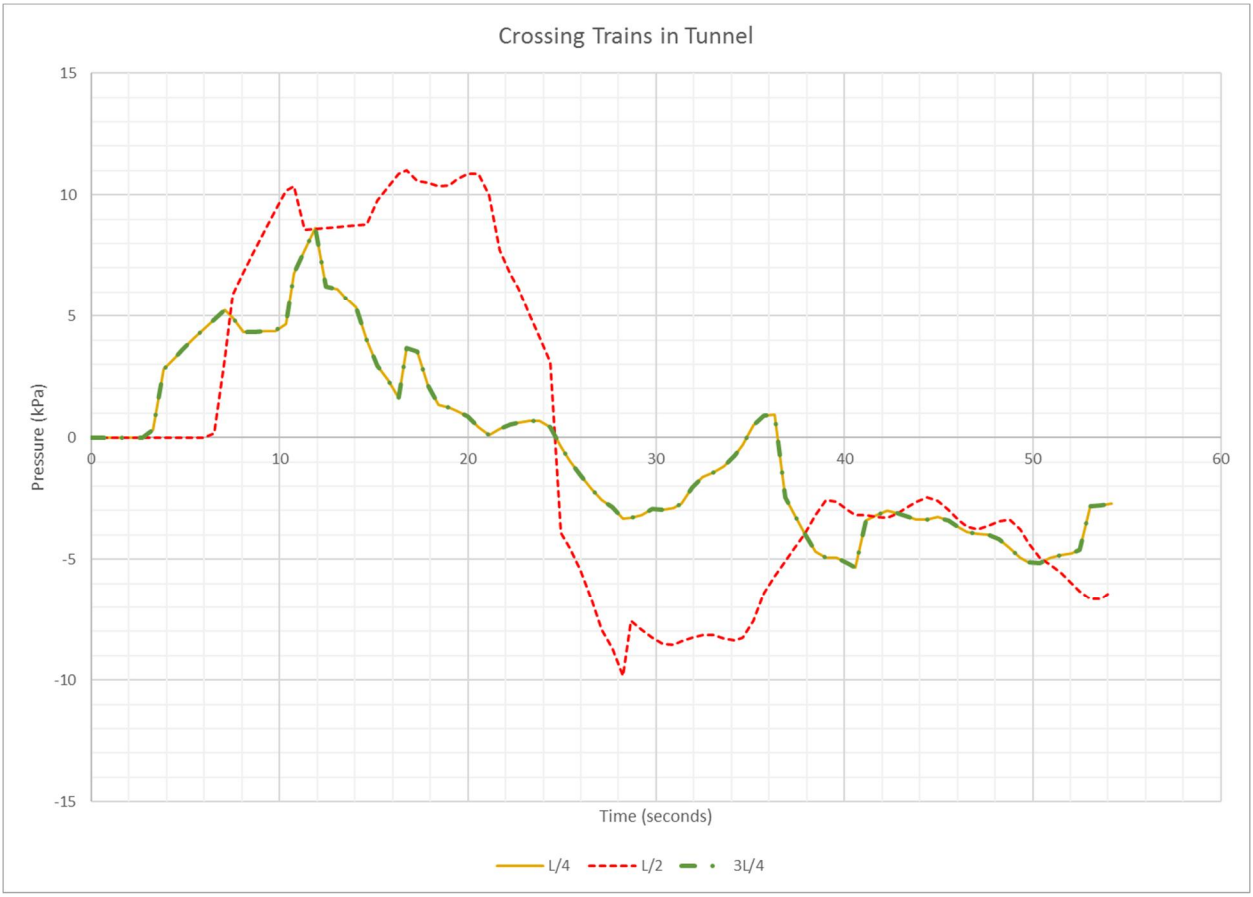

Figure 5: Pressure in the Tunnel

Single Train in Tunnel

Figure 6 below shows the output locations used in Figure 7 showing pressure results.

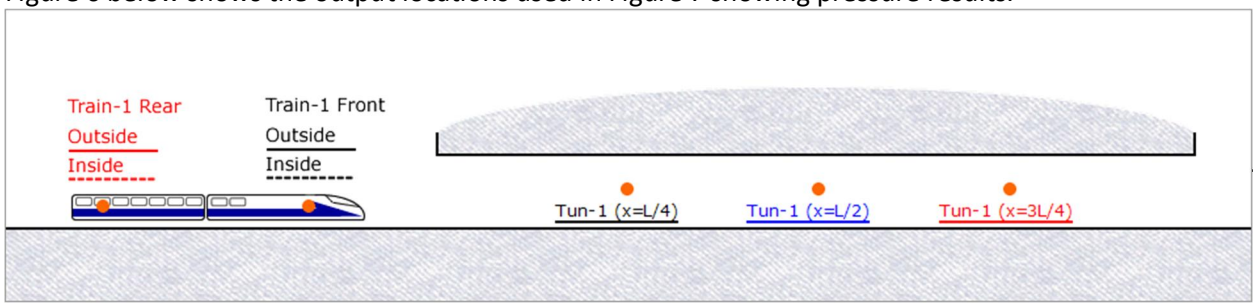

Figure 6: Single Train in Tunnel

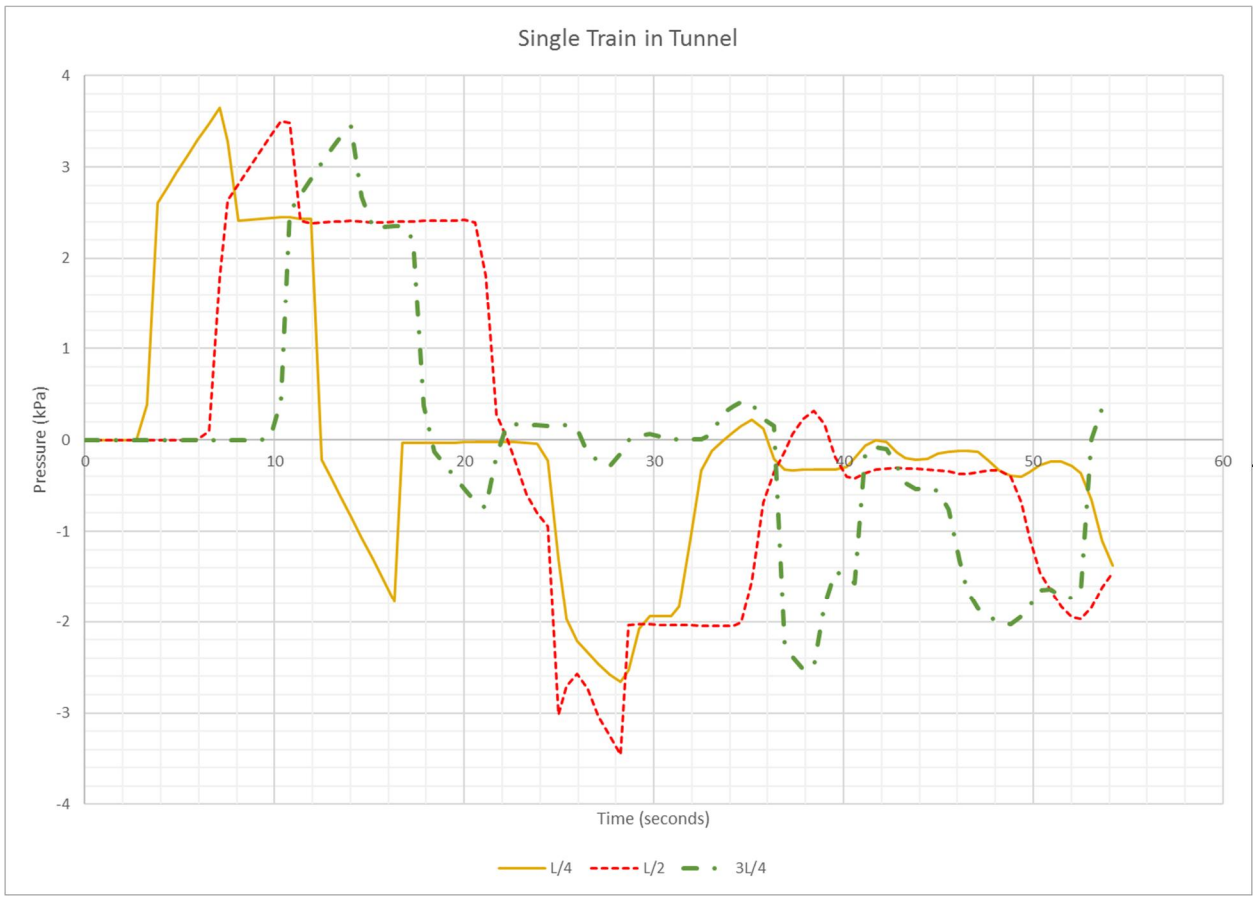

Figure 7: Pressure in the Tunnel

Micro Pressure Waves

Figure 8 below shows the output locations used in Figure 9 showing pressure results.

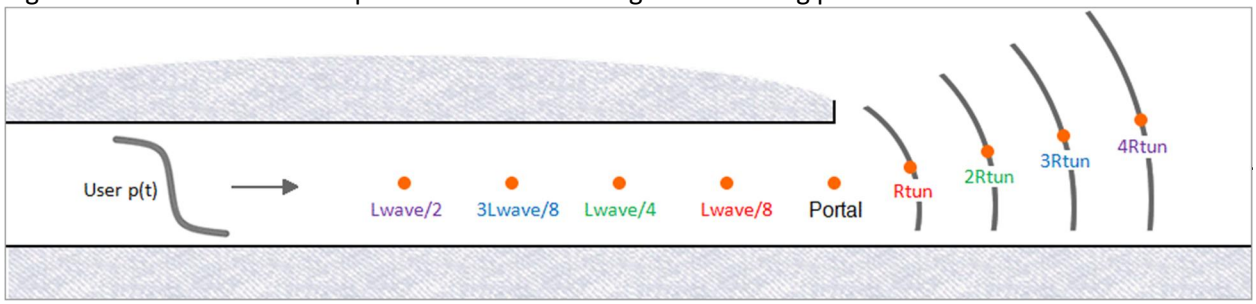

Figure 8: Micro Pressure Waves

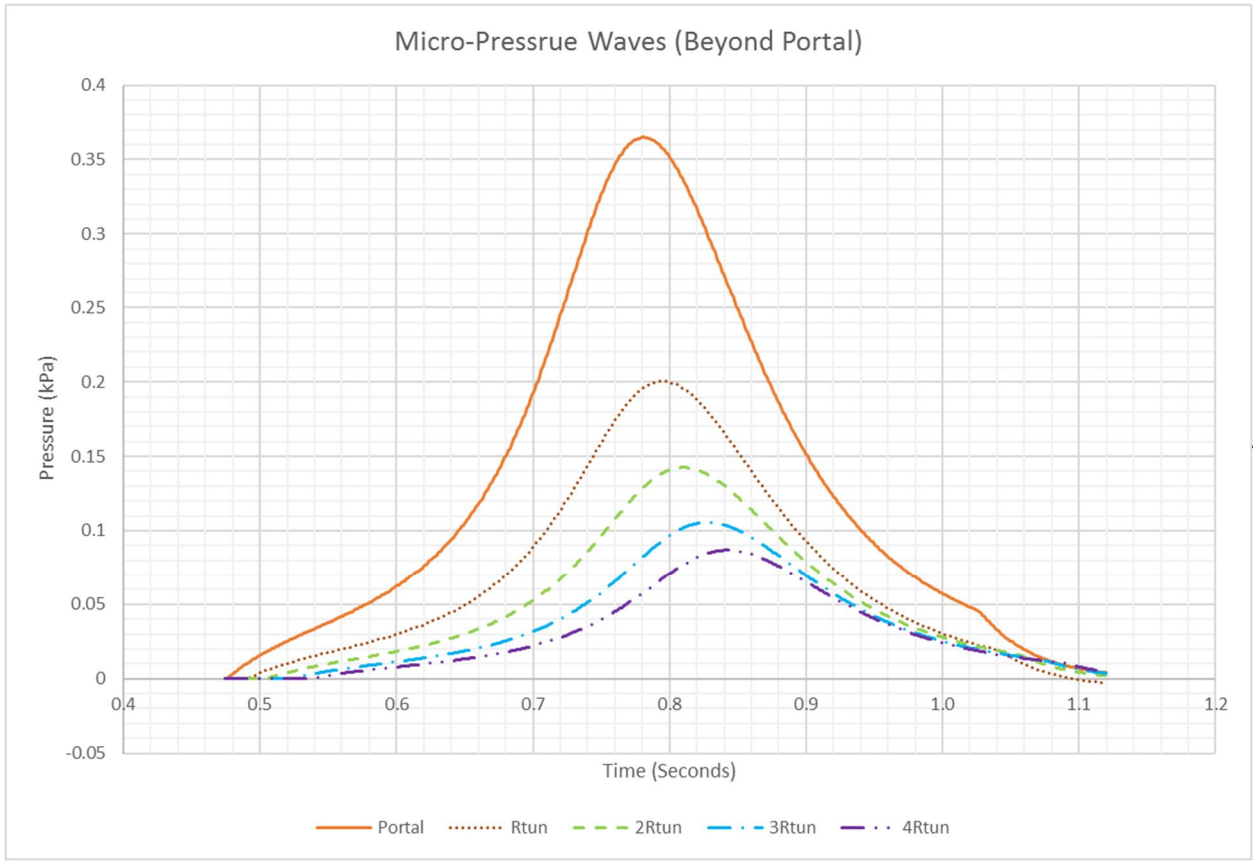

Figure 9: Micro Pressure Waves (Beyond Portal)

Discussions and Conclusions

Preliminary results for Crossing Trains in Tunnel (without Openings):

- Medical health criterion = 10 kPa (peak to peak pressure, Technical Memo TM 2.4.2)
- The maximum pressure change (peak to peak), to which train passengers and crews are subjected, would exceed 14.7 kPa for two trains passing at 354 kph.
- The maximum/minimum pressures on the tunnel structure would exceed +11.0 kPa / -9.8 kPa.

Preliminary results for Single Train in Tunnel (without Openings):

- The maximum pressure change (peak to peak) in the tunnel would be approximately 7.1 kPa.
- The pressure rise when the train entering the tunnel portal is 2.6 kPa.

Preliminary results for Micro-Pressure Waves (without Openings):

- The pressure at the portal is 365 Pa.

Pressure simulations were performed without ceiling openings. The quantity and size of ceiling openings were estimated based on literature search and engineering judgement. Reference [2] suggests that there was little benefit in increasing the number of shafts/openings above three. The cross-sectional area of air shafts/openings in tunnels should be around 10 to 35% of the area of the main tunnel. A total of 3 openings, spaced at approximately 0.75 miles apart could reduce the pressure by up to 40%.

For initial noise analysis, three openings are assumed at 1/4, 1/2 and 3/4 points of the tunnel length. Each opening is assumed to be 35% of the tunnel area or 31 m^2 (334 ft^2). The presence of openings is assumed to reduce the maximum pressure by 40%. This is an estimate for proof of concept at this stage. The tunnels referenced in the literatures are based on particular tunnel configurations, tunnel length, train area and speeds. The initial noise analysis should include two scenarios: 1) higher pressure without openings; and 2) with 3 ceiling openings and 40% reduction in pressure. Detailed analysis, such as CFD and passenger comfort analysis, should be performed for the acoustic enclosure with ceiling openings during next phase of design.

References

[1] ThermoTun Manual, www.thermotun-online.com

[2] “High-Speed Rail Aerodynamic Assessment and Mitigation Report”, Final Report Dec 2015, U.S. Department of Transportation, Federal Railroad Administration, Office of Research, Development and Technology, Washington, DC 20590,

Appendix 5

Noise Analysis Memo

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MEMORANDUM

To:	Julian Bratina
From:	Erich Thalheimer
Date:	June 25, 2019
Project Name:	California High-Speed Rail Project
Project Number:	189229H
Subject:	**CAHSR Grasslands Noise Barrier Alternatives Comparison Tech Memo**

Study Overview

This memo summarizes the technical analysis process and results of an acoustical mitigation assessment performed to determine the potential impact of the California High-Speed Rail Project on the Grasslands Ecological Area, and mitigation of such impact. The Grasslands Ecological Area (Grasslands) is home to several species of waterfowl that could be adversely affected by high-speed train noise. Thus, consideration is being given towards reducing the train noise footprint through the rail corridor within the Grasslands.

The proposed alignment runs east and west through the middle of the Grasslands for about 3 miles, from approximately Station 4930 to Station 5085. Parallel noise mitigation barriers on both sides of the tracks have been suggested as an appropriate mitigation technique. Four train noise barrier mitigation designs are considered in this assessment: (1) 14-ft noise barriers, (2) 17.5-ft noise barriers, (3) 17.5-ft noise barriers with a slanted cantilever top edge, and (4) a nearly-complete tunnel enclosure.

The Cadna-A® acoustical model, developed by DataKustik GmbH, was used to perform this study. Cadna-A is a general purpose, three dimensional, ray tracing acoustical model that implements ISO Standard 9613 for outdoor sound prediction and propagation. All four noise barrier alternatives were evaluated using the same Cadna-A model, thus allowing for direct comparison of the results.

This study was not scoped to recommend a preferred alternative. Rather, this study presents an evaluation of the acoustical benefits and consequences of the candidate noise barrier alternatives.

Noise Criteria Thresholds

Several noise criteria thresholds were previously established (by others) for this study to avoid disturbing, upsetting or harming waterfowl residing in the Grasslands area. The noise metric of choice for this study was the maximum sound level (Lmax) measured in A-weighted decibels (dBA) using an RMS 'slow' response time. The justification for this criterion is the desire to avoid startling the waterfowl by the quick onset of noise due to trains moving through the area. Use of the Lmax dBA 'slow' noise metric is consistent with recommendations in the Federal Railroad Administration (FRA) High-Speed Ground Transportation Noise and Vibration Impact Assessment Manual (2012).

The four noise criteria considered and evaluated through this study included the following:

- Permanent hearing damage (Lmax < 140 dBA)
- Temporary hearing damage (Lmax < 93 dBA)
- Avoidance of masking (Lmax < 84 dBA)
- Avoidance of arousal (Lmax < 77 dBA)

As Planned Condition

The current As Planned condition is shown in **Figure 1.** Trains passing through this section would involve CAHSR electric multiple unit (EMU) consists of approximately 660 feet in length, including their locomotives and cars, traveling at about 220 mph. This section of tracks within the Grasslands is relatively straight (east and west) but has a portion of elevated track on a 25-ft high top-of-rail viaduct from Station 4955 to Station 5051. The remainder of the tracks are at grade supported by embankment stone ballast, ranging in top-of-rail heights from 8-ft in the western end to 17-ft in the eastern end. The terrain and topography within 500 feet of both sides of the tracks is quite flat, with elevation changes of less than 10 feet.

Figure 1. Aerial View of CAHSR Grasslands Section

Cadna-A Noise Model

As previously noted, CAHSR train noise levels affecting the adjacent Grasslands were estimated using the Cadna-A® noise model developed by DataKustik GmbH. Cadna-A is a powerful, three dimensional, ray tracing acoustical model that implements ISO Standard 9613 for the prediction and propagation of outdoor sound.

Noise sources are input to the Cadna-A model as point, line and/or area components. Each source is characterized as emitting sound power levels (PWL) in octave bands or broadband A-weighted format. Attenuation due to distance, terrain and elevation differences, ground absorption, wind effects, foliage, building shielding, and attenuation from barriers and berms are computed in the model. The resulting sound pressure levels (SPL) are predicted at any receptor location(s) of interest.

The first step in configuring the Cadna-A model was to import geoshape project design files to serve as a base map of the area. In this manner, the exact alignment of the proposed CAHSR rail corridor could be modeled to a high degree of accuracy, including the topography data inherent in the geoshape files.

The two parallel tracks were then entered into the model at their respective elevations above grade. Cadna-A's optional FRA/FTA module was used in this case to simulate the methods and calculations described in FRA's High-Speed Ground Transportation Noise and Vibration Impact Assessment Manual (2012). The portion of tracks elevated on the viaduct section was assigned to be self-shielding due to the concrete guideway deck, and an adjustment of +3 dB was assigned to the elevated track sections consistent with FRA guidelines. The rest of the surrounding grounds were considered to be moderately acoustically absorptive (G = 0.5) for hard dirt/sand surfaces.

The four noise barrier alternatives were then entered into the Cadna-A model, including: (1) 14-ft noise barriers, (2) 17.5-ft noise barriers, (3) 17.5-ft noise barriers with a slanted cantilever top edge, and (4) a nearly complete tunnel enclose. The surfaces of the barriers facing the trains were assumed to be covered with a material with an average acoustical absorption coefficient of 0.85 NRC in order to reduce the performance degradation effect caused by reflective parallel barriers.

Noise receptors were entered into the model in traverse patterns at three locations, representative of each of the three different track conditions. One location was the approximate center of the track on ballast section towards the west near Station 4942; another location was the approximate middle of the elevated viaduct track near Station 5003; and the final location was the approximate center of the track on ballast section towards the east near Station 5067. The receptors were modeled as being 5 feet above the ground and were positioned in the traverse arrays every 50 feet out to a distance of 500 feet from the tracks (topographical data was not available beyond 500 feet).

Lastly, the noise model computed isopleth contours, or lines of equal loudness, for each of the four noise criteria thresholds (i.e. Lmax = 140, 93, 84 and 77 dBA). In doing so, the results could be presented so that the four respective noise impact zones (or noise criteria exceedance zones) can be clearly seen relative to one another.

Noise Barrier Results

The noise impact zones, or isopleth contour lines, for the As Planned (i.e. without barriers) and for the four noise barrier alternatives are shown in **Figures 2 thru 11**. Two figures, a western half and an eastern half, are provided for each scenario.

The results indicate that concern for permanent hearing damage (i.e. Lmax = 140 dBA) was unwarranted. The impact zone for 140 dBA would occur too close to the train itself to warrant any further concern. Therefore, each of the figures only shows isopleth lines for Lmax = 93, 84 and 77 dBA, respectively.

To be effective, a noise barrier must, at a minimum, break the line-of-sight between the noise source and the receptor. Noise barriers need to be very long relative to their height to avoid noise from flanking around the endpoints. In this manner, the height of the barrier becomes the most important aspect in determining its noise reduction effectiveness. The taller a noise barrier, the more noise reduction it will provide for receptors on the other side. The position of the barriers, relative to the noise source, was limited in this case to being erected along the CAHSR right-of-way (ROW).

As expected, the size of the noise impact zones gets smaller with each more substantial noise barrier alternative. Thus, the noise reduction provided by the 14-ft barrier is greater than the As Planned condition; the noise reduction provided by the 17.5-ft barrier is greater than the 14-ft barrier; the noise reduction provided by the 17.5-ft cantilever barrier is greater than the 17.5-ft barrier; and the noise reduction provided by the tunnel barrier is greater than the 17.5-ft cantilever barrier.

Table 1 summarizes the Cadna-A noise model results for the three traverse lines of discrete receptors (i.e. Western, Middle and Eastern). While the impact zone distances vary somewhat from point to point, the results in the table give an overview of the noise reduction benefits associated with each barrier alternative. The results in the table are approximations, rounded to nearest 50-ft increment. More exact definition of the noise impacts zones should be taken from the isopleth contour lines in **Figures 2 thru 11**.

Table 1. CAHSR Grasslands Noise Impact Zones and Noise Barrier Effectiveness

Design Scenario	**Approximate Noise Impact Zones (Feet From Tracks)**											
Track Segment	**Western**				**Middle**				**Eastern**			
Stations	Sta. 4930 to Sta. 4955				Sta. 4955 to Sta. 5051				Sta. 5051 to Sta. 5085			
Track Condition	Ballast TOR = 8 ft				Elevated TOR = 25 ft				Ballast TOR = 17 ft			
Noise Criteria	Perm	Temp	Mask	Arouse	Perm	Temp	Mask	Arouse	Perm	Temp	Mask	Arouse
As Planned	0	250	>500	>500	0	50	>500	>500	0	200	>500	>500
14 ft Barriers	0	<100	150	>500	0	<50	150	>500	0	<100	100	500
17.5 ft Barriers	0	<100	100	450	0	<50	150	>500	0	<100	100	400
17.5 ft Cantilever Barriers	0	<100	100	400	0	<50	150	500	0	<100	100	400
Tunnel Barriers	0	<100	100	300	0	<50	150	450	0	<100	100	300

Notes: Perm = Permanent hearing damage (Lmax < 140 dBA)
Temp = Temporary hearing damage (Lmax < 93 dBA)
Mask = Avoidance of masking (Lmax < 84 dBA)
Arouse = Avoidance of arousal (Lmax < 77 dBA)

As can be seen in the table, the provision of even a 14 ft tall barrier will provide significant noise reduction compared to the As Planned condition. The installation of taller or more comprehensive barriers would further reduce noise levels affecting the Grasslands, but at a less significant incremental rate, meaning there are diminishing returns for the additional costs involved with building larger barriers.

It is hoped that this study will aid CAHSR officials in considering these noise barrier alternatives from a quantitative perspective. Refinements to these noise barrier alternatives, or additional noise analyses are available upon request.

Disclaimer – This study only examined the acoustical aspects of the subject noise barriers. No attempt was made to estimate the costs of the barriers, or the structural requirements to build the barriers.

Figure 2. CAHSR Grasslands Noise Impact Zones
As Planned Condition (Part 1 of 2)

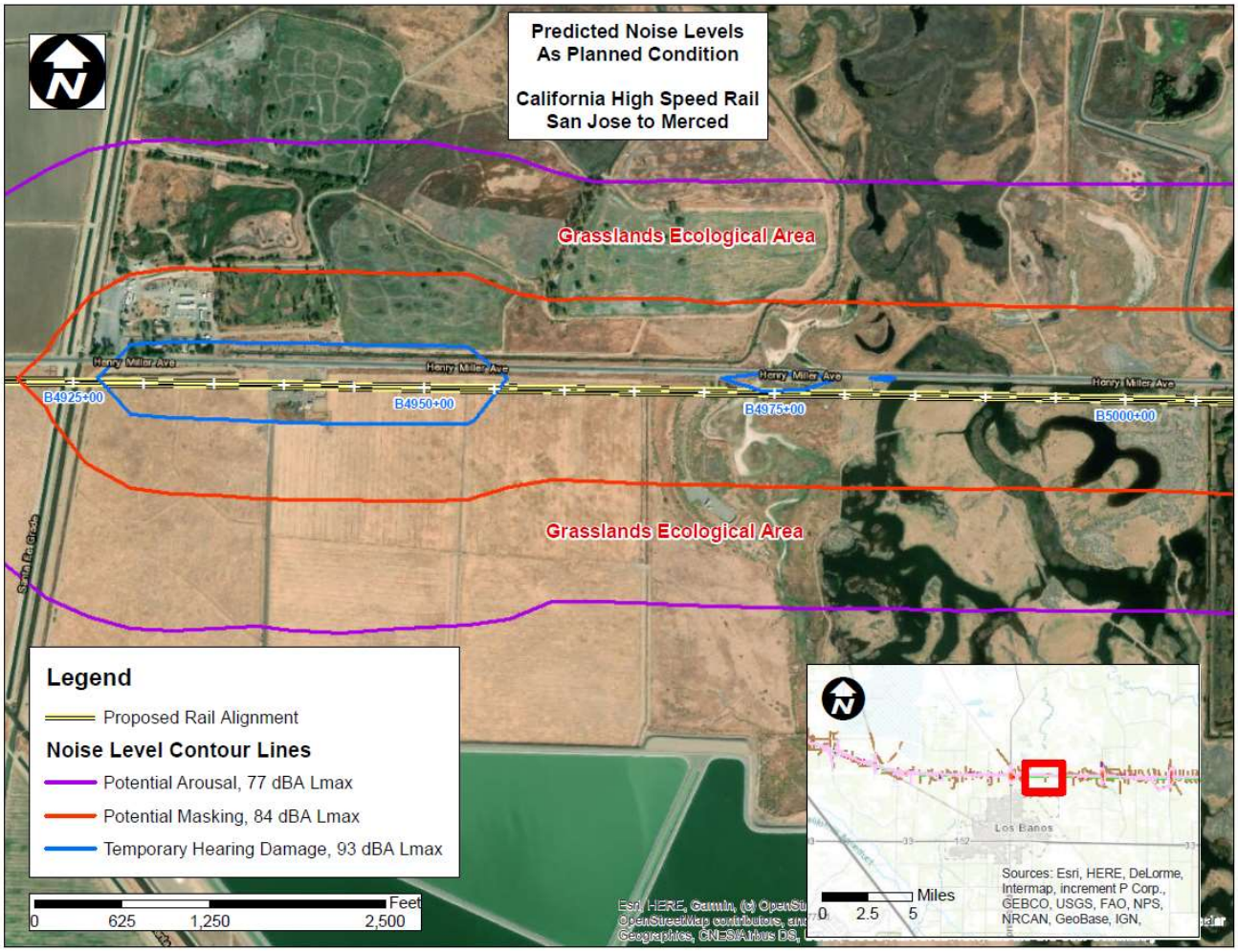


Figure 3. CAHSR Grasslands Noise Impact Zones
As Planned Condition (Part 2 of 2)

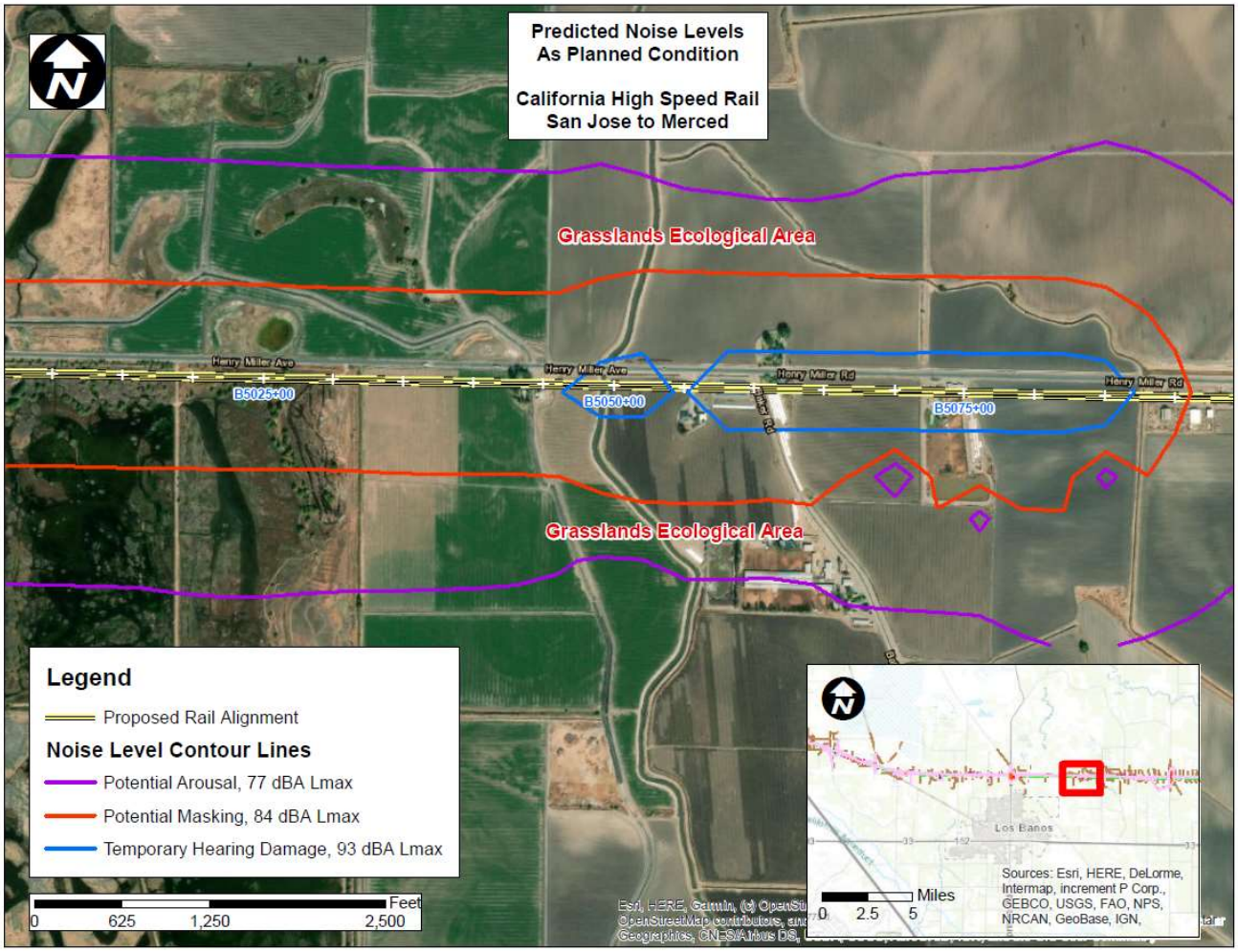


Figure 4. CAHSR Grasslands Noise Impact Zones With 14-ft Noise Barriers (Part 1 of 2)

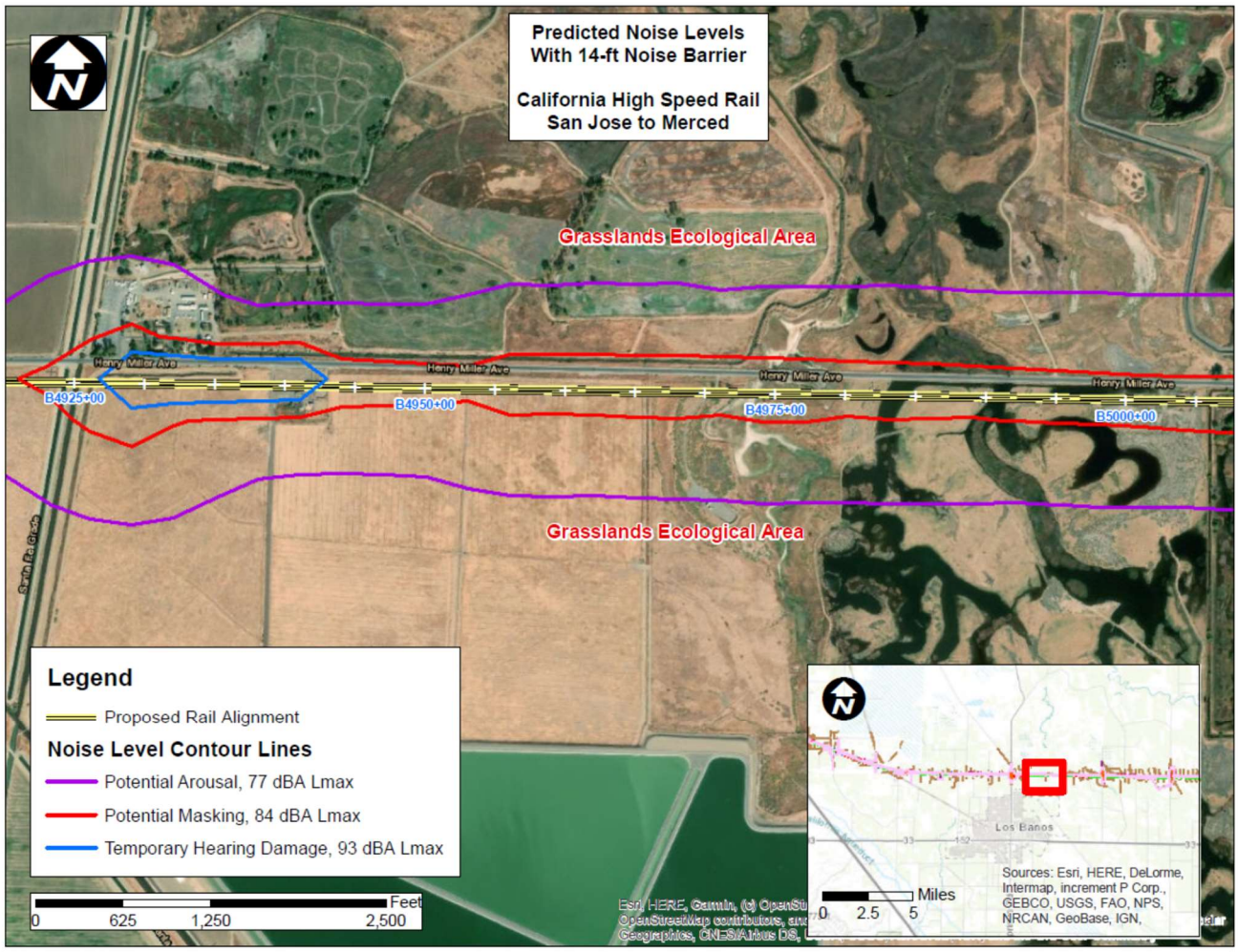


Figure 5. CAHSR Grasslands Noise Impact Zones
With 14-ft Noise Barriers (Part 2 of 2)

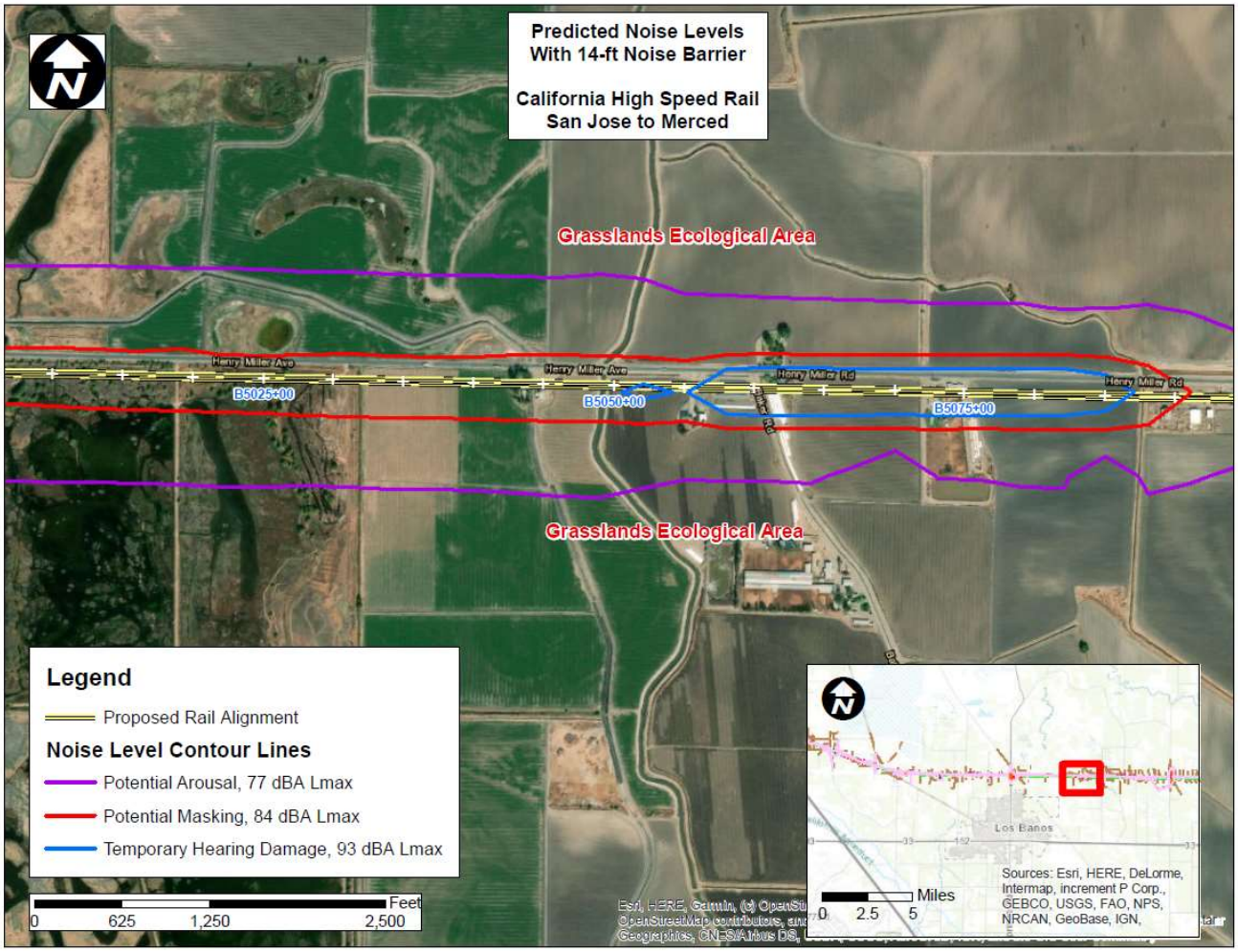


Figure 6. CAHSR Grasslands Noise Impact Zones With 17.5-ft Noise Barriers (Part 1 of 2)

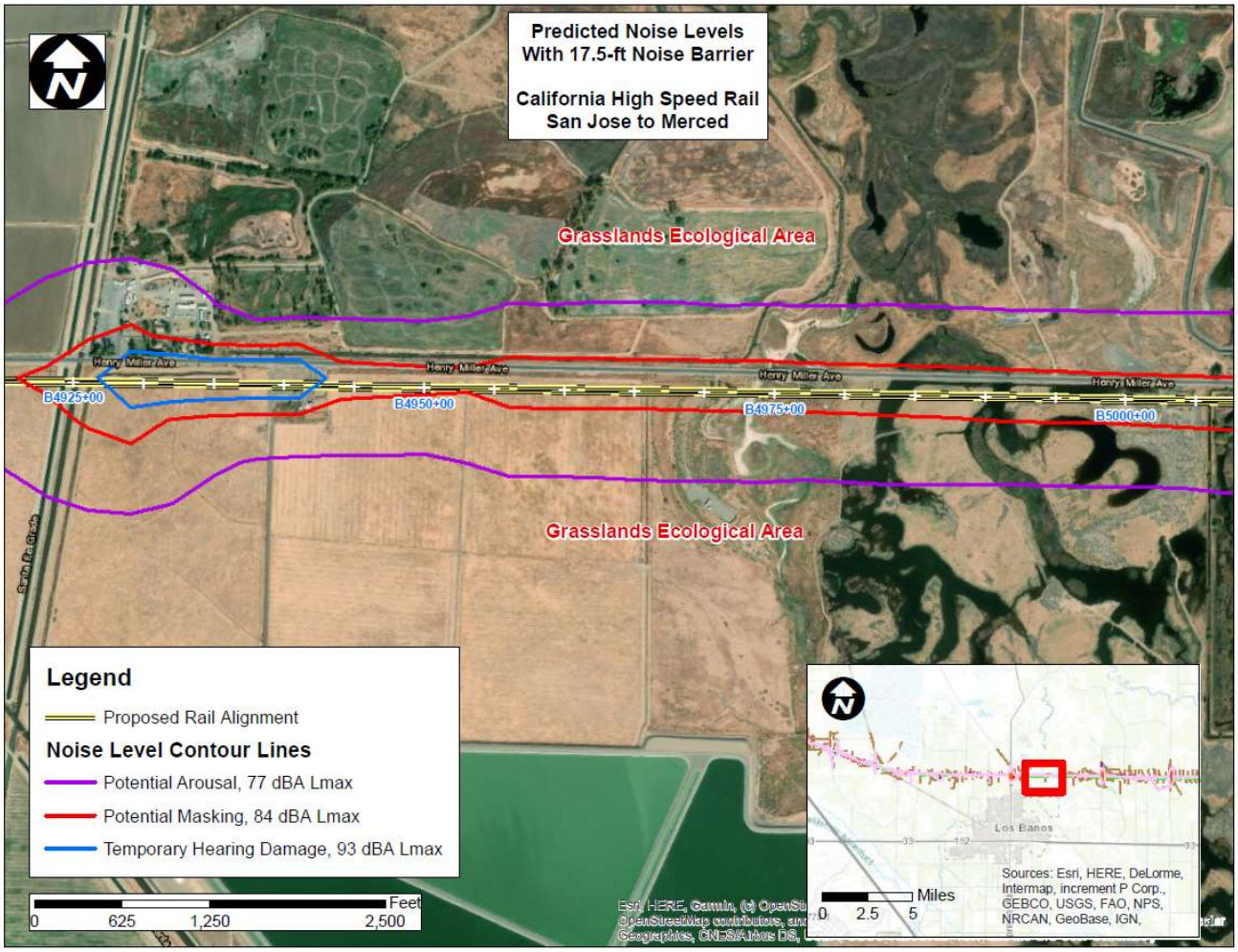


Figure 7. CAHSR Grasslands Noise Impact Zones With 17.5-ft Noise Barriers (Part 2 of 2)

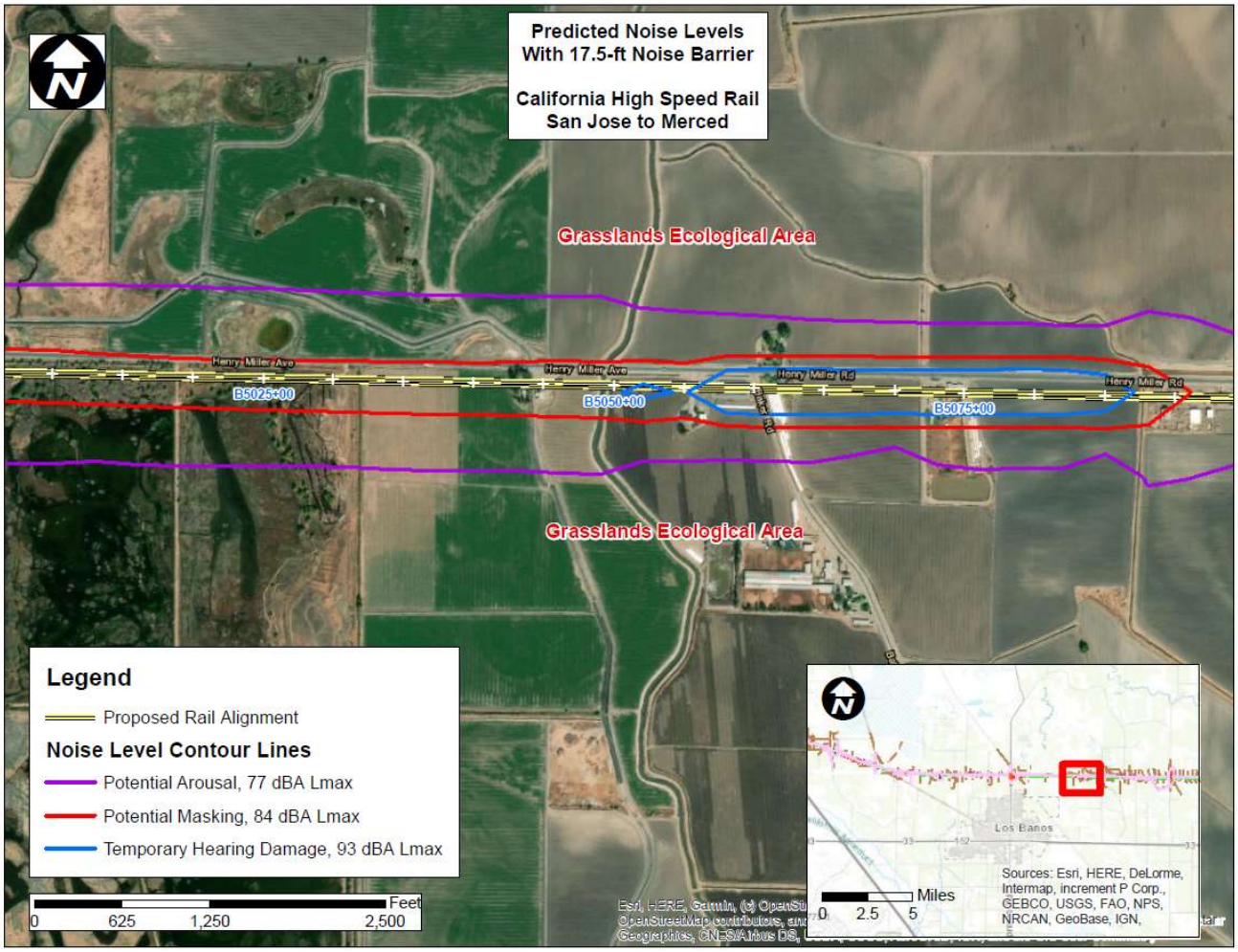


Figure 8. CAHSR Grasslands Noise Impact Zones
With 17.5-ft Cantilever Noise Barriers (Part 1 of 2)

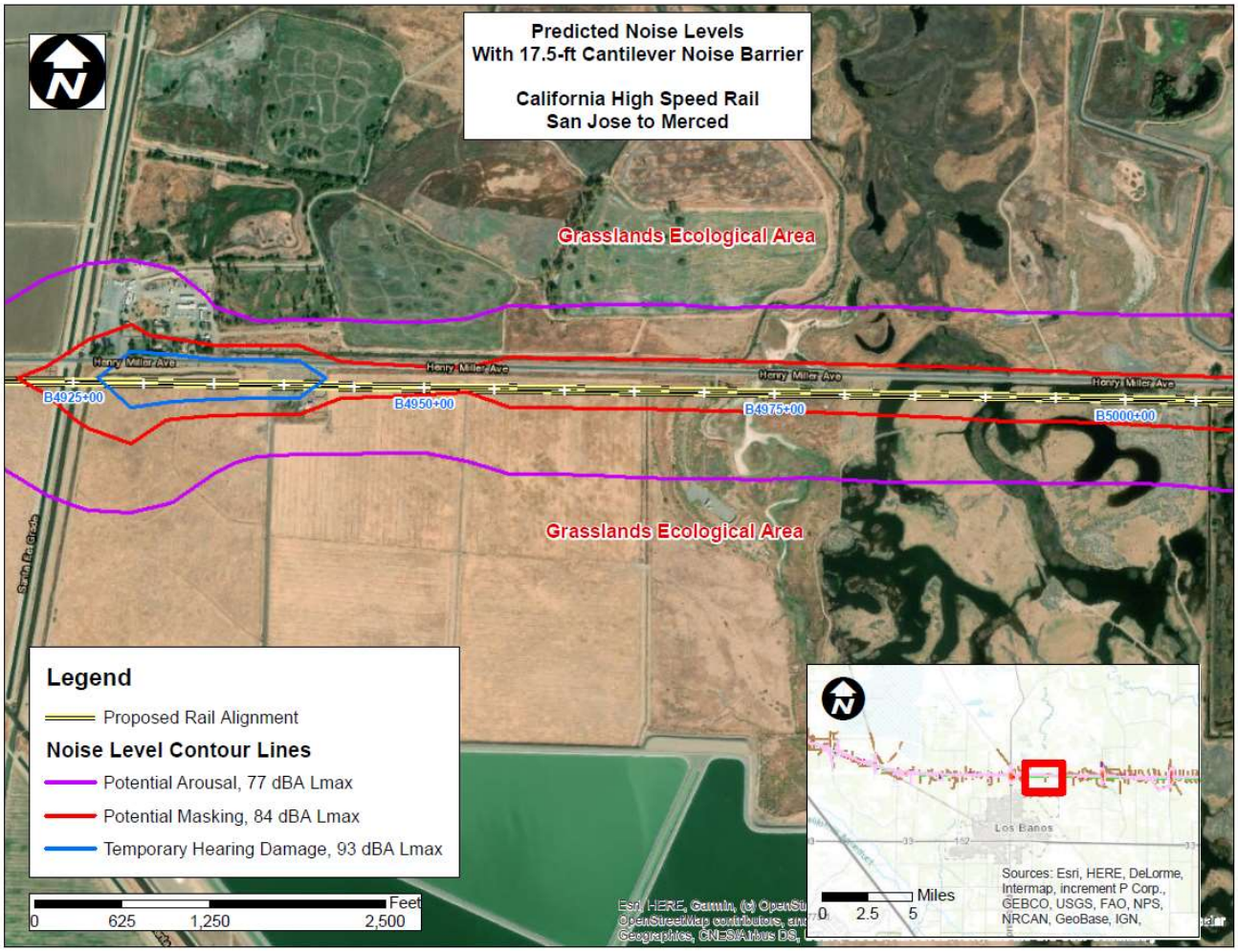


Figure 9. CAHSR Grasslands Noise Impact Zones
With 17.5-ft Cantilever Noise Barriers (Part 2 of 2)

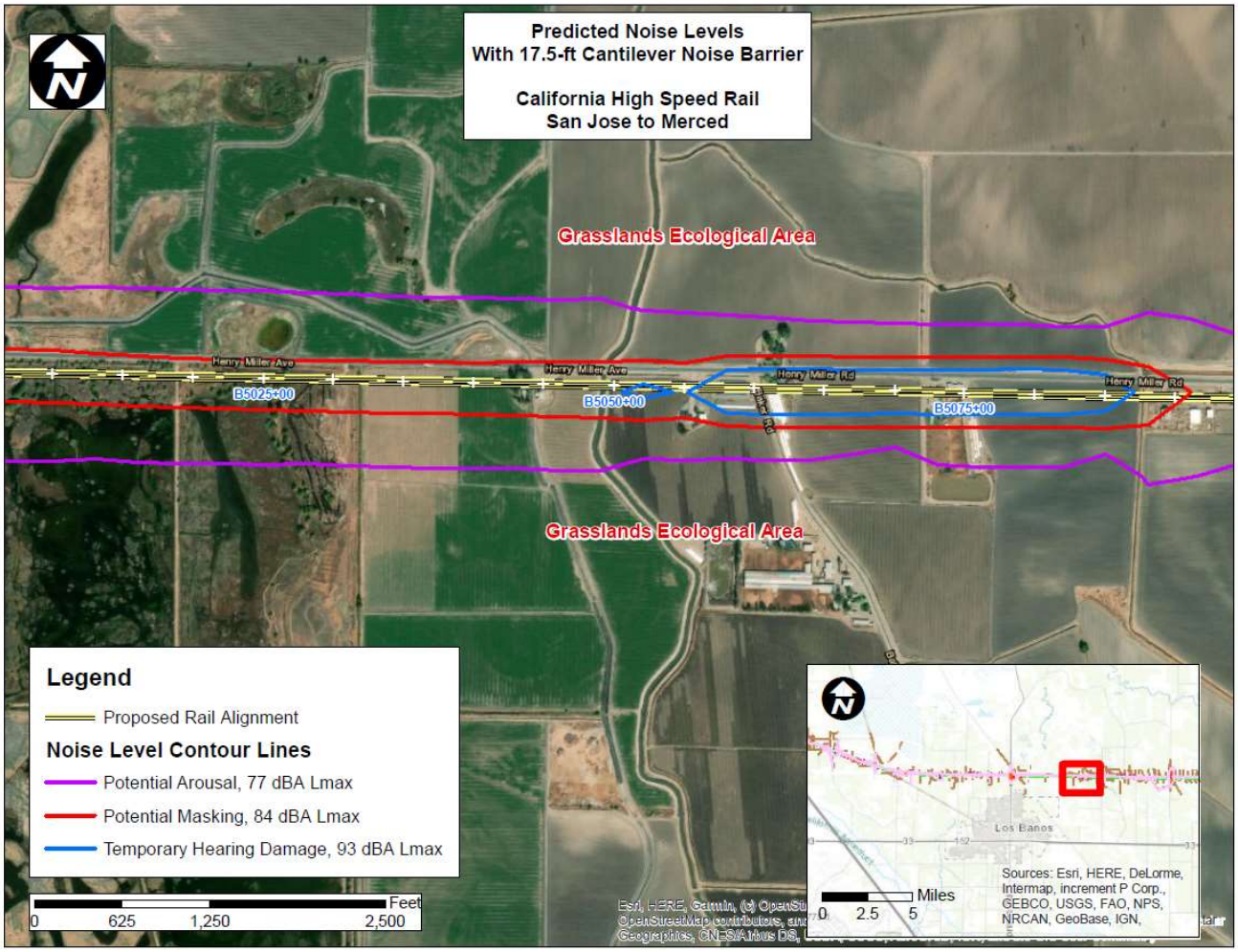


Figure 10. CAHSR Grasslands Noise Impact Zones With Tunnel Noise Barriers (Part 1 of 2)

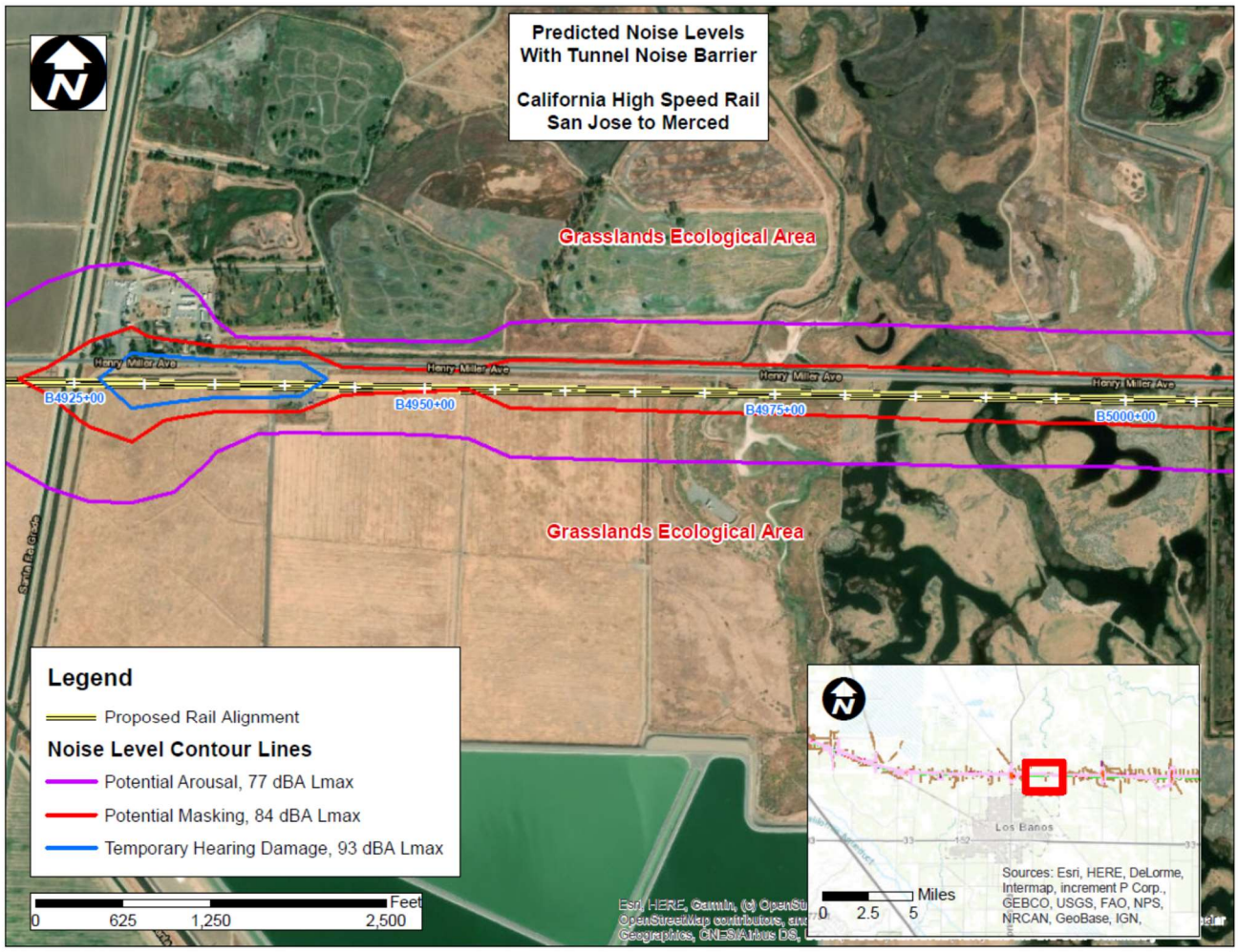
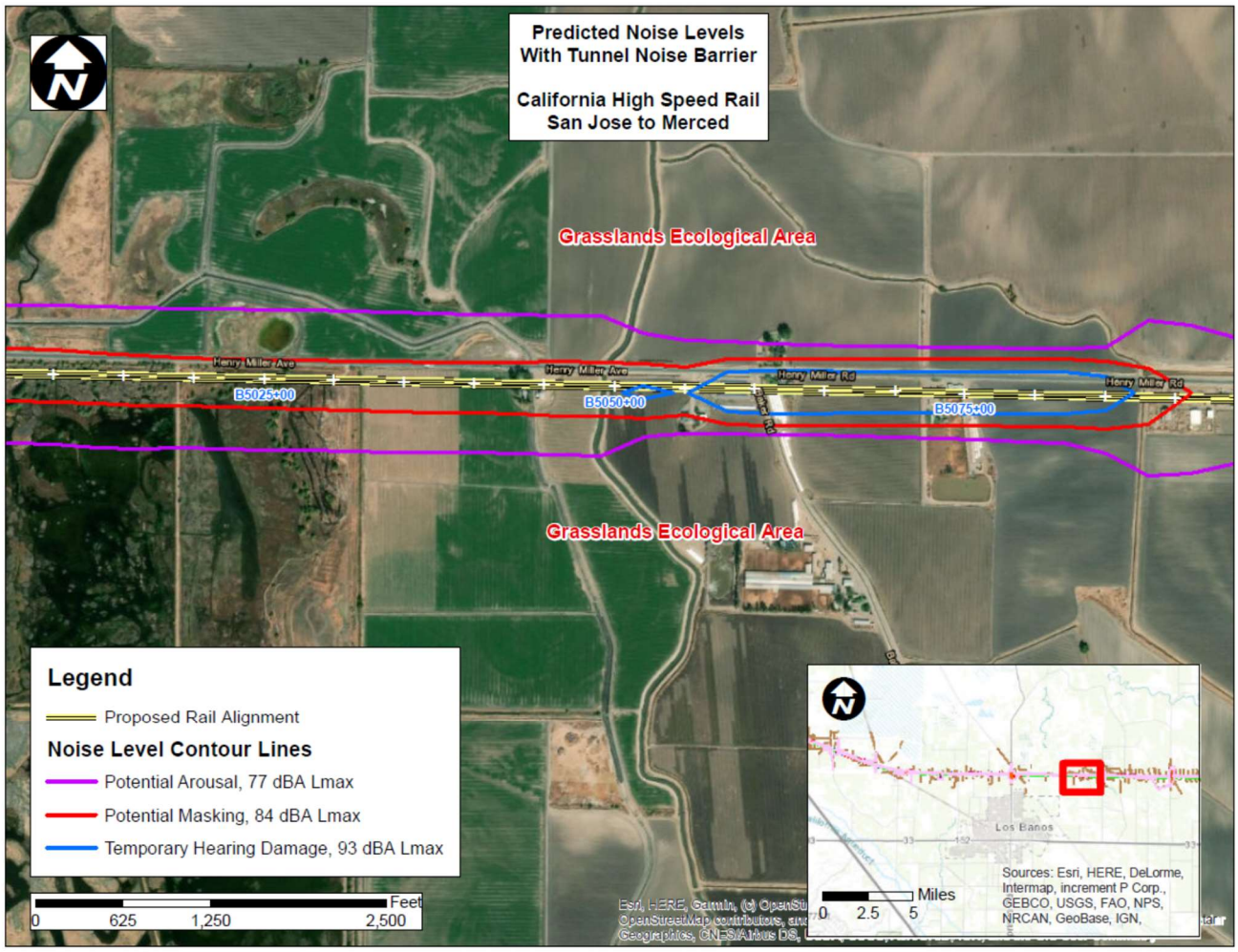


Figure 11. CAHSR Grasslands Noise Impact Zones With Tunnel Noise Barriers (Part 2 of 2)



Appendix 6

Cost Estimates

Noise Mitigation Options Estimate:

1.5 mi Viaduct & 1.5 mi Embankment:

Engineer's Estimate

9/16/2019 R.3

WBS Item	Description	Quant.	Unit	MHRS	Total Labor	Total Eq.Rent	Total Perm.Matl.	Total Subc.	**Direct Cost**	OH&P 15%	Subtotal Cost	Contingency 15%	**Total Direct Cost**	Unit Cost
10.10	Standard Soundwall along 1.5 mi Viaduct:	15,840	LF	17,058	$1,392,312	$697,447	$15,672,419	$0	**$17,762,178**	$2,664,327	$20,426,505	$3,063,976	**$23,490,481**	$1,482.98
10.20	Standard Soundwall along 1.5 mi Embankment:	15,840	LF	14,622	$1,187,781	$279,223	$11,630,203	$3,863,006	**$16,960,213**	$2,544,032	$19,504,244	$2,925,637	**$22,429,881**	$1,416.03
10.30	F&I Line Markers along 3.0 mi of Track:	1,056	EA	1,320	$78,207	$42,124	$12,143	$0	**$132,475**	$19,871	$152,346	$22,852	**$175,198**	$165.91
	MEASURE #1 Total Construction Cost	31,680	LF	33,000	2,658,300	1,018,794	27,314,766	3,863,006	**$34,854,865**	$5,228,230	$40,083,095	$6,012,464	**$46,095,560**	$1,455.04
20	Tubular Enclosure along 1.5mi Viaduct:	7,920	LF	115,674	$8,791,563	$3,099,518	$32,276,150	$5,195,520	**$49,362,751**	$7,404,413	$56,767,164	$8,515,075	**$65,282,239**	$8,242.71
30	Tubular Enclosure along 1.5 mi Embankment:	7,920	LF	115,674	$8,791,563	$3,099,518	$22,170,609	$6,893,723	**$40,955,414**	$6,143,312	$47,098,726	$7,064,809	**$54,163,535**	$6,838.83
	MEASURE #2 Total Construction Cost:	**15,840**	**LF**	**231,348**	**$17,583,127**	**$6,199,036**	**$54,446,759**	**$12,089,243**	**$90,318,165**	$13,547,725	$103,865,890	$15,579,883	**$119,445,773**	$7,540.77
40	Wall Panel Enclosure along 1.5mi Viaduct:	7,920	LF	64,385	$4,893,416	$1,854,376	$22,128,605	$5,195,520	**$34,071,917**	$5,110,788	$39,182,704	$5,877,406	**$45,060,110**	$5,689.41
50	Wall Panel Enclosure along 1.5 mi Embankment:	7,920	LF	61,148	$4,647,413	$1,777,795	$16,586,552	$6,893,723	**$29,905,483**	$4,485,822	$34,391,306	$5,158,696	**$39,550,001**	$4,993.69
	MEASURE #3 Total Construction Cost:	**15,840**	**LF**	**125,532**	**$9,540,829**	**$3,632,171**	**$38,715,158**	**$12,089,243**	**$63,977,400**	$9,596,610	$73,574,010	$11,036,101	**$84,610,111**	$5,341.55

Noise Mitigation Options Estimate: **Engineer's Estimate**

1.5 mi Viaduct & 1.5 mi Embankment: **9/16/2019** R.3

Item	Description	Quant.	Unit	Prod. Unit/Hr	Crew Hours	Days 8HR/Day	Man Hrs	Equip. Hrs	Labor Rate	Equip. Rent/Hr	Perm.Matl. Rate	Const.Matl. Rate	Subc. Rate	Total Labor	Total Eq.Rent	Total Perm.Matl.	Total Const.Matl.	Total Subc.	Direct Cost
10	**Standard Sound Wall:**					Days													
10.10	**Standard Soundwall along 1.5 mi Viaduct:**	**15,840**	**LF**	6.5	2,437	305													
	Acrylite Sound Wall System , (Quote by Armtec Company), Assume 4 Bays/Day = 2 Hrs/Bay = 2Hr/13LF=6.5'/HR	269,280	SF								$43.19					$11,630,203			$11,630,203
	90 TN RT Crane (Caltrans pg. 12 HCESP/GROVE/4760)	1	EA					2,437		$173.95					$423,903				$423,903
	Aerial Boom Manlift 60' (Caltrans pg. 15 HYLFT/BOOM/50-74)	1	EA					2,437		$47.31					$115,291				$115,291
	Flatbed Truck (Caltrans pg.34 TRUCK/T&TT/28-36)	1	EA					2,437		$39.96					$97,379				$97,379
	Pickup Truck (Caltrans pg.34 TRUCK/T&TT/06-12)	1	EA					2,437		$24.98					$60,874				$60,874
	Carpenter Foreman	1	EA				2,437		$86.27					$210,233					$210,233
	Carpenter Journeyman	4	EA				9,748		$83.93					$818,124					$818,124
	Flatbed Teamster - GR 2	1	EA				2,437		$64.23					$156,524					$156,524
	Crane Operator - GR 2-A	1	EA				2,437		$85.12					$207,431					$207,431
	Viaduct Structural Upgrade for 17ft high soundwall - Current Assumption is 2% of Viaduct cost															$4,042,216			$4,042,216
	Subtotal:						**17,058**							**$1,392,312**	**$697,447**	**$15,672,419**	**$0**	**$0**	**$17,762,178**
	Unit Cost:						0.9							$87.90	$44.03	$989.42	$0.00	$0.00	$1,121.35
						Days													
10.20	**Standard Soundwall along 1.5 mi Embankment:**	**15,840**	**LF**	6.5	2,437	305													
	16" CIDH Pile, 10 FT Long at 13' Spacing, (QTY = 15,840 LF @ 13' O.C. = 1218 EA @ 10 FT/EA = 12,184 LF), Quote Caltrans	12,184	LF										$68.31					$832,289	$832,289
	4,000 Psi Pile Cap & Reinforcement, (QTY = 1.5' W x 3.5' H x 15,840 LF = 3,080 CY)	3,080	CY										$984.00					$3,030,717	$3,030,717
	Acrylite Sound Wall System , (Quote by Armtec Company), Assume 4 Bays/Day = 0.5 Bay/HR = 6.5 LF/HR	269,280	SF								$43.19					$11,630,203			$11,630,203
	CAT446 Backhoe (Caltrans pg. 17 LDRRT/CAT/1868)	1	EA					2,437		$49.64					$120,969				$120,969
	Flatbed Truck (Caltrans pg.34 TRUCK/T&TT/28-36)	1	EA					2,437		$39.96					$97,379				$97,379
	Pickup Truck (Caltrans pg.34 TRUCK/T&TT/06-12)	1	EA					2,437		$24.98					$60,874				$60,874
	Carpenter Foreman	1	EA				2,437		$86.27					$210,233					$210,233
	Carpenter Journeyman	3	EA				7,311		$83.93					$613,593					$613,593
	Flatbed Teamster - GR 2	1	EA				2,437		$64.23					$156,524					$156,524
	Crane Operator - GR 2-A	1	EA				2,437		$85.12					$207,431					$207,431
	Embankment Sound wall Structural Upgrade for 17ft height - Current Assumption is 12% of soundwall cost															$1,859,185.11			$1,859,185
	Subtotal:						**14,622**							**$1,187,781**	**$279,223**	**$11,630,203**	**$0**	**$3,863,006**	**$16,960,213**
	Unit Cost:						1.1							$74.99	$17.63	$734.23	$0.00	$243.88	$1,070.72
						Days													
10.30	**F&I Line Markers along 3.0 mi of Track:**	**1,056**	**EA**	4	264	33													
	Aerial Marker Balls, Model JX (Quote by Flight Light)	83	EA								$151.17					$12,547			
	Bird-Flight Diverters, (Quote by Preformed Line Products)	1,056	EA								$11.50					$12,143			$12,143
	Aerial Boom Manlift 60' (Caltrans pg. 15 HYLFT/BOOM/50-74)	2	EA					528		$47.31					$24,980				$24,980
	Flatbed Truck (Caltrans pg.34 TRUCK/T&TT/28-36)	1	EA					264		$39.96					$10,549				$10,549
	Pickup Truck (Caltrans pg.34 TRUCK/T&TT/06-12)	1	EA					264		$24.98					$6,595				$6,595
	Labor Foreman	1	EA				264		$60.59					$15,996					$15,996
	Laborer - GR 3	3	EA				792		$57.14					$45,255					$45,255
	Flatbed Teamster - GR 2	1	EA				264		$64.23					$16,957					$16,957
	Subtotal:						**1,320**							**$78,207**	**$42,124**	**$12,143**	**$0**	**$0**	**$132,475**
	Unit Cost:						1.3							$74.06	$39.89	$11.50	$0.00	$0.00	$125.45
10	**Total Typical Mitigation on 3mi of track**	**31,680**	**LF**				**33,000**							**$2,658,300**	**$1,018,794**	**$27,314,766**	**$0**	**$3,863,006**	**$34,854,865**
20	**Tubular Enclosure along 1.5mi Viaduct:**	**7,920**	**LF**																
20.10	**4,000 Psi Concrete Anchor Wall:**	**5,280**	**CY**										$984.00					$5,195,520	**$5,195,520**
	(QTY = 3' W x 3' H x 7,920 LF = 2,640 CY x 2 EA = 5,280 CY)																		
						Days													
20.20	**Furnish & Install Steel:**	**8,902,241**	**LB**	1,000	8,902	1,113													
	(QTY = 8,902,241 LB = 4,451.12 TN @ 20 MH/TN = 89,022.4 MHs @ 10 men Crew = 8,902.24 CH = 1,000 LB/CH)																		
	Steel Rib - W14x38 Beam, (Quote by Durisol)	3,902,357	LB								$1.51					$5,898,998			$5,898,998
	Steel Straps - 1"x7"	2,552,774	LB								$1.51					$3,858,901			$3,858,901
	Struts 4" x 4" x 1/4" HSS	323,675	LB								$1.51					$489,283			$489,283
	Interior Cross Struts 4" x 4" x 1/4" Angle	521,580	LB								$1.51					$788,446			$788,446
	Longitudinal Braces 6" x 2" x 1/4" HSS	1,142,381	LB								$1.51					$1,726,880			$1,726,880
	Fasteners 4" x 4" x 1/4"	96,941	LB								$3.24					$314,015			$314,015
	Structural Plates 12" x 12" x 1/2"	224,726	LB								$1.51					$339,708			$339,708
	Cable Tray 4" x 3" x 1/4"	137,808	LB								$1.51					$208,317			$208,317
	Man Scissor Lift (Caltrans Pg.15, HYLFT/SCIS/31-50)	2	EA					17,804		$26.58					$473,243				$473,243
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					8,902		$9.49					$84,482				$84,482
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					8,902		$173.95					$1,548,545				$1,548,545
	Crane Operator 2-A	1	EA				8,902		$85.12					$757,759					$757,759
	Iron Worker Foremen	1	EA				8,902		$78.83					$701,764					$701,764
	Iron Worker	8	EA				71,218		$74.51					$5,306,448					$5,306,448
	Subtotal:						**89,022**							**$6,765,970**	**$2,106,270**	**$13,624,548**	**$0**	**$0**	**$22,496,789**
	Unit Cost:						100.00							$0.76	$0.24	$1.53	$0.00	$0.00	$2.53
						Days													
20.30	**Furnish & Install Aluminum Panels:**	**688,248**	**SF**	258	2,665	333													
	(QTY = 688,248 SF @ 10.76SF/Panel = 63,973 Panels @ 24 Panels/HR = 2,665.54 HRs = 258.24 SF/HR)																		

Noise Mitigation Options Estimate: **Engineer's Estimate**

1.5 mi Viaduct & 1.5 mi Embankment: **9/16/2019** R.3

Item	Description	Quant.	Unit	Prod. Unit/Hr	Crew Hours	Days 8HR/Day	Man Hrs	Equip. Hrs	Labor Rate	Equip. Rent/Hr	Perm.Matl. Rate	Const.Matl. Rate	Subc. Rate	Total Labor	Total Eq.Rent	Total Perm.Matl.	Total Const.Matl.	Total Subc.	Direct Cost
	2" Aluminum Panel 1.64'W x 6.56'L, (Quote by Durisol)	688,248	SF								$12.42					$8,546,061			$8,546,061
	Aerial Boom Manlift 60' (Caltrans pg. 15 HYLFT/BOOM/50-74)	4	EA					10,661		$47.31					$504,353				$504,353
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					2,665		$9.49					$25,292				$25,292
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					2,665		$173.95					$463,603				$463,603
	Crane Operator 2-A	1	EA				2,665		$85.12					$226,857					$226,857
	Iron Worker Foremen	1	EA				2,665		$78.83					$210,094					$210,094
	Iron Worker	8	EA				21,321		$74.51					$1,588,642					$1,588,642
20.4	**Structural Modifications** Viaduct Structural Upgrade for supporting enclosure - Assume 5% of viaduct structure cost ($134,740,541/mi)															$10,105,541			$10,105,541
	Subtotal:						**26,651**							**$2,025,593**	**$993,248**	**$18,651,602**	**$0**	**$0**	**$21,670,443**
	Unit Cost:						25.82							$2.94	$1.44	$27.10	$0.00	$0.00	$31.49
20	**Total Tubular Enclosure along 1.5 mi Viaduct**	**7,920**	**LF**				**115,674**							**$8,791,563**	**$3,099,518**	**$32,276,150**	**$0**	**$5,195,520**	**$49,362,751**
	Unit Cost:													$1,110.05	$391.35	$4,075.27	$0.00	$656.00	$6,232.67
30	**Tubular Enclosure along 1.5 mi Embankment:**	**7,920**	**LF**			Days													
30.10	**4,000 Psi Concrete Anchor Wall:**																		
	16" CIDH Pile, 10 FT Long at 13' Spacing, (QTY = 15,840 LF @ 13' O.C. = 1218 EA @ 10 FT/EA = 12,184 LF), Quote Caltrans	12,184	LF										$68.31					$832,289	
	(QTY = 3' W x 3.5' H x 7,920 LF = 3,080 CY x 2 EA = 6,160 CY)	**6,160**	**CY**										$984.00					$6,061,434	**$6,893,723**
30.20	**Furnish & Install Steel:**	**8,902,241**	**LB**	1,000	8,902	1,113													
	(QTY = 5,719,044 LB = 2,859.52 TN @ 20 MH/TN = 57,190.4 MHs @ 10 men Crew = 5,719 CH = 1,000 LB/CH)																		
	Steel Rib - W14x38 Beam, (Quote by Durisol)	3,902,357	LB								$1.51					$5,898,998			$5,898,998
	Steel Straps - 1"x7"	2,552,774	LB								$1.51					$3,858,901			$3,858,901
	Struts 4" x 4" x 1/4" HSS	323,675	LB								$1.51					$489,283			$489,283
	Interior Cross Struts 4" x 4" x 1/4" Angle	521,580	LB								$1.51					$788,446			$788,446
	Longitudinal Braces 6" x 2" x 1/4" HSS	1,142,381	LB								$1.51					$1,726,880			$1,726,880
	Fasteners 4" x 4" x 1/4"	96,941	LB								$3.24					$314,015			$314,015
	Structural Plates 12" x 12" x 1/2"	224,726	LB								$1.51					$339,708			$339,708
	Cable Tray 4" x 3" x 1/4"	137,808	LB								$1.51					$208,317			$208,317
	Man Scissor Lift (Caltrans Pg.15, HYLFT/SCIS/31-50)	2	EA					17,804		$26.58					$473,243				$473,243
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					8,902		$9.49					$84,482				$84,482
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					8,902		$173.95					$1,548,545				$1,548,545
	Crane Operator 2-A	1	EA				8,902		$85.12					$757,759					$757,759
	Iron Worker Foremen	1	EA				8,902		$78.83					$701,764					$701,764
	Iron Worker	8	EA				71,218		$74.51					$5,306,448					$5,306,448
	Subtotal:						**89,022**							**$6,765,970**	**$2,106,270**	**$13,624,548**	**$0**	**$0**	**$22,496,789**
	Unit Cost:						100.00							$0.76	$0.24	$1.53	$0.00	$0.00	$2.53
						Days													
30.30	**Furnish & Install Aluminum Panels:**	**688,248**	**SF**	258	2,665	333													
	(QTY = 688,248 SF @ 10.76SF/Panel = 63,973 Panels @ 24 Panels/HR = 2,665.54 HRs = 258.24 SF/HR)																		
	2" Aluminum Panel 1.64'W x 6.56'L, (Quote by Durisol)	688,248	SF								$12.42					$8,546,061			$8,546,061
	Aerial Boom Manlift 60' (Caltrans pg. 15 HYLFT/BOOM/50-74)	4	EA					10,661		$47.31					$504,353				$504,353
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					2,665		$9.49					$25,292				$25,292
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					2,665		$173.95					$463,603				$463,603
	Crane Operator 2-A	1	EA				2,665		$85.12					$226,857					$226,857
	Iron Worker Foremen	1	EA				2,665		$78.83					$210,094					$210,094
	Iron Worker	8	EA				21,321		$74.51					$1,588,642					$1,588,642
	Subtotal:						**26,651**							**$2,025,593**	**$993,248**	**$8,546,061**	**$0**	**$0**	**$11,564,902**
	Unit Cost:						25.82							$2.94	$1.44	$12.42	$0.00	$0.00	$16.80
30	**Total Tubular Enclosure along 1.5 mi Embankment**	**7,920**	**LF**				**115,674**							**$8,791,563**	**$3,099,518**	**$22,170,609**	**$0**	**$6,893,723**	**$40,955,414**
	Unit Cost:													$1,110.05	$391.35	$2,799.32	$0.00	$870.42	$5,171.14
20+30	**Total of 1.5 mi Tubular Enclosure on Embankment and 1.5 mi Tubular Enclosure on Viaduct**	**15,840**	**LF**				**231,348**							**$17,583,127**	**$6,199,036**	**$54,446,759**	**$0**	**$12,089,243**	**$90,318,165**
40	**Wall Panel Enclosure along 1.5mi Viaduct:**	**7,920**	**LF**																
40.10	**4,000 Psi Concrete Anchor Wall:**	**5,280**	**CY**										$984.00					$5,195,520	**$5,195,520**
	(QTY = 3' W x 3' H x 7,920 LF = 2,640 CY x 2 EA = 5,280 CY)																		

Noise Mitigation Options Estimate: **Engineer's Estimate**

1.5 mi Viaduct & 1.5 mi Embankment: **9/16/2019** R.3

Item	Description	Quant.	Unit	Prod. Unit/Hr	Crew Hours	Days 8HR/Day	Man Hrs	Equip. Hrs	Labor Rate	Equip. Rent/Hr	Perm.Matl. Rate	Const.Matl. Rate	Subc. Rate	Total Labor	Total Eq.Rent	Total Perm.Matl.	Total Const.Matl.	Total Subc.	Direct Cost
						Days													
40.20	**Furnish & Install Steel:**	**4,005,774**	**LB**	1,000	4,006	501													
	(QTY = 4,639,993 LB = 2320 TN @ 20 MH/TN = 46,400 MHs @ 10 men Crew = 4640 CH = 1,000 LB/CH)																		
	Steel Rib - W12x30 Beam	863,082	LB								$1.51					$1,304,678			$1,304,678
	Steel Rib upper and top - W10x22 Beam	1,094,663	LB								$1.51					$1,654,747			$1,654,747
	Struts 4" x 4" x 1/4" HSS	323,675	LB								$1.51					$489,283			$489,283
	Long - Interior Cross Struts 4" x 4" x 1/4" Angle	291,416	LB								$1.51					$440,520			$440,520
	Lat - Interior Cross Struts 4" x 4" x 1/4" Angle	207,397	LB								$1.51					$313,512			$313,512
	Longitudinal Braces W6x12	950,400	LB								$1.51					$1,436,672			$1,436,672
	Fasteners 4" x 4" x 1/4"	96,941	LB								$3.24					$314,015			$314,015
	Structural Plates 12" x 12" x 1/2"	40,392	LB								$1.51					$61,059			$61,059
	Cable Tray 4" x 3" x 1/4"	137,808	LB								$1.51					$208,317			$208,317
	Man Scissor Lift (Caltrans Pg.15, HYLFT/SCIS/31-50)	2	EA					8,012		$26.58					$212,947				$212,947
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					4,006		$9.49					$38,015				$38,015
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					4,006		$173.95					$696,804				$696,804
	Crane Operator 2-A	1	EA				4,006		$85.12					$340,971					$340,971
	Iron Worker Foremen	1	EA				4,006		$78.83					$315,775					$315,775
	Iron Worker	8	EA				32,046		$74.51					$2,387,762					$2,387,762
	Subtotal:						**40,058**							**$3,044,508**	**$947,766**	**$6,222,803**	**$0**	**$0**	**$10,215,077**
	Unit Cost:						100.00							$0.76	$0.24	$1.55	$0.00	$0.00	$2.55
						Days													
40.30	**Furnish & Install Fiberglass Panels:**	**628,214**	**SF**	258	2,433	304													
	(QTY = 628,214 SF @ 10.76SF/Panel = 63,973 Panels @ 24 Panels/HR = 2,665.54 HRs = 258.24 SF/HR)																		
	x" Fiberglass Panel , (perSF Quote by SoundFighter)	628,214	SF								$17.28					$10,853,032			$10,853,032
	Aerial Boom Manlift 60' (Caltrans pg. 15 HYLFT/BOOM/50-74)	4	EA					9,731		$47.31					$460,360				$460,360
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					2,433		$9.49					$23,086				$23,086
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					2,433		$173.95					$423,164				$423,164
	Crane Operator 2-A	1	EA				2,433		$85.12					$207,069					$207,069
	Iron Worker Foremen	1	EA				2,433		$78.83					$191,768					$191,768
	Iron Worker	8	EA				19,461		$74.51					$1,450,070					$1,450,070
40.4	**Structural Modifications** Viaduct Structural Upgrade for supporting enclosure - Assume 2.5% of viaduct structure cost ($134,740,541/mi)															$5,052,770			$5,052,770
	Subtotal:						**24,327**							**$1,848,907**	**$906,610**	**$15,905,802**	**$0**	**$0**	**$18,661,319**
	Unit Cost:						25.82							$2.94	$1.44	$25.32	$0.00	$0.00	$29.71
40	**Total Wall Panel Enclosure along 1.5 mi Viaduct**	**7,920**	**LF**				**64,385**							**$4,893,416**	**$1,854,376**	**$22,128,605**	**$0**	**$5,195,520**	**$34,071,917**
	Unit Cost:													$617.86	$234.14	$2,794.02	$0.00	$656.00	$4,302.01
50	**Wall Panel Enclosure along 1.5 mi Embankment:**	**7,920**	**LF**			Days													
50.10	**4,000 Psi Concrete Anchor Wall:**																		
	16" CIDH Pile, 10 FT Long at 13' Spacing, (QTY = 15,840 LF @ 13' O.C. = 1218 EA @ 10 FT/EA = 12,184 LF), Quote Caltrans	12,184	LF										$68.31					$832,289	
	(QTY = 3' W x 3.5' H x 7,920 LF = 3,080 CY x 2 EA = 6,160 CY)	**6,160**	**CY**										$984.00					$6,061,434	**$6,893,723**
50.20	**Furnish & Install Steel:**	**3,682,099**	**LB**	1,000	3,682	460													
	(QTY = 4,639,993 LB = 2320 TN @ 20 MH/TN = 46,400 MHs @ 10 men Crew = 4640 CH = 1,000 LB/CH)																		
	Steel Rib - W12x30 Beam	863,082	LB								$1.51					$1,304,678			$1,304,678
	Steel Rib upper and top - W10x22 Beam	1,094,663	LB								$1.51					$1,654,747			$1,654,747
	Long - Interior Cross Struts 4" x 4" x 1/4" Angle	291,416	LB								$1.51					$440,520			$440,520
	Lat - Interior Cross Struts 4" x 4" x 1/4" Angle	207,397	LB								$1.51					$313,512			$313,512
	Longitudinal Braces W6x12	950,400	LB								$1.51					$1,436,672			$1,436,672
	Fasteners 4" x 4" x 1/4"	96,941	LB								$3.24					$314,015			$314,015
	Structural Plates 12" x 12" x 1/2"	40,392	LB								$1.51					$61,059			$61,059
	Cable Tray 4" x 3" x 1/4"	137,808	LB								$1.51					$208,317			$208,317
	Man Scissor Lift (Caltrans Pg.15, HYLFT/SCIS/31-50)	2	EA					7,364		$26.58					$195,740				$195,740
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					3,682		$9.49					$34,943				$34,943
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					3,682		$173.95					$640,501				$640,501
	Crane Operator 2-A	1	EA				3,682		$85.12					$313,420					$313,420
	Iron Worker Foremen	1	EA				3,682		$78.83					$290,260					$290,260
	Iron Worker	8	EA				29,457		$74.51					$2,194,826					$2,194,826
	Subtotal:						**36,821**							**$2,798,506**	**$871,185**	**$5,733,520**	**$0**	**$0**	**$9,403,211**
	Unit Cost:						100.00							$0.76	$0.24	$1.56	$0.00	$0.00	$2.55
						Days													
50.30	**Furnish & Install Fiberglass Panels:**	**628,214**	**SF**	258	2,433	304													
	(QTY = 628,214 SF @ 10.76SF/Panel = 63,973 Panels @ 24 Panels/HR = 2,665.54 HRs = 258.24 SF/HR)																		
	x" Fiberglass Panel , (perSF Quote by SoundFighter)	628,214	SF								$17.28					$10,853,032			$10,853,032
	Aerial Boom Manlift 60' (Caltrans pg. 15 HYLFT/BOOM/50-74)	4	EA					9,731		$47.31					$460,360				$460,360
	Welding Machine (Caltrans Pg.34, WELD/AWM/250-500)	1	EA					2,433		$9.49					$23,086				$23,086
	Crane 90 Ton Grove RT-990 (Caltrans pg.12 HCESP/GROV/RT-990) - Unload Steel	1	EA					2,433		$173.95					$423,164				$423,164

Noise Mitigation Options Estimate: **Engineer's Estimate**

1.5 mi Viaduct & 1.5 mi Embankment: **9/16/2019** R.3

Item	Description	Quant.	Unit	Prod.	Crew	Days	Man	Equip.	Labor	Equip.	Perm.Matl.	Const.Matl.	Subc.	Total	Total	Total	Total	Total	Direct
				Unit/Hr	Hours	8HR/Day	Hrs	Hrs	Rate	Rent/Hr	Rate	Rate	Rate	Labor	Eq.Rent	Perm.Matl.	Const.Matl.	Subc.	Cost
	Crane Operator 2-A	1	EA				2,433		$85.12					$207,069					$207,069
	Iron Worker Foremen	1	EA				2,433		$78.83					$191,768					$191,768
	Iron Worker	8	EA				19,461		$74.51					$1,450,070					$1,450,070
	Subtotal:						**24,327**							**$1,848,907**	**$906,610**	**$10,853,032**	**$0**	**$0**	**$13,608,549**
	Unit Cost:						25.82							$2.94	$1.44	$17.28	$0.00	$0.00	$21.66
50	**Total Wall Panel Enclosure along 1.5 mi Embankment**	**7,920**	**LF**				**61,148**							**$4,647,413**	**$1,777,795**	**$16,586,552**	**$0**	**$6,893,723**	**$29,905,483**
	Unit Cost:													$586.79	$224.47	$2,094.26	$0.00	$870.42	$3,775.94
40+50	**Total of 1.5 mi Wall Panel Enclosure on Embankment and 1.5 mi Wall Panel Enclosure on Viaduct**	**15,840**	**LF**				**125,532**							**$9,540,829**	**$3,632,171**	**$38,715,158**	**$0**	**$12,089,243**	**$63,977,400**

California High Speed Rail: **Engineer's Estimate**

Conceptual Enclosure Structural Steel Estimate: **9/16/2019** R.2

Guideway Tubular Enclosure

Item	Item Description	Quantity	Length/EA	Total Length	Weight/LF	Weight/EA	Total Weight
	Tubular Enclosure along 1.5mi viaduct	EA	FT	FT	LB	LB	LB
1	Steel Rib - W14x38 beam	1,224	83.90	102,693.60	38	3,188.20	3,902,356.80
2	Steel Straps - 1"x7"	1,224	86.9	106,365.60	24	2,085.60	2,552,774.40
3	Struts 4" x 4" x 1/4" HSS	2,448	11	26,928.00	12.02	132.22	323,674.56
4	Interior Cross Struts 4" x 4" x 1/4" Angle	8,064	9.8	79,027.20	6.6	64.68	521,579.52
5	Longitudinal Braces 6" x 2" x 1/4" HSS	13,824	6.875	95,040.00	12.02	82.64	1,142,380.80
6	Fasteners 4" x 4" x 1/4"	29,376	0.5	14,688.00	6.6	3.30	96,940.80
7	Structural Plates 12" x 12" x 1/2"	11,016				20.4	224,726.40
8	Cable Tray 4" x 3" x 1/4"	3	7,920	23,760	5.8	45,936.00	137,808.00
							8,902,241.28
9	Noise Mitigation Panels, 2" Thick	688,248	SF				
	(Acrylic, Wood Pulp Comp., or Concrete)						

Item	Item Description	Quantity	Length/EA	Total Length	Weight/LF	Weight/EA	Total Weight
	Enclosure along 1.5mi embankment	EA	FT	FT	LB	LB	LB
1	Steel Rib - W14x38 beam	1,224	83.90	102,693.60	38	3,188.20	3,902,356.80
2	Steel Straps - 1"x7"	1,224	86.9	106,365.60	24	2,085.60	2,552,774.40
3	Concreter Parapet	2	7,920	15,840.00			
4	Interior Cross Struts 4" x 4" x 1/4" Angle	8,064	9.8	79,027.20	6.6	64.68	521,579.52
5	Longitudinal Braces 6" x 2" x 1/4" HSS	13,824	6.875	95,040.00	12.02	82.64	1,142,380.80
6	Fasteners 4" x 4" x 1/4"	29,376	0.5	14,688.00	6.6	3.30	96,940.80
7	Structural Plates 12" x 12" x 1/2"	11,016				20.4	224,726.40
8	Cable Tray 4" x 3" x 1/4"	3	7,920	23,760	5.8	45,936.00	137,808.00
							8,578,566.72
9	Noise Mitigation Panels, 2" Thick	688,248	SF				
	(Acrylic, Wood Pulp Comp., or Concrete)						

Guideway Wall Panel Enclosure

Item	Item Description	Quantity	Length/EA	Total Length	Weight/LF	Weight/EA	Total Weight
	Wall Panel Enclosure along 1.5mi viaduct	EA	FT	FT	LB	LB	LB
1	Steel Rib - W12x30 beam	990	29.06	28,769.40	30	871.80	863,082.00
2	Steel Rib upper - W10x22 beam	990	50.26	49,757.40	22	1,105.72	1,094,662.80
3	Struts 4" x 4" x 1/4" HSS	2,448	11	26,928.00	12.02	132.22	323,674.56
4	Long - Interior Cross Struts 4" x 4" x 1/4" Angle	990	44.6	44,154.00	6.6	294.36	291,416.40
5	Belt - Interior Cross Struts 4" x 4" x 1/4" Angle	124	253.9	31,423.84	6.6	1,675.94	207,397.33
6	Longitudinal Braces W6x12	9,900	8.000	79,200.00	12	96.00	950,400.00
7	Fasteners 4" x 4" x 1/4"	29,376	0.5	14,688.00	6.6	3.30	96,940.80
8	Structural Plates 12" x 12" x 1/2"	1,980				20.4	40,392.00
9	Cable Tray 4" x 3" x 1/4"	3	7,920	23,760	5.8	45,936.00	137,808.00
							4,005,773.89
10	Noise Mitigation Panels, 2" Thick	628,214	SF				
	Fiberglass, apprx. 5psf						

Item	Item Description	Quantity	Length/EA	Total Length	Weight/LF	Weight/EA	Total Weight
	Enclosure along 1.5mi embankment	EA	FT	FT	LB	LB	LB
1	Steel Rib - W14x38 beam	1,224	83.90	102,693.60	38	3,188.20	3,902,356.80
2	Steel Straps - 1"x7"	1,224	86.9	106,365.60	24	2,085.60	2,552,774.40
3	Concreter Parapet	2	7,920	15,840.00			
4	Interior Cross Struts 4" x 4" x 1/4" Angle	8,064	9.8	79,027.20	6.6	64.68	521,579.52
5	Longitudinal Braces 6" x 2" x 1/4" HSS	13,824	6.875	95,040.00	12.02	82.64	1,142,380.80
6	Fasteners 4" x 4" x 1/4"	29,376	0.5	14,688.00	6.6	3.30	96,940.80
7	Structural Plates 12" x 12" x 1/2"	11,016				20.4	224,726.40
8	Cable Tray 4" x 3" x 1/4"	3	7,920	23,760	5.8	45,936.00	137,808.00
							8,578,566.72
9	Noise Mitigation Panels, 2" Thick	688,248	SF				
	(Acrylic, Wood Pulp Comp., or Concrete)						

Concrete Estimate:

Engineer's Estimate

9/16/2019 R.1

	Description	Quant.	Unit	Prod.	Crew	Durations	Man	Equip.	Labor	Equip.	Perm.Matl.	Const.Matl.	Subc.	Total	Total	Total	Total	Total	Total
Activity				Unit/Hr	Hours	8HR/Day	Hrs	Hrs	Rate	Rent/Hr	Rate	Rate	Rate	Labor	Eq.Rent	Perm.Matl.	Const.Matl.	Subc.	Cost
	4,000 Psi Pile Cap (Standard Sound Wall 1.5 mi Embankment):	**15,840**	**LF**			Days													
10	**Fabricate Wall Forms:**	**4,200**	**SF**	49.00	86	10.7													
	Pre-Fab Supplies Flat	4,200	SF									$0.49					$2,046		$2,046
	5/8" Plywood	5,460	SF									$1.62					$8,866		$8,866
	Form Lumber	14,700	BF									$0.54					$7,956		$7,956
	185 CFM Diesel Comp. (Pg.1, AIRCP/PORT/016-025)	1	EA					86		$16.81					$1,441				$1,441
	Generator 10 KW (pg.6, ELGEN/GEN/008-015)	1	EA					86		$7.50					$643				$643
	Carpenter Foreman	1	EA				86		$86.27					$7,395					$7,395
	Carpenter Prefab	3	EA				257		$83.93					$21,582					$21,582
	Total Fabricate Forms						**343**							**$28,977**	**$2,084**	**$0**	**$18,868**	**$0**	**$49,928**
	Unit Cost:						12.25							$6.90	$0.50		$4.49	$0.00	$11.89
						Days													
20	**Erect & Strip Wall Forms:**	**93,139**	**SF**	70.40	1,323	165													
	Surface Form Oil	93,139	SF									$0.04					$4,033		$4,033
	Set/Strip Wood Form Supplies	121,081	SF									$1.35					$163,838		$163,838
	Pickup Truck (Caltrans pg.34 TRUCK/T&TT/06-12)	2	EA					2,646		$24.98					$66,097				$66,097
	185 CFM Diesel Comp. (Pg.1, AIRCP/PORT/016-025)	2	EA					2,646		$16.81					$44,479				$44,479
	Generator 10 KW (pg.6, ELGEN/GEN/008-015)	2	EA					2,646		$7.50					$19,845				$19,845
	Carpenter Foreman	2	EA				2,646		$86.27					$228,270					$228,270
	Carpenter Prefab	6	EA				7938		$83.93					$666,236					$666,236
	Total Erect & Strip Wall Forms						**10,584**							**$894,507**	**$130,421**	**$0**	**$167,871**	**$0**	**$1,192,799**
	Unit Cost:						8.80							$9.60	$1.40		$1.80	$0.00	$12.81
30	**Rebar - Furnish/Install (Black):**	**647,010**	**LBS**										$0.97					$627,599.70	**$627,600**
						Days													
40	**Place Concrete:**	**2,588.04**	**CY**	14.70	176	22													
	4000 psi Concrete	2,588.04	CY								$118.00					$305,389			$305,389
	Conc. Vib/Place Supply	2,588.04	CY									$1.52					$3,922		$3,922
	Pickup Truck (Caltrans pg.34 TRUCK/T&TT/06-12)	1	EA					176		$24.98					$4,398				$4,398
	Conc. Pump 36 M (Pg.5, CONPM/SHWG/1058)	1	EA					176		$107.63					$18,949				$18,949
	185 CFM Diesel Comp. (Pg.1, AIRCP/PORT/016-025)	1	EA					176		$16.81					$2,960				$2,960
	Generator 10 KW (pg.6, ELGEN/GEN/008-015)	1	EA					176		$7.50					$1,320				$1,320
	Conc. Pump Operator GR 5	1	EA				176		$79.53					$14,002					$14,002
	Laborer Foreman	1	EA				176		$60.59					$10,667					$10,667
	Concrete Vibratorman - GR 2	1	EA				176		$57.26					$10,081					$10,081
	Concrete Laborer - GR 2	3	EA				528		$57.26					$30,243					$30,243
	Total Place Concrete						**1,056**							**$64,993**	**$27,627**	**$305,389**	**$3,922**	**$0**	**$401,931**
	Unit Cost:						2.45							$25.11	$10.67	$118.00	$1.52	$0.00	$155.30
						Days													
50	**Wet Finish:**	**19,958**	**SF**	107.34	185.9	23													
	Wood float Supplies	19,958	SF									$0.09					$1,728		$1,728
	Screed Supplies	19,958	SF									$0.09					$1,728		$1,728
	Cement Mason Foreman	1	EA				185.9		$68.01					$12,646					$12,646
	Cement Mason/Conc. Finisher	1	EA				185.9		$65.67					$12,210					$12,210
	Subtotal:						**372**							**$24,856**	**$0**	**$0**	**$3,457**	**$0**	**$28,313**
	Unit Cost:						53.7							$1.25	$0.00		$0.17	$0.00	$1.42
						Days													
60	**Dry Finish:**	**93,139**	**SF**	138.36	673	84.1													
	Conc. Finish Supplies	93,139	SF									$0.03					$3,025		$3,025
	Point/Patch Supplies	93,139	SF									$0.10					$9,074		$9,074
	Cement Mason Foreman	1	EA				673		$68.01					$45,782					$45,782

	Cement Mason/Conc. Finisher	3	EA				2019		$65.67					$132,620					$132,620
	Subtotal:						**2693**							**$178,402**	**$0**	**$0**	**$12,099**	**$0**	**$190,501**
	Unit Cost:						34.6							$1.92	$0.00		$0.13	$0.00	$2.05
						Days													
70	**Water Cure:**	**113,098**	**SF**	224.50	504	63.0													
	Water Cure	113,098	SF									$0.04					$4,920		$4,920
	Concrete Finish Laborer - GR 2	2	EA				1008		$57.26					$57,692					$57,692
	Subtotal:						**1008**							**$57,692**	**$0**	**$0**	**$4,920**	**$0**	**$62,612**
	Unit Cost:						112.25							$0.51	$0.00	$0.00	$0.04	$0.00	$0.55
	Total 4,000 Psi Pile Cap (Standard Sound Wall 1.5 mi Embankment):						**16,055**							**$1,249,427**	**$160,132**	**$305,389**	**$211,136**	**$627,600**	**$2,553,684**
	Unit Cost:	**15,840**	**LF**																$161.22
	Unit Cost:	**2,588.04**	**CY**																**$986.72**

APPENDIX 3.7-D: SUPPLEMENTAL SPECIES HABITAT MODEL DESCRIPTIONS

Monarch butterfly (*Danaus plexippus*); Candidate under the FESA

Modeled Habitat Categories and Modeling Parameters	Model Evaluation
The monarch butterfly occurs throughout the United States and southern Canada where milkweed species (*Asclepias* spp.), their host plants, are present (Pelton et al. 2016; Western Association of Fish and Wildlife Agencies 2019). Breeding habitat contains native milkweeds to provide food for larvae and other flowers to provide nectar for adults but may also include trees or shrubs for shading and roosting and connectivity among these habitat elements. During the spring and summer, adult monarch butterfly spends its 2- to 5-week lifespan mating and nectaring on flowers, with the females searching for milkweed upon which to lay their eggs. Multiple generations are produced over the fall and summer, with the fall generation of adults migrating to overwintering sites and living for 6 to 9 months until the next spring breeding season (Pelton et al. 2016). The western monarch butterfly population breeds west of the Rocky Mountains and largely overwinters in coastal California, while the much larger eastern populations breed east of the Rocky Mountains and overwinter in Mexico (Western Association of Fish and Wildlife Agencies 2019). Monarch butterfly habitat is often described in terms of breeding, migratory, and overwintering sites. Breeding habitat contains native milkweed and other flowers to provide food for larvae and nectar for adults and trees or shrubs for shade and perching (Pelton et al. 2016 Xerces Society for Invertebrate Conservation 2018). There are 15 species of native milkweed is California, which occur in a variety of different habitats (Xerces Society for Invertebrate Conservation 2018), although nine species are rare and restricted in range and distribution (Xerces Society for Invertebrate Conservation 2011). Migratory habitat consists of nectar plants for adults during spring and fall migration. Breeding and migratory habitat are often synonymous since they contain the same key components (i.e., milkweed, nectar sources, roosting structures) (Western Association of Fish and Wildlife Agencies 2019). Overwintering sites in California are found in selected forested areas generally located within 1.5 miles from the Pacific Ocean or San Francisco Bay (Leong et al. 2004). Most overwintering sites occur at low elevations (<300 feet), in shallow canyons (Lane 1993), and on south-, southwest-, or west-facing slopes to maximize solar radiation and shelter from wind (Leong et al. 2004). Suitable grove conditions include temperatures above freezing, high humidity, dappled sunlight, access to water and nectar, and protection from high winds and storms (Western Association of Fish and Wildlife Agencies 2019). Trees commonly used for roosting in California include blue gum eucalyptus, Monterey pine, and Monterey cypress, but clusters have also been observed on red gum eucalyptus, western sycamore, coast redwood, coast live oak, Fremont's cottonwood, and Goodding's willow (Pelton et al. 2016; Western Association of Fish and Wildlife Agencies 2019). The California Natural Diversity Database (CNDDB) (CDFW 2020) and the Western Monarch Count (Xerces Society for Invertebrate Conservation 2020) does not identify any overwintering sites in the regional study area. The Western Monarch Count displays data from the Xerces Society's Western Monarch Overwintering Sites Database, which contains 400+ overwintering sites from records stretching back to 1970. The database includes historical records, original site surveys as part of the annual Western Monarch Thanksgiving Count (WMTC), and focused survey efforts by Xerces staff. The majority of known large overwintering sites are included in the WMTC to allow comparisons between years and sites and provide an estimate of the size of the monarch population that overwinters in western North America (Pelton et al. 2016). Records of milkweed, adult monarch butterflies, and breeding activity are prevalent throughout the study area (Xerces Society for Invertebrate Conservation 2018).	Prior to distribution for review by agency biologists, California High-Speed Rail Authority biologists knowledgeable about this species evaluated the model results and compared all habitat model types to the distribution of all occurrences in the CNDDB and Western Monarch Count (CDFW 2020; Xerces Society for Invertebrate Conservation 2020).

Modeled Habitat Categories and Modeling Parameters	Model Evaluation
Breeding/Migration Habitat—Potentially suitable breeding/migration habitat in the regional study area meets the following criteria (see Figure 3.7-D-1). ▪ Current range (Pelton et al. 2016; Western Association of Fish and Wildlife Agencies 2019) ▪ The following land cover types coincide with the habitat for milkweed (Xerces Society for Invertebrate Conservation 2011, 2018): all herbaceous-dominated land cover types, all tree-dominated land cover types, all aquatic land cover types, all agricultural land cover types, rock outcrop, constructed basin, and constructed watercourse.	

References Cited

California Department of Fish and Wildlife (CDFW). 2020. *California Natural Diversity Database*, RareFind 5, Version 5.2.7. https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data (accessed August 25, 2020).

Lane, J. 1993. Overwintering Monarch Butterflies in California: Past and Present. In S. B. Malcolm and M. P. Zalucki (eds.), *Biology and Conservation of the Monarch Butterfly*. Los Angeles, CA: Natural History Museum of Los Angeles County.

Leong, K. L. H., W. H. Sakai, W. Bremer, D. Feuerstein, and G. Yoshimura. 2004. Analysis of the Pattern of Distribution and Abundance of Monarch Butterfly's (*Danaus plexippus* L.) Overwintering Sites along the California Coastline. In K. Oberhauser and M. Solensky (eds.), *The Monarch Butterfly, Biology and Conservation*. Ithaca, NY: Cornell University Press.

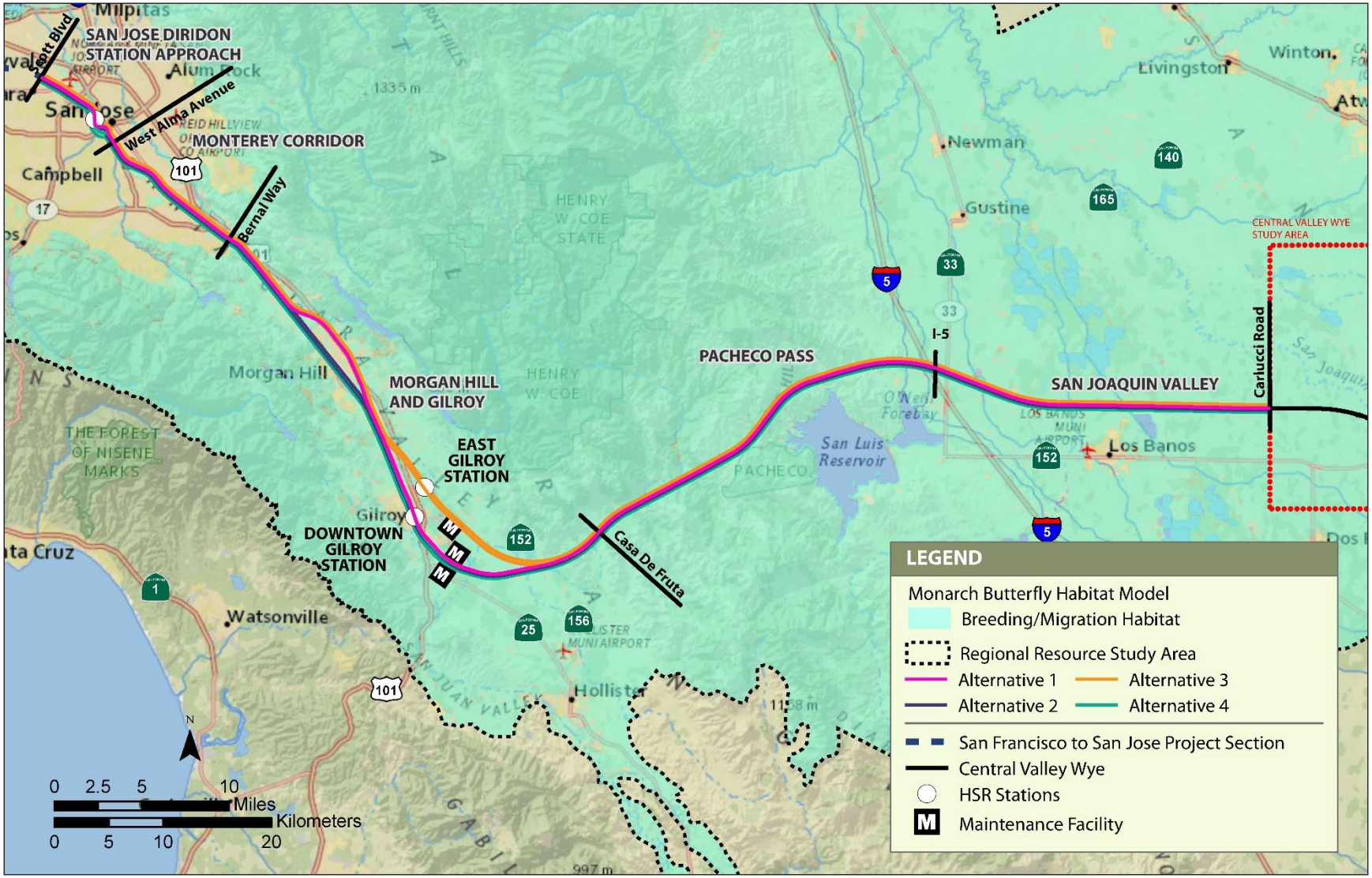
Pelton, E., S. Jepsen, C. Schultz, C. Fallon, and S. H. Black. 2016. *State of the Monarch Butterfly Overwintering Sites in California*. Portland, OR: The Xerces Society for Invertebrate Conservation. https://xerces.org/sites/default/files/2018-05/16-015_01_XercesSoc_State-of-Monarch-Overwintering-Sites-in-California_web.pdf (accessed August 25, 2020).

Western Association of Fish and Wildlife Agencies. 2019. *Western Monarch Butterfly Conservation Plan, 2019–2069*. Version 1.0. https://www.wafwa.org/Documents%20and%20Settings/37/Site%20Documents/Committees/Monarch/Western%20Monarch%20Butterfly%20Conservation%20Plan%202019-2069.pdf (accessed August 25, 2020).

Xerces Society for Invertebrate Conservation. 2011. *California Pollinator Plants: Native Milkweeds (*Asclepias *spp.)*. Portland, OR. https://xerces.org/sites/default/files/publications/15-006.pdf (accessed August 25, 2020).

———. 2018. *Managing for Monarchs in the West: Best Management Practices for Conserving the Monarch Butterfly and Its Habitat*. Portland, OR. https://xerces.org/sites/default/files/2018-06/18-009_01-Monarch_BMPs_Final_Web.pdf (accessed August 25, 2020).

———. 2020. *Western Monarch Count: Find an Overwintering Site*. Portland, OR. https://www.westernmonarchcount.org/find-an-overwintering-site-near-you/ (accessed August 25, 2020).



NOVEMBER 2020

Figure 3.7-D-1 Monarch Butterfly Habitat

Mountain lion (*Puma concolor*); Candidate under the CESA (Southern California/Central Coast Evolutionarily Significant Unit)

Modeled Habitat Categories and Modeling Parameters	Model Evaluation
Mountain lions occur broadly throughout the United States. In California, mountain lions occur in nearly all habitats (Zeiner et al. 1990). They require large areas of relatively undisturbed habitats with adequate connectivity to allow for dispersal and gene flow for population persistence (Center for Biological Diversity 2019). Wilmers et al. (2013) found that mountain lions were generally attracted to shrub, forest, and water; they were deterred by grasslands. Although this study shows that tree- and shrub-dominated habitat types are preferred over grasslands and human-disturbed areas during the day, nocturnal movement patterns showed that mountain lions utilize a broader range of habitats as they travel through their home ranges and hunt (Dickson et al. 2005; Wilmers et al. 2013). Mountain lions tend to avoid intensively developed suburban or urban areas, especially for denning and breeding (Dickson and Beier 2002; Wilmers et al. 2013). Dens are located in rocky terrain or in dense vegetation that provides cover (Zeiner et al. 1990; Wilmers et al. 2013). In June 2019, the Southern California/Central Coast evolutionarily significant unit (ESU) of mountain lion was petitioned for listing under the California Endangered Species Act (CESA). The California Department of Fish and Wildlife evaluated the petition, and the California Fish and Game Commission published a notice of findings on May 1, 2020, to list the Southern California/Central Coast population ESU as a candidate for listing under CESA. Six subpopulations comprise the ESU: (1) Santa Ana Mountains, (2) Eastern Peninsular Range, (3) San Gabriel/San Bernardino Mountains, (4) Central Coast South (Santa Monica Mountains), (5) Central Coast North (Santa Cruz Mountains), and (6) Central Coast Central. The boundaries of the ESU include areas generally south of the San Francisco Bay and Interstate (I-) 80, west of I-5 to the intersection of I-5 and State Route (SR) 58, south of SR 58 to I-15, south of I-15 from the SR 58 intersection to the California-Nevada border, and south to the California-Mexico border. The mountain lion habitat distribution model includes all areas of suitable habitat regardless of ESU (the majority of the study area is within the ESU); however, only animals within the ESU are candidates for listing under CESA. The mountain lion habitat distribution model is based on the assumption, as presented in both Burdett et al. (2010) and Wilmers et al. (2013), that anthropogenic factors modify mountain lion habitat suitability. Wilmers et al. (2013) found that human development has a stronger habitat selection pressure on denning behavior than nonreproductive behaviors, thus requiring a large setback from human development for breeding habitat. Furthermore, Wilmers et al. (2013) also found that mountain lions were more deterred by human development that provides more varied sources of human interferences (i.e., residences would be more strongly avoided than arterial roads) and give those areas a wider berth. Although mountain lions will use moderately disturbed areas as they travel and hunt (Wilmers et al. 2013; Gray et al. 2016), occupancy is lower in developed areas, and they are more likely to use developed areas if they border open spaces (Wilmers et al. 2013; Wang et al. 2015). Thus, mountain lions require a habitat mosaic that provides sufficient distance from human-disturbed areas for breeding and is connected to expansive, intact, heterogeneous habitats (Dickson and Beier 2002; Dickson et al. 2005; Kertson et al. 2011; Zeller et al. 2017). Wilmers et al. (2013) found that the influence of housing density on movement behavior was most effective when based on density of the surrounding area out to a distance of 150 meters and likewise on denning behavior based on a density calculated from a 600-meter search. ***Breeding and Foraging Habitat —***Potentially suitable breeding and foraging habitat in the regional study area meets the following criteria (Figure 3.7-D-2).	Prior to distribution for review by agency biologists, California High-Speed Rail Authority biologists knowledgeable about this species evaluated the model results. In response to the review, the rationale, model names, and the description of how the Wilmers et al. (2013) data was used to inform the breeding and foraging habitat model were revised for clarity.

Modeled Habitat Categories and Modeling Parameters	Model Evaluation
▪ Current range (Zeiner et al. 1990) AND ▪ All tree-dominated and shrub-dominated natural landcover types (Authority 2016) AND ▪ Areas having a dwelling density (within Santa Clara County only) less than 0.04 units per acres[1]	
High-Priority Foraging and Dispersal Habitat—High-priority foraging and dispersal habitat in the regional study area meets the following criteria (Figure 3.7-D-2). ▪ Current range (Zeiner et al. 1990) AND ▪ All herbaceous, shrub, woodland, and forested natural land cover types (Authority 2016) AND ▪ Within areas of high movement value[2] AND ▪ Does not meet the conditions of breeding and foraging habitat (as defined in the above model description).	

[1] Dwelling density is calculated using address points acquired from Santa Clara County. Density is calculated within a radius of 600 meters (1,968 feet) consistent with Wilmers et al. (2013). Within the regional study area and the species range, for the purposes of this analysis, it is assumed that dwelling density is only high enough to alter breeding habitat within Santa Clara County. For the portions of the regional study area outside Santa Clara County, dwelling density is assumed to be sufficiently low such that all suitable land cover types will be considered breeding habitat.

[2] Movement values were calculated as inputs to the local permeability modeling performed under the *Wildlife Corridor Assessment Report* (Authority 2020, Appendix C) in which landscape permeability is based on a calculated Habitat Suitability Index (HSI), which is a function of ranked land cover, road density, and topographic conditions. Areas having an HSI value higher than 50 (1–100 scale) (i.e., higher score indicated a greater potential for use as a movement corridor) were included in the high-priority foraging and dispersal habitat model.

Modeled Habitat Categories and Modeling Parameters	Model Evaluation
Low-Priority Foraging and Dispersal Habitat—Low-priority foraging and dispersal habitat in the regional study area meets the following criteria (Figure 3.7-D-2). ▪ Current range (Zeiner et al. 1990) AND ▪ All herbaceous, shrub, woodland, and forested natural land cover types (Authority 2016) AND ▪ Within areas of low movement value[3] AND Does not meet the conditions of breeding and foraging habitat (as defined in the above model description).	

References Cited

Burdett, C. L., K. R. Crooks, D. M. Theobald, K. R. Wilson, E. E. Boydston, L. M. Lyren, R. N. Fisher, T. W. Vickers, S. A. Morrison, and W. M. Boyce. 2010. Interfacing Models of Wildlife Habitat and Human Development to Predict the Future Distribution of Puma Habitat. *Ecosphere* 1(1):art4. doi:10.1890/ES10-00005.1. https://esajournals.onlinelibrary.wiley.com/doi/10.1890/ES10-00005.1 (accessed September 9, 2020).

California High-Speed Rail Authority (Authority). 2016. San Jose to Merced Project Section Biological Resources and Wetland Survey Plan. May.

———. 2020. San Jose to Merced Project Section: Biological and Aquatic Resources Technical Report. April. Sacramento, CA.

Center for Biological Diversity. 2019. A Petition to List the Southern California/Central Coast Evolutionarily Significant Unit (ESU) of Mountain Lions as Threatened under the California Endangered Species Act (CESA). https://www.biologicaldiversity.org/species/mammals/California-mountain-lion/pdfs/CESA-petition-for-Southern-California-Central-Coast-Mountain-Lions.pdf (accessed September 9, 2020).

Dickson, B. G., and P. Beier. 2002. Home-Range and Habitat Selection by Adult Cougars in Southern California. *Journal of Wildlife Management* 66:1235–1245.

Dickson, B. G., J. S. Jenness, P. Beier. 2005. Influence of vegetation, Topography, and Roads on Cougar Movement in Southern California. *Journal of Wildlife Management* 69: 264–276.

Gray et al. 2016

[3] Movement values were calculated as inputs to the local permeability modeling performed under the *Wildlife Corridor Assessment Report* (Authority 2020, Appendix C) in which landscape permeability is based on a calculated Habitat Suitability Index (HSI), which is a function of ranked land cover, road density, and topographic conditions. Areas having an HSI value less than 50 (1–100 scale) (i.e., lower score indicated a low potential for use as a movement corridor) were included in the low-priority foraging and dispersal habitat model.

Kertson, B. N., R. D. Spencer, J. M. Marzluff, J. Hepinstall-Cymerman, and C. E. Grue. 2011. Cougar Space Use and Movements in the Wildland–Urban Landscape of Western Washington. *Ecological Applications* 21(8):2866–2881.

Wang, Y., M. L. Allen, and C. C. Wilmers. 2015. Mesopredator Spatial and Temporal Responses to Large Predators and Human Development in the Santa Cruz Mountains of California. *Biological Conservation* 190:23–33.

Wilmers, C. C., Y. Wang, B. Nickel, P. Houghtaling, Y. Shakeri, M. L. Allen, J. Kermish-Wells, V. Yovovich, and T. Williams. 2013 Scale Dependent Behavioral Responses to Human Development by a Large Predator, the Puma. *PLoS ONE* 8(4):e60590. doi:10.1371/journal.pone.0060590. https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0060590&type=printable (accessed September 9, 2020).

Zeiner, D. C., W. F. Laudenslayer Jr., K. E. Mayer, and M. White (eds). 1988–1990. *California's Wildlife*. Vol. I–III. Sacramento, CA: California Department of Fish and Game. https://wildlife.ca.gov/Data/CWHR (accessed September 9, 2020).

Zeller, K. A., T. W. Vickers, H. B. Ernest, and W. M. Boyce. 2017. Multi-Level, Multi-Scale Resource Selection Functions and Resistance Surfaces for Conservation Planning: Pumas as a Case Study. *PLoS ONE* 12(6):1–20.

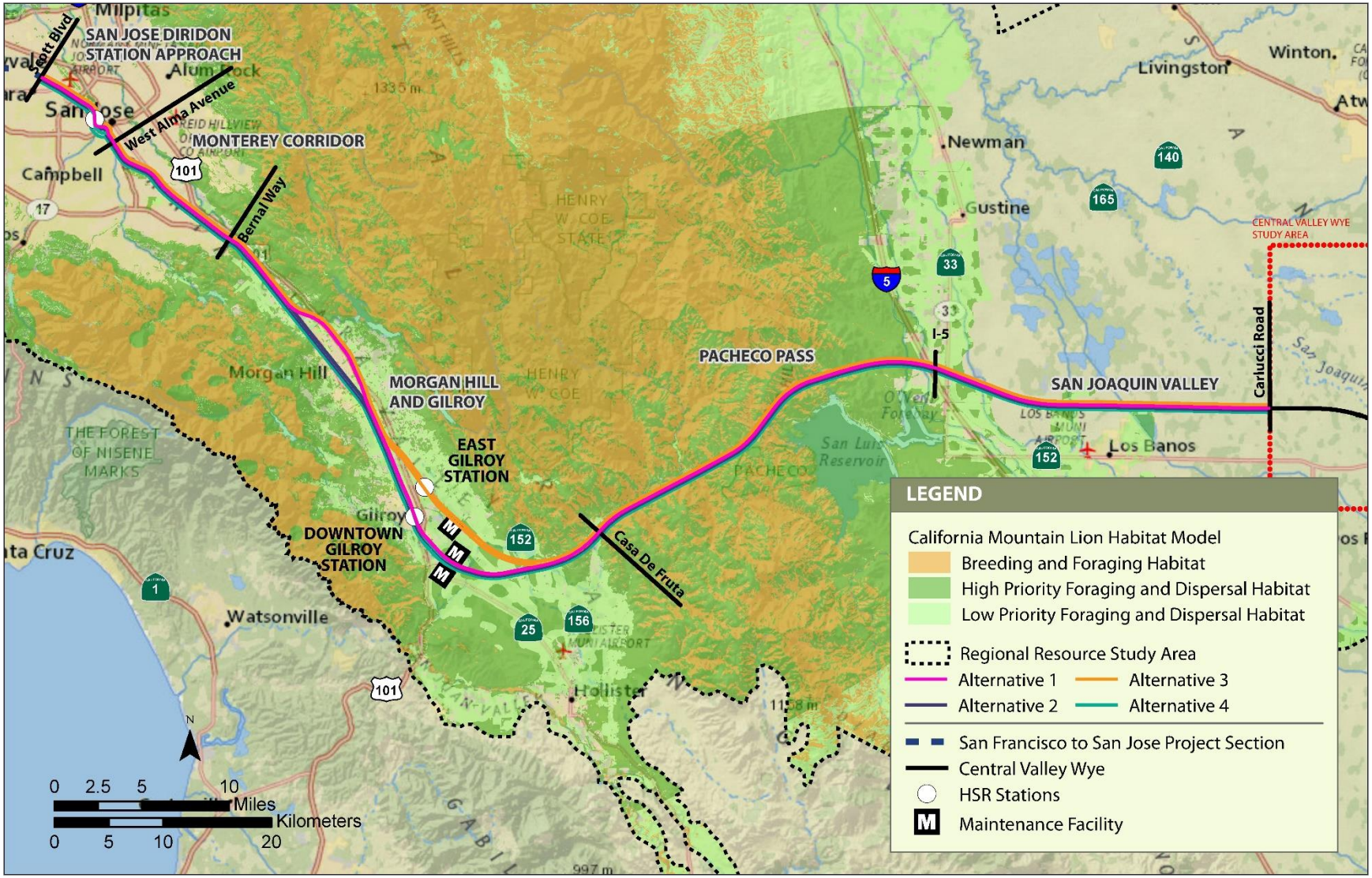


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Figure 3.7-D-2 Coastal Mountain Lion Habitat

APPENDIX 3.7-E: SUPPLEMENTAL NOISE ANALYSIS ON TERRESTRIAL WILDLIFE SPECIES

1 INTRODUCTION

Noise is defined as undesirable sound. Thus, the analysis of noise effects relies upon the theory and methods of acoustics, as applied to sensitive resources. Those resources include terrestrial wildlife in the study area: amphibians, reptiles, birds, and mammals. Acoustic concepts relevant to this analysis are presented in the *Wildlife Corridor Assessment Report* (WCA) (Authority 2020, Appendix C, Section 4.5.3.1).

All native wildlife potentially present in the project area were considered as potentially vulnerable to noise effects; however, this analysis is focused on mammals for the following reasons:

- An analysis of noise effects on birds has been presented in the WCA (Authority 2020, Appendix C, Sections 4.5 and 6.2.1.2).
- Reptiles and amphibians have very limited sensitivity to sound but appreciable sensitivity to vibration; thus, high-speed rail (HSR) impacts via that mechanism are more substantial. The Final environmental impact report (EIR)/environmental impact statement (EIS) will present an analysis of reptile and amphibian susceptibility to vibration.
- No evidence suggests invertebrate sensitivity to noise.
- The WCA (Section 6.2.1.1) analyzed noise effects on mammals in an analysis that relied mainly upon guidance propagated for evaluating noise effects on livestock. In response to public comment, this analysis more closely examines mammalian responses to HSR noise sources.

Analysis of mammalian wildlife response to noise generated by HSR traffic relies upon considerations of exposure and response. Exposure describes the noise itself, and response describes how the noise affects the animal. Existing studies of HSR noise and existing baseline noise sources, along with acoustic models, permit a quantitative estimation of noise exposure. Response, however, generally cannot be described in quantitative terms and must be inferred from published studies that consider different noise sources, different animals, and different locations compared to those that occur in the study area.

In this analysis, impacts of noise on mammalian wildlife are described as significant if either of the following California Environmental Quality Act (CEQA) significance thresholds would be exceeded:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS)
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites

The Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations (40 C.F.R. Parts 1500–1508) provide the basis for evaluating project impacts (as described in Section 3.1.6.4, Methods for Evaluating Impacts, of the Final EIR/EIS). As described in Section 1508.27 of these regulations, the criteria of context and intensity are considered together when determining the severity of the change introduced by the project.

- **Context—**For the analysis of impacts on biological and aquatic resources, the context would be the existing resources within the resource study area (RSA): the status of sensitive communities and species that occur or that could occur along the project corridor and the regulatory setting pertaining to biological and aquatic resources.
- **Intensity—**For the analysis of impacts on biological and aquatic resources, the intensity or severity of an impact would reflect the magnitude of the change between the existing and projected conditions—specifically, the degree to which the construction and operations of the project could affect these resources.

2 NOISE EXPOSURE IN THE STUDY AREA

Exposure has many components, such as:

- The timing and duration of the noise
- The distribution of noise energy at different frequencies
- How loud the noise is at different distances from the rail line
- How loud it is relative to background noise levels from other sources such as highways and airports

Existing studies of HSR noise and background noise, as well as acoustic models, permit a quantitative estimation of noise exposure. Much of this information is summarized in WCA Section 4.5.3.1 (Authority 2020, Appendix C), which describes how loud the train would be, how much acoustic energy would be generated at different frequencies, how noise is generated by a passing train, and the methods used to model noise generation. That analysis is focused on trains moving through rural areas associated with the Pajaro River Important Bird Area (IBA) and the Grasslands Ecological Area IBA, areas in which trains would achieve speeds of 220 miles per hour (mph). Terrestrial wildlife would also be exposed to train noise in areas between San Jose and the Pajaro River IBA, where trains would generally be moving more slowly and producing less noise, although taking longer to pass any stationary receptor. This analysis conservatively assumes that such trains would produce the same noise as the trains moving at a higher speed but would take twice as long to pass any affected animals.[1] The WCA also presents maps (Authority 2020, Appendix C, Figures 6-1, 6-2, and 6-3) showing the results of noise modeling for trains passing through the Upper Pajaro River IBA and the Grasslands Ecological Area IBA. Outside of those two areas, this analysis assumes peak noise levels consistent with that model. Although this introduces uncertainty to the analysis, it is a conservative assumption that the train is producing the same amount of noise as if it were traveling at 220 mph. The noise levels generated by such a train are shown in Table 1.

Table 1 Modeled Unshielded Distance to L_{max} Noise Contour for a Train Moving at 220 mph

L_{max}	Rail Alignment Type	
	Aerial (feet)	Embankment (feet)
93 dBA	93	138
87 dBA	278	320
81 dBA	555	760
75 dBA	1,100	1,580
69 dBA	2,200	3,180
63 dBA	4,400	6,350
57 dBA	8,800	12,700
51 dBA	17,600	25,400
45 dBA	35,200	50,800
39 dBA	70,400	101,600

dBA = A-weighted decibel
L_{max} = maximum sound level
All distance estimates are subject to acoustic model assumptions of flat terrain, agricultural vegetation, and no wind. Actual distances would be expected to vary depending on local conditions of train speed, wind speed and direction, air temperature, humidity, topography, buildings, and vegetation cover.

[1] Projected train speeds in this area vary between the alternatives but fall within the range of 110 to 220 mph.

It is assumed that a typical train would be 660 feet long and that approximately 176 trains would pass any given point in any given 24-hour period, with up to 148 trains between 7 a.m. and 10 p.m. and up to 28 trains between 10 p.m. and 7 a.m. A train moving past a given point would take 2.05 seconds to pass at a speed of 220 mph or 4.10 seconds at 110 mph; thus, maximum noise levels would be experienced for 5.8 minutes per day along parts of the alignment where trains were moving 220 mph or 11.6 minutes per day where trains were moving 110 mph. Train noise is also propagated forward and backward along the track, so lower noise levels would be experienced for longer durations.

Trains would sound horns when approaching stations and also at certain crossings. Horns would not be sounded for grade crossings under Alternatives 1, 2, or 3 but would be sounded under Alternative 4. All proposed locations for sounding of horns coincide with locations where horns are currently sounded by Caltrain or freight trains. Federal Railroad Administration (FRA) requirements for locomotive horns are summarized in Section 3.1.3.3 of the *Noise and Vibration Technical Report* (Volume 2, Appendix 3.4-A). The minimum permissible sound level for a horn is 96 dBA at a distance of 100 feet, and this is the proposed level under the project. Although the horns point forward, field measurements indicate that horns are approximately omnidirectional. Due to the rapid onset rate of horn noise, it has a high potential to cause a startle or stress response in affected wildlife. L_{max} values for horn noise would be perceived at distances approximately 50% greater than the values shown in Table 1. Nearly all horn-sounding locations are in urban areas that provide little value for wildlife, but four locations are within the rural area between the San Jose and Morgan Hill urban areas, and two are within the first mile south from the Gilroy urban area.

Existing background noise levels in the study area are presented in Appendix B of the *Noise and Vibration Technical Report* (Volume 2, Appendix 3.4-A). As shown there, L_{90} noise levels (i.e., the noise level that is exceeded 90% of the time, roughly an indication of the most quiet time of the day) from San Jose through Gilroy range from approximately 35 to 70 dBA. One station, N132, was located in the biologically sensitive upper Pacheco Creek area, and this station recorded an L_{90} noise level of 33 to 72 dBA. In the Upper Pajaro River IBA, measurement site N130 found an L_{90} noise level of 30 to 49 dBA. In the Grasslands Ecological Area IBA, L_{90} noise levels of 30 to 70 dBA were found at measurement sites N134, N135, and N136. Most stations show minimum levels between midnight and 5 a.m., and two periods with maximum levels at about 7 a.m. and 6 p.m.

Along much of the alignment, noise exposures would be reduced due to masking effects or due to mitigation in the form of noise barriers. Masking is defined as reduced perception of one sound due to the introduction of another sound. In this case, noise produced by an HSR train may be masked by the presence of another, louder noise source such as a highway or non-HSR railway. These factors are difficult to quantify. Masking effects would occur in areas where a competing noise source (vehicular traffic, usually associated with a major highway or an urban core area) would mask the noise of the HSR trains. Masking effects would be variable due to variation in the noise level produced by the masking source, as well as variation in the HSR noise levels. In general, though, the times of day with heavy HSR traffic coincide with the times of day having heavy vehicular traffic, and light HSR traffic tends to coincide with light vehicular traffic. Thus, masking would reduce the effects of HSR noise during the hours of peak activity, while having relatively little effect on HSR noise during the late night and early morning hours of minimum traffic.

The principal masking noise sources are highways and urban areas. The entire alignment north of Station B665+00 is located in the San Jose urban area. In this area, there are numerous arterial roads that support traffic much of the day, and the alignment is also collocated with Caltrain and freight rail traffic. Thus, noise impacts from the project would be masked on both sides of the alignment through much of the day. Southwards, to approximately Station B1025+00, the project is still collocated with Caltrain and freight rail. Immediately to the east is arterial traffic on Monterey Road, and approximately 1 mile farther east is U.S. Highway 101, a major freeway. Thus, noise impacts are partially masked between the alignment and Coyote Creek and are substantially masked east of U.S. Highway 101; however, there are few and minor masking

features west of the alignment, except that some topographic masking would occur in areas west of the valley floor. Continuing south, urban area masking would occur through the cities of Morgan Hill and Gilroy, down to Station B1730+00 where the rail alignment intersects U.S. Highway 101. South of there, however, the line turns east and transits open agricultural lands across the valley floor to about Station B2250+00; throughout this area, there are no major sources of masking noise on the landscape. Eastward to Station B2350+00, the alignment crosses State Route (SR) 152, then passes through a tunnel, and then crosses SR 152 again. The busy highway would provide some masking effect to reduce noise effects in the hills north of SR 152, while the tunnel would mask all train noise. From Station B2350+00 to B3330+00, the alignment would follow the valley of Pacheco Creek. Throughout this area, SR 152 is never more than 0.5 mile north of the alignment, and it would provide substantial masking in that direction. To the south, however, there are no sources of masking noise, except that some topographic masking would occur in areas on the slopes west of Pacheco Peak. From Station B3330+00 to Station B4030+00, the alignment is in a tunnel, and noise effects on wildlife would not be a concern. East from there to Volta, Station B4630+00, the alignment traverses rural and agricultural lands, with little masking except locally where the alignment crosses Interstate (I-)5 at nearly a perpendicular angle. From Volta to the project's eastern limit at Station B5330+00, however, the alignment traverses agricultural and wildlife lands on the south side of Henry Miller Road, a moderately busy arterial, which provides some masking for lands north of the alignment but no masking for lands south of the alignment. These masking features are summarized in Table 2, and the areas identified in Table 2 are shown in Figure 1.

The Final EIR/EIS proposed mitigation features to reduce noise impacts on humans and birds. These features in most locations consist of noise barriers, approximately 14 to 17 feet high, erected on both sides of the alignment. These noise barriers would attenuate noise by an average of 10 dBA for an observer located 100 feet from the alignment, with greater effect at lesser distances and reduced effect at greater distances. At greater distances, the attenuation effect is reduced due to reflection and refraction effects on sound waves emerging from between the barrier walls. Noise barriers are proposed in areas having sensitive human receptors (in accordance with the analysis in Section 3.4, Noise and Vibration, of the Final EIR/EIS) and within the Pajaro River and Grasslands Ecological Area IBAs (as specified in Section 3.7, BIO-MM#80, Minimize Permanent Intermittent Noise, Visual, and Train Strike Impacts on Wildlife Movement, of the Final EIR/EIS). Noise barriers protecting sensitive human receptors are predominantly located in urban areas, where they offer little benefit for wildlife. The locations of noise barriers proposed to protect wildlife, however, are listed in Table 2. In these areas, the noise exposure distances shown in Table 1 would be reduced by approximately two-thirds, with a smaller reduction (approximately one-third) for distances greater than about 5,000 feet.

Table 2 Masking and Mitigation Features along the Rail Alignment from San Jose to Merced

Alignment	Station Start[1]	Station End[1]	Masking on East/North	Masking on West/South	Label on Figure 1	Masking Source on East/North	Masking Source on West/South	Distance to Masking Source on East/North (feet)	Distance to Masking Source on West/South (feet)
San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy	B0000	B0665	Partial	Partial	Urban San Jose	San Jose urban area	San Jose urban area	0	0
Morgan Hill and Gilroy	B0665	B1025	Partial	Partial	Rural	Monterey Road, U.S. Highway 101	Topography in Santa Cruz Mountains	0–200, 1,700–4,800	4,100–8,800
Morgan Hill and Gilroy	B1025	B1730	Partial	Partial	Urban Morgan Hill	Morgan Hill/Gilroy urban area	Morgan Hill/Gilroy urban area	0	0
Morgan Hill and Gilroy	B1730	B1932	None	None	Rural	–	–	–	–
Morgan Hill and Gilroy	B1932	B2164	Partial	Partial	Bird Noise Barrier	Noise barrier[1]	Noise barrier[1]	0	0
Morgan Hill and Gilroy	B2164	B2250	None	None	Rural	–	–	–	–
Morgan Hill and Gilroy	B2200	B2255	Partial	None	Highway	State Route 152	None	0–2,900	–
Morgan Hill and Gilroy	B2255	B2350	Complete	Complete	Tunnel	Tunnel	Tunnel	0	0
Pacheco Pass	B2350	B3330	Partial	Partial	Rural	State Route 152	Topography on W slopes Pacheco Peak	100–2,000	1,000–6,000
Pacheco Pass	B3330	B4030	Complete	Complete	Tunnel	Tunnel	Tunnel	0	0
Pacheco Pass, San Joaquin Valley	B4030	B4550	None	None	Rural	None[2]	None[2]	–	–
San Joaquin Valley	B4550	B4630	Partial	Partial	Bird Noise Barrier	Noise barrier	Noise barrier	0	0

Alignment	Station Start[1]	Station End[1]	Masking on East/North	Masking on West/South	Label on Figure 1	Masking Source on East/North	Masking Source on West/South	Distance to Masking Source on East/North (feet)	Distance to Masking Source on West/South (feet)
San Joaquin Valley	B4630	B4914	Partial	None	Rural	Henry Miller Road	–	0–150	–
San Joaquin Valley	B4914	B5095	Partial	Partial	Bird Noise Barrier	Noise barrier	Noise barrier	0	0
San Joaquin Valley	B5095	B5330	Partial	None	Rural	Henry Miller Road	–	100–150	–

[1] Stationing shown is for Alternatives 1, 2, and 4. Under Alternative 3, the noise barrier would extend from Stations B1870 to B2097. Also, Alternative 3 would avoid the Gilroy urban area but instead would experience masking from U.S. Highway 101 from there to the maintenance-of-way facility (MOWF).
[2] There would be some local masking where the rail alignment crosses Interstate 5. The extent of masking would vary with conditions but would likely be within 1,000 feet of the highway more than 90% of the time.

3 MAMMALIAN WILDLIFE RESPONSES TO NOISE

Mammalian wildlife use sound mainly to forage, to evade predators, and for intraspecific communication. Among wildlife, hearing is arguably the most important sense; secondary loss of vision is more common than loss of hearing (Fong et al. 1995), suggesting that an animal with impaired hearing is at greater risk than one with impaired vision. Hearing enables herbivores to continue foraging while they listen for evidence of an approaching predator. Hearing enables predators to be effective in situations where vision has limited usefulness, such as dense vegetation or darkness. Many species of mammalian wildlife can hear sounds inaudible to humans. Whereas humans can hear sounds at frequencies of approximately 64 to 23,000 Hertz (Hz), most wild mammals can hear higher frequencies, with some bats hearing frequencies of 110,000 Hz, and some mammals hearing lower frequencies, e.g., 16 Hz in ferrets (Strain 2020). Hearing sensitivity in mammalian wildlife is generally comparable to that of humans, with a peak sensitivity of approximately 0 decibels (dB) recorded in such diverse mammals as ungulates, rodents, and bats (Heffner and Heffner 2010; Dent et al. 2018). However, predators often have considerably more sensitive hearing. The most sensitive species studied, the red fox, can hear sounds at -15 dB at 4 kilohertz (kHz), and the raccoon can hear to -12 dB at 1 kHz (Malkemper et al. 2014). That corresponds to sounds one-quarter to one-fifth as loud as the softest sound audible to a human. Reptiles, in comparison, have very poor hearing, with thresholds of 40 dB or greater and almost no ability to hear outside of a frequency range from ca. 50 to 1,000 Hz (Bowles 1995; Young and Aguilar 2002).

Francis and Barber (2013) describe noise effects on wildlife as ranging along a continuum from infrequent, abrupt, and unpredictable noise to chronic noise. The former noise may constitute a disturbance that elicits an antipredator response (Frid and Dill 2002; Francis and Barber 2013). Such a response is often called “startle” but can include a variety of antipredation responses such as vigilance and flight. Antipredation responses can affect mammalian wildlife by masking acoustic information (Francis and Barber 2013).

Masking is defined as reduced perception of one sound due to the introduction of another sound. In this case, wildlife perception of important sounds such as the activity of predators or prey may be masked by the sound of a passing HSR train. There have been extensive studies of masking effects in wildlife; a thorough review by Barber et al. (2010) provides the following examples, which give evidence of the diversity of mammalian wildlife reliance on sound:

- Proximity to noise sources increases vigilance behavior by California ground squirrels, at a cost to foraging efficiency.
- Pronghorn spend more time being vigilant and less time foraging within 300 meters of a road.
- For bats, frequencies between approximately 3 and 8 kHz are crucial for accurate sound localization.

There is evidence that noise of the magnitudes and durations that would occur under the project can elicit an antipredation response in mammalian wildlife. Train noise is not expected to exceed 93 dBA (L_{max}) at 138 feet (Table 1),[2] and, as discussed earlier, exposure to noise of this intensity would last no more than a few seconds at a time. However, due to the high speed of the train, onset levels would be rapid and thus could elicit an antipredation response. One study has found that sound levels above about 90 dB are likely to be adverse to mammalian wildlife and are associated with behavioral responses such as retreat from the sound source, freezing, or a strong startle response, but sound levels below about 90 dB usually do not cause such responses (Manci et al. 1988). However, more recent studies addressing a variety of wildlife species have not set quantitative thresholds of effect and have emphasized that a noise does not necessarily have to be at high intensity to elicit an antipredation response. In particular, temporal and spatial

[2] Alternatively, 96 dBA L_{max} at 100 feet when a train horn is being sounded. This is approximately the same noise level as 93 dBA at 138 feet, but few horn-sounding locations occur in modeled wildlife habitat. 96 dBA at 100 feet is also the peak noise level experienced under current conditions in portions of the proposed alignment colocated with Caltrain or freight train tracks.

context and similarity to relevant biological sounds are also important (Shannon et al. 2016). A study of desert bighorn and mule deer response to simulated military aircraft noise found that for exposures of one to seven simulated flybys per day, broadcast through loudspeakers at noise levels of 92 to 112 dB (i.e., levels comparable to or up to 10 times louder than the HSR train), animal responses included elevated heart rates for up to 3 minutes and sometimes looking toward the sound. Flight or evasion was not observed, and habituation to repeated exposures was observed. At the lowest noise levels, i.e., 92 dB, these responses were minimal (Weisenberger et al. 1996). Conversely, a study of pronghorn near highways in Alberta found that busy roadways (defined as more than 300 vehicles per day) were associated with elevated levels of vigilance and reduced foraging activity levels for pronghorn near the roadway (Gavin and Komers 2006). Accordingly, there is a substantial potential for train passage to produce an antipredation response in wildlife near the tracks, but data are insufficient to state the area within which such a response may occur in any given wildlife species. Antipredation response, whether triggered by noise or other stimuli, has been associated with a wide variety of responses in mammalian wildlife, including reduced foraging efficiency, altered mating behavior, reduced care for young, flight, stress physiology, and increased bioenergetic costs, with potential consequences both for individual fitness and for wildlife populations (Frid and Dill 2002; Francis and Barber 2013).

It is also possible that noise may affect wildlife movement corridors by deterring mammalian wildlife from crossing the rail alignment. A variety of studies have been performed to evaluate wildlife tendencies to cross barriers, usually major highways. In the Coyote Valley area, the *Coyote Valley Linkage Assessment Study* (Pathways for Wildlife et al. 2016) found that “Wildlife, including bobcat, grey fox, coyote, deer and other small and medium-sized mammals have been documented traveling from Coyote Ridge and Coyote Creek County Park on the east side of Coyote Valley by using the Coyote Creek Golf Course Drive Underpass to safely cross underneath Highway 101.” It also notes that roadkill provides evidence of mountain lion and badger attempts to cross U.S. Highway 101. Further camera trapping efforts documented by *Safe Passage for Coyote Valley* (Phillips et al. 2012) show crossing below U.S. Highway 101 in Coyote Valley by a mountain lion and a dusky woodrat. In the western Pacheco Pass area, recent camera trapping efforts at bridges along SR 152 by Pathways for Wildlife (2020) found that “within the twelve month monitoring period, multiple species including deer (*Odocoileus hemionus*), American badger (*Taxidea taxus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and opossum (*Didelphis virginiana*) were recorded consistently traveling under each of the three bridges.” Based on this evidence, it is clear that despite the presence of existing noise sources in the form of major highways, both common and sensitive wildlife do successfully use existing passage routes in the study area.

4 IMPACT ASSESSMENT

A substantial impact would occur if the project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. Eleven special-status mammal species are potentially affected: San Joaquin kit fox, Fresno kangaroo rat, mountain lion, Tule elk, badger, dusky-footed woodrat, ringtail, Townsend’s big-eared bat, western mastiff bat, pallid bat, and western red bat.

Noise has been identified as potentially affecting any of these species through behavioral changes such as masking prey sounds, masking predator sounds, masking intraspecific communication, or deterring an animal from crossing the rail alignment. In addition, a substantial impact would occur if the project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. These impacts are evaluated here on a species-by-species basis, concluding with an evaluation of potential impacts on non-special-status terrestrial mammals.

4.1 San Joaquin Kit Fox

San Joaquin kit fox habitat is evaluated in Appendix F of the WCA. Kit fox observations in the study area have been made in the area east of the east portal of the Pacheco Pass tunnel and particularly along a least-cost north-south movement corridor that, in the project vicinity, generally follows the California Aqueduct. The kit fox likely has extremely good hearing; the related red fox can hear sounds at -15 dB at 4 kHz (Malkemper et al. 2014). The kit fox would be subject to noise effects from HSR train passage. There is a high potential that this noise would affect kit fox foraging effectiveness. There is also some potential that it would increase predation risk and, by causing the fox to avoid the rail alignment, deter the fox from crossing the alignment. However, there is considerable evidence that kit foxes will use crossings at major highways. Bremner-Harrison et al. (2007) confirmed that San Joaquin kit foxes visited crossing structures at I-5, SR 58, and SR 14 but did not pass through the structures, presumably due to low openness factors; instead they crossed the highway, and two roadkills were found. Similarly, Clevenger et al. (2010) showed that swift foxes use crossing structures on 4-lane divided highways in Colorado and South Dakota, and McCollister and van Manen (2010) showed that red and gray foxes use undercrossings on divided highways in North Carolina. Potential noise impacts on kit foxes were assessed by USFWS (2009) in its biological opinion for the Merced to Fresno Project Section of the HSR system. It determined that "noise disturbance from operation of the HST will not occur during nocturnal activities of San Joaquin kit fox in areas adjacent to the alignment from 12:00 a.m. through 6:00 a.m." and that "it is likely that San Joaquin kit fox will become quickly adapted to the increased noise disturbance generated by operation of the HST[3]." In summary, there would be a considerable potential for operational noise to affect foraging and alignment crossing by San Joaquin kit fox, and measures to minimize those effects are discussed below (Section 5.1, San Joaquin Kit Fox).

4.2 Fresno Kangaroo Rat, Badger, Dusky-Footed Woodrat, and Ringtail

Habitat for the Fresno kangaroo rat and badger is evaluated in Appendix F of the WCA. That analysis finds optimum habitat permeability for the Fresno kangaroo rat east of the Pacheco Pass tunnel (approximately from Stations B4310 to B5100). For the badger, optimum permeability exists in Coyote Valley (approximately from Stations B0665 to B1025) and throughout the Pacheco Pass area (approximately from Stations B2250 to B4310). The dusky-footed woodrat and the ringtail were not modeled, but they belong to the same "moderate mobility small fauna" movement guild as the badger; dusky-footed woodrat has been observed in Coyote Valley in camera traps documenting wildlife passage across U.S. Highway 101 (Phillips et al. 2012).

The Fresno kangaroo rat is primarily nocturnal, but its daily peak activity occurs about 20 minutes after sunset (Lockard and Owings 1974), at which time train activity would be frequent (comparable to daylight hours). There is high potential that kangaroo rats in close proximity to passing trains would display a predation avoidance response when trains pass, disrupting foraging and other behaviors at those times. Kangaroo rat passage across the alignment might be delayed until later, when train activity diminishes.

The badger, dusky-footed woodrat, and ringtail are primarily nocturnal and thus most active during the times when there is little activity on the rail alignment. Thus, these animals are at relatively low risk of predation, impaired foraging, or passage impediments due to HSR noise.

In summary, there would be a considerable potential for operational noise to affect foraging and passage by Fresno kangaroo rat. Such impacts would be unlikely for badger, dusky-footed woodrat, and ringtail.

[3] HST or "high speed train" was the term USFWS used in 2009 to refer to the HSR project.

4.3 Mountain Lion

Habitat permeability for the mountain lion is evaluated in Appendix F of the WCA. That analysis finds optimum habitat permeability in Coyote Valley (approximately from Stations B0665 to B1025) and throughout the Pacheco Pass area (approximately from Stations B2250 to B4310). Evidence from both roadkills and camera traps indicates mountain lion passage through both areas, and both areas may provide mountain lion foraging habitat. The west Pacheco Pass area is particularly important for mountain lion habitat connectivity, as it provides a nexus for movement between the Santa Cruz Mountains, Diablo Range, Gabilan Range, and inner Coast Range. The mountain lion likely has good hearing ability and uses it for prey detection, especially at night.

In Coyote Valley, train noise would be masked by Monterey Road and U.S. Highway 101 along the alignment north of Morgan Hill, but there are no important sources of masking noise to the west of this alignment. HSR noise would affect nearly the whole valley floor in that direction, extending up into the hills. There is a high potential that this noise would affect mountain lion foraging effectiveness and that it would add to other existing barriers, such as the existing rail line and U.S. Highway 101, in deterring mountain lions from crossing the valley through this area.

In the Pacheco Pass area, train noise would be substantial along upper Pacheco Creek (Stations B2350 to B3330). This area includes possibly the best mountain lion foraging habitat in the San Jose–Merced segment, i.e., the perennial reach of Pacheco Creek upstream of Casa de Fruta. There is a high potential that train noise would affect mountain lion foraging effectiveness and that it would add to the existing barriers represented by SR 152 in deterring mountain lions from crossing the valley through this area. In summary, there would be a considerable potential for operational noise to affect foraging and alignment crossing by mountain lions, and measures to minimize those effects are discussed below (Section 5.2, Mountain Lion).

4.4 Tule Elk

Tracking collar data for Tule elk in the study area (Hobbs 2017) indicate that their activity is mainly in the vicinity of San Luis Reservoir and that SR 152 constitutes a barrier to further movement northwards. However, were the elk to have access to lands in the vicinity of the rail alignment between the east portal of the Pacheco Pass tunnel and the west edge of the San Joaquin Valley (approximately from Stations B4035 to B4290), they would then be subject to the effects of train noise. Such noise could impair elk foraging and might deter them from crossing the rail alignment, which is on viaduct for several extended sections in this area. However, as the elk will not foreseeably have access to this habitat, those impacts are not expected to occur. In summary, there would not be a considerable potential for operational noise to affect Tule elk.

4.5 Townsend's Big-Eared Bat, Western Mastiff Bat, Pallid Bat, and Western Red Bat

Bats in general are vulnerable to human-caused noise. Although their ability to hunt by echolocation is well known, many bats also hunt via "passive listening," i.e., hearing their prey. Many bats use a combination of echolocation and passive listening to hunt, e.g., by using echolocation to orient themselves but passive listening to home in on prey items (Jones et al. 2016). Bat audiograms typically reveal that their hearing is most sensitive at frequencies higher than 10 kHz (Heffner et al. 2013, Figure 4), which is well above the predominant sound frequencies of HSR trains (Deng et al. 2014). Experimental exposure of bats to traffic noise, as well as to noise from other sources including synthesized white noise, has shown that bats will forage by passive listening even in a high noise environment, with foraging most limited by continuous white noise (Schaub et al. 2008). These findings suggest that HSR noise can be expected to cause some reduction in bat foraging success but that there is a low likelihood of bats avoiding areas with HSR noise. Moreover, since bats are primarily nocturnal predators, most of their foraging would occur at times when trains were infrequent and exposure brief. In summary, there would not be a considerable potential for operational noise to affect Townsend's big-eared bat, western mastiff bat, pallid bat, or western red bat.

4.6 Non-Special-Status Mammals

A wide variety of non-special-status mammalian wildlife occur in the study area, representing a wide variety of mammals—bats, insectivores, rodents, rabbits, carnivores, and ungulates (mostly deer). Apart from rabbits and insectivores, these are the same groups represented by the special-status mammals. For all these animals, an impact would be significant if it interfered substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Bats and burrowing animals (most rodents and rabbits, and some carnivores) are at low risk of impacts. Bats are nocturnal and primarily function at acoustic frequencies higher than those produced by HSR trains. Burrowing animals are shielded from noise by the earth, but they are at elevated risk of impacts through the mechanism of vibration (separately analyzed). Insectivores are small animals with very limited home ranges that do not undertake migrations or other seasonal movements at a scale that would conflict with the HSR alignment; moreover, most of them are also burrowing animals. Potential impacts would be greatest with larger carnivores and ungulates, which sometimes perform long-distance movements that could be impeded by the rail alignment and commonly use sound to find prey or evade predation. However, all of the common carnivores and ungulates are distinguished by their tolerance for human activity. As detailed above in Section 3, Mammalian Wildlife Responses to Noise, existing studies of mammal use of crossings in Coyote Valley and upper Pacheco Creek have all documented frequent use of crossings at U.S. Highway 101 and SR 152 by common wildlife (Phillips et al. 2012; Pathways for Wildlife et al. 2016; Pathways for Wildlife 2020). These mammals are common because they are able to forage, evade predators, breed, and move about on the landscape despite the presence of human disturbances in the form of light, noise, and activity. Their primary vulnerability to humans is related to possible loss of habitat through conversion to other cover types, an impact that is not relevant to this analysis of noise effects. In summary, there would not be a considerable potential for operational noise to affect non-special-status mammals.

5 MEASURES TO REDUCE EFFECTS

The measures described in this section could be implemented to address operational noise impacts on relevant special-status species mammals. The measures described in this section involve construction of noise barriers similar to those proposed in Final EIR/EIS Mitigation Measure BIO-MM#80 to address impacts on birds.

5.1 San Joaquin Kit Fox

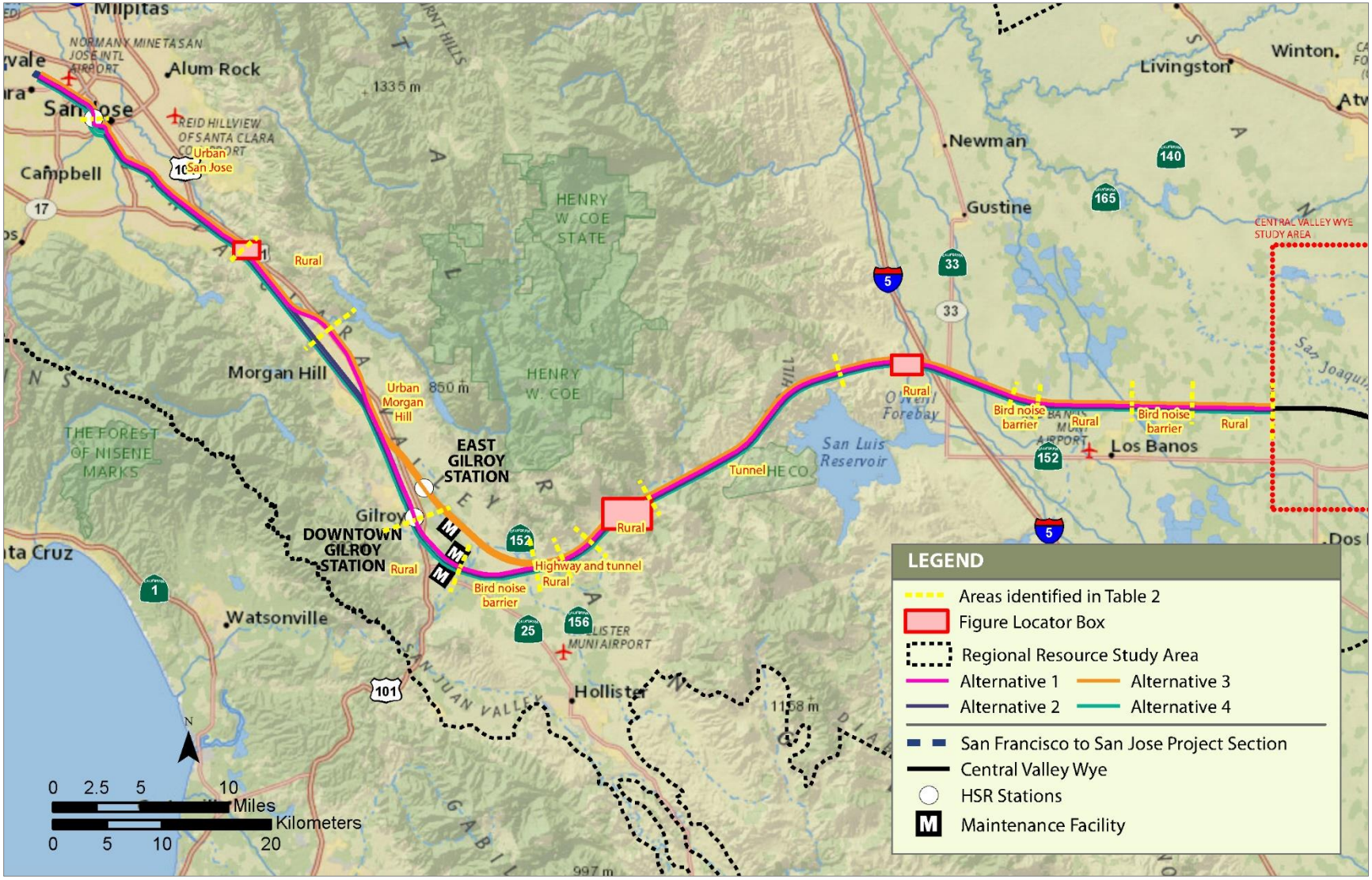
Installation of noise barriers adjacent to crossing structures and in locations where San Joaquin kit fox are expected to cross under viaducts would reduce impacts by facilitating San Joaquin kit fox movements across the rail alignment and by reducing the extent and severity of impacts on kit fox foraging behavior. This measure would be most effective in the area where least-cost paths for north-south migratory movements have been identified (WCA, Appendix F1, pages F-15 to F17). The highest-value location is north of the connection of San Luis Reservoir and the O'Neill Forebay, which has been identified as a regionally critical connection for north-south movements by this species. This is the viaduct section that crosses the California Aqueduct between Stations B4245 and B4255. Secondary high-value movement corridors in the area include the viaduct sections between Stations B4156 and B4171 and between Stations B4184 and B4197, as well as the kit fox crossing structures located at Stations B4204+75, B4224+50, B4238+33, and B4262+00. Noise barriers at crossing structures would be most beneficial if located on both sides of the track and extending at least 550 feet in each direction from the crossing if the crossing is beneath a viaduct or 720 feet in each direction if the crossing is beneath an embankment. This should be sufficient to produce a large zone of reduced noise that may be attractive to the fox. Noise barriers in these locations are designed to achieve a 10 dB noise reduction at 100 feet from the track, with greater effect at lesser distances and reduced effect at greater distances, as discussed earlier (page 3.7-E-4). The barrier would reduce L_{max} levels near the rail alignment to approximately one-quarter the level that would occur in the absence of the measure. With this

measure, impacts on San Joaquin kit fox habitat use and passage across the HSR alignment would be reduced but not eliminated.

5.2 Mountain Lion

The addition of noise barriers would reduce impacts on mountain lion by facilitating movements across the rail alignment and by reducing the extent and severity of impacts on mountain lion foraging behavior. Due to the severity of existing barriers to passage through Coyote Valley, there is limited confidence that such a measure would produce observable effects. However, noise barriers could facilitate mountain lion movement across Coyote Valley and upper Pacheco Creek. Barriers would be most effective if collocated with wildlife undercrossings providing passage from across U.S. Highway 101 in Coyote Valley and across SR 152 in upper Pacheco Creek.

In Coyote Valley, noise barriers to protect wildlife crossings would be beneficial if located between Stations B0648+80 and B0754+80, depending on the alternative (Figures 2a, 2b, 2c, and 2d). In the Pacheco Creek area, the highest value site for noise barriers is between Stations B3254+70 and B3303+00 (Figure 3). This includes the highest value corridor for north-south mountain lion movement in the area and is also located directly south of two Pacheco Creek bridges and one tributary culvert on SR 152 that have all been documented by camera traps to have high use by mammalian wildlife (Pathways for Wildlife 2020). The adjacent valley of Pacheco Creek contains high-value foraging habitat for a wide variety of mammals, including mountain lions, and the barrier would reduce noise impacts on that habitat. Due to the importance of this habitat, further benefits would accrue to mountain lion habitat if the barrier were extended southwest as far as Station B3175. As discussed above for the kit fox, it would also be beneficial to place noise barriers at the crossing of the California Aqueduct at Stations B4248+00 to B4249+00 (all alternatives; Figure 4). Barriers at that location would also facilitate mountain lion movements in that area. With these measures, impacts on mountain lion habitat use and passage across the HSR alignment would be reduced but not eliminated.



Source: Basemap, National Geographic ESRI 2017

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Figure 1 Project Alignment, Showing Locations of Noise Masking Features

Source: Basemap, National Geographic ESRI 2017

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Figure 2a Proposed Noise Barrier in Coyote Valley, Alternative 1

Source: Basemap, National Geographic ESRI 2017

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Figure 2b Proposed Noise Barrier in Coyote Valley, Alternative 2

Source: Basemap, National Geographic ESRI 2017

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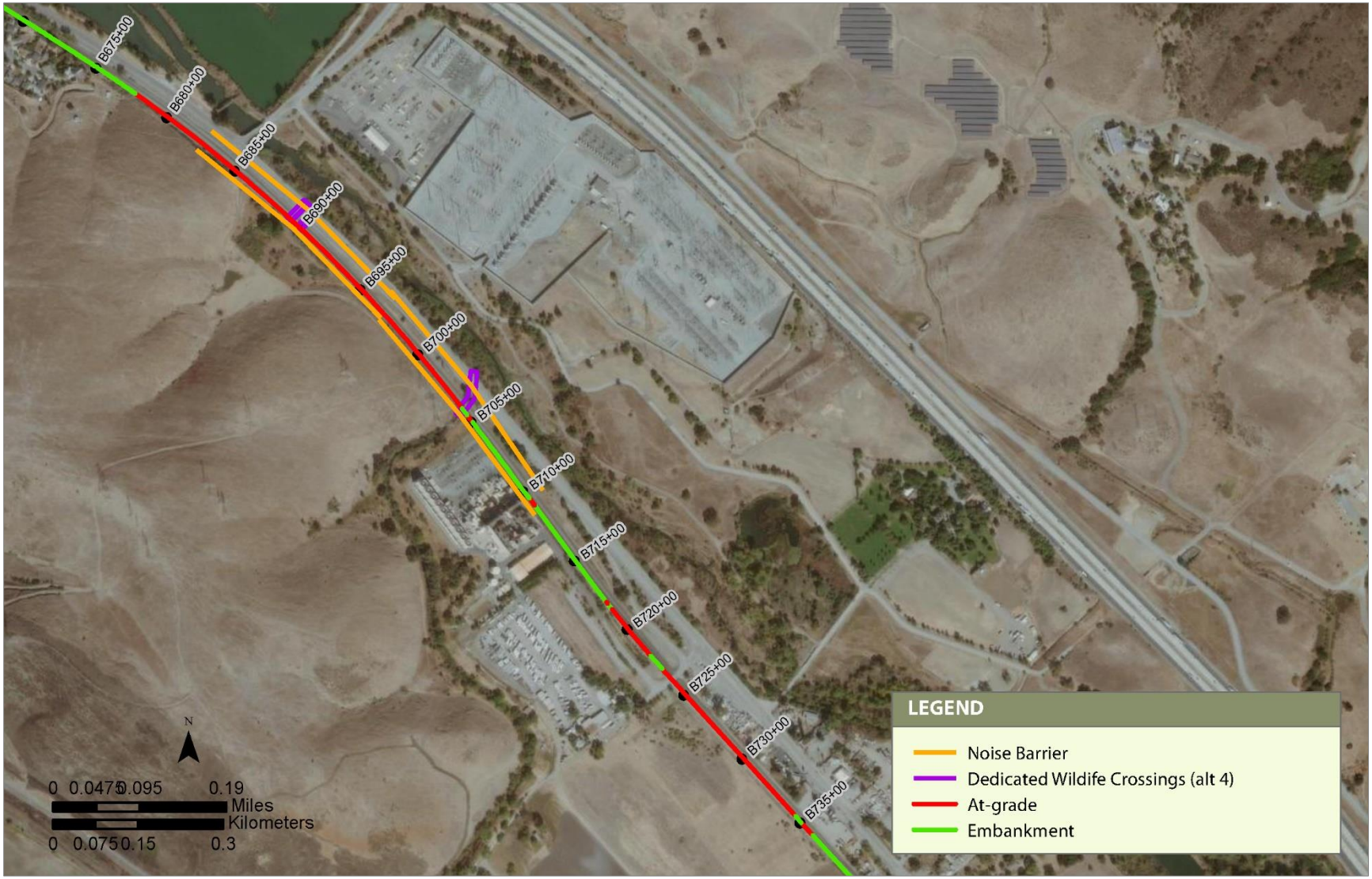
Figure 2c Proposed Noise Barrier in Coyote Valley, Alternative 3



Source: Basemap, National Geographic ESRI 2017

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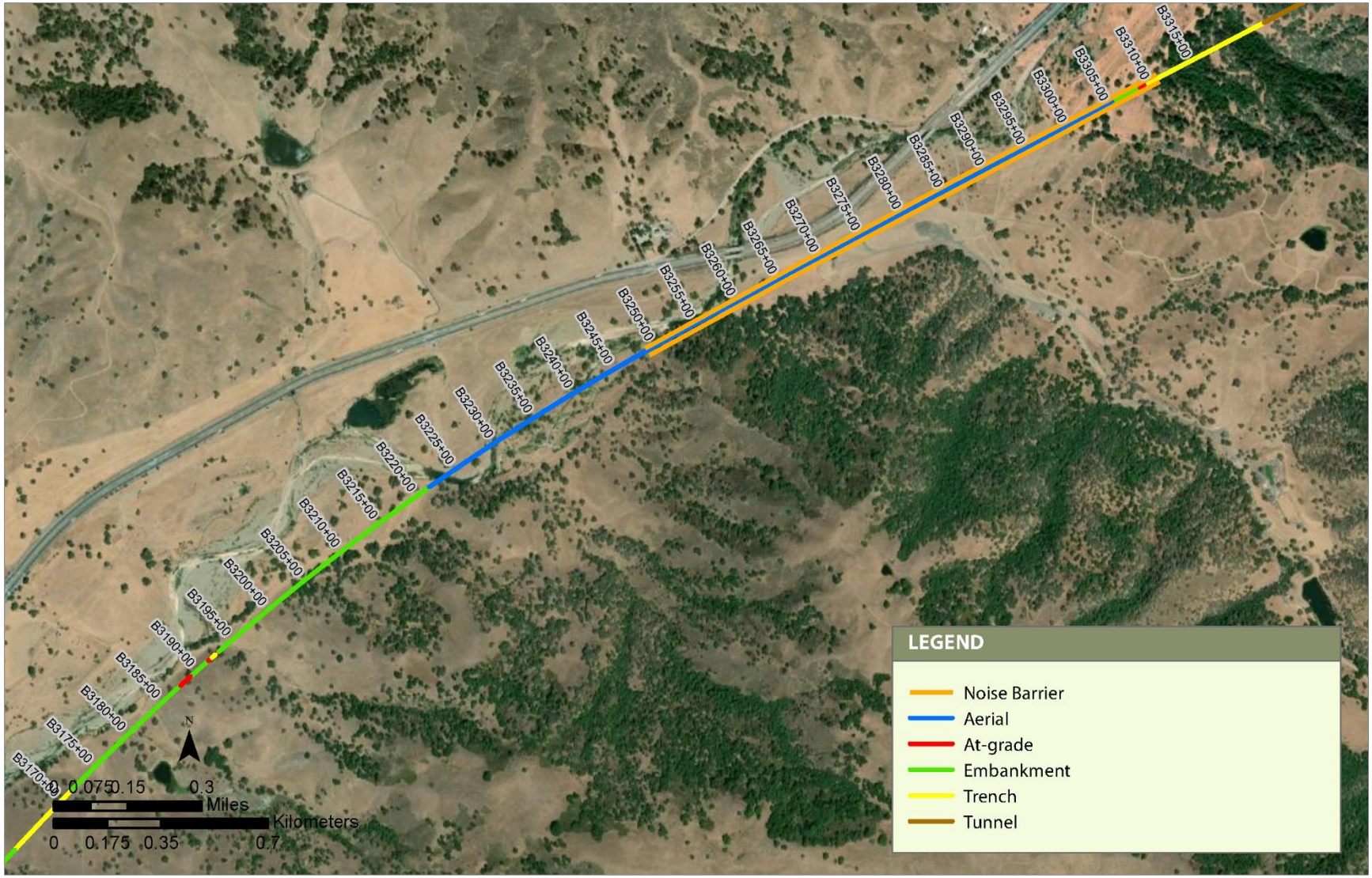
Figure 2d Proposed Noise Barrier in Coyote Valley, Alternative 4



Source: Basemap, National Geographic ESRI 2017

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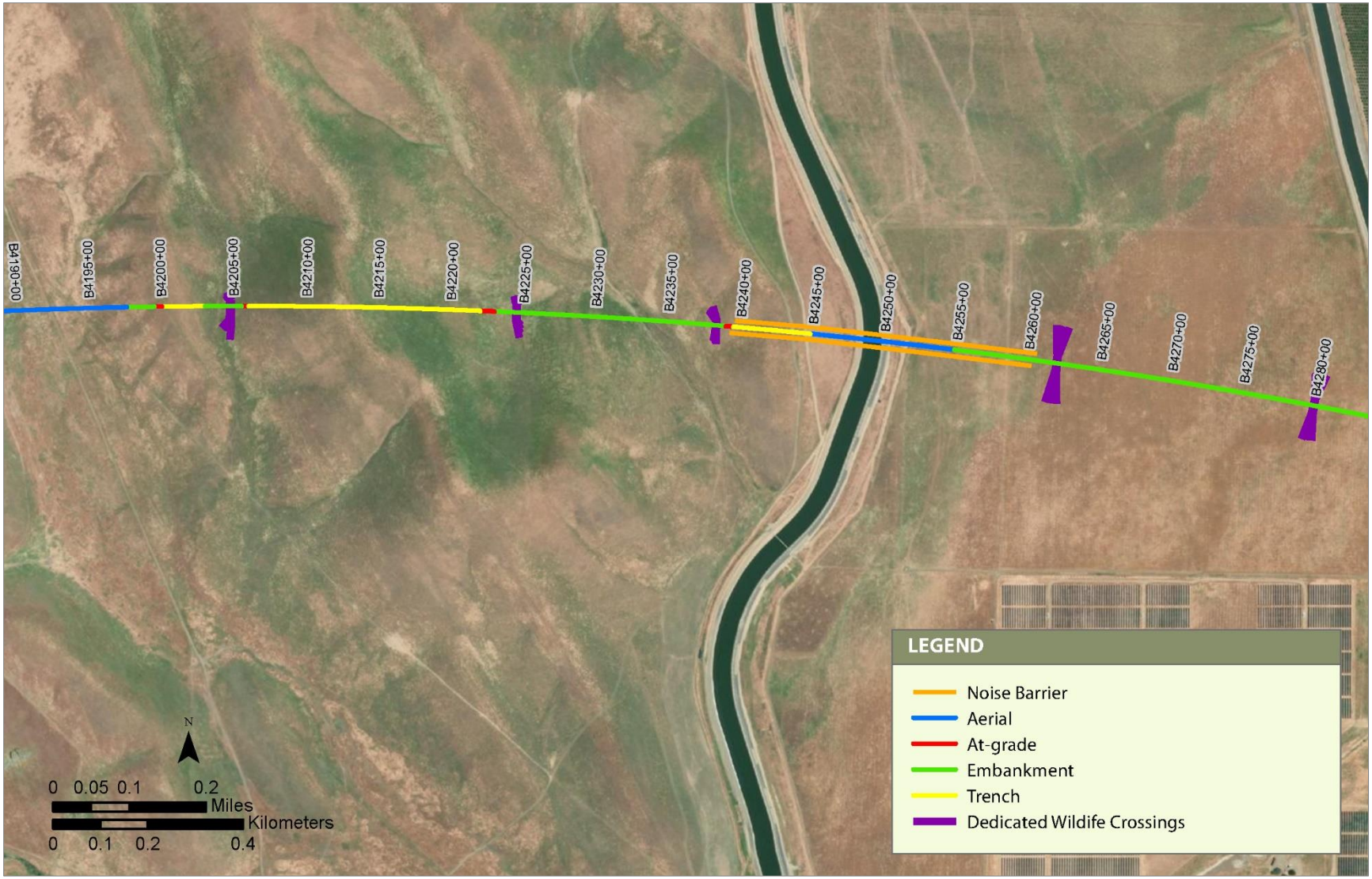
Figure 3 Proposed Noise Barrier near Upper Pacheco Creek



Source: Basemap, National Geographic ESRI 2017

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Figure 4 Proposed Noise Barrier near California Aqueduct

6 REFERENCES CITED

Barber, J. R., K. R. Crooks, and K. M. Fristrup. 2010. The Costs of Chronic Noise Exposure for Terrestrial Organisms. *Trends in Ecology & Evolution* 25(3):180–189.

Bowles, A. E. 1995. Responses of Wildlife to Noise. In R. L. Knight and K. J. Gutzwiller (eds.), *Wildlife and Recreationists: Coexistence through Management and Research*. Washington, DC: Island Press.

Bremner-Harrison, S., B. L. Cypher, C. M. Fiehler, A. P. Clevenger, and D. Hacker. 2007. *Use of Highway Crossing Structures by Kit Foxes*. California Department of Transportation.

California High-Speed Rail Authority (Authority). 2020. *San Jose to Merced Project Section: Biological and Aquatic Resources Technical Report.* April 2020. Sacramento, CA.

Clevenger, A. P., A. V. Kociolek, and B. L. Cypher. 2010. *Effects of Four-Lane Highways on Desert Kit Fox and Swift Fox: Inferences for the San Joaquin Kit Fox Population.* California Department of Transportation, Sacramento, CA.

Deng, Y., X. Xiao, B. He, and X. Jin. 2014. Analysis of External Noise Spectrum of High-Speed Railway. *Journal of Central South University* 21(12):4753–4761.

Dent, M. L., L. A. Screven, and A. Kobrina. 2018. Hearing in Rodents. In M. L. Dent, R. R. Fay, and A. N. Popper (eds.), *Rodent Bioacoustics, Springer Handbook of Auditory Research*. Springer International Publishing, Cham. https://doi.org/10.1007/978-3-319-92495-3_4 (accessed September 14, 2020).

Fong, D. W., T. C. Kane, and D. C. Culver. 1995. Vestigialization and Loss of Nonfunctional Characters. *Annual Review of Ecology and Systematics* 26(1):249–268. https://doi.org/10.1146/annurev.es.26.110195.001341 (accessed September 14, 2020).

Francis, C. D., and J. R. Barber. 2013. A Framework for Understanding Noise Impacts on Wildlife: An Urgent Conservation Priority. *Frontiers in Ecology and the Environment* 11(6):305–313.

Frid, A., and L. M. Dill. 2002. Human-Caused Disturbance Stimuli As a Form of Predation Risk. *Conservation Ecology* 6(1):11.

Gavin, S. D., and P. E. Komers. 2006. Do Pronghorn (*Antilocapra americana*) Perceive Roads As a Predation Risk? *Can. J. Zool*. 84(12):1775–80.

Heffner, H., and H. E. Heffner. 2010. The Behavioral Audiogram of Whitetail Deer (*Odocoileus virginianus*). *The Journal of the Acoustical Society of America* 127(3):EL111–EL114. https://asa.scitation.org/doi/full/10.1121/1.3284546 (accessed September 14, 2020).

Heffner, R. S., G. Koay, and H. E. Heffner. 2013. Hearing in American Leaf-Nosed Bats. IV: The common vampire bat, *Desmodus rotundus. Hearing Research* 296:42–50.

Hobbs, Joe. 2017. Elk and Pronghorn Coordinator, California Department of Fish and Wildlife. Historic elk distribution map emailed to Shannon Crossen of ICF. March 16, 2017.

Jones, P. L., R. A. Page, and J. M. Ratcliffe. 2016. To Scream or to Listen? Prey Detection and Discrimination in Animal-Eating Bats. In M. B. Fenton, A. D. Grinnell, A. N. Popper, and R. R. Fay (eds.), *Bat Bioacoustics, Springer Handbook of Auditory Research*. New York, NY: Springer. http://link.springer.com/10.1007/978-1-4939-3527-7_4 (accessed October 28, 2020).

Lockard, R. B., and D. H. Owings. 1974. Moon-Related Surface Activity of Bannertail (*Dipodomys spectabilis*) and Fresno (*D. nitratoides*) Kangaroo Rats. *Animal Behaviour* 22(1):262–273.

Malkemper, P., V. Topinka, and H. Burda. 2014. A Behavioral Audiogram of the Red Fox (*Vulpes vulpes*). *Hearing Research* 320.

Manci, K. M., D. N. Gladwin, R. Villella, and M. G. Cavendish. 1988. *Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis.* U.S. Fish and Wildlife Service National Ecology Research Center, Fort Collins, CO.

McCollister, M. F., and F. T. van Manen. 2010. Effectiveness of Wildlife Underpasses and Fencing to Reduce Wildlife–Vehicle Collisions. *Journal of Wildlife Management* 74(8):1722–1731.

Pathways for Wildlife. 2020. *Wildlife Permeability and Hazards across Highway 152 Pacheco Pass: Establishing a Baseline to inform Infrastructure and Restoration.* Prepared for Santa Clara Valley Habitat Agency.

Pathways for Wildlife, T. Diamond, and A. R. Snyder. 2016. *Coyote Valley Linkage Assessment Study Final Report.* California Department of Fish and Wildlife.

Phillips, J., R. Phillips, N. Srinivasan, D. Aso, W. Lao, and P. Cornely. 2012. *Safe Passage for Coyote Valley.* Cupertino, CA: De Anza College.

Schaub, A., J. Ostwald, and B. M. Siemers. 2008. Foraging Bats Avoid Noise. *Journal of Experimental Biology* 211:3174–3180. http://jeb.biologists.org/cgi/doi/10.1242/jeb.037283 (accessed October 28, 2020).

Shannon, G., M. F. McKenna, L. M. Angeloni, K. R. Crooks, K. M. Fristrup, E. Brown, and K. A. Warner. 2016. A Synthesis of Two Decades of Research Documenting the Effects of Noise on Wildlife: Effects of Anthropogenic Noise on Wildlife. *Biological Reviews* 91(4):982–1005.

Strain, G. M. 2020. *Frequency Hearing Ranges in Dogs and Cats*. https://www.lsu.edu/deafness/HearingRange.html (accessed September 14, 2020).

USFWS. 2009. Biological Opinion on the California High-Speed Train System: Merced to Fresno Section Project, Merced, Madera, and Fresno Counties. Sacramento Fish and Wildlife Office, Sacramento, CA.

Weisenberger, M. E., P. R. Krausman, M. C. Wallace, D. W. D. Young, and O. E. Maughan. 1996. Effects of Simulated Jet Aircraft Noise on Heart Rate and Behavior of Desert Ungulates. *The Journal of Wildlife Management* 60(1):52. https://www.jstor.org/stable/3802039?origin=crossref (accessed September 14, 2020).

Young, B. A., and A. Aguiar. 2002. Response of Western Diamondback Rattlesnakes *Crotalus atrox* to Airborne Sounds. *Journal of Experimental Biology* 205:3087–3092.

APPENDIX 3.7-F: SUPPLEMENTAL ARTIFICIAL LIGHT ANALYSIS ON TERRESTRIAL WILDLIFE SPECIES

1.1 Introduction

Artificial light at night (ALAN) is here defined, for the project, as all exterior artificial light sources used during construction and operations to light the site, as well as vehicle-mounted lighting. This analysis describes the potential biological effects of that lighting, within the context of California Environmental Quality Act (CEQA) thresholds of significance and National Environmental Policy Act (NEPA) impact definitions.

This analysis applies to all terrestrial wildlife species in the study area, though it is more focused on special-status species because their existing limited populations are more vulnerable to significant impacts compared to common species having large and robust populations. Impacts on birds have been previously treated in the Wildlife Corridor Assessment (Authority 2020, Appendix C, Sections 4.5 and 6.2.3).

In this document, exposure to ALAN is assumed to occur consistent with the project as described in Chapter 2, Alternatives, of the Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS), including implementation of impact avoidance and minimization features (IAMFs) and mitigation measures in the Final EIR/EIS. IAMFs and mitigation measures relevant to ALAN include the following:

- BIO-IAMF#12: “Use of facility lighting that does not attract birds or their prey to project sites. These include using non-steady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen). Lighting will not be installed under viaduct and bridge structures in riparian habitat areas.”
- BIO-MM#44: Nighttime light disturbance would be avoided near sandhill crane roost sites by not conducting any nighttime work from 1 hour before sunset to 1 hour after sunrise within 0.75 mile of observed roost sites between January 1 and March 15.
- BIO-MM#51: Nighttime light disturbance would be reduced in and adjacent to suitable habitat where known California condor roosting habitat occurs at Lover’s Leap south of State Route 152. Nighttime lighting would be focused, shielded, and directed away from the nighttime roost site. The project biologist would be on site during nighttime light use to determine the lighting risk to condors and to implement lighting avoidance measures (e.g., lighting shields) if necessary.
- BIO-MM#60: Effects on San Joaquin kit fox would be minimized; construction activities within 200 feet of any occupied dens would cease 0.5 hour after sunset and would not begin earlier than 0.5 hour before sunrise to avoid indirect impacts from artificial light on the species.
- BIO-MM#76a: “The Authority will avoid conducting ground-disturbing activities within known wildlife movement routes during nighttime hours, to the extent feasible, and will shield nighttime lighting to avoid illuminating wildlife movement corridors in circumstances where feasible.”
- BIO-MM#77a: This measure specifies, for the design of wildlife crossings, “Design entrances to minimize light reflection from train lights” and “Avoidance of artificial light at approaches to wildlife crossings.”
- BIO-MM#80: This measure requires the Authority to install 17-foot-high noise/visual barriers within a portion of the Grasslands Ecological Area (GEA) Important Bird Area (IBA), and within the Upper Pajaro River IBA, and a guideway enclosure within the main GEA IBA centered approximately at Mud Slough, to minimize effects on birds.

In this analysis, impacts of artificial light on wildlife are described as significant if either of the following CEQA significance thresholds would be exceeded:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

The Council on Environmental Quality NEPA regulations (40 Code of Federal Regulations [C.F.R.] Parts 1500–1508)[1] provide the basis for evaluating project impacts. As described in Section 1508.27 of these regulations, the criteria of context and intensity are considered together when determining the severity of the change introduced by the project.

- **Context—**For the analysis of impacts on biological and aquatic resources, the context would be the existing resources within the resource study area: the status of sensitive communities and species that occur or that could occur along the project corridor and the regulatory setting pertaining to biological and aquatic resources.
- **Intensity—**For the analysis of impacts on biological and aquatic resources, the intensity or severity of an impact would reflect the magnitude of the change between the existing and projected conditions—specifically, the degree to which the construction and operations of the project could affect these resources.

This analysis is organized as follows.

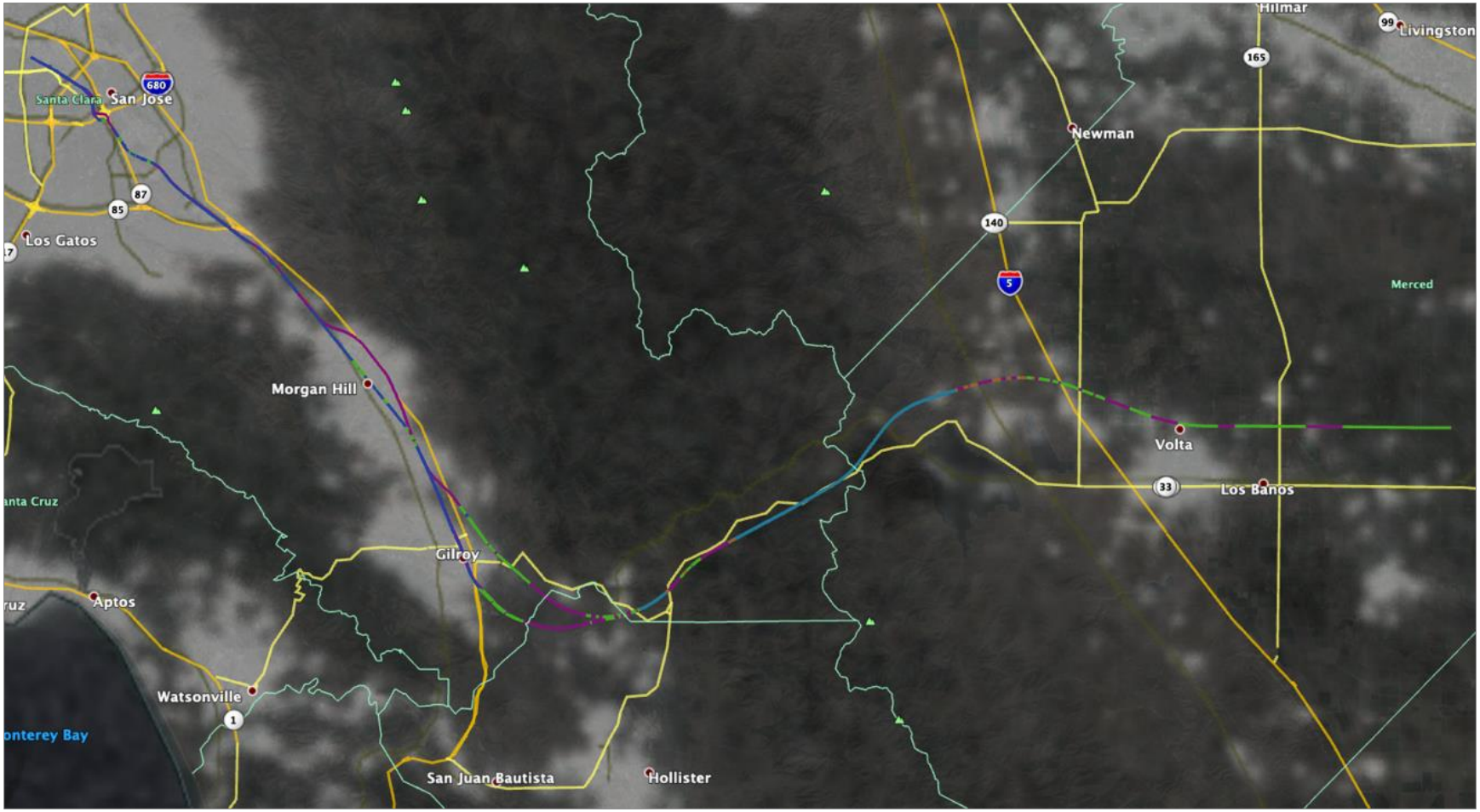
- Wildlife exposure to ALAN in the study area, considering both existing conditions and changes from that condition that would occur with construction of the project.
- Potential wildlife responses to ALAN, based on review of published studies of the subject.
- Impact assessment, including remarks on special-status species likely to be affected.
- Potential IAMFs to reduce the assessed impacts.

1.2 Artificial Light Exposure in the Study Area

ALAN alters natural light regimes spatially, temporally, and spectrally (Gaston et al. 2013). Spatial changes describe where ALAN occurs. Temporal changes affect both the timing and duration of ALAN exposure and include dynamic components, such as flickering and flashing. Spectral changes concern the color of the ALAN and are typically determined by the lighting source (e.g., LED, halogen, sodium vapor lamp). ALAN in biological systems can function as both a resource and as an information source (Gaston et al. 2013). As a resource, light may drive photosynthesis, or its absence may be critical to dark physiology processes. As an information source, light controls circadian clocks and photoperiodism, influences visual perception, and affects spatial orientation. The effects of ALAN on light as an information source have produced the most diverse and widely studied biological consequences.

The existing ALAN environment in the study area is depicted in Figure 1, which shows a satellite view of the study area at night (November 9, 2020, which was a cloudless night).

[1] The project is being evaluated under NEPA regulations as adopted prior to changes that occurred in 2020.



Source: Satellite imagery from NASA 2021

FEBRUARY 2021

Figure 1 Study Area at Night

As shown in Figure 1, the study area generally has a high level of existing light exposure from San Jose to the southern outskirts of Gilroy, though levels are appreciably lower in the Coyote Valley area. Note, however, that the alignment in Coyote Valley is colocated with an existing double track mainline used by Caltrain and by freight traffic; thus, the area has existing high exposure to operational train lighting. East of Gilroy, ALAN levels are low or very low throughout most of the alignment. Accordingly, this analysis determines potential ALAN effects to only occur in Coyote Valley and throughout the alignment east of Gilroy, where project activities have the potential to substantially alter ALAN exposure relative to existing conditions. The limits of areas (as defined in the Preliminary Engineering for Project Design Record drawings in Volume 3 of the Final EIR/EIS) with existing low ALAN exposure are shown in Table 1.

Table 1 Construction Stationing Limits of Areas with Existing Low ALAN Exposure

Area	Stationing Limits			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Coyote Valley	B680 to B1000	B720 to B1070	B630 to B1000	B670 to B1020
East of Gilroy	B1810 to B5335	B1810 to B5335	B1450 to B5335	B1750 to B5335

The project could cause biological effects attributable to ALAN by the following mechanisms.

- **Construction site lighting**. Site lighting is on site (i.e., within the combined temporary plus permanent impact footprint), with spillover to neighboring areas that may include wildlife habitat. Spillover would be minimized as required by BIO-MM#76a; this effect is detailed in Section 1.3.1, Continuous Lighting Effects. Light sources (spectrum) are currently dominated by metal halide light plants but would potentially be dominated by LEDs by the time the proposed work is performed. LED is a broad-spectrum source. Light intensity would vary with proximity to the light plant but would be designed to meet the Occupational Safety and Health Administration (OSHA) standard for general construction, 5 foot-candles[2] (54 lux; 29 C.F.R. § 1926.56), at the limits of the construction area. ALAN duration is potentially throughout the hours of darkness. Although directed toward the site, light sources would be visible to wildlife outside the project footprint. Night work within areas with existing low levels of ALAN and, thus, potential impacts due to construction site lighting, is only proposed in Coyote Valley and at the tunnel portals. At these locations, lighting would be minimized by implementation of BIO-MM#76a.
- **Construction vehicle lighting**. Vehicles going to and coming from the project site or vehicles operating within the project footprint may briefly direct light (headlights or spotlights) toward areas outside the project footprint. Though of short duration and limited spatial scope, lights of this intensity can influence wildlife behavior or physiology.
- **Operational site lighting**. This lighting occurs at stations and other facilities, such as the maintenance-of-way facility (MOWF) and the traction power stations. Operational site lighting would comply with BIO-IAMF#12. Operational site lighting is directed toward the site and is predominantly of a fairly low intensity. At the traction power stations, it consists of security lighting, approximately 5 lux. At the stations and MOWF, it is approximately 20 to 50 lux. Operational site lighting is continuous throughout the hours of darkness, except to the extent that it can sometimes be stopped consistent with BIO-IAMF#12. Although directed toward the site, light sources would be visible to wildlife outside the project footprint and could affect

[2] Many different units are used to measure light. This analysis primarily uses lux, which is a measure of the amount of light falling on a surface. Other common units include the lumen, which is one lux per square meter; the foot-candle, which is one lumen per square foot; and the candela, a measure of the intrinsic brightness of any point on a source of illumination. For conversion between these units, see https://www.compuphase.com/electronics/candela_lumen.htm (accessed January 19, 2021).

wildlife through the same mechanisms discussed for construction site lighting. The impact would be permanent.

- **Operational train lighting**. This lighting consists of train headlights and incidental light that may be visible at train windows. Headlights are required by Federal Railroad Administration (FRA) regulations and must have an output of 200,000 candelas. Three train headlights are required, but FRA allows a waiver that uses one headlight except at at-grade crossings; such crossings exist in Alternative 4 but not the other alternatives. The California High-Speed Rail Authority (Authority) intends to seek such a waiver, and only use three headlights near at-grade crossings; there are no such crossings within the areas specified in Table 1 (Volume 2, Appendix 2-B, Railroad Crossings, of the Final EIR/EIS). Spectrum is undefined but would likely be LED. This stimulus is bright, brief, and repetitive, occurring once at any given site for every night train passage.[3] Incidental light from train windows is of very low intensity, less than 1 lux, diminishing rapidly with distance from the train. Operational train lighting would be essentially invisible to wildlife in sections of the alignment confined by tunnels, trenches, or noise/visual barriers and would be minimized at wildlife crossings as specified by BIO-MM#77a.
- **Operations maintenance activity lighting**. This lighting includes vehicle headlights and work-site lighting of intensity comparable to construction site and construction vehicle lighting. The principal maintenance activities would be fence inspection, track inspection, and track or overhead contact system work. Fence inspection is performed during daylight hours. Track inspection inspects the entire project approximately every day. It is potentially performed at night but consists exclusively of track inspection, with all lighting directed at the track and confined within the fenceline; thus, there would be no illumination of wildlife habitat except by the headlight of the inspection train. Track or overhead contact system work also occurs entirely within the fenceline, but there could be incidental illumination of habitat in the same manner as described for construction work, and habitat could be illuminated by the headlight of the maintenance train. This lighting would affect no more than 1 mile of track per night and would be infrequent (intervals of months to years).
- **Cumulative impacts**. All forms of ALAN associated with the project are expected to make a regional contribution to light pollution and thus to skyglow, which has been associated with a variety of biological effects.

Light sources generally attenuate according to an inverse square law; with a doubling of distance from the light source, intensity decreases by a factor of four. Table 2 summarizes some common light sources relevant to this analysis and their brightness in lux.

Table 2 Illuminance Levels of Common Light Sources

Source	Brightness (lux)
Full sunlight	103,000
Cloudy day	1,000–10,000
Most homes	100–300
OSHA construction lighting requirement	54
Average street lighting	15
Average security lighting	5

[3] See Final EIR/EIS Table 2-14 for estimates of train frequency. The maximum would be 148 trains per day from 7 a.m. to 10 p.m. and 28 trains per day from 10 p.m. to 7 a.m. Over the course of the year, the night is an average of 12 hours long, with 1 hour less if civil, nautical, or astronomical twilight, respectively, are considered. There would be an average of approximately 35 evening trains and 4 morning trains each night, and these numbers vary with time of year and whether daylight savings time is observed.

Source	Brightness (lux)
Full moon	0.1–0.3
Urban skyglow	0.15
Quarter moon	0.01–0.03
Clear starry night	0.001
Cloudy night	0.00003–0.0001

Source: Gaston et al. (2013)
Note: OSHA = Occupational Health and Safety Administration

1.3 Wildlife Responses to Artificial Light

This section discusses research related to the effects on wildlife of three forms of project-related ALAN: continuous lighting directed onto the project site that is visible to wildlife located outside the project site, intermittent lighting from vehicle or train headlights that is directed toward wildlife habitat, and lighting from all project sources that contributes to skyglow. No research appears to have assessed the effects of light from high-speed trains in other countries or locations.

1.3.1 Continuous Lighting Effects

Research into the biological effects of ALAN and its minimization has focused almost exclusively on emissions from streetlights (Gaston and Holt 2018), a form of continuous lighting directed at an animal (or plant) or its habitat. This impact would occur under the project to the extent that the air over a project site may function as foraging habitat for birds or bats and by illumination of habitat proximal to the illuminated area. Consequently, the project largely avoids the impacts that have been attributed to ALAN simply by minimizing continuous direct illumination of habitat. However, project illumination of aerial habitat would be biologically important to the extent that it is an insect attractant, and both birds and bats may approach to forage on the insects; examples include short-eared owls and bats (Rydell 1991; Canario et al. 2012). Although some bats approach and forage near such lighting, others avoid such lights (Bolliger et al 2020). Which species respond in these different ways is difficult to predict, as even bats within the same genus have sometimes been found to behave quite differently (Rotics et al. 2011).

The extent of potential illumination of habitat proximal to the illuminated area was recently investigated during night work at a high-speed rail (HSR) construction site near Corcoran, California (Bakersfield to Fresno Project Section). At this location, metal halide light plants were used to illuminate the work site. Lights were directed downward and toward the work area. The OSHA construction lighting standard of 5 foot-candles was met within approximately 130 feet from the light plant. Beyond that distance, illumination diminished rapidly, reaching a value of approximately zero relative to background at 250 feet from the light source; background was 0.04 to 0.25 lux despite the absence of a moon, indicating substantial skyglow (H.T. Harvey and Associates 2020). Based on this evidence, it is expected that effects due to unintended illumination of habitat adjacent to a work area may be encountered at distances of up to 250 feet from an operating light plant.

Apart from effects on flying animals, no research appears to have examined the effect of lighting that is not directed at organisms or their habitat, except in the case of skyglow effects, discussed in Section 1.3.3, Skyglow Effects. Since lux levels would drop to ambient within 250 feet from lights located within the project footprint, such impacts are unlikely.

1.3.2 Intermittent Lighting Effects

Vehicle headlights are the predominant mobile source of ALAN. Gaston and Holt (2018) found that “the ecological impacts that might arise from these have received almost no attention, or only passing reference, either within the literature on impacts of artificial nighttime lighting, or on the ecological impacts of roads. Where they have been considered, the focus has been on the dazzling of vertebrates and the resultant potential for these causing collisions with vehicles.”

These researchers suggested that headlights could cause biological effects through the following mechanisms (Gaston and Holt 2018).

- Headlights are focused so as to illuminate at higher intensities than commonly experienced from other sources and well above activation thresholds for many biological processes.
- Headlights are projected largely in a horizontal plane and thus can carry over long distances.
- Headlights are introduced into much more extensive areas of the landscape than experience street lighting and similar forms of ALAN.
- Headlights typically have a broad spectrum that substantially overlaps with wavelengths that influence many biological processes.
- Headlights are often expressed as a series of pulses of light (produced by passage of separate vehicles), a dynamic known to have biological impacts.

Bennie et al. (2016) found that an automotive headlight measuring 10,000 lux at 1 meter (m) produced 25 lux at 50 m and 1 lux at 100 m; this is a substantially slower drop-off than predicted by the inverse square law, a result achieved due to sophisticated reflector design in the headlight. These results suggest a value of 0.1 lux (equivalent to a full moon) at a distance of 320 m. Comparable performance in a train headlight rated at 200,000 candela (the FRA requirement[4]) would result in a brightness of 0.1 lux (equivalent to a full moon) at a distance of 1,400 m. However, train headlight drop-off as a function of angle is extreme; FRA requires only 3,000 candela at 7.5 degrees off-axis, which would diminish to full-moon brightness (0.1 lux) at a distance of 170 m. These results indicate that at any time approximately 31,066 m^2 would be illuminated by the train's headlight to a brightness greater than the full moon. Due to the extremely low curvature of the HSR track, that light is projected essentially straight down the track, and the central 21,350 m^2 would be within the fenceline. Thus, only 9,716 m^2 (2.4 acres) of habitat would be illuminated at any time and to a relatively low (but variable) intensity; moreover, this would affect habitat only within 26.5 m from the fence (similar to the area most affected by train noise). Also, note that beyond a distance of 1,007 m, the elevated light levels would only be within the fenceline and thus would not illuminate habitat. Since the area of increased illumination extends over a distance of 1,007 m and the train's speed would be 220 miles per hour (98.35 m per second) in the portions of the alignment east of the Gilroy station where baseline light levels are low or very low, the elevated illumination would last up to 10.23 seconds each time a train passed.

Headlights typically have "white" light, with a color temperature of approximately 3,500 to 4,000 degrees Kelvin; white light has a "greater likelihood of substantial emissions in key parts of the action spectra of many biological processes." Concerns have particularly been raised around emissions in the blue part of the spectrum, which may affect melatonin levels and circadian rhythms of many species (Gaston and Holt 2018).

Although the vast majority of studies of the biological impacts of ALAN have focused on continuous lighting, laboratory studies on other organisms have shown that shorter exposure to pulsed lighting can have substantial effects. Examples gleaned from a literature review by Gaston and Holt (2018) include the following.

- For the moths *Helicoverpa armigera* and *Mamestra brassicae*, 0.5-second pulses of green light decreased activity in one species, with no effect on the other.
- For the mosquito *Anopheles gambiae*, 6-, 10-, or 30-minute pulses of 150 to 870 lux produced suppression of biting activity.

[4] 49 C.F.R. Section 229.125(a)(1) requires "If a locomotive is equipped with a single-lamp headlight, the single lamp shall produce a peak intensity of at least 200,000 candela and shall produce at least 3,000 candela at an angle of 7.5 degrees and at least 400 candela at an angle of 20 degrees from the centerline of the locomotive when the light is aimed parallel to the tracks."

- For the Japanese horse-mackerel *Trachuras japonicus*, pulses of 3.0, 1.36, 0.62, and 0.15 cycles per second, at peak of 100 lux, produced general aversion to intermittent light or attraction and school confusion.
- For the rat *Rattus norvegicus*, a 1 millisecond pulse at 2,000 megawatt per square centimeter reduced pineal N-acetyltransferase and melatonin content.
- For the rat *Rattus norvegicus*, a 5- to 60-minute pulse every 2 hours at 200 to 250 foot-candles produced greater visual cell damage than continuous light exposure.
- For the rat *Rattus norvegicus*, five 1-minute pulses every 2 hours using two standard 100 watt incandescent lamps produced decreased peak nighttime serum melatonin concentrations.
- For the Syrian hamster *Mesocricetus auratus*, a 1- or 5-second pulse at 32,000 microwatts per square centimeter depressed pineal melatonin production.
- For the Djungarian hamster *Phodopus sungorus*, a 1-minute pulse at 40 to 200 lux reduced melatonin synthesis during the consecutive night.

Although these represent laboratory studies of organisms not found in the study area, they do suggest that exposure to intermittent ALAN can affect melatonin production in a variety of mammals and could have varied and potentially adverse behavioral effects in other species. Melatonin is a hormone that regulates circadian rhythms in most vertebrates. It has been linked to a wide variety of essential behaviors, such as reproduction, the sleep cycle, body temperature, and timing of seasonal changes. These results suggest a broad potential for ALAN associated with headlights to affect circadian rhythms of wildlife in adverse ways.

Besides these specific studies, pulsed lighting has been shown to elicit avoidance behavior in many animals, with limited evidence for adaptive responses (Gaston and Holt 2018); and to be less of an attractant than continuous lighting (Gehring et al. 2009). Thus, wildlife may avoid areas exposed to pulsed lighting; this would affect animal movement and habitat fragmentation (Gaston and Holt 2018).

1.3.3 Skyglow Effects

Skyglow from ALAN is primarily caused by upwardly emitted artificial light being scattered in the atmosphere by water and dust. Ground-reflected artificial light can also contribute. Skyglow can increase background nighttime sky brightness to levels of 0.2–0.5 lux, comparable with late twilight and moonlight (Gaston et al. 2017). Skyglow has the potential to disrupt both circadian clocks and photoperiodism in some species (Gaston et al. 2013). It may also mask natural light signals used for navigation, including moon position and polarized atmospheric light (Gaston et al. 2013). Skyglow alone can be sufficient to mask natural monthly and seasonal regimes of lunar sky brightness and to increase the annual number and regime of full moon equivalent hours available to organisms during the night (Davies et al. 2013). ALAN has been found to substantially alter the timing of avian reproductive biology, even at light levels comparable to a full moon (i.e., 0.3 lux; Dominoni et al. 2013).

1.4 Impact Assessment

An impact would occur if the project would have a substantial adverse effect on wildlife movement or if it were to, either directly or through habitat modifications, adversely affect any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Eleven special-status mammal species are potentially affected: mountain lion, San Joaquin kit fox, Tule elk, badger, ringtail, dusky-footed woodrat, Fresno kangaroo rat, Townsend's big-eared bat, western mastiff bat, pallid bat, and western red bat.

Impacts are assumed possible due to exposure to continuous or intermittent lighting. The project is assumed to not make a substantial contribution to skyglow in the study area for the following reasons, thus skyglow impacts are not assessed.

- Continuous project light sources are required, as part of project design, to minimize illumination consistent with existing requirements under law and regulation and to use lighting that does not direct light upward. Consequently, continuous light sources have a low potential to contribute to skyglow, relative to current conditions, under which upward-directed light sources are abundant throughout most of the study area.
- Intermittent project light sources are directed laterally and thus have limited potential to contribute to skyglow.

Impacts of continuous and intermittent project lighting are evaluated here on a species-by-species basis, concluding with an evaluation of potential impacts on non-special-status wildlife.

1.4.1 Mountain Lion

Mountain lion would potentially be affected in areas where the project alignment overlaps modeled lion habitat in Coyote Valley and in most of the Pacheco Pass Subsection. Within this area, effects could occur, except in those areas where the alignment is in a tunnel or where operational lighting is hidden by noise/light barrier walls. Because the project would minimize lighting of modeled habitat from continuous sources of construction lighting and operations lighting, this lighting would have little potential to affect mountain lion. Intermittent sources of both construction and operations lighting would at times be directed toward modeled habitat. Exposures would be brief but could potentially last for periods of minutes in the case of construction lighting and up to 10 seconds in the case of operational train lighting. These exposures would be minimized due to the installation of noise/light barriers at critical wildlife crossings in Coyote Valley and Pacheco Pass; thus, effects on mountain lion passage corridors would be minor. Elsewhere, areas affected at each exposure to intermittent lighting would be on the order of up to 9,716 m^2 (2.4 acres). Exposure to intermittent light has been found to potentially affect melatonin metabolism and to elicit avoidance responses, as discussed in Section 1.3.2, Intermittent Lighting Effects, although no literature has been found addressing intermittent light effects on mountain lion or, indeed, upon any large mammals. Nonetheless, there is a clear potential for adverse behavioral and physiological effects resulting from intermittent light exposure from both construction and operations sources.

1.4.2 San Joaquin Kit Fox

San Joaquin kit fox would potentially be affected in areas where the project alignment overlaps modeled kit fox habitat, most significantly in the Pacheco Pass Subsection east of the easternmost Pacheco Pass tunnel near the O'Neil Forebay, where individuals are more likely to occur (as they move north from occupied areas in Panoche Valley to the south). Within this area, effects could occur, except that nighttime construction would not occur in this area, and operational lighting would be hidden at locations with noise/light barrier walls; these walls are located at a critical wildlife crossing east of Pacheco Pass and would serve to minimize effects on kit fox movement corridors. Continuous sources of operations lighting would minimize lighting of modeled habitat and thus have little potential to affect kit fox. Intermittent sources of operations lighting would at times be directed toward modeled habitat. Exposures would be brief, lasting up to 10 seconds in the case of operational train lighting. Areas affected at each exposure would be on the order of up to 9,716 m^2 (2.4 acres). Exposure to intermittent light has been found to potentially affect melatonin metabolism and to elicit avoidance responses, as discussed in Section 1.3.2, although no literature has been found addressing intermittent light effects on kit fox or, indeed, upon any large mammals. Nonetheless, there is a clear potential for adverse behavioral and physiological effects resulting from intermittent light exposure from both construction and operations sources.

1.4.3 Tule Elk

Tule elk would potentially be affected in areas where the project alignment overlaps modeled Tule elk habitat in the Pacheco Pass Subsection. Within this area, effects could occur, except in those areas where the alignment is in a tunnel or where operational lighting is hidden by noise/light barrier walls; these walls are located at a critical wildlife crossing west of Pacheco Pass and would serve to minimize effects on Tule elk movement. Construction lighting would be limited to tunnel portals. Because the project would minimize lighting of modeled habitat from continuous sources of construction lighting and operations lighting, this lighting would have little potential to affect Tule elk. Intermittent sources of both construction and operations lighting would at times be directed toward modeled habitat. Exposures would be brief but could potentially last for periods of minutes in the case of construction lighting and up to 10 seconds in the case of operational train lighting. Areas affected at each exposure would be on the order of up to 9,716 m^2 (2.4 acres). Exposure to intermittent light has been found to potentially affect melatonin metabolism and to elicit avoidance responses, as discussed in Section 1.3.2, although no literature has been found addressing intermittent light effects on Tule elk or, indeed, upon any large mammals. Nonetheless, there is a clear potential for adverse behavioral and physiological effects resulting from intermittent light exposure from both construction and operations sources.

1.4.4 Badger and Ringtail

Badger and ringtail would potentially be affected in areas where the project alignment overlaps modeled badger or ringtail habitat in Coyote Valley and in most of the Pacheco Pass Subsection. Within this area, effects could occur, except in those areas where the alignment is in a tunnel or where operational lighting is hidden by noise/light barrier walls; these walls are located at critical wildlife crossings in Coyote Valley and Pacheco Pass and would serve to minimize effects on wildlife movement. In the Pacheco Pass Subsection, construction lighting would be limited to tunnel portals. Continuous sources of both construction lighting and operations lighting would minimize lighting of modeled habitat and thus have little potential to affect badger or ringtail. Intermittent sources of both construction and operations lighting would at times be directed toward modeled habitat. Exposures would be brief but could potentially last for periods of minutes in the case of construction lighting and up to 10 seconds in the case of operational train lighting. Areas affected at each exposure would be on the order of up to 9,716 m^2 (2.4 acres). Exposure to intermittent light has been found to potentially affect melatonin metabolism and to elicit avoidance responses, as discussed in Section 1.3.2, although no literature has been found addressing intermittent light effects on badger, ringtail, or, indeed, upon any large mammals. Nonetheless there is a clear potential for adverse behavioral and physiological effects resulting from intermittent light exposure from both construction and operations sources.

1.4.5 Dusky-Footed Woodrat and Fresno Kangaroo Rat

Dusky-footed woodrat would potentially be affected in areas where the project alignment overlaps modeled woodrat habitat in Coyote Valley and from south of Gilroy to western Pacheco Pass. Fresno kangaroo rat would potentially be affected in areas where the project alignment overlaps modeled kangaroo rat habitat in the Central Valley east of Interstate 5. Within these areas, effects could occur, except in those areas where the alignment is in a tunnel or where operational lighting is hidden by noise/light barrier walls; such a barrier is located in the Grasslands Ecological Area and would serve to minimize effects on wildlife movement. In the Pacheco Pass Subsection, construction lighting would be limited to tunnel portals, and, in the Central Valley, construction lighting would be avoided. Because the project would minimize lighting of modeled habitat from continuous sources of construction lighting and operations lighting, this lighting would have little potential to affect woodrat or kangaroo rat. Intermittent sources of both construction and operations lighting would at times be directed toward modeled habitat. Exposures would be brief but could potentially last for periods of minutes in the case of construction lighting and up to 10 seconds in the case of operational train lighting. Areas affected at each exposure would be on the order of up to 9,716 m^2 (2.4 acres). Exposure to intermittent light has been found to potentially affect melatonin metabolism and to elicit avoidance responses, as discussed in Section 1.3.2; adverse effects on three rodent species have been identified, although no literature has been

found addressing intermittent light effects on woodrat or kangaroo rat. Nonetheless, there is a clear potential for adverse behavioral and physiological effects resulting from intermittent light exposure from both construction and operations sources.

1.4.6 Townsend's Big-Eared Bat, Western Mastiff Bat, Pallid Bat, and Western Red Bat

These bat species are potentially present throughout the project alignment. To the extent their foraging habitat is aerial, it overlaps both the construction and operational project footprints. In areas having existing high levels of ALAN, project lighting would not substantially alter that condition, and project impacts would thus be minor, likely indistinguishable from existing conditions. Projects impacts would also be minor in tunnels. Elsewhere, the project could introduce continuous lighting to areas where it is currently absent, with a potential for effects. Continuous lighting from construction could occur only in Coyote Valley and at the tunnel portals. Continuous lighting from operations will primarily occur at traction power stations located in areas where ALAN is currently low, at stations, at tunnel portals, and at the MOWF. Lighting at tunnel portals serves as a minimization measure to discourage bat roosting in and near tunnels, which would otherwise expose them to mortality via train strike.

As discussed in Section 1.3.1, continuous project lighting is likely to be an attractant to flying insects and thus to bats. Some bats avoid lighting in spite of its effects on flying insects; however, in view of the potential food source represented by continuous project lighting, one or more of these species would likely forage near ALAN sources. The principal adverse impact of ALAN on bats is that it limits habitat access for those species that are averse to light (Azam et al. 2015). If one or more of these four species are light-averse, they would lose access to areas illuminated by continuous project lighting. Moreover, because species' foraging patterns could be affected, these species could be exposed to more indirect effects, such as increased predation risk or altered competitive relationships with less light-averse species (Azam et al. 2015). This risk can be assessed for each species.

Townsend's big-eared bat (*Corynorhinus townsendii*, sometimes called *Plecotus townsendii*). This bat is primarily a forest species and a dark-loving bat. Species of *Plecotus* have been shown to be averse to light, avoiding lighted roadways (Rydell 1992). Thus, project ALAN may represent an adverse impact on this species by reducing habitat, altering competitive relationships with less-sensitive bat species, and contributing to habitat fragmentation. Impacts associated with construction throughout the alignment would be temporary, and impacts associated with continuous lighting at project facilities and with operational maintenance lighting would be permanent.

Western mastiff bat (*Eumops perotis*). A variety of bats in the genus *Eumops* have commonly been observed foraging over and near streetlights and other ALAN sources (Rydell 2006). If the western mastiff bat shows similar behavior, project ALAN is less likely to have adverse impacts on this species.

Pallid bat (*Antrozous pallidus*). The pallid bat has an unusual foraging strategy, primarily preying upon ground-dwelling invertebrates that it captures by detecting the sounds they make (Jones et al. 2016). Thus, areas illuminated by continuous project lighting, which are almost entirely parking areas and other areas that do not provide foraging opportunities, do not constitute habitat for pallid bats, and continuous lighting does not constitute an impact on this species.

Western red bat (*Lasiurus blossevillii*). Some species in the genus *Lasiurus* have been observed foraging over and near streetlights and other ALAN sources, including the red bat *L. borealis* (Rydell 2006). If the western red bat shows similar behavior, project ALAN is less likely to have adverse impacts on this species.

All four bat species are subject to impacts of intermittent light from construction and from train operations. Intermittent sources of both construction and operations lighting would at times be directed toward bat habitat. Exposures would be brief but could potentially last for periods of minutes in the case of construction lighting and up to 10 seconds in the case of operational train

lighting. Areas affected at each exposure would be on the order of up to 9,716 m^2 (2.4 acres). Exposure to intermittent light has been found to potentially affect melatonin metabolism and to elicit avoidance responses, as discussed in Section 1.3.2, although no literature has been found addressing intermittent light effects on any species of bat. However, studies have found that melatonin is critical to circadian and seasonal variations in bat physiology; for example, it is involved in seasonal metabolic changes in the pallid bat reproductive cycle (Beasley et al. 1984; Beasley and Leon 1986). There is a clear potential for adverse behavioral and physiological effects resulting from intermittent light exposure from both construction and operations sources.

1.4.7 Non-Special-Status Wildlife

Non-special-status wildlife includes a wide variety of vertebrate species. These species would potentially be affected in areas where the project introduces ALAN to areas that are currently relatively dark, in Coyote Valley and from south of Gilroy to the eastern end of the alignment. Within these areas, effects could occur, except in those areas where the alignment is in a tunnel or where operational lighting is hidden by noise/light barrier walls, which are located at multiple critical wildlife crossings and would serve to minimize effects on wildlife movement. Because the project would minimize lighting of wildlife habitat from continuous sources of construction lighting and operations lighting, this lighting would have little potential to affect wildlife. Intermittent sources of both construction and operations lighting would at times be directed toward wildlife habitat. Exposures would be brief but could potentially last for periods of minutes in the case of construction lighting and up to 10 seconds in the case of operational train lighting. Areas affected at each exposure would be on the order of up to 9,716 m^2 (2.4 acres). Exposure to intermittent light has been found to potentially affect melatonin metabolism and to elicit avoidance responses, as discussed in Section 1.3.2. This would create local and temporary habitat quality reductions; however, none of the non-special-status wildlife populations are known to be vulnerable to population-level effects as a result of such impacts.

1.5 Measures to Reduce Effects

The project incorporates BIO-IAMF#12 to minimize ALAN effects on wildlife by avoiding directing continuous light sources toward wildlife habitat, avoiding use of high-intensity lights to the extent allowable (the sole exception being train headlights, which are required to be of high intensity), minimizing directing light upward or laterally, and avoiding illumination of wildlife crossings or of streams or areas of riparian habitat.

In consideration of this IAMF and other relevant mitigation measures in the Final EIR/EIS, lighting effects remain from the use of continuous lighting that may serve as an attractant to wildlife occupying nearby habitat, and the use of intermittent lighting associated with vehicles used for construction, maintenance, or operations.

There are five types of mitigation measures to address ALAN impacts (Gaston et al. 2012; Schroer and Holker 2017): (1) maintaining and creating dark areas; (2) reducing light trespass so as to direct ALAN where it is needed and to prevent it from being directed elsewhere; (3) reducing the intensity of ALAN; (4) reducing the duration of ALAN by switching off lighting sources when they are not needed; and (e) reducing biological impacts of ALAN by using illumination sources that provide sufficient human benefit while minimizing wavelengths having high biological activity. The first two of these measures have been addressed to the extent feasible, using the measures named above. The following additional measures are recommended to further reduce lighting impacts within the areas identified in Table 1.

- Minimize intensity and duration of construction lighting: Design construction lighting to be consistent with the minimum lighting levels approved by OSHA for general construction—5 foot-candles (54 lux; 29 C.F.R. § 1926.56). When performing construction in or adjoining habitat for special-status species, notify wildlife agencies of planned activities and discuss means to minimize construction effects at the proposed site. To the extent feasible, minimize duration of lighting, for example by using methods other than lighting to ensure security of the construction site during the hours it is not in use.

- Minimize intermittent construction lighting: Minimize direction of construction vehicle headlights towards offsite locations. Use low beams or turn off headlights when safety considerations permit.
- Minimize intensity and duration of operational lighting: Provide operational facility outdoor lighting consistent with minimum OSHA requirements established by 29 C.F.R. Section 1926.56. To the extent feasible, minimize duration of lighting, for example by using methods other than lighting to ensure security of facilities during hours they are not in use.
- Minimize intensity of train lighting: Provide headlights consistent with the minimum standard allowed under 49 C.F.R. Section 229.125, that is a single-lamp headlight of at least 200,000 candelas. Off-axis performance of the headlight should likewise conform to regulatory minimum standards. Obtain an FRA variance to allow use of a single headlight except near at-grade crossings.
- Minimize use of lighting at short wavelengths: A variety of studies have shown that shorter (blue) wavelengths have deleterious effects on bats. These can be eliminated, particularly if LED lighting is used and intensities are minimized (Kerbiriou et al. 2020; Lewanzik and Voight 2017). Lamps should have the lowest color temperature feasible for the desired application; green and red lighting appears to have the least wildlife impact and will be appropriate for some applications, such as security lighting (Longcore and Rich 2016). To the extent feasible, filter or specify all lamps to remove wavelengths shorter than 530 nanometers; this will avoid the wavelengths shown to cause melatonin disruption in humans and many other vertebrates (Kayumov et al. 2005).
- Implement noise/visual barriers to shield view of the operational train at essential wildlife crossings.[5]

1.6 References Cited

Azam, C., C. Kerbiriou, A. Vernet, J.-F. Julien, Y. Bas, L. Plichard, J. Maratrat, and I. Le Viol. 2015. Is Part-Night Lighting an Effective Measure to Limit the Impacts of Artificial Lighting on Bats? *Global Change Biology* 21(12):4333–4341.

Beasley, L. J., and M. Leon. 1986. Metabolic Strategies of Pallid Bats (*Antrozous pallidus*) during Reproduction. *Physiology & Behavior* 36:159–166.

Beasley, L. J., L. Smale, and E. R. Smith. 1984. Melatonin Influences the Reproductive Physiology of Male Pallid Bats. *Biology of Reproduction* 30:300–305.

Bennie, J., T. W. Davies, D. Cruse, and K. J. Gaston. 2016. Ecological Effects of Artificial Light at Night on Wild Plants. *Journal of Ecology* 104(3):611–620.

Bolliger, J., T. Hennet, B. Wermelinger, R. Bösch, R. Pazur, S. Blum, J. Haller, and M. K. Obrist. 2020. Effects of Traffic-Regulated Street Lighting on Nocturnal Insect Abundance and Bat Activity. *Basic and Applied Ecology* 47:44–56.

California High-Speed Rail Authority (Authority). 2020. *San Jose to Merced Project Section: Biological and Aquatic Resources Technical Report.* April 2020. Sacramento, CA.

Canário, F., A. Hespanhol Leitão, and R. Tomé. 2012. Predation Attempts by Short-Eared and Long-Eared Owls on Migrating Songbirds Attracted to Artificial Lights. *Journal of Raptor Research* 46(2):232–234. doi:10.3356/JRR-11-15.1.

Davies, T. W., J. Bennie, R. Inger, and K. J. Gaston. 2013. Artificial Light Alters Natural Regimes of Night-Time Sky Brightness. *Sci Rep* 3(1):1722. doi:10.1038/srep01722.

[5] See Volume 2, Appendix 3.7-E, Supplemental Noise Analysis on Terrestrial Wildlife Species, of the Final EIR/EIS, where the location and design of additional noise/visual barriers are described.

Dominoni, D., M. Quetting, and J. Partecke. 2013. Artificial Light at Night Advances Avian Reproductive Physiology. *Proc. R. Soc. B.* 280(1756):20123017. doi:10.1098/rspb.2012.3017.

Gaston, K. J., J. Bennie, T. W. Davies, and J. Hopkins. 2013. The Ecological Impacts of Nighttime Light Pollution: A Mechanistic Appraisal. *Biological Reviews* 88:912–927.

Gaston, K. J., and L. A. Holt. 2018. Nature, Extent and Ecological Implications of Night-Time Light from Road Vehicles. *Journal of Applied Ecology* 55(5):2296–2307.

Gaston, K. J., T. W. Davies, J. Bennie, and J. Hopkins. 2012. Reducing the Ecological Consequences of Night-Time Light Pollution: Options and Developments. *The Journal of Applied Ecology* 49(6):1256–1266.

Gaston, K. J., T. W. Davies, S. L. Nedelec, and L. A. Holt. 2017. Impacts of Artificial Light at Night on Biological Timings. *Annual Review of Ecology, Evolution, and Systematics* 48(1):49–68.

Gehring, J., P. Kerlinger, and A. M. M. Li. 2009. Communication Towers, Lights, and Birds: Successful Methods of Reducing the Frequency of Avian Collisions. *Ecological Applications* 19(2):10.

H. T. Harvey and Associates. 2020. *California High Speed Rail, Avenue 88 and Highway 43 Interchange Illumination Measurements During Nightwork*. Prepared for Mike Eng, California High-Speed Rail Authority, Fresno, CA.

Jones, P. L., R. A. Page, and J. M. Ratcliffe. 2016. To Scream or to Listen? Prey Detection and Discrimination in Animal-Eating Bats. In M. B. Fenton, A. D. Grinnell, A. N. Popper, and R. R. Fay (eds.), *Bat Bioacoustics*. New York, NY: Springer.

Kayumov, L., R. F. Casper, R. J. Hawa, B. Perelman, S. A. Chung, S. Sokalsky, and C. M. Shapiro. 2005. Blocking Low-Wavelength Light Prevents Nocturnal Melatonin Suppression with No Adverse Effect on Performance during Simulated Shift Work. *The Journal of Clinical Endocrinology & Metabolism* 90(5):2755–2761.

Kerbiriou, C., K. Barré, L. Mariton, J. Pauwels, G. Zissis, A. Robert, and I. Le Viol. 2020. Switching LPS to LED Streetlight May Dramatically Reduce Activity and Foraging of Bats. *Diversity* 12(4):165.

Lewanzik, D., and C. C. Voigt. 2017. Transition from Conventional to Light-Emitting Diode Street Lighting Changes Activity of Urban Bats. *Journal of Applied Ecology* 54(1):264–271.

Longcore, T., and C. Rich. 2016. *Artificial Night Lighting and Protected Lands: Ecological Effects and Management Approaches*. Natural Resource Report, National Park Service, Fort Collins, CO.

NASA. 2021. Image Capture from Worldview Imagery Browser Using Nighttime Imagery (Day/Night Band, Enhanced Near Constant Contrast) from the Suomi NPP / VIIRS Satellite for November 9, 2020. https://worldview.earthdata.nasa.gov/?v=-127.14843258711134,33.73616295319357,-113.93500986983464,40.280003149021724&t=2020-11-09-T08%3A00%3A00Z&l=Reference_Features,VIIRS_SNPP_DayNightBand_ENCC (accessed January 19, 2021).

Rotics, S., T. Dayan, and N. Kronfeld-Schor. 2011. Effect of Artificial Night Lighting on Temporally Partitioned Spiny Mice. *Journal of Mammalogy* 92(1):159–168.

Rydell, J. 1991. Seasonal Use of Illuminated Areas by Foraging Northern Bats *Eptesicus nilssoni. Ecography* 14(3):203–207.

Rydell, J. 1992. Exploitation of Insects around Streetlamps by Bats in Sweden. *Functional Ecology* 6(6):744. doi:10.2307/2389972.

Rydell, J. 2006. Bats and Their Insect Prey at Streetlights. In C. Rich and T. Longcore (eds.), *Ecological consequences of artificial night lighting*. Washington, D.C.: Island Press.

Schroer, S., and F. Hölker. 2017. Light Pollution Reduction: Methods to Reduce the Environmental Impact of Artificial Light at Night. In *Handbook of Advanced Lighting Technology*.

APPENDIX 3.8-A: WATERBODIES CROSSED BY THE PROJECT ALTERNATIVES

Table 1 Waterbodies Crossed by the Project Alternatives

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
San Jose Diridon Station Approach				
Los Gatos Creek	✓	✓	✓	✓
Guadalupe River	✓	✓	✓	✓
Palustrine Forested Wetland 6	✓	✓	✓	✓
Monterey Corridor				
Constructed Basin 1	✓	✓	✓	
Constructed Watercourse 1	✓	✓	✓	✓
Constructed Basin 10	✓	✓	✓	✓
Morgan Hill and Gilroy				
Coyote Alamitos Canal		✓		
Coyote Creek	✓	✓	✓	✓
Coyote Creek Reservoir	✓	✓	✓	
Coyote Creek Palustrine Forested Wetlands	✓	✓	✓	✓
Marsh 8		✓		✓
Constructed Watercourse 124	✓	✓	✓	
Seasonal Wetland 14	✓	✓	✓	
Fisher Creek	✓	✓	✓	✓
Coyote Canal Extension	✓	✓	✓	✓
Constructed Watercourse 125				✓
Constructed Watercourse 126				✓
Seasonal Wetland 15	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Coyote Canal	✓	✓	✓	✓
Coyote Creek Tributary 1	✓	✓	✓	✓
Coyote Creek Tributary 2	✓	✓	✓	✓
Coyote Creek Tributary 3	✓	✓	✓	✓
Coyote Creek Tributary 4	✓	✓	✓	✓
Coyote Creek Tributary 5	✓	✓	✓	✓
Coyote Creek Tributary 6	✓	✓	✓	✓
Coyote Creek Tributary 7	✓	✓	✓	✓
Coyote Creek Tributary 8	✓	✓	✓	✓
Seasonal Wetland 16	✓	✓	✓	✓
Constructed Watercourse 127	✓	✓	✓	✓
Constructed Watercourse 129	✓	✓	✓	✓
Constructed Watercourse 161		✓		
Coyote Canal Tributary 1	✓	✓	✓	✓
Coyote Canal Tributary 2	✓	✓	✓	✓
Constructed Watercourse 130		✓		
Cochran Channel	✓		✓	
Constructed Basin 2		✓		
Seasonal Wetland 18		✓		
Constructed Basin 3		✓		
Seasonal Wetland 17		✓		
Seasonal Wetland 1		✓		✓
Fisher Creek Tributary 1		✓		✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Seasonal Wetland 2	✓	✓	✓	✓
West Little Llagas Creek Tributary 1	✓	✓	✓	✓
West Little Llagas Creek Tributary 2	✓	✓	✓	✓
Constructed Basin 11		✓		✓
Constructed Basin 4		✓		
Madrone Channel	✓		✓	
Butterfield Channel	✓	✓	✓	✓
West Little Llagas Creek	✓	✓	✓	✓
Seasonal Wetland 19		✓		
Constructed Basin 5		✓		
Constructed Basin 6		✓		
Little Llagas Creek	✓	✓	✓	✓
Llagas Creek	✓	✓	✓	✓
Constructed Basin 7	✓	✓	✓	
West Branch Llagas Creek	✓	✓	✓	✓
West Branch Llagas Creek Tributary 1	✓	✓	✓	✓
Constructed Watercourse 3		✓		
Constructed Watercourse 131	✓	✓		✓
Constructed Watercourse 132		✓		
Upper Miller Slough	✓	✓	✓	✓
Lower Miller Slough	✓		✓	
Palustrine Forested Wetland 7			✓	
Palustrine Forested Wetland 9			✓	

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Princevalle Channel	✓	✓		✓
Dexter Creek			✓	
Marsh 1			✓	
Jones Creek			✓	
San Ysidro Creek			✓	
Constructed Watercourse 4			✓	
Constructed Watercourse 5			✓	
Constructed Watercourse 6			✓	
Constructed Basin 12				✓
Constructed Basin 13				✓
Constructed Watercourse 7	✓	✓		
Gilroy Wastewater Treatment Ponds	✓	✓		
Constructed Watercourse 156	✓	✓		
Constructed Watercourse 8	✓	✓	✓	✓
Constructed Watercourse 9			✓	
Constructed Watercourse 10			✓	
Constructed Watercourse 11			✓	
Constructed Watercourse 12			✓	
Pajaro River	✓	✓	✓	✓
Constructed Watercourse 133	✓	✓	✓	✓
Constructed Watercourse 13	✓	✓	✓	✓
Seasonal Wetland 4	✓	✓		
Uvas Creek[1]	✓	✓		

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Carnadero Creek[1]	✓	✓		
Uvas-Carnadero Creek Palustrine Forested Wetlands	✓	✓		
Constructed Watercourse 14	✓	✓		
Palustrine Forested Wetland 8	✓	✓		
Constructed Watercourse 135	✓	✓		✓
Constructed Watercourse 15	✓	✓	✓	✓
Seasonal Wetland 5				✓
Constructed Watercourse 16	✓	✓		✓
Pajaro River Palustrine Forested Wetlands	✓	✓		✓
Constructed Watercourse 157	✓	✓	✓	✓
Constructed Watercourse 158	✓	✓	✓	✓
Constructed Watercourse 159	✓	✓	✓	✓
Constructed Watercourse 17	✓	✓		✓
Constructed Watercourse 18	✓	✓		✓
Constructed Watercourse 19	✓	✓		✓
Millers Canal	✓	✓	✓	✓
Constructed Watercourse 134			✓	
Constructed Watercourse 136			✓	
Constructed Watercourse 137	✓	✓	✓	✓
Constructed Watercourse 20	✓	✓		✓
Constructed Watercourse 21	✓	✓		✓
Constructed Watercourse 22	✓	✓		✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Constructed Watercourse 23	✓	✓	✓	✓
Marsh 2			✓	
Constructed Watercourse 25			✓	
Constructed Watercourse 138			✓	
Constructed Watercourse 26	✓	✓	✓	✓
Tequisquita Slough			✓	
Tequisquita Slough Pond 1	✓	✓		✓
Tequisquita Slough Pond 2			✓	
Tequisquita Slough Marsh	✓	✓	✓	✓
Tequisquita Slough Seasonal Wetland 1				
Tequisquita Slough Seasonal Wetland 2	✓		✓	✓
Constructed Watercourse 27			✓	
Pacheco Creek[3]	✓	✓	✓	✓
Pacheco Creek Tributary 1	✓	✓		✓
Seasonal Wetland 7	✓	✓		✓
Marsh 4	✓	✓	✓	✓
Seasonal Wetland 8	✓	✓	✓	✓
Constructed Watercourse 28	✓	✓	✓	✓
Palustrine Forested Wetland 10	✓	✓		✓
Palustrine Forested Wetland 2	✓		✓	
Marsh 5	✓	✓	✓	✓
Constructed Watercourse 29	✓	✓		✓
Constructed Watercourse 30	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Seasonal Wetland 9	✓	✓	✓	✓
Ortega Creek	✓	✓	✓	✓
Seasonal Wetland 10	✓	✓	✓	✓
Ortega Creek Tributary 1	✓	✓	✓	✓
Ortega Creek Tributary 2	✓	✓	✓	✓
Ortega Creek Tributary 3	✓	✓	✓	✓
Ortega Creek Tributary 4	✓	✓	✓	✓
Ortega Creek Tributary 5	✓	✓	✓	✓
Ortega Creek Tributary 6	✓	✓	✓	✓
Ortega Creek Tributary 7	✓	✓	✓	✓
Ortega Creek Tributary 8	✓	✓	✓	✓
Ortega Creek Tributary 9	✓	✓	✓	✓
Ortega Creek Tributary 10	✓	✓	✓	✓
Ortega Creek Tributary 11	✓	✓	✓	✓
Ortega Creek Tributary 13	✓	✓	✓	✓
Ortega Creek Tributary 14	✓	✓	✓	✓
Ortega Creek Tributary 15	✓	✓	✓	✓
Pond 2	✓	✓	✓	✓
Pond 3	✓	✓	✓	✓
Pacheco Creek Tributary 2			✓	
Pacheco Creek Tributary 3	✓	✓	✓	✓
Pacheco Creek Tributary 4	✓	✓	✓	✓
Pond 13	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Pond 4	✓	✓	✓	✓
Pond 5	✓	✓	✓	✓
Pacheco Creek Tributary 56	✓	✓	✓	✓
Pacheco Creek Tributary 5	✓	✓	✓	✓
Pacheco Creek Tributary 6	✓	✓	✓	✓
Pacheco Creek Tributary 31	✓	✓	✓	✓
Pacheco Creek Tributary 32	✓	✓	✓	✓
Pacheco Creek Palustrine Forested Wetlands 2	✓	✓	✓	✓
Constructed Watercourse 31	✓	✓	✓	✓
Pacheco Creek Tributary 7	✓	✓	✓	✓
Pacheco Creek Tributary 8	✓	✓	✓	✓
Pacheco Pass				
Pacheco Creek[2]	✓	✓	✓	✓
Pond 6	✓	✓	✓	✓
Pacheco Creek Tributary 9	✓	✓	✓	✓
Pacheco Creek Tributary 10	✓	✓	✓	✓
Carmen Creek	✓	✓	✓	✓
Carmen Creek Tributary 1	✓	✓	✓	✓
Pacheco Creek Tributary 33	✓	✓	✓	✓
Pacheco Creek Tributary 34	✓	✓	✓	✓
Pacheco Creek Tributary 35	✓	✓	✓	✓
Pacheco Creek Tributary 36	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Pacheco Creek Tributary 37	✓	✓	✓	✓
Pacheco Creek Tributary 38	✓	✓	✓	✓
Pacheco Creek Tributary 39	✓	✓	✓	✓
Pacheco Creek Tributary 40	✓	✓	✓	✓
Pacheco Creek Tributary 41	✓	✓	✓	✓
Pond 7	✓	✓	✓	✓
Pond 8	✓	✓	✓	✓
Pacheco Creek Tributary 42	✓	✓	✓	✓
Pond 9	✓	✓	✓	✓
Pacheco Creek Tributary 11	✓	✓	✓	✓
Pacheco Creek Tributary 12	✓	✓	✓	✓
Pacheco Creek Tributary 13	✓	✓	✓	✓
Pacheco Creek Tributary 14	✓	✓	✓	✓
Pacheco Creek Tributary 15				
Pacheco Creek Tributary 16	✓	✓	✓	✓
Constructed Watercourse 139	✓	✓	✓	✓
Elephant Head Creek	✓	✓	✓	✓
Elephant Head Creek Tributary 1	✓	✓	✓	✓
Constructed Watercourse 140	✓	✓	✓	✓
Constructed Watercourse 141	✓	✓	✓	✓
Constructed Watercourse 142	✓	✓	✓	✓
Constructed Watercourse 143	✓	✓	✓	✓
Pacheco Creek Tributary 17	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Marsh 7	✓	✓	✓	✓
Pacheco Creek Tributary 43	✓	✓	✓	✓
Pacheco Creek Tributary 44	✓	✓	✓	✓
Harper Canyon Creek	✓	✓	✓	✓
Harper Canyon Creek Tributary 1	✓	✓	✓	✓
Harper Canyon Creek Tributary 2	✓	✓	✓	✓
Harper Canyon Creek Tributary 3	✓	✓	✓	✓
Harper Canyon Creek Tributary 4				
Pacheco Creek Tributary 19	✓	✓	✓	✓
Pond 10	✓	✓	✓	✓
Pond 11	✓	✓	✓	✓
Pacheco Creek Tributary 20	✓	✓	✓	✓
Pacheco Creek Tributary 21	✓	✓	✓	✓
Pacheco Creek Tributary 22	✓	✓	✓	✓
Pacheco Creek Tributary 45	✓	✓	✓	✓
Pacheco Creek Tributary 46	✓	✓	✓	✓
Pacheco Creek Tributary 47	✓	✓	✓	✓
Pacheco Creek Tributary 48	✓	✓	✓	✓
Pacheco Creek Tributary 49	✓	✓	✓	✓
Pacheco Creek Tributary 50	✓	✓	✓	✓
Pacheco Creek Tributary 51	✓	✓	✓	✓
Pacheco Creek Tributary 52	✓	✓	✓	✓
Pacheco Creek Tributary 53	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Pacheco Creek Tributary 57	✓	✓	✓	✓
Pacheco Creek Tributary 23	✓	✓	✓	✓
Pacheco Creek Tributary 24	✓	✓	✓	✓
South Fork Pacheco Creek	✓	✓	✓	✓
Pacheco Creek Tributary 25	✓	✓	✓	✓
Pacheco Creek Tributary 54	✓	✓	✓	✓
Pacheco Creek Tributary 26	✓	✓	✓	✓
Pacheco Creek Tributary 27	✓	✓	✓	✓
Pacheco Creek Tributary 28	✓	✓	✓	✓
Pacheco Creek Tributary 55	✓	✓	✓	✓
Pacheco Creek Tributary 29	✓	✓	✓	✓
Pacheco Creek Tributary 30	✓	✓	✓	✓
San Luis Reservoir Tributary 1	✓	✓	✓	✓
San Luis Reservoir Tributary 2	✓	✓	✓	✓
San Luis Reservoir Tributary 3	✓	✓	✓	✓
San Luis Reservoir Tributary 4	✓	✓	✓	✓
San Luis Reservoir Tributary 5	✓	✓	✓	✓
San Luis Reservoir Tributary 6	✓	✓	✓	✓
San Luis Reservoir Tributary 7	✓	✓	✓	✓
San Luis Reservoir Tributary 8	✓	✓	✓	✓
San Luis Reservoir Tributary 9	✓	✓	✓	✓
Cottonwood Creek Tributary 1	✓	✓	✓	✓
Cottonwood Creek Tributary 2	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Cottonwood Creek Tributary 3	✓	✓	✓	✓
Cottonwood Creek Tributary 4	✓	✓	✓	✓
Cottonwood Creek	✓	✓	✓	✓
Cottonwood Creek Tributary 5	✓	✓	✓	✓
Cottonwood Creek Tributary 6	✓	✓	✓	✓
Cottonwood Creek Tributary 7	✓	✓	✓	✓
Cottonwood Creek Tributary 8	✓	✓	✓	✓
Cottonwood Creek Tributary 9	✓	✓	✓	✓
Cottonwood Creek Tributary 10	✓	✓	✓	✓
Cottonwood Creek Tributary 11	✓	✓	✓	✓
Cottonwood Creek Tributary 12	✓	✓	✓	✓
Cottonwood Creek Tributary 13	✓	✓	✓	✓
Cottonwood Creek Tributary 14	✓	✓	✓	✓
Cottonwood Creek Tributary 15	✓	✓	✓	✓
Cottonwood Creek Tributary 16	✓	✓	✓	✓
Romero Creek Tributary 1	✓	✓	✓	✓
Romero Creek	✓	✓	✓	✓
Romero Creek Tributary 2	✓	✓	✓	✓
Romero Creek Tributary 3	✓	✓	✓	✓
Romero Creek Tributary 4	✓	✓	✓	✓
Romero Creek Tributary 5	✓	✓	✓	✓
Romero Creek Tributary 6	✓	✓	✓	✓
Romero Creek Tributary 7	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Romero Creek Tributary 8	✓	✓	✓	✓
Seasonal Wetland 20	✓	✓	✓	✓
Seasonal Wetland 21	✓	✓	✓	✓
Romero Creek Tributary 10	✓	✓	✓	✓
Romero Creek Tributary 11	✓	✓	✓	✓
Romero Creek Tributary 12	✓	✓	✓	✓
Romero Creek Tributary 13	✓	✓	✓	✓
Romero Creek Tributary 14	✓	✓	✓	✓
Romero Creek Tributary 15	✓	✓	✓	✓
Romero Creek Tributary 16	✓	✓	✓	✓
Romero Creek Tributary 17	✓	✓	✓	✓
Romero Creek Tributary 18	✓	✓	✓	✓
Romero Creek Tributary 19	✓	✓	✓	✓
Romero Creek Tributary 20	✓	✓	✓	✓
Romero Creek Tributary 21	✓	✓	✓	✓
Alkali Vernal Pool Complex 1	✓	✓	✓	✓
Seasonal Wetland 11	✓	✓	✓	✓
California Aqueduct	✓	✓	✓	✓
Seasonal Wetland 12	✓	✓	✓	✓
Delta-Mendota Canal	✓	✓	✓	✓
Constructed Watercourse 32	✓	✓	✓	✓
Constructed Watercourse 33	✓	✓	✓	✓
Outside Canal	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Constructed Watercourse 34	✓	✓	✓	✓
Constructed Watercourse 35	✓	✓	✓	✓
Constructed Watercourse 36	✓	✓	✓	✓
San Joaquin Valley Crossing				
Constructed Watercourse 37	✓	✓	✓	✓
Constructed Watercourse 38	✓	✓	✓	✓
Constructed Watercourse 163	✓	✓	✓	✓
Constructed Watercourse 145	✓	✓	✓	✓
Constructed Basin 14	✓	✓	✓	✓
Constructed Watercourse 39	✓	✓	✓	✓
Constructed Watercourse 162	✓	✓	✓	✓
Constructed Watercourse 40	✓	✓	✓	✓
Main Canal	✓	✓	✓	✓
Constructed Basin 9	✓	✓	✓	✓
Constructed Watercourse 41	✓	✓	✓	✓
Constructed Watercourse 43	✓	✓	✓	✓
Constructed Watercourse 44	✓	✓	✓	✓
Constructed Watercourse 160	✓	✓	✓	✓
Constructed Watercourse 45	✓	✓	✓	✓
Constructed Watercourse 146	✓	✓	✓	✓
Constructed Watercourse 47	✓	✓	✓	✓
Constructed Watercourse 48	✓	✓	✓	✓
Constructed Watercourse 165	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Alkali Scrub Wetland 1	✓	✓	✓	✓
Alkali Scrub Wetland 7	✓	✓	✓	✓
Natural Watercourse 2	✓	✓	✓	✓
San Luis Wasteway	✓	✓	✓	✓
Seasonal Wetland 22	✓	✓	✓	✓
Alkali Scrub Wetland 2	✓	✓	✓	✓
Alkali Scrub Wetland 3	✓	✓	✓	✓
Seasonal Wetland 23	✓	✓	✓	✓
Alkali Scrub Wetland 4	✓	✓	✓	✓
Alkali Scrub Wetland 8	✓	✓	✓	✓
Alkali Scrub Wetland 9	✓	✓	✓	✓
Constructed Watercourse 51	✓	✓	✓	✓
Constructed Watercourse 52	✓	✓	✓	✓
Constructed Watercourse 53	✓	✓	✓	✓
Constructed Watercourse 54	✓	✓	✓	✓
Constructed Watercourse 55	✓	✓	✓	✓
Constructed Watercourse 56	✓	✓	✓	✓
Constructed Watercourse 57	✓	✓	✓	✓
Constructed Watercourse 58	✓	✓	✓	✓
Constructed Watercourse 59	✓	✓	✓	✓
Constructed Watercourse 60	✓	✓	✓	✓
Constructed Watercourse 61	✓	✓	✓	✓
Constructed Watercourse 62	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Constructed Watercourse 63	✓	✓	✓	✓
Constructed Watercourse 64	✓	✓	✓	✓
Constructed Watercourse 65	✓	✓	✓	✓
Constructed Watercourse 66	✓	✓	✓	✓
Constructed Watercourse 67	✓	✓	✓	✓
Constructed Watercourse 68	✓	✓	✓	✓
Constructed Watercourse 147	✓	✓	✓	✓
Constructed Watercourse 148	✓	✓	✓	✓
Constructed Watercourse 149	✓	✓	✓	✓
Constructed Watercourse 163	✓	✓	✓	✓
Los Banos Creek	✓	✓	✓	✓
Los Banos Creek Tributary 1	✓	✓	✓	✓
Constructed Watercourse 69	✓	✓	✓	✓
Constructed Watercourse 70	✓	✓	✓	✓
Constructed Watercourse 71	✓	✓	✓	✓
Constructed Watercourse 72	✓	✓	✓	✓
Constructed Basin 15	✓	✓	✓	✓
Seasonal Wetland 13	✓	✓	✓	✓
Constructed Watercourse 73	✓	✓	✓	✓
Constructed Watercourse 76	✓	✓	✓	✓
Constructed Watercourse 77	✓	✓	✓	✓
Constructed Watercourse 78	✓	✓	✓	✓
Constructed Watercourse 79	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Constructed Watercourse 80	✓	✓	✓	✓
Constructed Watercourse 81	✓	✓	✓	✓
Constructed Watercourse 82	✓	✓	✓	✓
Santa Fe Canal	✓	✓	✓	✓
Vernal Pool 4	✓	✓	✓	✓
Constructed Watercourse 84	✓	✓	✓	✓
San Luis Drain	✓	✓	✓	✓
San Luis Canal	✓	✓	✓	✓
Porter-Blake Bypass	✓	✓	✓	✓
Constructed Watercourse 85	✓	✓	✓	✓
Constructed Watercourse 86	✓	✓	✓	✓
Mud Slough Alkali Marshes	✓	✓	✓	✓
Mud Slough	✓	✓	✓	✓
Alkali Scrub Wetland 10	✓	✓	✓	✓
Alkali Scrub Wetland 11	✓	✓	✓	✓
Alkali Scrub Wetland 12	✓	✓	✓	✓
Alkali Scrub Wetland 13	✓	✓	✓	✓
Constructed Watercourse 87	✓	✓	✓	✓
Constructed Watercourse 88	✓	✓	✓	✓
San Pedro Canal	✓	✓	✓	✓
Constructed Watercourse 89	✓	✓	✓	✓
Constructed Watercourse 90	✓	✓	✓	✓
Constructed Watercourse 164	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Boundary Drain	✓	✓	✓	✓
Lone Tree Canal	✓	✓	✓	✓
Devon Drain	✓	✓	✓	✓
Constructed Watercourse 92	✓	✓	✓	✓
Constructed Watercourse 93	✓	✓	✓	✓
Midway Swamp Ditch	✓	✓	✓	✓
Constructed Watercourse 94	✓	✓	✓	✓
Constructed Watercourse 95	✓	✓	✓	✓
Constructed Watercourse 96	✓	✓	✓	✓
Constructed Watercourse 97	✓	✓	✓	✓
Constructed Watercourse 98	✓	✓	✓	✓
Constructed Watercourse 150	✓	✓	✓	✓
Constructed Watercourse 99	✓	✓	✓	✓
Constructed Watercourse 100	✓	✓	✓	✓
West Delta Canal	✓	✓	✓	✓
West Delta Drain	✓	✓	✓	✓
Constructed Watercourse 151	✓	✓	✓	✓
Constructed Watercourse 152	✓	✓	✓	✓
Constructed Watercourse 101	✓	✓	✓	✓
Dambrosa Branch No. 1	✓	✓	✓	✓
Constructed Watercourse 102	✓	✓	✓	✓
Constructed Watercourse 103	✓	✓	✓	✓
Constructed Watercourse 104	✓	✓	✓	✓

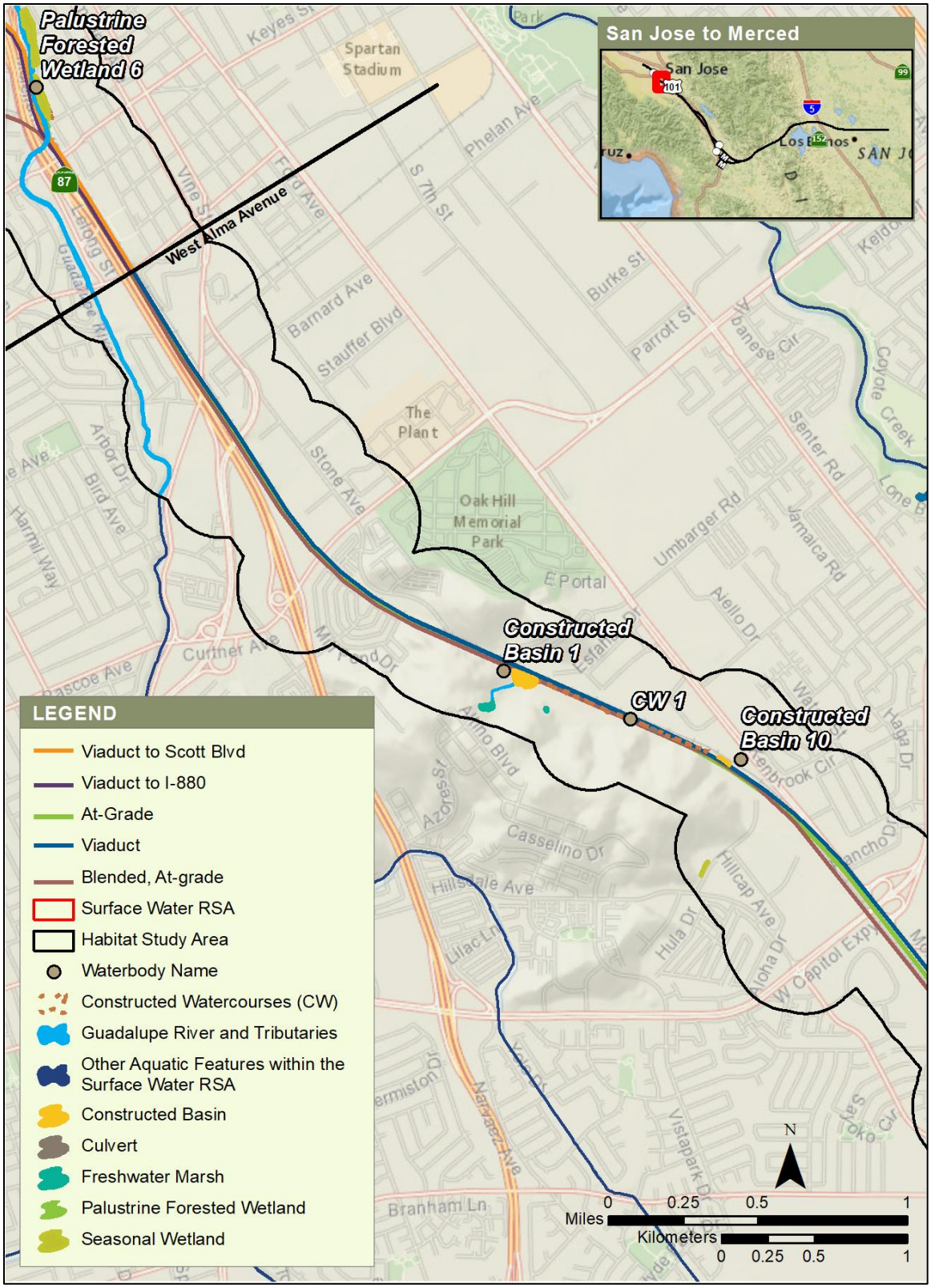
Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Delta Canal	✓	✓	✓	✓
Constructed Watercourse 105	✓	✓	✓	✓
East Delta Canal	✓	✓	✓	✓
Constructed Watercourse 107	✓	✓	✓	✓
Constructed Watercourse 108	✓	✓	✓	✓
Constructed Watercourse 109	✓	✓	✓	✓
Constructed Watercourse 110	✓	✓	✓	✓
Constructed Watercourse 111	✓	✓	✓	✓
Constructed Watercourse 112	✓	✓	✓	✓
Constructed Watercourse 113	✓	✓	✓	✓
Constructed Watercourse 114	✓	✓	✓	✓
Belmont Drain	✓	✓	✓	✓
County Road Ditch	✓	✓	✓	✓
Willis Branch	✓	✓	✓	✓
Constructed Watercourse 153	✓	✓	✓	✓
Poso Drain	✓	✓	✓	✓
Constructed Watercourse 115	✓	✓	✓	✓
Constructed Watercourse 116	✓	✓	✓	✓
Constructed Watercourse 117	✓	✓	✓	✓
Constructed Watercourse 118	✓	✓	✓	✓
Delta No. 1 Canal	✓	✓	✓	✓
Constructed Watercourse 154	✓	✓	✓	✓
Constructed Watercourse 155	✓	✓	✓	✓

Name	Within Alternative 1?	Within Alternative 2?	Within Alternative 3?	Within Alternative 4?
Constructed Watercourse 119	✓	✓	✓	✓
San Juan Drain	✓	✓	✓	✓
West San Juan No. 1 Canal	✓	✓	✓	✓
Constructed Watercourse 120	✓	✓	✓	✓
Constructed Watercourse 121	✓	✓	✓	✓
Constructed Watercourse 123	✓	✓	✓	✓
Total Quantity Within Alternatives	386	400	385	378

[1] Uvas Creek becomes Carnadero Creek near Bloomfield Avenue and U.S. 101.
[2] Pacheco Creek occurs within both the Morgan Hill and Gilroy and Pacheco Pass Subsections.

Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2016a and 2012b; Sowers et al. 2005 JANUARY 2020

Figure 1 Waterbodies, San Jose Diridon Station Approach



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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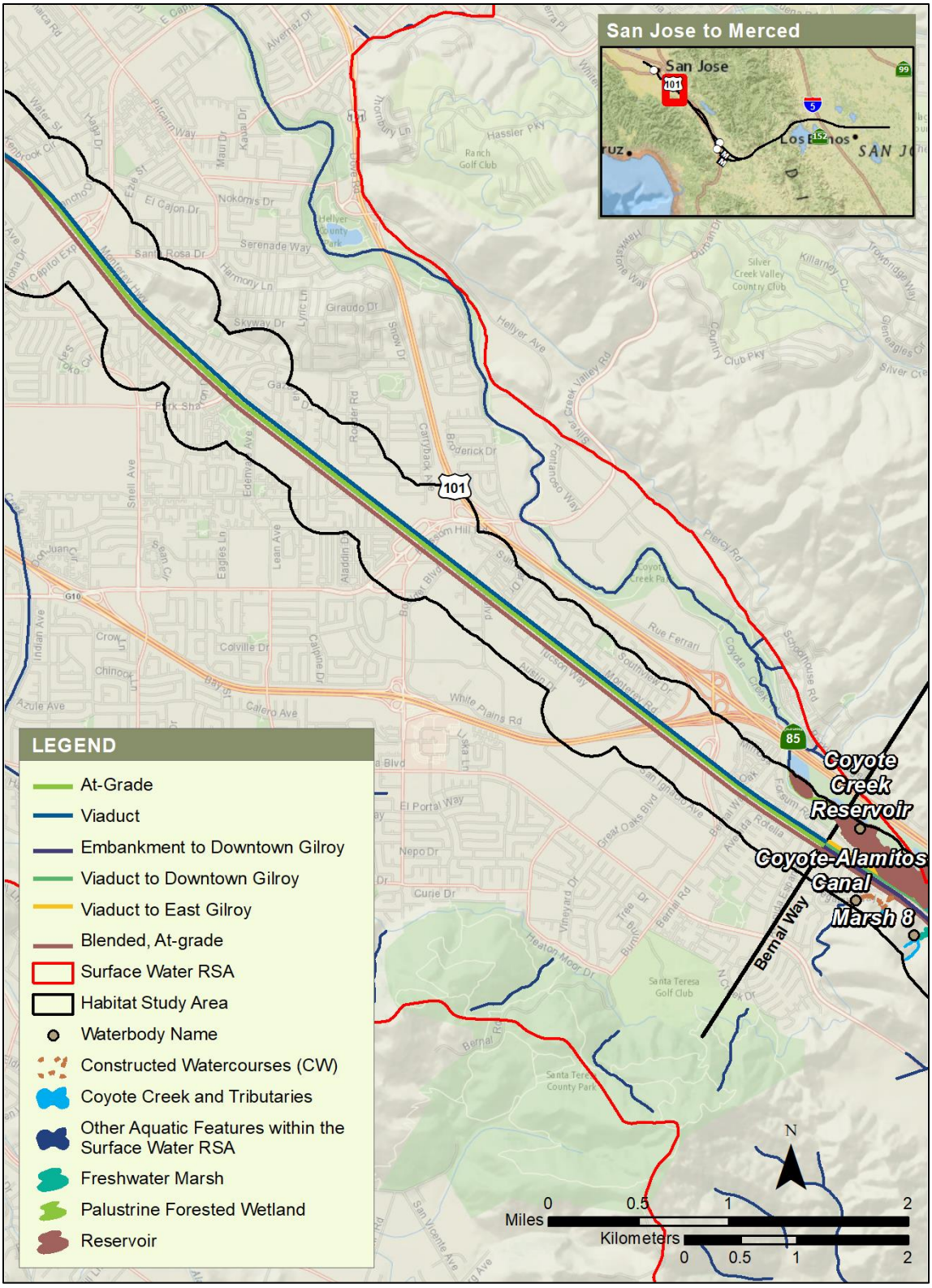
Figure 2 Waterbodies, Monterey Corridor Subsection (1 of 2)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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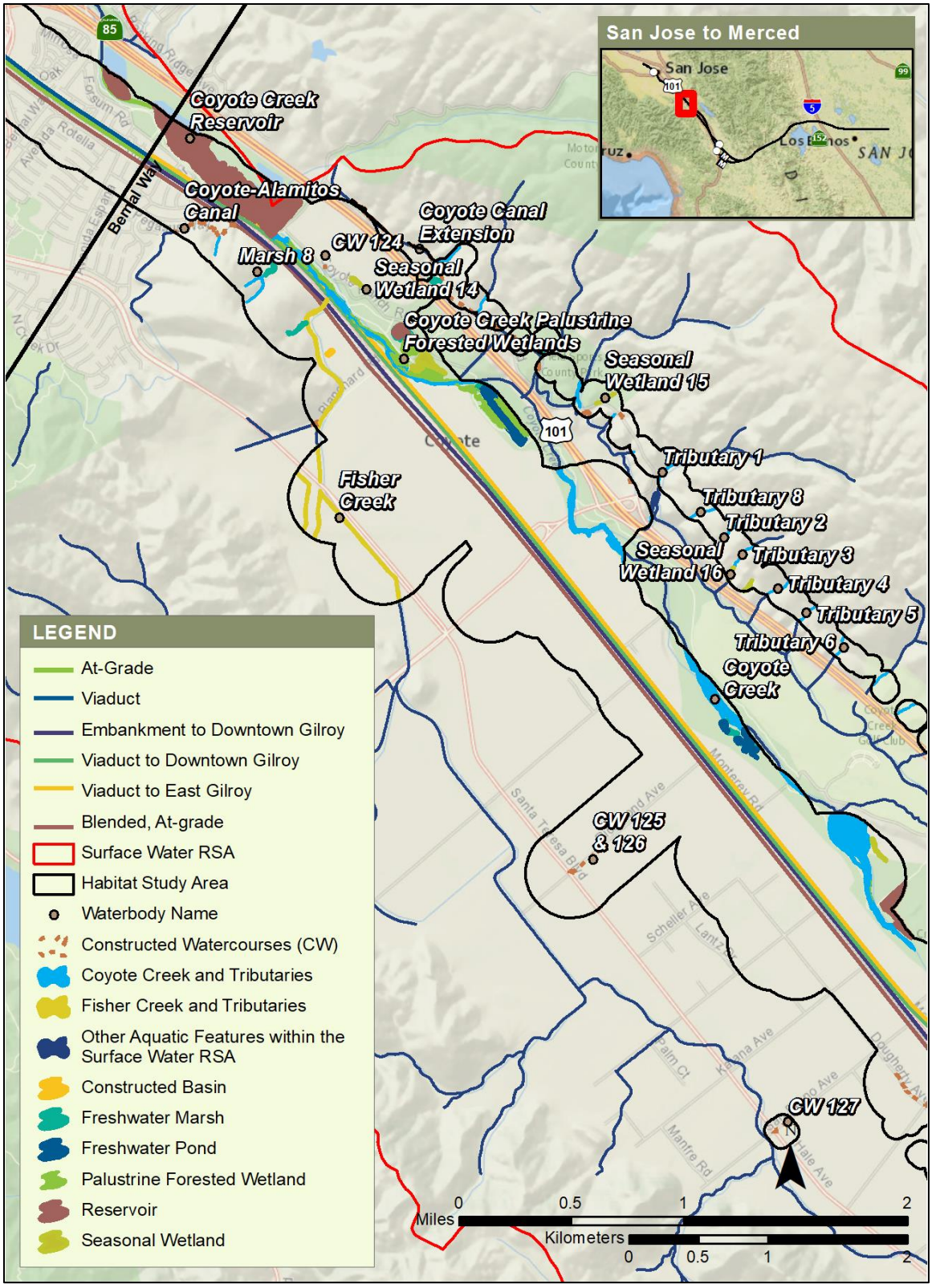
Figure 3 Waterbodies, Monterey Corridor Subsection (2 of 2)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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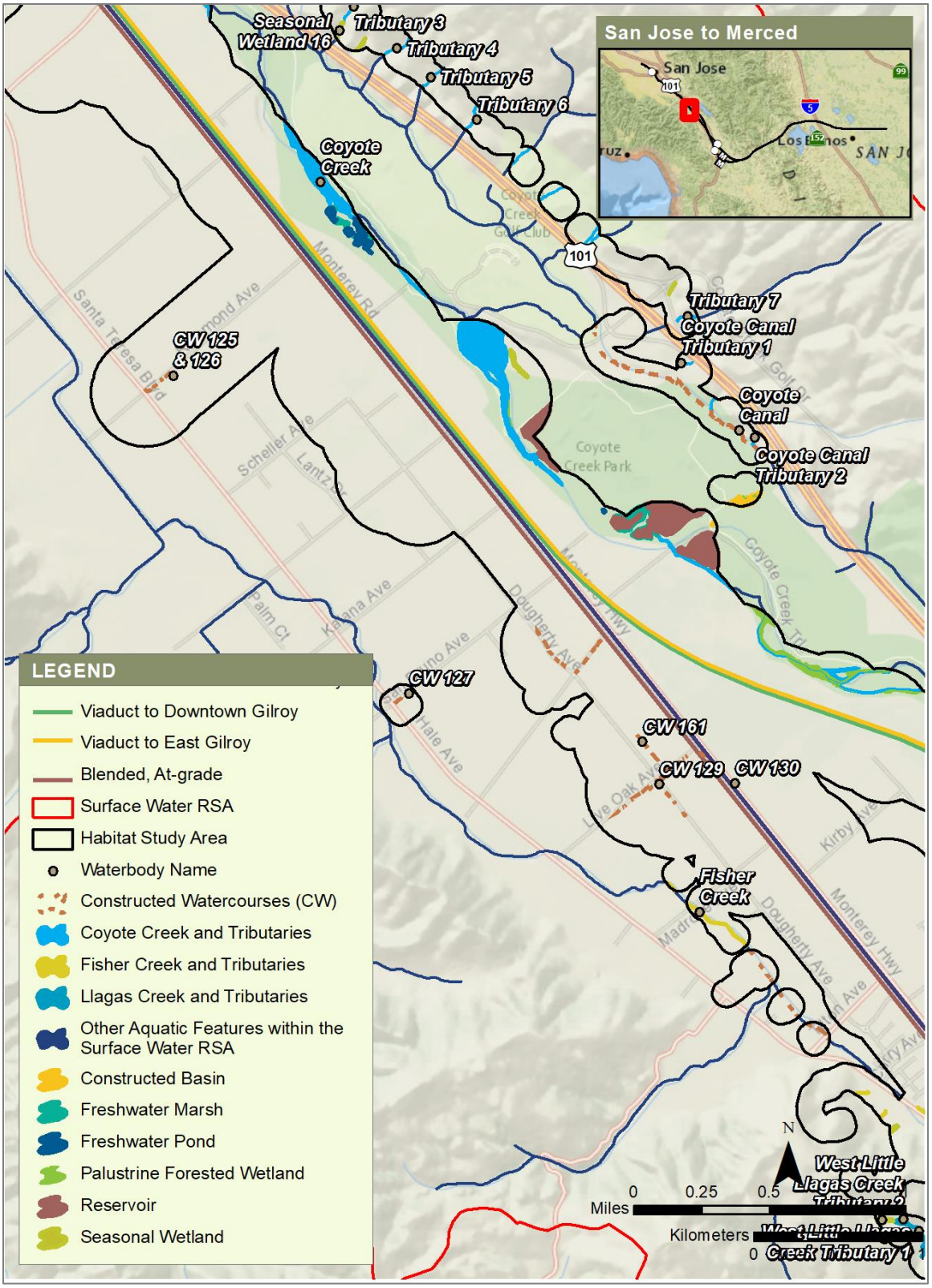
Figure 4 Waterbodies, Morgan Hill and Gilroy Subsection (1 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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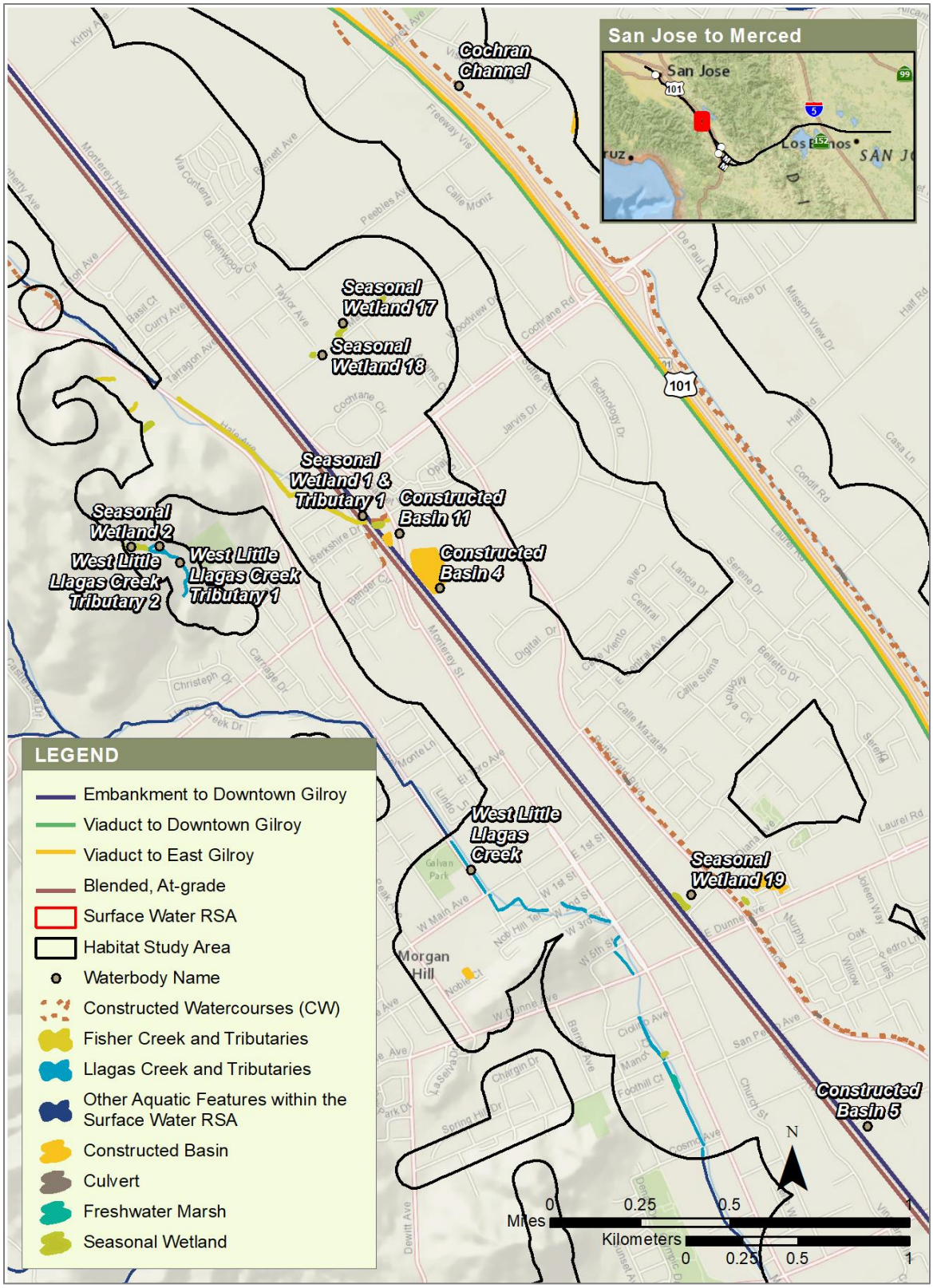
Figure 5 Waterbodies, Morgan Hill to Gilroy Subsection (2 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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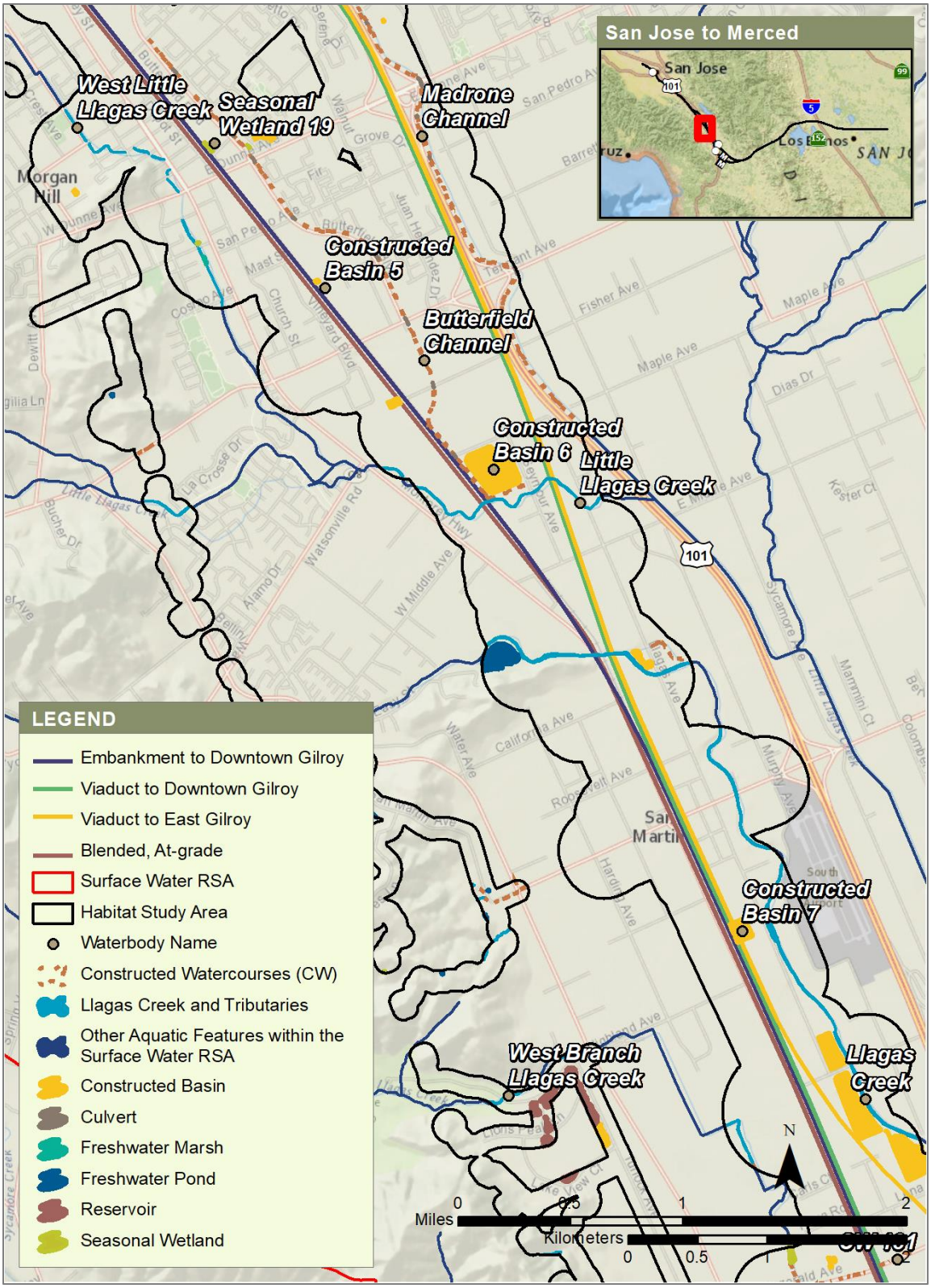
Figure 6 Waterbodies, Morgan Hill to Gilroy Subsection (3 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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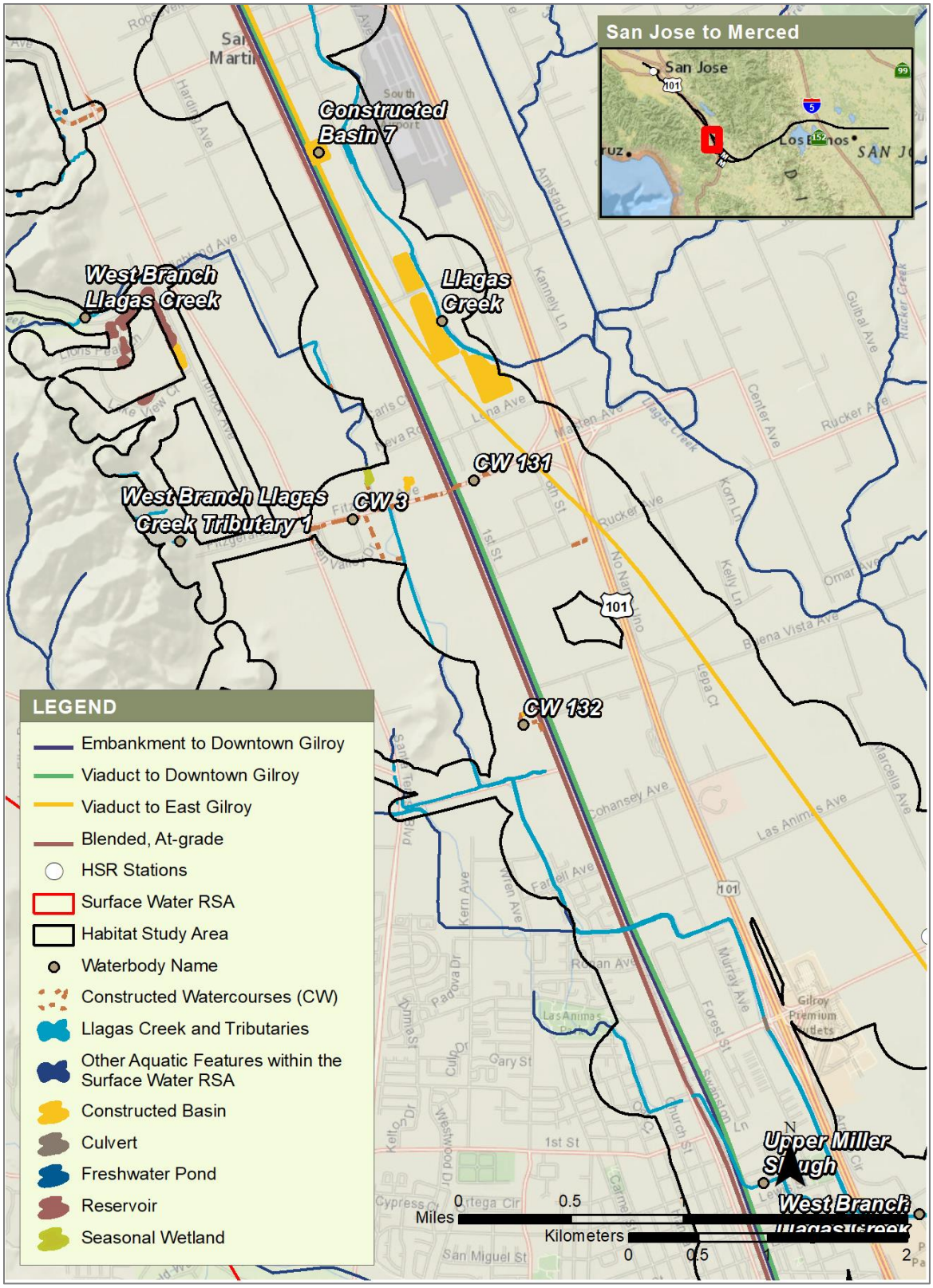
Figure 7 Waterbodies, Morgan Hill to Gilroy Subsection (4 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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Figure 8 Waterbodies, Morgan Hill to Gilroy Subsection (5 of 10)

Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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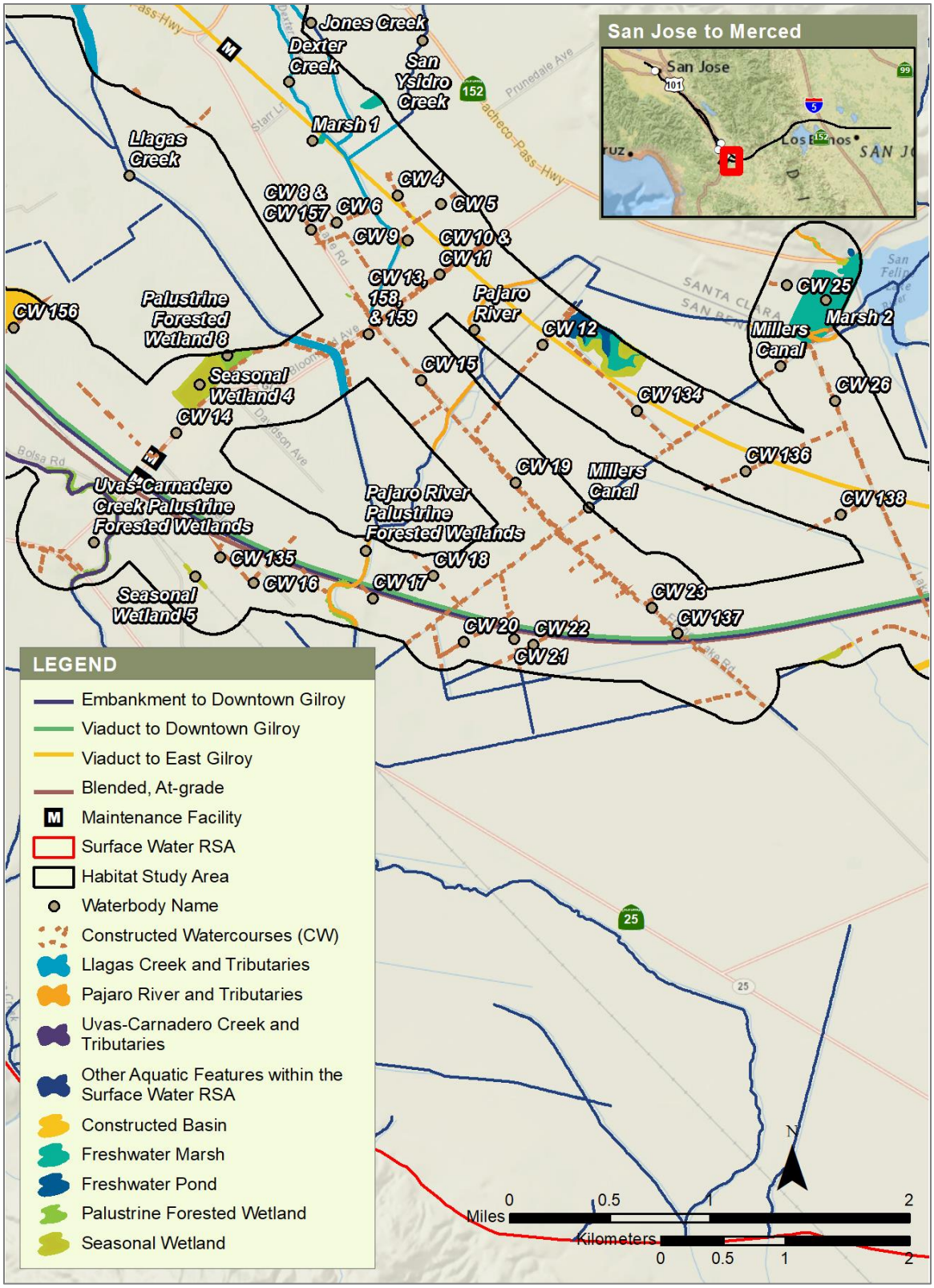
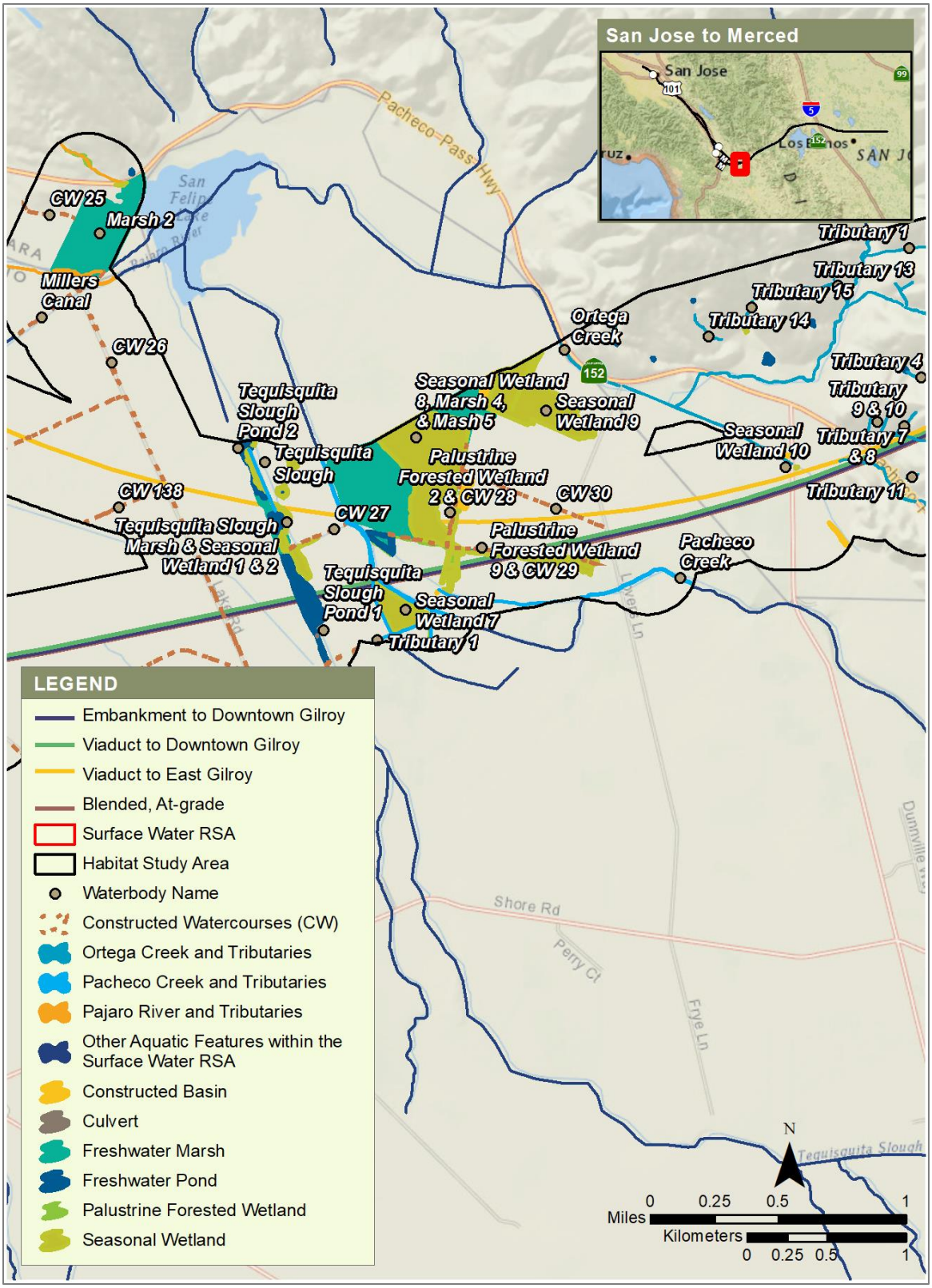
Figure 9 Waterbodies, Morgan Hill to Gilroy Subsection (6 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

Figure 10 Waterbodies, Morgan Hill to Gilroy Subsection (7 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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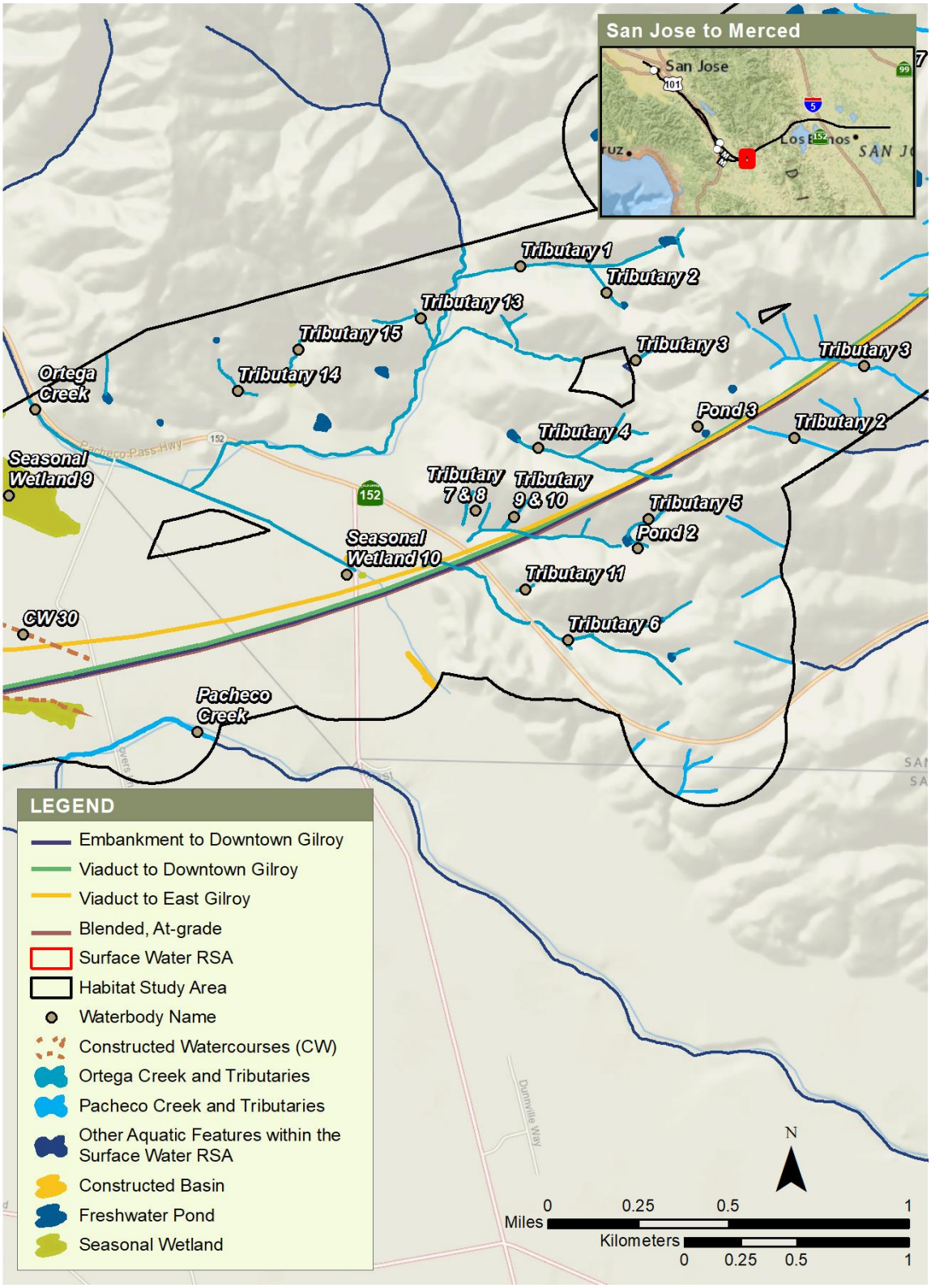
Figure 11 Waterbodies, Morgan Hill to Gilroy Subsection (8 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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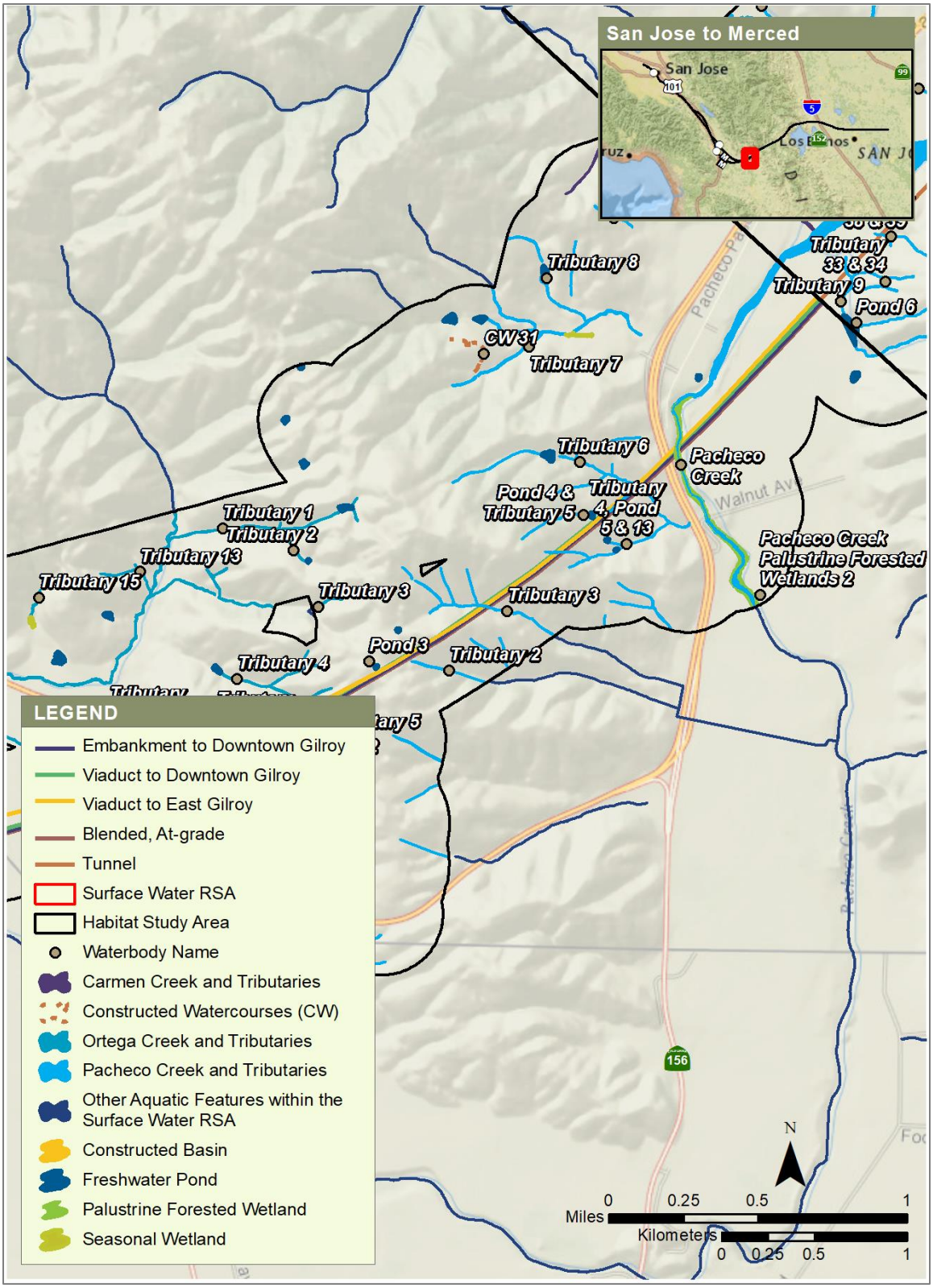
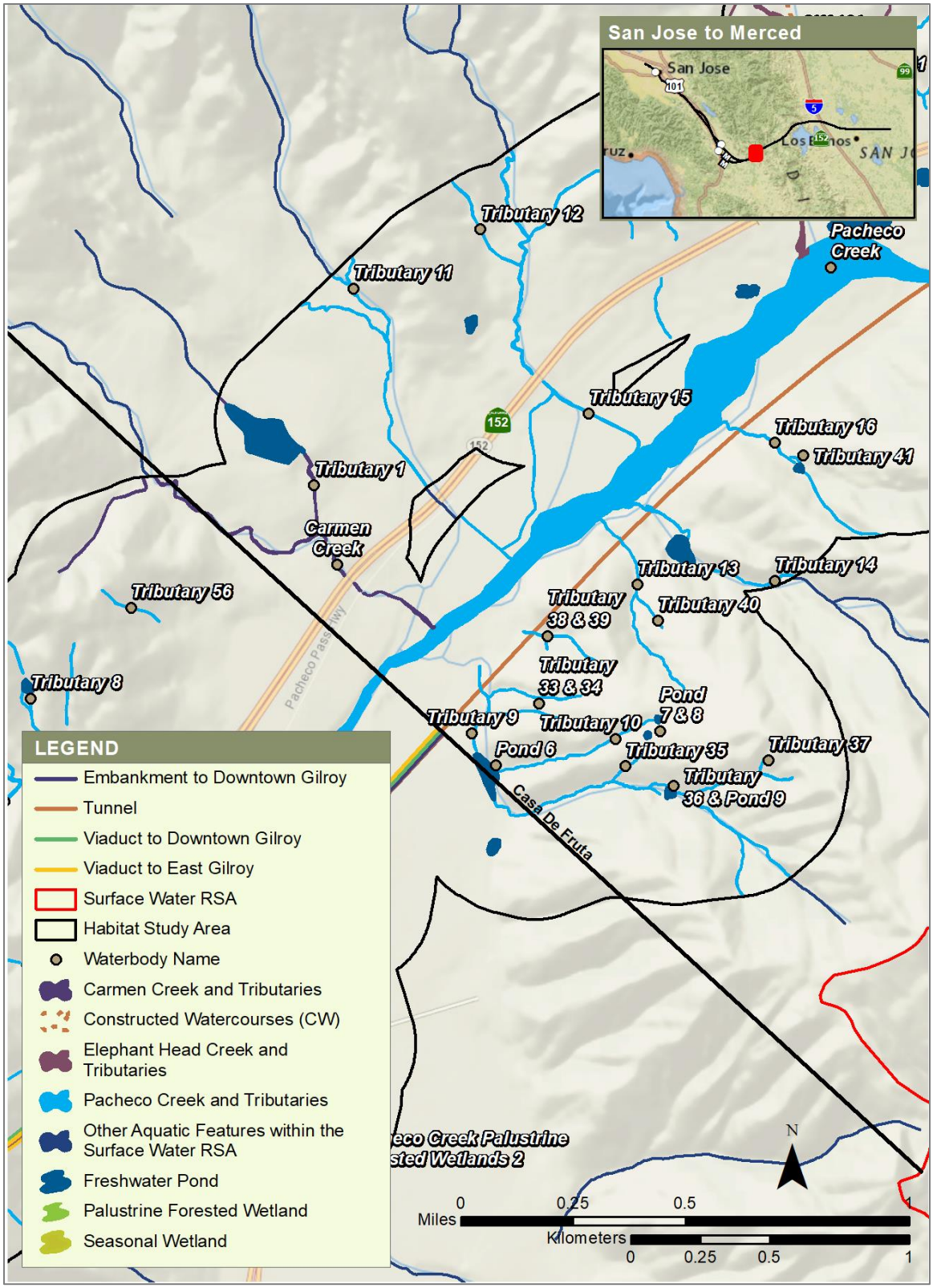
Figure 12 Waterbodies, Morgan Hill to Gilroy Subsection (9 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

Figure 13 Waterbodies, Morgan Hill to Gilroy Subsection (10 of 10)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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Figure 14 Waterbodies, Pacheco Pass Subsection (1 of 8)

Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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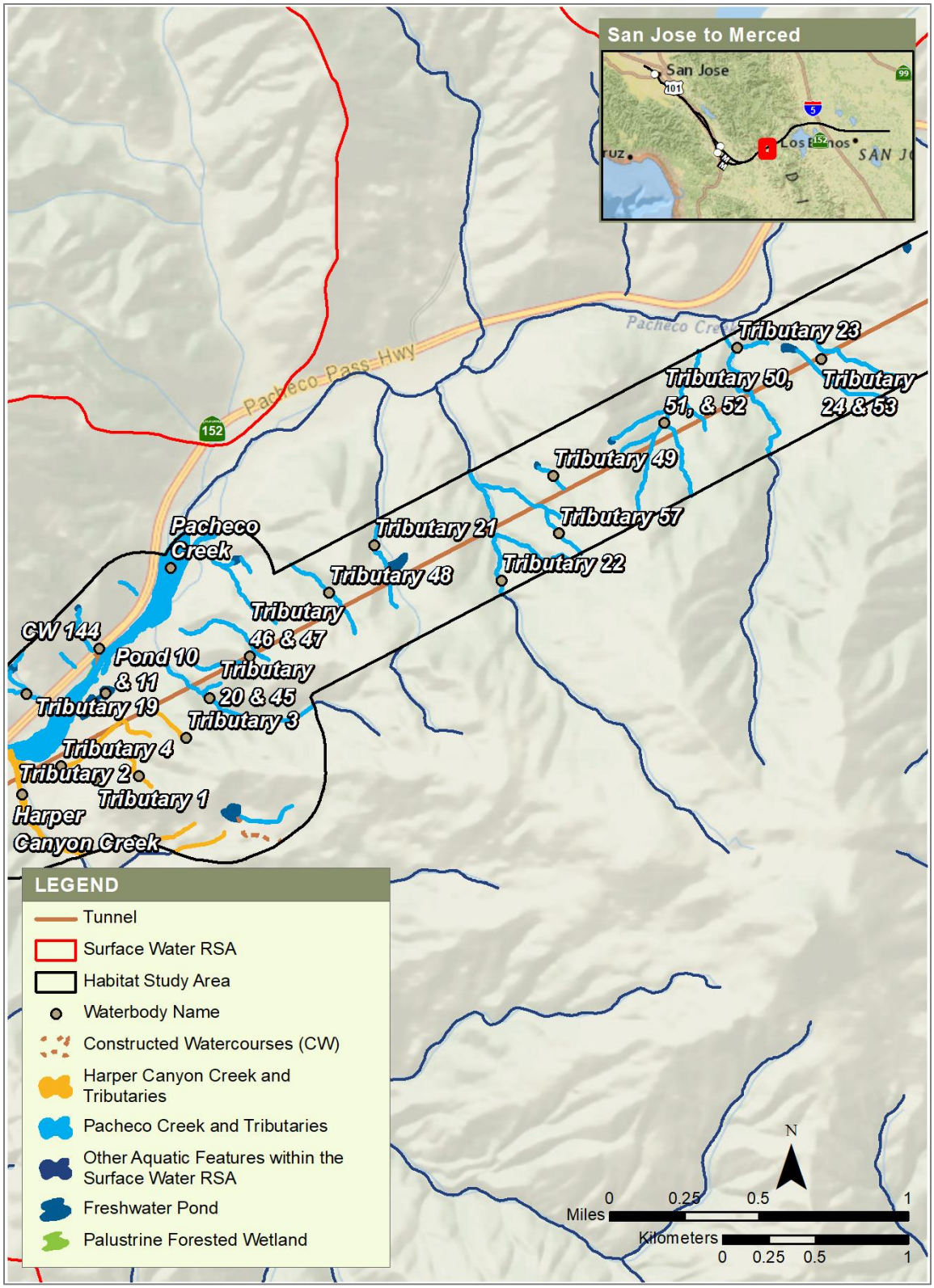
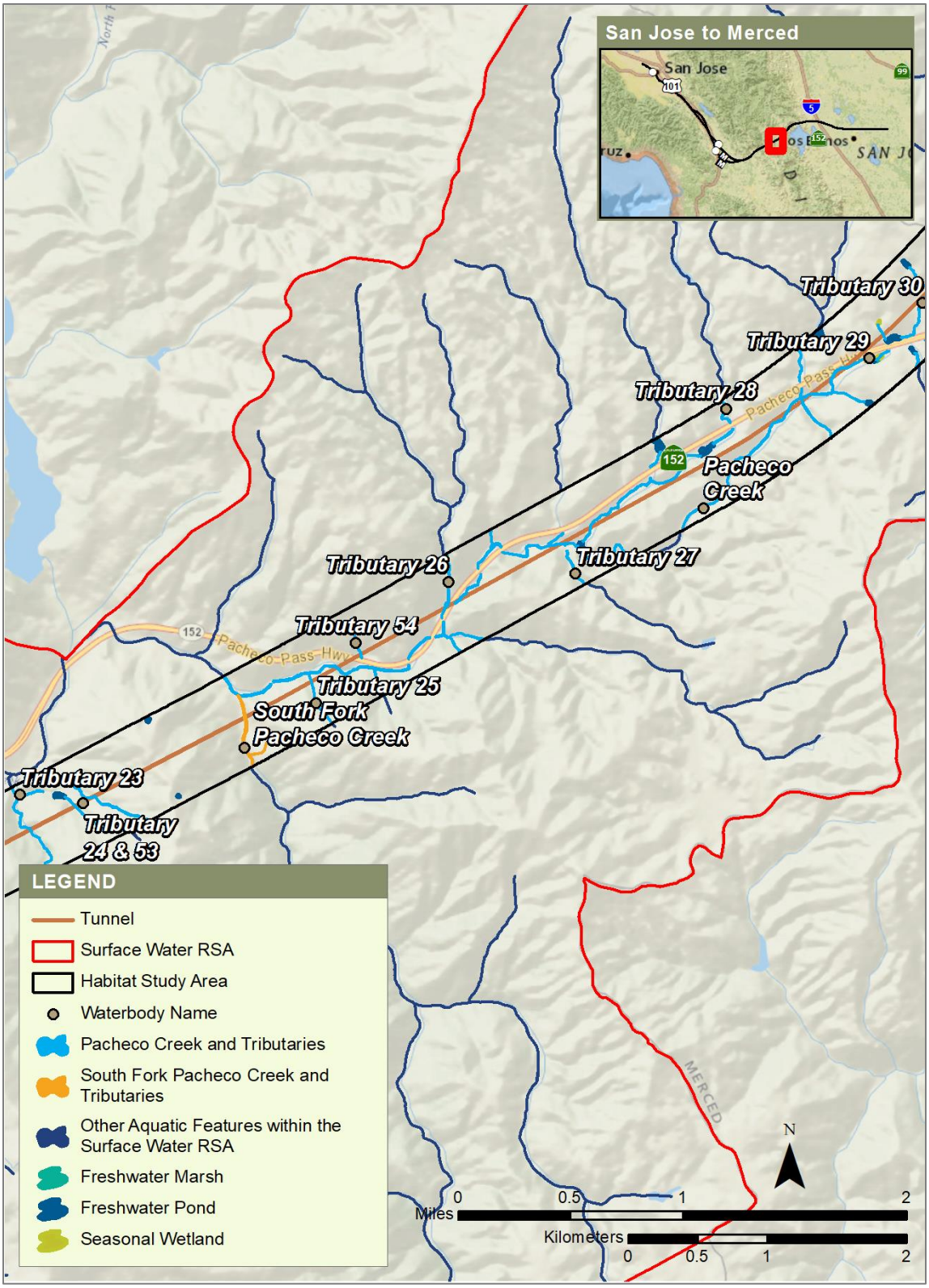
Figure 15 Waterbodies, Pacheco Pass Subsection (2 of 8)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

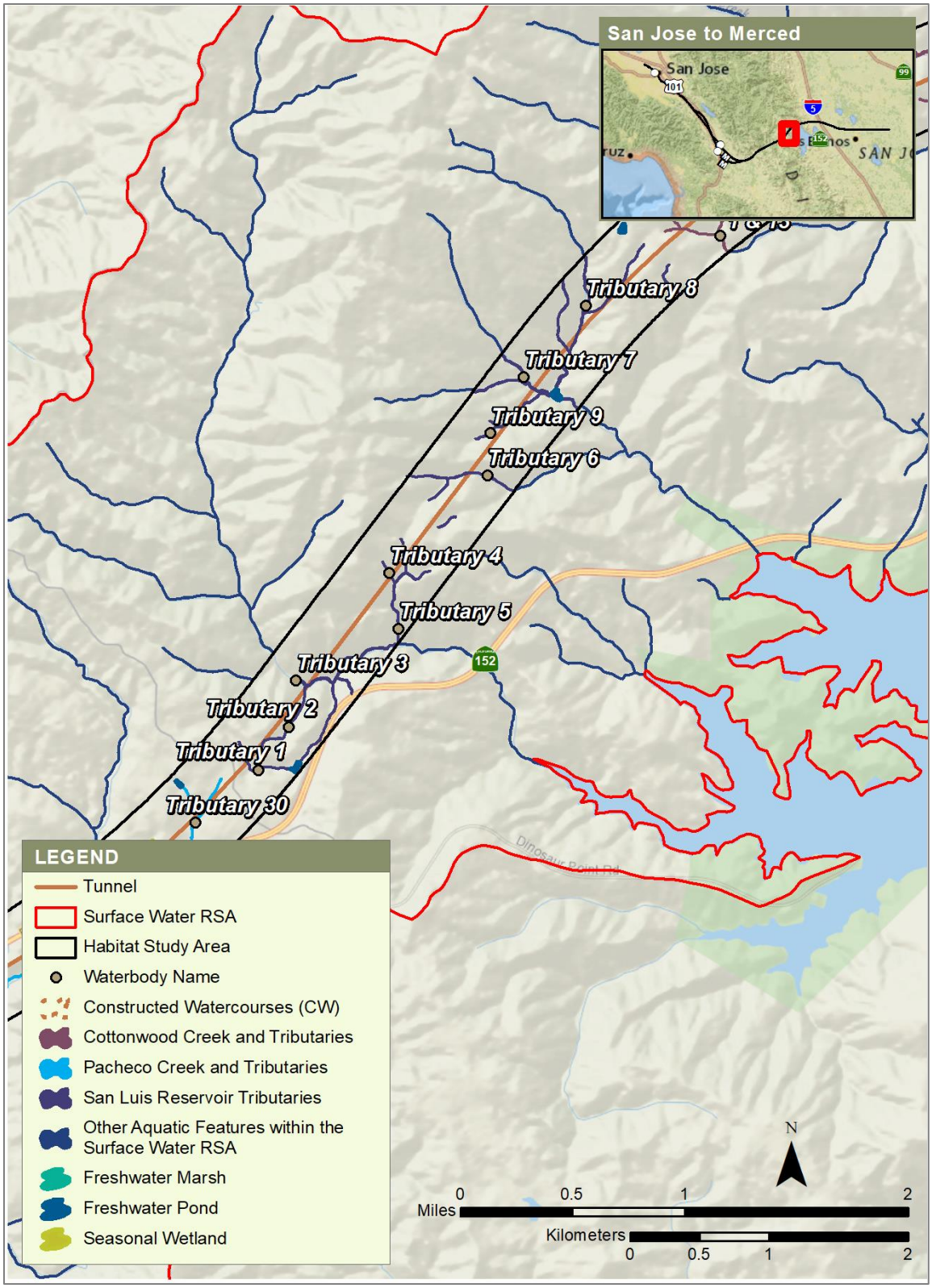
Figure 16 Waterbodies, Pacheco Pass Subsection (3 of 8)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

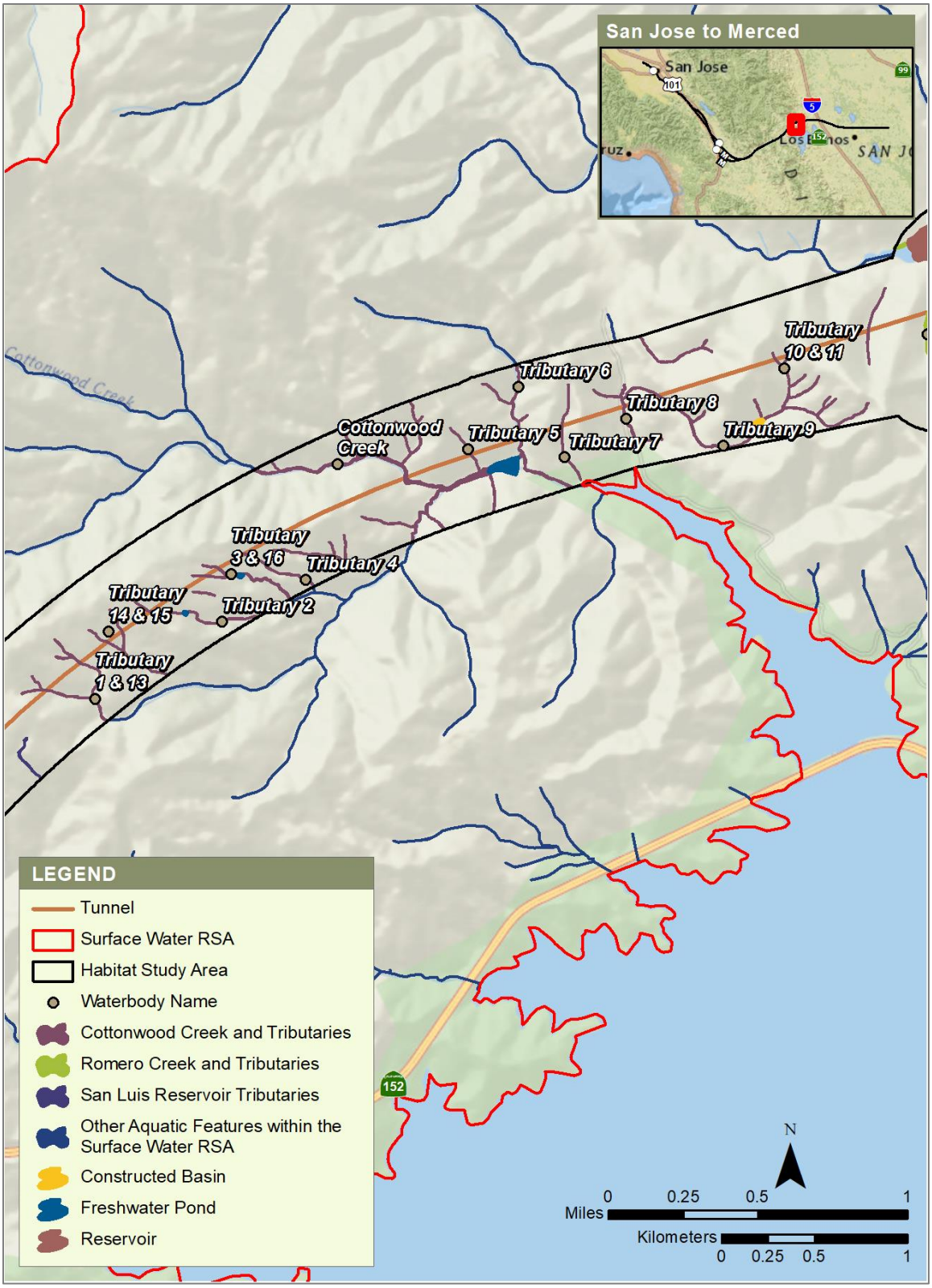
Figure 17 Waterbodies, Pacheco Pass Subsection (4 of 8)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

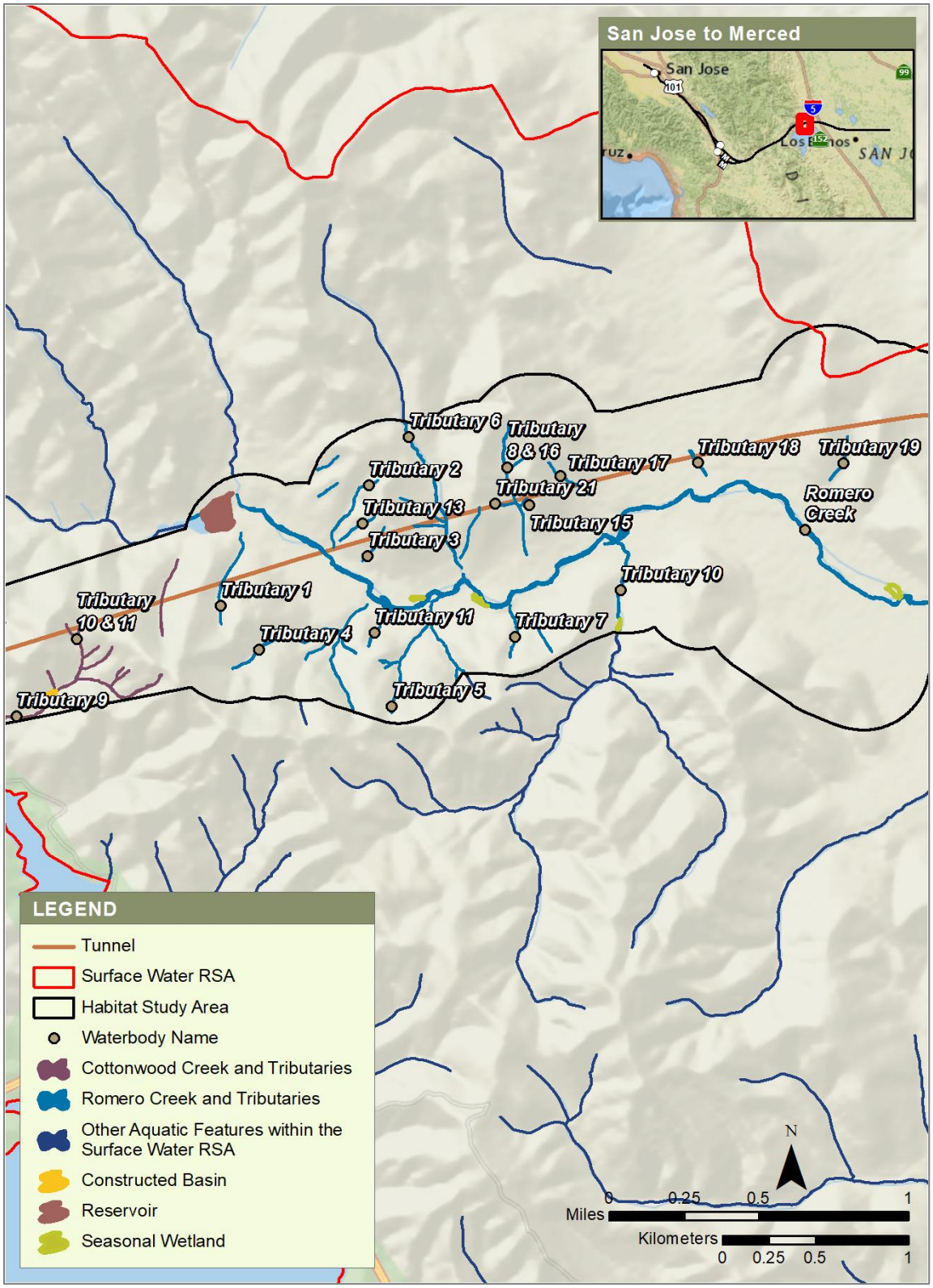
Figure 18 Waterbodies, Pacheco Pass Subsection (5 of 8)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

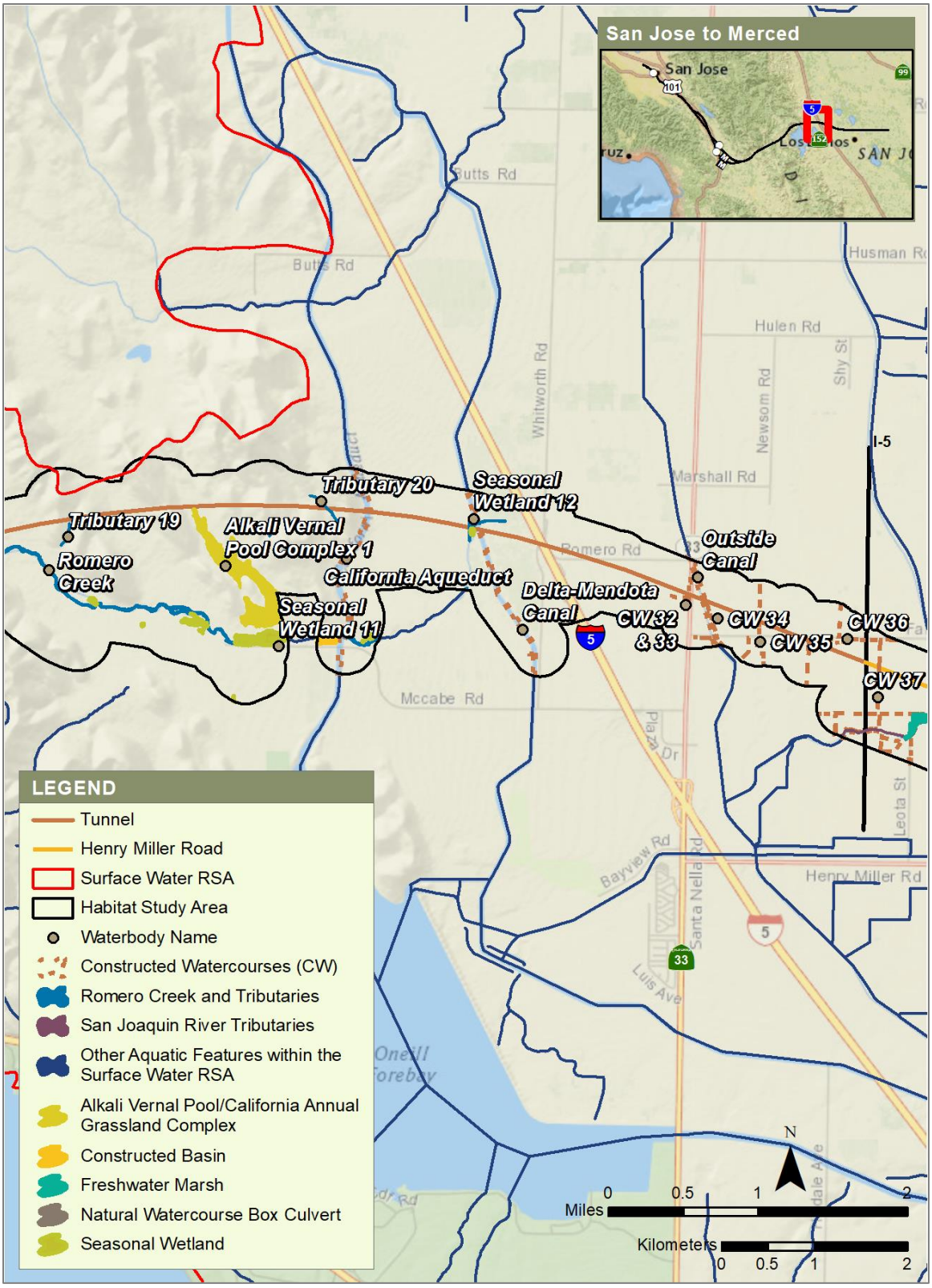
Figure 19 Waterbodies, Pacheco Pass Subsection (6 of 8)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

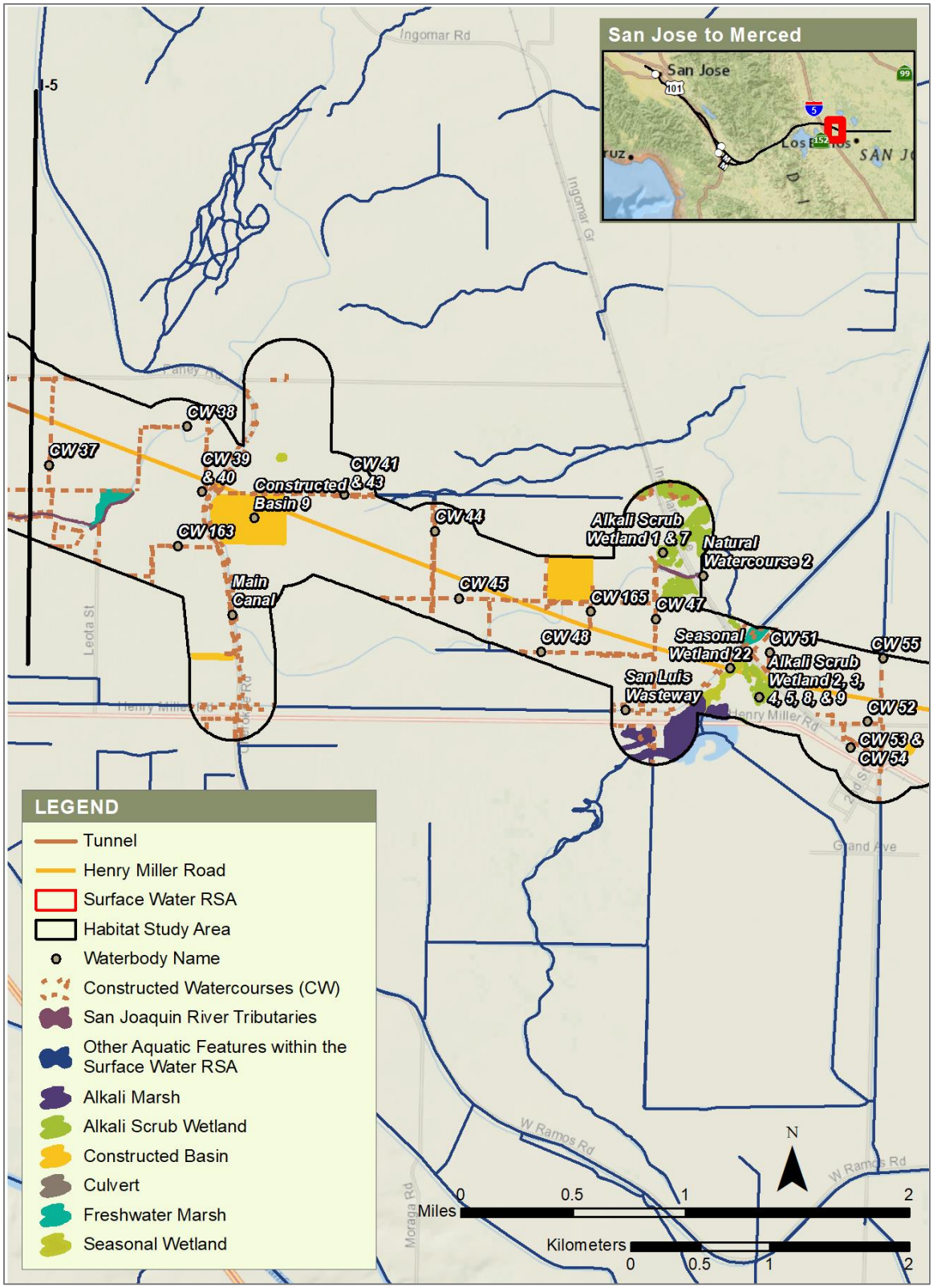
Figure 20 Waterbodies, Pacheco Pass Subsection (7 of 8)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

JANUARY 2020

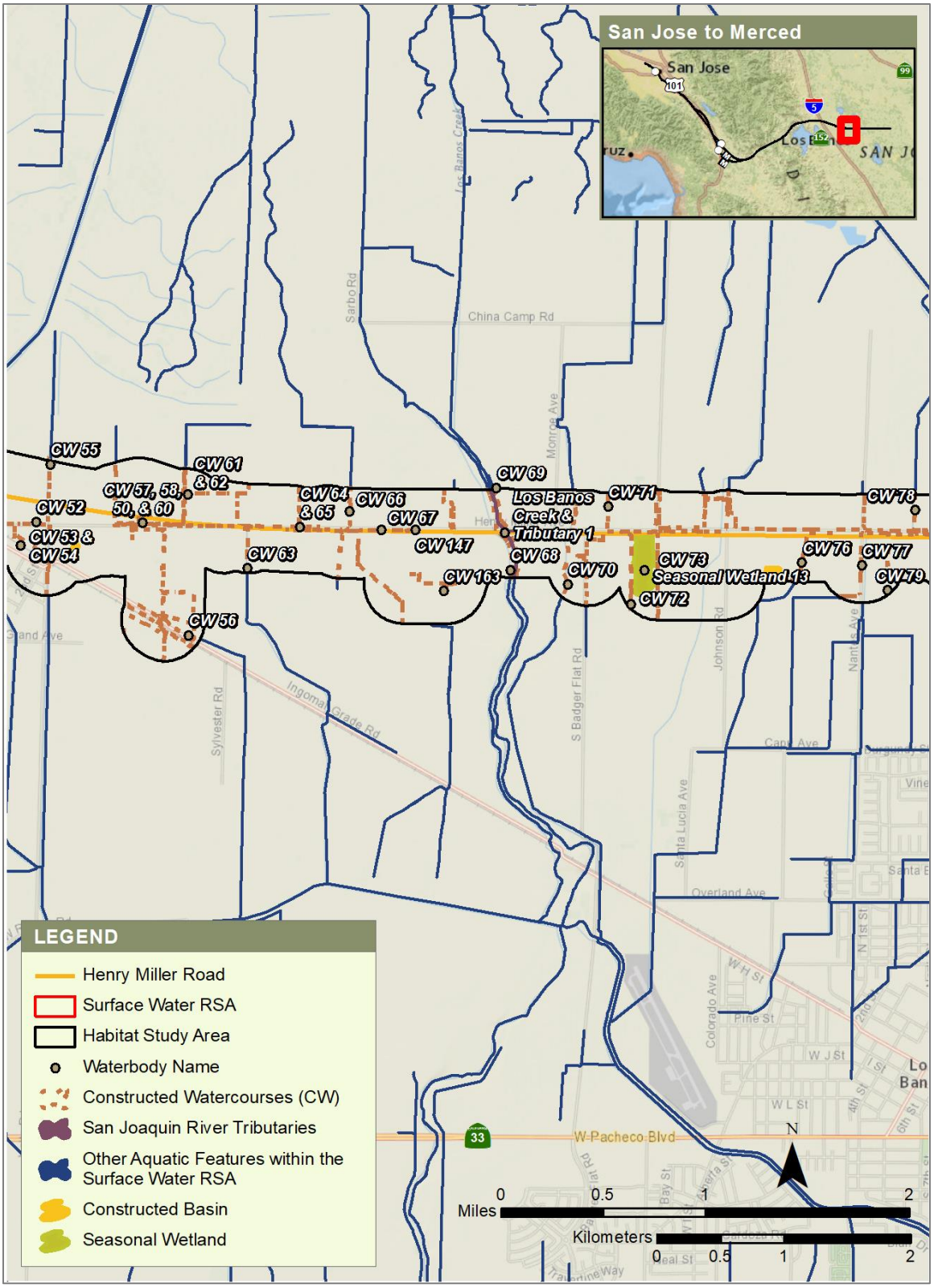
Figure 21 Waterbodies, Pacheco Pass Subsection (8 of 8)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

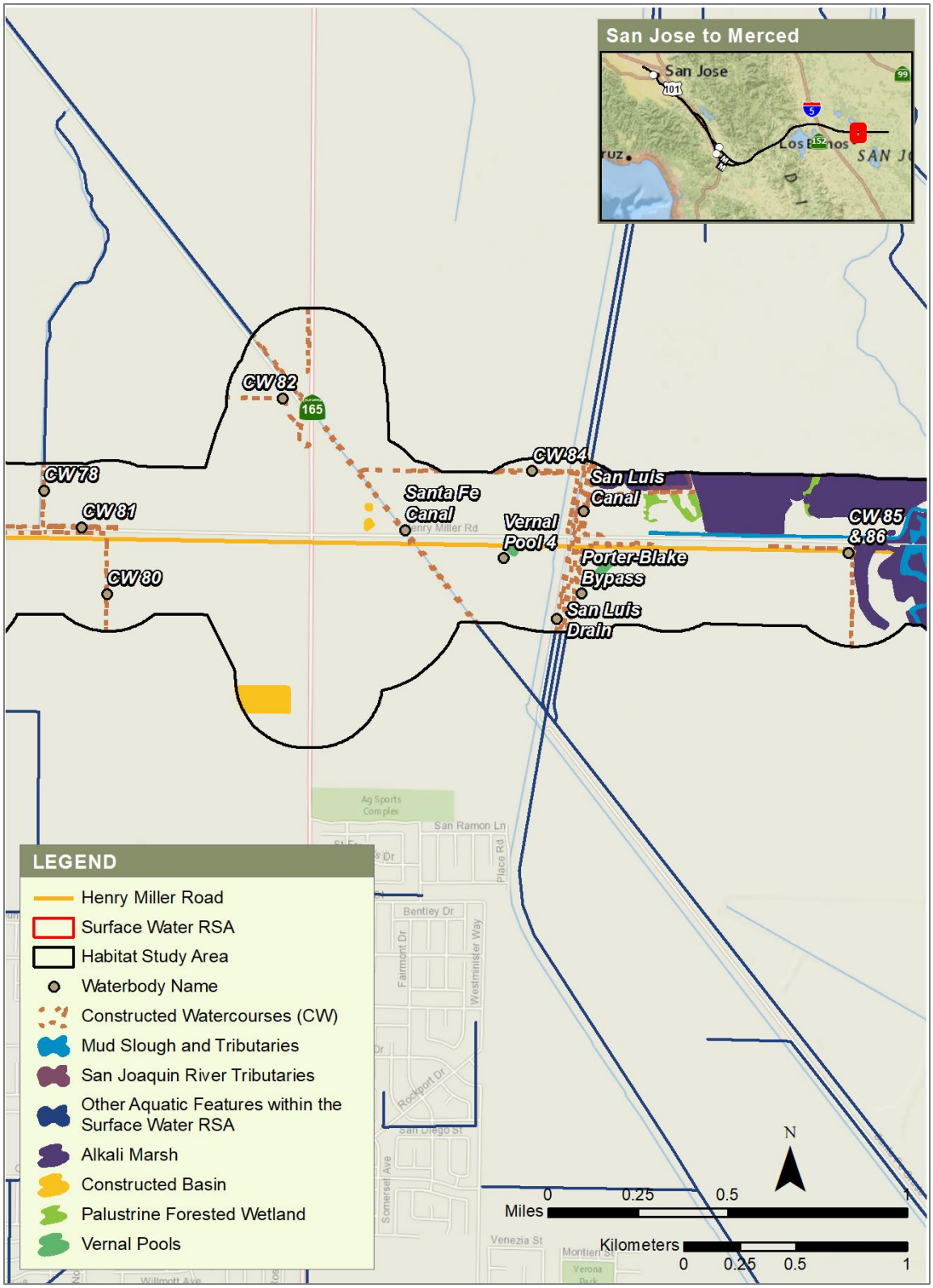
JANUARY 2020

Figure 22 Waterbodies, San Joaquin Valley Subsection (1 of 6)



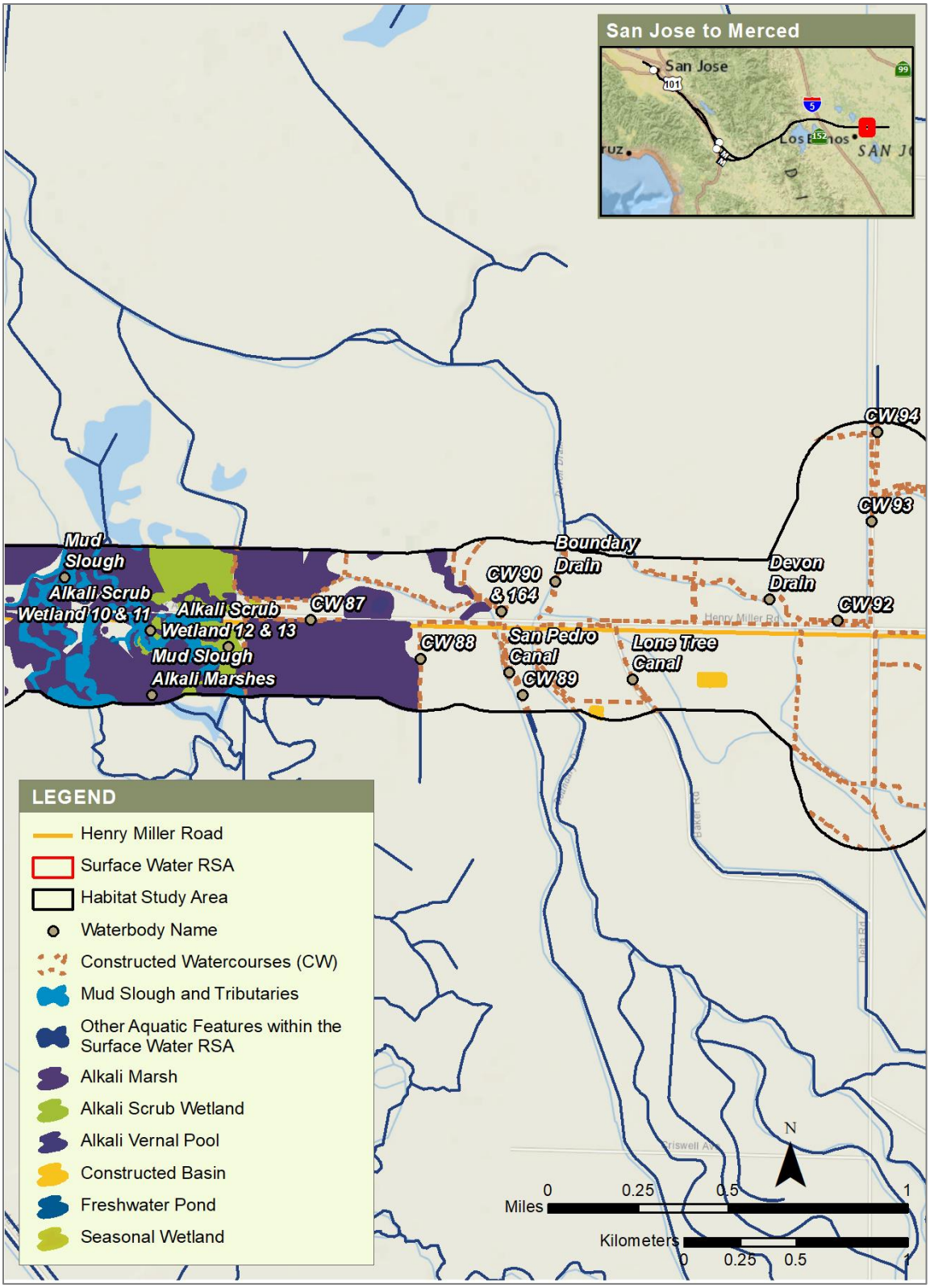
Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005
JANUARY 2020

Figure 23 Waterbodies, San Joaquin Valley Subsection (2 of 6)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005
JANUARY 2020

Figure 24 Waterbodies, San Joaquin Valley Subsection (3 of 6)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005

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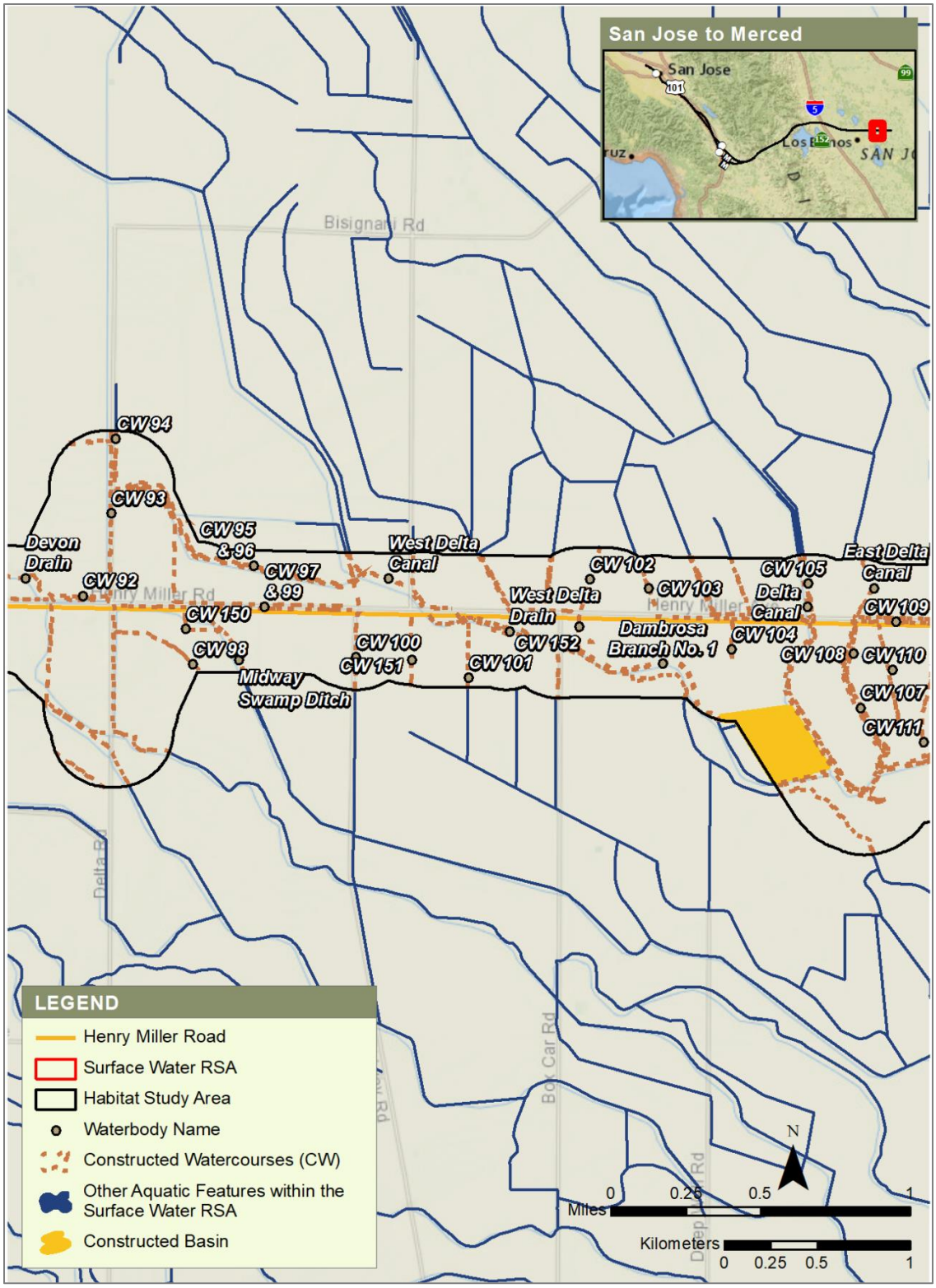
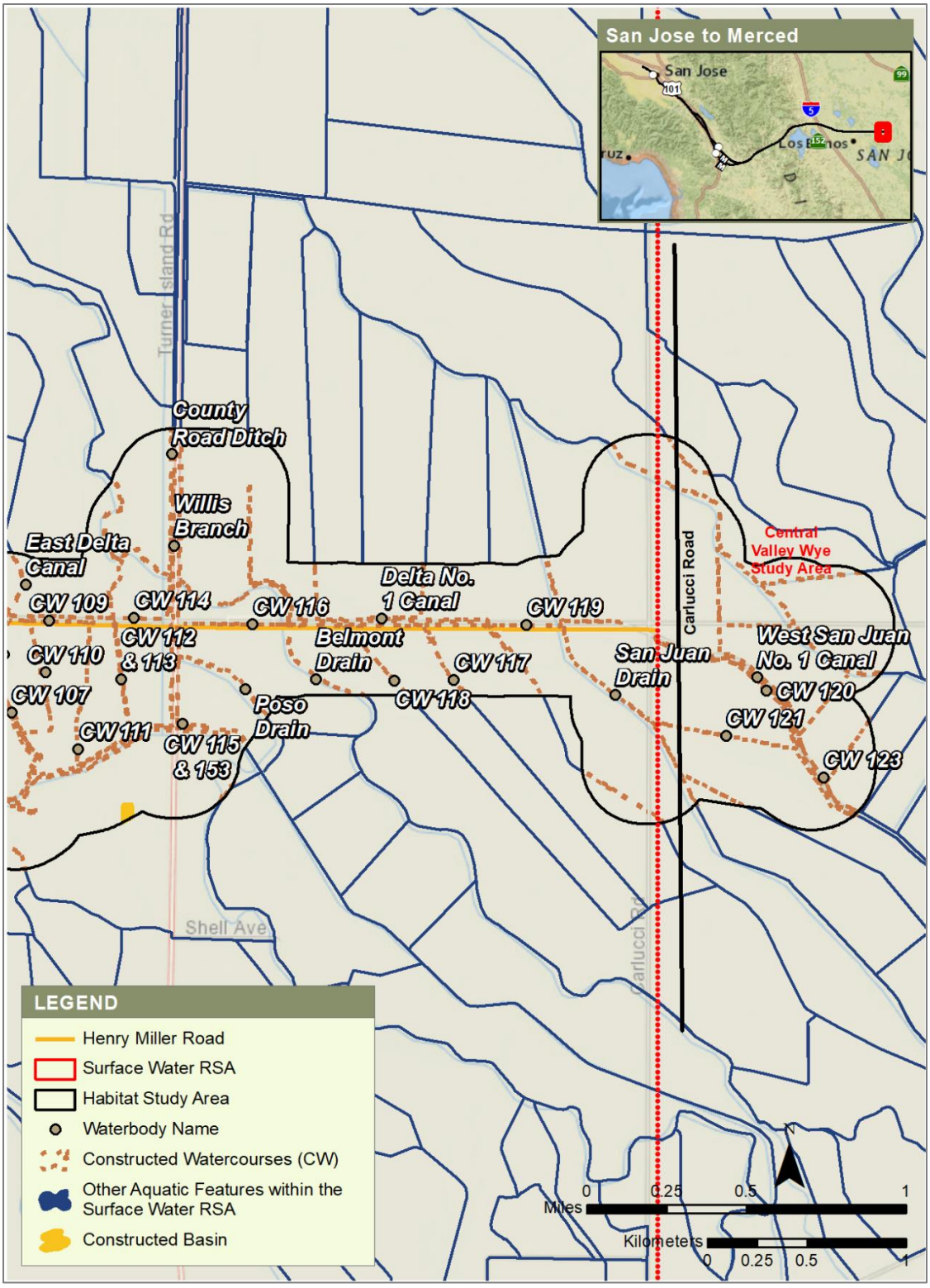
Figure 25 Waterbodies, San Joaquin Valley Subsection (4 of 6)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005 JANUARY 2020

Figure 26 Waterbodies, San Joaquin Valley Subsection (5 of 6)



Source: Authority 2020; USGS 2007–2014 and 2016; CDFW 2016; SCVWD 2012 and 2016; Sowers et al. 2005 JANUARY 2020

Figure 27 Waterbodies, San Joaquin Valley Subsection (6 of 6)

REFERENCES

California Department of Fish and Wildlife (CDFW). 2016. California Streams. GIS data. www.wildlife.ca.gov/Data/GIS/Clearinghouse (accessed June 20, 2016).

California High Speed Rail Authority (Authority). 2020. San Jose to Merced Project Section Biological and Aquatic Resources Technical Report.

HNTB. 2017. California High-Speed Train Project, San Jose to Merced, Composite Plans, Profiles, and Cross Sections, Draft PEPD Submittal. April 6, 2017.

Sowers, J. M., R. W. Givler, and S. C. Thompson (Sowers et al.). 2005. Creek & Watershed Map of the Santa Clara Basin. Digital database, Version 1.1. William Lettis and Associates, Inc., Walnut Creek, CA, 1:24,000 scale. www.explore.museumca.org/creeks/WholeMaps/15_Morgan%20Hill%20Creek.pdf (accessed March 22, 2016).

U.S. Geological Survey (USGS). 2007–2014. National Hydrography Dataset available on the World Wide Web (http://nhd.usgs.gov), accessed October 20, 2016.

———. 2016. The National Map Viewer. https://viewer.nationalmap.gov/advanced-viewer/ Accessed October 20, 2016.

Santa Clara Valley Water District (SCVWD). 2012. Watching Our Watersheds Interactive Map Layers, Central Santa Clara County. www.valleywater.org/WOW.aspx (accessed May 11, 2016).

———. 2016. Creeks and Canals in Santa Clara County. GIS database. Accessed May 18, 2016.

APPENDIX 3.8-B: SUMMARY OF HYDRAULIC MODELING FOR EXISTING AND PROPOSED CONDITIONS

1 INTRODUCTION

Since publication of the Draft Environmental Impact Report/Environmental Impact Statement, the following substantive changes have been made to this appendix:

- Section 4.4.2.1, Overview of Hydraulic Model, was revised to expand the description of the one-dimensional and two-dimensional components of the Santa Clara Valley Water District's (SCVWD) Hydrologic Engineering Centers River Analysis Program (HEC-RAS) model.
- Section 4.4.2.1 and Section 4.4.2.2, Inflow Hydrograph for Hydraulic Analysis, were revised to describe the simplified SCVWD model.
- Section 4.4.2.3, Water Surface Elevations – Main Channel, was revised to state that the outputs from the hydraulic analysis for Alternative 4 showed that the proposed high-speed rail (HSR) bridge immediately upstream of the existing railroad bridge would not raise the 100-year flood profile of Guadalupe River main channel. Table 4-6 was revised to reflect these results.

1.1 Overview of the San Jose to Central Valley Wye Project Extent

The San Jose to Central Valley Wye Project Extent (project extent or project) of the San Jose to Merced Project Section (Project Section) would be a critical link in the HSR system connecting San Francisco and the San Francisco Bay Area to Los Angeles and Anaheim. The Project Section would provide HSR service between the downtown San Jose Diridon Station and a station in downtown Merced, with a Gilroy station in either downtown Gilroy or east of Gilroy. The project extent would connect San Jose to the Central Valley portion of the HSR system—the portion of the system running north to Merced and south to Fresno and Southern California—at the Central Valley Wye in Merced County.

The project extent is an approximately 90-mile portion of the 145-mile-long Project Section, which includes dedicated HSR track and systems, and station locations at Diridon, Gilroy, and Merced; a maintenance of way (MOWF) facility in the Gilroy area; and an additional maintenance of way siding (MOWS) west of Turner Springs Road in the Central Valley. The project begins as a blended system north of the San Jose Diridon Station, transitioning to a fully dedicated system from approximately Interstate (I-) 880 south to Gilroy, then east through the Pacheco Pass to Carlucci Road, the western boundary of the Central Valley Wye. For a more detailed description of the project, the five subsections in the project section, and the three end-to-end alternatives, please refer to Chapter 2, Alternatives, of this Final environmental impact report (EIR)/environmental impact statement (EIS). The design options associated with each alternative are shown in Table 1-1.

Table 1-1 San Jose to Central Valley Wye Design Options by Subsection

Subsection/Design Options	Alternative 1	Alternative 2	Alternative 3	Alternative 4
San Jose Diridon Station Approach				
Viaduct to Scott Boulevard		X	X	
Viaduct to I-880	X			
Blended, at-grade				X
Monterey Corridor				
Viaduct	X		X	
At grade		X		
Blended, at-grade				X

Subsection/Design Options	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Morgan Hill and Gilroy				
Embankment to downtown Gilroy		X		
Viaduct to downtown Gilroy	X			
Viaduct to east Gilroy			X	
Blended, at-grade to downtown Gilroy				X
Pacheco Pass				
Tunnel	X	X	X	X
San Joaquin Valley				
Henry Miller Road	X	X	X	X

Source: Authority 2018

1.2 FEMA Flood Zones and Floodway

1.2.1 FEMA Flood Zones

The waterbodies with hydraulic models have floodplains and regulatory floodways delineated by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Maps (FIRM). The floodplains in the project footprint are shown in Table 1-2. The FEMA flood hazard zones are shown in Table 1-3. FEMA flood hazard zones at specific locations in the project vicinity are discussed in more detail in Chapter 2, Overview of Hydraulic Modeling for Project Alternatives, Chapter 3, One-Dimensional Hydraulic Analysis, and Chapter 4, Combined One- and Two-Dimensional Hydraulic Modeling. Figure 1-1 through Figure 1-12 show the existing FEMA floodplains in the RSA.

Table 1-2 Floodplains in the Project Footprint

Floodplain ID	In Alt. 1	In Alt. 2	In Alt. 3	In Alt. 4	Flood Zone	BFE (feet)	Depth (feet)	FEMA-Designated Floodway	County	Managing Agency	FEMA FIRM Panel(s)
San Jose Station Approach Subsection											
San Tomas Aquino Creek	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0227H
Isolated Floodplain 1	Yes	Yes	Yes	Yes	AH	65	N/A	No	Santa Clara	SCVWD	06085C0227H, 06085C0231H
Isolated Floodplain 2	Yes	Yes	Yes	Yes	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0231H
Isolated Floodplain 3	Yes	Yes	Yes	Yes	AH	63	N/A	No	Santa Clara	SCVWD	06085C0231H
Isolated Floodplain 4	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0233H
Isolated Floodplain 5	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0234H
Los Gatos Creek	Yes	Yes	Yes	Yes	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0234H
Guadalupe River 1	Yes	Yes	Yes	No	AH	97	N/A	No	Santa Clara	SCVWD	06085C0234H
Guadalupe River 2	Yes	Yes	Yes	Yes	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0234H
Guadalupe River 3	Yes	Yes	Yes	Yes	AO	N/A	2	No	Santa Clara	SCVWD	06085C0234H
Guadalupe River 4	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0234H
Guadalupe River 5	Yes	Yes	Yes	Yes	AO	N/A	2	No	Santa Clara	SCVWD	06085C0234H, 06085C0242H
Guadalupe River 6	Yes	Yes	Yes	Yes	AH	115-117	N/A	No	Santa Clara	SCVWD	06085C0234H, 06085C0242H
Monterey Corridor Subsection											
Isolated Floodplain 6	Yes	Yes	Yes	Yes	AH	131	N/A	No	Santa Clara	SCVWD	06085C0242H, 06085C0261H
Isolated Floodplain 7	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0261H
Isolated Floodplain 8	Yes	Yes	Yes	Yes	AH	131	N/A	No	Santa Clara	SCVWD	06085C0261H
Isolated Floodplain 9	Yes	Yes	Yes	No	AH	201	N/A	No	Santa Clara	SCVWD	06085C0261H

Floodplain ID	In Alt. 1	In Alt. 2	In Alt. 3	In Alt. 4	Flood Zone	BFE (feet)	Depth (feet)	FEMA-Designated Floodway	County	Managing Agency	FEMA FIRM Panel(s)
Morgan Hill and Gilroy Subsection											
Coyote Creek 1	Yes	Yes	Yes	No	AE	235-246	N/A	Yes	Santa Clara	SCVWD	06085C0407H, 06085C0426H, 06085C0428H
Coyote Creek 2	Yes	Yes	Yes	Yes	AE	239-249	N/A	No	Santa Clara	SCVWD	06085C0407H, 06085C0426H
Coyote Creek 3	Yes	Yes	Yes	Yes	AE	248-251	N/A	No	Santa Clara	SCVWD	06085C0426H
Coyote Creek 4	Yes	Yes	Yes	Yes	AE	249	N/A	No	Santa Clara	SCVWD	06085C0426H
Coyote Creek 5	Yes	Yes	Yes	No	AE	249-254	N/A	No	Santa Clara	SCVWD	06085C0426H, 06085C0428H
Coyote Creek 6	No	Yes	No	Yes	AE	249-251	N/A	Yes	Santa Clara	SCVWD	06085C0428H
Coyote Creek 7	No	Yes	No	No	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0428H
Coyote Creek 8	No	Yes	No	No	AE	266	N/A	Yes	Santa Clara	SCVWD	06085C0428H
Coyote Creek 9	Yes	Yes	Yes	Yes	AE	298-306	N/A	No	Santa Clara	SCVWD	06085C0429H, 06085C0437H
Fisher Creek 1	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0437H
Coyote Creek 10	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0437H, 06085C0441H
Coyote Creek 11	Yes	Yes	Yes	Yes	AE	324	N/A	Yes	Santa Clara	SCVWD	06085C0437H
Coyote Creek 12	Yes	Yes	Yes	Yes	AE	319	N/A	No	Santa Clara	SCVWD	06085C0437H
Coyote Creek 13	Yes	No	Yes	Yes	AE	355	N/A	No	Santa Clara	SCVWD	06085C0441H
Fisher Creek 2	No	Yes	No	Yes	AE	324-336	N/A	No	Santa Clara	SCVWD	06085C0441H
Fisher Creek 3	No	Yes	No	Yes	AE	324-335	N/A	Yes	Santa Clara	SCVWD	06085C0441H
Fisher Creek 4	No	Yes	No	Yes	AH	354	N/A	No	Santa Clara	SCVWD	06085C0443H
Madrone Channel 1	Yes	No	Yes	No	AE	373	N/A	No	Santa Clara	SCVWD	06085C0444H

Floodplain ID	In Alt. 1	In Alt. 2	In Alt. 3	In Alt. 4	Flood Zone	BFE (feet)	Depth (feet)	FEMA-Designated Floodway	County	Managing Agency	FEMA FIRM Panel(s)
West Little Llagas Creek	No	Yes	No	Yes	AE	335-351	N/A	No	Santa Clara	SCVWD	06085C0443H, 06085C0444H, 06085C0607H
Madrone Channel 2	Yes	No	Yes	No	AE	361	N/A	No	Santa Clara	SCVWD	06085C0444H
Madrone Channel 3	Yes	No	Yes	No	AE	349	N/A	No	Santa Clara	SCVWD	06085C0444H
Madrone Channel 4	Yes	No	Yes	No	AE	342	N/A	No	Santa Clara	SCVWD	06085C0607H
Llagas Creek 1	No	Yes	No	Yes	AE	318-319	N/A	No	Santa Clara	SCVWD	06085C0607H, 06085C0626H
Llagas Creek 2	Yes	Yes	Yes	Yes	AE	309-317	N/A	No	Santa Clara	SCVWD	06085C0607H, 06085C0626H
Llagas Creek 3	No	Yes	No	Yes	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0607H, 06085C0626H
Llagas Creek 4	No	Yes	No	No	AO	N/A	2	No	Santa Clara	SCVWD	06085C0626H
Llagas Creek 5	No	Yes	No	Yes	AE	308-312	N/A	No	Santa Clara	SCVWD	06085C0626H
Llagas Creek 6	No	Yes	No	No	AE	306-308	N/A	No	Santa Clara	SCVWD	06085C0626H
Llagas Creek 7	Yes	Yes	Yes	No	AE	303-305	N/A	No	Santa Clara	SCVWD	06085C0626H
Llagas Creek 8	Yes	Yes	Yes	No	AE	305-308	N/A	Yes	Santa Clara	SCVWD	06085C0626H
Llagas Creek 9	No	Yes	No	Yes	AE	208	N/A	No	Santa Clara	SCVWD	06085C0628H
Llagas Creek 10	No	Yes	No	Yes	AE	283-287	N/A	Yes	Santa Clara	SCVWD	06085C0628H
Llagas Creek 11	No	Yes	No	Yes	AE	286-289	N/A	No	Santa Clara	SCVWD	06085C0628H
Llagas Creek 12	No	Yes	No	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0628H
Llagas Creek 13	No	Yes	No	No	AE	258	N/A	No	Santa Clara	SCVWD	06085C0628H
Llagas Creek 14	No	Yes	No	Yes	AE	263	N/A	Yes	Santa Clara	SCVWD	06085C0628H
West Branch Llagas Creek 1	No	Yes	No	Yes	AE	245-247	N/A	Yes	Santa Clara	SCVWD	06085C0636H
West Branch Llagas Creek 2	No	Yes	No	Yes	AE	247	N/A	No	Santa Clara	SCVWD	06085C0636H

Floodplain ID	In Alt. 1	In Alt. 2	In Alt. 3	In Alt. 4	Flood Zone	BFE (feet)	Depth (feet)	FEMA-Designated Floodway	County	Managing Agency	FEMA FIRM Panel(s)
West Branch Llagas Creek 3	No	Yes	No	No	AE	224-247	N/A	No	Santa Clara	SCVWD	06085C0636H, 06085C0637H
West Branch Llagas Creek 4	Yes	Yes	Yes	No	AE	224	N/A	No	Santa Clara	SCVWD	06085C0637H
West Branch Llagas Creek 5	Yes	Yes	Yes	Yes	AO	N/A	1	No	Santa Clara	SCVWD	06085C0636H
Llagas Overbank 1	No	No	Yes	No	AE	187-203	N/A	No	Santa Clara	SCVWD	06085C0641H, 06085C0643H
Llagas Overbank 2	No	No	Yes	No	AE	185-203	N/A	Yes	Santa Clara	SCVWD	06085C0643H
Llagas Creek 15	No	No	Yes	No	AE	187-188	N/A	Yes	Santa Clara	SCVWD	06085C0643H
Llagas Creek 16	No	No	Yes	No	AE	187-188	N/A	No	Santa Clara	SCVWD	06085C0643H
Jones Creek	No	No	Yes	No	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0643H, 06085C0645H
Uvas-Carnadero Creek 1	Yes	Yes	No	Yes	AH	193-195	N/A	No	Santa Clara	SCVWD	06085C0752H, 06085C0756H
Uvas-Carnadero Creek 2	Yes	Yes	No	Yes	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0756H
Uvas-Carnadero Creek 3	Yes	Yes	No	Yes	AE	171-174	N/A	No	Santa Clara	SCVWD	06085C0756H
Uvas Creek West Overbank 1	Yes	Yes	No	Yes	AE	178-188	N/A	No	Santa Clara	SCVWD	06085C0756H
Uvas Creek West Overbank 2	Yes	Yes	No	Yes	AH	164	N/A	No	Santa Clara	SCVWD	06085C0756H
Uvas Creek West Overbank 3	Yes	Yes	No	No	AE	178	N/A	No	Santa Clara	SCVWD	06085C0756H
Soap Lake Floodplain 1 for Santa Clara County	Yes	Yes	Yes	Yes	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0756H, 06085C0757H, 06085C0760H
Soap Lake Floodplain 2 for San Benito County	Yes	Yes	Yes	Yes	A	N/A	N/A	No	San Benito	San Benito County	06069C0075D
Pacheco Creek	Yes	Yes	Yes	No	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0785H

Floodplain ID	In Alt. 1	In Alt. 2	In Alt. 3	In Alt. 4	Flood Zone	BFE (feet)	Depth (feet)	FEMA-Designated Floodway	County	Managing Agency	FEMA FIRM Panel(s)
Pacheco Pass Subsection											
Pacheco Creek	Yes	Yes	Yes	No	A	N/A	N/A	No	Santa Clara	SCVWD	06085C0700H, 06085C0805H
San Joaquin Valley Subsection											
San Joaquin River	Yes	Yes	Yes	Yes	A	N/A	N/A	No	Merced	Merced County	06047C0825G, 06047C0850G, 06047C0875G

Sources: FEMA 2009, 2010, 2014
Notes: In Santa Clara County, areas outside of the 100-year floodplain are generally Zone D.
Alt. = alternative
BFE = base flood elevation
FEMA = Federal Emergency Management Agency
FIRM = flood insurance rate map
SCVWD = Santa Clara Valley Water District

Table 1-3 FEMA Flood Hazard Zones

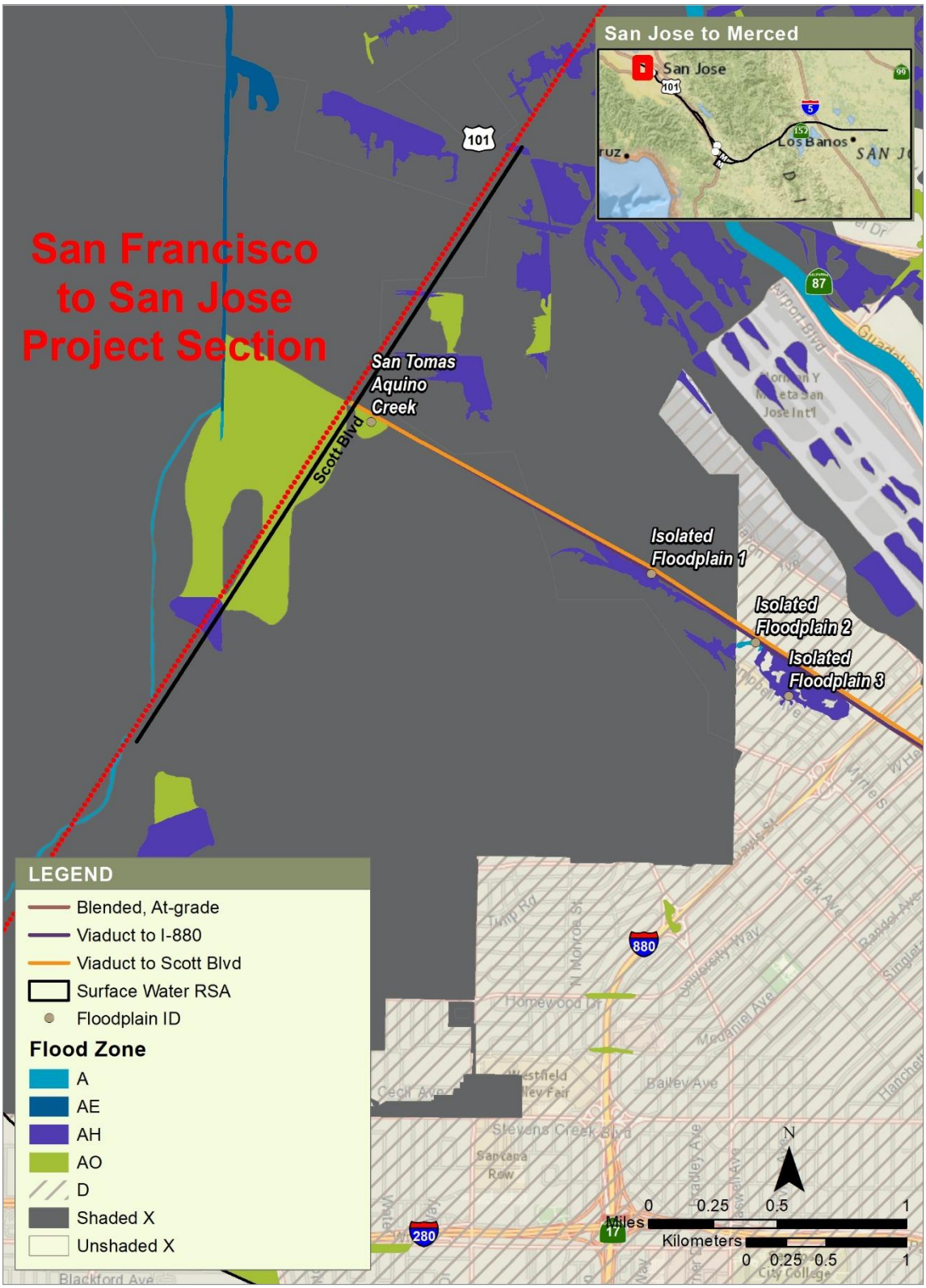
Zone	Flood Hazard
High-Risk Areas	
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or BFEs are shown within these zones.
AE	The base floodplain where BFEs are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. BFEs derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood-hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. Average flood depths derived from detailed analyses are shown within these zones.
Moderate- to Low-Risk Areas	
X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods.
X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level.
Coastal Areas	
V	Areas within 100-year coastal floodplains that have additional hazards associated with storm surges and waves. Approximate hydraulic analyses are performed for these areas, so BFEs are known.
VE	Areas within 100-year coastal floodplains that have additional hazards associated with storm surges and waves. Detailed hydraulic analyses are performed for these areas.
Undetermined Risk Areas	
D	Areas with possible, but undetermined flood risks. No analysis of flood hazards has been performed in these zones.

Source: FEMA 1998
BFE = base flood elevation
FIRM = flood insurance rate map

1.2.2 FEMA Floodway

According to the Code of Federal Regulations Title 44 Section 59.1, regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation (WSE) more than a designated height.

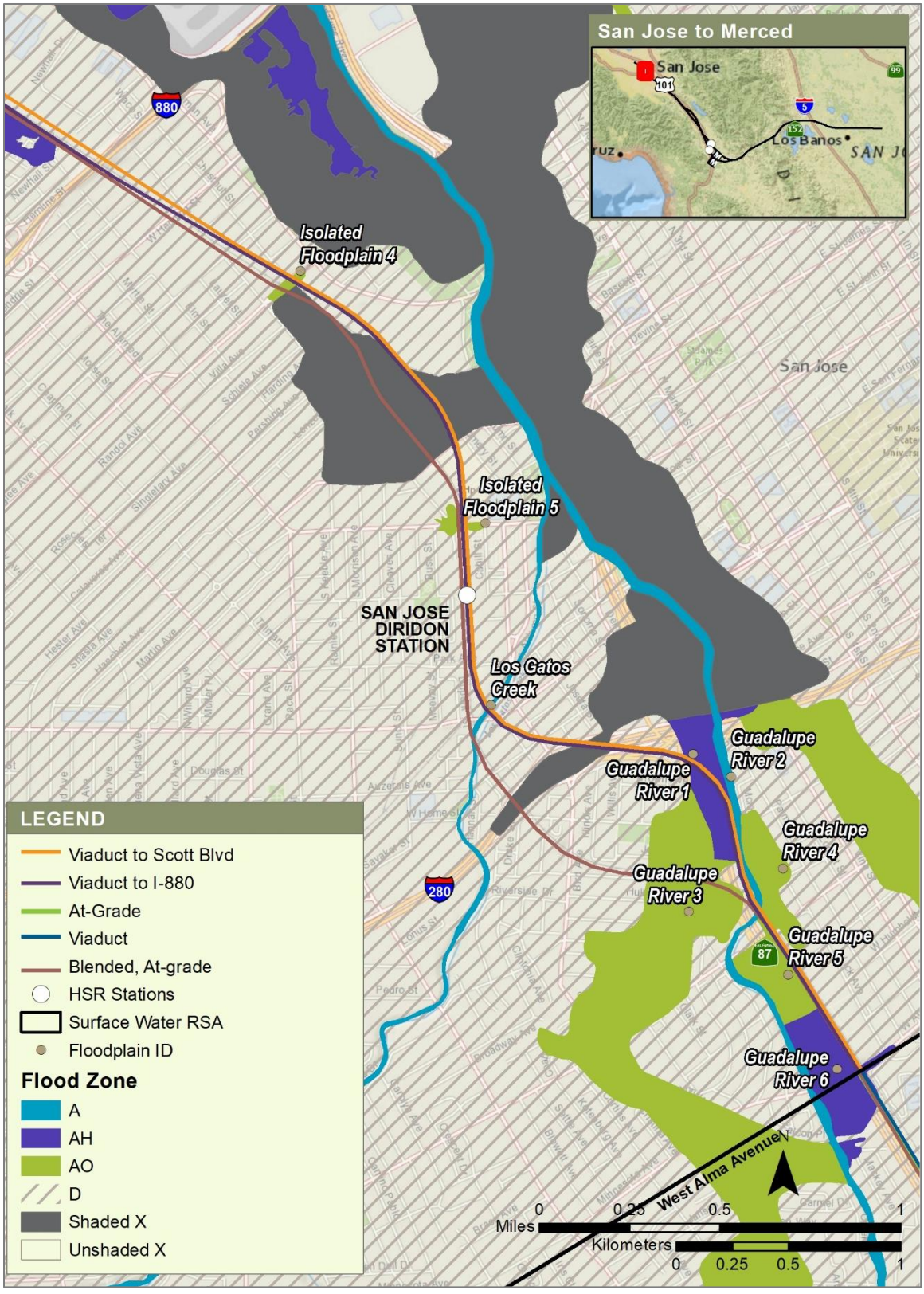
In project footprint, the FEMA FIRM assigned designated floodways to Coyote Creek, Fisher Creek, and Llagas Creek. The designated floodways in the project vicinity are discussed in Chapters 2 and 3.



Sources: FEMA 2009; Authority 2019

JANUARY 2019

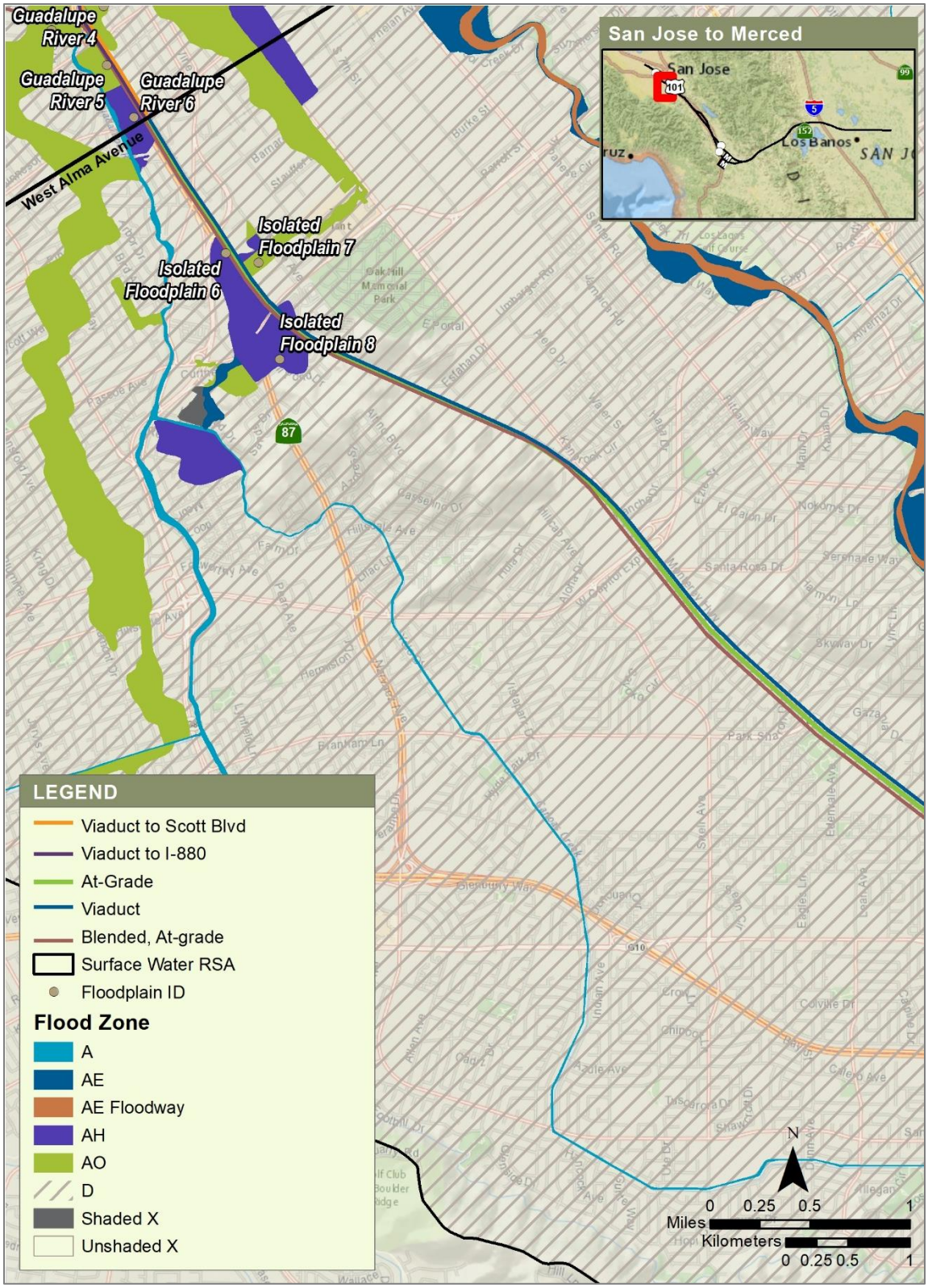
Figure 1-1 Floodplains, San Jose Diridon Station Approach Subsection (1 of 2)



Sources: FEMA 2009; Authority 2019

APRIL 2019

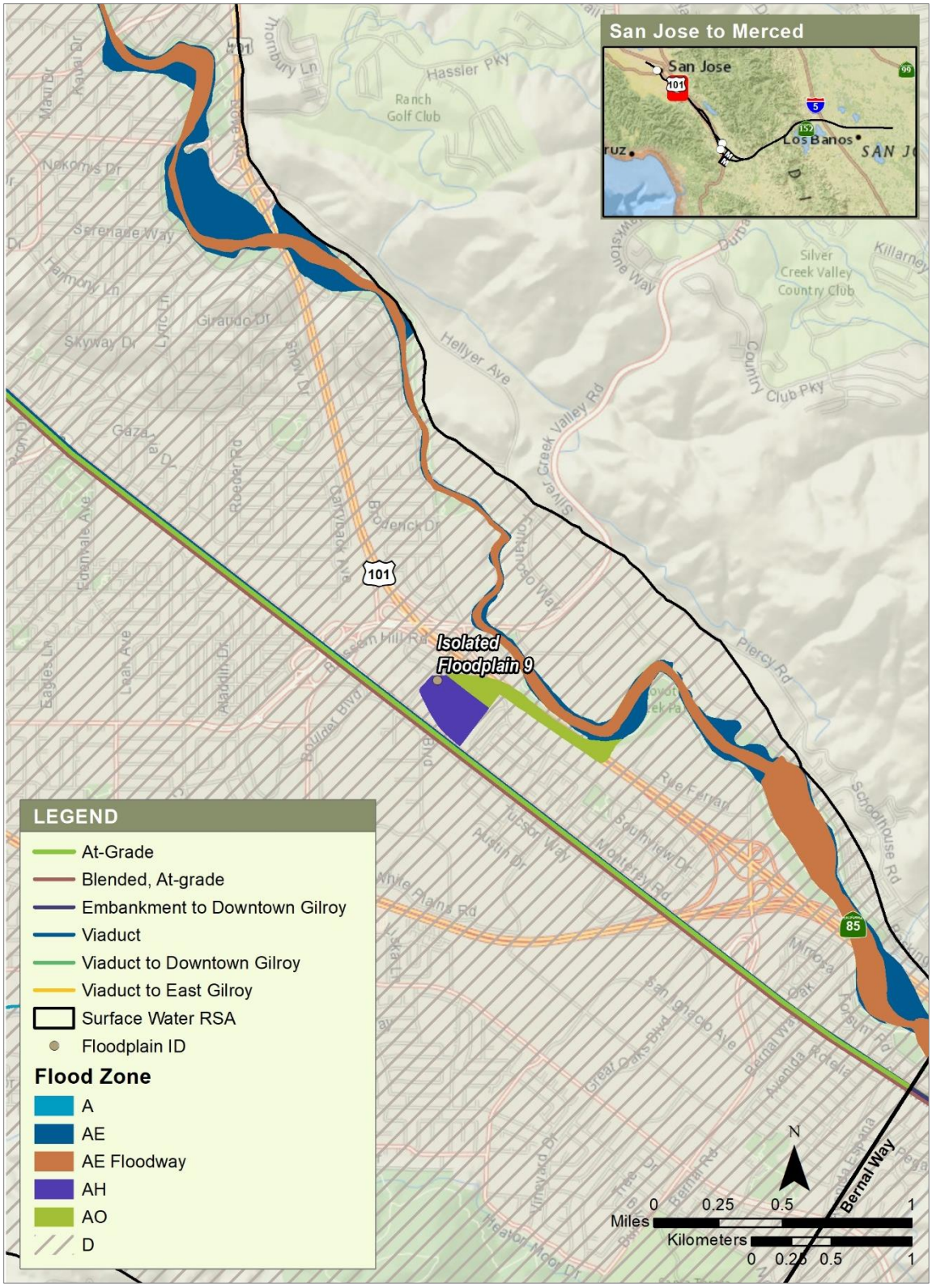
Figure 1-2 Floodplains, San Jose Diridon Station Approach Subsection (2 of 2)



Sources: FEMA 2009; Authority 2019

APRIL 2019

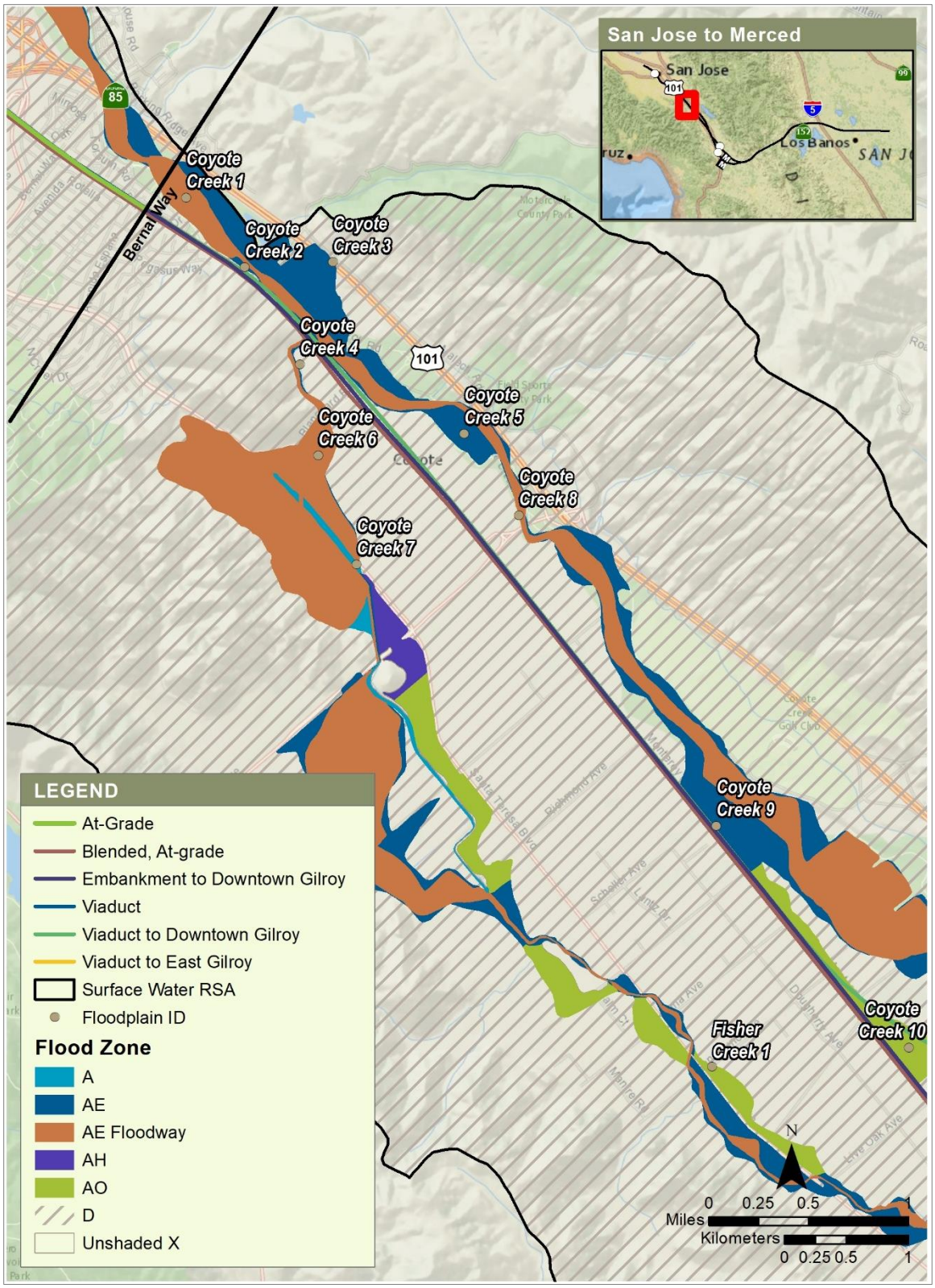
Figure 1-3 Floodplains, Monterey Corridor Subsection (1 of 2)



Sources: FEMA 2009; Authority 2019

JANUARY 2019

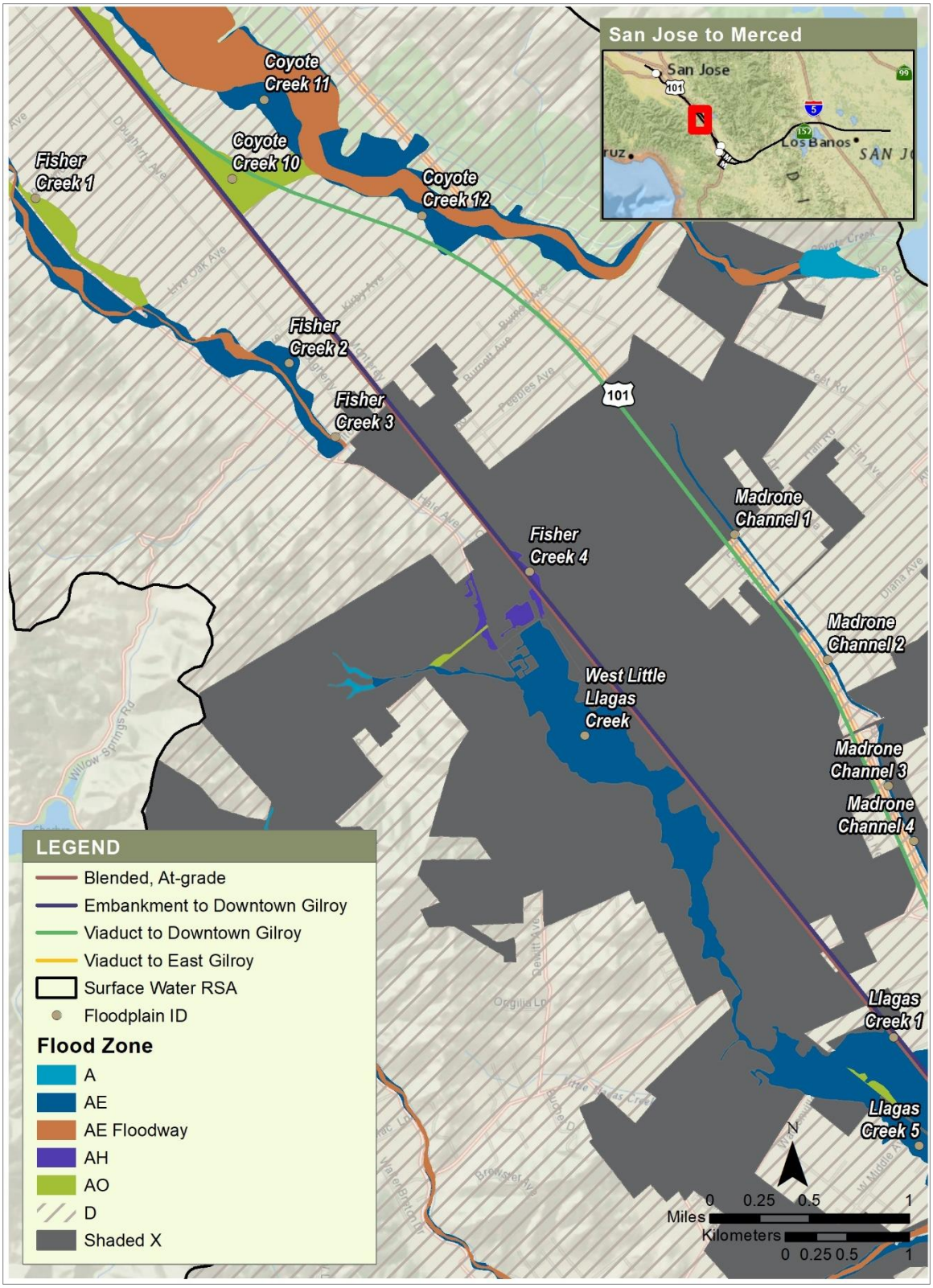
Figure 1-4 Floodplains, Monterey Corridor Subsection (2 of 2)



Sources: FEMA 2009; Authority 2019

JANUARY 2019

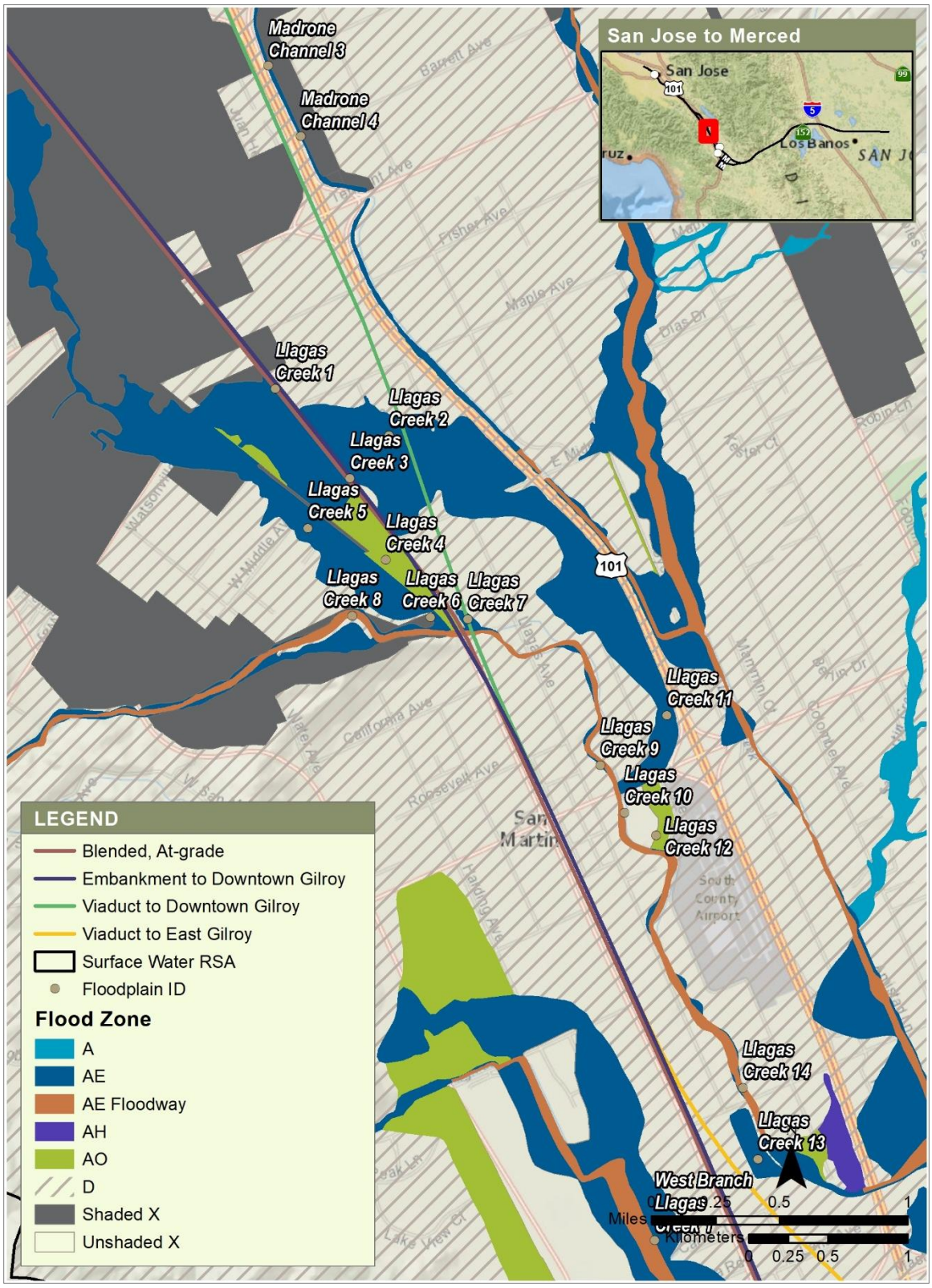
Figure 1-5 Floodplains, Morgan Hill and Gilroy Subsection (1 of 6)



Sources: FEMA 2009; Authority 2019

JANUARY 2019

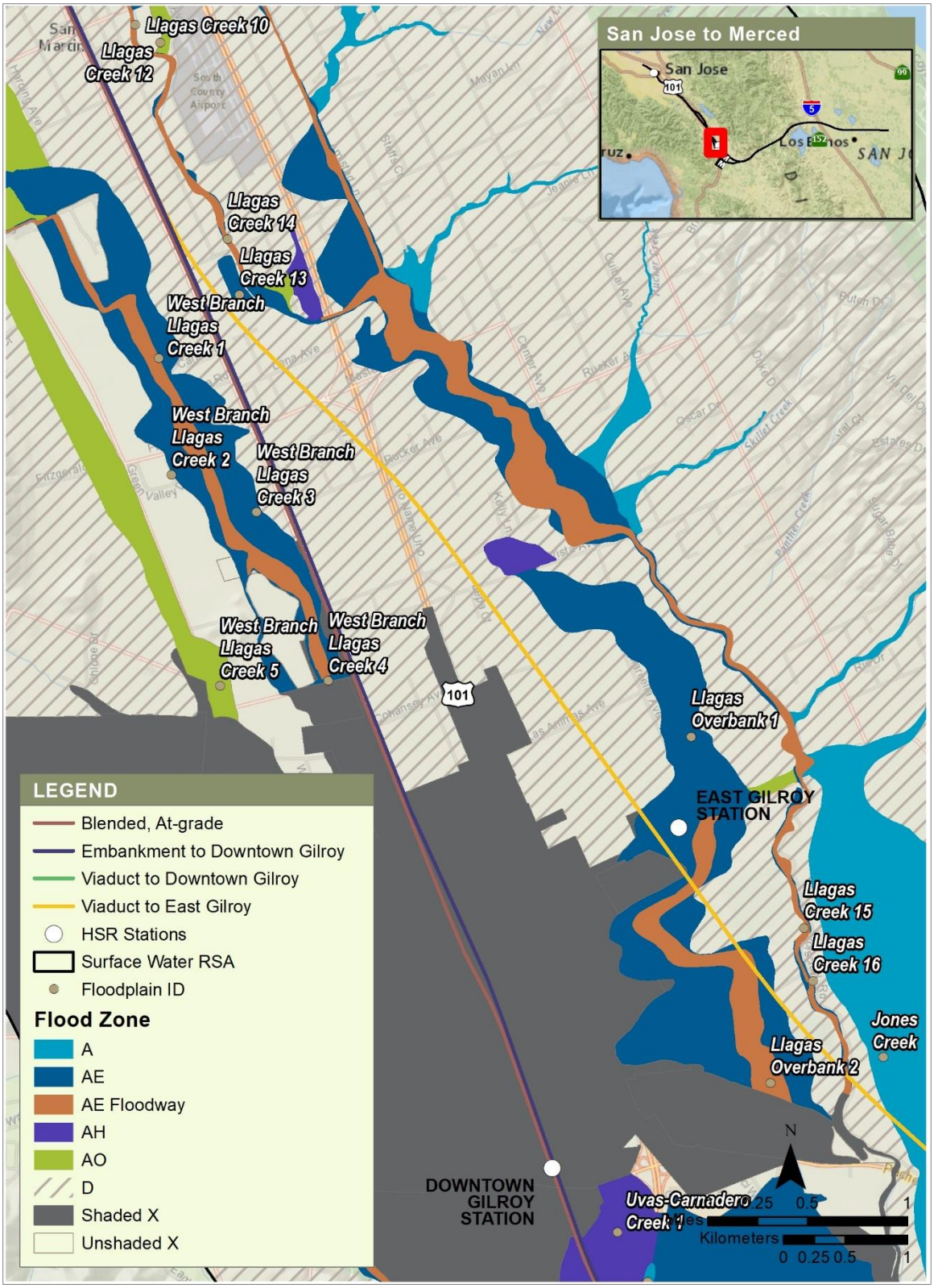
Figure 1-6 Floodplains, Morgan Hill and Gilroy Subsection (2 of 6)



Sources: FEMA 2009; Authority 2019

JANUARY 2019

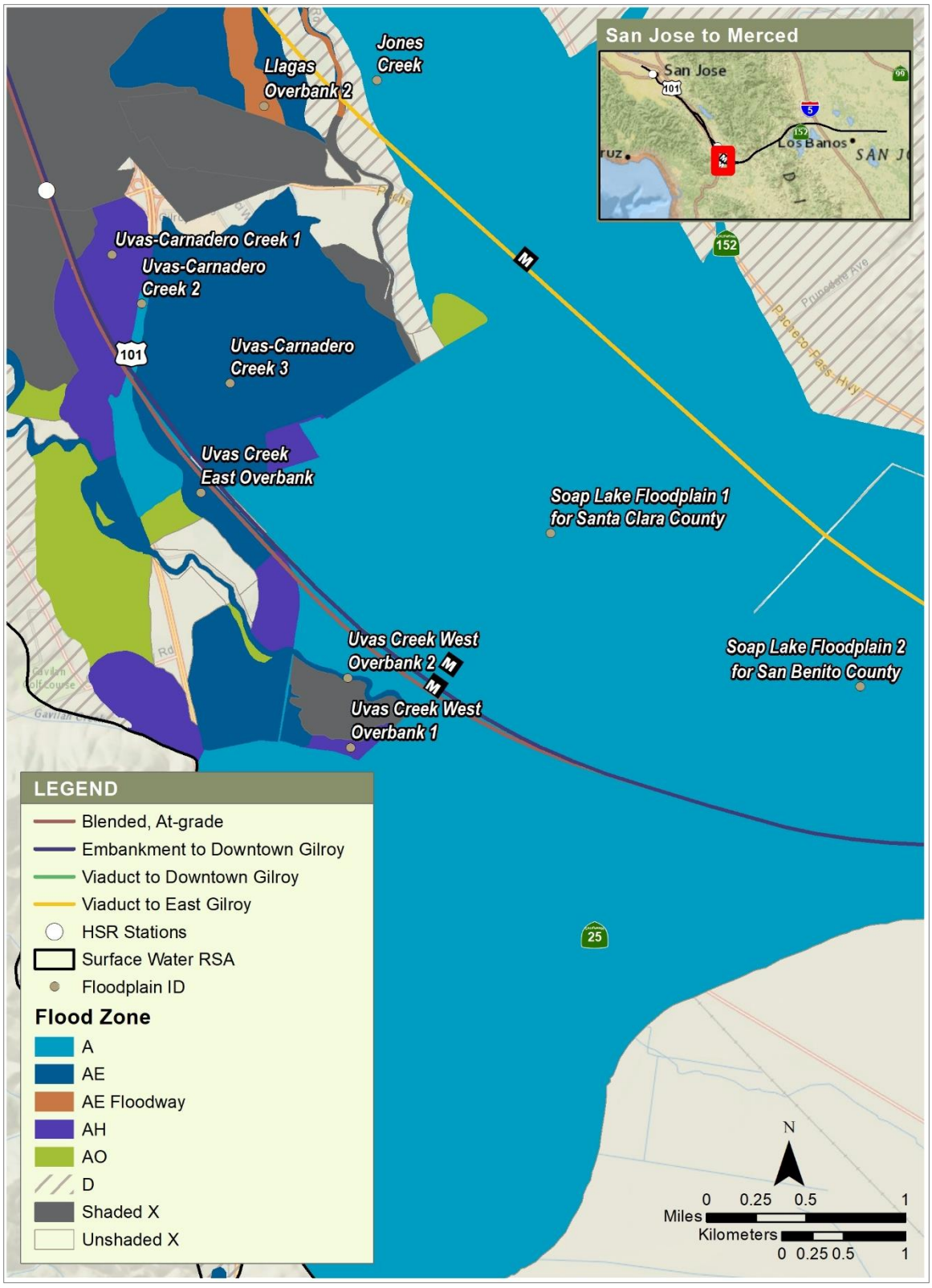
Figure 1-7 Floodplains, Morgan Hill and Gilroy Subsection (3 of 6)



Sources: FEMA 2009; Authority 2019

JANUARY 2019

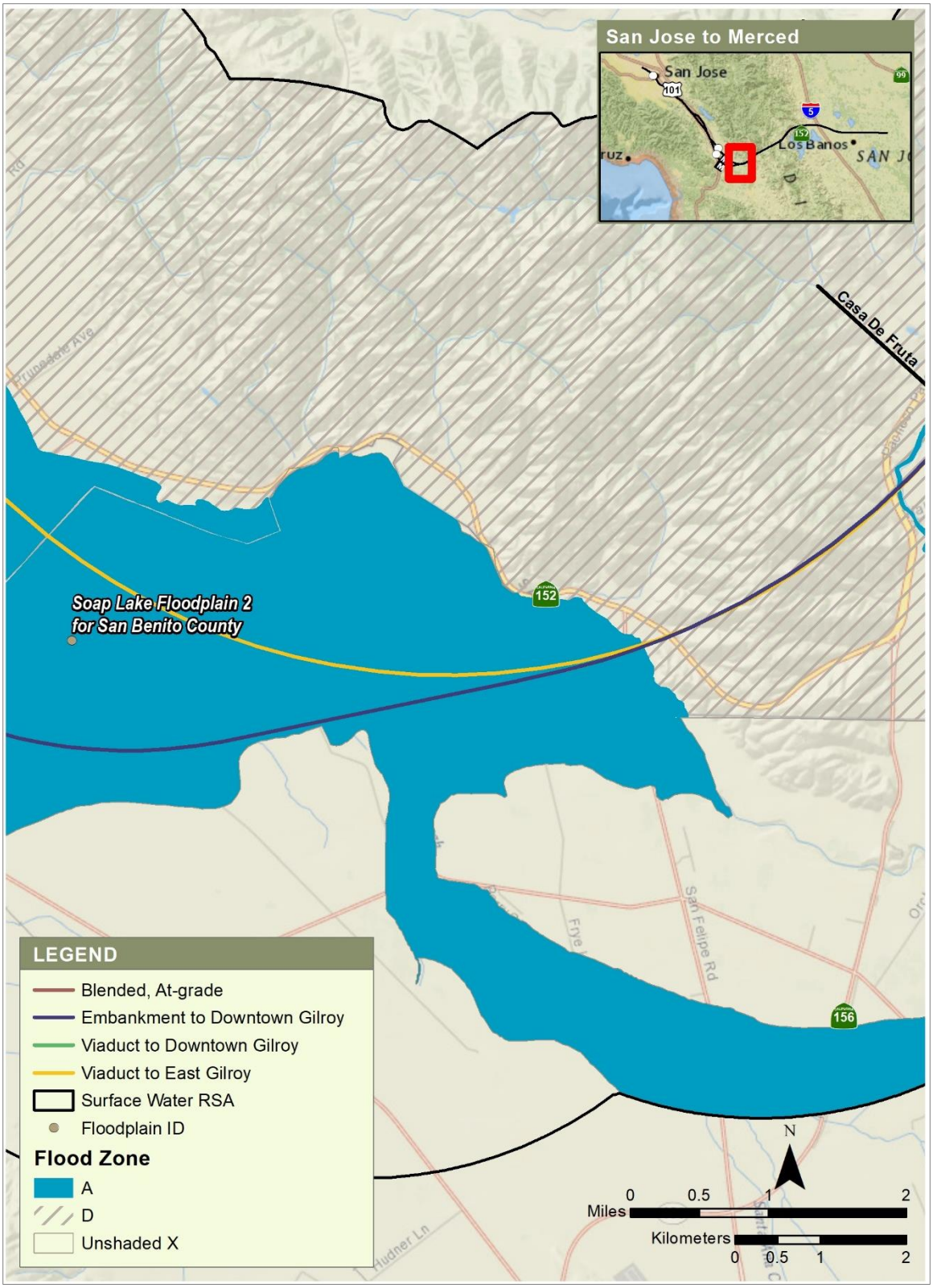
Figure 1-8 Floodplains, Morgan Hill and Gilroy Subsection (4 of 6)



Sources: FEMA 2009; Authority 2019

JANUARY 2019

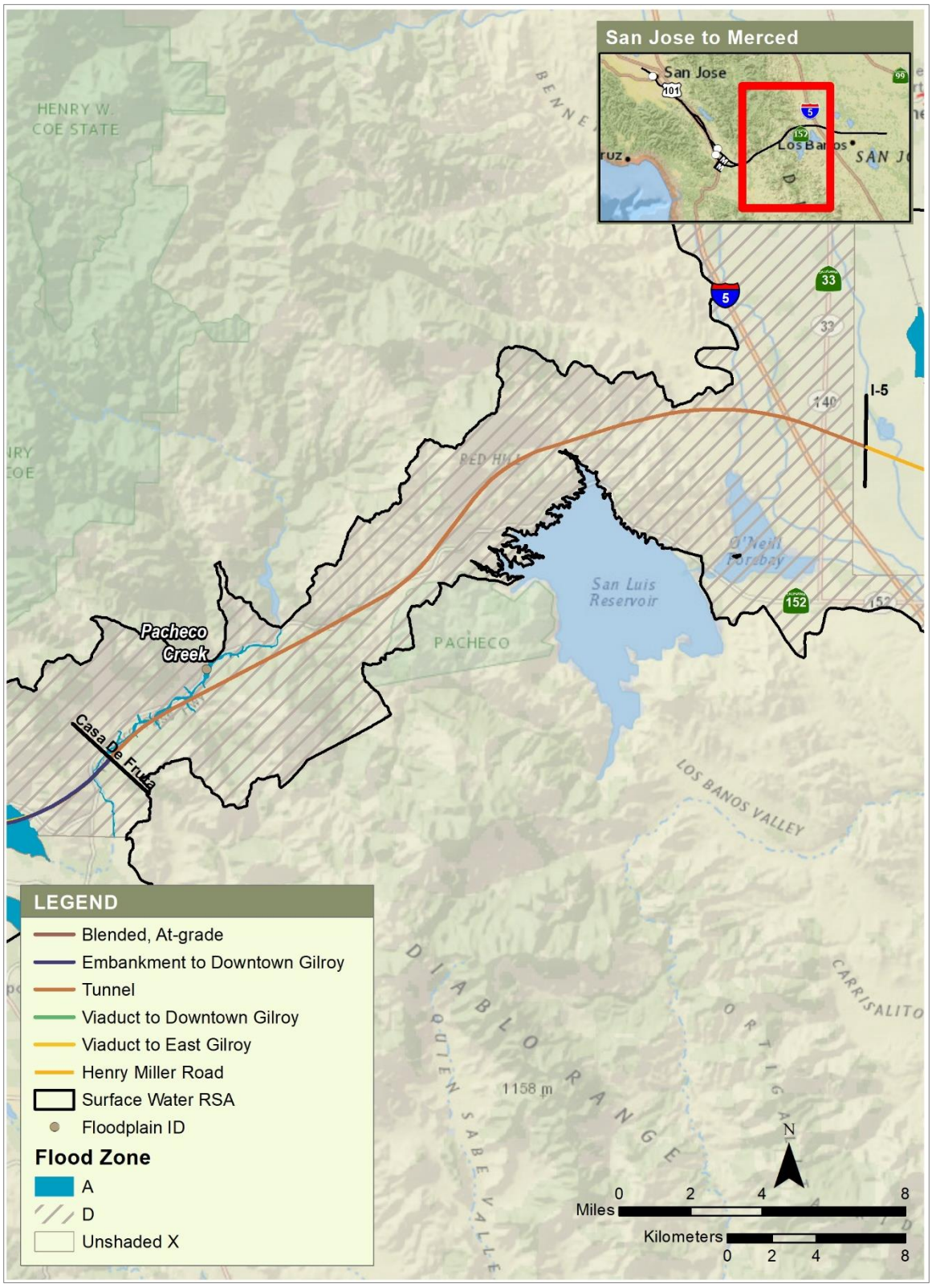
Figure 1-9 Floodplains, Morgan Hill and Gilroy Subsection (5 of 6)



Sources: FEMA 2009; Authority 2019

JANUARY 2019

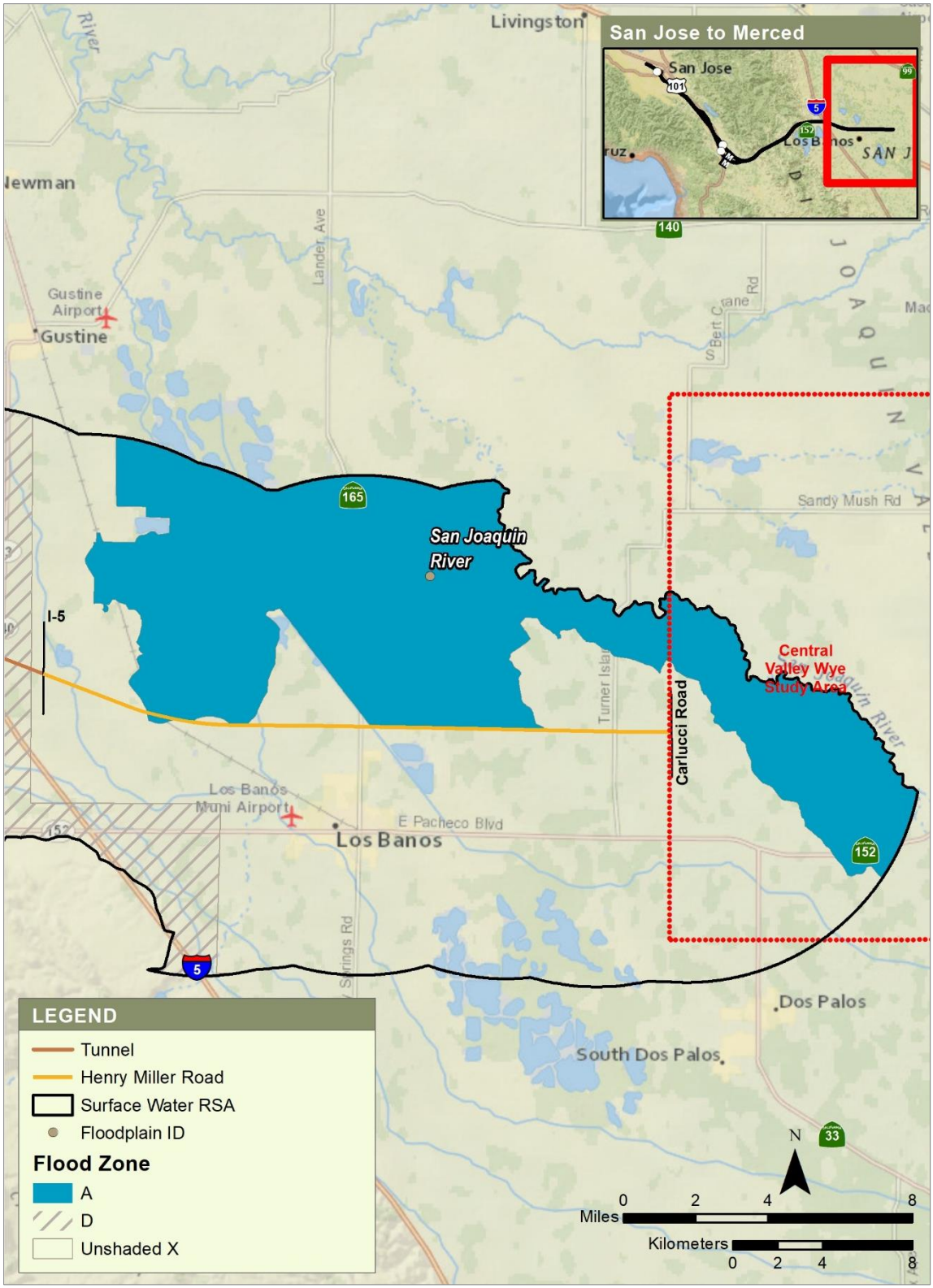
Figure 1-10 Floodplains, Morgan Hill and Gilroy Subsection (6 of 6)



Sources: FEMA 2008, 2009; Authority 2019

JANUARY 2019

Figure 1-11 Floodplains, Pacheco Pass Subsection (1 of 1)



Sources: FEMA 2008; Authority 2019

JANUARY 2019

Figure 1-12 Floodplains, San Joaquin Valley Subsection

2 OVERVIEW OF HYDRAULIC MODELING FOR PROJECT ALTERNATIVES

In the Project Section, there are 332 waterbodies in the footprint of the project alternatives. Of the 332 waterbodies, 7 waterbodies are in Zone A floodplains, 7 waterbodies are in Zone AE floodplains, 4 waterbodies are in Zone AE floodways, 5 waterbodies are in Zone AO floodplains, and 2 waterbodies are in Zone AH floodplains. Refer to Appendix 3.8-A, Waterbodies Crossed by the Project Alternatives, for a table that lists the waterbodies in the project footprint by subsection and alternative.

Under all project alternatives, construction of new embankment sections, viaduct sections, trench sections, and tunnel sections would be in or near these existing waterbodies and their associated floodplains. Proposed maintenance facilities would be in or near existing waterbodies and floodplains under all three alternatives. In addition to the new HSR tracks and facilities, the project would also require relocation of existing roadways (Alternatives 1, 2, and 3) and relocation of existing railroad track (Alternative 2) in or near waterbodies and floodplains.

To evaluate the project's potential effects on existing floodplains, a hydraulic analysis was performed by comparing the outputs of existing- and proposed-condition hydraulic models. A total of 16 hydraulic models were provided by FEMA, SCVWD, and Pajaro River Watershed Flood Prevention Authority (PRWFPA), which covered 12 floodplains in the footprint of the project alternatives. The hydraulic model covering remaining 13 floodplains were not available. Hydraulic models provided by the Federal Emergency Management Agency are summarized in Table 2-1. Hydraulic Models provided by SCVWD and PRWFPA are summarized in Table 2-2.

Figure 2-1 through Figure 2-6 illustrate the limits of the HEC-RAS hydraulic models provided by FEMA. Figure 2-7 through Figure 2-15 illustrate the limits of the HEC-RAS hydraulic models provided by SCVWD and PRWFPA. Because the hydraulic models provided by SCVWD and FEMA are in Hydraulic Engineering Circular # 2 (HEC-2) file format because they did not include geo-referencing of the channel cross sections and the alignment of the floodplain. The alignment and limits of channel cross sections shown in these figures are taken from the alignment of channel cross sections and floodplains included in the FEMA digital FIRM. The FEMA effective hydraulic models are included in this study per request from the SCVWD to include the hydraulic analysis using the FEMA effective hydraulic models when they are available.

The existing condition hydraulic models provided by FEMA, SCVWD, and PRWFPA were in either one-dimensional or combined one-and two-dimensional hydraulic model formats. Because these two types of models require different modeling approaches, the discussion of the hydraulic analysis was sorted by the type of hydraulic analysis performed. In addition, the Soap Lake floodplain model that was developed by combining the existing available hydraulic models using different modeling approaches and assumptions is discussed in Section 5.5, Hydraulic Analysis. The discussion of the hydraulic analysis using one-dimensional hydraulic analysis are included in Chapter 3, which includes discussion of: Coyote Creek, West Little Llagas Creek, Llagas Creek (near San Martin, at East San Martin Avenue, and east of Gilroy), West Little Llagas Creek – Middle Avenue Overflow, and West Branch Llagas Creek. The discussion of the hydraulic analysis using combined one- and two- dimensional hydraulic analysis are included in Chapter 4, which includes discussion of Los Gatos Creek, Guadalupe River and Tributaries, Fisher Creek, and Uvas-Carnadero Creek. The hydraulic analysis of Soap Lake floodplain is included in Chapter 5. Table 2-1 and Table 2-2 shows report sections corresponding to the hydraulic models provided by FEMA, SCVWD, and PRWFPA.

Because the design of the HSR structures is not entirely finalized, and detailed surveys of the waterbodies in the footprint of the project alternatives are not available, all the hydraulic models used assumptions in conducting the hydraulic analysis; these assumptions are discussed in detail in Section 3.3, General Hydraulic Model Assumptions, for the one-dimensional steady-state hydraulic analysis, Section 4.2, Hydraulic Model Assumptions, for the combined one- and two-dimensional unsteady state hydraulic analysis, and in Section 5.5.5, HSR Structures and Assumptions in the Hydraulic Model, for the combined one-and two-dimensional unsteady-state

hydraulic analyses of the Soap Lake floodplain. Consequently, all the hydraulic models will have to be revised when more detailed design plans and survey data become available. The hydraulic analyses of the remaining waterbodies without existing hydraulic models that are in or near the project footprint would be performed when the channel survey information becomes available.

Table 2-1 Hydraulic Models Provided by FEMA

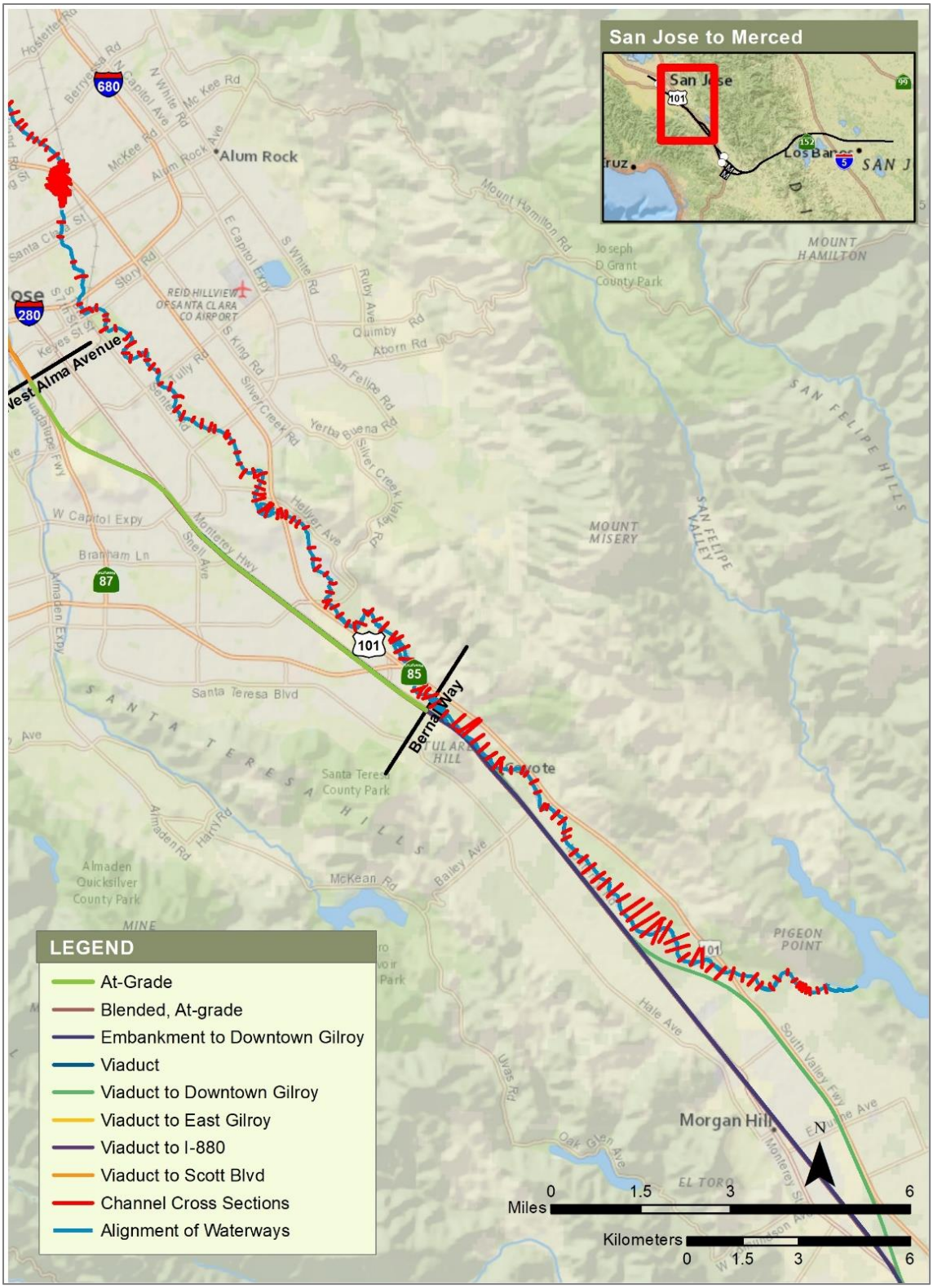
Floodplain	Date Received	Received Model Type	Figure for Model Footprint	Report Section
Coyote Creek	3/28/2018	HEC-2	Figure 2-1	3.4
West Little Llagas Creek	3/28/2018	HEC-2	Figure 2-2	**3.5**
Llagas Creek	3/28/2018	HEC-2	Figure 2-3	3.6, 3.7, & 3.10
West Branch Llagas Creek	3/28/2018	HEC-2	Figure 2-4	3.9
Llagas Overbank	3/28/2018	HEC-2	Figure 2-5	3.10
Uvas-Carnadero Creek	5/16/2018	HEC-RAS 1D/2D	Figure 2-6	4.6

Sources: FEMA 2018a 2018b, 2018c, 2018d, 2018e, 2018 f
FEMA = Federal Emergency Management Agency

Table 2-2 Hydraulic Models Provided by SCVWD and PRWFPA

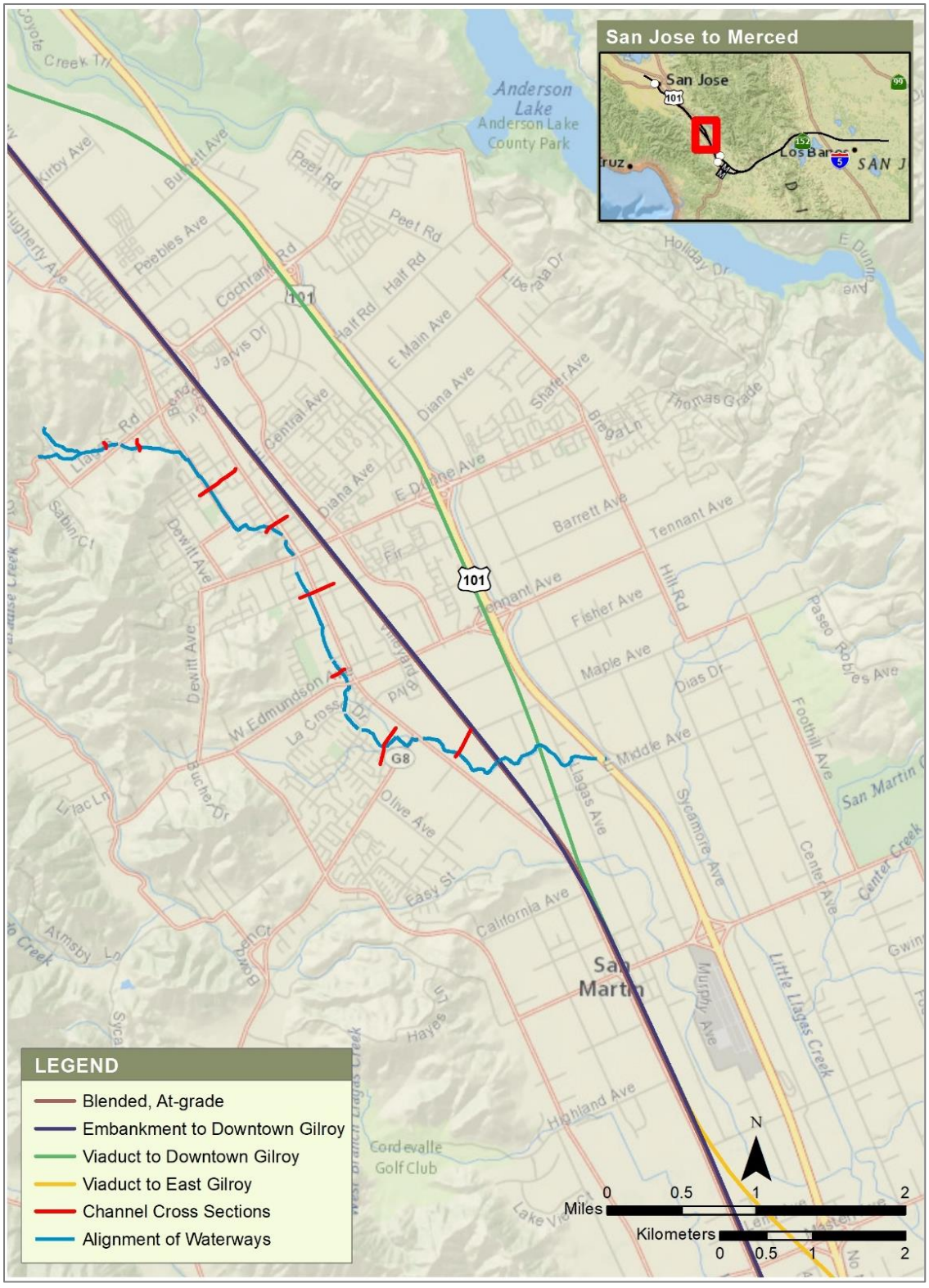
Floodplain	Date Received	Received Model Type	Figure for Model Footprint	Report Section
Los Gatos Creek	12/13/2018	HEC-RAS 1D/2D	Figure 2-7	4.3
Guadalupe River and Tributaries	7/24/2018	HEC-RAS 1D/2D	Figure 2-8	4.4
Coyote Creek	6/3/2016	HEC-RAS 1D	Figure 2-9	3.4
Fisher Creek	6/3/2016	HEC-RAS 1D/2D	Figure 2-10	4.5
West Little Llagas Creek, Middle Avenue Overflow[1]	10/29/2018	HEC-2	Figure 2-11	3.8
Llagas Creek (with Tributaries)	1/5/2018	HEC-RAS 1D	Figure 2-12	3.6, 3.7, & 3.10
Llagas Creek (Pajaro to Buena Vista Road)	6/3/2016	HEC-RAS 1D	Figure 2-13	5
Uvas-Carnadero Creek	6/3/2016	HEC-RAS 1D/2D	Figure 2-14	4.6
Soap Lake (Pajaro River and Tributaries)	6/28/2016	HEC-RAS 1D	Figure 2-15	5

Sources: PRWFPA 2016; SCVWD 2012, 2014, 2015a, 2015b 2016, 2018a, 2018b, 2018c
SCVWD = Santa Clara Valley Water District
PRWFPA = Pajaro River Watershed Flood Prevention Authority
[1] This model provided by SCVWD is the FEMA effective hydraulic model.



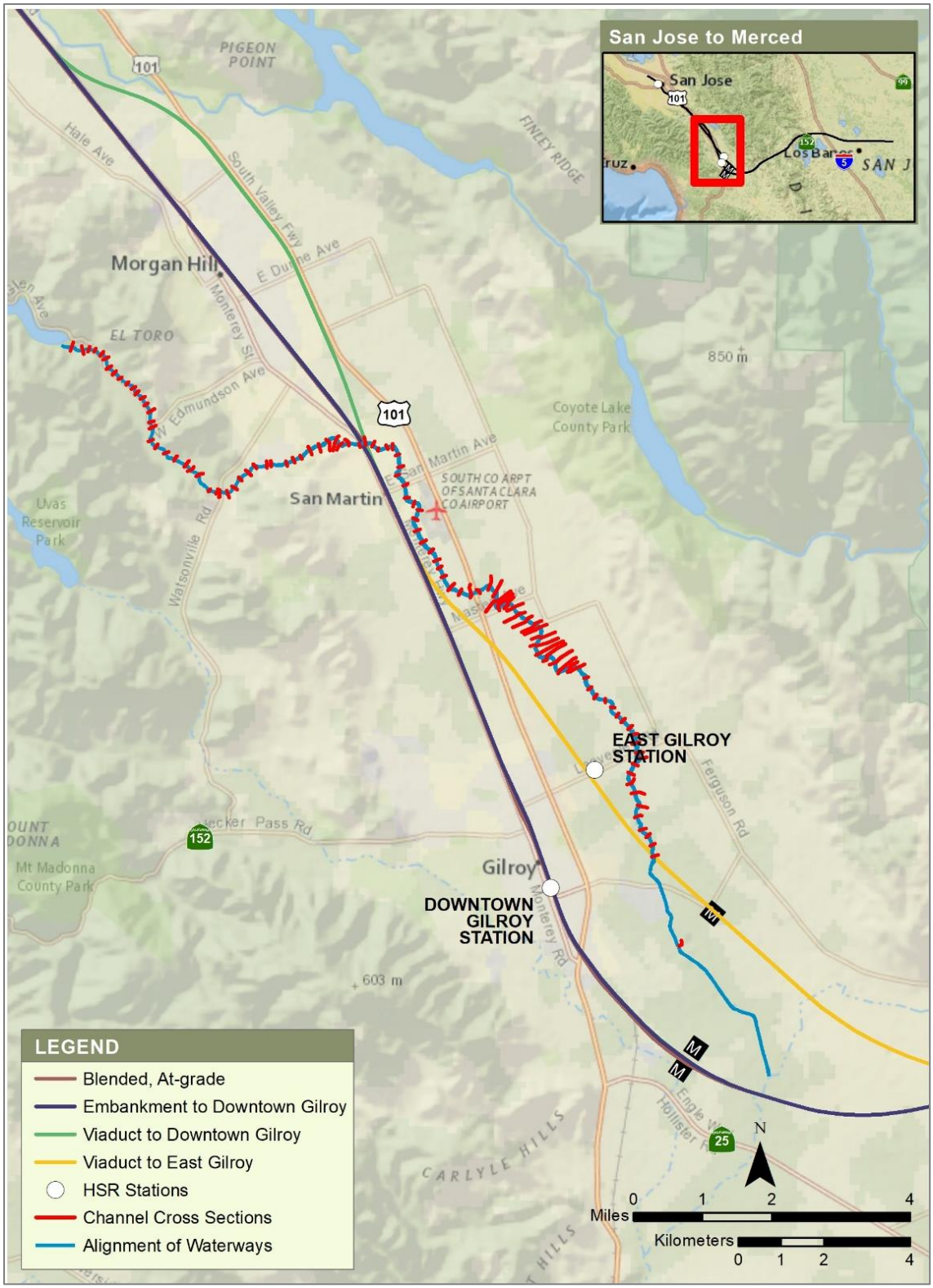
Sources: FEMA 2018a; Authority 2019 JANUARY 2019
Note: This figure is not showing all of the channel cross sections included in the hydraulic model.

Figure 2-1 Location and Limits of the Available Hydraulic Models: Coyote Creek, FEMA Model



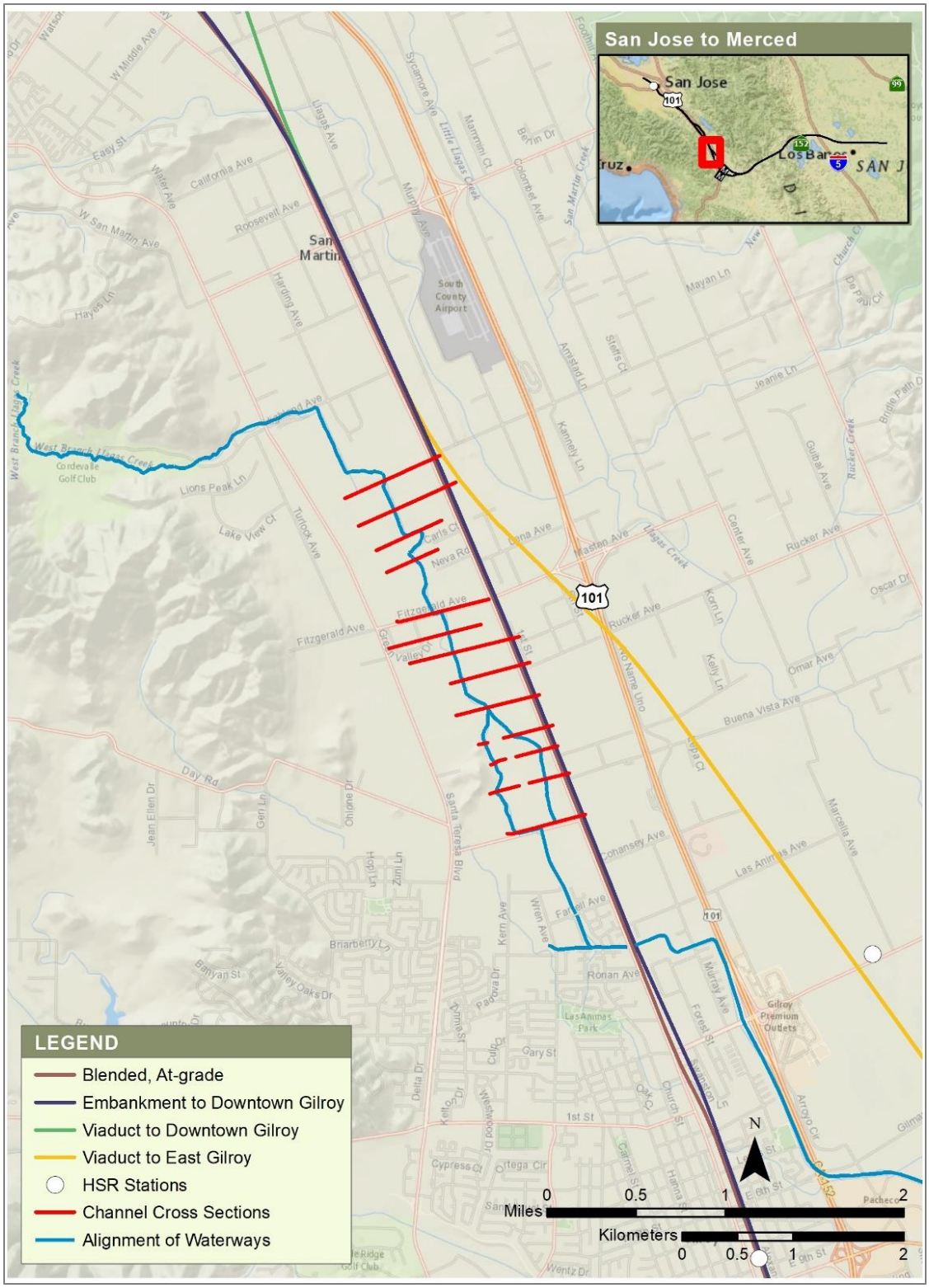
Sources: FEMA 2018b; Authority 2019 JANUARY 2019
Note: This figure is not showing all of the channel cross sections included in the hydraulic model.

Figure 2-2 Location and Limits of the Available Hydraulic Models: West Little Llagas Creek, FEMA Model



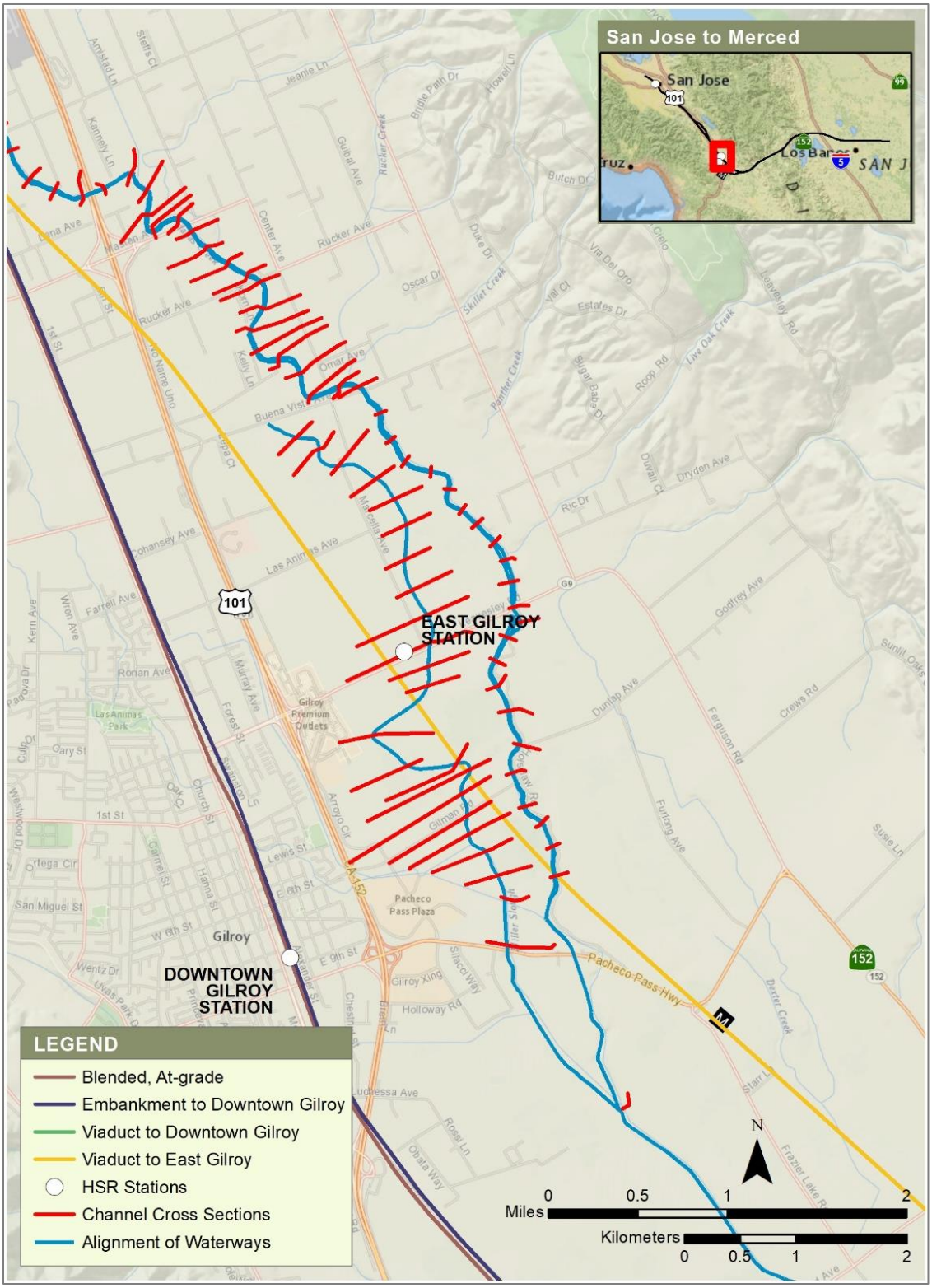
Sources: FEMA 2018c; Authority 2019
JANUARY 2019
Note: This figure is not showing all of the channel cross sections included in the hydraulic model.

Figure 2-3 Location and Limits of the Available Hydraulic Models: Llagas Creek, FEMA Model



Sources: FEMA 2018d; Authority 2019
JANUARY 2019
Note: This figure is not showing all of the channel cross sections included in the hydraulic model.

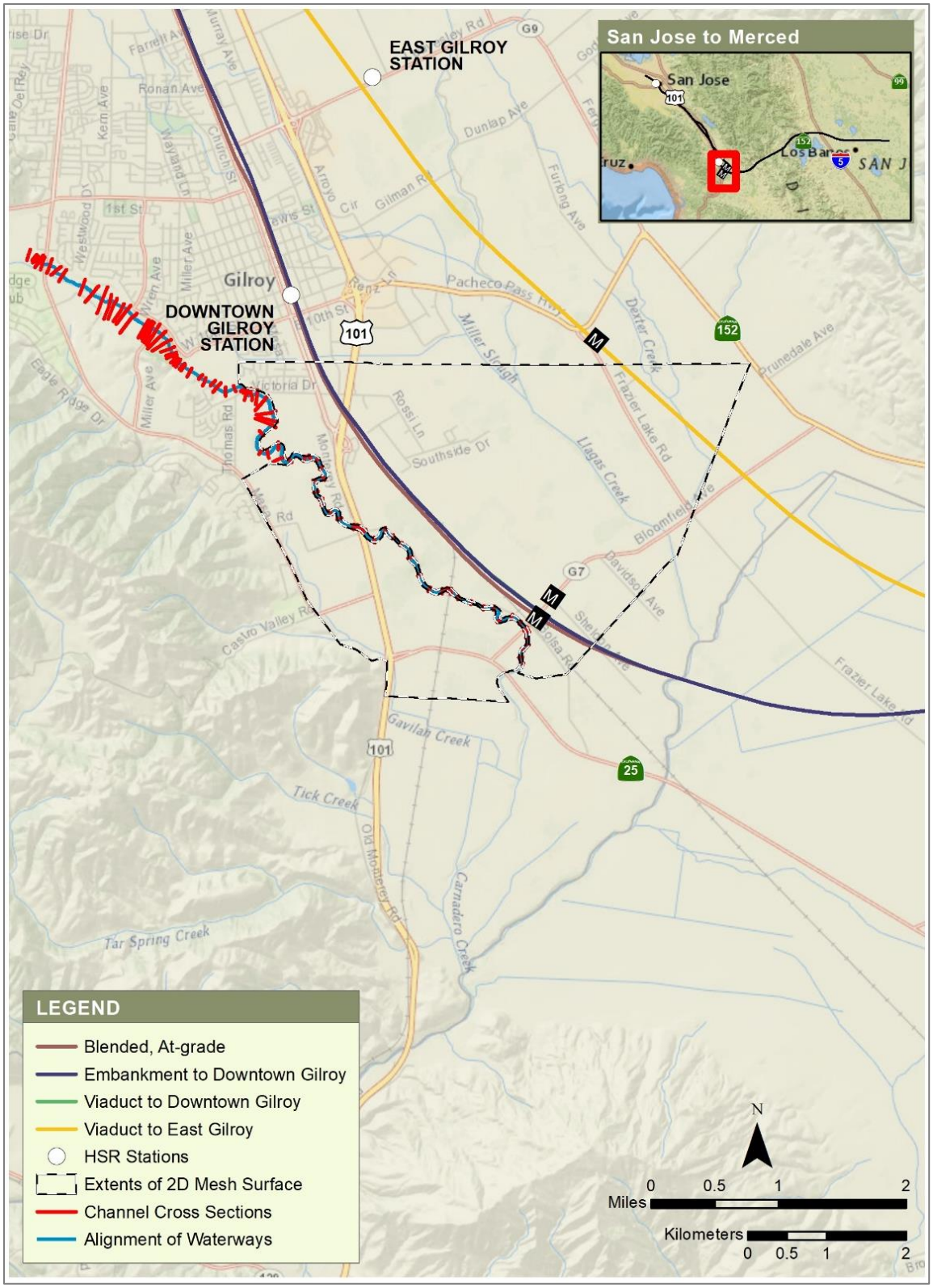
Figure 2-4 Location and Limits of the Available Hydraulic Models: West Branch Llagas Creek (north of Gilroy), FEMA Model



Sources: FEMA 2018c, 2018e; Authority 2019
Note: This figure is not showing all of the channel cross sections included in the hydraulic model.

JANUARY 2019

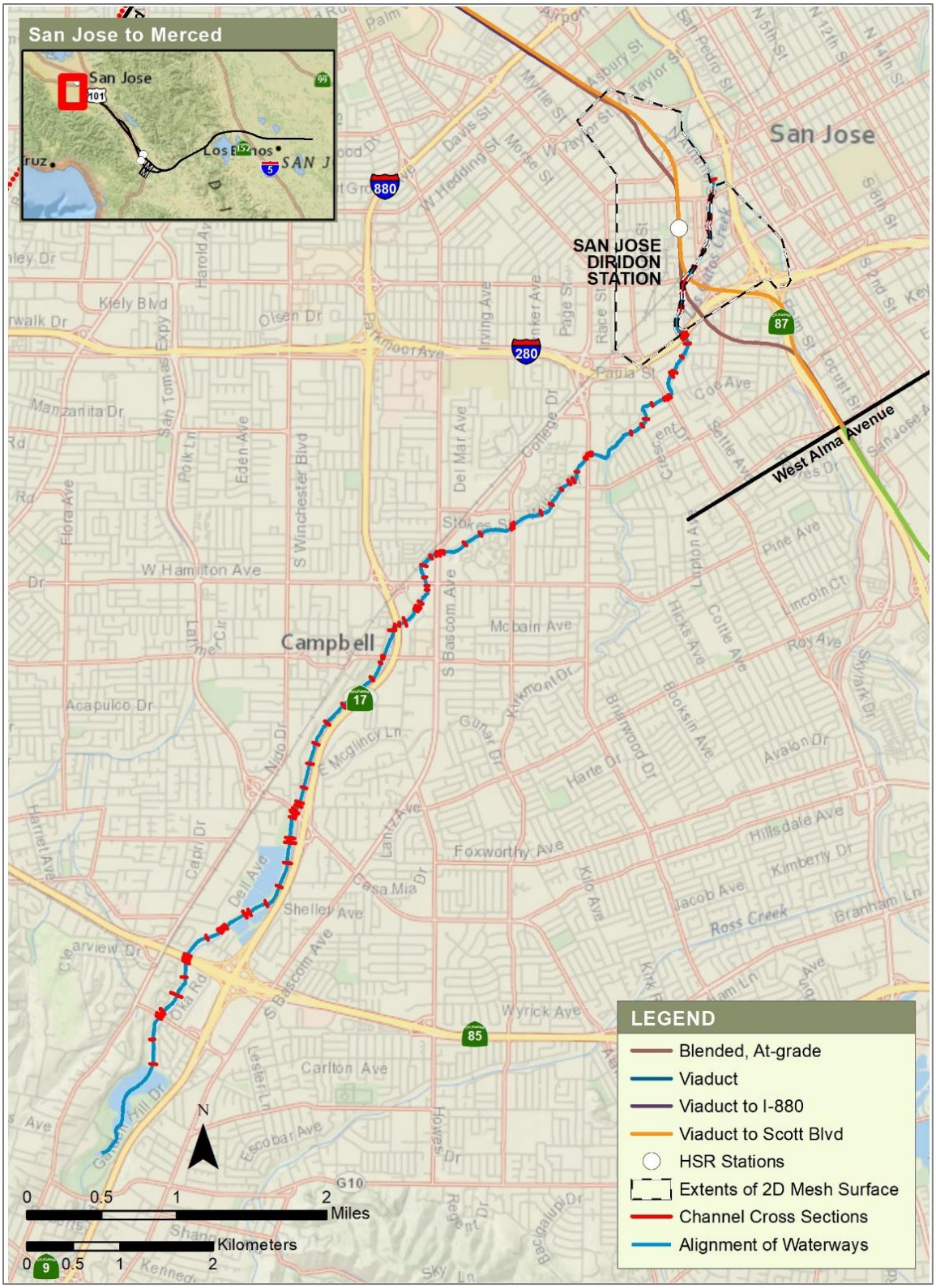
Figure 2-5 Location and Limits of the Available Hydraulic Models: Llagas Creek and Llagas Overbank (East of Gilroy), FEMA Model



Sources: FEMA 2018f; Authority 2019

JANUARY 2019

Figure 2-6 Location and Limits of the Available Hydraulic Models: Uvas-Carnadero Creek, FEMA Model



Sources: SCVWD 2018c; Authority 2019

JANUARY 2019

Figure 2-7 Location and Limits of the Available Hydraulic Models: Los Gatos Creek, SCVWD Model

Sources: SCVWD 2018a; Authority 2019

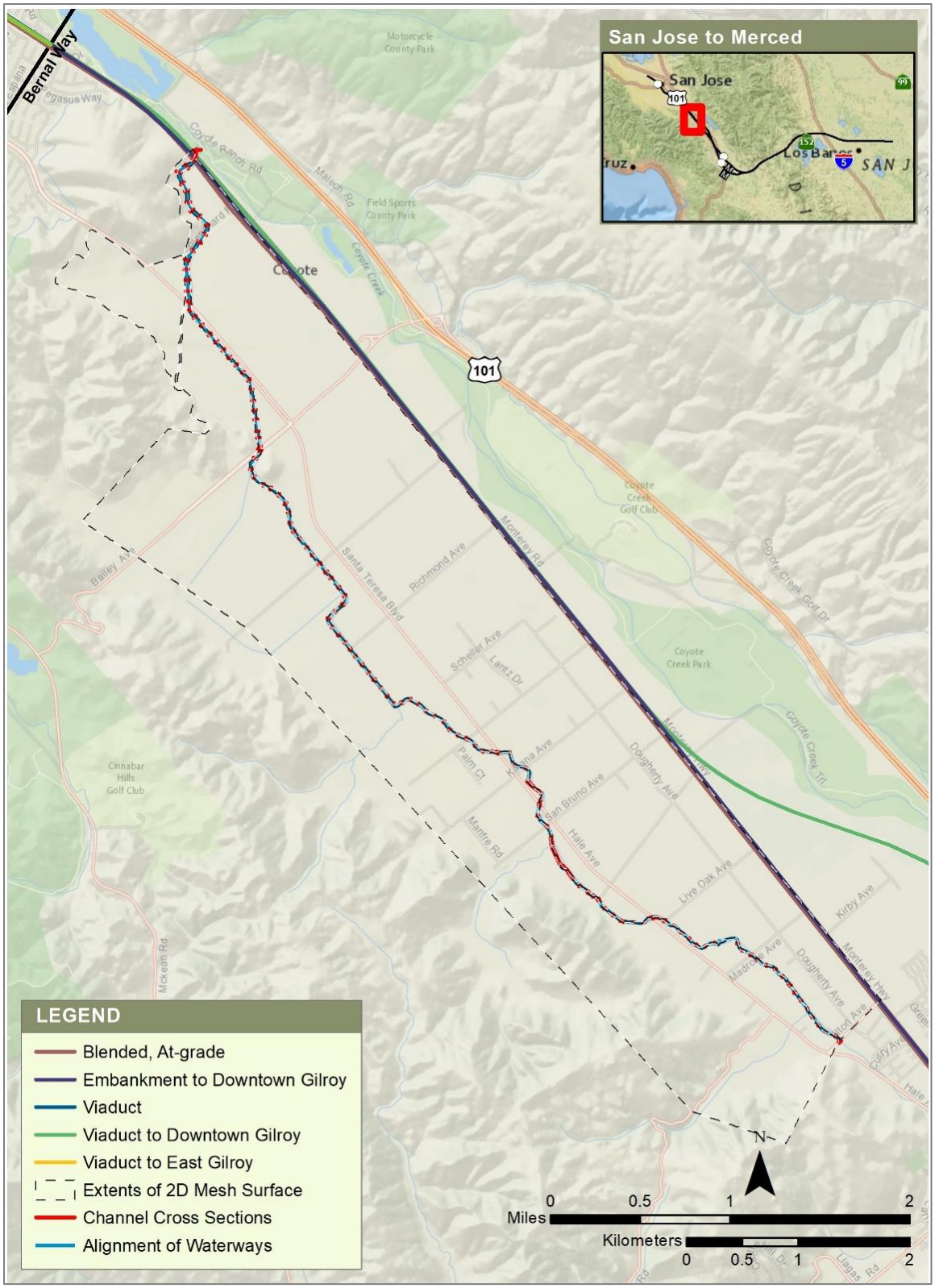
JANUARY 2019

Figure 2-8 Location and Limits of the Available Hydraulic Models: Guadalupe River and Tributaries, SCVWD Model

Sources: SCVWD 2014; Authority 2019

JANUARY 2019

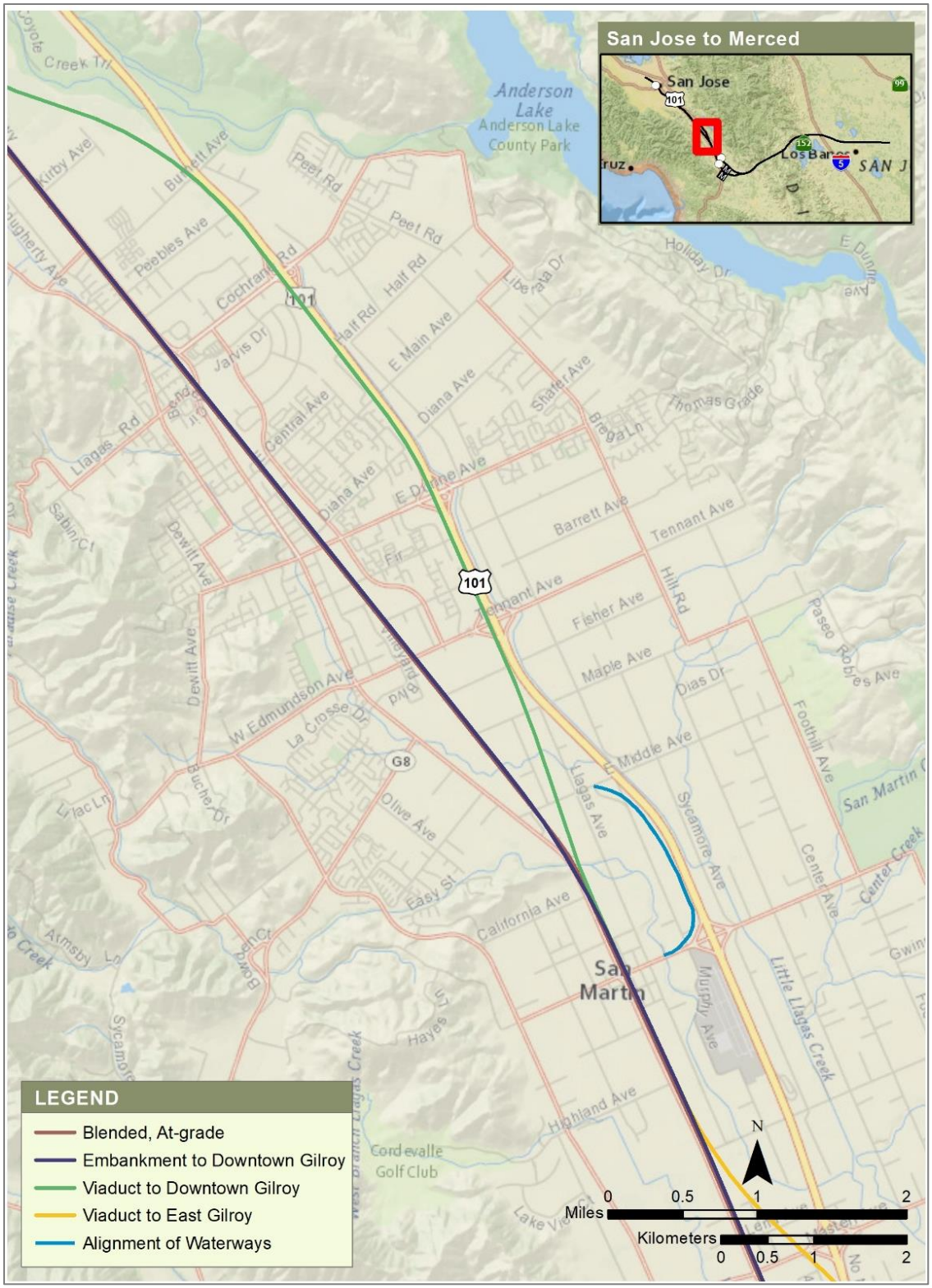
Figure 2-9 Location and Limits of the Available Hydraulic Models: Coyote Creek, SCVWD Model



Sources: SCVWD 2015a; Authority 2019

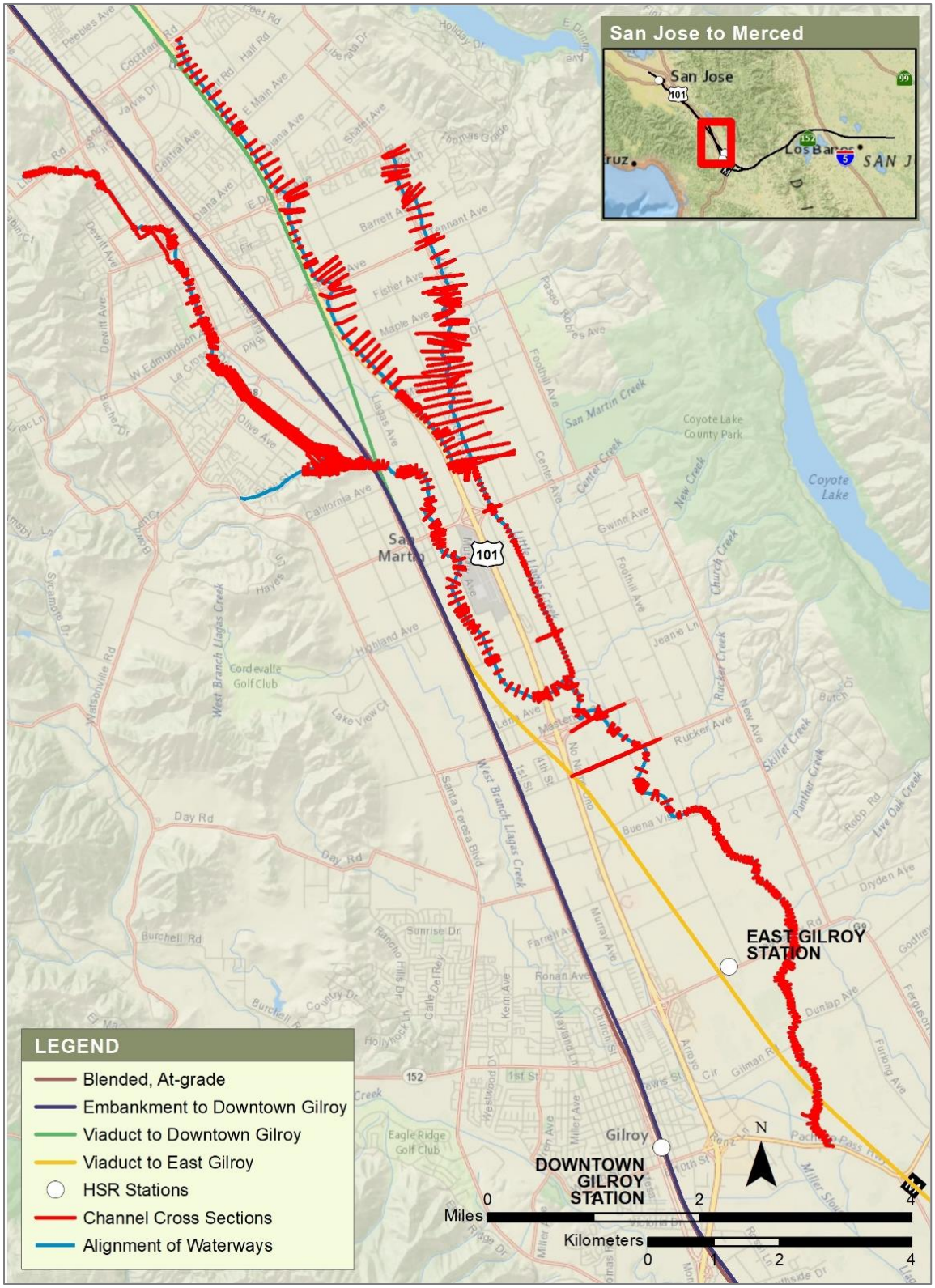
JANUARY 2019

Figure 2-10 Location and Limits of the Available Hydraulic Models: Fisher Creek, SCVWD Model



Sources: SCVWD 2018b; Authority 2019 JANUARY 2019
Note: There are no defined channel cross section locations in Middle Avenue Overflow.

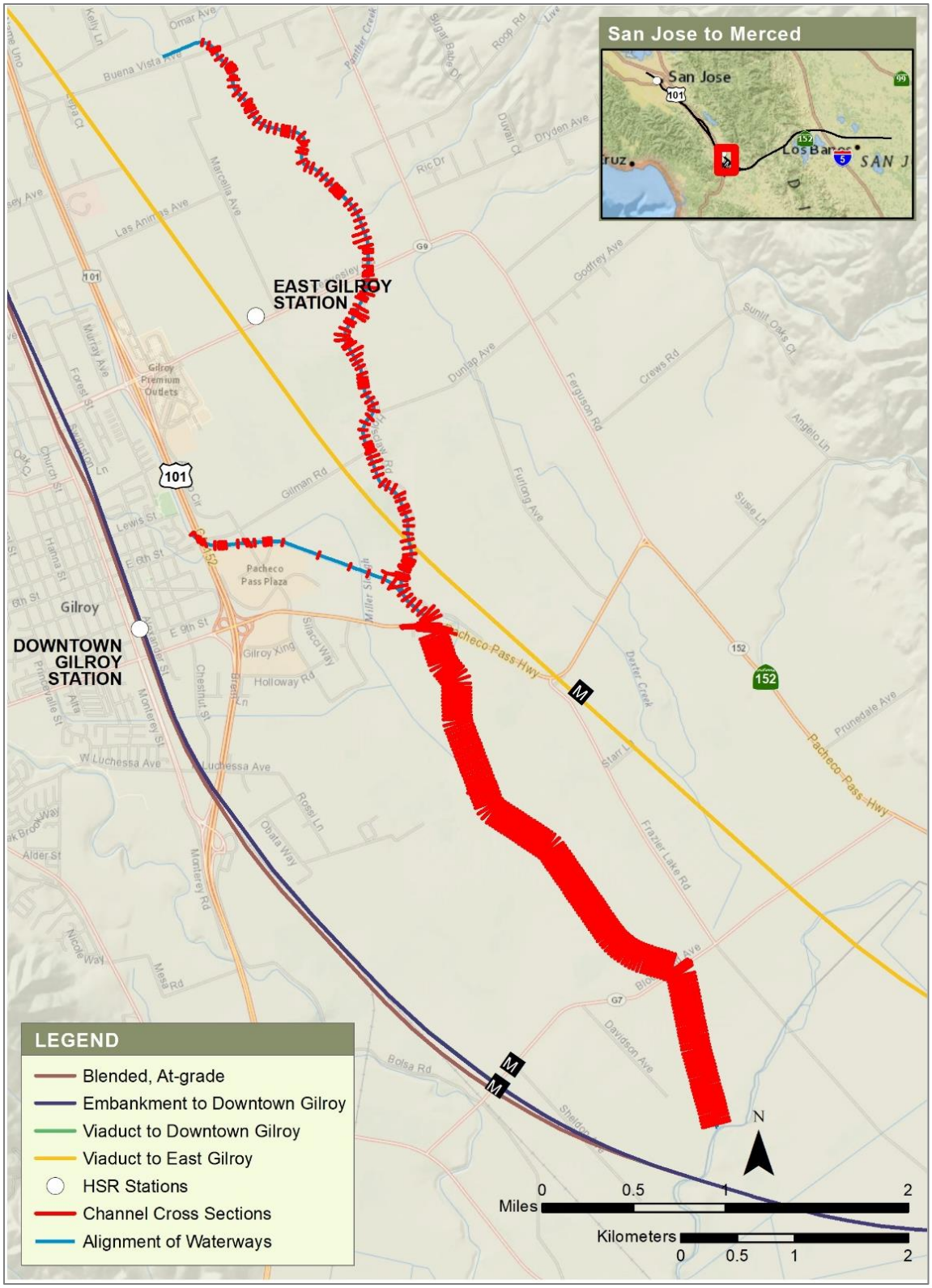
Figure 2-11 Location and Limits of the Available Hydraulic Models: West Little Llagas Creek – Middle Avenue Overflow, FEMA Model



Sources: SCVWD 2015b; Authority 2019

JANUARY 2019

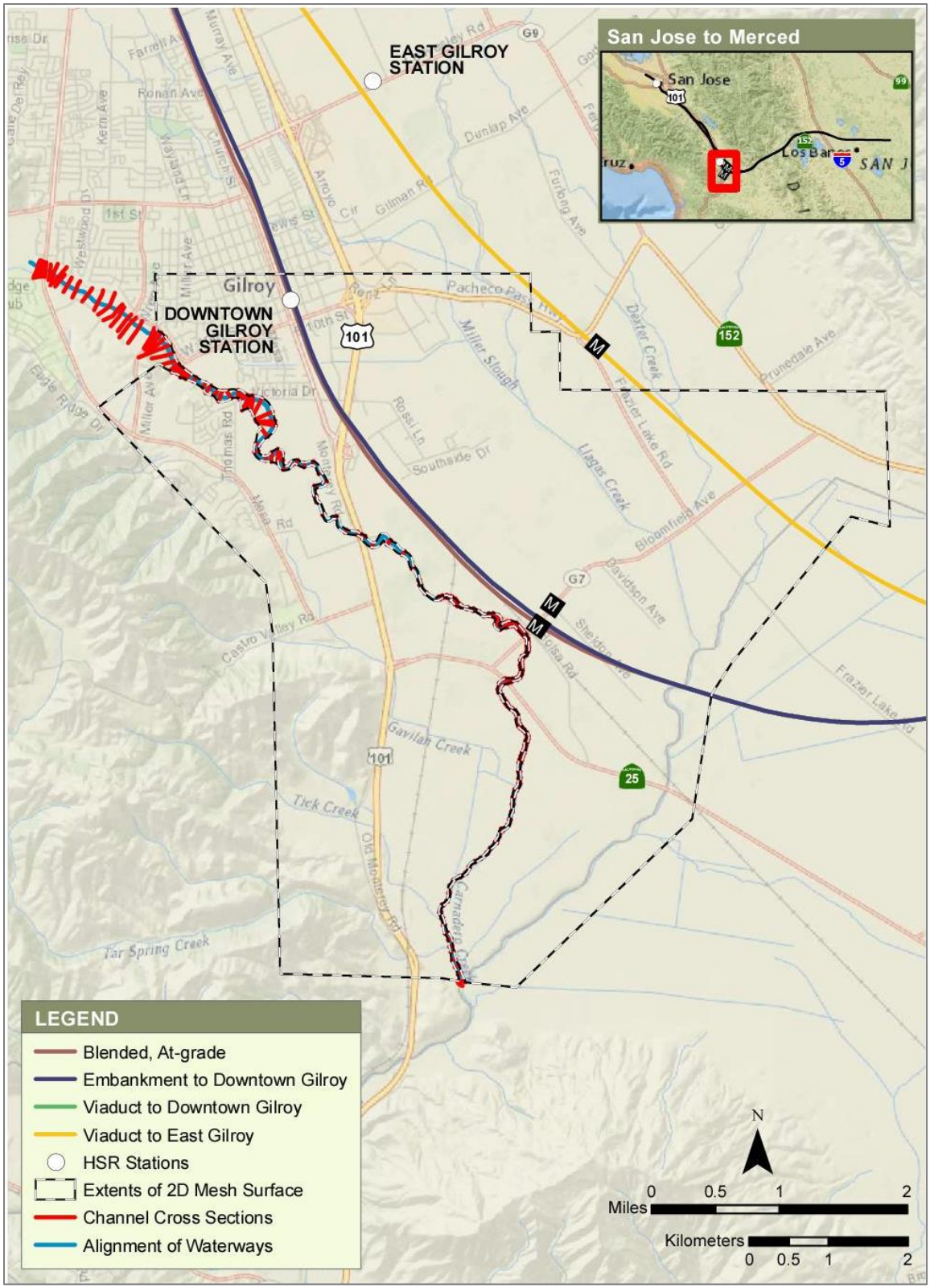
Figure 2-12 Location and Limits of the Available Hydraulic Models: Llagas Creek and Tributaries, SCVWD Model



Sources: SCVWD 2012; Authority 2019

JANUARY 2019

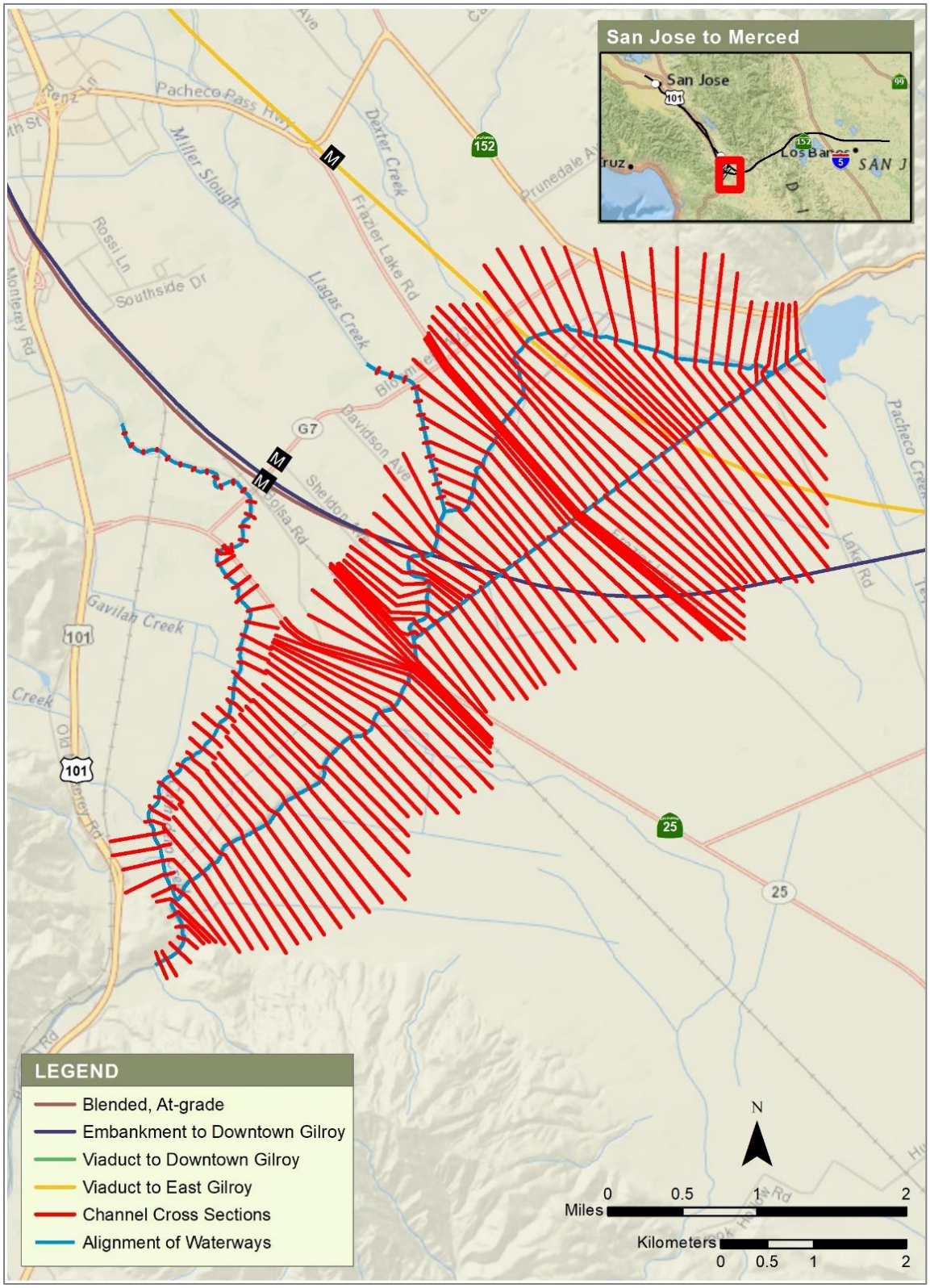
Figure 2-13 Location and Limits of the Available Hydraulic Models: Lower Llagas Creek, SCVWD Model



Sources: SCVWD 2016; Authority 2019

JANUARY 2019

Figure 2-14 Location and Limits of the Available Hydraulic Models: Uvas-Carnadero Creek, SCVWD Model



Sources: PRWFPA 2005; Authority 2019

JANUARY 2019

Figure 2-15 Location and Limits of the Available Hydraulic Models: Soap Lake (Pajaro River and Tributaries), PRWFPA Model

3 ONE-DIMENSIONAL HYDRAULIC ANALYSIS

A one-dimensional steady-state hydraulic analysis for the existing and proposed conditions were performed for the following four floodplains:

- Coyote Creek,
- West Little Llagas Creek (Mainline and Middle Avenue Overflow)
- West Branch Llagas Creek
- Llagas Creek (near San Martin, at East San Martin Avenue, at East of Gilroy, and Overbank)

This chapter provides a detailed discussion of the hydraulic analyses performed for these waterbodies for all four project alternatives.

For Coyote Creek, Llagas Creek (at San Martin, at East San Martin Avenue, at East Gilroy), the hydraulic model was provided by both FEMA and SCVWD. The hydraulic analysis was performed using both hydraulic models.

3.1 Design Tools

The HEC-RAS program, developed by the U.S. Army Corps of Engineers (USACE), was used to perform the hydraulic analyses of the four floodplains. For the hydraulic models provided in the USACE HEC-2 file format, HEC-RAS version 4.1.0 was selected to perform the hydraulic analysis.

3.2 Hydrology

The FEMA flood insurance study (FIS) for Santa Clara County, California, and Incorporated Areas, dated February 19, 2014, provided peak 100-year flow rates of the waterbodies near the project footprints. In addition, HEC-RAS hydraulic models provided by the SCVWD included 100-year flows.

The hydraulic analyses of the floodplain crossings were performed using peak 100-year flows, as specified in *Technical Memorandum 2.6.5, Hydraulics and Hydrology Design Guidelines* (Authority 2011b). Peak 100-year flows in FEMA's FIS for Santa Clara County and Incorporated Areas (last revised on February 19, 2014) (FEMA 2014) and hydraulic models provided by the SCVWD on June 3, 2016 and January 5, 2018, were compiled and reviewed (Table 3-1). The most conservative flow rates (i.e., highest) or best available data were used for the hydraulic analyses using the HEC-RAS hydraulic models. The hydraulic analysis was also performed using the FEMA effective hydraulic model and corresponding effective 100-year flood flows for the waterbodies in the FEMA detailed study. However, the FEMA effective hydraulic models may not represent the current channel condition of the floodplains, because it does not account for then recent channel improvements, new bridges, or other hydraulic structures constructed over the floodplain. Therefore, the outputs from the hydraulic analysis from the FEMA effective hydraulic models were not used to evaluate the project impacts for the waterbodies with more up-to-date hydraulic models to match the existing condition.

Table 3-1 Summary of 100-Year Flow Rates from FEMA and SCVWD

Floodplain	FEMA FIS Flow Rate (cfs)	SCVWD Flow Rate (cfs)	Type of Proposed Structures
Coyote Creek	12,630 to 15,000	15,000	New viaduct segment on the median of Monterey Road along left (west) bank of the creek and widening of Monterey Road (Alternatives 1 and 3) New embankment segment along left (west) bank of the creek and relocation of existing railroad track (Alternative 2) Share existing railroad track with UPRR and Caltrain. Second railroad track parallel to existing track would be installed at single-track segments. (Alternative 4)
West Little Llagas Creek	460 to 1,936	n/a	New viaduct segment over waterbody (Alternatives 1 and 3) New embankment segment with culvert opening over waterbody (Alternative 2) Second railroad track adjacent to existing railroad track would be installed at single-track segments (Alternative 4)
West Little Llagas Creek, Middle Avenue Overflow	658	n/a	Modifications to the roadway alignment (Alternative 2)
West Branch Llagas Creek	160 to 1,400	n/a	Modifications to the roadway alignment (Alternative 2)
Llagas Creek (at San Martin)	5,300	5,532	New viaduct segment over waterbody (Alternatives 1 and 3) New embankment segment with new bridge over waterbody, relocation of existing railroad bridge, and relocation of existing Monterey Road Bridge (Alternative 2) New 2-track railroad bridge on same alignment as existing railroad bridge (Alternative 4)
Llagas Creek (at East San Martin Avenue)	5,300	4,330	Modifications to the roadway alignment (Alternative 2)
Llagas Creek (at East Gilroy)	6,300	8,848 (17,800)[1]	New embankment segment with new bridge over creek (Alternative 3)
Llagas Overbank	900 to 7,500	n/a	New embankment segment (Alternative 3) Proposed Traction Power Switch Station (Alternatives 1 ,2 and 4)

Sources: SCVWD 2014, 2018a; FEMA 2014
FEMA = Federal Emergency Management Agency
SCVWD = Santa Clara Valley Water District
cfs = cubic feet per second
FIS = flood insurance study
UPRR = Union Pacific Railroad
[1] This flow rate of 8,848 cfs is flow remaining in the main channel of Llagas Creek at the project location. 100-year flow rate would be 17800 cfs with no spill flows on upstream of the project location.

3.3 General Hydraulic Model Assumptions

This section discusses assumptions used to perform the one-dimensional steady-state hydraulic analysis of the existing and proposed conditions. For all one-dimensional hydraulic analyses, the hydraulic model would have to be revised when more survey data and detailed project plans are available.

3.3.1 Vertical Datum (All Hydraulic Models)

Not all of the hydraulic models provided by the SCVWD provided the vertical datum referenced by the hydraulic model. Hydraulic models provided by the SCVWD without references to vertical datum were assumed to be referencing the North American Vertical Datum of 1988 (NAVD 88).

In addition, hydraulic models provided by the FEMA did not provide the vertical datum referenced by the hydraulic model. The inputs included in the FEMA hydraulic model were compared with the flood profiles included in the FEMA FIS for Santa Clara County, and it was assumed to be referencing the National Geodetic Vertical Datum of 1929 (NGVD 29) when the flood profiles from the hydraulic model are not matching with the flood profiles included in the FEMA FIS referencing NAVD 88 as vertical datum. All of the hydraulic models provided by FEMA were converted to reference NAVD 88 as vertical datum for this study.

3.3.2 Changes to Base Hydraulic Model (All Hydraulic Models)

The channel cross sections included in the HEC-2 HEC-RAS hydraulic models provided by FEMA, SCVWD, and PRWFPA were not always in the optimal locations to represent the upstream and downstream faces of the new and relocated bridges. In the proposed condition hydraulic model, the channel cross sections in the project footprint were interpolated, removed, or new cross sections were added based on available topographic information, to best represent the upstream and downstream faces of the existing and proposed bridges for all project alternatives. In this phase of the proposed project, it was assumed that these channel cross sections would best represent the channel characteristics of the waterbodies in the project footprint. These cross sections in the hydraulic models will be revised when detailed survey data becomes available.

3.3.3 Cut/Fill in the Channel Overbank Areas (All Hydraulic Models)

All four project alternatives propose modifications to the existing roadways in the project footprint. The extents of cut/fill and profile of proposed roadway were not available for all of the roadway crossings that were within the limits of the hydraulic model. Therefore, the proposed condition hydraulic model did not made changes to the channel geometry for the locations where detailed cut/fill information were not available.

3.3.4 HEC-2 Hydraulic Models

HEC-2 hydraulic model for Coyote Creek, West Little Llagas Creek, West Little Llagas Creek – Middle Avenue Overflow, West Branch Llagas Creek, Llagas Creek, and Llagas Overbank were provided to the Authority.

The hydraulic models for West Little Llagas Creek, West Little Llagas Creek - Middle Avenue Overflow, and West Branch Llagas Creek were provided to the Authority in electronical file format. These electronical files were converted into HEC-RAS version 4.1.0 to perform hydraulic analysis.

The hydraulic model for Coyote Creek, Llagas Creek, and Llagas Overbank were provided as pdf print of the inputs and outputs. The pdf print of the model inputs and outputs were compared with the hydraulic models available in the SCVWD's HEC-2/HEC-RAS library. When confirmed that they are identical, the electronic HEC-2 files from SCVWD HEC-2/HEC-RAS library are converted into HEC-RAS version 4.1.0 file format to perform hydraulic analysis.

All of the HEC-2 hydraulic models used to perform hydraulic analysis for this project were not georeferenced and did not provide alignment and limits of the channel cross sections and upstream/downstream limits of the floodplain. The upstream/downstream limits of the hydraulic

model and the extents of the channel cross sections were estimated based on following available information:

- The alignments and limits of the floodplains and channel cross sections shown in the FEMA FIRM.
- Comparison of the river stations included in the HEC-2 hydraulic model and the river stations from the flood profiles included in FEMA FIS.

The alignments and limits of channel cross sections shown in the FEMA FIRM did not provide approximate location of all of the channel cross sections included in the FEMA effective hydraulic model. In addition, the width of the channel cross sections from the FEMA FIRM did not always match with the channel widths from the corresponding channel cross sections included in the FEMA effective hydraulic model. Therefore, the location of the proposed HSR structures included in the channel geometry of the proposed condition hydraulic model were based on the best estimate from the available information.

3.3.5 Upper Llagas Flood Protection Project

SCVWD's Upper Llagas Flood Protection Project would modify the alignment of floodplains and extents of the 100-year floodplain in the project footprint. This SCVWD project is divided into two phases, and first construction phase is anticipated to occur by spring 2019 (SCVWD 2018e). The start of construction for the second construction phase is not yet determined by the SCVWD.

The SCVWD hydraulic model of Llagas Creek and tributaries showed ultimate built-out condition for this project. The hydraulic model intermediate condition after completion of Phase 1 was not available. The Authority assumed Upper Llagas Flood Protection Project would be completed before the start of construction of the San Jose to Merced segment of HSR.

The FEMA effective hydraulic models for Llagas Creek (near San Martin [Section 3.6] and at East San Martin Avenue [Section 3.7]) did not include improved channels after completion of Upper Llagas Flood Protection Project, which was assumed as existing condition for the project. Therefore, hydraulic analysis outputs from FEMA effective model were not used to evaluate project's potential floodplain impacts. The outputs from the SCVWD hydraulic model were used to evaluate the project's potential floodplain impacts.

After completion of Upper Llagas Flood Protection Project, existing floodplains for West Little Llagas Creek (Section 3.5), West Little Llagas Creek – Middle Avenue Overflow (Section 3.8), and Llagas Overbank (Section 3.11) in the project footprint would not be classified as 100-year floodplain. Therefore, hydraulic analysis outputs from FEMA effective model were not used to evaluate project's potential floodplain impacts. Because these floodplains were not included in the SCVWD hydraulic model and would be outside of the 100-year floodplain, project's potential impacts on the floodplain were not evaluated for these three existing floodplains.

3.4 Coyote Creek

3.4.1 Background Information

3.4.1.1 Floodplain Location

Coyote Creek begins at its headwaters at Anderson Reservoir and Dam and runs through the cities of Morgan Hill and San Jose before draining to the San Francisco Bay (Authority 2011a). In Morgan Hill, Coyote Creek has remained natural and includes a multipurpose recreational trail and wetlands areas.

3.4.1.2 FEMA Floodplain

According to the FEMA FIRM Panel Numbers 60685C0407H, 60685C0426H, 60685C0428H, 60685C0429H, 60685C0437H, and 60685C0441H (FEMA 2009), the main channel of Coyote Creek in the project footprint is identified as Zone AE with floodway (Figure 3-1 and Figure 3-2).

Coyote Creek in project footprint is recognized as a floodway. Therefore, the project cannot raise the 100-year flood profile of Coyote Creek.

3.4.1.3 Project Alternatives in the FEMA Floodplain

The permanent project footprints for all four project alternatives are in the existing 100-year floodplain for Coyote Creek (Figure 3-1 and Figure 3-2). Coyote Creek flows toward the southwest in the project vicinity, and Monterey Road and existing railroad track parallels Coyote Creek in the project footprint. None of the alternatives would entail hydraulic structures spanning Coyote Creek.

The proposed HSR viaduct section (Alternatives 1 and 3) follows the southwestern bank of Coyote Creek. This alternative requires widening of Monterey Highway to construct pier columns for viaduct section in the median of Monterey Highway.

The proposed embankment section for Alternative 2 follows the southwestern bank of Coyote Creek. This alternative would require realignment of exiting Monterey Highway and railroad track to accommodate two railroad tracks for the HSR.

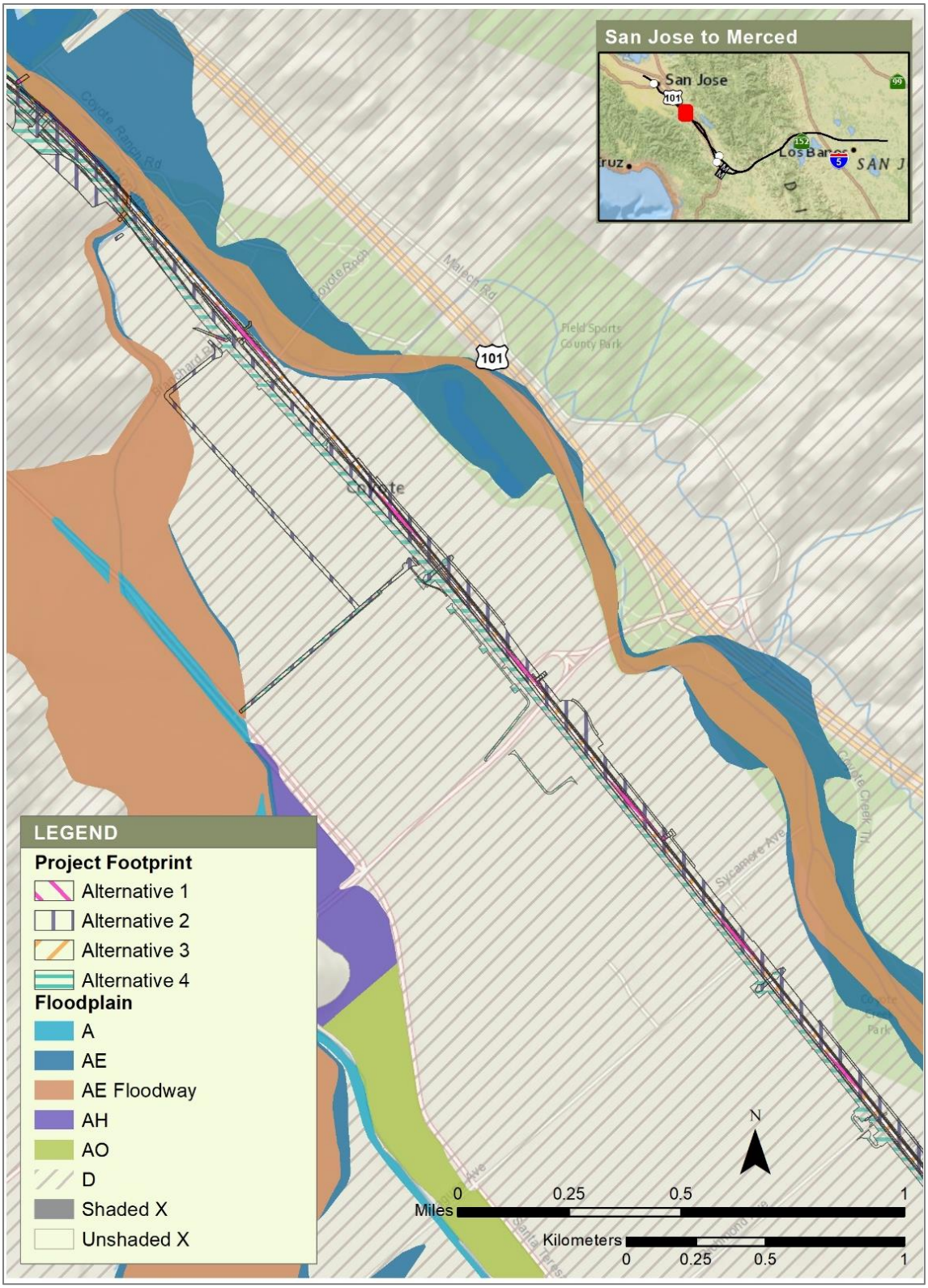
Alternative 4 proposes a blended at-grade track using the existing railroad track which is following the southwestern bank of Coyote Creek. This alternative require construction of additional railroad track at a single-track segment under the existing condition.

All project alternatives are proposing wildlife crossings under the existing railroad track and/or Monterey Highway.

3.4.1.4 Available Hydraulic Models

The FEMA effective hydraulic model and the SCVWD hydraulic model were available for this floodplain. Figure 3-3, Figure 3-4, and Figure 3-5 shows the approximate limits of the FEMA effective hydraulic model and the permanent project footprint for Alternatives 1 and 3, Alternative 2, and Alternative 4 along Coyote Creek, respectively. Figure 3-6, Figure 3-7, and Figure 3-8 shows the limits of the SCVWD hydraulic model and the permanent project footprint for Alternatives 1 and 3, Alternative 2, and Alternative 4 along Coyote Creek, respectively.

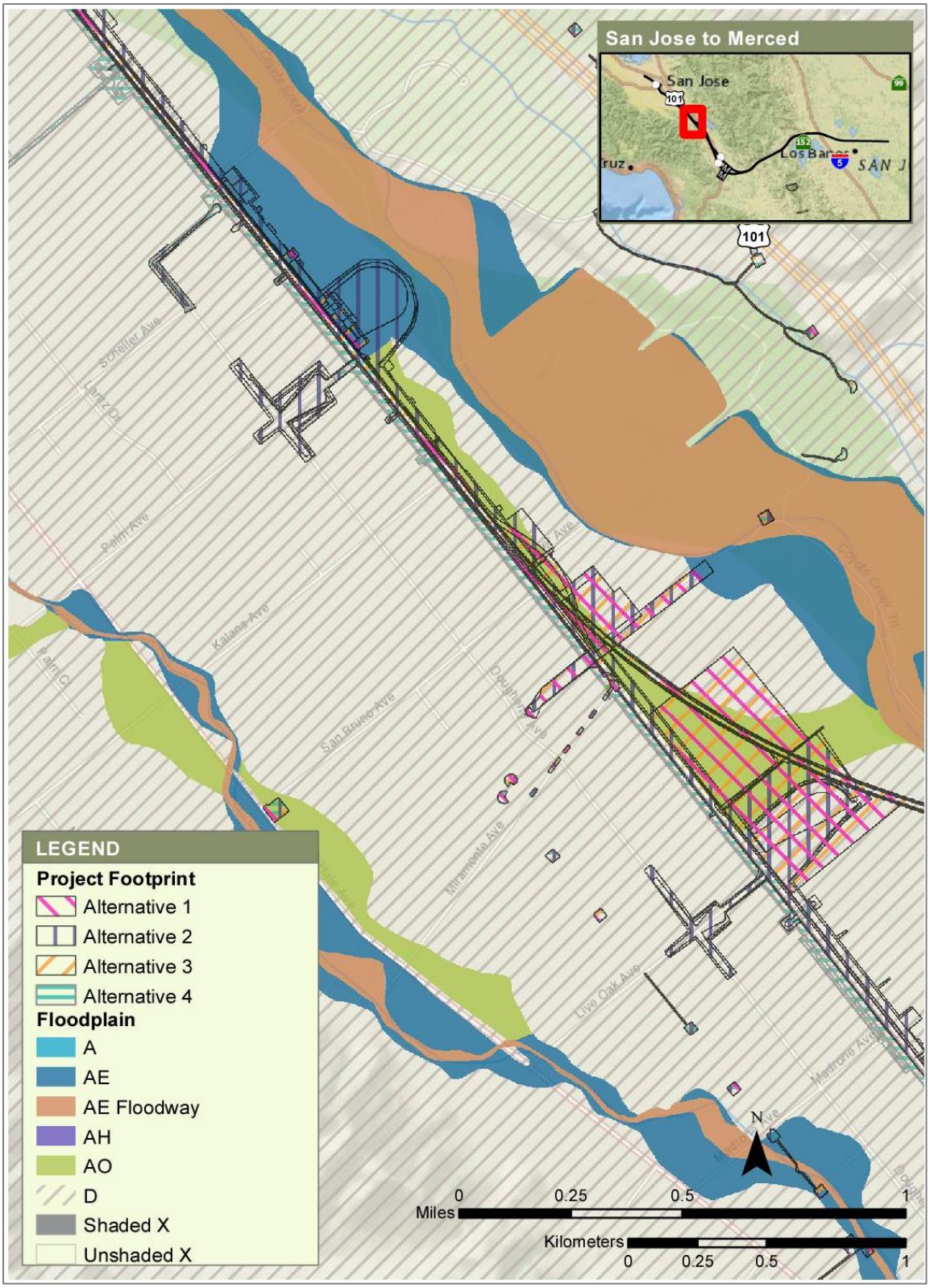
The FEMA effective hydraulic model provided does not include up-to-date available information that were included in the SCVWD hydraulic model. Therefore, the SCVWD hydraulic model was used to evaluate the project's potential impacts.



Sources: FEMA 2009; Authority 2019 .

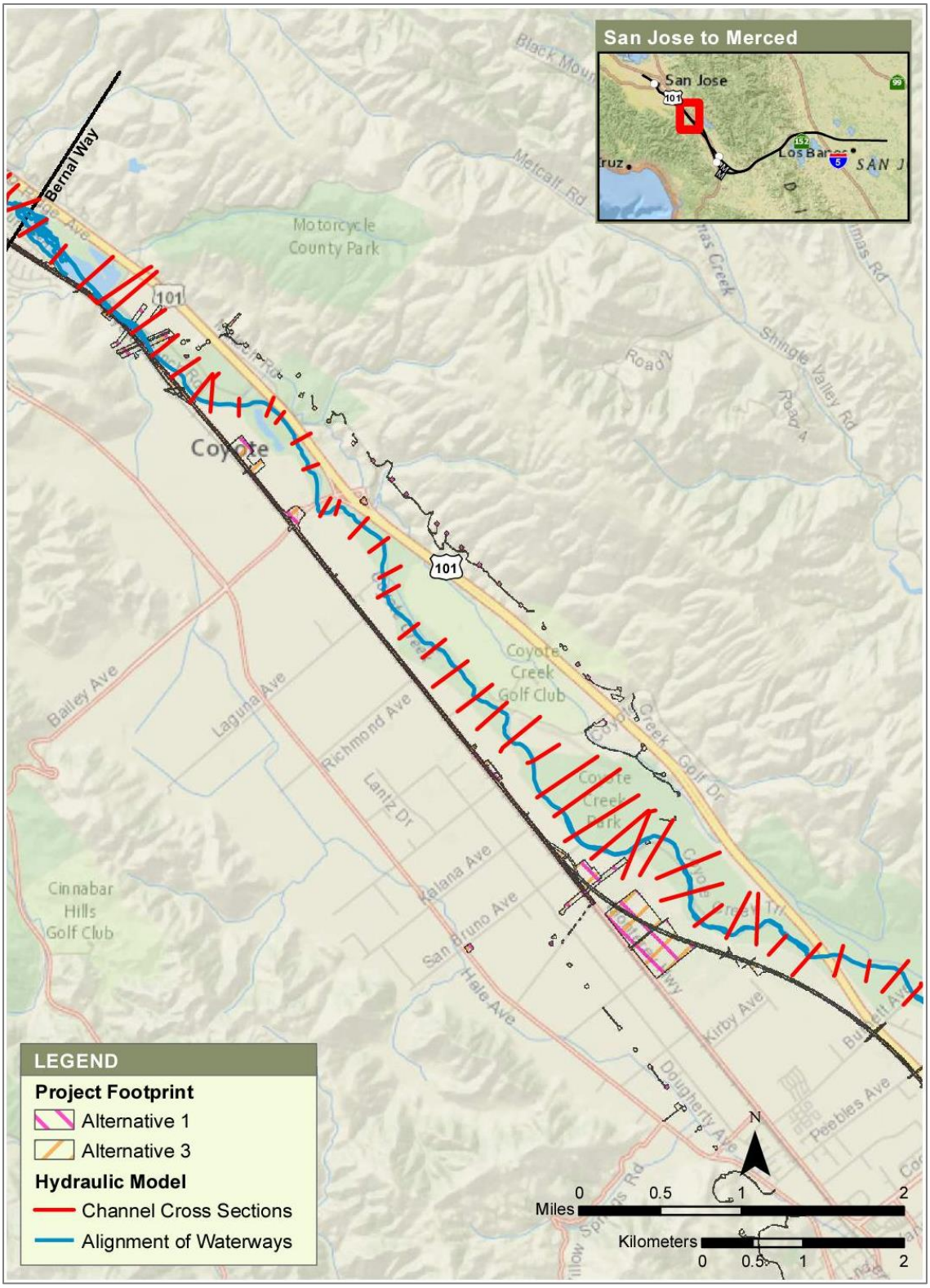
JANUARY 2019

Figure 3-1 Coyote Creek, FEMA FIRM Overlay with Project Footprints for Alternatives 1, 2, 3, and 4, Page 1/2



Sources: FEMA 2009; Authority 2019 . JANUARY 2019

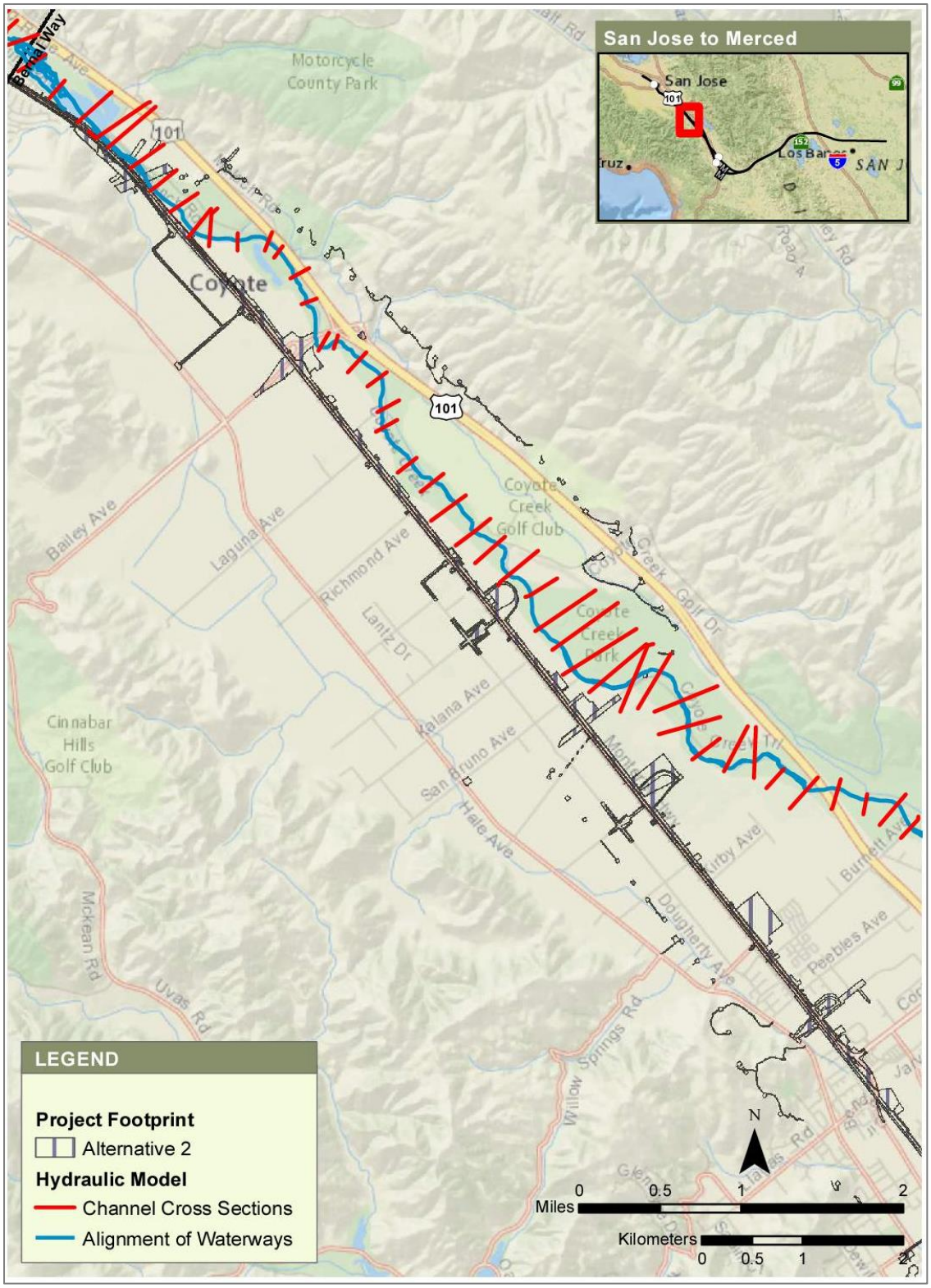
Figure 3-2 Coyote Creek, FEMA FIRM Overlay with Project Footprints for Alternatives 1, 2, 3, and 4, Page 2/2



Sources: FEMA 2018; Authority 2019. JANUARY 2019

Note: This figure does not display all channel cross sections included in the hydraulic model.

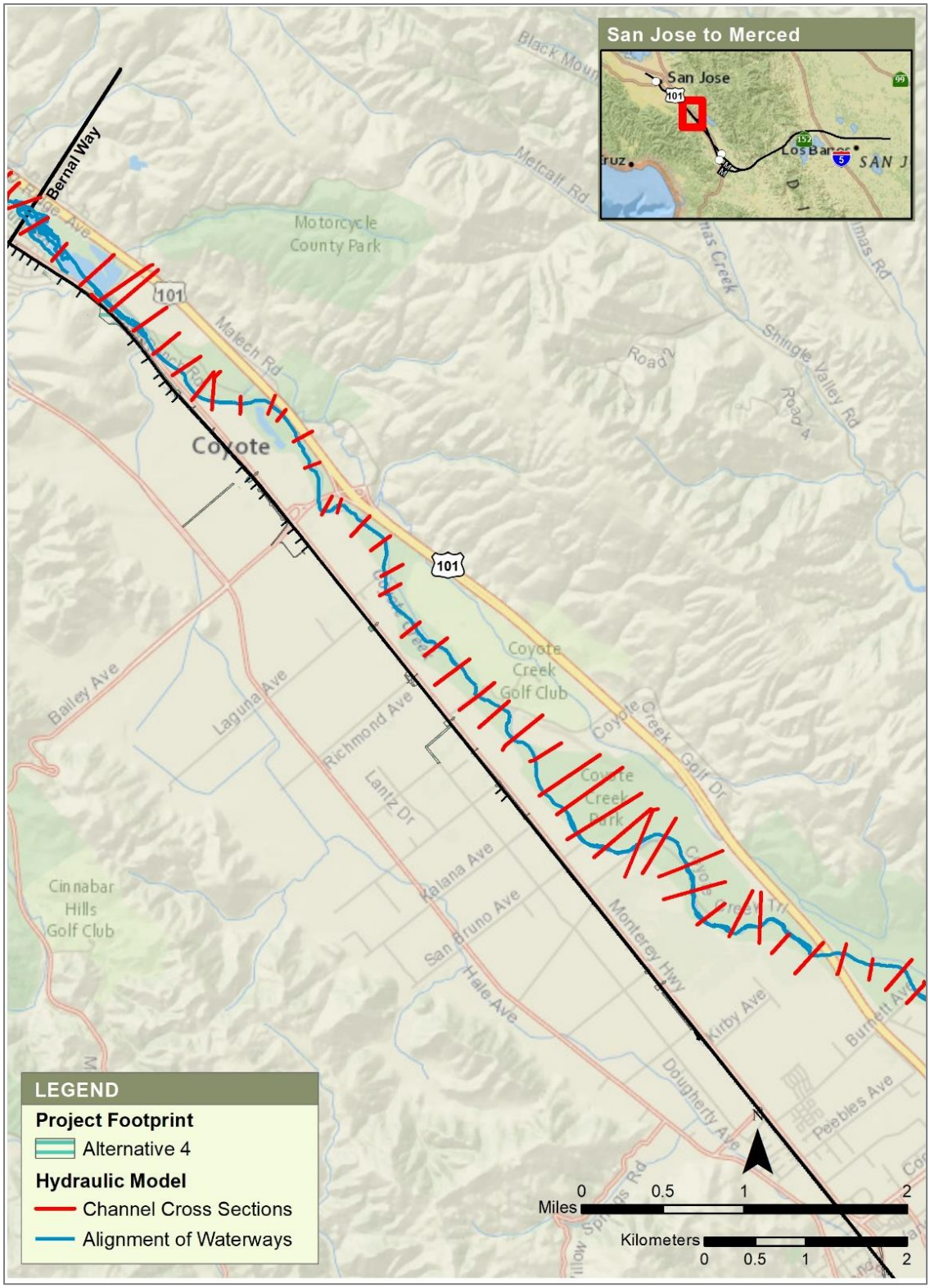
Figure 3-3 Coyote Creek, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternatives 1 and 3



Sources: FEMA 2018; Authority 2019. JANUARY 2019

Note: This figure does not display all channel cross sections included in the hydraulic model.

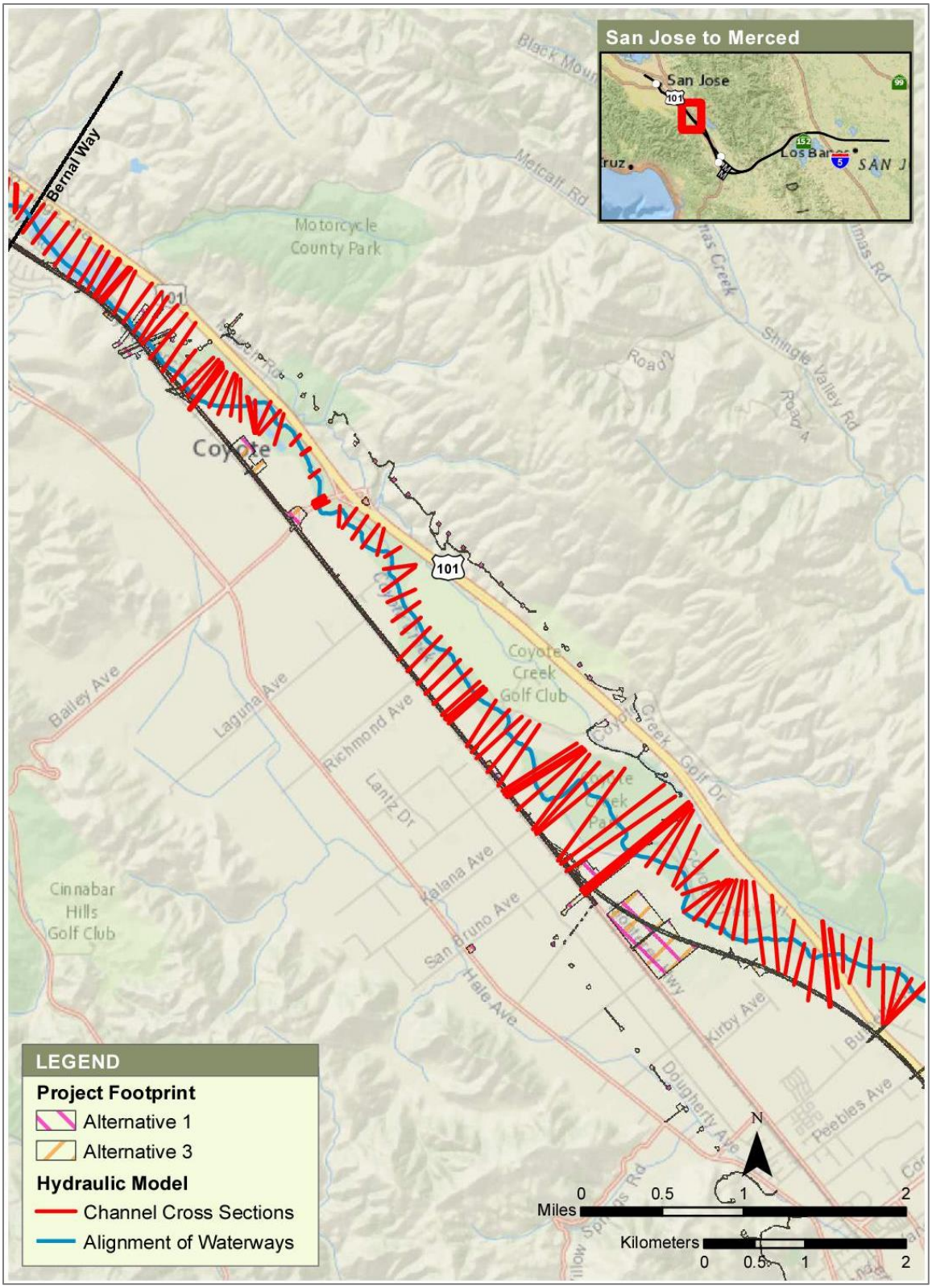
Figure 3-4 Coyote Creek, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 2



Sources: FEMA 2018; Authority 2019. JANUARY 2019

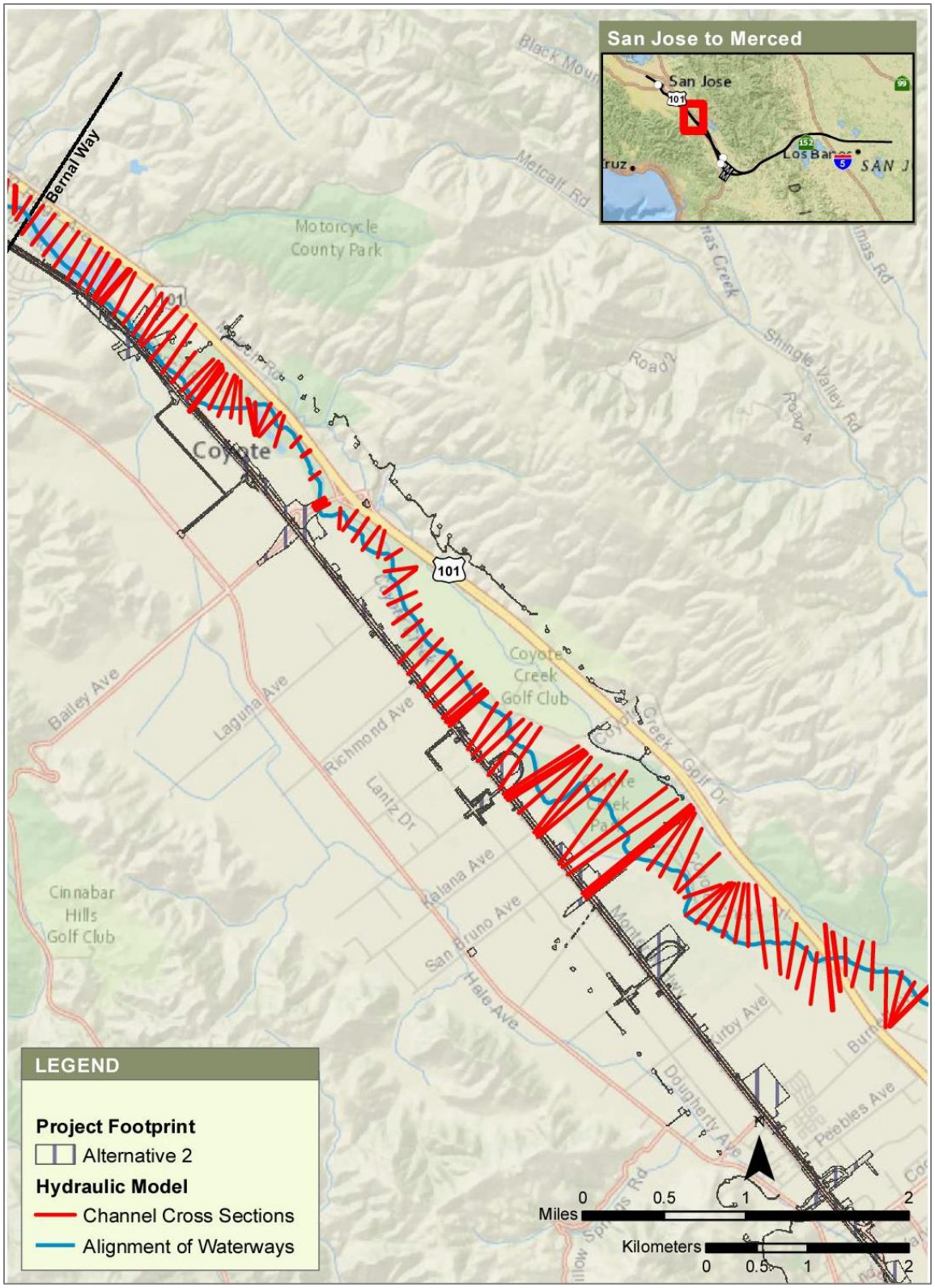
Note: This figure does not display all channel cross sections included in the hydraulic model.

Figure 3-5 Coyote Creek, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 4



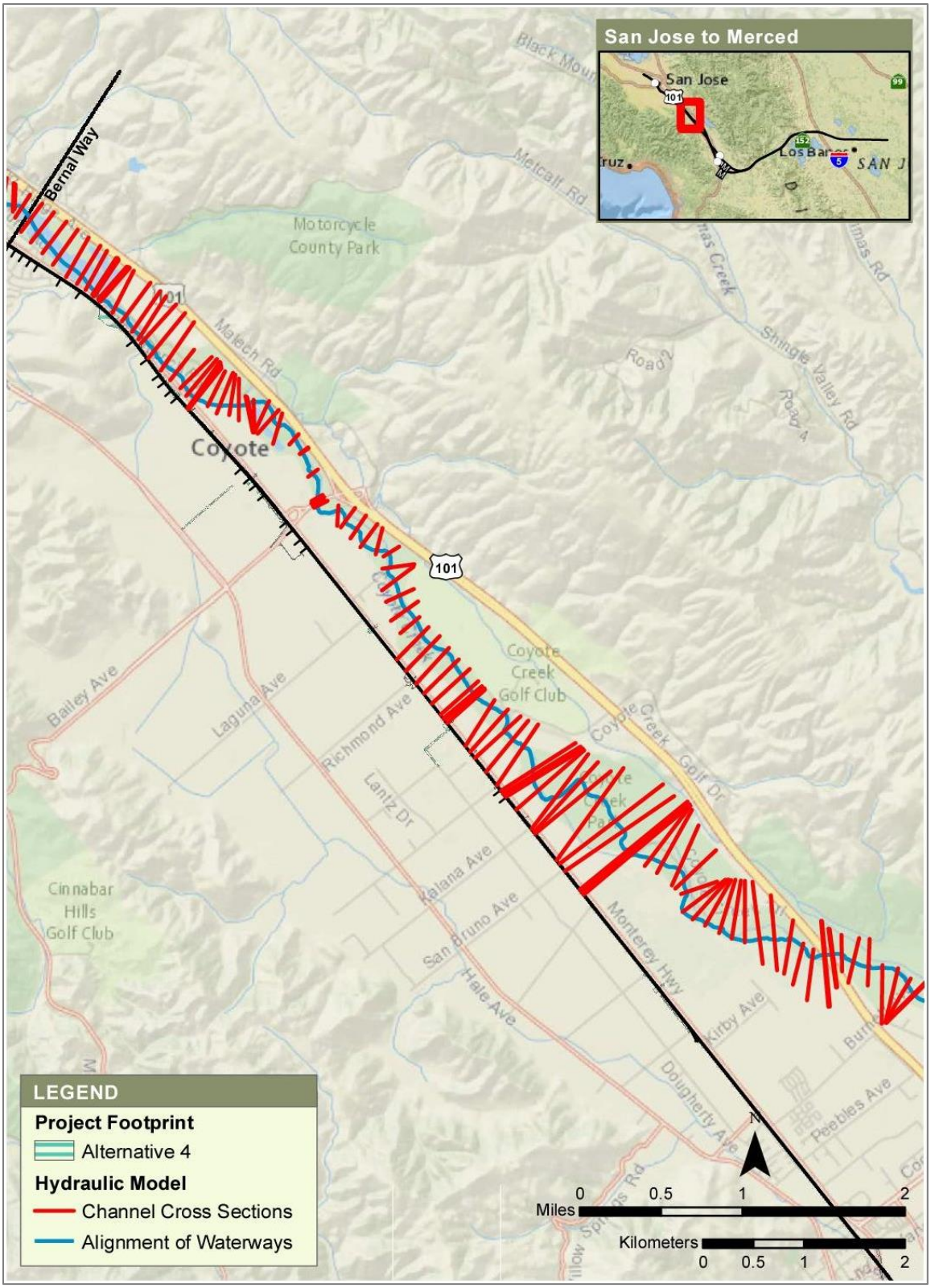
Sources: SCVWD 2014; Authority 2019 . JANUARY 2019

Figure 3-6 Coyote Creek, Plan View of SCVWD Hydraulic Model with Project Footprint for Alternatives 1 and 3



Sources: SCVWD 2014; Authority 2019 . JANUARY 2019

Figure 3-7 Coyote Creek, Plan View of SCVWD Hydraulic Model with Project Footprint for Alternative 2



Sources: SCVWD 2014; Authority 2019 . JANUARY 2019

Figure 3-8 Coyote Creek, Plan View of SCVWD Hydraulic Model with Project Footprint for Alternative 4

3.4.2 FEMA Effective Hydraulic Model

3.4.2.1 Overview of Hydraulic Model

The pier columns supporting the proposed viaduct segment on top of the Monterey Road for Alternatives 1 and 3 were represented in the proposed condition hydraulic model by adding piers into channel cross sections.

The limits of the FEMA effective model as shown in the channel information included in the FEMA digital FIRM for Santa Clara County extends into project footprint for Alternatives 2 and 4. However, the limits of the FEMA effective model where it extended into the permanent impact areas are at the locations where detailed grading plan is not available or areas with no fill inside the limits of the FEMA effective hydraulic model. Therefore, hydraulic analysis for Alternatives 2 and 4 were not performed using the FEMA effective hydraulic model.

3.4.2.2 Water Surface Elevations

The modeling results for the viaduct structure over Old Monterey Road (Alternatives 1 and 3), is shown in Table 3-2. The outputs for Alternatives 1 and 3 do not show increases in the 100-year flood profile inside the Coyote Creek main channel.

However, the flood profile of Coyote Creek from the hydraulic analysis is not representing the current condition of Coyote Creek, because it did not include the existing US 101/SR 85 Interchange Bridge over Coyote Creek located in the project vicinity. In addition, the extent of the channel cross sections in the southwestern overbank areas were not extended sufficiently to include the permanent project footprint for all proposed alternatives along Coyote Creek. Therefore, outputs from the hydraulic analysis using the FEMA effective hydraulic model was not used to evaluate the project's potential impacts on the existing 100-year floodplain.

Table 3-2 Hydraulic Modeling Results, Coyote Creek, Alternatives 1 and 3, FEMA Model

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Metcalf Rd	14,850	244.4	243.9	243.9	0.0
Upstream of Sycamore Avenue	15,000	270.5	268.5	268.5	0.0
At Coyote Creek Golf Drive	15,000	296.6	300.3	300.3	0.0
At Barnhart Ave	15,000	322.0	321.5	321.5	0.0
At US 101	15,000	355.5	348.4	348.4	0.0

Elevations are rounded to the nearest 0.1 foot.
FEMA = Federal Emergency Management Agency
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
US = U.S. Highway

3.4.3 SCVWD Hydraulic Model

3.4.3.1 Overview of Hydraulic Model

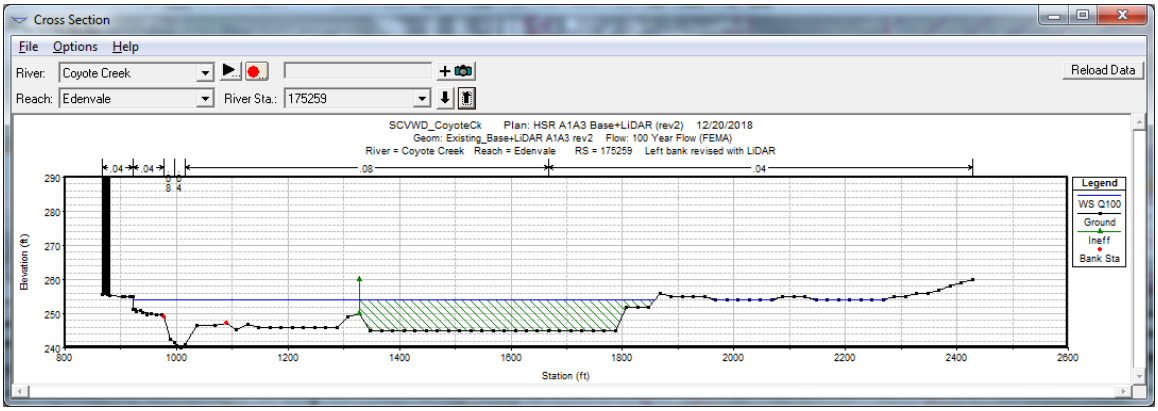
The upstream and downstream limits of the hydraulic model were outfalls from Anderson Reservoir and at the I-280 bridge, respectively. The distance between the upstream and downstream limits of the hydraulic model is approximately 22.4 miles and is represented by 371 channel cross sections. The extents of the channel cross sections for Coyote Creek in the SCVWD model along Monterey Highway is generally wider than the current effective FEMA model.

Anderson Reservoir is in unincorporated Santa Clara County just northeast of Morgan Hill. The reservoir outfall is located approximately 2 miles east of U.S. Highway (US) 101 and approximately 3 miles east of Old Monterey Road (Alternatives 1 and 3) and existing railroad track (Alternative 2). The I-280 bridge over Coyote Creek is approximately 2 miles east of the existing San Jose Diridon Station. Coyote Creek flows parallel to the proposed HSR alignment along the Monterey Corridor Subsection.

The pier columns supporting the proposed viaduct segment on top of the Monterey Road for Alternatives 1 and 3 were represented in the proposed condition hydraulic model by adding piers into channel cross sections. The cross-sectional geometry of the western bank that is in the footprint of Alternatives 1 and 3 were modified to represent the widening of the Monterey Road. Metcalf Road bridge included in the hydraulic model was modified to represent the proposed replacement of Metcalf Road bridge (Figure 3-9).

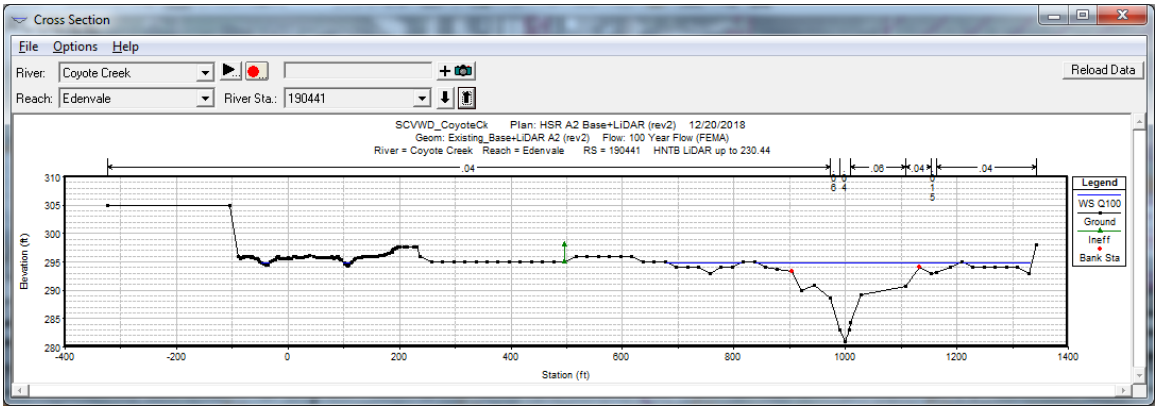
The proposed embankment sections for Alternatives 2 and 4 were represented in the proposed condition hydraulic model by adjusting the channel geometry of the channel cross sections in the footprint of Alternative 2 (Figure 3-10) and Alternative 4 (Figure 3-11). The hydraulic model for Alternative 2 also included the relocation of Monterey Road and the new overcrossing for Palm Avenue. The pavement elevation of Monterey Road in the Alternative 2 hydraulic model was assumed to be the same as the top of rail elevation.

Temporary - HEC-RAS Cross Sections



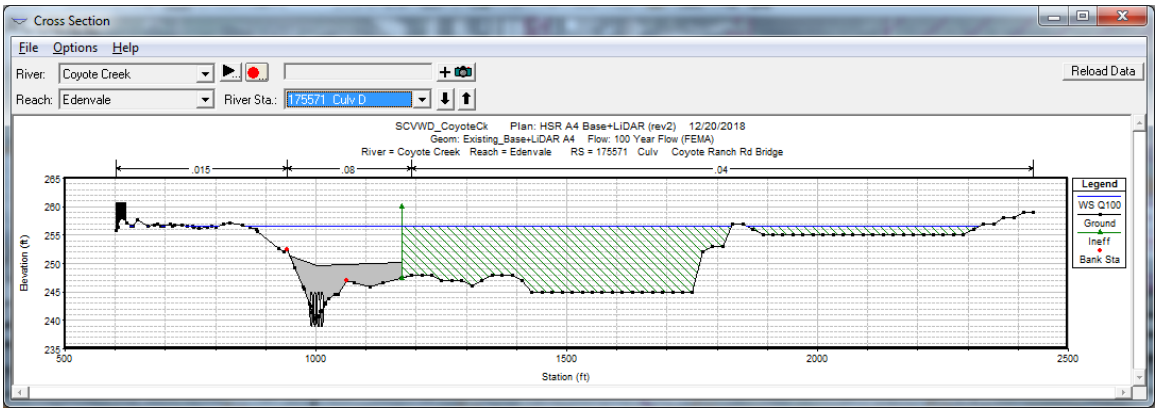
JANUARY 2019

Figure 3-9 Coyote Creek, HEC-RAS Channel Cross Section with Proposed Pier Columns for Alternatives 1 and 3



JANUARY 2019

Figure 3-10 Coyote Creek, HEC-RAS Channel Cross Section with Proposed Embankment Section for Alternative 2



JANUARY 2019

Figure 3-11 Coyote Creek, HEC-RAS Channel Cross Section with Proposed Embankment Section for Alternative 4

3.4.3.2 Water Surface Elevations

The modeling results for the viaduct structure over Old Monterey Road (Alternatives 1 and 3), the embankment structure between the existing railroad tracks and Old Monterey Road (Alternative 2), and existing and the additional railroad tracks (Alternative 4) are shown in Table 3-3, Table 3-4, and Table 3-5, respectively. The outputs for Alternatives 1, 3, and 4 showed increases to the vertical profile of Coyote Creek within the limits of the hydraulic model. The outputs for Alternative 2 showed a WSE increase of approximately 0.05 foot at the Palm Avenue overcrossing.

Table 3-3 Hydraulic Modeling Results, Coyote Creek, Alternatives 1 and 3

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At SR85/US 101	15,000	228.0	228.5	228.5	0.0
At Metcalf Rd	15,000	247.5	243.8	243.5	-0.3
At Coyote Ranch Rd	15,000	257.1	256.6	256.6	0.0
At Bailey Ave	15,000	270.3	270.9	270.9	0.0
At Coyote Creek Golf Drive	15,000	301.0	299.9	299.9	0.0
At Barnhart Ave	15,000	321.6	320.5	320.5	0.0
At US 101	15,000	357.2	359.0	359.0	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
SR= State Route
US = U.S. highway

Table 3-4 Hydraulic Modeling Results, Coyote Creek, Alternative 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At SR85/US 101	15,000	228.0	228.5	228.5	0.0
At Metcalf Rd	15,000	247.5	243.8	243.8	0.0
At Coyote Ranch Rd	15,000	257.1	256.6	256.6	0.0
At Bailey Ave	15,000	270.3	270.9	270.9	0.0
At Coyote Creek Golf Drive	15,000	301.0	299.9	299.9	0.0
At Proposed Palm Avenue Overcrossing	15,000	303.8	306.61	306.66	+0.05

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Barnhart Ave	15,000	321.6	320.5	320.5	0.0
At US 101	15,000	357.2	359.0	359.0	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
SR= State Route
US = U.S. highway

Table 3-5 Hydraulic Modeling Results, Coyote Creek, Alternative 4

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At SR85/US 101	15,000	228.0	228.5	228.5	0.0
At Metcalf Rd	15,000	247.5	243.8	243.8	0.0
At Coyote Ranch Rd	15,000	257.1	256.6	256.6	0.0
At Bailey Ave	15,000	270.3	270.9	270.9	0.0
At Coyote Creek Golf Drive	15,000	301.0	299.9	299.9	0.0
At Barnhart Ave	15,000	321.6	320.5	320.5	0.0
At US 101	15,000	357.2	359.0	359.0	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
SR= State Route
US = U.S. highway

3.5 West Little Llagas Creek

3.5.1 Background Information

3.5.1.1 Floodplain Location

West Little Llagas Creek is a tributary of Llagas Creek that flows through the City of Morgan Hill and San Martin (census-designated place). The confluence with Llagas Creek is immediately downstream of the US 101 cross culvert in San Martin, at 37° 6'21.22" North, 121°36'44.54"West. The existing railroad bridge over West Little Llagas Creek is located approximately 3,700 feet west of the US 101 cross culvert.

West Little Llagas Creek is in the footprint of Upper Llagas Flood Protection Project, and is potentially subject to the USACE Section 404 and 408 permitting process.

3.5.1.2 FEMA Floodplain

According to the FEMA FIRM Panel Numbers 60685C0607H and 60685C0626H (FEMA 2009, 2014), the main channel and overbank flow of West Little Llagas Creek in the project footprint for all four Alternatives is identified as Zone AE (Figure 3-12).

West Little Llagas Creek in the project footprint is recognized as FEMA 100-year floodplain. Therefore, project cannot raise the flood profile of West Little Llagas Creek by more than 1.0 foot.

SCVWD's Upper Llagas Flood Protection Project would reroute West Little Llagas Creek to flow southeast, west of Monterey Highway (see Reach 7a in Figure 3-13). With completion of Upper Llagas Flood Protection Project, rerouted West Little Llagas and the 100-year floodplain for West Little Llagas Creek would be located outside of the project footprint for all four alternatives (Figure 3-14). Therefore, project's potential floodplain impacts were not evaluated for the existing West Little Llagas Creek in the project footprint.

3.5.1.3 Project Alternatives in the FEMA Floodplain

The project footprints for all four project alternatives are in the existing 100-year floodplain for West Little Llagas Creek (Figure 3-12).

Alternatives 1 and 3 propose viaduct segment over the existing 100-year floodplain for West Little Llagas Creek at approximately station 1237+00 and approximately 1,800 feet west of the existing railroad crossing over the creek. The width of the Zone AE floodplain measured along the centerline of the proposed track alignment for Alternatives 1 and 3 is approximately 1,900 feet, and the proposed pier columns would be located inside the existing 100-year floodplain.

Alternative 2 proposes new embankment section adjacent to the east side of the existing railroad track. This alternative would remove existing railroad bridge over West Little Llagas Creek and replace it with the new cross culvert for below existing railroad track and proposed HSR embankment at approximately station 1307+50. The width of the Zone AE floodplain measured along the centerline of the proposed track alignment for Alternative 2 is approximately 2,700 feet.

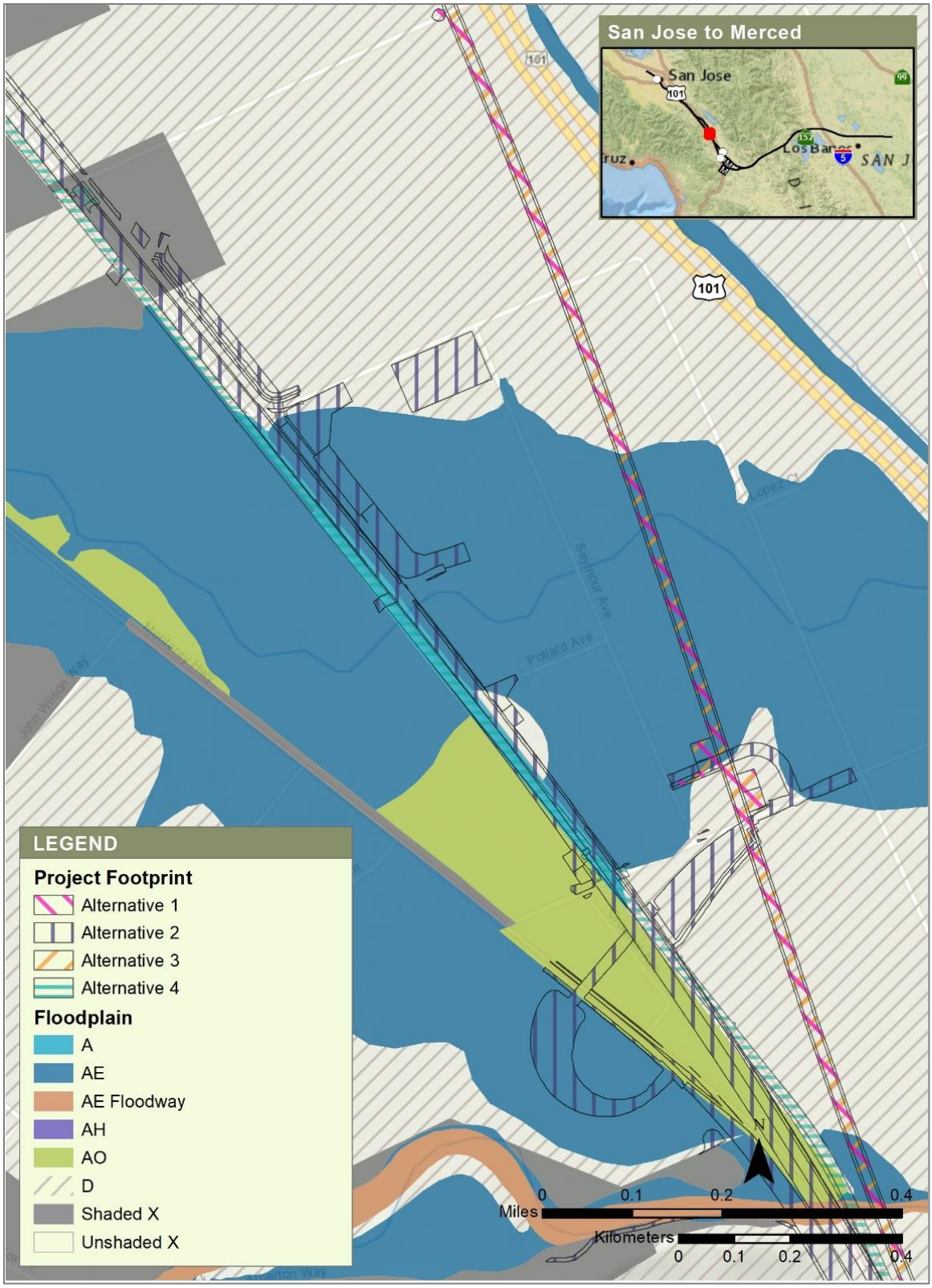
Alternative 4 proposes a blended at-grade segment using the existing railroad track, where existing single-track segment would be modified to double-track segment. This alternative would remove existing railroad bridge and replace it with new cross culvert at same location as the existing bridge, located at approximately station 1257+00. The width of the Zone AE floodplain measured along the centerline of the proposed track alignment for Alternative 4 is approximately 2,700 feet.

3.5.1.4 Available Hydraulic Models

The FEMA effective hydraulic model and SCVWD hydraulic model were available for West Little Llagas Creek.

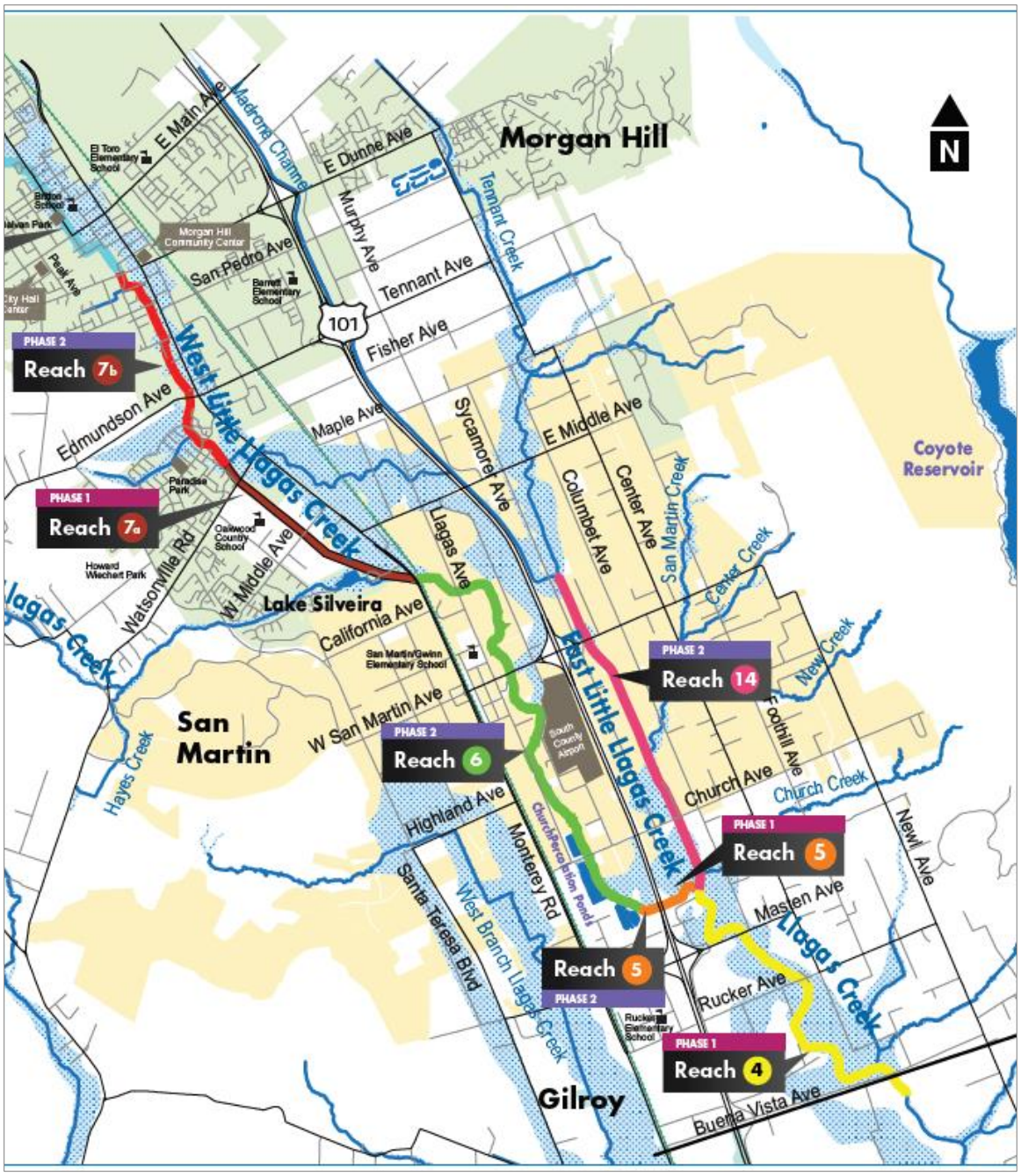
Because the SCVWD hydraulic model only included the post-project condition for the Upper Llagas Creek Flood Protection Project, West Little Llagas Creek included in the hydraulic model was located outside of the project footprint. Therefore, SCVWD hydraulic model was not used to evaluate potential floodplain impacts from the project.

The hydraulic analysis was performed using FEMA's effective hydraulic model. Figure 3-15, Figure 3-16, and Figure 3-17 shows the approximate limits of the FEMA effective hydraulic model and the permanent project footprint for Alternatives 1 and 3, Alternative 2, and Alternative 4 at West Little Llagas Creek, respectively. However, because existing condition for HSR was assumed to be after completion of Upper Llagas Flood Protection Project, the outputs from the hydraulic analysis would not be used to evaluate the project's potential impact on the existing floodplain.



Sources: FEMA 2009; Authority 2019 . JANUARY 2019

Figure 3-12 West Little Llagas Creek, FEMA FIRM Overlay with Project Footprints for Alternatives 1, 2, 3, and 4



Sources: SCVWD 2018e; JANUARY 2019

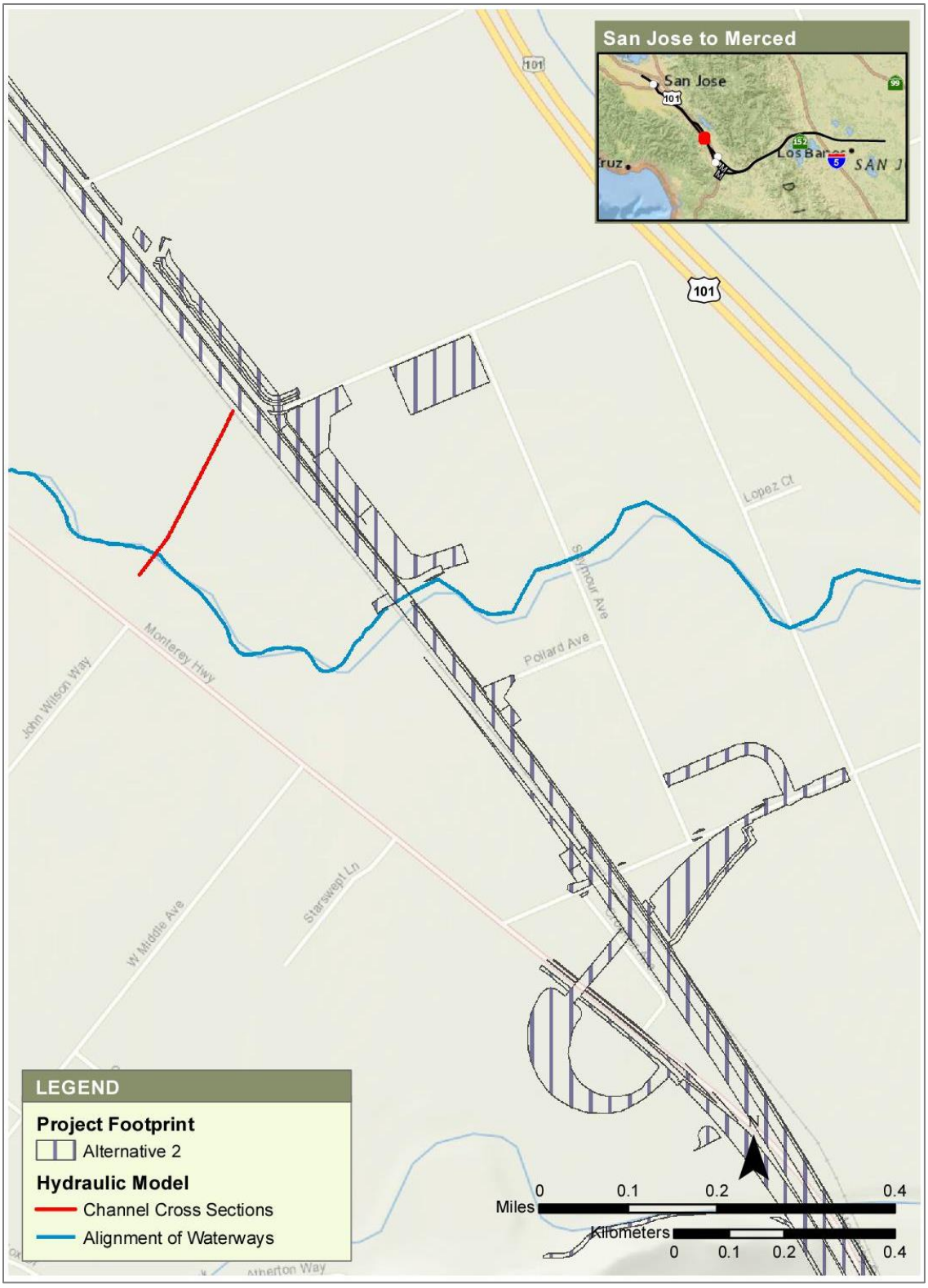
Figure 3-13 Plan View of SCVWD's Upper Llagas Flood Protection Project

Sources: FEMA 2009; Authority 2019; SCVWD 2018f January 2019

Figure 3-14 West Little Llagas Creek, Floodplain after Completion of Upper Llagas Flood Protection Project with Project Footprints for Alternatives 1, 2, 3, and 4

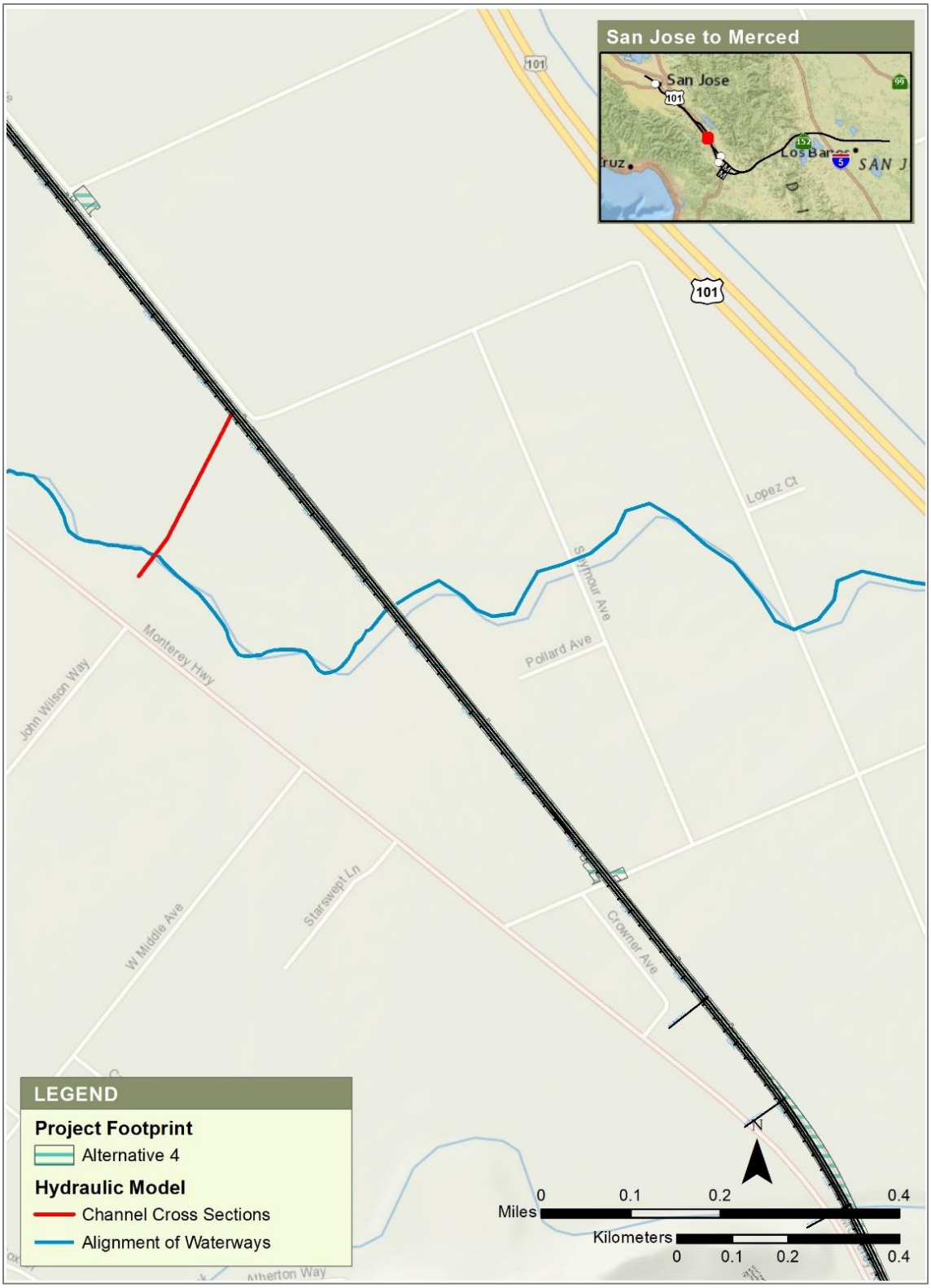
Sources: FEMA 2018; Authority 2019
JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-15 West Little Llagas Creek, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternatives 1 and 3



Sources: FEMA 2018; Authority 2019 . JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-16 West Little Llagas Creek, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 2



Sources: FEMA 2018; Authority 2019. JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-17 West Little Llagas Creek, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 4

3.5.2 FEMA Effective Hydraulic Model

3.5.2.1 Overview of Hydraulic Model

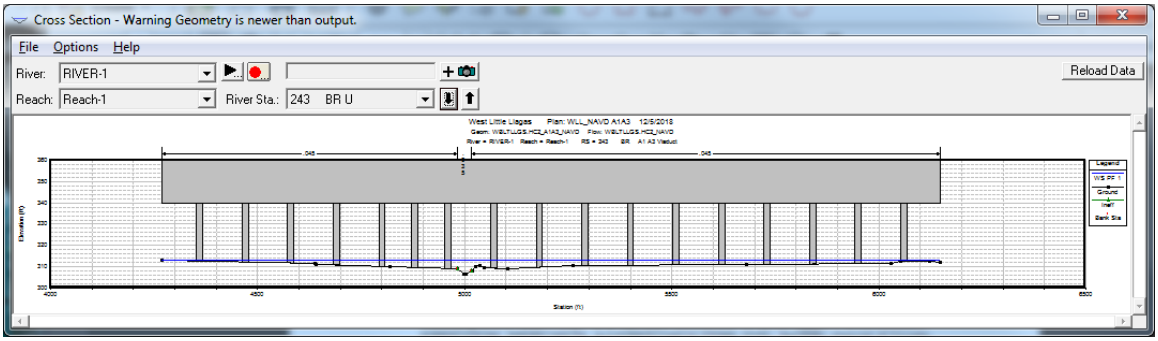
The upstream and downstream limits of West Little Llagas Creek in the FEMA effective hydraulic model were approximately 1,800 feet upstream of Llagas Road Bridge (approximately 22,590 feet upstream of the existing railroad bridge) and the outfall to Llagas Creek (approximately 4,420 feet downstream of the existing railroad crossing).

The pier columns supporting the viaduct segment over West Little Llagas Creek under Alternatives 1 and 3 were included in the proposed condition hydraulic model simulating the new proposed viaduct segment over the existing floodplain. The span length of the pier columns used in the hydraulic model was approximately 110 feet (Figure 3-18).

The embankment section immediately downstream (east) of the existing railroad track under Alternative 2 was represented in the hydraulic model by widening the footprint of the existing railroad bridge (Figure 3-19). The size of the bridge opening was set to be a 48-foot by 5-foot box culvert to match the proposed project plans for this alternative.

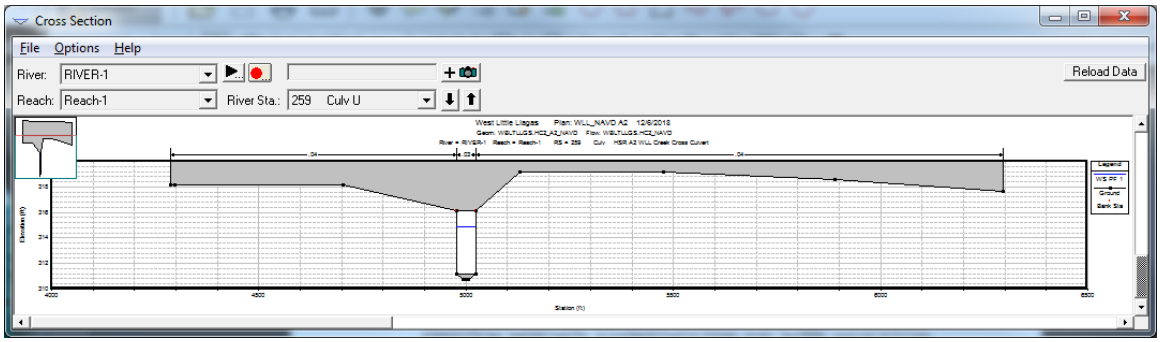
Alternative 4 would use the existing two-track segment near the existing West Little Llagas Creek bridge. There would be no changes to the vertical profile of railroad track near the existing West Little Llagas Creek bridge. The existing bridge structure would be replaced by a proposed 48-foot by 5-foot box culvert (width × height, Figure 3-20) in this alternative.

Sample RAS



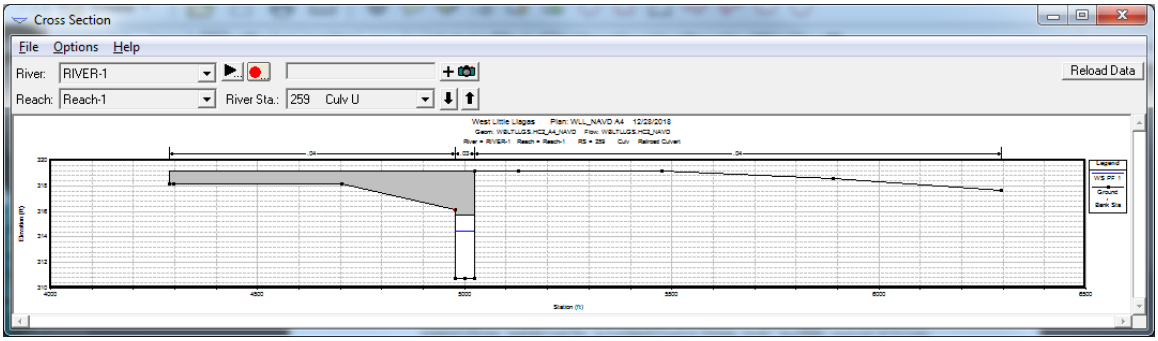
JANUARY 2019

Figure 3-18 West Little Llagas Creek, HEC-RAS Channel Cross Section with Proposed Pier Columns for Alternatives 1 and 3



JANUARY 2019

Figure 3-19 West Little Llagas Creek, HEC-RAS Channel Cross Section with Proposed Embankment Section for Alternative 2



JANUARY 2019

Figure 3-20 West Little Llagas Creek, HEC-RAS Channel Cross Section with Proposed Embankment Section for Alternative 4

3.5.2.2 Water Surface Elevations

The modeling results for Alternatives 1 and 3 are shown in Table 3-6. The proposed pier columns crossing the West Little Llagas Creek floodplain would not increase the 100-year flood profile of West Little Llagas Creek. The proposed railroad track is approximately 50 feet above the 100-year WSE of West Little Llagas Creek.

The modeling results for Alternative 2 are shown in Table 3-7. The proposed embankment section and new cross culvert proposed for Alternative 2 did not show increases in the 100-year flood profile of West Little Llagas Creek. The elevation difference between top of rail (approximately 323 feet NAVD) and 100-year WSE is approximately 6 feet.

The modeling results for Alternative 4 are shown in Table 3-8. The proposed embankment section and new cross culvert proposed for Alternative 4 did not show increases to the 100-year flood profile of West Little Llagas Creek. The elevation difference between top of rail (approximately 319.1 feet NAVD) and the 100-year WSE is approximately 2.1 feet. This elevation difference would not meet the HSR's design freeboard criteria for during the 100-year storm event.

Table 3-6 Hydraulic Modeling Results, West Little Llagas Creek, Alternatives 1 and 3

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Llagas Avenue	3,246	308.5	313.0	313.0	0.0
At proposed viaduct segment	3,280	309.0	313.1	313.1	0.0
At existing railroad bridge	1,936	316.2	319.2	319.2	0.0
At Monterey Highway	1,936	320.9	324.0	324.0	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

Table 3-7 Hydraulic Modeling Results, West Little Llagas Creek, Alternative 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Llagas Avenue	3,246	308.5	313.0	313.0	0.0
At existing railroad bridge	1,936	316.2	319.2	317.0	-2.2
At Monterey Highway	1,936	320.9	324.0	324.0	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

Table 3-8 Hydraulic Modeling Results, West Little Llagas Creek, Alternative 4

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Llagas Avenue	3,246	308.5	313.0	313.0	0.0
At existing railroad bridge	1,936	316.2	319.2	316.4	-2.8
At Monterey Highway	1,936	320.9	324.0	324.0	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

3.6 Llagas Creek (near San Martin)

3.6.1 Background Information

3.6.1.1 Floodplain Location

Llagas Creek flows through the cities of San Martin, Morgan Hill, and Gilroy. West Little Llagas Creek, Madrone Channel, and East Little Llagas Creek meet to form Upper Llagas Creek (Authority 2011a). Buena Vista Avenue divides Upper and Lower Llagas Creek. Lower Llagas Creek meets West Branch Llagas Creek at SR 152 before it drains to the Pajaro River.

Llagas Creek near San Martin is subject to the USACE Section 404 and 408 permitting process.

3.6.1.2 FEMA Floodplain

According to the FEMA FIRM Panel Number 60685C0626H (FEMA 2009), the main channel and overbank flow of Llagas Creek near the Monterey Highway bridge and railroad bridge is identified as Zone AE and floodway (Figure 3-21). The width of the floodway varies from approximately 80 feet to 130 feet in the footprint of the project alternatives. On the north side of the main channel, the overbank flood flow from West Little Llagas Creek are designated as Zone AE and AO floodplains.

SCVWD's Upper Llagas Flood Protection project modify Llagas Creek at the Monterey Highway crossing and would modify the footprint of the Zone AE and floodway, but the limits of the 100-year floodplain would still remain in the project footprint for all four project alternatives (Figure 3-22).

Llagas Creek near San Martin in project footprint is recognized as a floodway. Therefore, the project cannot raise the 100-year flood profile of Llagas Creek.

3.6.1.3 Project Alternatives in the FEMA Floodplain

Alternatives 1 and 3 propose a viaduct segment, which would cross the main channel of Llagas Creek at approximately station 1280+00. The location of the crossing is approximately 140 feet downstream (east) of the existing railroad crossing over Llagas Creek. The width of the floodplain and floodway measured along the proposed track alignment of these alternatives is approximately 525 feet. After completion of the Upper Llagas Flood Protection Project, the width of the floodplain and floodway measures along the proposed track alignment would be reduced to approximately 210 feet.

The proposed embankment section with the railroad bridge over Llagas Creek under Alternative 2 would cross Llagas Creek at approximately station 1352+00. The location of the creek crossing is approximately 100 feet upstream (west) of the existing railroad crossing over Llagas Creek. The

width of the floodplain and floodway measured along the proposed track alignment of this alternative is approximately 1,600 feet. After completion of the Upper Llagas Flood Protection Project, the width the floodplain and floodplain measure along relocated Monterey Highway, relocated Union Pacific Railroad (UPRR) track, and proposed HSR track, would be approximately 420 feet, 130 feet, and 110 feet.

Alternative 2 would also entail the relocation of the Monterey Road bridge and existing railroad bridge over Llagas Creek. The existing roadway and railroad bridges would be removed under this alternative. In addition, this Alternative would require modifications to the Llagas Creek channel that would be modified as part of the first phase of the Upper Llagas Flood Protection Project.

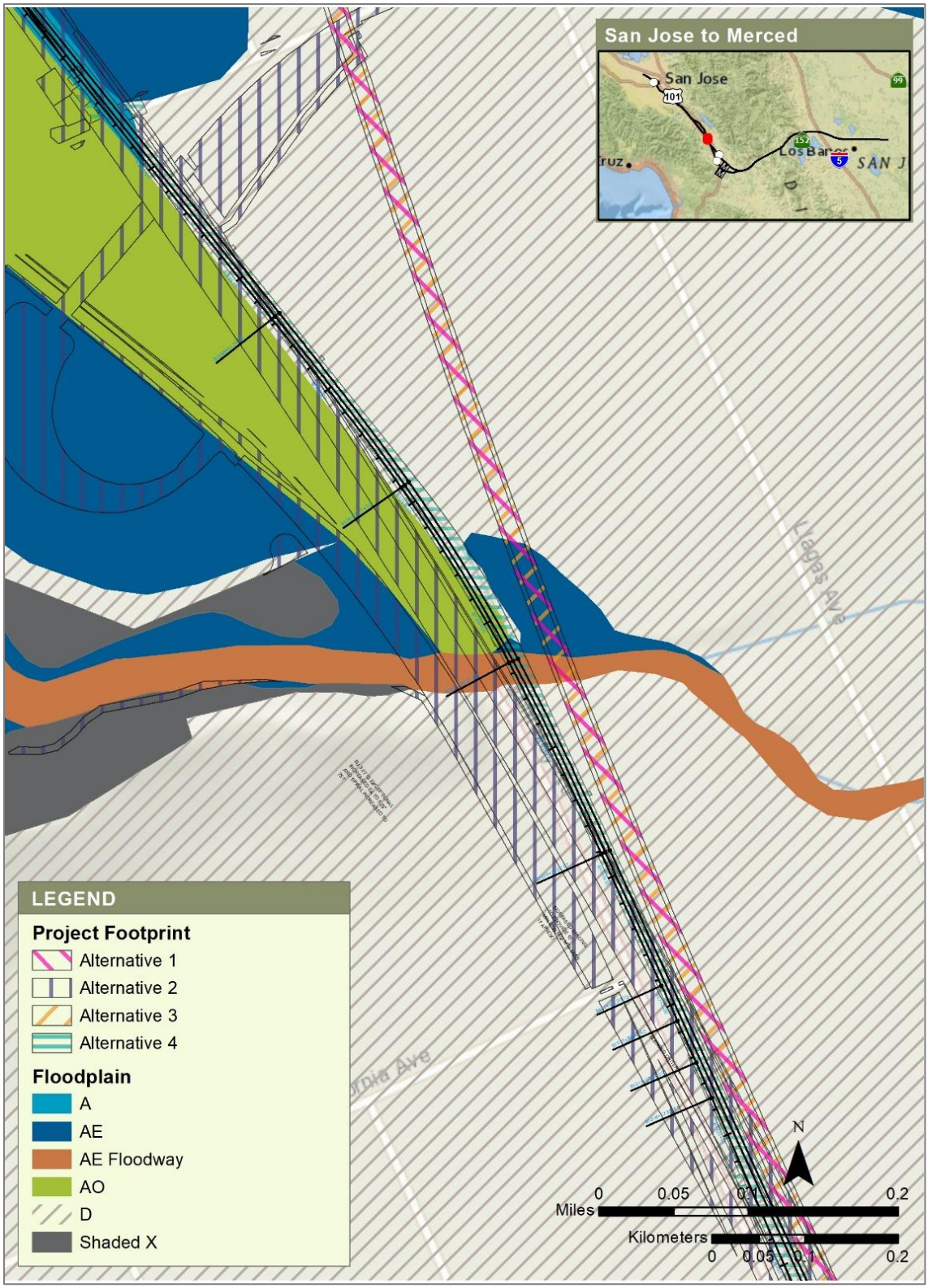
The proposed blended at-grade track with a railroad bridge over Llagas Creek for Alternative 4 would cross Llagas Creek at approximately station 1352+00. The existing single-track bridge over Llagas Creek would be replaced by a two-track bridge in the same alignment, extending to the west (upstream). There would be no changes to the vertical profile of railroad track on the bridge approach areas, and there would be no changes to Monterey Highway west (upstream) of the existing railroad bridge. The width of the existing FEMA floodplain and floodway measured along the existing railroad is approximately 500 feet. After completion of the Upper Llagas Flood Protection Project, the width of the floodplain and floodway measured along the proposed HSR track (shared with Caltrain and UPRR) would be approximately 130 feet.

3.6.1.4 Available Hydraulic Models

The FEMA effective hydraulic model and the SCVWD hydraulic model were available for this waterbody. Figure 3-23, Figure 3-24, and Figure 3-25 shows the approximate limits of the FEMA effective hydraulic model at Llagas Creek near San Martin with the project footprint for Alternatives 1 and 3, Alternative 2, and Alternative 4, respectively. Figure 3-26, Figure 3-27, and Figure 3-28 shows the limits of the SCVWD hydraulic model at Llagas Creek near San Martin with the project footprint for Alternatives 1 and 3, Alternative 2, and Alternative 4, respectively.

The FEMA effective hydraulic model provided does not include up-to-date available information that were included in the SCVWD hydraulic model. Therefore, SCVWD hydraulic model was used to evaluate the project's potential impacts.

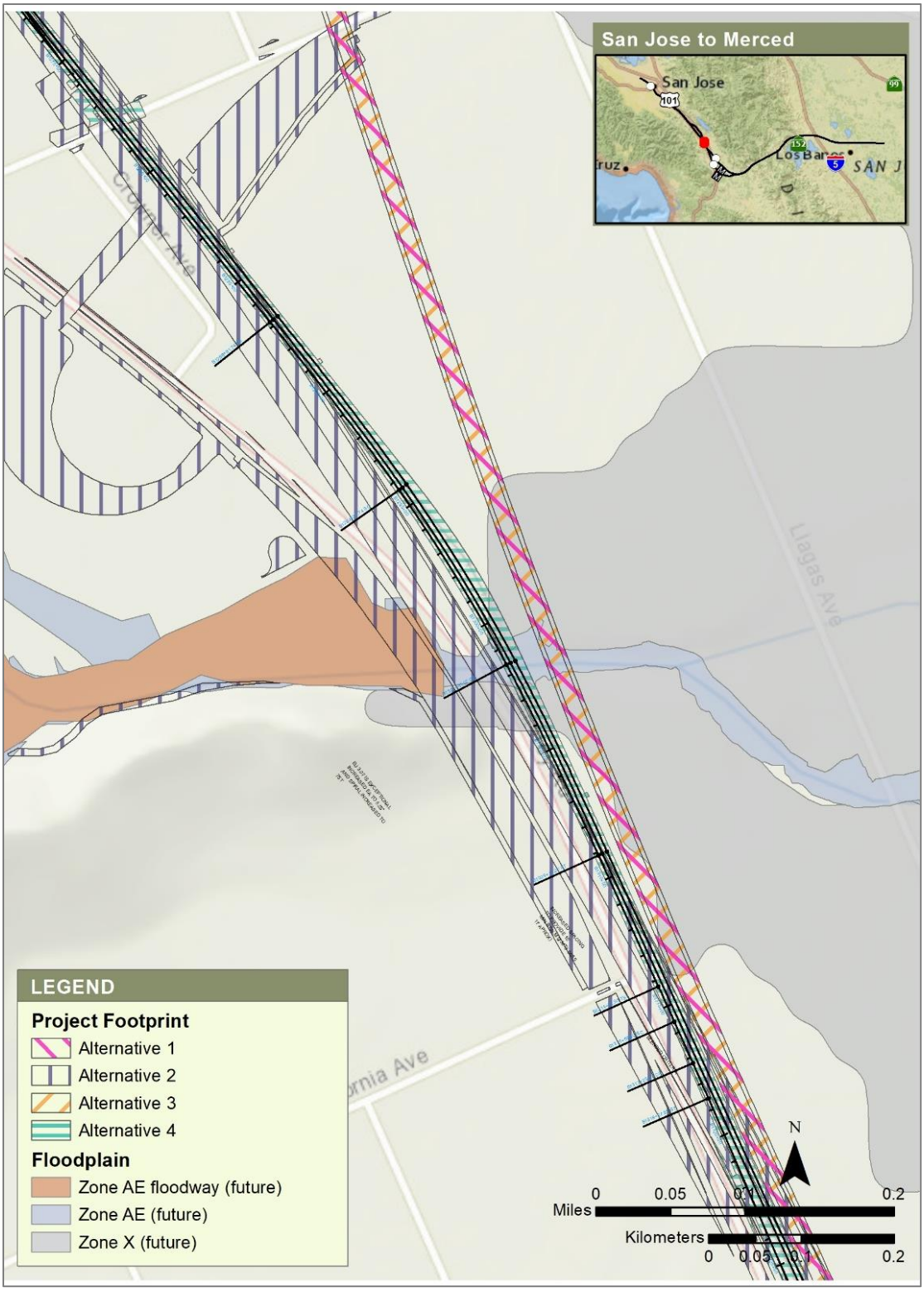
The FEMA effective hydraulic models for Llagas Creek (near San Martin) did not include improved channels after completion of Upper Llagas Flood Protection Project, which was assumed as existing condition for the project. Therefore, hydraulic analysis outputs from FEMA effective model were not used to evaluate project's potential floodplain impacts. The outputs from the SCVWD hydraulic model were used to evaluate the project's potential floodplain impacts.



Sources: FEMA 2009; Authority 2019

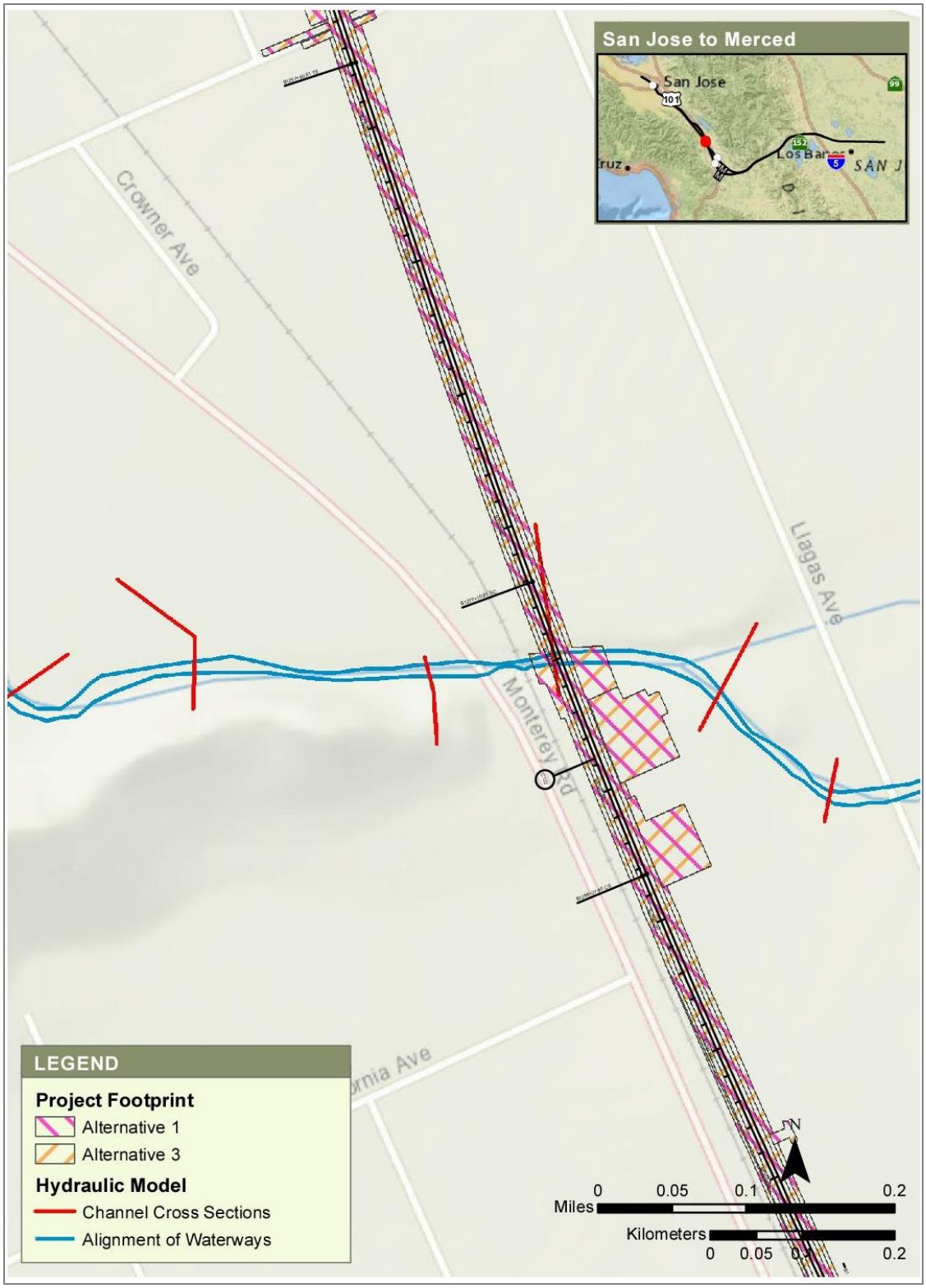
JANUARY 2019

Figure 3-21 Llagas Creek near San Martin, FEMA FIRM Overlay with Project Footprints for Alternatives 1, 2, 3, and 4



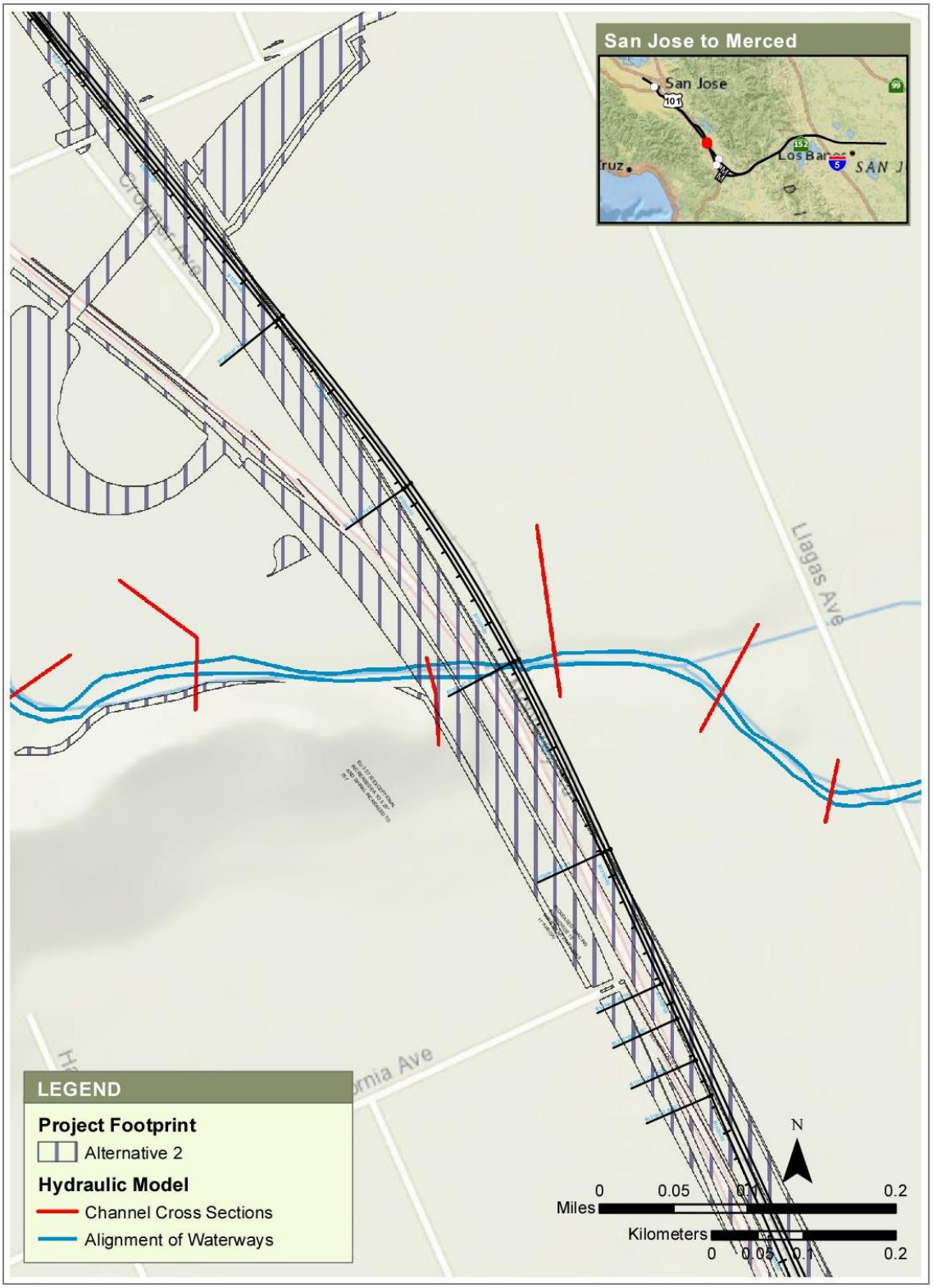
Sources: SCVWD 2018f; Authority 2019 JANUARY 2019

Figure 3-22 Llagas Creek (near San Martin), Floodplain after Completion of Upper Llagas Flood Protection Project with Project Footprints for Alternatives 1, 2, 3, and 4



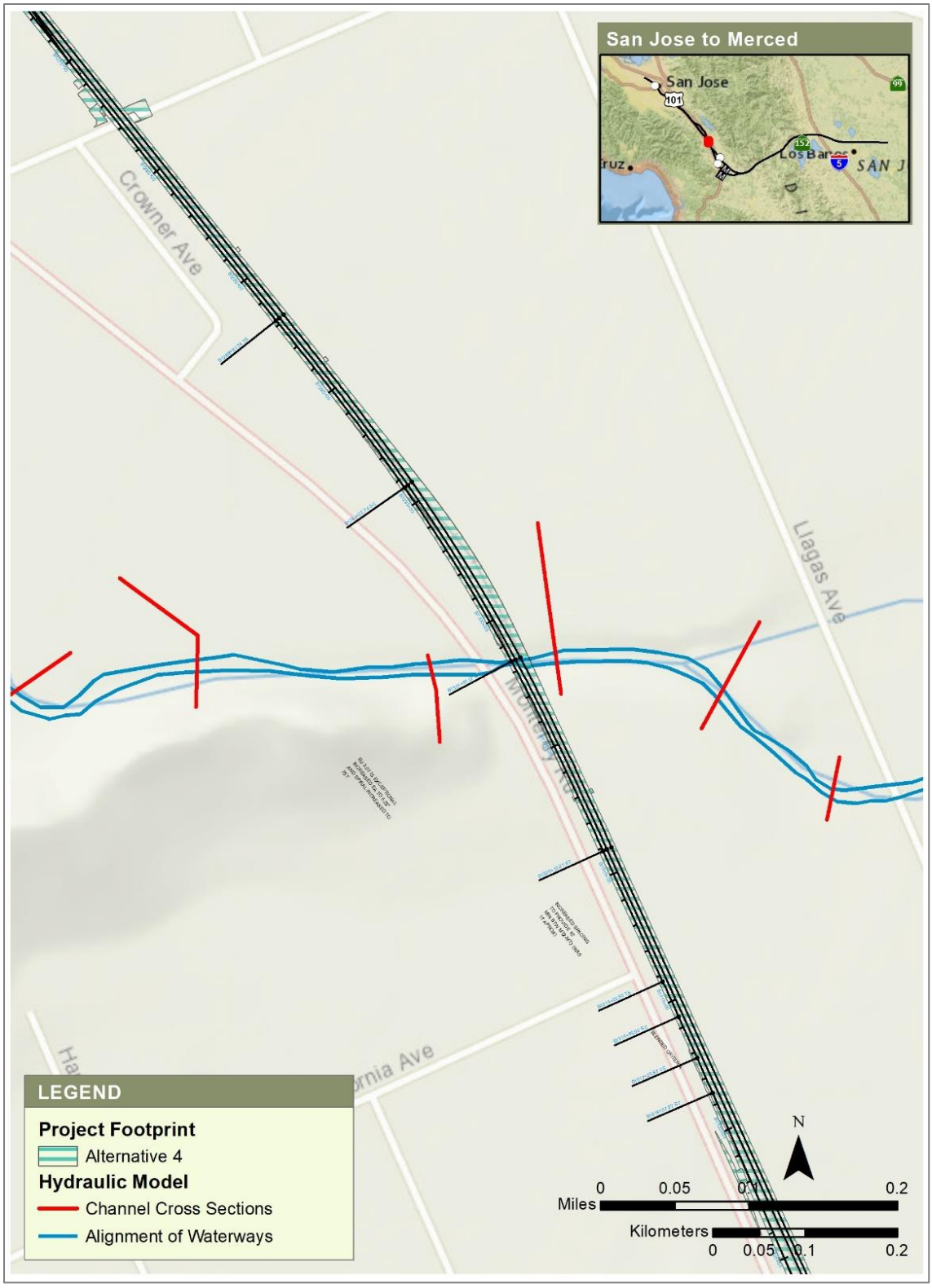
Sources: FEMA 2018; Authority 2019 . JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-23 Llagas Creek (near San Martin), Plan View of FEMA Effective Hydraulic Model with Project Footprints for Alternatives 1 and 3



Sources: FEMA 2018; Authority 2019 . JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-24 Llagas Creek (near San Martin), Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 2



Sources: FEMA 2018; Authority 2019 . JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-25 Llagas Creek (near San Martin), Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 4

Sources: SCVWD 2015b; Authority 2019

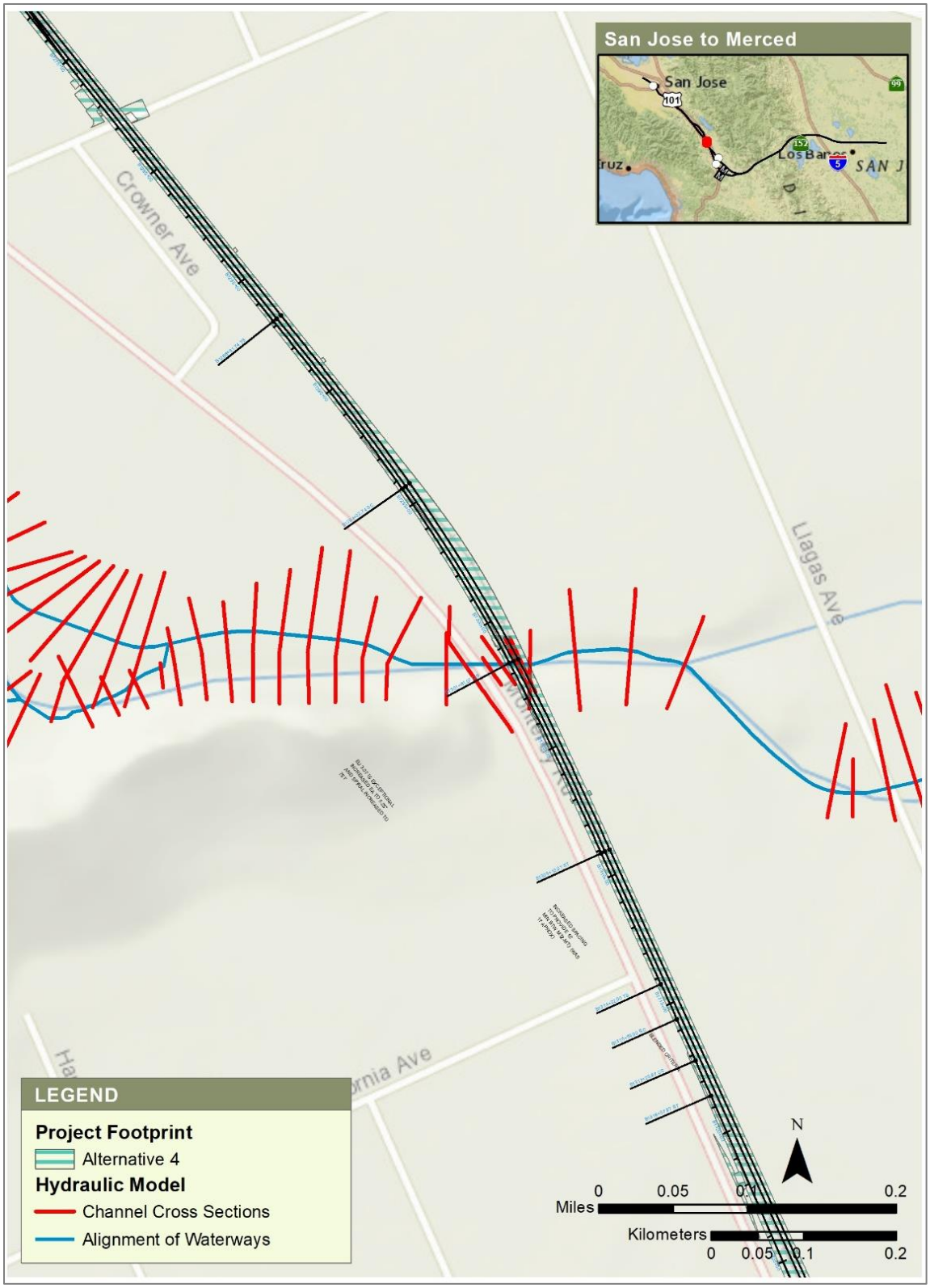
JANUARY 2019

Figure 3-26 Llagas Creek (near San Martin), Plan View of SCVWD Model at Proposed HSR Crossing, Alternatives 1 and 3

Sources: SCVWD 2015b; Authority 2019

JANUARY 2019

Figure 3-27 Llagas Creek (near San Martin), Plan View of SCVWD Model at Proposed HSR Crossing, Alternatives 2



Sources: SCVWD 2015b; Authority 2019

JANUARY 2019

Figure 3-28 Llagas Creek (near San Martin), Plan View of SCVWD Model at Proposed HSR Crossing, Alternative 4

3.6.2 FEMA Effective Hydraulic Model

3.6.2.1 Overview of Hydraulic Model

The upstream and downstream limits of the FEMA effective hydraulic model for Llagas Creek near San Martin were approximately 3,900 feet upstream of the existing railroad bridge and approximately 780 feet downstream of the existing railroad bridge.

The pier columns supporting the viaduct segment under Alternatives 1 and 3 were represented in the proposed condition hydraulic model for Alternatives 1 and 3 using the bridge function in HEC-RAS.

The relocated Monterey Road bridge, relocated existing railroad bridge, and proposed HSR bridge over Llagas Creek under Alternative 2 were represented in the proposed condition hydraulic model by adding interpolated channel cross sections and removing existing channel cross sections that were in conflict with the proposed bridge footprint.

The proposed condition hydraulic model for Alternative 4 replaced an existing single-track railroad bridge included in the base hydraulic model with the proposed two-track railroad bridge.

3.6.2.2 Water Surface Elevations

The modeling results for Alternatives 1 and 3 are shown in Table 3-9. The proposed pier columns crossing the Llagas Creek floodplain would increase the floodplain and floodway elevation by approximately 0.4 foot or less. (Table 3-9).

The modeling results for Alternative 2 are shown in Table 3-10. The relocation of the existing Monterey Road and railroad bridge and construction of a new bridge over Llagas Creek with a channel geometry not including improvements from the Upper Llagas Flood Protection Project would increase the 100-year flood profile of Llagas Creek upstream of the relocated Monterey Highway Bridge.

The modeling results for Alternative 4 are shown in Table 3-11. The proposed removal and replacement of existing single-track bridge with a proposed double-track bridge would raise the 100-year flood profile of Llagas Creek on upstream of the proposed railroad bridge.

The current effective FEMA hydraulic model assumed a smooth channel with minimal vegetation growth, but the existing channel shows moderate to dense vegetation growth in the main channel upstream and downstream of Monterey Road Bridge and the existing railroad bridge. In addition, Phase 1 of the Upper Llagas Flood Protection Project, expected to start construction in the Year 2019, would modify the creek channel upstream of the existing Monterey Bridge. Because the current effective FEMA hydraulic model does not represent these two existing project conditions, the hydraulic analysis of the existing and proposed conditions were also performed using the hydraulic model of Llagas Creek and tributaries provided by SCVWD as comparison, and is discussed in Section 3.6.3, SCVWD Hydraulic Model.

Table 3-9 Hydraulic Modeling Results, Llagas Creek (near San Martin), Alternatives 1 and 3

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At downstream limit of hydraulic model	5,300	298.4	301.2	301.2	0.0
At proposed viaduct segment	5,300	301.1	301.4	301.8	+0.4
At existing railroad crossing	5,300	302.0	302.6	302.7	+0.1
At existing Monterey Rd	5,300	305.6	303.0	303.0	0.0

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At upstream limit of hydraulic model	3,500	315.8	308.0	308.0	0.0

Elevations are rounded to the nearest 0.1 foot, except at immediately upstream of proposed viaduct segment
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

Table 3-10 Hydraulic Modeling Results, Llagas Creek (near San Martin), Alternative 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At downstream limit of hydraulic model	5,300	298.4	301.2	301.2	0.0
At existing railroad crossing (removed in Alt 2)	5,300	302.0	302.6	302.9	0.3
At upstream of proposed HSR bridge	5,300	305.6	303.0	302.8	(0.2)
At upstream of relocated Monterey Highway bridge	4,900	304.4	303.2	304.3	1.1
At upstream limit of hydraulic model	3,500	315.8	308.0	308.0	0.0

(Parentheses) indicate negative values
Elevations are rounded to the nearest 0.1 foot, except at immediately upstream of proposed viaduct segment
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high-speed rail

Table 3-11 Hydraulic Modeling Results, Llagas Creek (near San Martin), Alternative 4

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At downstream limit of hydraulic model	5,300	298.4	301.2	301.2	0.0
At proposed HSR/UPRR/ Caltrain crossing	5,300	302.0	302.6	303.1	(0.5)
At existing Monterey Rd	5,300	305.6	303.0	303.5	0.0
At upstream limit of hydraulic model	3,500	315.8	308.0	308.0	0.0

(Parentheses) indicate negative values
Note: Elevations are rounded to the nearest 0.1 foot
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high-speed rail
UPRR = Union Pacific Railroad

3.6.3 SCVWD Hydraulic Model

3.6.3.1 Overview of Hydraulic Model

The upstream and downstream limits of Llagas Creek in the SCVWD hydraulic model were at Atherton Way Hidden Pond (approximately 3,440 feet upstream of the existing railroad bridge) and immediately upstream of State Route 152 (approximately 51,200 feet downstream of the existing railroad bridge), respectively (Figure 2-12).

The channel cross sections included in the base hydraulic model at the project location were not located to best represent the potential changes from the proposed project. Therefore, channel cross sections in the SCVWD hydraulic model upstream and downstream of the existing Monterey Highway Bridge and existing railroad bridge were replaced with the channel cross sections based on the proposed grading plan for the Upper Llagas Flood Protection Project provided by SCVWD on December 2017 (SCVWD 2017).

The setup of the viaduct segment crossing Llagas Creek for Alternatives 1 and 3 in the SCVWD hydraulic model is same as the setup for the proposed condition for FEMA effective hydraulic model.

The relocated railroad bridge and the proposed HSR bridge over Llagas Creek under Alternative 2 were added in between the new channel cross sections in the hydraulic model. The channel geometry was adjusted at the locations where Alternative 2 proposed changes to the channel geometry of Llagas Creek after completion of the Upper Llagas Flood Protection Project.

The proposed condition hydraulic model for the Alternative 4 replaced existing single-track railroad bridge included in the base hydraulic model with a proposed two-track railroad bridge.

3.6.3.2 Water Surface Elevations

The modeling results for Alternatives 1 and 3 are shown in **Table 3-12**. In the proposed conditions, the pier columns crossing the Llagas Creek floodplain would not increase the vertical profile and horizontal extents of the existing Llagas Creek 100-year floodplain at Monterey Highway. The outputs from hydraulic model shows the 100-year flow would be mostly contained in the main channel of Llagas Creek and the proposed pier columns would have minimal contact with the 100-year flow.

The modeling results for Alternative 2 are shown in Table 3-13. The relocation of the existing Monterey Road and railroad bridge and construction of a new bridge over Llagas Creek would not increase the vertical profile and horizontal extents of the existing Llagas Creek 100-year floodplain at Monterey Highway.

The modeling results for Alternative 4 are shown in Table 3-14. The proposed removal and replacement of the existing single-track bridge with a proposed double-track bridge would not increase the 100-year flood profile of Llagas Creek on the upstream side of the proposed railroad bridge.

Table 3-12 Hydraulic Modeling Results, Llagas Creek (near San Martin), Alternatives 1 and 3

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Llagas Ave	4,330	300.0	298.7	298.7	0.0
At proposed viaduct portion of the alignment	4,330	302.7	302.4	302.4	0.0
At existing railroad crossing	5,532	303.0	303.85	303.84	(0.01)

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Monterey Highway	5,532	307.8	305.3	305.3	0.0
Downstream of confluence with West Little Llagas Creek Diversion	5,532	310.0	307.7	307.7	0.0
At West Middle Avenue (West Little Llagas Creek Diversion)	1,890	319.3	313.9	313.9	0.0

(Parentheses) indicate negative values
Elevations are rounded to the nearest 0.1 foot, except at immediately upstream of proposed viaduct segment
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

Table 3-13 Hydraulic Modeling Results, Llagas Creek (near San Martin), Alternative 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Llagas Ave	4,330	300.0	298.7	298.7	0.0
At existing railroad crossing	5,532	303.0	303.9	303.9	0.0
At upstream of proposed HSR bridge	5,532	307.8	305.5	304.9	(0.6)
At upstream of relocated Monterey Highway bridge	5,532	310.0	306.8	306.6	(0.2)
Downstream of confluence with West Little Llagas Creek Diversion	5,532	310.0	307.7	307.6	(0.1)
At West Middle Avenue (West Little Llagas Creek Diversion)	1,890	319.3	313.9	313.9	0.0

Elevations are rounded to the nearest 0.1 foot, except at immediately upstream of proposed viaduct segment
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high-speed rail

Table 3-14 Hydraulic Modeling Results, Llagas Creek (near San Martin), Alternative 4

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Llagas Ave	4,330	300.0	298.7	298.7	0.0
At proposed HSR/UPRR/ Caltrain crossing	5,532	303.0	303.9	303.6	(0.3)
At Monterey Highway	5,532	307.8	305.3	304.9	(0.4)
Downstream of confluence with West Little Llagas Creek Diversion	5,532	310.0	307.7	307.6	(0.1)
At West Middle Avenue (West Little Llagas Creek Diversion)	1,890	319.3	313.9	313.9	0.0

(Parentheses) indicate negative values
Note: Elevations are rounded to the nearest 0.1 foot
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high-speed rail
UPRR = Union Pacific Railroad

3.7 Llagas Creek (at East San Martin Avenue)

3.7.1 Background Information

3.7.1.1 Floodplain Location

Llagas Creek flows through the cities of San Martin, Morgan Hill, and Gilroy. West Little Llagas Creek, Madrone Channel, and East Little Llagas Creek meet to form Upper Llagas Creek (Authority 2011a). Buena Vista Avenue divides Upper and Lower Llagas Creek. Lower Llagas Creek meets West Branch Llagas Creek at SR 152 before it drains to the Pajaro River.

Llagas Creek at East San Martin Avenue would be subject to the USACE Section 404 and 408 permitting process.

3.7.1.2 FEMA Floodplain

According to the FEMA FIRM Panel Number 60685C0628H (FEMA 2009), the main channel and overbank flow of Llagas Creek near the existing East San Martin Avenue bridge is identified as Zone AE and floodway (Figure 3-29). This figure also shows Zone AE on east side of the mainline Llagas Creek, which would be discussed in detail in Section 3.8, West Little Llagas Creek, Middle Avenue Outflow.

SCVWD's Upper Llagas Flood Protection Project would modify Llagas Creek at East San Martin Avenue and would modify the footprint of the Zone AE and floodway (Figure 3-30).

Llagas Creek near San Martin in the project footprint is currently recognized as a floodway. Therefore, the project cannot raise the 100-year flood profile of Llagas Creek.

3.7.1.3 Project Alternatives in the FEMA Floodplain

The project footprint for Alternative 2 is in the existing 100-year floodplain for Llagas Creek at East San Martin Avenue, before and after completion of Upper Llagas Flood Protection Project (Figure 3-29 and Figure 3-30).

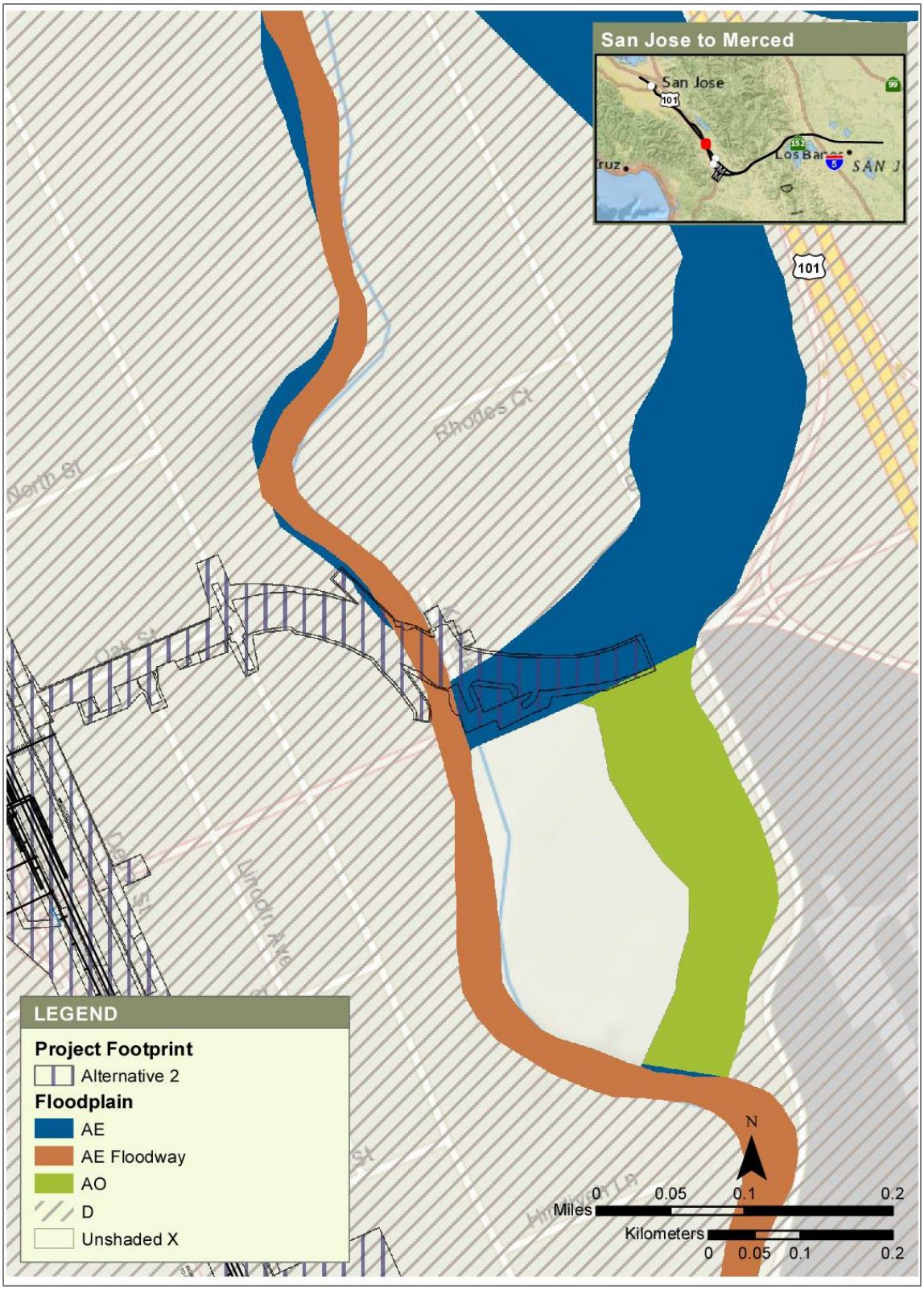
The project footprints for the remaining three alternatives are located outside of the limits of Llagas Creek floodplain/floodway at East San Martin Avenue, both before and after the completion of the Upper Llagas Flood Protection Project.

Alternative 2 proposes to change the alignment of East San Martin Avenue, which includes removal of the existing East San Martin Avenue bridge over Llagas Creek and construction of a new roadway bridge located approximately 300 feet upstream (north) of the existing bridge.

3.7.1.4 Available Hydraulic Models

The FEMA effective hydraulic model and the SCVWD hydraulic model were available for this waterbody. Figure 3-31 shows the approximate limits of the FEMA effective hydraulic model with the project footprint for Alternative 2. Figure 3-32 shows the limits of the SCVWD hydraulic model with the project footprint for Alternative 2.

The FEMA effective hydraulic models for Llagas Creek (at East San Martin Avenue) did not include improved channels after completion of Upper Llagas Flood Protection Project, which was assumed as an existing condition for the project. Therefore, hydraulic analysis outputs from FEMA effective model were not used to evaluate project's potential floodplain impacts. The outputs from the SCVWD hydraulic model were used to evaluate the project's potential floodplain impacts.



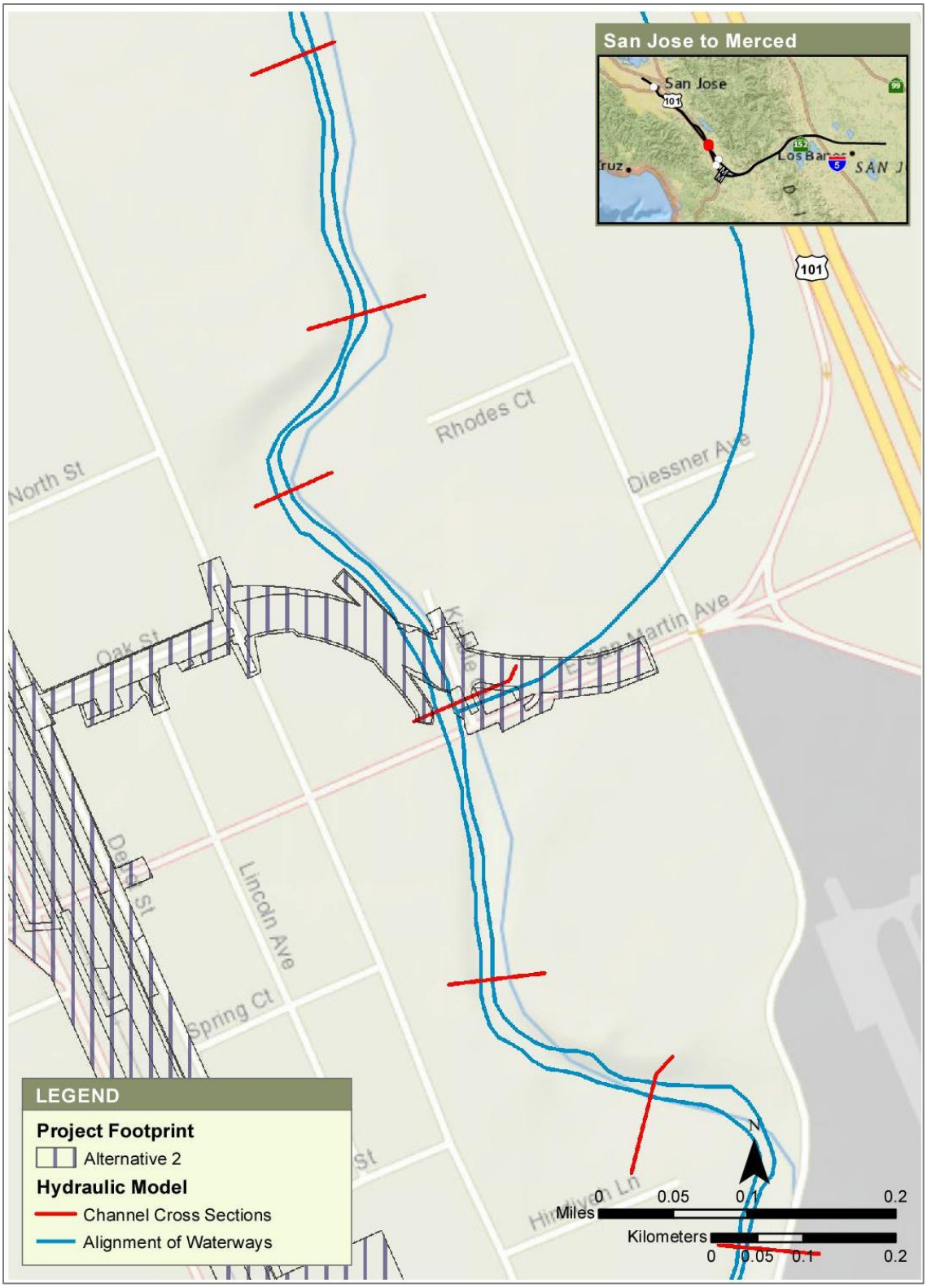
Sources: FEMA 2009; Authority 2019

JANUARY 2019

Figure 3-29 Llagas Creek (at East San Martin Avenue), FEMA FIRM at Project Footprint for Alternative 2

Sources: SCVWD 2018f; Authority 2019 JANUARY 2019

Figure 3-30 Llagas Creek (at East San Martin Avenue), Floodplain after Completion of Upper Llagas Flood Protection Project with Project Footprint for Alternative 2



Sources: FEMA 2018; Authority 2019. JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-31 Llagas Creek (At East San Martin Avenue), Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 2

Sources: SCVWD 2015b; Authority 2019

JANUARY 2019

Figure 3-32 Llagas Creek (At East San Martin Avenue), Plan View of SCVVWD Hydraulic Model with Project Footprint for Alternative 2

3.7.2 FEMA Effective Hydraulic Model

3.7.2.1 Overview of Hydraulic Model

The upstream and downstream limits of FEMA effective hydraulic model for Llagas Creek at East San Martin Avenue were approximately 5,300 feet upstream of the existing East San Martin Road Bridge and approximately 21,920 feet downstream of the existing East San Martin Road Bridge.

For the proposed condition hydraulic model for Alternative 2, the existing East San Martin Road Bridge was removed and the new bridge was placed approximately 300ft upstream.

The proposed condition hydraulic model for Alternative 2 removed the existing East San Martin Road Bridge included in the base hydraulic model and added proposed East San Martin Road Bridge approximately 300 feet upstream (north).

The FEMA effective hydraulic model provided two flooding scenarios for the 100-year storm event. The first scenario allowed overbank flows to flow outside of the main channel of Llagas Creek within the model limits. The second scenario used the “Encroachment” function in HEC-RAS to force the flows to remain inside a narrower assigned area of Llagas Creek channel within the model limits. The hydraulic analysis of existing and proposed conditions were performed for both flooding scenarios.

The Manning’s roughness coefficient assigned in the FEMA effective hydraulic model is 0.025 and 0.030, which represents smooth, well maintained channel with minimal vegetation growth and minimal obstructions to the flood flow. This input in the FEMA effective hydraulic model may not represent the existing site condition at the beginning of construction for project. The existing site condition shows moderate to dense vegetation growth in the main channel and embankment slopes of Llagas Creek near East San Martin Avenue Bridge, which would be represented using higher Manning’s roughness coefficient value.

3.7.2.2 Water Surface Elevations

The modeling results for the Alternative 2 near the proposed East San Martin Road Bridge are shown in Table 3-15 and Table 3-16 for without and with overbank flows. The outputs for Alternative 2 with overbank flows showed decreases in 100-year flood profile immediately upstream of the relocated East San Martin Road Bridge over Llagas Creek. However, the 100-year flood profile with no overbank flood flows showed increases in 100-year flood profile immediately upstream of the relocated East San Martin Road Bridge over Llagas Creek. The change in 100-year flood profile attenuated at the next upstream bridge crossing (Llagas Avenue) for both cases.

Table 3-15 Hydraulic Modeling Results, Llagas Creek (at East San Martin Avenue), Alternative 2, with Overbank Flow

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Church Avenue	4,330	264.1	259.2	259.2	0.0
At relocated East San Martin Avenue Bridge	4,330	288.3	288.4	286.6	(1.8)
At Llagas Avenue	4,330	300.8	298.8	298.8	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

Table 3-16 Hydraulic Modeling Results, Llagas Creek (at East San Martin Avenue), Alternative 2, with No Overbank Flow

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Church Avenue	4,330	264.1	263.2	263.2	0.0
At relocated East San Martin Avenue Bridge	4,330	288.3	288.7	291.2	2.5
At Llagas Avenue	4,330	300.8	300.7	300.7	0.0

(Parentheses) indicate negative values
Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

When using the FEMA effective hydraulic model to determine the changes in the 100-year flood profile of Llagas Creek for Alternative 2, the potential floodplain impacts were controlled by the use of “Encroachment” function in HEC-RAS hydraulic model. In addition, the FEMA effective hydraulic models for Llagas Creek (near San Martin) would not represent the existing condition for the project.

Therefore, FEMA effective hydraulic model for Llagas Creek at East San Martin Avenue would not be suitable to evaluate the project’s potential impacts on the existing 100-year floodplain. The hydraulic analysis was also performed using the SCVWD’s hydraulic model as a comparison.

3.7.3 SCVWD Model

3.7.3.1 Overview of Hydraulic Model

The SCVWD hydraulic model for Llagas Creek at East San Martin Avenue is same as the hydraulic model described in Section 3.6, Llagas Creek (near San Martin). The setup of the proposed condition hydraulic model for Alternative 2 is same as the FEMA effective hydraulic model described in Section 3.7.2, FEMA Effective Hydraulic Model.

3.7.3.2 Water Surface Elevations

The modeling results for the Alternative 2 near the proposed East San Martin Road Bridge are shown in Table 3-17. The outputs for Alternative 2 did not show increases in 100-year flood profile near the relocated East San Martin Road Bridge over Llagas Creek.

Table 3-17 Hydraulic Modeling Results, Llagas Creek at East San Martin Avenue, Alternative 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Church Avenue	4,330	264.0	263.3	263.3	0.0
At relocated East San Martin Avenue Bridge	4,330	286.0	287.1	287.0	(0.1)
At Llagas Avenue	4,330	300.0	298.7	298.7	0.0

(Parentheses) indicate negative values
Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

3.8 West Little Llagas Creek, Middle Avenue Overflow

3.8.1 Background Information

3.8.1.1 Floodplain Location

West Little Llagas Creek is a tributary of Llagas Creek that flows through the City of Morgan Hill and San Martin (census-designated place). The confluence with Llagas Creek is immediately downstream of US 101 cross culvert in San Martin, at 37° 6'21.22" North, 121°36'44.54"West. Existing railroad bridge over West Little Llagas Creek is located approximately 3,700 feet west of the US 101 cross culvert.

3.8.1.2 FEMA Floodplain

According to the FEMA FIRM Panel Numbers 60685C0626H and 60685C0626H (FEMA 2009, 2014), the main channel of West Little Llagas Creek downstream (east) of the existing railroad crossing does not have capacity to convey the 100-year flow, and the overbank flow on south side sheet flows south and does not re-enter the main channel of West Little Llagas Creek (Figure 3-33). The overbank flow outfalls into Llagas Creek near East San Martin Avenue Bridge.

West Little Llagas Creek in the project footprint is recognized as a FEMA 100-year floodplain. Therefore, project cannot raise the flood profile of West Little Llagas Creek by more than 1.0 foot.

SCVWD's Upper Llagas Flood Protection Project would reroute West Little Llagas Creek to flow southeast, west of Monterey Highway (see Reach 7a in Figure 3-13).

With completion of Upper Llagas Flood Protection Project, the rerouted West Little Llagas would outfall into Llagas Creek on west of Monterey Highway and would no longer travel at the locations where the existing FIRM shows overbank flood flow flowing south along the west side of US 101. West Little Llagas Creek – Middle Avenue Overflow would no longer be classified as 100-year floodplain after completion of the Upper Llagas Flood Protection Project (Figure 3-34).

3.8.1.3 Project Alternatives in the FEMA Floodplain

The project footprint for Alternative 2 is in the existing 100-year floodplain for West Little Llagas - Middle Avenue Overflow. The project footprints for the other three alternatives are located outside of the limits of the existing 100-year floodplain.

Alternative 2 proposes to change the alignment of East San Martin Avenue, which includes removal of the existing East San Martin Avenue bridge over Llagas Creek and construction of a new roadway bridge located approximately 300 feet upstream (north) of the existing bridge. The proposed eastern bridge approach would introduce fill inside the existing floodplain. This bridge

approach area would not be classified as a fill inside the existing floodplain after completion of the Upper Llagas Flood Protection Project.

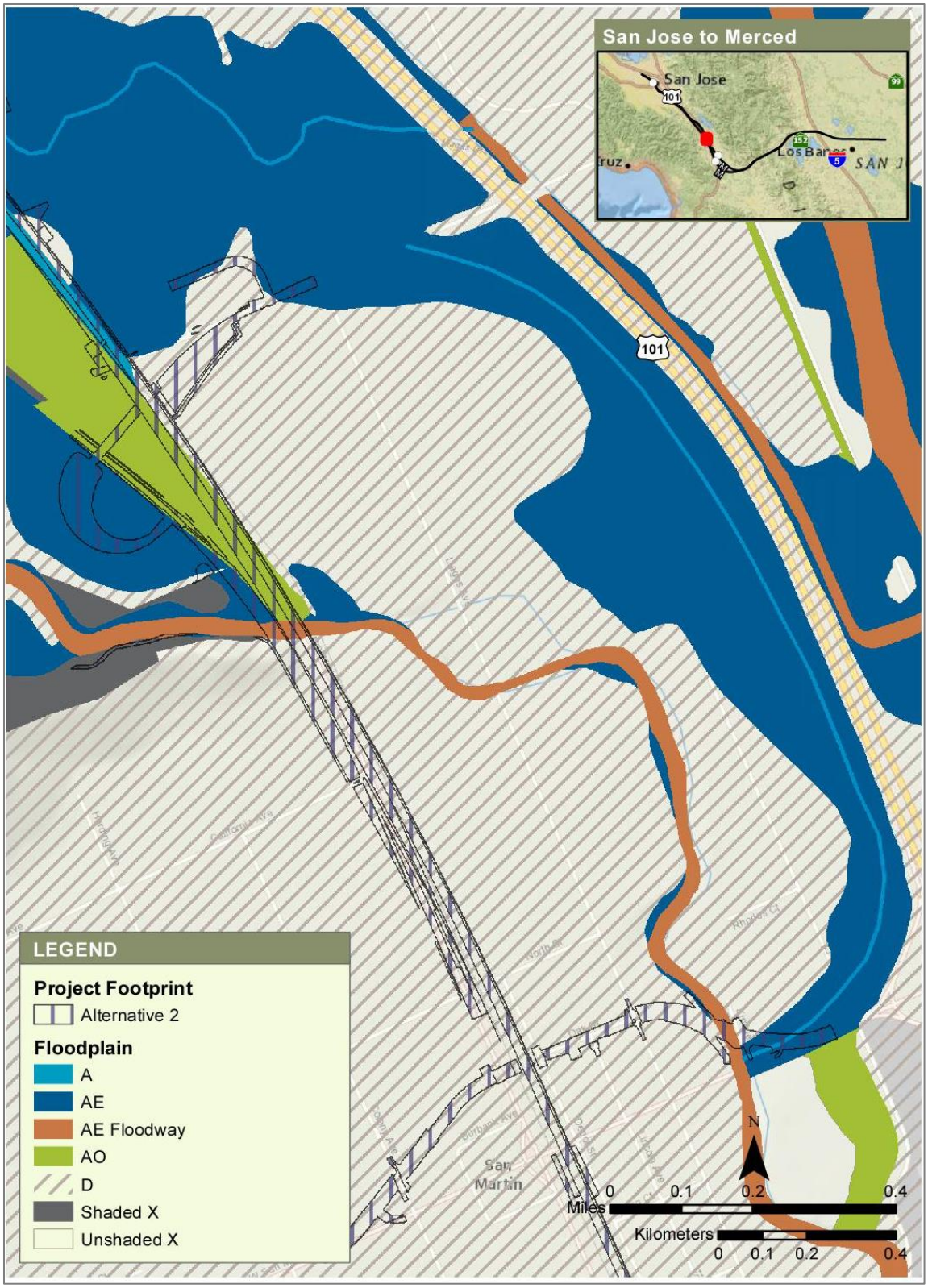
The project footprints for the remaining three alternatives are located outside of the limits of the 100-year floodplain for West Little Llagas - Middle Avenue Overflow, both before and after the completion of the Upper Llagas Flood Protection Project.

3.8.1.4 Available Hydraulic Models

FEMA effective hydraulic model was available to perform the hydraulic analysis of this waterbody and was used to perform the hydraulic analysis. Figure 3-35 shows the approximate limits of the FEMA effective hydraulic model and the permanent project footprint for Alternative 2 at West Little Llagas Creek Middle Avenue Overflow.

Upper Llagas Flood Protection Project would remove existing 100-year floodplain assigned to West Little Llagas Creek – Middle Avenue Overflow. Therefore, the SCVWD hydraulic model of Llagas Creek and tributaries for the Upper Llagas Flood Protection Project did not include West Little Llagas Creek – Middle Avenue Overflow. Hydraulic analysis of West Little Llagas Creek – Middle Avenue Overflow was not performed using the SCVWD hydraulic model.

As stated in Section 3.3.5, Upper Llagas Flood Protection Project, West Little Llagas Creek – Middle Avenue Overflow would not be recognized as a 100-year floodplain with completion of the Upper Llagas Flood Protection Project. The outputs from the hydraulic analysis were not used to evaluate the project's potential impact on the existing floodplain.



Sources: FEMA 2009; Authority 2019

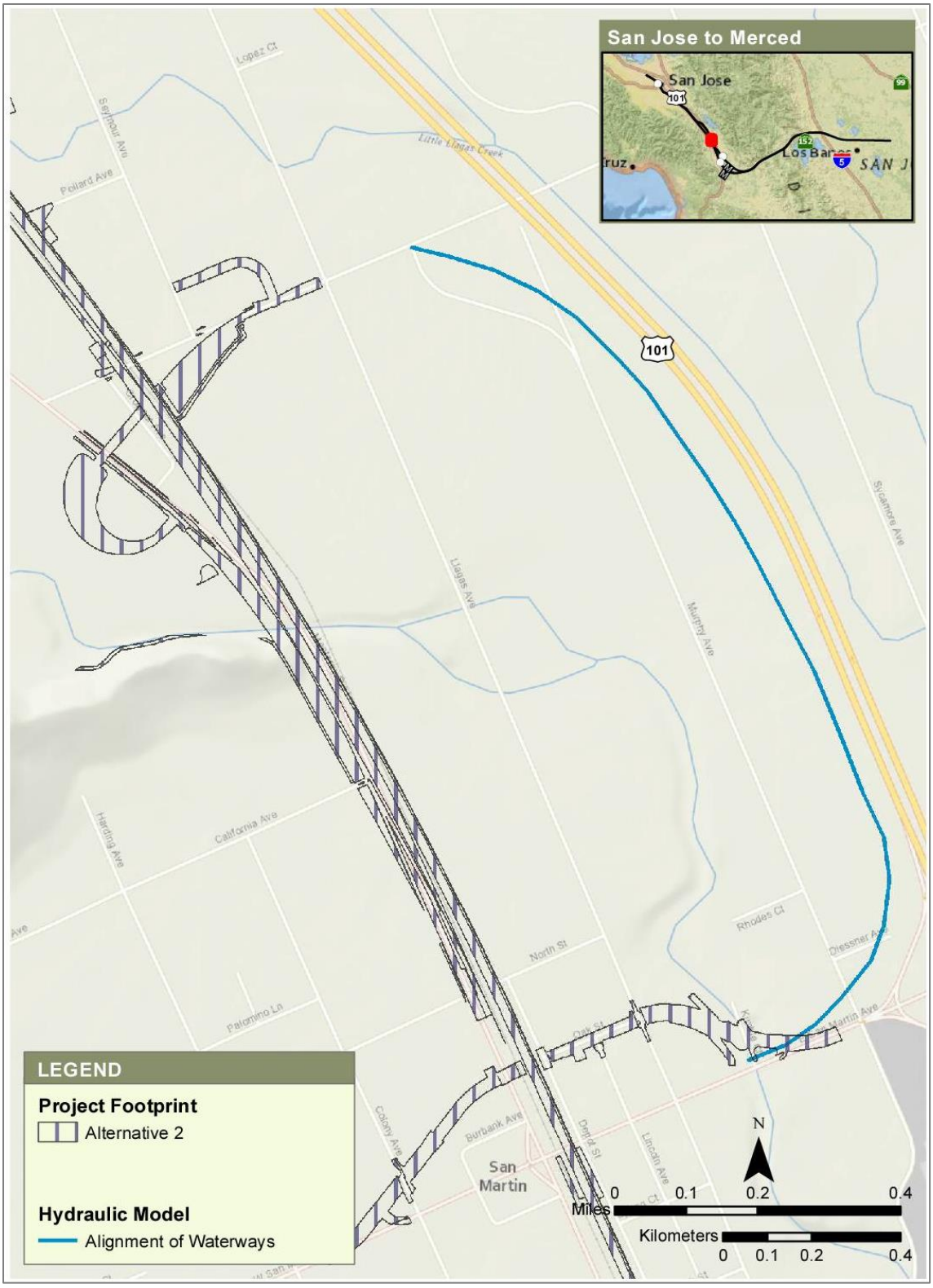
JANUARY 2019

Figure 3-33 West Little Llagas Creek Middle Avenue Overflow, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 2

Sources: SCVWD 2018f; Authority 2019

JANUARY 2019

Figure 3-34 West Little Llagas Creek Middle Avenue Overflow, Floodplain after Completion of Upper Llagas Flood Protection Project with Project Footprint for Alternative 2



Sources: SCVWD 2018b; Authority 2019 JANUARY 2019

Note: this figure does not display channel cross sections included in the hydraulic model.

Figure 3-35 West Little Llagas Creek Middle Avenue Overflow, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 2

3.8.2 FEMA Effective Hydraulic Model

3.8.2.1 Overview of Hydraulic Model

The FEMA FIRM and FIS for Santa Clara County did not provide location of the channel cross sections relative to the project footprint for Alternative 2. The channel cross sections included in the hydraulic model was replaced with channel cross sections with known locations to allow the comparison of the existing and propose conditions.

The proposed East San Martin Avenue Bridge over Llagas Creek and the bridge approach for Alternative 2 would be elevated from the existing grade to provide sufficient freeboard for the proposed bridge over Llagas Creek. The fill for the eastern bridge approach area that are within the limits of the FEMA effective hydraulic model were represented by adjusting the channel cross section.

3.8.2.2 Water Surface Elevation

The modeling results for West Little Llagas Creek – Middle Avenue Overflow for Alternative 2 near the proposed East San Martin Road Bridge are shown in Table 3-18. The outputs for Alternative 2 showed increases in 100-year flood profile immediately on upstream (east) of the areas obstructed by the proposed bridge approach area.

As stated in Sections 3.3.5 and 3.8.1, Background Information, the FEMA effective hydraulic model for West Little Llagas Creek – Middle Avenue Overflow would not represent the existing project conditions for the HSR. Because West Little Llagas Creek – Middle Avenue Overflow would not be classified as 100-year floodplain, mitigation measures would not be required.

Table 3-18 Hydraulic Modeling Results, West Little Llagas Creek, Alternative 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Outfall to Llagas Creek at East San Martin Avenue	658	n/a	286.0	286.0	0.0
500 feet upstream (east) of outfall	658	n/a	287.1	287.6	0.5
900 feet upstream (east) of outfall	658	n/a	289.5	289.6	0.1

Elevations are rounded to the nearest 0.1 foot.
This model represents overbank flood flow with undefined channel. There is no channel bank represented in the hydraulic model.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

3.9 West Branch Llagas Creek

3.9.1 Background Information

3.9.1.1 Floodplain Location

The West Branch Llagas Creek is tributary of Llagas Creek, flowing through the cities of San Martin and Gilroy on west side of Monterey Highway and existing railroad track.

3.9.1.2 FEMA Floodplain

According to the FEMA FIRM Panel Numbers 06085C0628H, 06085C0636H, and 06085C0637H (FEMA 2009), the main channel and overbank flow of West Branch Llagas Creek flowing parallel on the west side of Monterey Highway is identified as Zone AE and floodway (Figure 3-36).

3.9.1.3 Project Alternatives in the FEMA Floodplain

The permanent project footprint for Alternative 2 is in the existing 100-year floodplain for West Branch Llagas Creek (Figure 3-36). The permanent impact areas for the remaining three project alternatives are outside of the limits of the existing FEMA 100-year floodplain of West Branch Llagas Creek.

There are no existing/proposed railroad bridge over West Branch Llagas Creek. Alternative 2 proposes grade separation of the existing roadways crossing the existing railroad and realignment of Monterey Highway traveling parallel to the existing railroad track on the west side. In the footprint of the existing 100-year floodplain/floodway of West Branch Llagas Creek, Alternative 2 proposes ground excavation for the roadway grade separation of following roads undercrossing the proposed railroad track:

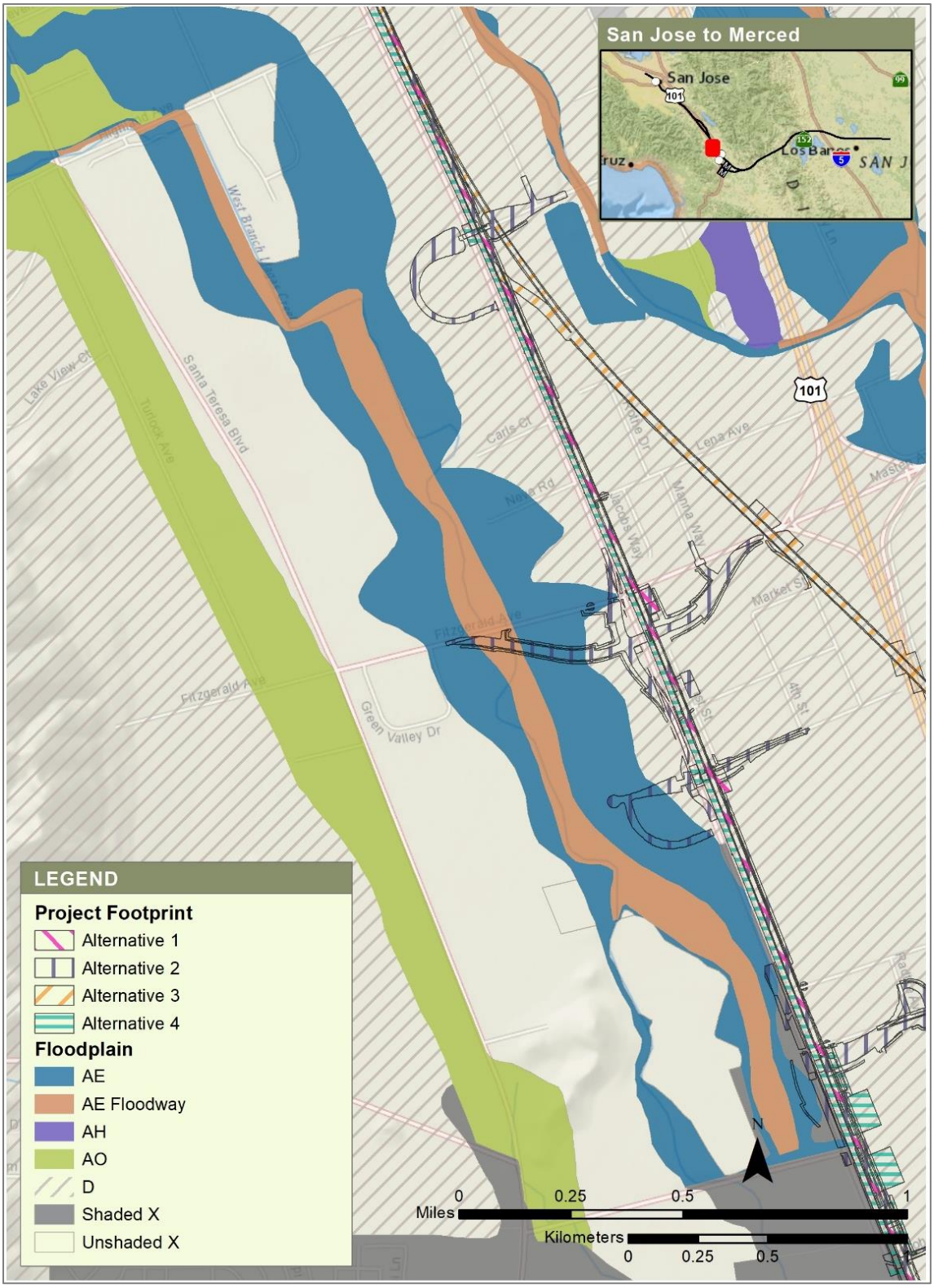
- Masten Avenue
- Rucker Avenue
- Buena Vista Avenue

This alternative would also require realignment and regrading of Monterey Highway, and portions of the realigned Monterey Highway would be in the existing 100-year floodplain for West Branch Llagas Creek.

3.9.1.4 Available Hydraulic Model

The FEMA effective hydraulic model was available to perform hydraulic analysis of this waterbody. Figure 3-37 shows the approximate limits of the FEMA effective hydraulic model and permanent project footprint for Alternative 2.

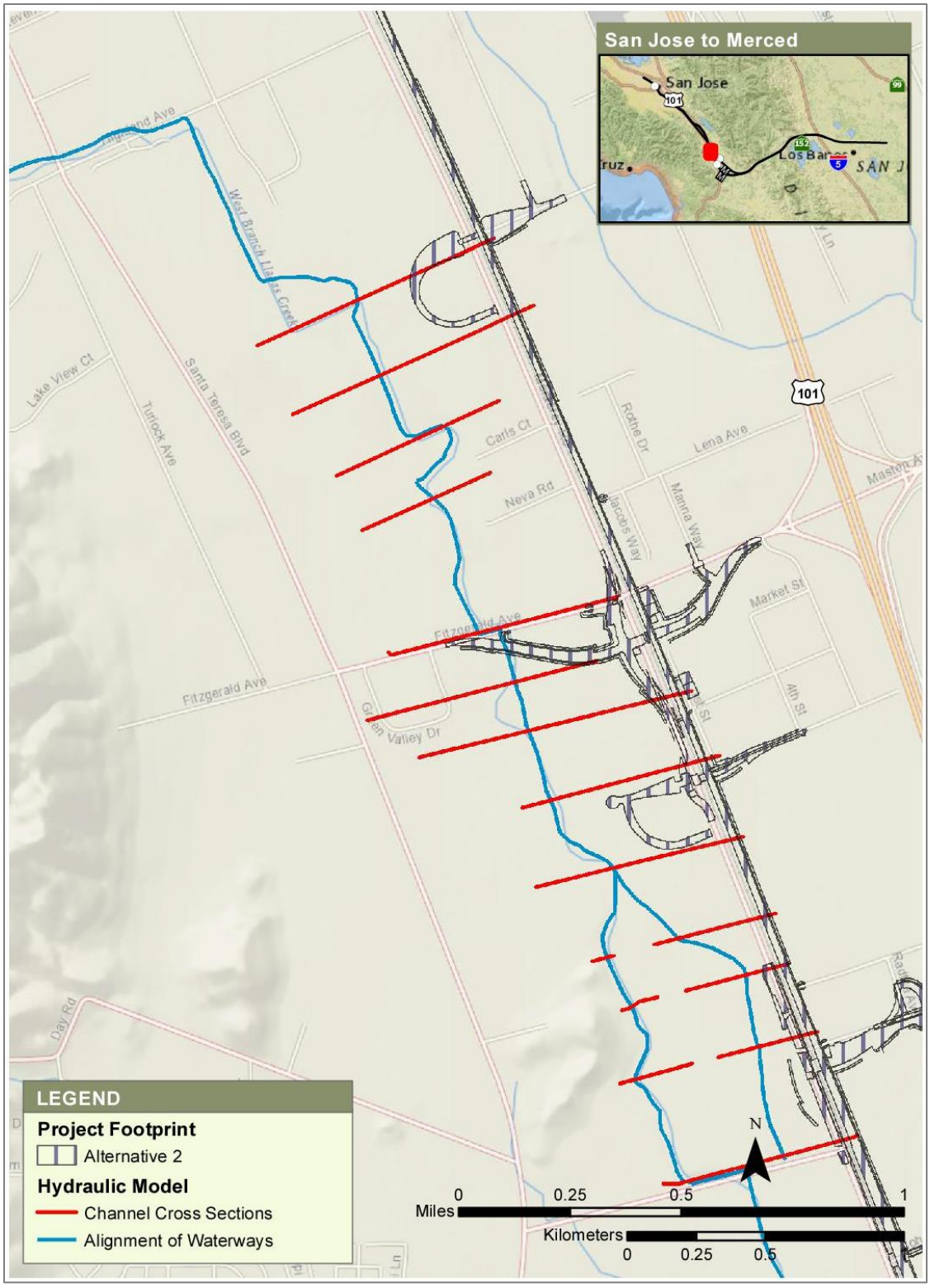
The SCVWD hydraulic model was not available for West Branch Llagas Creek. Therefore, hydraulic analysis was only performed using the FEMA effective hydraulic model.



Sources: FEMA 2009; Authority 2019

JANUARY 2019

Figure 3-36 West Brach Llagas Creek, Floodplain Map Zoomed to Project Location



Sources: FEMA 2018; Authority 2019. JANUARY 2019
Note: this figure does not display channel cross sections included in the hydraulic model.

Figure 3-37 West Brach Llagas Creek, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 2

3.9.2 FEMA Effective Hydraulic Model

3.9.2.1 Overview of Hydraulic Model

The upstream and downstream limits of FEMA effective hydraulic model for West Branch Llagas Creek were at Highland Avenue (at approximately Station B1437+00) and at Day Road (at approximately Station B1581+00).

The limits of the channel cross sections included the existing railroad track on embankment. The proposed condition hydraulic included the proposed embankment section for Alternative 2. The detailed grading of channel excavation for the roadways in the footprint of the existing 100-year floodplain for West Branch Llagas Creek was not available. Therefore, the proposed condition hydraulic model did not include the proposed channel excavation for the roadway grade separation project part of Alternative 2. This model setup would be revised in the design phase of this project.

3.9.2.2 Water Surface Elevation

The modeling results for the Alternative 2 near the West Branch Llagas Creek are shown in Table 3-19. The outputs for Alternative 2 did not show increases in 100-year flood profile near the West Branch Llagas Creek between West San Martin Avenue on north and Day Road on south.

Table 3-19 Hydraulic Modeling Results, West Branch Llagas Creek, Alternative 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Day Road	160	229.5	229.2	229.2	0.0
At Santa Clara Avenue	1,375	240.5	241.5	241.5	0.0
At Fitzgerald Avenue	1,375	244.3	246.9	246.9	0.0

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

3.10 Llagas Creek (East of Gilroy)

3.10.1 Background Information

3.10.1.1 Floodplain Location

Llagas Creek flows through San Martin, Morgan Hill, and Gilroy. West Little Llagas Creek, Madrone Channel, and East Little Llagas Creek meet to form Upper Llagas Creek (Authority 2011a). Buena Vista Avenue divides Upper and Lower Llagas Creek. Lower Llagas Creek meets with West Branch Llagas Creek at SR 152 before it drains to the Pajaro River.

Llagas Creek east of Gilroy would require a permit process NRCS similar to the USACE Section 408 review and approval process.

3.10.1.2 FEMA Floodplain

According to the FEMA FIRM Panel Number 060685C0641H and 060685C0643H (FEMA 2009), the main channel of Llagas Creek in the project footprint is identified as Zone AE and a floodway (Figure 3-38). Llagas Creek at this location has levees on both sides of the main channel. The levees along the western bank are recognized by FEMA and appear in the FIRM #06085C0643H (FEMA 2009). The width of the effective Zone AE floodplain and floodway measured along the proposed railroad alignment for Alternative 3 is approximately 300 feet.

Llagas Creek east of Gilroy is outside of the Upper Llagas Flood Protection Project. There would be no changes to the channel geometry in this location, but changes in the flooding pattern would change the extents of the 100-year floodplain in the project footprint. The main channel of Llagas Creek would remain as Zone AE floodplain, but the width of the future Zone AE floodplain measured along the railroad alignment for Alternative 3 would change to approximately 330 feet (Figure 3-39).

Llagas Creek east of Gilroy in the project footprint is recognized as a floodway. Therefore, the project cannot raise the 100-year flood profile of Llagas Creek at East of Gilroy.

3.10.1.3 Project Alternatives in the FEMA Floodplain

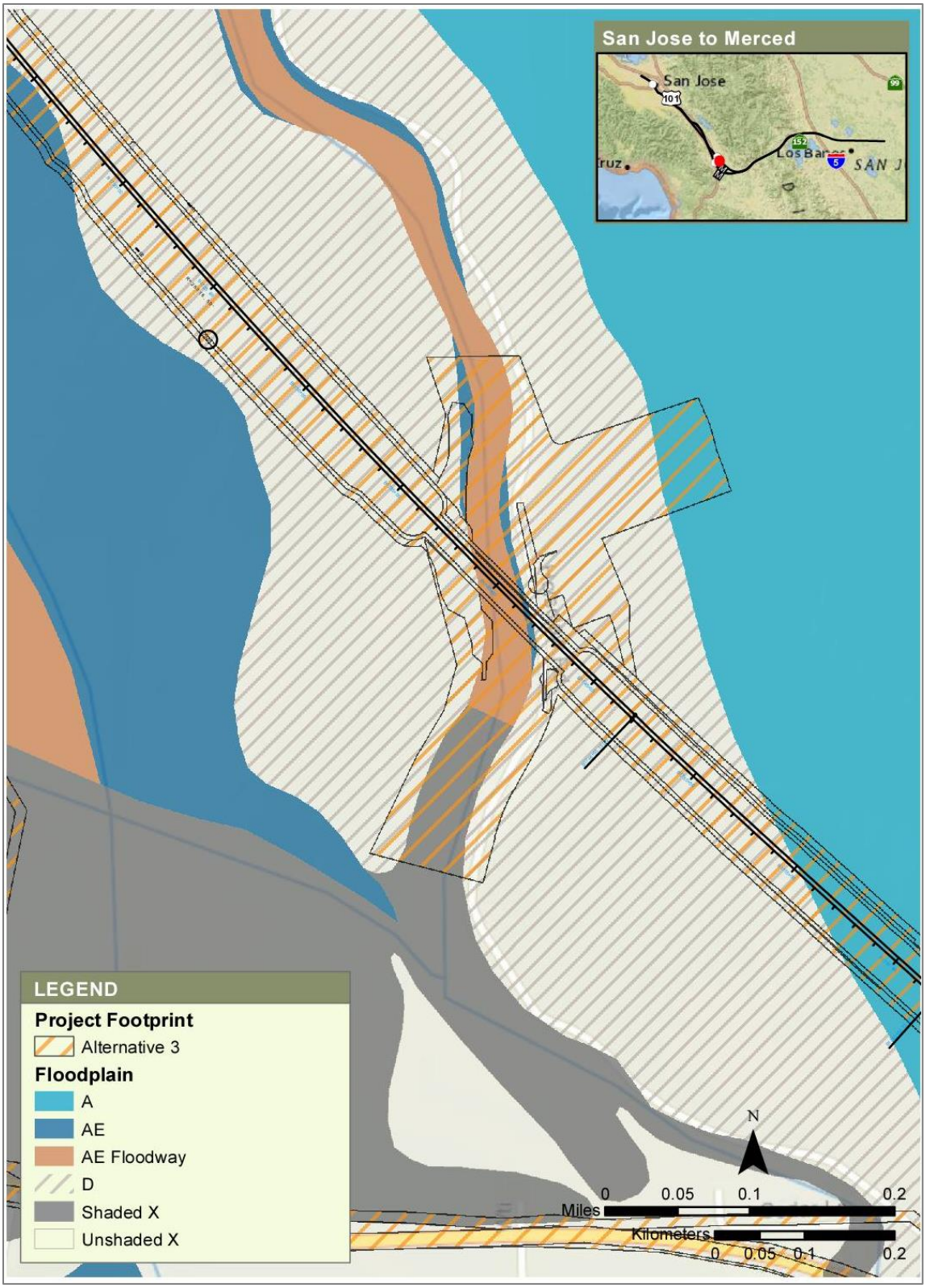
The project footprint for Alternative 3 is in the existing 100-year floodplain for Llagas Creek at East of Gilroy (Figure 3-38). The Upper Llagas Flood Protection Project would change the limits of the 100-year floodplain of Llagas Creek in the east of Gilroy (Figure 3-39), and the project footprint for Alternative 3 would still be within the modified 100-year floodplain. The permanent impact areas for the remaining three project alternatives are outside of the limits of the existing FEMA 100-year floodplain of Llagas Creek at East of Gilroy.

Alternative 3 would entail a new railroad bridge over Llagas Creek from approximately station 1736+00 to 1744+50. The proposed railroad bridge crossing would be located approximately 2,700 feet upstream (north) of the existing SR 152 bridge over Llagas Creek. The proposed pier columns in the main channel of Llagas Creek would obstruct the flood flow and could potentially increase the profile of the floodplain and floodway. The project would entail widening the channel by offsetting the levees to the outside to maintain the existing floodplain and floodway profile of Llagas Creek.

3.10.1.4 Available Hydraulic Model

The FEMA effective hydraulic model and SCVWD hydraulic model were available for this waterbody. Figure 3-40 shows the approximate limits of the FEMA effective hydraulic model with the project footprint for Alternative 2. Figure 3-41 shows the limits of the SCVWD hydraulic model with the project footprint for Alternative 2.

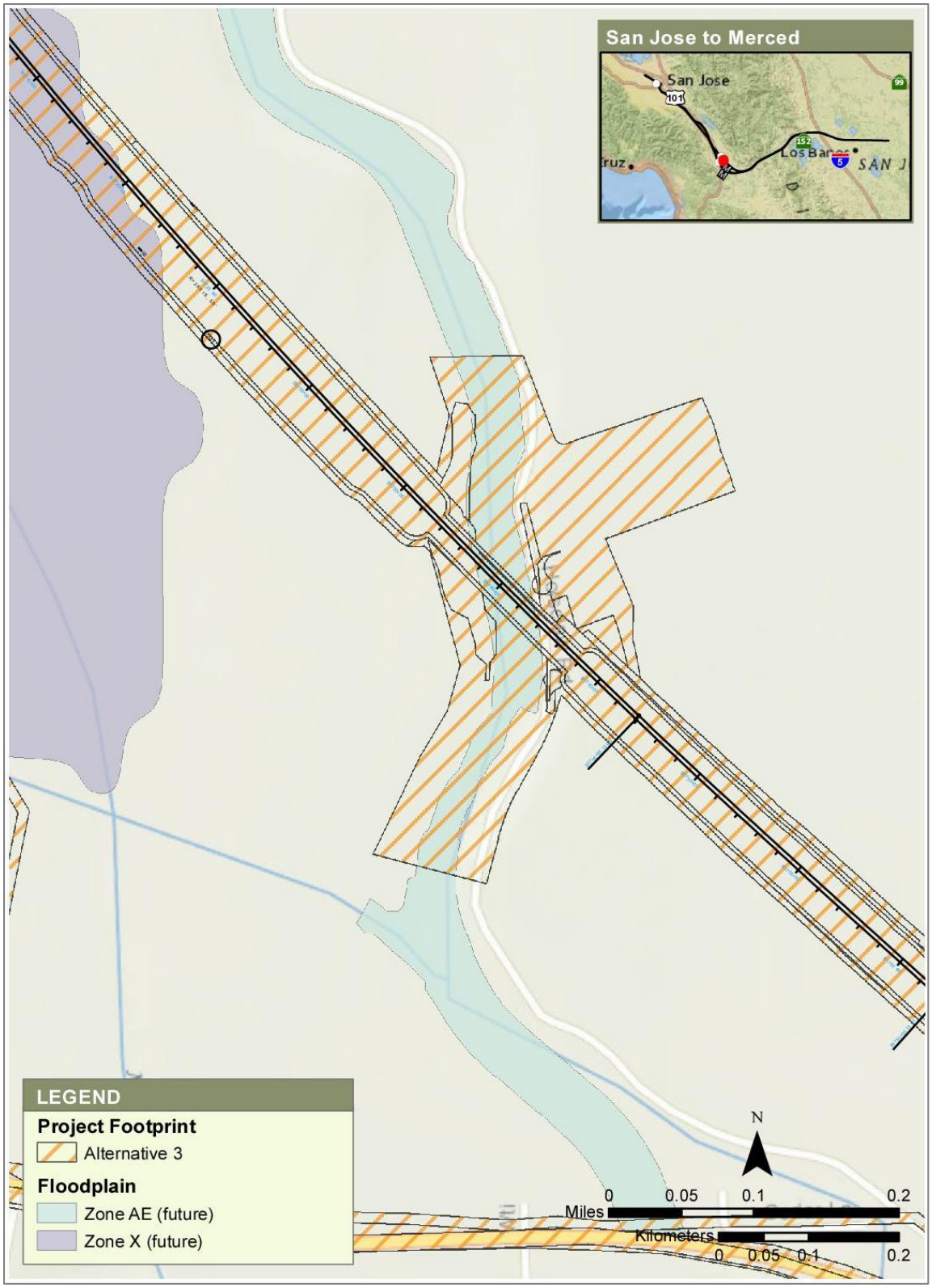
The FEMA effective hydraulic model provided does not include up-to-date available information that were included in the SCVWD hydraulic model. Therefore, the SCVWD hydraulic model was used to evaluate the project's potential impacts.



Sources: FEMA 2009; Authority 2019

JANUARY 2019

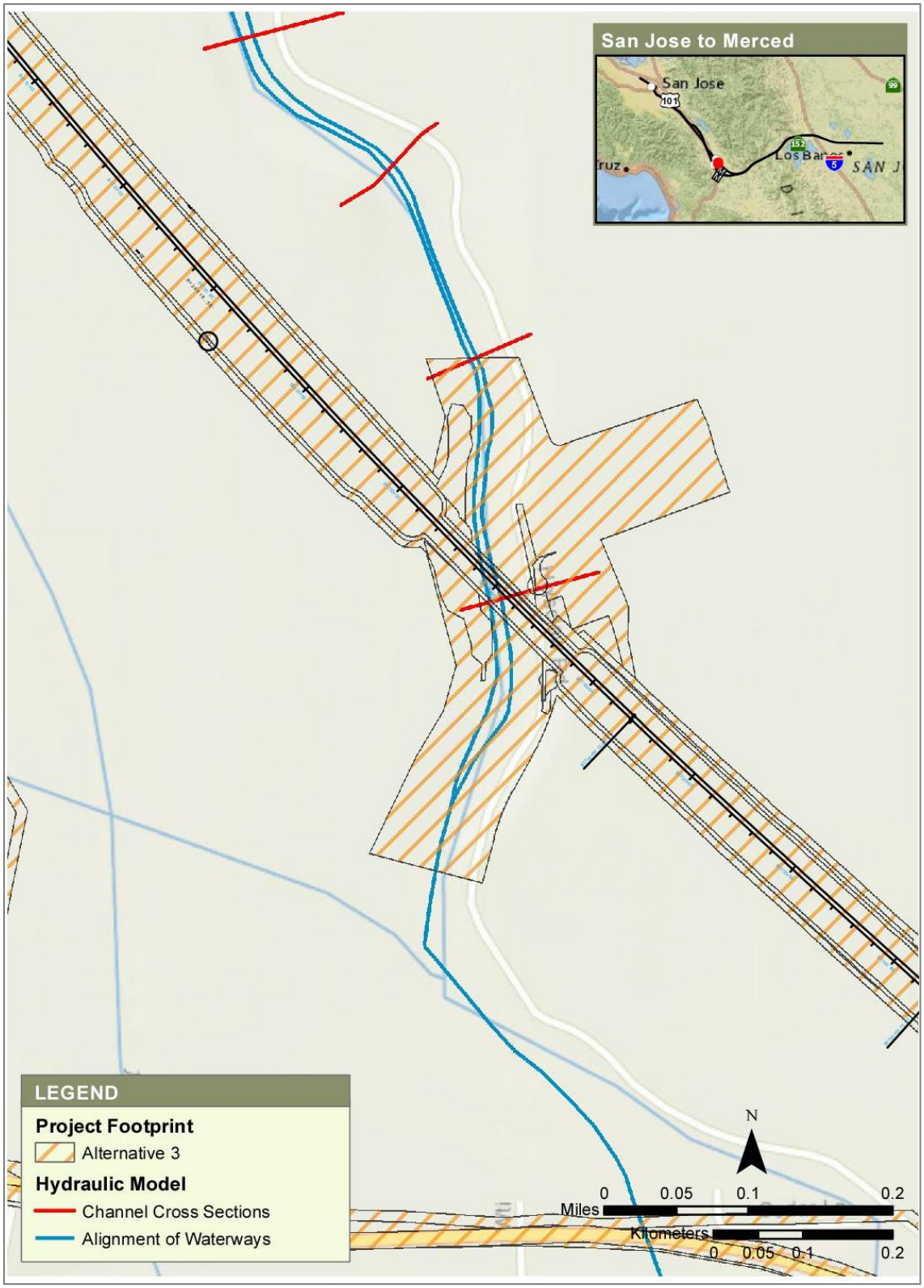
Figure 3-38 Llagas Creek (East of Gilroy), Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 3



Sources: SCVWD 2018f; Authority 2019

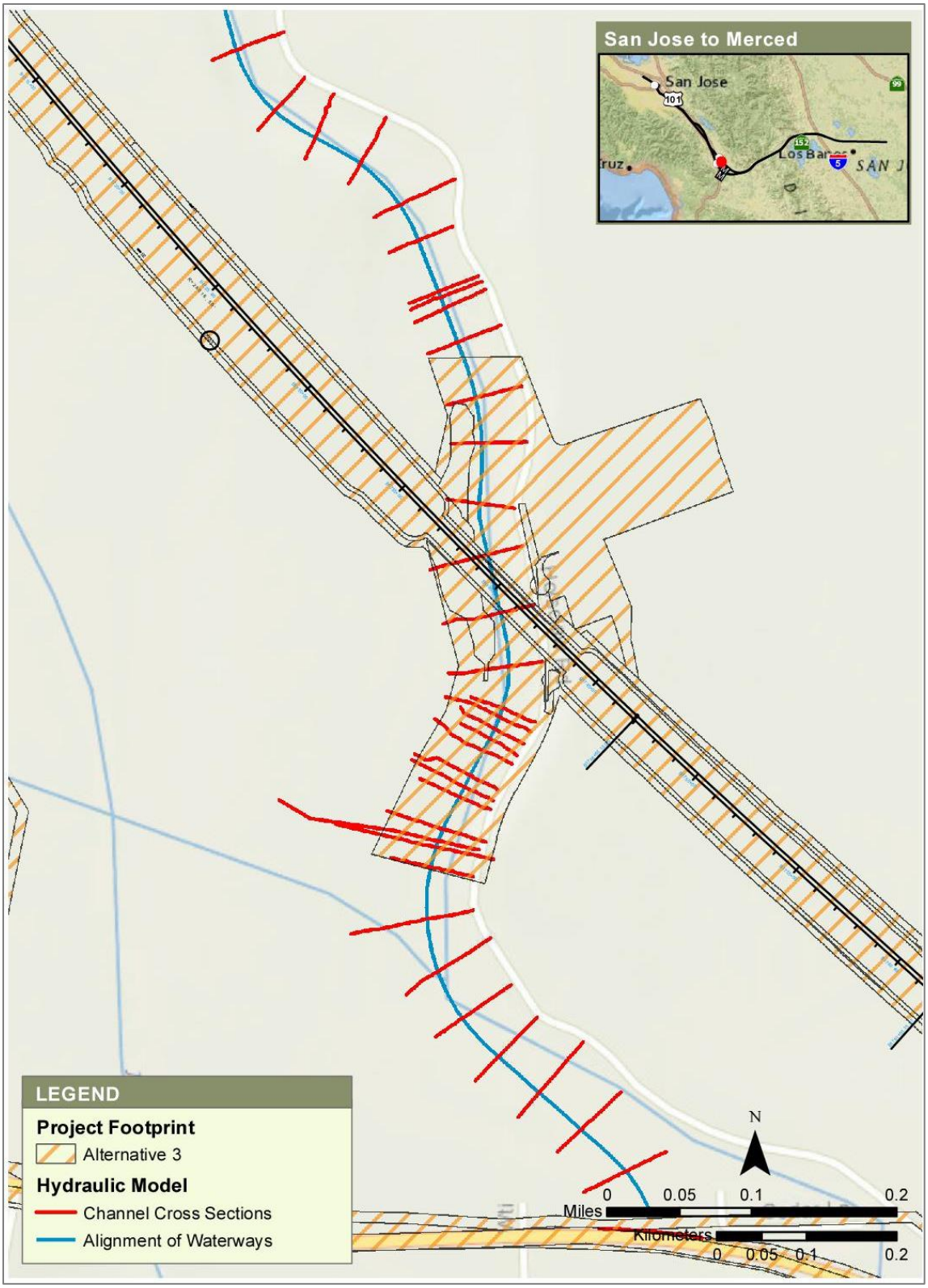
JANUARY 2019

Figure 3-39 Llagas Creek (East of Gilroy), Floodplain after Completion of Upper Llagas Flood Protection Project with Project Footprint for Alternative 3



Sources: FEMA 2018; Authority 2019 JANUARY 2019
Note: this figure does not show all of the channel cross sections in the hydraulic model.

Figure 3-40 Llagas Creek (East of Gilroy), FEMA Hydraulic Model at Project Location



Sources: SCVWD 2015b; Authority 2019

JANUARY 2019

Figure 3-41 Llagas Creek (East of Gilroy), HEC-RAS Channel Cross Sections at Project Location

3.10.2 FEMA Effective Hydraulic Model

3.10.2.1 Overview of Hydraulic Model

The upstream and downstream limits of Llagas Creek east of Gilroy in the FEMA effective hydraulic model were approximately 3,400 feet upstream of Buena Vista Avenue Bridge (approximately 20,600 feet upstream of the proposed railroad bridge) and approximately 1,800 feet downstream of the Southside Drive Bridge (approximately 9,500 feet downstream of the proposed railroad crossing).

The channel width from the FEMA FIRM is approximately 400 to 500 feet (Figure 3-40), but the channel width of the FEMA effective hydraulic model at project location is approximately 12,000 feet. The footprint of hydraulic model includes Llagas Overbank on west and Zone A SHFA on east. Therefore, the setup of the FEMA effective hydraulic model would allow flood flow interaction between three independent floodplains. In addition, the current effective FEMA hydraulic model for Llagas Creek at the project location does include the changes to Llagas Creek and its tributaries resulting from SCVWD's Upper Llagas Creek Flood Protection Project.

3.10.2.2 Water Surface Elevations

The modeling results for Alternative 3 with the proposed creek widening are shown in Table 3-20. The outputs from hydraulic analysis showed the proposed Alternative 3 bridge would not increase the 100-year flood profile of Llagas Creek.

Table 3-20 Hydraulic Modeling Results, Llagas Creek (East of Gilroy), Alternative 3 with Creek Widening

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At State Route 152 Bridge	5,800	183.8	179.9	179.9	0.0
At proposed railroad bridge for Alternative 3	6,300	188.7	191.1	191.1	0.0
At Gilman Rd	6,300	196.8	196.2	196.2	0.0

Elevations are rounded to the nearest 0.1 foot
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

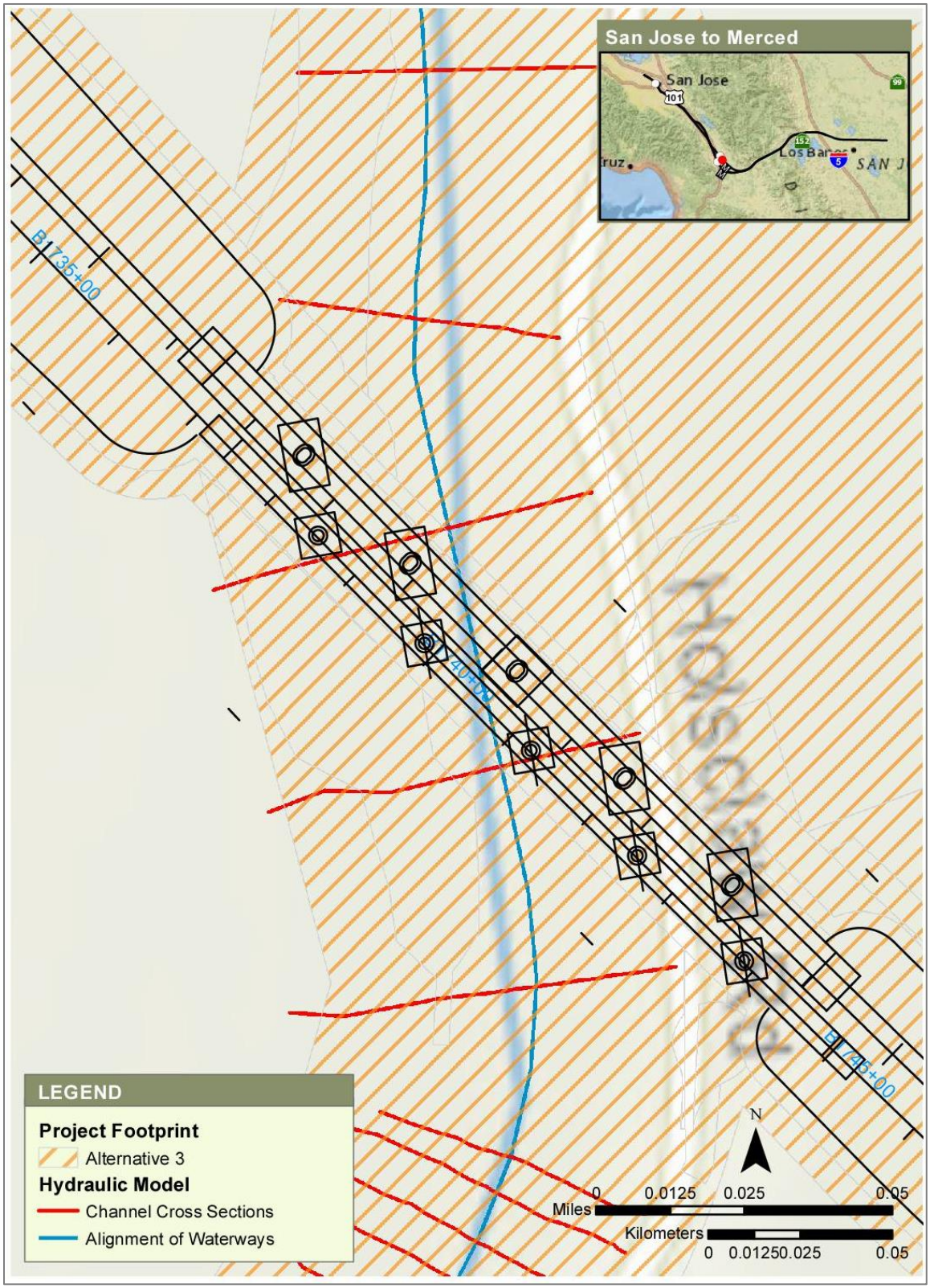
The current effective FEMA hydraulic model allow interaction between existing 100-year floodplain for Llagas Creek mainline, Llagas Overbank Flow on west, and Zone A floodplain on east of Llagas Creek mainline, even though FEMA FIRM does not show interaction between these three floodplains. Therefore, the outputs from the hydraulic analysis of the existing condition and Alternative 3 may not accurately represent the existing and proposed site conditions during the 100-year storm event, assuming Upper Llagas Flood Protection Project is completed prior to the beginning of construction for the HSR project. Therefore, hydraulic analysis was also performed using the hydraulic model of Llagas Creek and tributaries provided by SCVWD, and outputs from the SCVWD hydraulic model was used to evaluate the project's potential impacts on the existing 100-year floodplain.

3.10.3 SCVWD Hydraulic Model

3.10.3.1 Overview of Hydraulic Model

The SCVWD hydraulic model of Llagas Creek at East Gilroy (Figure 2-12) is same as the hydraulic models of Llagas Creek discussed in Section 3.6.3, SCVWD Hydraulic Model, (Llagas Creek near San Martin) and Section 3.7.3, SCVWD Model (Llagas Creek at East San Martin Avenue).

According to the preliminary bridge design for Llagas Creek bridge for Alternative 3, four piers would be inside the footprint of the hydraulic model and three piers would be inside the FEMA designated floodway (Figure 3-41). The three piers inside the designated floodway and one pier on outside of the western levee are included in the proposed condition hydraulic model for Alternative 3 (Figure 3-42). To represent the creek widening near the project footprint, the levees at the proposed bridge crossing in the hydraulic model were set back up to 50 feet to balance the potential floodplain and floodway impacts from the proposed pier columns inside the main channel of Llagas Creek.



Sources: SCVWD 2015b; Authority 2019 JANUARY 2019

Figure 3-42 Llagas Creek (East of Gilroy), HEC-RAS Channel Cross Sections, Zoomed to Proposed Llagas Creek Bridge for Alternative 3

3.10.3.2 Water Surface Elevations

The modeling results for Alternative 3 with the proposed creek widening are shown in Table 3-21. The proposed bridge piers for Alternative 3 in the main channel of Llagas Creek with the proposed creek widening would raise the 100-year WSE of Llagas Creek by 0.4 foot or less. HYD-MM#2, Maintain Existing 100-year Water Surface Elevations of the Llagas Creek Floodway near Holsclaw Road in East Gilroy, would be implemented to mitigate the impact of the bridge piers on the floodway. Mitigation could potentially include, but is not necessarily limited to, the following design solutions: optimizing the design of the piers supporting the proposed bridge or relocating the piers; relocating the existing levee in order to establish a wider channel and floodplain; and/or dredging the channel.

Table 3-21 Hydraulic Modeling Results, Llagas Creek (East of Gilroy), Alternative 3 with Creek Widening

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At confluence with West Branch Llagas Creek	8,248	189.9	180.6	180.6	0.0
At proposed railroad bridge for Alternative 3	8,248	191.6	191.2	191.6	0.4
At Gilman Rd	8,248	195.9	193.6	193.7	0.1

Elevations are rounded to the nearest 0.1 foot
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

3.10.3.3 Water Surface Elevations, Future SCVWD Hydrologic Condition

According to SCVWD, the design flow rate of 8,248 cubic feet per second (cfs) used in their hydraulic model accounts for escape flows from Llagas Creek upstream of the project location. The future flood control project on lower Llagas Creek, following the Upper Llagas Flood Protection Project, would allow Llagas Creek to fully convey the 100-year flow, which would be approximately 17,800 cfs at the project location (SCVWD 2018g).

During the meeting in April, 26, 2018, SCVWD requested the Authority to design proposed Llagas Creek Bridge for Alternative 3 to handle the future 100-year flood flow rate of 17,800 cfs at the project location without raising the current 100-year flood profile of Llagas Creek. The preliminary hydraulic analysis for Alternative 3 with additional channel widening was performed o to show that the proposed Alternative 3 bridge over Llagas Creek has sufficient opening width to accommodate future 100-year flow of 17,800 cfs and without raising the current 100-year flood profile shown in the hydraulic model. In this conceptual future condition for Alternative 3, the channel cross sections of Llagas Creek from upstream of the proposed HSR Alternative 3 bridge and confluence with West Branch Llagas Creek was widened approximately 70 to 90 feet and with channel excavation between bridge upstream face to the existing drop structure.

The outputs from the hydraulic analysis for Alternative 3 in the future scenario with additional modifications to the main channel of Llagas Creek showed that proposed bridge opening is sufficient to convey the future 100-year flow of 17,800 cfs without raising the flood profile from the 100-year flood profile based on flow rate of 8,248 cfs.

3.11 Llagas Overbank (East of Gilroy)

3.11.1 Background Information

3.11.1.1 Floodplain Location

Llagas Creek flows through San Martin, Morgan Hill, and Gilroy. West Little Llagas Creek, Madrone Channel, and East Little Llagas Creek meet to form Upper Llagas Creek (Authority 2011a). Buena Vista Avenue divides Upper and Lower Llagas Creek. Lower Llagas Creek meets with West Branch Llagas Creek at SR 152 before it drains to the Pajaro River.

3.11.1.2 FEMA Floodplain

The FEMA FIRM Panel Numbers 06085C0637H, 06085C0641H, and 06085C0643H (FEMA 2009) shows overbank flood flows from Llagas Creek forms shallow overland flow traveling parallel to Llagas Creek approximately 2,000 to 3,000 feet west of the mainline Llagas Creek. The overbank flood flow from are designated as Zone AO, Zone AE, and floodway (Figure 3-43).

The 100-year flood elevation of the Llagas Overbank with the project footprint varies from approximately 205 feet NAVD 88 at the proposed HSR access road located approximately 2,000 feet upstream (north) of Leavesley Road crossing to approximately 185 feet NAVD 88 at Gilman Road.

The Llagas Overbank in the project footprint is recognized as a floodway in the current effective FEMA FIRM. Therefore, the project cannot raise the 100-year flood profile of Llagas Overbank.

SCVWD's Upper Llagas Flood Protection Project would modify the existing floodplain/floodway footprint of Llagas Overbank (Figure 3-44). With completion of Upper Llagas Flood Protection Project, Llagas Overbank would not be classified as outside of the 100-year floodplain.

3.11.1.3 Project Alternatives in the FEMA Floodplain

The project footprints for all four project alternatives are in the existing 100-year floodplain for Llagas Overbank.

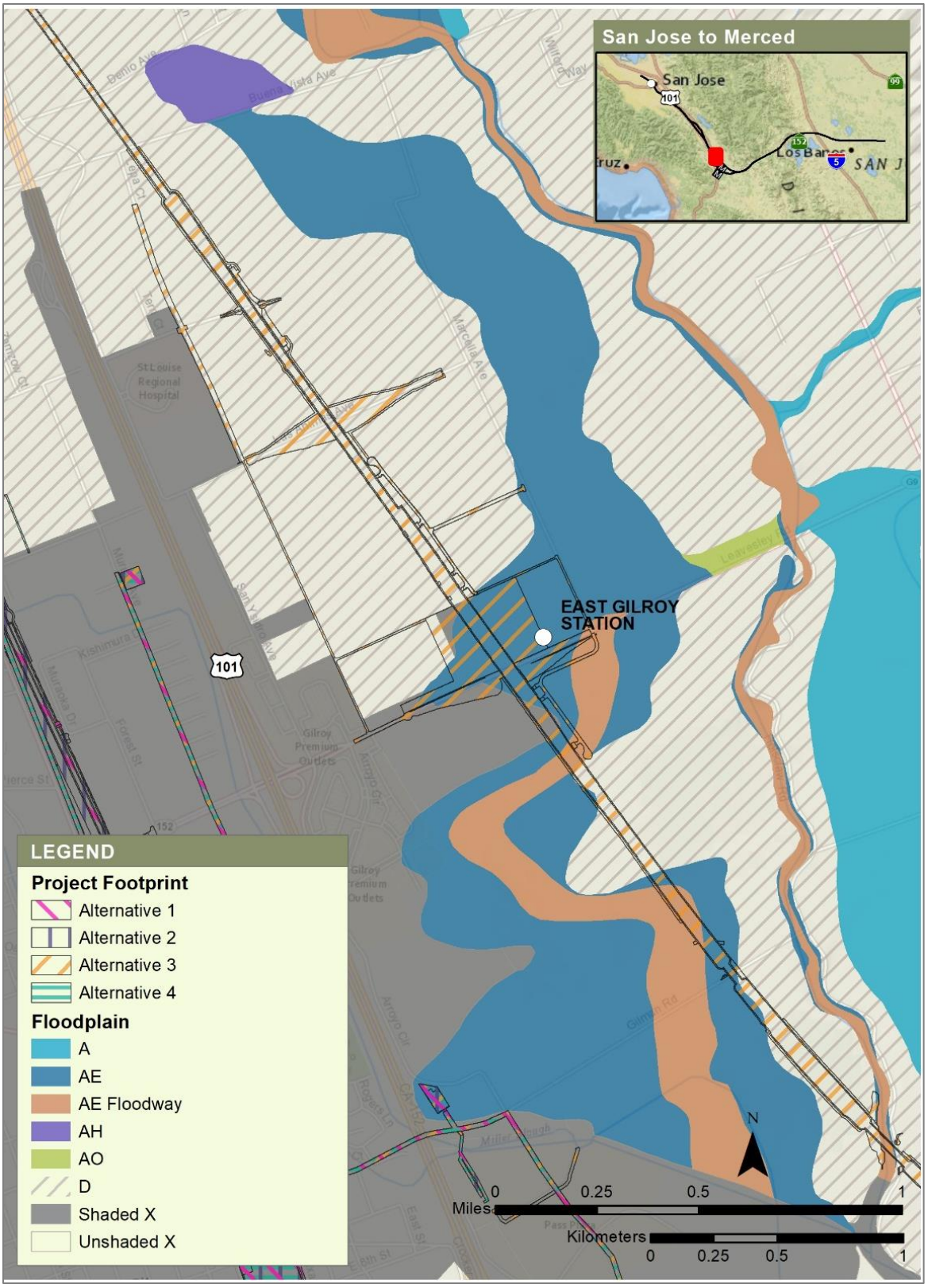
Alternatives 1, 2, and 4 propose a traction power switch station on Gilman Road would be in the limits of the existing 100-year floodplain. The base flood elevation (BFE) shown in the FEMA FIRM in the project footprint for Alternatives 1, 2, and 4 varies from 190 to 191 feet NAVD 88.

Alternative 3 would entail a new embankment segment over Llagas Overbank. Stations B1651+00 to B1684+00 and stations B1693+00 to B1720+00 would be inside the existing FEMA 100-year floodplain. Equalizers are proposed to maintain the existing flood pattern shown in the FEMA FIRM.

3.11.1.4 Available Hydraulic Models

FEMA effective hydraulic model was available to perform hydraulic analysis of this waterbody. Figure 3-45 shows the approximate limits of the FEMA effective hydraulic model with the project footprint for Alternatives 1, 2, and 4. Figure 3-46 shows the limits of the FEMA effective hydraulic model with the project footprint for Alternative 3. The SCVWD hydraulic model of Llagas Creek and tributaries for Upper Llagas Flood Protection Project did not include Llagas Overbank.

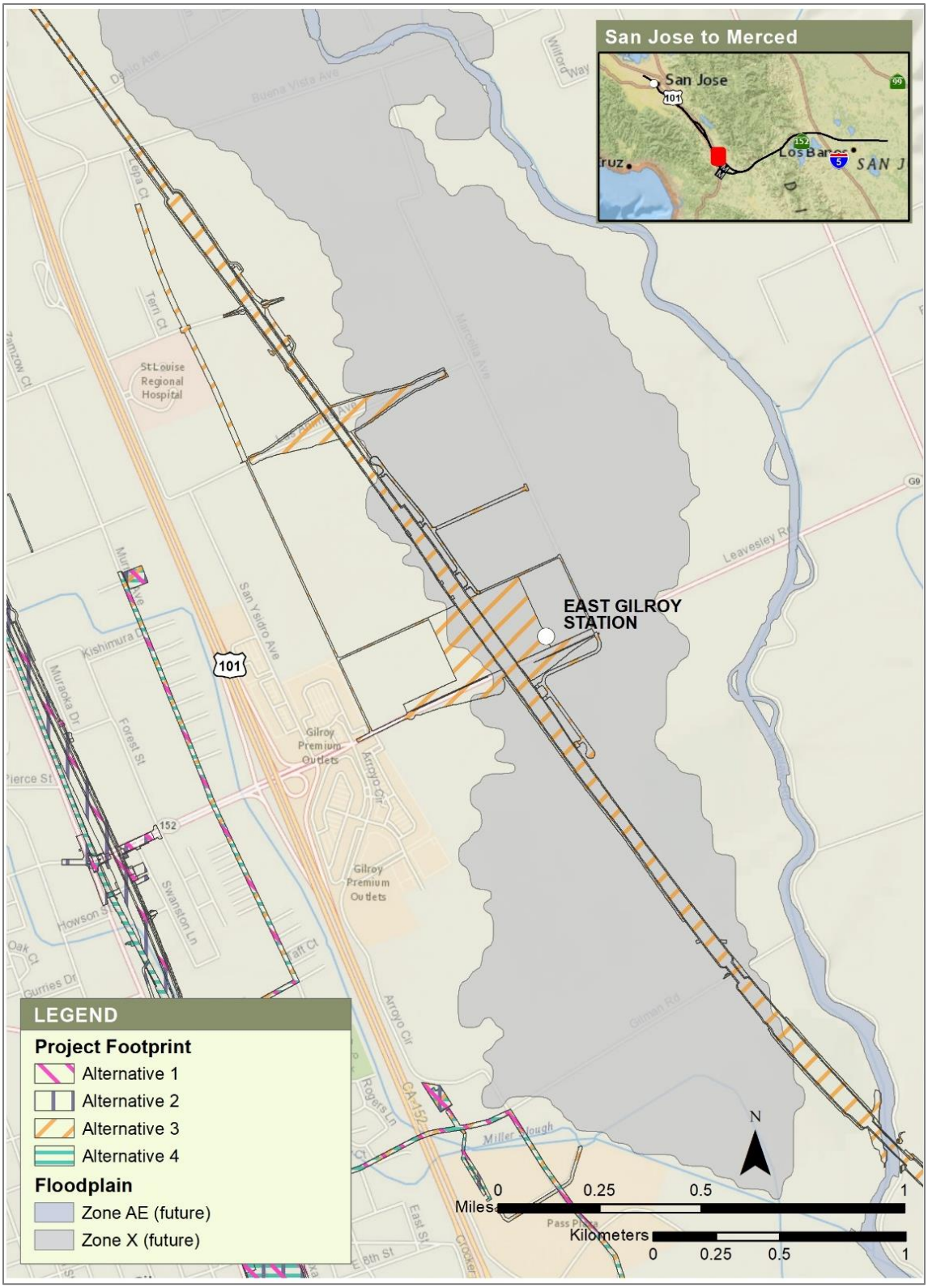
The hydraulic analysis was performed using FEMA effective hydraulic model. The hydraulic analysis outputs would not be used to evaluate the project's potential impacts on the 100-year floodplain, because Llagas Overbank would not be classified as 100-year floodplain after completion of the Upper Llagas Flood Protection Project.



Sources: FEMA 2009; Authority 2019

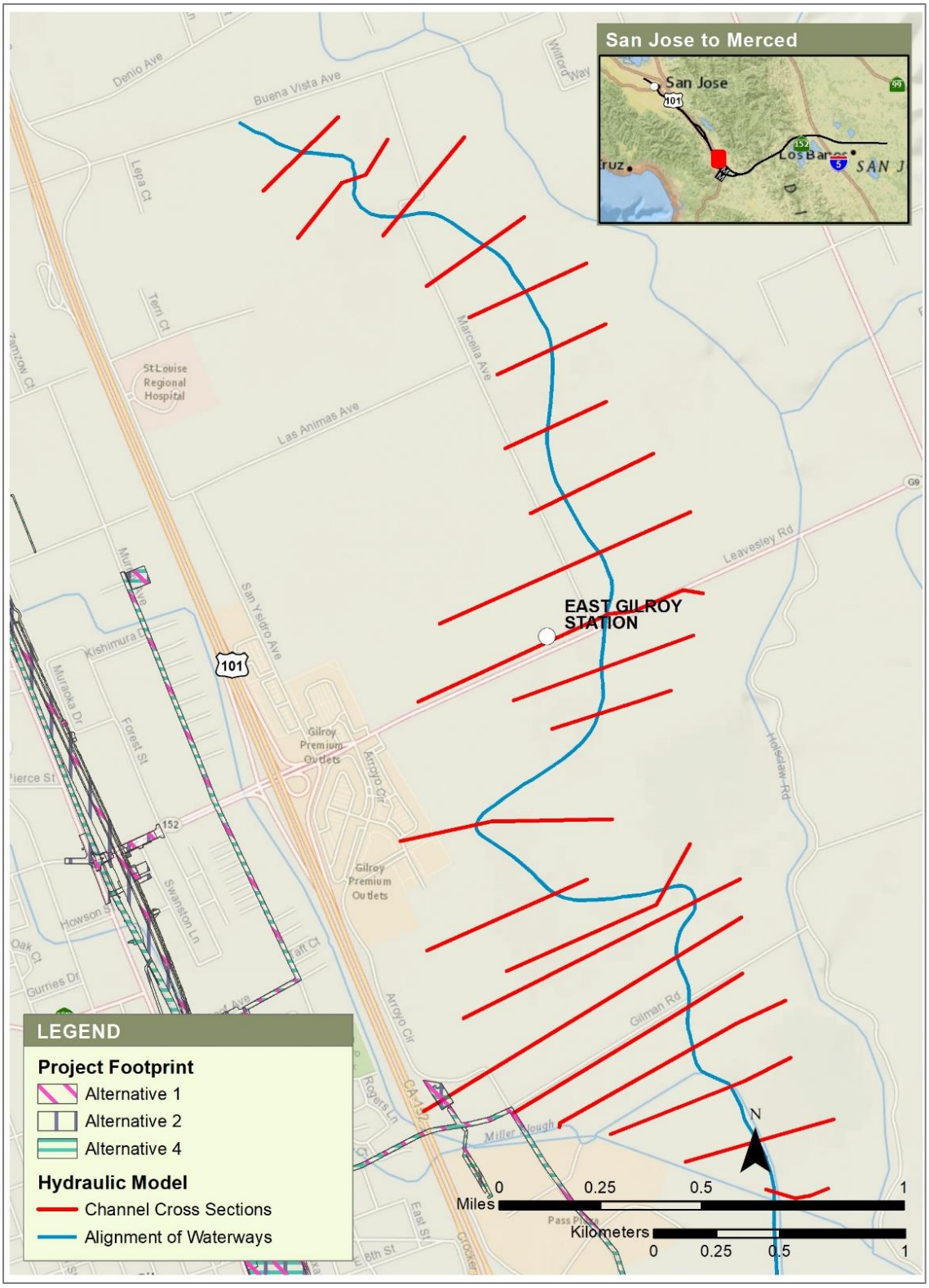
JANUARY 2019

Figure 3-43 Llagas Overbank, FEMA FIRM Zoomed to Project Location



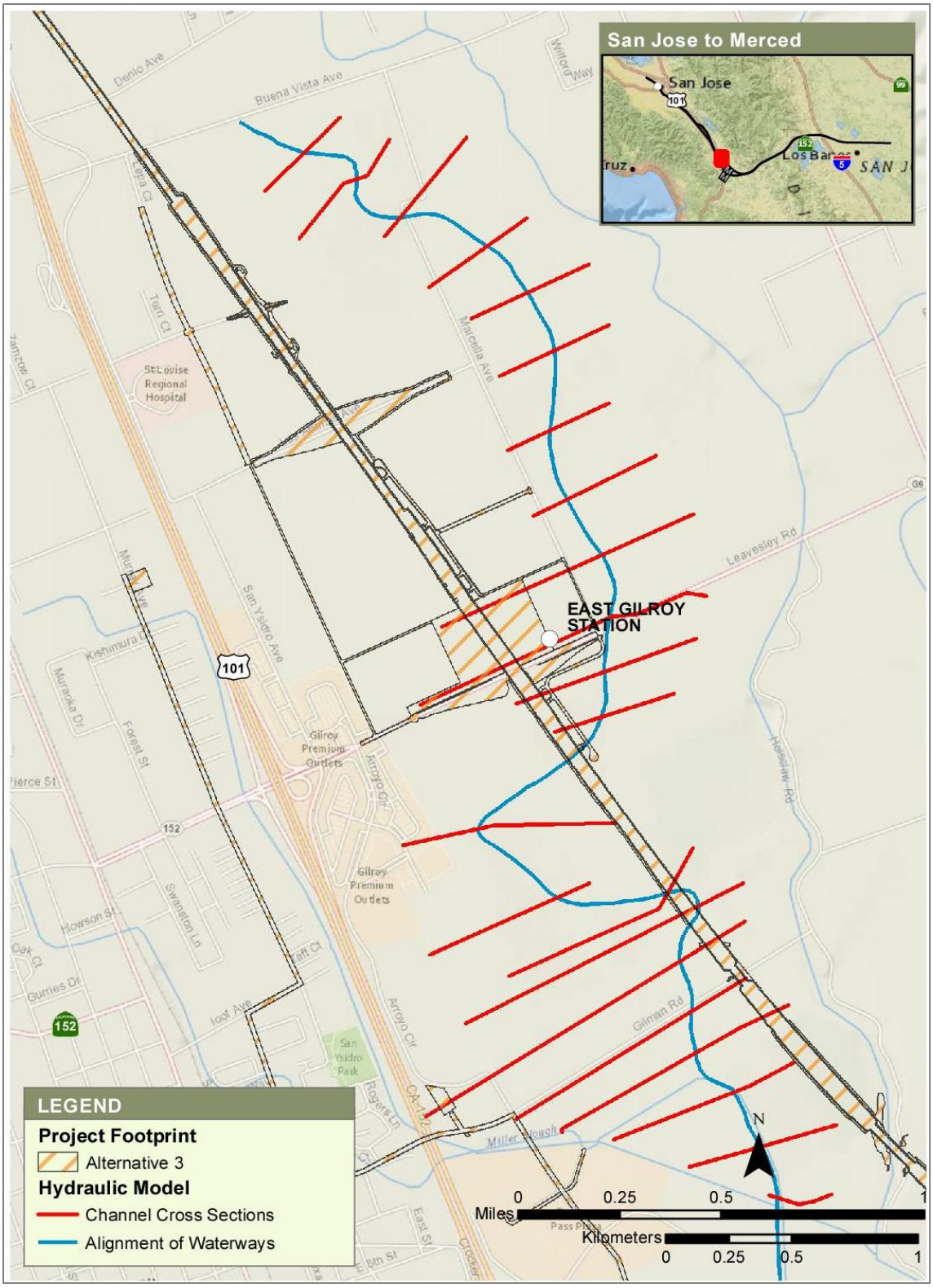
Sources: SCVWD 2018f; Authority 2019 JANUARY 2019

Figure 3-44 Llagas Overbank, Floodplain after Completion of Upper Llagas Flood Protection Project with Project Footprints for Alternatives 1, 2, 3, and 4



Sources: FEMA 2018; Authority 2019. JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-45 Llagas Overbank, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternatives 1, 2, 3, and 4



Sources: FEMA 2018; Authority 2019. JANUARY 2019
Note: this figure does not display all of the channel cross sections included in the hydraulic model.

Figure 3-46 Llagas Overbank, Plan View of FEMA Effective Hydraulic Model with Project Footprint for Alternative 3

3.11.2 FEMA Effective Hydraulic Model

3.11.2.1 Overview of Hydraulic Model

The upstream and downstream limits of Llagas Overbank in the FEMA effective hydraulic model were approximately 1,300 feet upstream of Buena Vista Avenue and approximately 1,800 feet downstream of the Southside Drive Bridge.

The proposed traction power switching station for Alternatives 1, 2, and 4 that is located inside the existing 100-year floodplain was represented in the hydraulic model by adding the flood flow obstruction with the same footprint as the proposed traction power switching station.

The proposed embankments for Alternative 3 that are in the footprint of the hydraulic model were represented using the obstruction feature equivalent to the footprint of the proposed structures. The width of obstruction assigned in channel cross sections varies from approximately 300 to 1,700 feet.

3.11.2.2 Water Surface Elevation

The modeling results for the Alternatives 1, 2, and 4 and Alternative 3 are shown in Table 3-22 and Table 3-23. The outputs for Alternatives 1, 2, and 4 did not show increases in 100-year flood profile of Llagas Overbank. The outputs for Alternative 3 showed elevation increase up to 0.3 foot in the project vicinity.

Table 3-22 Hydraulic Modeling Results, Llagas Overbank, Alternatives 1, 2, and 4

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Gilman Road	4,800	n/a	191.4	191.4	0.0
At Proposed Traction Power Switching Station	4,650	n/a	192.3	192.3	0.0
Approximately 1,000 feet downstream (South)of Leavesley Road	4,650	n/a	200.3	200.3	0.0
At Leavesley Road	4,650	n/a	201.2	201.2	0.0
At Buena Vista Road	300	n/a	223.8	223.8	0.0

Elevations are rounded to the nearest 0.1 foot
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
Overbank flood flow at this location do not have defined channel.

Table 3-23 Hydraulic Modeling Results, Llagas Overbank, Alternative 3

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Gilman Road	4,800	n/a	191.4	191.4	0.0
At proposed traction power switching station	4,650	n/a	192.3	192.3	0.0
Approximately 1,000 feet downstream (South)of Leavesley Road	4,650	n/a	200.3	200.6	0.3
At Leavesley Road	4,650	n/a	201.2	201.2	0.0
At Buena Vista Road	300	n/a	223.8	223.8	0.0

Elevations are rounded to the nearest 0.1 foot
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation

4 COMBINED ONE- AND TWO-DIMENSIONAL HYDRAULIC MODELING

4.1 Hydrology

The FEMA and SCVWD combined one- and two-dimensional HEC-RAS models used to perform existing and proposed condition hydraulic analyses included the hydrographs for the 100-year storm event. The hydrographs included in the hydraulic model are discussed in detail in each of the subsections “Inflow Hydrograph for Hydraulic Analysis”, for each floodplain.

4.2 Hydraulic Model Assumptions

The assumptions for all of the one-dimensional hydraulic model discussed in Section 3.3, general Hydraulic Model Assumptions, are also applicable for the combined one- and two-dimensional unsteady-state hydraulic models. The modeling assumptions that are specific to each hydraulic model are discussed in each of the Overview of the Hydraulic Model subsections for each floodplain.

4.3 Los Gatos Creek

4.3.1 Background Information

4.3.1.1 Floodplain Location

Los Gatos Creek runs 24 miles through Santa Clara Valley’s Guadalupe River watershed from the Santa Cruz Mountains, just south of Loma Prieta peak, north through the Santa Clara Valley until it reaches its confluence with the Guadalupe River in downtown San Jose (Authority 2011a). The Guadalupe River then continues to San Francisco Bay.

4.3.1.2 FEMA Floodplain

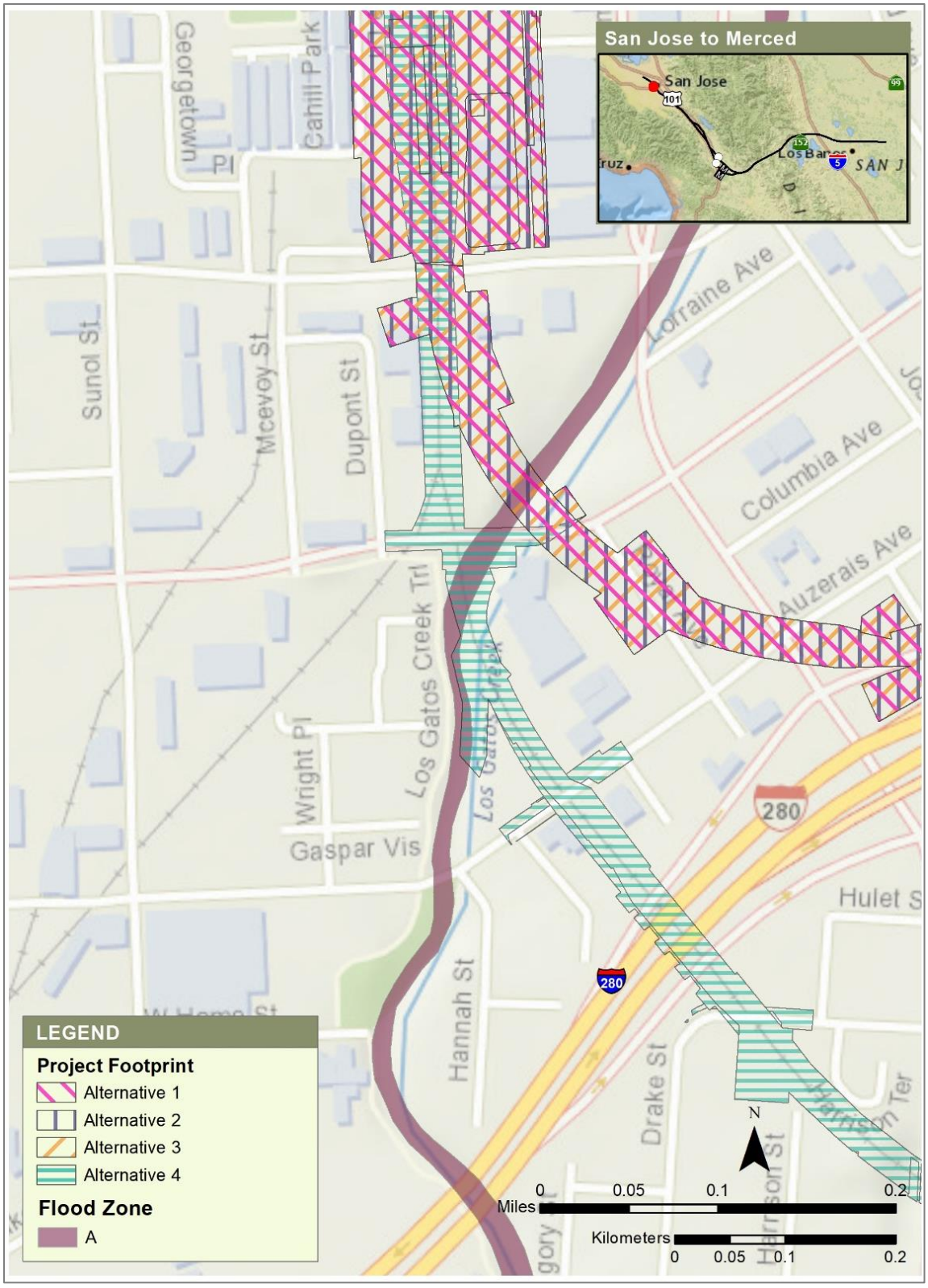
According to the FEMA FIRM Panel No. 60685C0234H (FEMA 2009), Los Gatos Creek in the project footprint is identified as Zone A (Figure 4-1). The FEMA FIRM does not show overbank flood flows in the project vicinity. The width of the Zone A measured along proposed track alignment is approximately 70 feet for Alternatives 1, 2, and 3 and approximately 130 feet for Alternative 4.

4.3.1.3 Project Alternatives in the FEMA Floodplain

The project footprints for Alternatives 1, 2, and 3 overlap with the existing 100-year floodplain for Los Gatos Creek. However, the proposed viaduct segment supported by pier columns for Alternatives 1, 2, and 3 would span over Los Gatos Creek and the proposed pier columns supporting the viaduct would be constructed outside the limits of the existing Zone A floodplain. The proposed railroad track profile over Los Gatos Creek would be approximately 60 feet above the existing channel bank elevation of Los Gatos Creek and would not be in contact with the 100-year flood flow as shown in the FEMA FIRM.

Alternative 4 proposes blended at-grade track using the railroad track currently used by Caltrain and UPRR, constructed in 2017. The HSR train would share the existing railroad bridge over Los Gatos Creek with Caltrain and UPRR. The modifications to the existing bridge structure are not proposed in this project alternative.

For all four project alternatives, no changes are proposed inside the existing FEMA 100-year floodplain of Los Gatos Creek.



Sources: FEMA 2009; Authority 2019

JANUARY 2019

Figure 4-1 Los Gatos Creek, FEMA FIRM Overlay with Project Footprints for Alternatives 1, 2, 3, and 4

4.3.1.4 Available Hydraulic Model

Los Gatos Creek in the project vicinity is identified as Zone A, which is assigned to floodplains determined by approximate methods. In addition, the date of the current effective FEMA FIRM (2009) is before the construction of the existing bridge in the year 2017, which would be used as the blended railroad track for HSR in Alternative 4. Therefore, the hydraulic analysis using FEMA's effective hydraulic model was not performed for Los Gatos Creek.

The more recent SCVWD hydraulic model was documented in this study. Figure 4-2 and Figure 4-3 shows the limits of the SCVWD hydraulic model and project footprint for Alternatives 1, 2, 3 and Alternative 4 at Los Gatos Creek, respectively.

4.3.2 SCVWD Hydraulic Model

4.3.2.1 Overview of Hydraulic Model

The upstream and downstream limits of Los Gatos Creek included in the hydraulic model were immediately downstream of Vasona Park Road Bridge in Vasona Reservoir (approximately 37,860 feet upstream of existing Caltrain/UPRR bridge over Los Gatos Creek) and confluence with Guadalupe River (approximately 4,100 feet downstream of the proposed HSR viaduct over Los Gatos Creek).

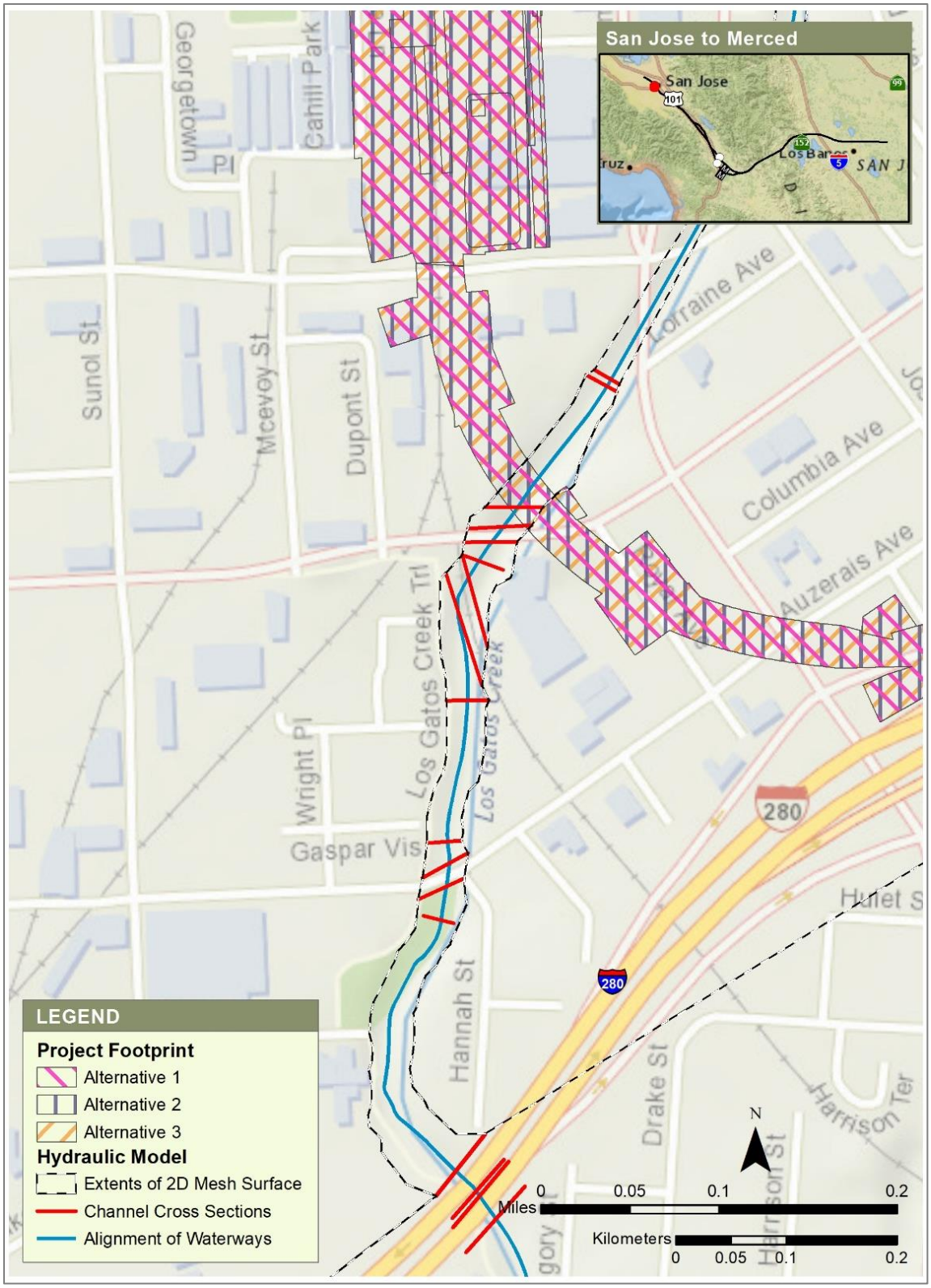
The two-dimensional mesh included in the hydraulic model used to represent the overbank flood flows, included areas roughly bounded by I-280 on south, I-87 on east, West Taylor Street on north, and The Alameda/Race Street on west. The area of the two-dimensional mesh included in the hydraulic model is approximately 836 acres.

The outputs from the existing condition hydraulic analysis showed that the existing railroad bridge over Los Gatos Creek would be overtopped during the 100-year storm event.

The proposed pier columns for Alternatives 1, 2, and 3 is located outside of the limits of the Los Gatos Creek main channel represented in one-dimensional riverine model. The hydraulic model for Alternatives 1, 2, and 3 did not make any modifications to the model inputs in the one-dimensional riverine component.

The proposed pier columns for Alternatives 1, 2, and 3 are within the limits of the two-dimensional mesh included in the hydraulic model, which represents the extents of the overbank flood flows from Los Gatos Creek within the model limits. The Manning's roughness coefficient of 1.0 was assigned in the footprint of the proposed piers columns for Alternatives 1, 2, and 3 to represent the additional obstruction from the proposed pier columns in the overbank area.

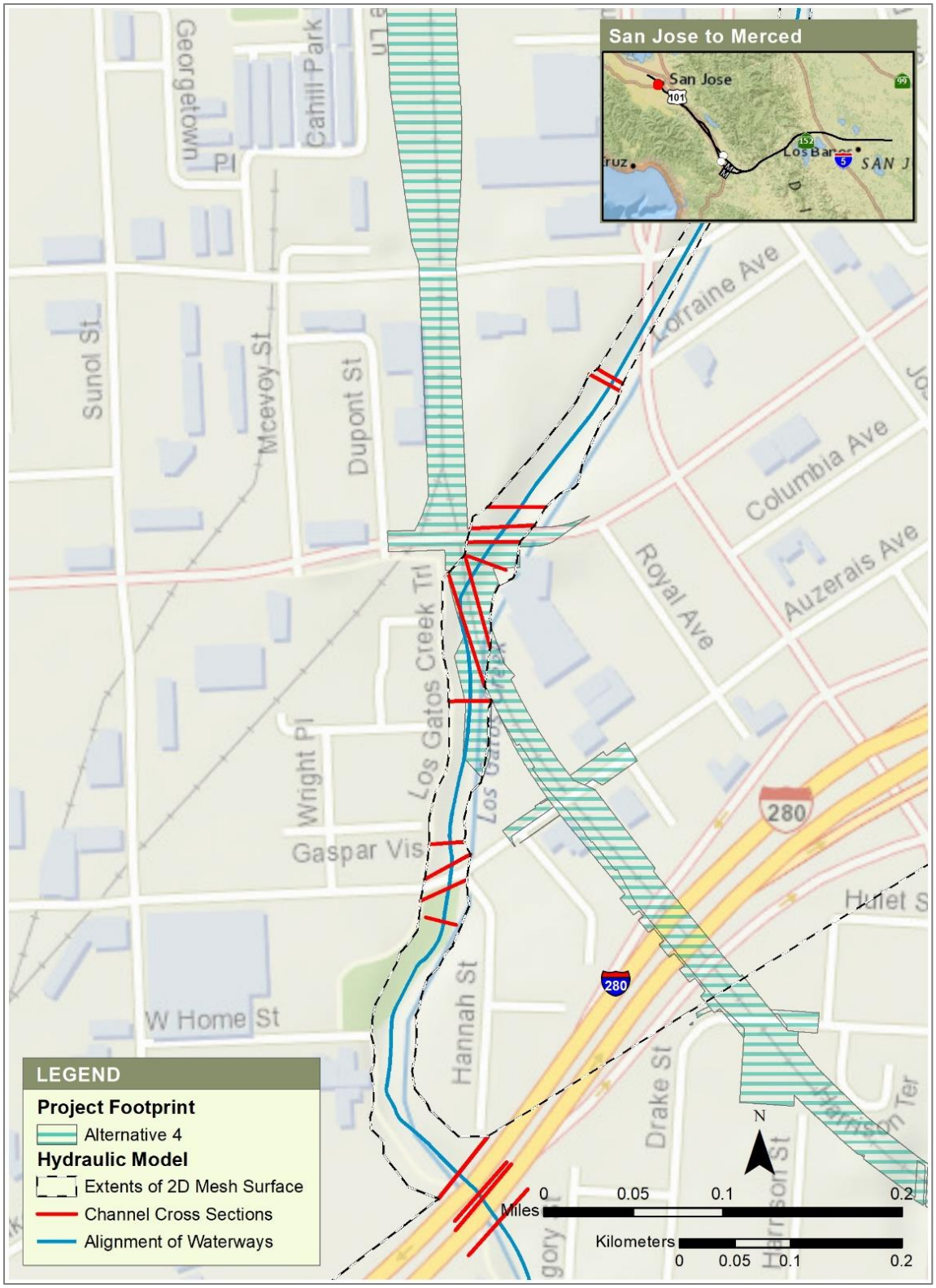
Alternative 4 does not proposed any improvements to the existing Los Gatos Creek bridge. Because detailed design of the removal/replacement Bird Avenue undercrossing proposed in this alternative is not available, hydraulic analysis for Alternative 4 was not performed in this phase of the proposed project.



Sources: SCVWD 2018c; Authority 2019

JANUARY 2019

Figure 4-2 Los Gatos Creek, Plan View of SCVWD Hydraulic Model with Project Footprint for Alternatives 1, 2, and 3



Sources: SCVWD 2018c; Authority 2019

JANUARY 2019

Figure 4-3 Los Gatos Creek, Plan View of SCVWD Hydraulic Model with Project Footprint for Alternative 4

4.3.2.2 Inflow Hydrograph for Hydraulic Analysis

According to SCVWD, flow hydrographs from the 2009 USACE Guadalupe Hydrology Report were used in the Los Gatos Creek HEC-RAS model (SCVWD 2018c). There were 11 locations in the hydraulic model with assigned inflows. The peak 100-year flows at each inflow location are summarized in Table 4-1. The inflow locations in the hydraulic model are shown in Figure 4-4.

Table 4-1 Peak 100-year Inflows into Los Gatos Creek Hydraulic Model

Location	Distance from Existing Railroad Bridge[1]	Peak 100-year Inflow (cfs)
RS 41962.09	37,860 feet upstream	7,730
RS 36755.72	32,660 feet upstream	511
RS 30400	26,300 feet upstream	130
RS 24499.3	20,400 feet upstream	130
RS 19915.39	15,820 feet upstream	107
RS 12899.16	8,800 feet upstream	107
RS 12591.04	8,490 feet upstream	107
RS 5087.607	990 feet upstream	267
RS 3953	150 feet downstream	36
RS 3363.051	740 feet downstream	36

Source: SCVWD 2018c
RS = River Station
cfs = cubic feet per second
[1] Rounded to the nearest 10 feet.

Source: SCVWD 2018c JANUARY 2019

Figure 4-4 Inflow Locations in the SCVWD Hydraulic Model of Los Gatos Creek

4.3.2.3 Water Surface Elevations, Main Channel

The outputs from the existing condition and Alternatives 1, 2, and 3 are shown in Table 4-1. The outputs from hydraulic analysis shows the proposed pier columns for Alternatives 1, 2, and 3 placed in two-dimensional mesh area of the hydraulic model would not have an impact on the 100-year flood profile of Los Gatos Creek in the main channel.

Because there were minimal impacts on the existing 100-year floodplain, the existing railroad bridge would remain overtopped during 100-year storm event for Alternatives 1, 2, and 3. Alternative 4 does not propose any improvements to the existing Los Gatos Creek bridge; the existing railroad bridge that would be shared by HSR, Caltrain, and UPRR would remain overtopped during 100-year storm event.

Table 4-2 Hydraulic Modeling Results, Los Gatos Creek, Alternatives 1, 2, and 3

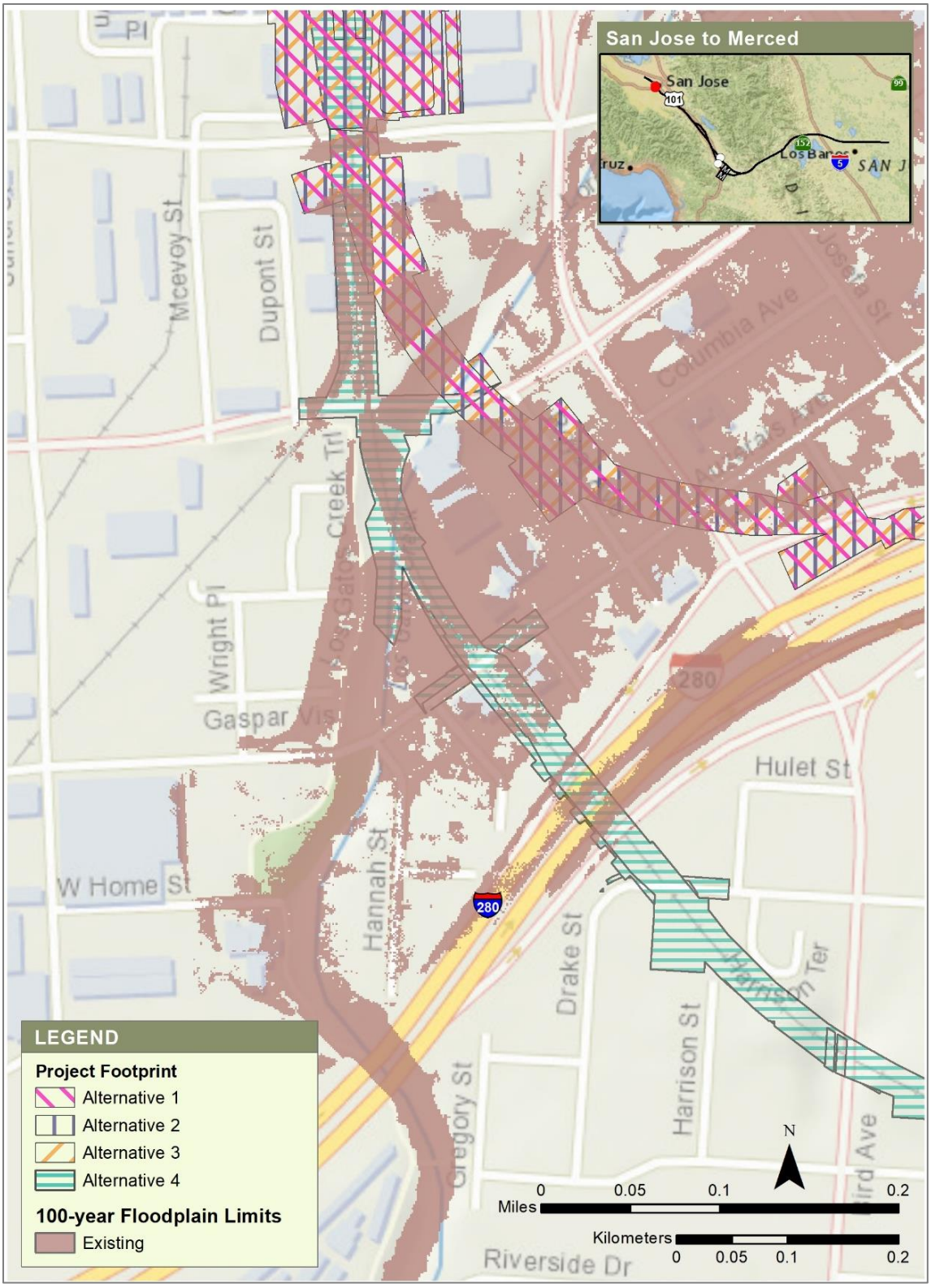
Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At Confluence with Guadalupe River	7,700	81.3	78.2	78.2	0.0
At proposed HSR viaduct crossing (66+00)	7,900	99.6	99.6	99.6	0.0
At exist Railroad Bridge	7,630	98.9	101.2	101.2	0.0
At Auzerais Avenue Bridge	8,030	103.7	105.9	105.9	0.0
At I-280 Bridge	8,260	109.2	109.5	109.5	0.0

cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
Elevations are rounded to the nearest 0.1 foot.
HSR = high=speed rail
I = Interstate
Flow rate shown in this table is for flood flows remaining inside the main channel, and is rounded up to the nearest 10 cfs.

4.3.2.4 Water Surface Elevations, Overbank Area

The outputs from the hydraulic analysis of the existing condition and Alternatives 1, 2, and 3 using the SCVWD hydraulic model showed overbank flood flows from Los Gatos Creek during 100-year storm event. The proposed pier columns for Alternative 1, 2, and 3 located outside of the main channel of Los Gatos Creek were in contact with the overbank flood flows.

The extents of the 100-year floodplain in the overbank area of the hydraulic model for the existing condition and Alternatives 1, 2, and 3 are shown in Figure 4-5. The proposed pier columns represented as areas with the Manning's roughness coefficient of 1.00 in the overbank areas represented by two-dimensional mesh showed no substantial changes to the extents of the 100-year floodplain.



Sources: SCVWD 2018c; Authority 2019

JANUARY 2019

Figure 4-5 Extent of 100-Year Floodplain, Existing Condition and Alternatives 1, 2, 3, and 4

4.4 Guadalupe River and Tributaries

4.4.1 Background Information

4.4.1.1 Floodplain Location

Guadalupe River runs through downtown San Jose for 3 miles from I-280 to I-880 (Authority 2011a). The Guadalupe River's headwaters form in the Santa Cruz Mountains near the summit of Loma Prieta and Mount Umunhum. The river main stem begins on the Santa Clara Valley floor at the northern end of Lake Almaden, which is fed by Los Alamitos Creek and Guadalupe Creek, just downstream of Coleman Road in San Jose. From there, it flows north 14 miles through San Jose, emptying into San Francisco Bay at Alviso Slough. Historically, Guadalupe River was even shorter, originating several miles farther north at the downstream end of a large willow swamp that is now Willow Glen.

Guadalupe River in the project vicinity would be subject to the USACE Section 404 and 408 permitting process. The FEMA SFHA in the main channel of Guadalupe River that would be subject to USACE Section 404 and 408 permitting process is Zone A.

4.4.1.2 FEMA Floodplain

According to the FEMA FIRM Panel No. 60685C0234H (FEMA 2009), the main channel of the Guadalupe River in the project footprint is identified as Zone A with a width of approximately 150 feet (Figure 4-6). The FEMA FIRM also shows overbank flood flows from Guadalupe River and tributaries that are identified as Zone AO and AH (Figure 4-6 and Figure 4-7). The FEMA FIRM shows overbank flood flows from Canoas Creek overtopping the existing Caltrain track between Almaden Expressway and Curtner Avenue Bridges over the existing railroad track (Figure 4-7).

4.4.1.3 Project Alternatives in the FEMA Floodplain

The project footprints for all project alternatives are in the existing 100-year floodplain for Guadalupe River and Tributaries.

Under Alternatives 1, 2, and 3, a viaduct segment supported by pier columns would span the Guadalupe River and run along the top of the western channel bank. All project alternatives are identical near the Guadalupe River crossing. The proposed pier columns for the viaduct segment are inside FEMA SFHA Zones A, AO and AH.

Under Alternative 4, HSR would share the corridor with UPRR and Caltrain and would construct a new at-grade track adjacent to the existing track. Near the Guadalupe River bridge crossing, Alternative 4 is proposing a new single-track bridge structure over I-280, SR 87, and Guadalupe River on the south side of the existing bridge structure. The existing railroad track over I-280, SR 87, and Guadalupe River would remain. It also proposes to remove and replace existing underpasses for Bird Avenue and Delmas Avenue.

The FEMA FIRM shows that the overbank flow from Canoas Creek is overtopping the existing railroad track (Figure 4-7). The FEMA SHFA at this location is AH with an elevation of 131 feet NAVD 88.

The profile of the proposed railroad track for Alternatives 1, 2, and 3 are at the same level or lower than the existing railroad track profile adjacent to the proposed tracks, and has locations where the top of rail elevation is lower than the FEMA 100-year WSE at this location. The current plan for all Alternatives 1, 2, and 3 does not show any proposed hydraulic features to prevent the flooding on proposed HSR track during 100-year storm event. Therefore, portions in the proposed railroad track for HSR Alternatives 1, 2, and 3 would be submerged during the 100-year storm event.

Alternative 4 would be sharing the existing railroad track with Caltrain and UPRR at this location, and would maintain the existing railroad track profile at this location. Because there would be no changes to the existing track profile, proposed railroad track for HSR at this location is subject to flooding during the 100-year storm event, as shown in the current effective FEMA FIRM. The

current plan for Alternative 4 does not show proposed hydraulic features to prevent the flooding on proposed HSR track during 100-year storm event. Therefore, the proposed railroad track for HSR Alternative 4 would be submerged during the 100-year storm event.

The vertical profile of the proposed railroad track would be controlled by the vertical clearance required at the Almaden Expressway and Curtner Avenue undercrossing and possess a constraint to the feasibility of raising the proposed railroad track to be raised above the existing FEMA 100-year flood elevation. Floodwalls have been incorporated into the project alternatives to prevent the proposed track to be flooded or overtopped during the 100-year storm event.

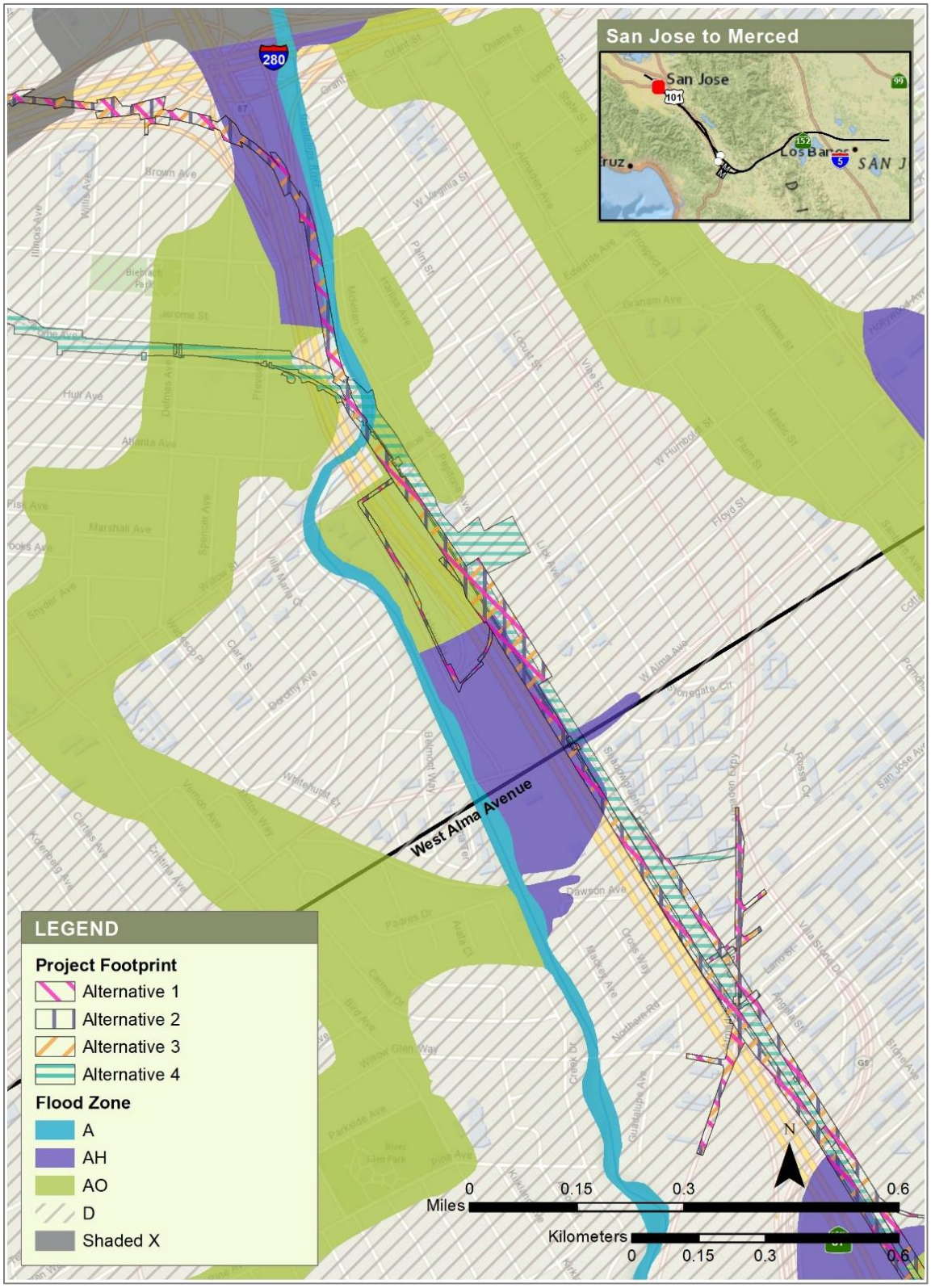
4.4.1.4 Available Hydraulic Model

The FEMA effective hydraulic model was not available because the existing floodplain is designated as Zone A, defined as FEMA SHFA determined by approximate methods.

The hydraulic model provided by SCVWD was available for this waterbody and was used to perform hydraulic analysis to determine project's potential impacts on the existing floodplain.

Figure 4-8 and Figure 4-9 show the limits of the SCVWD hydraulic model and project footprint for Alternatives 1, 2, and 3 and Alternative 4, respectively, near the existing railroad bridge over Guadalupe River. Figure 4-10 and Figure 4-11 show the limits of the SCVWD hydraulic model and project footprint for Alternatives 1, 2, and 3 and Alternative 4, respectively, near Almaden Expressway and Curtner Avenue bridges over the existing railroad track.

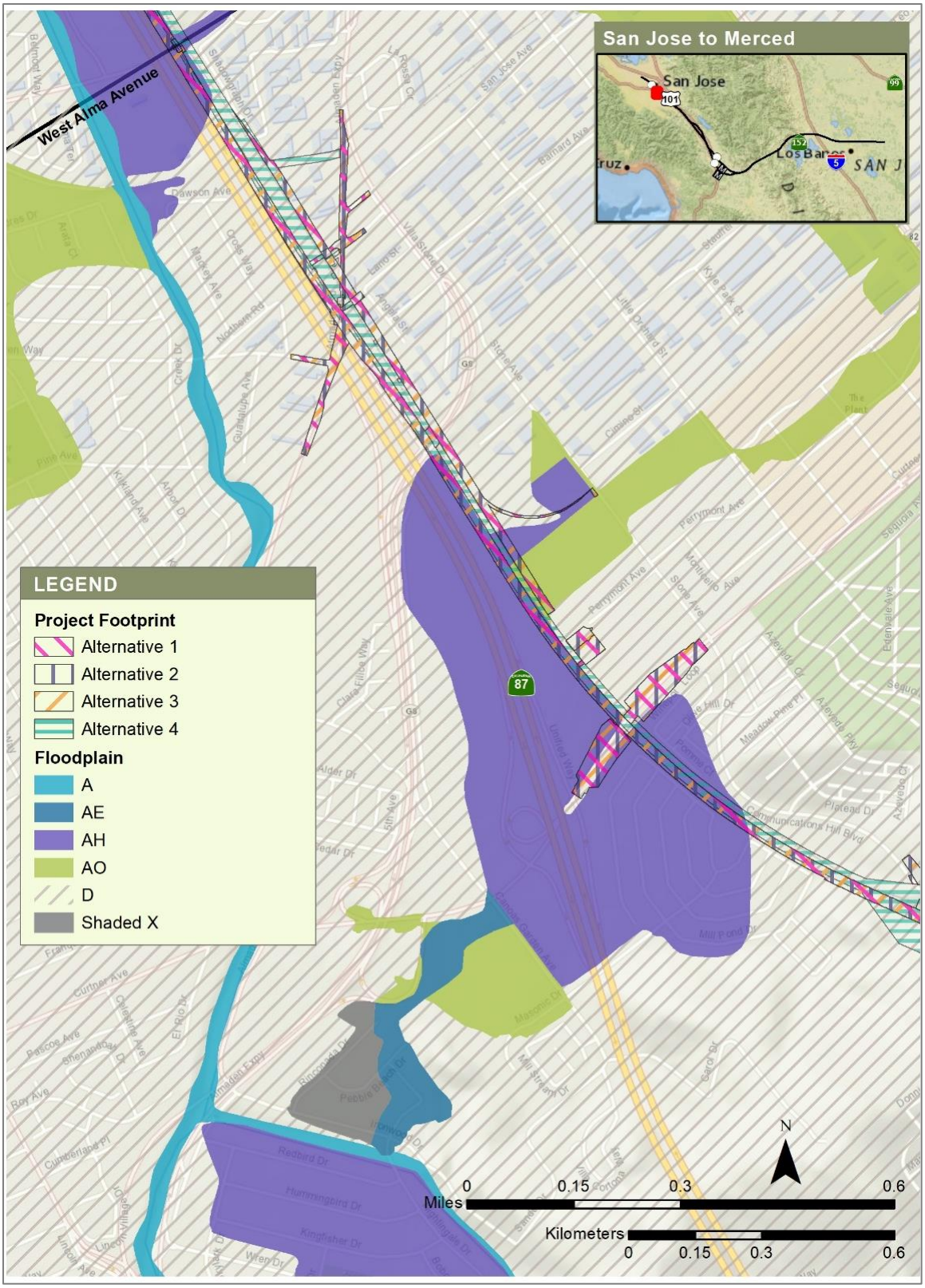
The existing and proposed conditions of the 100-year flood profile of Guadalupe River near the existing and proposed railroad bridges over Guadalupe River were compared. The extents of the overbank flood flow in Almaden-Curtner area were also compared between existing and proposed conditions.



Sources: FEMA 2009; Authority 2019

JANUARY 2019

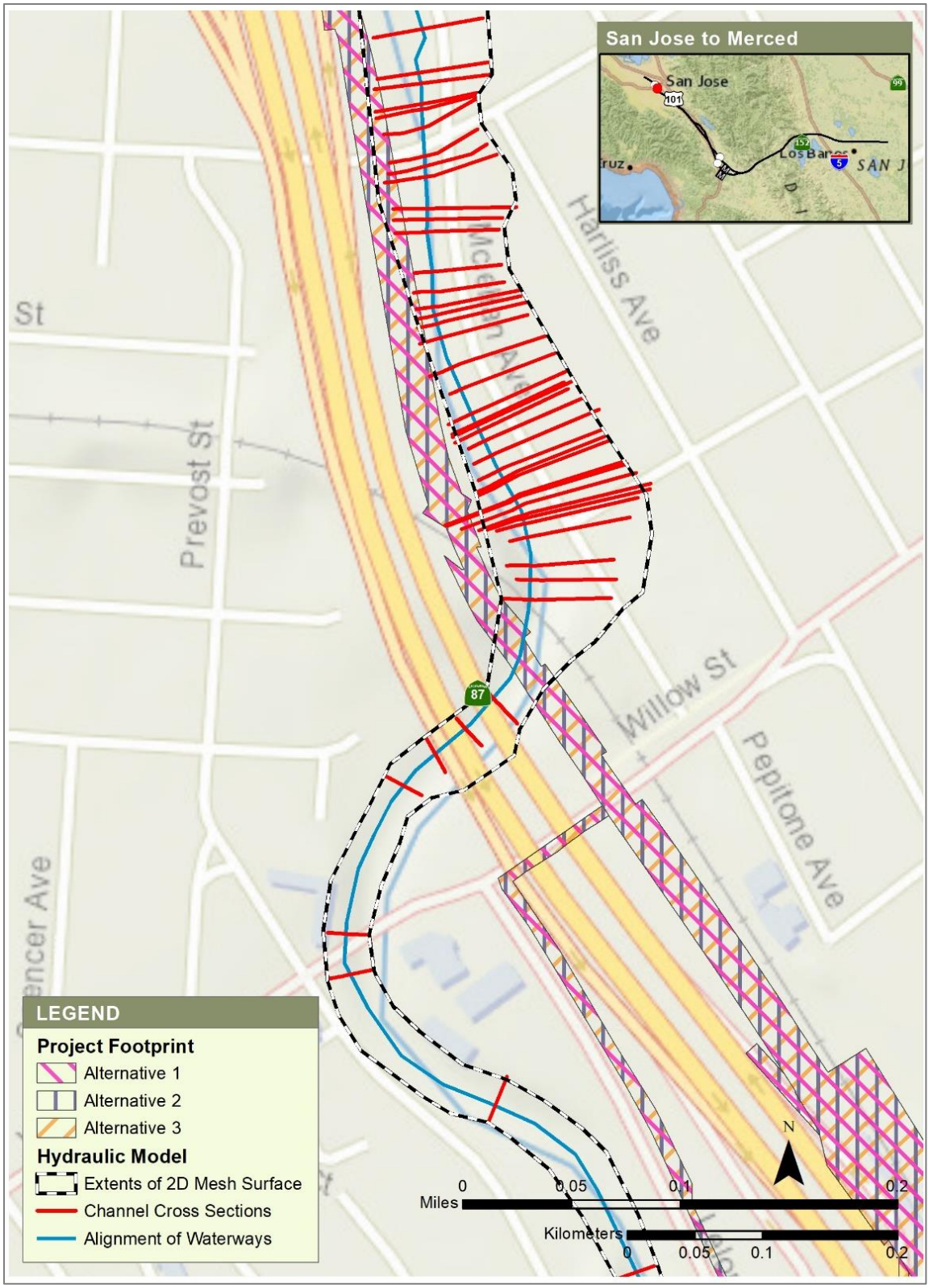
Figure 4-6 Guadalupe River, FEMA FIRM Overlay at Guadalupe River Bridge with Project Footprints for Alternatives 1, 2, 3, and 4



Sources: FEMA 2009; Authority 2019

JANUARY 2019

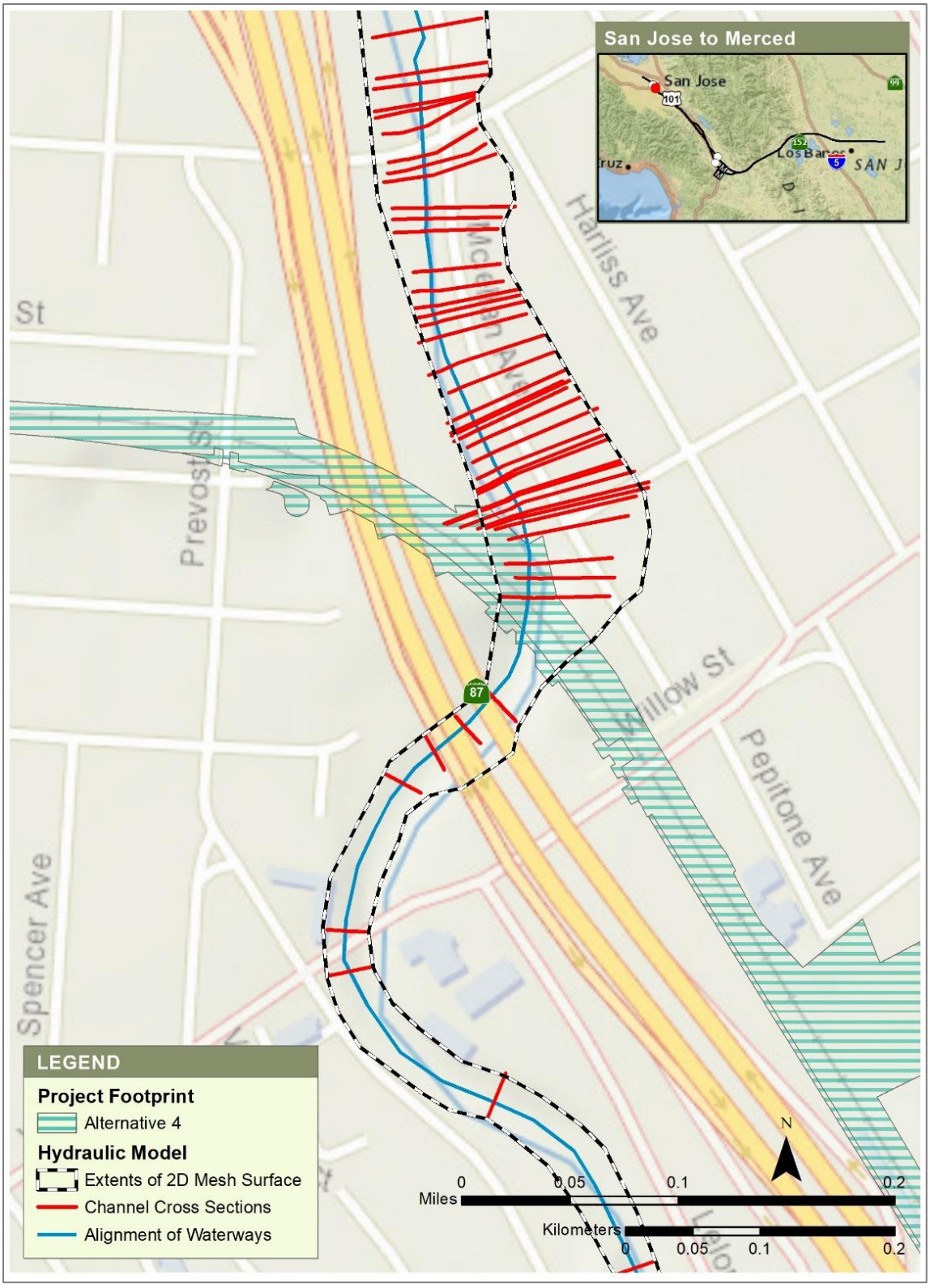
Figure 4-7 Guadalupe River, FEMA FIRM Overlay at Almaden-Curtner Area with Project Footprints for Alternatives 1, 2, 3, and 4



Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

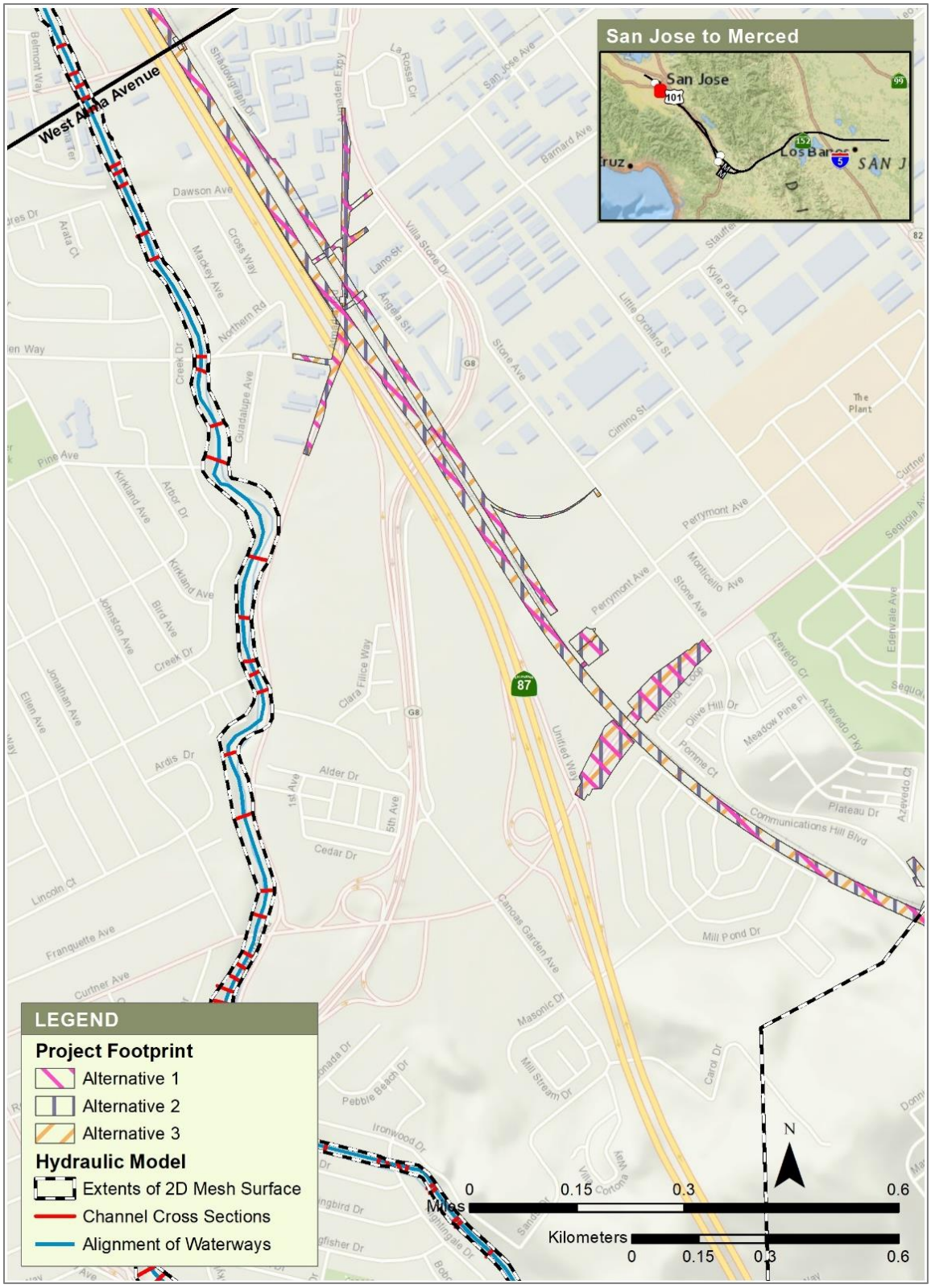
Figure 4-8 Guadalupe River, Plan View of SCVWD Hydraulic Model at Guadalupe River mainline with Project Footprints for Alternatives 1, 2, and 3



Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

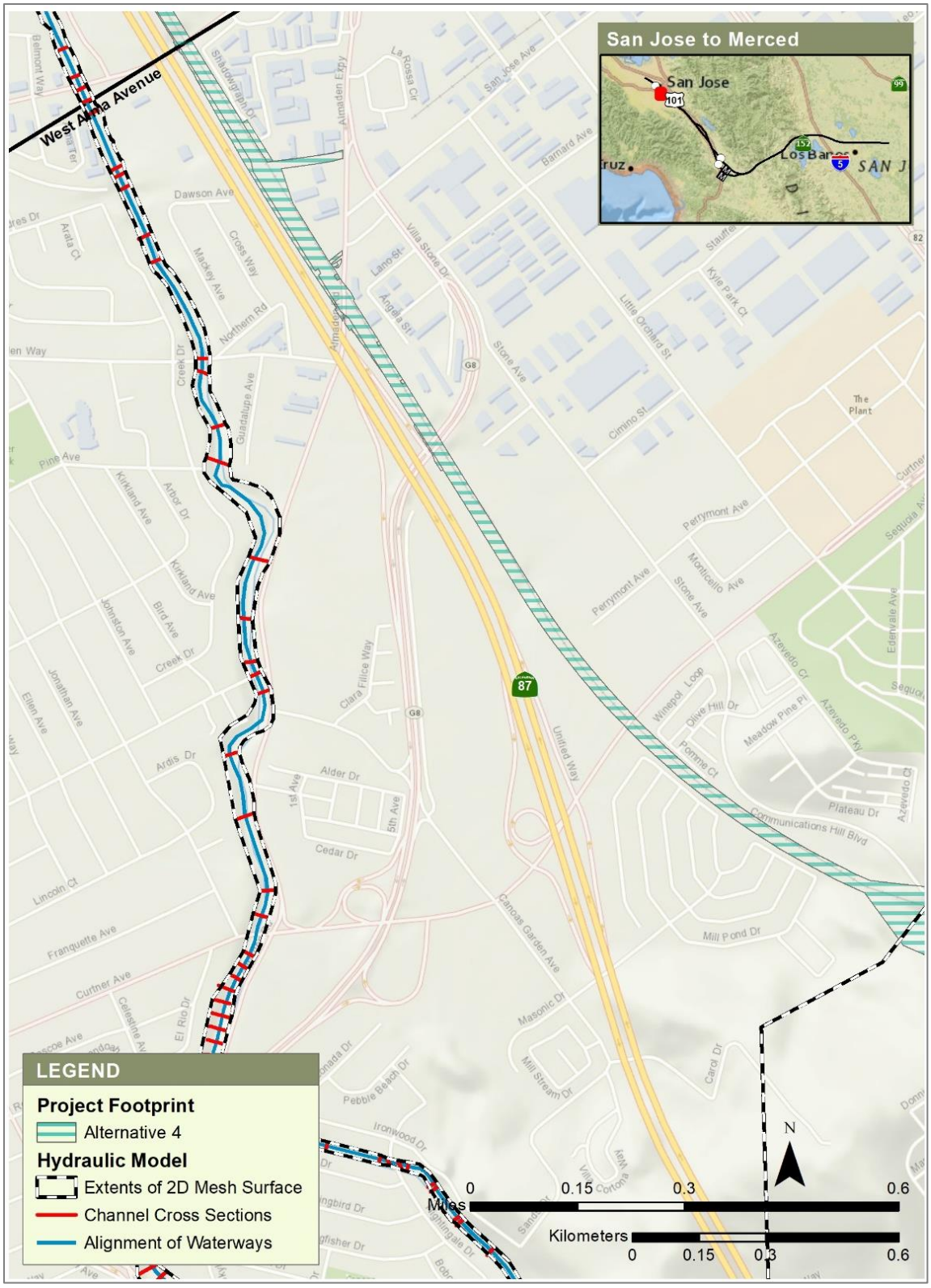
Figure 4-9 Guadalupe River, Plan View of SCVWD Hydraulic Model at Guadalupe River Mainline with Project Footprint for Alternative 4



Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

Figure 4-10 Guadalupe River, Plan View of SCVWD Hydraulic Model at Almaden-Curtner Area with Project Footprint for Alternatives 1, 2, and 3



Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

Figure 4-11 Guadalupe River, Plan View of SCVWD Hydraulic Model at Almaden-Curtner Area with Project Footprint for Alternative 4

4.4.2 SCVWD Hydraulic Model

4.4.2.1 Overview of Hydraulic Model

The combined one- and two-dimensional hydraulic model of Guadalupe River and its tributaries provided by SCVWD was developed using the USACE HEC-RAS. The one-dimensional component of the SCVWD's HEC-RAS model refers to the main channel of Guadalupe River and tributaries (Canoas Creek and Ross Creek) represented by a series of channel cross sections and bridge crossings. The two-dimensional component of the SCVWD's HEC-RAS model refers to the overland floodplain area of Guadalupe River and tributaries represented by the computational mesh. The length and upstream/downstream limits of the floodplains included in the hydraulic model are summarized in Table 4-3.

Table 4-3 Floodplains included in Guadalupe River Hydraulic Model

Name of Floodplain	Reach Length (feet)	Location of Upstream Limit	Location of Downstream Limit
Guadalupe River	32,630	Approximately 500 feet downstream (north) of Coleman Road	Immediately upstream of I-280/SR 87 Interchange
Canoas Creek	39,000	At Cottle Road	Confluence with Guadalupe River
Ross Creek	25,920	At Blossom Hill Road	Confluence with Guadalupe River

Source: SCVWD 2018a
I = Interstate
SR = State Route

There were no changes to the setup of the SCVWD hydraulic model to perform the hydraulic analysis of existing condition.

The pier columns supporting the proposed viaduct segments along the Guadalupe River and at the Guadalupe River crossings for Alternatives 1, 2, and 3 were represented in the HEC-RAS model of the proposed condition. The proposed railroad bridge over Guadalupe River crossing for Alternatives 4 was represented in the HEC-RAS model of the by widening the existing railroad bridge over Guadalupe River located immediately downstream of the proposed railroad bridge.

The HEC-RAS model for Alternatives 1, 2, and 3 and Alternative 4 made adjustments to the model inputs in the two-dimensional mesh to include the proposed cut and fill, proposed structures within the existing FEMA 100-year floodplain, and project features that would minimize the potential for floodplain impacts. The full setup of the hydraulic model will be revised during the design phase of this project.

Floodwalls and equalizer culverts have been incorporated into Alternatives 1, 2, 3, and 4 to prevent the 100-year flood flow associated with the Canoas Creek/Guadalupe River overflow floodplain from overtopping the proposed HSR corridor near the overcrossings of Almaden Expressway and Curtner Avenue. Hydraulic analysis of the proposed condition with floodwalls and equalizers were also performed for Alternatives 1, 2, and 3 and Alternative 4.

In addition to the hydraulic analysis using a full model, a simplified one-dimensional hydraulic model (simplified SCVWD model), based on SCVWD's HEC-RAS model, was used for the hydraulic analysis of the Guadalupe River main channel for Alternatives 1, 2, 3, and Alternative 4 at the proposed railroad bridge crossing. The simplified SCVWD model was created by removing the two-dimensional model components and one-dimensional model components representing upstream tributaries from SCVWD's model. For this hydraulic model, new additional Guadalupe River channel cross sections were added to the model at the project location, based on the Santa

Clara County LiDAR data published in October 2020 (OCM Partners 2021). The new railroad bridge with channel grading, consistent with the existing design, was incorporated into the model to replicate the proposed condition.

4.4.2.2 Inflow Hydrograph for Hydraulic Analysis

There were 36 locations in the hydraulic model with assigned inflows. The peak 100-year flows at each inflow location are summarized in Table 4-4. The inflow locations in the hydraulic model are shown in Figure 4-12.

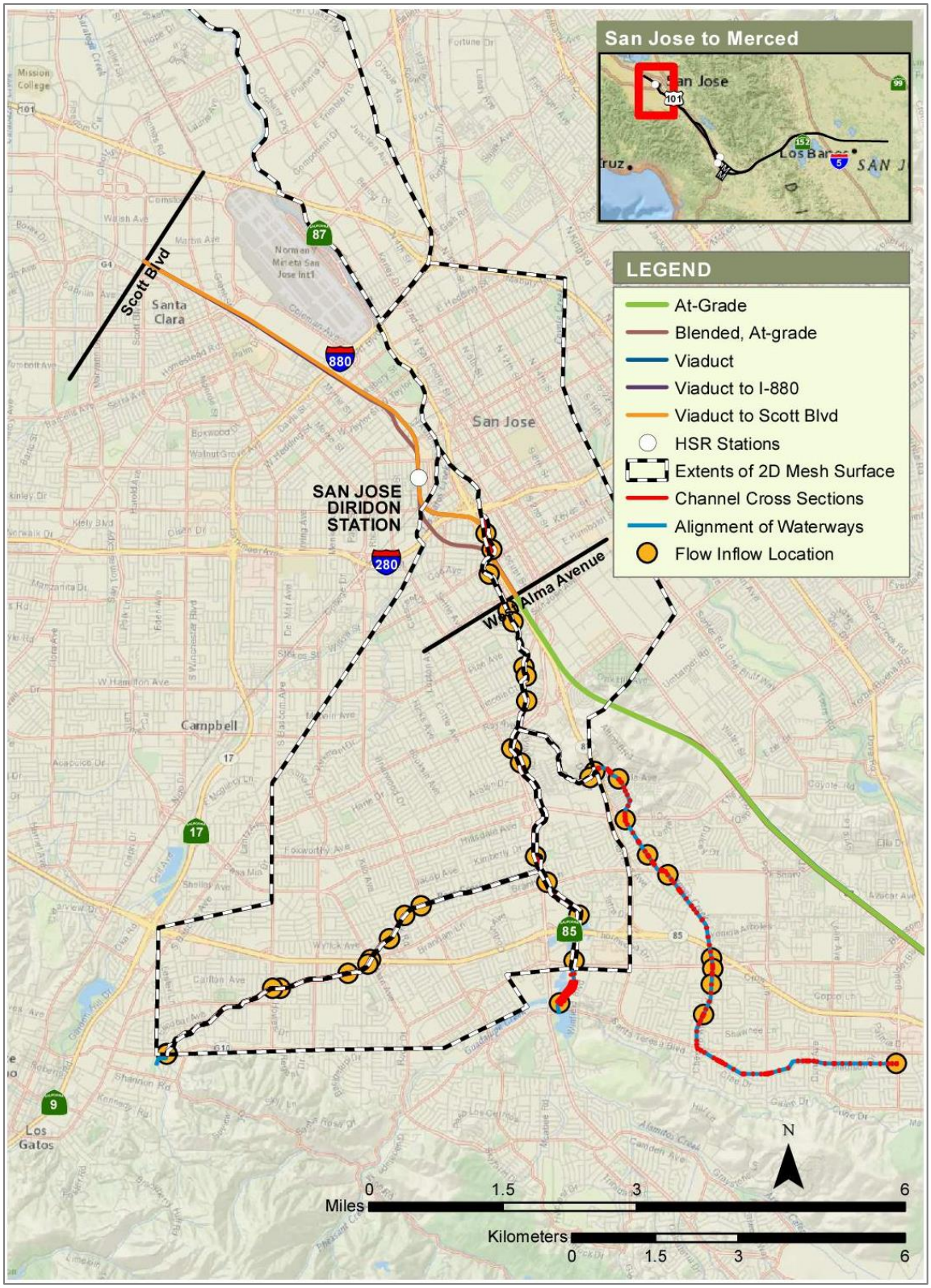
Table 4-4 Peak 100-Year Inflows into Guadalupe River and Tributaries Hydraulic Model

Floodplain Name	River Station in Hydraulic Model	Distance from Existing Railroad Bridge[1]	Peak Inflow (cfs)
Guadalupe River	104500	30,300 feet upstream	11,165
Guadalupe River	101450	27,250 feet upstream	137
Guadalupe River	98800	24,600 feet upstream	68
Guadalupe River	95900	21,700 feet upstream	68
Guadalupe River	94200	20,000 feet upstream	138
Guadalupe River	88000	13,800 feet upstream	275
Guadalupe River	87000	12,800 feet upstream	46
Guadalupe River	84005	9,800 feet upstream	45
Guadalupe River	82343	8,100 feet upstream	81
Guadalupe River	81773	7,570 feet upstream	45
Guadalupe River	78690	4,490 feet upstream	59
Guadalupe River	77944	3,740 feet upstream	81
Guadalupe River	75490	1,290 feet upstream	53
Guadalupe River	73691.23	500 feet downstream	105
Guadalupe River	72705.37	1,500 feet downstream	26
Canoas Creek	39008.19	46,800 feet upstream	475
Canoas Creek	38981.17	46,700 feet upstream	238
Canoas Creek	24395.26	32,220 feet upstream	93
Canoas Creek	22565.98	30,390 feet upstream	31
Canoas Creek	21618.92	29,440 feet upstream	196
Canoas Creek	21011.59	28,830 feet upstream	177
Canoas Creek	15301.56	23,120 feet upstream	177
Canoas Creek	13527.74	21,350 feet upstream	56
Canoas Creek	11053.71	18,880 feet upstream	56
Canoas Creek	8395.165	16,220 feet upstream	29
Canoas Creek	6665.77	14,490 feet upstream	36
Canoas Creek	6192.517	14,010 feet upstream	106
Ross Creek	25994.8	53010 feet upstream	1,067
Ross Creek	25951.9	52970 feet upstream	161
Ross Creek	18158.9	45180 feet upstream	80

Floodplain Name	River Station in Hydraulic Model	Distance from Existing Railroad Bridge[1]	Peak Inflow (cfs)
Ross Creek	17695	44710 feet upstream	201
Ross Creek	13572.8	40590 feet upstream	187
Ross Creek	12213	39230 feet upstream	120
Ross Creek	11906.9	38920 feet upstream	67
Ross Creek	10211.4	37230 feet upstream	67
Ross Creek	8544.6	35560 feet upstream	174
Ross Creek	7397.7	34420 feet upstream	107

Sources: SCVWD 2018a
cfs = cubic feet per second
[1] Distance from existing railroad bridge is rounded to the nearest 10 feet.

In the simplified SCVWD model of Guadalupe River for all alternative, the single flow rate of 7,290 cfs was used for the main channel of Guadalupe River, based on the outputs from the existing condition hydraulic model at the project location.



Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

Figure 4-12 Inflow Locations in the Guadalupe River and Tributaries Hydraulic Model

4.4.2.3 Water Surface Elevations – Main Channel

The modeling results are shown in Table 4-5 for Alternatives 1, 2, and 3 and Table 4-6 for Alternative 4. The extents of the 100-year floodplain compared with the existing condition are shown in Figure 4-13 for Alternatives 1, 2, 3, and Figure 4-14 for Alternative 4. The changes to the 100-year floodplain elevation from the existing condition are shown in Figure 4-15 for Alternatives 1, 2, 3, and Figure 4-16 for Alternative 4.

The outputs from the hydraulic analysis for Alternatives 1, 2, 3 showed that pier columns supporting the viaduct near the Guadalupe River crossing would not raise the 100-year flood profile inside the Guadalupe River main channel. The overbank floodplain near the existing railroad bridge over Guadalupe River would be raised by approximately 0.1 foot or less during the 100-year storm event. The outputs from the hydraulic analysis for Alternative 4 showed that the proposed HSR bridge immediately upstream of the existing railroad bridge would not raise the 100-year flood profile of Guadalupe River main channel.

Project features would be required under all alternatives to lower the 100-year flood profile in the main channel and in the overbank floodplain back to the level of existing condition.

Table 4-5 Hydraulic Modeling Results, Guadalupe River, Alternatives 1, 2, and 3

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At West Virginia Street	7,290	99.0	93.3	93.3	0.0
At downstream of existing railroad bridge	7,290	104.0	100.3	100.3	0.0
Upstream of proposed viaduct crossing	7,290	106.6	104.1	104.0	-0.1
Upstream of Willow Street	7,290	109.0	109.0	109.0	0.0

Elevations are rounded to the nearest 0.1 foot, unless otherwise noted.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high-speed rail

Table 4-6 Hydraulic Modeling Results, Guadalupe River, Alternative 4

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At upstream of I-280 bridge	7,290	91.8	88.9	88.9	0.0
At West Virginia Street	7,290	99.0	93.3	93.3	0.0
Downstream of existing railroad bridge	7,290	104.0	100.3	100.3	0.0
Immediately upstream of proposed HSR bridge	7,290	106.6	104.1	104.1	0.0
Downstream end of SR 87 (northbound) bridge	7,290	107.0	104.4	104.4	0.0
Upstream end of SR 87 (northbound) bridge	7,290	108.0	105.1	105.1	0.0

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
Upstream end of SR 87 (southbound) bridge	7,290	108.0	105.6	105.6	0.0
Upstream of Willow Street	7,290	109.0	109.0	109.0	0.0
At upstream of I-280 bridge	7,290	91.8	88.9	88.9	0.0

Elevations are rounded to the nearest 0.1 foot, unless otherwise noted.
cfs = cubic feet per second
HSR = high-speed rail
I- = interstate
NAVD 88 = North American Vertical Datum of 1988
SR = State Route
WSE = water surface elevation

Table 4-7 Hydraulic Modeling Results, Guadalupe River Overbank Floodplain, Alternative 1, 2, 3[1]

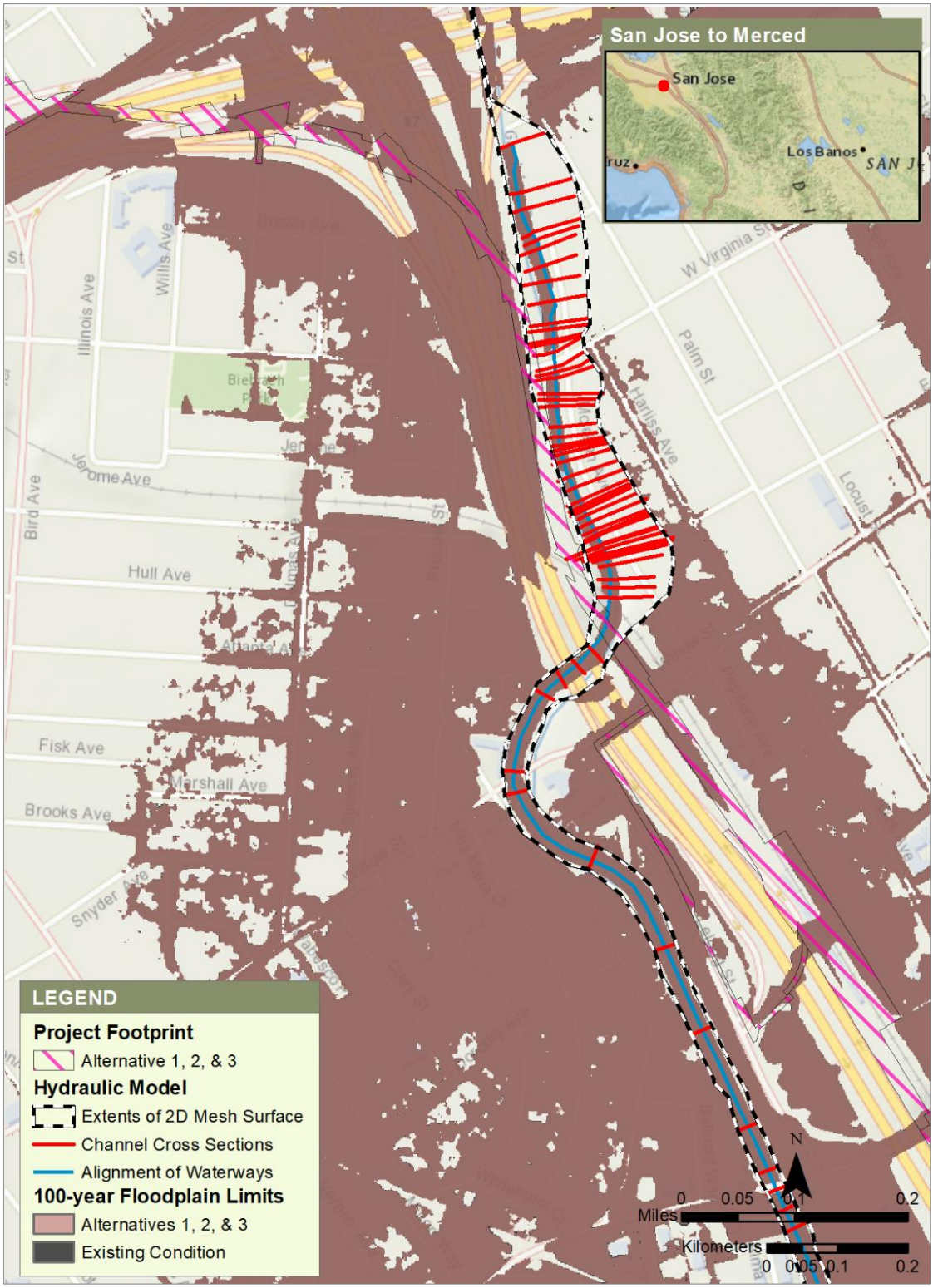
Location	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
Intersection of Prevost Street and Fuller Avenue	103.32	103.33	+0.01
Intersection of Prevost Street and Atlanta Avenue	105.94	105.95	+0.02
Intersection of Prevost Street and Willow Avenue	110.69	110.70	+0.01
Intersection of Mills Court and Atlanta Avenue	106.13	106.15	+0.02
At Willow Street below Existing Railroad Bridge	108.50	108.49	-0.01

cfs = cubic feet per second
HSR = high-speed rail
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
Elevations are rounded to the nearest 0.1 foot, unless otherwise noted.
[1] Results are the same for Alternative B (Viaduct to I-880) and Alternative B (Viaduct to Scott Boulevard).

Table 4-8 Hydraulic Modeling Results, Guadalupe River Overbank Floodplain, Alternative 4

Location	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
Intersection of Prevost Street and Fuller Avenue	103.32	103.37	+0.04
Intersection of Prevost Street and Atlanta Avenue	105.94	105.97	+0.03
Intersection of Prevost Street and Willow Avenue	110.69	110.69	0.00
Intersection of Mills Court and Atlanta Avenue	106.13	106.26	+0.13
At Willow Street below Existing Railroad Bridge	108.50	108.51	+0.01

cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
Elevations are rounded to the nearest 0.1 foot, unless otherwise noted.



Sources: SCVWD 2018b; Authority 2019b

OCTOBER 2021

Figure 4-13 Guadalupe River, 100-Year Floodplain Footprints from Hydraulic Analysis for Existing Condition and Alternatives 1, 2, and 3

Sources: SCVWD 2018b; Authority 2019b

OCTOBER 2021

Figure 4-14 Guadalupe River, 100-Year Floodplain Footprints from Hydraulic Analysis for Existing Condition and Alternative 4

Sources: SCVWD 2018b; Authority 2019b

OCTOBER 2021

Figure 4-15 Guadalupe River, 100-Year Floodplain Elevation Change From Existing Condition to Alternatives 1, 2, and 3

Sources: SCVWD 2018b; Authority 2019b

OCTOBER 2021

Figure 4-16 Guadalupe River, 100-year Floodplain Elevation Change from Existing Condition to Alternative 4

4.4.2.4 Overbank Flood Flow at Almaden-Curtner Area

The modeling results for the two-dimensional floodplain analysis near the Almaden Expressway overcrossing and Curtner Avenue overcrossing over existing railroad track are shown in Figure 4-13 for existing condition, Figure 4-14 for Alternatives 1, 2, and 3 and Figure 4-15 for Alternative 4. The proposed condition with floodwalls and equalizers for Alternatives 1, 2, and 3 and Alternative 4 are shown in Figure 4-16 and Figure 4-17, respectively.

The outputs from the existing condition hydraulic analysis showed the maximum 100-year WSE elevation on the west (upstream) of existing railroad track to be approximately 132.4 to 132.5 ft NAVD 88 between Almaden Expressway overcrossing and Curtner Avenue overcrossing. The existing top of rail elevation in this area is approximately 133 ft NAVD 88 and is lower than the maximum 100-year WSE. Therefore, overbank flood flow overtopped existing railroad track and flow northwest, showing the flooding footprint similar to the FEMA FIRM (Figure 4-7 and 4-13).

The outputs from the proposed condition hydraulic analysis for Alternatives 1, 2, and 3 showed the maximum 100-year WSE elevation on the west (upstream) of existing railroad track to be approximately 132.4 ft to 132.5 ft NAVD 88 between Almaden Expressway overcrossing and Curtner Avenue overcrossing. The changes to the maximum 100-year WSE and extents of the flooded area were minimal at this location for Alternatives 1, 2, and 3 (Figure 4-14). The proposed top of rail elevation for Alternatives 1, 2, and 3 between Almaden Expressway overcrossing and Curtner Avenue overcrossing varies from approximately 125.1 ft at the local low point to approximately 134.7 ft at Curtner Avenue overcrossing. Because elevation of the local low point is lower than the maximum 100-year WSE, the overbank flood flow would overtop the proposed HSR track during the 100-year storm event.

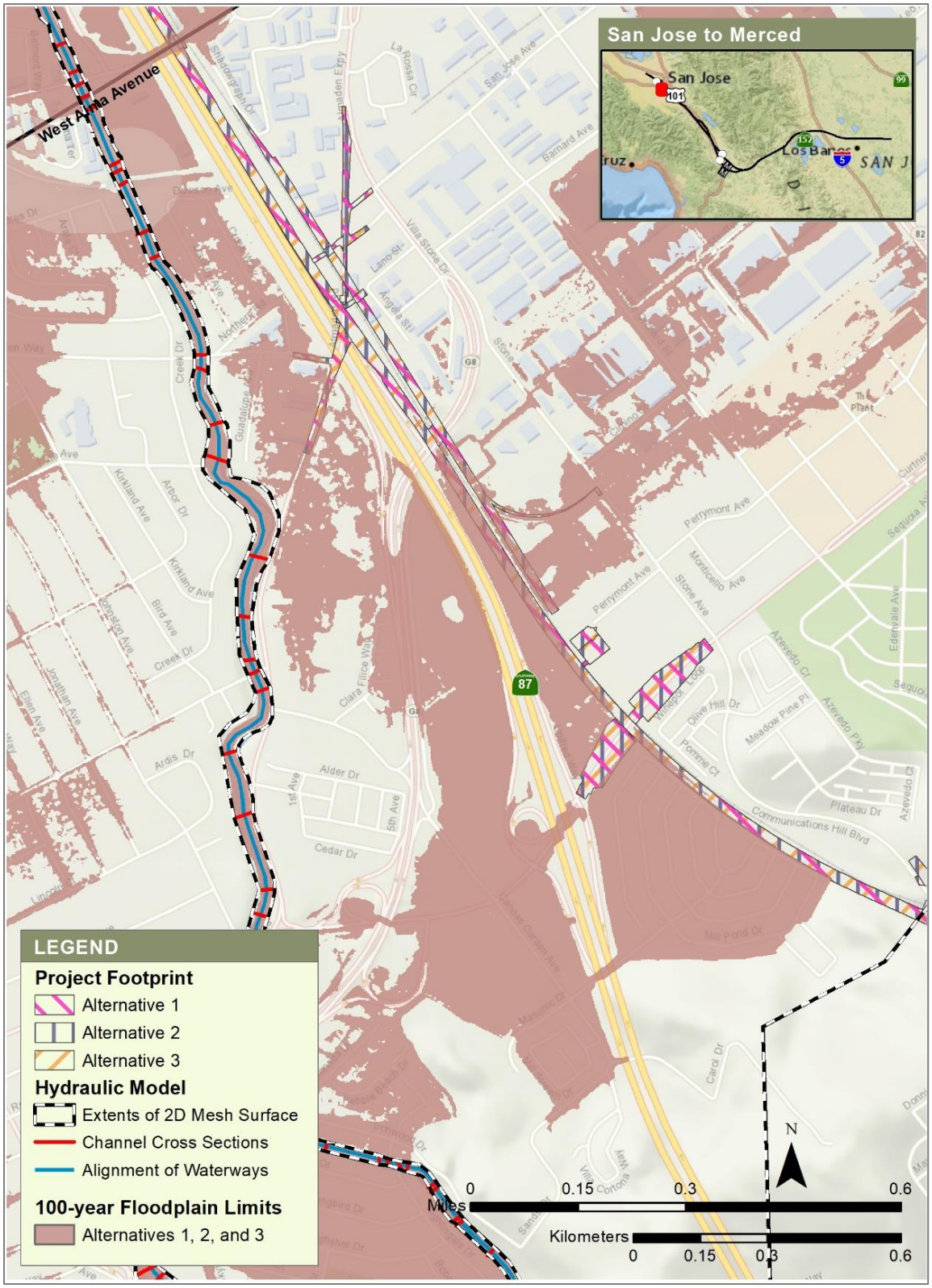
The outputs from the proposed condition hydraulic analysis for Alternative 4 showed the maximum 100-year WSE elevation on the west (upstream) of existing railroad track to be approximately 132.4 ft to 132.5 ft NAVD 88 between Almaden Expressway overcrossing and Curtner Avenue overcrossing. The changes to the maximum 100-year WSE and extents of the flooded area were minimal at this location for Alternative 4 (Figure 4-15). The proposed top of rail elevation for Alternative 4 between Almaden Expressway overcrossing and Curtner Avenue overcrossing would remain unchanged from the existing condition. Because elevation of the local low point is lower than the maximum 100-year WSE, the overbank flood flow would overtop the proposed HSR track during the 100-year storm event.

The outputs from the proposed condition hydraulic analysis with floodwalls and equalizers culverts along proposed HSR track showed that seventeen 36-in. equalizer culverts would replicate the extents and elevation of the existing 100-year floodplain from the existing condition hydraulic model. The hydraulic analysis for Alternatives 1, 2, and 3 and Alternative 4 with floodwall and equalizer culvert showed no substantial changes to the WSE and extents of the 100-year floodplain.

Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

Figure 4-17 100-Year Floodplain at Almaden-Curtner Area from Hydraulic Analysis, Existing Condition



Sources: SCVWD 2018a; Authority 2019

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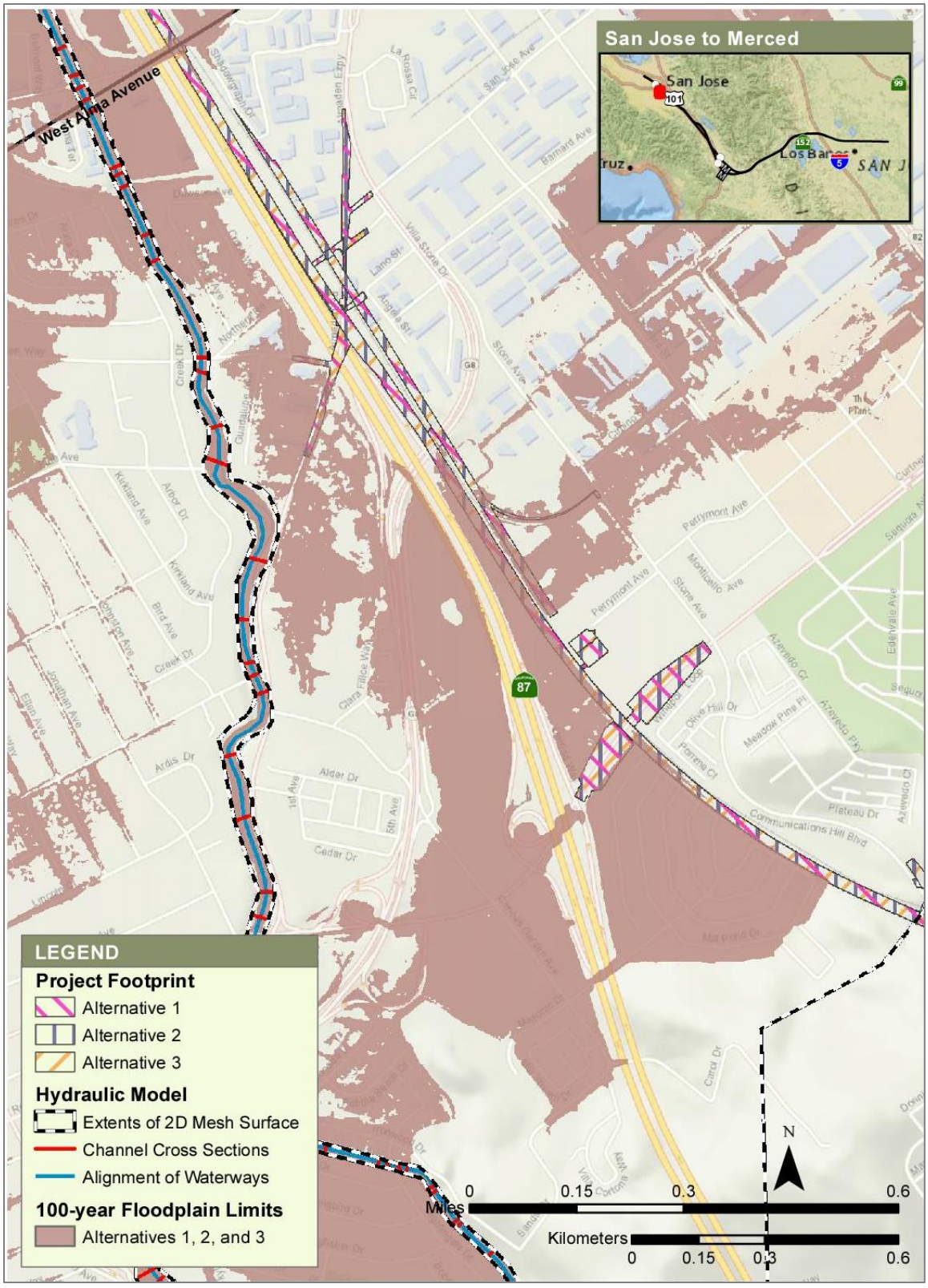
Figure 4-18 100-Year Floodplain at Almaden-Curtner Area from Hydraulic Analysis, Alternatives 1, 2, and 3

Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

Figure 4-19 100-Year Floodplain at Almaden-Curtner Area from Hydraulic Analysis, Alternative 4



Sources: SCVWD 2018a; Authority 2019

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Figure 4-20 100-Year Floodplain at Almaden-Curtner Area from Hydraulic Analysis, Alternatives 1, 2, and 3 with Floodwall and Equalizer Culverts

Sources: SCVWD 2018a; Authority 2019

JANUARY 2019

Figure 4-21 100-Year Floodplain at Almaden-Curtner Area from Hydraulic Analysis, Alternative 4 with Floodwall and Equalizer Culverts

4.5 Fisher Creek

4.5.1 Background Information

4.5.1.1 Floodplain Location

Fisher Creek is a tributary of Coyote Creek that flow northwest along western Coyote Valley and to the west of Coyote Creek. The creek changes flow direction from northwest to northeast approximately 1,000 feet upstream of the outfall to Coyote Creek.

4.5.1.2 FEMA Floodplain

According to the FEMA FIRM Panel No. 60685C0426H (FEMA 2009), the main channel of Fisher Creek in the project footprint is identified as Zone AE with a floodway (Figure 4-22). The width of the floodway measured along existing railroad bridge over Fisher Creek is approximately 120 feet.

4.5.1.3 Project Alternatives in the FEMA Floodplain

The project footprints for all project alternatives are in the existing 100-year floodplain for Fisher Creek.

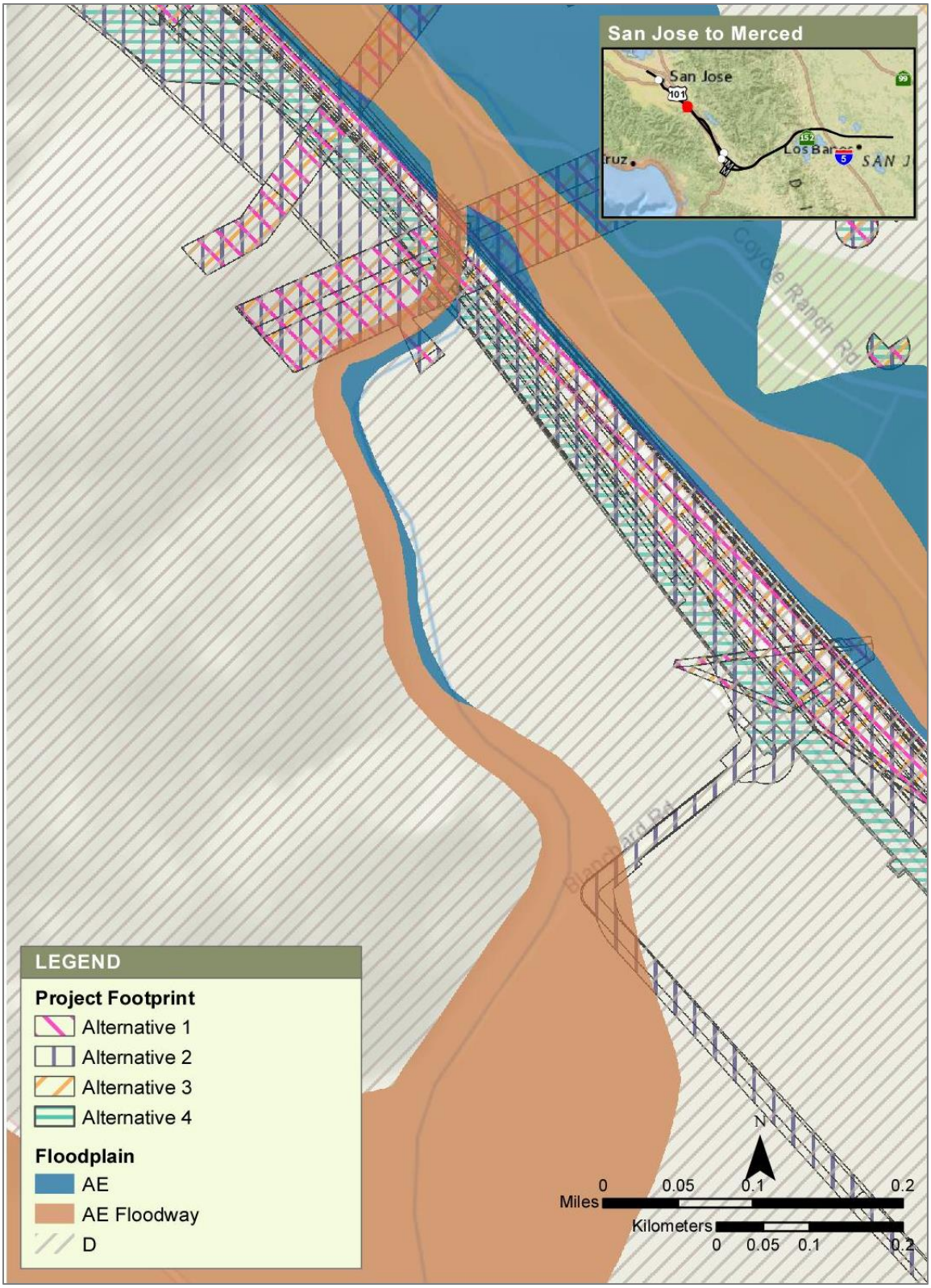
Near the Fisher Creek crossing, Alternatives 1 and 3 would entail a viaduct section supported by pier columns placed in the median of Monterey Road. The viaduct section would cross Fisher Creek at approximately station 665+00. The width of the Zone AE floodplain and floodway measured along the centerline of the proposed track alignment for Alternatives 1 and 3 is approximately 150 feet. This alternative is also proposing to replace the existing Monterey Road bridge/culvert with 40 feet by 9.1 feet (width x height) wildlife crossing. There would be no changes to the existing railroad bridge over Fisher Creek.

Near the Fisher Creek crossing, Alternative 2 would use a new embankment section immediately west of Monterey Road. The existing railroad track paralleling Monterey Road on the west would be relocated farther west to accommodate two new HSR tracks. In addition, the project is proposing to replace the existing bridge/culvert below Monterey Road and existing railroad track with a 40-foot by 11-foot (width by height) wildlife crossing. The embankment section for Alternative 2 would cross Fisher Creek at approximately station 754+50.

Near the Fisher Creek crossing, Alternative 4 would share the existing two railroad tracks with Caltrain and UPRR. There would be no changes to the horizontal/vertical profile of the existing railroad track near Fisher Creek crossing. There would be no changes to the vertical/horizontal alignment of Monterey Highway near the Fisher Creek crossing. The existing bridge/culvert below Monterey Road and the existing railroad track would be replaced by a 40-foot by 11-foot (width × height) wildlife crossing. The wildlife crossing footprint for this alternative would be similar to Alternative 2. The existing railroad track for Alternative 4 would cross Fisher Creek at approximately station 704+00.

4.5.1.4 Available Hydraulic Model

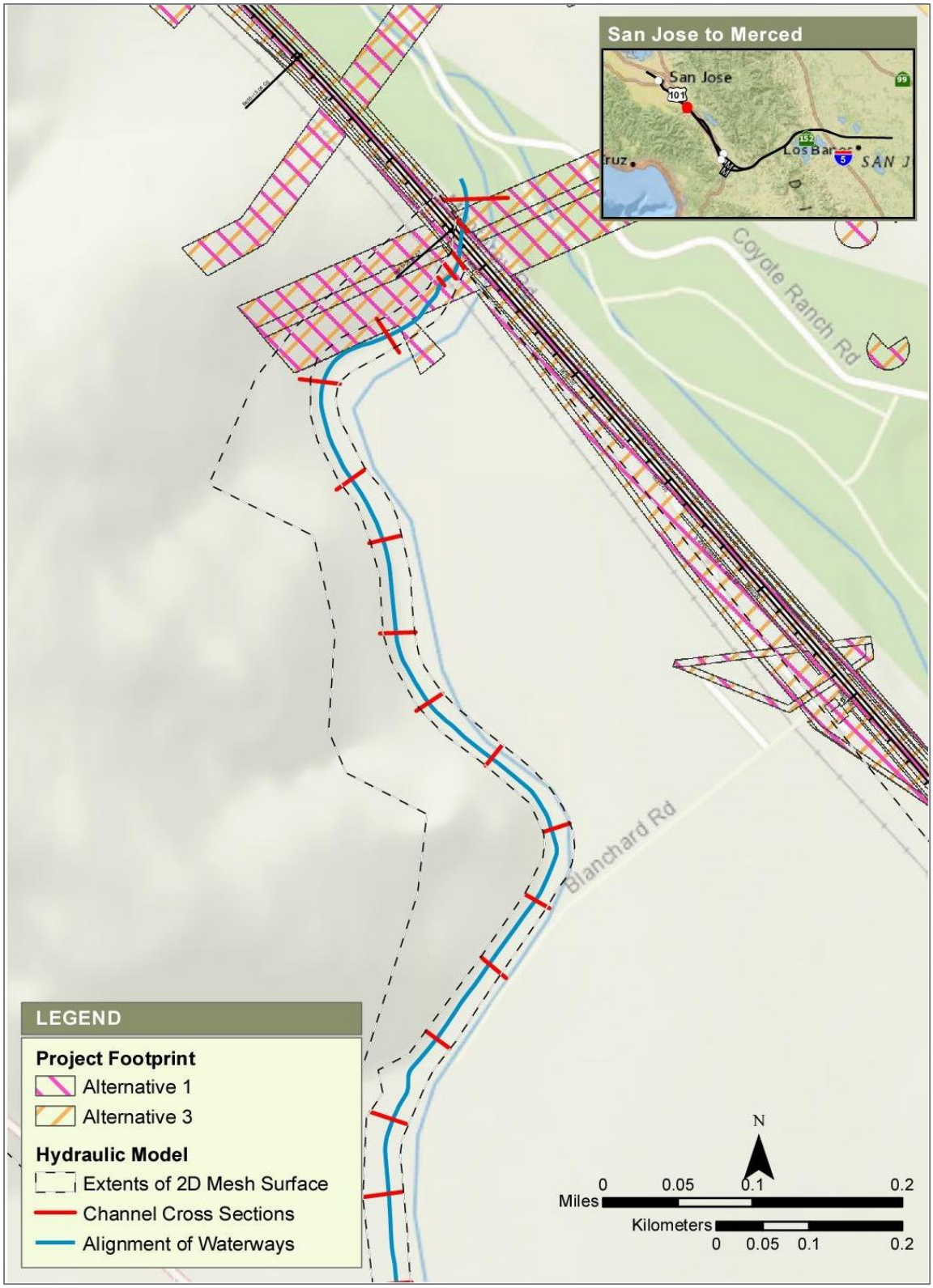
The SCVWD hydraulic model was used to evaluate the potential project impacts on Fisher Creek floodplain, because FEMA did not provide the effective hydraulic model of Fisher Creek to the Authority. Figure 4-23, Figure 4-24, and Figure 4-25 shows the limits of the SCVWD hydraulic model and the project footprint for Alternatives 1 and 3, Alternative 2, and Alternative 4 at Fisher Creek, respectively.



Sources: FEMA 2009; Authority 2019

JANUARY 2019

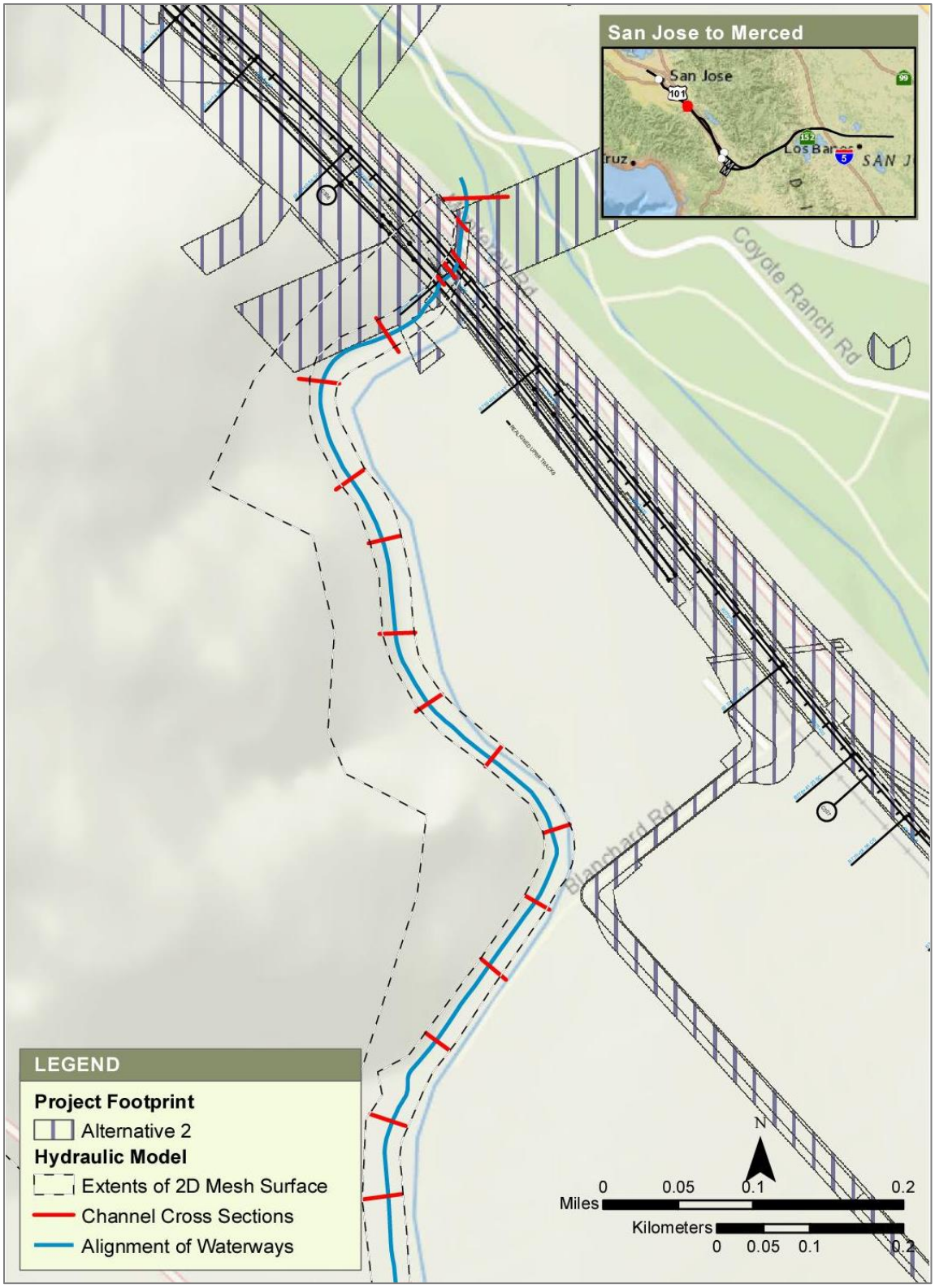
Figure 4-22 FEMA FIRM, Fisher Creek at Project Location



Sources: SCVWD 2015a; Authority 2019

JANUARY 2019

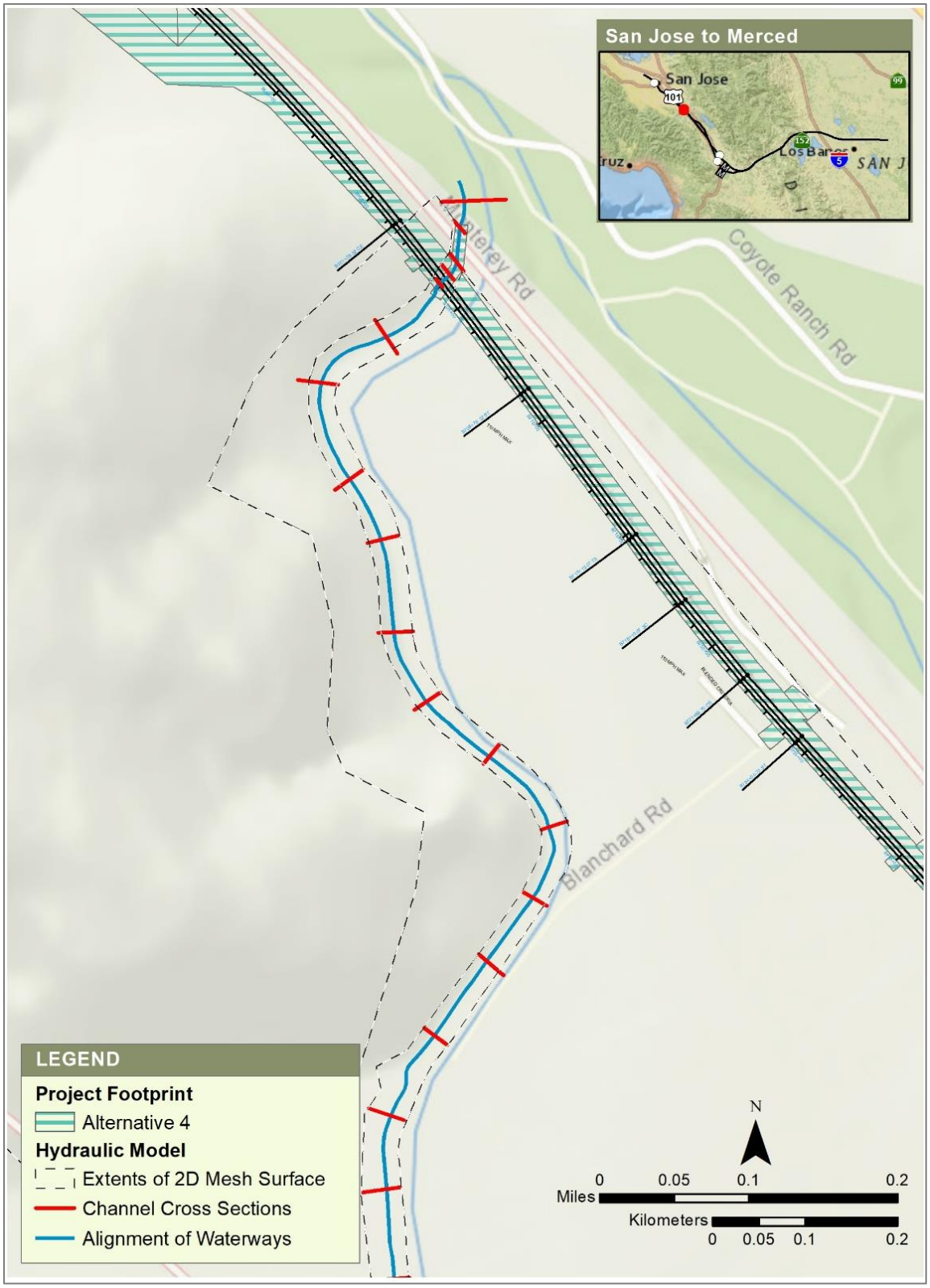
Figure 4-23 Fisher Creek, Plan View of SCVWD Hydraulic Model with Project Footprints for Alternatives 1 and 3



Sources: SCVWD 2015a; Authority 2019

JANUARY 2019

Figure 4-24 Fisher Creek, Plan View of SCVWD Hydraulic Model with Project Footprint for Alternative 2



Sources: SCVWD 2015a; Authority 2019

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Figure 4-25 Fisher Creek, Plan View of SCVWD Hydraulic Model with Project Footprint for Alternative 4

4.5.2 SCVWD Hydraulic Model

4.5.2.1 Overview of Hydraulic Model

The upstream and downstream limits of Fisher Creek included in the hydraulic model were immediately downstream of Old Monterey Road in the City of Morgan Hill (approximately 43,880 feet upstream of existing Monterey Road bridge) and confluence with Coyote Creek (approximately 170 feet downstream of existing Monterey Road bridge).

The two-dimensional mesh included in the SCVWD model covered areas west of Monterey Highway. The area of the two-dimensional mesh included in the hydraulic model is approximately 4,926 acres.

The downstream control WSE in the HEC-RAS hydraulic model of Fisher Creek was modified because the input parameters in the SCVWD's hydraulic model were lower than the 100-year WSE shown in the FEMA FIRM for Santa Clara County and Incorporated Areas (FEMA 2014). The downstream control for the hydraulic model was adjusted to 249 feet NAVD 88 to match the FEMA 100-year flood elevation shown in the FEMA FIRM. Because timing of the peak 100-year flood flow relative to the peak 100-year flood flow was not available, the downstream control WSE was set to be 249 feet from beginning to end of the hydraulic analysis.

The extents of the two-dimensional mesh in the base hydraulic model did not cover Monterey Highway. Therefore, the proposed pier columns on median of Monterey Highway were outside of the limits of the hydraulic model and was not included in the proposed condition hydraulic analysis of Alternative 1 and 3. Similarly, detailed grading for Alternatives 2 and 4 were not available. Therefore, the proposed condition hydraulic analysis for Alternatives 2 and 4 did not make adjustments to the ground elevation for the two-dimensional mesh. Because footprint of the wildlife crossing shown in the plans for Alternatives 2 and 4 was identical, the proposed condition hydraulic analysis for these two alternatives were performed using the same hydraulic model. This will be revised in the next phase, when the detailed design is available to differentiate Alternatives 2 and 4.

4.5.2.2 Inflow Hydrograph for Hydraulic Analysis

The hydraulic model of Fisher Creek included hydrograph of Fisher Creek and its tributaries during the 100-year storm event. There were 14 locations in the hydraulic model with assigned inflows. Ten inflow locations are assigned as direct inflow into channel cross section, and four remain inflow locations are assigned as surface runoff flowing from the upstream limit of the two-dimensional mesh assigned in the hydraulic model. The peak 100-year flows at each inflow location are summarized in Table 4-9. The inflow locations in the hydraulic model are shown in

Sources: SCVWD 2015a; Authority 2019 JANUARY 2019

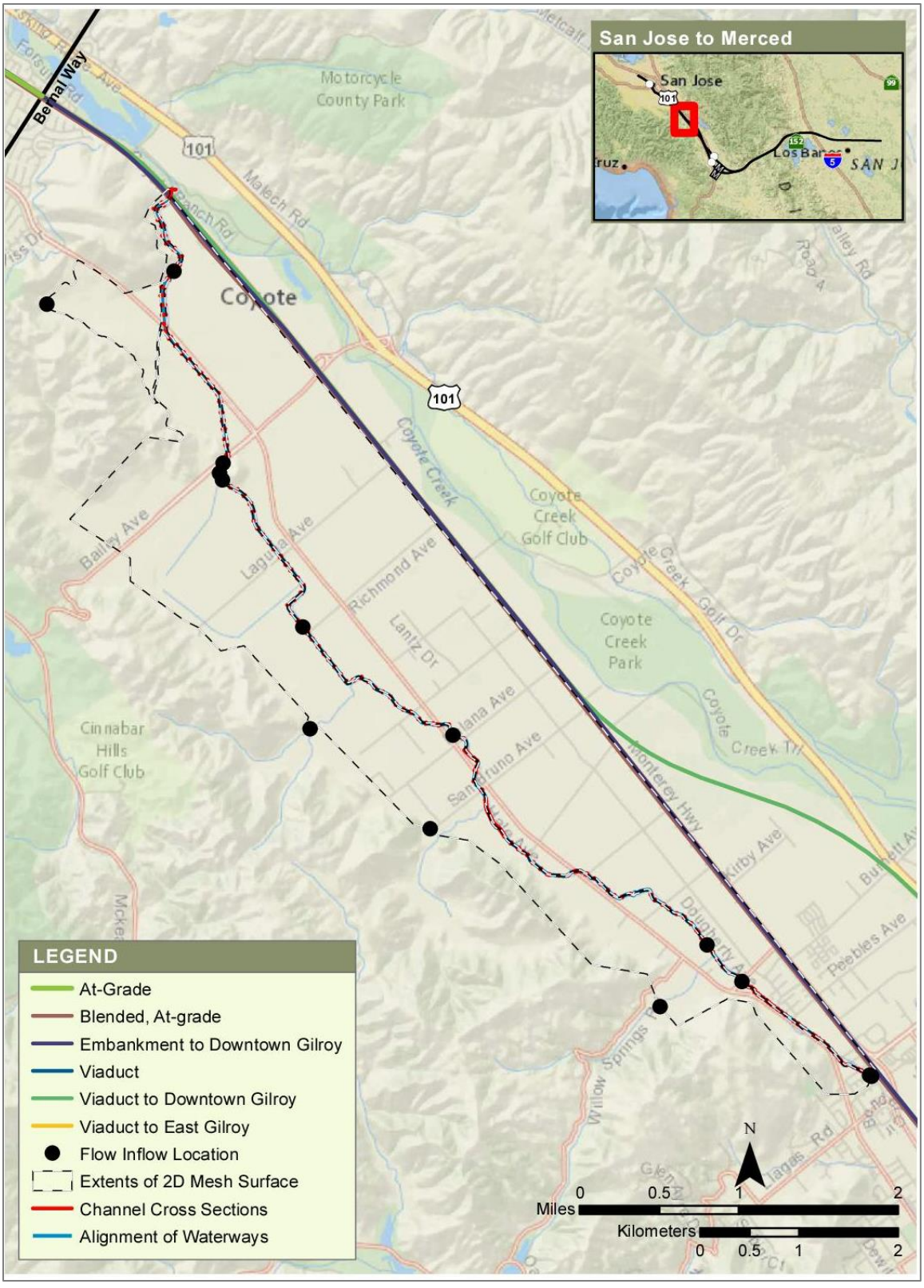
Figure 4-26.

Table 4-9 Peak 100-Year Inflows into Fisher Creek Hydraulic Model

River Station in Hydraulic Model	Distance from Existing Monterey Highway Bridge[1]	Peak Inflow (cfs)
RS 49999.31	43,780 feet upstream	107
RS 49815.4	43,710 feet upstream	107
RS 38831	38,370 feet upstream	214
RS 37096.59	36,640 feet upstream	294
RS 24250.93	23,990 feet upstream	155
RS 17491.97	17,220 feet upstream	260
RS 11195.68	10,930 feet upstream	326

River Station in Hydraulic Model	Distance from Existing Monterey Highway Bridge[1]	Peak Inflow (cfs)
RS 10944.99	10,670 feet upstream	375
RS 10583.33	10,310 feet upstream	109
RS 3361.912	3,090 feet upstream	159
Overland flow at Palm Avenue	n/a	288
Overland flow at San Bruno Avenue	n/a	294
Overland flow at Willow Springs Road	n/a	231
Overland flow from northwestern tributary	n/a	152

Sources: SCVWD 2015a
RS = River Station
Cfs = cubic feet per second
[1] Note: Distance from existing railroad bridge is rounded to the nearest 10 feet.



Sources: SCVWD 2015a; Authority 2019

JANUARY 2019

Figure 4-26 Inflow Locations in the Fisher Creek Hydraulic Model

4.5.2.3 Water Surface Elevations

The modeling results for Alternatives 1 and 3 and Alternatives 2 and 4 are shown in Table 4-10 and Table 4-11, respectively. The outputs from the hydraulic analysis showed that the proposed wildlife crossing proposed for Monterey Road Bridge (all alternatives) and the railroad bridge (Alternatives 2 and 4) would lower the 100-year flood profile of Fisher Creek main channel upstream of the project location.

Table 4-10 Hydraulic Modeling Results, Fisher Creek, Alternatives 1 and 3

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At downstream of Old Monterey Rd	810	247.1	249.0	249.0	0.0
At upstream of Old Monterey Road with proposed wildlife crossing and proposed HSR viaducts on the roadway median	810	247.6	249.4	249.0	(0.4)
At upstream existing railroad crossing	810	254.6	249.4	249.0	(0.4)
At upstream of Santa Teresa Boulevard	880	251.9	251.0	250.9	(0.1)

Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high=speed rail

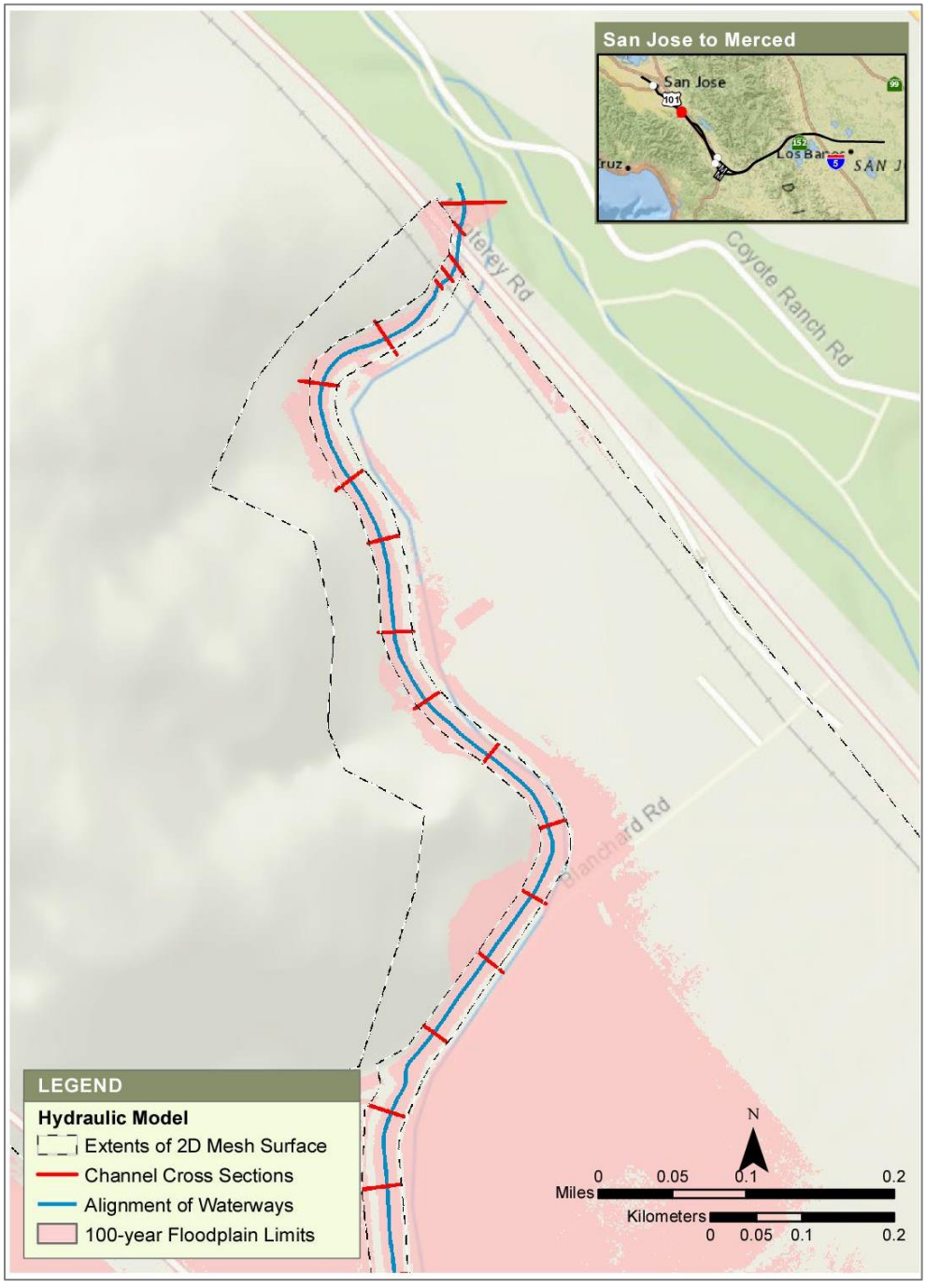
Table 4-11 Hydraulic Modeling Results, Fisher Creek, Alternatives 2 and 4

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
At downstream of Old Monterey Rd	810	247.1	249.0	249.0	0.0
At upstream of proposed cross culvert/wildlife crossing below railroad tracks	810	254.6	249.4	249.1	(0.3)
At upstream of Santa Teresa Boulevard	880	251.9	251.0	250.8	(0.2)

(Parentheses) indicate negative values
Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high=speed rail

4.5.2.4 Overbank Flood Flow

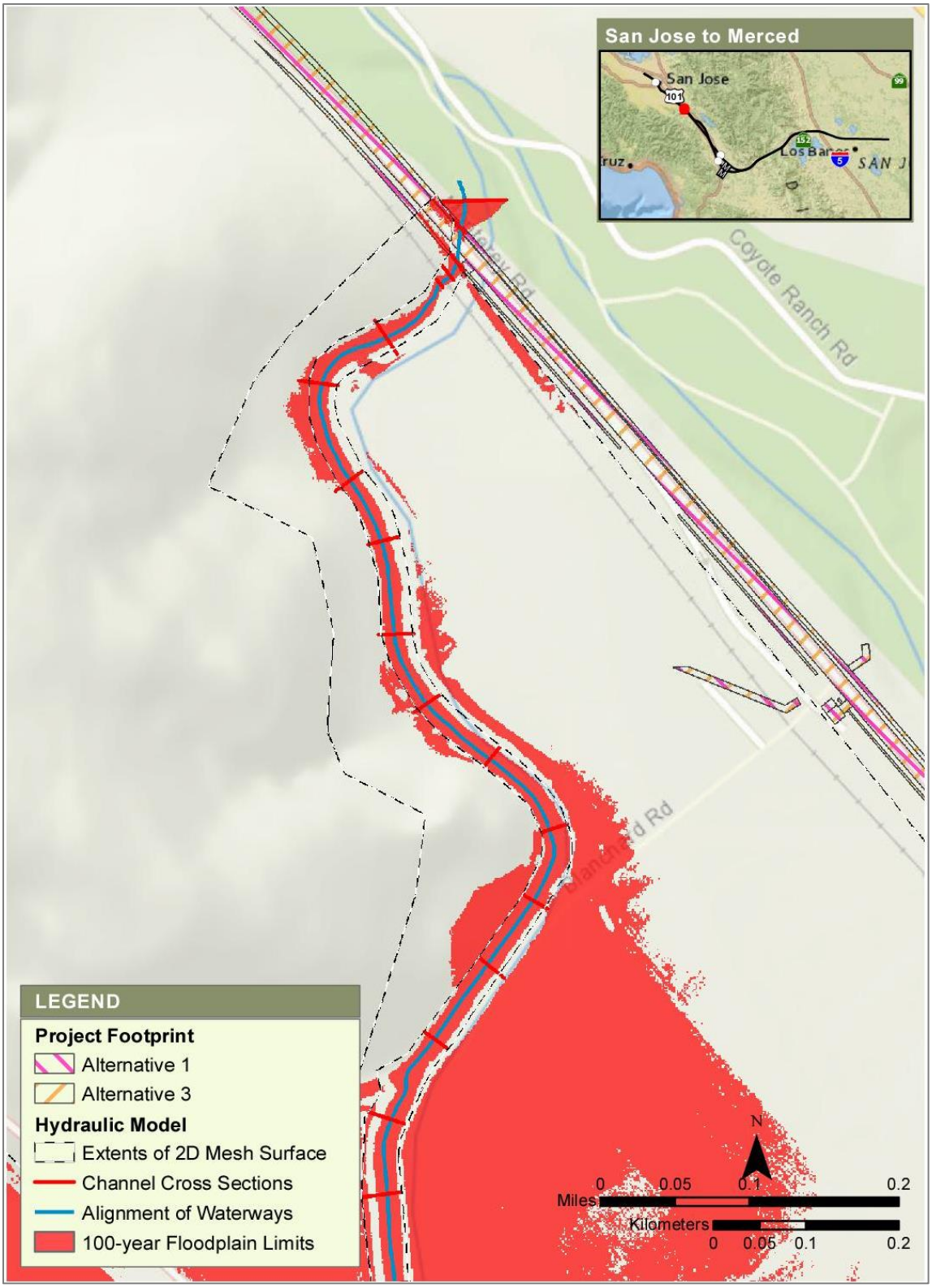
The modeling results for the two-dimensional floodplain analysis for Fisher Creek in the project vicinity are shown in Figure 4-23 for existing condition, Figure 4-24 for Alternatives 1 and 3, and Figure 4-25 for Alternatives 2 and 4. The outputs from the proposed condition hydraulic analysis showed that the proposed wildlife crossing/cross culvert with a larger flow opening that would lower the 100-year flood profile of mainline Fisher Creek would also reduce the extents of the 100-year floodplain by in the project vicinity.



Sources: SCVWD 2015a; Authority 2019

JANUARY 2019

Figure 4-27 Fisher Creek 100-Year Floodplain from Hydraulic Analysis, Existing Condition



Sources: SCVWD 2015a; Authority 2019

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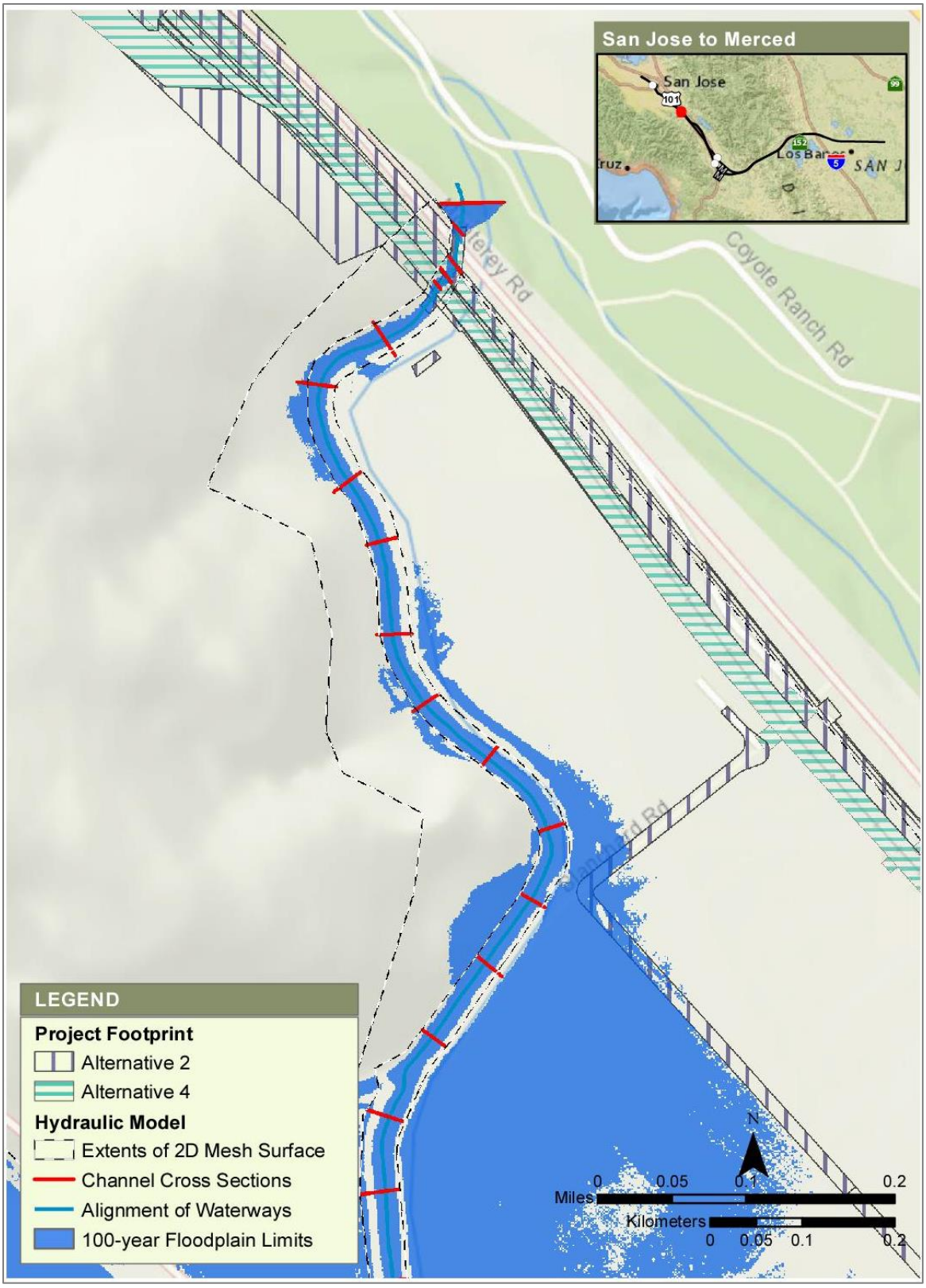
Figure 4-28 Fisher Creek 100-Year Floodplain from Hydraulic Analysis, Alternatives 1 and 3



Sources: SCVWD 2015a; Authority 2019

JANUARY 2019

Figure 4-29 Fisher Creek 100-Year Floodplain from Hydraulic Analysis, Alternatives 2 and 4

4.6 Uvas-Carnadero Creek

4.6.1 Background Information

4.6.1.1 Floodplain Location

Uvas-Carnadero Creek originates in the Santa Cruz Mountains, and it has a watershed size of approximately 87 square miles. Uvas Creek drains the southern slope of Loma Prieta, where the Uvas-Carnadero Creek watershed abuts the Los Gatos Creek, Alamitos Creek, and Llagas Creek watersheds. Uvas Creek generally flows in a southeasterly direction through the Santa Cruz Mountains towards Gilroy. Near the US 101, Uvas Creek changes its name to Carnadero Creek; therefore, this system is commonly referred to as Uvas-Carnadero Creek. Carnadero Creek discharges into Pajaro River just upstream of the Pajaro Narrows (SCVWD 2012b).

4.6.1.2 FEMA Floodplain

According to the FEMA FIRM panel numbers 06085C0752H, 06085C0756H, 06085C0760H (FEMA 2009), and FEMA LOMR Case No. 16-09-2429P, the FEMA SFHAs for Uvas-Carnadero Creek and overbank flood flows in the project footprint for are Zones A, AH, AO, and AE. FEMA LOMR Case No. 16-09-2429P became effective in January 8, 2018 revised the 100-year flood profile of mainline Uvas-Carnadero Creek between US 101 and Bloomfield Avenue and at the overbank area bounded by Uvas-Carnadero Creek on north, by Bloomfield Avenue on south and east, and by the railroad track on west. The remaining floodplains are effective since 2009.

There are no designated floodways in the Uvas-Carnadero Creek floodplain in the project footprint. The 100-year WSEs of Uvas-Carnadero Creek and overbank flood flows in the project footprint vary from approximately 195 feet NAVD in the City of Gilroy (Alternatives 1, 2, and 4) to approximately 166 feet NAVD 88 at the Bloomfield Avenue Bridge (Alternatives 1 and 2) and the overbank areas (Alternative 4).

Uvas-Carnadero Creek in the project footprint is recognized as a FEMA 100-year floodplain. Therefore, the project cannot raise the flood profile of Uvas-Carnadero Creek by more than 1.0 foot.

4.6.1.3 Project Alternatives in the FEMA Floodplain

The project footprints for Alternatives 1 and 2 include the Bloomfield Avenue Bridge over Uvas-Carnadero Creek (Figure 4-30). These two alternatives would replace the existing Bloomfield Avenue Bridge with a taller bridge to cross over the proposed maintenance facility. The project footprints for Alternatives 1 and 2 are also within the limits of the 100-year floodplain of the overbank flood flow of Uvas-Carnadero Creek. Alternative 1 is proposing a viaduct segment and maintenance facility in the exiting FEMA 100-year floodplain. Alternative 2 is proposing embankments, a trench section with lid, and a maintenance facility in the exiting FEMA 100-year floodplain.

The project footprint for Alternative 4 does not cross Uvas-Carnadero Creek, but is within the limits of the 100-year floodplain of the overbank flood flow of Uvas-Carnadero Creek (Figure 4-31). Alternative 4 is proposing embankments and a maintenance facility in the exiting FEMA 100-year floodplain.

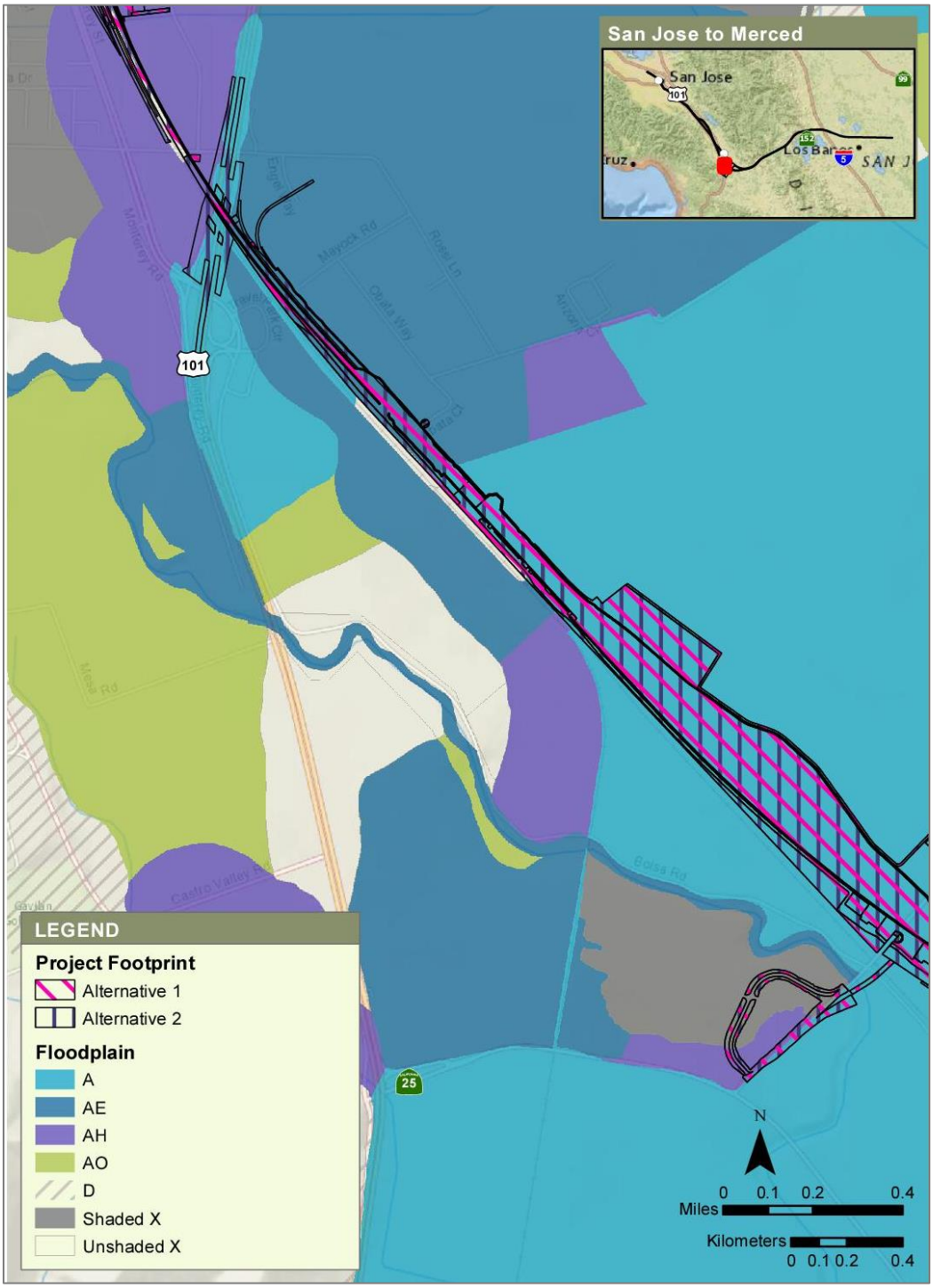
The project footprint for Alternative 3 is outside the limits of the 100-year floodplain of Uvas-Carnadero Creek, excluding the Soap Lake floodplain area.

4.6.1.4 Available Hydraulic Model

The FEMA effective hydraulic model and hydraulic model provided by SCVWD were available for this waterbody.

The SCVWD hydraulic model was used to develop combined one- and two-dimensional hydraulic model of the Soap Lake floodplain, discussed in detail in Chapter 5, Combined One- and Two-Dimensional Hydraulic Modeling for Soap Lake floodplain. Therefore, the outputs from this hydraulic model would not be discussed further in this section of this study.

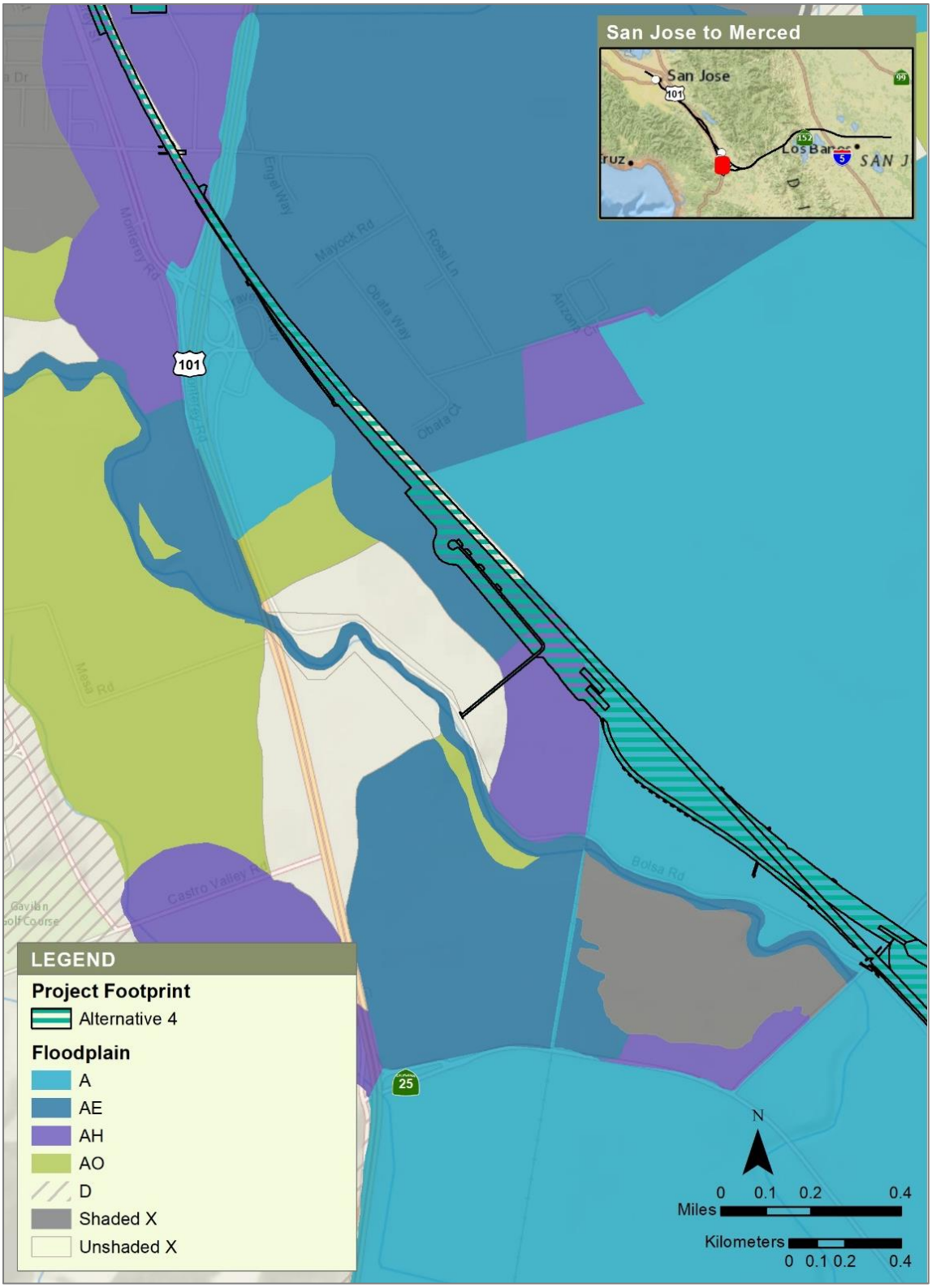
This section addresses the project's potential impacts on the mainline Uvas-Carnadero Creek floodplain using the FEMA effective hydraulic model of Uvas-Carnadero Creek. The project's potential impacts on the overbank flood flows of Uvas-Carnadero Creek in the project footprint are discussed in Chapter 5.



Sources: FEMA 2009; Authority 2019

JANUARY 2019

Figure 4-30 FEMA FIRM, Uvas-Carnadero Creek at Project Location with Project Footprints for Alternatives 1 and 2



Sources: FEMA 2009; Authority 2019

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Figure 4-31 FEMA FIRM, Uvas-Carnadero Creek at Project Location with Project Footprint for Alternative 4

4.6.2 FEMA Hydraulic Model

The upstream and downstream limits of Uvas-Carnadero Creek representing the one-dimensional component of the hydraulic model is at Santa Teresa Blvd (approximately 33,100 feet upstream of the existing Bloomfield Avenue Bridge) and approximately 1,700 feet downstream of the existing Bloomfield Avenue Bridge. The two-dimensional surface area is assigned on the overbanks between the downstream limit of the hydraulic model and West Luchessa Avenue bridge (approximately 21,900 feet upstream of Bloomfield Avenue Bridge). The area of the two-dimensional surface included in the hydraulic model is approximately 4,820 acres.

The hydraulic analysis of the existing condition was performed without making any changes to the base hydraulic model. The proposed condition hydraulic model for Alternatives 1 and 2 removed and replaced the existing Bloomfield Avenue Bridge over Uvas-Carnadero Creek. The hydraulic analysis for Alternatives 3 and 4 were not performed because the project footprint for these two alternatives were outside of the main channel of Uvas-Carnadero Creek.

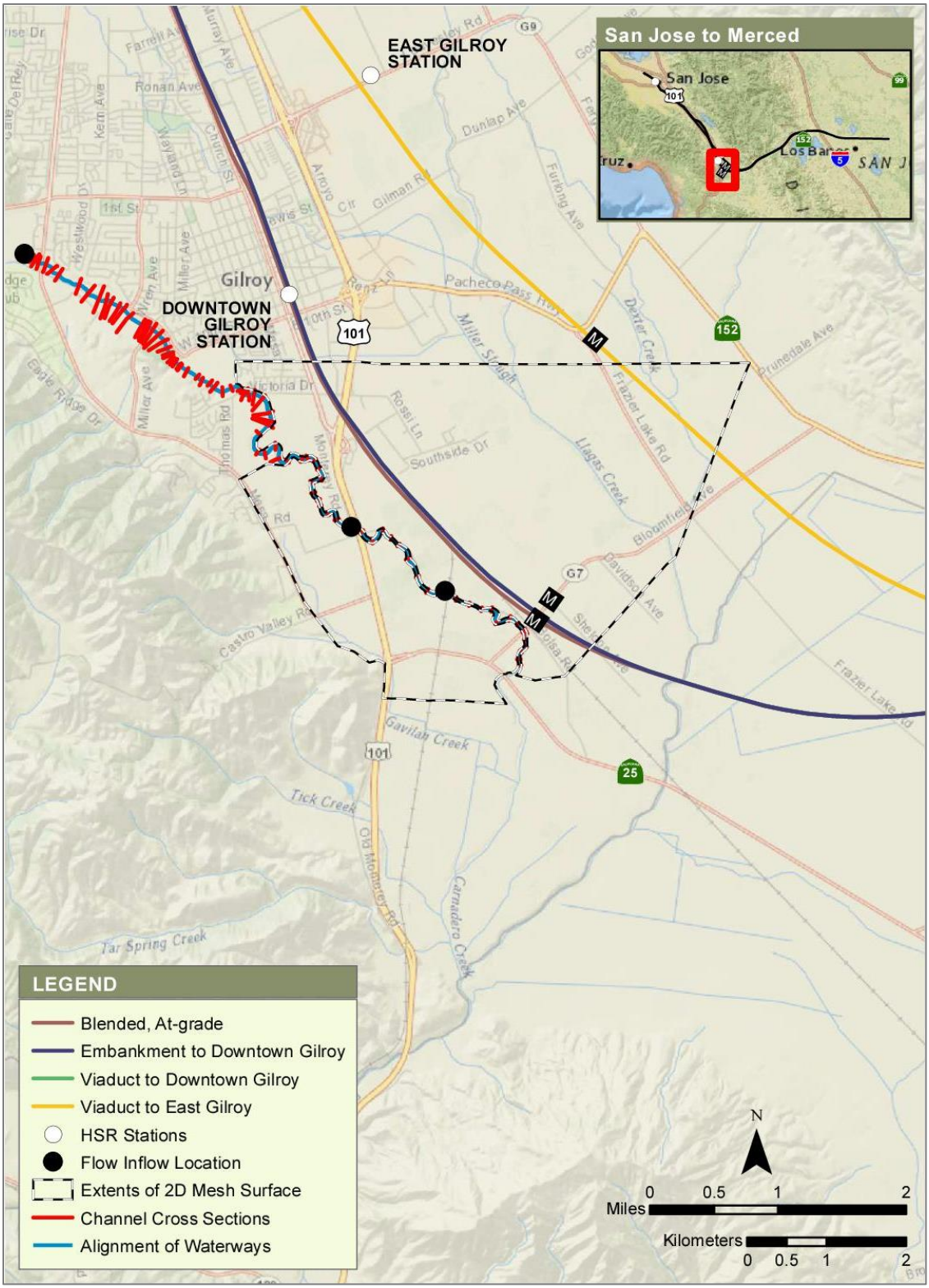
4.6.2.1 Inflow Hydrograph for Hydraulic Analysis

The hydraulic model of Uvas-Carnadero Creek included hydrographs of Uvas-Carnadero Creek during 100-year storm event. There were 3 locations in the hydraulic model with assigned inflows, all assigned as direct inflow into the creek main channel. The peak 100-year flows at each inflow location are summarized in Table 4-10. The inflow locations in the hydraulic model are shown in Figure 4-28.

Table 4-12 Peak 100-Year Inflows into Los Gatos Creek Hydraulic Model

Location	Distance from Existing Bloomfield Avenue Bridge[1]	Peak Inflow (cfs)
RS 32605	33,300 feet upstream	13,480
RS 10720	10,440 feet upstream	1,740
RS 4805.184	4,290 feet upstream	570

Sources FEMA 2018f
RS = River Station
cfs = cubic feet per second
[1] Distance from existing railroad bridge is rounded to the nearest 10 feet.



Sources: FEMA 20018f; Authority 2019

JANUARY 2019

Figure 4-32 Inflow Locations in the Hydraulic Model of Uvas-Carnadero Creek

4.6.2.2 Water Surface Elevations in the main Channel

The modeling results for Alternatives 1 and 2 are shown in Table 4-13. The outputs from hydraulic analysis show the replacement of the existing Bloomfield Avenue Bridge would not raise the 100-year flood profile of Uvas-Carnadero Creek in the project vicinity.

Table 4-13 Hydraulic Modeling Results, Uvas-Carnadero Creek, Alternatives 1 and 2

Location	Flow Rate (cfs)	Channel Bank Elevation (feet NAVD 88)	WSE—Existing Condition (feet NAVD 88)	WSE—Proposed Condition (feet NAVD 88)	Change in WSE (feet)
Downstream limit of hydraulic model, approximately 1,580 feet downstream of existing Bloomfield Avenue Bridge	5,660	161.7	163.9	163.9	0.0
Upstream of proposed Bloomfield Avenue bridge/ Downstream of existing Bloomfield Avenue bridge	6,850	170.1	166.2	166.1	(0.1)
At existing railroad bridge (Approximately 4,220 feet upstream of exist Bloomfield Avenue bridge)	7,080	178.0	174.5	174.5	0.0

(Parentheses) indicate negative values
Elevations are rounded to the nearest 0.1 foot.
cfs = cubic feet per second
NAVD 88 = North American Vertical Datum of 1988
WSE = water surface elevation
HSR = high=speed rail

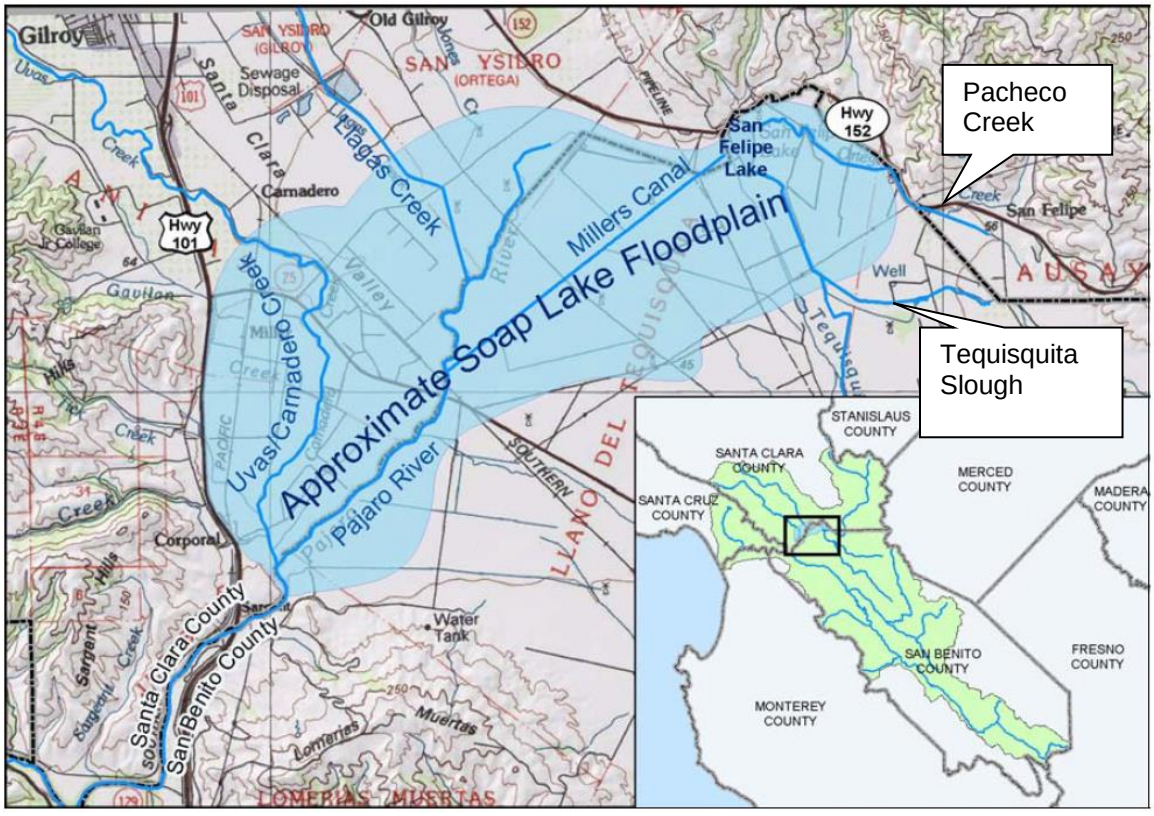
5 COMBINED ONE- AND TWO-DIMENSIONAL HYDRAULIC MODELING FOR SOAP LAKE FLOODPLAIN

5.1 General Information

The Soap Lake floodplain lies along the Pajaro River in San Benito and Santa Clara Counties between SR 152 and US 101. The approximate footprint of the Soap Lake floodplain is illustrated on Figure 5-1. Soap Lake is a natural detention basin storing water and reducing peak flows that would otherwise increase flooding in the lower Pajaro River in San Benito, Santa Cruz, and Monterey Counties. The major waterbodies contributing to the Soap Lake floodplain are Uvas-Carnadero Creek, Llagas Creek, Tequisquita Slough, and Pacheco Creek.

Soap Lake is a very important flood management feature for downstream areas because flood storage and attenuation in Soap Lake leads to a substantial decrease in peak flows downstream. According to the PRWFPA's *Pajaro River Watershed Study Final Phase 3 and 4a Report*, the outputs from the HEC-1 hydrologic model for Pajaro River watershed with and without Soap Lake showed substantial decreases in the peak flood flows at Chittenden stream gage, approximately 5 miles downstream of the Soap Lake outlet (PRWFPA 2005) (Table 5-1 and Figure 5-2).

The preliminary findings from the combined one- and two-dimensional hydraulic analysis were presented to the PRWFPA on December 21, 2016. The approach of the HSR to crossing the Soap Lake floodplain is to minimize potential changes to the WSEs, horizontal extent, and peak flows for the 100-year storm event.



Source: PRWFPA 2005

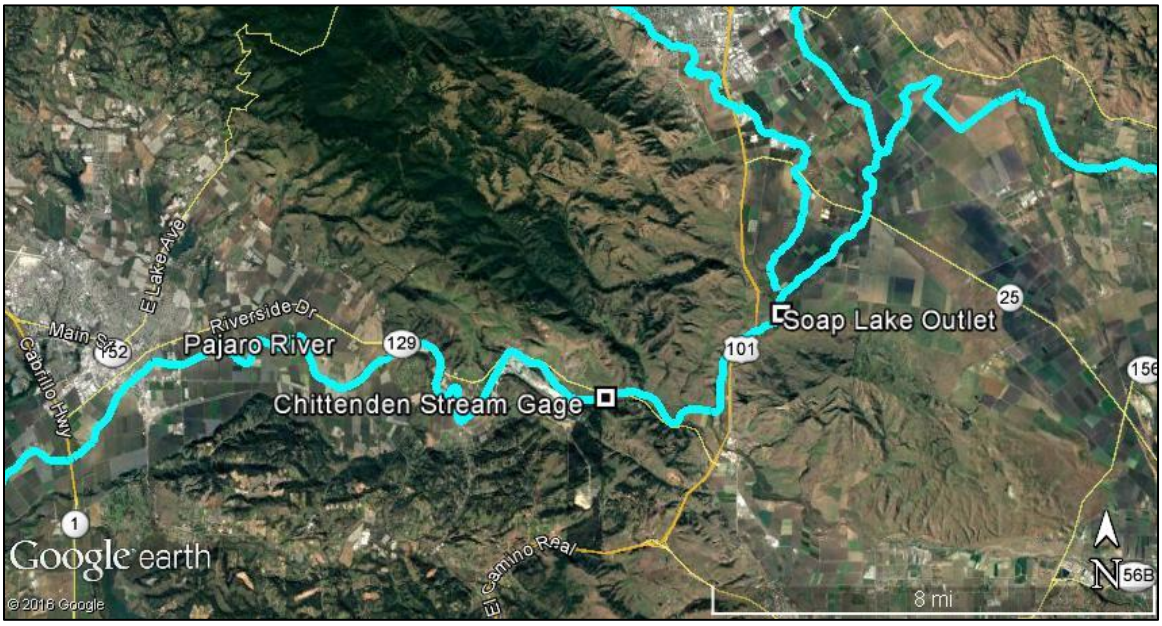
APRIL 2017

Figure 5-1 Soap Lake Approximate Floodplain Area

Table 5-1 Peak Flows at Chittenden Stream Gage with and without Soap Lake Attenuation

Recurrence Interval (year)	Peak Flow with Soap Lake (cfs)	Peak Flow without Soap Lake (cfs)	Peak Difference (cfs)
2	3,600	3,600	0
10	16,900	19,500	2,600
25	28,700	35,300	6,600
50	38,600	50,300	11,700
100	45,200	60,500	15,300
200	60,500	82,400	21,900

Source: PRWFPA 2005
cfs = cubic feet per second



Source: PRWFPA 2005

APRIL 2017

Figure 5-2 Location of Chittenden Stream Gage

5.2 Existing Floodplain Mapping in Soap Lake Floodplain

The Soap Lake floodplain is located in the FEMA FIRMs 06085C0756H, 06085C0757H, 06085C0760H, 06085C0770H, and 06085C0780H in Santa Clara County and the FEMA FIRMs 06069C0045D, 06069C0050D, and 06069C0075D in San Benito County.

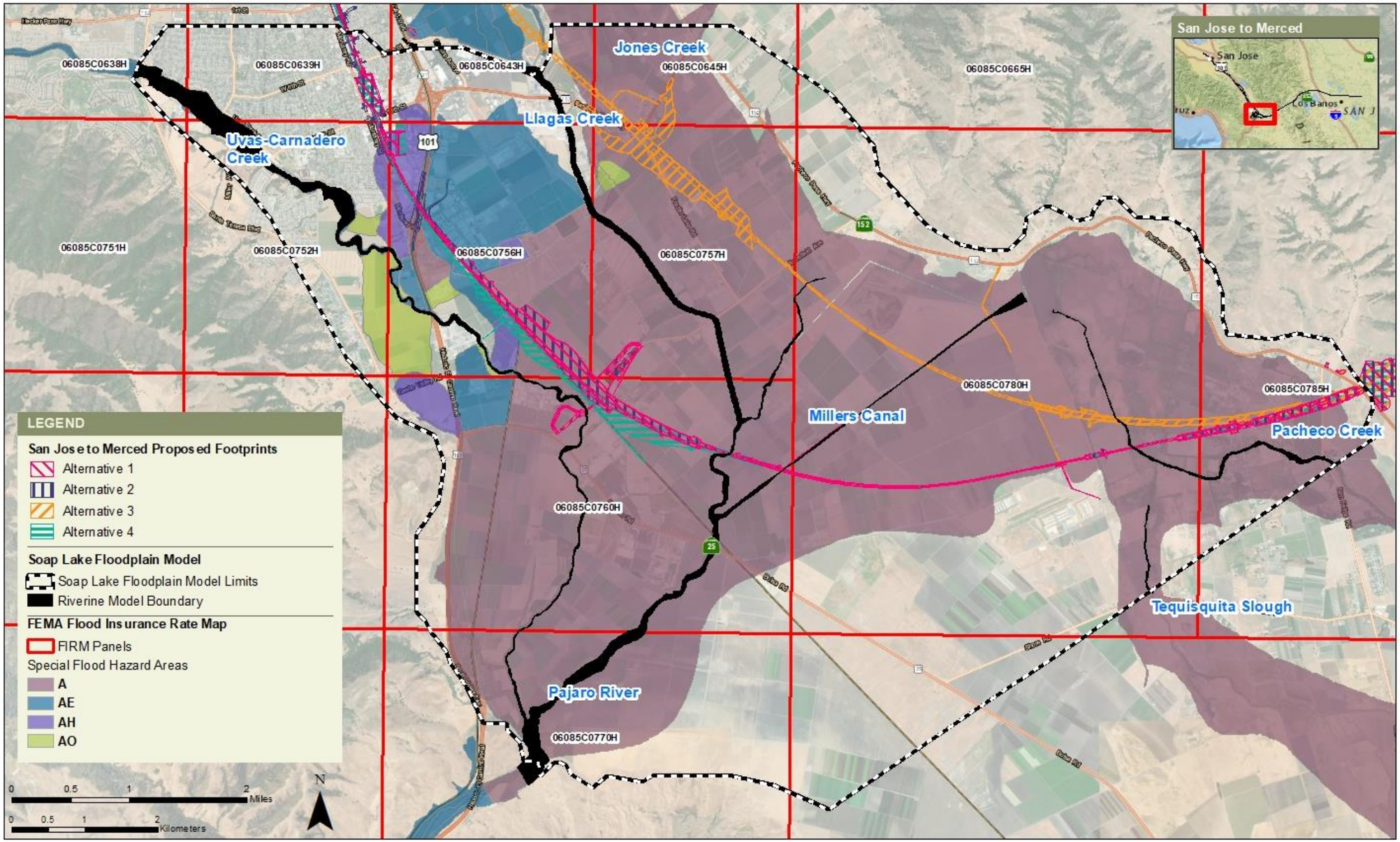
The FEMA FIRMs in Santa Clara County classify the Soap Lake floodplain and its vicinity as Special Flood Hazard Area Zones A, AE, AH, and AO. The FEMA FIRMs in San Benito County indicate that the Soap Lake floodplain and its vicinity are classified as Special Flood Hazard Area Zone A. The FEMA Special Flood Hazard Area Zones near the Soap Lake floodplain are illustrated on Figure 5-3.

Zone A represents areas subject to flooding by the 100-year flood event determined by approximate methods where BFEs are not shown. Because detailed analyses are not performed for such areas, BFEs and flood depths have not been determined by FEMA for the floodplains in the Soap Lake floodplain and vicinity. A majority of the Soap Lake floodplain is designated as Zone A.

Zone AE represents areas subject to flooding by the 100-year flood event determined by detailed methods. The FIRM shows BFEs in this 100-year flood zone. The mainline of Uvas-Carnadero Creek, Llagas Creek, Llagas Overbank Flow, and overbank spill flows from Uvas-Carnadero Creek, and Pajaro River at the Soap Lake outlet are designated as Zone AE near the Soap Lake floodplain.

Zone AH represents areas subject to flooding by the 100-year flood event where average depths are between 1 and 3 feet. Zone AH typically represents areas of shallow ponding during the 100-year flood event. The FIRM shows BFEs derived from detailed hydraulic analyses in this 100-year flood zone. The portions of the overbank spill flows from Uvas-Carnadero Creek are designated as Zone AH near the Soap Lake floodplain.

Zone AO represents areas subject to flooding by the 100-year flood event where average depths are between 1 and 3 feet. Zone AO typically represents areas with shallow sheet flow on sloping terrain during the 100-year flood event. The average flood depths from detailed hydraulic analyses are shown in this 100-year flood zone. The portions of the overbank spill flows from Uvas-Carnadero Creek and portions of the overbank spill flows from Jones Creek are designated as Zone AO near the Soap Lake floodplain.



Source: FEMA 2009; Authority 2019

JANUARY 2019

Figure 5-3 FEMA 100-Year Floodplain in the Vicinity of Soap Lake Floodplain

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5.3 Background Information

The hydrologic and hydraulic analyses of the Soap Lake floodplain were performed by combining the information available from the previous studies performed in its vicinity. Table 5-2 shows the list of resources obtained for the hydrologic and hydraulic analyses.

Table 5-2 Resources Obtained for Hydrologic and Hydraulic Analysis

Agency	Obtained Resource	Date
Federal Emergency Management Agency	Flood Insurance Study for Santa Clara County and Incorporated Areas	Published February 14, 2014
Pajaro River Watershed Flood Prevention Authority	One-dimensional hydraulic model of Soap Lake floodplain This model was used in the *Pajaro River Watershed Study, Final Phase 3 and 4a Report*, published February 2005	Received June 26, 2016
Santa Clara Valley Water District	Combined one- and two-dimensional hydraulic model of Uvas-Carnadero Creek One-dimensional hydraulic model of Llagas Creek and West Branch Llagas Creek	Received June 3, 2016
	One-dimensional hydraulic model of Llagas Creek and Tributaries and Hydrologic Analysis of Llagas Creek Watershed	Received January 5, 2018
Schaaf & Wheeler	Hydrologic model of Pajaro River Watershed This model was used in *Technical Memorandum No. 1.2.7* for the PRWFPA's *Pajaro River Watershed Study* (2001)	Received June 30, 2016
Towill, Inc.	One- and three-feet grid LiDAR digital elevation map of Soap Lake floodplain	Received January 6, 2017

PRWFPA = Pajaro River Watershed Flood Prevention Authority

5.4 Hydrologic Data Sources

This section describes the hydrologic data sources that were used to develop the inflow hydrographs into the Soap Lake floodplain model. Analysts reviewed the available hydrologic data from the FEMA FIS, hydraulic models provided by the SCVWD and PRWFPA, and the hydrologic model provided by Schaaf and Wheeler on behalf of PRWFPA.

5.4.1 Available 100-Year Flows

The FEMA FIS for Santa Clara County and Incorporated Areas, last revised on February 14, 2014, provided the peak 100-year flow of Uvas-Carnadero Creek, Llagas Creek, and the Pajaro River. The FEMA FIS for San Benito County and Incorporated Areas, last revised on April 16, 2009, did not provide peak flows of waterbodies near the Soap Lake floodplain.

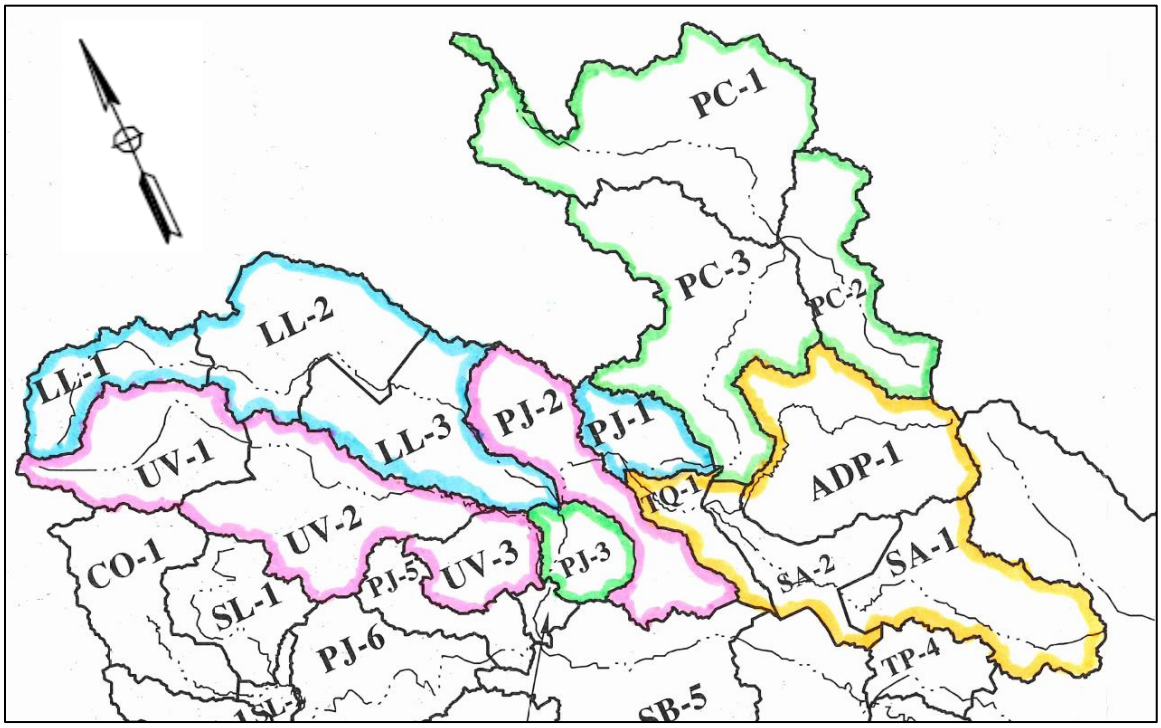
The hydraulic model for Uvas-Carnadero Creek provided by the SCVWD included the 100-year, 60-hour hydrograph used in the unsteady-state hydraulic analysis. The hydraulic model for Llagas Creek provided by the SCVWD included the peak 100-year flows used in the steady-state hydraulic analysis. SCVWD also provided hydrologic analysis of Llagas Creek, which included peak flow of Llagas Creek with no overbank flood flows in upstream of Soap Lake (SCVWD 2018g).

The one-dimensional hydraulic model of Soap Lake floodplain provided by PRWFPA included the peak 100-year flows of Uvas-Carnadero Creek, Llagas Creek, and Uvas Creek.

On behalf of PRWFPA, Schaaf & Wheeler provided the outputs of the HEC-1 hydrologic model used in *Technical Memorandum No. 1.2.7* for the PRWFPA's *Pajaro River Watershed Study* (2001). The memorandum provided the layout of the subwatersheds in the HEC-1 hydrologic

model (Figure 5-4 and Table 5-3). The outputs from HEC-1 hydrologic model included peak flows at each subwatershed in the hydrologic model.

The obtained peak flows of the waterbodies entering the Soap Lake floodplain from FEMA, SCVWD, and Schaaf and Wheeler are shown in Table 5-4.



Source: Schaaf and Wheeler 2001 APRIL 2017

Figure 5-4 Subwatershed Layout for the Pajaro River Watershed Study

Table 5-3 Waterbodies Entering Soap Lake Floodplain

Waterbody Name	Subwatersheds in Figure 5-4	Subwatershed Area (square miles)
Uvas-Carnadero Creek	UV-1, UV-2, and UV-3	86.5
Llagas Creek	LL-1, LL-2, and LL-3	90.2
Tequisquita Slough	ADP-1, SA-1, SA-2, and TQ-1	115.3
Pacheco Creek	PC-1, PC-2, and PC-3	153.2
Unnamed waterbodies outfalling to San Felipe Lake	PJ-1	13.7
Jones Creek and unnamed tributaries outfalling to Pajaro River	PJ-2	34.0
Unnamed waterbodies outfalling to Pajaro River	PJ-3	12.0

Source: Schaaf and Wheeler 2001

Table 5-4 Soap Lake Peak Flows from Available Studies

Waterbody Name	FEMA FIS (cfs)	SCVWD Hydraulic Models (cfs)	PRWFPA Soap Lake Hydraulic Model (cfs)	HEC-1 Hydrologic Model (cfs)
Uvas-Carnadero Creek (upstream of confluence with Pajaro River)	14,000	17,000	12,927	13,041
West Branch Llagas Creek (upstream of confluence with Llagas Creek)	N/A	6,160	N/A	N/A
Llagas Creek (upstream of confluence with West Branch Llagas Creek)	5,200	8,848	N/A	N/A
Llagas Creek (downstream of confluence with West Branch Llagas Creek)	N/A	15,237 (17,800 from Watershed Study)	N/A	N/A
Llagas Creek (upstream of confluence with Pajaro River)	18,800	(18,800 from watershed study)	8,597	10,764
Tequisquita Slough (Upstream of confluence with Pacheco Creek)	N/A	N/A	N/A	10,409
Pacheco Creek (upstream of Soap Lake floodplain outfall)	N/A	N/A	N/A	13,408
Subwatershed PJ-1 (unnamed streams outfalling into Frazier Lake)	N/A	N/A	N/A	2,125
Subwatershed PJ-2 (Jones Creek and unnamed tributaries outfalling into Soap Lake between Frazier Lake and Llagas Creek/Pajaro River confluence)	N/A	N/A	N/A	6,243
Subwatershed PJ-3 (unnamed tributaries outfalling into Soap Lake downstream of Llagas Creek/Pajaro River confluence)	N/A	N/A	N/A	2,856
Pajaro River (at Soap Lake outlet)	30,500	N/A	26,087	26,594

Sources: Schaaf and Wheeler 2001; PRWFPA 2005a, 2005b; SCVWD 2012, 2013b, 2016 2018g; FEMA 2014
cfs = cubic feet per second

5.4.2 Inflow Hydrographs for Hydraulic Analysis

The peak 100-year flow of Uvas-Carnadero Creek from the SCVWD model was the most conservative among the four data sources and was used for the hydraulic analysis of the Soap Lake floodplain. The timing of the peak 100-year flow (17,000 cfs, Table 5-4) was assumed same as the timing of the peak 100-year flow of Uvas-Carnadero Creek from HEC-1 hydrologic model (Figure 5-5). Figure 5-6 shows comparison of the 100-year flow hydrograph of Uvas-Carnadero Creek from SCVWD and HEC-1 hydrologic model.

The peak 100-year flows of Llagas Creek from the HEC-1 hydrologic model is from a study performed in 2001. According to SCVWD, the peak 100-year flow of Llagas Creek included in the SCVWD was based on the USACE's *Upper Llagas Creek Flood Control Project Existing Conditions Floodplains Study* dated September 2006. The FEMA FIS for Santa Clara County dated February 14, 2014, provided the peak 100-year flow of Llagas Creek just upstream of the Soap Lake floodplain. The peak flow rates for Llagas Creek have not been revised from the FEMA FIS for Santa Clara County dated August 17, 1998.

The peak 100-year flows from the FEMA FIS were most conservative among the available 100-year peak flows (Table 5-4). However, the FEMA FIS flows are oldest among the three types of available data, and the FEMA FIS did not provide peak flows of Llagas Creek immediately downstream of confluence with West Branch Llagas Creek. Because sufficient data were not available from the FEMA FIS for the tributary of Llagas Creek, the peak flow of 17,800 cfs from the SCVWD's watershed assessment (SCVWD 2018g) of Llagas Creek was selected as the inflow for the hydraulic analysis of the Soap Lake floodplain. Because SCVWD watershed assessment only provided the peak flow, the hydrograph of Llagas Creek downstream of the confluence with West Little Llagas Creek were assumed to be following the same flooding pattern as the hydrograph of Llagas Creek from the HEC-1 hydrologic model. The hydrograph Llagas Creek were determined by multiplying the hydrograph by the ratio of peak flows between HEC-1 hydrologic model and the SCVWD design flood flows. The timing of the peak flood flow was assumed to remain unchanged from the HEC-1 hydrologic model. Figure 5-7 shows comparison of the 100-year flow hydrographs of Llagas Creek from SCVWD and 100-year flow hydrograph of Llagas Creek from HEC-1 hydrologic model.

For the remaining waterbodies (Jones Creek, unnamed waterbodies, Tequisquita Slough, and Pacheco Creek), the output from the HEC-1 hydrologic model was the only source of the peak flows and was used for the hydraulic analysis of the Soap Lake floodplain.

Subwatershed PJ-2 from the HEC-1 hydrologic model represents the unnamed waterbodies outfalling to Soap Lake, downstream of the confluence of PJ-1 and Pacheco Creek. In addition, PJ-2 represents the storm runoff entering the Soap Lake floodplain flowing from the north and south of this reach, as illustrated on Figure 5-4. Therefore, the hydrograph for PJ-2 in the Soap Lake floodplain model was evenly divided into PJ-2 north and PJ-2 south, based on the watershed area north and south of the Soap Lake to separate out the incoming flows from north and south of the Soap Lake floodplain.

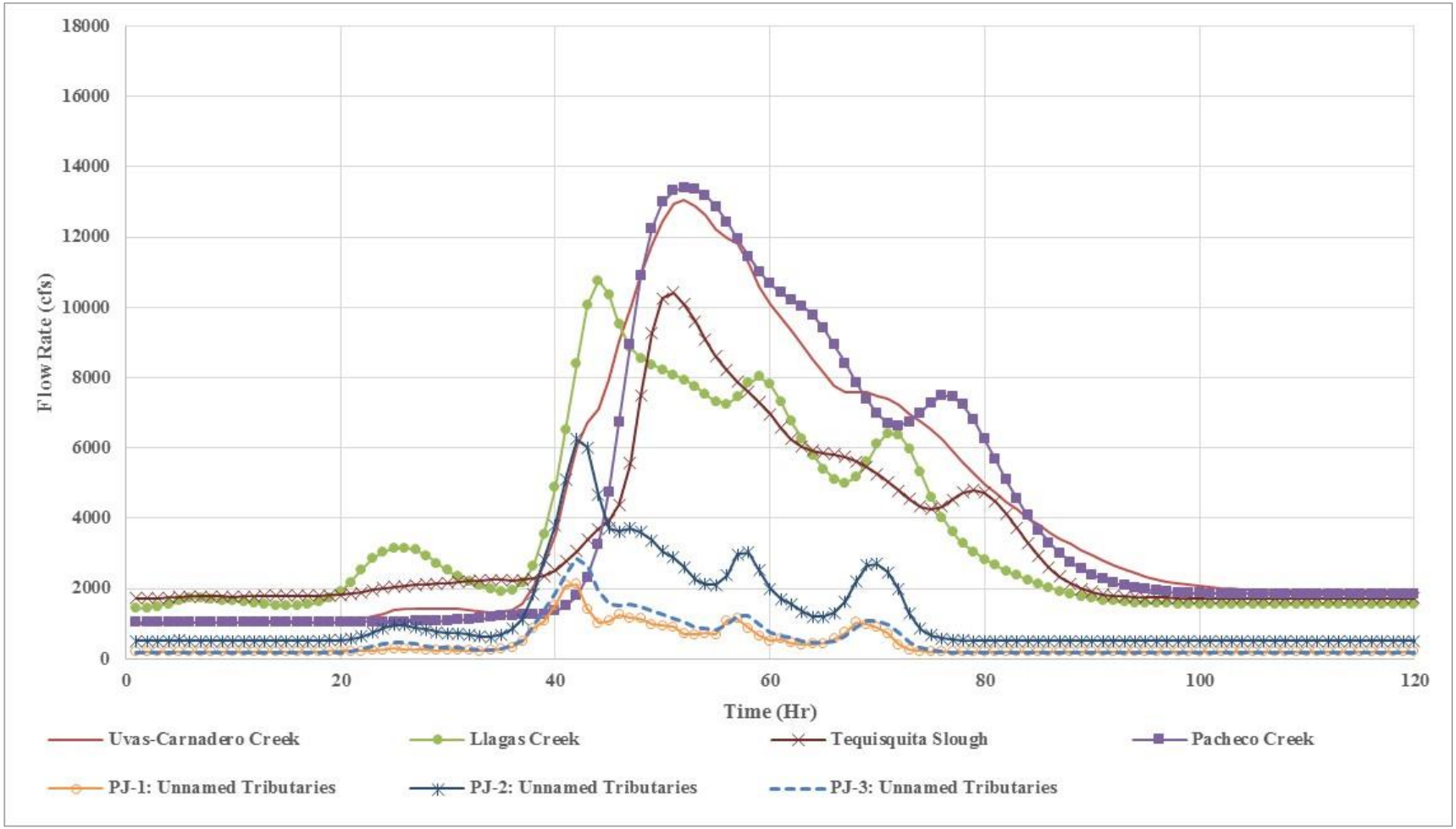
The inflow hydrographs used in the hydraulic analyses are illustrated on Figure 5-8. The begin and end times of the simulation were set to match with the duration of the 60-hr hydrograph of Uvas-Carnadero Creek from SCVWD, adjusted to match with the peak flood of Uvas-Carnadero Creek from the HEC-1 hydrologic model as illustrated on Figure 5-6. To provide stability in the hydraulic model simulation, the inflows at the beginning of the simulations were assumed to be 1 cfs for all of the subwatersheds of the Soap Lake floodplain included in the Soap Lake floodplain model, and was set to match with the inflows from selected hydrographs at hour 2. In addition, the inflow of 5 cfs was assumed to flow into Millers Canal in the first 10 hours of the model simulation to avoid the dry channel before receiving the inflows from Tequisquita Slough, Pacheco Creek, Subwatershed PJ-1, and Subwatershed PJ-2 (south).

The inflow hydrograph for the hydraulic analysis of Soap Lake floodplain are illustrated on Figure 5-8. The peak 100-year flows from the hydrographs assigned to the Soap Lake floodplain model are summarized in Table 5-5.

Table 5-5 Peak 100-Year Flows from the Hydrographs for Soap Lake Floodplain Model

Waterbody Name	Peak 100-year Flow (cfs)	Source
Uvas-Carnadero Creek	17,000	SCVWD 2016
Llagas Creek (downstream of confluence with West Branch Llagas Creek)	17,800	SCVWD 2018
Tequisquita Slough	10,409	*Schaaf and Wheeler 2001*
Pacheco Creek	13,408	*Schaaf and Wheeler 2001*
Subwatershed PJ-1	2,125	*Schaaf and Wheeler 2001*
Subwatershed PJ-2 (north)	3,122	*Schaaf and Wheeler 2001*
Subwatershed PJ-2 (south)	3,122	*Schaaf and Wheeler 2001*
Subwatershed PJ-3	2,856	*Schaaf and Wheeler 2001*

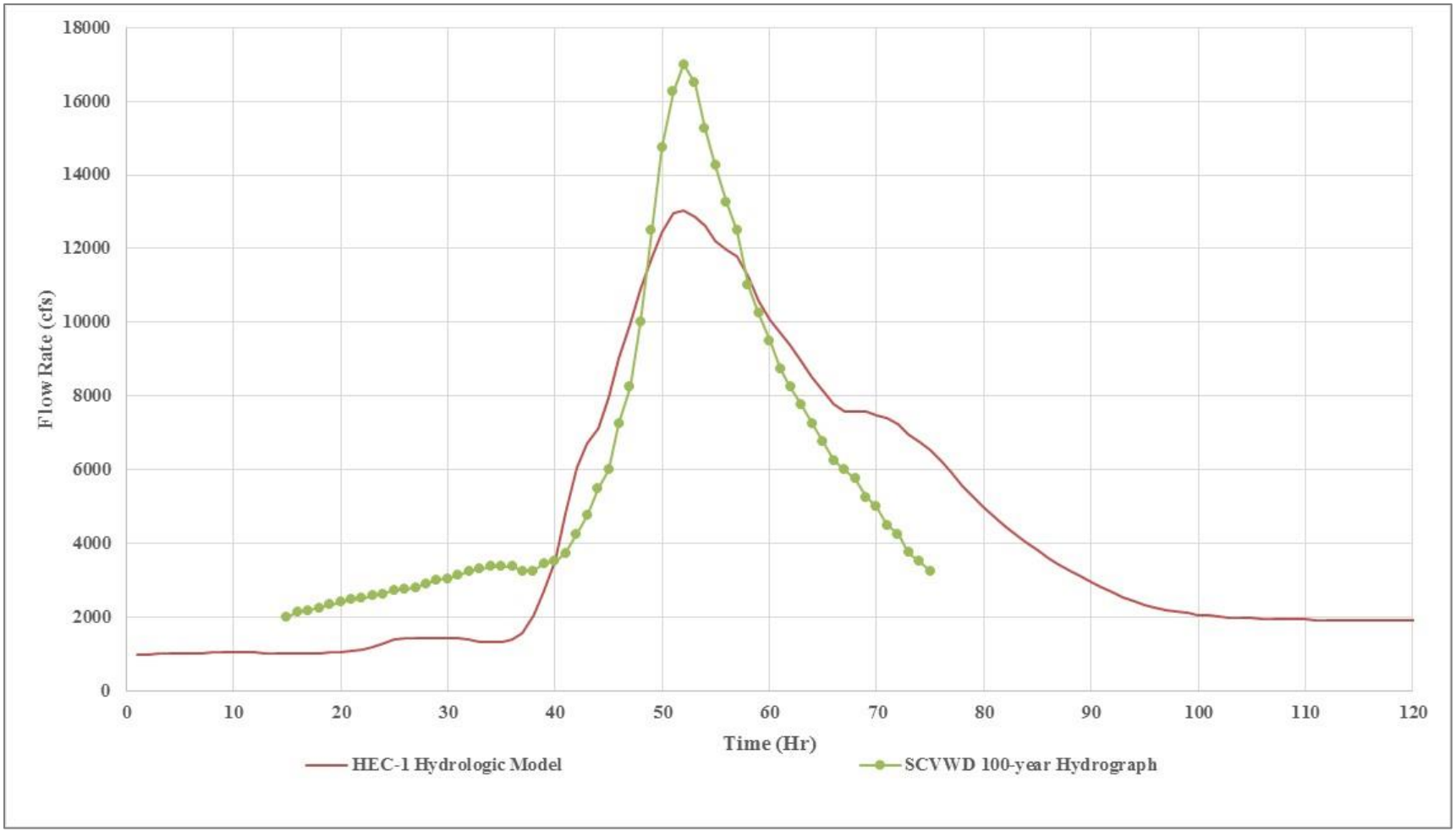
Sources: Schaaf and Wheeler 2001; SCVWD 2016, 2018g
cfs = cubic feet per second



Source: Schaaf and Wheeler 2001

JANUARY 2019

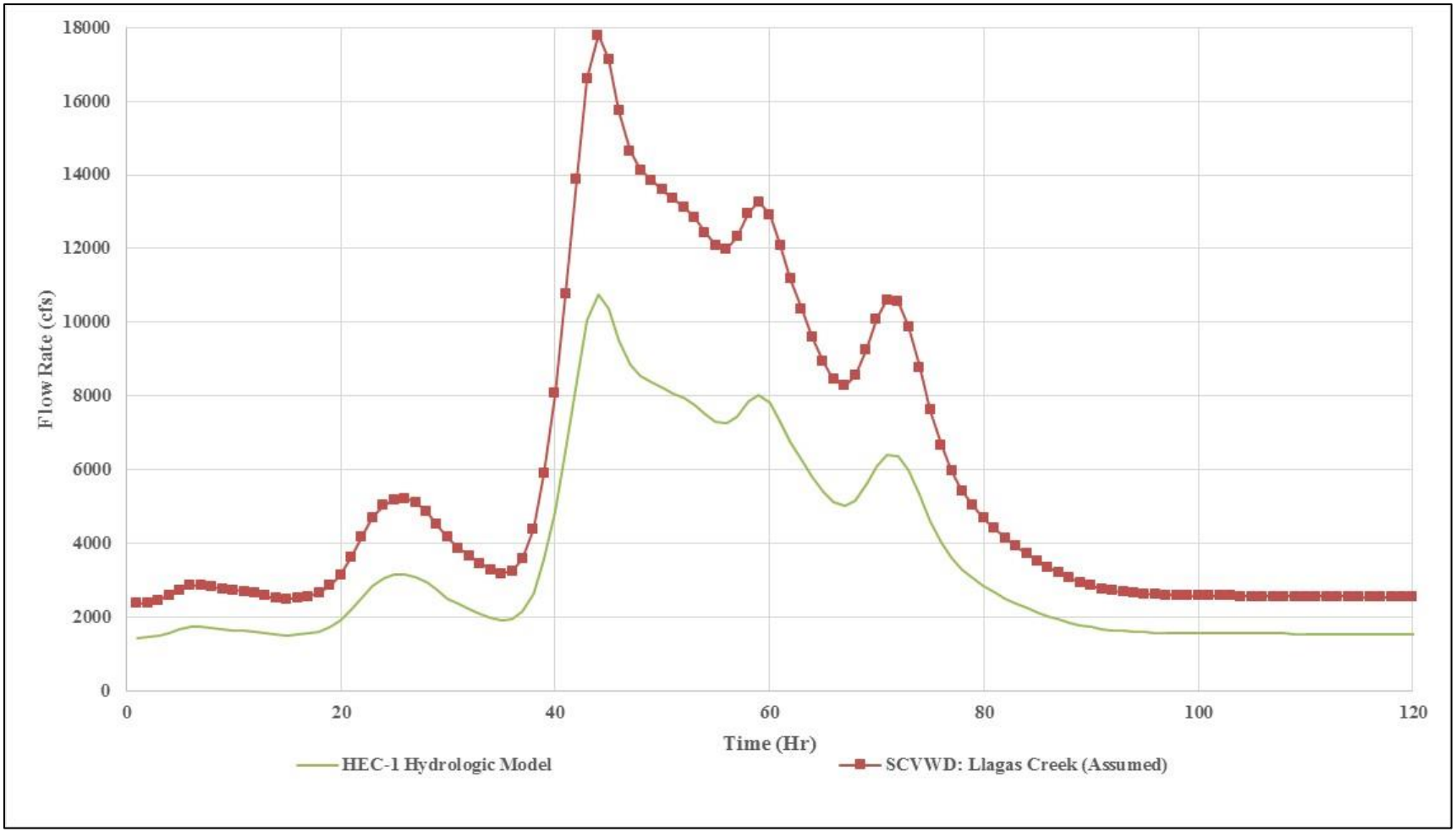
Figure 5-5 100-Year Flow Hydrographs from HEC-1 Hydrologic Model



Sources: Schaaf and Wheeler 2001; SCVWD 2016

JANUARY 2019

Figure 5-6 Comparison of 100-Year Flow Hydrographs for Uvas-Carnadero Creek



Sources: Schaaf and Wheeler 2001; SCVWD 2016

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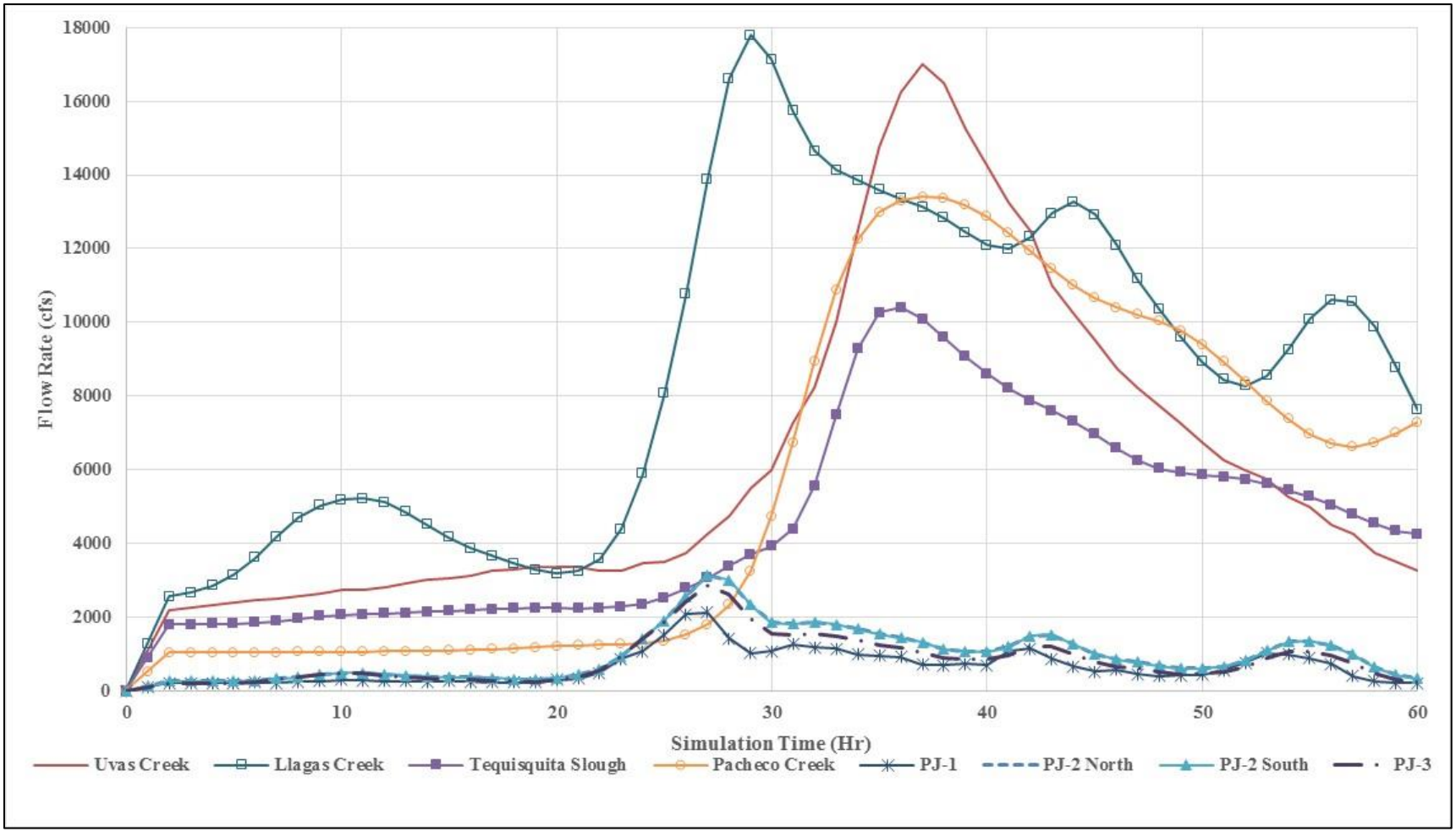
Figure 5-7 Comparison of the 100-Year Flow Hydrographs for Llagas Creek



Sources: Schaaf and Wheeler 2001; SCVWD 2016, 2018g

JANUARY 2019

Figure 5-8 100-Year Flow Hydrographs for Soap Lake Floodplain Subwatersheds for Hydraulic Analysis

5.5 Hydraulic Analysis

5.5.1 Overview of Hydraulic Analysis

Innovyze's Infoworks ICM software was used to perform the combined one- and two-dimensional hydraulic analysis of the Soap Lake floodplain. ICM is an integrated one-dimensional and two-dimensional hydrodynamic simulation, incorporating both above- and below-ground elements of catchments. This software was chosen because of its ability to combine one-dimensional open channel flows and a full two-dimensional mesh solution for the floodplain flows.

The ICM hydraulic model for the Soap Lake floodplain is composed of a one-dimensional riverine model, two-dimensional floodplain model, inflow hydrographs assigned into the one- and two-dimensional components of the hydraulic model, and geometric features assigned in the model to represent the proposed HSR structures. The following sections describe each of the components in the ICM hydraulic model for the Soap Lake floodplain.

5.5.2 One-Dimensional Riverine Model

The ICM hydraulic model for the Soap Lake floodplain included one-dimensional riverine models of Uvas-Carnadero Creek, Llagas Creek, Pajaro River, Millers Canal, Tequisquita Slough, and Pacheco Creek. Figure 5-6 illustrates the location, alignment, and limits of the one-dimensional riverine models included in the ICM hydraulic model.

The hydraulic model of Uvas-Carnadero Creek, Llagas Creek, and Lower Llagas Creek provided by the SCVWD and the hydraulic model of the Soap Lake floodplain provided by PRWFPA were imported into the ICM hydraulic model to use as the one-dimensional riverine component of the model.

The channel cross sections for Uvas-Carnadero Creek and Llagas Creek overlapped between the SCVWD model and the PRWFPA' Soap Lake floodplain model. Because the hydraulic model prepared by SCVWD was more recent than the Soap Lake floodplain model provided by PRWFPA, the channel cross sections included in the SCVWD hydraulic model were used in the combined one- and two-dimensional hydraulic model for locations with overlap. The input parameters in the SCVWD's hydraulic model, such as channel cross sections, distance between cross sections, Manning's roughness coefficients assigned to each cross section, and bridge dimensions, remained unchanged from the original model in general.

The Soap Lake floodplain used in the *Pajaro River Watershed Study, Final Phase 3 and 4a Report* published in February 2005 included Uvas-Carnadero Creek, Llagas Creek, Pajaro River, and Millers Canal. Because the footprint of this one-dimensional hydraulic model included the overbank areas that would be represented using the two-dimensional mesh in the ICM hydraulic model, the limits of the one-dimensional model were trimmed to include only the main channel of the riverine model. The remaining model attributes from the one-dimensional riverine model were unchanged when they were imported to the ICM hydraulic model.

Within the limits of the Soap Lake Hydraulic Model, there are three confluences of the one-dimensional riverine components: Llagas Creek and Pajaro River, Pajaro River and Millers Canal, and Pajaro River and Uvas-Carnadero Creek. The channel cross sections cut from the terrain files were added to the river reaches at the junctions to improve the accuracy of the hydraulic model.

There were no hydraulic models available for Tequisquita Slough and Pacheco Creek near the Soap Lake floodplain. The riverine models for these two creeks were added into the ICM model using the digital elevation model (DEM) file of Soap Lake floodplain provided by Towill on January 6, 2017.

Tequisquita Slough in the Soap Lake floodplain model is set to outfall into the two-dimensional floodplain model, instead of outfalling into the river reach of Pacheco Creek. Similarly, the upstream limit of Pacheco Creek in the Soap Lake floodplain is set to receive the overland spill flow from the two-dimensional floodplain, instead of assigning the inflow hydrographs at the upstream limit of the one-dimensional riverine model. The one-dimensional and two-dimensional

model connections at the upstream or downstream limits of the riverine model for Tequisquita Slough and Pacheco Creek in the Soap Lake floodplain model were assigned, because the terrain file used in the Soap Lake floodplain model does not show a defined floodplain channel beyond the limits of the riverine model. Therefore, based on the current available info, terminating the one-dimensional riverine model in the middle of the two-dimensional floodplain would best represent the flood flows in Pacheco Creek and Tequisquita Slough in the Soap Lake floodplain model. When a detailed survey is available during the design phase of this project, the riverine model limits may be revised if the new survey shows a defined channel.

The riverine models that correspond to Subwatersheds PJ-1, PJ-2, and PJ-3 from the HEC-1 model were not included in the ICM hydraulic model because there was not sufficient information available to determine the geometry of the floodplains corresponding to the Subwatersheds PJ-1, PJ-2, and PJ-3 (except for Jones Creek which is part of the PJ-2 watershed coming from north). The inflow for Subwatershed PJ-3 was represented as inflows into the Pajaro River between the confluences with Llagas Creek and Millers Canal. The inflows for Subwatersheds PJ-1 and PJ-2 were represented as floodplain sheet flows in the two-dimensional floodplain model. The setup of the inflows entering the Soap Lake Floodplain may be revised during the design phase of this project if the revised watershed study becomes available.

The other floodplains, including the irrigation canals and unnamed streams were not represented using the one-dimensional riverine model, because unlike Tequisquita Slough and Pacheco Creek, these floodplains did not have available hydrologic information. In addition, a detailed drainage design to cover the small systems in the project footprint was not available to incorporate into the Soap Lake floodplain model. Therefore, potential flood flows inside the unnamed floodplains and irrigation canals were represented as floodplain sheet flow in the two-dimensional hydraulic component of the Soap Lake floodplain model, discussed in detail in the following section. The setup of the other floodplains in the limits of the Soap Lake Floodplain may be revised during the design phase of this project if the revised watershed study and hydrologic analysis become available.

5.5.3 Two-Dimensional Floodplain Model

The two-dimensional floodplain component of the ICM hydraulic model was created by combining the terrain files of Santa Clara County included in the SCVWD's combined one- and two-dimensional hydraulic model of Uvas-Carnadero Creek and the DEM file of Soap Lake floodplain provided by Towill on January 6, 2017. Figure 5-9 illustrates the limits of the combined terrain file. At the locations covered by both terrain files, the terrain data from Towill was selected because it was taken more recently and had higher resolution. The two DEM files were merged using ESRI ArcMAP software, and the Focal Statistics Tool in ESRI ArcMAP was used to fill in the data gaps that were found in the combined terrain file. Figure 5-10 illustrates the limits of the ICM model and the extents of the two terrain files combined into the single terrain file. In general, areas around the Santa Clara/San Benito County line and in San Benito County reference the Towill terrain file. The areas farther north reference the SCVWD terrain file.

The ground elevation in the limits of the ICM model varies from approximately 120 feet NAVD 88 at the Soap Lake outlet to approximately 200 feet NAVD 88 at the northern and northeastern model limits. The total area in the hydraulic model is approximately 26,300 acres.

The two-dimensional floodplain components of the ICM hydraulic model are represented by meshes with elevations based on the terrain file. The range of the mesh size selected for the hydraulic model is summarized in Table 5-6. The mesh size for a flat, uniform floodplain surface was represented in a larger mesh size. The locations with a rapid change in ground elevation, such as irrigation ditches and unnamed waterbodies and embankments for roadways, are represented using a finer mesh size. Equalizers on the proposed embankment section were 10 feet wide in the Soap Lake floodplain model and were represented using finer mesh close to the size of the grid size of the terrain file.

Table 5-6 Mesh Sizes Selected for Soap Lake Floodplain Model

Terrain Type	Range of Mesh Size (square feet)
General floodplain area	100 to 7,500
City of Gilroy, upstream/downstream of equalizers, proposed diches along embankment, and misc. floodplain areas requiring finer mesh size	100 to 500
Equalizers (for proposed condition only)	25 to 150

The two-dimensional floodplain model and one-dimensional riverine model for the Soap Lake Floodplain are connected using the bank flow connections, which enable overbank flood flow to leave and re-enter between the two modeling components.

The SCVWD's combined one- and two-dimensional hydraulic model of Uvas-Carnadero Creek used Manning's roughness coefficient of 0.060 to represent the floodplain areas in Santa Clara County. The Soap Lake floodplain model also used the same Manning's roughness coefficient for the entire two-dimensional floodplain component of the ICM hydraulic model, except at the equalizers below the proposed embankment for the project alternatives and relocated channel for Jones Creek for Alternative 3. The Manning's roughness coefficients for the two-dimensional floodplain model would be revised during the design phase of this project to account for the land uses within the limits of the hydraulic model.

5.5.4 Inflow Hydrograph

The inflow hydrographs selected for the hydraulic analysis of the Soap Lake Floodplain are discussed in Section 5.4, Hydrologic Data Sources.

The locations of the inflow hydrographs in the ICM hydraulic model are illustrated on Figure 5-11. The inflow hydrographs for Uvas-Carnadero Creek, Llagas Creek, Tequisquita Slough, and Pacheco Creek were assigned at the upstream limit of the riverine 1-D model.

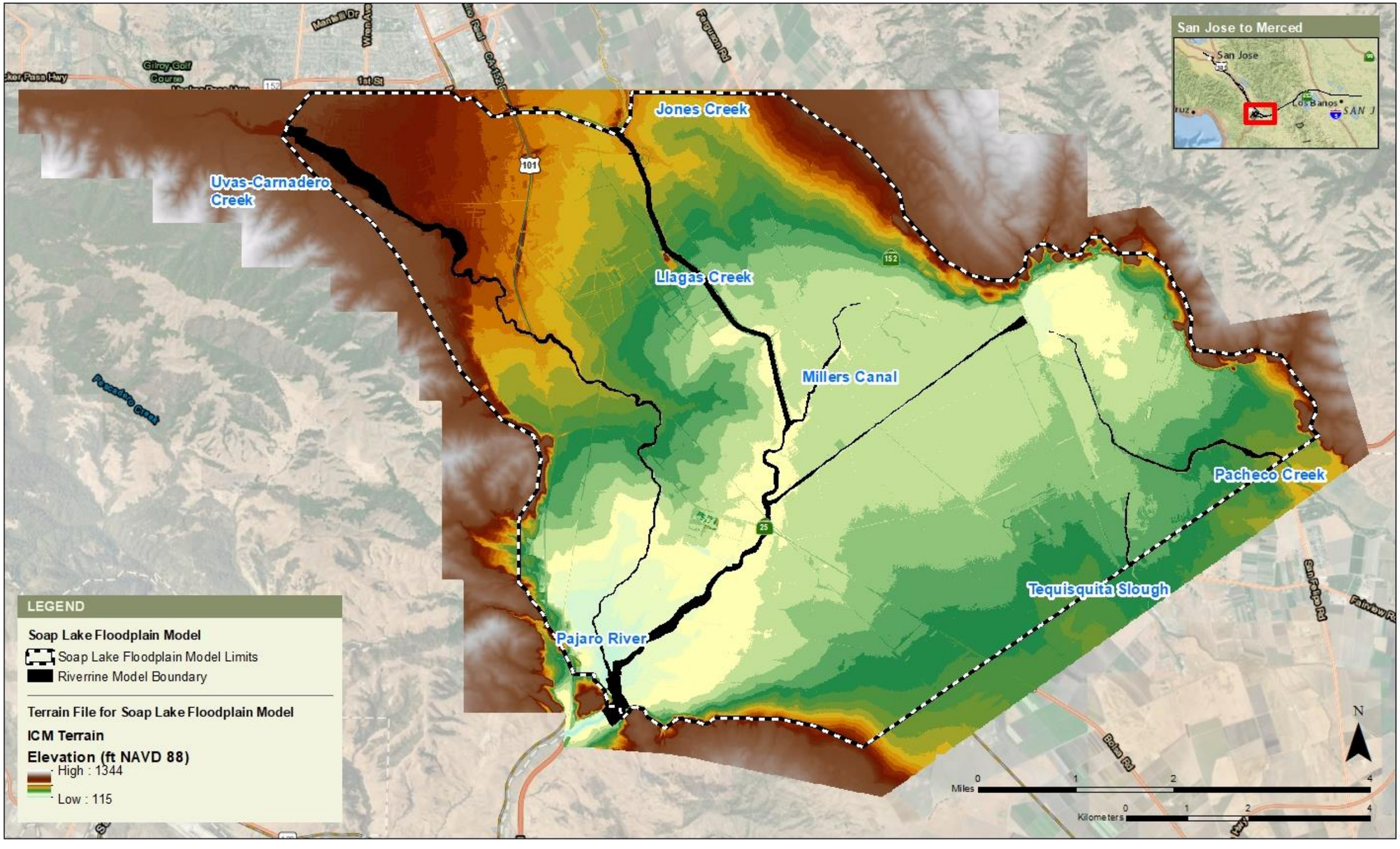
Because inflows from Subwatersheds PJ-1, PJ-2 north, PJ-2 south, and PJ-3 are for unnamed streams, and there are no riverine models associated with those flows, the inflow hydrographs were treated as the floodplain sheet flow entering the limits of the ICM floodplain model.

Subwatershed PJ-1 represents the unnamed waterbodies outfalling to Pacheco Creek between the confluence of Tequisquita Slough and San Felipe Lake in the HEC-1 hydrologic model. PJ-1 was represented in the Soap Lake floodplain model as a floodplain sheet flow entering the limits of the model on upstream of San Felipe Lake to best represent the location of this subwatershed in the HEC-1 hydrologic model.

Subwatershed PJ-2 north was assigned to replicate the FEMA 100-year floodplain sheet flowing incoming from north on east of Llagas Creek, which also included Jones Creek. The extents of the floodplain sheet flow inflow for PJ-2 north at the model boundary was assigned to match with the extents of the FEMA 100-year floodplain.

Subwatershed PJ-2 south was assigned to represent the unnamed waterbodies flowing from the south of the Soap Lake. The extents of the floodplain sheet flow for PJ-2 south was selected at the location at the local low point east of Frazier Lake Road to match with the watershed delineation illustrated on Figure 5-4.

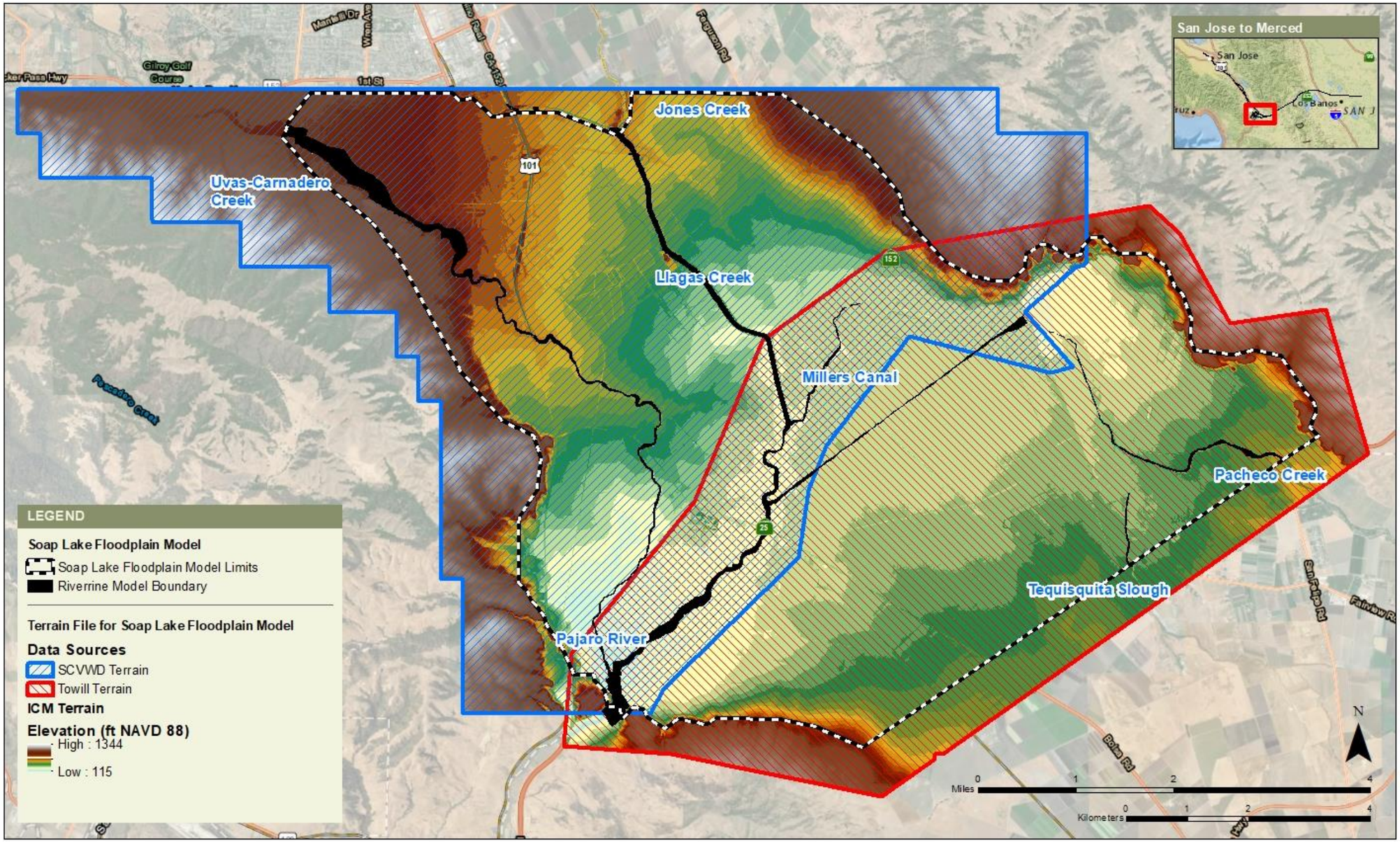
Subwatershed PJ-3 represents the unnamed waterbodies outfalling Soap Lake between San Felipe Lake and the confluence of Uvas-Carnadero Creek and Pajaro River in the HEC-1 hydrologic model. The inflow hydrograph for PJ-3 in the Soap Lake Floodplain was assigned at the confluence of Pajaro River and Llagas Creek to best represent the location of PJ-3 in the HEC-1 hydrologic model.



Sources: SCVWD 2016; Towill 2017

JANUARY 2019

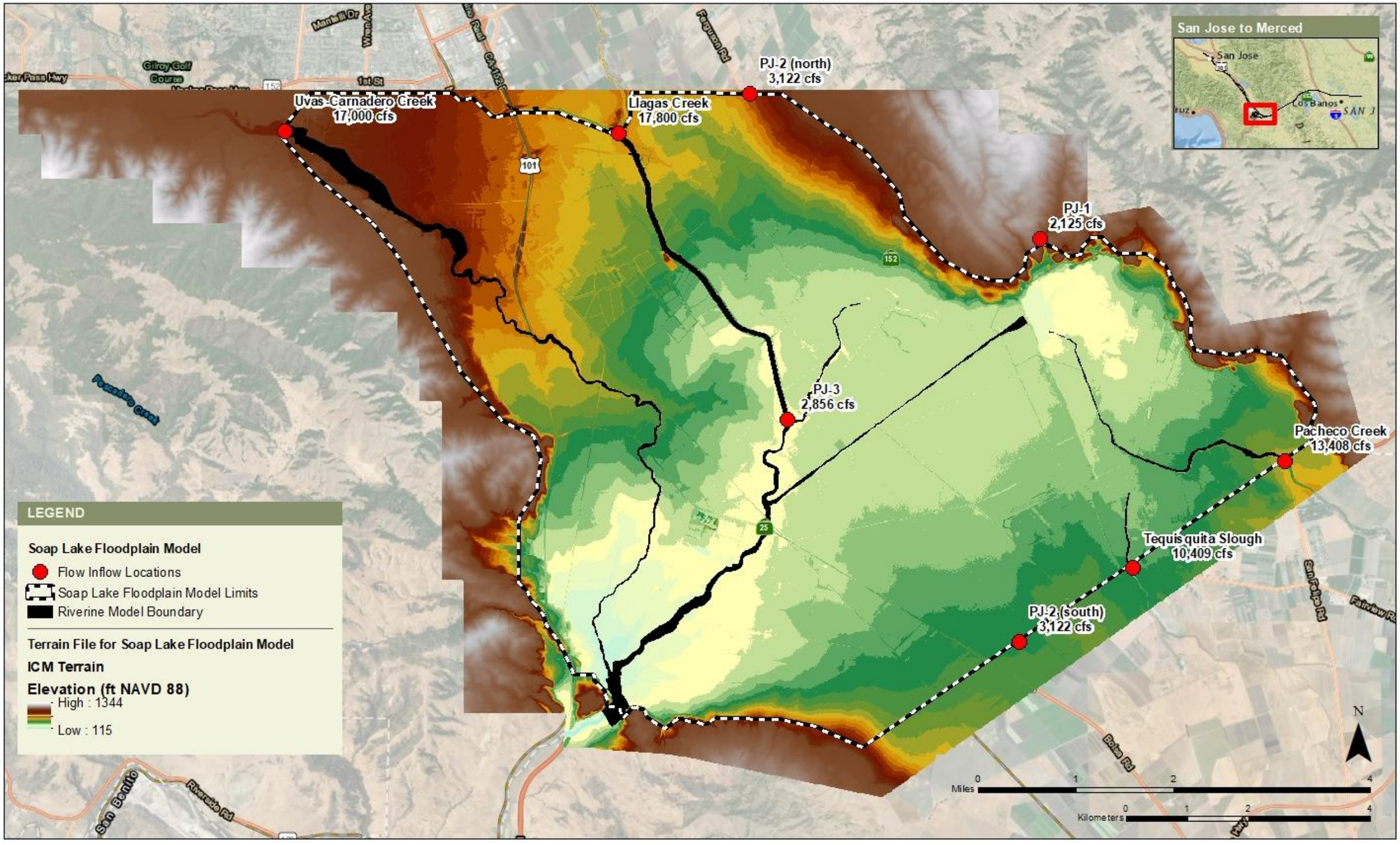
Figure 5-9 Limits and Location of the One-Dimensional Riverine Model Component in the ICM Hydraulic Model



Sources: SCVWD 2016; Towill 2017

JANUARY 2019

Figure 5-10 Limits of the Terrain Files Referenced in the ICM Hydraulic Model



Sources: Schaaf and Wheeler 2001; SCVWD 2016, 2018; Towill 2017

JANUARY 2019

Figure 5-11 Inflow Locations in the ICM Hydraulic Model

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5.5.5 HSR Structures and Assumptions in the Hydraulic Model

5.5.5.1 Model Setup

Within the limits of the Soap Lake floodplain model, there are existing storm drain systems and existing cross-drainage structures that are not represented in the one-dimensional riverine model. Because information related to these underground systems and cross drainage information was not readily available, this information was not included in the Soap Lake floodplain model to compare the existing and proposed conditions.

Infoworks ICM can assign rainfall and groundwater infiltration directly to the two-dimensional floodplain. The groundwater infiltration was not assigned in the hydraulic model, because it was assumed that the areas within the limits of the Soap Lake floodplain model are fully saturated during the design 100-year storm event. The direct rainfall onto the two-dimensional floodplain was not included in the hydraulic analysis, because it would double-count the flood flow for the Subwatershed PJ-3, which includes limits of the Soap Lake floodplain model.

The inflow for the first two hours of the simulation was set lower than the values from the hydrograph, and an additional inflow of 5 cfs was assigned to Millers Canal at the first 10 hours of the simulation to provide model stability. Because assigned flow rates of 1 cfs and 5 cfs are small in comparison to the peak 100-year flows of the inflows into the Soap Lake Floodplain and are only assigned at the timesteps before the peak 100-year flood, flows from incoming watersheds enter into the Soap Lake floodplain model. Therefore, it was assumed that the inflows assigned to Millers Canal would not have an influence to the extents and depth of the 100-year floodplain within the limits of the Soap Lake Floodplain model.

A void area is assigned in the two-dimensional mesh at the river reach junctions in the ICM model to prevent the double-counting of the floodplain storage volume in the one-dimensional riverine model and the surface file in the two-dimensional floodplain model.

5.5.5.2 Proposed HSR Structures

The HSR structure types proposed near the Soap Lake floodplain are trench, embankment, and viaducts/bridges for Alternative 2, while the types for Alternatives 1, 3, and 4 consist of embankment and viaduct/bridges. The floodplain minimization measures proposed in the Soap Lake floodplain are equalizers, maximizing the length of the viaduct segment in the footprint of the Soap Lake floodplain, installing lids over the trench segment, and flood basins.

The trench segment proposed in the downtown Gilroy area under Alternative 2 would have floodwalls around the footprint of the trench segment to prevent the overland flood flow from entering the proposed HSR track. The floodwalls are represented in the ICM hydraulic model by assigning a void polygon in the footprint of the trench section with a floodwall, which would act as a wall in the hydraulic model. When undercrossing US 101 in the City of Gilroy, the proposed trench segment would be covered by lids, which would prevent the overland flood flow from entering the proposed HSR track. Within the limits of the segments covered by lids, it was assumed that the project would not modify the existing terrain and would maintain the existing flooding pattern and roughness of the overbank spill flow from Uvas-Carnadero Creek. This assumption is represented in the ICM hydraulic model by not changing the setup of the hydraulic model from the existing conditions within the limits of the trench section with lid.

The embankment portions under Alternatives 1, 2, and 4, as well as the segments under Alternative 3 within the limits of the Soap Lake floodplain model, were assumed elevated above the 100-year floodplain. This assumption was represented in the ICM hydraulic model by assigning void polygons in the footprint of the proposed embankment, which would remove the footprint of the embankment from the potential flooded areas within the limits of the ICM hydraulic model. The ditches along the embankment portion — that would be used for stormwater treatment — would convey runoff from low-intensity storm events and dissipate the energy from the flows concentrated inside the equalizers. These ditches were assumed to be approximately 15 feet wide in the hydraulic model. As discussed in Section 5.5.3, Two-Dimensional Floodplain Model, ditches along the HSR right-of-way were represented in the Soap Lake floodplain model

using a finer resolution than the general floodplain area within the limits of the Soap Lake floodplain model.

The viaduct/bridge portions were represented in the ICM hydraulic model by placing 15-foot-wide square piers every 100–120 feet, as shown in the draft plans. The span widths were modified at the bridge crossings where pier locations were included in the CADD file for the proposed alignment. The location and size of the piers included in the Soap Lake floodplain model would be revised during the design phase of this project when the design of the span length and pier type selections are finalized.

The maintenance facilities proposed under the downtown Gilroy (Alternatives 1, 2, and 4) and east Gilroy (Alternative 4) scenarios were modeled the same way as the embankments, but with a wider footprint. The footprint of the proposed maintenance facility was represented as a void space in the Soap Lake floodplain model.

The equalizers for these three project alternatives were assumed to have an opening width of 10 feet for every 100 feet in the hydraulic model. The equalizers in the hydraulic model were represented as openings below the embankment section to help maintain the existing shallow overland floodplain flow within the limits of the Soap Lake floodplain model. Because a detailed design of the equalizers is not available at this phase of the project, they were represented using narrow overland flow with Manning's n value of 0.015 below the embankment section. Sluice gate with opening height of 3 feet was assigned at the upstream and downstream ends of the 10-foot-wide opening area to control the inflows/outflows into the areas assigned as equalizers. The Manning's n value was set lower than the 0.060 used as the general value for the entire floodplain, because equalizers would have a smoother surface than the overall landscape within the limits of the Soap Lake floodplain model. The flowline elevations of the equalizers were assumed to be generally at grade. The flowline elevations of the equalizers were set below-grade at the locations when additional discharge capacity was required to prevent substantial increases to the 100-year floodplain elevation local to the upstream face of the equalizers.

The flood basins located near the footprint of the proposed maintenance facilities were assumed to have depths of 3–4 feet below the original grade. The drainage features, such as culverts with flap gates to release the flood flow from the proposed basins, were not included in the hydraulic model.

Alternative 3 is proposing realignment of Jones Creek. Because a detailed design of the creek realignment was not provided, a realigned Jones Creek in the Soap Lake floodplain model for Alternative 3 is represented by lowering the terrain by approximately 3 feet, and the width of the realigned channel with lowered terrain was set to convey the peak 100-year flow from Subwatershed PJ-2 north when combined with the equalizers assigned below the footprint of the maintenance facility. The design of the realigned Jones Creek in the Soap Lake floodplain model will be refined in the design phase of this project.

5.5.6 Modeled Alternatives

The hydraulic analyses of the Soap Lake floodplain were performed for the following five conditions:

- Existing Condition
- Alternative 1 —With minimization measures and impact avoidance and minimization features (IAMF)
- Alternative 2 — With minimization measures and IAMFs
- Alternative 3 — With minimization measures and IAMFs
- Alternative 4 — With minimization measures and IAMFs

The area of the embankments in the FEMA 100-year floodplain, lengths of viaduct, number of equalizers, and area of the flood basins for each alternative are shown in Table 5-7.

Table 5-7 HSR Structures in the Soap Lake Floodplain Model

HSR Proposed Alignment	Area of Embankments and Viaducts within the FEMA 100-Year Floodplain (acres)	Total Length of Viaduct Segment (feet)	Number of Equalizers	Area of Flood Basins and Ditches (acres)
Existing Condition	N/A	N/A	N/A	N/A
Alternative 1 (through downtown Gilroy by viaduct)	179	26,120	111	28
Alternative 2 (through downtown Gilroy by embankment)	194	23,540	111	28
Alternative 3 (through east Gilroy)	194	22,420	93	41
Alternative 4 (through downtown Gilroy, shared corridor with existing railroad)	157	23,550	105	17

Sources: FEMA 2009; Authority 2019
HSR = high-speed rail
FEMA = Federal Emergency Management Agency

5.5.7 Hydraulic Analysis Outputs

The maximum extents of the 100-year floodplain for the existing condition hydraulic analysis compared with the existing FEMA floodplain limits are illustrated on Figure 5-12. The maximum 100-year WSEs for the existing condition hydraulic analysis are illustrated on Figure 5-13. The maximum floodplain depth for the existing condition hydraulic analysis is illustrated on Figure 5-14. All three figures depict the flooded areas with a maximum 100-year flood depth greater than 0.1 foot in the existing condition's hydraulic analysis. Figure 5-15 through Figure 5-18

illustrate the change in the maximum 100-year flood elevation between the existing and four proposed conditions.

The maximum 100-year floodplain elevation in the Soap Lake floodplain area varies from approximately 150 feet to 155 feet NAVD 88. The flood elevation in the City of Gilroy varies from approximately 185 feet to 200 feet NAVD 88 (Figure 5-13). The footprint of the 100-year floodplain of the existing condition model is similar to the extents of the FEMA 100-year floodplain near the Soap Lake outlet in the toe of the foothills on the eastern side of the floodplain and the south side downstream of the existing railroad crossing. The extents of the 100-year floodplain are larger on the south side on the upstream side of the existing railroad crossing because of the concentrated flood flow for unnamed streams (PJ-2 south) entering the Soap Lake floodplain from south on east of Frazier Lake Road, which is not shown in the FEMA FIRM.

Figure 5-12 also indicates that the some of the areas along the railroad track between Uvas-Carnadero Creek to the west and the Pajaro River to the east that are inside the FEMA 100-year floodplain are outside the 100-year floodplain in the ICM hydraulic model. The outputs from the existing condition hydraulic analysis also showed the Jones Creek floodplain width of approximately 2,000 feet, which is substantially narrower than the floodplain width of approximately 5,000 feet from the FEMA FIRM. The extents of floodplain are narrower in the hydraulic model, most likely because the FEMA FIRM floodplain limits were delineated using an approximate method.

The embankments, viaducts, and maintenance facilities proposed for the alternatives would block the flood flow during the 100-year storm event and would cause backwater upstream of the HSR alignment.

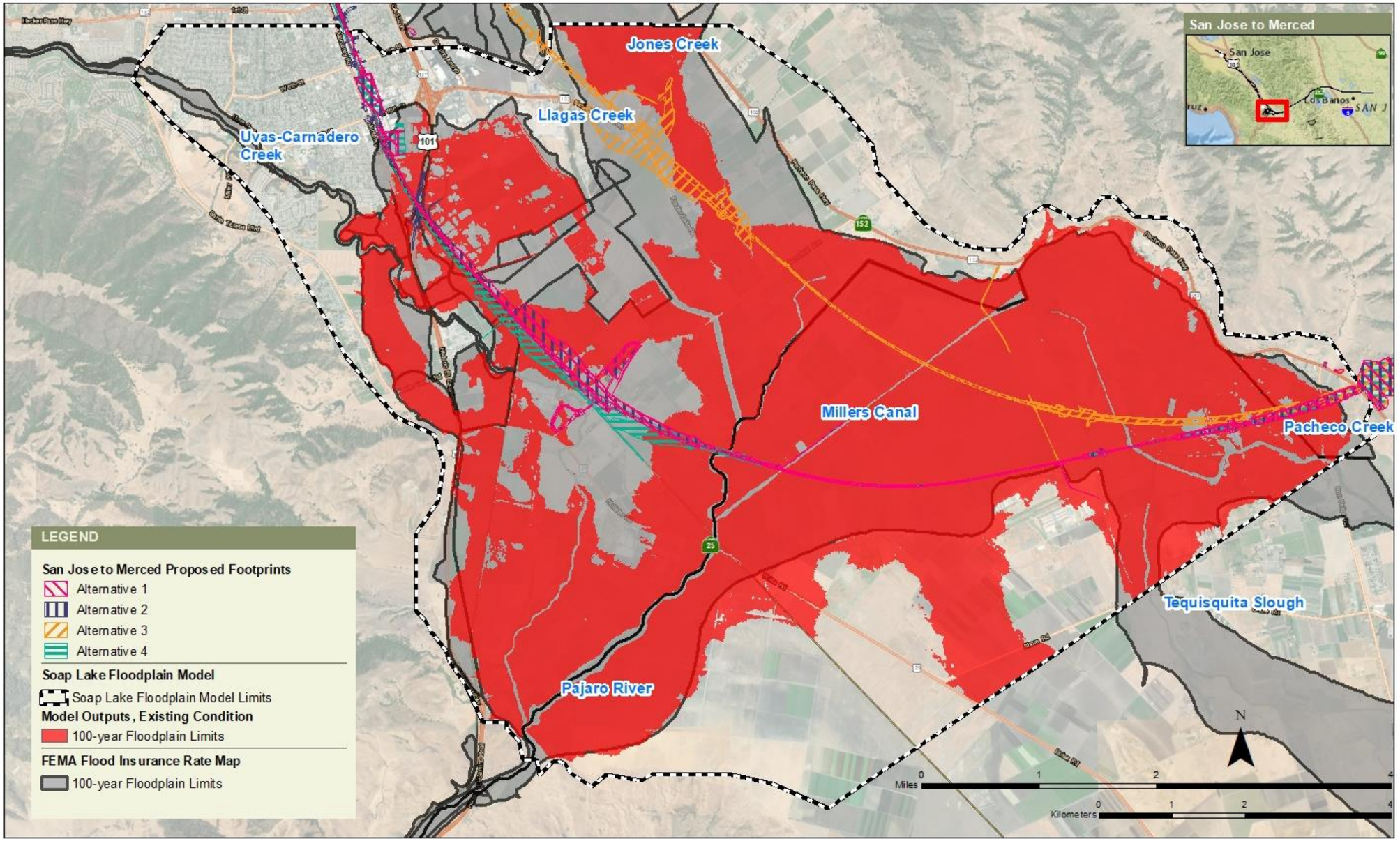
Figure 5-15 illustrates the change in the maximum 100-year flood elevation between the existing condition and Alternative 1 with design measures and project features (HYD-IAMF#2: Flood

Protection) that minimize effects on floodplains. The proposed design measures for Alternative 1 (1) extending the viaduct segment inside the soap lake floodplain, (2) providing equalizer culverts in the embankment section, and (4) providing flood basins near the proposed maintenance facility. The total length of viaduct section in the Soap Lake floodplain is approximately 26,120 feet. The area of basins and ditches included in the hydraulic mode for Alternative 1 was approximately 28 acres, and the number of equalizer culverts was 111. With implementation of IAMFs and proposed design features, the outputs from the hydraulic analysis for Alternative 1 showed that the proposed maintenance facility and embankment/viaduct portions of the HSR alignment would have minimal effects on the vertical profile and horizontal extent of the Soap Lake floodplain during the 100-year storm event.

Figure 5-16 illustrates the change in the maximum 100-year flood elevation between the existing condition and Alternative 2 with design measures and project features (HYD-IAMF#2: Flood Protection) that minimize effects on floodplains. The proposed design measures for Alternative 1 are (1) extending the viaduct segment inside the soap lake floodplain, (2) providing equalizer culverts in the embankment section, (3) placing a lid on the trench section in Gilroy, and (4) providing flood basins near the proposed maintenance facility. The total length of viaduct section in the Soap Lake floodplain is approximately 23,540 feet. The area of basins and ditches included in the hydraulic mode for Alternative 1 was approximately 28 acres, and the number of equalizer culverts was 111. With implementation of these IAMFs and proposed design features, the outputs from the hydraulic analysis for Alternative 2 showed that the proposed maintenance facility and embankment, viaduct, and trench portions of the HSR alignment would have minimal effects on the vertical profile and horizontal extent of the Soap Lake floodplain during the 100-year storm event.

Figure 5-17 illustrates the change in the maximum 100-year flood elevation between the existing condition and Alternative 3 with design measures and project features (HYD-IAMF#2: Flood Protection) that minimize effects on floodplains. The proposed design measures for Alternative 3 are (1) extending the viaduct segment inside the soap lake floodplain, (2) providing equalizer culverts in the embankment section, (3) realigning Jones Creek, and (4) providing flood basins near the proposed maintenance facility. The total length of viaduct section in the Soap Lake floodplain is approximately 22,420 feet. The area of basins and ditches included in the hydraulic mode for Alternative 1 was approximately 41 acres, and the number of equalizer culverts included in the hydraulic model was 96. With implementation of these IAMFs and proposed design features, the outputs from the hydraulic analysis for Alternative 3 showed that the proposed maintenance facility and the embankment and viaduct portions of the HSR alignment would have minimal effects on the vertical profile and horizontal extent of the Soap Lake floodplain during the 100-year storm event.

Figure 5-18 illustrates the change in the maximum 100-year flood elevation between the existing condition and Alternative 4 with design measures and project features (HYD-IAMF#2: Flood Protection) that minimize effects on floodplains. The proposed design measures for Alternative 4 are (1) extending the viaduct segment inside the soap lake floodplain, (2) providing equalizer culverts in the embankment section, and (4) providing flood basins near the proposed maintenance facility. The total length of viaduct section in the Soap Lake floodplain is approximately 23,550 feet. The area of basins and ditches included in the hydraulic mode for Alternative 1l was approximately 17 acres, and the number of equalizer culverts included in the hydraulic model was 105. With implementation of IAMFs and proposed design features, the outputs from the hydraulic analysis for Alternative 1 showed that the proposed maintenance facility and embankment/viaduct portions of the HSR alignment would have minimal effects on the vertical profile and horizontal extent of the Soap Lake floodplain during the 100-year storm event.



Source: FEMA 2009

JANUARY 2019

Figure 5-12 Comparison of the FEMA 100-Year Floodplain and Existing Condition 100-Year Floodplain from Hydraulic Analysis

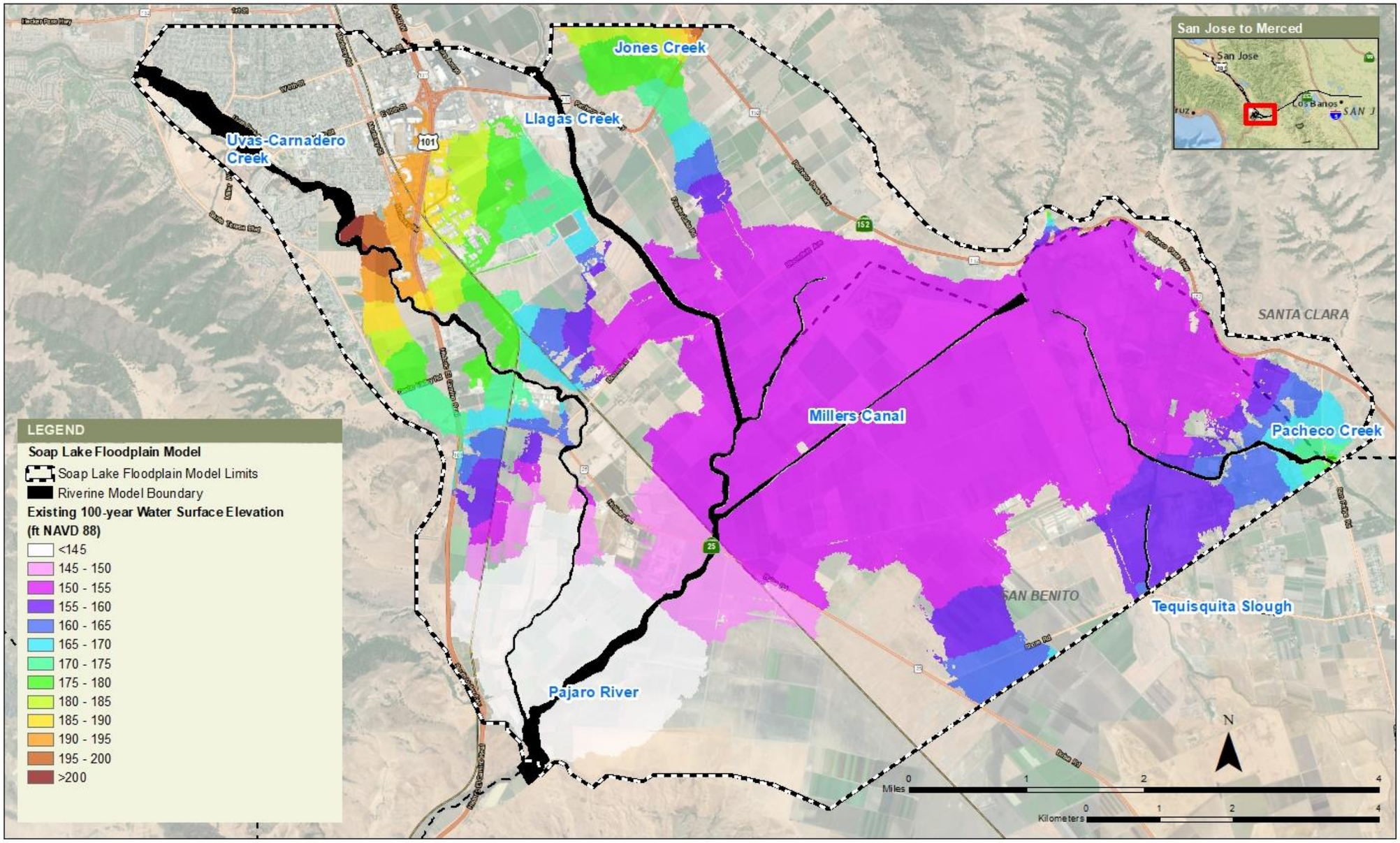


Figure 5-13 100-Year Water Surface Elevations from Existing Condition Hydraulic Analysis

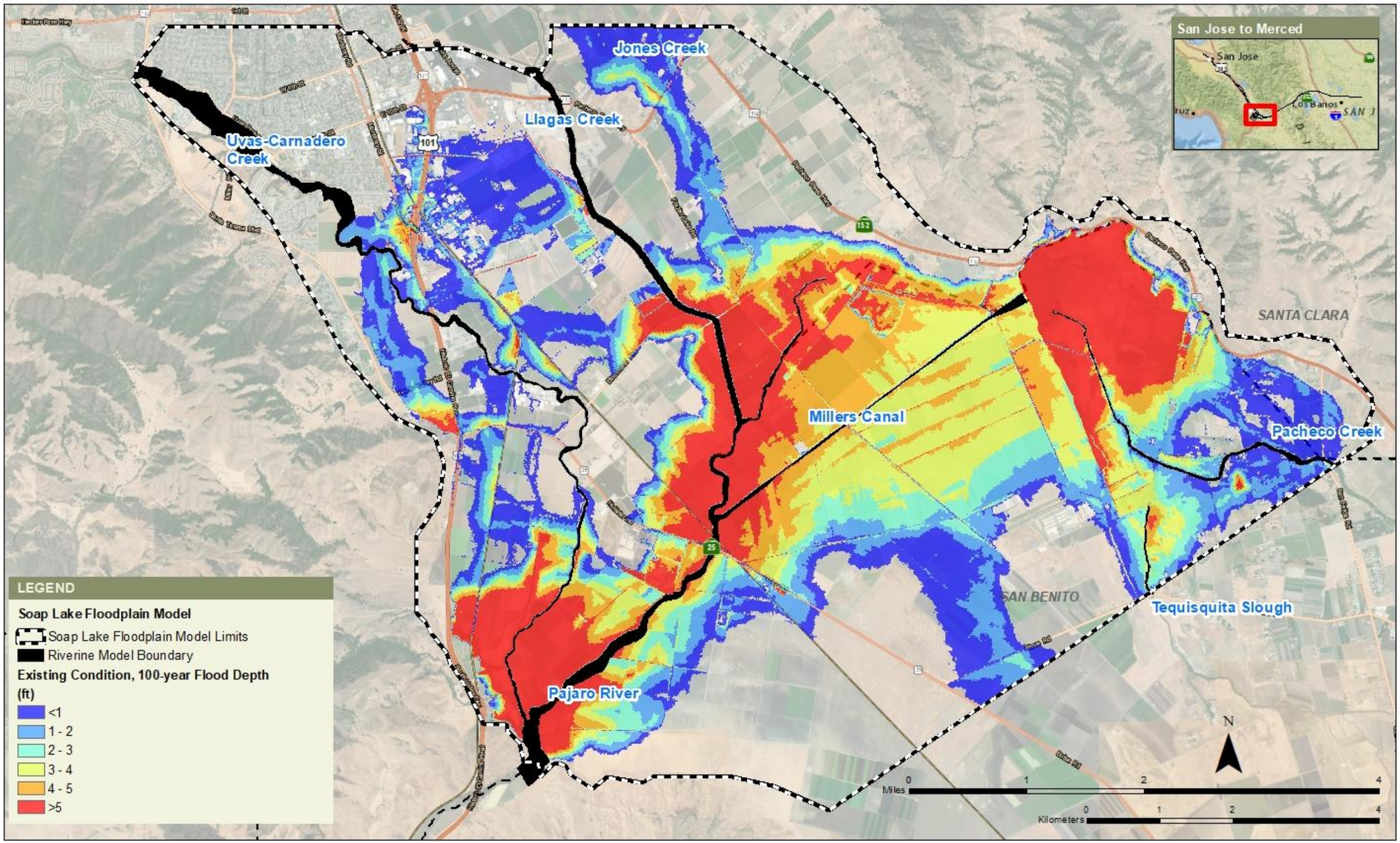


Figure 5-14 100-Year Floodplain Depth from Existing Condition Hydraulic Analysis

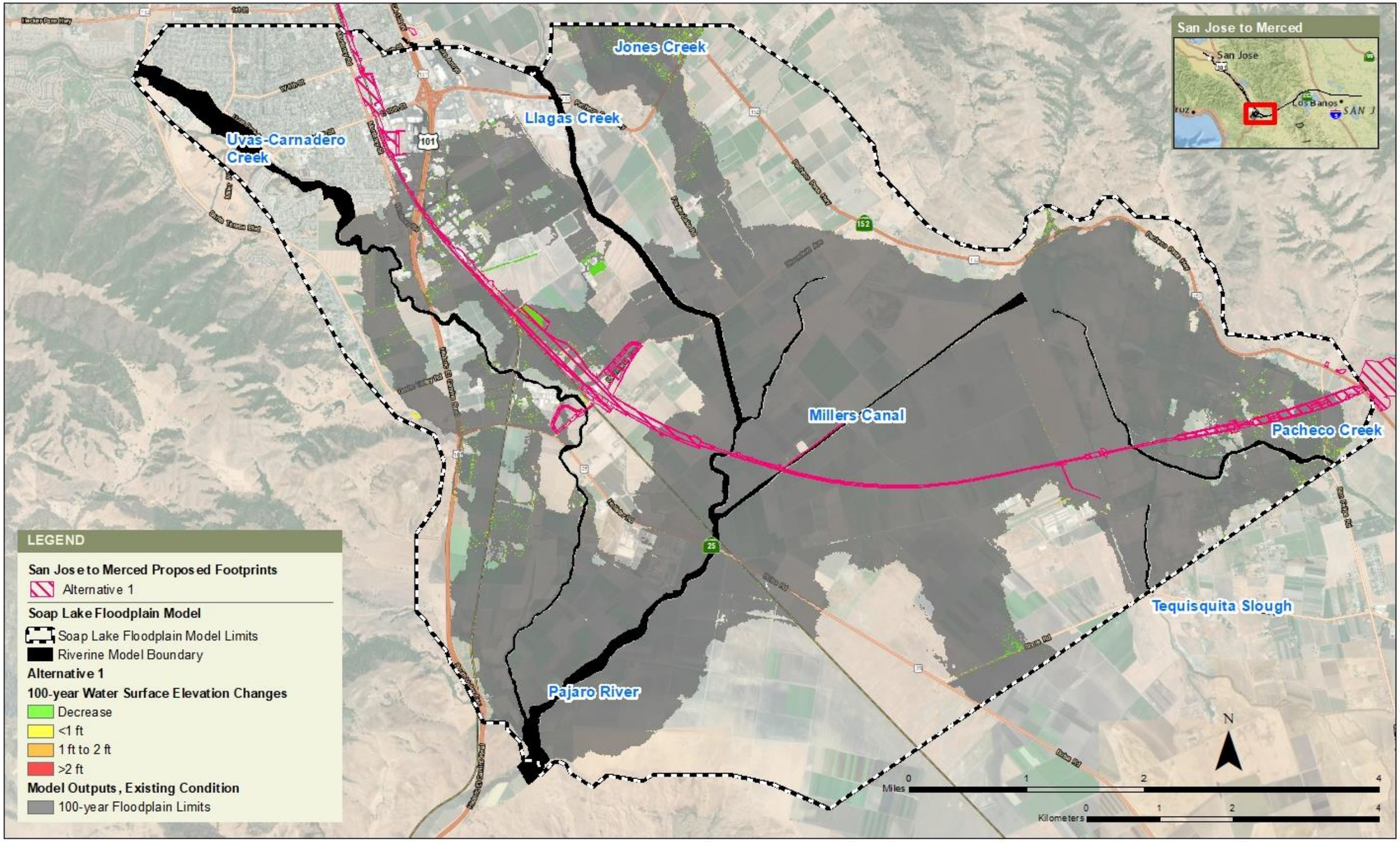


Figure 5-15 Alternative 1: Changes to the Maximum 100-Year Floodplain Elevation

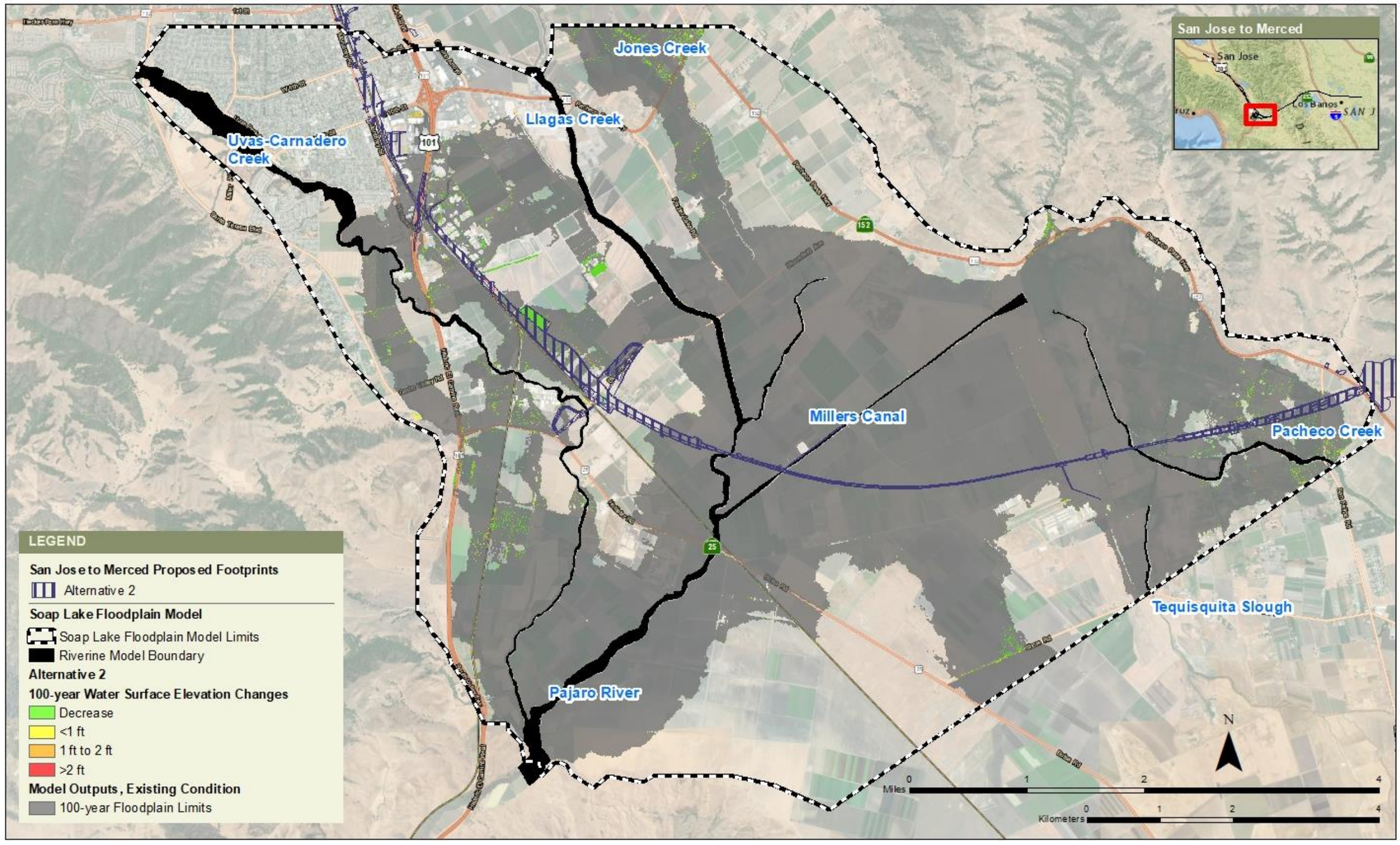


Figure 5-16 Alternative 2: Changes to the Maximum 100-Year Floodplain Elevation

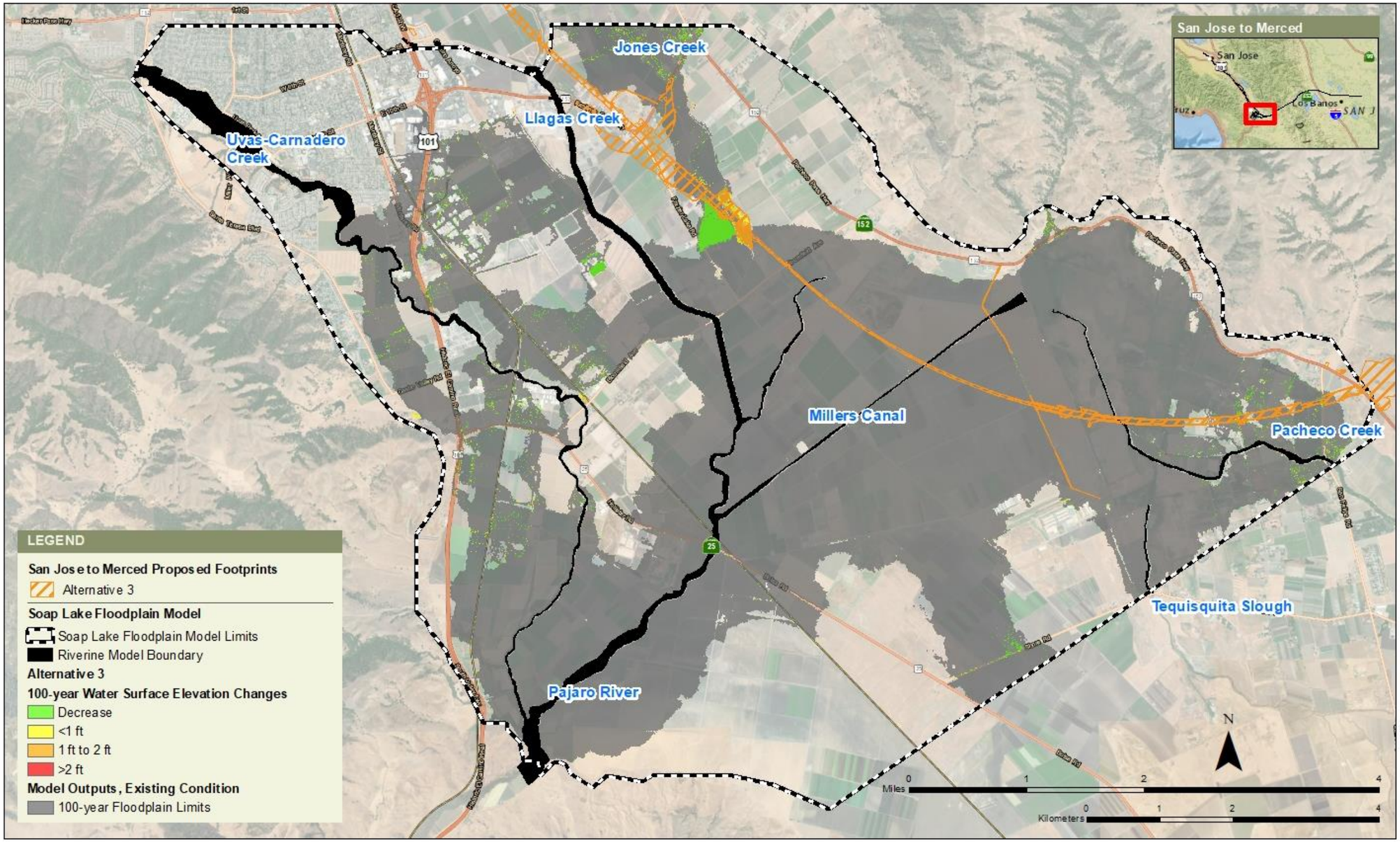


Figure 5-17 Alternative 3: Changes to the Maximum 100-Year Floodplain Elevation

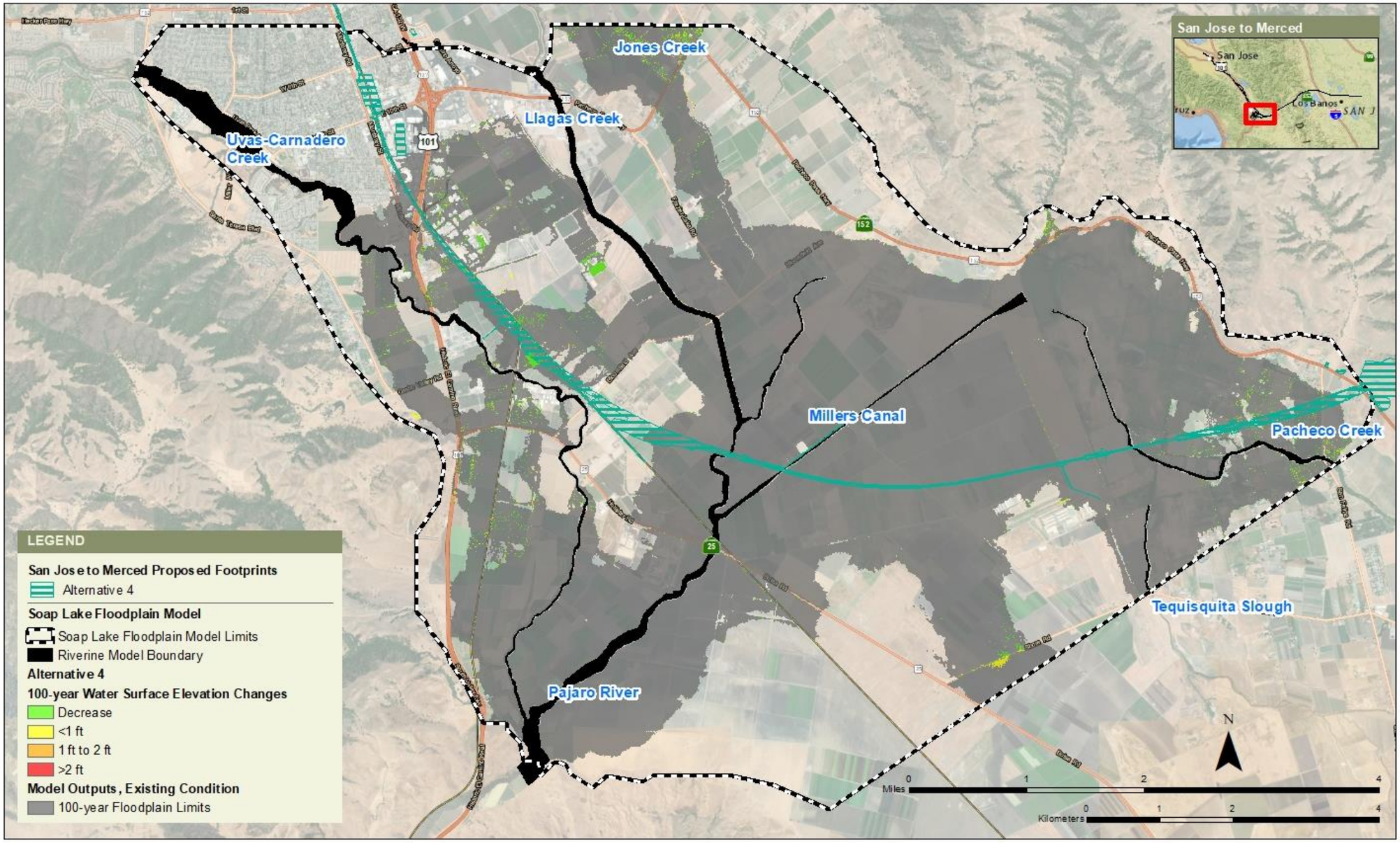


Figure 5-18 Alternative 4: Changes to the Maximum 100-Year Floodplain Elevation

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APPENDIX 3.8-B: REFERENCES

California High-Speed Rail Authority (Authority). 2011a. *California High-Speed Train Engineering Report. Draft San Jose to Merced Floodplain Impacts Assessment Report.*

California High-Speed Rail Authority (Authority). 2011b. *California High Speed Train Project Technical Memorandum. Hydraulics and Hydrology Design Guidelines.*

California High-Speed Rail Authority (Authority). 2019. *San Jose to Merced Project Section, Record Preliminary Engineering for Project Definition*. May 2019.

FEMA. 1998. *Managing Floodplain Development Through The National Flood Insurance Program.* Developed March 1998, Updated March 2007. www.fema.gov/media-library/assets/documents/6029.

Federal Emergency Management Agency (FEMA). 2008. Flood Insurance Rate Map, Merced County, California, and Incorporated Areas. Panel No 06047C0825G.

Federal Emergency Management Agency (FEMA). 2008. Flood Insurance Rate Map, Merced County, California, and Incorporated Areas. Panel No 06047C0850G.

Federal Emergency Management Agency (FEMA). 2008. Flood Insurance Rate Map, Merced County, California, and Incorporated Areas. Panel No 06047C0875G.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0234H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0407H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0426H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0428H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0429H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0436H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0437H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0441H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0607H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0626H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0641H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0643H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0752H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0756H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0760H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0770H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, Santa Clara County, California, and Incorporated Areas. Panel No 06085C0780H.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, San Benito County, California, and Incorporated Areas. Panel No 06069C0045D.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, San Benito County, California, and Incorporated Areas. Panel No 06069C0050D.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map, San Benito County, California, and Incorporated Areas. Panel No 06069C0075D.

Federal Emergency Management Agency (FEMA). 2009. *Flood Insurance Study, San Benito County, California, and Incorporated Areas.*

Federal Emergency Management Agency (FEMA). 2010. *Flood Insurance Study, Merced County, California, and Incorporated Areas. (Preliminary).*

Federal Emergency Management Agency (FEMA). 2014. *Flood Insurance Study, Santa Clara County, California, and Incorporated Areas.*

Federal Emergency Management Agency (FEMA). 2018a. Coyote Creek HEC-2 Hydraulic Model Input/output print files. Received on March 28, 2018.

Federal Emergency Management Agency (FEMA). 2018b. West Little Llagas Creek HEC-2 Hydraulic Model. Received on March 28, 2018.

Federal Emergency Management Agency (FEMA). 2018c. Llagas Creek HEC-2 Hydraulic Model Input/output print files. Received on March 28, 2018.

Federal Emergency Management Agency (FEMA). 2018d. West Branch Llagas Creek HEC-2 Hydraulic Model. Received on March 28, 2018.

Federal Emergency Management Agency (FEMA). 2018e. Llagas Overbank HEC-2 Hydraulic Model Input/output print files. Received on March 28, 2018.

Federal Emergency Management Agency (FEMA). 2018f. Uvas-Carnadero Creek HEC-RAS Hydraulic Model. Received on May 16, 2018.

OCM Partners. 2021. 2020 Lidar DEM: Santa Clara County, CA. https://www.fisheries.noaa.gov/inport/item/64806 (accessed September 13, 2021).

Pajaro River Watershed Flood Prevention Authority (PRWFPA). 2011. *Pajaro River Watershed Study.*

Pajaro River Watershed Flood Prevention Authority (PRWFPA). (2005). *Pajaro River Watershed Study Final Phase 3 and 4a Report*.

Pajaro River Watershed Flood Prevention Authority's (PRWFPA). (2005). Pajaro River HEC-RAS Hydraulic Model at Soap Lake Floodplain. Received on June 26, 2016.

Santa Clara Valley Water District (SCVWD). 2012a. Llagas Creek HEC-RAS Hydraulic Model, Pajaro River to Buena Vista Road. Received on June 3, 2016.

Santa Clara Valley Water District (SCVWD). 2012b. Watching Our Watersheds Interactive Map Layers, Central Santa Clara County. www.valleywater.org/WOW.aspx (accessed May 11, 2016).

Santa Clara Valley Water District (SCVWD). 2014. Coyote Creek HEC-RAS Hydraulic Model. Received June 3, 2016.

Santa Clara Valley Water District (SCVWD). 2015a. Fisher Creek HEC-RAS Hydraulic Model. Received June 3, 2016.

Santa Clara Valley Water District (SCVWD). 2015b. Llagas Creek HEC-RAS Hydraulic Model for Upper Llagas Flood Protection Project. Received January 5, 2018.

Santa Clara Valley Water District (SCVWD). 2016. Uvas Creek HEC-RAS Hydraulic Model. Received June 3, 2016.

Santa Clara Valley Water District (SCVWD). 2017a. Phase 1 Drawings Vol 1 of 2 - 100% Submittal Not For Construction. Received December 20, 2017.

Santa Clara Valley Water District (SCVWD). 2017b. Phase 2 Drawings Vol 1 of 2 - 100% Submittal Not For Construction. Received December 20, 2017.

Santa Clara Valley Water District (SCVWD). 2018a. Guadalupe River and Tributaries HEC-RAS Hydraulic Model. Received July 24, 2018.

Santa Clara Valley Water District (SCVWD). 2018b. West Little Llagas Creek, Middle Avenue Overflow HEC-2 Hydraulic Model. Received October 29, 2018.

Santa Clara Valley Water District (SCVWD). 2018c. Los Gatos Creek HEC-RAS Hydraulic Model. Received December 13, 2018.

Santa Clara Valley Water District (SCVWD). 2018d. Technical Memorandum, Los Gatos Creek Modeling and Mapping, 2D Hydraulic Model Details & Results Analysis. Received December 13, 2018.

Santa Clara Valley Water District (SCVWD). 2018e. *E6: Upper Llagas Flood Protection Project.* www.valleywater.org/project-updates/creek-river-projects/upper-llagas-creek-flood-protection> (accessed January 16, 2019).

Santa Clara Valley Water District (SCVWD). 2018f. *Technical Support Data Notebook for Llagas Creek Flood Protection Project.* Received January 5 2018.

Santa Clara Valley Water District (SCVWD). 2018g. Llagas Flow. Received January 5 2018.

Schaaf & Wheeler Consulting Civil Engineers. 2001. *Pajaro River Watershed Study.* Technical Memorandum No. 1.2.7- Hydrologic Model.

Towill, Inc. 2016. 1- and 3-ft grid LIDAR digital elevation map of Soap Lake Floodplain. Received January 6, 2017.

APPENDIX 3.8-C: BASIN PLAN WATER QUALITY IMPACT ASSESSMENT

APPENDIX 3.8-C: BASIN PLAN WATER QUALITY IMPACT ASSESSMENT

This Volume 2 technical appendix compiles information regarding the existing surface water quality conditions for waterbodies in the San Jose to Central Valley Wye Project Extent (project) footprint as documented in the San Francisco Bay, Central Coast, and Central Valley Regional Water Quality Control Boards' (RWQCB) Basin Plans. This appendix also summarizes potential impacts on each waterbody by alternative according to Section 3.8, Hydrology and Water Resources, of this Final environmental impact report (EIR)/environmental impact statement (EIS). The purpose of this appendix is to summarize impacts on waterbodies and Basin Plans to inform the Clean Water Act Section 401 Water Quality Certification.

Beneficial Uses in the RSA

Most of the waterbodies within the surface water resource study area (RSA) provide both economic and environmental beneficial uses. Economic beneficial uses include agricultural water supply (AGR), commercial and sport fishing (COMM), industrial service supply (IND), navigation (NAV), hydropower generation (POW), water recreation (contact [REC-1] and non-contact [REC-2]), and shellfish harvesting (SHELL). Environmental beneficial uses include preservation of biological habitats of special significance (BIOL), cold freshwater habitat (COLD), estuarine habitat (EST), freshwater replenishment (FRSH), groundwater recharge (GWR), fish migration (MIGR), preservation of rare and endangered species (RARE), fish spawning (SPWN), warm freshwater habitat (WARM), and wildlife habitat (WILD). Table 1 lists the waterbodies that have been identified within the RSA in alphabetical order and lists their beneficial uses. It also indicates whether the waterbody is within the project footprint.

Table 1 Beneficial Uses of Waterbodies in the RSA Identified by the San Francisco Bay, Central Coast, and Central Valley RWQCBs' Basin Plans

Waterbody	Subsection	Existing Beneficial Uses
San Francisco Bay RWQCB		
Alamitos (Los Alamitos) Creek	Not in project footprint	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Anderson Reservoir	Not in project footprint	MUN, GWR, COMM, COLD, SPWN, WARM, WILD, REC-1, REC-2
Canoas Creek	Not in project footprint	WARM, WILD, REC-1, REC-2
Coyote Creek	San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy	GWR, COMM, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Fisher Creek	Monterey Corridor, Morgan Hill and Gilroy	WARM, WILD, REC-1, REC-2
Guadalupe Creek	Not in project footprint	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Guadalupe River	San Jose Diridon Station Approach, Monterey Corridor	GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Lacustrine Wetlands[1]	Morgan Hill and Gilroy	AGR, COLD, FRESH, GWR, MIGR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE
Los Gatos Creek	San Jose Diridon Station Approach, Monterey Corridor	MUN, FRSH, AGR, GWR, COLD, RARE, WARM, WILD, REC-1
Palustrine Wetlands[2]	Morgan Hill and Gilroy	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE
Ross Creek	Not in project footprint	GWR, WARM, WILD, REC-1, REC-2

Waterbody	Subsection	Existing Beneficial Uses
Thompson Creek	Not in project footprint	WARM, WILD, REC-1, REC-2
Upper Penitencia Creek	Not in project footprint	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Upper Silver Creek	Not in project footprint	RARE, WARM, WILD, REC-1, REC-2
Yerba Buena Creek	Not in project footprint	WARM, WILD, REC-1, REC-2
Central Coast RWQCB		
Alamias Creek	Not in project footprint	MUN, AGR, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, COMM
Carnadero Creek	Morgan Hill and Gilroy	MUN, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, RARE, COMM
Chesbro Reservoir	Not in project footprint	MUN, AGR, GWR, REC-1, REC-2, WILD, WARM, MIGR, SPWN, RARE, FRSH, NAV, COMM
Little Llagas Creek	Morgan Hill and Gilroy	MUN, AGR, GWR, REC-1, REC-2, WILD, WARM, COMM
Live Oak Creek	Not in project footprint	MUN, AGR, GWR, REC-1, REC-2, WILD, COLD, WARM, COMM
Llagas Creek (Below Chesbro Reservoir)	Morgan Hill and Gilroy	MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, RARE, COMM
Pacheco Creek	Morgan Hill and Gilroy, Pacheco Pass	MUN, AGR, GWR, REC-1, REC-2, WILD, COLD, MIGR, SPWN, BIOL, RARE, FRESH, COMM
Pajaro River	Morgan Hill and Gilroy	MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, FRESH, COMM
Pescadero Creek (tributary of San Benito River)	Not in project footprint	MUN, AGR, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, COMM
San Felipe Lake	Not in project footprint	MUN, AGR, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, FRSH, NAV, COMM
Tequisquita Slough	Morgan Hill and Gilroy	GWR, REC-1, REC-2, WILD, WARM, SPWN, COMM
Uvas Creek, downstream	Morgan Hill and Gilroy	MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, RARE, COMM
Central Valley RWQCB		
Agatha Canal (North)	Not in project footprint	AGR (L), WARM (L), WILD, BIOL
California Aqueduct	Pacheco Pass	MUN, AGR, PROC, IND, POW, REC-1, REC-2, WILD
Delta-Mendota Canal	Pacheco Pass	MUN, AGR, REC-1, REC-2, WARM, WILD
Los Banos Creek	San Joaquin Valley	AGR (L), WARM (L), WILD, BIOL
Mud Slough (North)[3]	San Joaquin Valley	AGR (L), REC-1, REC-2, WILD, WARM, SPWN, COMM, SHELL
O'Neill Reservoir	Not in project footprint	MUN, AGR, REC-1, REC-2, WARM

Waterbody	Subsection	Existing Beneficial Uses
Salt Slough	Not in project footprint	AGR, REC-1, REC-2, WARM, SPWN, WILD, COMM, BIOL, SHELL
San Joaquin River (Mendota Dam to Sack Dam)	Not in project footprint	AGR, PROC, REC-1, REC-2, WARM, MIGR, SPWN, WILD
San Luis Canal	San Joaquin Valley	AGR (L), WARM (L), WILD, BIOL
San Luis Reservoir	Not in project footprint	MUN, AGR, IND, POW, REC-1, REC-2, WARM, WILD
San Luis Wasteway	San Joaquin Valley	AGR (L), WARM (L), WILD, BIOL
San Pedro Canal	San Joaquin Valley	AGR (L), WARM (L), WILD, BIOL
Santa Fe Canal	San Joaquin Valley	AGR (L), WARM (L), WILD, BIOL

Source: SFBRWQCB 2017; Central Coast RWQCB 2019; Central Valley RWQCB 2018
AGR = agricultural supply; BIOL = preservation of biological habitats of special significance; COLD = cold freshwater habitat; COMM = commercial and sport fishing; FRSH = freshwater replenishment; GWR = groundwater recharge; IND = industrial service supply; (L) = limited beneficial use; MIGR = fish migration; MUN = municipal and domestic supply; POW = hydropower generation; PROC = industrial process supply; RARE = preservation of rare, threatened, or endangered species; REC-1 = water contact recreation; REC-2 = noncontact water recreation; SPWN = fish spawning, reproduction or early development; WARM = warm freshwater habitat; WILD = wildlife habitat
[1] Lacustrine wetlands include Coyote Creek Reservoir
[2] Palustrine wetlands include Constructed Basin 1, Coyote Creek Palustrine Forested Wetlands, Constructed Basin 2, Constructed Basin 3, Seasonal Wetland 1, Seasonal Wetland 2, Pond 1, and Constructed Basin 4
[3] Mud Slough (North) also includes the Mud Slough Alkali Marshes

Water Quality Objectives

Water quality objectives are the control and management criteria necessary to preserve the beneficial uses of a waterbody or groundwater aquifer. They are measured and analyzed through qualitative and quantitative factors. The tables in this section describe the surface water and groundwater quality objectives that were developed by the respective jurisdictional RWQCBs to protect the existing beneficial uses of surface water and groundwater within the RSA.

Table 2 Surface Water Quality Objectives

Parameter	Surface Water Quality Objective
San Francisco Bay RWQCB	
Bacteria	Water quality objectives for bacteria in Table 3-1 of the basin plan shall be strictly applied except when otherwise provided for in a TMDL.
Bioaccumulation	Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
Color	Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen	In waters with the beneficial use of COLD, dissolved oxygen may not be depressed below 7.0 milligrams per liter. In waters with the beneficial use of warm, dissolved oxygen may not be depressed below 5.0 milligrams per liter. The basin plan also contains dissolved oxygen objectives for tidal waters.
Floating Materials	Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

Parameter	Surface Water Quality Objective
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.
Population and Community Ecology	All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce significant alterations in population or community ecology or receiving water biota. In addition, the health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors.
pH	The pH shall not be depressed below 6.5 nor raised above 8.5. This encompasses the pH range usually found in waters within the basin. Controllable water quality factors shall not cause changes greater than 0.5 units in normal ambient pH levels.
Radioactivity	Radionuclides shall not be present in concentrations that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. Waters designated with the beneficial use of MUN shall not contain concentrations of radionuclides in excess of the limits specified in table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations.
Salinity	Controllable water quality factors shall not increase the total dissolved solids or salinity of waters of the state so as to adversely affect beneficial uses, particularly fish migration and estuarine habitat.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. Controllable water quality factors shall not cause a detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life.
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Sulfide	All water shall be free from dissolved sulfide concentrations above natural background levels.
Tastes and Odors	Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, that cause nuisance, or that adversely affect beneficial uses.
Temperature	The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the regional board that such alteration in temperature does not adversely affect beneficial uses. In waters with the beneficial uses of warm or cold, the temperature shall not be increased by more than 5° Fahrenheit (2.8° Celsius) above natural receiving water temperature
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10% in areas where natural turbidity is greater than 50 Nephelometric turbidity units (NTU).
Un-Ionized Ammonia	The discharge of wastes shall not cause receiving waters to contain concentrations of un-ionized ammonia in excess of the following limits (in milligrams per liter as Nitrogen): annual median: 0.025; maximum, central bay and upstream: 0.16; maximum, lower bay: 0.4.

Parameter	Surface Water Quality Objective
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that negatively affect beneficial uses. The basin plan contains numerical water quality objectives for specific chemical constituents for specific stream types, waterbodies, watersheds, tidal areas, and beneficial uses. See the tables in chapter 3 of the basin plan for more information.
Central Coast RWQCB	
Color	Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses. Coloration attributable to materials of waste origin shall not be greater than 15 units or 10% above natural background color, whichever is greater.
Tastes and Odors	Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, that cause nuisance, or that adversely affect beneficial uses.
Floating Material	Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Settleable Material	Waters shall not contain settleable material in concentrations that result in deposition of material that causes nuisance or adversely affects beneficial uses
Oil and Grease	Waters shall not contain oils, greases, waxes, or other similar materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increase in turbidity attributable to controllable water quality factors shall not exceed the following limits: 1. Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%. 2. Where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU. 3. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10%. Allowable zones of dilution within which higher concentrations would be tolerated would be defined for each discharge in discharge permits.
pH	In waters with the beneficial uses of MUN, AGR, REC-1, or REC-2, the pH value shall neither be depressed below 6.5 nor raised above 8.3. In waters with the beneficial uses of COLD or WARM, the pH value shall not be depressed below 7.0 or raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters. For waters not mentioned by a specific beneficial use, the pH value shall not be depressed below 7.0 or raised above 8.5.

Parameter	Surface Water Quality Objective
Dissolved Oxygen	For waters not mentioned by a specific beneficial use, dissolved oxygen concentration shall not be reduced below 5.0 milligrams per liter at any time. Median values should not fall below 85% saturation as a result of controllable water quality conditions. In waters with the beneficial uses of COLD, the dissolved oxygen concentration shall not be reduced below 7.0 milligrams per liter at any time. In waters with the beneficial uses of WARM, the dissolved oxygen concentration shall not be reduced below 5.0 milligrams per liter at any time. In waters with the beneficial use of AGR, dissolved oxygen concentration shall not be reduced below 2.0 milligrams per liter at any time.
Temperature	Natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the regional board that such alteration in temperature does not adversely affect beneficial uses. In waters with the beneficial uses of COLD or WARM, at no time or place shall the temperature be increased by more than 5º Fahrenheit above natural receiving water temperature.
Toxicity	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Pesticides	No individual pesticide or combination of pesticides shall reach concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life. For waters where existing concentrations are presently nondetectable or where beneficial uses would be impaired by concentrations in excess of nondetectable levels, total identifiable chlorinated hydrocarbon pesticides shall not be present at detectable concentrations.
Organic Chemicals	Where wastewater effluents are returned to land for irrigation uses, regulatory controls shall be consistent with Title 22 of the California Code of Regulations and other relevant local controls. In waters with the beneficial use of MUN, water shall not contain concentrations of organic chemicals in excess of the limiting concentrations set forth in California Code of Regulations, title 22, chapter 15, article 5.5, section 64444.5, Table 5 and listed in Table 3-1.
Other Organics	Methylene Blue Activated Substances: 0.2 Milligrams per liter; Phenols: 0.1 Milligrams per liter; Polychlorinated Biphenyls (PCBs): 0.3 µg/L; Phthalate Esters: 0.002 µg/L
Phenol	In waters with the beneficial use of MUN, waters shall not contain phenol concentrations in excess of 1.0 micrograms per liter.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life. In waters with the beneficial use of MUN, waters shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, title 22, chapter 15, article 5, sections 64441 and 64443, table 4.
Bacteria	In waters with the beneficial uses of REC-1 or REC-2, fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100 milliliters, nor shall more than 10% of total samples during any 30-day period exceed 400/100 milliliters.

Parameter	Surface Water Quality Objective
Chemical Constituents	In waters with the beneficial use of MUN, water shall not contain concentrations of organic chemicals in excess of the limiting concentrations set forth in California code of regulations, title 22, article 4, chapter 15, section 64435, tables 2 and 3 as listed in table 3-2. In waters with the beneficial use of AGR, waters shall not contain concentrations of chemical constituents in amounts which adversely affect the beneficial use. Waters used for irrigation and livestock watering shall not exceed concentrations for those chemicals listed in table 3-4 of the basin plan. In waters with the beneficial uses of WARM or COLD, waters shall not contain concentrations of chemical constituents known to be deleterious to fish or wildlife in excess of the limits listed in table 3-5.
Cadmium	In waters with the beneficial use of SPWN, cadmium shall not exceed 0.003 milligrams per liter in hard water or 0.0004 milligrams per liter in soft water at any time. Hard water is defined as water exceeding 100 milligrams per liter as calcium carbonate.
Central Valley RWQCB	
Bacteria	In waters designated REC-1 the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 milliliters, nor shall more than 10% of the total number of samples taken during any 30-day period exceed 400/100 milliliters.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths in concentrations that cause nuisance or negatively affect beneficial uses.
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that negatively affect beneficial uses. At a minimum, water designated MUN shall not contain concentrations of chemical constituents in excess of the Maximum Contaminant Levels specified in title 22 of the California code of regulations.
Color	Waters shall be free of discoloration that causes nuisance or negatively affects beneficial uses.
Dissolved Oxygen	Within the legal boundaries of the delta, the do concentration shall not be reduced by the amounts specified in the basin plan. For surface waterbodies outside the legal boundaries of the delta, the monthly median dissolved oxygen concentrations shall not fall below 85% of saturation in the main water mass, and the 95-percentile concentration shall not fall below 75% of saturation. The dissolved oxygen concentrations shall not be reduced below the minimum levels specified in the basin plan.
Floating Material	Waters shall not contain floating material in amounts that cause nuisance or negatively affect beneficial uses.
Methylmercury	For the delta and yolo bypass waterways listed in appendix 43 of the basin plan, the average methylmercury concentrations shall not exceed 0.08 and 0.24 milligrams of methylmercury per kilogram, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150–500 millimeters total length). The average methylmercury concentrations shall not exceed 0.03 milligrams of methylmercury per kilogram, wet weight, in whole fish less than 50 millimeters in length.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise negatively affect beneficial uses.
pH	The pH of water shall not be depressed below 6.5, raised above 8.5, or changed at any time more than 0.3 unit from normal ambient pH.

Parameter	Surface Water Quality Objective
Pesticides	Pesticide concentrations shall not exceed the levels shown in Table Iii-2a of the Basin Plan and shall meet all other objectives listed in the Basin Plan pertaining to concentrations, discharges, total identifiable persistent chlorinated hydrocarbon pesticides, antidegradation policies, municipal supply, and thiobencarb.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
Salinity	The objectives in table iii-3 of the basin plan shall be met for the specified waterbodies. Salinity objectives applicable in the delta can be found in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.
Sediment	The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or negatively affect beneficial uses.
Settable Material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or negatively affects beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or negatively affect beneficial uses.
Taste and Odors	Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise negatively affect beneficial uses.
Temperature	Natural receiving water temperatures of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the RWQCB that such alteration in temperature does not negatively affect beneficial uses.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or negatively affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed limits provided in the basin plan.
Bacteria	In waters designated REC-1 the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 milliliters, nor shall more than 10% of the total number of samples taken during any 30-day period exceed 400/100 milliliters.

Source: San Francisco Bay RWQCB 2017; Central Coast RWQCB 2019; Central Valley RWQCB 2018
RWQCB = Regional Water Quality Control Board
TMDL = total maximum daily load
AGR = agricultural supply
COLD = cold freshwater habitat
MUN = municipal and domestic supply
REC-1 = water contact recreation
REC-2 = noncontact water recreation
SPWN = fish spawning, reproduction or early development
WARM = warm freshwater habitat

Table 3 Groundwater Quality Objectives

Parameter	Groundwater Quality Objective
San Francisco Bay RWQCB	
Bacteria	For groundwater basins and/or subbasins with the beneficial use of MUN, the median of the most probable number of coliform organisms over any seven-day period shall be less than 1.1 most probable number per 100 milliliters (MPN/100 mL).
Organic and Inorganic Chemical Constituents	All groundwater shall be maintained free of organic and inorganic chemical constituents in concentrations that adversely affect beneficial uses. For groundwater basins and/or subbasins with the beneficial use of MUN, shall not contain concentrations of constituents in excess of the maximum (MCLs) or secondary maximum contaminant levels (SMCLs) specified in Table 3-5 of the basin plan. For groundwater basins and/or subbasins with the beneficial use of AGR, groundwater shall not contain concentrations of chemical constituents in excess of levels specified in Table 3-6 of the basin plan. For groundwater basins and/or subbasins with the beneficial use of IND, groundwater shall not contain pollutant levels that impair current/potential industrial uses.
Radioactivity	For groundwater basins and/or subbasins with the beneficial use of MUN, groundwater shall not contain concentrations of radionuclides in excess of the MCLs specified in Table 3-5 of the basin plan and Table 4 (Radioactivity) of Section 64443 of Title 22.
Taste and Odor	For groundwater basins and/or subbasins with the beneficial use of MUN, groundwater shall not contain taste- or odor-producing substances in concentrations that cause a nuisance or adversely affect beneficial uses. At a minimum, groundwater shall not contain concentrations in excess of SMCLs in Table 3-5 of the basin plan.
Central Coast RWQCB	
Tastes and Odors	Groundwaters shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life. For groundwater basins and/or subbasins with the beneficial use of MUN, ground waters shall not contain concentrations of radionuclides in excess of the limits specified in the California Code of Regulations.
Bacteria	For groundwater basins and/or subbasins with the beneficial use of municipal and domestic supply, the median concentration of coliform organisms over any seven-day period shall be less than 2.2/100 milliliters.
Organic Chemicals	For groundwater basins and/or subbasins with the beneficial use of MUN, ground waters shall not contain concentrations of organic chemicals in excess of the maximum contaminant levels for primary drinking water standards specified in the California Code of Regulations
Inorganic Chemicals	For groundwater basins and/or subbasins with the beneficial use of MUN, groundwaters shall not contain concentrations of inorganic chemicals in excess of the maximum contaminant levels for primary drinking water standards specified in the California Code of Regulations. For groundwater basins and/or subbasins with the beneficial use of AGR, water used for irrigation and livestock watering shall not exceed the concentrations for those chemicals listed in Tables and 3-1 and 3-2 of the basin plan.

Parameter	Groundwater Quality Objective
Central Valley RWQCB	
Bacteria	For groundwater basins and/or subbasins with the beneficial use of MUN, the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml.
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that negatively affect beneficial uses. At a minimum, water designated MUN shall not contain concentrations of chemical constituents in excess of the Maximum Contaminant Levels specified in title 22 of the California code of regulations. At a minimum, water designated MUN shall not contain lead in excess of 0.015 mg/l.
Radioactivity	At a minimum, ground waters designated for MUN shall not contain concentrations of radionuclides in excess of the MCLs specified in Section 64443 of Title 22 of the California Code of Regulations
Taste and Odors	Ground waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
Toxicity	Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s).

Source: San Francisco Bay RWQCB 2017; Central Coast RWQCB 2019; Central Valley RWQCB 2018
RWQCB = Regional Water Quality Control Board

Clean Water Act Section 303(d) List and Total Maximum Daily Loads

Section 303(d) of the Clean Water Act requires states to develop a list of waterbodies that do not meet water quality objectives. A Total Maximum Daily Load (TMDL) is a regulatory response initiated by a state to determine the loading capacity of the waterbody and to allocate that load among different pollutant sources so that the appropriate control actions can be taken and water quality standards achieved. Wasteload allocations established by TMDLs are generally implemented through requirements in National Pollutant Discharge Elimination System (NPDES) permits under Section 402 of the Clean Water Act. The TMDL process links the attainment of water quality standards in the Basin Plan with the implementation of actions required by NPDES permits that are designed to attain those standards. The table below summarizes the waterbodies in the RSA with pollution levels that consistently exceed one or more water quality objectives that cause impairments, as described on the 2014-2016 303(d) List.

Table 4 Impaired Waterbodies in the RSA

Waterbody	Impairment	Status of TMDL	Notes on TMDL
San Francisco Bay RWQCB			
Anderson Reservoir (Lake)	Mercury	TMDL required	Estimated to be complete by 2013, on Statewide Mercury Control Program for Reservoirs list
	PCBs	TMDL required	Estimated to be complete by 2019
Calabazas Creek	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides

Waterbody	Impairment	Status of TMDL	Notes on TMDL
Coyote Creek (Santa Clara County)[1]	Trash	TMDL required	Estimated attainment: 2029
	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Toxicity	TMDL required	Estimated completion: 2029
Alamitos Creek	Mercury	Addressed with approved TMDL	Approved in 2010
Guadalupe Creek	Mercury	Addressed with approved TMDL	Approved in 2010
Guadalupe River[1]	Mercury	Addressed with approved TMDL	Approved in 2010
	Trash	TMDL required	Estimated attainment: 2029
	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
Guadalupe Slough	Toxicity	TMDL required	Estimated to be complete by 2029
Los Gatos Creek (R2)[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
Oiger Quarry Ponds	Mercury	TMDL required	Estimated to be complete by 2029, on Statewide Mercury Control Program for Reservoirs list
Saratoga Creek	Trash	TMDL required	Estimated attainment: 2029
	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
Silver Creek (Santa Clara County)	Trash	TMDL required	Estimated attainment: 2029
Central Coast RWQCB			
Carnadero Creek (Uvas Creek below Bloomfield Road) [1]	E. coli	Addressed with approved TMDL	Approved in 2010; see fecal coliform impairment
	Fecal coliform	Addressed with approved TMDL	Approved in 2010
	Low dissolved oxygen	TMDL required	Estimated to be complete by 2018
	Nitrate	TMDL required	Estimated to be complete by 2018
	Turbidity	TMDL required	Estimated to be complete by 2023
Chesbro Reservoir	Mercury	TMDL required	Estimated to be complete by 2018, on Statewide Mercury Control Program for Reservoirs list

Waterbody	Impairment	Status of TMDL	Notes on TMDL
Jones (Furlong) Creek[1]	Chlorpyrifos	Addressed with approved TMDL	Includes diazinon
	E. coli	TMDL required	Estimated to be complete by 2027
	Fecal coliform	Addressed with approved TMDL	Approved in 2010
	Nitrate	TMDL required	Estimated to be complete by 2018
	Turbidity	TMDL required	Estimated to be complete by 2023
Llagas Creek (below Chesbro Reservoir)[1]	Chloride	TMDL required	Estimated to be complete by 2027
	Chlorpyrifos	Addressed with approved TMDL	Approved in 2013
	Electrical conductivity	TMDL required	Estimated to be complete by 2027
	E. coli	TMDL required	Estimated to be complete by 2027; see fecal coliform impairment
	Fecal coliform	Addressed with approved TMDL	Approved in 2010
	Low dissolved oxygen	TMDL required	Estimated to be complete by 2018
	Sodium	TMDL required	Estimated to be complete by 2027
	Nitrate	Addressed with approved TMDL	Approved in 2006, replaces nutrients TMDL
	Total dissolved solids	TMDL required	Estimated to be complete by 2027
	Turbidity	TMDL required	Estimated to be complete by 2023
	Sedimentation/ Siltation	Addressed with approved TMDL	Approved in 2007
Millers Canal[1]	Chlorophyll-a	TMDL required	Estimated to be complete by 2018
	E. coli	TMDL required	Estimated to be complete by 2027
	Fecal coliform	Addressed with approved TMDL	Approved in 2010
	Low dissolved oxygen	TMDL required	Estimated to be complete by 2018
	Nitrate	Addressed with approved TMDL	Approved in 2006
	pH	TMDL required	Estimated to be complete by 2027
	Temperature, water	TMDL required	Estimated to be complete by 2023
	Toxicity	TMDL required	Estimated to be complete by 2023
	Turbidity	TMDL required	Estimated to be complete by 2023

Waterbody	Impairment	Status of TMDL	Notes on TMDL
Pacheco Creek[1]	Fecal coliform	Addressed with approved TMDL	Approved in 2010
	Low dissolved oxygen	TMDL required	Estimated to be complete by 2027
	Turbidity	TMDL required	Estimated to be complete by 2023
Pajaro River[1]	Boron	TMDL required	Estimated to be complete by 2027
	Chlordane	TMDL required	Estimated to be complete by 2027
	Chloride	TMDL required	Estimated to be complete by 2027
	Chlorpyrifos	Addressed with approved TMDL	Approved in 2013; includes diazinon; applies to entire watershed
	Chromium	TMDL required	Estimated to be complete by 2027
	DDD	TMDL required	Estimated to be complete by 2027
	DDE	TMDL required	Estimated to be complete by 2027
	DDT	TMDL required	Estimated to be complete by 2027
	Diazinon	Addressed with approved TMDL	Approved in 2013
	Dieldrin	TMDL required	Estimated to be complete by 2027
	E. coli	TMDL required	Estimated to be complete by 2027; see fecal coliform impairment
	Fecal coliform	Addressed with approved TMDL	Approved in 2010
	Low dissolved oxygen	TMDL required	Estimated to be complete by 2027
	PCBs	TMDL required	Estimated to be complete by 2027
	pH	TMDL required	Estimated to be complete by 2027
	Sodium	TMDL required	Estimated to be complete by 2027
	Toxicity	TMDL required	Estimated to be complete by 2023
	Turbidity	TMDL required	Estimated to be complete by 2023
	Nitrate	Addressed with approved TMDL	Approved in 2006, replaces nutrients TMDL
	Sedimentation/ Siltation	Addressed with approved TMDL	Approved in 2007

Waterbody	Impairment	Status of TMDL	Notes on TMDL
Tequisquita Slough[1]	Ammonia	TMDL required	Estimated to be complete by 2018
	Chlorophyll-a	TMDL required	Estimated to be complete by 2018
	Fecal coliform	Addressed with approved TMDL	Approved in 2010
	Low dissolved oxygen	TMDL required	Estimated to be complete by 2018
	pH	TMDL required	Estimated to be complete by 2027
	Toxicity	TMDL required	Estimated to be complete by 2023
	Turbidity	TMDL required	Estimated to be complete by 2023
Uvas Creek (below Uvas Reservoir) [1]	Low dissolved oxygen	TMDL required	Estimated to be complete by 2018
	Turbidity	TMDL required	Estimated to be complete by 2023
Central Valley RWQCB			
Agatha Canal (Merced County)	pH	TMDL required	Estimated to be complete by 2021
	Selenium	Addressed with approved TMDL	Approved in 2010
Grassland Marshes	Electrical conductivity	TMDL required	Estimated to be complete by 2027
	Selenium	Addressed with approved TMDL	Approved in 2000
Los Banos Creek (below Los Banos Reservoir, Merced County)[1]	Indicator bacteria	TMDL required	Estimated to be complete by 2021
	Total dissolved solids	TMDL required	Estimated to be complete by 2027
	Low dissolved oxygen	TMDL required	Estimated to be complete by 2023
	Toxicity	TMDL required	Estimated to be complete by 2027
Mud Slough, North (upstream of San Luis Dam)	Boron	TMDL required	Estimated to be complete by 2019
	Electrical conductivity	TMDL required	Estimated to be complete by 2019
	Indicator bacteria	TMDL required	Estimated to be complete by 2021
	Selenium	Addressed with approved TMDL	Approved 2002
	Pesticides	TMDL required	Estimated to be complete by 2019
	Toxicity	TMDL required	Estimated to be complete by 2021
O'Neill Forebay	Mercury	TMDL required	Estimated to be complete by 2012, on Statewide Mercury Control Program for Reservoirs list
	PCBs	TMDL required	Estimated to be complete by 2027
Poso Slough	Sediment toxicity	TMDL required	Estimated to be complete by 2021

Waterbody	Impairment	Status of TMDL	Notes on TMDL
San Luis Reservoir	Chlordane	TMDL required	Estimated to be complete by 2027
	Mercury	TMDL required	Estimated to be complete by 2027, on Statewide Mercury Control Program for Reservoirs list
	PCBs	TMDL required	Estimated to be complete by 2027
	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)	TMDL required	Estimated to be complete by 2027
Salt Slough (Mud Slough to San Dam, Merced County)	Chlorpyrifos	Addressed by action other than TMDL	Expected attainment: 2026
	Toxicity	TMDL required	Estimated to be complete by 2027

Source: SWRCB 2016
E. coli = Escherichia coli
DDT = dichlorodiphenyltrichloroethane
DDD = dichlorodiphenyldichloroethane
PCB = polychlorinated biphenyl
SWRCB = State Water Resources Control Board
[1] These waterbodies intersect the project footprint.

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Summary of Impacts on Beneficial Uses, Water Quality Objectives, and Clean Water Act Section 303(d) List impairments

The following table lists the waterbodies within the project footprint with beneficial uses designated in the respective Basin Plan. The beneficial uses of each waterbody, as listed in the respective Basin Plan, is provided, as well as the applicable Water Quality Objectives and Section 303(D) impairments, if any. Because of the vast number of waterbodies within the jurisdiction of the San Francisco Bay, Central Coast, and Central Valley RWQCBs' jurisdictions, the RWQCBs do not identify beneficial uses for each individual waterbody in their respective Basin Plans. Waterbodies that do not have individual beneficial use designations in a Basin Plan do not have any beneficial uses listed in the following table. However, the RWQCBs protect beneficial uses of waters of the state whether or not they are identified in a Basin Plan. Generally, the RWQCBs designate beneficial uses for unlisted waterbodies on a case-by-case basis. In addition, the following table identifies whether temporary, permanent, and operations impacts would occur in each waterbody. Refer to Appendix 2-E of this EIR/EIS for a description of the IAMFs that have been incorporated into the design of each of the project alternatives. Refer to Section 3.7, Biological and Aquatic Resources, for the impacts on aquatic resources and the mitigation measures due to the removal/disturbance of waterbodies and wetlands as well as tunneling below waterbodies.

Table 5 Summary of Impacts on Beneficial Uses, Water Quality Objectives, and Clean Water Act Section 303(d) List Impairments by Alternative

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Jose Diridon Station Approach Subsection					**Viaduct to I-880**	**Viaduct to Scott**		**Blended, At-grade**
Los Gatos Creek	San Francisco Bay	MUN, FRSH, AGR, GWR, COLD, RARE, WARM, WILD, REC-1	Diazinon	Table 3-1, Table 3-2, Table 3-4, Table 3-5, and Table 3-6. Dissolved oxygen: 7.0 milligrams per liter minimum	The project would result in minor disturbances to Los Gatos Creek during construction of a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the channel of Los Gatos Creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Vegetation management may result in leaks, spills, or other discharges of pesticides to Los Gatos Creek. However, the Authority would not use diazinon for vegetation management.	Same as Alternative 1.		The project would use the existing Los Gatos Creek bridge. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the channel of Los Gatos Creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Vegetation management may result in leaks, spills, or other discharges of pesticides to Los Gatos Creek. However, the Authority would not use diazinon for vegetation management.
Guadalupe River	San Francisco Bay	GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	Mercury, trash, diazinon	Table 3-2, Table 3-4, and Table 3-4A. Dissolved oxygen: 7.0 milligrams per liter minimum. Mercury: 2.4 micrograms per liter 1-hour average. Methylmercury: 0.05 milligrams per kilogram fish tissue (5–15 centimeters in length); 0.1 milligrams per kilogram fish (15–35 centimeters in length).	The project would result in minor disturbances to Guadalupe River to construct a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the channel of Guadalupe River, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Discharges of refuse from the construction site may exacerbate the trash impairment. Construction site BMPs and good housekeeping would avoid or minimize the potential for discharging refuse into Guadalupe River. Vegetation management may result in leaks, spills, or other discharges of pesticides to Guadalupe River. However, the Authority would not use diazinon for vegetation management.	Same as Alternative 1.		The Project would build a new bridge over Guadalupe River, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the widened crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and near the Guadalupe River, such as vegetation management and bridge maintenance, as well as continuous discharges of brake dust, PAHs, and other contaminants from trains. Discharges of refuse from the construction site may exacerbate the trash impairment. Construction site BMPs and good housekeeping would avoid or minimize the potential for discharging refuse into Guadalupe River. Vegetation management may result in leaks, spills, or other discharges of pesticides to Guadalupe River. However, the Authority would not use diazinon for vegetation management.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Palustrine Forested Wetland 6	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would result in minor disturbances to Palustrine Forested Wetland 6 in order to build a viaduct over Guadalupe River. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Palustrine Forested Wetland 6.	Same as Alternative 1.		The project would result in minor disturbances to Palustrine Forested Wetland 6 in order to build a new bridge over Guadalupe River. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Palustrine Forested Wetland 6.
Monterey Corridor Subsection					**Viaduct**	**At Grade**	**Viaduct**	**Blended, At-grade**
Constructed Basin 1	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would partially fill Constructed Basin 1 for the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	The project would have no impact on Constructed Basin 1 because it is not within the footprint of Alternative 4.
Constructed Watercourse 1	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would permanently relocate or fill Constructed Watercourse 1, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. If the waterbody is relocated, Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the watercourse, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 1 for construction access. This work may potentially result in erosion or discharge of polluted runoff. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.
Constructed Basin 10	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would result in minor disturbances to Constructed Basin 10 because it is located within a temporary construction easement. Nearby activities may potentially result in erosion or discharge of polluted runoff. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	The project would require filling the entire basin for curve straightening, requiring temporary diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Morgan Hill and Gilroy Subsection					**Viaduct to Downtown Gilroy**	**Embankment to Downtown Gilroy**	**Viaduct to East Gilroy**	**Blended, At-grade**
Coyote Alamitos Canal	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would have no impact on Coyote Alamitos Canal because it is not within the footprint of Alternative 1.	The project would have no impact on Coyote Alamitos Canal, because it would be protected during construction. Operations would avoid the canal.	Same as Alternative 1.	Same as Alternative 1.
Coyote Creek	San Francisco Bay	GWR, COMM, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	Trash, diazinon, toxicity	Table 3-1, Table 3-2, and Table 3-4. Dissolved oxygen: 7.0 milligrams per liter minimum.	The project would modify the Metcalf Road bridge over Coyote Creek, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the modified bridge would change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Discharges of refuse from the construction site may exacerbate the trash impairment. Discharges of any pollutant from the construction site may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging refuse and other toxic contaminants into Coyote Creek. Vegetation management may result in leaks, spills, or other discharges of pesticides to Coyote Creek. However, the Authority would not use diazinon for vegetation management.	The project would modify the Metcalf Road bridge over Coyote Creek and the Fisher Creek culvert, requiring temporary stream diversion and dewatering, and provide a grade separation at the Bailey Avenue bridge. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the grade separation would change the path, speed, and volume of existing discharges and flows. Operations would avoid Coyote Creek. Discharges of refuse from the construction site may exacerbate the trash impairment. Discharges of any pollutant from the construction site may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging refuse and other toxic contaminants into Coyote Creek. Vegetation management may result in leaks, spills, or other discharges of pesticides to Coyote Creek. However, the Authority would not use diazinon for vegetation management.	Same as Alternative 1.	The project would require temporary stream diversion and dewatering of Coyote Creek in order to modify the Fisher Creek culvert and wildlife crossing. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the grade separation would change the path, speed, and volume of existing discharges and flows. Operations would avoid Coyote Creek. Discharges of refuse from the construction site may exacerbate the trash impairment. Discharges of any pollutant from the construction site may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging refuse and other toxic contaminants into Coyote Creek. Vegetation management may result in leaks, spills, or other discharges of pesticides to Coyote Creek. However, the Authority would not use diazinon for vegetation management.
Coyote Creek Reservoir	San Francisco Bay	AGR, COLD, FRESH, GWR, MIGR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would require filling a portion the reservoir to modify the Metcalf Road bridge over the Coyote Creek Reservoir, requiring temporary stream diversion and dewatering in Coyote Reservoir. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the modified bridge would change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would result in minor disturbances to the Coyote Creek Reservoir within the temporary construction easement at Bailey Avenue bridge. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Coyote Creek Reservoir.	Same as Alternative 1.	The project would have no impact on Coyote Creek Reservoir because it is not within the footprint of Alternative 4.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Coyote Creek Palustrine Forested Wetlands	San Francisco Bay	AGR, COLD, FRESH, GWR, MIGR, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would widen Monterey Road into Coyote Creek Palustrine Forested Wetlands, requiring temporary stream diversion and dewatering. A utility pipeline relocation would also temporarily disturb the wetland. This work may potentially result in erosion or discharge of polluted runoff. Grading for the widened crossing would change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains to Coyote Creek Palustrine Forested Wetlands.	The project would require temporary stream diversion and dewatering of the wetlands in order to build a wildlife crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Coyote Creek Palustrine Forested Wetlands.	Same as Alternative 1.	The project would temporarily disturb Coyote Creek Palustrine Forested Wetlands to construct wildlife crossings and a culvert in Fisher Creek, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Coyote Creek Palustrine Forested Wetlands.
Marsh 8	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Marsh 8 because it is not within the footprint of Alternative 1.	The project would result in minor disturbances to the marsh because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the marsh.	Same as Alternative 1.	The project would result in minor disturbances to the marsh during construction of a wildlife crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the marsh.
Constructed Watercourse 124	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would have no impact on Constructed Watercourse 124, because it would be protected during construction. Operations would avoid the watercourse.	Same as Alternative 1.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 124 because it is not within the footprint of Alternative 4.
Seasonal Wetland 14	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would result in minor disturbances to the wetland because it is located within a temporary construction easement associated with raising existing overhead electrical lines. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.	The project would have no impact on Seasonal Wetland 14, because it would be protected during construction. Operations would avoid the watercourse.	Same as Alternative 1.	The project would have no impact on Seasonal Wetland 14 because it is not within the footprint of Alternative 4.
Fisher Creek	San Francisco Bay	WARM, WILD, REC-1, REC-2	None listed.	Table 3-1, Table 3-2, and Table 3-4. Dissolved oxygen: 5.0 milligrams per liter minimum.	The project would temporarily disturb Fisher Creek to abandon, remove, and replace the existing culvert with a proposed wildlife crossing/culvert. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the channel, such as vegetation management and culvert maintenance as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	The project would construct a new culvert/wildlife crossing in Fisher Creek. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the channel, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Coyote Canal Extension	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would result in minor disturbances to Coyote Canal Extension, because of a proposed temporary roadway crossing required for PG&E network upgrades. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Coyote Canal Extension.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Constructed Watercourse 125	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would have no impact on Constructed Watercourse 125 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to the watercourse for construction access. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.
Constructed Watercourse 126	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would have no impact on Constructed Watercourse 126 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to the watercourse for construction access. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.
Seasonal Wetlands 15–16	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would involve a temporary roadway crossing for PG&E upgrades, requiring work in the wetlands. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetlands.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Coyote Canal	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would involve a temporary roadway crossing for PG&E network upgrades, requiring work in the canal, and temporary disturbances during installation of a nearby steel lattice tower. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Coyote Canal.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Coyote Creek Tributaries 1–8	San Francisco Bay	GWR, COMM, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	Trash, diazinon, toxicity	Table 3-1, Table 3-2, and Table 3-4. Dissolved oxygen: 7.0 milligrams per liter minimum.	The project would involve a temporary roadway crossings for these waterbodies to build PG&E upgrades, requiring work in tributaries 1, 5, 6, and 8. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these Coyote Creek tributaries.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Constructed Watercourse 127 and 129	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would involve a temporary roadway crossing for PG&E upgrades, requiring work in these watercourses. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these watercourses.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 161	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would have no impact on Constructed Watercourse 161 because it is not within the footprint of Alternative 1	The project would relocate the watercourse and build a culvert in the watercourse for the Live Oak Avenue grade separation, requiring work in the waterbody and temporary stream diversion and dewatering. Operations would avoid the watercourse.	Same as Alternative 1.	Same as Alternative 1.
Coyote Canal Tributary 1	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would involve a temporary roadway crossing for PG&E upgrades, requiring work in Coyote Canal Tributary 1. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the tributary.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Constructed Watercourse 130	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would have no impact on Constructed Watercourse 130 because it is not within the footprint of Alternative 1	The project would relocate or fill the watercourse to realign Monterey Road, requiring work in the waterbody and temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.
Cochran Channel	San Francisco Bay	None designated in the Basin Plan	None listed.	Table 3-4	The project would result in minor disturbances to Cochran Channel because it is within several utility temporary construction easements. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Cochran Channel.	The project would have no impact on Cochran Channel because it is not within the footprint of Alternative 2.	Same as Alternative 1.	Same as Alternative 2.
Constructed Basin 2	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Constructed Basin 2 because it is not within the footprint of Alternative 1.	The project would fill a portion of Constructed Basin 2 to construct an embankment for the Madrone Parkway grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new embankment would also change the path, speed, and volume of existing discharges and flows. Operations would avoid Constructed Basin 2.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Seasonal Wetland 18	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Seasonal Wetland 18 because it is not within the footprint of Alternative 1.	The project would fill a portion of Seasonal Wetland 18 to construct an embankment for the Madrone Parkway grade separation. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new embankment would also change the path, speed, and volume of existing discharges and flows. Operations would the wetland.	Same as Alternative 1.	Same as Alternative 1.
Constructed Basin 3	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Constructed Basin 3 because it is not within the footprint of Alternative 1.	The project would fill a portion of Constructed Basin 3 to relocate Monterey Road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid Constructed Basin 3.	Same as Alternative 1.	Same as Alternative 1.
Seasonal Wetland 17	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Seasonal Wetland 17 because it is not within the footprint of Alternative 1.	The project would result in minor disturbances to Seasonal Wetland 17 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.	Same as Alternative 1.	Same as Alternative 1.
Seasonal Wetland 1	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Seasonal Wetland 1 because it is not within the footprint of Alternative 1.	The project would partially fill Seasonal Wetland 1 for the relocation of Monterey Road, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid Seasonal Wetland 1.	Same as Alternative 1.	The project would result in minor disturbances to Seasonal Wetland 1, because it is within a temporary construction easement for construction access. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Seasonal Wetland 1.
Fisher Creek Tributary 1	San Francisco Bay	WARM, WILD, REC-1, REC-2	None listed.	Table 3-1, Table 3-2, and Table 3-4. Dissolved oxygen: 7.0 milligrams per liter minimum.	The project would have no impact on Fisher Creek Tributary 1 because it is not within the footprint of Alternative 1.	The project would result in minor disturbances to Fisher Creek Tributary 1, because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.	Same as Alternative 1.	The project would result in minor disturbances to Fisher Creek Tributary 1, because it is within a temporary construction easement for construction access. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Seasonal Wetland 2	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would construct a temporary roadway crossing over Seasonal Wetland 2 for PG&E network upgrades, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Seasonal Wetland 2.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
West Little Llagas Creek Tributary 1 and 2	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	The project would construct a temporary roadway crossing over West Little Llagas Creek Tributary 1 and 2 for PG&E network upgrades, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid West Little Llagas Creek Tributary 1 and 2.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Constructed Basin 11	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Constructed Basin 11 because it is not within the footprint of Alternative 1.	The project would completely fill Constructed Basin 11 to construct the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. This would also cause a depletion of water resources within the project extent. Operations would not affect Constructed Basin 11.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Basin 11, because it is within a temporary construction easement for construction access. This work may potentially result in erosion or discharge of polluted runoff. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.
Constructed Basin 4	San Francisco Bay / Central Coast	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	San Francisco Bay RWQCB: Table 3-4. Central Coast RWQCB: Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	The project would have no impact on Constructed Basin 4 because it is not within the footprint of Alternative 1.	The project would fill a portion of Constructed Basin 4 and offset capacity loss by expanding another portion of the basin, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Madrone Channel	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Madrone Channel, because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Madrone Channel.	The project would have no impact on Madrone Channel because it is not within the footprint of Alternative 2.	Same as Alternative 1.	Same as Alternative 2.
Butterfield Channel	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Butterfield Channel, because it is within temporary construction easements. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Butterfield Channel.	The project would relocate a portion of Butterfield Channel in order to construct the track embankment and reconstruct a culvert at Maple Avenue, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the channel, such as vegetation management and culvert maintenance as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	There would be no effect on Butterfield Channel because construction of the project would be confined to the paved areas on Main Avenue. Operations would avoid Butterfield Channel.
West Little Llagas Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to West Little Llagas Creek, because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid West Little Llagas Creek.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Seasonal Wetland 19	San Francisco Bay	AGR, COLD, FRESH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None listed.	Table 3-4	The project would have no impact on Seasonal Wetland 19 because it is not within the footprint of Alternative 1.	The project would partially fill Seasonal Wetland 19 for maintenance access, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the channel, such as vegetation management and culvert maintenance as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.
Constructed Basin 5	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Basin 5 because it is not within the footprint of Alternative 1.	The project would result in minor disturbances to Constructed Basin 5, because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.
Constructed Basin 6	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Basin 6 because it is not within the footprint of Alternative 1.	The project would partially fill Constructed Basin 6 and expand another portion of the basin to offset capacity loss, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid the basin.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Little Llagas Creek	Central Coast	MUN, AGR, GWR, REC-1, REC-2, WILD, WARM, COMM	None listed.	Table 3-1, Table 3-2, Table 3-3, Table 3-4, Table 3-5 Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter Fecal coliform[1, 2] pH: 7.0 minimum, 8.3 maximum Phenol: 1.0 microgram per liter maximum Temperature: 5 degrees Fahrenheit increase maximum Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	The project would result in minor disturbances to Little Llagas Creek to construct a viaduct without piers inside the channel and new high-voltage utility crossings. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near Little Llagas Creek, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would construct a new culvert crossing for Little Llagas Creek, requiring work in the waterbody, and new high-voltage utility crossings. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Little Llagas Creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would extend the existing Little Llagas Creek culvert, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near Little Llagas Creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Llagas Creek	Central Coast	MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, RARE, COMM	Chloride, chlorpyrifos, electrical conductivity, E. coli, fecal coliform, low dissolved oxygen, sodium, nitrate, total dissolved solids, turbidity, sedimentation / siltation	Table 3-1, Table 3-2, Table 3-3, Table 3-4, Table 3-5, Table 3-7 Cadmium: 0.003 milligrams per liter in hard water,[3] 0.0004 milligrams per liter in soft water. Dissolved oxygen: shall not be reduced below 7.0 milligrams per liter. Fecal coliform[1, 2]. pH: 7.0 minimum, 8.3 maximum. Phenol: 1.0 microgram per liter maximum. Temperature: 5 degrees Fahrenheit increase maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	The project would result in minor disturbances to Llagas Creek to construct a viaduct without piers inside the channel and two new high-voltage utility crossings. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near Llagas Creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Leaks of pesticides from vegetation management during construction and operations may exacerbate the pesticides impairment. The Authority would not use chlorpyrifos for vegetation management; however, reduced shading would result from ongoing vegetation management during operations, resulting in decreased dissolved oxygen levels. Increased iron from brake dust, PAHs, may also exacerbate the low dissolved oxygen impairment through the stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the E. coli and fecal coliform impairments. However, construction site BMPs would avoid or minimize the potential for discharging sanitary waste. Work in and near Llagas Creek during construction, bridge/culvert maintenance, and discharges of brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Discharges of brake dust, PAHs, may also exacerbate the electrical conductivity and dissolved solids impairments.	The project would remove the existing railroad bridge, relocate Monterey Road to cross Llagas Creek to the west of the existing crossing, modify the Upper Llagas Creek Flood Protection Project in coordination with the Santa Clara Valley Water District, and add a new crossing for the West San Martin Avenue grade separation, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Llagas Creek, such as vegetation management and culvert/bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Leaks of pesticides from vegetation management during construction and operations may exacerbate the pesticides impairment. The Authority would not use chlorpyrifos for vegetation management; however, reduced shading would result from ongoing vegetation management during operations, resulting in decreased dissolved oxygen levels. Increased iron from brake dust, PAHs, may also exacerbate the low dissolved oxygen impairment through the stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the E. coli and fecal coliform impairments. However, construction site BMPs would avoid or minimize the potential for discharging sanitary waste. Work in and near Llagas Creek during construction, bridge/culvert maintenance, and discharges of brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Discharges of brake dust, PAHs, may also exacerbate the electrical conductivity and dissolved solids impairments.	The project would construct a new viaduct crossing over Llagas Creek, a new bridge crossing with piers in the channel requiring work in the waterbody, and two new high-voltage utility crossings over Llagas Creek. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossings would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Llagas Creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Leaks of pesticides from vegetation management during construction and operations may exacerbate the pesticides impairment. The Authority would not use chlorpyrifos for vegetation management; however, reduced shading would result from ongoing vegetation management during operations, resulting in decreased dissolved oxygen levels. Increased iron from brake dust, PAHs, may also exacerbate the low dissolved oxygen impairment through the stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the E. coli and fecal coliform impairments. However, construction site BMPs would avoid or minimize the potential for discharging sanitary waste. Work in and near Llagas Creek during construction, bridge/culvert maintenance, and discharges of brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Discharges of brake dust, PAHs, may also exacerbate the electrical conductivity and dissolved solids impairments.	The project would reconstruct the existing Llagas Creek culvert, requiring work in the waterbody, and construct a new high voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Llagas Creek, such as vegetation management and culvert/bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Leaks of pesticides from vegetation management during construction and operations may exacerbate the pesticides impairment. The Authority would not use chlorpyrifos for vegetation management; however, reduced shading would result from ongoing vegetation management during operations, resulting in decreased dissolved oxygen levels. Increased iron from brake dust, PAHs, may also exacerbate the low dissolved oxygen impairment through the stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the E. coli and fecal coliform impairments. However, construction site BMPs would avoid or minimize the potential for discharging sanitary waste. Work in and near Llagas Creek during construction, bridge/culvert maintenance, and discharges of brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Discharges of brake dust, PAHs, may also exacerbate the electrical conductivity and dissolved solids impairments.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Basin 7	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would fill a portion of Constructed Basin 7 within the proposed right-of-way, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	The project would have no impact on Constructed Basin 7 because it is not within the footprint of Alternative 4.
West Branch Llagas Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would extend the existing box culvert, requiring work in the waterbody, and construct three new high-voltage utility crossings over West Branch Llagas Creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near West Branch Llagas Creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would extend the existing box culvert and construct a new crossing at the Masten Avenue grade separation, requiring work in the waterbody, and construct three new high-voltage utility crossings over West Branch Llagas Creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near West Branch Llagas Creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would result in minor disturbances to West Branch Llagas Creek to construct a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid West Branch Llagas Creek.	The project would use the existing West Branch Llagas Creek culvert and result in minor disturbances within temporary construction easements for utility and PG&E network upgrades. This work may potentially result in erosion or discharge of polluted runoff. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.
West Branch Llagas Creek Tributary 1	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a temporary roadway crossing for PG&E network upgrades, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid West Branch Llagas Creek Tributary 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 3	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 3 because it is not within the footprint of Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 3, because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 3.	Same as Alternative 1.	Same as Alternative 1.
Constructed Watercourse 131	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a viaduct over Constructed Watercourse 131 and relocate the waterbody around a viaduct pier, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 131, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would relocate or provide a culvert for a proposed cul-de-sac and build a new crossing at realigned Monterey Road for the Masten Avenue grade separation, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 131, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains	The project would have no impact on Constructed Watercourse 131 because it is not within the footprint of Alternative 3.	The project would result in minor disturbances to Constructed Watercourse 131, because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.
Constructed Watercourse 132	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 132 because it is not within the footprint of Alternative 1.	The project would relocate the watercourse around a proposed pump station, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid the watercourse.	The project would have no impact on Constructed Watercourse 132 because it is not within the footprint of Alternative 3	Same as Alternative 3.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Upper Miller Slough	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new viaduct crossing and armor the channel to protect the viaduct piers on the top of the bank, requiring work in the waterbody, as well as construct a new high-voltage utility crossing over Upper Miller Slough. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Upper Miller Slough, such as vegetation management and culvert/bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would relocate Upper Miller Slough to cross below the track embankment and add several new culverts, requiring work in the waterbody, as well as construct a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Upper Miller Slough, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would result in minor disturbances to Upper Miller Slough to construct a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Upper Miller Slough.	The project would remove and replace the existing bridge over Upper Miller Slough with a 3-cell box culvert with 10-ft wide and 7-ft high cells, requiring work in the waterbody. New utility crossings would also be constructed. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Upper Miller Slough, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.
Lower Miller Slough	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Lower Miller Slough because it is within temporary construction easements. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Lower Miller Slough.	The project would have no impact on Lower Miller Slough because it is not within the footprint of Alternative 2.	The project would result in minor disturbances to Lower Miller Slough to construct a new utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Lower Miller Slough.	Same as Alternative 2.
Palustrine Forested Wetland 7 and 9	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Palustrine Forested Wetland 7 and 9 because they are not within the footprint of Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Palustrine Forested Wetland 7 and 9 to construct new utility crossings. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Lower Miller Slough.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Princevalle Channel	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Princevalle Channel to construct a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the waterbody, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would extend the existing Princevalle Channel culvert, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the waterbody, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	The project would have no impact on Princevalle Channel because it is not within the footprint of Alternative 3.	Same as Alternative 2.
Dexter Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Dexter Creek because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would construct two new culverts in Dexter Creek for the SR 152 grade separation and add a culvert for a farm access road, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation and farm access road would also change the path, speed, and volume of existing discharges and flows. Operations would avoid Dexter Creek.	Same as Alternative 1.
Marsh 1	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Marsh 1 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would completely fill Marsh 1 to construct the East Gilroy MOWF. This work may potentially result in erosion or discharge of polluted runoff. Operations would not affect Marsh 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Jones Creek	Central Coast	None designated in the Basin Plan	Chlorpyrifos, E. coli, fecal coliform, nitrate, turbidity	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. Fecal coliform[1]. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Joens Creek because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would relocate the Jones Creek channel along the northeastern boundary of the East Gilroy MOWF and cross the track below a proposed viaduct, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and East Gilroy MOWF would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Jones Creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Leaks of pesticides from vegetation management during construction and operations would not exacerbate the chlorpyrifos impairment, because the Authority would not use chlorpyrifos during construction and operations. Construction site BMPs would avoid or minimize potential discharges of sanitary waste from the construction site. Work in and near Jones Creek during construction, bridge maintenance, and the release of brake dust, PAHs, and other contaminants from trains may exacerbate the turbidity and sedimentation impairments. However, construction site BMPs would minimize the potential for discharging sediment to the creek during the construction and operations.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Ysidro Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on San Ysidro Creek because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would add a culvert for a farm access road and connect the creek to the relocated Jones Creek channel, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and channel modifications for the East Gilroy MOWF and farm access road would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the waterbody.	Same as Alternative 1.
Constructed Watercourse 4	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 4 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would relocate Constructed Watercourse 4 along the proposed farm access road. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and relocating the channel for the farm access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Constructed Watercourse 4, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 5	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 5 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 5 to construct a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges to and existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 5, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.
Constructed Watercourse 6	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 6 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would add a culvert for a proposed farm access road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the farm access road would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.	Same as Alternative 1.
Constructed Basin 12 and 13	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Basin 12 and 13 because they are not within the footprint of Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	The project would require completely filling these constructed basins to build the railbed leading to the South Gilroy MOWF, requiring temporary stream diversion, dewatering, and work in the waterbodies. This work may potentially result in erosion or discharge of polluted runoff. Operations would not affect these basins.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 7	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct new culverts in Constructed Watercourse 7 and the waterbody would be partially filled for construction of a retaining wall, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 7, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 7 because it is not within the footprint of Alternative 3.	Same as Alternative 3.
Gilroy Wastewater Treatment Ponds	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would fill a portion of the Gilroy Wastewater Treatment Ponds to construct the railbed leading to the South Gilroy MOWF, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these waterbodies would change the areas and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on the Gilroy Wastewater Treatment Ponds because they are not within the footprint of Alternative 3.	Same as Alternative 3.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 156	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would relocate, fill, or culvert the watercourse to build the South Gilroy MOWF, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these waterbodies would change the areas and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 156, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 156 because it is not within the footprint of Alternative 3.	Same as Alternative 3.
Constructed Watercourse 8	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 8 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 8.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 8 construct a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 8.	Same as Alternative 3.
Constructed Watercourse 9	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 9 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 9 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 9.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 10	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 10 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would construct a new culvert within Constructed Watercourse 10, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 10, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.
Constructed Watercourse 11	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 11 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would involve construction of a new culvert within Constructed Watercourse 11, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 11, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 12	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 12 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 12, which would be protected in place during construction. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near Constructed Watercourse 12, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pajaro River	Central Coast	MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, FRESH, COMM	Boron, chlordane, chloride, chlorpyrifos, DDD, DDE, DDT, diazinon, dieldrin, E. coli, fecal coliform, low dissolved oxygen, nitrate, nutrients, PCBs, pH, sodium, toxicity, turbidity, nitrate, sedimentation / siltation	Table 3-1, Table 3-2, Table 3-3, Table 3-4, Table 3-5, Table 3-7 Cadmium: 0.003 milligrams per liter in hard water[3], 0.0004 milligrams per liter in soft water Dissolved oxygen: shall not be reduced below 7.0 milligrams per liter Fecal coliform[1, 2] pH: 7.0 minimum, 8.3 maximum Phenol: 1.0 microgram per liter maximum Temperature: 5 degrees Fahrenheit increase maximum Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	The project would construct a new viaduct crossing with a pier footing within the channel banks, requiring temporary stream diversion and dewatering, and a new high-voltage utility crossing over Pajaro River. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossings would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pajaro River, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Leaks of pesticides from vegetation management during construction and operations may result in discharges of pesticides to Pajaro River. However, the Authority would not use chlorpyrifos, chlordane, DDD, DDE, DDT, diazinon, and dieldrin during construction and operations. Vegetation management, reduced shading over Pajaro River, and discharges of iron from brake dust, PAHs, may also exacerbate the low dissolved oxygen impairment through increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the E. coli and fecal coliform impairments. Work in and near Pajaro River during construction, vegetation management, bridge/culvert maintenance, and discharges from brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Accidental discharges of any pollutant may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste, sediment, and accidental discharges. Construction of the concrete viaduct structures may temporarily contribute to elevated pH.	Same as Alternative 1.	The project would construct a new viaduct crossing over Pajaro River without piers within the channel, a new high-voltage utility crossing, and a new crossing at Lake Road. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossings would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pajaro River, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Leaks of pesticides from vegetation management during construction and operations may result in discharges of pesticides to Pajaro River. Vegetation management, reduced shading over Pajaro River, and discharges of iron from brake dust, PAHs, may also exacerbate the low dissolved oxygen impairment through increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the E. coli and fecal coliform impairments. Work in and near Pajaro River during construction, vegetation management, bridge/culvert maintenance, and discharges from brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Accidental discharges of any pollutant may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste, sediment, and accidental discharges. Construction of the concrete viaduct structures may temporarily contribute to elevated pH.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 133	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 133 due to construction of a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 133.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Constructed Watercourse 13	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 13 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 13.	Same as Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 13 to construct a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 13.
Seasonal Wetland 4	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would partially fill Seasonal Wetland 4 for the Bloomfield Avenue grade separation, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would avoid Seasonal Wetland 4.	Same as Alternative 1.	The project would have no impact on Seasonal Wetland 4 because it is not within the footprint of Alternative 3.	Same as Alternative 3.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Uvas-Carnadero Creek	Central Coast	Uvas Creek: MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, WARM, MIGR, SPWN, RARE, COMM Carnadero Creek: MUN, GWR, REC-1, REC-2, WILD, COLD, MIGR, RARE, COMM	Uvas Creek: low dissolved oxygen, turbidity Carnadero Creek: E. coli, fecal coliform, low dissolved oxygen, nitrate, turbidity	Table 3-1, Table 3-2, Table 3-5 Dissolved oxygen: shall not be reduced below 7.0 milligrams per liter Fecal coliform[1, 2] pH: 7.0 minimum, 8.3 maximum Phenol: 1.0 microgram per liter maximum Temperature: 5 degrees Fahrenheit increase maximum Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	The project would result in minor disturbances to Uvas Creek to construct a new roadway crossing along relocated Bloomfield Avenue without columns inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would avoid Uvas Creek. Vegetation management during construction may exacerbate the low dissolved oxygen impairment from reduced shading. Work in and near Uvas Creek during construction may exacerbate the turbidity impairment. However, construction site BMPs would avoid or minimize discharges of sediment from the construction site.	Same as Alternative 1.	The project would have no impact on Uvas Creek because it is not within the footprint of Alternative 3.	Same as Alternative 3.
Uvas-Carnadero Creek Palustrine Forested Wetlands	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new roadway crossing along relocated Bloomfield Avenue with piers in the wetland, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would avoid Uvas-Carnadero Creek Palustrine Forested Wetlands.	Same as Alternative 1.	The project would have no impact on Uvas-Carnadero Creek Palustrine Forested Wetlands because it is not within the footprint of Alternative 3.	Same as Alternative 3.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 14	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would relocate Constructed Watercourse 14 along the toe of the embankment for the Bloomfield Avenue grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would avoid Uvas-Carnadero Creek Palustrine Forested Wetlands. Operations would avoid Constructed Watercourse 14.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 14 because it is not within the footprint of Alternative 3.	Same as Alternative 3.
Palustrine Forested Wetland 8	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would partially fill Palustrine Forested Wetland 8 for the Bloomfield Avenue grade separation, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the wetland, such as vegetation management.	Same as Alternative 1.	The project would have no impact on Palustrine Forested Wetland 8 because it is not within the footprint of Alternative 3.	Same as Alternative 3.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 135	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would fill Constructed Watercourse 135 within the proposed HSR right-of-way, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the embankment would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 135 because it is not within the footprint of Alternative 3.	The project would fill the watercourse within the limits of the South Gilroy MOWF or relocate the waterbody to be outside the proposed South Gilroy MOWF. This work would require temporary stream diversion, dewatering, and work in the waterbody, which may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the MOWF would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.
Constructed Watercourse 15	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Wetland 15 because it is within temporary construction easements. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.	Same as Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 15 to construct a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 15.
Seasonal Wetland 5	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Seasonal Wetland 5 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	The project would result in minor disturbances to Seasonal Wetland 5 because it is within the existing Hollister Freight Branch railroad right-of-way. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the wetland, such as vegetation management.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 16	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct new culverts and relocate a portion of Constructed Watercourse 16, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 16, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 16 because it is not within the footprint of Alternative 3.	The project would relocate a portion of Constructed Watercourse 16 and cross the South Gilroy MOWF in a new culvert, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 16, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.
Pajaro River Palustrine Forested Wetlands	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new viaduct crossing over Pajaro River Palustrine Forested Wetlands with piers in the wetland, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pajaro River Palustrine Forested Wetlands, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Pajaro River Palustrine Forested Wetlands because it is not within the footprint of Alternative 3.	Same as Alternative 1.
Constructed Watercourse 157 and 158	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to the watercourses because they are located within a temporary constructed easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourses.	Same as Alternative 1.	The project would result in minor disturbances to the watercourses due to the construction of a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourses.	Same as Alternative 3.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 159	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 159 watercourses due to the construction of a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Constructed Watercourse 17	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would relocate Constructed Watercourse 17 around a proposed viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Constructed Watercourse 17, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 17 because it is not within the footprint of Alternative 3.	Same as Alternative 1.
Constructed Watercourse 18	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 18 because it is within a staging area. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 18.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 18 because it is not within the footprint of Alternative 3.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 19	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 19 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 19.	Same as Alternative 1.	The project would have no impact on Constructed Watercourse 19 because it is not within the footprint of Alternative 3.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Millers Canal	Central Coast	None designated in the Basin Plan	Chlorophyll-a, E. coli, fecal coliform, low dissolved oxygen, nitrate, pH, temperature, toxicity, turbidity	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new viaduct crossing with a pier inside the channel banks, requiring temporary stream diversion and dewatering, and a new utility crossing over Millers Canal. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Millers Canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Reduced shading over Millers Canal from vegetation management and discharges of iron from brake dust, PAHs, may exacerbate the low dissolved oxygen impairment through increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the fecal coliform impairment. Construction near or in Millers Canal, vegetation management during construction and operations, and discharges of brake dust, PAHs, and other contaminants from trains may exacerbate the turbidity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste and sediment during the construction phase. Construction of the concrete viaduct structure may temporarily exacerbate the pH impairment.	Same as Alternative 1.	The project would construct a new viaduct crossing, a new culvert or bridge requiring temporary stream diversion and dewatering, and a new high-voltage utility crossing over Millers Canal. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Millers Canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Reduced shading over Millers Canal from vegetation management and discharges of iron from brake dust, PAHs, may exacerbate the low dissolved oxygen impairment through increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the fecal coliform impairment. Construction near or in Millers Canal, vegetation management during construction and operations, and discharges of brake dust, PAHs, and other contaminants from trains may exacerbate the turbidity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste and sediment during the construction phase.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 134	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 134 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would construct a viaduct over the watercourse and relocate the watercourse to cross below the viaduct at a perpendicular angle, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Grading to relocate the channel would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.
Constructed Watercourse 136	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 136 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would construct a viaduct over the watercourse and relocate the watercourse to flow around a viaduct pier, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Grading to relocate the channel would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 137	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a viaduct over the watercourse and relocate the watercourse to flow around a viaduct pier, requiring temporary stream diversion, dewatering, and work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Grading to relocate the channel would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 137 due to construction of a new high-voltage utility line. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 137.	Same as Alternative 1.
Constructed Watercourse 20, 21, and 22	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would build a viaduct over Constructed Watercourse 20, 21, and 22 and relocate the watercourses around proposed viaduct piers, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near watercourses, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on the watercourses because they are not within the footprint of Alternative 3.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 23	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would build a viaduct over Constructed Watercourse 23, relocate the watercourse around a proposed viaduct pier, which would require temporary stream diversion and dewatering, and build a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Constructed Watercourse 23, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would result in minor disturbances to Constructed Watercourse 23 due to construction of a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Watercourse 12.	Same as Alternative 1.
Marsh 2	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Marsh 2 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would partially fill Marsh 2 for improvements along Lake Road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid Marsh 2.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 25	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 25 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would construct a culvert within Constructed Watercourse 25, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid Constructed Watercourse 25.	Same as Alternative 1.
Constructed Watercourse 138	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 138 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would build a viaduct over Constructed Watercourse 138 and relocate the watercourse around a proposed viaduct pier, which would require temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Constructed Watercourse 138, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 26	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a culvert within Constructed Watercourse 26, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 26, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would relocate Constructed Watercourse 26 around a proposed viaduct pier and construct new culverts for access roads, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and access roads would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Constructed Watercourse 26, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.
Tequisquita Slough, Tequisquita Slough Ponds 1 and 2, Tequisquita Slough Marsh, Tequisquita Slough Seasonal Wetlands 1 and 2	Central Coast	GWR, REC-1, REC-2, WILD, WARM, SPWN, COMM	Ammonia, chlorophyll-a, fecal coliform, low dissolved oxygen, pH, toxicity, turbidity	Table 3-5 Cadmium: 0.003 milligrams per liter in hard water[3], 0.0004 milligrams per liter in soft water Dissolved oxygen: shall not be reduced below 7.0 milligrams per liter Fecal coliform[1, 2] pH: 7.0 minimum, 8.3 maximum Phenol: 1.0 microgram per liter maximum Temperature: 5 degrees Fahrenheit increase maximum Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU	The project would construct an embankment within Tequisquita Slough Pond 1 with equalizer culverts to allow flood flows to pass through the embankment. Additionally, an area would be excavated so surface water can flow around the embankment and cross below a viaduct section. This work would require temporary stream diversion and dewatering. A new high-voltage utility line would be constructed over the marsh and seasonal wetland 2, resulting in minor disturbances. All of this work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near these waterbodies, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Tequisquita Slough, pond 2, and seasonal wetland 1 would not be impacted because	Same as Alternative 1.	The project would construct an embankment within Tequisquita Slough with equalizer culverts to allow flood flows to pass through the embankment. Additionally, an area would be excavated so surface water can flow around the embankment and cross below a viaduct section. Pond 2, the marsh, and seasonal wetland 1 would also be partially filled for the track embankment. A new high-voltage utility would be constructed over seasonal wetland 2. All of this work would require temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these waterbodies would change their slopes, affecting the path, speed, and volume of existing discharges into the waterbodies. These modifications would also affect the path, speed, and volume of existing flows within	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
				Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	they are not within the footprint of Alternative 1. Reduced shading over the waterbodies from vegetation management and discharges of iron from brake dust may exacerbate the low dissolved oxygen impairment through increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the fecal coliform impairment. Work in and near the waterbodies during construction, vegetation management, and discharges from brake dust and PAHs may exacerbate the turbidity impairment. Construction of the concrete viaduct structures may exacerbate the pH impairment. Accidental discharges of any pollutant may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste, sediment, and alkalinity associated with concrete, and accidental leaks and spills during the construction phase.		the waterbodies. Grading and fill for the new crossings would also change the path, speed, and volume of existing discharges to and existing flows within all waterbodies. Operations would include intermittent work in or near these waterbodies such as vegetation management, and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Tequisquita Slough Pond 1 would not be impacted because it is not within the footprint of Alternative 3. Reduced shading over these waterbodies from vegetation management and discharges of iron from brake dust may exacerbate the low dissolved oxygen impairment through increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the fecal coliform impairment. Work in and near the waterbodies during construction, vegetation management, and discharges of brake dust and PAHs may exacerbate the turbidity impairment. Construction of the concrete viaduct structures may exacerbate the pH impairment. Accidental discharges of any pollutant may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste, sediment, and alkalinity associated with concrete, and accidental leaks and spills during the construction phase.	

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 27	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Constructed Watercourse 27 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would construct a new culvert within Constructed Watercourse 27, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Watercourse 27, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.
Pacheco Creek	Central Coast	MUN, AGR, GWR, REC-1, REC-2, WILD, COLD, MIGR, SPWN, BIOL, RARE, FRESH, COMM	Fecal coliform, low dissolved oxygen, turbidity	Table 3-1, Table 3-2, Table 3-3, Table 3-4, Table 3-5 Cadmium: 0.003 milligrams per liter in hard water[3], 0.0004 milligrams per liter in soft water Dissolved oxygen: shall not be reduced below 7.0 milligrams per liter Fecal coliform[1, 2] pH: 7.0 minimum, 8.3 maximum Phenol: 1.0 microgram per liter maximum Temperature: 5 degrees Fahrenheit increase maximum Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	The project would construct new viaduct crossings with piers in the channel or on the banks, new tunnel crossings, and a new high-voltage utility crossing over Pacheco Creek. Additionally, some cut/fill may be required within the creek banks in order to build an embankment and minimize landslide risk. This work would require temporary stream diversion and dewatering, and it could potentially result in erosion or discharge of polluted runoff. Tunnel construction may affect the hydrology of Pacheco Creek through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Grading and fill for the new crossings would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pacheco Creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Reduced shading over Pacheco Creek from vegetation management and discharges of iron from brake dust, PAHs, may exacerbate the low dissolved oxygen impairment through	Same as Alternative 1.	The project would construct a new viaduct crossing with piers in the channel or on the banks, new tunnel crossings, and high-voltage utility crossings. Additionally, some cut/fill may be required within the creek banks in order to build an embankment and minimize landslide risk. This work would require temporary stream diversion and dewatering, and it could potentially result in erosion or discharge of polluted runoff. Tunnel construction may affect the hydrology of Pacheco Creek through a lowering of the groundwater table. Project features require minimizing groundwater withdrawal and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Grading and fill for the new crossings would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pacheco Creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
					increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the fecal coliform impairment. Work in and near Pacheco Creek during construction, vegetation management, bridge maintenance, and discharges from brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Accidental discharges of any pollutant may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste and sediment and accidental spills during the construction phase.		dust, PAHs, and other contaminants from trains. Vegetation management, reduced shading over Pacheco Creek, and discharges of iron from brake dust, PAHs, may exacerbate the low dissolved oxygen impairment through increased water temperatures and stimulation of microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the fecal coliform impairment. Work in and near Pacheco Creek during construction, vegetation management, bridge maintenance, and discharges from brake dust, PAHs, may exacerbate the turbidity and sedimentation impairments. Accidental discharges of any pollutant may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste and sediment and accidental spills during the construction phase.	
Pacheco Creek Tributary 1	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would relocate Pacheco Creek Tributary 1 around a proposed viaduct pier, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pacheco Creek Tributary 1, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Pacheco Creek Tributary 1 because it is not within the footprint of Alternative 3.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Seasonal Wetland 7	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new viaduct crossing over Seasonal Wetland 7, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Seasonal Wetland 7, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Seasonal Wetland 7 because it is not within the footprint of Alternative 3.	Same as Alternative 1.
Marsh 4	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new utility crossing over Marsh 4, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Marsh 4.	Same as Alternative 1.	The project would partially fill Marsh 4 for the track embankment and construct a new viaduct crossing, requiring temporary stream diversion and dewatering. A new high-voltage utility crossing would also be constructed over Marsh 4. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Marsh 4, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Seasonal Wetland 8	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new utility crossing over Seasonal Wetland 8 and a new viaduct crossing with piers in the wetland, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Seasonal Wetland 8, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would partially fill Seasonal Wetland 8 for the track embankment and construct a new viaduct crossing with piers in the wetland, requiring work in the waterbody. A new high-voltage utility crossing would also be constructed over Seasonal Wetland 8. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges to and existing flows within the waterbody. Operations would include intermittent work in or near Seasonal Wetland 8 such as vegetation management and culvert/bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.
Constructed Watercourse 28	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 28 during construction of a new utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Constructed Wetland 28.	Same as Alternative 1.	The project would construct a new culvert within Constructed Watercourse 28, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Constructed Wetland 28, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Palustrine Forested Wetland 10	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would build a viaduct over Palustrine Forested Wetland 10 with a pier in the wetland, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the wetland such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	The project would have no impact on Palustrine Forested Wetland 10 because it is not within the footprint of Alternative 3.	Same as Alternative 1.
Palustrine Forested Wetland 2	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would have no impact on Palustrine Forested Wetland 2 because it is not within the footprint of Alternative 1.	Same as Alternative 1.	The project would partially fill Palustrine Forested Wetland 2 for the track embankment, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would result in continuous discharges of brake dust and other contaminants from trains.	Same as Alternative 1.
Marsh 5	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Marsh 5 during construction of a new utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Marsh 5.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 29	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would relocate and construct a new culvert within Constructed Watercourse 29, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the waterbody, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1	The project would have no impact on Constructed Watercourse 29 because it is not within the footprint of Alternative 3.	Same as Alternative 1
Constructed Watercourse 30	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would relocate Constructed Watercourse 30, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid Constructed Watercourse 30.	Same as Alternative 1	The project would relocate Constructed Watercourse 30 along the northern toe of the track embankment and to cross below a proposed viaduct, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Constructed Watercourse 30, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Seasonal Wetland 9	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new utility crossing over Seasonal Wetland 9, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Seasonal Wetland 9.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Ortega Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would install temporary roadway crossings within the creek during construction, requiring work in the waterbody, and construct four new high-voltage utility crossings over Ortega Creek. This work may potentially result in erosion or discharge of polluted runoff. Groundwater inflows during tunnel construction may affect the hydrology of Ortega Creek's tributaries, resulting in altered stream flows in Ortega Creek. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would avoid the creek.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Seasonal Wetland 10	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Seasonal Wetland 10 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Ortega Creek Tributary 1	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Ortega Creek Tributary 1 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Ortega Creek Tributary 2	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Ortega Creek Tributary 2 during construction of a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Ortega Creek Tributary 3	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Ortega Creek Tributary 3 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Ortega Creek Tributary 4	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would temporarily impact the hydrology of Ortega Creek Tributary 4 from tunnel construction. Groundwater inflows during tunnel construction may affect the hydrology of Ortega Creek Tributary 4 through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would avoid the waterbody.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Ortega Creek Tributary 5	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would temporarily impact the hydrology of Ortega Creek Tributary 5 from tunnel construction. Groundwater inflows during tunnel construction may affect the hydrology of Ortega Creek Tributary 5 through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Additionally, the project may permanently modify the creek to minimize landslide risk, depending on the final grading plan. Permanent modifications to the waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody, and it would require work to be performed within the waterbody. This work may potentially result in erosion or discharge of polluted runoff, and the modifications may affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Ortega Creek Tributary 5, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Ortega Creek Tributary 6	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify Ortega Creek Tributary 6 due to earthwork required to minimize landslide risk, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Ortega Creek Tributary 6, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Ortega Creek Tributary 7	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Ortega Creek Tributary 7 because it is within a staging area. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Ortega Creek Tributary 8, 9, 10, and 11	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify these creeks due to earthwork required to minimize landslide risk, requiring work in the waterbodies. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these waterbodies would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creeks, such as vegetation management.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Ortega Creek Tributary 13, 14, and 15	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to these creeks due to construction of new high-voltage utility crossings. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these creeks.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Pond 2	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify Pond 2 due to earthwork required to minimize landslide risk, requiring work in the pond. This work may potentially result in erosion or discharge of polluted runoff. Modifications to pond would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid the pond.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Pond 3	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would install a temporary roadway crossing over Pond 3, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the waterbody.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pacheco Creek Tributary 2 and 3	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would temporarily impact the hydrology of Pacheco Creek Tributary 2 and 3 from tunnel construction. Groundwater inflows during tunnel construction may affect the hydrology of these creeks through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would avoid the waterbody.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Pacheco Creek Tributary 4	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would temporarily impact the hydrology of Pacheco Creek Tributary 4 from tunnel construction and permanently modify the waterbody for landslide minimization, requiring work in the waterbody. Groundwater inflows during tunnel construction may affect the hydrology of Pacheco Creek Tributary 4 through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Permanent modifications to the waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody, and it would require work to be performed within the waterbody. This work may potentially result in erosion or discharge of polluted runoff, and the modifications may affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Pacheco Creek Tributary 4, such as vegetation management.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pond 4, 5, and 13	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify these ponds to minimize landslide risk, requiring work in the ponds. Permanent modifications to the ponds would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody, and it would require work to be performed within the waterbody. This work may potentially result in erosion or discharge of polluted runoff, and the modifications may affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid the ponds.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Pacheco Creek Tributary 56	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Pacheco Creek Tributary 56 due to construction of a new high-voltage utility crossing. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pacheco Creek Tributary 5	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would temporarily impact the hydrology of Pacheco Creek Tributary 5 from tunnel construction , install a new culvert at the tunnel portal, and permanently modify the creek to minimize landslide risk. Groundwater inflows during tunnel construction may affect the hydrology of Pacheco Creek Tributary 5 through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Permanent modifications to the waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody, and it would require work to be performed within the waterbody. This work may potentially result in erosion or discharge of polluted runoff, and the modifications may affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Pacheco Creek Tributary 5, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Pacheco Creek Tributary 6	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would involve construction of a new culvert at a proposed access road, a new culvert at the tunnel portal, and permanent modifications due to earthwork required to minimize landslide risk, all of which would require work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pacheco Creek Tributary 6, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pacheco Creek Tributary 31 and 32	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify these creeks to minimize landslide risk, requiring work in the creeks. Permanent modifications to the ponds would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody, and it would require work to be performed within the waterbody. This work may potentially result in erosion or discharge of polluted runoff, and the modifications may affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creeks, such as vegetation management.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Pacheco Creek Palustrine Forested Wetlands 2	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new viaduct crossing with piers in the wetland, requiring work in the waterbody, and new high-voltage utility crossings over Pacheco Creek Palustrine Forested Wetlands 2. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near Pacheco Creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Constructed Watercourse 31	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Constructed Watercourse 31 from construction of a new high-voltage utility line over the waterbody, and it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the waterbody.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pacheco Creek Tributary 7 and 8	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Pacheco Creek Tributary 7 and 8 from construction of a new high-voltage utility line. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these creek s.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Pacheco Pass Subsection								
Pacheco Creek	Central Coast	MUN, AGR, GWR, REC-1, REC-2, WILD, COLD, MIGR, SPWN, BIOL, RARE, FRESH, COMM	Fecal coliform, low dissolved oxygen, turbidity	Table 3-1, Table 3-2, Table 3-4, Table 3-5, Table 3-7 Cadmium: 0.003 milligrams per liter in hard water[3], 0.0004 milligrams per liter in soft water Dissolved oxygen: shall not be reduced below 7.0 milligrams per liter Fecal coliform[1, 2] pH: 7.0 minimum, 8.3 maximum Phenol: 1.0 microgram per liter maximum Temperature: 5 degrees Fahrenheit increase maximum Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum	See entry for Pacheco Creek under the Morgan Hill and Gilroy subsection.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pond 6	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify Pond 6 due to earthwork required to minimize landslide risk, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near Pond 6, such as vegetation management.			
Pacheco Creek Tributary 9	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new culvert within Pacheco Creek Tributary 9, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent activities in or near the creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Pacheco Creek Tributary 10	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify Pacheco Creek Tributary 10 due to earthwork required to minimize landslide risk, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent activities in or near the creek, such as vegetation management.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Carmen Creek and Carmen Creek Tributary 1	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would install one temporary roadway crossing, requiring work in the waterbody, and a new high-voltage utility line over the creek. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Carmen Creek.			
Pacheco Creek Tributary 33, 34, 35, 36, 38, 39, and 40	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify these creeks due to earthwork required to minimize landslide risk, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent activities in or near the creeks, such as vegetation management. Operations would also result in continuous discharges of brake dust, PAHs, and other contaminants from trains into Pacheco Creek Tributary 38.			
Pacheco Creek Tributary 37 and 41	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Pacheco Creek Tributary 37 and 41 because they are located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these creeks.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pond 7, 8, and 9	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify Pond 7, 8, and 9 due to earthwork required to minimize landslide risk, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid these ponds.			
Pacheco Creek Tributary 42	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Pacheco Creek Tributary 42 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.			
Pacheco Creek Tributary 11 and 12	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would install temporary roadway crossings, requiring work in the waterbodies, and a new high-voltage utility line over the creeks. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Pacheco Creek Tributary 11 and 12.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pacheco Creek Tributary 13 and 14	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct new culverts within Pacheco Creek Tributary 13 and 14, requiring work in the waterbodies. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these waterbodies would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbodies. Operations would include intermittent work in or near the creeks, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Pacheco Creek Tributary 15	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Pacheco Creek Tributary 15 because it is within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the waterbody.			
Pacheco Creek Tributary 16	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a new culvert in the creek, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the waterbody, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 139	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to the watercourse during construction of a new high-voltage utility line over the creek. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Elephant Head Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would install a temporary roadway crossing, requiring work in the waterbody, and a new high-voltage utility line over the creek. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Elephant Head Creek.			
Elephant Head Creek Tributary 1	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to the creek during construction of a new high-voltage utility line over the creek. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 140 and 141	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to the watercourses during construction of a new high-voltage utility line over their channels. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourses.			
Constructed Watercourse 142	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to the watercourse during construction of a viaduct near the channel. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse. Operations would include intermittent work in or near the watercourse, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 143	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would install a new culvert in the watercourse for a proposed access road, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the waterbody, such as vegetation management and culvert maintenance.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Pacheco Creek Tributary 17	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to the creek during construction of a new high-voltage utility line over the creek. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.			
Marsh 7	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to the marsh because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the marsh.			
Pacheco Creek Tributary 43 and 44	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to these creeks from construction of a new high-voltage utility line over the creeks. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creeks.			

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Harper Canyon Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Harper Canyon Creek to construct a new viaduct crossing without piers inside the channel and new utility crossings. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Harper Canyon Creek Tributary 1	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Harper Canyon Creek Tributary 1 because it is located within a staging area near the western portal of Tunnel 2. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the creek.			
Harper Canyon Creek Tributary 2	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would result in minor disturbances to Harper Canyon Creek Tributary 2 due to nearby earthwork associated with minimizing the risk of landslides and construction of the tunnel portal. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the creek, such as vegetation management.			

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Harper Canyon Creek Tributary 3	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify the creek due to earthwork to construct the western portal of Tunnel 2 and install a culvert at the proposed portal, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the waterbody, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Harper Canyon Creek Tributary 4	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would construct a viaduct over the creek, relocate the creek to flow around a viaduct pier, and install a culvert at a proposed access road, all of which would require work in the creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Pacheco Creek Tributary 19	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	Although the creek is located within the project footprint, it would be avoided by construction activities. Operations would include intermittent work in or near the creek, such as vegetation management.			

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Pond 10 and 11	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	There would be no impact on Pond 10 and 11 during construction, because the pond would be avoided during construction. Operations would include intermittent work in or near the ponds, such as vegetation management.			
Pacheco Creek Tributary 20	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would permanently modify Pacheco Creek Tributary 20 for landslide minimization, requiring work in the creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Pacheco Creek Tributaries 21 – 30, 46 – 55, and 57	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would temporarily impact the hydrology of Pacheco Creek Tributaries 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, and 57 from tunnel construction. Groundwater inflows during tunnel construction may affect the hydrology of these tributaries through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would avoid the waterbodies.			

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South Fork Pacheco Creek	Central Coast	None designated in the Basin Plan	None listed.	Dissolved oxygen: shall not be reduced below 5.0 milligrams per liter, median values should not fall below 85% saturation. pH: 7.0 minimum, 8.5 maximum. Turbidity: 20% maximum for natural turbidity between 0 to 50 NTU; 10 NTU change maximum for natural turbidity between 50 to 100 NTU; 10% maximum change for natural turbidity greater than 100 NTU. Unionized ammonia: 0.025 milligrams per liter (as nitrogen) maximum.	The project would temporarily impact the hydrology of South Fork Pacheco Creek from tunnel construction. Groundwater inflows during tunnel construction may affect the hydrology of South Fork Pacheco Creek through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would avoid the waterbody.			
San Luis Reservoir Tributaries 1 – 9	Central Valley	None designated in the Basin Plan. Beneficial uses of San Luis Reservoir apply: MUN, AGR, IND, POW, REC-1, REC-2, WILD, WARM	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would temporarily impact the hydrology of San Luis Reservoir Tributaries 1, 2, 3, 4, 5, 6, 7, 8, and 9 from tunnel construction. Groundwater inflows during tunnel construction may affect the hydrology of these waterbodies through a lowering of the groundwater table, which also may indirectly affect the hydrology of San Luis Reservoir. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would avoid the waterbodies.			
Cottonwood Creek and Tributaries 1 – 16	Central Valley	Beneficial uses of San Luis Reservoir apply: MUN, AGR, IND, POW, REC-1, REC-2, WILD, WARM	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would temporarily impact the hydrology of Cottonwood Creek and tributaries 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16 from tunnel construction. Groundwater inflows during tunnel construction may affect the hydrology of Cottonwood Creek through a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would avoid the waterbody.			
Romero Creek Tributary 1	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would involve the construction of a new tunnel crossing at Romero Creek Tributary 1, which may temporarily impact the hydrology of the creek from a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. The project would also result in minor disturbances to the creek because it is within a temporary construction easement, which may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the creek, such as vegetation management.			
Romero Creek	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct with a pier in the creek and a new utility crossing over Romero Creek. The project would also partially fill the creek and install a new culvert for an HSR access road, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. The project would also temporarily and indirectly impact the hydrology of Romero Creek from tunnel construction. This would occur because surface flows in Romero Creek Tributary 1 may be impacted from a lowering of the groundwater table. Project features require constructing and designing the tunnels to be as watertight as possible and controlling discharges of contaminated groundwater; however, these actions are not anticipated to avoid the impact from tunnel construction entirely. Operations would include intermittent work in or near the creek, such as vegetation management and bridge/culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Romero Creek Tributary 2	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new viaduct crossing over Romero Creek Tributary 2 and relocate the channel around a viaduct pier, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Romero Creek Tributary 3	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would permanently modify Romero Creek Tributary 3 due earthwork required to construct the embankment, requiring work in the waterbody. Additionally, the project would install a culvert in the creek for maintenance access. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Romero Creek Tributary 4 and 5	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct new culvert in Romero Creek Tributary 4 and 5 for an HSR access road, requiring work in the creeks. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these creeks would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the creeks. These modifications would also affect the path, speed, and volume of existing flows within the creeks. Operations would include intermittent work in or near these creeks, such as culvert maintenance.			
Romero Creek Tributary 6	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new viaduct crossing over Romero Creek Tributary 6. The project would also permanently modify the creek due earthwork required to construct the railbed embankment and install culverts for maintenance access, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the embankment would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Romero Creek Tributary 7	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Romero Creek Tributary 7 for an HSR access road, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as culvert maintenance.			
Romero Creek Tributary 8	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new wildlife crossing/culvert at the track embankment within Romero Creek Tributary 8, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Seasonal Wetland 20 and 21	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would temporarily disturb the wetlands from construction of an HSR access road. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near these wetlands, such as culvert maintenance.			
Romero Creek Tributary 10	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Romero Creek Tributary 10 for an HSR access road, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management.			
Romero Creek Tributary 11 and 12	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would temporarily disturb these creeks because they are located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these creeks.			
Romero Creek Tributary 13	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would permanently modify the creek due to earthwork required to construct the track embankment and install a new culvert for maintenance access, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management.			
Romero Creek Tributary 14	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would permanently modify Romero Creek Tributary 14 due to earthwork required to construct the track embankment, install a new culvert at the track embankment, and install a new culvert for maintenance access, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Romero Creek Tributary 15	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would permanently modify the creek due to earthwork required to construct the track embankment and install a new culvert for maintenance access, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management.			
Romero Creek Tributary 16	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a new culvert for maintenance access, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management.			

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Romero Creek Tributary 17 and 18	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct over the creeks and install culverts for maintenance access, requiring work in the creeks. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Romero Creek Tributary 19	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a new culvert for maintenance access, requiring work in the creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management.			
Romero Creek Tributary 20	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a new culvert at the track embankment, requiring work in the creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Romero Creek Tributary 21	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would permanently modify the creek due to earthwork required to construct the track embankment and install a new culvert at the embankment, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the creek, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Alkali Vernal Pool Complex 1	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill a portion of the vernal pool to construct an HSR access road and install a culvert at the access road, requiring work in the vernal pool. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the access road would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the vernal pool, such as bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Seasonal Wetland 11	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill a portion of the wetland to construct an HSR access road and install a culvert at the access road, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the access road would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the wetland, such as vegetation management and culvert maintenance.			
California Aqueduct	Central Valley	MUN, AGR, PROC, IND, POW, REC-1, REC-2, WILD	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would protect California Aqueduct in place during construction of a viaduct over the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the aqueduct, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Seasonal Wetland 12	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would partially fill Seasonal Wetland 12 for the track embankment, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Delta-Mendota Canal	Central Valley	MUN, AGR, REC-1, REC-2, WARM, WILD	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would protect Delta-Mendota Canal in place during construction of a viaduct over the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 32	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the channel around the embankment to cross below the viaduct, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 33	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 33 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the waterbody.			
Outside Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would protect Outside Canal in place during construction of a viaduct over the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 34	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate Constructed Watercourse 34 to cross below the proposed viaduct, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 35	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Constructed Watercourse 35, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Constructed Watercourse 36	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Constructed Watercourse 36, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the waterbody. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
San Joaquin Valley Subsection								
Constructed Watercourse 37	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct crossing over Constructed Watercourse 37and a new culvert within the watercourse, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 38	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct over the watercourse and relocate a portion of the watercourse, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 145	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a culvert in the watercourse for emergency access, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance.			
Constructed Basin 14	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a culvert in the basin for emergency access, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this basin would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the basin. These modifications would also affect the path, speed, and volume of existing flows within the basin. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the basin, such as vegetation management and culvert maintenance.			
Constructed Watercourse 39	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to flow around a proposed viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Constructed Watercourse 162	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a culvert in the watercourse for emergency access, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance.			
Constructed Watercourse 40	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill the watercourse within the proposed HSR right-of-way, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Main Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Main Canal to protect the canal in place during construction of a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Basin 9	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct over Constructed Basin 9 with piers in the basin, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the basin, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 41	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to flow around proposed viaduct piers, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 43	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 43 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the waterbody.			
Constructed Watercourse 44	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Constructed Watercourse 44, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Constructed Watercourse 160	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 160 because it is located within the proposed HSR right-of-way but no improvements are proposed. Operations would include intermittent work in or near the watercourse, such as vegetation management			
Constructed Watercourse 45	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Constructed Watercourse 45, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 146	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 146 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Constructed Watercourse 47	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would extend the existing culvert for the proposed access road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance.			
Constructed Watercourse 48	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert to cross below the embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Grading and fill for the grade separation and farm access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 165	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new viaduct over the watercourse and relocate the watercourse around a viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Grading and fill for the grade separation and farm access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Alkali Scrub Wetland 1	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would partially fill Alkali Scrub Wetland 1 to construct a proposed access road, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the access road would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the wetland.			

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Alkali Scrub Wetland 7	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to the wetland because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.			
Natural Watercourse 2	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert to cross below a proposed access road, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the waterbody, such as culvert maintenance.			
San Luis Wasteway	Central Valley	AGR (L), WILD (L), WARM, BIOL	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to San Luis Wasteway during construction of a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Seasonal Wetland 22	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would temporarily disturb the watercourse during construction of a viaduct over the wetland, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the waterbody, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Alkali Scrub Wetland 2	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new viaduct crossing over Alkali Scrub Wetland 2 and partially fill the wetland for maintenance access, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the wetland, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Alkali Scrub Wetland 3	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would partially fill Alkali Scrub Wetland 3 for maintenance access, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the maintenance access road would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Seasonal Wetland 23	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct with a column in the wetland and partially fill the wetland, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the wetland, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Alkali Scrub Wetland 4	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Alkali Scrub Wetland 4 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the wetland.			
Alkali Scrub Wetland 8	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would partially fill Alkali Scrub Wetland 8 for maintenance access, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the maintenance access road would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Alkali Scrub Wetland 9	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would completely fill this small wetland in order to construct a viaduct pier, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. This would also cause a depletion of water resources within the project extent. Operations would not affect the wetland.			
Constructed Watercourse 51	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 51 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Constructed Watercourse 52	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert within Constructed Watercourse 52 and relocate a portion of the channel along the embankment for the Henry Miller Road grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the embankment would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Constructed Watercourse 53	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 53 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Constructed Watercourse 54	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to the watercourse, because it is located in a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			

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Constructed Watercourse 55	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert where the watercourse crosses the track embankment, a new culvert where the watercourse would cross relocated Henry Miller Road, and relocate a portion of the watercourse, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and relocated Henry Miller Road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 56	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct two new culverts in Constructed Watercourse 56, one for the track embankment and one for the driveway to the proposed traction power facility, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 57	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Constructed Watercourse 57, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 58	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to the watercourse because it is located in a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Constructed Watercourse 59	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would completely fill Constructed Watercourse 59 for the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. This would also cause a depletion of water resources within the project extent. Operations would not affect the watercourse.			
Constructed Watercourse 60	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would no impact on Construct Watercourse 60 because it would be protected during construction and operations would avoid the watercourse.			
Constructed Watercourse 61	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Constructed Watercourse 61, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 62, 63, 64, and 65	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate these constructed watercourses to the toe of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these waterbodies would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new embankment would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 66	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate a portion of the watercourse and provide a culvert where it crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 67	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate Constructed Watercourse 67 along the toe of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 68	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse around a proposed viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 147	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate Constructed Watercourse 147 along the toe of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 148	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would completely fill this watercourse to build the track embankment and for maintenance access, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. This would also cause a depletion of water resources within the project extent. Operations would not affect the watercourse.			
Constructed Watercourse 149 and 163	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to these constructed watercourses because they are located within a staging area. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these waterbodies.			

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Los Banos Creek	Central Valley	AGR (L), WILD (L), WARM, BIOL	Indicator bacteria, total dissolved solids, low dissolved oxygen, toxicity	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Los Banos Creek to construct a new viaduct without piers inside the channel and protect the creek in place. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains. Reduced shading over Los Banos Creek from vegetation management and discharges of iron from brake dust, PAHs, may exacerbate the low dissolved oxygen impairment through increased water temperatures and increased microorganism growth. Discharges of bacterial pathogens from sanitary waste during construction may exacerbate the indicator bacteria impairment. Accidental discharges of any pollutant may exacerbate the toxicity impairment. Construction site BMPs would avoid or minimize the potential for discharging sanitary waste and accidental leaks and spills during the construction phase.			
Los Banos Creek Tributary 1	Central Valley	AGR (L), WILD (L), WARM, BIOL	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would temporarily disturb the creek because of construction of viaduct footings, requiring work in the waterbody. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the creek, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 69	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to flow around a viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 70	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to flow around a viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 71	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct over the watercourse and relocate the watercourse to cross below a proposed access road with a new culvert, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 72	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert to cross below the track embankment and a proposed access road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Constructed Basin 15	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would completely fill this basin to build the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. This would also cause a depletion of water resources within the project extent. Operations would not affect the basin.			
Seasonal Wetland 13	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would partially fill Seasonal Wetland 13 to construct a proposed access road, requiring work in the wetland. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the access road would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the wetland.			
Constructed Watercourse 73	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert where the watercourse crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 76	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert where the watercourse crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 77	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct two new culverts, one where the watercourse crosses the track embankment and one where the watercourse crosses a proposed access road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and access road would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in or near the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 78	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to the south side of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			

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Constructed Watercourse 79 and 80	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourses to the south side of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these waterbodies would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 81	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 81 because it is located within a utility temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Constructed Watercourse 82	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a temporary culvert for a temporary detour at the Mercy Springs grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the grade separation road would change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Santa Fe Canal	Central Valley	AGR (L), WILD (L), WARM, BIOL	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new reinforced concrete box culvert where the canal crosses the rail embankment and install a temporary culvert for a temporary detour at the Mercy Springs grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Vernal Pool 4	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill a majority of Vernal Pool 4 for the track embankment and a proposed access road, requiring work in the vernal pool. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the area and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and access road would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 84	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 84 because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
San Luis Drain	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new reinforced concrete box culvert where the drain crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Luis Canal	Central Valley	AGR (L), WILD (L), WARM, BIOL	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new reinforced concrete box culvert where the canal crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Porter-Blake Bypass	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate a portion of the canal and construct a new culvert where the canal crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 85 and 86	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourses south of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges to and existing flows within the waterbody. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Mud Slough Alkali Marshes	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct with piers in the marshes, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the marshes, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Mud Slough, Mud Slough Alkali Marshes, and Alkali Scrub Wetland 10, 11, 12, and 13	Central Valley	AGR (L), REC-1, REC-2, WILD, WARM, SPWN, COMM, SHELL	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a viaduct that crosses over Mud Slough and adjacent wetlands with piers in the waterbodies, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the waterbodies, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 87	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate Constructed Watercourse 87 around a proposed viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 88	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate Constructed Watercourse 88 around a proposed viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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San Pedro Canal	Central Valley	AGR (L), WILD (L), WARM, BIOL	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to San Pedro Canal during construction of a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around San Pedro Canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 89	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate Constructed Watercourse 89 around a proposed viaduct pier, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 90	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to the watercourse because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Constructed Watercourse 164	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to the watercourse because it is located within a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Boundary Drain	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Boundary Drain during construction of a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around Boundary Drain, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Lone Tree Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new 4-foot by 3-foot reinforced concrete box culvert to cross the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Devon Drain	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new 6-foot by 4-foot reinforced concrete box culvert to cross the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Constructed Watercourse 92	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert in Constructed Watercourse 92 and fill a portion of the watercourse for the proposed Delta Road grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the proposed grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Constructed Watercourse 93	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the channel to the west of the Delta Road grade separation and provide a culvert to cross the Delta Road to Henry Miller Road connector, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the proposed grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Midway Swamp Ditch	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a temporary culvert in Midway Swamp Ditch for a temporary roadway required to construct the Delta Road grade separation. Additionally, the project would install a new 48-inch reinforced concrete pipe culvert where the ditch crosses the track embankment and relocate a portion of the ditch south of Henry Miller Road along the toe of the Delta Road embankment. Temporary stream diversion and dewatering is required. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the ditch, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 94, 95, 96, and 97	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to these watercourses because they are located in a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid these watercourses.			
Constructed Watercourse 98	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a culvert within Constructed Watercourse 98 to cross a proposed access road and relocate the channel to flow into relocated Midway Swamp Ditch, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the proposed access road would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Constructed Watercourse 150	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a culvert in Constructed Watercourse 150 to cross the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and bridge maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 99	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to the watercourse because it is located in a temporary construct easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in and around the watercourse, such as vegetation management and bridge maintenance.			

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Constructed Watercourse 100	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a new culvert where Constructed Watercourse 100 crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
West Delta Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate a portion of the canal on the south side of Henry Miller Road and extend the existing culvert where the canal crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
West Delta Drain	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate a portion of the canal on the south side of Henry Miller Road and install a new 7-foot by 3-foot reinforced concrete box culvert where the canal crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 151	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill the watercourse within the proposed HSR right-of-way, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 152	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a culvert where the watercourse crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 101	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to maintain connectivity with relocated West Delta Drain, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would avoid the watercourse.			
Dambrosa Branch No. 1	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new reinforced concrete box culvert for Dambrosa Branch No. 1 where it crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

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Constructed Watercourse 102	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 102 because it is located in a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			
Constructed Watercourse 103	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate a portion of the watercourse to flow along the south side of the MOWS and construct a new culvert for the watercourse to cross the MOWS and track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and MOWS would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 104	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to maintain connectivity with relocated Constructed Watercourse 103, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Delta Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a temporary culvert for the construction of the Turner Island Road grade separation and construct a new culvert where Delta Canal crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the proposed grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 105	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert where Constructed Watercourse 105 crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
East Delta Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new reinforced concrete box culvert where East Delta Canal crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 107	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert where Constructed Watercourse 107 crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 108	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill the watercourse for the track embankment and relocate the watercourse to connect with Constructed Watercourse 109 on the south side of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 109	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to the south of the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 110, 111, 112, and 113	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert these watercourses cross the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to these watercourses would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbodies. These modifications would also affect the path, speed, and volume of existing flows within these watercourses. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around these watercourses, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 114	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to the west of the Turner Island Road grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Belmont Drain	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	During construction of the Turner Island Road grade separation, a temporary culvert in Belmont Drain would be provided for a temporary roadway detour. The project would construct a new culvert where Belmont Drain crosses the track embankment and two new culverts where Belmont Drain crosses the Turner Island Road grade separation. Temporary stream diversion and dewatering is required. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
County Road Ditch	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	During construction of the Turner Island Road grade separation, a temporary culvert in County Road Ditch would be provided for a temporary roadway detour. The project would relocate the channel west of the Turner Island Road grade separation. Temporary stream diversion and dewatering is required. Temporary stream diversion and dewatering is required. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the grade separation would also change the path, speed, and volume of existing. Operations would avoid County Road Ditch.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Willis Branch	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	During construction of the Turner Island Road grade separation, a temporary culvert would be provided for a temporary roadway detour. The project would also relocate the Willis Branch to the west of the Turner Island Road grade separation and install new culverts to cross the track embankment. Temporary stream diversion and dewatering is required. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 153	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate or fill the watercourse for the Turner Island Road grade separation, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Poso Drain	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the canal to the east side of the Turner Island Road grade separation and install a new culvert to pass below track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the drain, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 115	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to the east side of the Turner Island Road grade separation and construct a new culvert for a proposed farm access road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new access road and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Constructed Watercourse 116	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the watercourse to the north of the proposed HSR right-of-way, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new access road and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 117	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 117. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 118	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert where the watercourse crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Delta No. 1 Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new culvert where the canal crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 154	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill the watercourse within the proposed HSR right-of-way, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 155	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would install a new culvert in the watercourse at the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the watercourse, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
Constructed Watercourse 119	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill the watercourse within the proposed HSR right-of-way, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing and grade separation would also change the path, speed, and volume of existing discharges and flows. Operations would result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
San Juan Drain	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would construct a new reinforced concrete box culvert in San Juan Drain where it crosses the track embankment and a new culvert where it crosses the intersection of Carlucci Road and relocated Hutchins Road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would include intermittent work in and around the canal, such as vegetation management and culvert maintenance, as well as result in continuous discharges of brake dust, PAHs, and other contaminants from trains.			
West San Juan No. 1 Canal	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would protect the existing culvert and construct a new culvert where it crosses the track embankment, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the new crossing would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the canal.			

Waterbody	RWQCB	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the RWQCBs' Basin Plans)	Alternative 1 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 2 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 3 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative 4 Impacts to Beneficial Uses, Listed Impairments, and Water Quality Objectives
Constructed Watercourse 120	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would fill a portion of the watercourse for a retaining wall along the northern edge of the Carlucci Road embankment on the south side of Henry Miller Road, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the retaining wall would also change the path, speed, and volume of existing discharges and flows. Operations would avoid the watercourse.			
Constructed Watercourse 121	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would relocate the channel around the proposed relocation of Hutchins Road to outfall into San Juan Drain. The project would also construct a new culvert at the watercourse to maintain connectivity with Constructed Watercourse 120 below Hutchins Road. Temporary stream diversion and dewatering is required. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this waterbody would change the channel length and slopes, affecting the path, speed, and volume of existing discharges into the waterbody. These modifications would also affect the path, speed, and volume of existing flows within the waterbody. Grading and fill for the relocated Hutchins Road would also change the path, speed, and volume of existing discharges to and existing flows within the waterbody. Operations would avoid Constructed Watercourse 121.			
Constructed Watercourse 123	Central Valley	None designated in the Basin Plan	None listed.	Dissolved oxygen: 5.0 milligrams per liter minimum. pH: 6.5 minimum, 8.5 maximum. Temperature: 5 degrees Fahrenheit change maximum. Turbidity: maximum change based on natural levels.	The project would result in minor disturbances to Constructed Watercourse 123, because it is located in a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid the watercourse.			

CDFW = California Department of Fish and Wildlife
CWA = Clean Water Act
BMP = best management practices
PPDG = Caltrans' Project Planning and Design Guide
NTU = Nephelometric Turbidity Units
RWQCB = Regional Water Quality Control Board
SWRCB = California State Water Resources Control Board
Authority = California High-Speed Rail Authority
MOWF = Maintenance of Way Facility
PAH = polycyclic aromatic hydrocarbons
AGR = agricultural supply; BIOL = preservation of biological habitats of special significance; COLD = cold freshwater habitat; COMM = commercial and sport fishing; FRSH = freshwater replenishment; GWR = groundwater recharge; IND = industrial service supply; (L) = limited beneficial use; MIGR = fish migration; MUN = municipal and domestic supply; POW = hydropower generation; PROC = industrial process supply; RARE = preservation of rare, threatened, or endangered species; REC-1 = water contact recreation; REC-2 = noncontact water recreation; SPWN = fish spawning, reproduction or early development; WARM = warm freshwater habitat; WILD = wildlife habitat
Waterbodies are listed from north to south along the project alignment.
Narrative water quality objectives in the jurisdictional RWQCB Basin Plans also apply to each waterbody unless otherwise specified in the Basin Plan; refer to EIR/EIS Volume 1, Section 3.8, Hydrology and Water Resources, for a list of narrative water quality objectives.
1 = Fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than 10% of the total number of samples taken during any 30-day period exceed 400/100 ml.
2 = Fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 2000/100 ml, nor shall more than 10% of samples collected during any 30-day period exceed 4000/100 ml.
3 = Hard water is defined as water exceeding 100 milligrams per liter calcium carbonate (CaCO3).

References

California Regional Water Quality Control Board, Central Coast Region. 2019. Water Quality Control Plan for the Central Coastal Basin.

California Regional Water Quality Control Board, Central Valley Region. 2018. The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region Fourth Edition the Sacramento River Basin and the San Joaquin River Basin.

California Regional Water Quality Control Board, San Francisco Bay Region. 2017. San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan).

APPENDIX 3.11-A: SAFETY AND SECURITY DATA

APPENDIX 3.11-A: SAFETY AND SECURITY DATA

Table 1 Number of Fatal and Nonfatal Train Accidents/Incidents by County, 2011–2016

County	Accidents/Incident			Casualties	
	Total	Type of Accident/Incident		Total Fatalities	Total Nonfatal Conditions
		Fatal	Nonfatal		
Santa Clara	187	37	150	37	129
San Benito	3	1	2	1	2
Merced	82	31	51	31	37
Total	**272**	**69**	**203**	**69**	**168**

Sources: FRA 2017a, 2017b, 2017c
Data are for January 2011 through December 2016.

Table 2 Types and Causes of Train Accidents/Incidents by County, 2011–2016

County	Type of Accident/Incident				Cause of Accident/Incident				
	Collision[1]	Derailment	Highway Railroad Crossing	Other[2]	Track	Signal	Human Error	Motive Power/ Equipment	Miscellaneous[3]
Santa Clara	1	3	30	153	1	0	3	1	182
San Benito	0	0	3	0	0	0	0	0	3
Merced	0	1	32	49	0	0	1	0	81
Total	**1**	**4**	**65**	**202**	**1**	**0**	**4**	**1**	**266**

Sources: FRA 2017a, 2017b, 2017c
Data are for January 2011 through December 2016.
[1] Collision accidents include head-on, rear-end, side, raking, broken-train, or heavy-rail collisions.
[2] Other accidents include trespassing incidents and activities such as getting on or off equipment, doing maintenance work, throwing switches, setting handbrakes, stumbling, and tripping.
[3] Miscellaneous causes of accidents include all accidents described under Other.

Table 3 At-Grade Crossing Incidents in the Region, 2011–2016

Cross Street	Railroad	Location	Number of Incidents				Incident Type	Number of Casualties	
			Total[1]	Property Damage[2]	Casualty	Not Reported[3]		Killed	Injured
Santa Clara County									
Charleston Road	PCMZ	Palo Alto	1	0	1	0	Vehicle	1	0
Charleston Street	PCMZ	Palo Alto	1	0	–	1	Pedestrian	---	--
Charleston Road	PCMZ	Palo Alto	1	0	0	0	Vehicle	0	0
East Meadow Drive	PCMZ	Palo Alto	1	0	–	1	Pedestrian	–	–
Charleston Road	PCMZ	Palo Alto	1	0	–	1	Pedestrian	–	–
Charleston Road	PCMZ	Palo Alto	1	0	–	1	Pedestrian	–	–
Charleston Road	PCMZ	Palo Alto	1	0	–	1	Pedestrian	–	–
East Meadow Drive	PCMZ	Palo Alto	1	1	0	0	Vehicle	0	0
East Meadow Drive	PCMZ	Palo Alto	1	1	0	0	Vehicle	0	0
Charleston Road	PCMZ	Palo Alto	1	0	1	0	Vehicle	1	0
Rengstroff Avenue	PCMZ	Mountain View	1	1	0	0	Vehicle	0	0
Castro Street	PCMZ	Mountain View	1	0	0	0	Vehicle	0	0
East Meadow Drive	PCMZ	Mountain View	1	0	1	0	Vehicle	0	1
Mary Avenue	PCMZ	Sunnyvale	1	0	0	0	Pedestrian	0	0
Mary Avenue	PCMZ	Sunnyvale	1	1	0	0	Vehicle	0	0
Mary Avenue	PCMZ	Sunnyvale	1	1	0	0	Vehicle	0	0
North Main Street	ATK	Milpitas	1	0	1	0	Pedestrian	1	0
Agnew Road	ATK	Santa Clara	1	0	1	0	Vehicle	0	1
Agnew Road	ATK	Santa Clara	1	0	1	0	Vehicle	0	1
Southwest Expressway	VTAZ	San Jose	1	0	1	0	Pedestrian	1	0
Race Street	VTAZ	San Jose	1	0	1	0	Pedestrian	0	1
Private	ATK	San Jose	1	0	1	0	Vehicle	0	1
Stokes Street	VTAZ	San Jose	1	0	1	0	Other (not reported)	1	0
Private	ATK	San Jose	1	1	0	0	Vehicle	0	0

Cross Street	Railroad	Location	Number of Incidents				Incident Type	Number of Casualties	
			Total[1]	Property Damage[2]	Casualty	Not Reported[3]		Killed	Injured
Stokes	VTAZ	San Jose	1	0	1	0	Pedestrian	1	0
Virginia Street	PCMZ	San Jose	1	0	1	0	Other (not reported)	1	0
Auzerais Avenue	ACEX	San Jose	1	0	1	0	Pedestrian	0	1
San Pedro Avenue	UPRR	Morgan Hill	1	1	0	0	Vehicle	0	0
Masten Avenue	UPRR	Morgan Hill	1	0	1	0	Vehicle	0	1
Masten Avenue	UPRR	Gilroy	1	0	1	0	Vehicle	1	0
San Benito County									
4th Street	UPRR	Hollister	1	1	0	0	Vehicle	0	0
Private	ATK	San Benito	1	0	1	0	Vehicle	0	2
Private	UPRR	Aromas	1	0	1	0	Vehicle	1	0
Merced County									
Applegate Road	UPRR	Atwater	1	1	0	0	Vehicle	0	0
Hunt Road	CFNR	Gustine	1	1	0	0	Vehicle	0	0
3rd Avenue	CFNR	Gustine	1	1	0	0	Vehicle	0	0
Main Street	UPRR	Livingston	1	0	1	0	Pedestrian	1	0
U Street	BNSF	Merced	1	1	0	0	Other (not reported)	0	0
R Street	BNSF	Merced	1	0	1	0	Vehicle	1	0
Southern Pacific Avenue	UPRR	Merced	1	1	0	0	Vehicle	0	0
K Street	ATK	Merced	1	1	0	0	Vehicle	0	0
Vista Road	UPRR	Merced	1	1	0	0	Vehicle	0	0
Martin Luther King	UPRR	Merced	1	1	0	0	Other (not reported)	0	0
Bear Creek Road	BNSF	Merced	1	1	0	0	Vehicle	0	0
Winton Way	ATK	Winton	1	0	1	0	Vehicle	0	6
Private	CFNR	Los Banos	1	1	0	0	Vehicle	0	0
Plainsburg Road	BNSF	Planada	1	1	0	0	Vehicle	0	0

Cross Street	Railroad	Location	Number of Incidents				Incident Type	Number of Casualties	
			Total[1]	Property Damage[2]	Casualty	Not Reported[3]		Killed	Injured
Olive Avenue	BNSF	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Bellevue Avenue	BNSF	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Private	BNSF	Unincorporated Merced County	1	0	0	0	Vehicle	0	0
Shaffer Road	ATK	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Private	ATK	Unincorporated Merced County	1	0	1	0	Vehicle	1	1
Bellevue Avenue	BNSF	Unincorporated Merced County	1	0	1	0	Vehicle	0	1
Arboleda Drive	BNSF	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Olive Avenue	BNSF	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Private	BNSF	Unincorporated Merced County	1	0	1	0	Vehicle	1	0
Private	ATK	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Vista Road	UPRR	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Olive Avenue	ATK	Unincorporated Merced County	1	0	1	0	Vehicle	1	1
Franklin Road	BNSF	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Santa Fe Avenue	ATK	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Shaffer Road	BNSF	Unincorporated Merced County	1	1	0	0	Vehicle	0	0

Cross Street	Railroad	Location	Number of Incidents				Incident Type	Number of Casualties	
			Total[1]	Property Damage[2]	Casualty	Not Reported[3]		Killed	Injured
Sandy Mush Road	UPRR	Unincorporated Merced County	1	1	0	0	Vehicle	0	0
Winton Way	ATK	Winton	1	0	1	0	Pedestrian	1	1
Winton Way	ATK	Winton	1	0	1	0	Vehicle	1	2
Regional Total			**65**	**30**	**26**	**5**	**All**	**16**	**21**

Sources: FRA 2016a, 2016b, 2016c
Data are for January 2011 through December 2016
UPRR = Union Pacific Railroad
BNSF = BNSF Railway
CFNR = California Northern Railroad Company
ATK = Amtrak
PCMZ = Caltrain Commuter Railroad Company
ACEX = Altamont Corridor Express
VTAZ = Valley Transportation Authority
[1] The total number of incidences can include reported incidences that did not result in property damages or casualties.
[2] Incidents in which a train struck a vehicle involving no injuries or fatalities are listed in table as "property damage only."
[3] The FRA does not report injury or fatality data for suicides/suicide attempts, and as a result, the number of casualties is unknown. These incidents are listed in the table as "not reported" and the values for casualties, including deaths or injuries, are listed as "–," because the occurrence or numbers of casualties related to these incidents are unknown.
None of the accidents listed above occurred within 0.5 mile of the project alternatives' centerlines.

Table 4 Hospitals Providing Emergency Care to the Resource Study Area

Hospital	Address
Kaiser Permanente Santa Clara Medical Center and Medical Offices	700 Lawrence Expressway, Santa Clara, CA 95051
Regional Medical Center of San Jose	225 North Jackson Avenue, San Jose, CA 95116
O'Connor Hospital	2105 Forest Avenue, San Jose, CA 95128
Santa Clara Valley Medical Center	751 South Bascom Avenue, San Jose, CA 95128
Kaiser Permanente San Jose Medical Center	250 Hospital Parkway, San Jose, CA 95119
De Paul Health Center	18550 Depaul Drive, Morgan Hill, CA 95037
St Louise Hospital	9400 No Name Uno, Gilroy, CA 95020
Memorial Hospital Los Banos	520 West I Street, Los Banos, CA 93635

Source: California Office of Statewide Health Planning & Development 2016

Table 5 Fire Department Equipment in the Resource Study Area

Fire Department	Equipment	
Santa Clara County—Local Responsibility Areas		
San Jose Fire Department	▪ 30 front line engines ▪ 15 relief engines ▪ 9 front line trucks ▪ 9 relief trucks ▪ 7 front line brush patrol apparatus	▪ 6 relief brush patrol apparatus ▪ 2 front line aircraft rescue and firefighter apparatus ▪ 1 relief aircraft recue and firefighter apparatus ▪ 3 front line urban search/rescue and hazmat apparatus ▪ 90 auxiliary search/rescue and hazmat apparatus
Santa Clara County Fire Department	▪ 20 engines ▪ 3 rescues ▪ 3 trucks ▪ 6 Type 3 engines ▪ 2 Type 6 engines ▪ 3 battalions ▪ 1 strike team ▪ 4 command vehicles ▪ 1 U71 operations vehicle ▪ 1 U72 EMS vehicle ▪ 1 U73 training vehicle ▪ 1 U74 56-hour vehicle	▪ 1 haz mat 72 ▪ 1 breath support 72 ▪ 1 haz mat 172 ▪ 1 Unit US&R 85 ▪ 7 trailers ▪ 1 engine (#20) ▪ 1 hose wagon ▪ 1 engine (1936) ▪ 1 chemical hand cart ▪ 1 squad 1 ▪ 1 engine (1928)

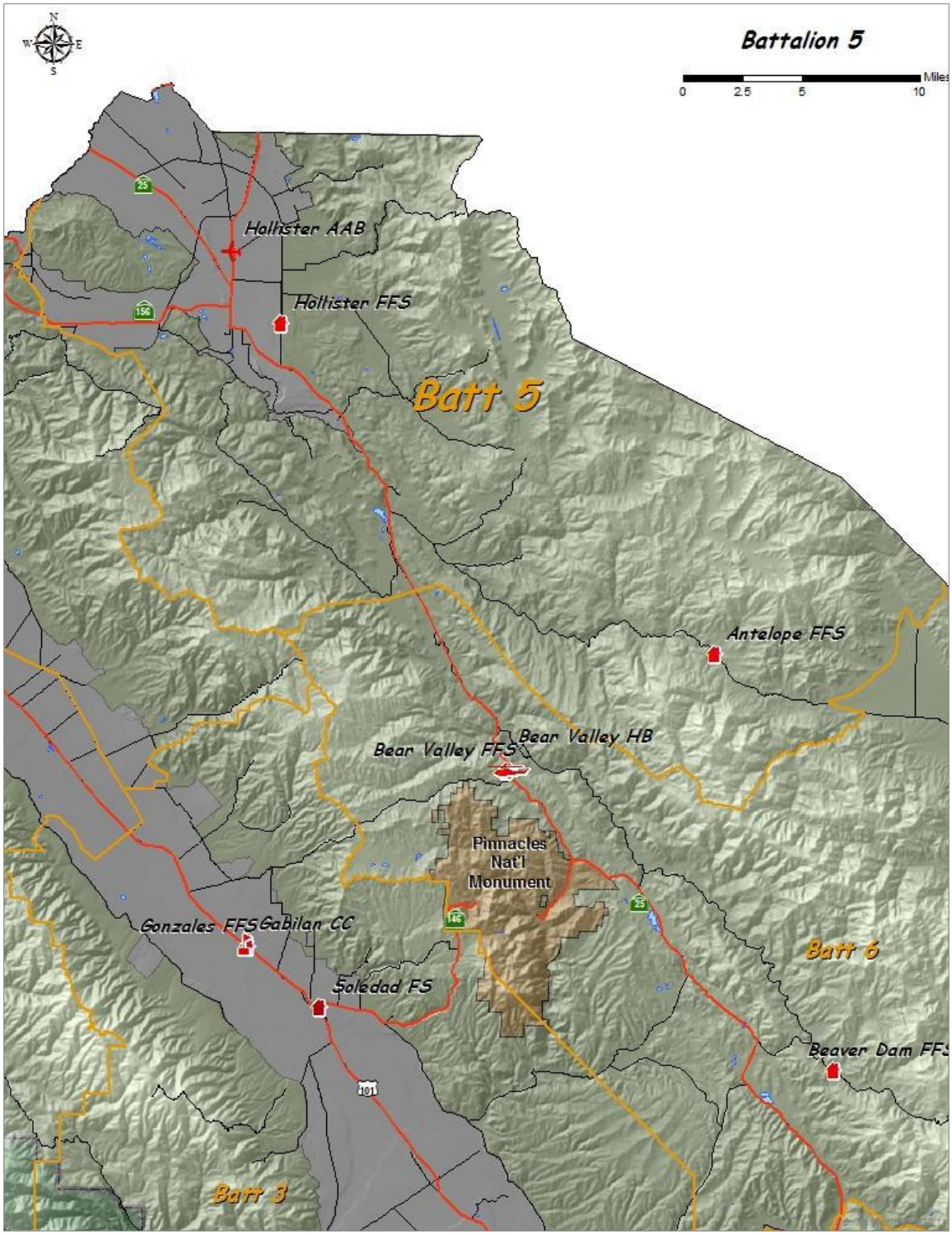
Fire Department	Equipment
Morgan Hill Fire Department	▪ 2 Type 1 engine ▪ 1 Type 2 aerial ladder truck ▪ 1 Type 6 engine
Gilroy Fire Department	▪ 3 pumper trucks ▪ 1 triple combination pumper ▪ 1 ladder truck ▪ 1 Type 3 truck ▪ 2 Type 4 4x4 pumper trucks
Santa Clara County—State Responsibility Areas	
CAL FIRE Santa Clara Unit-Morgan Hill Station: Morgan Hill Battalion 1	▪ 2 Type 3 engines ▪ 1 Type 2 bulldozer
CAL FIRE Santa Clara Unit-Morgan Hill Station: Morgan Hill Battalion 7	▪ 1 Type 1 engine ▪ 1 Water tender ▪ 1 Type 3 ALS engine
CAL FIRE Santa Clara Unit-Almaden Station: San Jose Battalion 2	▪ 1 Type 3 engine
CAL FIRE Santa Clara Unit-Coyote Station: Morgan Hill Battalion 1	▪ 1 Type 3 engine
San Benito County—State Responsibility Areas	
CAL FIRE Northern Region Santa Clara Unit Pacheco Pass: Battalion 1	▪ 1 Type 3 paramedic engine ▪ 1 Type 3 ALS engine
Merced County—State Responsibility Areas	
City of Los Banos Fire Department	Fire Station 1: ▪ 2 fire engines ▪ 1 ladder truck ▪ 1 EMS/rescue truck ▪ 1 Type 1 pumper ▪ 1 water truck Fire Station 2: ▪ 2 fire engines

Sources: City of Morgan Hill 2013, 2017; City of Gilroy 2003, 2017; Gilroy Fire Department 2016a, 2016b, 2016c; City of Los Banos 2017; City of San Jose 2015, 2016; San Jose Fire Department 2014, 2016a, 2016b; Merced County Fire Department 2017; County of San Benito 2015a, 2015b; Santa Clara County Fire Department 2016
US&R = Urban Search and Rescue
ALS = advanced life support
EMS = emergency medical services

Source: CAL FIRE 2017

DECEMBER 2017

Figure 1 Boundaries of CAL FIRE Santa Clara Unit Battalions



Source: CAL FIRE 2014a

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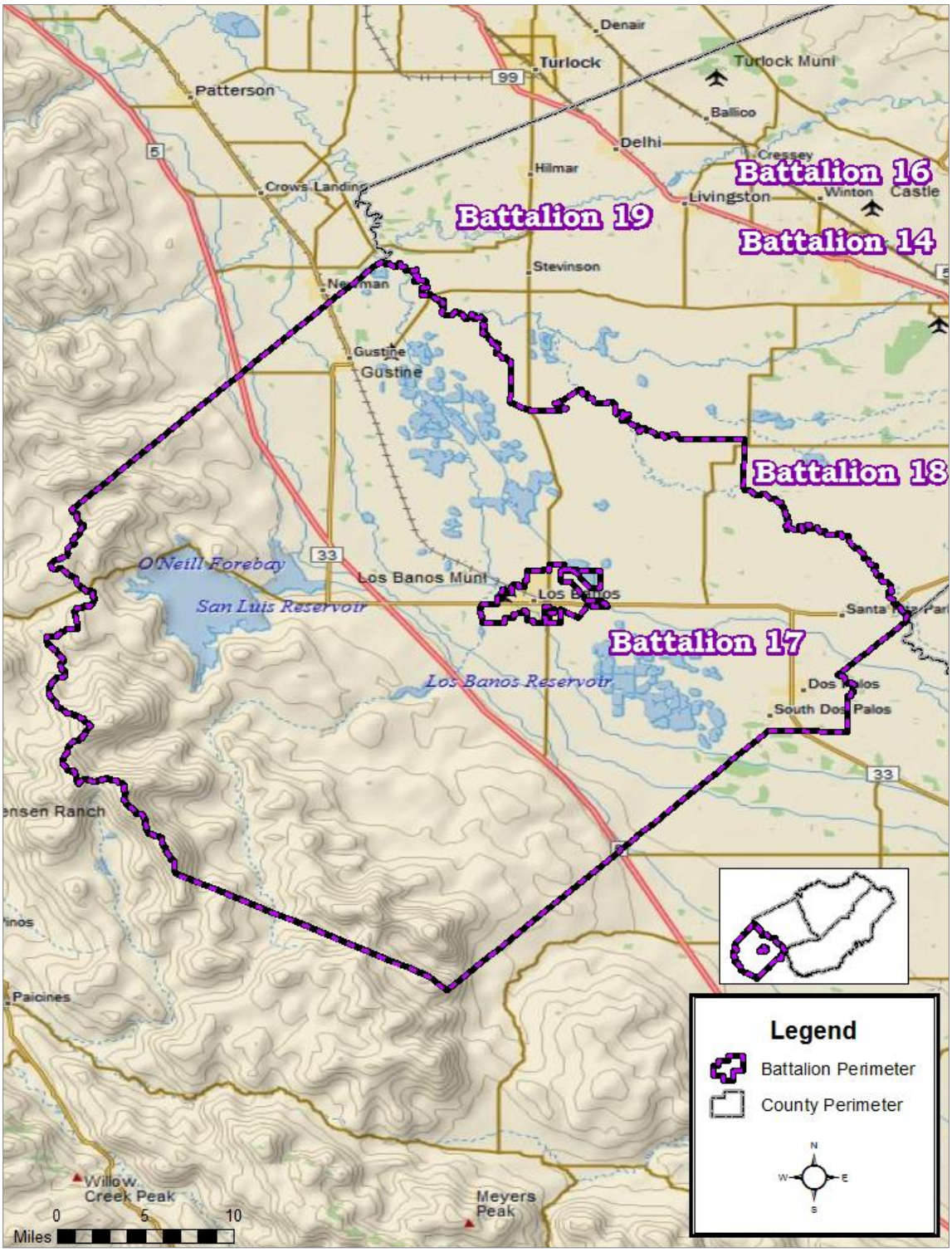
Figure 2 Boundaries of CAL FIRE San Benito-Monterey Battalion 5



Source: CAL FIRE 2014b

DECEMBER 2017

Figure 3 Boundaries of CAL FIRE Madera-Mariposa-Merced Unit Battalion 17

Table 6 Critical Facilities and Infrastructure Providing Emergency Services to the Resource Study Area

Facility Type	Name	Location	Alternative
Police Department	Santa Clara Police Department	601 El Camino Real, Santa Clara, 95050	All Alternatives
Fire Department	City of Santa Clara Fire Department Station 1	777 Benton Street, Santa Clara 95050	All Alternatives
Fire Department	City of Santa Clara Fire Department Station 2	1900 Walsh Avenue, Santa Clara 95050	All Alternatives
Correctional Facility	Santa Clara County Jail	150 West Hedding Street, San Jose, 95110	All Alternatives
Police Department	San Jose Police Department	201 West Mission Street, San Jose, 95110	All Alternatives
Fire Department	San Jose Fire Department Station 1	225 North Market Street #124, San Jose, 95110	All Alternatives
Fire Department	San Jose Fire Department Station 30	454 Auzerais Avenue, San Jose, 95126	All Alternatives
Fire Department	San Jose Fire Department Station 3	98 Martha Street, San Jose, 95112	All Alternatives
Fire Department	San Jose Fire Department Station 7	800 Emory Street, San José, 95126	All Alternatives
Fire Department	San Jose Fire Department Administration	1661 Senter Road, San Jose, 95112	All Alternatives
Police Department	San Jose Police Department Property and Evidence Facility	1588-B Monterey Road, San Jose, 95110	All Alternatives
Sheriff Department	Santa Clara County Sheriff	1601 South De Anza Boulevard, #148, Cupertino, 95014	Alternatives 1, 2, & 3
Fire Department	San Jose Fire Department Station 18	4430 Monterey Highway, San Jose, 95111	Alternatives 1, 2, & 3
Fire Department	San Jose Fire Department Station 35	135 Poughkeepsie Road, San Jose, 95123	Alternatives 1, 2, & 3
Police Department	San Jose Police Department South	6087 Great Oaks Parkway, San Jose, 95138	Alternatives 1, 2, & 3
Fire Department	San Jose Fire Department Station 27	6027 San Ignacio Avenue, San Jose, 95119	Alternatives 1, 2, & 3
Correctional Facility	William F. James Boys Ranch	19050 Malaguerra Avenue, Morgan Hill, 95037	Alternatives 1 & 3
Fire Department	Morgan Hill Fire Department El Toro Fire Station	18300 Old Monterey Road, Morgan Hill, 95037	Alternatives 2 & 4
Fire Department	Morgan Hill Fire Department Dunne Hill Fire Station	2100 E. Dunne Avenue, Morgan Hill, 95037	Alternatives 1 & 3
Police Department	Morgan Hill Police Department	16200 Vineyard Boulevard, Morgan Hill, 95037	Alternative 2

Facility Type	Name	Location	Alternative
CAL FIRE	Santa Clara-Morgan Hill CAL FIRE Station 1	15670 Monterey Street, Morgan Hill, 95037	Alternative 2
Highway Patrol	Gilroy Inspection Facility	12000 South Valley Freeway, San Martin, 95046	Alternatives 1, 2, & 3
Fire Department	South Santa Clara County Fire Department Station No. 2	10810 No Name Uno, Gilroy, 95020	Alternative 3
Fire Department	City of Gilroy Fire Station	880 Sunrise Drive, Gilroy, 95020	Alternatives 1, 2, and 4
Fire Department	Gilroy Fire Department Las Animas Fire Station	8383 Wren Avenue, Gilroy, 95020	Alternatives 1 & 2
Police Department	Gilroy Police Department	7301 Hanna Street, Gilroy, 95020	Alternatives 1 & 2
Fire Department	Gilroy Fire Department	7070 Chestnut Street, Gilroy, 95020	Alternatives 1, 2, and 4
Highway Patrol	Highway Patrol CHP Hollister-Gilroy	740 Renz Lane, Gilroy, 95020	Alternatives 1, 2, & 3
CAL FIRE	Department of Forestry and Fire Protection Hollister Ranger Station	San Felipe Road, Hollister 95023	All Alternatives
CAL FIRE	Pacheco	12280 Pacheco Pass Highway, Hollister, 95023	All Alternatives
Sheriff Department	San Benito County Sheriff's Office	2301 Technology Parkway, Hollister, CA 95023	All Alternatives
Sheriff Department	Merced County Sheriff Department	Santa Nella Shopping Center, 13193 CA-33, Gustine, 95322	All Alternatives
CAL FIRE	Madera Mariposa Merced Unit - Los Banos	31011 West Gonzaga Road, Gustine, 95322	All Alternatives
Sheriff Department	Merced County Sheriff Department	445 I Street, Los Banos, 93635	All Alternatives
Fire Department	Merced County Fire Department - Los Banos Fire Station 71	525 H Street, Los Banos, CA 93635	All Alternatives

SR = State Route
CHP = California Highway Patrol
CAL FIRE = California Department of Forestry and Fire Protection

Table 7 Existing Tall Structures within the Resource Study Area

Alternative	Facility Type	High-Risk Facility Location	Ownership of Facility	Height of Structure[1]
San Jose Diridon Station Approach Subsection				
All alternatives	Bridge	Scott Boulevard Overpass	City of Santa Clara	23 ft 4 in
All alternatives	Bridge	Lafayette Street Pedestrian Overpass	Local Jurisdiction	23 ft 6 in
All alternatives	Bridge	De La Cruz Boulevard Overpass	Local Jurisdiction	23 ft 0 in
All alternatives	Bridge	Laurel Street Overhead (I-880 Overpass)	Caltrans	23 ft 0 in
All alternatives	Silo	Fuel Terminal, San Jose	Private sector	25 ft (estimate)
All alternatives	Bridge	West Hedding Street Overpass	Local Jurisdiction	Not applicable; would be rebuilt under[2]
Alternative 4	Signal	Signal Overbridge	HSR	
Alternative 4	Silo	Concrete Plant, San Jose	Private Sector	30 ft (estimate)
Alternative 4	Signal	Signal Overbridge	HSR	
Alternative 4	Building	Warehouse Building, San Jose	Private Sector	25 ft (estimate)
Alternative 4	Signal	Signal Overbridge	HSR	
All alternatives	Signal	Signal Overcrossing	HSR	
Alternative 4	Bridge	W San Carlos Street Overcrossing	Local Jurisdiction	24 ft 6 in
Alternative 4	Signal	Signal Overcrossing	HSR	
Alternative 4	Building	Apartment Building	Private Sector	100 ft (estimate)
Monterey Corridor Subsection				
All alternatives	Bridge	Almaden Expressway Overhead	Local Jurisdiction	Not applicable; would be rebuilt over[3]
Alternative 4	Signal	Signal Overcrossing	HSR	
All alternatives	Bridge	Curtner Avenue Overhead (San Jose Overhead UPRR)	Local Jurisdiction	Not applicable; would be rebuilt over[3]
All alternatives	Bridge	American Dairy Pedestrian Bridge	Local Jurisdiction	Not applicable; would be rebuilt over[4]
Alternative 4	Signal	Signal Overbridge	HSR	
All alternatives	Bridge	Capitol Expressway Overhead	Local Jurisdiction	24 ft 6 in
All alternatives	Bridge	Blossom Hill Road Overhead	Local Jurisdiction	24 ft 6 in
All alternatives	Bridge	Xander's Crossing Pedestrian Bridge	Local Jurisdiction	24 ft 6 in
Alternative 4	Bridge	Pedestrian Overpass	Local Jurisdiction	24 ft 6 in
All alternatives	Bridge	SR 85: 37 0488L&R – Coyote Overhead	Caltrans	24 ft 6 in

Alternative	Facility Type	High-Risk Facility Location	Ownership of Facility	Height of Structure[1]
All alternatives	Bridge	SR 85: 37 0634F – Route 101-85/S101 HOV Connector	Caltrans	24 ft 6 in
All alternatives	Bridge	Bernal Road Overhead	Local Jurisdiction	24 ft 6 in
Morgan Hill and Gilroy Subsection				
Alternative 4	Tower	Power Plant, Coyote	Private Sector	100 ft (estimate)
All alternatives	Bridge	Bailey Avenue Overhead	City of San Jose	24 ft 6 in
Alternative 4	Silos	Industrial Facility, Morgan Hill	Private Sector	100 ft (estimate)
Alternatives 2 & 4	Bridge	Butterfield Blvd Overhead	Local Jurisdiction	24 ft 6 in
Alternative 4	Silo	Industrial Plant, Gilroy	Private Sector	25 ft (estimate)
Alternative 4	Bridge	El Camino Real Overcrossing	Local Jurisdiction	24 ft 6 in
Alternatives 1 & 2	Bridge	South Gilroy (US 101) Overhead	Caltrans	Not applicable; would be rebuilt over[3]
Pacheco Pass Subsection				
None				
San Joaquin Valley Subsection				
None				

ft = feet
in = inches
I- = Interstate
UPRR = Union Pacific Railroad
SR = State Route
US = U.S. Highway
HOV = high-occupancy vehicle
Caltrans = California Department of Transportation
US = U.S. Highway
[1] Distance from soffit to top of rail
[2] Existing bridge would be replaced with an underpass.
[3] Existing bridge has insufficient clearance and would be reconstructed to design height standards.
[4] Existing bridge would be replaced with a roadway bridge at the same location.

Table 8 High-Risk Utilities within the Resource Study Area, Alternatives 1, 2, and 3[1]

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
San Jose Diridon Station Approach Subsection							
PG&E	Electric OH	0052+00 to 0066+00	x	x	x	Both	Relocate
PG&E	Transmission Tower	0052+00	x	x	x	–	Protect in Place
PG&E	Transmission Tower	0059+70	x	x	x	–	Relocate
PG&E	Natural Gas	0208+90	x	x	x	Transverse	Relocate
Monterey Corridor Subsection							
PG&E	Electric OH	0334+50		x		Transverse	Relocate
PG&E	Electric OH	0334+50 to 0345+50		x		Longitudinal	Relocate
PG&E	Natural Gas	0481+20		x		Transverse	Relocate
San Jose Water Company	Potable Water	0298+50		x		Transverse	Protect in Place
Santa Clara Valley Water District	Potable Water	0363+30		x		Transverse	Relocate
PG&E	Natural Gas	0464+50 to 0480+20		x		Longitudinal	Relocate
PG&E	Electric OH	0334+00	x		x	Transverse	Relocate
PG&E	Natural Gas	0480+00	x		x	Transverse	Protect in Place
San Jose Water Company	Potable Water	0298+00	x		x	Transverse	Protect in Place
Santa Clara Valley Water District	Potable Water	0362+30	x		x	Transverse	Protect in Place
Morgan Hill and Gilroy Subsection							
Unknown	Electric & Telecom OH on Joint Pole	0645+54	x		x	Transverse	Relocate
Unknown	Electric & Telecom OH on Joint Pole	1308+66	x		x	Transverse	Relocate
Unknown	Electric & Telecom OH on Joint Pole	1322+56	x		x	Transverse	Relocate
PG&E	Electric OH	0717+33	x		x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
PG&E	Electric OH	0657+00	x		x	Transverse	Protect in Place
PG&E	Electric OH	0657+50	x		x	Transverse	Protect in Place
PG&E	Electric OH	0658+00	x		x	Transverse	Protect in Place
PG&E	Electric OH	0663+00	x		x	Transverse	Relocate
PG&E	Electric OH	0663+30	x		x	Transverse	Relocate
PG&E	Electric OH	0663+85	x		x	Transverse	Protect in Place
PG&E	Electric OH	0664+00	x		x	Transverse	Protect in Place
PG&E	Electric OH	0664+45	x		x	Transverse	Relocate
PG&E	Electric OH	0664+70	x		x	Transverse	Relocate
PG&E	Electric OH	0665+20	x		x	Transverse	Relocate
PG&E	Electric OH	0665+45	x		x	Transverse	Relocate
PG&E	Electric OH	0892+60	x		x	Transverse	Protect in Place
PG&E	Electric OH	0892+75	x		x	Transverse	Protect in Place
PG&E	Electric OH	0893+35	x		x	Transverse	Protect in Place
PG&E	Electric OH	0893+60	x		x	Transverse	Protect in Place
CPN Pipeline Company	Natural Gas	0682+70	x		x	Transverse	Relocate
PG&E	Natural Gas	0717+85	x		x	Transverse	Protect in Place
PG&E	Natural Gas	0861+50	x		x	Transverse	Protect in Place
PG&E	Natural Gas	1043+10	x		x	Transverse	Relocate
PG&E	Natural Gas	1119+50	x		x	Transverse	Protect in Place
Santa Clara Valley Water District	Potable Water	0636+85 to 0645+00	x		x	Both	Protect in Place
City of Morgan Hill	Potable Water	1172+45	x		x	Transverse	Protect in Place
City of Morgan Hill	Potable Water	1188+70	x		x	Transverse	Protect in Place

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
Level 3/AboveNet	Telecommunication Indoor Facility	1334+00	x		x	-	Relocate
Electric OH	Electric OH	0807+28		x		Transverse	Relocate
Electric OH	Electric OH	0811+30		x		Transverse	Relocate
Electric OH	Electric OH	1015+00		x		Transverse	Relocate
Unknown	Electric OH	1034+30		x		Transverse	Relocate
Unknown	Electric OH	1039+11		x		Transverse	Relocate
Electric OH	Electric OH	987+00		x		Transverse	Relocate
PG&E	Electric OH	0747+20		x		Transverse	Protect in Place
PG&E	Electric OH	0747+70		x		Transverse	Protect in Place
PG&E	Electric OH	0748+15		x		Transverse	Protect in Place
PG&E	Electric OH	0752+60		x		Transverse	Protect in Place
PG&E	Electric OH	0752+90		x		Transverse	Protect in Place
PG&E	Electric OH	0753+45		x		Longitudinal	Protect in Place
PG&E	Electric OH	0753+60		x		Longitudinal	Protect in Place
PG&E	Electric OH	0754+05		x		Transverse	Protect in Place
PG&E	Electric OH	0754+30		x		Transverse	Protect in Place
PG&E	Electric OH	0754+80		x		Transverse	Protect in Place
PG&E	Electric OH	0755+10		x		Transverse	Protect in Place
PG&E	Electric OH	0982+30		x		Transverse	Relocate
PG&E	Electric OH	0982+50		x		Transverse	Relocate
PG&E	Electric OH	0983+10		x		Transverse	Relocate
PG&E	Electric OH	0983+35		x		Transverse	Relocate
CPN Pipeline Company	Natural Gas	0771+70		x		Transverse	Protect in Place
PG&E	Natural Gas	0807+75		x		Transverse	Protect in Place

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
PG&E	Natural Gas	0951+50		x		Transverse	Protect in Place
PG&E	Natural Gas	1203+50		x		Transverse	Protect in Place
Santa Clara Valley Water District	Potable Water	0726+00 to 0727+00		x		Both	Protect in Place
Level 3/AboveNet	Telecommunication Indoor Facility	1406+50		x		–	Relocate
PG&E	Transmission Tower	0982+50		x		–	Relocate
PG&E	Transmission Tower	0983+50		x		–	Relocate
Unknown	Electric & Telecom OH on Joint Pole	1654+73	x			Transverse	Relocate
–	Electric & Telecom OH on Joint Pole	2044+46	x			Transverse	Relocate
PG&E	Electric OH	1580+90	x			Transverse	Relocate
PG&E	Electric OH	1581+10	x			Transverse	Relocate
Unknown	Electric OH	1607+09	x			Transverse	Relocate
PG&E	Electric OH	1723+66	x			Transverse	Relocate
PG&E	Electric OH	1802+57 to 1810+00	x			Longitudinal	Relocate
PG&E	Electric OH	1803+03	x			Transverse	Relocate
PG&E	Electric OH	1838+60	x			Transverse	Relocate
PG&E	Electric OH	1838+75	x			Transverse	Relocate
PG&E	Electric OH	1870+47	x			Transverse	Remove
PG&E	Electric OH	2094+00	x			Transverse	Relocate
PG&E	Natural Gas	2107+75	x			Transverse	Protect in Place
PG&E	Natural Gas	1464+40	x			Transverse	Relocate
City of Gilroy	Potable Water	1628+50 to 1640+00	x			Both	Relocate
City of Gilroy	Potable Water	1640+00	x			Transverse	Relocate
City of Gilroy	Potable Water	1655+10	x			Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
City of Gilroy	Potable Water	1680+90	x			Transverse	Relocate
City of Gilroy	Potable Water	1693+63 to 1700+71	x			Longitudinal	Relocate
City of Gilroy	Potable Water	1704+40	x			Transverse	Protect in Place
City of Gilroy	Potable Water	1709+26	x			Transverse	Remove
City of Gilroy	Potable Water	1729+50	x			Transverse	Protect in Place
City of Gilroy	Potable Water	1766+50	x			Transverse	Relocate
City of Gilroy	Potable Water	1802+35	x			Transverse	Remove
Santa Clara Valley Water District	Recycled Water	1749+35	x			Transverse	Protect in Place
PG&E	Transmission Tower	1581+00	x			–	Relocate
Unknown & Verizon	Electric & Telecom OH on Joint Pole	1521+20 to 1526+30		x		Both	Relocate
Unknown	Electric & Telecom OH on Joint Pole	1681+00		x		Transverse	Relocate
Unknown	Electric OH	1502+00 to 1529+00		x		Longitudinal	Relocate
Unknown	Electric OH	1568+50		x		Transverse	Relocate
Unknown	Electric OH	1568+50 to 1572+00		x		Longitudinal	Relocate
Unknown	Electric OH	1693+81		x		Transverse	Relocate
Unknown	Electric OH	1723+66		x		Transverse	Relocate
Unknown	Electric OH	1802+50 to 1810+00		x		Longitudinal	Relocate
Unknown	Electric OH	1803+03		x		Transverse	Relocate
PG&E	Electric OH	1580+70		x		Transverse	Relocate
PG&E	Electric OH	1580+95		x		Transverse	Relocate
PG&E	Electric OH	1838+60		x		Transverse	Relocate
PG&E	Electric OH	1838+75		x		Transverse	Relocate
PG&E	Natural Gas	1464+10		x		Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
PG&E	Natural Gas	2107+75		x		Transverse	Protect in Place
City of Gilroy	Potable Water	1709+24		x		Transverse	Abandon
City of Gilroy	Potable Water	1723+92		x		Transverse	Relocate
City of Gilroy	Potable Water	1655+00		x		Transverse	Protect in Place
City of Gilroy	Potable Water	1681+68		x		Transverse	Relocate
City of Gilroy	Potable Water	1704+40		x		Transverse	Relocate
City of Gilroy	Potable Water	1729+50		x		Transverse	Relocate
City of Gilroy	Potable Water	1766+30		x		Transverse	Relocate
City of Gilroy	Potable Water	1802+35		x		Transverse	Remove
Santa Clara Valley Water District	Recycled Water	1749+35		x		Transverse	Protect in Place
PG&E	Transmission Tower	1580+85		x		–	Relocate
–	Electric & Fiber Optic OH on Joint Pole	1710+61			x	Transverse	Relocate
–	Electric & Telecom OH on Joint Pole	1603+65			x	Transverse	Relocate
–	Electric & Telecom OH on Joint Pole	1622+06			x	Transverse	Relocate
–	Electric & Telecom OH on Joint Pole	1661+00			x	Transverse	Relocate
–	Electric & Telecom OH on Joint Pole	1742+50			x	Transverse	Relocate
–	Electric & Telecom OH on Joint Pole	1796+00 to 1808+00			x	Longitudinal	Relocate
–	Electric & Telecom OH on Joint Pole	1798+55			x	Transverse	Relocate
–	Electric OH	1464+18			x	Transverse	Relocate
–	Electric OH	1486+71			x	Transverse	Relocate
–	Electric OH	1525+52			x	Transverse	Relocate
–	Electric OH	1681+00			x	Transverse	Relocate
–	Electric OH	1751+65			x	Transverse	Remove

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
–	Electric OH	1783+00			x	Transverse	Relocate
–	Electric OH	1824+32			x	Transverse	Relocate
PG&E	Electric OH	1570+00			x	Transverse	Relocate
PG&E	Gas	1804+50 to 1814+00			x	Longitudinal	Abandon
PG&E	Natural Gas	1464+10			x	Transverse	Relocate
Department of Water Resources	Potable Water	1795+00			x	Longitudinal	Protect in Place
Pacheco Pass Subsection							
Unknown	Electric & Telecom OH on Joint Pole	2188+94	x	x		Transverse	Relocate
PG&E & Unknown	Electric & Telecom OH on Joint Pole	2228+14	x	x		Transverse	Relocate
PG&E	Electric OH	2372+38	x	x		Transverse	Relocate
PG&E	Natural Gas	2193+10	x	x		Transverse	Protect in Place
Department of Water Resources	Potable Water	2220+00 to 2231+00	x	x		Longitudinal	Protect in Place
U.S. Department of the Interior, Bureau of Reclamation	Potable Water	2287+50	x	x		Transverse	Protect in Place
–	Electric OH	1951+33			x	Transverse	Relocate
–	Electric OH	2023+05			x	Transverse	Relocate
–	Electric OH	2027+00			x	Transverse	Relocate
PG&E	Natural Gas	1897+70			x	Transverse	Relocate
PG&E	Natural Gas	2028+00			x	Transverse	Protect in Place
PG&E	Natural Gas	2122+00			x	Transverse	Protect in Place
Department of Water Resources	Potable Water	2137+00 to 2156+00			x	Longitudinal	Protect in Place

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
Department of Water Resources	Potable Water	2156+00 to 2165+00			x	Longitudinal	Protect in Place
U.S. Department of the Interior, Bureau of Reclamation	Potable Water	2287+50			x	Transverse	Protect in Place
Shell	Crude Oil	4207+50	x	x	x	Transverse	Protect in Place
ConocoPhillips	Crude Oil	4247+25	x	x	x	Transverse	Protect in Place
Chevron	Crude Oil	4267+20	x	x	x	Transverse	Protect in Place
–	Electric & Telecom OH on Joint Pole	4366+50	x	x	x	Transverse	Relocate
–	Electric OH	4046+79	x	x	x	Transverse	Relocate
PG&E	Electric OH	4251+64	x	x	x	Transverse	Relocate
–	Electric OH	4372+43	x	x	x	Transverse	Relocate
–	Electric OH	4372+52 to 4375+50	x	x	x	Longitudinal	Relocate
PG&E	Electric OH	3666+00	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	3686+20	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4098+83	x	x	x	Transverse	Relocate
PG&E	Electric OH	4177+80	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4178+30	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4178+70	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4179+50	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4180+00	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4180+50	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4182+50	x	x	x	Transverse	Relocate
PG&E	Electric OH	4183+30	x	x	x	Transverse	Protect in Place
PG&E	Electric OH	4183+60	x	x	x	Transverse	Protect in Place

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
Shell	Gas	4285+00	x	x	x	Transverse	Abandon
---	Irrigation Ditch	4366+26	x	x	x	Transverse	Relocate
U.S. Department of the Interior, Bureau of Reclamation	Potable Water	3270+50 to 3305+00	x	x	x	Both	Relocate
San Joaquin Valley Subsection							
PG&E	Electric & Telecom OH on Joint Pole	4597+20	x	x	x	Transverse	Relocate
PG&E	Electric & Telecom OH on Joint Pole	4798+51	x	x	x	Transverse	Relocate
PG&E	Electric & Telecom OH on Joint Pole	4882+50 to 4888+00	x	x	x	Longitudinal	Relocate
PG&E	Electric & Telecom OH on Joint Pole	5095+00 to 5102+30	x	x	x	Longitudinal	Relocate
PG&E	Electric & Telecom OH on Joint Pole	5097+97	x	x	x	Transverse	Relocate
PG&E	Electric OH	4568+13	x	x	x	Transverse	Relocate
PG&E	Electric OH	4595+34	x	x	x	Transverse	Relocate
PG&E	Electric OH	4615+00 to 4642+00	x	x	x	Longitudinal	Relocate
PG&E	Electric OH	4622+22	x	x	x	Transverse	Relocate
PG&E	Electric OH	4657+81	x	x	x	Transverse	Relocate
PG&E	Electric OH	4761+86	x	x	x	Transverse	Relocate
PG&E	Electric OH	4780+28	x	x	x	Transverse	Relocate
PG&E	Electric OH	4856+42	x	x	x	Transverse	Relocate
PG&E	Electric OH	4886+00	x	x	x	Transverse	Relocate
PG&E	Electric OH	4966+39	x	x	x	Transverse	Relocate
PG&E	Electric OH	5032+24	x	x	x	Transverse	Relocate
PG&E	Electric OH	5055+82	x	x	x	Transverse	Relocate
PG&E	Electric OH	5060+13	x	x	x	Transverse	Relocate
PG&E	Electric OH	5177+75	x	x	x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 1	Alternative 2	Alternative 3	Transverse/ Longitudinal	Disposition
PG&E	Electric OH	5257+17	x	x	x	Transverse	Relocate
Chevron	Oil	4595+68	x	x	x	Transverse	Abandon
PG&E	PG&E Electric OH	4664+50 to 4717+00	x	x	x	Longitudinal	Relocate
PG&E	PG&E Electric OH	5319+00 to 5335+50	x	x	x	Longitudinal	Relocate
PG&E	PG&E Electric OH	5336+20	x	x	x	Transverse	Relocate
Henry Miller Reclamation District	Willis Branch Pump Station Facility	5257+00	x	x	x	Transverse	Relocate

PG&E = Pacific Gas and Electric
OH = overhead
UG = underground
Telecomm = Telecommunication
[1] Because of differences in stationing, Alternative 4 is addressed in Table 9

Table 9 High-Risk Utilities within the Resource Study Area, Alternative 4

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
San Jose Diridon Approach Subsection					
PG&E	Electric OH	3018+36	x	Transverse	Protect in Place
PG&E	Electric OH	3030+30 to 3033+00	x	Longitudinal	Relocate
City of San Jose	Electric OH	3032+47	x	Transverse	Protect in Place
City of San Jose	Electric OH	3032+58	x	Transverse	Protect in Place
PG&E	Electric OH	3033+00	x	Transverse	Relocate
PG&E	Electric OH	3033+00 to 3036+40	x	Longitudinal	Relocate
Unknown	Electric OH	3050+75	x	Transverse	Protect in Place
PG&E	Electric OH	3108+74	x	Transverse	Protect in Place
PG&E	Electric OH	3122+37	x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PG&E	Electric OH	3305+84	x	Transverse	Relocate
PG&E & Unknown	Electric OH & Telecom OH on Joint Pole	3018+48	x	Transverse	Protect in Place
PG&E & Unknown	Electric OH & Telecom OH on Joint Pole	3022+63	x	Transverse	Protect in Place
PG&E and Unknown	Electric OH & Telecom OH on Joint Pole	3066+23	x	Transverse	Protect in Place
PG&E	Electric OH & Telecom OH on Joint Pole	3114+23	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	3143+86	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	3246+64	x	Transverse	Relocate
Unknown	Electric UG	3047+24	x	Transverse	Protect in Place
Unknown	Electric UG	3050+50 to 3053+50	x	Longitudinal	Relocate
Unknown	Electric UG	3050+77	x	Transverse	Protect in Place
PG&E	Electric UG	3057+41	x	Transverse	Protect in Place
PG&E	Electric UG	3066+17	x	Transverse	Protect in Place
Unknown	Fiber Optic	3065+66 to 3124+00	x	Longitudinal	Relocate
Level 3/AT&T/AboveNet	Fiber Optic	all	x	Longitudinal	Relocate
QWEST/WTG	Fiber Optic	all	x	Longitudinal	Relocate
AT&T	Fiber Optic	all	x	Longitudinal	Relocate
AT&T/MCI/MFN	Fiber Optic	all	x	Longitudinal	Relocate
AT&T	Fiber Optic	all	x	Longitudinal	Relocate
Level 3/AboveNet	Fiber Optic	all	x	Longitudinal	Relocate
Sprint/MCI	Fiber Optic	all	x	Longitudinal	Relocate
PG&E	Gas	3022+38	x	Transverse	Protect in Place
PG&E	Gas	3022+55	x	Transverse	Protect in Place
Unknown	Gas	3046+69	x	Transverse	Protect in Place
Unknown	Gas	3050+82	x	Transverse	Protect in Place

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PG&E	Gas	3057+53	x	Transverse	Protect in Place
PG&E	Natural Gas	3247+40	x	Transverse	Protect in Place
Unknown	Oil	3046+90	x	Transverse	Protect in Place
Unknown	Oil	3046+91	x	Transverse	Protect in Place
Santa Clara Valley Water District	Potable Water	3022+23	x	Transverse	Protect in Place
Cal Water	Potable Water	3022+32	x	Transverse	Protect in Place
City of San Jose	Potable Water	3046+37	x	Transverse	Protect in Place
City of San Jose	Potable Water	3046+45	x	Transverse	Protect in Place
City of San Jose	Potable Water	3046+80	x	Transverse	Protect in Place
City of San Jose	Potable Water	3051+18	x	Transverse	Protect in Place
City of San Jose	Potable Water	3057+50	x	Transverse	Protect in Place
Unknown	Potable Water	3066+12	x	Transverse	Protect in Place
Unknown	Potable Water	3077+19	x	Transverse	Protect in Place
City of San Jose	Storm Drain Pump Station	3164+17	x	Transverse	Relocate
City of San Jose	Storm Drain Pump Station	3187+92	x	Transverse	Relocate
PG&E	Transmission Pole	3033+00	x	Transverse	Relocate
PG&E	Electric OH	0384+43	x	Transverse	Relocate
PG&E	Electric OH	0494+72	x	Transverse	Relocate
PG&E	Electric OH	0549+92	x	Transverse	Relocate
PG&E	Electric OH	0550+04	x	Transverse	Relocate
PG&E	Electric OH	0574+19	x	Transverse	Relocate
Morgan Hill and Gilroy Subsection					
PG&E	Electric OH	0696+71	x	Transverse	Protect in Place
PG&E	Electric OH	0696+79	x	Transverse	Protect in Place

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PG&E	Electric OH	0697+26	x	Transverse	Protect in Place
PG&E	Electric OH	0701+92	x	Transverse	Protect in Place
PG&E	Electric OH	0702+22	x	Transverse	Protect in Place
PG&E	Electric OH	0702+76	x	Transverse	Protect in Place
PG&E	Electric OH	0702+94	x	Transverse	Protect in Place
PG&E	Electric OH	0703+36	x	Transverse	Protect in Place
PG&E	Electric OH	0703+58	x	Transverse	Protect in Place
PG&E	Electric OH	0704+10	x	Transverse	Protect in Place
PG&E	Electric OH	0704+35	x	Transverse	Protect in Place
Unknown	Electric OH	0756+95	x	Transverse	Relocate
Unknown	Electric OH	0782+61	x	Transverse	Relocate
Unknown	Electric OH	0864+13	x	Transverse	Relocate
Unknown	Electric OH	0869+54	x	Transverse	Relocate
PG&E	Electric OH	0930+83	x	Transverse	Protect in Place
PG&E	Electric OH	0932+00	x	Transverse	Protect in Place
PG&E	Electric OH	0932+56	x	Transverse	Protect in Place
PG&E	Electric OH	0932+84	x	Transverse	Protect in Place
PG&E	Electric OH	0955+82	x	Transverse	Relocate
PG&E	Electric OH	1153+28	x	Transverse	Relocate
Unknown	Electric OH	1174+00 to 1235+00	x	Longitudinal	Relocate
PG&E	Electric OH	1209+51	x	Transverse	Relocate
PG&E	Electric OH	1277+93	x	Transverse	Relocate
PG&E	Electric OH	1518+65	x	Transverse	Relocate
PG&E	Electric OH	1519+54	x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PG&E	Electric OH	1530+26	x	Transverse	Relocate (Raise)
PG&E	Electric OH	1530+44	x	Transverse	Relocate (Raise)
PG&E	Electric OH	1530+54	x	Transverse	Relocate
PG&E	Electric OH	1556+76	x	Transverse	Relocate
Unknown	Electric OH	1643+46	x	Transverse	Relocate
Unknown	Electric OH	1649+39	x	Transverse	Relocate
PG&E	Electric OH	1673+28	x	Transverse	Relocate
PG&E	Electric OH	1798+78	x	Transverse	Relocate (Raise)
PG&E	Electric OH	1798+94	x	Transverse	Relocate (Raise)
Unknown	Electric OH	1824+65	x	Transverse	Relocate
Unknown	Electric OH	1865+62	x	Transverse	Relocate
Unknown & Verizon	Electric OH & Telecom OH on Joint Pole	0936+78	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1122+36	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1175+15	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1184+23	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1330+83	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1344+88	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1413+96	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1435+23	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1448+41	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1460+27	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1476+00	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1483+19	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1510+61	x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PGE & Verizon	Electric OH & Telecom OH on Joint Pole	1545+03	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1609+59	x	Transverse	Relocate
PG&E & Verizon	Electric OH & Telecom OH on Joint Pole	1715+00	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1788+73	x	Transverse	Remove
Unknown	Electric OH & Telecom OH on Joint Pole	1841+81	x	Transverse	Relocate
Unknown	Electric OH & Telecom OH on Joint Pole	1871+66	x	Transverse	Remove
Level 3/AT&T/AboveNet	Fiber Optic	all	x	Longitudinal	Relocate
QWEST/WTG	Fiber Optic	all	x	Longitudinal	Relocate
AT&T	Fiber Optic	all	x	Longitudinal	Relocate
AT&T/MCI/MFN	Fiber Optic	all	x	Longitudinal	Relocate
AT&T	Fiber Optic	all	x	Longitudinal	Relocate
Level 3/AboveNet	Fiber Optic	all	x	Longitudinal	Relocate
Sprint/MCI	Fiber Optic	all	x	Longitudinal	Relocate
CPN Pipeline Company	Natural Gas	0720+44	x	Transverse	Protect in Place
PG&E	Natural Gas	0757+37	x	Transverse	Protect in Place
PG&E	Natural Gas	1153+23	x	Transverse	Remove
PG&E	Natural Gas	1414+03	x	Transverse	Protect in Place
San Jose Water Company	Potable Water	0337+67	x	Transverse	Extend Casing as Needed
Santa Clara Valley Water District	Potable Water	0401+88	x	Transverse	Protect in Place
Santa Clara Valley Water District	Potable Water	0676+62	x	Transverse	Protect in Place
Unknown	Potable Water	1006+84	x	Transverse	Protect in Place
City of Gilroy	Potable Water	1564+73	x	Transverse	Protect in Place
City of Gilroy	Potable Water	1604+95	x	Transverse	Protect in Place
Unknown	Potable Water	1609+86	x	Transverse	Protect in Place

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
Unknown	Potable Water	1631+53	x	Transverse	Relocate
Unknown	Potable Water	1643+23	x	Transverse	Protect in Place
Unknown	Potable Water	1649+14	x	Transverse	Protect in Place
City of Gilroy	Potable Water	1654+23	x	Transverse	Protect in Place
Unknown	Potable Water	1673+52	x	Transverse	Remove
City of Gilroy	Potable Water	1679+31	x	Transverse	Relocate
City of Gilroy	Potable Water	1715+13	x	Transverse	Protect in Place
Santa Clara Valley Water District	Recycled Water	1698+60	x	Transverse	Protect in Place
City of Morgan Hill	Storm Drain Pump Station	1087+18	x	Transverse	Relocate
CA High-Speed Rail	Track Drainage Pump Station	0723+76	x	Transverse	New
CA High-Speed Rail	Track Drainage Pump Station	0749+76	x	Transverse	New
CA High-Speed Rail	Track Drainage Pump Station	0843+00	x	Transverse	New
CA High-Speed Rail	Track Drainage Pump Station	0888+27	x	Transverse	New
CA High-Speed Rail	Track Drainage Pump Station	0966+19	x	Transverse	New
CA High-Speed Rail	Track Drainage Pump Station	1275+83	x	Transverse	New
CA High-Speed Rail	Track Drainage Pump Station	1360+00	x	Transverse	New
–	Electric & Telecom OH on Joint Pole	2044+46	x	Transverse	Relocate
PG&E	Electric OH	2094+00	x	Transverse	Relocate
PG&E	Natural Gas	2107+75	x	Transverse	Protect in Place
City of San Jose	Storm Drain Pump Station	3032+39	x	Transverse	Relocate
Unknown	Irrigation Ditch	1884+31	x	Transverse	Realign
Unknown	Irrigation Ditch	1890+28	x	Transverse	Realign
Pacheco Pass Subsection					
Unknown	Electric & Telecom OH on Joint Pole	2188+94	x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PG&E & Unknown	Electric & Telecom OH on Joint Pole	2228+14	x	Transverse	Relocate
PG&E	Electric OH	2372+38	x	Transverse	Relocate
PG&E	Natural Gas	2193+10	x	Transverse	Protect in Place
Department of Water Resources	Potable Water	2220+00 to 2231+00	x	Longitudinal	Protect in Place
U.S. Department of the Interior, Bureau of Reclamation	Potable Water	2287+50	x	Transverse	Protect in Place
Shell	Crude Oil	4207+50	x	Transverse	Protect in Place
ConocoPhillips	Crude Oil	4247+25	x	Transverse	Protect in Place
Chevron	Crude Oil	4267+20	x	Transverse	Protect in Place
–	Electric & Telecom OH on Joint Pole	4366+50	x	Transverse	Relocate
–	Electric OH	4046+79	x	Transverse	Relocate
PG&E	Electric OH	4251+64	x	Transverse	Relocate
–	Electric OH	4372+43	x	Transverse	Relocate
–	Electric OH	4372+52 to 4375+50	x	Longitudinal	Relocate
PG&E	Electric OH	3666+00	x	Transverse	Protect in Place
PG&E	Electric OH	3686+20	x	Transverse	Protect in Place
PG&E	Electric OH	4098+83	x	Transverse	Relocate
PG&E	Electric OH	4177+80	x	Transverse	Protect in Place
PG&E	Electric OH	4178+30	x	Transverse	Protect in Place
PG&E	Electric OH	4178+70	x	Transverse	Protect in Place
PG&E	Electric OH	4179+50	x	Transverse	Protect in Place
PG&E	Electric OH	4180+00	x	Transverse	Protect in Place
PG&E	Electric OH	4180+50	x	Transverse	Protect in Place
PG&E	Electric OH	4182+50	x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PG&E	Electric OH	4183+30	x	Transverse	Protect in Place
PG&E	Electric OH	4183+60	x	Transverse	Protect in Place
Shell	Gas	4285+00	x	Transverse	Abandon
–	Irrigation Ditch	4366+26	x	Transverse	Relocate
U.S. Department of the Interior, Bureau of Reclamation	Potable Water	3270+50 to 3305+00	x	Both	Relocate
San Joaquin Valley Subsection					
PG&E	Electric & Telecom OH on Joint Pole	4597+20	x	Transverse	Relocate
PG&E	Electric & Telecom OH on Joint Pole	4798+51	x	Transverse	Relocate
PG&E	Electric & Telecom OH on Joint Pole	4882+50 to 4888+00	x	Longitudinal	Relocate
PG&E	Electric & Telecom OH on Joint Pole	5095+00 to 5102+30	x	Longitudinal	Relocate
PG&E	Electric & Telecom OH on Joint Pole	5097+97	x	Transverse	Relocate
PG&E	Electric OH	4568+13	x	Transverse	Relocate
PG&E	Electric OH	4595+34	x	Transverse	Relocate
PG&E	Electric OH	4615+00 to 4642+00	x	Longitudinal	Relocate
PG&E	Electric OH	4622+22	x	Transverse	Relocate
PG&E	Electric OH	4657+81	x	Transverse	Relocate
PG&E	Electric OH	4761+86	x	Transverse	Relocate
PG&E	Electric OH	4780+28	x	Transverse	Relocate
PG&E	Electric OH	4856+42	x	Transverse	Relocate
PG&E	Electric OH	4886+00	x	Transverse	Relocate
PG&E	Electric OH	4966+39	x	Transverse	Relocate
PG&E	Electric OH	5032+24	x	Transverse	Relocate
PG&E	Electric OH	5055+82	x	Transverse	Relocate

Owner	Facility Type	Station Number	Alternative 4	Transverse/ Longitudinal/	Disposition
PG&E	Electric OH	5060+13	x	Transverse	Relocate
PG&E	Electric OH	5177+75	x	Transverse	Relocate
PG&E	Electric OH	5257+17	x	Transverse	Relocate
Chevron	Oil	4595+68	x	Transverse	Abandon
PG&E	PG&E Electric OH	4664+50 to 4717+00	x	Longitudinal	Relocate
PG&E	PG&E Electric OH	5319+00 to 5335+50	x	Longitudinal	Relocate
PG&E	PG&E Electric OH	5336+20	x	Transverse	Relocate
Henry Miller Reclamation District	Willis Branch Pump Station Facility	5257+00	x	Transverse	Relocate

PG&E = Pacific Gas and Electric
OH = overhead
UG = underground
Telecomm = Telecommunication

References

California Department of Forestry and Fire Protection (CAL FIRE). 2014a. *San Benito-Monterey Unit 2012 Strategic Fire Plan,* May 14, 2012. http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf1278.pdf (accessed April 28, 2017).

———. 2014b. *Madera-Mariposa-Merced Unit 2014 Strategic Fire Plan, May 1, 2014, Figure B: Battalion Maps,* Page 7. http://firewisemaderacounty.org/wp-content/uploads/2012/04/2014-05-01-CAL-FIRE-Madera-Mariposa-Merced-Unit-MMU-Strategic-Fire-Plan-California-Department-of-Forestry-and-Fire.pdf (accessed April 28, 2017).

———. 2017. Santa Clara Unit Station Location and BC Map. March 2017. www.ssccfd.com/wp-content/uploads/2017/03/Unit-Battalion-Breakdowns-map_20170312.pdf (accessed December 14, 2017).

California Office of Statewide Health Planning & Development. 2016. *List of Hospitals in California, USA.* http://gis.oshpd.ca.gov/atlas/places/list-of-hospitals (accessed July 12, 2016).

City of Gilroy. 2003. Gilroy Fire Department Memorandum, To Jay Baksa, City Administrator. From Jeff Clet, Fire Chief. Subject: Master Plan Update, September 11, 2003. Page 1. www.cityofgilroy.org/DocumentCenter/Home/View/5258 (accessed February 3, 2017).

———. 2017. Fire Department Operations, Apparatus. http://www.ci.gilroy.ca.us/176/Apparatus (accessed March 8, 2017).

City of Los Banos. 2017. Los Banos Fire Department. www.losbanos.org/city-government/departments/fire/ (accessed February 2, 2017).

City of Morgan Hill. 2013. City of Morgan Hill Office of Emergency Services: Emergency Operations Plan. Morgan Hill, CA. Adopted June 6, 2013. Page 1. www.morgan-hill.ca.gov/1288/Emergency-Response-Plan (accessed February 2, 2017).

———. 2017. City of Morgan Hill Public Safety Master Plan, February 10, 2017. https://user-ddhj25y.cld.bz/City-of-Morgan-Hill-Public-Safety-Master-Plan/1 (accessed August 9, 2017).

City of San Jose. 2015. City of San José. Annual Report on City Services 2014-15, Fire Department. Page 51. December 2015. www.sanjoseca.gov/DocumentCenter/View/48242.

———. 2016. City of San José 2016-2017 Adopted Operating Budget - San Jose at a Glance. Page I-8. www.sanjoseca.gov/DocumentCenter/View/61777

County of Merced. 2013. *2030 Merced County General Plan.* Merced, CA. Adopted December 10, 2013.

County of San Benito. 2015a. *San Benito County 2035 General Plan*. Adopted July 21, 2015. Page 6-14; Page 7-2; Page 7-12; Page 7-18; Page 7-19; Page 7-19; Page 9-2. http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf (accessed February 2, 2017).

———. 2015b. *San Benito County Operational Area Emergency Operations Plan*. Adopted August 2015. Page i. www.cosb.us/wp-content/uploads/SBC-EOP-2015.pdf (accessed February 2, 2017).

Federal Railroad Administration (FRA). 2016a. *Table 5.15: Consolidated Hwy Rail Accident Incident by State/Region/County.* Merced County. 2011-2015. Office of Safety Analysis. http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/ConsolidatedHwyRailIncidents.aspx (accessed December 29, 2016).

———. 2016b. *Table 5.15: Consolidated Hwy Rail Accident Incident by State/Region/County.* San Benito County. 2011-2015. Office of Safety Analysis. http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/ConsolidatedHwyRailIncidents.aspx (accessed December 29, 2016).

———. 2016c. *Table 5.15: Consolidated Hwy Rail Accident Incident by State/Region/County.* Santa Clara County. 2011-2015. Office of Safety Analysis. http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/ConsolidatedHwyRailIncidents.aspx (accessed December 29, 2016).

———. 2017a. *Table 1.11: One Year Accident/Incident Overview by State/Region/County.* Merced County. 2011-October 31, 2016. Office of Safety Analysis. http://safetydata.fra.dot.gov/OfficeofSafety/ (accessed January 30, 2017).

———. 2017b. *Table 1.11: One Year Accident/Incident Overview by State/Region.* San Benito County. 2011-October 31, 2016. Office of Safety Analysis. http://safetydata.fra.dot.gov/OfficeofSafety/ (accessed January 30, 2017).

———. 2017c. *Table 1.11: One Year Accident/Incident Overview by State/Region.* San Benito County. 2011-October 31, 2016. Office of Safety Analysis. http://safetydata.fra.dot.gov/OfficeofSafety/ (accessed January 30, 2017).

Gilroy Fire Department. 2016a. Email message from Roy J. Shackel, Fire Captain, OES Coordinator, KD6QVL, Gilroy Fire Department/OES, Gilroy CA to Jessica Viramontes, ICF, San Francisco, CA, RE: HSR Information Request, November 21, 2016, 1:57 PM, Page 1.

———. 2016b. Email message from Roy J. Shackel, Fire Captain, OES Coordinator, KD6QVL, Gilroy Fire Department/OES, Gilroy CA to Jessica Viramontes, ICF, San Francisco, CA, HSR Information Request, November 21, 2016, 4:31 PM, Page 1.

———. 2016c. Email message from Roy J. Shackel, Fire Captain, OES Coordinator, KD6QVL, Gilroy Fire Department/OES, Gilroy CA to Jessica Viramontes, ICF, San Francisco, CA, RE: HSR Information Request, November 28, 2016, 11:54 AM, Page 1.

Merced County Fire Department. 2017. *Merced County Fire Department Website, Stations.* www.co.merced.ca.us/BusinessDirectoryII.aspx?lngBusinessCategoryID=26 (accessed May 1, 2017).

San Jose Fire Department. 2014. San Jose Fire Department Response Time Performance Initial Analysis, Final Report, prepared by San José Fire Department Data Working Group, April 7, 2014, Pages 4–5.

———. 2016a. Letter to Mr. Guy Preston, Northern California Regional Delivery Manager California High Speed Rail Authority RE Request for Fire Service Information on Proposed High-Speed Rail Draft EIR/EIS from Robert Sapien, Jr., Assistant Fire Chief, San José Fire Department, November 23, 2016, Page 4.

———. 2016b. San Jose Fire Department City-Wide Response Metrics As of 12/14/2016. www.sanjoseca.gov/DocumentCenter/View/36885 Page 1 (accessed February 3, 2017).

Santa Clara County Fire Department. 2016. Santa Clara County Fire Department 2016 Annual Report. www.sccfd.org/images/documents/SCCFD_2016_Annual_Report_FINAL.pdf (accessed April 28, 2017).

APPENDIX 3.11-B: AIRPORT OBSTRUCTIONS

APPENDIX 3.11-B: AIRPORT OBSTRUCTIONS

Introduction

Since publication of the Draft Environmental Impact Report/Environmental Impact Statement, the following substantive changes have been made to this appendix:

- Text was updated throughout this appendix to address comments on Federal Aviation Regulation (FAR) 14 Code of Federal Regulations (C.F.R.) Part 77.

Under the California Environmental Quality Act (CEQA) Guidelines, Appendix G (California Code of Regulations [Cal. Code. Regs.], tit. 14, Ch. 3, §§ 15000–15837) the following significance criterion applies to the California High-Speed Rail (HSR) Project:

> For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

Safety hazards can include the development of land uses that are incompatible with airport operations or result in the imposition of airspace obstacles that represent hazards to aviation, and subsequently to people on the ground in areas exposed to aircraft overflight. The purpose of this appendix is to evaluate whether the San Jose to Central Valley Wye Project Extent (project) alternatives impinge upon the FAR Part 77 imaginary airspace surfaces or airport impact areas for any airports in the project vicinity, thus constituting a potential impact under CEQA.

Four public or public-use airports and three heliports are located in the project vicinity. These airports and heliports are described in greater detail in the following sections. No privately operated airstrips were identified within 2 miles of the project alternatives' footprints.

Norman Y. Mineta San Jose International Airport

Norman Y. Mineta San Jose International Airport is an air carrier airport owned by the City of San Jose. The airport is located approximately 1.5 miles from downtown San Jose and approximately 0.3 mile from the project alternatives' footprints at an elevation of 62 feet above mean sea level (ASML), and covers approximately 1,050 acres. The airport operates three parallel runways—Runway 12L-30R, Runway 12R-30L, and Runway 11-29. Traffic at the airport was forecast to increase from a recorded 188,462 operations in 2006 to a projected 330,000 operations by 2017. The 2017 estimate of 330,000 operations was extended to 2027 in the November 2015 update to the Airport Comprehensive Land Use Plan. (County of Santa Clara 2016a).

San Martin Airport

San Martin Airport is a general aviation airport owned by the County of Santa Clara. The airport is located approximately 0.25 mile from the project alternatives' footprints. The airport operates one 3,100-foot-long runway (Runway 14-32) and is forecast to increase from an estimated 56,000 operations in 2002 to 175,560 operations by 2022. The airport elevation is 281 feet AMSL.

Frazier Lake Airpark

Frazier Lake Airpark is a general aviation airport owned by the Frazier Lake Airpark Corporation. The airport is located approximately 0.15 mile from project alternatives' footprints. The airport operates two parallel runways, a 2,500-foot-long runway (Runway 5-23) and a 3,000-foot-long runway (Runway 5W-23W), and is forecast to increase from an estimated 9,800 operations in 1998 to 23,990 operations by 2020. The airport elevation is 153 feet AMSL.

Los Banos Municipal Airport

Los Banos Municipal Airport is a general aviation airport owned by the City of Los Banos and operated through the Public Works Department. The airport is located approximately 2 miles from the project alternatives' footprints. The airport operates one 3,800-foot-long runway (Runway 14-32) and is forecast to increase from an estimated 16,000 operations in 2010 to 21,000 operations by 2015. The airport elevation is 121 feet AMSL.

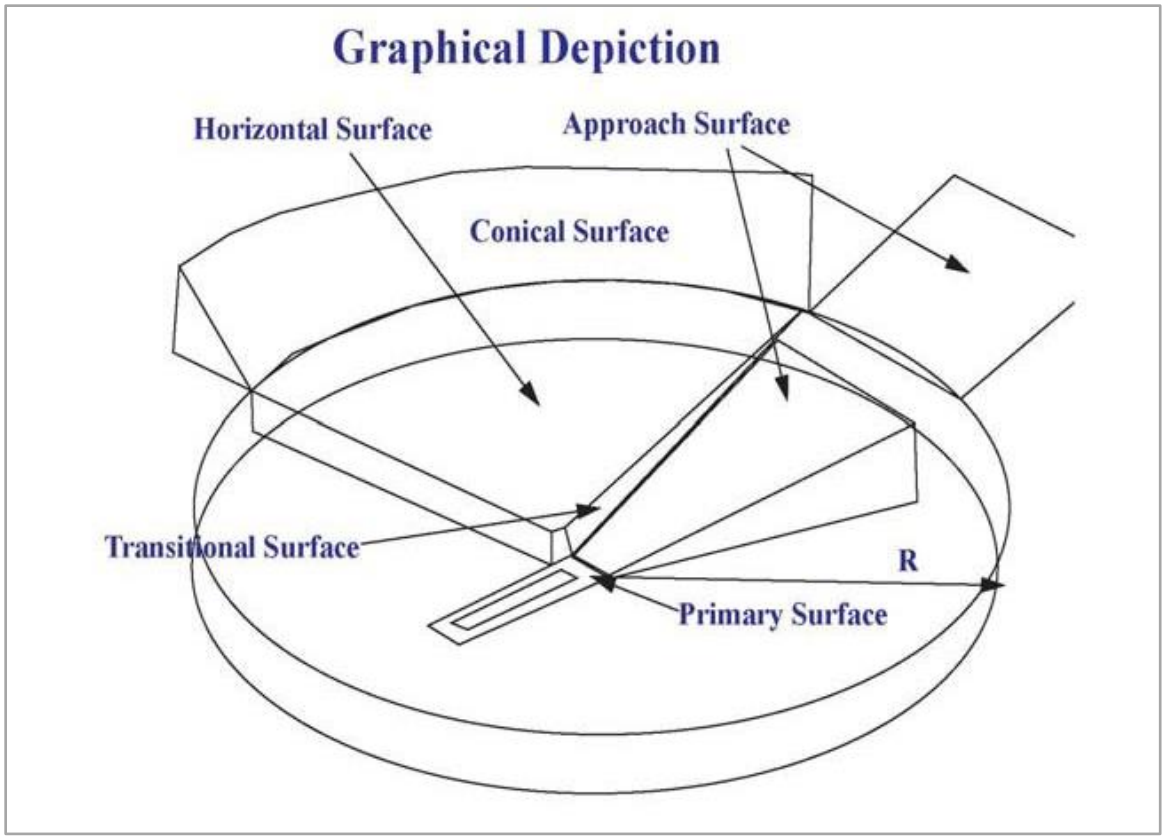
Airport Influence Areas

San Jose (Mineta) International Airport, San Martin (South County) Airport, Los Banos Airport, and Frazier Lake Airpark are subject to airport comprehensive land use plans (CLUP) (County of Santa Clara 2016a, 2016b; County of San Benito 2001; County of Merced 2012). Each CLUP identifies the Airport Influence Area (AIA)—the geographic boundary of the airport land use compatibility plan (ALUCP). Airport master plans and land use compatibility plans from county airport land use commissions regulate land use within airport safety zones to minimize airport hazards and risk of accidents. ALUCPs establish the AIA after a hearing and in consultation with the involved agencies, as required by California Public Utilities Code Section 21675(c). Proposed projects that encroach into an AIA defined in a CLUP are subject to review in accordance with procedures established in the CLUP.

Imaginary Surfaces

Terminal instrument procedures (TERPS) are instrument approach and departure procedures for both civilian and military airports. TERPS define imaginary surfaces to help develop instrument procedures and conduct obstacle analysis for instrument operations. For the purposes of identifying airspace obstacles for airports, the most commonly identified imaginary surfaces include those surfaces for civil aviation facilities defined under 14 C.F.R. Part 77 (Part 77) and TERPS. These imaginary surfaces for civil airports fall into five standard categories: primary, approach, transitional, horizontal, and conical. The size and shape of these surfaces can vary based on the runway category and the type of operating procedures available or planned for that runway. Examples of these surfaces are shown on Figure 1.

Under Part 77 regulations for determining obstructions to airspace, an existing object, including a mobile object, would be an obstruction to air navigation if it penetrates the surface of a takeoff and landing area of an airport or any imaginary surface established for the airport (14 C.F.R. § 77.24).



Source: Washington Department of Transportation Aviation 2012 APRIL 2017

Figure 1 Part 77 Airspace Surfaces

Subpart B, Notice of Construction or Alteration, of the Part 77 regulations requires that the FAA be notified of any proposed construction or alteration of objects within 20,000 feet of a runway and having a height that would exceed a 100:1 imaginary surface (1 foot upward per 100 feet of horizontal distance) beginning at the nearest point of the runway. This requirement applies to runways more than 3,200 feet in length (e.g., Norman Y. Mineta San Jose International Airport). For shorter runways, such as Los Banos Airport Runway 14-32, the notification surface has a 50:1 slope and extends 10,000 feet from the runway. Notification is required with regard to any public-use or military airport. Official determinations of the areas and elevations within which the federal notification requirements apply are subject to the authority of the FAA. The FAA may require filing of notices for proposed construction based on considerations other than the proposed height of the structure. For example, in some areas of complex airspace and high air traffic volumes, the FAA may be concerned about the potential for new construction of any height to interfere with electronic navigation aids. In these areas, FAA may also require notification of proposed construction projects (Caltrans 2011).

Analysis

This analysis evaluates the project alternatives with respect to encroachment into the AIAs for each airport. For purposes of evaluating AIA encroachment, AIA plans for each of the airports were obtained from the latest versions of their respective ALUCPs (County of Santa Clara 2016a, 2016b; County of San Benito 2001; County of Merced 2012). The AIA airspace plans were georeferenced using ArcGIS 9.3 and overlaid with geographic information system (GIS) shape files representing the project alternatives for the purpose of identifying their location relative to each airport's AIA. The online FAR Part 77 Notice Criteria Tool (FAA 2018) was also used to assess FAA notification requirements for proposed construction of the alternatives.

Table 1 shows the project alternatives' encroachment areas in relation to the airports' AIAs. For San Jose Airport, San Martin Airport, Frazier Lake Airpark, and Los Banos Municipal Airport, there were four AIAs included in the airport land use plans; A Request for Qualifications (RFQ) for Frazier Lake Airpark Land Use Compatibility Plan was submitted in August 2018, and will eventually include an updated AIA. Under Alternative 1, 121.3 acres of temporary construction area and 235.4 acres of permanent construction area are within the AIA for airports near the project alternatives. Under Alternative 2, 304.4 acres of temporary construction area and 308.4 acres of permanent construction area are within the AIA for airports near the project alternatives. Under Alternative 3, 170.1 acres of temporary construction area and 256.6 acres of permanent construction area are within the AIA for airports near the project alternatives. Under Alternative 4, 100.2 acres of temporary construction area and 213.9 acres of permanent construction area are within the AIA for airports near the project alternatives.

Table 1 Airport Influence Area Encroachment Area for Each Project Alternative

Airport	Encroachment Area (acres)							
	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.
Mineta/San Jose International Airport	55.0	97.9	96.5	86.4	96.5	86.4	15.2	70.5
San Martin Airport	24.3	38.7	165.9	123.1	50.2	49.6	36.1	44.9
Frazier Lake Airpark	42.0	98.8	42.0	98.8	23.4	120.6	42.0	98.8
Los Banos Municipal Airport	0	0	0	0	0	0	0	0
Total	121.3	235.4	304.4	308.4	170.1	256.6	93.4	214.4

Sources: County of Santa Clara 2016a, 2016b
Temp. = temporary
Perm. = permanent

Signaling and train control elements within the right-of-way would include 10-foot-by-8-foot communications shelters or signal huts/bungalows that house signal relay components and microprocessor components, cabling to the field hardware and track, signals, and switch machines on the track. Communications towers within these facilities would be located near track switches and would be grouped with other traction power, maintenance, station, and similar HSR facilities where possible. Where communications towers cannot be located with traction power substations or other HSR facilities, the communications facilities would be located near the HSR corridor in a fenced area of approximately 20 feet by 15 feet. The communications towers for each project alternative are identified in Tables 2a–d.

Table 2a Part 77 Notification for Alternative 1

Airport	Communication Tower			
	City/Community	Alternative 1		
		Location	Height Exceedance[1]	Navigation[2]
Norman Y. Mineta San Jose International Airport	Santa Clara	Radio Tower 2	61 ft	X
		Radio Tower 1	53 ft	X
	San Jose	Radio Tower 8	103 ft	X
		Radio Tower 6	96 ft	X
		Radio Tower 5	70 ft	X
		Radio Tower 3	67 ft	X

Airport	Communication Tower			
	City/Community	Alternative 1		
		Location	Height Exceedance[1]	Navigation[2]
San Martin Airport	San Martin	Radio Tower 33	44 ft	N/A
		Radio Tower 31	43 ft	N/A
Frazier Lake Airpark	N/A	None	N/A	N/A
Los Banos Municipal Airport	N/A	None	N/A	N/A

Sources: FAA 2018
N/A = not applicable
ft = feet
[1] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is with the designated airport imaginary surfaces and is therefore required to file in accordance with 77.9.
[2] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is in proximity to a navigation facility and may impact the assurance of navigation signal reception and is therefore required to file in accordance with 77.9.

Table 2b Part 77 Notification for Alternative 2

Airport	Communication Tower			
	City/Community	Alternative 2		
		Location	Height Exceedance[1]	Navigation[2]
Norman Y. Mineta San Jose International Airport	San Jose	Radio Tower 7	103 ft	X
		Radio Tower 6	96 ft	X
		Radio Tower 5	70 ft	X
		Radio Tower 3	67 ft	X
San Martin Airport	San Martin	Radio Tower 32	41 ft	N/A
		Radio Tower 30	43 ft	N/A
Frazier Lake Airpark	N/A	None	N/A	N/A
Los Banos Municipal Airport	N/A	None	N/A	N/A

Sources: FAA 2018
N/A = not applicable
ft = feet
[1] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is with the designated airport imaginary surfaces and is therefore required to file in accordance with 77.9.
[2] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is in proximity to a navigation facility and may impact the assurance of navigation signal reception and is therefore required to file in accordance with 77.9.

Table 2c Part 77 Notification for Alternative 3

Airport	Communication Tower			
	City/Community	Alternative 3		
		Location	Height Exceedance[1]	Navigation[2]
Norman Y. Mineta San Jose International Airport	San Jose	Radio Tower 8	103 ft	X
		Radio Tower 6	96 ft	X
		Radio Tower 5	70 ft	X
		Radio Tower 3	67 ft	X

Airport	Communication Tower			
	City/Community	Alternative 3		
		Location	Height Exceedance[1]	Navigation[2]
San Martin Airport	San Martin	Radio Tower 33	44 ft	N/A
		Radio Tower 31	43 ft	N/A
Frazier Lake Airpark	N/A	None	N/A	N/A
Los Banos Municipal Airport	N/A	None	N/A	N/A

Sources: FAA 2018
N/A = not applicable
ft = feet
[1] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is with the designated airport imaginary surfaces and is therefore required to file in accordance with 77.9.
[2] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is in proximity to a navigation facility and may impact the assurance of navigation signal reception and is therefore required to file in accordance with 77.9.

Table 2d Part 77 Notification for Alternative 4

Airport	Communication Tower			
	City/Community	Alternative 4		
		Location	Height Exceedance[1]	Navigation[2]
Norman Y. Mineta San Jose International Airport	San Jose	Radio Tower 9	N/A	X
		Radio Tower 4	70 ft	X
San Martin Airport	San Martin	Radio Tower 29	24 ft	N/A
Frazier Lake Airpark	N/A	None	N/A	N/A
Los Banos Municipal Airport	N/A	None	N/A	N/A

Sources: FAA 2018
N/A = not applicable
ft = feet
[1] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is with the designated airport imaginary surfaces and is therefore required to file in accordance with 77.9.
[2] The FAR Part 77 Notice Criteria Tool indicates that the proposed structure is in proximity to a navigation facility and may impact the assurance of navigation signal reception and is therefore required to file in accordance with 77.9.

Results

Norman Y. Mineta San Jose International Airport

All four project alternatives encroach into the AIA of San Jose International Airport (SJC), as shown in Table 1.

All four project alternatives have communication towers located in Santa Clara (Radio Towers 1 and 2) and San Jose (Radio Towers 3 through 9). According to the FAR Part 77 Notice Criteria Tool, in Santa Clara, Radio Tower 1 would exceed height restrictions by 53 feet, and Radio Tower 2, by 61 feet. Both of the towers are in proximity to a navigation facility associated with the airport, and may affect the assurance of navigation signal reception, according to the FAR Part 77 Notice Criteria Tool. The nearest runway to the proposed communication towers is SJC Runway 12L/30R. The FAR Part 77 Notice Criteria Tool also indicates that the proposed communication towers would exceed an instrument approach area by 67, 70, 70, 96,103, and 103 feet for Radio Towers 3, 4, 5, 6, 7, and 8, respectively, and an aeronautical study for each tower would need to be conducted to determine if the structure would exceed a standard of subpart C of 14 C.F.R. Part 77. Radio Tower 9 is in close proximity to a navigation facility associated with the airport, and may affect the assurance of navigation signal reception. The FAR Part 77 Notice Criteria Tool

indicates that FAR Part 77 notification would be required for approval of construction of the communication towers in Santa Clara and San Jose under all four alternatives.

San Martin Airport

All four project alternatives encroach into the AIA of San Martin Airport (E16), as shown in Table 1.

All four project alternatives have communication towers located in San Martin (Radio Towers 29 through 33). According to the FAR Part 77 Notice Criteria Tool, the proposed communication towers would exceed an instrument approach area by 24, 43, 43, 41, and 44 feet for Radio Towers 29, 30, 31, 32, and 33 respectively. An aeronautical study for each tower would need to be conducted to evaluate the proposal because the OEAAA source is not able to provide airport or runway data for San Martin Airport. The nearest runway to the proposed communication tower locations is E16 Runway 14/32. The FAR Part 77 Notice Criteria Tool indicates that FAR Part 77 notification would be required for approval of construction of the communication towers in San Martin under all four project alternatives.

Frazier Lake Airpark

Each of the four project alternatives encroaches into the AIA of Frazier Lake Airpark.

The FAR Part 77 Notice Criteria Tool indicates that FAR Part 77 notification would not be required for approval of construction of the communication towers in San Benito and Santa Clara Counties in the vicinity of Frazier Lake Airpark under all four project alternatives.

Los Banos Municipal Airport

None of the four project alternatives encroach into the AIA of Los Banos Municipal Airport.

The FAR Part 77 Notice Criteria Tool indicates that FAR Part 77 notification would not be required for approval of construction of the communication towers in Merced County in the vicinity of Los Banos Municipal Airport under all four project alternatives.

Heliports

Three privately-operated heliports in Santa Clara County are located within 2 miles of the project alternatives' footprints. These are located at the Santa Clara Towers building in San Jose, Santa Clara Valley Medical Center in San Jose, and St. Louise Hospital in Gilroy. The three heliports are rooftop facilities associated with medical center and residential high-rise properties and would not be affected by project construction and operations.

Privately-Operated Airstrips

No privately-operated airstrips were identified within 2 miles of the project alternatives' footprints for any of the project alternatives.

References

California Department of Transportation (Caltrans). 2011. *California Airport Land Use Planning Handbook, California Department of Transportation, Division of Aeronautics*. October 2011. Pages 1–7. http://dot.ca.gov/hq/planning/aeronaut/documents/alucp/AirportLandUsePlanningHandbook.pdf (accessed March 7, 2017).

Federal Aviation Administration (FAA). 2018. *FAA Notice Criteria Tool–Desk Reference Guide* V_2014.2.0. https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp (accessed November 27, 2018).

County of Merced. 2012. *Merced County Airport Land Use Compatibility Plan Containing the individual compatibility plans for: Castle Airport, Gustine Municipal Airport, Los Banos Municipal Airport, Merced Regional Airport, and Turlock Municipal Airport.* Prepared for Merced County Airport Land Use Commission. Adopted June 21, 2012. Page 2–24 www.co.merced.ca.us/pdfs/planning/aluc/alucp_july2012/2012_mer_alucp_entire_document.pdf (accessed February 2, 2017).

County of San Benito. 2001. *Frazier Lake Airpark Comprehensive Land Use Plan*. San Benito County Airport Land Use Commission, 2001. Page 3-1, Page 3-11. http://frazierlake.com/public_docs/CLUP-Text.pdf (accessed February 2, 2017).

County of Santa Clara. 2016a. *Comprehensive Land Use Plan Santa Clara County: Norman Y. Mineta-San Jose International Airport.* Santa Clara County Airport Land Use Commission, San Jose, California. May 25, 2011. Amended November 16, 2016. Pages 4-5; 4-9; 4-10 www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_SJC_CLUP.pdf (accessed January 25, 2017).

———. 2016b. *Comprehensive Land Use Plan Santa Clara County: South County Airport (San Martin Airport).* Santa Clara County Airport Land Use Commission, San Jose, California. September 10, 2008. Amended November 16, 2016. Pages 4-5, 4-9, 4-10. www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_E16_CLUP.pdf (accessed January 25, 2017).

San Benito County Airport Land Use Commission. 2018. *Request for Qualifications (RFQ) Frazier Lake Airpark Land Use Compatibility Plan*. San Benito County Airport Land Use Commission, 2018. http://sanbenitocog.org/wp-content/uploads/2018/08/RFQ-Frazier-Lake-Airpark-Compatability-Plan.pdf (accessed November 29, 2018).

Washington State Department of Transportation Aviation. 2012. *FAR Part 77 Basics – Aviation*. www.wsdot.wa.gov/NR/rdonlyres/8AA4326B-7B35-448A-BC39-3734CA638687/0/FAA_Part77_Basics.pdf (accessed April 19, 2017).

APPENDIX 3.12-A: RELOCATION ASSISTANCE DOCUMENTS

CALIFORNIA High-Speed Rail Authority

Your Rights and Benefits as a Displacee Under the Uniform Relocation Assistance Program ***(Residential)***

July 2013

www.hsr.ca.gov

INTRODUCTION

In building any large, modern transportation project, the displacement of a small percentage of the population is often necessary. However, it is the policy of the California High-Speed Rail Authority (Authority) that displaced persons shall not suffer unnecessarily as a result of a program, like the High-Speed Rail Project (Project) that is designed to benefit the public as a whole.

Individuals, families, businesses, farms, and nonprofit organizations displaced by the Project may be eligible for relocation advisory services and payments.

This brochure provides information about available relocation services and payments. If you are required to move as the result of the Project, a Relocation Agent will contact you. The Relocation Agent will be able to answer your specific questions and provide additional information.

UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970 AS AMENDED "THE UNIFORM ACT"

The purpose of the Uniform Act is to provide for uniform and equitable treatment of persons displaced from their homes, businesses, farms, or nonprofit organizations by federal and federally assisted programs and to establish uniform and equitable land acquisition policies for federal and federally assisted programs.

Title 49, Part 24, of the Code of Federal Regulations implements the Uniform Act in accordance with the following relocation assistance objective:

> To ensure that persons displaced as a direct result of federal or federally-assisted projects are treated fairly, consistently and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

While every effort has been made to assure the accuracy of this booklet, you must understand that it does not have the force and effect of law, rule, or regulation governing the payment of benefits. In the event of any difference between a statement in this brochure and any provision of law, rule or regulation, the latter will be followed.

SOME IMPORTANT DEFINITIONS

You will be able to understand your relocation benefits better if you become familiar with the following terms:

Comparable Replacement Dwelling is a dwelling which is:

1. Decent, safe, and sanitary. (*See definition below*.)
2. Functionally equivalent to the displacement dwelling.
3. Adequate in size to accommodate the persons being relocated.
4. In an area not subject to unreasonable adverse environmental conditions.
5. In a location generally not less desirable than the location of your displacement dwelling with respect to public utilities and commercial and public facilities, and reasonably accessible to your place of employment.
6. On land that is typical in size for residential development with typical improvements.
7. Currently available on the market.
8. Within your financial means.

Decent, Safe and Sanitary (DS&S) Dwelling is a dwelling that meets applicable local housing and occupancy codes. It also shall:

1. Be structurally sound, weather tight, and in good repair.

2. Contain a safe electrical wiring system adequate for lighting and other devices.

3. Contain a heating system capable of sustaining a healthful temperature (of approximately 70 degrees) for a displaced person, except in those areas where local climatic conditions do not require such a system.

4. Be adequate in size with respect to the number of rooms and area of living space needed to accommodate the displaced persons. The number of persons occupying each habitable room used for sleeping purposes shall not exceed that permitted by local housing codes.

5. Have a separate, well-lighted and ventilated bathroom that provides privacy to the user and contains a sink, bathtub or shower stall, and a toilet, all in good working order and properly connected to appropriate sources of water and to a sewage drainage system.

   Note: *In the case of a housekeeping dwelling, there shall be a kitchen area that contains a fully usable sink, properly connected to potable hot and cold water and to a sewage drainage system, and adequate space and utility service connections for a stove and refrigerator.*

6. Contains unobstructed egress to safe, open space at ground level. If the replacement dwelling unit is on the second story or above, with access directly from or through a common corridor, the common corridor must have at least two means of egress.

7. For a displaced person with a disability, be free of any barriers which would preclude reasonable ingress, egress, or use of the dwelling by that displaced person.

Displaced Person or Displacee is any person who moves from real property or moves personal property from real property as a result of the acquisition of the real property, in whole or in part, or as the result of a written notice from the agency of its intent to acquire the real property needed for this transportation project. In the case of a partial acquisition, the Authority shall determine if a person is displaced as a direct result of the acquisition.

Persons **not lawfully present** in the United States are not eligible to receive relocation payments and assistance.

Relocation benefits will vary, depending upon the type and length of occupancy. As a residential displacee, you will be classified as either:

- An owner occupant of a residential property (includes mobile homes)

- A tenant occupant of a residential property (includes mobile homes and sleeping rooms)

Dwelling is the place of permanent or customary and usual residence of a person, according to local custom or law, including a single family house; a single family unit in a two-family, multi-family, or multi-purpose property; a unit of a condominium or cooperative housing project; a non-housekeeping unit; a mobile home; or any other residential unit.

Owner is a person who is considered to have met the requirement to own a dwelling if the person purchases or holds any of the following interests in real property:

1. Fee title, a life estate, a land contract, a 99-year lease, or a lease, including any options for extension, with at least 50 years to run from the date of acquisition; **OR**

2. An interest in a cooperative housing project that includes the right to occupy a dwelling; **OR**

3. A contract to purchase any interests or estates described in (1) or (2); **OR**

4. Any other interest, including a partial interest, which in the judgment of the Authority warrants consideration as ownership.

Tenant is a person who has the temporary use and occupancy of real property owned by another.

MOVING EXPENSES

If you qualify as a displaced person, you are entitled to reimbursement of your moving costs and certain related expenses incurred in moving. The methods of moving and the various types of moving cost payments are explained below.

Displaced individuals and families may choose to be paid on the basis of actual, reasonable moving costs and related expenses, or according to a fixed moving cost schedule. However, to ensure your eligibility and prompt payment of moving expenses, you should contact your Relocation Agent before you move.

You Can Choose Either

Actual Reasonable Moving Costs
You may be paid for your actual reasonable moving costs and related expenses when a commercial mover performs the move. Reimbursement will be limited to a move of 50 miles or less. Related expenses ***may*** include:

- Transportation
- Packing and unpacking personal property
- Disconnecting and reconnecting household appliances
- Temporary storage of personal property
- Insurance while property is in storage or transit

OR

Fixed Moving Cost Schedule
You may be paid on the basis of a fixed moving cost schedule. Under this option, you will not be eligible for reimbursement of related expenses listed above. The fixed schedule is designed to cover these expenses.

Examples (Year 2012 Rate):
4 Rooms - $1,295
7 Rooms - $2,090

The Fixed Move Schedule for a furnished unit (e.g. you are a tenant of an apartment that is furnished by your landlord) is also based on the following schedule.

Example (Year 2012 Rate):
1 Room - $450
Each additional room - $85

Under the Fixed Move Schedule, you will not receive any additional payments for temporary storage, lodging, transportation or utility hook-ups.

REPLACEMENT HOUSING PAYMENTS

The type of Replacement Housing Payment (RHP) depends on whether you are an owner or a tenant, and on the length of your occupancy in the property being acquired. If you are a qualified **owner occupant** of more than 180 days prior to the initiation of negotiations for the acquisition of your property, you may be entitled to a RHP that consists of:

Price Differential, AND
Mortgage Differential, AND
Incidental Expenses;

OR

Rent Differential

If you are a qualified **owner occupant** of more than 90 days but less than 180 days, **OR** you are a qualified **tenant occupant** of at least 90 days, you may be entitled to a RHP as follows:

Rent Differential

OR

Downpayment Option

Length of occupancy simply means counting the number of days that you actually occupied a dwelling before the date of initiation of negotiations by the Authority for the purchase of the property. The term "initiation of negotiations" means the date the Authority makes the first personal contact with the owner of real property, or the owner's representative, to give either of them a written offer for the property to be acquired.

Note: *If you have been in occupancy* ***less than 90 days*** *before the initiation of negotiations and the property is subsequently acquired, or if you move onto the property after the initiation of negotiations and you are still in occupancy on the date of acquisition, you may or may not be eligible for a Replacement Housing Payment. Check with your Relocation Agent before you make any decision to vacate your property.*

FOR OWNER OCCUPANTS OF 180 DAYS OR MORE

If you qualify as a 180-day owner occupant, you may be eligible, in addition to the fair market value of your property, for a Replacement Housing Payment that consists of a Price Differential, Mortgage Differential and/or Incidental Expenses.

The **Price Differential** payment is the amount by which the cost of a replacement dwelling exceeds the acquisition cost of the displacement dwelling. This payment will assist you in purchasing a comparable decent, safe, and sanitary (DS&S) replacement dwelling. The Authority will compute the maximum payment you may be eligible to receive.

In order to receive the full amount of the calculated Price Differential, you must purchase a decent, safe and sanitary dwelling and spend at least the amount calculated by the Authority to be the cost of a comparable replacement property. (spend to get requirement)

The **Mortgage Differential** payment will reimburse you for any increased mortgage interest costs you might incur because the interest rate on your new mortgage exceeds the interest rate on the property acquired by the Authority. The payment computation is complex as it is based on prevailing rates, your existing loan and your new loan. Also, a part of this payment may be prorated, for example, as reimbursement for a portion of your loan origination fees and mortgage points.

To be eligible to receive this payment, the acquired property must have been encumbered by a bona fide mortgage that was a valid lien for at least 180 days prior to the initiation of negotiations.

You may also be reimbursed for any actual and necessary **Incidental Expenses** that you incur in relation to the purchase of your replacement property. These expenses may be those costs for title search, recording fees, credit report, appraisal report, and certain other closing costs associated with the purchase of property. You will not be reimbursed for any recurring costs such as prepaid real estate taxes and property insurance.

If the total amount of your **Replacement Housing Payment** (Price Differential, Mortgage Differential and Incidental Expenses) exceeds $22,500, the payment must be deposited directly into an escrow account or paid directly to the mortgage company.

Examples of Price Differential Payment Computation:
Assume that the Authority purchases your property for $98,000. After a thorough study of available, decent, safe and sanitary dwellings on the open market, the Authority determines that a comparable replacement property will cost you $100,000. If your purchase price is $100,000, you will receive $2,000 (*see Example A*).

If your actual purchase price is more than $100,000, you pay the difference *(see Example B*). If your purchase price is less than $100,000, the differential payment will be based on actual costs (*see Example C*).

How much of a differential payment you receive depends on how much you actually spend on a replacement dwelling as shown in these examples:

The Authority's Computation

Cost of Comparable Replacement Property	$100,000
Acquisition Price of Your Property	-$ 98,000
Maximum Price Differential	$ 2,000

Example A

Purchase Price of Replacement Property	$100,000
Cost of Comparable Replacement Property	$100,000
Acquisition Price of Your Property	-$ 98,000
Maximum Price Differential	$ 2,000

Example B

Purchase Price of Replacement Property	$105,000
Cost of Comparable Replacement Property	$100,000
Acquisition Price of Your Property	- $ 98,000
Maximum Price Differential	$ 2,000
You Must Pay the Additional	$ 5,000

Example C

Cost of Comparable Replacement Property	$100,000
Purchase Price of Replacement Property	$ 99,000
Acquisition Price of Your Property	- $ 98,000
Price Differential	$ 1,000

In Example C you will only receive $1,000, not the full amount of the Authority's "Comparable Replacement Property," because of the "Spend to Get" requirements.

If you are a "180-day owner occupant" in order to receive the full amount of the Replacement Housing Payment *(Price Differential, Mortgage Differential and Incidental Expenses),* **you must:**

A) Purchase and occupy a DS&S replacement dwelling within one year after the later of:

1. The date you first receive a notification of an available replacement house, **OR**

2. The date that the Authority has paid the acquisition cost of your current dwelling (usually the closing of escrow on State's acquisition),

AND

B) Spend at least the amount of the Authority's "Comparable Replacement Property" for a replacement property,

AND

C) File a claim for relocation payments within 18 months of the later:

1. The date you vacate the property acquired by the Authority, **OR**

2. The date that the Authority has paid the acquisition cost of your current dwelling (usually the close of escrow on State's acquisition)

You will not be eligible to receive any relocation payments until the Authority has actually made the first written offer to purchase the property. Also, you will receive at least 90 days' written notice before you must move.

FOR OWNER OCCUPANTS AND TENANTS OF 90 DAYS OR MORE

If you qualify as a 90-day occupant (either as an owner or tenant), you may be eligible for a Replacement Housing Payment in the form of a Rent Differential.

The **Rent Differential** payment is designed to assist you in renting a comparable decent, safe and sanitary replacement dwelling. The payment is based on the difference between the base monthly rent for the property acquired by the Authority (including average monthly cost for utilities) and the lesser of:

a. The monthly rent and estimated average monthly cost of utilities for a comparable replacement dwelling as determined by the Authority, **OR**

b. The monthly rent and estimated average monthly cost of utilities for the decent, safe and sanitary dwelling that you actually rent as a replacement dwelling.

Utility costs are those expenses you incur for heat, lights, water and sewer regardless of the source (e.g. electricity, propane, and septic system). They do not include garbage, cable, telephone, or security. The utilities at your property are the average costs over the last 12 months. The cost of utilities at the comparable replacement property is based on the estimated costs for the last 12 months for the type of dwelling and area used in the calculation.

This difference between (a) and (b) is multiplied by 42 months and may be paid to you in a lump sum payment or in periodic installments in accordance with policy and regulations.

In order to receive the full amount of the calculated Rent Differential, you must rent a decent, safe and sanitary dwelling and spend at least the amount calculated by the Authority to be the rental rate of a comparable replacement property.

This payment may, with certain limitations, be converted to a **Downpayment Option** to assist you in purchasing a replacement property.

Example of Rent Differential Payment Computation:
After a thorough study of comparable, decent, safe and sanitary dwellings that are available for rent, the Authority determines that a comparable replacement property will rent for $325.00 per month.

The Authority's Computation (rates are per month)

Rental Rate for Comparable Replacement Property	$ 325
PLUS average estimated utilities costs	+100
TOTAL Cost to Rent Comparable Replacement Property	= $ 425
Rental Rate for Your Current Property	$ 300
PLUS average utilities costs	+ 90
TOTAL Cost to Rent Current Property	= $ 390
Comparable Replacement Property including utilities	$ 425
Cost you currently pay to rent your property including utilities	- 390
Difference	= $ 35

Multiplied by 42 months = $1,470 Rent Differential

Example A:

Rental Rate you pay for a Replacement Property including estimated average utilities costs	$ 525
Comparable Replacement Property including utilities	$ 425
Cost you currently pay to rent your property including utilities	$ 390

Because $425 is less than $525, the Rent Differential is based on the difference between $390 and $425.

Rent Differential ($35 x 42 months = $1,470)

In this case you spent "at least" the amount of the Comparable Replacement Property on the replacement property and will receive the full amount.

Example B:

Rental Rate you pay for a Replacement Property including estimated average utilities costs	$ 400
Comparable Replacement Property including utilities	$ 425
Cost you currently pay to rent your property including utilities	$ 390

Because $400 is less than $425, the Rent Differential is based on the difference between $400 and $390.

Rent Differential ($10 x 42 months = $420)

In this case you spent "less than" the amount of the Comparable Replacement Property on the replacement property and will not receive the full amount.

If you are a "90- day owner occupant" in order to receive the full amount of your replacement housing payment *(Rent Differential)***, you must:**

A) Rent and occupy a DS&S replacement dwelling within one year after the later of:

1. The date you first receive a notification of an available replacement dwelling, **OR**

2. The day you vacate the property acquired by the Authority, **AND**

B) Spend at least the amount of the Authority's calculation of "Comparable Replacement Property" to rent a replacement property,

AND

C) File a claim for relocation payments within 18 months of the later of:

1. The date you vacate the property acquired by the Authority, **OR**

2. The date that the Authority has paid the acquisition cost of your current dwelling (usually the close of escrow on State's acquisition)

You will not be eligible to receive any relocation payments until the Authority has actually made the first written offer to purchase the property. Also, you will receive at least 90 days' written notice before you must move.

Note 1: *The time periods for a 90-day owner occupant are different from those for a 180-day owner occupant.*

Note 2: *If the Rent Differential is converted to a Downpayment Option, there is no "spend-to-get" requirement.*

DOWNPAYMENT OPTION

The Rent Differential payment may, with certain limitations, be converted to a **Downpayment Option** to assist you in purchasing a replacement property. The downpayment option is a direct conversion of the Rent Differential payment.

If the Authority's calculated Rent Differential is between $0 and $5,250, your downpayment option will be $5,250, which can be used toward the purchase of a replacement decent, safe and sanitary dwelling.

If the Rent Differential is over $5,250, you may be able to convert the entire amount of the Rent Differential to a downpayment option.

The downpayment option must be used for the acquisition of the replacement dwelling, plus any eligible incidental expenses (see "180-day Owner Occupants Incidental Expenses") related to the purchase of the property. You must work closely with your Relocation Agent to ensure you can utilize the full amount of your downpayment option toward the purchase.

If any portion of the Rent Differential was used prior to the decision to convert to a downpayment option, those advance payments will be deducted from the entire benefit.

LAST RESORT HOUSING

On most projects, an adequate supply of housing will be available for sale and for rent, and the benefits provided will be sufficient to enable you to relocate to comparable housing. However, there may be projects in certain locations where the supply of available housing is insufficient to provide the necessary housing for those persons being displaced. In such cases, the Authority will utilize a method called Last Resort Housing. Last Resort Housing allows the Authority to construct, rehabilitate or modify housing in order to meet the needs of the people displaced from a project. The Authority can also pay above the statutory limits of $5,250 and $22,500 in order to make available housing affordable.

RELOCATION ADVISORY ASSISTANCE

Any individual, family, business or farm displaced by the Authority shall be offered relocation advisory assistance for the purpose of locating a replacement property. Relocation services are provided by qualified personnel employed by, or under contract with, the Authority. It is their goal and desire to be of service to you and to assist in any way possible to help you relocate successfully. A Relocation Agent from the Authority will contact you personally. Relocation services and payments will be explained to you in accordance with your eligibility. During the Agent's initial interview with you, your housing needs and desires will be determined as well as your need for assistance. You cannot be required to move unless at least one comparable replacement dwelling is made available to you. You can expect to receive the following services, advice and assistance from your Relocation Agent who will:

- Explain the relocation benefits and eligibility requirements.
- Provide the amount of the replacement housing payments in writing.
- Assure the availability of a comparable replacement property before you move.
- Inspect possible replacement residential units for DS&S compliance.
- Provide information on counseling you can obtain to help minimize hardships in adjusting to your new location.
- Assist you in completing loan documents, rental applications or Relocation Claims Forms.

AND provide information on:

- Security deposits
- Interest rates and terms
- Typical downpayments
- VA and FHA loan requirements
- Real property taxes
- Consumer education literature on housing

If you desire, your Relocation Agent will give you current listings of other available replacement housing. Transportation will be provided to inspect available housing, especially if you are elderly or handicapped. Though you may use the services of a real estate broker, the Authority cannot provide a referral.

Your Relocation Agent is familiar with the services provided by others in your community and will provide information on other federal, state, and local housing programs offering assistance to displaced persons. If you have special needs, your Relocation Agent will make every effort to secure the services of those agencies with trained personnel who have the expertise to help you.

If the high-speed rail project will require a considerable number of people to be relocated, the Authority may establish a temporary Relocation Field Office on or near the project. Project relocation offices will be open during convenient hours and evening hours if necessary.

In addition to these services, the Authority is required to coordinate its relocation activities with other agencies causing displacements to ensure that all persons displaced receive fair and consistent relocation benefits.

Remember: YOUR RELOCATION AGENT is there to offer advice and assistance. Do not hesitate to ask questions. And be sure you fully understand all of your rights and available benefits.

YOUR RIGHTS AS A DISPLACEE

All eligible displacees have a freedom of choice in the selection of replacement housing, and the Authority will not require any displaced person to accept a replacement dwelling provided by the Authority. If you decide not to accept the replacement housing offered by the Authority, you may secure a replacement dwelling of your choice, providing it meets DS&S housing standards. The Authority will not pay more than your calculated benefits on any replacement property.

The most important thing to remember is that the replacement dwelling you select must meet the basic “decent, safe, and sanitary” standards. **DO NOT** execute a purchase agreement or a rental agreement

until a representative from the Authority has inspected and certified in writing that the dwelling you propose to occupy meets the basic standards. **DO NOT** jeopardize your right to receive a replacement housing payment by moving into a substandard dwelling.

It is important to remember that your relocation benefits will not have an adverse effect on your:

- Social Security Eligibility
- Welfare Eligibility
- Income Taxes

In addition, Title VIII of the Civil Rights Act of 1968 and later acts and amendments make discriminatory practices in the purchase and rental of most residential units illegal if based on race, color, religion, sex, or national origin.

Whenever possible, minority persons shall be given reasonable opportunities to relocate to a decent, safe, and sanitary replacement dwelling, not located in an area of minority concentration, and that is within their financial means. This policy, however, does not require the Authority to provide a person a larger payment than is necessary to enable that person to relocate to a comparable replacement dwelling.

The Authority's Non-Discrimination Policy ensures that all services and/or benefits will be administered to the general public without regard to race, color, national origin, or sex in compliance with Title VI of the 1964 Civil Rights Act (42 USC, sec. 2000d, et seq.). And you always have the right to appeal any decision by the Authority regarding your relocation benefits and eligibility.

Your right of appeal is guaranteed in the Uniform Act which states that any person may file an appeal with the head of the responsible agency if that person believes that the agency has failed to determine properly the person's eligibility or the amount of a payment authorized by the Act.

If you indicate your dissatisfaction, either verbally or in writing, the Authority will assist you in filing an appeal and will explain the procedures to be followed. You will be given a prompt and full opportunity to be heard. You have the right to be represented by legal counsel or other representative in connection with the appeal (but solely at your own expense). The Authority will consider all pertinent justifications and materials submitted by you and other available information needed to ensure a fair review. The Authority will provide you with a written determination resulting from the appeal with an explanation of the basis for the decision. If you are still dissatisfied with the relief granted, the Authority will advise you that you may seek judicial review.

Reference: Uniform Relocation Assistance and Real Property Acquisition

Policies Act of 1970, as amended (42 U.S.C. sec. 4601 et seq.) (Uniform Act);

and Implementing Regulations (49 C.F.R. Part 24)

CALIFORNIA High-Speed Rail Authority

Your Rights and Benefits as a Displacee Under the Uniform Relocation Assistance Program ***(Mobile Home)***

July 2013

www.hsr.ca.gov

INTRODUCTION

In building any large, modern transportation project, the displacement of a small percentage of the population is often necessary. However, it is the policy of the California High-Speed Rail Authority (Authority) that displaced persons shall not suffer unnecessarily as a result of a program, like the High-Speed Rail Project (Project), designed to benefit the public as a whole.

Individuals, families, businesses, farms, and nonprofit organizations displaced by the Project may be eligible for relocation advisory services and payments.

This brochure provides information about available relocation services and payments. If you are required to move as the result of the Project, a Relocation Agent will contact you. The Relocation Agent will be able to answer your specific questions and provide additional information.

UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970 AS AMENDED "THE UNIFORM ACT"

The purpose of the Uniform Act is to provide for uniform and equitable treatment of persons displaced from their homes, businesses, farms, or nonprofit organizations by federal and federally assisted programs and to establish uniform and equitable land acquisition policies for federal and federally assisted programs.

Title 49, Part 24, of the Code of Federal Regulations implements the Uniform Act in accordance with the following relocation assistance objective:

> To ensure that persons displaced as a direct result of federal or federally-assisted projects are treated fairly, consistently and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

While every effort has been made to assure the accuracy of this booklet, you must understand that it does not have the force and effect of law, rule, or regulation governing the payment of benefits. In the event of any difference between a statement in this brochure and any provision of law, rule or regulation, the latter will be followed.

SOME IMPORTANT DEFINITIONS

You will be able to understand your relocation benefits better if you become familiar with the following terms:

Comparable Replacement Dwelling is a dwelling which is:

1. Decent, safe, and sanitary. (*See definition below*.)
2. Functionally equivalent to the displacement dwelling.
3. Adequate in size to accommodate the persons being relocated.
4. In an area not subject to unreasonable adverse environmental conditions.
5. In a location generally not less desirable than the location of your displacement dwelling with respect to public utilities and commercial and public facilities, and reasonably accessible to your place of employment.
6. On land that is typical in size for residential development with typical improvements.
7. Currently available on the market.
8. Within your financial means.

Decent, Safe and Sanitary (DS&S) Dwelling is a dwelling that meets applicable local housing and occupancy codes. It also shall:

1. Be structurally sound, weather tight, and in good repair.

2. Contain a safe electrical wiring system adequate for lighting and other devices.

3. Contain a heating system capable of sustaining a healthful temperature (of approximately 70 degrees) for a displaced person, except in those areas where local climatic conditions do not require such a system.

4. Be adequate in size with respect to the number of rooms and area of living space needed to accommodate the displaced persons. The number of persons occupying each habitable room used for sleeping purposes shall not exceed that permitted by local housing codes.

5. Have a separate, well-lighted and ventilated bathroom that provides privacy to the user and contains a sink, bathtub or shower stall, and a toilet, all in good working order and properly connected to appropriate sources of water and to a sewage drainage system.

   Note: *In the case of a housekeeping dwelling, there shall be a kitchen area that contains a fully usable sink, properly connected to potable hot and cold water and to a sewage drainage system, and adequate space and utility service connections for a stove and refrigerator.*

6. Contains unobstructed egress to safe, open space at ground level. If the replacement dwelling unit is on the second story or above, with access directly from or through a common corridor, the common corridor must have at least two means of egress.

7. For a displaced person with a disability, be free of any barriers which would preclude reasonable ingress, egress, or use of the dwelling by that displaced person.

Displaced Person or Displacee is any person who moves from real property or moves personal property from real property as a result of the acquisition of the real property, in whole or in part, or as the result of a written notice from the agency of its intent to acquire the real property needed for this transportation project. In the case of a partial acquisition, the Authority shall determine if a person is displaced as a direct result of the acquisition.

Residents **not lawfully present** in the United States are not eligible to receive relocation payments and assistance.

Relocation benefits will vary, depending upon the type and length of occupancy. As a residential displacee, you will be classified as either:

- An owner occupant of a residential property (includes mobile homes)

- A tenant occupant of a residential property (includes mobile homes and sleeping rooms)

Dwelling is the place of permanent or customary and usual residence of a person, according to local custom or law, including a single family house; a single family unit in a two-family, multi-family, or multi-purpose property; a unit of a condominium or cooperative housing project; a non-housekeeping unit; a mobile home; or any other residential unit.

Mobile Home generally refers to single, double or triple wide mobile home units. It does not include manufactured homes that are permanently affixed to the realty, as these are treated as single family dwellings. However, it may include certain trailers or recreational vehicles that are a primary residence depending on how they are permanently affixed to the real property.

Owner is a person who is considered to have met the requirement to own a dwelling if the person purchases or holds any of the following interests in real property:

1. Fee title, a life estate, a land contract, a 99-year lease, or a lease, including any options for extension, with at least 50 years to run from the date of acquisition; **OR**

2. An interest in a cooperative housing project that includes the right to occupy a dwelling; **OR**

3. A contract to purchase any interests or estates described in (1) or (2); **OR**

4. Any other interest, including a partial interest, which in the judgment of the Authority warrants consideration as ownership.

Tenant is a person who has the temporary use and occupancy of real property owned by another.

MOBILE HOMES

If the mobile home ***is not*** acquired by the Authority, the owner (regardless of who occupies it) of a mobile home is eligible for a payment to move the mobile home to a replacement piece of land based on an actual cost basis. This includes the cost to disassemble, move and reassemble any porches, decks, skirting and/or awnings.

Additional costs may be eligible for reimbursement if the Authority determines they are “actual, reasonable and necessary.” Some of these costs might include:

- Anchoring the unit to the new pad
- Additional axles or brakes on the mobile home that are required for transportation
- Temporary protection of an extra wide mobile home unit that must be split during the move
- Utility hook-ups to the unit (e.g. water, sewer, septic, electricity, gas), if utilities are already available to the mobile home location (e.g. pad)
- Necessary repairs to meet local and state codes
- Modifications necessary to meet “decent, safe and sanitary” requirements
- With limitations, a non-returnable entrance fee to the mobile home park

The movement of the mobile home must be performed by a qualified mover and the payment will be based on the lower of two bids obtained by the owner of the mobile home and approved by the Authority. The Authority cannot pay for the move of the mobile home beyond 50 miles unless there are no suitable replacement pieces of land or mobile home parks within the 50-mile radius. Approval for a move beyond 50 miles must be obtained in advance of the move.

MOVING EXPENSES

In addition to moving the mobile home, the occupants (regardless of who owns it) may be eligible for a payment to move their personal property, if they qualify as “displaced persons.”

The methods of moving and the various types of moving cost payments are explained below. Displaced individuals and families may choose to be paid on the basis of actual, reasonable moving costs and related expenses, or according to a fixed moving cost schedule. However, to ensure your eligibility and prompt payment of moving expenses, you should contact your Relocation Agent before you move.

You Can Choose Either

Actual Reasonable Moving Costs. You may be paid for your actual reasonable moving costs and related expenses when a commercial mover performs the move.

Reimbursement will be limited to a move of 50 miles or less. Related expenses ***may*** include:

- Transportation
- Packing and unpacking personal property
- Disconnecting and reconnecting household appliances
- Temporary storage of personal property
- Insurance while property is in storage or transit

OR

Fixed Moving Cost Schedule
You may be paid on the basis of a fixed moving cost schedule. Under this option, you will not be eligible for reimbursement of related expenses listed above. The fixed schedule is designed to cover these expenses.

Examples (Year 2012 Rate):
4 Rooms - $1,295
7 Rooms - $2,090

If the furniture is moved with the mobile home, the amount of the fixed payment is based on the following schedule:

Example (Year 2012 Rate):
1 Room - $450
Each additional room - $85

Normally no additional payments for temporary storage, lodging, transportation or utility hook-ups of household appliances can be paid with the fixed move schedule. However, the mobile home occupants who choose to move back into the same mobile home at the new location may receive an allowance for food and lodging during the move and set-up time. Also, utility hook-ups to the mobile home unit may be eligible for reimbursement.

Note: *Even if the mobile home is acquired by the Authority, the occupants of the mobile home (regardless of who owns it) are still eligible for a payment to move their personal property.*

REPLACEMENT HOUSING PAYMENTS

The occupant of a mobile home unit may be eligible for a replacement housing payment. The type of Replacement Housing Payment (RHP) depends on whether you are an owner or a tenant *of the mobile home,* and the length of occupancy in the mobile home unit that is on property being acquired for the Project.

If you are a qualified **owner occupant** of both the land and the mobile home for more than 180 days prior to the initiation of negotiations for the acquisition of your property, and the mobile home unit is acquired by the Authority, you may be entitled to a RHP that consists of:

Price Differential, AND
Mortgage Differential, AND
Incidental Expenses;

OR

Rent Differential

You do not have to purchase and occupy another mobile home unit in order to receive your RHP - however, the new residential unit must meet the “decent, safe and sanitary” requirements.

If the mobile home is not acquired by the Authority, you may still be eligible for a RHP to assist you with purchasing a replacement piece of land where you can move your mobile home.

It is important to know that if you ***do not own both*** the mobile home and the property, your RHP can be limited. You must work closely with your Relocation Agent to fully understand your eligibility.

If you are a qualified **owner occupant** of the mobile home for more than 90 days but less than 180 days, OR you are a qualified **tenant occupant** of the mobile home for at least 90 days, you may be entitled to a RHP as follows:

Rent Differential

OR

Downpayment Option

As the occupant of a mobile home, regardless of the length of time or your status as an owner or tenant, your payment will vary depending upon the following:

- Whether the mobile home unit was acquired by the Authority
- Whether you are the owner of the mobile home
- Whether you will occupy the mobile home at the new location if it is moved
- Whether you choose to occupy another type of unit such as a single family residence.

Length of occupancy simply means counting the number of days that you actually occupied the mobile home unit on the land that is being acquired by the Authority prior to the date of initiation of negotiations by the Authority for the purchase of the property. The term “initiation of negotiations” means the date the Authority makes the first personal contact with the owner of the real property, or the owner’s representative, to give either of them a written offer for the property to be acquired.

Note: *If you have been in occupancy* ***less than 90 days*** *before the initiation of negotiations and the property is subsequently acquired, or if you move onto the property after the initiation of negotiations and you are still in occupancy on the date of acquisition, you may or may not be eligible for a Replacement Housing Payment. Check with your Relocation Agent before you make any decision to vacate your property.*

FOR OWNER OCCUPANTS OF 180 DAYS OR MORE

If you qualify as a 180-day owner occupant, you may be eligible, in addition to the fair market value of your property, for a Replacement Housing Payment that consists of a Price Differential, Mortgage Differential and/or Incidental Expenses.

The **Price Differential** payment is the amount by which the cost of a replacement dwelling exceeds the acquisition cost of the displacement dwelling. This payment will assist you in purchasing a comparable decent, safe, and sanitary (DS&S) replacement dwelling. The Authority will compute the maximum payment you may be eligible to receive.

In order to receive the full amount of the calculated Price Differential, you must purchase a decent, safe and sanitary dwelling and spend at least the amount calculated by the Authority to be the cost of a comparable replacement property.

The **Mortgage Differential** payment will reimburse you for any increased mortgage interest costs you might incur because the interest rate on your new mortgage exceeds the interest rate on the property acquired by the Authority. The payment computation is complex as it is based on prevailing rates, your existing loan and your new loan. Also, a part of this payment may be prorated, for example, as reimbursement for a portion of your loan origination fees and mortgage points.

To be eligible to receive this payment, the acquired property must have been encumbered by a bona fide mortgage that was a valid lien for at least 180 days prior to the initiation of negotiations.

You may also be reimbursed for any actual and necessary **Incidental Expenses** that you incur in relation to the purchase of your replacement property. These expenses may be those costs for title search, recording fees, credit report, appraisal report, and certain other closing costs associated with the purchase of property. You will not be reimbursed for any recurring costs such as prepaid real estate taxes and property insurance.

If the total amount of your **Replacement Housing Payment** (Price Differential, Mortgage Differential and Incidental Expenses) exceeds $22,500, the payment must be deposited directly into an escrow account or paid directly to the mortgage company.

EXAMPLES OF PRICE DIFFERENTIAL PAYMENT COMPUTATION

SCENARIO 1: If you ***owned and occupied the mobile home for at least 180 days,*** and it's on ***your own property,*** and the Authority ***acquires your mobile home,*** then you are entitled to receive a **Price Differential** based on a comparable residential property.

Assume that the Authority purchases your property and mobile home for $98,000. After a thorough study of available, decent, safe and sanitary dwellings on the open market, the Authority determines that a comparable replacement property, a mobile home on a similar size lot, will cost you $100,000. If your purchase price of the replacement property is $100,000, you will receive $2,000 *(see Example A).*

If your actual purchase price is more than $100,000, you pay the difference (see *Example B).* If your actual purchase price is less than $100,000, the differential payment will be based on actual costs *(see Example C).*

Remember: You do not have to purchase another mobile home as your replacement property.

How much of a differential payment you receive depends on how much you actually spend on a replacement dwelling as shown in these examples:

The Authority's Computation

Cost of Comparable Replacement Mobile Home:	$100,000
Acquisition Price of Your Mobile Home:	-$ 98,000
Maximum Price Differential	$ 2,000

Example A

Purchase Price of Replacement Mobile Home:	$100,000
Cost of Comparable Replacement Mobile Home:	$100,000
Acquisition Price of Your Mobile Home:	-$ 98,000
Maximum Price Differential	$ 2,000

Example B

Purchase Price of Replacement Mobile Home:	$105,000
Cost of Comparable Replacement Mobile Home:	$100,000
Acquisition Price of Your Mobile Home:	- $ 98,000
Maximum Price Differential	$ 2,000
You Must Pay the Additional	$ 5,000

Example C

Cost of Comparable Replacement Mobile Home:	$100,000
Purchase Price of Replacement Mobile Home:	- $ 99,000
Acquisition Price of Your Mobile Home:	$ 98,000
Price Differential	$ 1,000

In Example C you will only receive $1,000, not the full amount of the Authority's "Comparable Replacement Property," because of the "Spend to Get" requirements.

SCENARIO 2: If you ***owned and occupied the mobile home for at least 180 days,*** and it's on ***your own property,*** and the Authority DOES NOT ***acquire your mobile home,*** then you are entitled to receive a **Price Differential** based on a comparable residential property on which you can relocate your mobile home.

Assume that the Authority purchases your land for $48,000. After a thorough study of available locations for purchase that can accommodate the mobile home unit that you retained (which will be moved by a qualified mover), the Authority determines that a comparable replacement piece of land will cost you $51,000. If your actual purchase price is $51,000, you will receive $3,000 *(see Example A).*

If your actual purchase price is more than $51,000, you pay the difference (see *Example B).* If your actual purchase price is less than $51,000, the differential payment will be based on actual costs *(see Example C)*

Remember: You do not have to buy a replacement piece of land for your mobile home. You can sell your mobile home to a private party, and purchase a single family residence. However, your RHP will be based on the replacement value of the land.

How much of a differential payment you receive depends on how much you actually spend on a replacement dwelling as shown in these examples:

The Authority's Computation

Comparable Replacement Land:	$ 51,000
Acquisition Price of Your Land:	- $ 48,000
Maximum Price Differential:	$ 3,000

Example A

Purchase Price of Replacement Land:	$ 51,000
Comparable Replacement Land:	$ 51,000
Acquisition Price of Your Land:	-$ 48,000
Maximum Price Differential	$ 3,000

Example B

Purchase Price of Replacement Land:	$ 55,000
Comparable Replacement Land:	$ 51,000
Acquisition Price of Your Land:	-$ 48,000
Maximum Price Differential:	$ 3,000
You Must Pay the Additional:	$ 4,000

Example C

Comparable Replacement Property:	$ 51,000
Purchase Price of Replacement:	$ 49,500
Acquisition Price of Your Property:	- $ 48,000
Price Differential	$ 1,500

In Example C you will only receive $1,500 - not the full amount of the Authority's "Comparable Replacement Property" because of the "Spend to Get" requirements.

SCENARIO 3: If you ***owned and occupied the mobile home for at least 180 days,*** and it's on land that you rent (e.g. a mobile home park), and the Authority DOES NOT ***acquire your mobile home,*** you may be entitled to a **Rent Differential** based on a comparable piece of land.

However, if the Authority acquires your mobile home because it cannot be moved, it is not considered "decent, safe and sanitary," there are no comparable replacement locations, or available mobile home parks will not accept it because of its size or condition, you may be entitled to a **Price Differential** for the mobile home plus a **Rent Differential** for the land you rent in the Mobile Home Park.

Assume that for $38,000, the Authority purchases your mobile home that is located in a Mobile Home Park where you pay $400 per month for rent (which includes heat, lights, water, garbage, and sewer). The Authority conducts a thorough study of available pieces of land for rent that can accommodate a mobile home unit **and** determines the purchase price of a comparable mobile home unit. An example of your entitlement might be:

The Authority's Computation

Comparable replacement land for rent:	$ 500
Rent you currently pay at the mobile home park:	$ 400
Monthly difference:	$ 100
Multiplied times 42 months = Maximum Rent Differential:	$ 4,200

IF you spend at least $500 per month at the new location.

PLUS:

Comparable Replacement Mobile Home for purchase	$ 42,000
Acquisition Price of Mobile Home you occupy	$ 38,000
Maximum Price Differential:	$ 4,000

IF you pay at least $42,000 for a new mobile home to be set up at the new mobile home park

If you are a "180 day owner occupant," in order to receive the full amount of the Replacement Housing Payment *(Price Differential, Mortgage Differential and Incidental Expenses),* **you must:**

A) Purchase and occupy a DS&S replacement dwelling within one year after the later of:

1. The date you first receive a notification of an available replacement residential property (e.g., mobile home on an existing location, land available for your mobile home, or another type of residential unit), **OR**

2. The date that the Authority has paid the acquisition cost of your mobile home and/or land (usually the closing of escrow on the Authority's acquisition),

AND

B) Spend at least the amount of the Authority's "Comparable Replacement Property" for a replacement property,

AND

C) File a claim for relocation payments within 18 months of the later:

1. The date you vacate the property acquired by the Authority, **OR**

2. The date that the Authority has paid the acquisition cost of your current dwelling (usually the close of escrow on the Authority's acquisition).

You will not be eligible to receive any relocation payments until the Authority has actually made the first written offer to purchase the property. Also, you will receive at least 90 days' written notice before you must move.

FOR OWNER OCCUPANTS AND TENANTS OF 90 DAYS OR MORE

If you qualify as a 90-day occupant (either as an owner or tenant), you may be eligible for a Replacement Housing Payment in the form of a Rent Differential. Remember, it is your status in the mobile home unit that determines your "occupancy."

The **Rent Differential** payment is designed to assist you in renting a comparable decent, safe and sanitary replacement dwelling. The payment is based on the difference between the base monthly rent for the property acquired by the Authority (including average monthly cost for utilities) and the lesser of:

a. The monthly rent and estimated average monthly cost of utilities for a comparable replacement dwelling as determined by the Authority, **OR**

b. The monthly rent and estimated average monthly cost of utilities for the decent, safe and sanitary dwelling that you actually rent as a replacement dwelling.

Utility costs are those expenses you incur for heat, lights, water and sewer regardless of the source (e.g., electricity, propane, and septic system). It does not include garbage, cable, telephone, or security. The cost of utilities at your property is based on the average costs over the last 12 months. The cost of utilities at the comparable replacement property is based on the estimated costs for the last 12 months for the type of dwelling and area used in the calculation.

This difference between (a) and (b) is multiplied by 42 months and may be paid to you in a lump sum payment or in periodic installments in accordance with policy and regulations.

In order to receive the full amount of the calculated Rent Differential, you must spend at least the amount calculated by the Authority on a replacement property. (spend to get)

This payment may, with certain limitations, be converted to a **Downpayment Option** to assist you in purchasing a replacement property. (See page 12 for a full explanation).

Examples of Replacement Housing Payments for 90 day occupants:

Situation 1: You ***owned and occupied*** the mobile home unit and the land for at least 90 days but not more than 180 days. You are entitled to a **Rent Differential** based on the difference between the economic rent of your home (the unit and the land) and that of a comparable home (the unit and the land) that is available for rent.

If you move the mobile home, you are entitled to a **Rent Differential** based on the difference between the economic rent of the mobile home site and that of a comparable mobile home site that is available for rent.

Situation 2: You ***rented and occupied*** for at least 90 days the mobile home unit that was located on land you owned. You are entitled to a **Rent Differential** based on the difference between the actual rent of your mobile home plus the economic rent of the mobile home site, and that of a comparable mobile home (the unit and site) that is available for rent.

Situation 3: You ***rented and occupied the*** mobile home and the land for at least 90 days. You are entitled to a **Rent Differential** based on the difference between the actual rent of the mobile home unit (including utilities) and the land, and that of a comparable home (the unit and the land) that is available for rent.

Situation 4: You ***owned and occupied*** the mobile home for at least 90 days, on land that you rented. You are entitled to a **Rent Differential** based on the difference between the economic rent of the mobile home PLUS the actual rent of the mobile home site, and the cost of a comparable mobile home (the unit and site) that is available for rent.

If you move the mobile home, you are entitled to a **Rent Differential** based on the difference between the actual or economic rent of the mobile home site and that of a comparable mobile home site that is available for rent.

If you are a "90 day owner occupant," in order to receive the full amount of your Replacement Housing Payment *(Rent Differential), you* **must:**

A) Rent and occupy a DS&S replacement dwelling within one year after the later of:

1. The date you first receive a notification of an available replacement dwelling, **OR**

2. The date you vacate the property acquired by the Authority, **AND**

B) Spend at least the amount of the Authority's "Comparable Replacement Property" to rent a replacement property,

AND

C) File a claim for relocation payments within 18 months of the later of:

1. The date you vacate the property acquired by the Authority, **OR**

2. The date that the Authority has paid the acquisition cost of your current dwelling (usually the close of escrow on the Authority's acquisition).

If you are a "90 day occupant," in order to receive the full amount of your Replacement Housing Payment *(Rent Differential), you* **must:**

A) Rent and occupy a DS&S replacement dwelling within one year after day you vacate the property acquired by the Authority,

AND

B) Spend at least the amount of the Authority's "Comparable Replacement Property" to rent a replacement property,

AND

C) File a claim for relocation payments within 18 months of the day you vacate the property acquired by the Authority.

You will not be eligible to receive any relocation payments until the Authority has actually made the first written offer to purchase the property. Also, you will receive at least 90 days' written notice before you must move.

DOWNPAYMENT OPTION

The Rent Differential payment may, with certain limitations, be converted to a **Downpayment Option** to assist you in purchasing a replacement property. The Downpayment Option is a direct conversion of the Rent Differential payment.

If the Authority's calculated Rent Differential is between $0 and $5,250, your downpayment will be $5,250 which can be used towards the purchase of a replacement decent, safe and sanitary dwelling.

If the Rent Differential is over $5,250, you may be able to convert the entire amount of the Rent Differential to a Downpayment Option.

The Downpayment Option must be used for the required downpayment, which is usually a percentage of the entire purchase price, plus any eligible incidental expenses *(see page 10; 180-day Owner Occupants Incidental Expenses)* related to the purchase of the property. You must work closely with your Relocation Agent to ensure you can utilize the full amount of your Downpayment Option towards the purchase.

If any portion of the Rent Differential was used prior to the decision to convert to a downpayment, those advance payments will be deducted from the entire benefit.

LAST RESORT HOUSING

On most projects, an adequate supply of housing will be available for sale and for rent, and the benefits provided will be sufficient to enable you to relocate to comparable housing. However, there may be projects in certain locations where the supply of available housing is insufficient to provide the necessary housing for those persons being displaced. In such cases, the Authority will utilize a method called Last Resort Housing. Last Resort Housing allows the Authority to construct, rehabilitate or modify housing in order to meet the needs of the people displaced from a project. The Authority can also pay above the statutory limits of $5,250 and $22,500 in order to make available housing affordable.

RELOCATION ADVISORY ASSISTANCE

Any owner or occupant of a mobile home displaced by the Authority shall be offered relocation advisory assistance for the purpose of locating a replacement property. Relocation services are provided by qualified personnel employed by, or under contract with, the Authority. It is their goal and desire to be of service to you and assist in any way possible to help you successfully relocate.

A Relocation Agent from the Authority will contact you personally. Relocation services and payments will be explained to you in accordance with your eligibility. During the initial interview with you, your housing needs and desires will be determined as well as your need for assistance. You cannot be required to move unless at least one comparable replacement dwelling is made available to you. You can expect to receive the following services, advice and assistance from your Relocation Agent who will:

- Explain the relocation benefits and eligibility requirements.
- Provide the amount of the replacement housing payments in writing.
- Assure the availability of a comparable property before you move.
- Inspect possible replacement residential units for DS&S compliance.
- Provide information on counseling you can obtain to help minimize hardships in adjusting to your new location.
- Assist you in completing loan documents, rental applications or Relocation claims.

AND provide information on:

- Security deposits
- Interest rates and terms
- Typical down payments
- VA and FHA loan requirements
- Real and personal property taxes
- Qualified mobile home movers, including disassembly and reassembly
- Mobile Home Park requirements and fees
- Consumer education literature on housing

If you desire, your Relocation Agent will give you current listings of other available replacement housing. Transportation will be provided to inspect available housing, especially if you are elderly or handicapped. Though you may use the services of a real estate broker, the Authority cannot provide a referral.

Your Relocation Agent is familiar with the services provided by others in your community and will provide information on other federal, state, and local housing programs offering assistance to displaced persons. If you have special problems, your Relocation Agent will make every effort to secure the services of those agencies with trained personnel who have the expertise to help you.

If the high-speed rail project will require a considerable number of people to be relocated, the Authority may establish a temporary Relocation Field Office on or near the project. Project relocation offices will be open during convenient hours and evening hours if necessary.

In addition to these services, the Authority is required to coordinate its relocation activities with other agencies causing displacements to ensure that all persons displaced receive fair and consistent relocation benefits.

Remember: YOUR RELOCATION AGENT is there to offer advice and assistance. Do not hesitate to ask questions. And be sure you fully understand all of your rights and available benefits.

YOUR RIGHTS AS A DISPLACEE

All eligible displacees have a ***freedom of choice*** in the selection of replacement housing, and the Authority will not require any displaced person to accept a replacement dwelling provided by the Authority. If you decide not to accept the replacement housing offered by the Authority, you may secure a replacement dwelling of your choice, providing it meets DS&S housing standards. The Authority will not pay more than your calculated benefits on any replacement property.

The most important thing to remember is that the replacement dwelling you select must meet the basic "decent, safe, and sanitary" standards. ***Do not execute a purchase agreement or a rental agreement*** until a representative from the Authority has inspected and certified in writing that the dwelling you propose to occupy meets the basic standards. ***DO NOT jeopardize*** your right to receive a replacement housing payment by moving into a substandard dwelling.

It is important to remember that your relocation benefits will ***not have an adverse*** affect on your:

- Social Security Eligibility
- Welfare Eligibility
- Income Taxes

In addition, **Title VIII of the Civil Rights Act of 1968** and later acts and amendments make discriminatory practices in the purchase and rental of most residential units illegal if based on race, color, religion, sex, or national origin.

Whenever possible, minority persons shall be given reasonable opportunities to relocate to decent, safe, and sanitary replacement dwellings, not located in an area of minority concentration, and that is within their financial means. This policy, however, does not require the Authority to provide a person a larger payment than is necessary to enable a person to relocate to a comparable replacement dwelling.

The Authority's **Non-Discrimination Policy** ensures that all services and/or benefits will be administered to the general public without regard to race, color, national origin, or sex in compliance with Title VI of the 1964 Civil Rights Act (42 USC, sec. 2000d. et seq.).

And you always have the **Right to Appeal** any decision by the Authority regarding your relocation benefits and eligibility. Your Right of Appeal is guaranteed in the Uniform Act which states that any person may file an appeal with the head of the responsible agency if that person believes that the agency has failed to properly determine the person's eligibility or the amount of a payment authorized by the Act.

If you indicate your dissatisfaction, either verbally or in writing, the Authority will assist you in filing an appeal and explain the procedures to be followed. You will be given a prompt and full opportunity to be heard. You have the right to be represented by legal counsel or other representative in connection with the appeal (but solely at your own expense). The Authority will consider all pertinent justifications and materials submitted by you and other available information needed to ensure a fair review. The Authority will provide you with a written determination resulting from the appeal with an explanation of the basis for the decision. If you are still dissatisfied with the relief granted, the Authority will advise you that you may seek judicial review.

Reference: Uniform Relocation Assistance and Real Property Acquisition

Policies Act of 1970, as amended (42 U.S.C. sec. 4601 et seq.) (Uniform Act);

and Implementing Regulations (49 C.F.R. Part 24)

CALIFORNIA High-Speed Rail Authority

Your Rights and Benefits as a Displacee Under the Uniform Relocation Assistance Program ***(Business, Farm or Nonprofit Organization)***

July 2013

www.hsr.ca.gov

INTRODUCTION

In building any large, modern transportation project, the displacement of a small percentage of the population is often necessary. However, it is the policy of the California High-Speed Rail Authority (Authority) that displaced persons shall not suffer unnecessarily as a result of a program, like the High-Speed Rail Project (Project), that is designed to benefit the public as a whole.

Businesses, farms, and nonprofit organizations displaced by the Project may be eligible for relocation advisory services and payments.

This brochure provides information about available relocation services and payments. If you are required to move as the result of the Project, a Relocation Agent will contact you. The Relocation Agent will be able to answer your specific questions and provide additional information.

UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970 AS AMENDED, "THE UNIFORM ACT"

The purpose of the Uniform Act is to provide for uniform and equitable treatment of persons displaced from their homes, businesses, farms or nonprofit organizations, by federal and federally assisted programs and to establish uniform and equitable land acquisition policies for federal and federally assisted programs.

Title 49, Part 24, of the Code of Federal Regulations implements the Uniform Act in accordance with the following relocation assistance objective:

To ensure that persons displaced as a direct result of federal or federally-assisted projects are treated fairly, consistently and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

While every effort has been made to assure the accuracy of this brochure, you must understand that it does not have the force and effect of law, rule, or regulation governing the payment of benefits. In the event of any difference between a statement in this brochure and any provision of law, rule or regulation, the latter will be followed.

Relocation Services

The California-High Speed Rail Authority has two programs to aid businesses, farms and nonprofit organizations which must relocate.

These are:

1. The Relocation Advisory Assistance Program, which is to aid you in locating a suitable replacement property, and

2. The Relocation Payments Program, which is to reimburse you for certain costs involved in relocating. These payments are classified as:

    - Moving and Related Expenses (costs to move personal property not acquired).
    - Reestablishment Expenses (expenses related to the replacement property).
    - In-Lieu Payment (a fixed payment in lieu of moving and related expenses, and reestablishment expenses).

Note: *A payment for loss of goodwill is considered an acquisition cost. California law and the federal regulations mandate that relocation payments cannot duplicate other payments such as loss of goodwill. You will* **not** *be eligible to receive any relocation payments until the State has actually made the first written offer to purchase the property. You will also receive at least 90 days' written notice before you must move.*

SOME IMPORTANT DEFINITIONS

You will be able to understand your relocation benefits better if you become familiar with the following terms:

Business is any lawful activity, except a farm operation (see definition on following page), that is conducted primarily for the purchase, sale, lease and/or rental of personal and/or real property, and/or for the manufacture, processing, and/or marketing of products, commodities, and/or any other personal property, or primarily for the sale of services to the public, or primarily for outdoor advertising display purposes when the display must be moved as a result of the project, or by a nonprofit organization that has established its nonprofit status under applicable federal or state law.

Displaced Person or Displacee is any person who moves from real property or moves personal property from real property as a result of the acquisition of the real property, in whole or in part, or as the result of a written notice from the agency of its intent to acquire the real property needed for this transportation project. In the case of a partial acquisition, the Authority shall determine if a person is displaced as a direct result of the acquisition.

Owners and tenants **not lawfully present** in the United States are not eligible to receive relocation payments and assistance.

Contributes Materially means that during the two taxable years before the taxable year in which displacement occurs, a business or farm operation must have had average annual gross receipts of at least $5,000 or average annual net earnings of at least $1,000, or their income must have contributed at least 33 1/3 percent of the owner's or operator's average annual gross income from all sources, in order to qualify as a bona-fide operation.

Farm Operation is any activity conducted solely or primarily for the production of one or more agricultural products or commodities, including timber, for sale and home use, and customarily producing such products or commodities in sufficient quantity to be capable of contributing materially to the operator's support.

Nonprofit Organization is a public or private entity that has established its nonprofit status under applicable law and is exempt from paying federal income taxes.

MOVING EXPENSES

If you qualify as a displaced business, farm or nonprofit organization, you are entitled to reimbursement of your moving costs and certain related expenses incurred in moving. To qualify you must legally occupy the property as the owner or lessee/tenant when the Authority initiates negotiations for the acquisition of the property **or** at the time the Authority acquires title or takes possession of the property. However, to assure your eligibility and prompt payment of moving expenses, you should contact your Relocation Agent before you move.

You Can Choose Either:

Actual Reasonable Moving Costs. You may be paid for your actual reasonable moving costs and related expenses when a commercial mover performs the move. Reimbursement will be limited to a move of 50 miles or less. Related expenses, with limitations, ***may*** include:

- Transportation
- Packing and unpacking of personal property
- Disconnecting and reconnecting personal property related to the operation
- Temporary storage of personal property

- Insurance while property is in storage or transit, or the loss and damage of personal property if insurance is not reasonably available
- Expenses in finding a replacement location
- Professional services to plan and monitor the move of the personal property to the new location
- Licenses, permits and fees required at the replacement location

OR

Self-Move Agreement. You may be paid to move your own personal property based on the lower of two acceptable bids obtained by the Authority. Under this option, you will still be eligible for reimbursement of related expenses listed above that were not included in the bids.

OR

In-Lieu Payment. You can accept a fixed payment between $1,000 and $20,000, based on your annual earnings **in lieu of,** that is, **in place of** the moving cost, related expenses and reestablishment cost.

Actual Reasonable Moving Costs:

You may be paid the actual reasonable and necessary costs of your move when a professional mover performs the move. All of your moving costs must be supported by paid receipts or other evidence of expenses incurred. In addition to the transportation costs of your personal property, certain other expenses may also be reimbursable, such as packing, crating, unpacking and uncrating, and the disconnecting, dismantling, removing, reassembling, and reinstalling of relocated machinery, equipment, and other personal property.

Other expenses such as professional services necessary for planning and carrying out the move, temporary storage costs, and the cost of licenses, permits and certifications may also be reimbursable. This is not intended to be an all-inclusive list of moving related expenses. Your Relocation Agent can provide you with a complete explanation of reimbursable expenses.

Self-Move Agreement:

If you agree to take full responsibility for all or part of the move of your business, farm, or nonprofit organization, the Authority may approve a payment not to exceed the lower of two acceptable bids obtained by the Authority from qualified moving firms or a qualified Authority agent. A low-cost or uncomplicated move may be based on a single bid or estimate at the Authority's discretion. The advantage of this moving option is that it relieves the displaced business, farm or nonprofit organization operator from documenting all moving expenses. The Authority may make the payment without additional documentation as long as the payment is limited to the amount of the lowest acceptable bid or estimate. Other expenses, such as professional services for planning, storage costs, and the cost of licenses, permits, and certifications may also be reimbursable if determined to be necessary. These latter expenses must be pre-approved by the Relocation Agent.

Requirements:

Before you move, you must provide the Authority with the:

- Certified inventory of all personal property to be moved
- Date you intend to vacate the property
- Address of the replacement property
- Opportunity to monitor and inspect the move from the acquired property to the replacement property.

Related Expenses:

1. Searching Expenses for Replacement Property. Displaced businesses, farms and nonprofit organizations are entitled to reimbursement for actual reasonable expenses incurred in searching for a replacement property, not to exceed $2,500. Expenses may include transportation, meals, and lodging when away from home; the reasonable value of the time spent during the search; fees paid to the real estate agents, brokers or consultants; and other expenses determined to be reasonable and necessary by the Authority.

2. Direct Loss of Tangible Personal Property. Displaced businesses, farms, and nonprofit organizations may be eligible for a payment for the actual direct loss of tangible personal property which is incurred as a result of the move or discontinuance of the operation. This payment will be based upon the **lesser of**:

a. The fair market value of the item for continued use at the displacement site minus the proceeds from its sale.

OR

b. The estimated cost of moving and reinstalling the replaced item, based on the lowest acceptable bid or estimate obtained by the Authority for eligible moving and related expenses, including dismantling and reassembly, but with no allowance for storage, cost of code requirement betterments or upgrades at the replacement site.

EXAMPLE:

You determine that the “document shredder” cannot be moved to the new location because of its condition, and you will not replace it at the new location.

Fair market value of the document shredder based on its use at the current location	$ 1,500
Proceeds: Price received from selling the document shredder	- $ 500
Net Value	$ 1,000

OR

Estimated cost to move	$ 1,050

Based on the lesser of the two, the amount of the payment for Loss of Tangible Personal Property	= **$ 1,000**

Note: You are also entitled to all reasonable costs incurred in attempting to sell the document shredder (e.g. advertisement).

3. Purchase of Substitute Personal Property. If an item of personal property, which is used as part of the business, farm, or nonprofit organization, is not moved but is promptly replaced with a substitute item that performs a comparable function at the replacement site, the displacee is entitled to payment of the **lesser of**:

a. The cost of the substitute item, including installation costs at the replacement site, minus any proceeds from the sale or trade-in of the replaced item;

OR

b. The estimated cost of moving and reinstalling the replaced item, based on the lowest acceptable bid or estimate obtained by the Authority for eligible moving and related expenses, including dismantling and reassembly, but with no allowance for storage, cost of code requirement betterments or upgrades at the replacement site.

EXAMPLE:

You determine that the copying machine cannot be moved to the new location because it is now obsolete and you will replace it.

Cost of a substitute copy machine including installation costs at the replacement site	$ 3,000
Trade-in Allowance	- $ 2,500
Net Value	$ 500

OR

Estimated cost to move	$ 550

Based on the lesser of the above, the amount of the payment for Substitute Personal Property	= **$ 500**

You determine that the chairs will not be used at the new location because they no longer match the decor and you will replace them.

Cost of substitute chairs	$ 1,000
Proceeds from selling the chairs	- $ 100
Net Value	$ 900

OR

Estimated cost to move	$ 200

Based on the lesser of the above, the amount of the payment for Substitute Personal Property	= **$ 200**

Note: *You are also entitled to all reasonable costs incurred in attempting to sell the copy machine and/or chairs.*

4. Disconnecting and Reinstallation. You will be reimbursed for your actual and reasonable costs to disconnect, dismantle, remove, reassemble and reinstall any machinery, equipment or other personal property in relation to its move to the new location. This includes connection to utilities available nearby and any modifications to the personalty that are necessary to adapt it to the utilities at the replacement site.

5. Physical changes at the new location. You may be reimbursed for certain physical changes to the replacement property if the changes are necessary to permit the reinstallation of machinery or equipment necessary for the continued operation of the business.

Note: *The changes cannot increase the value of the building for general purposes, nor can they increase the mechanical capability of the buildings beyond its normal requirements.*

6. The cost of installing utilities from the right of way line to the structure(s) or improvements on the replacement site.

7. The reasonable cost of marketing studies, feasibility surveys and soil testing.

8. The reasonable cost of professional real estate services needed for the purchase or lease of a replacement site.

9. The amount of one-time assessments or impact fees for anticipated heavy utility usage.

REESTABLISHMENT EXPENSES

A small business, farm or nonprofit organization may be eligible for a payment, not to exceed $10,000, for expenses actually incurred in relocating and reestablishing the enterprise at a replacement site.

Reestablishment expenses may include, but are not limited to, the following:

1. Repairs or improvements to the replacement real property required by federal, state or local laws, codes or ordinances.

2. Modifications to the replacement real property to make any structures suitable for the business operation.

3. Construction and installation of exterior signing to advertise the business.

4. Redecoration or replacement such as painting, wallpapering, paneling or carpeting when required by the condition of the replacement site or for aesthetic purposes.

5. Advertising the new business location.

6. The estimated increased costs of operation at the replacement site during the first two years, for items such as:

    a) Lease or rental charges

    b) Personal or real property taxes

    c) Insurance premiums, and

    d) Utility charges (excluding impact fees).

7. Other items that the Authority considers essential for the reestablishment of the business or farm.

Note: *A nonprofit organization must substantiate that it cannot be relocated without a substantial loss of existing patronage (membership or clientele). The payment is based on the average of two years annual gross revenues less administrative expenses.*

IN-LIEU PAYMENT (FIXED)

Business - Displaced businesses may be eligible for a fixed payment in lieu of (in place of) actual moving expenses, personal property losses, searching expenses, and reestablishment expenses. The fixed payment may not be less than $1,000 or more than $20,000.

For a business to be eligible for a fixed payment, the Authority must determine the following:

1. The business owns or rents personal property that must be moved due to the displacement.

2. The business cannot be relocated without a substantial loss of existing patronage.

3. The business is not part of a commercial enterprise having more than three other businesses engaged in the same or similar activity and which are under the same ownership and are not being displaced by the Authority.

4. The business contributed materially to the income of the displaced business operator during the two taxable years prior to displacement. Any business operation that is engaged solely in the rental of space to others is not eligible for a fixed payment. This includes the rental of space for residential or business purposes.

Farm Operation – Displaced farm operations may be eligible for a fixed payment in lieu of (in place of) actual moving expenses, personal property losses, searching expenses, and reestablishment expenses. The fixed payment may not be less than $1,000 or more than $20,000. In the case of a partial acquisition of land, which was a farm operation before the acquisition, the fixed payment shall be made only if the Authority determines that:

1. The acquisition of part of the land caused the operator to be displaced from the farm operation on the remaining land; or

2. The partial acquisition caused a substantial change in the nature of the farm operation.

Eligibility requirements for nonprofit organizations are slightly different from eligibility requirements for businesses and farm operations. If you represent a nonprofit organization that is being displaced and are interested in a fixed payment, please consult your Relocation Agent for additional information.

The Computation of Your In-Lieu Payment:

The fixed payment for a displaced business or farm is based upon the average annual net earnings of the operation for the two taxable years immediately preceding the taxable year in which it is displaced. The Authority may use a different two year period if it is determined that the last two taxable years do not accurately reflect the earnings of the operation.

EXAMPLE: The Authority acquires your property and you move in 2011:

2009 Annual Net Earnings	$10,500
2010 Annual Net Earnings	$ 12,500
TOTAL	$ 23,000
Average over two years	**$ 11,500**

This two-year average would be the amount of your in-lieu payment.

Remember: This payment is in place of all other moving benefits, including reestablishment expenses. You must provide the Authority with proof of net earnings to support your claim.

Proof of net earnings can be documented by income tax returns, certified financial statements, or other reasonable evidence of net earnings acceptable to the Authority.

Note: The computation for nonprofit organizations differs in that the payment is computed on the basis of average annual gross revenues less administrative expenses for the two year period specified above.

Before You Move:

A. Request a determination of entitlement for in-lieu payment from your Relocation Agent.

B. Include a written statement of the reasons the business cannot be relocated without a substantial loss in net earnings.

C. Provide certified copies of tax returns for the two tax years immediately preceding the tax year in which you move. For example, if you move anytime in the year 2012, regardless of when negotiations began or the Authority took title to the property, the taxable years would be 2010 and 2011.

D. You will be notified of the amount you are entitled to after the application is received and approved,

E. You cannot receive the payment until after you vacate the property, AND submit a claim for the payment within 18 months of the date of your move.

RELOCATION ADVISORY ASSISTANCE

Any business, farm or nonprofit organization displaced by the Authority shall be offered relocation advisory assistance for the purpose of locating a replacement property. Relocation services are provided by qualified personnel employed by, or under contract with, the Authority. It is their goal and desire to be of service to you and to assist in any way possible to help you relocate successfully.

A Relocation Agent from the Authority will contact you personally. Relocation services and payments will be explained to you in accordance with your eligibility. During the Agent's initial interview with you, your needs and preferences will be determined as well as your need for assistance.

You can expect to receive the following services, advice and assistance from your Relocation Agent who will:

- Determine your needs and preferences.
- Explain the relocation benefits and eligibility requirements.
- Provide information on replacement properties for your consideration.
- Provide information on counseling you can obtain to help minimize hardships in adjusting to your new location.
- Assist you in completing loan documents, rental applications or relocation claims forms.

AND will provide information on:

- Security deposits
- Interest rates and terms
- Typical downpayments
- Permits, fees and local planning
- SBA loan requirements
- Real property taxes
- Consumer education literature

If you desire, your Relocation Agent will give you current listings of other available replacement property. Transportation will be provided to inspect available property, especially if you are elderly or handicapped. Although you may use the services of a real estate broker, the Authority cannot provide a referral.

Your Relocation Agent is familiar with the services provided by others in your community and will provide information on other federal, state, and local programs offering assistance to displaced persons. If you have special needs, your Relocation Agent will make every effort to secure the services of those agencies with trained personnel who have the expertise to help you.

If the high-speed rail project will require a considerable number of people to be relocated, the Authority may establish a temporary Relocation Field Office on or near the project. Project relocation offices will be open during convenient hours and evening hours if necessary.

In addition to these services, the Authority is required to coordinate its relocation activities with other agencies causing displacements to ensure that all persons displaced receive fair and consistent relocation benefits.

Remember: YOUR RELOCATION AGENT is there to offer advice and assistance. Do not hesitate to ask questions. And be sure you fully understand all of your rights and available benefits.

YOUR RIGHTS AS A DISPLACEE

It is important to remember that your relocation benefits will not have an adverse effect on your:

- Social Security Eligibility
- Welfare Eligibility
- Income Taxes

In addition, Title VIII of the Civil Rights Act of 1968 and later acts and amendments make discriminatory practices in the purchase and rental of most residential units illegal if based on race, color, religion, sex, or national origin.

The Authority's Non-Discrimination Policy ensures that all services and/or benefits will be administered to the general public without regard to race, color, national origin, or sex in compliance with Title VI of the 1964 Civil Rights Act (42 USC, sec. 2000d, et seq.).

And you always have the right to appeal any decision by the Authority regarding your relocation benefits and eligibility.

Your right to appeal is guaranteed in the Uniform Act which states that any person may file an appeal with the head of the responsible agency if that person believes that the agency has failed to determine properly the person's eligibility or the amount of a payment authorized by the Act.

If you indicate your dissatisfaction, either verbally or in writing, the Authority will assist you in filing an appeal and explain the procedures to be followed. You will be given a prompt and full opportunity to be heard. You have the right to be represented by legal counsel or other representative in connection with the appeal (but solely at your own expense).

The Authority will consider all pertinent justifications and materials submitted by you and other available information needed to ensure a fair review. The Authority will provide you with a written determination resulting from the appeal with an explanation of the basis for the decision. If you are still dissatisfied with the relief granted, the Authority will advise you that you may seek judicial review.

Reference: Uniform Relocation Assistance and Real Property Acquisition

Policies Act of 1970, as amended (42 U.S.C. sec. 4601, et seq.) (Uniform Act);

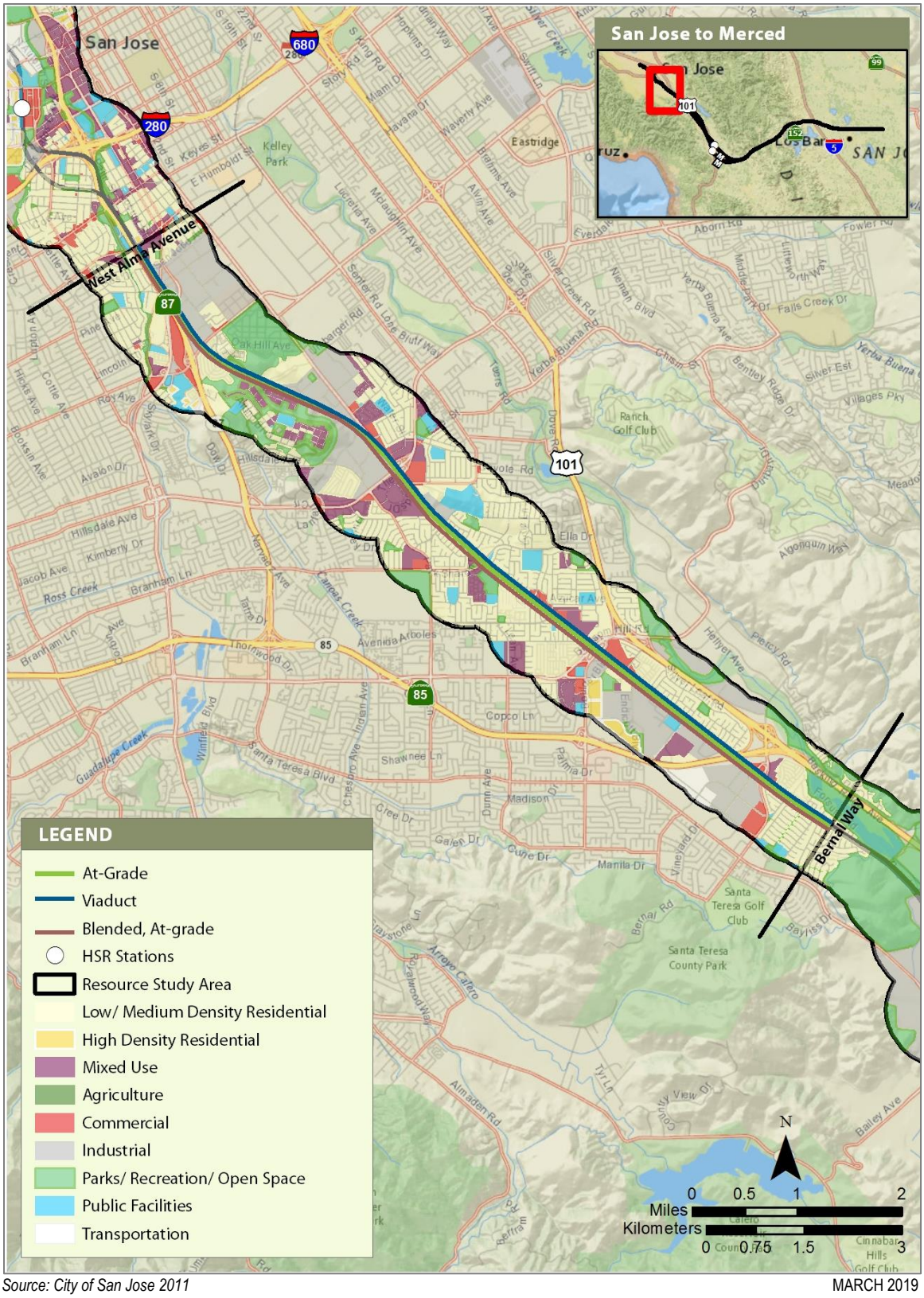
and Implementing Regulations (49 C.F.R. Part 24)

APPENDIX 3.13-A: GENERAL PLAN LAND USE MAPS—SAN JOSE TO CENTRAL VALLEY WYE PROJECT EXTENT RSA

Source: City of San Jose 2011

MARCH 2019

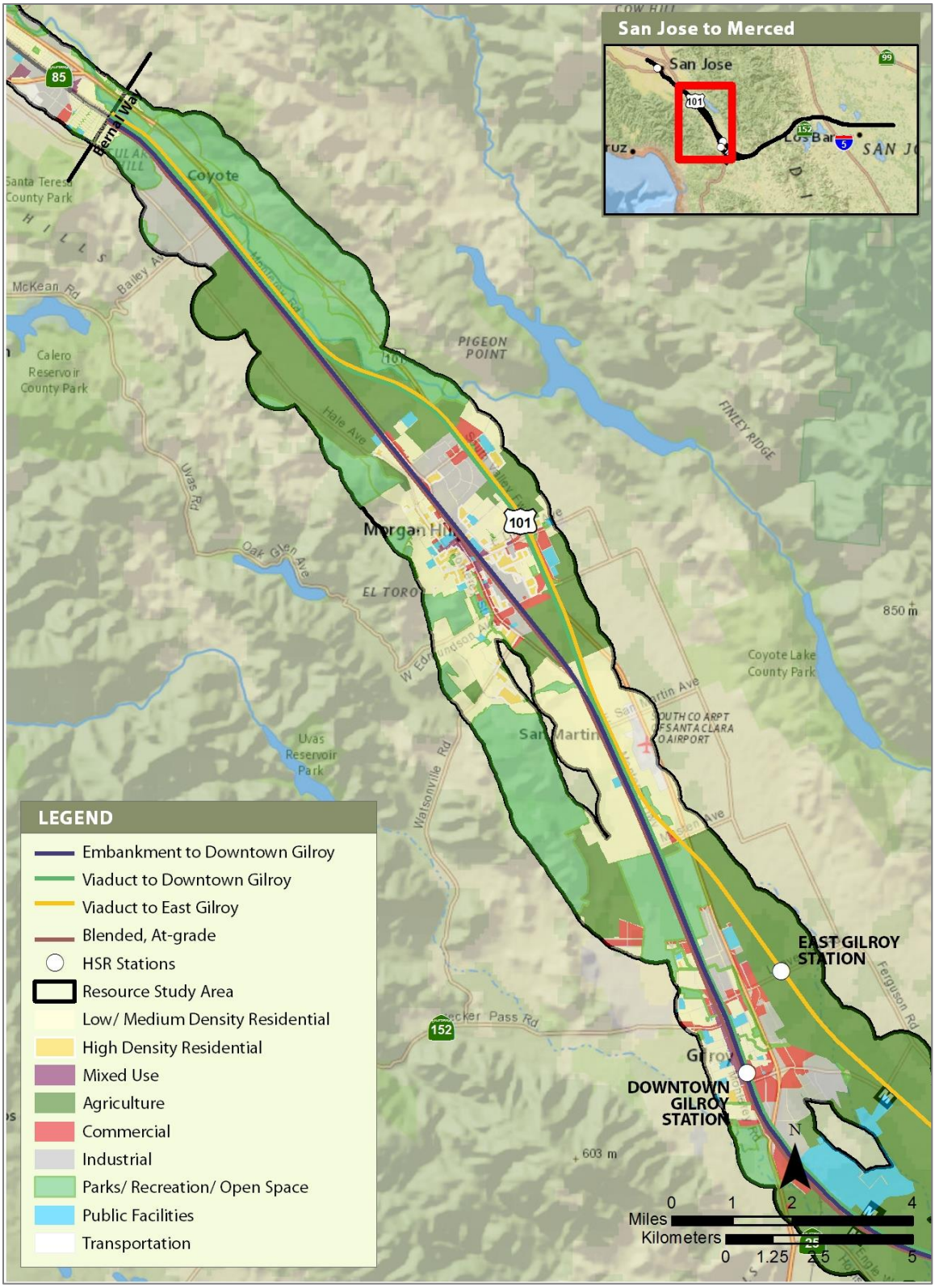
Figure 3.13A-1 General Plan Land Use Designations—San Jose Diridon Station Approach Subsection



Source: City of San Jose 2011

MARCH 2019

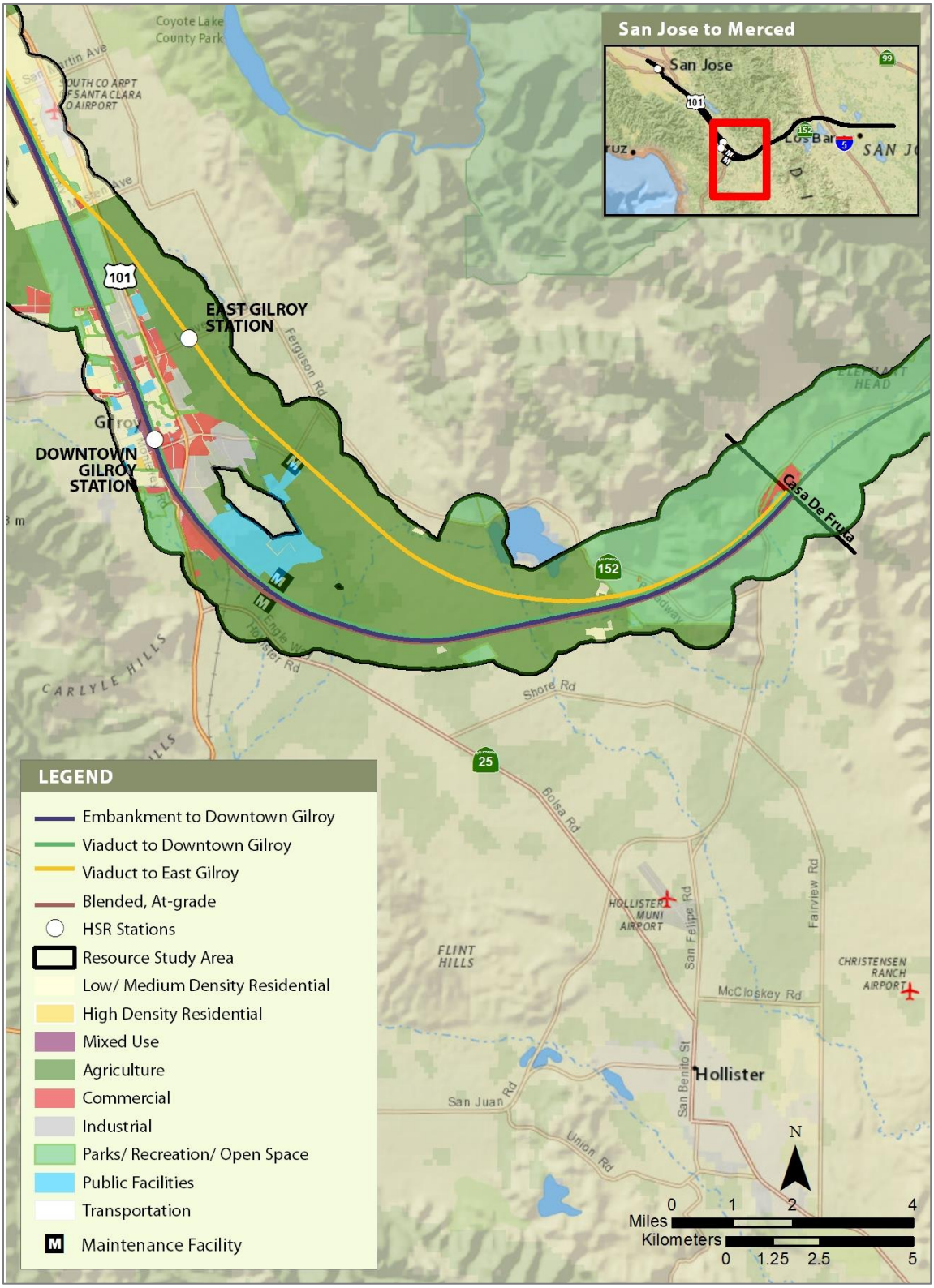
Figure 3.13A-2 General Plan Land Use Designations—Monterey Corridor Subsection



Source: City of Morgan Hill 2016; City of Gilroy 2002

MARCH 2019

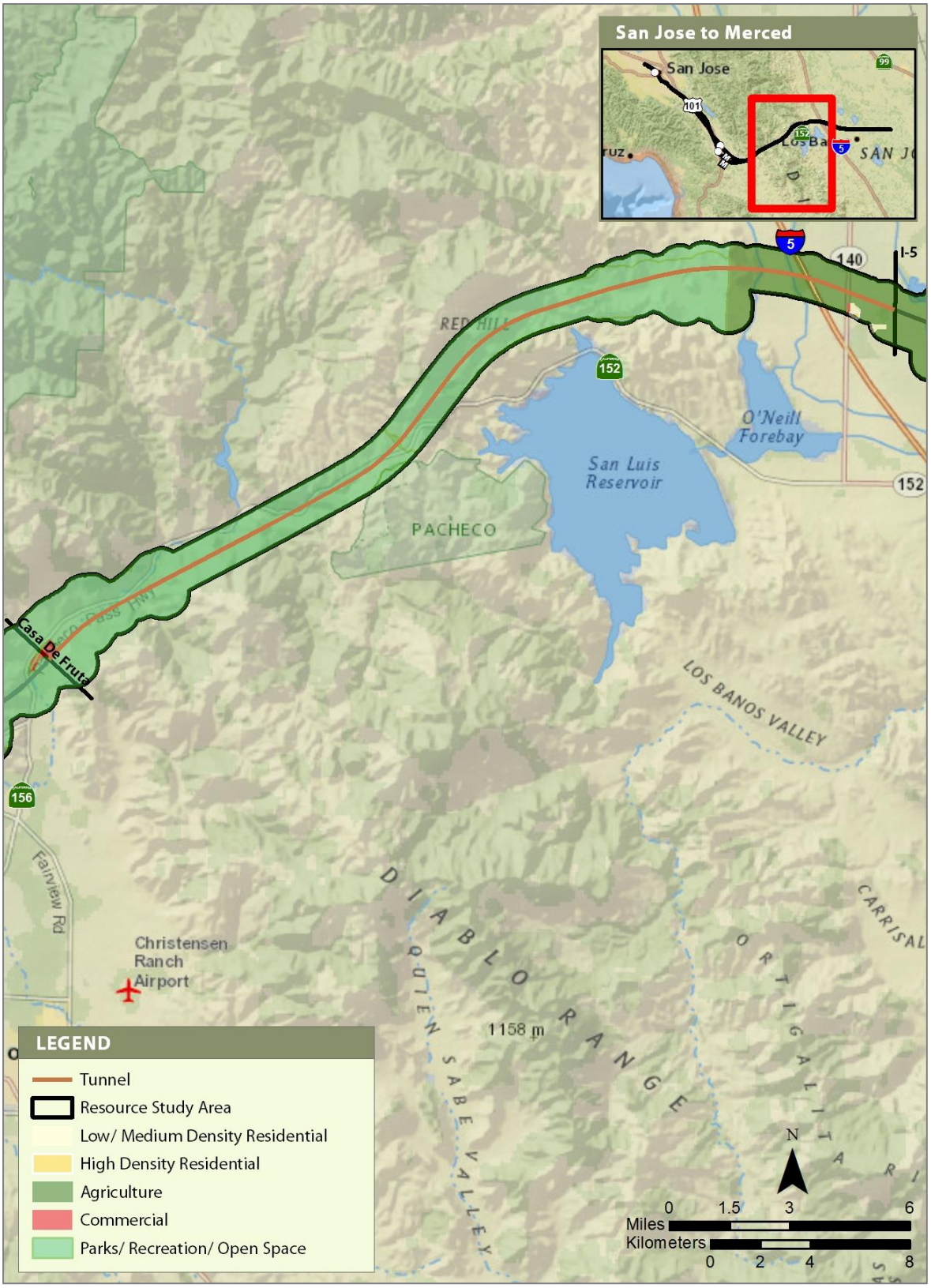
Figure 3.13A-3 General Plan Land Use Designations—Morgan Hill and Gilroy Subsection (Part 1 of 2)



Source: City of Morgan Hill 2016; City of Gilroy 2002; County of San Benito 2015

MARCH 2019

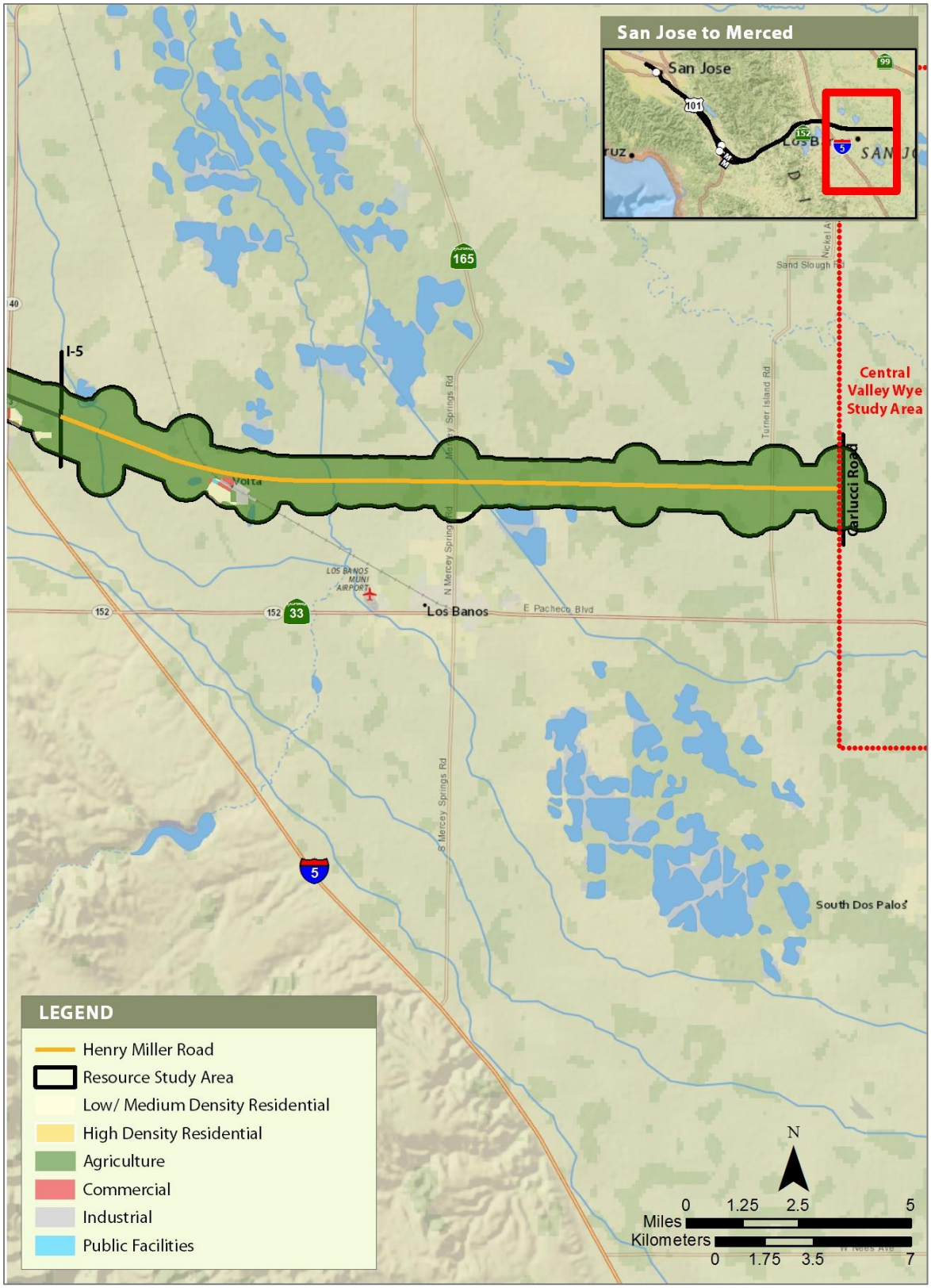
Figure 3.13A-4 General Plan Land Use Designations—Morgan Hill and Gilroy Subsection (Part 2 of 2)



Source: County of Santa Clara 1994; County of Merced 2013

MARCH 2019

Figure 3.13A-5 General Plan Land Use Designations—Pacheco Pass Subsection



Source: County of Merced 2013

MARCH 2019

Figure 3.13A-6 General Plan Land Use Designations—San Joaquin Valley Subsection

References

City of Gilroy. 2002. *Gilroy 2002–2020 General Plan*. http://www.cityofgilroy.org/274/2020-General-Plan (accessed May 9, 2016, March 23, 2017).

City of Morgan Hill. 2016. *Morgan Hill 2035 General Plan*. http://www.morgan-hill.ca.gov/75/General-Plan (accessed September 5, 2017).

City of San Jose. 2011. *Envision: San José 2040 General Plan*. Revised March 23, 2016. https://www.sanjoseca.gov/DocumentCenter/Home/View/474 (accessed June 3, 2016).

County of San Benito. 2015. *San Benito County 2035 General Plan*. http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf (accessed May 16, 2016, March 22, 2017).

County of Santa Clara. 1994. *Santa Clara County General Plan*. https://www.sccgov.org/sites/dpd/DocsForms/Documents/GP_Book_A.pdf (accessed May 16, 2016, March 22, 2017).

County of Merced. 2013. *2030 Merced County General Plan*. http://www.co.merced.ca.us/pdfs/planning/sudpmaps/Volta.pdf (accessed July 19, 2016, March 22, 2017)

APPENDIX 3.14-A: PARCELS CONTAINING IMPORTANT FARMLAND IN THE SAN JOSE TO CENTRAL VALLEY WYE PROJECT RESOURCE STUDY AREA

Appendix 3.14-A: Parcels Containing Important Farmland in the San Jose to Central Valley Wye Project Resource Study Area

Tables 1a through 1d show the acres of Important Farmland that would be permanently converted by the San Jose to Merced Project Section alternatives (project alternatives) by individual assessor's parcel number (APN). Tables 2a through 2d show the acres of Important Farmland that would be temporarily used by the project alternatives by individual APN.[1]

[1] Total acreages do not exactly match total acreages presented in the *California High-Speed Rail San Jose to Merced Project Section Agricultural Farmland Technical Report* or EIR/EIS Section 3.14, Agricultural Farmland. This is because the county parcel data presented in this appendix include some road gaps and parcel overlaps at county boundaries between parcels in the detailed parcel-level analysis, whereas the acreages presented in the technical report and Section 3.14 analysis are based on continuous data with no gaps for roads or overlaps at county boundaries. While the data sets do not match, they both are accurate calculations based on the underlying data and corresponding calculations from each dataset are accurate.

Table 1a Parcels of Important Farmland Permanently Converted under Alternative 1 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be permanently converted.				
Monterey Corridor				
No parcels of Important Farmland would be permanently converted.				
Morgan Hill and Gilroy				
013-010-001-000	—	<0.1	—	—
013-010-021-000	—	8.1	0.2	—
013-010-028-000	—	1.5	—	—
013-020-008-000	—	—	—	0.5
013-020-010-000	—	—	—	1.2
013-020-013-000	—	10.8	—	<0.1
013-020-014-000	—	10.0	—	—
013-020-021-000	—	—	—	0.2
013-040-015-000	—	8.5	—	—
013-040-027-000	—	0.2	—	10.4
013-050-003-000	—	—	—	5.6
013-030-004-000	—	—	—	2.6
013-050-005-000	1.3	—	—	—
015-020-016-000	2.8	—	—	—
015-020-020-000	7.5	—	—	—
015-020-021-000	1.5	—	—	—
015-020-022-000	0.6	—	—	—
015-030-006-000	0.7	—	—	—
015-030-010-000	<0.1	—	—	—
015-030-028-000	1.4	—	—	—
015-030-030-000	3.5	—	—	—
015-030-031-000	7.1	—	—	—
015-030-032-000	3.4	—	—	—
725-02-018	0.4	—	—	—
725-02-019	2.9	—	—	—
725-02-023	0.4	—	—	—
725-03-001	0.5	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
725-03-002	5.9	—	—	—
725-04-001	0.4	—	—	—
725-04-002	4.8	—	—	—
725-05-005	—	—	—	0.1
725-05-006	—	—	—	0.2
725-05-013	<0.1	—	—	2.0
725-06-004	—	—	—	0.1
725-06-006	—	—	—	<0.1
725-06-008	—	—	—	<0.1
725-07-009	—	—	—	1.1
725-07-015	<0.1	—	—	1.4
725-12-007	0.1	—	—	—
725-12-008	0.1	—	—	—
725-12-013	<0.1	—	—	0.1
726-38-013	—	<0.1	—	—
817-07-014	—	—	—	0.1
817-08-001	—	—	—	1.5
817-08-019	—	—	—	0.4
817-11-024	—	—	—	<0.1
817-11-073	—	—	—	2.0
817-60-024	—	—	—	<0.1
825-01-007	<0.1	—	—	—
825-01-008	1.8	—	—	—
825-01-012	<0.1	—	—	—
825-01-015	0.5	—	—	—
825-01-016	1.3	—	—	—
825-04-001	2.4	—	—	—
825-04-005	1.0	—	—	—
825-04-009	<0.1	—	—	—
825-07-051	1.1	—		—
825-07-052	1.3	—	—	—
825-07-053	0.2	—	—	
825-07-054	0.1	0.1	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
825-07-055	<0.1	—	—	—
825-07-056	0.5	—	—	—
825-07-057	0.1	0.3	—	—
830-03-011	1.8	—	—	—
830-03-012	0.1	—	—	—
830-03-024	0.2	—	—	—
830-04-004	0.8	<0.1	—	—
830-04-005	2.3	0.7	—	—
835-04-068	—	—	—	1.2
835-06-008	0.1	2.0	—	—
835-06-009	—	<0.1	—	—
835-06-010	—	0.1	—	—
835-06-011	1.9	0.2	—	—
835-06-027	—	<0.1	—	—
835-06-028	0.1	<0.1	—	—
835-07-007	1.8	0.4	—	—
835-07-013	<0.1	—	—	—
835-07-020	0.4	0.1	—	—
841-25-016	<0.1	—	—	—
841-27-001	0.1	—	—	—
841-27-003	—	0.1	—	—
841-27-014	0.1	<0.1	—	—
841-27-019	<0.1	—	—	—
841-27-020	<0.1	—	—	—
841-27-027	—	<0.1	—	—
841-28-001	0.1	—	—	—
841-28-003	<0.1	—	—	—
841-28-005	—	<0.1	—	—
841-28-007	0.1	—	—	—
841-28-018	0.1	—	—	—
841-28-021	—	<0.1	—	—
841-28-025	0.1	—	—	—
841-28-026	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-29-024	0.1	—	—	—
841-30-003	34.8	—	—	—
841-30-004	37.6	—	—	—
841-30-007	9.4	—	—	—
841-30-008	27.9	—	5.1	—
841-30-009	0.1	—	—	—
841-30-012	0.7	—	—	—
841-33-008	2.6	—	—	—
841-33-009	0.4	—	—	—
841-33-010	2.0	—	—	—
841-35-001	—	—	<0.1	—
841-35-002	1.8	—	<0.1	—
841-38-001	11.3	—	—	—
841-38-003	3.7	—	—	—
841-38-004	3.2	—	—	—
841-38-005	2.5	—	—	—
841-38-006	2.5	—	—	—
841-38-009	—	1.4	0.4	—
841-38-010	11.6	9.6	—	—
841-38-011	3.8	—	—	—
841-28-017	0.9	—	—	—
841-28-022	0.1	—	—	—
841-38-025	0.1	—	—	—
841-38-028	5.5	—	—	—
841-39-016	0.1	—	—	—
841-39-20	0.1	—	—	—
841-39-024	0.4	1.1	—	—
841-61-006	<0.1	—	—	—
841-76-014	<0.1	—	—	—
841-79-006	0.2	—	—	—
841-79-013	0.2	—	—	—
898-22-003	7.2	—	0.2	0.3
898-22-004	0.8	—	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
898-22-020	4.4	—	—	—
898-22-026	—	—	—	4.1
898-25-039	0.1	—	—	—
898-32-002	0.1	—	—	—
898-32-027	4.3	—	—	—
898-32-031	0.4	—	—	—
898-32-032	0.3	—	—	—
898-32-033	13.2	—	—	—
898-32-034	<0.1	—	—	—
898-41-002	2.4	—	—	2.6
898-41-016	2.7	—	—	2.9
Total	**265.5**	**55.4**	**5.9**	**43.4**
Pacheco Pass				
069-220-014	—	—	—	32.7
069-220-023	18.2	—	—	—
069-220-036	—	—	—	7.8
069-220-039	—	—	—	0.1
069-220-054	—	—	—	0.6
069-240-034	—	—	—	0.1
069-240-038	—	—	—	<0.1
069-240-039	—	—	—	0.9
069-250-004	0.7	—	0.3	2.4
070-070-034	13.5	—	—	—
070-909-004	—	—	6.4	—
070-100-008	10.5	1.6	—	—
070-100-009	0.8	—	—	—
070-100-014	—	2.5	5.1	—
070-100-022	—	0.7	—	—
070-100-030	10.6	1.6	—	—
070-100-031	9.9	—	—	—
070-100-032	12.8	—	—	—
070-100-033	6.8	—	—	—
070-100-034	1.0	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-220-002	0.6	—	—	—
898-21-010	<0.1	—	—	—
898-22-020	1.4	—	—	—
Total	**86.6**	**6.4**	**11.8**	**44.8**
San Joaquin Valley				
070-090-004	0.3	0.6	3.6	—
070-090-015	1.8	<0.1	—	—
070-090-016	0.9	1.8	0.5	—
070-090-037	—	—	9.7	—
070-090-038	—	—	1.0	—
070-090-042	3.6	11.2	2.7	—
070-112-012	—	8.2	29.0	—
070-112-013	—	20.1	1.8	—
070-112-016	—	2.0	0.3	—
070-112-017	—	0.1	—	—
070-112-018	—	<0.1	—	—
070-113-005	—	—	<0.1	—
070-113-009	—	0.6	—	10.0
070-113-013	—	—	—	0.2
070-113-014	—	0.1	—	<0.1
070-160-026	2.9	—	1.8	—
070-160-027	2.6	—	0.1	—
070-160-051	0.9	—	0.5	16.5
070-160-052	—	—	—	12.4
070-201-015	—	5.8	0.9	—
070-201-026	—	<0.1	—	0.3
070-201-027	—	—	—	0.2
070-202-017	—	—	1.1	—
070-220-006	—	0.8	0.1	0.2
070-270-014	—	1.2	—	<0.1
070-270-015	—	0.9	—	—
070-270-016	—	0.5	—	—
070-270-018	—	0.5	—	0.5

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-270-019	—	<0.1	—	0.1
070-270-020	—	<0.1	—	<0.1
073-160-008	0.1	—	—	—
073-170-006	0.1	—	—	—
073-170-010	2.4	1.4	—	—
073-170-021	5.3	1.5	—	—
073-180-007	0.9	—	—	—
073-180-031	—	<0.1	—	—
073-180-032	1.4	0.3	—	—
073-180-033	2.6	0.7	—	—
073-190-011	1.9	0.5	—	—
073-190-012	2.9	8.8	—	—
073-190-014	0.5	1.3	—	—
073-190-019	—	1.2	—	—
073-190-021	<0.1	—	—	—
073-190-024	<0.1	<0.1	—	—
073-190-025	2.2	7.1	—	—
073-190-026	5.6	6.4	—	—
073-200-001	1.4	—	—	—
073-200-002	3.9	—	—	—
073-200-012	1.9	19.5	—	—
073-200-013	—	2.8	—	—
073-200-021	0.3	—	—	—
073-200-022	3.5	—	—	—
073-200-023	0.3	7.0	—	—
073-210-001	9.6	—	—	—
073-210-007	0.1	—	—	4.4
073-210-008	5.1	—	—	—
073-380-003	9.1	1.1	—	—
073-380-017	0.2	4.3	—	—
073-380-020	1.5	—	—	—
073-380-027	4.4	4.7	—	—
073-420-008	0.7	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-420-024	0.3	—	—	—
073-420-026	<0.1	0.3	—	—
073-420-027	—	0.2	—	—
073-420-028	<0.1	0.4	—	—
073-420-033	2.8	0.9	—	—
073-420-056	<0.1	—	—	—
073-420-062	—	0.1	—	—
073-420-063	—	<0.1	—	—
073-420-064	0.2	—	—	—
073-420-080	—	<0.1	—	—
081-020-001	4.2	—	—	—
081-020-002	3.6	—	—	—
081-020-008	4.4	—	3.4	—
081-020-009	7.9	—	—	—
081-040-001	3.0	—	<0.1	—
081-040-002	0.2	—	—	—
081-040-003	5.1	—	0.1	—
081-040-004	<0.1	—	1.0	—
081-040-014	0.2	—	—	—
081-060-025	—	—	<0.1	5.4
081-060-026	0.3	—	4.6	<0.1
081-060-060	1.7	0.6	3.1	0.1
081-060-075	<0.1	—	—	—
082-020-001	2.5	—	—	—
082-020-002	2.6	—	—	—
082-020-003	1.3	—	2.6	—
082-020-004	8.6	1.6	1.8	—
082-020-005	0.2	1.6	0.5	—
085-280-026	—	0.1	—	—
085-290-004	2.8	4.6	—	—
085-290-006	5.6	3.4	—	—
085-290-007	8.5	2.1	—	—
085-290-030	1.8	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
085-290-031	3.3	2.0	—	—
085-290-034	5.1	5.3	—	—
085-290-035	2.2	1.8	—	—
085-290-036	<0.1	0.2	—	—
085-290-038	—	0.1	—	—
085-400-004	0.3	—	—	—
085-400-005	0.5	—	—	—
085-400-037	0.1	0.2	—	—
085-400-056	1.3	0.6	—	—
085-400-061	—	0.1	—	—
085-400-072	0.2	—	—	—
Total	**162.0**	**150.1**	**70.0**	**50.3**

APN = assessor's parcel number

— = *No parcels of Important Farmland would be permanently converted by this alternative.*

Table 1b Parcels of Important Farmland Permanently Converted under Alternative 2 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be permanently converted.				
Monterey Corridor				
No parcels of Important Farmland would be permanently converted.				
Morgan Hill and Gilroy				
013-010-001-000	—	<0.1	—	—
013-010-021-000	—	8.1	0.2	—
013-010-028-000	—	1.5	—	—
013-020-008-000	—	—	—	0.5
013-020-010-000	—	—	—	1.2
013-020-013-000	—	10.8	—	<0.1
013-020-014-000	—	10.0	—	—
013-020-021-000	—	—	—	0.2
013-040-015-000	—	8.5	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
013-040-027-000	—	0.2	—	10.4
013-050-003-000	—	—	—	5.6
013-050-004-000	—	—	—	2.6
013-050-005-000	1.3	—	—	—
015-020-016-000	2.8	—	—	—
015-020-020-000	7.5	—	—	—
015-020-021-000	1.5	—	—	—
015-020-022-000	0.6	—	—	—
015-030-006-000	0.7	—	—	—
015-030-010-000	<0.1	—	—	—
015-030-028-000	1.4	—	—	—
015-030-030-000	3.5	—	—	—
015-030-031-000	7.1	—	—	—
015-030-032-000	3.4	—	—	—
708-25-002	0.1	—	—	—
708-25-004	1.5	—	—	—
708-26-001	0.1	—	—	—
708-26-002	2.6	—	—	—
708-26-003	1.1	—	—	—
708-27-001	0.3	—	—	0.9
708-27-002	0.4	—	—	—
708-28-002	<0.1	—	—	0.7
712-04-001	<0.1	—	—	—
712-04-002	0.5	—	—	—
712-04-004	0.1	—	—	—
712-04-085	0.1	—	—	—
712-04-088	<0.1	—	—	—
712-04-089	0.1	—	—	—
712-07-105	—	—	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
712-08-023	—	—	—	0.1
712-08-025	0.4	0.5	—	—
712-09-012	0.1	—	—	—
712-18-007	0.1	—	—	—
712-18-009	<0.1	—	—	—
712-18-011	<0.1	—	—	—
712-27-003	<0.1	—	—	<0.1
712-27-012	0.2	—	—	—
712-27-039	2.0	—	—	—
712-27-040	<0.1	—	—	—
712-28-001	2.7	—	—	—
712-28-058	0.1	—	—	—
725-02-036	0.2	0.7	—	—
725-03-001	7.9	—	—	—
725-03-002	9.8	—	—	—
725-04-001	2.1	—	—	—
725-04-002	4.0	—	—	—
725-05-005	—	—	—	0.3
725-05-006	—	—	—	0.8
725-05-013	<0.1	—	—	2.8
725-06-004	—	—	—	1.2
725-06-006	—	—	—	0.8
725-05-013	<0.1	—	—	2.8
725-06-004	—	—	—	1.2
725-06-006	—	—	—	0.8
725-06-007	—	—	—	0.8
725-06-008	—	—	—	0.1
725-07-004	—	—	—	<0.1
725-07-007	—	—	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
725-07-009	—	—	—	1.8
725-07-014	—	—	—	0.1
725-07-015	0.8	—	—	6.0
725-10-024	—	—	—	1.2
725-10-025	—	—	—	1.5
725-11-021	—	—	—	<0.1
725-11-022	—	—	—	2.1
725-11-023	—	—	—	0.1
725-11-024	—	—	—	0.1
725-12-006	<0.1	—	—	—
725-12-007	0.7	—	—	—
725-12-008	0.8	—	—	—
725-12-013	<0.1	—	—	2.0
725-14-014	0.3	—	—	—
725-14-015	0.3	—	—	—
725-14-016	<0.1	—	—	—
764-09-013	—	—	—	0.7
764-10-003	—	—	—	<0.1
764-62-061	—	—	—	0.2
764-63-001	—	—	—	<0.1
764-63-002	—	—	—	<0.1
764-63-003	—	—	—	<0.1
764-63-004	—	—	—	0.1
764-63-005	—	—	—	0.1
764-63-006	—	—	—	0.1
764-63-007	—	—	—	0.1
764-63-008	—	—	—	0.1
764-63-010	—	—	—	0.1
764-63-011	—	—	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
764-63-012	—	—	—	<0.1
764-63-013	—	—	—	<0.1
764-63-014	—	—	—	<0.1
764-63-051	—	—	—	1.8
764-63-052	—	—	—	<0.1
779-05-011	0.4	—	—	—
779-05-038	1.1	<0.1	—	—
779-05-039	0.2	—	—	—
779-05-047	1.2	0.1	—	—
779-06-002	—	—	—	0.1
779-06-003	—	—	—	1.7
779-08-012	<0.1	—	—	—
779-09-003	—	—	—	<0.1
779-09-060	0.4	—	—	—
779-09-061	0.5	—	—	<0.1
779-11-028	0.1	—	—	—
779-14-004	0.6	0.4	—	—
779-14-005	1.0	1.7	—	—
779-15-001	0.2	2.4	—	—
783-18-002	5.6	3.5	—	—
783-18-003	0.6	<0.1	—	—
783-18-004	1.5	—	—	—
783-18-005	3.1	0.4	—	—
783-18-017	0.9	1.6	—	—
783-18-020	—	0.1	—	—
783-19-001	—	<0.1	—	—
783-19-010	—	0.5	—	—
817-07-007	<0.1	—	—	—
817-07-022	1.4	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
817-07-023	1.3	—	—	—
825-01-007	<0.1	—	—	—
825-01-008	2.4	—	—	—
825-01-015	0.6	—	—	—
825-01-016	1.7	—	1.1	—
825-03-008	<0.1	—	—	—
825-04-001	4.0	—	—	—
825-06-013	<0.1	—	—	—
825-06-014	<0.1	—	—	—
825-06-023	0.8	—	—	—
825-06-025	0.1	—	—	—
825-06-028	0.1	—	—	—
825-06-034	0.6	—	—	—
825-06-035	3.6	—	—	—
825-06-037	1.3	—	—	—
825-06-038	3.5	—	—	—
825-06- 039	0.3	3.3	—	—
825-07-049	0.1	—	—	—
825-07- 050	0.6	—	—	—
825-07-051	<0.1	—	—	—
825-07-052	0.9	—	—	—
825-37-051	0.1	—	—	—
830-03-011	8.6	—	—	—
830-03-012	0.1	—	—	—
830-03-014	<0.1	—	—	—
830-03-024	0.2	—	—	—
830-03-025	<0.1	—	—	—
830-04-004	1.1	<0.1	—	—
830-04-005	4.7	1.0	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
830-04-010	<0.1	—	—	—
835-02-014	—	<0.1	—	—
835-04-068	—	—	—	1.2
835-06-007	<0.1	<0.1	—	—
835-06-008	0.1	4.1	—	—
835-06-009	—	<0.1	—	—
835-06-010	—	0.1	—	—
835-06-011	7.7	0.3	—	—
835-06-012	<0.1	—	—	—
835-06-013	0.2	—	—	—
835-06-027	—	<0.1	—	—
835-06-028	0.1	<0.1	—	—
835-06-029	0.2	0.2	—	—
835-06-030	<0.1	0.2	—	—
835-06-031	1.3	—	—	—
835-06-040	0.4	—	—	—
835-07-007	3.0	0.4	—	—
835-07-013	<0.1	—	—	3.4
835-07-015	—	—	<0.1	—
835-07-020	0.3	<0.1	—	0.5
841-25-016	<0.1	—	—	—
841-27-001	0.1	—	—	—
841-27-003	—	0.1	—	—
841-27-014	0.1	<0.1	—	—
841-27-019	<0.1	—	—	—
841-27-020	<0.1	—	—	—
841-27-027	—	<0.1	—	—
841-28-001	0.1	—	—	—
841-28-003	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-28-005	—	<0.1	—	—
841-28-007	0.1	—	—	—
841-28-018	0.1	—	—	—
841-28-021	—	<0.1	—	—
841-28-025	0.1	—	—	—
841-28-026	<0.1	—	—	—
841-29-024	0.1	—	—	—
841-30-003	34.8	—	—	—
841-30-004	37.6	—	—	—
841-30-007	9.4	—	—	—
841-30-008	27.9	—	5.1	—
841-30-009	0.1	—	—	—
841-30-012	0.7	—	—	—
841-33-008	2.6	—	—	—
841-33-009	0.4	—	—	—
841-33-010	2.0	—	—	—
841-35-001	—	—	<0.1	—
841-35-002	1.8	—	<0.1	—
841-38-001	11.3	—	—	—
841-38-003	3.7	—	—	—
841-38-004	3.2	—	—	—
841-38-005	2.5	—	—	—
841-38-006	2.5	—	—	—
841-38-009	—	1.4	0.4	—
841-38-010	11.6	9.6	—	—
841-38-011	3.8	—	—	—
841-38-017	0.9	—	—	—
841-38-022	0.1	—	—	—
841-38-025	0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-38-028	5.5	—	—	—
841-39-016	0.1	—	—	—
841-39-020	0.1	—	—	—
841-39-024	0.4	1.1	—	—
841-61-006	<0.1	—	—	—
841-76-014	<0.1	—	—	—
841-79-006	0.2	—	—	—
841-79-013	0.2	—	—	—
898-22-003	7.2	—	0.2	0.3
898-22-004	0.8	—	—	0.1
898-22-020	4.4	—	—	—
898-22-026	—	—	—	4.1
898-25-039	0.1	—	—	—
898-32-002	0.1	—	—	—
898-32-027	4.3	—	—	—
898-32-031	0.4	—	—	—
898-32-032	0.3	—	—	—
898-32-033	13.2	—	—	—
898-32-034	<0.1	—	—	—
898-41-002	2.4	—	—	2.6
898-41-016	2.7	—	—	2.9
Total	**339.0**	**72.9**	**7.0**	**64.1**
Pacheco Pass				
069-220-014	—	—	—	32.7
069-220-023	18.2	—	—	—
069-220-036	—	—	—	7.8
069-220-039	—	—	—	0.1
069-220-054	—	—	—	0.6
069-240-034	—	—	—	0.1
069-240-038	—	—	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
069-240-039	—	—	—	0.9
069-250-004	0.7	—	0.3	2.4
070-070-034	13.5	—	—	—
070-090-004	—	—	6.4	—
070-100-008	10.5	1.6	—	—
070-100-009	0.8	—	—	—
070-100-014	—	2.5	5.1	—
070-100-022	—	0.7	—	—
070-100-030	10.6	1.6	—	—
070-100-031	9.9	—	—	—
070-100-032	12.8	—	—	—
070-100-033	6.8	—	—	—
070-100-034	1.0	—	—	—
070-220-002	0.6	—	—	—
898-21-010	<0.1	—	—	—
898-22-020	1.4	—	—	—
Total	**86.6**	**6.4**	**11.8**	**44.8**
San Joaquin Valley				
070-090-004	0.3	0.6	3.6	—
070-090-015	1.8	<0.1	—	—
070-090-016	0.9	1.8	0.5	—
070-090-037	—	—	9.7	—
070-090-038	—	—	1.0	—
070-090-042	3.6	11.2	2.7	—
070-112-012	—	8.2	29.0	—
070-112-013	—	20.1	1.8	—
070-112-016	—	2.0	0.3	—
070-112-017	—	0.1	—	—
070-112-018	—	<0.1	—	—
070-113-005	—	—	<0.1	—
070-113-009	—	0.6	—	10.0
070-113-013	—	—	—	0.2
070-113-014	—	0.1	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-160-026	2.9	—	1.8	—
070-160-027	2.6	—	0.1	—
070-160-051	0.9	—	0.5	16.5
070-160-052	—	—	—	12.4
070-201-015	—	5.8	0.9	—
070-201-026	—	<0.1	—	0.3
070-201-027	—	—	—	0.2
070-202-017	—	—	1.1	—
070-220-006	—	0.8	0.1	0.2
070-270-014	—	1.2	—	<0.1
070-270-015	—	0.9	—	—
070-270-016	—	0.5	—	—
070-270-018	—	0.5	—	0.5
070-270-019	—	<0.1	—	0.1
070-270-020	—	<0.1	—	<0.1
073-160-008	0.1	—	—	—
073-170-006	0.1	—	—	—
073-170-010	2.4	1.4	—	—
073-170-021	5.3	1.5	—	—
073-180-007	0.9	—	—	—
073-180-031	—	<0.1	—	—
073-180-032	1.4	0.3	—	—
073-180-033	2.6	0.7	—	—
073-190-011	1.9	0.5	—	—
073-190-012	2.9	8.8	—	—
073-190-014	0.5	1.3	—	—
073-190-019	—	1.2	—	—
073-190-020	—	0.8	—	—
073-190-021	<0.1	—	—	—
073-190-024	<0.1	<0.1	—	—
073-190-025	2.2	7.1	—	—
073-190-026	5.6	6.4	—	—
073-200-001	1.4	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-200-002	3.9	—	—	—
073-200-012	1.9	19.5	—	—
073-200-013	—	2.8	—	—
073-200-021	0.3	—	—	—
073-200-022	3.5	—	—	—
073-200-023	0.3	7.0	—	—
073-210-001	9.6	—	—	—
073-210-007	0.1	—	—	4.4
073-210-008	5.1	—	—	—
073-380-003	9.1	1.1	—	—
073-380-017	0.2	4.3	—	—
073-380-020	1.5	—	—	—
073-380-027	4.4	4.7	—	—
073-420-008	0.7	—	—	—
073-420-024	0.3	—	—	—
073-420-026	<0.1	0.3	—	—
073-420-027	—	0.2	—	—
073-420-028	<0.1	0.4	—	—
073-420-033	2.8	0.9	—	—
073-420-056	<0.1	—	—	—
073-420-062	—	0.1	—	—
073-420-063	—	<0.1	—	—
073-420-064	0.2	—	—	—
073-420-080	—	<0.1	—	—
081-020-001	4.2	—	—	—
081-020-002	3.6	—	—	—
081-020-008	4.4	—	3.4	—
081-020-009	7.9	—	—	—
081-040-001	3.0	—	<0.1	—
081-040-002	0.2	—	—	—
081-040-003	5.1	—	0.1	—
081-040-004	<0.1	—	1.0	—
081-040-014	0.2	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
081-060-025	—	—	<0.1	5.4
081-060-026	0.3	—	4.6	<0.1
081-060-060	1.7	0.6	3.1	0.1
081-060-075	<0.1	—	—	—
082-020-001	2.5	—	—	—
082-020-002	2.6	—	—	—
082-020-003	1.3	—	2.6	—
082-020-004	8.6	1.6	1.8	—
082-020-005	0.2	1.6	0.5	—
085-280-026	—	0.1	—	—
085-290-004	2.8	4.6	—	—
085-290-006	5.6	3.4	—	—
085-290-007	8.5	2.1	—	—
085-290-030	1.8	—	—	—
085-290-031	3.3	2.0	—	—
085-290-034	5.1	5.3	—	—
085-290-035	2.2	1.8	—	—
085-290-036	<0.1	0.2	—	—
085-290-038	—	0.1	—	—
085-400-004	0.3	—	—	—
085-400-005	0.5	—	—	—
085-400-037	0.1	0.2	—	—
085-400-056	1.3	0.6	—	—
085-400-061	0.2	—	—	—
Total	**162.0**	**150.1**	**70.0**	**50.3**

APN = assessor's parcel number

— = *No parcels of Important Farmland would be permanently converted by this alternative.*

Table 1c Parcels of Important Farmland Permanently Converted under Alternative 3 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be permanently converted.				
Monterey Corridor				
No parcels of Important Farmland would be permanently converted.				
Morgan Hill and Gilroy				
013-010-001-000	—	<0.1	—	—
013-010-005-000	—	4.7	—	—
013-010-029-000	—	0.1	—	0.9
013-010-032-000	—	0.1	—	6.1
013-020-008-000	—	—	—	0.5
013-020-009-000	—	0.8	—	6.1
013-020-010-000	—	—	—	13.6
013-020-013-000	—	4.2	—	<0.1
013-020-014-000	—	4.0	—	—
013-020-017-000	—	—	—	7.3
013-020-021-000	—	—	—	0.2
013-050-003-000	—	—	—	1.0
013-050-004-000	—	—	—	0.2
015-020-016-000	8.2	—	—	—
015-020-019-000	0.7	—	—	—
015-020-020-000	4.5	—	—	—
015-020-021-000	0.2	—	—	—
015-020-022-000	0.1	—	—	—
015-030-010-000	<0.1	—	—	—
015-030-028-000	1.4	—	—	—
015-030-030-000	5.5	—	—	—
015-030-031-000	0.1	—	—	—
015-030-032-000	12.6	—	—	—
725-02-018	0.4	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
725-02-019	2.9	—	—	—
725-02-023	0.4	—	—	—
725-03-001	0.5	—	—	—
725-03-002	5.9	—	—	—
725-04-001	0.4	—	—	—
725-04-002	4.8	—	—	—
725-05-005	—	—	—	0.1
725-05-006	—	—	—	0.2
725-05-013	<0.1	—	—	2.0
725-06-004	—	—	—	0.1
725-06-006	—	—	—	<0.1
725-06-008	—	—	—	<0.1
725-07-009	—	—	—	1.1
725-07-015	<0.1	—	—	1.4
725-12-007	0.1	—	—	—
725-12-008	0.1	—	—	—
725-12-013	<0.1	—	—	0.1
726-38-013	—	<0.1	—	—
817-07-014	—	—	—	0.1
817-08-001	—	—	—	1.5
817-08-019	—	—	—	0.4
817-11-024	—	—	—	<0.1
817-11-073	—	—	—	2.0
817-60-024	—	—	—	<0.1
825-01-007	<0.1	—	—	—
825-01-008	1.8	—	—	—
825-01-015	0.5	—	—	—
825-01-016	0.9	—	0.4	—
825-04-001	2.4	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
825-04-005	1.0	—	—	—
825-04-009	<0.1	—	—	—
825-07-051	1.1	—	—	—
825-07-052	1.3	—	—	—
825-07-053	0.2	—	—	—
825-07-054	0.1	0.1	—	—
825-07-055	<0.1	—	—	—
825-07-056	0.5	—	—	—
825-07-057	0.1	0.3	—	—
830-03-002	0.4	—	—	—
830-03-007	0.8	—	—	—
830-03-011	0.4	—	—	—
830-03-021	<0.1	—	—	—
830-03-023	3.1	—	—	—
830-03-025	0.9	—	—	—
830-04-004	1.4	—	—	—
830-04-005	6.4	—	—	—
830-04-068	—	—	—	1.2
835-05-032	<0.1	—	—	—
835-05-033	0.1	—	—	—
835-08-008	3.8	—	—	—
835-12-015	<0.1	—	—	—
835-12-016	1.3	—	—	—
835-13-017	<0.1	—	—	—
835-13-018	0.4	—	—	—
835-13-028	0.4	—	—	—
835-14-010	1.8	—	—	—
835-14-021	4.4	—	—	—
835-14-040	0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
835-14-042	0.2	—	—	—
835-14-044	0.1	—	—	—
835-15-001	1.5	—	—	—
835-15-002	4.6	—	—	—
835-15-003	0.1	—	—	—
835-15-005	6.4	—	—	—
835-15-006	—	1.3	—	—
835-15-007	6.3	0.4	—	—
835-15-008	2.5	—	—	—
835-15-009	0.4	—	—	—
835-15-011	4.4	2.5	—	—
835-15-014	—	0.3	—	—
835-15-024	2.0	—	—	—
835-15-025	3.0	—	—	—
835-15-026	0.5	—	—	—
835-15-028	10.6	3.1	—	—
835-15-042	0.1	<0.1	—	—
835-15-046	—	<0.1	—	—
835-15-047	1.8	—	—	—
835-15-048	1.8	2.9	—	—
835-15-049	5.1	2.7	—	—
835-15-053	13.7	—	—	—
835-15-054	<0.1	—	—	—
841-18-026	—	4.2	—	—
841-18-048	6.1	6.7	—	—
841-18-052	<0.1	—	—	—
841-19-008	1.9	—	—	—
841-19-012	0.1	—	—	—
841-19-024	—	5.1	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-19-033	<0.1	—	—	—
841-19-034	—	0.7	—	—
841-19-036	18.4	5.5	—	—
841-19-037	—	0.7	—	—
841-21-016	0.1	—	—	—
841-22-017	1.4	0.4	—	—
841-22-056	3.1	—	—	—
841-22-088	0.2	—	—	—
841-22-089	0.5	—	—	—
841-22-090	1.0	—	—	—
841-22-104	<0.1	—	—	—
841-23-006	5.5	—	—	—
841-23-013	<0.1	—	—	—
841-24-012	6.3	—	—	—
841-24-034	11.1	—	—	—
841-24-036	<0.1	—	—	—
841-24-044	1.6	—	0.8	—
841-25-004	0.1	—	—	—
841-25-008	0.3	8.8	—	—
841-25-016	25.9	2.9	—	—
841-25-023	1.2	0.2	—	—
841-25-024	0.1	—	—	—
841-25-025	0.2	—	—	—
841-25-029	0.8	—	—	—
841-26-012	28.6	0.1	—	—
841-26-022	0.3	—	—	—
841-26-027	5.6	—	—	—
841-26-032	0.1	0.1	—	4.0
841-27-001	2.0	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-27-003	3.5	0.8	—	—
841-27-014	14.5	<0.1	—	—
841-27-019	0.4	0.3	—	—
841-27-020	10.9	2.8	—	—
841-27-027	—	<0.1	—	—
841-28-001	16.6	—	—	—
841-28-003	0.1	—	—	—
841-28-005	—	<0.1	—	—
841-28-007	0.1	—	—	—
841-28-018	0.1	—	—	—
841-28-021	—	<0.1	—	—
841-28-025	2.3	—	—	—
841-28-026	0.5	—	—	—
841-39-024	0.4	1.1	—	—
841-40-008	—	—	—	0.9
841-40-010	—	—	—	2.3
841-40-011	—	—	—	2.1
841-49-002	2.3	<0.1	—	—
841-49-003	0.9	—	—	—
841-49-004	<0.1	—	—	—
841-49-006	<0.1	—	—	—
841-49-008	5.2	0.7	—	—
841-49-009	—	0.1	—	—
841-49-013	0.2	—	—	—
841-49-014	—	<0.1	—	—
841-49-015	<0.1	<0.1	—	—
841-49-018	2.0	1.9	—	—
841-49-019	<0.1	<0.1	—	—
841-60-002	1.6	10.	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-61-003	1.6	—	—	—
841-61-004	0.3	5.6	—	—
841-61-005	1.5	0.9	—	—
841-61-006	1.5	—	—	—
898-22-003	6.9	—	0.2	0.2
898-22-004	0.9	—	—	0.1
898-22-020	4.4	—	—	—
898-22-026	—	—	—	5.1
898-25-039	0.9	—	—	—
898-26-002	—	—	—	0.1
898-26-003	—	—	—	<0.1
898-32-027	4.5	—	—	—
898-32-031	0.1	—	—	—
898-32-032	0.1	—	—	—
898-32-033	6.6	—	—	—
898-41-002	1.6	—	—	2.3
898-41-016	1.5	—	—	3.9
Total	**366.4**	**87.2**	**1.4**	**67.1**
Pacheco Pass				
069-220-014	—	—	—	32.7
069-220-023	18.2	—	—	—
069-220-036	—	—	—	7.8
069-220-039	—	—	—	0.1
069-220-054	—	—	—	0.6
069-240-034	—	—	—	0.1
069-240-038	—	—	—	<0.1
069-240-039	—	—	—	0.9
069-250-004	0.7	—	0.3	2.4
070-070-034	13.5	—	—	—
070-090-004	—	—	6.4	—
070-100-008	10.5	1.6	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-100-009	0.8	—	—	—
070-100-014	—	2.5	5.1	—
070-100-022	—	0.7	—	—
070-100-030	10.6	1.6	—	—
070-100-031	9.9	—	—	—
070-100-032	12.8	—	—	—
070-100-033	6.8	—	—	—
070-100-034	1.0	—	—	—
070-220-002	0.6	—	—	—
898-21-010	<0.1	—	—	—
898-22-020	1.4	—	—	—
Total	**86.6**	**6.4**	**11.8**	**44.8**
San Joaquin Valley				
070-090-004	0.3	0.6	3.6	—
070-090-015	1.8	<0.1	—	—
070-090-016	0.9	1.8	0.5	—
070-090-037	—	—	9.7	—
070-090-038	—	—	1.0	—
070-090-042	3.6	11.2	2.7	—
070-112-012	—	8.2	29.0	—
070-112-013	—	20.1	1.8	—
070-112-016	—	2.0	0.3	—
070-112-017	—	0.1	—	—
070-112-018	—	<0.1	—	—
070-113-005	—	—	<0.1	—
070-113-009	—	0.6	—	10.0
070-113-013	—	—	—	0.2
070-113-014	—	0.1	—	<0.1
070-160-026	2.9	—	1.8	—
070-160-027	2.6	—	0.1	—
070-160-051	0.9	—	0.5	16.5
070-160-052	—	—	—	12.4
070-201-015	—	5.8	0.9	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-201-026	—	<0.1	—	0.3
070-201-027	—	—	—	0.2
070-202-017	—	—	1.1	—
070-220-006	—	0.8	0.1	0.2
070-270-014	—	1.2	—	<0.1
070-270-015	—	0.9	—	—
070-270-016	—	0.5	—	—
070-270-018	—	0.5	—	0.5
070-270-019	—	<0.1	—	0.1
070-270-020	—	<0.1	—	<0.1
073-160-008	0.1	—	—	—
073-170-006	0.1	—	—	—
073-170-010	2.4	1.4	—	—
073-170-021	5.3	1.5	—	—
073-180-007	0.9	—	—	—
073-180-031	—	<0.1	—	—
073-180-032	1.4	0.3	—	—
073-180-033	2.6	0.7	—	—
073-190-011	1.9	0.5	—	—
073-190-012	2.9	8.8	—	—
073-190-014	0.5	1.3	—	—
073-190-019	—	1.2	—	—
073-190-020	—	0.8	—	—
073-190-021	<0.1	—	—	—
073-190-024	<0.1	<0.1	—	—
073-190-025	2.2	7.1	—	—
073-190-026	5.6	6.4	—	—
073-200-001	1.4	—	—	—
073-200-002	3.9	—	—	—
073-200-012	1.9	19.5	—	—
073-200-013	—	2.8	—	—
073-200-021	0.3	—	—	—
073-200-022	3.5	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-200-023	0.3	7.0	—	—
073-210-001	9.6	—	—	—
073-210-007	0.1	—	—	4.4
073-210-008	5.1	—	—	—
073-380-003	9.1	1.1	—	—
073-380-017	0.2	4.3	—	—
073-380-020	1.5	—	—	—
073-380-027	4.4	4.7	—	—
073-420-008	0.7	—	—	—
073-420-024	0.3	—	—	—
073-420-026	<0.1	0.3	—	—
073-420-027	—	0.2	—	—
073-420-028	<0.1	0.4	—	—
073-420-033	2.8	0.9	—	—
073-420-056	<0.1	—	—	—
073-420-062	—	0.1	—	—
073-420-063	—	<0.1	—	—
073-420-064	0.2	—	—	—
073-420-080	—	<0.1	—	—
081-020-001	4.2	—	—	—
081-020-002	3.6	—	—	—
081-020-008	4.4	—	3.4	—
081-020-009	7.9	—	—	—
081-040-001	3.0	—	<0.1	—
081-040-002	0.2	—	—	—
081-040-003	5.1	—	0.1	—
081-040-004	<0.1	—	1.0	—
081-040-014	0.2	—	—	—
081-060-025	—	—	<0.1	5.4
081-060-026	0.3	—	4.6	<0.1
081-060-060	1.7	0.6	3.1	0.1
081-060-075	<0.1	—	—	—
082-020-001	2.5	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
082-020-002	2.6	—	—	—
082-020-003	1.3	—	2.6	—
082-020-004	8.6	1.6	1.8	—
082-020-005	0.2	1.6	0.5	—
085-280-026	—	0.1	—	—
085-290-004	2.8	4.6	—	—
085-290-006	5.6	3.4	—	—
085-290-007	8.5	2.1	—	—
085-290-030	1.8	—	—	—
085-290-31	3.3	2.0	—	—
085-290-034	5.1	5.3	—	—
085-290-035	2.2	1.8	—	—
085-290-036	<0.1	0.2	—	—
085-290-038	—	0.1	—	—
085-400-004	0.3	—	—	—
085-400-005	0.5	—	—	—
085-400-037	0.1	0.2	—	—
085-400-056	1.3	0.6	—	—
085-400-061	—	0.1	—	—
085-400-072	0.2	—	—	—
Total	**162.0**	**150.1**	**70.0**	**50.3**

APN = assessor's parcel number
— = *No parcels of Important Farmland would be permanently converted by this alternative.*

Table 1d Parcels of Important Farmland Permanently Converted under Alternative 4 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be permanently converted.				
Monterey Corridor				
No parcels of Important Farmland would be permanently converted.				
Morgan Hill and Gilroy				
013-010-001-000	—	<0.1	—	—
013-010-021-000	—	9.6	0.8	—
013-010-028-000	—	1.5	—	—
013-020-008-000	—	—	—	0.5
013-020-010-000	—	—	—	1.2
013-020-013-000	—	10.8	—	<0.1
013-020-014-000	—	10.0	—	—
013-020-021-000	—	—	—	0.2
013-040-015-000	—	8.5	—	—
013-040-027-000	—	0.2	—	10.4
013-050-003-000	—	—	—	5.6
013-050-004-000	—	—	—	2.6
013-050-005-000	1.3	—	—	—
015-020-016-000	2.8	—	—	—
015-020-020-000	7.5	—	—	—
015-020-021-000	1.5	—	—	—
015-020-022-000	0.6	—	—	—
015-030-006-000	0.7	—	—	—
015-030-010-000	<0.1	—	—	—
015-030-028-000	1.4	—	—	—
015-030-030-000	3.5	—	—	—
015-030-031-000	7.1	—	—	—
015-030-032-000	3.4	—	—	—
708-24-005	—	—	—	<0.1
708-24-009	<0.1	—	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
708-25-005	—	—	—	0.1
708-26-001	0.2	—	—	—
708-26-002	0.1	—	—	—
708-26-003	1.9	—	—	—
708-27-001	0.2	—	—	1.1
708-27-002	0.7	—	—	—
708-27-007	1.5	—	—	—
708-28-002	<0.1	—	—	0.7
712-01-008	1.7	—	—	1.0
712-01-010	0.2	—	—	—
712-01-012	0.3	—	—	—
712-02-013	0.2	—	—	—
712-04-001	0.5	—	—	—
712-04-002	1.0	—	—	—
712-04-004	<0.1	—	—	—
712-04-084	<0.1	—	—	—
712-04-085	4.7	—	—	0.2
712-04-087	0.6	—	—	—
712-04-088	0.2	—	—	—
712-04-089	0.2	—	—	—
712-06-077	0.7	—	—	1.8
712-07-075	—	—	<0.1	—
712-07-076	—	—	<0.1	—
712-07-080	<0.1	—	—	—
712-07-096	0.8	—	1.2	—
712-08-025	0.5	—	—	—
712-08-080	—	—	—	<0.1
712-08-085	—	0.5	—	—
712-08-086	—	<0.1	—	0.4
712-09-003	—	—	<0.1	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
712-09-004	—	—	<0.1	—
712-09-009	—	—	0.6	—
712-09-012	1.0	0.8	—	0.3
712-15-049	—	—	<0.1	—
712-18-007	0.4	—	—	—
712-18-009	0.6	—	—	—
712-18-010	0.1	—	—	—
712-18-011	0.5	—	—	—
712-27-003	0.6	—	—	1.3
712-27-004	—	—	—	0.1
712-27-040	<0.1	—	—	<0.1
712-28-001	<0.1	—	—	—
712-28-004	0.6	—	—	—
712-28-054	<0.1	—	—	—
712-28-055	<0.1	—	—	—
725-03-001	0.1	—	—	—
725-06-008	—	—	—	<0.1
725-10-024	—	—	—	<0.1
764-09-013	—	—	—	3.0
764-10-003	—	—	—	0.2
764-62-059	—	—	—	<0.1
817-06-016	0.1	—	—	—
825-01-007	<0.1	—	—	—
825-01-008	0.2	—	—	—
825-01-010	<0.1	—	—	—
825-01-012	2.9	—	—	—
825-01-015	<0.1	—	—	—
825-01-016	0.2	—	—	—
825-03-008	0.1	—	—	—
825-04-001	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
825-06-016	<0.1	—	—	—
825-06-018	<0.1	—	—	—
825-06-023	0.1	—	—	—
825-06-025	<0.1	—	—	—
825-06-028	1.1	—	—	—
825-06-033	<0.1	—	—	—
825-06-035	0.1	—	—	—
825-06-038	0.1	—	—	—
830-03-024	0.1	—	—	—
830-04-004	<0.1	<0.1	—	—
830-04-005	<01	<0.1	—	—
835-02-014	—	0.1	—	—
835-04-068	—	—	—	1.2
835-06-007	—	0.6	—	—
835-06-008	<0.1	5.1	—	—
835-06-009	—	<0.1	—	—
835-06-010	—	<0.1	—	
835-06-011	4.3	1.6	—	—
835-06-027	—	<0.1	—	—
835-06-028	0.2	<0.1	—	—
835-06-029	1.5	0.3	—	—
835-06-030	<0.1	1.4	—	—
835-07-020	4.5	1.4	—	1.7
841-14-027	2.4	—	—	—
841-14-028	1.0	—	—	—
841-14-060	2.6	—	—	—
841-14-080	<0.1	—	—	—
841-25-016	<0.1	—	—	—
841-27-001	0.1	—	—	—
841-27-003	—	0.1	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-27-014	0.1	<0.1	—	—
841-27-019	<0.1	—	—	—
841-27-020	<0.1	—	—	—
841-27-027	—	<0.1	—	—
841-28-001	0.1	—	—	—
841-28-003	<0.1	—	—	—
841-28-005	—	<0.1	—	—
841-28-007	0.1	—	—	—
841-28-018	0.1	—	—	—
841-28-021	—	<0.1	—	—
841-28-025	0.1	—	—	—
841-28-026	<0.1	—	—	—
841-30-003	2.3	—	—	—
841-30-004	0.4	—	—	—
841-30-008	7.5	—	1.7	—
841-30-009	13.0	—	0.5	—
841-31-003	11.6	—	<0.1	—
841-31-004	6.7	—	<0.1	—
841-31-008	9.5	—	—	—
841-31-009	6.0	—	—	—
841-31-010	6.6	—	—	—
841-31-011	1.7	—	—	—
841-31-021	2.2	—	—	—
841-31-022	6.8	—	—	—
841-31-023	7.1	—	—	—
841-31-024	2.8	—	—	—
841-33-004	<0.1	—	—	—
841-38-001	7.2	—	—	—
841-38-003	7.1	—	—	—
841-38-004	7.5	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-38-005	6.9	—	—	—
841-38-006	18.3	0.1	—	—
841-38-007	3.1	—	—	—
841-38-009	—	2.1	1.0	—
841-38-010	9.7	13.4	—	—
841-38-011	0.6	—	—	—
841-38-025	0.3	—	—	—
841-38-028	4.9	—	—	—
841-39-024	0.4	1.1	—	—
841-61-006	<0.1	—	—	—
898-22-003	7.2	—	0.2	0.3
898-22-004	0.8	—	—	0.1
898-22-020	4.4	—	—	—
898-22-026	—	—	—	4.1
898-25-039	0.1	—	—	—
898-32-002	0.1	—	—	—
898-32-027	4.3	—	—	—
898-32-031	0.4	—	—	—
898-32-032	0.3	—	—	—
898-32-033	13.2	—	—	—
898-32-034	<0.1	—	—	—
898-41-002	2.4	—	—	2.6
898-41-016	2.7	—	—	2.9
Total	**255.4**	**64.5**	**6.1**	**43.6**
Pacheco Pass				
069-220-014	—	—	—	32.7
069-220-023	18.2	—	—	—
069-220-036	—	—	—	7.8
069-220-039	—	—	—	0.1
069-220-054	—	—	—	0.6
069-240-034	—	—	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
069-240-038	—	—	—	<0.1
069-240-039	—	—	—	0.9
069-250-004	0.7	—	0.3	2.4
070-070-034	13.5	—	—	—
070-090-004	—	—	6.4	—
070-100-008	10.5	1.6	—	—
070-100-009	0.8	—	—	—
070-100-014	—	2.5	5.1	—
070-100-022	—	0.7	—	—
070-100-030	10.6	1.6	—	—
070-100-031	9.9	—	—	—
070-100-032	12.8	—	—	—
070-100-033	6.8	—	—	—
070-100-034	1.0	—	—	—
070-220-002	0.6	—	—	—
898-21-010	<0.1	—	—	—
898-22-020	1.4	—	—	—
Total	**86.6**	**6.4**	**11.8**	**44.8**
San Joaquin Valley				
070-090-004	0.3	0.6	3.6	—
070-090-015	1.8	<0.1	—	—
070-090-016	0.9	1.8	0.5	—
070-090-037	—	—	—	9.7
070-090-038	—	—	—	1.0
070-090-042	3.6	11.2	2.7	—
070-112-012	—	8.2	29.0	—
070-112-013	—	20.1	1.8	—
070-112-016	—	2.0	0.3	—
070-112-017	—	0.1	—	—
070-112-018	—	<0.1	—	—
070-113-005	—	—	<0.1	—
070-113-009	—	0.6	—	10.0
070-113-013	—	—	—	0.2
070-113-014	—	0.1	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-160-026	2.9	—	1.8	—
070-160-027	2.6	—	0.1	—
070-160-051	0.9	—	0.5	16.5
070-160-052	—	—	—	12.4
070-201-015	—	5.8	0.9	—
070-201-026	—	<0.1	—	0.3
070-201-027	—	—	—	0.2
070-202-017	—	—	1.1	—
070-220-006	—	0.8	0.1	0.2
070-270-014	—	1.2	—	<0.1
070-270-015	—	0.9	—	—
070-270-016	—	0.5	—	—
070-270-018	—	0.5	—	0.5
070-270-019	—	<0.1	—	0.1
070-270-020	—	<0.1	—	<0.1
073-160-008	0.1	—	—	—
073-170-006	0.1	—	—	—
073-170-010	2.4	1.4	—	—
073-170-021	5.3	1.5	—	—
073-180-007	0.9	—	—	—
073-180-031	—	<0.1	—	—
073-180-032	1.4	0.3	—	—
073-180-033	2.6	0.7	—	—
073-190-011	1.9	0.5	—	—
073-190-012	2.9	8.8	—	—
073-190-014	0.5	1.3	—	—
073-190-019	—	1.2	—	—
073-190-020	—	0.8	—	—
073-190-021	<0.1	—	—	—
073-190-024	<0.1	<0.1	—	—
073-190-025	2.2	7.1	—	—
073-190-026	5.6	6.4	—	—
073-200-001	1.4	—	—	—
073-200-002	3.9	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-200-012	1.9	19.5	—	—
073-200-013	—	2.8	—	—
073-200-021	0.3	—	—	—
073-200-022	3.5	—	—	—
073-200-023	0.3	7.0	—	—
073-210-001	9.6	—	—	—
073-210-007	0.1	—	—	4.4
073-210-008	5.1	—	—	—
073-380-003	9.1	1.1	—	—
073-380-017	0.2	4.3	—	—
073-380-020	1.5	—	—	—
073-380-027	4.4	4.7	—	—
073-420-008	0.7	—	—	—
073-420-024	0.3	—	—	—
073-420-026	<0.1	0.3	—	—
073-420-027	—	0.2	—	—
073-420-028	<0.1	0.4	—	—
073-420-033	2.8	0.9	—	—
073-420-056	<0.1	—	—	—
073-420-062	—	0.1	—	—
073-420-063	—	<0.1	—	—
073-420-064	0.2	—	—	—
073-420-080	—	<0.1	—	—
081-020-001	4.2	—	—	—
081-020-002	3.6	—	—	—
081-020-008	4.4	—	3.4	—
081-020-009	7.9	—	—	—
081-040-001	3.0	—	<0.1	—
081-040-002	0.2	—	—	—
081-040-003	5.1	—	0.1	—
081-040-004	<0.1	—	1.0	—
081-040-014	0.2	—	—	—
081-060-025	—	—	<0.1	5.4
081-060-026	0.3	—	4.6	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
081-060-060	1.7	0.6	3.1	0.1
081-060-075	<0.1	—	—	—
082-020-001	2.5	—	—	—
082-020-002	2.6	—	—	—
082-020-003	1.3	—	2.6	—
082-020-004	8.6	1.6	1.8	—
082-020-005	0.2	1.6	0.5	—
085-280-026	—	0.1	—	—
085-290-004	2.8	4.6	—	—
085-290-006	5.6	3.4	—	—
085-290-007	8.5	2.1	—	—
085-290-030	1.8	—	—	—
085-290-031	3.3	2.0	—	—
085-290-034	5.1	5.3	—	—
085-290-035	2.2	1.8	—	—
085-290-036	<0.1	0.2	—	—
085-290-038	—	0.1	—	—
085-400-004	0.3	—	—	—
085-400-005	0.5	—	—	—
085-400-037	0.1	0.2	—	—
085-400-056	1.3	0.6	—	—
085-400-061	—	0.1	—	—
085-400-072	0.2	—	—	—
Total	**162.0**	**150.1**	**70.0**	**50.3**

APN = assessor's parcel number
No parcels of Important Farmland would be permanently converted.

Table 2a Parcels of Important Farmland Temporarily Used under Alternative 1 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be temporarily used				
Monterey Corridor				
No parcels of Important Farmland would be temporarily used				
Morgan Hill and Gilroy				
013-010-021-000	—	3.5	1.0	3.5
013-010-028-000	—	0.9	—	0.9
013-020-013-000	—	3.9	—	3.9
013-020-014-000	—	5.7	—	5.7
013-040-015-000	—	0.1	—	0.1
013-050-005-000	6.7	—	—	—
015-020-020-000	<0.1	—	—	—
015-020-022-000	0.5	—	—	—
015-030-006-000	0.1	—	—	—
015-030-030-000	2.9	—	—	—
015-030-031-000	1.4	—	—	—
015-030-032-000	<0.1	—	—	—
708-26-002	<0.1	—	—	—
708-26-003	0.1	—	—	—
712-04-085	<0.1	—	—	—
712-06-077	0.2	—	—	—
712-07-096	<0.1	—	—	—
712-10-064	<0.1	—	—	—
712-10-066	0.7	—	—	—
712-26-006	0.6	—	—	—
712-26-007	<0.1	—	—	—
712-26-009	1.6	—	<0.1	—
712-26-010	<0.1	—	0.2	—
712-26-011	—	—	0.7	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
712-26-014	—	—	<0.1	—
712-26-015	—	—	0.2	—
712-26-025	1.0	—	—	—
725-02-018	0.1	—	—	—
725-02-019	1.1	—	—	—
725-02-023	0.1	—	—	—
725-03-001	6.5	—	—	—
725-03-002	37.3	—	—	—
725-04-001	8.8	—	—	—
725-04-002	34.0	—	—	—
725-04-003	<0.1	—	—	—
725-05-013	0.1	—	—	—
725-05-014	0.4	—	—	—
725-07-015	<0.1	—	—	—
725-12-007	<0.1	—	—	—
725-12-008	<0.1	—	—	—
725-12-013	<0.1	—	—	—
725-14-007	<0.1	—	—	—
725-14-008	2.1	—	—	—
725-14-009	2.1	—	—	—
725-14-014	1.5	—	—	—
725-14-015	1.6	—	—	—
725-14-016	<0.1	—	—	—
725-14-017	<0.1	—	—	—
726-38-012	—	<0.1	—	<0.1
726-38-013	—	<0.1	—	<0.1
726-39-003	0.1	—	—	—
728-29-021	0.1	—	—	—
728-29-022	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
783-18-022	4.1	1.6	—	1.6
783-18-025	0.8	—	<0.1	—
783-18-026	<0.1	—	—	—
783-18-027	0.1	—	—	—
783-19-010	0.4	0.1	—	0.1
825-01-007	<0.1	—	—	—
825-01-008	0.8	—	—	—
825-01-012	0.3	—	—	—
825-01-015	0.2	—	—	—
825-01-016	0.5	—	—	—
825-04-001	1.2	—	—	—
825-04-005	0.5	—	—	—
825-04-009	<0.1	—	—	—
825-07-051	0.4	—	—	—
825-07-052	0.3	—	—	—
825-07-053	0.1	—	—	—
825-07-054	<0.1	0.1	—	0.1
825-07-055	0.1	<0.1	—	<0.1
825-07-056	0.2	—	—	—
825-07-057	<0.1	0.1	—	0.1
830-03-011	0.5	—	—	—
830-03-012	0.1	—	—	—
830-04-004	0.3	—	—	—
830-04-005	0.9	0.2	—	0.2
835-02-014	—	<0.1	—	<0.1
835-05-015	0.2	—	—	—
835-05-016	<0.1	—	—	—
835-06-003	0.9	—	—	—
835-06-006	—	<0.1	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
835-06-007	2.0	7.1	—	7.1
835-06-008	<0.1	7.5	—	7.5
835-06-011	4.1	5.2	—	5.2
835-06-012	0.1	—	—	—
835-06-013	1.1	—	—	—
835-06-014	0.3	—	—	—
835-06-027	—	<0.1	—	<0.1
835-06-028	0.1	<0.1	—	<0.1
835-06-029	0.2	0.1	—	0.1
835-06-030	<0.1	<0.1	—	<0.1
835-07-007	0.8	—	—	—
835-07-013	<0.1	—	—	—
835-07-020	0.7	0.2	—	0.2
841-14-060	2.6	—	—	—
841-18-082	1.3	0.2	—	0.2
841-29-024	<0.1	—	—	—
841-30-003	0.6	—	—	—
841-30-004	0.8	—	—	—
841-30-007	6.8	—	<0.1	—
841-30-008	1.6	—	1.6	—
841-30-009	0.2	—	0.1	—
841-30-012	0.2	—	—	—
841-31-023	1.4	—	—	—
841-33-003	<0.1	—	0.1	—
841-33-004	0.1	—	0.4	—
841-33-008	9.8	—	—	—
841-33-009	0.4	—	—	—
841-33-010	5.7	—	0.1	—
841-25-001	<0.1	—	<0.1	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-35-002	5.6	—	<0.1	—
841-38-001	4.3	—	—	—
841-38-005	0.1	—	—	—
841-38-006	0.3	—	—	—
841-38-009	—	0.4	0.6	0.4
841-38-010	0.2	0.1	—	0.1
841-38-017	0.6	—	—	—
841-38-022	<0.1	—	—	—
841-40-008	—	<0.1	—	<0.1
841-40-010	—	0.1	—	0.1
841-40-011	0.1	<0.1	—	<0.1
898-22-003	2.4	—	0.2	—
898-22-004	0.1	—	—	—
898-22-020	1.4	—	—	—
898-22-027	0.3	—	0.1	—
898-22-028	<0.1	—	—	—
898-32-031	0.8	—	—	—
898-32-032	0.1	—	—	—
898-32-033	1.7	—	—	—
898-32-034	0.9	—	—	—
898-41-016	2.5	—	—	—
Total	**186.9**	**37.3**	**5.3**	**37.3**
Pacheco Pass				
069-220-014	—	—	—	<0.1
069-220-023	0.2	—	—	—
069-220-036	—	—	—	1.9
069-220-039	—	—	—	0.8
069-220-054	—	—	—	<0.1
069-240-034	—	—	—	0.7
069-240-038	—	—	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
069-240-039	—	—	—	11.8
069-250-004	0.4	—	0.2	1.5
070-070-034	4.7	—	—	—
070-100-008	0.6	—	—	—
070-100-009	1.6	—	—	—
070-100-012	0.1	—	—	—
070-100-014	—	0.4	0.3	—
070-100-022	—	1.0	—	—
070-100-028	0.5	—	—	—
070-100-030	0.9	2.3	2.7	—
070-100-031	0.7	—	—	—
070-100-032	0.3	—	—	—
070-100-033	0.1	—	—	—
070-100-034	0.1	—	—	—
070-220-002	1.3	—	—	—
898-22-020	0.4	—	—	—
Total	**12.0**	**3.7**	**3.2**	**16.8**
San Joaquin Valley				
070-090-004	—	—	0.1	—
070-090-037	—	—	<0.1	—
070-090-042	0.2	4.0	—	—
070-112-012	—	0.2	2.1	—
070-112-013	—	0.8	<0.1	—
070-112-017	—	<0.1	—	—
070-113-009	—	—	—	0.8
070-160-014	—	—	0.2	—
070-160-020	—	0.1	0.2	—
070-160-026	0.4	—	0.1	—
070-160-027	0.5	—	0.5	—
070-160-051	0.7	—	0.2	7.9
070-160-052	—	—	—	2.7
070-180-021	<0.1	—	—	—
070-180-028	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-190-013	<0.1	<0.1	0.1	<0.1
070-201-010	<0.1	—	—	—
070-201-015	—	8.5	0.1	—
070-201-026	—	0.1	<0.1	1.2
070-201-027	—	—	—	0.6
070-202-002	—	—	0.2	—
070-202-017	—	—	0.6	—
070-220-006	—	0.2	—	0.1
070-220-015	—	—	0.1	—
070-270-014	—	1.1	—	—
070-270-015	—	1.0	—	—
070-270-016	—	0.3	—	—
070-270-018	—	0.3	—	0.2
070-270-019	—	0.1	—	0.1
070-270-020	—	0.1	—	0.2
073-160-001	<0.1	—	—	—
073-160-008	0.1	—	0.3	—
073-170-006	0.6	—	—	—
073-170-008	—	0.2	—	—
073-170-010	2.5	9.7	—	—
073-170-021	6.0	3.1	—	—
073-180-007	0.4	—	—	—
073-180-017	—	0.1	—	—
073-180-027	—	<0.1	—	—
073-180-031	—	0.2	—	—
073-180-032	<0.1	0.1	—	—
073-180-033	<0.1	<0.1	—	—
073-190-002	0.1	0.4	—	—
073-190-011	0.6	0.3	—	—
073-190-012	<0.1	0.9	—	—
073-190-014	<0.1	0.3	—	—
073-190-019	—	0.2	—	—
073-190-020	1.1	0.5	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-190-021	0.1	—	—	—
073-190-025	0.1	4.1	—	—
073-190-026	6.4	5.7	—	—
073-200-001	0.2	—	—	—
073-200-001	0.1	—	—	—
073-200-012	0.1	11.4	—	—
073-200-013	<0.1	0.3	—	—
073-200-021	<0.1	—	—	—
073-200-022	0.4	—	—	—
073-200-023	0.4	2.9	—	—
073-210-001	0.1	—	—	—
073-210-007	0.2	—	—	1.5
073-210-008	0.9	—	—	—
073-380-003	12.2	6.1	—	—
073-380-017	0.7	2.6	—	—
073-380-018	<0.1	—	—	—
073-380-020	2.2	—	—	—
073-380-027	4.5	6.9	—	—
073-420-008	0.6	—	—	—
073-420-011	—	0.2	—	—
073-420-024	0.4	—	—	
073-420-026	<0.1	0.9	—	—
073-420-027	—	<0.1	—	—
073-420-028	<0.1	0.6	—	—
073-420-033	0.1	0.6	—	—
073-420-056	0.1	—	—	—
073-420-062	—	<0.1	—	—
073-420-063	<0.1	0.5	—	—
073-420-064	0.5	—	—	—
073-420-074	—	<0.1	—	—
073-420-080	—	0.1	—	—
081-020-001	0.7	—	—	—
081-020-002	0.7	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
081-020-008	1.3	—	1.0	—
081-020-009	3.1	—	—	—
081-040-004	—	—	0.1	—
081-040-014	0.2	—	—	—
081-060-025	—	—	—	0.5
081-060-026	<0.1	1.1	30.8	3.4
081-060-032	—	—	<0.1	<0.1
081-060-033	0.9	—	0.8	3.4
081-060-060	<0.1	—	0.1	0.1
081-060-062	0.3	—	0.2	0.1
081-060-063	—	—	0.4	0.7
081-060-075	<0.1	—	—	—
081-060-077	—	—	—	<0.1
081-060-083	—	—	—	0.5
082-020-001	0.8	—	—	—
082-020-002	0.1	—	—	—
082-020-003	0.1	—	0.1	—
082-020-004	8.9	0.2	1.0	—
082-020-005	1.4	0.7	<0.1	—
085-280-026	0.2	0.3	—	—
085-290-004	1.4	3.7	—	—
085-290-006	1.6	1.3	—	—
085-290-007	0.7	0.2	—	—
085-290-030	0.2	—	—	—
085-290-031	0.7	0.9	—	—
085-290-034	9.5	12.6	—	—
085-290-035	1.2	0.3	—	—
085-290-036	<0.1	0.5	—	—
085-290-038	0.2	0.4	—	—
085-400-004	0.1	—	—	—
085-400-005	0.3	—	—	—
085-400-037	<0.1	0.2	—	—
085-400-056	0.6	<0.1	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
085-400-061	—	0.3	—	—
085-400-072	<0.1	—	—	—
Total	**79.0**	**98.5**	**39.0**	**20.7**

APN = assessor's parcel number
— = *No parcels of Important Farmland would be temporarily used by this alternative.*

Table 2b Parcels of Important Farmland Temporarily Used under Alternative 2 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be temporarily used				
Monterey Corridor				
No parcels of Important Farmland would be temporarily used				
Morgan Hill and Gilroy				
013-010-021-000	—	3.5	1.0	—
013-010-028-000	—	0.9	—	—
013-020-010-000	—	—	—	<0.1
013-020-013-000	—	3.9	—	<0.1
013-020-014-000	—	5.7	—	—
013-020-021-000	—	—	—	<0.1
013-040-015-000	—	0.1	—	—
013-040-027-000	—	—	—	<0.1
013-050-003-000	—	—	—	8.4
013-050-004-000	—	—	—	1.6
013-050-005-000	6.7	—	—	—
015-020-020-000	<0.1	—	—	—
015-020-022-000	0.5	—	—	—
015-030-006-000	0.1	—	—	—
015-030-030-000	2.9	—	—	—
015-030-031-000	1.4	—	—	—
015-030-032-000	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
708-25-002	0.9	—	—	—
708-25-004	0.3	—	—	—
708-26-001	0.5	—	—	—
708-26-002	1.4	—	—	—
708-26-003	0.1	—	—	—
708-27-001	<0.1	—	—	0.7
708-27-002	1.0	—	—	—
708-27-007	1.7	—	—	<0.1
708-28-002	0.1	—	—	0.8
712-01-008	0.1	—	—	0.1
712-01-012	0.8	—	—	—
712-04-001	0.1	—	—	—
712-04-002	1.4	—	—	—
712-04-004	0.1	—	—	—
712-04-085	0.3	—	—	<0.1
712-04-088	0.6	—	—	—
712-04-089	<0.1	—	—	—
712-06-077	0.2	—	—	0.1
712-07-096	<0.1	—	—	—
712-07-105	—	—	—	0.8
712-07-111	—	—	—	<0.1
712-07-112	—	—	—	0.1
712-08-023	—	—	—	0.7
712-08-025	0.4	0.9	—	—
712-08-048	—	—	—	<0.1
712-09-012	0.1	—	—	—
712-10-064	<0.1	—	—	—
712-10-066	0.7	—	—	—
712-18-007	0.4	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
712-18-009	0.1	—	—	—
712-18-011	0.1	—	—	—
712-26-006	0.7	—	—	—
712-26-007	<0.1	—	—	—
712-26-009	1.8	—	<0.1	—
712-26-010	<0.1	—	0.3	—
712-26-011	—	—	0.7	—
712-26-014	—	—	<0.1	—
726-26-015	—	—	0.2	—
712-26-025	1.0	—	—	—
712-27-003	<0.1	—	—	0.1
712-27-012	0.7	—	—	—
712-27-039	1.5	—	—	—
712-27-040	0.1	—	—	—
712-28-001	2.2	—	—	—
712-28-005	<0.1	—	—	—
712-28-006	<0.1	—	—	—
712-28-051	<0.1	—	—	—
712-28-052	<0.1	—	—	—
712-28-058	0.9	—	—	—
725-02-036	<0.1	<0.1	—	—
725-03-001	2.3	—	—	—
725-03-002	20.1	—	—	—
725-04-001	<0.1	—	—	—
725-04-002	3.3	—	—	—
725-05-005	—	—	—	<0.1
725-05-013	0.1	—	—	8.5
725-05-014	0.3	—	—	0.5
725-06-004	—	—	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
725-06-006	—	—	—	<0.1
725-06-007	—	—	—	<0.1
725-06-008	—	—	—	<0.1
725-07-007	—	—	—	4.3
725-07-009	—	—	—	0.2
725-07-014	—	—	—	0.1
725-07-015	0.1	—	—	4.9
725-10-024	—	—	—	<0.1
725-11-022	—	—	—	1.9
725-11-023	—	—	—	<0.1
725-12-006	<0.1	—	—	—
725-12-007	<0.1	—	—	—
725-12-008	<0.1	—	—	—
725-12-013	<0.1	—	—	1.0
725-14-014	1.2	—	—	—
725-14-015	1.2	—	—	—
764-09-013	—	—	—	2.8
764-10-003	—	—	—	0.1
764-62-059	—	—	—	<0.1
764-62-061	—	—	—	0.3
764-63-001	—	—	—	0.1
764-63-002	—	—	—	0.1
764-63-003	—	—	—	0.1
764-63-004	—	—	—	0.1
764-63-005	—	—	—	0.1
764-63-006	—	—	—	<0.1
764-63-007	—	—	—	<0.1
764-63-008	—	—	—	0.1
764-63-009	—	—	—	0.2

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
764-63-010	—	—	—	0.1
764-63-011	—	—	—	0.1
764-63-012	—	—	—	0.1
764-63-013	—	—	—	0.1
764-63-014	—	—	—	0.1
764-63-015	—	—	—	0.1
764-63-016	—	—	—	0.1
764-63-051	—	—	—	0.2
764-63-052	—	—	—	0.2
767-20-014	—	—	—	0.5
767-20-015	—	—	—	0.5
767-20-019	—	—	—	0.1
767-43-005	—	—	—	<0.1
779-05-011	0.3	—	—	—
779-05-038	1.9	—	—	—
779-05-039	0.1	—	—	—
779-05-047	1.8	0.8	—	—
779-06-002	—	—	—	<0.1
779-06-003	—	<0.1	—	11.7
779-08-012	<0.1	—	—	—
779-09-001	<0.1	—	—	—
779-09-003	—	—	—	0.2
779-09-060	0.2	—	—	—
779-09-061	0.5	<0.1	—	2.9
779-11-027	<0.1	—	—	—
779-11-028	0.1	—	—	—
779-14-004	0.2	0.2	—	—
779-14-005	0.1	0.2	—	—
779-15-001	1.9	9.9	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
779-15-049	0.1	—	—	—
783-17-026	—	—	—	0.9
783-17-070	—	—	—	<0.1
783-18-002	2.1	0.7	—	—
783-18-003	0.4	—	—	—
783-18-004	0.6	—	—	—
783-18-005	1.2	0.3	—	—
783-18-017	0.6	1.1	—	—
783-18-020	—	0.1	—	—
783-18-022	4.1	1.6	—	—
783-18-025	0.8	—	<0.1	<0.1
783-18-026	<0.1	—	—	—
783-18-027	0.1	—	—	—
783-19-001	—	<0.1	—	—
783-19-010	0.5	0.2	—	—
817-06-016	0.1	—	—	—
817-07-007	<0.1	—	—	—
817-07-022	0.6	—	—	—
817-07-023	1.2	—	—	—
817-07-025	<0.1	—	—	—
817-08-037	1.4	—	—	—
817-09-050	—	—	—	0.5
817-09-055	—	—	—	0.3
825-01-007	<0.1	—	—	—
825-01-008	0.2	—	—	—
825-01-010	<0.1	—	—	—
825-01-012	2.9	—	—	—
825-01-015	2.8	—	—	—
825-01-016	0.3	—	0.5	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
825-03-008	0.2	—	—	—
825-04-001	2.1	—	—	—
825-05-028	—	<0.1	—	—
825-06-013	<0.1	—	—	—
825-06-014	0.4	—	—	—
825-06-015	0.4	—	—	—
825-06-016	0.8	—	—	—
825-06-018	0.2	—	—	—
825-06-023	4.3	2.6	—	—
825-06-024	—	<0.1	—	—
825-06-025	<0.1	0.1	—	—
825-06-028	1.0	—	—	—
825-06-033	<0.1	—	—	—
825-06-034	3.3	<0.1	—	—
825-06-035	1.4	—	—	—
826-06-036	3.4	0.5	—	—
825-06-037	2.5	—	—	—
825-06-038	0.3	—	—	—
825-06-040	1.9	—	—	—
825-06-041	1.9	—	—	—
825-06-042	3.8	—	—	—
825-06-043	2.0	1.7	—	—
825-07-049	0.1	—	—	—
825-07-050	0.7	—	—	—
825-07-051	0.3	—	—	—
825-07-052	0.4	—	—	—
825-37-051	0.1	—	—	—
830-03-011	2.9	—	—	—
830-03-012	0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
830-03-014	0.2	—	—	—
830-03-023	0.1	—	—	—
830-03-024	<0.1	—	—	—
830-03-025	0.2	—	—	—
830-04-004	<0.1	<0.1	—	—
830-04-005	0.4	<0.1	—	—
830-04-010	0.1	—	—	—
835-02-014	—	0.1	—	—
835-04-067	—	—	—	1.9
835-04-068	—	—	—	2.5
835-05-015	0.2	—	—	—
835-05-016	<0.1	—	—	—
835-06-003	0.9	—	—	—
835-06-006	—	<0.1	—	0.1
835-06-007	<0.1	0.1	—	<0.1
835-06-008	—	0.5	—	—
835-06-011	1.6	1.0	—	0.1
835-06-012	0.1	—	—	<0.1
835-06-013	1.2	—	—	—
835-06-014	0.3	—	—	—
835-06-027	—	<0.1	—	—
835-06-028	0.2	—	—	—
835-06-029	1.4	0.1	—	—
835-06-030	<0.1	1.4	—	—
835-06-031	1.3	—	—	—
835-06-037	<0.1	—	—	—
835-06-040	0.5	—	—	—
835-06-041	<0.1	—	—	—
835-06-042	0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
835-07-007	<0.1	—	—	—
835-07-013	—	—	—	0.4
835-07-015	—	—	0.6	—
835-07-020	4.6	1.4	—	1.5
841-14-060	2.6	—	—	—
841-29-024	<0.1	—	—	—
841-30-003	0.6	—	—	—
841-30-004	0.8	—	—	—
841-30-007	6.8	—	<0.1	—
841-30-008	1.6	—	1.6	—
841-30-009	0.2	—	0.1	—
841-30-012	0.2	—	—	—
841-31-023	1.3	—	—	—
841-33-003	<0.1	—	0.1	—
841-33-004	0.1	—	0.4	—
841-33-008	9.8	—	—	—
841-33-009	0.4	—	—	—
841-33-010	5.7	—	0.1	—
841-35-001	<0.1	—	<0.1	—
841-35-002	5.6	—	<0.1	—
841-38-001	4.3	—	—	—
841-38-005	0.1	—	—	—
841-38-006	0.3	—	—	—
841-38-009	—	0.4	0.6	—
841-38-010	0.2	0.1	—	—
841-38-017	0.6	—	—	—
841-38-022	<0.1	—	—	—
841-40-008	—	<0.1	—	0.1
841-40-010	—	0.1	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-40-011	0.1	<0.1	—	—
898-22-003	2.4	—	0.2	0.1
898-22-004	0.1	—	—	—
898-22-020	1.4	—	—	—
898-22-026	—	—	—	12.0
898-22-027	0.3	—	0.1	—
898-22-028	<0.1	—	—	—
898-32-031	0.8	—	—	—
898-32-032	0.1	—	—	—
898-32-033	1.7	—	—	—
898-32-034	0.9	—	—	—
898-41-016	2.5	—	—	0.5
Total	**187.8**	**40.3**	**6.5**	**77.1**
Pacheco Pass				
069-220-014	—	—	—	<0.1
069-220-023	0.2	—	—	—
069-220-036	—	—	—	1.9
069-220-039	—	—	—	0.8
069-220-054	—	—	—	<0.1
069-240-034	—	—	—	0.7
069-240-038	—	—	—	<0.1
069-240-039	—	—	—	11.8
069-250-004	0.4	—	0.2	1.5
070-070-034	4.7	—	—	—
070-100-008	0.6	—	—	—
070-100-009	1.6	—	—	—
070-100-012	0.1	—	—	—
070-100-014	—	0.4	0.3	—
070-100-022	—	1.0	—	—
070-100-028	0.5	—	—	—
070-100-030	0.9	2.3	2.7	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-100-031	0.7	—	—	—
070-100-032	0.3	—	—	—
070-100-033	0.1	—	—	—
070-100-034	0.1	—	—	—
070-220-002	1.3	—	—	—
898-22-020	0.4	—	—	—
Total	**12.0**	**3.7**	**3.2**	**16.8**
San Joaquin Valley				
070-090-004	—	—	0.1	—
070-090-037	—	—	<0.1	—
070-090-042	0.2	4.0	—	—
070-112-012	—	0.2	2.1	—
070-112-013	—	0.8	<0.1	—
070-112-017	—	<0.1	—	—
070-113-009	—	—	—	0.8
070-160-014	—	—	0.2	—
070-160-020	—	0.1	0.2	—
070-160-026	0.4	—	0.1	—
070-160-027	0.5	—	0.5	—
070-160-051	0.7	—	0.2	7.9
070-160-052	—	—	—	2.7
070-180-021	<0.1	—	—	—
070-180-028	<0.1	—	—	—
070-190-013	<0.1	<0.1	0.1	<0.1
070-201-010	<0.1	—	—	—
070-201-015	—	8.5	0.1	—
070-201-026	—	0.1	<0.1	1.2
070-201-027	—	—	—	0.6
070-202-002	—	—	0.2	—
070-202-017	—	—	0.6	—
070-220-006	—	0.2	—	0.1
070-220-015	—	—	0.1	—
070-270-014	—	1.1	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-270-015	—	1.0	—	—
070-270-016	—	0.3	—	—
070-270-018	—	0.3	—	0.2
070-270-019	—	0.1	—	0.1
070-270-020	—	0.1	—	0.2
073-160-001	<0.1	—	—	—
073-160-008	0.1	—	0.3	—
073-170-006	0.6	—	—	—
073-170-008	—	0.2	—	—
073-170-010	2.5	9.7	—	—
073-170-021	6.o	3.1	—	—
073-180-007	0.4	—	—	—
073-180-017	—	0.1	—	—
073-180-027	—	<0.1	—	—
073-180-031	—	0.2	—	—
073-180-032	<0.1	0.1	—	—
073-180-033	<0.1	<0.1	—	—
073-190-002	0.1	0.4	—	—
073-190-011	0.6	0.3	—	—
073-190-012	<0.1	0.9	—	—
073-190-014	<0.1	0.3	—	—
073-190-019	—	0.2	—	—
073-190-020	1.1	0.5	—	—
073-190-021	0.1	—	—	—
073-190-025	0.1	4.1	—	—
073-190-026	6.4	5.7	—	—
073-200-001	0.2	—	—	—
073-200-002	0.1	—	—	—
073-200-012	0.1	11.4	—	—
073-200-013	<0.1	0.3	—	—
073-200-021	<0.1	—	—	—
073-200-022	0.4	—	—	—
073-200-023	0.4	2.9	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-210-001	0.1	—	—	—
073-210-007	0.2	—	—	1.5
073-210-008	0.9	—	—	—
073-380-003	12.2	6.1	—	—
073-380-017	0.7	2.6	—	—
073-380-018	<0.1	—	—	—
073-380-020	2.2	—	—	—
073-380-027	4.5	6.9	—	—
073-420-008	0.6	—	—	—
073-420-011	—	0.2	—	—
073-420-024	0.4	—	—	—
073-420-026	<0.1	0.9	—	—
073-420-027	—	<0.1	—	—
073-420-028	<0.1	0.6	—	—
073-420-033	0.1	0.6	—	—
073-420-056	0.1	—	—	—
073-420-062	—	<0.1	—	—
073-420-063	<0.1	0.5	—	—
073-420-064	0.5	—	—	—
073-420-074	—	<0.1	—	—
073-420-080	—	0.1	—	—
081-020-001	0.7	—	—	—
081-020-002	0.7	—	—	—
081-020-008	1.3	—	1.0	—
081-020-009	3.1	—	—	—
081-040-004	—	—	0.1	—
081-040-014	0.2	—	—	—
081-040-025	—	—	—	0.5
081-060-026	<0.1	1.1	30.8	3.4
081-060-032	—	—	<0.1	<0.1
081-060-033	0.9	—	0.8	<0.1
081-060-060	<0.1	—	0.1	0.1
081-060-062	0.3	—	0.2	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
081-060-063	—	—	0.4	0.7
081-060-075	<0.1	—	—	—
081-060-077	—	—	—	<0.1
081-060-083	—	—	—	0.5
082-020-001	0.8	—	—	—
082-020-002	0.1	—	—	—
082-020-003	0.1	—	0.1	—
082-020-004	8.9	0.2	1.0	—
082-020-005	1.4	0.7	<0.1	—
082-280-026	0.2	0.3	—	—
085-290-004	1.4	3.7	—	—
085-290-006	1.6	1.3	—	—
085-290-007	0.7	0.2	—	—
085-290-030	0.2	—	—	—
085-290-031	0.7	0.9	—	—
085-290-034	9.5	12.6	—	—
085-290-035	1.2	0.3	—	—
085-290-036	<0.1	0.5	—	—
085-290-038	0.2	0.4	—	—
085-400-004	0.1	—	—	—
085-400-005	0.3	—	——	
085-400-037	<0.1	0.2	—	—
085-400-056	0.6	<0.1	—	—
085-400-061	—	0.3	—	—
085-400-072	<0.1	—	—	—
Total	**79.0**	**98.5**	**39.0**	**20.7**

APN = assessor's parcel number

— = *No parcels of Important Farmland would be temporarily used by this alternative.*

Table 2c Parcels of Important Farmland Temporarily Used under Alternative 3 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be temporarily used				
Monterey Corridor				
No parcels of Important Farmland would be temporarily used				
Morgan Hill and Gilroy				
013-010-005-000	—	2.9	—	—
013-010-029-000	—	0.1	—	0.5
013-010-032-000	—	0.2	—	3.4
013-020-009-000	—	0.3	—	2.9
013-020-010-000	—	—	—	9.6
013-020-017-000	—	—	—	6.4
013-020-021-000	—	—	—	0.1
015-020-016-000	<0.1	—	—	—
015-020-019-000	<0.1	—	—	—
015-020-020-000	<0.1	—	—	—
015-020-021-000	<0.1	—	—	—
015-020-022-000	<0.1	—	—	—
015-030-030-000	0.1	—	—	—
015-030-031-000	0.1	—	—	—
708-26-002	<0.1	—	—	—
708-26-003	0.1	—	—	—
712-04-085	<0.1	—	—	—
712-06-077	0.2	—	—	0.1
712-07-096	<0.1	—	—	—
712-07-105	—	—	—	0.2
712-07-111	—	—	—	<0.1
712-07-112	—	—	—	0.1
712-08-023	—	—	—	0.2
712-10-064	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
712-10-066	0.7	—	—	—
712-26-006	0.6	—	—	—
712-26-007	<0.1	—	—	—
712-26-009	1.6	—	<0.1	—
712-26-010	<0.1	—	0.2	—
712-26-011	—	—	0.7	—
712-26-014	—	—	<0.1	—
712-26-015	—	—	0.2	—
712-26-025	1.0	—	—	—
725-02-018	0.1	—	—	—
725-02-019	1.1	—	—	—
725-02-023	0.1	—	—	—
725-03-001	6.5	—	—	—
725-03-002	37.3	—	—	—
725-04-001	8.8	—	—	—
725-04-002	34.0	—	—	—
725-04-003	<0.1	—	—	—
725-05-013	0.1	—	—	9.3
725-05-014	0.4	—	—	0.5
725-06-004	—	—	—	0.1
725-06-006	—	—	—	0.2
725-06-007	—	—	—	0.1
725-06-008	—	—	—	<0.1
725-07-009	—	—	—	0.2
725-07-015	<0.1	—	—	0.3
725-10-024	—	—	—	0.1
725-10-025	—	—	—	0.1
725-11-021	—	—	—	<0.1
725-11-022	—	—	—	0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
725-11-023	—	—	—	<0.1
725-11-024	—	—	—	0.1
725-12-007	<0.1	—	—	—
725-12-008	<01	—	—	—
725-12-013	<0.1	—	—	0.3
725-14-007	<0.1	—	—	—
725-14-008	2.1	—	—	—
725-14-009	2.1	—	—	—
725-14-014	1.5	—	—	—
725-14-015	1.6	—	—	—
725-14-016	<0.1	—	—	—
725-14-017	<0.1	—	—	—
726-38-012	—	<0.1	—	—
726-38-013	—	<0.1	—	—
726-39-003	0.1	—	—	—
728-29-021	0.1	—	—	—
728-29-022	<0.1	—	—	—
767-20-014	—	—	—	0.5
767-20-015	—	—	—	0.5
767-20-019	—	—	—	0.1
767-43-005	—	—	—	<0.1
783-17-026	—	—	—	0.9
783-17-070	—	—	—	<0.1
783-18-022	4.1	1.6	—	—
783-18-025	0.8	—	<0.1	0.1
783-18-026	<0.1	—	—	—
783-18-027	0.1	—	—	—
783-19-010	0.3	—	—	—
817-07-014	—	—	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
817-08-001	—	—	—	0.6
817-08-019	—	—	—	0.1
817-11-024	—	—	—	<0.1
817-11-073	—	—	—	3.9
825-01-007	<0.1	—	—	—
825-01-008	0.7	—	—	—
825-01-012	0.1	—	—	—
825-01-015	0.2	—	—	—
825-01-016	0.3	—	2.7	—
825-04-001	1.2	—	—	—
825-04-005	0.5	—	—	—
825-04-009	<0.1	—	—	—
825-07-051	0.4	—	—	—
825-07-052	0.3	—	—	—
825-07-053	0.1	—	—	—
825-07-054	<0.1	0.1	—	—
825-07-055	0.1	<0.1	—	—
825-07-056	0.2	—	—	—
825-07-057	<0.1	0.1	—	—
830-03-002	1.4	—	—	—
830-03-007	0.2	—	—	—
830-03-011	0.4	—	—	—
830-03-020	<0.1	—	—	—
830-03-021	<0.1	—	—	—
830-03-023	0.4	—	—	—
830-03-025	0.2	—	—	—
830-04-004	0.4	—	—	—
830-04-005	20.0	1.9	—	—
830-04-041	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
830-04-062	<0.1	—	—	—
835-04-067	—	—	—	1.9
835-04-068	—	—	—	2.5
835-04-081	<0.1	—	—	—
835-05-015	0.2	—	—	—
835-05-016	<0.1	—	—	—
835-05-032	0.1	—	—	—
835-05-033	0.1	—	—	—
835-06-003	0.8	—	—	—
835-06-006	—	<0.1	—	0.1
835-06-007	—	<0.1	—	<0.1
835-06-008	0.1	—	—	—
835-06-011	0.2	0.3	—	<0.1
835-06-012	0.1	—	—	—
835-06-013	0.9	—	—	—
835-06-028	<0.1	—	—	—
835-06-029	<0.1	—	—	—
835-06-030	<0.1	—	—	—
835-07-020	<0.1	—	—	—
835-08-008	0.9	—	—	—
835-12-015	<0.1	—	—	—
835-12-016	0.3	—	—	—
835-13-018	0.1	—	—	—
835-13-028	0.2	—	—	—
835-14-040	0.1	—	—	—
835-14-042	0.1	—	—	—
835-14-044	0.1	—	—	—
835-14-056	0.1	—	—	—
835-15-001	0.7	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
835-15-002	5.2	—	—	—
825-15-003	14.9	—	—	—
835-15-005	1.1	—	—	—
835-15-006	—	1.5	—	—
835-15-007	12.6	<0.1	—	—
835-15-008	6.4	—	—	—
835-15-009	0.3	—	—	—
835-15-011	1.2	1.1	—	—
835-15-014	—	0.2	—	—
835-15-024	0.8	—	—	—
835-15-025	1.4	—	—	—
835-15-026	2.2	—	—	—
835-15-028	<0.1	—	—	—
835-15-042	1.2	<0.1	—	—
835-15-046	—	<0.1	—	—
835-15-047	1.4	—	—	—
835-15-048	0.8	1.9	—	—
835-15-049	2.0	1.2	—	—
835-15-053	0.1	—	—	—
835-16-003	0.1	—	—	—
841-18-026	—	1.0	—	—
841-18-046	0.1	—	—	—
841-18-047	1.2	—	—	—
841-18-048	1.5	<0.1	—	—
841-18-052	0.6	—	—	—
841-18-075	<0.1	—	—	—
841-18-076	<0.1	—	—	—
841-18-081	<0.1	—	—	—
841-18-082	4.0	0.2	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-18-094	<0.1	—	—	—
841-19-008	1.1	—	—	—
841-19-012	0.1	—	—	—
841-19-024	—	0.9	—	—
841-19-033	0.5	—	—	—
841-19-034	<0.1	0.4	—	—
841-19-035	<0.1	—	—	—
841-19-036	6.5	0.2	—	—
841-19-037	—	0.5	—	—
841-21-016	0.1	—	—	—
841-22-017	0.5	—	—	—
841-22-056	0.5	—	—	—
841-22-088	0.5	—	—	—
841-22-090	<0.1	—	—	—
841-22-099	4.7	—	—	—
841-22-100	0.4	—	—	—
841-22-104	<0.1	—	—	—
841-22-112	0.4	—	—	—
841-23-006	4.1	—	—	—
841-24-012	<0.1	—	—	—
841-24-034	0.6	—	0.1	—
841-24-036	<0.1	—	—	—
841-24-044	0.1	—	8.2	—
841-25-004	0.1	—	—	—
841-25-005	0.1	—	—	—
841-25-008	0.1	1.5	—	—
841-25-016	5.9	<0.1	—	—
841-25-023	0.2	—	—	—
841-25-025	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-25-029	0.1	—	—	—
841-26-012	0.7	<0.1	—	—
841-26-022	<0.1	—	—	—
841-26-027	0.1	—	—	—
841-26-032	<0.1	0.1	—	2.0
841-27-001	<0.1	—	—	—
841-27-003	<0.1	—	—	—
841-27-014	0.1	—	—	—
841-27-019	<0.1	0.2	—	—
841-27-020	<0.1	0.1	—	—
841-40-008	—	—	—	0.5
841-40-010	—	—	—	1.4
841-40-011	—	—	—	1.5
841-49-002	0.5	—	—	—
841-49-003	0.1	—	—	—
841-49-004	<0.1	—	—	—
841-49-006	0.1	<0.1	—	—
841-49-008	1.0	0.3	—	—
841-49-009	<0.1	0.1	—	—
841-49-0013	0.1	—	—	—
841-49-014	—	<0.1	—	—
841-49-015	0.1	0.2	—	—
841-60-002	<0.1	<0.1	—	—
841-61-004	—	<0.1	—	—
841-61-006	0.1	—	—	—
898-22-003	3.0	—	—	<0.1
898-22-004	<0.1	—	—	—
898-22-020	1.6	—	—	—
898-22-026	—	—	—	10.9

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
898-22-027	0.3	—	0.1	—
898-22-028	<0.1	—	—	—
898-32-027	<0.1	—	—	—
898-32-031	1.2	—	—	—
898-32-032	1.7	—	—	—
898-32-033	3.1	—	—	—
898-41-002	<0.1	—	—	—
898-41-016	6.0	—	—	0.4
Total	**243.7**	**19.2**	**12.3**	**62.7**
Pacheco Pass				
069-220-014	—	—	—	<0.1
069-220-023	0.2	—	—	—
069-220-036	—	—	—	1.9
069-220-039	—	—	—	0.8
069-220-054	—	—	—	<0.1
069-240-034	—	—	—	0.7
069-240-038	—	—	—	<0.1
069-240-039	—	—	—	11.8
069-250-004	0.4	—	0.2	1.5
070-070-034	4.7	—	—	—
070-100-008	0.6	—	—	—
070-100-009	1.6	—	—	—
070-100-012	0.1	—	—	—
070-100-014	—	0.4	0.3	—
070-100-022	—	1.0	—	—
070-100-028	0.5	—	—	—
070-100-030	0.9	2.3	2.7	—
070-100-031	0.7	—	—	—
070-100-032	0.3	—	—	—
070-100-033	0.1	—	—	—
070-100-034	0.1	—	—	—
070-220-002	1.3	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
898-22-020	0.4	—	—	—
Total	**12.0**	**3.7**	**3.2**	**16.8**
San Joaquin Valley				
070-090-004	—	—	0.1	—
070-090-037	—	—	<0.1	—
070-090-042	0.2	4.0	—	—
070-112-012	—	0.2	2.1	—
070-112-013	—	0.8	<0.1	—
070-112-017	—	<0.1	—	—
070-113-009	—	—	—	0.8
070-160-014	—	—	0.2	—
070-160-020	—	0.1	0.2	—
070-160-026	0.4	—	0.1	—
070-160-027	0.5	—	0.5	—
070-160-051	0.7	—	0.2	7.9
070-160-052	—	—	—	2.7
070-180-021	<0.1	—	—	—
070-180-028	<0.1	—	—	—
070-190-013	<0.1	<0.1	0.1	<0.1
070-201-010	<0.1	—	—	—
070-201-015	—	8.5	0.1	—
070-201-026	—	0.1	<0.1	1.2
070-201-027	—	—	—	0.6
070-202-002	—	—	0.2	—
070-202-017	—	—	0.6	—
070-220-006	—	0.2	—	0.1
070-220-015	—	—	0.1	—
070-270-014	—	1.1	—	0.1
070-270-015	—	1.0	—	—
070-270-016	—	0.3	—	—
070-270-018	—	0.3	—	0.2
070-270-019	—	0.1	—	0.1
070-270-020	—	0.1	—	0.2

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-160-001	<0.1	—	—	—
073-160-008	0.1	—	0.3	—
073-170-006	0.6	—	—	—
073-170-008	—	0.2	—	—
073-170-010	2.5	9.7	—	—
073-170-021	6.0	3.1	—	—
073-180-007	0.4	—	—	—
073-180-017	—	0.1	—	—
073-180-027	—	<0.1	—	—
073-180-031	—	0.2	—	—
073-180-032	<0.1	0.1	—	—
073-180-033	<0.1	<0.1	—	—
073-190-002	0.1	0.4	—	—
073-190-011	0.6	0.3	—	—
073-190-012	<0.1	0.9	—	—
073-190-014	<0.1	0.3	—	—
073-190-019	—	0.2	—	—
073-190-020	1.1	0.5	—	—
073-190-021	0.1	—	—	—
073-190-025	0.1	4.1	—	—
073-190-026	6.4	5.7	—	—
073-200-001	0.2	—	—	—
073-200-002	0.1	—	—	—
073-200-012	0.1	11.4	—	—
073-200-013	<0.1	0.3	—	—
073-200-021	<0.1	—	—	—
073-200-022	0.4	—	—	—
073-200-023	0.4	2.9	—	—
073-210-001	0.1	—	—	—
073-210-007	0.2	—	—	1.5
073-210-008	0.9	—	—	—
073-380-003	12.2	6.1	—	—
073-380-017	0.7	2.6	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-380-018	<0.1	—	—	—
073-380-020	2.2	—	—	—
073-380-027	4.5	6.9	—	—
073-420-008	0.6	—	—	—
073-420-011	—	0.2	—	—
073-420-024	0.4	—	—	—
073-420-026	<0.1	0.9	—	—
073-420-027	—	<0.1	—	—
073-420-028	<0.1	0.6	—	—
073-420-033	0.1	0.6	—	—
073-420-056	0.1	—	—	—
073-420-062	—	<0.1	—	—
073-420-063	<0.1	0.5	—	—
073-420-064	0.5	—	—	—
073-420-074	—	<0.1	—	—
073-420-080	—	0.1	—	—
081-020-001	0.7	—	—	—
081-020-002	0.7	—	—	—
081-020-008	1.3	—	1.0	—
081-020-009	3.1	—	—	—
081-040-004	—	—	0.1	—
081-040-014	0.2	—	—	—
081-060-025	—	—	—	0.5
081-060-026	<0.1	1.1	30.8	3.4
081-060-032	—	—	<0.1	<0.1
081-060-033	0.9	—	0.8	<0.1
081-060-060	<0.1	—	0.1	0.1
081-060-062	0.3	—	0.2	0.1
081-060-063	—	—	0.4	0.7
081-060-075	<0.1	—	—	—
081-060-077	—	—	—	<0.1
081-060-083	—	—	—	0.5
082-020-001	0.8	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
082-020-002	0.1	—	—	—
082-020-003	0.1	—	0.1	—
082-020-004	8.9	0.2	1.0	—
082-020-005	1.4	0.7	<0.1	—
085-280-026	0.2	0.3	—	—
085-290-004	1.4	3.7	—	—
085-290-006	1.6	1.3	—	—
085-290-007	0.7	0.2	—	—
085-290-030	0.2	—	—	—
085-290-031	0.7	0.9	—	—
085-290-034	9.5	12.6	—	—
085-290-035	1.2	0.3	—	—
085-290-036	<0.1	0.5	—	—
085-290-038	0.2	0.4	—	—
085-400-004	0.1	—	—	—
085-400-005	0.3	—	—	—
085-400-037	<0.1	0.2	—	—
085-400-056	0.6	<0.1	—	—
085-400-061	—	0.3	—	—
085-400-072	<0.1	—	—	—
Total	**79.0**	**98.5**	**39.0**	**20.7**

APN = assessor's parcel number
— = *No parcels of Important Farmland would be temporarily used by this alternative.*

Table 2d Parcels of Important Farmland Temporarily Used under Alternative 4 (acres)

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
San Jose Diridon Station Approach				
No parcels of Important Farmland would be temporarily used				
Monterey Corridor				
No parcels of Important Farmland would be temporarily used				
Morgan Hill and Gilroy				
013-010-021-000	—	5.1	0.4	—
013-010-028-000	—	0.9	—	—
013-020-010-000	—	—	—	<0.1
013-020-013-000	—	3.9	—	<0.1
013-020-014-000	—	5.7	—	—
013-020-021-000	—	—	—	<0.1
013-040-015-000	—	0.1	—	—
013-040-027-000	—	—	—	<0.1
013-050-003-000	—	—	—	8.4
013-050-004-000	—	—	—	1.6
013-050-005-000	6.7	—	—	—
015-020-020-000	<0.1	—	—	—
015-020-022-000	0.5	—	—	—
015-030-006-000	0.1	—	—	—
015-030-030-000	2.9	—	—	—
015-030-031-000	1.4	—	—	—
015-030-032-000	<0.1	—	—	—
708-24-009	<0.1	—	—	<0.1
708-25-005	—	—	—	0.2
708-26-002	0.7	—	—	<0.1
708-26-003	0.7	—	—	—
708-27-001	0.3	—	—	—
708-27-002	1.1	—	—	—
708-27-007	1.4	—	—	—
708-28-002	—	—	—	<0.1
712-01-004	3.0	—	—	—
712-01-008	0.4	—	—	<0.1

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
712-01-010	3.5	—	—	<0.1
712-01-012	0.3	—	—	—
712-02-013	<0.1	—	—	—
712-02-032	0.2	—	—	—
712-04-001	0.4	—	—	—
712-04-002	0.2	—	—	—
712-04-004	0.2	—	—	—
712-04-081	0.1	—	<0.1	—
712-04-082	0.1	—	—	—
712-04-084	<0.1	—	—	—
712-04-085	0.4	—	—	—
712-04-086	0.1	—	—	—
712-04-087	1.1	—	—	—
712-04-088	<0.1	—	—	—
712-06-077	<0.1	—	—	<0.1
712-07-063	—	—	0.1	—
712-07-064	—	—	0.1	—
712-07-075	—	—	<0.1	—
712-07-076	—	—	0.2	—
712-07-080	0.2	—	<0.1	—
712-07-096	<0.1	—	<0.1	—
712-07-105	—	—	—	0.2
712-07-111	—	—	—	<0.1
712-07-112	—	—	—	0.1
712-08-023	—	—	—	0.2
712-08-025	0.2	—	—	—
712-08-080	—	—	—	<0.1
712-08-085	—	0.4	—	—
712-08-086	—	<0.1	—	0.4
712-09-003	—	—	0.1	—
712-09-004	—	—	<0.1	—
712-09-012	<0.1	—	—	<0.1
712-10-064	<0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
712-10-066	0.7	—	—	—
712-15-049	—	—	—	<0.1
712-18-007	0.1	—	—	—
712-18-009	0.1	—	—	—
712-18-010	<0.1	—	—	—
712-18-011	0.6	—	—	—
712-18-013	<0.1	—	—	—
712-18-014	<0.1	—	—	—
712-18-017	<0.1	—	—	—
712-26-005	<0.1	—	—	<0.1
712-26-006	0.3	—	—	0.1
712-26-007	<0.1	—	—	—
712-26-009	—	—	<0.1	—
712-26-010	—	—	<0.1	—
712-26-011	—	—	<0.1	—
712-26-014	—	—	<0.1	—
712-26-015	—	—	0.2	—
712-26-025	1.0	—	—	—
712-27-004	—	—	—	0.4
712-27-040	0.2	—	—	<0.1
712-28-001	0.2	—	—	—
712-28-054	<0.1	—	—	—
712-28-055	<0.1	—	—	—
725-03-001	0.2	—	—	—
725-04-002	<0.1	—	—	—
725-05-013	<0.1	—	—	0.2
725-06-006	—	—	—	<0.1
725-06-008	—	—	—	0.1
725-10-024	—	—	—	0.1
725-10-025	—	—	—	<0.1
764-09-013	—	—	—	0.4
764-62-059	—	—	—	0.2
767-20-014	—	—	—	0.5

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
767-20-015	—	—	—	0.5
767-20-019	—	—	—	0.1
767-43-005	—	—	—	<0.1
779-09-060	<0.1	—	—	—
779-09-061	<0.1	—	—	—
783-17-026	—	—	—	0.9
783-17-070	—	—	—	<0.1
783-18-022	4.1	1.6	—	—
783-18-025	0.8	—	<0.1	<0.1
783-18-026	<0.1	—	—	—
783-18-027	0.1	—	—	—
783-19-010	0.4	0.1	—	—
825-01-007	<0.1	—	—	—
825-01-008	0.5	—	—	—
825-01-010	<0.1	—	—	—
825-01-012	0.1	—	—	—
825-01-015	0.1	—	—	—
825-01-016	0.3	—	—	—
825-03-008	0.1	—	—	—
825-04-001	0.4	—	—	—
825-04-005	<0.1	—	—	—
825-05-028	—	<0.1	—	—
825-06-013	<0.1	—	—	—
825-06-014	0.1	—	—	—
825-06-015	<0.1	—	—	—
825-06-016	0.1	—	—	—
825-06-018	0.1	—	—	—
825-06-023	0.2	—	—	—
825-06-025	<0.1	<0.1	—	—
825-06-028	0.1	—	—	—
825-06-035	0.2	—	—	—
825-06-038	0.2	—	—	—
830-03-011	0.1	—	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
830-03-012	<0.1	—	—	—
830-03-024	0.1	—	—	—
830-04-004	0.2	<0.1	—	—
830-04-005	0.6	0.2	—	—
835-02-014	—	<0.1	—	—
835-04-067	—	—	—	1.9
835-04-068	—	—	—	2.5
835-05-015	0.2	—	—	—
835-05-016	<0.1	—	—	—
835-06-003	0.9	—	—	—
835-06-006	—	<0.1	—	0.1
835-06-007	<0.1	1.6	—	<0.1
835-06-008	0.1	4.4	—	—
835-06-009	—	<0.1	—	—
835-06-010	—	0.1	—	—
835-06-011	1.5	0.7	—	0.1
835-06-012	0.1	—	—	<0.1
835-06-013	0.9	—	—	—
835-06-014	0.6	—	—	—
835-06-027	—	<0.1	—	—
835-06-028	0.1	—	—	—
835-06-029	0.2	<0.1	—	—
835-06-030	<0.1	0.2	—	—
835-07-007	<0.1	0.1	—	—
835-07-020	0.4	0.1	—	0.2
841-14-027	0.6	—	—	—
841-14-028	0.3	—	—	—
841-14-080	<0.1	—	—	—
841-30-003	0.5	—	—	—
841-30-004	0.1	—		—
841-30-008	0.6	—	0.1	—
841-30-009	0.2	—	<0.1	—
841-31-003	0.7	—	<0.1	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
841-31-004	0.6	—	<0.1	—
841-31-008	0.4	—	—	—
841-31-009	0.1	—	—	—
841-31-010	0.5	—	—	—
841-31-011	0.6	—	—	—
841-31-021	0.3	—	—	—
841-31-022	0.4	—	—	—
841-31-024	0.7	—	<0.1	—
841-33-004	0.1	—	—	—
841-38-001	0.3	—	—	—
841-38-003	0.2	—	—	—
841-38-004	0.3	—	—	—
841-38-005	0.4	—	—	—
841-38-006	0.6	0.1	—	—
841-38-007	0.4	—	—	—
841-38-009	—	0.6	0.2	—
841-38-010	1.0	2,7	—	—
841-38-011	0.2	—	—	—
841-38-025	<0.1	—	—	—
841-38-028	0.2	—	—	—
898-22-003	2.4	—	0.2	0.1
898-22-004	0.1	—	—	—
898-22-020	1.4	—	—	—
898-22-026	—	—	—	12.0
898-22-027	0.3	—	0.1	—
898-22-028	<0.1	—	—	—
898-32-031	0.8	—	—	—
898-32-032	0.1	—	—	—
898-32-033	1.7	—	—	—
898-32-034	0.9	—	—	—
898-41-016	2.5	—	—	0.5
Total	**65.0**	**26.9**	**1.7**	**32.2**

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
Pacheco Pass				
069-220-014	—	—	—	<0.1
069-220-023	0.2	—	—	—
069-220-036	—	—	—	1.9
069-220-039	—	—	—	0.8
069-220-054	—	—	—	<0.1
069-240-034	—	—	—	0.7
069-240-038	—	—	—	<0.1
069-240-039	—	—	—	11.8
069-250-004	0.4	—	0.2	1.5
070-070-034	4.7	—	—	—
070-100-008	0.6	—	—	—
070-100-009	1.6	—	—	—
070-100-012	0.1	—	—	—
070-100-014	—	0.4	0.3	—
070-100-022	—	1.0	—	—
070-100-028	0.5	—	—	—
070-100-030	0.9	2.3	2.7	—
070-100-031	0.7	—	—	—
070-100-032	0.3	—	—	—
070-100-033	0.1	—	—	—
070-100-034	0.1	—	—	—
070-220-002	1.3	—	—	—
898-22-020	0.4	—	—	—
Total	**12.0**	**3.7**	**3.2**	**16.8**
San Joaquin Valley				
070-090-004	—	—	0.1	—
070-090-037	—	—	<0.1	—
070-090-042	0.2	4.0	—	—
070-112-012	—	0.2	2.1	—
070-112-013	—	0.8	<0.1	—
070-112-017	—	<0.1	—	—
070-113-009	—	—	—	0.8

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
070-160-014	—	—	0.2	—
070-160-020	—	0.1	0.2	—
070-160-026	0.4	—	0.1	—
070-160-027	0.5	—	0.5	—
070-160-051	0.7	—	0.2	7.9
070-160-052	—	—	—	2.7
070-180-021	<0.1	—	—	—
070-180-028	<0.1	—	—	—
070-190-013	<0.1	<0.1	0.1	<0.1
070-201-010	<0.1	—	—	—
070-201-015	—	8.5	0.1	—
070-201-026	—	0.1	<0.1	1.2
070-201-027	—	—	—	0.6
070-202-002	—	—	0.2	—
070-202-017	—	—	0.6	—
070-220-006	—	0.2	—	0.1
070-220-015	—	—	0.1	—
070-270-014	—	1.1	—	0.1
070-270-015	—	1.0	—	—
070-270-016	—	0.3	—	—
070-270-018	—	0.3	—	0.2
070-270-019	—	0.1	—	0.1
070-270-020	—	0.1	—	0.2
073-160-001	<0.1	—	—	—
073-160-008	0.1	—	0.3	—
073-170-006	0.6	—	—	—
073-170-008	—	0.2	—	—
073-170-010	2.5	9.7	—	—
073-170-021	6.0	3.1	—	—
073-180-007	0.4	—	—	—
073-180-017	—	0.1	—	—
073-180-027	—	<0.1	—	—
073-180-031	—	0.2	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-180-032	<0.1	0.1	—	—
073-180-033	<0.1	<0.1	—	—
073-190-002	0.1	0.4	—	—
073-190-011	0.6	0.3	—	—
073-190-012	<0.1	0.9	—	—
073-190-014	<0.1	0.3	—	—
073-190-019	—	0.2	—	—
073-190-020	1.1	0.5	—	—
073-190-021	0.1	—	—	—
073-190-025	0.1	4.1	—	—
073-190-026	6.4	5.7	—	—
073-200-001	0.2	—	—	—
073-200-002	0.1	—	—	—
073-200-012	0.1	11.4	—	—
073-200-013	<0.1	0.3	—	—
073-200-021	<0.1	—	—	—
073-200-022	0.4	—	—	—
073-200-023	0.4	2.9	—	—
073-210-001	0.1	—	—	—
073-210-007	0.2	—	—	1.5
073-210-008	0.9	—	—	—
073-380-003	12.2	6.1	—	—
073-380-017	0.7	2.6	—	—
073-380-018	<0.1	—	—	—
073-380-020	2.2	—	—	—
073-380-027	4.5	6.9	—	—
073-420-008	0.6	—	—	—
073-420-011	—	0.2	—	—
073-420-024	0.4	—	—	—
073-420-026	<0.1	0.9	—	—
073-420-027	—	<0.1	—	—
073-420-028	<0.1	0.6	—	—
073-420-033	0.1	0.6	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
073-420-056	0.1	—	—	
073-420-062	—	<0.1	—	—
073-420-063	<0.1	0.5	—	—
073-420-064	0.5	—	—	—
073-420-074	—	<0.1	—	—
073-420-080	—	0.1	—	—
081-020-001	0.7	—	—	—
081-020-002	0.7	—	—	—
081-020-008	1.3	—	1.0	—
081-020-009	3.1	—	—	—
081-040-004	—	—	0.1	—
081-040-014	0.2	—	—	—
081-060-025	—	—	—	0.5
081-060-026	<0.1	1.1	30.8	3.4
081-060-032	—	—	<0.1	<0.1
081-060-033	0.9	—	0.8	<0.1
081-060-060	<0.1	—	0.1	0.1
081-060-062	0.3	—	0.2	0.1
081-060-063	—	—	0.4	0.7
081-060-075	<0.1	—	—	—
081-060-077	—	—	—	<0.1
081-060-083	—	—	—	0.5
082-020-001	0.8	—	—	—
082-020-002	0.1	—	—	—
082-020-003	0.1	—	0.1	—
082-020-004	8.9	0.2	1.0	—
082-020-005	1.4	0.7	<0.1	—
085-280-026	0.2	0.3	—	—
085-290-004	1.4	3.7	—	—
085-290-006	1.6	1.3	—	—
085-290-007	0.7	0.2	—	—
085-290-030	0.2	—	—	—
085-290-031	0.7	0.9	—	—

APN	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance
085-290-034	9.5	12.6	—	—
085-290-036	<0.1	0.5	—	—
085-290-038	0.2	0.4	—	—
085-400-004	0.1	—	—	—
085-400-005	0.3	—	—	—
085-400-037	<0.1	0.2	—	—
085-400-056	0.6	<0.1	—	—
085-400-061	—	0.3	—	—
085-400-072	<0.1	—	—	—
Total	**79.0**	**98.5**	**39.0**	**20.7**

APN = assessor's parcel number

— = *No parcels of Important Farmland would be temporarily used by this alternative.*

APPENDIX 3.14-B: RESULTS AND FINDINGS OF LAND EVALUATION AND SITE ASSESSMENT PURSUANT TO THE FARMLAND PROTECTION POLICY ACT

Appendix 3.14-B: RESULTS AND FINDINGS OF LAND EVALUATION AND SITE ASSESSMENT PURSUANT TO THE FARMLAND PROTECTION POLICY ACT

This appendix summarizes the results of the farmland Land Evaluation and Site Assessment (LESA) for the San Jose to Central Valley Wye Project Section (Project Section), which was performed in compliance with Farmland Protection Policy Act (FPPA) requirements. The purpose of the FPPA is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses (7 United States Code § 4201). Specifically, the FPPA requires that federal agencies:

- Use criteria (described in this appendix) to identify and take into account the adverse impacts of their programs on the preservation of farmland.
- Consider alternative actions, as appropriate, that could lessen adverse impacts.
- Make sure that their programs, to the extent practicable, are compatible with state and local government and private programs and policies to protect farmland.

San Jose to Central Valley Wye Project Alternatives

The four San Jose to Central Valley Wye project alternatives evaluated in the main body of this technical report (the *San Jose to Merced Project Section Agricultural Farmland Technical Report* or Agricultural Farmland Technical Report) would pass through five subsections (San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley) and three counties (Santa Clara, San Benito, and Merced Counties). Calculations and results from the Natural Resources Conservation Service (NRCS) are reported by county. Therefore, results for each alternative discuss each county separately.

Land Evaluation and Site Assessment

As required by the FPPA implementing regulations (7 Code of Federal Regulations Part 658), NRCS staff and high-speed rail (HSR) system analysts performed LESA calculations using the CPA-106 form (for corridor-type projects) to determine an overall farmland conversion score.[1] Using alignment information provided by a geographic information system (GIS), the NRCS calculated the relative value of each of the alternative corridors as farmland; the NRCS land evaluation calculations and the Farmland Mapping and Monitoring Program site assessment criteria are presented in Attachment 1, Natural Resources Conservation Service Land Evaluation Explanations and Calculations—Santa Clara County; Attachment 2, Natural Resources Conservation Service Land Evaluation Explanations and Calculations—San Benito County; and Attachment 3, Natural Resources Conservation Service Land Evaluation Explanations and Calculations—Merced County. The NRCS provided separate scores for each county.

When the NRCS provided land evaluation scores, analysts calculated site assessment scores for each alternative. Analysts determined the total LESA rating by adding the land evaluation score (up to 100 points) and site assessment scores (up to 160 points) for each county and weighting scores based on the percentage of the alternative lying within each county (total possible score of 260 points). Analysts then compared the results to significance thresholds established in the FPPA implementing regulations. After determining total LESA scores, the analysts evaluated farmland effects and assessed relative suitability of sites for farmland protection.

The U.S. Department of Agriculture recommends that:

1. Sites[2] with the highest combined scores be regarded as most suitable for protection and the sites with the lowest scores as least suitable for protection.

[1] In the CPA-106 form, note that Corridor A corresponds to Alternative 1, Corridor B corresponds to Alternative 2, Corridor C corresponds to Alternative 3, and Corridor D corresponds to Alternative 4..

[2] Because the project is a linear project, the LESA terminology *site* refers to *corridor* or *alignment*.

2. Sites receiving a total score of less than 160 points not be given further consideration for protection and no additional sites need to be evaluated.
3. Sites receiving a total score of 160 or more points be given increasingly higher levels of consideration for protection.
4. When making decisions on proposed actions for sites receiving total scores of 160 or more points, the following should be considered:
    a. Use of land that is not farmland or use of existing structures.
    b. Alternative sites, locations, and designs that would serve the proposed purpose but would convert either fewer acres of farmland or other farmland that has a lower relative value.
    c. Special siting requirements of the project and the extent to which an alternative site fails to satisfy the special siting requirements as well as the originally selected site.

Farmland Conversion Effects Results

Table 1 shows the total LESA scores for the project alternatives (analyzed according to the portions of the alternatives in each county). All four alternatives had total LESA scores of less than 160 points in Santa Clara County, San Benito County, and Merced County.

Table 1 Land Evaluation and Site Assessment Scores for the Project Alternatives

Alternative	Relative Value of Farmland Points	Total Corridor Assessment Points	Total LESA Points
Santa Clara County			
Alternative 1	59	67	126
Alternative 2	64	61	125
Alternative 3	63	67	130
Alternative 4	59	48	107
San Benito County			
Alternative 1	41	77	118
Alternative 2	41	78	119
Alternative 3	44	75	119
Alternative 4	41	77	118
Merced County			
Alternative 1	54	83	137
Alternative 2	54	83	137
Alternative 3	54	83	137
Alternative 4	54	83	137

Source: NRCS-CPA-106 forms for Santa Clara County (Attachment 1), San Benito County (Attachment 2), and Merced County (Attachment 3) (NRCS 2019)
LESA = Land Evaluation and Site Assessment

Findings

The FPPA does not mandate that a federal agency make a specific decision based on LESA ratings but provides suitability guidance for protection of farmland from conversion to nonagricultural uses. As analyzed based on FPPA guidance, all four project alternatives received scores of less than 160 in Santa Clara, San Benito, and Merced Counties. Because all alternatives received scores of less than 160, none of the alternatives needs special consideration.

The project vicinity contains urban, suburban, rural residential, and agricultural lands. Some of California's most productive agricultural lands are located in the project vicinity, in the Southern Santa Clara Valley (County of Santa Clara 2015). San Benito County's leading industry is production agriculture (County of San Benito 2016), and Merced County in the San Joaquin Valley continues to be an important agriculture center in California and the nation (American Farmland Trust 2013). Therefore, effects on agricultural lands from the project alternatives cannot be completely avoided, although effects have been avoided and minimized to the extent feasible. The Agricultural Farmland Technical Report describes impact avoidance and minimization features that are incorporated into the project design and would avoid or minimize potential effects, including administering a farmland consolidation program to sell remnant parcels to neighboring landowners for consolidation with adjacent farmland properties for the purpose of continuing agricultural use. In addition, the Authority has proposed a mitigation measure to fund the California Department of Conservation Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of effects and to fund the purchase of agricultural conservation easements from willing sellers.

The two program environmental impact reports (EIR)/environmental impact statements (EIS) for the California high-speed rail system—the *Final Program EIR/EIS for the Proposed California High-Speed Train System* (Authority and FRA 2005) and the *San Francisco Bay Area (Bay Area) to Central Valley High-Speed Train Final Program EIR/EIS* (Bay Area to Central Valley Program EIR) (Authority and FRA 2008)—and two partially revised and recirculated versions of the Bay Area to Central Valley Program EIR, the 2010 *Bay Area to Central Valley High-Speed Train Revised Final Program EIR* (Authority 2010) and the 2012 *Bay Area to Central Valley High-Speed Train Partially Revised Final Program EIR* (Bay Area to Central Valley Revised Program EIR) (Authority 2012) are collectively referred to as the Program EIR/EIS documents. The Program EIR/EIS documents recognized that effects on agricultural resources could be substantial, and some potential alternatives were rejected during the programmatic review because of their effects on agriculture. Recognizing the need to protect important agricultural resources as much as possible, the project alternatives would follow existing road and railway alignments to the extent feasible.

References

American Farmland Trust. 2013. *Saving Farmland, Growing Cities: A Framework for Implementing Effective Farmland Conservation Policies in the San Joaquin Valley.* Davis, CA. January 2013.

California High-Speed Rail Authority (Authority). 2010. *Bay Area to Central Valley High-Speed Train (HST) Revised Final Program Environmental Impact Report (EIR)*. Sacramento, CA and Washington, DC. August 2010.

———. 2012. *Bay Area to Central Valley High-Speed Train (HST) Partially Revised Final Program Environmental Impact Report (EIR)*. Sacramento, CA. April 2012.

California High-Speed Rail Authority and Federal Railroad Administration (Authority and FRA). 2005. *Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System*. Sacramento, CA and Washington, DC. August 2005.

———. 2008. *San Francisco Bay Area (Bay Area) to Central Valley High-Speed Train Final Program EIR/EIS*. Sacramento, CA and Washington, DC.

———. 2019. *San Jose to Merced Project Section Agricultural Lands Technical Report* Sacramento, CA and Washington, DC.

County of San Benito. 2016. Agricultural Commissioner. *San Benito County 2015 Annual Crop Report.* Hollister, CA.

County of Santa Clara. 2015. *Santa Clara County 2015 Crop Report.* San Jose, CA.

Natural Resources Conservation Service (NRCS). 2019. Evaluation of NRCS-CPA-106 forms for Santa Clara County, San Benito County, and Merced County. State Office, Davis, CA.

APPENDIX 3.14-B, ATTACHMENT 1:
Natural Resources Conservation Service Land Evaluation Explanations and Calculations for Santa Clara County

APPENDIX 3.14-B, ATTACHMENT 1: NATURAL RESOURCES CONSERVATION SERVICE LAND EVALUATION EXPLANATIONS AND CALCULATIONS—SANTA CLARA COUNTY

INTRODUCTION

This attachment provides an explanation for corridor assessment points assigned to the San Jose to Central Valley Wye Project Extent (project) in part VI of the NRCS-CPA-106 form prepared for Santa Clara County. The scores indicated in the questions pertain to the portion of each project alternative that falls within Santa Clara County.

Explanations

Alternative 1

A. **Total acres to be converted directly?** The regional consultant overlaid the alternative on a map of the Farmland Mapping and Monitoring Program (FMMP) categories to determine how many acres of Important Farmland would be permanently converted by Alternative 1. The results indicate that a total of 315 acres would be permanently converted directly.

B. **Total acres to be converted indirectly or to receive services?** To determine the acreage of indirect impact, particularly the acreage of remnant and severed parcels created by the alternative, the regional consultant identified remnant parcels of Important Farmland that would be less than 20 acres. The regional consultant then reviewed each remnant to determine whether it would be viable or nonviable for continued agriculture (i.e., identified those remnants with shape, size, location, or hardship that would make them nonviable for continued agricultural use) (ARWS 2018a, 2018b, 2018c, 2018d). The results indicate that a total of 81 acres would be permanently indirectly converted as remnant or severed parcels.

C. **Total acres in corridor?** The regional consultant added the total acreage to be directly converted with the total acreage to be indirectly converted. The result indicates that a total of 396 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant generated a buffer of 1 mile around Alternative 1 in Santa Clara County, including the temporary construction easement, to determine the total acreage of land within a 1-mile radius of the alternative in Santa Clara County. The buffer was overlaid on a map of the FMMP categories, which include Urban and Built-Up Land. For this analysis, Urban and Built-Up Land is considered urban use (DOC 2014a). Then, the acreage within the buffer that is classified as Urban and Built-Up Land was calculated using a geographic information system (GIS), and the remaining acreage was considered nonurban use. The results indicated that 65 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 9.

2. **How much of the perimeter of the site borders on land in nonurban use?** The length of the perimeter of Alternative 1 in Santa Clara County, including the temporary construction easement, was measured by the regional consultant to determine the total length of the perimeter in Santa Clara County. The regional consultant then calculated the proportion of the alternative perimeter that borders on land classified as Urban and Built-Up Land, and the remaining proportion of the perimeter was considered to border nonurban use. The results indicated that 64 percent of the alternative perimeter borders on land in nonurban use. This criterion received a score of 7.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the area around Alternative 1 in Santa Clara County for the years between 2005 and 2015, as well as information from the Santa Clara County Agricultural Commissioner (Deviney pers. comm.), in general, some properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 13.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The area for Alternative 1 in Santa Clara County, including remnant parcels that would likely not be suitable for farming after the project is completed, was overlaid on a map of Protected Farmland (DOC 2014b), defined as lands enrolled in Williamson Act or Farmland Security Zone contracts by the regional consultant. There are 797 acres of farmlands protected by private programs such as the Williamson Act and agricultural conservation easements. The results indicated that 6 percent of the land within the project footprint in Santa Clara County is Protected Farmland. This criterion received a score of 20.
5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The average size farm in Santa Clara County was 229 acres in 2012 (USDA 2012), the most recent year for which average farm size data are available. Alternative 1 traverses farm units that are an average of 30 acres, or approximately 13 percent of the size of the average farm unit in the county. This criterion received a score of 0.
6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** In some areas, the alignment of Alternative 1 deviates from transportation corridors and bisects or otherwise severs agricultural parcels. Some of the remnant parcels resulting from this severance may not be viable for continued agricultural use. The regional consultant team used GIS software to identify parcels of Important Farmland that would be 20 acres or less following severance due to construction of the project. It was assumed that parcels greater than 20 acres would be viable for continued agricultural use. Analysts then evaluated the characteristics of each of the remnant parcels of 20 acres or less using criteria described in Appendix C, Remnant Parcel Analysis, to determine which parcels would be viable for continued agricultural use and which parcels would likely result in conversion to nonagricultural use. The acreage of the remnant parcels determined not viable for continued agricultural use was compared to the acreage of the original parcels (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.
7. **Does the site have available adequate supply of farm support services and markets?** According to the Santa Clara County Agricultural Commissioner (Deviney pers. comm.), the area in the vicinity of Alternative 1 has been farmed for 50 to 100 years and it has some support services and markets. There are three pesticide and fertilizer dealers within Santa Clara County; however, the majority of the farm producers procure farm services in neighboring Monterey County. This alternative would have a limited effect on farm services. This criterion received a score of 3.
8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** According to satellite imagery analysis of the area around Alternative 1 performed by the regional consultant, the overall amount of on-farm investment is moderate. Ancillary agricultural structures, barns, fruit trees, irrigation lines, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to some of the fields. This criterion received a score of 10.
9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant overlaid the alternative on a map of the FMMP categories to determine how many acres of Important Farmland would be permanently converted by Alternative 1, plus acreage of nonviable remnant parcels less than 20 acres (i.e., those that have shape, size, location, or hardship that would make them nonviable for continued agricultural use) (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 420,154 acres of Important Farmland and Grazing Land in Santa Clara County (DOC 2016), the permanent conversion of 396 acres of Important Farmland and Grazing in Santa Clara County under Alternative 1, or less than 0.1 percent of the total

Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. For Alternative 1, neither of the proposed stations would be located on prime agricultural land. The San Jose Diridon Station would be constructed at the existing Caltrain station site and the Downtown Gilroy Station would be built in an urban area. However, stations have the potential to induce population growth and farmland conversion in the long run. The construction of the Downtown Gilroy Station under Alternative 1 could induce growth in Gilroy because the station would improve the commuting options and the cost of living could draw people out of the larger, more expensive cities.

    There are two locations under consideration for a maintenance of way facility (MOWF): one is in east Gilroy and the other is in south Gilroy. For Alternative 1, south Gilroy would be the proposed location. While this site is located in an agricultural area, the MOWF would be used primarily for storage of rail vehicles and therefore would not induce growth or lead to the eventual conversion of farmland. In addition, one maintenance of infrastructure siding facility (MOIS) is proposed in Merced County west of Turner Island Road.

    Alternative 1 would involve the construction of new track, traction power substations (TPSS), and automated train control (ATC) sites. HSR track and electrical infrastructure does not have the same potential to induce growth as stations. Therefore, guideway use and power or communication facilities would be largely compatible with adjacent agriculture and would not induce urban development.

    For these reasons, it is possible that Alternative 1 would lead to eventual conversion of surrounding farmland but it would remain sufficiently compatible with existing agriculture uses. This criterion received a score of 5.

Additional Notes

Alternative 1 is the tied with Alternatives 2 and 4 for the longest length at approximately 89 miles, with 52 miles in Santa Clara County.

Alternative 2

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 461 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 162 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 623 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 64 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 9.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for Alternative 1. The results indicated that 61 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 7.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015, as well as information from the Santa Clara County Agricultural Commissioner (Deviney pers. comm.), in general, some properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 3.
4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 823 acres of farmlands protected by private programs such as the Williamson Act and agricultural conservation easements. The results indicated that 5 percent of the land within the project footprint in Santa Clara County is Protected Farmland. This criterion received a score of 20.
5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 2 traverses farm units that are an average of 29 acres, or approximately 13 percent of the size of the average farm unit in the county. This criterion received a score of 0.
6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total approximately 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.
7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would have a limited effect on farm services. This criterion received a score of 3.
8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is moderate. Ancillary agricultural structures, barns, fruit trees, irrigation lines, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to some of the fields. This criterion received a score of 12.
9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 420,154 acres of Important Farmland and Grazing Land in Santa Clara County (DOC 2016), the permanent conversion of 623 acres of Important Farmland and Grazing Land in Santa Clara County under Alternative 2, or less than 0.2 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.
10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. For Alternative 2, neither of the proposed stations would be located on prime agricultural land. The San Jose Diridon Station would be constructed at the existing Caltrain station site, and the Downtown Gilroy Station would be built in an urban area. However, stations have the potential to induce population growth and farmland conversion in the long run. The construction of the Downtown Gilroy Station could induce growth in Gilroy because the station would improve the commuting options and the cost of living could draw people out of the larger, more expensive cities.

There are also two locations under consideration for a MOWF: one is in east Gilroy and the other is in south Gilroy. For Alternative 2, south Gilroy would be the proposed location. While this site is located in an agricultural area, the maintenance facility would be used primarily for storage of rail vehicles and therefore not induce growth or lead to the eventual conversion of farmland. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road.

Alternative 2 would involve the construction of new track, TPSSs, and ATC sites. HSR track and electrical infrastructure does not have the same potential to induce growth as stations. Therefore, guideway and power or communication facilities would be largely compatible with adjacent agriculture and would not induce urban development.

For these reasons, it is possible that Alternative 2 would lead to eventual conversion of surrounding farmland but it would remain sufficiently compatible with existing agriculture uses. This criterion received a score of 7.

Additional Notes

Alternative 2 is tied with Alternatives 1 and 4 for the longest length at approximately 89 miles, with 52 miles in Santa Clara County.

Alternative 3

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 475 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 169 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 644 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 65 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 9.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for Alternative 1. The results indicated that 68 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 7.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the Santa Clara County Agricultural Commissioner (Deviney pers. comm.), in general, some properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 5.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 877 acres of farmlands protected by private programs such as the Williamson Act and agricultural conservation easements. The results indicated that 3 percent of the land within the project footprint in Santa Clara County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 3 traverses farm units that are an average of 25 acres, or

approximately 11 percent of the size of the average farm unit in the county. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total approximately 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.
7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would have a limited effect on farm services. This criterion received a score of 3.
8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is moderate. Ancillary agricultural structures, barns, fruit trees, irrigation lines, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to some of the fields. This criterion received a score of 16.
9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 420,154 acres of Important Farmland and Grazing Land in Santa Clara County (DOC 2016), the permanent conversion of 644 acres of Important Farmland and Grazing Land in Santa Clara County under Alternative 3, or less than 0.2 percent of the total Important Farmland in the County, is unlikely to would result in reduction in demand for farm support services in the area. This criterion received a score of 0.
10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. The San Jose Diridon Station would be constructed at the existing Caltrain station site. For Alternative 3, the East Gilroy Station would be located on prime agricultural land. Stations have the potential to induce population growth and farmland conversion in the long run. The construction of the East Gilroy Station could induce growth in Gilroy because the station would improve the commuting options and the cost of living could draw people out of the larger, more expensive cities.

    There are also two locations under consideration for a MOWF: one is in east Gilroy and the other is in south Gilroy. For Alternative 3, east Gilroy would be the proposed location. While this site is located in an agricultural area, the maintenance facility would be used primarily for storage of rail vehicles and therefore not induce growth or lead to the eventual conversion of farmland. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road.

    Alternative 3 would involve the construction of new track, TPSSs, and ATC sites. HSR track and electrical infrastructure does not have the same potential to induce growth as stations. Therefore, guideway and power or communication facilities would be largely compatible with adjacent agriculture and would not induce urban development.

    For these reasons, it is possible that Alternative 3 would lead to eventual conversion of surrounding farmland but it would remain sufficiently compatible with existing agriculture uses. This criterion received a score of 7.

Additional Notes

Alternative 3 is the shortest alternative at 87 miles long, with 52 miles in Santa Clara County.

Alternative 4

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 302 acres would be permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 60 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 362 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 65 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 9.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for Alternative 1. The results indicated that 64 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 7.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the Santa Clara County Agricultural Commissioner (Deviney pers. comm.), in general, some properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 2.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 741 acres of farmlands protected by private programs such as the Williamson Act and agricultural conservation easements. The results indicated that 8 percent of the land within the project footprint in Santa Clara County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 4 traverses farm units that are an average of 34 acres, or approximately 15 percent of the size of the average farm unit in the county. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.

7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would have a limited effect on farm services. This criterion received a score of 3.

8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** The regional consultant used the same methods

described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is low. This criterion received a score of 2.

9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 420,154 acres of Important Farmland and Grazing Land in Santa Clara County (DOC 2016), the permanent conversion of 362 acres of Important Farmland and Grazing Land in Santa Clara County under Alternative 4, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. For Alternative 4, neither of the proposed stations would be located on prime agricultural land. The San Jose Diridon Station would be constructed at the existing Caltrain station site, and the Downtown Gilroy Station would be built in an urban area. However, stations have the potential to induce population growth and farmland conversion in the long run. The construction of the Downtown Gilroy Station could induce growth in Gilroy because the station would improve the commuting options and the cost of living could draw people out of the larger, more expensive cities.

    There are also two locations under consideration for a MOWF: one is in east Gilroy and the other is in south Gilroy. For Alternative 2, south Gilroy would be the proposed location. While this site is located in an agricultural area, the maintenance facility would be used primarily for storage of rail vehicles and therefore not induce growth or lead to the eventual conversion of farmland. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road.

    Alternative 2 would involve the construction of new track, TPSSs, and ATC sites. HSR track and electrical infrastructure does not have the same potential to induce growth as stations. Therefore, guideway and power or communication facilities would be largely compatible with adjacent agriculture and would not induce urban development.

    For these reasons, it is possible that Alternative 2 would lead to eventual conversion of surrounding farmland but it would remain sufficiently compatible with existing agriculture uses. This criterion received a score of 5.

Additional Notes

Alternative 4 is tied with Alternatives 1 and 2 for the longest length at approximately 89 miles, with 52 miles in Santa Clara County.

References

Associated Right of Way Services, Inc. (ARWS). 2018a. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 1. October 25, 2018..

———. 2018b. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 2. October 25, 2018.

———. 2018c. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 3. October 25, 2018.

———. 2018d. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 4.November 6, 2018. .

California Department of Conservation (DOC). 2014a. Farmland Mapping and Monitoring Program.

———. 2014b. Santa Clara County 2012–2014 Land Use Conversion. www.conservation.ca.gov/dlrp/fmmp/Pages/Merced.aspx (accessed November 8, 2016).

———.2016. Santa Clara County 2012–2014 Land Use Conversion. www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2012-2014/conversion_tables/sclcon14.xls (accessed September 29, 2017).

Deviney, Joseph. 2017. Agricultural Commissioner/Sealer of Weights & Measures, Santa Clara County, CA. August 9, 2017—Personal communication with Kristin Salamack, ICF International, regarding information for LESA.

U.S. Department of Agriculture (USDA). 2012. 2012 Census Volume 1, Chapter 2, County Level Data. www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/California/cav1.pdf (accessed August 7, 2017).

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request	4. Sheet 1 of _____
1. Name of Project	5. Federal Agency Involved	
2. Type of Project	6. County and State	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated | Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction **Acres:** **%**	7. Amount of Farmland As Defined in FPPA **Acres:** **%**
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	**Alternative Corridor For Segment _____**			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor				
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — **Maximum Points**				
1. Area in Nonurban Use — **15**				
2. Perimeter in Nonurban Use — **10**				
3. Percent Of Corridor Being Farmed — **20**				
4. Protection Provided By State And Local Government — **20**				
5. Size of Present Farm Unit Compared To Average — **10**				
6. Creation Of Nonfarmable Farmland — **25**				
7. Availablility Of Farm Support Services — **5**				
8. On-Farm Investments — **20**				
9. Effects Of Conversion On Farm Support Services — **25**				
10. Compatibility With Existing Agricultural Use — **10**				
TOTAL CORRIDOR ASSESSMENT POINTS — **160**	0	0	0	0
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — **100**	0	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment) — **160**	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)* — **260**	0	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: Diana P. Robas | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

APPENDIX 3.14-B, ATTACHMENT 2:
Natural Resources Conservation Service Land Evaluation Explanations and Calculations for San Benito County

APPENDIX 3.14-B, ATTACHMENT 2: NATURAL RESOURCES CONSERVATION SERVICE LAND EVALUATION EXPLANATIONS AND CALCULATIONS—SAN BENITO COUNTY

INTRODUCTION

This attachment provides an explanation for corridor assessment points assigned to the proposed San Jose to Central Valley Wye Project Extent (project) in part VI of the NRCS-CPA-106 form prepared for San Benito County. The scores indicated in the questions pertain to the portion of each project alternative that falls within San Benito County.

Explanations

Alternative 1

A. **Total acres to be converted directly?** The regional consultant overlaid the alternative on a map of the Farmland Mapping and Monitoring Program (FMMP) categories to determine how many acres of Important Farmland would be permanently converted by Alternative 1. The results indicate that a total of 104 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** To determine the acreage of indirect impact, particularly the acreage of remnant and severed parcels created by the alternative, the regional consultant identified remnant parcels of Important Farmland that would be less than 20 acres. The regional consultant then reviewed each remnant to determine whether it would be viable or nonviable for continued agriculture (i.e., identified those remnants with shape, size, location, or hardship that would make them nonviable for continued agricultural use) (ARWS 2018a, 2018b, 2018c, 2018d). The results indicate that a total of 0.1 acres would be permanently indirectly converted as remnant or severed parcels.

C. **Total acres in corridor?** The regional consultant added the total acreage to be directly converted with the total acreage to be indirectly converted. The result indicates that a total of 104 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant generated a buffer of 1 mile around Alternative 1 in San Benito County, including the temporary construction easement, to determine the total acreage of land within a 1-mile radius of the alternative in San Benito County. The buffer was overlaid on a map of the FMMP categories, which include Urban and Built-Up Land. For this analysis, Urban and Built-Up Land is considered urban use (DOC 2014a). Then, the acreage within the buffer that is classified as Urban and Built-Up Land was calculated using a geographic information system (GIS), and the remaining acreage was considered nonurban use. The results indicated that 99 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The length of the perimeter of Alternative 1 in San Benito County, including the temporary construction easement, was measured by the regional consultant to determine the total length of the perimeter in San Benito County. The regional consultant then calculated the proportion of the alternative perimeter that borders on land classified as Urban and Built-Up Land, and the remaining proportion of the perimeter was considered to border nonurban use. The results indicated that 100 percent of the alternative perimeter borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of Alternative 1 in San Benito County for the years between 2005 and 2015 as well as information from the San Benito County Agricultural Commissioner (Overstreet pers. comm.), in general, many properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 19.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The area for Alternative 1, including remnant parcels that would likely not be suitable for farming after the project is completed, was overlaid on a map of Protected Farmland (DOC 2014b), defined as lands enrolled in Williamson Act or Farmland Security Zone contracts by the regional consultant. There are 115 acres of farmlands protected by private programs such as the Williamson Act and agricultural conservation easements. The results indicated that 8 percent of the land within the project footprint in San Benito County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The average size farm in San Benito County was 962 acres in 2012 (USDA 2012), the most recent year for which average farm size data are available. Alternative 1 traverses farm units that are an average of 177 acres, or approximately 18 percent of the size of the average farm unit in the county. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** In some areas the alignment of Alternative 1 deviates from transportation corridors and bisects or otherwise severs agricultural parcels. Some of the remnant parcels resulting from this severance may not be viable for continued agricultural use. The regional consultant team used GIS software to identify parcels of Important Farmland that would be 20 acres or less following severance due to construction of the project. It was assumed that parcels greater than 20 acres would be viable for continued agricultural use. Analysts then evaluated the characteristics of each of the remnant parcels of 20 acres or less using criteria described in Appendix C, Remnant Parcel Analysis, to determine which parcels would be viable for continued agricultural use and which parcels would likely result in conversion to nonagricultural use. The acreage of the remnant parcels determined not viable for continued agricultural use was compared to the acreage of the original parcels (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.

7. **Does the site have available adequate supply of farm support services and markets?** According to the San Benito County Agricultural Commissioner (Overstreet pers. comm.), the area in the vicinity of Alternative 1 has been farmed for 50 to 100 years and it has adequate support services and markets. This alternative would not have an effect on farm services. This criterion received a score of 5.

8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** According to satellite imagery analysis of the area around Alternative 1 performed by the regional consultant, the overall amount of on-farm investment is moderate. Ancillary agricultural structures, barns, fruit trees, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to some of the fields. This criterion received a score of 6.

9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant overlaid the alternative on a map of the FMMP categories to determine how many acres of Important Farmland would be permanently converted by Alternative 1, plus acreage of nonviable remnant parcels less than 20 acres (i.e., those that have shape, size, location, or hardship that would make them nonviable for continued agricultural use) (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 671,685 acres of Important Farmland and Grazing Land in San Benito County (DOC 2016), the permanent conversion of 104 acres of Important Farmland and Grazing in San Benito County under Alternative 1, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. For Alternative 1, the Gilroy station would be located downtown. Stations have the potential to induce population growth and farmland conversion. While there are no proposed stations in San Benito County, the proximity of the proposed could result in population growth and the eventual conversion of surrounding agricultural land.

    There are two locations under consideration for a maintenance of way facility (MOWF) but both are in Gilroy, in Santa Clara County, not in San Benito County. In addition, one maintenance of infrastructure siding facility (MOIS) is proposed in Merced County west of Turner Island Road.

    Alternative 1 would involve the construction of new track, traction power substations (TPSS), and automated train control (ATC) sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities would be largely compatible with adjacent agriculture and would not induce urban development. Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 1 is tied with Alternatives 2 and 4 for the longest length at approximately 89 miles, with 5 miles in San Benito County.

Alternative 2

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 104 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 0.1 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 104 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 99 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for Alternative 1. The results indicated that 100 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the San Benito County Agricultural Commissioner (Overstreet pers. comm.), in general, many properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 19.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 115 acres of farmlands protected by private programs such as the Williamson Act and agricultural

conservation easements . The results indicated that 8 percent of the land within the project footprint in San Benito County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 2 traverses farm units that are an average of 177 acres, or approximately 18 percent of the size of the average farm unit in the county. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels that would be within the project footprint of this alternative. This criterion received a score of 0.

7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would not have an effect on farm services. This criterion received a score of 5.

8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is moderate. Ancillary agricultural structures, barns, fruit trees, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to some of the fields. This criterion received a score of 7.

9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 671,685 acres of Important Farmland and Grazing Land in San Benito County (DOC 2016), the permanent conversion of 104 acres of Important Farmland and Grazing Land in San Benito County under Alternative 2, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use? The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. For Alternative 2, the Gilroy station would be located downtown. Stations have the potential to induce population growth and farmland conversion. While there are no proposed stations in San Benito County, the proximity of the proposed Downtown Gilroy Station could result in population growth and the eventual conversion of surrounding agricultural land.

    There are two locations under consideration for a MOWF but both are in Gilroy, not San Benito County. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road.

    Alternative 2 would involve the construction of new track, TPSSs, and ATC sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities are largely compatible with adjacent agriculture and would not induce urban development.

    Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 2 is tied with Alternatives 1 and 4 for the longest length at approximately 89 miles, with 5 miles in San Benito County.

Alternative 3

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 100 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 2 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 102 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that over 99 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for Alternative 1. The results indicated that 100 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the San Benito County Agricultural Commissioner (Overstreet pers. comm.), in general, many properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 17.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 130 acres of farmlands protected by private programs such as the Williamson Act and agricultural conservation easements. The results indicated that 8 percent of the land within the project footprint in San Benito County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 3 traverses farm units that are an average of 184 acres, or approximately 19 percent of the size of the average farm unit. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.

7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would not have an effect on farm services. This criterion received a score of 5.

8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other**

soil and water conservation measures? The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is moderate. Ancillary agricultural structures, barns, fruit trees, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to some of the fields. This criterion received a score of 6.

9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 671,685 acres of Important Farmland and Grazing Land in San Benito County (DOC 2016), the permanent conversion of 102 acres of Important Farmland and Grazing Land in San Benito County under Alternative 3, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. For Alternative 3, the station location would be on prime agricultural land in east Gilroy. Stations have the potential to induce population growth and farmland conversion. While there are no proposed stations in San Benito County, the proximity of the East Gilroy Station could result in population growth and the eventual conversion of surrounding agricultural land.

    There are two locations under consideration for a MOWF but both are in Gilroy, not San Benito County. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road.

    Alternative 3 would involve the construction of new track, TPSSs, and ATC sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities are largely compatible with adjacent agriculture and would not induce urban development. Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 3 is the shortest alternative at 87 miles long, with 4 miles in San Benito County.

Alternative 4

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 107 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 0.2 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 107 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 99 percent of the total acreage within the buffer was non urban use. The criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for alternative 1. The results

indicated that 100 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years?** Accorrdin to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the San Benito County Agricultural Commissioner (Overstreet pers.comm.), in general, many properties in the vicinity of this alternative have been consistenyly farmed for 10 or more years. This criterion received a scrore of 19.
4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for alternative 1. There are 118 acres of farmlands protected by private programs such as the Williamson Act and agricultural conservation easements. The results indicated that 8 percent of the land within the project footprint in San Benito County is Protected Farmland. This criterion received a score of 20.
5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 or Alternative 1. Alternative 2 traverses farm units that are an average of 61.8 acres,or approximately 177 acres, or approximately 18 percent of the average farm unit in the county. This criterion received a score of 0.
6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels that would be within the project footprint of this alternative. This criterion received a score of 0.
7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative1. This alternative would not have an effect on farm services. This criterion received a score of 5.
8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is moderate. Ancillary agricultural structures, barns, fruit trees, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to some of the fields. This criterion received a score of 6.
9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximatelt 671,685 acres of Important Farmland and Grazing Land in San Benito County (DOC 2016), the permanent conversion of 107 acres of Important Farmland and Grazing Land in San Benito County under Alternative 4, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.
10. Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use? The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. For Alternative 4, the Gilroy station would be located downtown. Stations have the potential to induce population growth and farmland conversion. While there are no proposed stations in San Benito County, the proximity of the proposed Downtown Gilroy Station could result in population growth and the eventual conversion of surrounding agricultural land.

There are also two locations under consideration for a MOWF but both are in Gilroy, not San Benito County. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road.

Alternative 4 would involve the construction of new track, TPSSs, and ATC sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities are largely compatible with adjacent agriculture and would not induce urban development.

Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 4 is tied with Alternatives 1 and 2 for the longest length at approximately 89 miles, with 5 miles in San Benito County.

References

Associated Right of Way Services, Inc. (ARWS). 2018a. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 1.October 25, 2018..

———. 2018b. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 2.October 25, 2018..

———. 2018c. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 3.October 5, 2018. .

———. 2018d. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 4.November 6, 2018.

California Department of Conservation (DOC). 2014a. Farmland Mapping and Monitoring Program.

———. 2014b. San Benito County 2012–2014 Land Use Conversion. www.conservation.ca.gov/dlrp/fmmp/Pages/Merced.aspx (accessed August 7, 2017).

———. 2016. San Benito County 2012–2014 Land Use Conversion. www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2012-2014/conversion_tables/sbtcon14.xls (accessed September 29, 2017).

Overstreet, Karen. 2017. Agricultural Commissioner/Sealer of Weights & Measures, San Benito County, CA. Pugust 9, 2017—Personal communication with Kristin Salamack, ICF International, regarding information for LESA.

U.S. Department of Agriculture (USDA). 2012. 2012 Census Volume 1, Chapter 2, County Level Data. www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/California/cav1.pdf (accessed: August 7, 2017).

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request	4. Sheet 1 of _____
1. Name of Project	5. Federal Agency Involved	
2. Type of Project	6. County and State	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated | Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction **Acres:** **%**	7. Amount of Farmland As Defined in FPPA **Acres:** **%**
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	**Alternative Corridor For Segment _____**			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor				
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — **Maximum Points**				
1. Area in Nonurban Use — **15**				
2. Perimeter in Nonurban Use — **10**				
3. Percent Of Corridor Being Farmed — **20**				
4. Protection Provided By State And Local Government — **20**				
5. Size of Present Farm Unit Compared To Average — **10**				
6. Creation Of Nonfarmable Farmland — **25**				
7. Availablility Of Farm Support Services — **5**				
8. On-Farm Investments — **20**				
9. Effects Of Conversion On Farm Support Services — **25**				
10. Compatibility With Existing Agricultural Use — **10**				
TOTAL CORRIDOR ASSESSMENT POINTS — **160**	0	0	0	0
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — **100**	0	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment) — **160**	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)* — **260**	0	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: Diana P. Robas | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

APPENDIX 3.14-B, ATTACHMENT 3:
Natural Resources Conservation Service Land Evaluation Explanations and Calculations for Merced County

APPENDIX 3.14-B, ATTACHMENT 3: NATURAL RESOURCES CONSERVATION SERVICE LAND EVALUATION EXPLANATIONS AND CALCULATIONS—MERCED COUNTY

INTRODUCTION

This attachment provides an explanation for corridor assessment points assigned to the proposed San Jose to Central Valley Wye Project Extent (project) in part VI of the NRCS-CPA-106 form prepared for Merced County. All four alternative alignments are the same within Merced County. The scores indicated in the questions pertain to the portion of each project alternative that falls within Merced County.

Explanations

Alternative 1

A. **Total acres to be converted directly?** The regional consultant overlaid the alternative on a map of the Farmland Mapping and Monitoring Program (FMMP) categories to determine how many acres of Important Farmland would be permanently converted by Alternative 1. The results indicate that a total of 616 acres would be permanently converted, of which 79 acres are remnant parcels.

B. **Total acres to be converted indirectly or to receive services?** To determine the acreage of indirect impact, particularly the acreage of remnant and severed parcels created by the alternative, the regional consultant identified remnant parcels of Important Farmland that would be less than 20 acres. The regional consultant then reviewed each remnant to determine whether it would be viable or nonviable for continued agriculture (i.e., identified those remnants with shape, size, location, or hardship that would make them nonviable for continued agricultural use) (ARWS 2018a, 2018b, 2018c, 2018d). The results indicate that a total of 80 acres would be permanently indirectly converted as remnant or severed parcels.

C. **Total acres in corridor?** The regional consultant added the total acreage to be directly converted with the total acreage to be indirectly converted. The results indicate that a total of 696 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant generated a buffer of 1 mile around Alternative 1 in Merced County, including the temporary construction easement, to determine the total acreage of land within a 1-mile radius of the alternative in Merced County. The buffer was overlaid on a map of the FMMP categories, which include Urban and Built-Up Land. For this analysis, Urban and Built-Up Land is considered urban use (DOC 2014a). Then, the acreage within the buffer that is classified as Urban and Built-Up Land was calculated using a geographic information system (GIS), and the remaining acreage was considered nonurban use. The results indicated that over 97 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The length of the perimeter of Alternative 1 in Merced County, including the temporary construction easement, was measured by the regional consultant to determine the total length of the perimeter in Merced County. The regional consultant then calculated the proportion of the alternative perimeter that borders on land classified as Urban and Built-Up Land, and the remaining proportion of the perimeter was considered to border nonurban use. The results indicated that 97 percent of the alternative perimeter borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the area around Alternative 1 in Merced County for the years between 2005 and 2015, as well as information from the Merced County Agricultural Commissioner (Robinson pers. comm.), in general, some properties in the vicinity of this

alternative have been consistently farmed for 10 or more years. This criterion received a score of 11.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The area for Alternative 1 in Merced County, including remnant parcels that would likely not be suitable for farming after the project is completed, was overlaid on a map of Protected Farmland (DOC 2014b), defined as lands enrolled in Williamson Act or Farmland Security Zone contracts by the regional consultant. There are 670 acres of farmlands protected by private programs such as the Williamson Act). The results indicated that 3 percent of the land within the project footprint in Merced County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The average size farm in Merced County was 394 acres in 2012 (USDA 2012), the most recent year for which average farm size data are available. Alternative 1 traverses farm units that are an average of 142 acres, or approximately 36 percent of the size of the average farm unit in the county. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** In some areas, the alignment of Alternative 1 deviates from transportation corridors and bisects or otherwise severs agricultural parcels. Some of the remnant parcels resulting from this severance may not be viable for continued agricultural use. The regional consultant team used GIS software to identify parcels of Important Farmland that would be 20 acres or less following severance due to construction of the project. It was assumed that parcels greater than 20 acres would be viable for continued agricultural use. Analysts then evaluated the characteristics of each of the remnant parcels of 20 acres or less using criteria described in Appendix C, Remnant Parcel Analysis, to determine which parcels would be viable for continued agricultural use and which parcels would likely result in conversion to nonagricultural use. The acreage of the remnant parcels determined not viable for continued agricultural use was compared to the acreage of the original parcels (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.

7. **Does the site have available adequate supply of farm support services and markets?** According to the Merced County Agricultural Commissioner (Robinson pers. comm.), the area in the vicinity of Alternative 1 has been farmed for 50 to 100 years and it has mostly adequate support services and markets. For example, there are some specialty crops in Merced County where farmers may feel the farm service supply within the county is inadequate. Conversely farmers of more common crops such as almonds would likely have more than adequate farm service supplies within the county. This alternative would have a limited effect on farm services. This criterion received a score of 5.

8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** According to satellite imagery analysis of the area around Alternative 1 performed by the regional consultant, the overall amount of on-farm investment is high. Ancillary agricultural structures, barns, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to many of the fields. This criterion received a score of 20.

9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant overlaid the alternative on a map of the FMMP categories to determine how many acres of Important Farmland would be permanently converted by Alternative 1, plus acreage of nonviable remnant parcels less than 20 acres (i.e., those that have shape, size, location, or hardship that would make them nonviable for continued agricultural use) (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 1,157,906 acres of Important Farmland and Grazing Land in Merced County (DOC 2016), the permanent conversion of 696 acres of Important Farmland and

Grazing in Merced County under Alternative 1, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. Stations have the potential to induce population growth and farmland conversion. However, neither station would be located in Merced County.

    There are two locations under consideration for a maintenance of way facility (MOWF) but both are in Gilroy, in Santa Clara County, not in Merced County. In addition, one maintenance of infrastructure siding facility (MOIS) is proposed in Merced County west of Turner Island Road. The MOIS facility would be a small facility, would be compatible with adjacent agricultural uses, and would not induce urban development.

    Alternative 1 would involve the construction of new track, traction power substations (TPSS), and automated train control (ATC) sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities are largely compatible with adjacent agriculture and would not induce urban development. Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 1 is tied with Alternatives 2 and 4 for the longest length at approximately 89 miles, with 32 miles in Merced County.

Alternative 2

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 616 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 80 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 696 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 97 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for Alternative 1. The results indicated that 97 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the Merced County Agricultural Commissioner (Robinson pers. comm.), in general, some properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 11.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 670 acres of

farmlands protected by private programs such as the Williamson Act. The results indicated that 3 percent of the land within the project footprint in Merced County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 2 traverses farm units that are an average of 142 acres, or approximately 36 percent of the size of the average farm unit. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.

7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would have a limited effect on farm services. This criterion received a score of 5.

8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is high. Ancillary agricultural structures, barns, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to many of the fields. This criterion received a score of 20.

9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 1,157,906 acres of Important Farmland and Grazing Land in Merced County (DOC 2016), the permanent conversion of 696 acres of Important Farmland and Grazing Land in Merced County under Alternative 2, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. Stations have the potential to induce population growth and farmland conversion. However, neither station would be located in Merced County.

    There are two locations under consideration for a MOWF but both are in Gilroy, not in Merced County. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road. The MOIS facility would be a small facility, would be compatible with adjacent agricultural uses, and would not induce urban development.

    Alternative 2 would involve the construction of new track, TPSSs, and ATC sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities are largely compatible with adjacent agriculture and would not induce urban development. Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 2 is tied with Alternatives 1 and 4 for the longest length at approximately 89 miles, with 32 miles in Merced County.

Alternative 3

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 616 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 80 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 696 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 97 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used same methodology described in Criterion 2 for Alternative 1. The results indicated that 97 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the Merced County Agricultural Commissioner (Robinson pers. comm.), in general, some properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 11.

4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 670 acres of farmlands protected by private programs such as the Williamson Act. The results indicated that 3 percent of the land within the project footprint in Merced County is Protected Farmland. This criterion received a score of 20.

5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 3 traverses farm units that are an average of 142 acres, or approximately 36 percent of the size of the average farm unit in the county. This criterion received a score of 0.

6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.

7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would have a limited effect on farm services. This criterion received a score of 5.

8. **Does this site have substantial and well maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other**

soil and water conservation measures? The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is high. Ancillary agricultural structures, barns, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to many of the fields. This criterion received a score of 20.

9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 1,157,906 acres of Important Farmland and Grazing Land in Merced County (DOC 2016), the permanent conversion of 696 acres of Important Farmland and Grazing Land in Merced County under Alternative 3, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.

10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. Stations have the potential to induce population growth and farmland conversion. However, neither station would be located in Merced County.

    There are two locations under consideration for a MOWF but both are in Gilroy, not Merced County. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road. The MOIS facility would be a small facility, would be compatible with adjacent agricultural uses, and would not induce urban development.

    Alternative 3 would involve the construction of new track, TPSSs, and ATC sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities are largely compatible with adjacent agriculture and would not induce urban development. Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 3 is the shortest alternative at 87 miles long, with 32 miles in Merced County.

Alternative 4

A. **Total acres to be converted directly?** The regional consultant used the same methodology described in Question A for Alternative 1. The results indicate that a total of 616 acres would be directly permanently converted.

B. **Total acres to be converted indirectly or to receive services?** The regional consultant used the same methodology described in Question B for Alternative 1. The results indicate that a total of 80 acres would be indirectly converted.

C. **Total acres in corridor?** The regional consultant used the same methodology described in Question C for Alternative 1. The results indicate that a total of 696 acres would be directly and indirectly permanently converted.

1. **How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?** The regional consultant used the same methodology described in Criterion 1 for Alternative 1. The results indicated that 97 percent of the total acreage within the buffer was nonurban use. This criterion received a score of 15.

2. **How much of the perimeter of the site borders on land in nonurban use?** The regional consultant used the same methodology described in Criterion 2 for Alternative 1. The results indicated that 97 percent of the perimeter of the alternative borders on land in nonurban use. This criterion received a score of 10.

3. **How much of the site has been farmed more than 5 of the last 10 years?** According to satellite imagery analysis of the project footprint for the years between 2005 and 2015 as well as information from the Merced County Agricultural Commissioner (Robinson pers.comm.), in general, some properties in the vicinity of this alternative have been consistently farmed for 10 or more years. This criterion received a score of 11.
4. **Is the site subject to state or local government policies or programs to protect farmland or covered by private programs to protect farmland?** The regional consultant used the same methodology described in Criterion 4 for Alternative 1. There are 670 acres of farmlands protected by private programs such as the Williamson Act. The results indicated that 3 percent of the land within the project footprint in Merced County is Protected Farmland. This criterion received a score of 20.
5. **Are the farm units containing the site as large as the average-size farming unit in the county?** The regional consultant used the same methodology described in Criterion 5 for Alternative 1. Alternative 4 traverses farm units that are an average of 142 acres, or approximately 36 percent of the size of the average farm unit. This criterion received a score of 0.
6. **How much of the remaining land on the farm will become nonfarmable if this site is selected?** The regional consultant used the same methodology described in Criterion 6 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). The results indicated that the acreage of nonviable remnant parcels on farmable land would total less than 1 percent of the acreage of the original parcels within the project footprint of this alternative. This criterion received a score of 0.
7. **Does the site have available adequate supply of farm support services and markets?** The regional consultant used the same methodology described in Criterion 7 for Alternative 1. This alternative would have a limited effect on farm services. This criterion received a score of 5.
8. **Does this site have substantial and well-maintained on-farm investments such as barns, fruit trees and vines, field terraces, drainage, irrigation, waterways, and other soil and water conservation measures?** The regional consultant used the same methods described in Criterion 8 for Alternative 1. The overall amount of on-farm investment is high. Ancillary agricultural structures, barns, irrigation lines, waterways, and drainage ditches were observed on the farms. Soil and water conservation measures have been applied to many of the fields. This criterion received a score of 20.
9. **Would this project, by converting the land to nonagricultural use, reduce the support for farm support services in the area?** The regional consultant used the same methodology described in Criterion 9 for Alternative 1 (ARWS 2018a, 2018b, 2018c, 2018d). Considering there are approximately 1,157,906 acres of Important Farmland and Grazing Land in Merced County (DOC 2016), the permanent conversion of 696 acres of Important Farmland and Grazing Land in Merced County under Alternative 4, or less than 0.1 percent of the total Important Farmland in the County, is unlikely to result in reduction in demand for farm support services in the area. This criterion received a score of 0.
10. **Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of the surrounding farmland to nonagricultural use?** The project would include construction of the San Jose Diridon Station and a second station in either downtown Gilroy or east Gilroy, depending on the alternative selected. Stations have the potential to induce population growth and farmland conversion. However, neither station would be located in Merced County.

    There are two locations under consideration for MOWF but both are in Gilroy, not in Merced County. In addition, one MOIS facility is proposed in Merced County west of Turner Island Road. The MOIS facility would be a small facility, would be compatible with adjacent agricultural uses, and would not induce urban development.

Alternative 4 would involve the construction of new track, TPSSs, and ATC sites. In contrast to stations, which could induce population growth and farmland conversion, guideway use and power or electrical facilities are largely compatible with adjacent agriculture and would not induce urban development. Therefore, it is unlikely that guideway use would contribute to eventual conversion of surrounding farmland to nonagricultural use. This criterion received a score of 2.

Additional Notes

Alternative 4 is tied with Alternatives 1 and 2 for the longest length at approximately 89 miles, with 32 miles in Merced County.

References

Associated Right of Way Services, Inc. (ARWS). 2018a. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 1. October 25, 2018.

———. 2018b. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 2. October 25, 2018.

———. 2018c. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 3. October 25, 2018.

———. 2018d. Remainder Analysis (Step 2): Important Farmland Viability, Alternative 2. November 6, 2018.

California Department of Conservation (DOC). 2014a. Farmland Mapping and Monitoring Program.

———. 2014b. Merced County 2012-2014 Land Use Conversion. www.conservation.ca.gov/dlrp/fmmp/Pages/Merced.aspx (accessed August 7, 2017).

———. 2016. Merced County 2012-2014 Land Use Conversion. www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2012-2014/conversion_tables/mercon14.xls (accessed September 29, 2017).

Robinson, David. 2017. Agricultural Commissioner/Sealer of Weights & Measures, Merced County Merced, CA. August 9, 2017—Personal communication with Kristin Salamack, ICF International, regarding information for LESA.

U.S. Department of Agriculture (USDA). 2012. 2012 Census Volume 1, Chapter 2, County Level Data. www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/California/cav1.pdf (accessed August 7, 2017).

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request	4. Sheet 1 of _____
1. Name of Project	5. Federal Agency Involved	
2. Type of Project	6. County and State	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated | Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction **Acres:** **%**	7. Amount of Farmland As Defined in FPPA **Acres:** **%**
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	**Alternative Corridor For Segment _____**			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor				
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — **Maximum Points**				
1. Area in Nonurban Use — **15**				
2. Perimeter in Nonurban Use — **10**				
3. Percent Of Corridor Being Farmed — **20**				
4. Protection Provided By State And Local Government — **20**				
5. Size of Present Farm Unit Compared To Average — **10**				
6. Creation Of Nonfarmable Farmland — **25**				
7. Availablility Of Farm Support Services — **5**				
8. On-Farm Investments — **20**				
9. Effects Of Conversion On Farm Support Services — **25**				
10. Compatibility With Existing Agricultural Use — **10**				
TOTAL CORRIDOR ASSESSMENT POINTS — **160**	0	0	0	0
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — **100**	0	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment) — **160**	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)* — **260**	0	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: Diana P. Robas | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

APPENDIX 3.14-C: REMNANT PARCEL ANALYSIS

APPENDIX 3.14-C: REMNANT PARCEL ANALYSIS

Remnant Parcel Analysis

The identification of nonviable remnant parcels of Important Farmland in the San Jose to Central Valley Wye Project Extent (project extent or project) required a two-step process. In Step 1, analysts used geographic information system (GIS) software to identify remnant parcels of Important Farmland that would be 20 acres or less following severance as a result of project construction. These severed parcels of Important Farmland were provisionally considered nonviable remnants that could be converted to a nonagricultural use. The parcels of more than 20 acres were considered viable for continued agricultural use and were not included in this analysis.

In Step 2, analysts reviewed the characteristics of the remnant parcels identified in Step 1 on a parcel-by-parcel basis to identify those parcels likely to remain in agricultural use and those likely to be converted to nonagricultural use. Analysts used the following criteria to determine the viability of continued agricultural use of remnant parcels or likely conversion to a nonagricultural use.

- **Access—**Would the project restrict or eliminate access to the remnant parcel such that it can no longer continue in agricultural use (e.g., proposed roadway closure or severance, or permanent high-speed rail (HSR) fencing around tracks, electrical stations or maintenance roads)?
- **Size and shape—**Would the project create a parcel too small or oddly shaped to be viable for agriculture, even if combined with adjacent agricultural parcels?
- **Location—**Would the project create a parcel that could not be consolidated with adjacent agricultural parcels because of location?
- **Hardship—**Would the project create a severance that causes an overall hardship in maintaining economic activity on what might otherwise appear to be an economically viable remnant parcel?

Tables 1, 2, 3, and 4 show all parcels that were identified under Step 1 for each alternative and the results of the analysis described under Step 2 to identify viable parcels likely to continue in agricultural use and nonviable parcels not likely to continue in agricultural use (ARWS 20181, 2018b). Attachments 1 through 7 contain mapbooks showing the location of severed parcels for each alternative by subsection.

Table 1 Acreages of Remnant Parcels of Important Farmland under Alternative 1

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
San Jose Diridon Station Approach Subsection									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Monterey Corridor Subsection									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Morgan Hill and Gilroy Subsection									
Santa Clara County									
712-10-066	3.2	VDG-137	2.5	<0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-137	2.5	2.5	Not limited	Previously limited	Not limited	No	Viable
712-26-006	3.2	VDG-138	1.4	1.4	Not limited	Not limited	Not limited	No	Viable
		VDG-139	1.3	1.3	Not limited	Not limited	Not limited	No	Viable
		VDG-1561	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-1562	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-1565	0.5	0.5	Not limited	Not limited	Not limited	No	Viable
712-26-007	<0.1	VDG-140	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-1566	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
712-26-009	8.4	VDG-141	3.6	3.6	Not limited	Not limited	Not limited	No	Viable
		VDG-142	3.2	3.2	Not limited	Not limited	Not limited	No	Viable
		VDG-1569	1.6	1.6	Not limited	Not limited	Not limited	No	Viable
725-02-018	7.9	VDG-157	7.4	1.2	Not limited	Not limited	Limited	Yes	Viable
		VDG-157	7.4	6.2	Not limited	Not limited	Limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VDG-1609	0.1	0.1	Not limited	Not limited	Limited	Yes	Viable
725-02-019	44.7	VDG-159	10.1	0.3	Not limited	Not limited	Limited	Yes	Viable
		VDG-1620	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		VDG-159	10.1	9.8	Not limited	Not limited	Limited	Yes	Viable
		VDG-1615	0.5	0.5	Not limited	Not limited	Limited	Yes	Viable
		VDG-1620	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
725-05-005	6.2	VDG-187	5.9	5.3	Not limited	Not limited	Not limited	No	Viable
		VDG-187	5.9	0.6	Not limited	Not limited	Not limited	No	Viable
725-05-006	5.9	VDG-188	5.7	1.2	Not limited	Not limited	Not limited	No	Viable
		VDG-188	5.7	4.5	Not limited	Not limited	Not limited	No	Viable
725-06-004	9.0	VDG-200	8.8	1.6	Not limited	Not limited	Not limited	No	Viable
		VDG-1754	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-200	8.8	1.2	Not limited	Not limited	Not limited	No	Viable
725-06-006	5.9	VDG-201	5.8	<0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-1757	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-1759	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-201	5.8	5.7	Not limited	Previously limited	Not limited	No	Viable
725-06-007	2.8	VDG-1761	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-202	2.7	2.7	Not limited	Previously limited	Not limited	No	Viable
725-07-009	3.0	VDG-1771	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-204	1.6	0.9	Not limited	Not limited	Not limited	No	Viable
		VDG-1771	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-1772	0.2	0.2	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VDG-204	1.6	0.7	Not limited	Not limited	Not limited	No	Viable
725-07-014	7.7	VDG-1781	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-207	7.7	7.3	Not limited	Not limited	Not limited	No	Viable
		VDG-207	7.7	0.3	Not limited	Not limited	Not limited	No	Viable
725-11-022	4.0	VDG-1823	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-230	3.9	3.9	Not limited	Not limited	Not limited	No	Viable
725-11-023	9.7	VDG-1825	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-231	9.7	2.4	Not limited	Not limited	Not limited	No	Viable
		VDG-1825	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-231	9.7	7.3	Not limited	Not limited	Not limited	No	Viable
725-12-005	8.3	VDG-1829	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-232	8.3	8.1	Not limited	Not limited	Not limited	No	Viable
		VDG-232	8.3	0.1	Not limited	Not limited	Not limited	No	Viable
725-12-006	0.2	VDG-1832	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-233	0.2	0.2	Not limited	Not limited	Not limited	No	Viable
		VDG-233	0.2	<0.1	Not limited	Not limited	Not limited	No	Viable
725-12-007	9.8	VDG-1835	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-234	9.7	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-1835	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-234	9.7	9.7	Not limited	Not limited	Not limited	No	Viable
725-12-008	8.2	VDG-235	8.0	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-1840	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-1841	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VDG-235	8.0	8.0	Not limited	Not limited	Not limited	No	Viable
725-14-008	5.1	VDG-250	3.0	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-250	3.0	3.0	Not limited	Not limited	Not limited	No	Viable
725-14-009	5.4	VDG-251	3.3	1.8	Not limited	Not limited	Not limited	No	Viable
		VDG-251	3.3	1.5	Not limited	Not limited	Not limited	No	Viable
725-14-010	6.5	VDG-252	6.5	3.4	Not limited	Not limited	Not limited	No	Viable
		VDG-252	6.5	3.1	Not limited	Not limited	Not limited	No	Viable
725-14-011	5.1	VDG-253	3.5	3.5	Not limited	Not limited	Not limited	No	Viable
		VDG-254	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-253	3.5	<0.1	Not limited	Not limited	Not limited	No	Viable
725-14-014	1.7	VDG-257	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
728-38-003	5.5	VDG-373	5.5	2.1	Not limited	Not limited	Not limited	No	Viable
		VDG-373	5.5	3.4	Not limited	Not limited	Not limited	No	Viable
783-19-009	4.1	VDG-530	4.1	1.0	Not limited	Previously limited	Not limited	No	Viable
		VDG-530	4.1	3.1	Not limited	Previously limited	Not limited	No	Viable
825-01-015	4.4	VDG-598	3.7	1.0	Not limited	Not limited	Not limited	No	Viable
		VDG-2602	0.2	0.2	Not limited	Not limited	Not limited	No	Viable
		VDG-598	3.7	2.8	Not limited	Not limited	Not limited	No	Viable
825-01-016	11.5	VDG-599	9.8	<0.1	Not limited	Not limited	Not limited	No	Viable
		VDG-2607	0.4	0.4	Not limited	Not limited	Not limited	No	Viable
		VDG-599	9.8	9.7	Not limited	Not limited	Not limited	No	Viable
825-07-054	4.0	VDG-2755	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-640	3.8	3.8	Not limited	Previously limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
825-07-055	3.3	VDG-2758	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-641	3.2	3.2	Not limited	Previously limited	Not limited	No	Viable
825-07-056	3.3	VDG-2761	0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-642	2.6	0.3	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-2761	0.1	0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-2762	<0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-642	2.6	2.3	Not limited	Previously limited	Limited	Yes	Not viable
825-07-057	3.9	VDG-2768	0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-643	3.3	3.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-2768	0.1	0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-643	3.3	0.2	Not limited	Previously limited	Limited	Yes	Not viable
835-04-068	6.0	VDG-707	1.9	0.2	Not limited	Previously limited	Limited	No	Not viable
		VDG-707	1.9	1.7	Not limited	Previously limited	Limited	No	Not viable
		VDG-708	0.1	0.1	Not limited	Previously limited	Limited	No	Not viable
835-07-007	9.3	VDG-3136	0.1	0.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-3137	0.2	0.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-744	5.8	0.6	Not limited	Not limited	Not limited	Yes	Viable
		VDG-3135	0.8	0.8	Not limited	Not limited	Not limited	Yes	Viable
		VDG-3137	0.2	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-744	5.8	5.1	Not limited	Not limited	Not limited	Yes	Viable
841-23-013	1.9	VDG-3870	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VDG-935	1.9	1.8	Not limited	Previously limited	Not limited	No	Viable
		VDG-935	1.9	<0.1	Not limited	Previously limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
898-22-026	33.6	VDG-4368	1.0	0.9	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-4365	<0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-4366	<0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-4367	<0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-4368	1.0	0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VDG-4386	<0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
898-32-002	1.2	VDG-1126	0.8	0.8	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1348	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
898-32-027	8.8	VDG-1128	0.3	0.3	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1350	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
898-41-002	18.3	VDG-1136	2.6	1.5	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1136	2.6	1.1	Not limited	Not limited	Not limited	Yes	Viable
898-41-016	88.7	VDG-1141	6.6	0.5	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1142	8.5	0.7	Not limited	Not limited	Not limited	Yes	Viable
		VDG-4545	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-4548	0.5	0.5	Not limited	Not limited	Not limited	Yes	Viable
		VDG-4558	1.2	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1141	6.6	6.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1142	8.5	7.7	Not limited	Not limited	Not limited	Yes	Viable
		VDG-4545	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-4546	0.4	0.4	Not limited	Not limited	Not limited	Yes	Viable
		VDG-4547	1.3	1.3	Not limited	Not limited	Not limited	Yes	Viable
		VDG-4548	0.5	0.1	Not limited	Not limited	Not limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VDG-4558	1.2	1.2	Not limited	Not limited	Not limited	Yes	Viable
San Benito County									
015-020-0210	13.9	VDG-1347	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1349	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		VDG-1351	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VDG-65	11.5	11.5	Not limited	Not limited	Not limited	Yes	Viable
Pacheco Pass Subsection									
Merced County									
070-100-0300	175.3	T-289	0.3	0.3	Not limited	Limited due to project	Limited	Yes	Not viable
		T-291	0.6	0.6	Not limited	Limited due to project	Limited	Yes	Not viable
		T-292	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
San Joaquin Valley Subsection									
Merced County									
081-060-03200	10.9	HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	10.0	Not limited	Not limited	Not limited	No	Viable
		HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	<0.1	Not limited	Not limited	Not limited	No	Viable
081-060-06300	9.3	HMR-11	5.6	2.9	Not limited	Not limited	Not limited	No	Viable
		HMR-12	2.6	2.5	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-11	5.6	2.7	Not limited	Not limited	Not limited	No	Viable
		HMR-12	2.6	0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	1.1	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
085-290-03000	12.8	HMR-16	9.9	0.6	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-310	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-311	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-16	9.9	9.3	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-309	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-319	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-320	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
085-290-03100	16.6	HMR-15	7.9	1.0	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	0.5	Not limited	Not limited	Limited	Yes	Viable
		HMR-300	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-15	7.9	6.9	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	1.5	Not limited	Not limited	Limited	Yes	Viable

Source: ARWS 2018a
APN = assessor's parcel number
— = No APN provided for remnant parcel.

Table 2 Acreages of Remnant Parcels of Important Farmland under Alternative 2

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
San Jose Diridon Station Approach Subsection									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Monterey Corridor									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Morgan Hill and Gilroy Subsection									
Santa Clara County									
712-04-004	2.0	EDG-146	1.7	1.7	Not limited	Not limited	Not limited	No	Viable
		EDG-2173	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2174	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
712-04-088	10.6	EDG-152	10.0	2.5	Not limited	Not limited	Not limited	No	Viable
		EDG-152	10.0	7.5	Not limited	Not limited	Not limited	No	Viable
		EDG-2192	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2193	0.5	0.5	Not limited	Not limited	Not limited	No	Viable
712-10-066	3.2	EDG-198	2.5	<0.1	Not limited	Previously limited	Not limited	No	Viable
		EDG-198	2.5	2.5	Not limited	Previously limited	Not limited	No	Viable
712-26-006	3.2	EDG-210	1.3	1.3	Not limited	Not limited	Not limited	No	Viable
		EDG-211	1.2	1.2	Not limited	Not limited	Not limited	No	Viable
		EDG-2329	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2330	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
712-26-007	0.1	EDG-212	0.1	0.1	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
712-26-009	8.4	EDG-213	3.5	3.5	Not limited	Not limited	Not limited	No	Viable
		EDG-214	3.1	3.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2337	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2338	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
712-27-039	17.9	EDG-225	14.3	1.4	Not limited	Not limited	Not limited	No	Viable
		EDG-2364	1.2	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2369	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-225	14.3	12.9	Not limited	Not limited	Not limited	No	Viable
		EDG-2364	1.2	1.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2365	0.4	0.4	Not limited	Not limited	Not limited	No	Viable
		EDG-2366	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2369	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2370	0.2	0.2	Not limited	Not limited	Not limited	No	Viable
		EDG-2371	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
712-27-040	1.5	EDG-226	1.4	0.7	Not limited	Not limited	Not limited	No	Viable
		EDG-2372	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2375	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-226	1.4	0.6	Not limited	Not limited	Not limited	No	Viable
		EDG-227	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2373	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
725-05-005	6.2	EDG-2524	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-271	5.3	5.0	Not limited	Not limited	Not limited	No	Viable
		EDG-2524	0.1	<0.1	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		EDG-271	5.3	0.4	Not limited	Not limited	Not limited	No	Viable
725-05-006	5.8	EDG-272	5.0	1.2	Not limited	Not limited	Not limited	No	Viable
		EDG-272	5.0	3.8	Not limited	Not limited	Not limited	No	Viable
725-06-004	9.0	EDG-285	7.8	1.2	Not limited	Not limited	Not limited	No	Viable
		EDG-2547	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-285	7.8	6.6	Not limited	Not limited	Not limited	No	Viable
725-06-006	5.9	EDG-286	5.2	<0.1	Not limited	Previously limited	Not limited	No	Viable
		EDG-2550	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		EDG-2553	<.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		EDG-286	5.2	5.1	Not limited	Previously limited	Not limited	No	Viable
725-06-007	2.8	EDG-2554	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		EDG-287	2.0	2.0	Not limited	Previously limited	Not limited	No	Viable
725-11-023	9.7	EDG-2682	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-319	9.2	2.0	Not limited	Not limited	Not limited	No	Viable
		EDG-2682	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-319	9.2	7.2	Not limited	Not limited	Not limited	No	Viable
725-12-005	8.3	EDG-2686	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-320	7.8	7.6	Not limited	Not limited	Not limited	No	Viable
		EDG-320	7.8	0.1	Not limited	Not limited	Not limited	No	Viable
725-12-006	0.2	EDG-2688	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-321	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2688	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-321	0.1	0.1	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
725-12-007	9.8	EDG-322	9.0	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-2690	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-322	9.0	9.0	Not limited	Not limited	Not limited	No	Viable
725-12-008	8.2	EDG-323	7.4	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-323	7.4	7.4	Not limited	Not limited	Not limited	No	Viable
725-14-008	5.1	EDG-338	5.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-338	5.1	5.1	Not limited	Not limited	Not limited	No	Viable
725-14-011	5.1	EDG-339	5.1	5.1	Not limited	Not limited	Not limited	No	Viable
		EDG-339	5.1	<0.1	Not limited	Not limited	Not limited	No	Viable
725-14-014	1.7	EDG-342	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-342	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
725-14-015	1.6	EDG-2766	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-343	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-344	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
779-11-027	4.7	EDG-3716	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-716	4.6	0.6	Not limited	Not limited	Not limited	No	Viable
		EDG-3716	0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-3717	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-716	4.6	4.1	Not limited	Not limited	Not limited	No	Viable
779-11-028	7.0	EDG-3718	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		EDG-717	6.7	6.7	Not limited	Previously limited	Not limited	No	Viable
783-19-008	2.0	EDG-3899	0.3	0.3	Not limited	Previously limited	Not limited	No	Viable
		EDG-3900	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		EDG-782	1.7	1.2	Not limited	Previously limited	Not limited	No	Viable
		EDG-782	1.7	0.5	Not limited	Previously limited	Not limited	No	Viable
783-19-009	4.1	EDG-3902	0.2	0.2	Not limited	Previously limited	Not limited	No	Viable
		EDG-783	3.9	0.8	Not limited	Previously limited	Not limited	No	Viable
		EDG-783	3.9	3.1	Not limited	Previously limited	Not limited	No	Viable
825-01-016	11.5	EDG-4476	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-973	8.0	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-4476	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-4477	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-4478	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-4479	0.2	0.2	Not limited	Not limited	Not limited	No	Viable
		EDG-4480	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-4481	0.2	0.1	Not limited	Not limited	Not limited	No	Viable
		EDG-973	8.0	7.9	Not limited	Not limited	Not limited	No	Viable
830-03-012	0.2	EDG-1075	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		EDG-4982	0.1	0.1	Not limited	Limited due to project	Limited	Yes	Not viable
835-04-068	6.0	EDG-1116	1.9	0.2	Not limited	Previously limited	Limited	No	Not viable
		EDG-1116	1.9	1.7	Not limited	Previously limited	Limited	No	Not viable
		EDG-1117	0.1	0.1	Not limited	Previously limited	Limited	No	Not viable
835-07-007	9.3	EDG-1150	5.1	0.3	Not limited	Not limited	Not limited	Yes	Viable
		EDG-5388	0.3	0.2	Not limited	Not limited	Not limited	Yes	Viable
		EDG-5389	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		EDG-5395	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Not viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		EDG-1150	5.1	4.7	Not limited	Not limited	Not limited	Yes	Viable
		EDG-5388	0.3	<0.1	Not limited	Not limited	Not limited	Yes	Viable
841-23-013	1.9	EDG-1348	1.9	1.8	Not limited	Previously limited	Not limited	No	Viable
		EDG-6299	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		EDG-1348	1.9	<0.1	Not limited	Previously limited	Not limited	No	Viable
898-22-026	33.6	EDG-6801	1.0	0.9	Not limited	Limited due to project	Limited	Yes	Not viable
		EDG-6798	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		EDG-6799	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		EDG-6800	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		EDG-6801	1.0	0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		EDG-6819	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
898-32-002	1.2	EDG-1552	0.8	0.8	Not limited	Not limited	Not limited	Yes	Viable
		EDG-1774	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
898-32-027	8.8	EDG-1554	0.3	0.3	Not limited	Not limited	Not limited	Yes	Viable
		EDG-1776	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
898-41-002	18.3	EDG-1562	2.6	1.5	Not limited	Not limited	Not limited	Yes	Viable
		EDG-1562	2.6	1.1	Not limited	Not limited	Not limited	Yes	Viable
898-41-016	88.7	EDG-1567	6.6	0.5	Not limited	Not limited	Not limited	Yes	Viable
		EDG-1568	8.5	0.7	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6978	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6981	0.5	0.5	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6991	1.2	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		EDG-1567	6.6	6.1	Not limited	Not limited	Not limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		EDG-1568	8.5	7.7	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6978	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6979	0.4	0.4	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6980	1.3	1.3	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6981	0.5	0.1	Not limited	Not limited	Not limited	Yes	Viable
		EDG-6991	1.2	1.2	Not limited	Not limited	Not limited	Yes	Viable
San Benito County									
015-020-0210	13.9	EDG-1773	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		EDG-1775	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		EDG-1777	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		EDG-65	11.5	11.5	Not limited	Not limited	Not limited	Yes	Viable
Pacheco Pass Subsection									
Merced County									
070-100-03000	175.3	T-289	0.3	0.3	Not limited	Limited due to project	Limited	Yes	Not viable
		T-291	0.6	0.6	Not limited	Limited due to project	Limited	Yes	Not viable
		T-292	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
San Joaquin Valley Subsection									
Merced County									
081-060-03200	10.9	HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	10.0	Not limited	Not limited	Not limited	No	Viable
		HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	0.9	Not limited	Not limited	Not limited	No	Viable
081-060-06300	9.3	HMR-11	5.6	2.9	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		HMR-12	2.6	2.5	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-11	5.6	2.9	Not limited	Not limited	Not limited	No	Viable
		HMR-12	2.6	2.5	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	1.1	Not limited	Not limited	Not limited	No	Viable
085-290-03000	12.8	HMR-16	9.9	0.6	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-310	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-311	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-16	9.9	9.3	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-309	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-319	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-320	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
085-290-03100	16.6	HMR-15	7.9	1.0	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	0.5	Not limited	Not limited	Limited	Yes	Viable
		HMR-300	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-15	7.9	6.9	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	1.5	Not limited	Not limited	Limited	Yes	Viable

Source: ARWS 2018a
APN = assessor's parcel number
— = No APN provided for remnant parcel.
1 The first remnant ID listed applies to the Monterey Corridor—Skyway Drive Variant A. The second remnant ID listed applies to the Monterey Corridor—Skyway Drive Variant B. Remnant parcel information is the same for both options.

Table 3 Acreages of Remnant Parcels of Important Farmland under Alternative 3

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
San Jose Diridon Station Approach Subsection									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Monterey Corridor Subsection									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Morgan Hill and Gilroy Subsection									
Santa Clara County									
712-10-066	3.2	VEG-146	2.5	<0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-146	2.5	2.5	Not limited	Previously limited	Not limited	No	Viable
712-26-006	3.2	VEG-147	1.4	1.4	Not limited	Not limited	Not limited	No	Viable
		VEG-148	1.3	1.3	Not limited	Not limited	Not limited	No	Viable
		VEG-1498	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-1499	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-1502	0.5	0.5	Not limited	Not limited	Not limited	No	Viable
712-26-007	0.1	VEG-149	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-1503	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
712-26-009	8.4	VEG-150	3.6	3.6	Not limited	Not limited	Not limited	No	Viable
		VEG-1506	1.6	1.6	Not limited	Not limited	Not limited	No	Viable
		VEG-151	3.2	3.2	Not limited	Not limited	Not limited	No	Viable
725-02-018	7.9	VEG-166	7.4	1.2	Not limited	Not limited	Limited	Yes	Viable
		VEG-1546	0.1	0.1	Not limited	Not limited	Limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VEG-166	7.4	6.2	Not limited	Not limited	Limited	Yes	Viable
725-02-019	44.7	VEG-1557	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		VEG-168	10.1	0.3	Not limited	Not limited	Limited	Yes	Viable
		VEG-1552	0.5	0.5	Not limited	Not limited	Limited	Yes	Viable
		VEG-1557	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		VEG-168	10.1	9.8	Not limited	Not limited	Limited	Yes	Viable
725-05-005	6.2	VEG-196	5.9	5.3	Not limited	Not limited	Not limited	No	Viable
		VEG-196	5.9	0.6	Not limited	Not limited	Not limited	No	Viable
725-05-006	5.8	VEG-197	5.7	1.2	Not limited	Not limited	Not limited	No	Viable
		VEG-197	5.7	4.5	Not limited	Not limited	Not limited	No	Viable
725-06-004	9.0	VEG-209	8.8	1.2	Not limited	Not limited	Not limited	No	Viable
		VEG-1691	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-209	8.8	7.6	Not limited	Not limited	Not limited	No	Viable
725-06-006	5.9	VEG-210	5.8	<0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-1694	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-1696	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-210	5.8	<0.1	Not limited	Previously limited	Not limited	No	Viable
725-06-007	2.8	VEG-1698	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-211	2.7	2.7	Not limited	Previously limited	Not limited	No	Viable
725-07-009	3.0	VEG-1708	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-213	1.6	0.9	Not limited	Not limited	Not limited	No	Viable
		VEG-1708	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-1709	0.2	0.2	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VEG-213	1.6	0.7	Not limited	Not limited	Not limited	No	Viable
725-07-014	7.7	VEG-1718	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-216	7.7	7.3	Not limited	Not limited	Not limited	No	Viable
		VEG-216	7.7	0.3	Not limited	Not limited	Not limited	No	Viable
725-11-022	4.0	VEG-1760	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-239	3.9	3.9	Not limited	Not limited	Not limited	No	Viable
725-11-023	9.7	VEG-1762	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-240	9.7	2.4	Not limited	Not limited	Not limited	No	Viable
		VEG-1762	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-240	9.7	7.3	Not limited	Not limited	Not limited	No	Viable
725-12-005	8.3	VEG-1766	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-241	8.3	8.1	Not limited	Not limited	Not limited	No	Viable
		VEG-241	8.3	0.1	Not limited	Not limited	Not limited	No	Viable
725-12-006	0.2	VEG-1769	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-242	0.2	0.2	Not limited	Not limited	Not limited	No	Viable
		VEG-242	0.2	<0.1	Not limited	Not limited	Not limited	No	Viable
725-12-007	9.8	VEG-1772	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-243	9.7	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-1772	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-243	9.7	9.7	Not limited	Not limited	Not limited	No	Viable
725-12-008	8.2	VEG-244	8.0	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-1777	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-1778	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VEG-244	8.0	8.0	Not limited	Not limited	Not limited	No	Viable
725-14-008	5.1	VEG-259	3.0	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-259	3.0	3.0	Not limited	Not limited	Not limited	No	Viable
725-14-009	5.4	VEG-260	3.3	1.8	Not limited	Not limited	Not limited	No	Viable
		VEG-260	3.3	1.5	Not limited	Not limited	Not limited	No	Viable
725-14-010	6.5	VEG-261	6.5	3.4	Not limited	Not limited	Not limited	No	Viable
		VEG-261	6.5	3.1	Not limited	Not limited	Not limited	No	Viable
725-14-011	5.1	VEG-262	3.5	3.5	Not limited	Not limited	Not limited	No	Viable
		VEG-263	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-262	3.5	<0.1	Not limited	Not limited	Not limited	No	Viable
725-14-014	1.7	VEG-266	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
728-38-003	5.5	VEG-382	5.5	2.1	Not limited	Not limited	Not limited	No	Viable
		VEG-382	5.5	3.4	Not limited	Not limited	Not limited	No	Viable
825-01-015	4.4	VEG-580	3.4	2.4	Not limited	Not limited	Not limited	No	Viable
		VEG-2526	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-580	3.4	2.4	Not limited	Not limited	Not limited	No	Viable
825-01-016	11.5	VEG-582	5.4	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-2531	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-2533	0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-2534	2.7	2.7	Not limited	Not limited	Not limited	No	Viable
		VEG-582	5.4	5.4	Not limited	Not limited	Not limited	No	Viable
825-07-054	4.0	VEG-2683	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-623	3.8	3.8	Not limited	Previously limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
825-07-055	3.3	VEG-2686	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-624	3.2	3.2	Not limited	Previously limited	Not limited	No	Viable
825-07-056	3.3	VEG-2689	0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VEG-625	2.6	0.3	Not limited	Previously limited	Limited	Yes	Not viable
		VEG-2689	0.1	0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VEG-2690	<0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VEG-625	2.6	2.3	Not limited	Previously limited	Limited	Yes	Not viable
825-07-057	3.9	VEG-2696	0.1	<0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VEG-626	3.3	3.1	Not limited	Previously limited	Limited	Yes	Not viable
		VEG-2696	0.1	0.1	Not limited	Previously limited	Limited	Yes	Not viable
		VEG-626	3.3	0.2	Not limited	Previously limited	Limited	Yes	Not viable
830-03-002	2.3	VEG-2732	<0.1	<0.1	Not limited	Previously limited	Limited	No	Not viable
		VEG-636	0.4	0.4	Not limited	Previously limited	Limited	No	Not viable
		VEG-637	<0.1	<0.1	Not limited	Previously limited	Limited	No	Not viable
835-04-068	6.0	VEG-685	1.9	0.2	Not limited	Previously limited	Limited	No	Not viable
		VEG-685	1.9	1.7	Not limited	Previously limited	Limited	No	Not viable
		VEG-686	0.1	0.1	Not limited	Previously limited	Limited	No	Not viable
835-15-002	9.9	VEG-3061	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		VEG-3063	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
835-15-003	15.0	VEG-745	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
835-15-031	9.8	VEG-756	9.8	9.8	Not limited	Not limited	Not limited	No	Viable
835-15-048	11.2	VEG-3221	0.3	0.3	Limited due to project	Limited due to project	Not limited	Yes	Viable
		VEG-766	0.4	0.4	Limited due to project	Limited due to project	Not limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
835-15-049	41.1	VEG-3241	0.7	0.7	Limited due to project	Limited due to project	Not limited	Yes	Viable
		VEG-768	3.6	3.6	Limited due to project	Limited due to project	Not limited	Yes	Viable
841-18-081	7.1	VEG-3540	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-825	7.1	7.1	Not limited	Not limited	Not limited	No	Viable
841-18-083	10.5	VEG-3449	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3450	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3451	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3452	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3453	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3454	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3455	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3456	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3457	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3458	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3459	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3460	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3461	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3462	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3463	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3464	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3545	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3546	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-3547	0.1	0.1	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VEG-828	10.4	9.6	Not limited	Not limited	Not limited	No	Viable
		VEG-3449	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-828	10.4	0.8	Not limited	Not limited	Not limited	No	Viable
841-19-024	45.1	VEG-3580	0.1	0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		VEG-845	0.1	0.1	Not limited	Limited due to project	Limited	Yes	Not viable
841-22-112	9.7	VEG-3703	1.8	1.5	Not limited	Previously limited	Not limited	No	Viable
		VEG-3704	0.1	0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-3707	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		VEG-866	7.5	4.8	Not limited	Previously limited	Not limited	No	Viable
		VEG-3703	1.8	0.4	Not limited	Previously limited	Not limited	No	Viable
		VEG-866	7.5	2.7	Not limited	Previously limited	Not limited	No	Viable
841-23-013	1.9	VEG-3757	0.1	0.1	Not limited	Previously limited	Limited	No	Not viable
		VEG-3760	0.1	0.1	Not limited	Previously limited	Limited	No	Not viable
		VEG-870	0.3	0.3	Not limited	Previously limited	Limited	No	Not viable
841-24-034	23.4	VEG-3786	0.1	<0.1	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-3789	<0.1	<0.1	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-882	3.0	1.0	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-883	0.1	<0.1	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-884	8.4	<0.1	Limited due to project	Limited due to project	Not limited	Yes	Viable
		VEG-3786	0.1	0.1	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-3787	<0.1	<0.1	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-3788	0.6	0.6	Limited due to project	Limited due to project	Not limited	Yes	Viable
		VEG-3789	<0.1	<0.1	Limited due to project	Limited due to project	Limited	Yes	Not viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		VEG-882	3.0	2.0	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-883	0.1	0.1	Limited due to project	Limited due to project	Limited	Yes	Not viable
		VEG-884	8.4	8.4	Limited due to project	Limited due to project	Not limited	Yes	Viable
841-24-044	27.4	VEG-3802	0.6	0.6	Not limited	Limited due to project	Limited	Yes	Not viable
		VEG-3803	0.3	0.3	Not limited	Limited due to project	Limited	Yes	Not viable
		VEG-889	2.4	2.4	Not limited	Limited due to project	Limited	Yes	Not viable
		VEG-889	2.4	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
841-25-025	6.4	VEG-898	6.1	1.8	Not limited	Not limited	Not limited	No	Viable
		VEG-3863	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		VEG-898	6.1	4.4	Not limited	Not limited	Not limited	No	Viable
841-27-019	1.0	VEG-3974	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
898-22-026	33.6	VEG-1009	1.1	1.0	Not limited	Limited due to project	Limited	Yes	Not viable
		VEG-4273	0.3	0.2	Not limited	Limited due to project	Limited	Yes	Not viable
		VEG-1009	1.1	0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		VEG-4273	0.3	0.2	Not limited	Limited due to project	Limited	Yes	Not viable
898-32-027	8.8	VEG-1058	1.8	1.8	Not limited	Not limited	Not limited	Yes	Viable
		VEG-1290	0.4	0.4	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4355	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4493	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
898-32-032	19.4	VEG-4372	0.2	0.2	Not limited	Limited due to project	Limited	Yes	Not viable
898-32-033	19.5	VEG-4376	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
898-41-002	18.3	VEG-1063	2.3	1.4	Not limited	Not limited	Not limited	Yes	Viable
		VEG-1063	2.3	0.8	Not limited	Not limited	Not limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
898-41-016	88.7	VEG-1068	6.5	0.5	Not limited	Not limited	Not limited	Yes	Viable
		VEG-1069	7.6	0.7	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4419	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4422	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4440	1.2	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-1068	6.5	6.0	Not limited	Not limited	Not limited	Yes	Viable
		VEG-1069	7.6	6.8	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4419	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4420	0.4	0.4	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4421	1.2	1.2	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4422	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4423	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4440	1.2	1.2	Not limited	Not limited	Not limited	Yes	Viable
San Benito County									
015-020-0210	13.9	VEG-1289	0.4	0.4	Not limited	Not limited	Not limited	Yes	Viable
		VEG-1291	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-4492	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		VEG-71	13.1	13.1	Not limited	Not limited	Not limited	Yes	Viable
Pacheco Pass Subsection									
Merced County									
070-100-030000	175.3	T-289	0.3	0.3	Not limited	Limited due to project	Limited	Yes	Not viable
		T-291	0.6	0.6	Not limited	Limited due to project	Limited	Yes	Not viable
		T-292	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
San Joaquin Valley Subsection									
Merced County									
081-060-032000	10.9	HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	10.0	Not limited	Not limited	Not limited	No	Viable
		HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	0.9	Not limited	Not limited	Not limited	No	Viable
081-060-063000	9.3	HMR-11	5.6	2.9	Not limited	Not limited	Not limited	No	Viable
		HMR-12	2.6	2.5	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-11	5.6	2.7	Not limited	Not limited	Not limited	No	Viable
		HMR-12	2.6	0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	1.1	Not limited	Not limited	Not limited	No	Viable
085-290-30000	12.8	HMR-16	9.9	0.6	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-310	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-311	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-16	9.9	9.3	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-309	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-319	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-320	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
085-290-031000	16.6	HMR-15	7.9	1.0	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	0.5	Not limited	Not limited	Limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		HMR-300	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-15	7.9	6.9	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	1.5	Not limited	Not limited	Limited	Yes	Viable

Source: ARWS 2018a
APN = assessor's parcel number
— = No APN provided for remnant parcel.

Table 4 Acreages of Remnant Parcels of Important Farmland under Alternative 4

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
San Jose Diridon Station Approach Subsection									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Monterey Corridor Subsection									
Santa Clara County									
There would be no remnant parcels of Important Farmland.									
Morgan Hill and Gilroy Subsection									
Santa Clara County									
712-04-001	2.9	BMHG-1531a	<0.1	<0.1	Not Limited	Limimted due to project	Limited	Yes	Not Viable
		BMHG-1532a	<0.1	<0.1	Not Limited	Limited due to project	Limited	Yes	Not Viable
712-04-004	2.0	BMHG-147	1.8	1.8	Not limited	Not limited	Not limited	No	Viable
		BMHG-1543	0.2	0.2	Not limited	Not limited	Not limited	No	Viable
712-04-087	12.1	BMHG-153	10.4	10.4	Not limited	Not limited	Not limited	No	Viable
		BMHG-1576	0.3	0.3	Not limited	Limited due to project	Limited	Yes	Not viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		BMHG-1577	0.8	0.8	Not limited	Not limited	Not limited	No	Viable
712-04-088	10.6	BMHG-154	10.3	2.5	Not limited	Not limited	Not limited	No	Viable
		BMHG-1581	0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-154	10.3	7.9	Not limited	Not limited	Not limited	No	Viable
		BMHG-1580	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-1581	0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
712-07-076	2.2	BMHG-1601	0.2	0.2	Not limited	Not limited	Limited	No	Viable
		BMHG-161	2.0	2.0	Not limited	Not limited	Limited	No	Viable
712-10-066	3.2	BMHG-1731	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		BMHG-202	2.5	<0.1	Not limited	Previously limited	Not limited	No	Viable
		BMHG-1730	0.7	0.7	Not limited	Previously limited	Not limited	No	Viable
		BMHG-1731	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		BMHG-202	2.5	2.5	Not limited	Previously limited	Not limited	No	Viable
712-26-006	3.2	BMHG-1756	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-1757	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-1758	0.3	0.3	Not limited	Not limited	Not limited	No	Viable
		BMHG-216	2.9	2.9	Not limited	Not limited	Not limited	No	Viable
		BMHG-217	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
712-26-007	0.1	BMHG-1759	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-1760	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-218	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
712-26-009	8.4	BMHG-1761	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-219	8.4	8.4	Not limited	Not limited	Not limited	No	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
712-27-039	17.9	BMHG-227	17.9	1.5	Not limited	Not limited	Limited	No	Viable
		BMHG-227	17.9	16.4	Not limited	Not limited	Limited	No	Viable
712-27-040	1.5	BMHG-1787	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-1788	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-1789	0.3	0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-228	1.2	0.6	Not limited	Not limited	Not limited	No	Viable
		BMHG-1789	0.3	0.2	Not limited	Not limited	Not limited	No	Viable
		BMHG-228	1.2	0.5	Not limited	Not limited	Not limited	No	Viable
725-06-006	5.9	BMHG-257	5.9	<0.1	Not limited	Previously limited	Not limited	No	Viable
		BMHG-1825	<0.1	<0.1	Not limited	Previously limited	Not limited	No	Viable
		BMHG-257	5.9	5.9	Not limited	Previously limited	Not limited	No	Viable
825-01-015	4.4	BMHG-605	4.2	1.0	Not limited	Not limited	Not limited	No	Viable
		BMHG-2395	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-605	4.2	3.3	Not limited	Not limited	Not limited	No	Viable
825-01-016	11.5	BMHG-606	11.0	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-2401	0.3	0.3	Not limited	Not limited	Not limited	No	Viable
		BMHG-606	11.0	11.0	Not limited	Not limited	Not limited	No	Viable
825-04-005	11.8	BMHG-2468	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-625	11.7	5.6	Not limited	Not limited	Not limited	No	Viable
		BMHG-2468	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-625	11.7	6.1	Not limited	Not limited	Not limited	No	Viable
835-04-068	6.0	BMHG-2657	2.6	<0.1	Not limited	Previously limited	Limited	No	Not viable
		BMHG-694	1.9	0.2	Not limited	Previously limited	Limited	No	Not viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		BMHG-696	<0.1	<0.1	Not limited	Previously limited	Limited	No	Not viable
		BMHG-2657	2.6	2.5	Not limited	Previously limited	Limited	No	Not viable
		BMHG-694	1.9	1.7	Not limited	Previously limited	Limited	No	Not viable
		BMHG-695	0.1	0.1	Not limited	Previously limited	Limited	No	Not viable
		BMHG-696	<0.1	<0.1	Not limited	Previously limited	Limited	No	Not viable
835-07-007	9.3	BMHG-2786	0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-722	9.2	1.2	Not limited	Not limited	Not limited	No	Viable
		BMHG-2786	0.1	0.1	Not limited	Not limited	Not limited	No	Viable
		BMHG-722	9.2	8.1	Not limited	Not limited	Not limited	No	Viable
841-23-013	1.9	BMHG-876	1.9	1.9	Not limited	Previously limited	Not limited	No	Viable
		BMHG-876	1.9	<0.1	Not limited	Previously limited	Not limited	No	Viable
841-38-006	37.2	BMHG-3372	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3373	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3374	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-927	3.8	3.8	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-928	14.1	14.1	Not limited	Not limited	Not limited	Yes	Viable
898-22-026	33.6	BMHG-3559	1.0	0.9	Not limited	Limited due to project	Limited	Yes	Not viable
		BMHG-3546	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		BMHG-3556	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		BMHG-3557	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		BMHG-3558	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
		BMHG-3559	1.0	0.1	Not limited	Limited due to project	Limited	Yes	Not viable
898-32-002	1.2	BMHG-1041	0.8	0.8	Not limited	Not limited	Not limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		BMHG-1262	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
898-32-027	8.8	BMHG-1043	0.3	0.3	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-1264	0.2	0.2	Not limited	Not limited	Not limited	Yes	Viable
898-41-002	18.3	BMHG-1051	2.6	1.5	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-1051	2.6	1.1	Not limited	Not limited	Not limited	Yes	Viable
898-41-016	88.7	BMHG-1056	6.6	0.5	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-1057	8.5	0.7	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3728	1.2	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3730	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3733	0.5	0.5	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-1056	6.6	6.1	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-1057	8.5	7.7	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3728	1.2	1.2	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3730	<0.1	<0.1	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3731	0.4	0.4	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3732	1.3	1.3	Not limited	Not limited	Not limited	Yes	Viable
		BMHG-3733	0.5	0.1	Not limited	Not limited	Not limited	Yes	Viable
San Benito County									
015-020-02100	13.9	BMHG-1261	0.2	0.2	Not Limited	Not limited	Not limited	Yes	Viable
		BMHG-1263	0.2	0.2	Not Limited	Not limited	Not limited	Yes	Viable
		BMHG-1265	<0.1	<0.1	Not Limited	Not limited	Not limited	Yes	Viable
		BMHG-65	11.5	11.5	Not Limited	Not limited	Not limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
Pacheco Pass Subsection									
Merced County									
070-100-0300	175.3	T-289	0.3	0.3	Not limited	Limited due to project	Limited	Yes	Not viable
		T-291	0.6	0.6	Not limited	Limited due to project	Limited	Yes	Not viable
		T-292	<0.1	<0.1	Not limited	Limited due to project	Limited	Yes	Not viable
San Joaquin Valley Subsection									
Merced County									
081-060-03200	10.9	HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	10.0	Not limited	Not limited	Not limited	No	Viable
		HMR-271	<0.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-9	10.9	<0.1	Not limited	Not limited	Not limited	No	Viable
081-060-06300	9.3	HMR-11	5.6	2.9	Not limited	Not limited	Not limited	No	Viable
		HMR-12	2.6	2.5	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	<0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-11	5.6	2.7	Not limited	Not limited	Not limited	No	Viable
		HMR-12	2.6	0.1	Not limited	Not limited	Not limited	No	Viable
		HMR-275	1.1	1.1	Not limited	Not limited	Not limited	No	Viable
085-290-03000	12.8	HMR-16	9.9	0.6	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-310	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-311	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-16	9.9	9.3	Not limited	Not limited	Limited	Yes	Viable
		HMR-308	0.2	<0.1	Not limited	Not limited	Limited	Yes	Viable

APN	Original Acreage	Remnant ID	Remnant Acreage	Important Farmland Acreage	Access	Size and Shape	Location	Hardship	Viability
		HMR-309	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-319	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
		HMR-320	<0.1	<0.1	Not limited	Not limited	Limited	Yes	Viable
085-290-03100	16.6	HMR-15	7.9	1.0	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	0.5	Not limited	Not limited	Limited	Yes	Viable
		HMR-300	0.2	0.2	Not limited	Not limited	Limited	Yes	Viable
		HMR-15	7.9	6.9	Not limited	Not limited	Limited	Yes	Viable
		HMR-299	2.0	1.5	Not limited	Not limited	Limited	Yes	Viable

Source: ARWS 2018b
APN = assessor's parcel number
— = No APN provided for remnant parcel.

References

Associated Right of Way Services, Inc. (ARWS). 2018a. Remainder Analysis (Step 2): Important Farmland Viability, San Jose to Central Valley Wye Project, Alternatives 1, 2, and 3. October 25, 2018.

———.2018b. Remainder Analysis (Step 2): Important Farmland Viability, San Jose to Central Valley Wye Project, Alternative 4. November 6, 2018.

APPENDIX 3.14-D: INDUCED WIND IMPACTS: EFFECTS ON POLLINATION; BLOSSOMS AND DUST

California High Speed Rail Authority

Induced Wind Impacts

Effects on Pollination; Blossoms and Dust

Agricultural Working Group White Paper

Approved: 7/2/2012

BACKGROUND

The California High Speed Rail Authority (CHSRA) proposes to connect the large population centers in California and thus establish a new railway in the San Joaquin Valley. The new rail alignment is proposed to be constructed either on existing farmland or adjacent to, where such land lies between urban and commercial parcels in the Valley. Most, if not all, of the Valley counties through which the railway is proposed to travel have Right-To-Farm Ordinances which make reference to "customary and/or traditional" agricultural practices. The proposed project has raised questions and concerns regarding its impact on many established and customary agricultural practices and consequent potential imposition of new regulatory restrictions. Customary agricultural practices found in the Valley are as varied as is the diversity of agricultural products and commodities produced. The San Joaquin Valley as a natural resource is unique to the state, the nation, and arguably the world by the quality and quantity in the diversity of its agriculture.

The CHSRA has created a "technical" agricultural working group to assist the CHSRA in responding to the more technically oriented questions and concerns that have been asked regarding impacts to agriculture resulting from activities during the construction phase and the daily operation of the High Speed Train (HST). The agricultural working group membership is comprised of members in possession of technical expertise in various categories of agriculture activities and infrastructure.

ISSUE

Concern is expressed that the High Speed Train while traveling at 220mph will create wind currents that will affect pollination by damaging blossoms, disrupt bee pollination activity, reduce crop production due to dust, and cause pesticide drift. Each of these will be reviewed in this paper under individual sections.

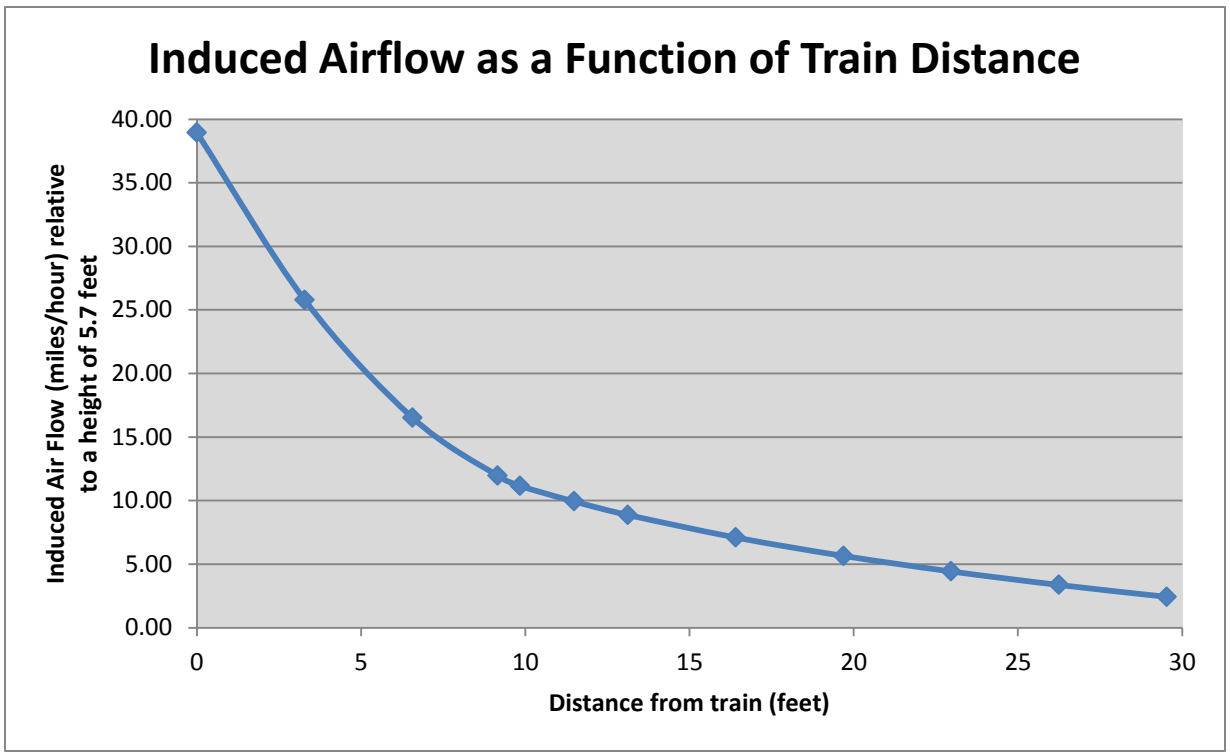
DISCUSSION

WIND SPEED

Any effects of induced wind by the HST on pollination will be a matter of the wind speed generated. Estimates of the generated wind speed were made independently, by separate engineering consultants using different methodologies (see attached Technical Memorandum: Potential Impact from Induced Winds for High-Speed Trains). Various reference sources were used. One of these is from Professors Sterling and Baker, both professors at the School of Civil Engineering, at the University of Birmingham, Birmingham, UK. Their studies focus mainly on the impact of induced wind (which they refer to as the "slipstream") on people waiting along the track (both workers and public) in regards to safety. Their recent paper (Sterling et al., 2008) presents two sets of induced wind profiles from the German Intercity Connect (ICE) high speed train. They indicated that they considered these to be high quality data that show the slipstream velocity as a function of the distance from the train. These data show that for trackside measurements the induced winds are between 5% and 10% of the speed of the train at 3 meters (~10ft) from the side of the train.

A second reference, (Li, et.al, "A Study of the Influence of Aerodynamic Forces on a Human Body near a High-Speed Train, Aerodynamics of Heavy Vehicles, Trucks, Buses, and Trains", 2008) utilized a curve fit

equation for estimating the wind speed and is charted below. The equation can be used up to 30ft. At this distance the estimated wind speed is approximately 2.4mph as shown in the following chart.



Induced Airflow as a Function of Distance for a Train Traveling at 220mph

Note that at 10ft from the side of the train this chart shows an approximate wind speed of 11.2mph which is within the 5-10% predicted from the research noted above (11-22mph for a HST at 220mph). These speeds are comparable to and under the meteorological data for Daily Average Wind Speed from both the Merced and Fresno airport reporting stations. The HST Right of Way standard when at grade is 100 feet wide with the two tracks being centered and 16.5 feet apart. The distance of 30 feet falls well within the HST Right of Way.

POLLINATION

The potential impact to pollinators, such as the honey bee, is discussed with in a separate White Paper; Bees and Pollination.

BLOSSOMS

The potential impact to blossoms and/or flowering trees has also been raised as a concern particularly in regards to the pollination thereof as well as the physical impact of wind to leaves and blossoms. As noted above, the HST induced wind would dissipate to about 2mph as it reaches the edge of the Right of Way. A comparable wind statistic is the Daily Average Peak Gust, where a Peak Gust is a maximum 5-second average wind speed. The meteorological data from the Western Regional Climate Center for Merced Regional Airport (1998-2008), Fresno Yosemite International Airport (1996-2008), and

Bakersfield Meadows Field Airport (196-2008) show Daily Average Peak Gusts ranged from 15.0mph to 21.3mph, 14.2mph to 21.7mph, and 14.7 mph to 21.4 mph respectively.

Throughout the season, farmers apply different crop protection products for various plant problems. Materials may be applied by airplane, helicopter, or ground units and are most commonly applied with ground based air blast spray units that have adequate air volume and speed to carry spray materials to their target which might be as far as 30 feet from the sprayer. Some of these applications occur while blossoms are present on the trees. In discussion with the manufacturer of the "Air-o-Fan" sprayer, it was noted that the velocity of air from the fan was around 140mph at the exit of the fan (Air-O-Fan Model: D-40R, (Specifications Attached). The distance from the fan and its target determines the cubic feet per minute needed to displace the internal air of the canopy. In this example, the range quoted was 40,000cfm to 350,000cfm.

Therefore, it is expected the HST will not create conditions that will cause blossom loss.

DUST

In arid agriculture conditions such as in the San Joaquin Valley, there are two main impacts of dust on plant foliage: photosynthesis and pests (spider mites). While there are other impacts to consider, they are generally not significant enough to be considered damaging.

Excess dust on leaves will decrease photosynthesis of the plant and have a stressing effect on the leaf's ability for respiration. A decrease in photosynthesis is a result of the reduced sunlight penetrating the dust to the leaf and can reduce the plant's productive capacity. The leaf is a plant's primary means of cooling itself by the process of transpiration. Excessive dust can inhibit transpiration, allowing leaf temperatures to rise and causing a negative effect on plant stress load.

These stresses create conditions in arid climates that have been demonstrated to foster spider mite infestations. Primary spider mite species are the Pacific, Two-spotted, and European Red spider mite, while others can be problematic at times on certain varieties of plants (e.g. Russet and Willamette spider mites). Spider mite webbing can worsen the dust collection on the plant. Spider mites also feed on the moisture in the leaves by sucking on the cell materials for their survival and multiplication. The results of this activity can cause defoliation and lower production significantly.

There are materials that can control spider mite populations, but generally the lower the dust pressure the less significant the mite pressure will be in a field. Watering roads and other dust control measures often are practiced to slow mite buildup, particularly on the perimeter of fields from where mites typically encroach. Environmentally, the mite population is most affected by moisture in the daily cycle of heating and cooling. This usually happens in the fall of the year when temperatures fall and nights become longer.

Traffic for maintenance of rail should most often be between 12:00 a.m. and 5:00 a.m., which is during the period of day when dew is most prevalent helping keep atmospheric dust to a minimum. It is

anticipated that most HST maintenance equipment will travel on the steel rails which also helps eliminate dust as it is not in contact with soil.

During construction of the HST system, contractors are obligated to control fugitive dust in accordance with California Air Resources Board and San Joaquin Valley Air Pollution Control District permits, therefore construction should have no significant impacts on adjacent crops.

Velocities within the HST Right of Way will be higher and appropriate ground maintenance should be part of standard operation procedures to further minimize the potential for conditions related to dust creation. Dust generation due to the potential for additional farm roads (related to split parcels) along the HST Right of Way may affect specific farm operations. The need for revised "Dust Plans" or operational changes, including cost impacts, would be addressed within the Right of Way process.

Therefore the HST will not create significant dust resulting in increased pests such as spider mites.

DRIFT (OF PESTICIDES)

As noted within the Agricultural Working Group White Paper on pesticide use, existing laws prohibit drift from pesticide applications. Current pesticide application practices include both ground and aerial applications. These methods are used successfully for application of pesticides in areas with transportation routes presently (roads, highways and railroads). Also noted within the AWG White Paper on pesticide use is that the HST Right of Way would be treated the same as other transportation routes. Thus concern regarding potential pesticide drift relates to the ability for the HST induced wind to draw [move] pesticides from an adjacent field into the Right of Way or into another adjoining field.

There is the general practice that the application of pesticides is not performed in winds that exceed 5-10mph. The actual limiting of application is determined by factors such as pesticide label instructions, the experience of the applicator, the perceived risk of drift involved and specific application conditions and regulations.

The situation of the HST moving pesticides from an adjacent field into the HST Right of Way or into an adjoining field is not reasonably foreseeable as a result of the wind speeds noted above.

CONCLUSION

The HST induced wind is not excessive at the edge of the right-of-way.

The effect of HST on blossoms and flowering trees is minimal due to the expected wind speed at the edge of the right-of-way.

The effect of HST induced wind on creating dust is minimal due to the expected wind speed at the edge of the right-of-way.

The risk of HST induced wind creating conditions to cause pesticide drift is minimal due to the expected wind speed at the edge of the right-of-way.

APPENDIX 3.14-E: WILLIAMSON ACT COMPLIANCE DATA

Table 1 shows the total acres and number of parcels of protected farmland (i.e., under Williamson Act contracts) that would be directly affected by the San Jose to Central Valley Wye Project Extent (project) alternatives in Santa Clara, San Benito, and Merced Counties.[1] Protected agricultural land that would be taken out of production by the project ranges from 944.4 acres under Alternative 4 to 1,042.7 acres under Alternative 3. Alternatives 1 and 2 would see intermediate acreages of protected agricultural land removed from production, at 952 acres and 956.4 acres respectively.

Tables 2a through 2d show the individual parcels under Williamson Act contracts, including those currently under contract nonrenewal,[2] that could be affected by each project alternative.[3] The tables include existing parcel size and the remainder parcel size after construction of the project. Parcels that no longer meet the minimum Williamson Act contract acreage in Santa Clara, San Benito, and Merced Counties may no longer qualify for Williamson Act contract. [4]

Table 3 shows the county parcel size thresholds for Williamson Act contracts for Santa Clara, San Benito, and Merced Counties.

Table 4 shows the estimated total acres and number of remainder parcels of protected farmland under each alternative. The acreage for the remainder parcels would be smaller than each county's threshold for protected farmland contracts. Agricultural land acreage protected under the Williamson Act that potentially could fall below county thresholds ranges from 797.6 acres for Alternative 4 to 890.4 acres for Alternative 3. Alternatives 1 and 2 would see intermediate acreages of remainder parcels protected agricultural land under county thresholds: 849.4 and 876 acres respectively.[5]

[1] There would be no permanent effects from implementation of network interconnections in Santa Clara, San Benito, and Merced Counties; therefore, no further discussion is required.

[2] The term *nonrenewal* refers to the method of terminating a Williamson Act or Farmland Security Zone contract by filing a notice of nonrenewal. The contract is terminated 10 years from the time of notice of nonrenewal. Nonrenewal can be initiated by the landowner or the local government.

[3] None of the three counties that would be affected by the project participate in the Farmland Security Zone program.

[4] Total acreages do not exactly match total acreages presented in the Agricultural Farmland Technical Report (the technical report to which this appendix is attached) or EIR/EIS Section 3.14 (Agricultural Farmland) . This is because the county parcel data presented in this appendix include some road gaps and parcel overlaps at county boundaries between parcels in the detailed parcel-level analysis, whereas the acreages presented in the Agricultural Farmland Technical Report and Section 3.14 analyses are based on continuous data with no gaps for roads or overlaps at county boundaries. While the data sets do not correspond, they both are accurate calculations based on the underlying data.

[5] See previous footnote.

Table 1 Farmland Protected by Williamson Act Contracts Removed from Agricultural Production by Project Alternative

Alternatives by Subsection and County	Williamson Act Land (acres)		Williamson Act Land Parcels (number of parcels)	
	Renewal	Nonrenewal	Renewal	Nonrenewal
Alternative 1				
San Jose Diridon Station Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	296.8	59.8	46	9
San Benito County	86.5	—	16	—
Pacheco Pass				
Santa Clara County	140.2	—	10	—
San Benito County	—	—	—	—
Merced County	258.2	—	9	—
San Joaquin Valley				
Merced County	107.7	2.8	26	1
TOTAL	**889.4**	**62.6**	**107**	**10**
Alternative 2				
San Jose Diridon Station Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	297.1	63.9	46	12
San Benito County	86.5	—	16	—
Pacheco Pass				
Santa Clara County	140.2	—	10	—
San Benito County	—	—	—	—
Merced County	258.2	—	9	—
San Joaquin Valley				
Merced County	107.7	2.8	26	1
TOTAL	**889.7**	**66.7**	**107**	**13**

Alternatives by Subsection and County	Williamson Act Land (acres)		Williamson Act Land Parcels (number of parcels)	
	Renewal	Nonrenewal	Renewal	Nonrenewal
Alternative 3				
San Jose Diridon Station Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	406.7	11.0	59	6
San Benito County	116.1	—	19	—
Pacheco Pass				
Santa Clara County	140.2	—	10	—
San Benito County	—	—	—	—
Merced County	258.2	—	9	—
San Joaquin Valley				
Merced County	107.7	2.8	26	1
TOTAL	**1,028.9**	**13.8**	**123**	**7**
Alternative 4				
San Jose Diridon Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	332.6	14.2	43	5
San Benito County	88.7	—	16	—
Pacheco Pass				
Santa Clara County	140.2	—	10	—
San Benito County	—	—	—	—
Merced County	258.2	—	9	—
San Joaquin Valley				
Merced County	107.7	2.8	26	1
TOTAL	**927.4**	**17.0**	**104**	**6**

Sources: County of Merced 2017, County of San Benito 2017, County of Santa Clara 2017
— = There are no parcels in this location.

Table 2a Protected Farmland Affected by Alternative 1

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
San Jose Diridon Station Approach				
Santa Clara County				
There are no protected farmland parcels.				
Monterey Corridor				
Santa Clara County				
There are no protected farmland parcels.				
Morgan Hill and Gilroy				
Santa Clara County				
825-04-005	11.8 (R)	1.0	10.7	74.107
830-04-005	28.9 (NR)	3.1	25.9	74.018
835-07-007	9.3 (NR)	2.6	6.7	73.163
841-24-012	28.6 (R)	<0.1	28.6	70.064
841-27-001	102.9 (R)	0.3	102.7	68.107
841-27-003	15.4 (R)	0.1	15.3	72.011
841-27-014	68.4 (R)	0.2	68.2	70.122
841-27-019	1.0 (R)	<0.1	1.0	70.151
841-27-020	42.9 (R)	0.1	42.8	70.045
841-28-003	24.8 (R)	<0.1	24.8	71.225
841-28-007	30.7 (R)	<0.1	30.7	70.103
841-28-018	88.2 (R)	<0.1	88.2	88.007
841-28-021	38.6 (NR)	<0.1	38.6	70.012
841-28-025	14.0 (R)	0.1	13.9	68.103

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
841-28-026	35.6 (R)	<0.1	35.6	68.103
841-30-003	106.6 (NR)	34.8	71.7	73.024
841-30-007	114.6 (NR)	11.7	102.9	70.120
841-33-008	55.6 (R)	2.5	53.1	70.025
841-33-010	15.4 (R)	1.9	13.4	70.025
841-38-003	10.2 (R)	3.7	6.5	70.093
841-38-005	9.7 (R)	2.5	7.2	70.092
841-38-006	37.2 (R)	2.5	34.7	70.102
841-38-009	120.0 (R)	2.0	118.1	76.053
841-38-010	149.1 (R)	21.3	127.8	70.121
841-38-011	29.5 (R)	3.8	25.7	4001
841-38-017	46.9 (R)	1.4	45.5	72.024
841-38-022	18.7 (R)	0.2	18.5	70.016
841-38-025	9.7 (NR)	3.5	6.2	68.123
841-38-031	4.2 (NR)	2.0	2.2	70.091
841-38-032	5.3 (NR)	1.7	3.6	70.091
841-39-015	17.4 (NR)	0.4	17.0	70.066
841-39-017	180.1 (R)	1.3	178.7	70.066
841-39-020	26.3 (R)	0.1	26.2	70.013
841-49-008	34.1 (R)	<0.1	34.1	68.076
841-60-002	19.9 (R)	0.1	19.8	70.100
898-20-043	551.7 (R)	11.0	540.7	67.024
898-22-003	52.6 (R)	7.9	44.7	73.112

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
898-22-004	47.2 (R)	0.9	46.3	75.071
898-24-010	636.3 (R)	<0.1	636.3	67.025
898-24-026	359.1 (R)	5.2	353.9	67.025
898-24-030	374.8 (R)	5.5	369.3	67.025
898-24-036	368.5 (R)	93.3	275.1	67.025
898-25-040	43.6 (R)	<0.1	43.6	70.042
898-25-042	18.9 (R)	0.3	18.6	71.240
898-30-001	103.2 (R)	1.1	102.1	67.025
898-31-005	153.5 (R)	5.2	148.4	71.145
898-32-027	8.8 (R)	4.3	4.5	72.136
898-32-032	19.7 (R)	0.3	19.4	71.243
898-32-033	19.5 (R)	13.2	6.3	71.243
898-32-034	22.2 (R)	<0.1	22.2	71.243
898-41-001	88.7 (R)	5.6	83.2	67.025
898-41-002	18.3 (R)	5.6	12.7	67.025
898-58-001	466.4 (R)	93.2	373.2	67.025
898-59-007	22.5 (R)	0.5	22.0	72.145
898-59-008	5.0 (R)	0.4	4.6	72.145
San Benito County				
013-010-021-000	176.9 (R)	9.6	167.3	73022
013-020-008-000	169.5 (R)	0.5	169.0	68114
013-020-010-000	151.8 (R)	1.2	150.6	68114
013-020-013-000	151.7 (R)	10.8	140.9	68114

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
013-020-014-000	168.6 (R)	10.0	158.6	68114
013-020-021-000	242.8 (R)	5.8	237.0	68114
013-040-015-000	218.2 (R)	8.6	209.5	75022
013-050-005-000	56.2 (R)	2.7	53.5	72905
015-020-016-000	37.2 (R)	2.8	34.3	70016
015-020-020-000	14.9 (R)	7.6	7.3	15002
015-020-021-000	13.9 (R)	2.0	11.9	15003
015-020-022-000	32.4 (R)	4.2	28.2	15005
015-030-006-000	70.4 (R)	6.2	64.2	72005
015-030-030-000	12.3 (R)	4.0	8.2	15006
015-030-031-000	13.4 (R)	7.1	6.3	15007
015-030-032-000	58.4 (R)	3.4	55.0	15008
Pacheco Pass				
Santa Clara County				
898-19-005	643.7 (R)	1.2	642.6	73.153
898-19-029	440.0 (R)	90.1	349.9	73.153
898-19-043	468.4 (R)	30.5	438.0	73.153
898-20-032	474.0 (R)	8.1	465.9	67.024
898-20-033	27.5 (R)	0.2	27.3	67.024
898-20-036	4.6 (R)	0.0	4.6	67.024
898-20-042	484.0 (R)	6.6	477.3	67.024
898-20-043	551.7 (R)	11.0	540.7	67.024
898-37-004	198.8 (R)	0.5	198.2	72.143

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
898-60-004	61.7	0.9	60.8	72.145
San Benito County				
There are no protected farmland parcels.				
Merced County				
069-210-009-000	250.2 (R)	25.2	225.0	01019
069-210-010-000	324.4 (R)	40.4	284.0	01019
069-220-011-000	272.2 (R)	32.7	239.5	01019
069-230-003-000	602.8 (R)	19.7	583.1	01019
069-230-007-000	635.8 (R)	32.9	602.9	01019
069-230-012-000	288.7 (R)	75.6	213.2	01019
069-240-033-000	928.0 (R)	17.6	910.4	01019
070-090-004-000	88.9 (R)	10.9	78.0	01063
070-100-014-000	63.9 (R)	7.7	56.2	01063
San Joaquin Valley				
Merced County				
070-090-004-000	88.9 (R)	10.9	78.0	01063
070-202-017-000	22.0 (R)	1.1	20.9	000684
070-270-014-000	104.4 (R)	1.2	103.1	02007
070-270-018-000	1.8 (R)	1.0	0.8	000645
070-270-019-000	35.6 (R)	0.2	35.5	000645
070-270-020-000	64.9 (R)	<0.1	64.9	000645
073-160-008-000	78.1 (R)	0.1	78.0	01119
073-170-006-000	106.8 (R)	0.1	106.7	01120

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
073-170-010-000	91.0 (R)	3.9	87.1	01120
073-170-021-000	168.8 (R)	7.8	161.0	2000394
073-180-007-000	227.7 (R)	1.2	226.5	000277
073-180-031-000	18.8 (R)	<0.1	18.8	000696
073-190-002-000	108.4 (R)	5.3	103.1	01120
073-190-011-000	59.5 (R)	2.4	57.1	000277
073-200-013-000	56.7 (NR)	2.8	53.9	000306
073-200-022-000	53.4 (R)	4.5	48.9	01119
073-210-002-000	77.0 (R)	2.4	74.6	000664
073-380-003-000	546.6 (R)	10.2	536.4	000697
073-380-017-000	118.7 (R)	4.5	114.2	000697
073-380-027-000	57.1 (R)	9.0	48.1	000697
081-020-009-000	29.4 (R)	7.9	21.6	03021
081-060-060-000[a]	225.1 (R)	5.5	219.5	01108
085-290-006-000	95.0 (R)	9.0	86.1	000597
085-290-007-000	289.8 (R)	10.6	279.2	000697
085-290-034-000	248.4 (R)	10.4	238.0	000697
085-290-035-000	243.0 (R)	3.9	239.0	000697
085-290-037-000	9.7 (R)	0.9	8.8	000697

Sources: County of Merced 2017, County of San Benito 2017, County of Santa Clara 2017
APN = assessor's parcel number
a Parcel 081-060-060-000 is recorded in different Merced County databases with different acreages: Assessor's Office records 221.5 acres, GIS department records 225.1 acres (the value used in this report), and the Williamson Act contract from 2001 records 223.2 acres. This may be the result of portions of road being included in gross acreage numbers which are not included in the taxable portion of the parcel.

Table 2b Protected Farmland Affected by Alternative 2

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
San Jose Diridon Station Approach				
Santa Clara County				
There are no protected farmland parcels.				
Monterey Corridor				
Santa Clara County				
There are no protected farmland parcels.				
Morgan Hill and Gilroy				
Santa Clara County				
712-08-023	15.0 (NR)	0.1	14.9	72.041
779-11-027	4.7 (NR)	<0.1	4.7	71.105
779-11-028	7.0 (NR)	0.1	6.8	71.105
830-04-005	28.9 (NR)	5.7	23.3	74.018
835-06-031	16.1 (R)	1.3	14.7	68.141
835-07-007	9.3 (NR)	3.9	5.4	73.163
841-24-012	28.6 (R)	<0.1	28.6	70.064
841-27-001	102.9 (R)	0.3	102.7	68.107
841-27-003	15.4 (R)	0.1	15.3	72.011
841-27-014	68.4 (R)	0.2	68.2	70.122
841-27-019	1.0 (R)	<0.1	1.0	70.151
841-27-020	42.9 (R)	0.1	42.8	70.045
841-28-003	24.8 (R)	<0.1	24.8	71.225
841-28-007	30.7 (R)	<0.1	30.7	70.103

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
841-28-018	88.2 (R)	<0.1	88.2	88.007
841-28-021	38.6 (NR)	<0.1	38.6	70.012
841-28-025	14.0 (R)	0.1	13.9	68.103
841-28-026	35.6 (R)	<0.1	35.6	68.103
841-30-003	106.6 (NR)	34.8	71.7	73.024
841-30-007	114.6 (NR)	11.7	102.9	70.120
841-33-008	55.6 (R)	2.5	53.1	70.025
841-33-010	15.4 (R)	1.9	13.4	70.025
841-38-003	10.2 (R)	3.7	6.5	70.093
841-38-005	9.7 (R)	2.5	7.2	70.092
841-38-006	37.2(R)	2.5	34.7	70.102
841-38-009	120.0 (R)	2.0	118.1	76.053
841-38-010	149.1 (R)	21.3	127.8	70.121
841-38-011	29.5 (R)	3.8	25.7	4001
841-38-017	46.9 (R)	1.4	45.5	72.024
841-38-022	18.7 (R)	0.2	18.5	70.016
841-38-025	9.7 (NR)	3.5	6.2	68.123
841-38-031	4.2 (NR)	2.0	2.2	70.091
841-38-032	5.3 (NR)	1.7	3.6	70.091
841-39-015	17.4 (NR)	0.4	17.0	70.066
841-39-017	180.1 (R)	1.3	178.7	70.066
841-39-020	26.3 (R)	0.1	26.2	70.013
841-49-008	34.1 (R)	<0.1	34.1	68.076

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
841-60-002	19.9 (R)	0.1	19.8	70.100
898-20-043	551.7 (R)	11.0	540.7	67.024
898-22-003	52.6 (R)	7.9	44.7	73.112
898-22-004	47.2 (R)	0.9	46.3	75.071
898-24-010	636.3 (R)	<0.1	636.3	67.025
898-24-026	359.1 (R)	5.2	353.9	67.025
898-24-030	374.8 (R)	5.5	369.3	67.025
898-24-036	368.5 (R)	93.3	275.1	67.025
898-25-040	43.6 (R)	<0.1	43.6	70.042
898-25-042	18.9 (R)	0.3	18.6	71.240
898-30-001	103.2 (R)	1.1	102.1	67.025
898-31-005	153.5 (R)	5.2	148.4	71.145
898-32-027	8.8 (R)	4.3	4.5	72.136
898-32-032	19.7 (R)	0.3	19.4	71.243
898-32-033	19.5 (R)	13.2	6.3	71.243
898-32-034	22.2 (R)	<0.1	22.2	71.243
898-41-001	88.7 (R)	5.6	83.2	67.025
898-41-002	18.3 (R)	5.6	12.7	67.025
898-58-001	466.4 (R)	93.2	373.2	67.025
898-59-007	22.5 (R)	0.5	22.0	72.145
898-59-008	5.0 (R)	0.4	4.6	72.145
San Benito County				
013-010-021-000	176.9 (R)	9.6	167.3	73022

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
013-020-008-000	169.5 (R)	0.5	169.0	68114
013-020-010-000	151.8 (R)	1.2	150.6	68114
013-020-013-000	151.7 (R)	10.8	140.9	68114
013-020-014-000	168.6 (R)	10.0	158.6	68114
013-020-021-000	242.8 (R)	5.8	237.0	68114
013-040-015-000	218.2 (R)	8.6	209.5	75022
013-050-005-000	56.2 (R)	2.7	53.5	72905
015-020-016-000	37.2 (R)	2.8	34.3	70016
015-020-020-000	14.9 (R)	7.6	7.3	15002
015-020-021-000	13.9 (R)	2.0	11.9	15003
015-020-022-000	32.4 (R)	4.2	28.2	15005
015-030-006-000	70.4 (R)	6.2	64.2	72005
015-030-030-000	12.3 (R)	4.0	8.2	15006
015-030-031-000	13.4 (R)	7.1	6.3	15007
015-030-032-000	58.4 (R)	3.4	55.0	15008
Pacheco Pass				
Santa Clara County				
898-19-005	643.7 (R)	1.2	642.6	73.153
898-19-029	440.0 (R)	90.1	349.9	73.153
898-19-043	468.4 (R)	30.5	438.0	73.153
898-20-032	474.0 (R)	8.1	465.9	67.024
898-20-033	27.5 (R)	0.2	27.3	67.024
898-20-036	4.6 (R)	<0.1	4.6	67.024

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
898-20-042	484.0 (R)	6.6	477.3	67.024
898-20-043	551.7 (R)	11.0	540.7	67.024
898-37-004	198.8 (R)	0.5	198.2	72.143
898-60-004	61.7 (R)	0.9	60.8	72.145
San Benito County				
There are no protected farmland parcels.				
Merced County				
069-210-009-000	250.2 (R)	25.2	225.0	01019
069-210-010-000	324.4 (R)	40.4	284.0	01019
069-220-011-000	272.2 (R)	32.7	239.5	01019
069-230-003-000	602.8 (R)	19.7	583.1	01019
069-230-007-000	635.8 (R)	32.9	602.9	01019
069-230-012-000	288.7 (R)	75.6	213.2	01019
069-240-033-000	928.0 (R)	17.6	910.4	01019
070-090-004-000	88.9 (R)	10.9	78.0	01063
070-100-014-000	63.9 (R)	7.7	56.2	01063
San Joaquin Valley				
Merced County				
070-090-004-000	88.9 (R)	10.9	78.0	01063
070-202-017-000	22.0 (R)	1.1	20.9	000684
070-270-014-000	104.4 (R)	1.2	103.1	02007
070-270-018-000	1.8 (R)	1.0	0.9	000645
070-270-019-000	35.6 (R)	0.2	35.5	000645

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
070-270-020-000	64.9 (R)	<0.1	64.9	000645
073-160-008-000	78.1 (R)	0.1	78.0	01119
073-170-006-000	106.8 (R)	0.1	106.7	01120
073-170-010-000	91.0 (R)	3.9	87.1	01120
073-170-021-000	168.8 (R)	7.8	161.0	2000394
073-180-007-000	227.7 (R)	1.2	226.5	000277
073-180-031-000	18.8 (R)	<0.1	18.8	000696
073-190-002-000	108.4 (R)	5.3	103.1	01120
073-190-011-000	59.5 (R)	2.4	57.1	000277
073-200-013-000	56.7 (NR)	2.8	53.9	000306
073-200-022-000	53.4 (R)	4.5	48.9	01119
073-210-002-000	77.0 (R)	2.4	74.6	000664
073-380-003-000	546.6 (R)	10.2	536.4	000697
073-380-017-000	118.7 (R)	3.5	114.2	000697
073-380-027-000	57.1 (R)	9.0	48.1	000697
081-020-009-000	29.4 (R)	7.9	21.6	03021
081-060-060-000[a]	225.1 (R)	5.5	219.5	01108
085-290-006-000	95.0 (R)	9.0	86.1	000597
085-290-007-000	289.8 (R)	10.6	279.2	000697
085-290-034-000	248.4 (R)	10.4	238.0	000697
085-290-035-000	243.0 (R)	3.0	239.0	000697
085-290-037-000	9.7 (R)	0.9	8.8	000697

Sources: County of Merced 2017, County of San Benito 2017, County of Santa Clara 2017
APN = assessor's parcel number

a Parcel 081-060-060-000 is recorded in different Merced County databases with different acreages: Assessor's Office records 221.5 acres, GIS department records 225.1 acres (the value used in this report), and the Williamson Act contract from 2001 records 223.2 acres. This may be the result of portions of road being included in gross acreage numbers which are not included in the taxable portion of the parcel.

Table 2c Protected Farmland Affected by Alternative 3

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
San Jose Diridon Station Approach				
Santa Clara County				
There are no protected farmland parcels.				
Monterey Corridor				
Santa Clara County				
There are no protected farmland parcels.				
Morgan Hill and Gilroy				
Santa Clara County				
825-04-005	11.8 (R)	1.0	10.7	74.107
830-03-002	2.3 (NR)	0.4	1.9	74.057
830-03-007	13.2 (NR)	3.0	10.2	74.057
830-04-005	28.9 (NR)	6.4	22.5	74.018
835-15-047	47.5 (R)	2.0	45.5	71.127
841-21-016	43.5 (R)	0.1	43.4	72.205
841-22-017	18.3 (R)	1.8	16.6	73.071
841-22-056	27.2 (R)	4.0	23.2	68.050
841-22-088	20.4 (R)	0.2	202.	68.053
841-22-089	5.5 (R)	0.5	5.0	68.053
841-22-112	9.7 (R)	0.3	9.3	68.004
841-24-012	28.6 (R)	7.2	21.4	70.064
841-24-034	23.4 (R)	11.1	12.3	75.031
841-24-044	27.4 (R)	4.3	23.0	73.085

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
841-25-008	31.1 (R)	9.1	22.0	71.226
841-25-023	6.7 (R)	1.4	5.2	70.014
841-25-025	6.4	0.2	6.2	70.014
841-26-012	117.2 (R)	28.9	88.3	67.021
841-26-027	22.9 (R)	5.6	17.4	67.020
841-26-032	74.8 (R)	4.3	70.5	67.019
841-27-001	102.9 (R)	2.1	100.8	68.107
841-27-003	15.4 (R)	6.7	8.7	72.011
841-27-014	68.4 (R)	14.5	53.9	70.122
841-27-019	1.0 (R)	0.7	0.3	70.151
841-27-020	42.9 (R)	20.3	22.5	70.045
841-28-003	24.8 (R)	0.1	24.7	71.225
841-28-007	30.7 (R)	<0.1	30.7	70.103
841-28-018	88.2 (R)	<0.1	88.2	88.007
841-28-021	38.6 (NR)	<0.1	38.6	70.012
841-28-025	14.0 (R)	3.1	10.9	68.103
841-28-026	35.6 (R)	0.6	34.9	68.103
841-39-017	180.1 (R)	1.3	178.8	70.066
841-40-008	73.5 (NR)	1.1	72.4	88.006
841-40-010	99.1 (R)	2.2	96.9	67.019
841-40-011	77.4 (R)	2.1	75.2	67.019
841-49-002	22.7 (R)	3.2	19.5	68.076
841-49-008	34.1 (R)	6.8	27.3	68.076

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
841-49-009	5.2 (R)	0.2	5.0	68.056
841-49-013	7.1 (NR)	0.1	7.0	68.035
841-49-014	15.6 (R)	<0.1	15.5	68.035
841-49-015	26.6 (R)	0.1	26.5	68.035
841-49-018	14.9 (R)	4.8	10.2	67.030
841-49-019	0.0 (R)	0.0	—	67.030
841-60-002	19.9 (R)	11.8	8.1	70.100
898-20-043	551.7 (R)	11.0	540.7	67.024
898-22-003	52.6 (R)	7.6	45.1	73.112
898-22-004	47.2 (R)	1.0	46.1	75.071
898-24-010	636.3 (R)	<0.1	636.3	67.025
898-24-026	359.1 (R)	5.2	353.9	67.025
898-24-030	375.8 (R)	5.5	369.3	67.025
898-24-036	368.5 (R)	93.4	275.1	67.025
898-25-040	43.6 (R)	<0.1	43.6	70.042
898-25-042	18.9 (R)	0.3	18.6	71.240
898-26-001	55.4 (R)	0.2	55.2	72.028
898-26-003	123.1 (R)	0.2	122.9	81.010
898-30-001	103.2 (R)	1.1	102.1	67.025
898-31-005	153.5 (R)	5.2	148.4	71.145
898-32-027	8.8 (R)	4.5	4.3	72.136
898-32-032	19.7 (R)	0.1	19.6	71.243
898-32-033	19.5 (R)	6.6	12.8	71.243

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
898-41-001	88.7 (R)	5.4	83.4	67.025
898-41-002	18.3 (R)	4.5	13.8	67.025
898-58-001	466.4 (R)	93.2	373.1	67.025
898-59-007	22.5 (R)	0.5	22.0	72.145
898-59-008	5.0 (R)	0.4	4.6	72.145
San Benito County				
013-010-005-000	319.1 (R)	4.7	314.4	71078
013-010-029-000	53.7 (R)	1.0	52.7	88001
013-010-032-000	295.7 (R)	6.2	289.6	71055
013-020-008-000	169.5 (R)	0.5	169.0	68114
013-020-009-000	190.5 (R)	6.9	183.7	68114
013-020-010-000	151.8 (R)	13.7	138.0	68114
013-020-013-000	151.7 (R)	4.3	147.5	68114
013-020-014-000	168.6 (R)	4.0	164.6	68114
013-020-017-000	202.9 (R)	7.3	195.6	68114
013-020-021-000	242.8 (R)	31.8	211.0	68114
013-050-005-000	56.2 (R)	<0.1	56.2	72905
015-020-016-000	37.2 (R)	8.5	28.7	70016
015-020-019-000	12.7 (R)	0.7	11.9	15001
015-020-020-000	14. 9 (R)	4.5	10.4	15002
015-020-021-000	13.9 (R)	0.3	13.6	15003
015-020-022-000	32.4 (R)	2.6	29.8	15005
015-030-030-000	12.3 (R)	5.7	6.6	15006

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
015-030-031-000	13.4 (R)	0.1	13.3	15007
015-030-032-000	58.4 (R)	13.3	45.1	15008
Pacheco Pass				
Santa Clara County				
841-19-005	643.7 (R)	1.2	642.6	73.153
898-19-029	440.0 (R)	90.1	349.9	73.153
898-19-043	468.4 (R)	30.5	438.0	73.153
898-20-032	474.0 (R)	8.1	465.9	67.024
898-20-033	27.5 (R)	0.2	27.3	67.024
898-20-036	4.6 (R)	<0.1	4.6	67.024
898-20-042	484.0 (R)	6.6	477.3	67.024
898-20-043	551.7 (R)	11.0	540.7	67.024
898-37-004	198.8 (R)	0.5	198.2	72.143
89-60-004	61.7 (R)	0.9	60.8	72.145
San Benito County				
There are no protected farmland parcels.				
Merced County				
069-210-009-000	250.2 (R)	25.2	225.0	01019
069-210-010-000	324.4 (R)	40.4	284.0	01019
069-220-011-000	272.2 (R)	32.7	239.5	01019
069-230-003-000	602.8 (R)	19.7	583.1	01019
069-230-007-000	635.8 (R)	32.9	602.9	01019
069-230-012-000	288.7 (R)	75.6	213.2	01019

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
069-240-033-000	928.0 (R)	17.6	910.4	01019
070-090-004-000	88.9 (R)	10.9	78.0	01063
070-100-014-000	63.9 (R)	7.7	56.2	01063
San Joaquin Valley				
Merced County				
070-090-004-000	88.9 (R)	10.9	78.0	01063
070-202-017-000	22.0 (R)	1.1	20.9	000684
070-270-014-000	104.4 (R)	1.2	103.1	02007
070-270-018-000	1.8 (R)	1.0	0.9	000645
070-270-019-000	35.6 (R)	0.2	35.5	000645
070-270-020-000	64.9 (R)	<0.1	64.9	000645
073-160-008-000	78.1 (R)	0.1	78.0	01119
073-170-006-000	106.8 (R)	0.1	106.7	01120
073-170-010-000	91.0 (R)	3.9	87.1	01120
073-170-021-000	168.8 (R)	7.8	161.0	2000394
073-180-007-000	227.7 (R)	1.2	226.5	000277
073-180-013-000	18.8 (R)	<0.1	18.8	000696
073-190-002-000	108.4 (R)	5.3	103.1	01120
073-190-011-000	59.5 (R)	2.4	57.1	000277
073-200-013-000	56.7 (NR)	2.8	53.9	000306
073-200-022-000	53.4 (R)	4.5	48.9	01119
073-210-002-000	77.0 (R)	2.4	74.6	000664
073-380-003-000	546.6 (R)	10.2	536.4	000697

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
073-380-017-000	118.7 (R)	4.5	114.2	000697
073-380-027-000	57.1 (R)	9.0	48.1	000697
081-020-009-000	29.4 (R)	7.9	21.6	03021
081-060-060-000[a]	225.1 (R)	5.5	219.5	01108
085-290-006-000	95.0 (R)	9.0	86.1	000597
085-290-007-000	289.8 (R)	10.6	279.2	000697
085-290-034-000	248.4 (R)	10.4	238.0	000697
085-290-035-000	243.0 (R)	3.9	239.0	000697
085-290-037-000	9.7 (R)	0.9	8.8	000697

Sources: County of Merced 2017, County of San Benito 2017, County of Santa Clara 2017
APN = assessor's parcel number
a Parcel 081-060-060-000 is recorded in different Merced County databases with different acreages: Assessor's Office records 221.5 acres, GIS department records 225.1 acres (the value used in this report), and the Williamson Act contract from 2001 records 223.2 acres. This may be the result of portions of road being included in gross acreage numbers which are not included in the taxable portion of the parcel.

Table 2d Protected Farmland Affected by Alternative 4

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
San Jose Diridon Station Approach				
Santa Clara County				
There are no protected farmland parcels.				
Monterey Corridor				
Santa Clara County				
There are no protected farmland parcels.				
Morgan Hill and Gilroy				
Santa Clara County				

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
830-04-005	28.9 (NR)	0.1	28.8	74.018
841-24-012	28.6 (R)	<0.1	28.6	70.064
841-27-001	102.9 (R)	0.3	102.7	68.107
841-27-003	15.4 (R)	0.1	15.3	72.011
841-27-014	68.4 (R)	0.2	68.2	70.122
841-27-019	1.0	<0.1	1.0	70.151
841-27-020	42.9 (R)	0.1	42.8	70.045
841-28-003	24.8 (R)	<0.1	24.8	71.225
841-28-007	30.7 (R)	<0.1	30.7	70.103
841-28-018	88.2 (R)	<0.1	88.2	88.007
841-28-021	38.6 (NR)	<0.1	38.6	70.012
841-28-025	14.0 (R)	0.1	13.9	68.103
841-28-026	35.6 (R)	<0.1	13.9	68.103
841-30-003	106.6 (NR)	2.3	104.2	73.024
841-31-008	19.7 (R)	9.5	10.2	72.120
841-31-009	15.4 (NR)	6.0	9.4	74.056
841-31-010	29.5 (R)	6.5	23.0	73.049
841-38-003	10.2 (R)	7.1	3.1	70.093
841-38-005	9.7 (R)	6.9	2.8	70.092
841-38-006	37.2 (R)	18.5	18.7	70.102
841-38-007	26.9 (R)	3.1	23.8	68.088
841-38-009	120.0 (R)	3.3	116.7	76.053
841-38-010	149.1 (R)	23.1	126.0	70.121

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
841-38-011	29.5 (R)	0.6	28.8	4001
841-38-025	9.7 (NR)	5.7	4.0	68.123
841-39-017	180.1 (R)	1.3	178.8	70.066
841-49-008	34.1 (R)	<0.1	34.1	68.076
841-60-002	19.9 (R)	0.1	19.8	70.100
898-20-043	551.7 (R)	11.0	540.7	67.024
898-22-003	52.6 (R)	7.9	44.7	73.112
898-22-004	47.2 (R)	0.9	46.3	75.071
898-24-010	636.3 (R)	<0.1	636.3	67.025
898-24-026	359.1 (R)	5.2	353.9	67.025
898-24-030	374.8 (R)	5.5	369.3	67.025
898-24-036	368.5 (R)	93.3	275.1	67.025
898-25-040	43.6 (R)	<0.1	43.6	70.042
898-25-042	18.9 (R)	0.3	18.6	71.240
898-30-001	103.2 (R)	1.1	102.1	67.025
898-31-005	153.5 (R)	5.2	148.4	71.145
898-32-027	8.8 (R)	4.3	4.5	72.136
898-32-032	19.7 (R)	0.3	19.4	71.243
898-32-033	19.5 (R)	13.2	6.3	71.243
898-32-034	22.2 (R)	<0.1	22.2	71.243
898-41-001	88.7 (R)	5.6	83.2	67.025
898-41-002	18.3 (R)	5.6	12.7	67.025
898-58-001	466.4 (R)	93.2	373.2	67.025

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
898-59-007	22.5 (R)	0.5	22.0	72.145
898-59-008	5.0 (R)	0.4	4.6	72.145
San Benito County				
013-010-021-000	176.9 (R)	11.7	165.1	73022
013-020-008-000	169.5 (R)	0.5	169.0	68114
013-020-010-000	151.8 (R)	1.2	150.6	68114
013-020-013-000	151.7 (R)	10.8	140.9	68114
013-020-014-000	168.6 (R)	10.0	158.6	68114
013-020-021-000	242.8 (R)	5.8	237.0	68114
013-040-015-000	218.2 (R)	8.6	209.5	75022
013-050-005-000	56.2 (R)	2.7	53.5	72905
015-020-016-000	37.2 (R)	2.8	34.3	70016
015-020-020-000	14.9 (R)	7.6	7.3	15002
015-020-021-000	13.9 (R)	2.0	11.9	15003
015-020-022-000	32.4 (R)	4.2	28.2	15005
015-030-006-000	70.4 (R)	6.2	64.2	72005
015-030-030-000	12.3 (R)	4.0	8.2	15006
015-030-031-000	13.4 (R)	7.1	6.3	15007
015-030-032-000	58.4 (R)	3.4	55.0	15008
Pacheco Pass				
Santa Clara County				
898-19-005	643.7 (R)	1.2	642.6	73.153
898-19-029	440.0 (R)	90.1	349.9	73.153

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
898-19-043	458.6 (R)	30.5	438.0	73.153
898-20-032	474.0 (R)	8.1	465.9	67.024
898-20-033	27.5 (R)	0.2	27.3	67.024
898-20-036	4.6 (R)	<0.1	4.6	67.024
898-20-042	484.0 (R)	6.6	477.3	67.024
898-20-043	551.7 (R)	11.0	540.7	67.024
898-37-004	198.8 (R)	0.5	198.2	72.143
898-60-004	61.7 (R)	0.9	60.8	72.145
San Benito County				
There are no protected farmland parcels.				
Merced County				
069-210-009-000	250.2 (R)	25.2	225.0	01019
069-210-010-000	324.4 (R)	40.4	284.0	01019
069-220-011-000	272.2 (R)	32.7	239.5	01019
069-230-003-000	602.8 (R)	19.7	583.1	01019
069-230-007-000	635.8 (R)	32.9	602.9	01019
069-230-012-000	288.7 (R)	75.6	213.2	01019
069-240-033-000	928.0 (R)	17.6	910.4	01019
070-090-004-000	88.9 (R)	10.9	78.0	1063
070-100-014-000	63.9 (R)	7.7	56.2	1063
San Joaquin Valley				
Merced County				
070-090-004-000	88.9 (R)	10.9	78.0	1063

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
070-202-017-000	22.0 (R)	1.1	20.9	000684
070-270-014-000	104.4 (R)	1.2	103.1	02007
070-270-018-000	1.8 (R)	1.0	0.9	000645
070-270-019-000	35.6 (R)	0.2	35.5	000645
070-270-020-000	64.9 (R)	<0.1	64.9	000645
073-160-008-000	78.1 (R)	0.1	78.0	01119
073-170-006-000	106.8 (R)	0.1	106.7	01120
073-170-010-000	91.0 (R)	3.9	87.1	01120
073-170-021-000	168.8 (R)	7.8	161.0	2000394
073-180-007-000	227.7 (R)	1.2	226.5	000277
073-180-031-000	18.8 (R)	<0.1	18.8	000696
073-190-002-000	108.4 (R)	5.3	103.1	01120
073-190-011-000	59.5 (R)	2.4	57.1	000277
073-200-013-000	56.7 (NR)	2.8	53.9	000306
073-200-022-000	53.4 (R)	4.5	48.9	01119
073-210-002-000	77.0 (R)	2.4	74.6	000664
073-380-003-000	546.6 (R)	10.2	536.4	000697
073-380-017-000	118.7 (R)	4.5	114.2	000697
073-380-027-000	57.1 (R)	9.0	48.1	000697
081-020-009-000	29.4 (R)	7.9	21.6	03021
081-060-060-000[a]	225.1 (R)	5.5	219.5	01108
085-290-006-000	95.0 (R)	9.0	86.1	000597
085-290-007-000	289.8 (R)	10.6	279.2	000697

APN by Subsection and County	Existing Parcel Size (acres) (Renewable (R) or Nonrenewable (NR))	Impact (acres)	Remainder Parcel Size (acres)	Williamson Act Contract Number
085-290-034-000	248.4 (R)	10.4	238.0	000697
085-290-035-000	243.0 (R)	3.9	239.0	000697
085-290-037-000	9.7 (R)	0.9	8.8	000697

Sources: County of Merced 2017, County of San Benito 2017, County of Santa Clara 2017
APN = assessor's parcel number
a Parcel 081-060-060-000 is recorded in different Merced County databases with different acreages: Assessor's Office records 221.5 acres, GIS department records 225.1 acres (the value used in this report), and the Williamson Act contract from 2001 records 223.2 acres. This may be the result of portions of road being included in gross acreage numbers which are not included in the taxable portion of the parcel.

Table 3 County Parcel Size Thresholds for Williamson Act Contracts (acres)

Counties	Prime[1]	Nonprime[1]
Santa Clara County	10	40
San Benito County	(1) 10 acres of orchards, vineyards or irrigated vegetable and field crops;(2) 40 acres of irrigated pasture or dry-land farmed land; (3) 160 acres of grazing land; or (4) a combination of actual acreage in any of the above categories, provided that the sum of the percentages in any of the above categories equals or exceeds 100%	
Merced County[2]	10	40

[1] Prime and nonprime refers to land on soils classified by Natural Resources Conservation Service as Prime or nonprime.

[2] As of August 18, 2009, Merced County Board of Supervisors determined that the County would no longer accept new land under Williamson Act contract because the State of California ceased tax reimbursement payments.

Table 4 Protected Farmland Remainder Parcels below County Thresholds by Project Alternative

Alternatives by Subsection and County	Williamson Act Land (acres)[1]		Williamson Act Land Parcels (count)	
	Renewal	Nonrenewal	Renewal	Nonrenewal
Alternative 1				
San Jose Diridon Station Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	456.8	100.2	25	7
San Benito County	21.9	—	3	—
Pacheco Pass				
Santa Clara County	32.0	—	2	—
San Benito County	—	—	—	—
Merced County	—	—	—	—
San Joaquin Valley				
Merced County	184.6	53.9	5	1
TOTAL	**695.3**	**154.1**	**35**	**8**
Alternative 2				
San Jose Diridon Station Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	460.9	122.7	25	10
San Benito County	21.9	—	3	—

Alternatives by Subsection and County	Williamson Act Land (acres)[1]		Williamson Act Land Parcels (count)	
	Renewal	Nonrenewal	Renewal	Nonrenewal
Pacheco Pass				
Santa Clara County	32.0	—	2	—
San Benito County	—	—	—	—
Merced County	—	—	—	—
San Joaquin Valley				
Merced County	184.6	53.9	5	1
TOTAL	**699.4**	**176.6**	**35**	**11**
Alternative 3				
San Jose Diridon Station Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	533.1	80.2	34	5
San Benito County	6.6	—	1	—
Pacheco Pass				
Santa Clara County	32.0	—	2	—
San Benito County	—	—	—	—
Merced County	—	—	—	—
San Joaquin Valley				
Merced County	184.6	53.9	5	1
TOTAL	**756.3**	**134.1**	**42**	**6**

Alternatives by Subsection and County	Williamson Act Land (acres)[1]		Williamson Act Land Parcels (count)	
	Renewal	Nonrenewal	Renewal	Nonrenewal
Alternative 4				
San Jose Diridon Station Approach				
Santa Clara County	—	—	—	—
Monterey Corridor				
Santa Clara County	—	—	—	—
Morgan Hill and Gilroy				
Santa Clara County	424.4	80.8	24	4
San Benito County	21.9	—	3	—
Pacheco Pass				
Santa Clara County	32.0	—	2	—
San Benito County	—	—	—	—
Merced County	—	—	—	—
San Joaquin Valley				
Merced County	184.6	53.9	5	1
TOTAL	**662.9**	**134.7**	**34**	**5**

Sources: County of Merced 2017, County of San Benito 2017, County of Santa Clara 2017
— = There are no parcels in this location.

References

County of Merced. 2017. Williamson Act Data. www.co.merced.ca.us/1624/Download-GIS-Data. (accessed September 2017).

County of San Benito. 2017. Williamson Act Data. Office of the Assessor. San Benito County Open Data.

County of Santa Clara. 2017. Williamson Act Data. Planning Office. http://gisdata2-sccplanning.opendata.arcgis.com/datasets/williamson-act-parcels-ongoing-contract. (accessed September 2017).

APPENDIX 3.17-A: CORRESPONDENCE

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- Added further correspondence from 2018 through July 2021 .

San Jose to Merced Section Interested Parties Consultation Log 2010 to Present

Consultation Date	Action	Interested Party	Description of Consultation
8/26/2010	Letter	History San Jose, Jim Reed	Consultant provides information about the project regarding the San Francisco to San Jose and San Jose to Merced Project Sections; specifically in regard to the San Jose to Merced Project Section, requesting information regarding historic properties/resources.
8/26/2010	Letter	San Jose Planning Division: Department of Planning, Building, and Code Enforcement, John Davidson	Consultant provides information about the project and some historic resources regarding the San Francisco to San Jose and San Jose to Merced Project Sections, and requests information and input regarding other historic properties/resources.
8/26/2010	Letter	Santa Clara County Department of Planning and Development, Dana Peak	Consultant provides information about the project and some historic resources in the project area regarding the San Francisco to San Jose and San Jose to Merced Project Sections, and requests information and input regarding historic properties/resources.
8/26/2010	Letter	Santa Clara County Historical and Genealogical Society	Consultant provides information about the project regarding the San Francisco to San Jose and San Jose to Merced Project Sections, and requests information and input regarding historic resources.
11/2/2015	Letter	Brisbane Planning Department, Community Development Department, John Swiecki (jswiecki@ci.brisbane.ca.us)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Burlingame Historical Society, Jennifer Pfaff (jjpf@pacbell.net)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	California Heritage Council, Christopher Layton	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	California Historical Society, Anthea Hartig PhD (ahartig@calhist.org)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	California Preservation Foundation, Cindy Heitzman	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Caltrans District 10, Ben Broyles (ben_broyles@dot.ca.gov)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.

Consultation Date	Action	Interested Party	Description of Consultation
11/2/2015	Letter	Caltrans District 4, Brett Rushing (brett.rushing@dot.ca.gov)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Caltrans District 5, Krista Kiaha (krista.kiaha@dot.ca.gov)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	History San Jose, Alida J. Bray (abray@historyjanjose.org)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Preservation Action Council San Jose	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Railroad Station Historical Society, Jim Dent (jdent1@optonline.net)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Redwood City Historic Resources Advisory Committee, Seth Adams (sadams@redwoodcity.org)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	San Jose Historical Landmarks Commission, Martina Davis	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	San Jose Planning Division Department of Planning, Building, and Code Enforcement, Jason Rogers	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	San Jose Planning Division Department of Planning, Building, and Code Enforcement, John Davidson	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Santa Clara County Department of Planning and Development, Kirk Girard (kirk.girard@pln.sccgov.org)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Santa Clara County Historical and Genealogical Society, Jane Harmer	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Santa Clara County Historical Heritage Commission, La'Tria Strother (latria.strother@cob.sccgov.org)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.

Consultation Date	Action	Interested Party	Description of Consultation
11/2/2015	Letter	Santa Clara Valley Transit Authority Planning and Program Development, Lauren Bobadilla (retired)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	Society of California Pioneers-Seymour Pioneer Museum Mercedes, Moore Devine (mmdevine@californiapioneers.org)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/2/2015	Letter	South Bay Historical Railroad Society, Inc. ([info@sbhrs.org)	Authority sends information and request for input to San Francisco to San Jose and San Jose to Merced Project Sections interested parties regarding the Merced to Fresno: Central Valley Wye.
11/16/2015	Email	Burlingame Historical Society - Jennifer Pfaff	Ms. Pfaff confirms intent to be a consulting party.
11/16/2015	Email	Brisbane Planning Department - Community Development Department - John Swiecki	Mr. Swiecki responds on behalf of Brisbane to become a consulting party.
12/14/2015	Email	Redwood City - Seth Adams	Seth Adams responds on behalf of Redwood City to become consulting party
12/17/2015	Teleconference	City of San Jose Planning Department, Jason Rogers, and San Jose Historical Landmarks Commission, Martina Davis	Jason Rogers (Planning Director for City of San Jose Planning Department) and Martina Davis (San Jose Historical Landmarks Commission) requested conference call with Authority in response to November 2, 2015, outreach letter regarding both San Francisco to San Jose and San Jose to Merced Project Sections. Davis and Rogers are working on the Diridon Station area and requested communication be maintained to ensure that best practices regarding historic preservation are well coordinated.
5/12/2016	Flyer attached; Email	AMardesich@cityofsancarlos.org	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Atherton Heritage Association (meo@rjoster.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Response: Delivery to these recipients or groups is complete, but no delivery notification was sent by the destination server.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Atherton Planning Department (hking@ci.atherton.ca.us)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Response: Tuesday, May 17, 2016 10:17 AM Thank you for your email. I am no longer working in the Town of Atherton as of May 12, 2016. I have taken a full time position in another jurisdiction. Please forward all planning related questions to Lisa Costa Sanders, lcostasanders@ci.atherton.ca.us Thank you Haleigh King
5/12/2016	Flyer attached; Email	Atherton Planning Department, Lisa Costa Sanders	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Belmont Planning and Zoning Division—Department of Community Development (cdemelo@belmont.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Brisbane Library, History Collection, Francisco (Vargas brisbane@smcl.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Burlingame Planning Division—Department of Community Development, Kevin Gardiner (kgardiner@burlingame.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	California Heritage Council (info@californiaheritagecouncil.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. The e-mail message could not be delivered because the user's mail folder is full.
5/12/2016	Flyer attached; Email	California Historical Society (ahartig@calhist.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	California Historical Society (Cadams@calhist.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	California Historical Society, Hugh Rowland (hrowland@calhist.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	California Pioneers of Santa Clara County (president@californiapioneers.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	California Preservation Foundation, Cindy Heitzman (cpf@californiapreservation.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message Subject: High-Speed Rail Community Open House Meetings Sent: Friday, May 13, 2016 12:32:54 AM (UTC) Coordinated Universal Time was read on Friday, May 13, 2016 12:32:48 AM (UTC) Coordinated Universal Time.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Caltrans District 4, Brett Rushing (brett.rushing@dot.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message To: Rushing, Brett@DOT Subject: High-Speed Rail Community Open House Meetings Sent: Thursday, May 12, 2016 3:37:16 PM (UTC-08:00) Pacific Time (US & Canada) was read on Friday, May 13, 2016 11:40:48 AM (UTC-08:00) Pacific Time (US & Canada).
5/12/2016	Flyer attached; Email	Caltrans District 5, Krista Kiaha (krista.kiaha@dot.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Caltrans Tripousis, Ben@HSR (Ben.Tripousis@hsr.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message To: Tripousis, Ben@HSR Subject: High-Speed Rail Community Open House Meetings Sent: Thursday, May 12, 2016 3:37:16 PM (UTC-08:00) Pacific Time (US & Canada) was read on Thursday, May 12, 2016 3:38:10 PM (UTC-08:00) Pacific Time (US & Canada).
5/12/2016	Flyer attached; Email	City of San Carlos—Planning Division, Lisa Porras (LPorras@cityofsancarlos.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Carlos, Jill Lewis (JLewis@cityofsancarlos.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	City of San Carlos, Laura Russell (LRussell@cityofsancarlos.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Carlos, Laurie Cudworth (LCudworth@cityofsancarlos.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Mateo, Ronald Munekawa (munekawa@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Mateo, Brittni Barron (bbarron@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Mateo, Darcy Forsell (dforsell@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Mateo, Gavin Moynahan (gmoynahan@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	City of San Mateo, Julia Klein (jklein@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Mateo, Lily Lim (llim@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Mateo, Roscoe Mata (rmata@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	City of San Mateo, Simon S. Vuong (svuong@cityofsanmateo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Gilroy Historic Heritage Commission (kelsey.heyd@ci.gilroy.ca.us)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Gilroy Historical Museum (gilroy.museum@ci.gilroy.ca.us)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Gilroy Historical Society (info@gilroyhistoricalsociety.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Greenmeadow Community Association (gmcainfo@gmail.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Hillsborough Planning Division, Elizabeth Cullinan (ecullinan@hillsborough.net)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Hillsborough Planning Division (vgrundmann@hillsborough.net)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Historic Preservation Society of Santa Clara/Harris-Lass House Museum (info@harrislass.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	History San Jose (abray@historyjanjose.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Holbrook Palmer Park Foundation/Holbrook Palmer Park (Pattieatthepark@yahoo.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Los Banos Genealogical Society (lbgensoc@gmail.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Los Banos Planning Department (sandra.benetti@losbanos.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Menlo Park Historical Association (mphistorical@yahoo.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Menlo Park Planning Division—Department of Community Development (planning@menlopark.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Merced County Historical Society Merced County Courthouse (Museum info@mercedmuseum.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Merced County Planning Department, Mark Hendrickson (MHendrickson@co.merced.ca.us)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Millbrae Historical Society/Millbrae Train Museum (mlb.lock@att.net)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	MMcNulty@cityofsancarlos.org	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Morgan Hill Historical Society (info@morganhillhistoricalsociety.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Morgan Hill Planning Division, Andrew Crabtree (andrew.crabtree@morganhill.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Mountain View Historical Society and the Mountain View History Center, Mountain View Public Library (historyroom@mountainviewhistorical.org; info@mountainviewhistorical.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Museum of American Heritage (mail@moah.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Museum of San Carlos History (scminfo@sancarloshistorymuseum.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Museum of the City of San Francisco, Gladys Hansen (curator@sfmusuem.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Palo Alto Department of Planning and Community Environment (planner@cityofpaloalto.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Palo Alto Historic Resources Board (hrb@cityofpaloalto.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Palo Alto Historical Association (steve.staiger@cityofpaloalto.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Palo Alto History Museum (info@paloaltohistorymuseum.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Annie Parker (Annie.Parker@hsr.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message Subject: High-Speed Rail Community Open House Meetings Sent: Thursday, May 12, 2016 3:37:16 PM (UTC-08:00) Pacific Time (US & Canada) was read on Thursday, May 12, 2016 4:06:19 PM (UTC-08:00) Pacific Time (US & Canada).
5/12/2016	Flyer attached; Email	Railroad Station Historical Society (jdent1@optonline.net)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Redwood City Planning and Housing Division—Department of Community Development (aaknin@redwoodcity.org; rcllh@redwoodcity.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Benito County Historical Society (info@sbchistoricalsociety.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Benito County Planning and Land Use Division (sbcplan@cosb.us)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	San Bruno History Room at the San Bruno Public Library, Tim Wallace (wallace@plsinfo.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Bruno Planning Division—Department of Community Development (dwoltering@sanbruno.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Francisco City and County Planning Department—Historic Preservation Program, Tina Tam (tina.tam@sfgov.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Francisco Heritage, Mike Buhler (mbuhler@sfheritage.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Francisco History Association (sfhaboard@sanfranciscohistory.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Francisco Museum and Historical Society (info@sfhistory.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	San Jose Preservation Action Council (info@preservation.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Mateo County—Planning and Building Department (plngbldg@smcgov.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	San Mateo County Historical Association/History Museum (info@historysmc.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Santa Clara Arts and Historical Consortium Headen-Inman House (jimnarveson@earthlink.net)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Santa Clara County Department of Planning and Development, Kirk Girard (kirk.girard@pln.sccgov.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message Subject: High-Speed Rail Community Open House Meetings Sent: Thursday, May 12, 2016 11:18:29 PM (UTC) Coordinated Universal Time was read on Thursday, May 12, 2016 11:18:23 PM (UTC) Coordinated Universal Time.
5/12/2016	Flyer attached; Email	Santa Clara County Historical and Genealogical Society (president@scchgs.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	Santa Clara County Historical Heritage Commission, La'Tria Strother (latria.strother@cob.sccgov.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message to Strother, La'Tria Subject: High-Speed Rail Community Open House Meetings Sent: Monday, May 16, 2016 4:08:01 PM (UTC) Coordinated Universal Time was read on Monday, May 16, 2016 4:07:56 PM (UTC) Coordinated Universal Time.
5/12/2016	Flyer attached; Email	Santa Clara Department of Planning and Inspection, Sharon Goei (Planning@santaclaraca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Santa Clara Historical and Landmarks Commission (historicallandmarkscommission@santaclaraca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Society of California Pioneers-Seymour Pioneer Museum (mmdevine@californiapioneers.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	South Bay Historical Railroad Society, Inc. (info@sbhrs.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Thursday, May 12, 2016 3:37 PM Delivery has failed to these recipients or groups
5/12/2016	Flyer attached; Email	South San Francisco Chestnut Avenue Museum (ssfhistorical@gmail.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/12/2016	Flyer attached; Email	South San Francisco Planning Division—Department of Economic and Community Development (web-ecd@ssf.net)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Sunnyvale Heritage Preservation Commission (heritagepreservation@sunnyvale.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Sunnyvale Historical Society—Sunnyvale Heritage Park Museum (info@heritageparkmuseum.org)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016	Flyer attached; Email	Sunnyvale Planning Division—Department of Community Development, Trudi Ryan (tryan@ci.sunnyvale.ca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.
5/12/2016		San Jose Planning Division and Historical Landmarks Committee - Martina Davis, Jason Rogers, Meenaxi Panakkal, John Davidson (Martina.Davis@sanjoseca.gov, jason.rogers@sanjoseca.gov, meenaxi.panakkal@sanjoseca.gov, john.davidson@sanjoseca.gov)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/13/2016	Flyer attached; Email	California Heritage Council, Dianne Rowe (dianerowe@aol.com)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message Subject: Read: High-Speed Rail Community Open House Meetings Sent: Friday, May 13, 2016 7:42:42 PM (UTC) Coordinated Universal Time was read on Friday, May 13, 2016 7:42:41 PM (UTC) Coordinated Universal Time.
5/16/2016	Flyer attached; Email	City of Gilroy Community Development Department, Sue O'Strander (Sue.OStrander@ci.gilroy.ca.us)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties. Your message Subject: High-Speed Rail Community Open House Meetings Sent: Monday, May 16, 2016 5:05:50 PM (UTC) Coordinated Universal Time was read on Monday, May 16, 2016 5:05:38 PM (UTC) Coordinated Universal Time
5/16/2016	Flyer attached; Email	Gilroy Planning Division Department of Community Development (sue.martin@ci.gilroy.ca.us)	In November of 2015, the Authority sent a letter with current information regarding the advancement of the project section between San Jose and Merced. We are continuing to move ahead and wanted to call attention to some community open house meetings that are planned this month specifically for the San Jose to Merced Project Section, which spans Santa Clara, San Benito, Merced, and Madera Counties.

Consultation Date	Action	Interested Party	Description of Consultation
5/17/2016	Flyer; Email	All Parties on the San Francisco to San Jose and San Jose to Merced Project Sections Interested Parties Lists	Good morning, In November of last year we sent you a letter, along with other local government planning departments, local government heritage/preservation commissions, and historical interest groups, with current information regarding the planning and development of the high-speed rail project section being advanced between San Francisco and San Jose. The purpose of this letter was to invite your participation in the cultural resources investigation that will be conducted in accordance with Section 106 of the National Historic Preservation Act, as well as the National Environmental Policy Act and the California Environmental Quality Act. We are continuing to move ahead with planning for this and other rail sections. I wanted to call your attention to some public scoping meetings that are planned this month specifically for the San Francisco to San Jose Project Section, which spans San Francisco, San Mateo, and Santa Clara Counties. Please see the attached flyer, which provides the dates and locations of the three meetings scheduled to occur this month. Public scoping meetings are a good way to learn more about the project and to speak directly with technical, environmental, and engineering staff. Lisa Costa Sanders (lcostasanders@ci.atherton.ca.us) was emailed separately because Haleigh King no longer works for City of Atherton. Delivery failed to: dpetrovich@ci.millbrae.ca.us; jimnarveson@earthlink.net; info@sbhrs.org;tryan@ci.sunnyvale.ca.gov; curator@sfmusuem.org; historyroom@mountainviewhistorical.org; info@californiaheritagecouncil.org.
5/18/2016	Email	Samantha Swan, Ann Calnan (Samantha.Swan@vta.org, Ann.Calnan@vta.org)	Email coordination to plan phone call regarding work in area where San Jose to Merced and San Francisco to San Jose Project Sections overlap.
1/26/2017	Phone call	William E. Hooker III	Ms. Scantlebury and Mr. Hooker discuss the San Joaquin Valley National Cemetery.
3/20/2017	Email	Burlingame Historical Society – Jennifer Pfaff	Ms. Pfaff requests copies of publications dealing with impacts/mitigation to areas of concern.
3/23/2017	Email	California Heritage Council California Historical Society California Pioneers of Santa Clara County California Preservation Foundation Gilroy Historic Heritage Commission Gilroy Historical Museum Gilroy Historical Society	Invite to Open Houses to be held in April and May 2017 for the San Jose to Merced Project Section.

Consultation Date	Action	Interested Party	Description of Consultation
		Gilroy Planning Division Department of Community Development History San Jose Los Banos Genealogical Society Los Banos Planning Department Merced County Historical Society Merced County Courthouse Museum Merced County Planning Department Morgan Hill Historical Society Morgan Hill Planning Division Railroad Station Historical Society San Benito County Historical Society San Benito County Planning and Land Use Division San Jose Historical Landmarks Commission San Jose Planning Division - Department of Planning, Building, and Code Enforcement San Jose Preservation Action Council Santa Clara Arts and Historical Consortium Headen-Inman House Santa Clara County Department of Planning and Development Santa Clara County Historical and Genealogical Society Santa Clara County Historical Heritage Commission Santa Clara Department of Planning and Inspection Santa Clara Historical and Landmarks Commission	

Consultation Date	Action	Interested Party	Description of Consultation
		Santa Clara Valley Transit Authority Planning and Program Development Society of California Pioneers-Seymour Pioneer Museum South Bay Historical Railroad Society, Inc.	
6/17/2017	Phone call	Morgan Hill Historical Society – Kathy Sullivan	Ms. Scantlebury and Ms. Sullivan discuss historic Villa Mira Monte.
6/27/2017	Email	Morgan Hill Historical Society – Kathy Sullivan	Ms. Scantlebury provides Ms. Sullivan with documents and regulations as a follow-up to their phone conversation
1/11/2018	Phone Call; Email	Brad Evanson, City of Gilroy Community Development Department	Ms. Scantlebury has a conversation with Mr. Evanson regarding historical resources in the city of Gilroy
1/17/2019	Meeting	Morgan Hill Historical Society – Kathy Sullivan	The Authority met with the Morgan Hill Historical Society to discuss Villa Mira Monte
1/31/2019	Email	Morgan Hill Historical Society – Kathy Sullivan	The Authority sent a post-meeting follow-up email regarding the NRHP nomination form for Villa Mira Monte
2/12/2019	Email	Bureau of Reclamation -- Scott Williams	Authority sent draft Archaeological Survey Report (ASR) for Pacheco Pass Geotech Investigations on US BOR Fee Land to USBOR for review and comment.
2/19/2019	Email	Bureau of Reclamation -- Scott Williams	US BOR approves ASR for Pacheco Pass Geotech Investigations.
2/21/2019	Email	FRA	Authority transmits DPR evaluation form for the SPRR Gilroy to S.F corridor to FRA for review and comment.
3/29/2021	Email	SHPO	Authority transmits DPR form for the SPRR Gilroy to S.F corridor to SHPO for review and comment.
4/10/2019	Email	SHPO	SHPO comments on the DPR form for the SPRR Gilroy to S.F corridor.
4/12/2019	Email	FRA	San Jose to Merced Draft ASR (Feb 2019) and Draft HASR (March 2019) to FRA for 30-day review and comment.
5/1/2019	Phone Call; Email	California Trolley & Railroad Corporation (CTRC)	Ms. Scantlebury contacted the CTRC regarding “Save the Coyote Depot.” No response was received.

Consultation Date	Action	Interested Party	Description of Consultation
5/15/2019	Phone Call; Email	South Bay Historical Railroad Society	Authority called and emailed regarding the updated DPR 523 form for the Southern Pacific Railroad, San Francisco to Gilroy; no response was received.
6/14/2019	Email	San Jose Historical Landmarks Commission – Martina Davis and Juliet Arroyo; VTA – Samantha Swan; City of Gilroy – Sue O'Strander; Morgan Hill Historical Society – Kathy Sullivan	Transmittal of the San Jose to Merced Project Section Historic Architectural Survey Report (HASR) for review and concurrence.
9/9/2019	Phone Call; Email	Morgan Hill Historical Society – Kathy Sullivan	Ms. Sullivan called the Authority to clarify that Villa Mira Monte is a recreational facility for Section 4(f) compliance and emailed supporting deed information to the Authority. Ms. Scantlebury also noted that Villa Mira Monte is not a National Historic Landmark and, therefore, is not protected under Section 110.
9/20/2019	Letter	Kathy Sullivan, Morgan Hill Historical Society 17860 Monterey Road P.O. Box 1258 Morgan Hill, CA 95038	Ms. Scantlebury contacted the Morgan Hill Historical Society to thank them for providing deed information on Villa Mira Monte and to provide an update on regulatory review with regards to the property.
1/29/2020	Email	Santa Clara Valley Transit Authority Planning and Program Development - Samantha Swan	Authority provides a response to Samantha Swan regarding specific parcels that were identified the JM HASR.
2/27/2020	Email, Letter	Advisory Council on Historic Preservation (ACHP) - Sarah Stokely; California Office of Historic Preservation (OHP) - Tristan Tozer; Federal Railroad Administration (FRA) - Stephanie B Perez; Surface Transportation Board (STB) - Office of Environmental Analysis - David Navecky; Santa Clara Valley Transit Authority Planning and Program Development - Samantha Swan; Morgan Hill Historical Society - Kathy Sullivan; Gilroy Planning Division Department of Community Development - Sue O'Strander; San Jose Historical Landmarks Commission - Juliet Arroyo	Authority transmits JM FOE to SHPO and consulting parties for review and comment.

Consultation Date	Action	Interested Party	Description of Consultation
5/1/2020	Email, Letter	Advisory Council on Historic Preservation (ACHP) - Sarah Stokely; California Office of Historic Preservation (OHP) - Tristan Tozer; Federal Railroad Administration (FRA) - Stephanie B Perez; Surface Transportation Board (STB) - Office of Environmental Analysis - David Navecky	Authority transmits notification of intent to make a *de minimis* impact determination under Section 4(f) for the San Martin Winery in San Martin.
4/14/2021	Email	ACHP	Authority notifies ACHP of potential adverse effects on J-M project section and invites ACHP to participate in consultation.
5/3/2021	Email	ACHP	ACHP notifies Authority that it is declining participation in consulting on the J-M project section.
6/2/2021	Email	SHPO, STB, San Jose Planning Division, Santa Clara County Department of Planning and Development, Santa Clara Valley Transit Authority Planning and Program Development, Gilroy Planning Division Department of Community Development, Morgan Hill Historical Society	Authority transmits the draft J-M MOA and BETP to signatory and consulting parties.
6/8/2021	Email	STB	STB indicated that it has no comment on the J-M MOA.
Statewide			
9/20/2017	Email	SHPO, FRA, STB, USACE, ACHP	Transmittal of the Draft Programmatic Agreement Annual Report to signatory parties for review and comment.
10/2/2017	Email	FRA, STB, USACE, SHPO, ACHP	Request for Programmatic Agreement Annual Reports teleconference per Programmatic Agreement Stipulation XVII.C.4.
10/23/2017	Phone Call; Meeting	FRA, STB, USACE, ACHP, SHPO	Authority hosted teleconference to discuss the Programmatic Agreement Annual Report, pursuant to Programmatic Agreement Stipulation XVII.C.4. There were no comments on the Programmatic Agreement report.
11/2/2017	Email	David Navecky, STB	David Navecky, STB, had no comments on the Programmatic Agreement Annual Report.
12/18/2017	Letter	SHPO	SHPO receives final versions of revised Programmatic Agreement Annual Report.
1/12/2018	Letter; Email	FRA, STB, USACE, SHPO, ACHP	Letter to signatory parties requesting comment on Authority's proposal to amend the Programmatic Agreement.

Consultation Date	Action	Interested Party	Description of Consultation
1/18/2018	Letter; Email	FRA, STB, SHPO	SHPO and FRA respond to Authority's request to amend the Programmatic Agreement.
1/30/2018	Letter	Elaine Jackson-Retondo, National Park Service, Pacific West Region	Notice of Authority's participation in FRA's NEPA Assignment program to National Park Service.
2/28/2018	Email	FRA	FRA concurs on Programmatic Agreement amendments but declines to be a signatory.
3/6/2018	Letter; Email	ACHP—Charlene Vaugh, Sarah Stokely	ACHP received notice on 01/12/18 regarding proposed amendments to the Programmatic Agreement and agrees that Programmatic Agreement needs revisions.
7/8/2018	Email	SHPO, FRA, ACHP, STB, USACE	Transmittal of Draft First Amended Programmatic Agreement Among the Surface Transportation Board, the United States Army Corps of Engineers, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority Regarding the Compliance with Section 106 of the National Historic Preservation Act As It Pertains to the California High-Speed Rail Project, May 2018 (Draft First Amended PA).
9/17/2018	Email, Letter	SHPO, FRA, STB, USACE, ACHP	Transmittal of Annual Report on the Programmatic Agreement for Compliance with Section 106 of the National Historic Preservation Act for review and comment.
10/8/2018	Email	SHPO	SHPO comments on the Annual Report on the Programmatic Agreement for Compliance with Section 106 of the National Historic Preservation Act.
11/30/2018	Letter; Email	SHPO	Transmittal of Authority's response to SHPO's comments on the draft PA Annual report.
12/17/2018	Letter, Email	SHPO	SHPO indicates that the Authority addressed its comments from 10/8/2021 on the PA Annual Report.
2/17/2019	Phone call	FRA	Authority provides program status update.
6/27/2019	Phone call	FRA	Authority provides program status update.
8/30/2019	Email, Letter	ACHP, SHPO, FRA, STB	Notification of Authority's proposed amendment to the Section 106 Programmatic Agreement.
10/11/2019	Email	SHPO	SHPO responds to the Authority's 8/30/2019 email notification and concurs that amending the PA is appropriate.
10/23/2020	Phone call	ACHP, SHPO	PA Amendment discussion.

Consultation Date	Action	Interested Party	Description of Consultation
11/23/2020	Meeting	ACHP, SHPO	Meeting with SHPO and ACHP to discuss an amendment to the PA.
2/23/2021	Meeting	ACHP, SHPO, FRA	Meeting to discuss PA Amendment, NEPA MOU, and duration extension.
3/1/2021	Meeting	STB	Meeting with STB to discuss PA Amendment.
3/16/2021	Meeting	FRA	Meeting to discuss PA Amendment.
5/18/2021	Email	SHPO	Ms. Polanco responded to Mr. Rushing sending a draft of the proposed PA Amendment.
5/18/2021	Meeting	ACHP, SHPO, FRA	Meeting to discuss PA Amendment.
5/25/2021	Email	FRA, ACHP, SHPO, STB	Katherine Zeringue takes an initial review of the draft PA Amendment and sees no red flags.
5/25/2021	Email	ACHP, SHPO, FRA	Transmitted draft minutes from the 5/18/2021 PA Amendment meeting to ACHP, SHPO, and FRA for review and comment.
6/1/2021	Email	FRA	FRA indicates that it intends to comment by June 11, 2021.
6/3/2021	Email	SHPO	Authority responds to SHPO request regarding legal authority under which the FRA assigned, and the Authority assumed the FRA's Section 106 responsibilities.
6/8/2021	Email	ACHP, STB, FRA	Authority sends an email to remind parties to comment. STB responds to email.
6/10/2021	Email	ACHP	ACHP comments on the PA Amendment.
6/14/2021	Email	FRA	FRA comments on the PA Amendment.
6/22/2021	Email	STB	STB comments on the PA Amendment.
6/25/2021	Email	ACHP, STB, FRA	Authority circulates final PA Amendment for signature.
7/21/2021	Email	ACHP, SHPO, FRA, STB	ACHP transmits the fully executed PA Amendment to the signatories.

SHPO = State Historic Preservation Officer
FRA = Federal Railroad Administration
STB = Surface Transportation Board
USACE = United States Army Corps of Engineers
ACHP = Advisory Council on Historic Preservation
NEPA = National Environmental Policy Act
HSR = high-speed rail

State of California • Natural Resources Agency
Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION
OFFICE OF HISTORIC PRESERVATION
Lisa Ann L. Mangat, *Director*

Julianne Polanco, State Historic Preservation Officer
1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

March 27, 2020 Reply in Reference To: FRA100524A

Brett Rushing
Cultural Resources Program Manager
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, CA 95814

Re: Request for Review and Comment on Findings Presented in the *San Jose to Merced Project Section, Section 106 Finding of Effect Report*, Prepared by ICF (February 2020)

Dear Mr. Rushing:

The California High-Speed Rail Authority (Authority) is continuing consultation with the State Historic Preservation Officer (SHPO) regarding the San Jose to Merced Project Section of the California High-Speed Rail (HSR) Program. This consultation is undertaken in accordance with the *2011 Programmatic Agreement Among the Federal Railroad Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority* (PA). The Authority is requesting SHPO comments on the *San Jose to Merced Project Section, Section 106 Finding of Effect Report* (FOE Report) prepared by ICF in February 2020 and on a finding of effect on 21 historic built properties and 33 archaeological resources.

The FOE Report assess effects on built environment and archaeological properties that would result from implementation of the Preferred Alternative for the San Jose to Central Valley Wye Project Extent (Preferred Alternative) of the California High-Speed Rail System. The Preferred Alternative consists of portions of the San Jose to Merced Project Section that extends from Scott Boulevard in San Jose to Carlucci Road in Merced County, the western limit of the Central Valley Wye. The Area of Potential Effects delineated for the San Jose to Merced Project Section Archaeological Survey Report (Authority and FRA 2019) and the San Jose to Merced Project Section Historic Architectural Survey Report (Authority and FRA 2019).

The Preferred Alternative has the potential to adversely affect five built environment historic properties, including three that would be demolished (the Madrone Underpass, Live Oak Creamery, and the Cozzi Family Property). Additionally, construction of new HSR station facilities would remove character-defining features and alter historic setting characteristics of the Southern Pacific Depot in San Jose and diminish the agricultural setting of the Negra Ranch. Mitigation Measures, such as a stipulation to involve stakeholders in the development of interpretive or educational materials, will be developed with consulting parties.

The FOE Report also concludes that the Preferred Alternative would potentially adversely affect two archaeological properties (CA-SCL-30/H and CA-338H) in the APE. Another 31 archaeological resources within the APE are assumed to be eligible for listing on the National Register of Historic Places, although formal evaluation of these resources is pending due to lack

of legal access to parcels and rights-of-way. The assessment of effects for all 33 resources will be phased in accordance with 36 CFR § 800.5(a)(3) and PA Stipulation VI.E and VIII.A.1.

Having reviewed your letter and the FOE Report, SHPO offers the following comments:

- SHPO concurs that, pursuant to 36 CFR § 800.5(a)(1) and (2), the Preferred Alternative has the potential to adversely affect the Southern Pacific Depot in San Jose, the Madrone Underpass, Live Oak Creamery, Negra Ranch, and the Cossi Family Property.

- SHPO concurs that, pursuant to 36 CFR § 800.5(b), the Preferred Alternative will have no adverse effect on the Santa Clara Railroad Complex, Sunlite Baking Co., San Martin Winery, Southern Pacific Station in Gilroy, Pacheco California Department of Forestry Station, and the Cottani Family Property.

- SHPO concurs that, pursuant to 36 CFR § 800.4(d)(1), the preferred alternative will have no effect on Pacific Intertie Transmission Line, Villa Mira Monte, Hoenck House, IOOF Orphanage School, Horace Wilson House, Ellis Ranch, Millers Canal, the California Aqueduct, the Delta Mendota Canal, and the San Joaquin & Kings River Main Canal.

- SHPO agrees that, per 36 CFR § 800.5(a)(3) and PA Stipulation VI.E and VIII.A.1., the phased application of the criteria of adverse effect on 33 archaeological resources identified in Table 2 of the Authority's February 28, 2020 letter is appropriate at this time.

- SHPO has no comments on the format or structure of the FOE Report.

If you have any questions or comments, contact State Historian Tristan Tozer at (916) 445-7027 or at Tristan.Tozer@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

APPENDIX 3.17-B: CULTURAL RESOURCES - SAN JOSE TO MERCED PROJECT SECTION TRIBAL OUTREACH AND CONSULTATION EFFORTS 2009–2021

APPENDIX 3.17-B: CULTURAL RESOURCES - SAN JOSE TO MERCED PROJECT SECTION TRIBAL OUTREACH AND CONSULTATION EFFORTS 2009–2021

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- Text was added to reflect the addition of the Tamien Nation as a Section 106 consulting party.

List of tribal governments and individuals contacted for the San Jose to Central Valley Wye Alternatives 2009 – 2018.

- Amah Mutsun Tribal Band—Valentin Lopez and Edward Ketchum; Jean-Marie Feyling
- Amah Mutsun Tribal Band of Mission San Juan Bautista—Irenne Zwierlein and Michelle Zimmer
- Barbareño/Ventureño Band of Mission Indians - Patrick "Pat" Tumamait
- California Valley Miwok Tribe
- Choinumni Tribe of Yokuts
- Cold Springs Rancheria of Mono Indians
- Costanoan Rumsen Carmel Tribe—Tony Cerda
- Chowchilla Tribe of Yokuts—Jerry Brown, Bart Topping, Chris Castro, and Tara Brown
- Dunlap Band of Mono Indians—Florence Dick, Mandy Marine
- Dumna Wo-Wah Tribal Government—Robert Ledger, Sr. and James Redmoon
- Fernandeño Tataviam Band of Mission Indians - Jairo Avila
- Gabrieleño Band of Mission Indians Kizh Nation - Andrew "Andy" Salas
- Gabrielino/Tongva Nation - Sam Dunlap
- Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) —Ann-Marie Sayers
- Juaneno Band of Mission Indians Acjachemen Nation - Joyce Perry
- Kern Valley Indian Community - Robert "Bob" Robinson
- Kings River Choinumni Farm Tribe—John Davis
- Muwekma Ohlone Indian Tribe of the SF Bay Area—Rosemary Cambra
- No Tribal Affiliation—Jakki Kehl
- No Tribal Affiliation—Angie “Yo-Wis-Nuth” Osborne
- No Tribal Affiliation—Linda G. Yamane
- No Tribal Affiliation—Kathleen Petty
- No Tribal Affiliation—Juanita Ingalls
- North Fork Mono Tribe—Ron Goode
- North Fork Rancheria of Mono Indians of California—Maryann McGovran and Christina McDonald
- North Valley Yokuts—Katherine Erolinda Perez

- Ohlone/Costanoan-Esselen Nation—Louise J. Miranda Ramirez
- Ohlone Indian Tribe—Andrew Galvan and Vincent Medina
- Pechanga Band of Luiseño Indians - Ebru Ozdil
- Picayune Rancheria of Chukchansi Indians—Claudia Gonzales and Mary Motola
- Salinan Nation Cultural Preservation Association—Jose Freeman, Gregg Castro, Robert Duckworth
- Salinan Tribe of Monterey and San Luis Obispo—Fred Segobia and Shirley Macagi
- Salinan-Chumash Nation—Xielolixii
- San Manuel Band of Mission Indians - Lee Clauss
- Santa Rosa Tachi Yokut Tribe—Ruben Barrios Sr. and Lalo Franco
- Soboba Band of Luiseño Indians - Joseph Ontiveros
- Southern Sierra Miwuk Nation—Lois Martin
- Table Mountain Rancheria—Leanne Walker-Grant and Robert Pennell
- Tamien Nation—Quirina Luna Geary
- Tejon Indian Tribe - Colin Rambo
- Trina Marine Ruano Family—Ramona Garibay
- Tule River Indian Tribe of California—Neil Peyron, Joseph Garfield, Kerri Vera, and Felix Christman
- Wuksache Indian Tribe/Eshom Valley Band—Kenneth Woodrow
- Xolon-Salinan Tribe—Johnny R. Eddy, Jr. and Donna Haro

Action	Date	Tribal Representative	Summary
Letter	3/1/2009	All California Tribes	Invitation to Scoping Meeting
Letter	9/17/2009	Statewide	Consultation request letter mailed to tribes listed in the Tribal Consultation Plan
Letter	10/1/2009	All California Tribes	In October 2009, letters were sent to individual contacts provided by NAHC
Phone Call	11/1/2009	All California Tribes	In November 2009, a phone call and a follow-up call were placed to each contact provided by the NAHC requesting comment or information.
Letter	2/25/2010	North Fork Rancheria of Mono Indians of California - Judy Elaine Bethel-Fink Picayune Rancheria of Chukchansi Indians - Durta Graham Santa Rosa Tachi Yokut Tribe - Clarence Atwell Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco Table Mountain Rancheria - Leanne Walker-Grant Tule River Indian Tribe of California - Ryan Garfield	FRA initiates Government-to-Government Consultation
Letter	3/16/2010	No Tribal Affiliation - Jakki Kehl Salinan Nation Cultural Preservation Association - Jose Freeman North Fork Rancheria of Mono Indians of California - Judy Elaine Bethel-Fink Southern Sierra Miwuk Nation - Les James Big Sandy Rancheria of Western Mono Indians of California - Elizabeth Hutchins-Kipp Trina Marine Ruano Family - Ramona Garibay North Fork Mono Tribe - Ron Goode Salinan Tribe of Monterey and San Luis Obispo Counties - Shirley Macagni Cold Springs Rancheria of Mono Indians - Travis Coleman Cold Springs Rancheria of Mono Indians - Tina Williams Table Mountain Rancheria - Robert Pennell Table Mountain Rancheria - Leanne Walker-Grant	Initiation of Native American Tribal Government Consultation

Action	Date	Tribal Representative	Summary
		Xolon-Salinan Tribe - Donna Haro Cold Springs Rancheria of Mono Indians - Carol Bill Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers Southern Sierra Miwuk Nation - Anthony Brochini Sierra Nevada Native American Coalition - Lawrence Bill No Tribal Affiliation - Angie "Yo-Wis-Nuth" Osborne Dunlap Band of Mono Indians - Florence Dick Dunlap Band of Mono Indians - Mandy Marine Dumna Wo-Wah Tribal Government - Karin Wilson Kirkendal Dunlap Band of Mono Indians Kings River Choinumni Farm Tribe - John Davis Table Mountain Rancheria - Michael Russell	
Meeting	7/22/2010	No Native American representatives attended.	Communication Meeting for all interested tribal members. Organized meeting in Visalia to allow a forum for the community to provide feedback. No Native American representatives attended.
Teleconference	8/16/2010	Amah Mutsun Tribal Band; Big Sandy Rancheria of Western Mono Indians of California; Choinumni Tribe of Yokuts; Dumna Wo-Wah Tribal Government	Tribal Information Meeting Consultation Meeting for all interested tribal members. Authority and FRA representatives presented project information.
Letter	9/15/2010	Amah Mutsun Tribal Band - Valentin Lopez and Edward Ketchum Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein Chowchilla Tribe of Yokuts - Jerry Brown Dumna Wo-Wah Tribal Government - James Redmoon Dumna Wo-Wah Tribal Government - Keith Turner Wuksache Indian Tribe/Eshom Valley Band - Kenneth Woodrow Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers Native American Advisory Council to CAL FIRE - Patricia Ann Murphy Brattland	Tribal Meeting to Review the California High-Speed Train Project, San Jose to Merced.

Action	Date	Tribal Representative	Summary
		Muwekma Ohlone Indian Tribe of the SF Bay Area - Rosemary Cambra Sierra Nevada Native American Coalition - Lawrence Bill North Fork Rancheria of Mono Indians of California - Judy Elaine Bethel-Fink North Valley Yokuts - Katherine Erolinda Perez No Tribal Affiliation - Jakki Kehl Southern Sierra Miwuk Nation - Anthony Brochini Southern Sierra Miwuk Nation - Jay Johnson Southern Sierra Miwuk Nation - Les James Ohlone Indian Tribe - Andrew Galvin Trina Marine Ruano Family - Ramona Garibay Amah Mutsun Tribal Band - Jean-Marie Feyling Xolon-Salinan Tribe - Donna Haro Salinan Tribe of Monterey and San Luis Obispo Counties - Shirley Macagni Salinan Nation Cultural Preservation Association - Jose Freeman	
Teleconference	9/29/2010	Amah Mutsun Tribal Band - Valentin Lopez	Tribal coordination conference call. Tribe discussed concerns regarding alignment and proximity to sites, issues with access to land/incomplete survey, and tribal monitor list.
Meeting	10/11/2010	Amah Mutsun Tribal Band - Valentin Lopez No Tribal Affiliation - Jakki Kehl; No Tribal Affiliation - Linda G. Yamane; No Tribal Affiliation - Kathleen Petty; No Tribal Affiliation - Juanita Ingalls; North Fork Mono Tribe - Ron Goode	Tribal Coordination Meeting. Overview of statewide project, section specific project discussion, discussion of archaeology currently in prelim phase, PA still under development.
Meeting	10/12/2010	North Fork Mono Tribe - Ron Goode	Tribal Coordination Meeting. Project alignment described, potential for site disturbances addressed. Only Ron Goode, North Fork Mono Tribe, attended meeting.
Letter	12/6/2010	All Federally Recognized Tribes	Invitation for Federally-Recognized Tribes to Participate in Dec 15, 2010 teleconference.

Action	Date	Tribal Representative	Summary
Teleconference; Phone Call	12/15/2010	Pechanga Band of Luiseno Indians; Santa Rosa Tachi Yokut Tribe; Soboba Band of Luiseno Indians	Teleconference included FRA, ACHP, SHPO, and Federally recognized tribes (all Federally recognized tribes were invited but only Pechanga, Santa Rosa Tachi Yokuts, and Soboba participated). This was an informal meeting to discuss the 106 approach and solicit input from tribes.
Presentation	1/8/2011	Amah Mutsun Tribal Band	Informational presentation held for the Amah Mutsun Tribal Band. Discussed critical issues and anticipated next steps related to outreach.
Teleconference	1/19/2011	All California Tribes	Teleconference included FRA, ACHP, SHPO and Federally recognized tribes. FRA hosted an informal tribal teleconference to discuss comments on the draft PA and next steps.
Letter; Email	3/24/2011	San Luis Rey Band of Mission Indians - Merri Lopez-Keifer, Esq.	Tribe formally requests to participate in drafting statewide PA.
Phone Call	4/13/2011	Santa Rosa Tachi Yokut Tribe - Ruben Barrios and Clarence Atwell	Consultant conducts outreach. Left voicemail.
Phone Call	4/14/2011	North Fork Rancheria of Mono Indians of California - Judy Elaine Bethel-Fink	Consultant spoke with Bethel-Fink by phone to discuss her availability to attend future meetings.
Phone Call	4/18/2011	Santa Rosa Tachi Yokut Tribe - Ruben Barrios	Consultant conducts outreach. Left voicemail 4/18. 4/26, 4/28/2011.
Letter	5/16/2011	Santa Rosa Tachi Yokut Tribe - Clarence Atwell Amah Mutsun Tribal Band - Edward Ketchum	Consultant mailed letter.
Letter	5/18/2011	Amah Mutsun Tribal Band - Edward Ketchum	Consultant mailed letter.
Letter	5/20/2011	Santa Rosa Tachi Yokut Tribe - Clarence Atwell	Tribe confirms receipt of letter sent by consultant on 5/16/2011.
Letter	5/27/2011	All California Federally Recognized Tribes	Letter sent from FRA to federally recognized tribes in California invites tribes to meet with the FRA to consult about the HSR System between June 20 and 24, 2011.
Memo	5/31/2011	Amah Mutsun Tribal Band	This memorandum from ICF to Bryan Porter summarized the 1/8/2011 meeting with the Amah Mutsun Tribal Band regarding the San Jose to Merced Project Section.
Phone Call	12/9/2011	Santa Rosa Tachi Yokut Tribe - Ruben Barrios Table Mountain Rancheria - Robert Pennell Amah Mutsun Tribal Band - Edward Ketchum	Consultant conducts outreach. Left voicemail.

Action	Date	Tribal Representative	Summary
Letter	12/28/2011	All California Federally Recognized Tribes	Letter from FRA to California federally recognized tribes summarizes the 12/15/2010, conference call and issues an invitation to a second telephone conference planned for 1/19/2011. The draft PA was enclosed with this letter, and the FRA invited participation in the PA's development, as well as the forthcoming draft MOA.
Phone Call	1/5/2012	Amah Mutsun Tribal Band - Valentin Lopez Table Mountain Rancheria - Robert Pennell	Phone call to Chairman Lopez to introduce Ms. Allred. Chairman Lopez plans to attend the informational meeting on 1/10/2012. Mr. Pennell invited to the Jan 2012 meeting.
Phone Call	1/18/2012	Dumna Wo-Wah Tribal Government - Robert Ledger Sr.	Chairman Ledger called consultant to request project update.
Phone Call	2/21/2012	Amah Mutsun Tribal Band - Valentin Lopez	Chairman Lopez called to confirm his comments were received on the Environmental Document (the Bay Area to Central Valley Partially Revised Draft Program EIR). Ms. Allred called Chairman Lopez the morning of 2/22/2012 to confirm that his comments had been received.
Phone Call	2/27/2012	Amah Mutsun Tribal Band - Valentin Lopez	Chairman Lopez called to request meeting to review draft Environmental Document (the Bay Area to Central Valley Partially Revised Draft Program EIR).
Email	2/27/2012	Amah Mutsun Tribal Band - Valentin Lopez	Ms. Allred emails Chairman Lopez with information regarding schedule to comment on environmental documents.
Phone Call	3/7/2012	Amah Mutsun Tribal Band - Valentin Lopez	Chairman Lopez called to reschedule meeting to discuss draft documents.
Letter	3/7/2012	Amah Mutsun Tribal Band - Valentin Lopez	Chairman Lopez emails Ms. Allred a draft Tribal Treatment Plan and requests confidentiality agreement be signed between Tribe and the HSR.
Meeting	3/14/2012	Amah Mutsun Tribal Band - Valentin Lopez	Chairman Lopez discusses the concerns of the Amah Mutsun Tribe with regard to JM, which Chairman Lopez indicated as the project section that is of most concern to his tribe.
Presentation; Meeting	5/16/2012	Caltrans Native American Advisory Committee - (NAAC)	Quarterly Meeting, held in Woodland, an overview of the high-speed rail program and tribal participation was presented to NAAC members.
Presentation; Meeting	6/12/2012	Bureau of Indian Affairs; All Federally Recognized Tribes - Central Valley Yokut Tribes	BIA Central CA Tribal Leadership 2012 Meeting. An overview of the HSR program and tribal participation was presented at the meeting. Representatives of federally recognized central valley tribes were in attendance.

Action	Date	Tribal Representative	Summary
Meeting	6/13/2012	California Native American Heritage Commission (NAHC)	Native American Heritage Commission (NAHC) Quarterly Meeting. Overview and status of the high-speed rail program and tribal involvement were presented to the commissioners and public participants at the meeting.
Presentation; Meeting	8/1/2012	Caltrans Native American Advisory Committee - (NAAC)	Quarterly NAAC meeting where Ms. Allred and Mr. Martinez presented information about HSR.
Letter	8/13/2012	All California Tribes; Statewide	List of tribes was obtained from NAHC for purposes of statewide tribal outreach for the high-speed rail program.
Letter	8/20/2012	All California Tribes; Statewide	Letter prepared collaboratively by Ms. Allred and Mr. Dave Singleton of the NAHC. The purpose of the letter was to heighten awareness and encourage tribal participation in the high-speed rail program (not section specific).
Letter	2/8/2013	Santa Rosa Tachi Yokut Tribe - Shana Powers	Transmittal of ASR addendum and Geoarchaeology maps sent to Ms. Powers, per her request.
Presentation	3/20/2013	Caltrans Native American Advisory Committee - (NAAC)	Presentation at the Caltrans Quarterly NAAC meeting in Woodland, CA providing an update and status of the HSR project to the NAAC participants.
Email	3/21/2013	Picayune Rancheria of Chukchansi Indians - Nancy Ayala	Mr. McLoughlin sent detailed email to Ms. Ayala in response to an inquiry she made to Rep. Denham's office regarding concerns about the treatment of human remains if discovered during construction.
Phone Call	4/12/2013	Table Mountain Rancheria - Robert Pennell	Mr. Pennell requests copies of technical documents.
Phone Call	4/24/2013	Amah Mutsun Tribal Band - Valentin Lopez	Phone conversation between Mr. Sharp and Chairman Lopez regarding Tribe's concerns about cultural resources that may be affected by the project.
Email	4/25/2013	Amah Mutsun Tribal Band - Valentin Lopez	Email documenting previous day's phone conversation re: Chairman Lopez's concerns about tribal cultural resources that may be affected by the project.
Presentation	5/8/2013	Caltrans Native American Advisory Committee - (NAAC)	Presentation at the Caltrans Quarterly NAAC meeting in Woodland, CA providing an update and status of the HSR project to the NAAC participants.
Letter; Email	5/9/2013	Table Mountain Rancheria - Robert Pennell	Mr. Sharp mailed several cultural technical reports to Mr. Pennell, per his request.

Action	Date	Tribal Representative	Summary
Phone Call	5/9/2013	Amah Mutsun Tribal Band - Valentin Lopez	Email from Ms. Allred documenting phone conversation with Chairman Lopez and proposing several potential dates to meet to examine alignment maps.
Email	5/9/2013	Table Mountain Rancheria - Robert Pennell	Ms. Allred responded to an email from Mr. Pennell, who asked what Caltrans' involvement is in the HSR project. Ms. Allred explained that Caltrans is not a part of CAHSRA.
Email	5/21/2013	Amah Mutsun Tribal Band - Valentin Lopez	Follow-up email to Chairman Lopez regarding setting up a meeting to discuss his tribe's concerns.
Email	6/5/2013	Table Mountain Rancheria - Robert Pennell Tule River Indian Tribe of California - Neil Peyron	Invitation to view technical reports and other documents electronically in SharePoint.
Presentation and Conference	6/12/2013	Bureau of Indian Affairs	Bureau of Indian Affairs, Central California Tribal Leadership Conference. Carol Farris, CalSTA, gave a brief presentation about HSR on behalf of the Authority.
Meeting	6/18/2013	Amah Mutsun Tribal Band - Edward Ketchum, Valentin Lopez, and Darcie L. Houck, Esq.	Meeting held to discuss the tribe's concerns about the HSR project's potential effects to cultural resources.
Presentation; Meeting	6/26/2013	Picayune Rancheria of Chukchansi Indians; Santa Rosa Tachi Yokut Tribe; Table Mountain Rancheria; Tule River Indian Tribe of California	Meeting at the Tule River Reservation with several representatives of the Central Valley Yokuts Tribes whereby the Authority and FRA presented a general overview of the HSR project and discussed the project's status and schedule for the Central Valley.
Meeting	6/26/2013	Tule River Indian Tribe of California - Irma Hunter, Kevin Bonds, Rhoda Hunter, Roxanne Bartt, Wendi Correa, Yolanda Gibson Charmaine McDarment and Joseph Garfield; Table Mountain Rancheria - Cristina Gonzales, Robert Pennell, Beverly J. Hunter, Mathew Jones; Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco, Pete Alanis, Shana Powers; Picayune Rancheria of Chuckchansi - Jane Wyatt; Picayune Rancheria of Chuckchansi - Charles Sargesa;	NAGPRA Tribal Group Meeting (Central Valley Federal Yokuts Tribes), held in Porterville (Tule River Indian Reservation).
Face to Face Meeting	6/26/2013	Tule River Indian Tribe of California - Kerri Vera, Neil Peyron, and Joseph Garfield	Tribal representatives verbally indicated that they wished to be a consulting party for the FB, MF, and JM project sections.
Meeting	6/27/2013	Bureau of Indian Affairs	Bureau of Indian Affairs, Central California Tribal Leadership Conference. Carol Farris, CalSTA, gave a brief presentation about HSR on behalf of the Authority.

Action	Date	Tribal Representative	Summary
Email	7/5/2013	Amah Mutsun Tribal Band - Valentin Lopez	Email to Chairman Lopez indicating that the Authority is still working mapping.
Email	7/8/2013	Picayune Rancheria of Chukchansi Indians; Table Mountain Rancheria; Tule River Indian Tribe of California; Santa Rosa Tachi Yokut Tribe	Email to Central Valley Yokuts Tribes providing a written summary of the meeting that took place on 06/26/13.
Letter/Verbal	7/10/2013	Picayune Rancheria of Chukchansi Indians Tex McDonald and Tricia Attard	Tribe formally requests to be a consulting party for the FB, MF, and JM project sections
Email	7/16/2013	Santa Rosa Tachi Yokut Tribe - Shana Powers	Email exchange between Ms. Powers and Ms. Allred regarding mapping and confidentiality.
Email	7/17/2013	Amah Mutsun Tribal Band - Edward Ketchum, Valentin Lopez, and Darcie L. Houck, Esq.	Tribe invited to view preliminary maps at the Authority office in Sacramento.
Email	7/18/2013	Tule River Indian Tribe of California - Joseph Garfield	Email exchange with Mr. Garfield to confirm the points of contact for his tribe.
Email	7/24/2013	Picayune Rancheria of Chukchansi Indians - Nancy Ayala; Picayune Rancheria of Chukchansi Indians - Tricia Attard; Picayune Rancheria of Chukchansi Indians - Samuel Elizondo; Picayune Rancheria of Chukchansi Indians - Tracy Brechbuehl; Table Mountain Rancheria - Robert Pennell	Authority confirms Tribe's request to become a consulting party.

Action	Date	Tribal Representative	Summary
Letter	7/24/2013	Amah Mutsun Tribal Band - Jean-Marie Feyling Amah Mutsun Tribal Band - Edward Ketchum Amah Mutsun Tribal Band - Valentin Lopez Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein Salinan Nation Cultural Preservation Association - Doug Alger Salinan Nation Cultural Preservation Association - Gregg Castro Ohlone Indian Tribe - Andrew Galvin Xolon-Salinan Tribe - Johnny R. Eddy, Jr. Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers Trina Marine Ruano Family - Ramona Garibay North Valley Yokuts - Katherine Erolinda Perez Muwekma Ohlone Indian Tribe of the SF Bay Area - Rosemary Cambra Salinan Nation Cultural Preservation Association - Robert Duckworth Salinan-Chumash Nation – Xielolixii No Tribal Affiliation - Jakki Kehl	Letter to local tribes providing an update regarding the status of the cultural resources studies for the MF section and the SJ-M Wyes area.
Presentation	7/31/2013	Caltrans Native American Advisory Committee - (NAAC)	Presentation at the Caltrans Quarterly NAAC meeting in Valley Center (in Southern CA) providing an update and status of the HSR project to NAAC members who represent tribal governments statewide.
Email	8/6/2013	Tule River Indian Tribe of California - Kerri Vera	Email exchange with Ms. Vera regarding coordinating a time to meet with the tribe to discuss cultural resources concerns along the alignment.
Email	8/7/2013	San Pasqual Band of Mission Indians - Tracy Blue	Ms. Allred replied to an email from Mr. Blue regarding his inquiry about the Authority's small business enterprise program.
Email	8/7/2013	Caltrans Native American Advisory Committee - (NAAC)	Ms. Allred sent an email with a variety of information about the Authority's Small/Disadvantaged Business program for distribution to all the members of the NAAC.

Action	Date	Tribal Representative	Summary
Email	8/8/2013	Santa Rosa Tachi Yokut Tribe - Shana Powers	Email response to Ms. Powers providing project update information and right-of-way access status
Email; Announcement	8/13/2013	Santa Rosa Tachi Yokut Tribe - Shana Powers, Hector "Lalo" Franco; Picayune Rancheria of Chukchansi Indians - Nancy Ayala; Picayune Rancheria of Chukchansi Indians - Tracy Brechbuehl; Picayune Rancheria of Chukchansi Indians - Samuel Elizondo; Picayune Rancheria of Chukchansi Indians - Tricia Attard; Tule River Indian Tribe of California - Charmaine McDarment - Joseph Garfield, Neil Peyron, Kerri Vera; Table Mountain Rancheria - Robert Pennell	Ms. Allred provided information about upcoming job training for High-Speed Rail building and construction jobs.
Email	8/21/2013	Table Mountain Rancheria - Robert Pennell	Ms. Allred replied to an email inquiry from Mr. Pennell who asked for copies of any new cultural reports.
Email	8/28/2013	Big Sandy Rancheria of Western Mono Indians of California; Chowchilla Tribe of Yokuts; Cold Springs Rancheria of Mono Indians; Dumna Wo-Wah Tribal Government; Pechanga Band of Luiseno Indians; North Fork Mono Tribe; North Fork Rancheria of Mono Indians of California; San Pasqual Band of Mission Indians; Santa Rosa Tachi Yokut Tribe; Picayune Rancheria of Chukchansi Indians; Table Mountain Rancheria; Tule River Indian Tribe of California; Wuksache Indian Tribe/Eshom Valley Band	Email to several representatives of tribes with whom Ms. Allred had been recently working to encourage them to participate in the CalSTA's Tribal Listening Forum to be held on 8/28/2013 to help provide input to the agency's tribal consultation policy that is going to be developed.
Email	8/29/2013	Santa Rosa Tachi Yokut Tribe - Shana Powers	Email follow-up to Ms. Powers to inquire if they would still like to meet with the Authority to review project maps and identify areas of sensitivity.
Meeting	9/3/2013	All California Tribes	CalSTA Tribal Consultation Policy Listening Forum
GIS shape files on CD; Letter; Email	9/19/2013	Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco and Shana Powers; Tule River Indian Tribe of California - Joseph Garfield, Kerri Vera, Neil Peyron; Picayune Rancheria of Chukchansi Indians - Nancy Ayala; Picayune Rancheria of Chukchansi Indians - Tracy Brechbuehl; Picayune Rancheria of Chukchansi Indians - Samuel Elizondo; Picayune Rancheria of Chukchansi Indians - Tricia Attard; Table Mountain Rancheria - Robert Pennell	Transmittal of GIS shape files for the Wye, MF, and FB sections.

Action	Date	Tribal Representative	Summary
Email	10/10/2013	Amah Mutsun Tribal Band - Valentin Lopez	Follow-up to 7/17/2013 email sent by Ms. Allred to Chairman Lopez whereby Ms. Allred offered to arrange a meeting to discuss the tribe's concerns about cultural resources in JM Project Section
Presentation; Meeting	10/23/2013	Caltrans Native American Advisory Committee - (NAAC)	Caltrans Native American Advisory Committee (NAAC) meeting. The Authority's Small Business Advocate, Robert Padilla, gave a presentation about Small/Disadvantaged Business and employment opportunities on the HSR Project.
Meeting	10/25/2013	Amah Mutsun Tribal Band - Valentin Lopez and Edward Ketchum	Meeting to discuss the tribe's concerns about affects to cultural resources along the JM Project Section.
Email; Letter	11/6/2013	Amah Mutsun Tribal Band - Valentin Lopez	Email summarizing the meeting and action items from the 10/25/2013 meeting with the tribe. In addition, a letter was sent to Chairman Lopez inviting his tribe to be a formal Section 106 Consulting Party for the JM section of the HSR project.
Email	11/14/2013	Amah Mutsun Tribal Band; Big Sandy Rancheria of Western Mono Indians of California; Chowchilla Tribe of Yokuts; Cold Springs Rancheria of Mono Indians; Dumna Wo-Wah Tribal Government; North Fork Rancheria of Mono Indians of California; Pechanga Band of Luiseno Indians; Tule River Indian Tribe of California; Picayune Rancheria of Chukchansi Indians; Table Mountain Rancheria; Santa Rosa Tachi Yokut Tribe; North Fork Mono Tribe; Bishop-Paiute Tribe - Tracy Blue; San Pasqual Band of Mission Indians; Wuksache Indian Tribe/Eshom Valley Band	Purpose of email was to bring to the tribes' attention the CA State Transportation Agency's (CalSTA's) comment period for their newly released Draft Consultation Policy.
Presentation	1/17/2014	California Native American Heritage Commission (NAHC)	California Native American Heritage Commission (NAHC) Quarterly Meeting. A brief presentation was made to the NAHC.
Meeting	3/12/2014	Caltrans Native American Advisory Committee - (NAAC)	The Authority provided an update/status of the high-speed rail project for NAAC members.
Meeting	5/28/2014	Caltrans Native American Advisory Committee - (NAAC)	The Authority provided an update/status of the high-speed rail project for NAAC members.

Action	Date	Tribal Representative	Summary
Letter; Email	6/18/2014	Amah Mutsun Tribal Band; Big Sandy Rancheria of Western Mono Indians of California; Choinumni Tribe of Yokuts; Chowchilla Tribe of Yokuts; Cold Springs Rancheria of Mono Indians; North Fork Mono Tribe; North Fork Rancheria of Mono Indians of California; North Valley Yokuts; Picayune Rancheria of Chukchansi Indians; Santa Rosa Tachi Yokut Tribe; Southern Sierra Miwuk Nation; Table Mountain Rancheria; Tule River Indian Tribe of California; Wuksache Indian Tribe/Eshom Valley Band; Sierra Nevada Native American Coalition; Dumna Wo-Wah Tribal Government	An invitation letter to upcoming Tribal Informational Meeting hosted by the Authority for the Central Valley Wye portion of the project.
Meeting	8/27/2014	Caltrans Native American Advisory Committee - (NAAC)	The Authority provided an update/status of the high-speed rail project, as well as a system-wide overview of the project.
Letter; Email	9/12/2014	Caltrans Native American Advisory Committee - (NAAC)	Ms. Allred sent email to NAAC Chairman Myers addressing high-speed rail small business goals and employment opportunities for tribes.
Email	10/9/2014	Statewide - To all tribal representatives/consulting parties with whom Authority and FRA have been working on the high-speed rail project for all sections.	Notification to tribes statewide that that the California State Transportation Agency will be hosting a Tribal Consultation meeting to discuss matters of concern to the tribal community.
Presentation	10/17/2014	California Native American Heritage Commission (NAHC)	Presentation to the Commissioners of the CA Native American Heritage Commission during the public session of their quarterly meeting.
Presentation	11/12/2014	Caltrans Native American Advisory Committee - (NAAC)	Authority staff gave an overview and update of the high-speed rail program to the NAAC, which includes representatives from tribes statewide.
Meeting	11/20/2014	Statewide	The Governor's quarterly agency/department tribal liaison meeting involves updates and info from the Office of the Governor's Tribal Liaison regarding agency tribal consultation policies, legislative updates, and training opportunities.
Presentation; Meeting	2/18/2015	Caltrans Native American Advisory Committee - (NAAC)	Caltrans Native American Advisory Committee (NAAC) members and agency representatives. Authority staff gave an overview and update of the high-speed rail program.
Conference call	5/13/2015	Caltrans Native American Advisory Committee - (NAAC)	Caltrans Native American Advisory Committee (NAAC) members and agency representatives. Authority staff gave an overview and update of the high-speed rail program.

Action	Date	Tribal Representative	Summary
Presentation/ Discussion	6/18/2015	Statewide	Statewide tribal consultation meeting hosted by CA State Transportation Agency
Email	6/26/2015	Amah Mutsun Tribal Band - Valentin Lopez	Follow-up information sent to Chairman Lopez in response to concerns raised at the June 18th 2015 CalSTA Tribal Consultation Meeting.
Email	6/26/2015	Cahto Tribe of Laytonville California - Aaron Oliver	Follow up to questions raised at the June 18th CalSTA Tribal Consultation Meeting regarding tribal employment opportunities on the high-speed rail project.
Letter	6/28/2015	Ohlone/Costanoan-Esselen Nation - Louise J. Miranda Ramirez	Tribe requests formal notification of proposed projects under CEQA within the Ohlone/Costanoan—Esselen Nation's Geographic Area of Traditional and Cultural Affiliation.
Email	7/6/2015	California Native American Heritage Commission (NAHC)	Ms. Allred requests updated tribal contact list and Sacred Lands File search for Santa Clara, San Benito, and Merced Counties.
Presentation/ Discussion	8/12/2015	Statewide	Caltrans Native American Advisory Committee (NAAC) members and agency representatives. Authority staff gave an overview and update of the high-speed rail program.
Letter	8/21/2015	California Native American Heritage Commission (NAHC)	NAHC conducts search of the Sacred Lands File and provides contact list.
Letter	8/27/2015	Salinan Tribe of Monterey and San Luis Obispo Counties - Fred Segobia	Tribe formally requests participation in project planning process in accordance with AB 52.
Letter	9/15/2015	California Native American Heritage Commission (NAHC)	NAHC conducts partial search of the Sacred Lands File and provides contact list for JM project section (Santa Clara, San Benito and Merced Counties)
Letter; Email	10/5/2015	Amah Mutsun Tribal Band - Valentin Lopez	Information sharing and request for input/participation
Email; Letter	10/6/2015	All Tribes on the NAHC Contact List - San Francisco to San Jose; All Tribes on the NAHC Contact List - San Jose to Merced	Announcement/Notification in writing of program overview and tribal participation information.
Meeting; Presentation	11/18/2015	Caltrans Native American Advisory Committee - (NAAC)	The Authority has a recurring slot on the NAAC meeting agenda and provides project status and updates to the committee to help keep the tribal community informed, as well as to raise awareness; encourage tribal participation, and lay the groundwork for future consultations with tribes.

Action	Date	Tribal Representative	Summary
Meeting	12/17/2015	Amah Mutsun Tribal Band - Edward Ketchum, Valentin Lopez, and Darcie L. Houck, Esq.	Focused cultural resources meeting on SJ-Carlucci segment. Tribe expressed concern about alignment from Gilroy to Pacheco Pass.
Meeting	2/3/2016	Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco, Shana Powers, Greg Cuara, Pete Alanis, and Anthony Hunter	Focused meeting with Tribal Consulting Parties regarding all the Central Valley project sections.
Meeting	2/3/2016	Table Mountain Rancheria - Sara Lane Barnett	Focused meeting with Tribal Consulting Parties regarding all the Central Valley project sections.
Meeting	2/12/2016	Tule River Indian Tribe of California - Joseph Garfield	Focused meeting with Tribal Consulting Parties regarding all the Central Valley project sections.
Meeting	2/12/2016	Tejon Indian Tribe - Katherine Montes Morgan, Colin Rambo, and William Gollnick	Focused meeting with Tribal Consulting Parties regarding all the Central Valley project sections.
Meeting; Presentation	3/9/2016	Caltrans Native American Advisory Committee - (NAAC)	Sarah Allred gave a presentation about the HSR program, including an overview of the program and a status/schedule of the various project sections.
Presentation; Meeting	3/21/2016	Pit River Tribe - Bill George, Brandi McDaniels, Herb Quinn, J. Hayward, Sr., Morningstar Gali; Redding Rancheria - Radley Davis and Tony Hayward	Tribes statewide were invited to attend. Meeting held in Redding, CA. The first of three statewide tribal listening sessions aimed at reaching out to California Tribes who may be interested in the cultural resources investigations for the HSR program.
Meeting; Presentation	3/25/2016	Pechanga Band of Luiseno Indians - Lindsey Fletcher, Esq.	Tribes statewide were invited to attend Listening Session. The Pechanga Band of Mission Indians (Ms. Lindsey Fletcher, Associate General Counsel for the Pechanga Band of Luiseño Indians) was the only participant who attended.
Meeting	3/29/2016	Table Mountain Rancheria - Sara Lane Barnett; Santa Ynez Band of Chumash Indians/Santa Ynez Elders Council - Freddie Romero; Agua Caliente Band of Cahuilla - Margaret Park; Big Sandy Rancheria of Western Mono Indians of California - Hazel Earley; Susanville Indian Rancheria - Katie White; Wuksache Indian Tribe/Eshom Valley Band - Kenneth Woodrow	Tribes statewide were invited to attend Listening Session. The third and final of three statewide tribal listening sessions. The intent of the meeting was to notify tribes that the Authority/FRA are proposing to revise PA for compliance with Section 106. Encouraged tribes to provide input on the PA
Letter	4/29/2016	California Native American Heritage Commission (NAHC)	Contact list from the NAHC for Santa Clara County

Action	Date	Tribal Representative	Summary
Email; Flyer	5/4/2016	Ohlone Indian Tribe - Andrew Galvin Amah Mutsun Tribal Band - Valentin Lopez Tule River Indian Tribe of California - Neil Peyron, Joseph Garfield and Kerri Vera Chowchilla Tribe of Yokuts - Tara Brown Jackley and Jerry Brown Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein North Valley Yokuts - Katherine Erolinda Perez Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers Picayune Rancheria of Chukchansi Indians - Mary Motola Table Mountain Rancheria - Robert Pennell Costanoan Rumsen Carmel Tribe - Tony Cerda Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco, Ruben Barrios and Shana Powers Picayune Rancheria of Chukchansi Indians - Reggie Lewis and Mary Motola Picayune Rancheria of Chukchansi Indians - Mr. Alberta Muwekma Ohlone Indian Tribe of the SF Bay Area - Rosemary Cambra Dumna Wo-Wah Tribal Government - Robert Ledger Sr. Southern Sierra Miwuk Nation - Lois Martin	Invitation to May 2016 Community Open House meetings
Letter	5/6/2016	California Native American Heritage Commission (NAHC)	Contact list from the NAHC for Madera County
Email	5/6/2016	Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein	Ms. Zwierlein requests information regarding tribal monitoring opportunities.
Email	5/16/2016	Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein	Invitation to May Scoping Meetings

Action	Date	Tribal Representative	Summary
Email	5/16/2016	North Fork Rancheria of Mono Indians of California - Maryann McGovran Wuksache Indian Tribe/Eshom Valley Band - Kenneth Woodrow California Valley Miwok Tribe - Silvia Burley North Fork Mono Tribe - Ron Goode	Invitation to Community Open House
Meeting	5/18/2016	Tule River Indian Tribe of California - Charmaine McDarment and Neil Peyron; Tejon Indian Tribe - Colin Rambo; Table Mountain Rancheria - Sara Lane Barnett, Robert Pennell; Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco, Ruben Barrios, Greg Cuara and Shana Powers	Yokuts Coalition Meeting to discuss all Central Valley project sections, status of cultural investigations, tribal participation in the program, and development of burial treatment plans.
Phone Call	5/19/2016	Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers	Chairwoman Ann Marie requests information about HSR program and would like to meet with Authority.
Email	5/20/2016	Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein and Michelle Zimmer	Tribe provides information regarding its traditional territory; Tribe has monitors available.
Email	5/20/2016	Picayune Rancheria of Chukchansi Indians - Mary Motola, Nokomis Hernandez, Mr. Alberta	Authority seeks clarification of tribal leadership (as leadership has changed).
Email	5/23/2016	Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein and Michelle Zimmer	Ms. Allred and Ms. Zwierlein exchange emails regarding areas of interest for participation and monitoring.

Action	Date	Tribal Representative	Summary
Email; Letter	6/2/2016	Southern Sierra Miwuk Nation - Lois Martin Tule River Indian Tribe of California - Neil Peyron, Kerri Vera, Joseph Garfield Picayune Rancheria of Chukchansi Indians - Mary Motola, Nokomis Hernandez, Claudia Gonzales Dumna Wo-Wah Tribal Government - John Ledger Chowchilla Tribe of Yokuts - Tara Brown Jackley and Jerry Brown North Valley Yokuts - Katherine Erolinda Perez Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers Ohlone Indian Tribe - Andrew Galvin Muwekma Ohlone Indian Tribe of the SF Bay Area - Rosemary Cambra Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein and Michelle Zimmer Costanoan Rumsen Carmel Tribe - Tony Cerda Amah Mutsun Tribal Band - Valentin Lopez and Edward Ketchum Table Mountain Rancheria - Sara Lane Barnett, Robert Pennell, Leanne Walker-Grant, Cristina Gonzales Santa Rosa Tachi Yokut Tribe - Ruben Barrios, Shana Powers, and Hector "Lalo" Franco	Invitation to attend upcoming Tribal Information Meetings on Tuesday June 28th in Morgan Hill and Wednesday June 29th in Chowchilla re FJ and between JM.
Email; Phone Call	6/6/2016	Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers	This email followed a phone conversation regarding postponing meeting.
Meeting	6/29/2016	Picayune Rancheria of Chukchansi Indians - Mary Motola; Table Mountain Rancheria - Robert Pennell and Sara Lane Barnett; Tule River Indian Tribe of California - Joseph Garfield	Tribal Information Meeting to discuss project update and future plans for Tribes to submit ethnographies, ideas for creative mitigation were discussed.

Action	Date	Tribal Representative	Summary
Email	6/29/2016	California Valley Miwok Tribe - Silvia Burley; Chowchilla Tribe of Yokuts - Tara Brown Jackley; Dumna Wo-Wah Tribal Government - Robert Ledger Sr.; North Valley Yokuts - Katherine Erolinda Perez; Picayune Rancheria of Chukchansi Indians - Claudia Gonzales, Mary Motola and- Nokomis Hernandez; Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco, Ruben Barrios and Shana Powers; Southern Sierra Miwuk Nation - Lois Martin; Table Mountain Rancheria - Robert Pennell and Sara Lane Barnett; Tule River Indian Tribe of California - Joseph Garfield, Kerri Vera and Neil Peyron	Tribal Information Meeting Reminders emailed to Tribal Representatives regarding the upcoming 6/29/2016 meeting.
Email	6/30/2016	Tule River Indian Tribe of California - Joseph Garfield, Kerri Vera, Neil Peyron	Authority sends Tribe the Tribal Monitor Designation Form.
Email	7/1/2016	Amah Mutsun Tribal Band - Valentin Lopez	Ms. Allred follows-up with Chairman Lopez regarding the tribe's status as a consulting party and invites the tribe to tour the JM alignment
Meeting	7/7/2016	Chowchilla Tribe of Yokuts - Jerry Brown	Potential effects of the project to cultural resources and creative mitigation ideas were discussed. Further meetings with the new chairperson, Mr. Bart Topping, need to be arranged to discuss the project further.
Email	7/20/2016	Picayune Rancheria of Chukchansi Indians - Nokomis Hernandez; Santa Rosa Tachi Yokut Tribe - Greg Cuara, Hector "Lalo" Franco, Ruben Barrios, and Shana Powers; Table Mountain Rancheria - Beverly J. Hunter, Sara Lane Barnett, Cristina Gonzales and Robert Pennell; Tejon Indian Tribe - Colin Rambo; Tule River Indian Tribe of California - Charmaine McDarment, Joseph Garfield, Kevin Bonds, Neil Peyron, Victor Silvas Sr., Yolanda Gibson, William "Willie" Carrillo, Sr., William Garfield, Priscilla Santos, Kenneth McDarment, Gary Santos, Dan Hackey and Amanda Peyron	Summary of 5/18/2016 NAGPRA Coalition Meeting held at Tule River Indian Reservation, Porterville, CA
Email	7/22/2016	Tule River Indian Tribe of California - Charmaine McDarment, Joseph Garfield, Gayline Hunter, Victor Silvas Sr.; Table Mountain Rancheria - Robert Pennell, Sara Lane Barnett, Cristina Gonzales; Santa Rosa Tachi Yokut Tribe - Hector "Lalo" Franco, Pete Alanis, Shana Powers, Greg Cuara; Picayune Rancheria of Chukchansi Indians - Mary Motola	Yokuts Coalition follows-up regarding action items from the 6/29/2016 Tribal Information Meeting in Chowchilla. These action items include sharing records search, participation in field surveys, property access updates, and artifact treatment plan(s). Tribe coordinating with Authority to set-up conference call to include FRA.

Action	Date	Tribal Representative	Summary
Email	7/26/2016	Amah Mutsun Tribal Band - Valentin Lopez	Authority reaches out to Tribe as follow-up to Tribal Information Meeting. Provides Tribal Monitor Designation Form.
Email reply	7/27/2016	Amah Mutsun Tribal Band - Valentin Lopez	Chairman Lopez replies to Authority's email confirming the tribe's interest in the JM project section; provides completed Tribal Monitor Designation Form to identify monitors to represent the tribe; and identifies potential time frame for scheduling the alignment tour for the tribe.
Email	7/28/2016	Santa Rosa Tachi Yokut Tribe - Greg Cuara, Hector "Lalo" Franco, Shana Powers; Table Mountain Rancheria - Robert Pennell and Sara Lane Barnett; Tule River Indian Tribe of California - Joseph Garfield; Picayune Rancheria of Chukchansi Indians - Mary Motola	Tribe and Authority discuss mitigation ideas as a follow-up to the 6/29/2016 JM meeting in Chowchilla, CA.
Email	8/15/2016	Tejon Indian Tribe - Colin Rambo	Mr. Rambo, THPO, states question regarding possibility of compensation or reimbursement for ethnography.
Email	8/25/2016	Amah Mutsun Tribal Band - Valentin Lopez	Ms. Allred provides Chairman Lopez with logistics/details for the alignment tour scheduled for 9/15/2016
Email	8/31/2016	Amah Mutsun Tribal Band - Valentin Lopez	Ms. Allred gives Chairman Lopez a copy of the meeting notes for the JM section Tribal Information Meeting that was held in Chowchilla on 6/29/2016.
CD; Letter	9/1/2016	Amah Mutsun Tribal Band - Valentin Lopez Table Mountain Rancheria - Robert Pennell; Tule River Indian Tribe of California - Joseph Garfield; Picayune Rancheria of Chukchansi Indians - Mary Motola	Ms. Allred provides Tribes with copy of the Northwest Information Center Records Search per discussion during Morgan Hill & Chowchilla meetings that were held June 28 and 29, 2016.
Alignment Tour	9/15/2016	Amah Mutsun Tribal Band - Valentin Lopez, Edward Ketchum, Eleanor "Nora" Castro, Frank Cordova; Natalie Garcia, Gabriel Pineida	The Authority arranged a bus-chartered alignment tour of the San Jose to Merced project section specifically for the chairperson and representatives of the Amah Mutsun Tribal Band for the purposes of identifying areas of tribal cultural resource sensitivity along the project alignment.
Tribal Event	9/23/2016	Statewide	Authority participates in Native American Day 2016 at the state capitol.
Email	11/2/2016	Amah Mutsun Tribal Band - Valentin Lopez	Ms. Allred confirms that she will be in attendance at the Amah Mutsun Land Trust board meeting to be held on 11/4/2016.
Email	11/2/2016	Amah Mutsun Tribal Band - Valentin Lopez	Ms. Allred provides Chairman Lopez summary of the 9/15/2016 Alignment Tour

Action	Date	Tribal Representative	Summary
Meeting	11/4/2016	Amah Mutsun Tribal Band - Edward Ketchum, Eleanor "Nora" Castro, and Valentin Lopez	Ms. Allred and Ms. MacKinnon attend the Amah Mutsun Land Trust Board meeting. Ms. Allred provided the attendees with a brief overview of the HSR project and discussed advanced mitigation.
Email	11/10/2016	Table Mountain Rancheria - Robert Pennell and Sara Lane Barnett	GIS files sent to Ms. Lane Barnett for JM and BP Alternative Alignments
Meeting	11/16/2016	Caltrans Native American Advisory Committee - (NAAC)	Ms. Allred participated in the Caltrans quarterly Native American Advisory Committee meeting to provide status update regarding the HSR program to NAAC members.
Email	11/29/2016	Table Mountain Rancheria - Robert Pennell	Ms. Allred sends Mr. Pennell her initial comments on the draft Burial Treatment Plan.
Face to Face Meeting	12/13/2016	California Native American Heritage Commission (NAHC)	Meeting with the NAHC to discuss statewide tribal outreach and consultation efforts. A coordinated effort to engage Tribes who have been non-responsive was discussed. Authority and NAHC plan to meet regularly to facilitate tribal participation.
Letter; Email	12/19/2016	Santa Rosa Tachi Yokut Tribe - Shana Powers	Tribe updates their designated Tribal Monitors form.
Email	12/22/2016	Santa Rosa Tachi Yokut Tribe - Shana Powers, Hector "Lalo" Franco, Greg Cuara, Robert G. Jeffs	Ms. Powers requests additional KMZ files for all central valley sections.
Email	10/9/2017	Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers; Muwekma Ohlone Indian Tribe of the SF Bay Area - Rosemary Cambra; Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein; Costanoan Rumsen Carmel Tribe - Tony Cerda; Dumna Wo-Wah Tribal Government - Robert Ledger Sr.; North Valley Yokuts - Katherine Erolinda Perez	E-update for NorCal Project Sections (FJ and JM)
Letter, Email	10/23/2017	Amah Mutsun Tribal Band - Valentin Lopez and Ed Ketchum	The Authority met with Mr. Lopez to discuss the San Jose to Merced Project Section and provided an update to alignment alternatives in the Pajaro Floodplain and Pacheco Pass. Mr. Ketchum was invited but unable to attend.
Email, Phone Call	10/27/2018	Amah Mutsun Tribal Band - Valentin Lopez	Mr. Lopez called Authority to express that he was pleased with the 10/23/17 meeting and requested some additional information.

Action	Date	Tribal Representative	Summary
Email	1/8/2018	Amah Mutsun Tribal Band - Valentin Lopez and Edward Ketchum; Barbareño/Ventureño Band of Mission Indians - Julie Lynn Tumamait-Stenslie and Patrick "Pat" Tumamait; Chowchilla Tribe of Yokuts - Bart Topping; Cold Springs Rancheria of Mono Indians - Jeffery Lee; Fernandeño Tataviam Band of Mission Indians - Jairo Avila, Kimia Fatehi, Rudy J. Ortega, Jr.; Gabrieleño Band of Mission Indians Kizh Nation - Andrew "Andy" Salas, Dr. E. Gary Stickel; Gabrielino/Tongva Nation - Sandonne Goad and Sam Dunlap; Juaneno Band of Mission Indians Acjachemen Nation - Joyce Perry and Matias Belardes; Kern Valley Indian Community - Robert "Bob" Robinson; North Fork Mono Tribe - Ron Goode; North Fork Rancheria of Mono Indians of California - Christina McDonald and Maryann McGovran; Ohlone Indian Tribe - Andrew Galvan and Vincent Medina; Pechanga Band of Luiseño Indians - Anna Hoover; Picayune Rancheria of Chukchansi Indians - Lisa Parker, Tara Estes-Harter, and Claudia Gonzales; San Manuel Band of Mission Indians - Lee Clauss; Santa Rosa Tachi Yokut Tribe - Robert G. Jeff and Ruben Barrios; Soboba Band of Luiseño Indians - Joseph Ontiveros; Table Mountain Rancheria - Robert Pennell, Leanne Walker-Grant; Tejon Indian Tribe - Colin Rambo; Tule River Tribe of California - Charmaine McDarment, Gayline Hunter, Joseph Garfield, and Kerri Vera	Notice regarding Authority's participation in FRA's NEPA Assignment Program.
Email	1/10/2018	Barbareño/Ventureño Band of Mission Indians - Patrick "Pat" Tumamait	Mr. Pat Tumamait comments on notice of NEPA Assignment and requested continued consultation. Authority responds on 1/11/18 that consultation will continue with both federally recognized and non-federally recognized tribes alike.

Action	Date	Tribal Representative	Summary
Letter, Email	1/19/2018	Amah Mutsun Tribal Band – Valentin Lopez and Edward Ketchum; Amah Mutsun Tribal Band of Mission San Juan Bautista - Irenne Zwierlein; Dumna Wo-Wah Tribal Government - Robert Ledger Sr.; Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers; Muwekma Ohlone Indian Tribe of the SF Bay Area - Rosemary Cambra; Ohlone Indian Tribe - Andrew Galvan and Vincent Medina; Picayune Rancheria of Chukchansi Indians - Tara Estes-Harter, Claudia Gonzales, and Lisa Parker; Southern Sierra Miwuk Nation - Lois Martin; Xolon-Salinan Tribe - Karen White; North Valley Yokuts - Katherine Erolinda Perez	AB 52 letter sent to tribes for JM geotech work. Ed Ketchum, Amah Mutsun Band, and Ann Marie Sayers, Indian Canyon, responded with comments.
Email, Phone call	1/24/2018	Amah Mutsun Tribal Band - Edward Ketchum	Mr. Ketchum and Mr. Rushing discussed the JM geotech project, Mr. Ketchum called in response to letter he received (under AB 52 notification of new project).
Phone Call	1/24/2018	Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers	Ms. Sayers and Ms. Reynolds discussed the JM Geotech project, Ms. Ketchum called in response to letter he received (under AB 52 notification of new project).

Action	Date	Tribal Representative	Summary
Email	4/6/2018	Barbareño/Ventureño Band of Mission Indians - Patrick "Pat" Tumamait; Amah Mutsun Tribal Band - Valentin Lopez and Ketchum; Springs Rancheria of Mono Indians; Fernandeño Tataviam Band of Mission Indians - Jairo Avila and Kimia Fatehi; Chowchilla Tribe of Yokuts - Bart Topping; Gabrieleño Band of Mission Indians Kizh Nation - Andrew "Andy" Salas; Gabrielino/Tongva Nation - Sandonne Goad and Sam Dunlap; Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers and Kanyon Sayers-Roods; Juaneno Band of Mission Indians Acjachemen Nation - Matias Belardes; Kern Valley Indian Community - Robert "Bob" Robinson; California Valley Miwok Tribe - Silvia Burley; North Fork Rancheria of Mono Indians of California - Christina McDonald; North Fork Mono Tribe - Ron Goode; Ohlone Indian Tribe - Andrew Galvan and Vincent Medina; Picayune Rancheria of Chukchansi Indians - Tara Estes-Harter; San Manuel Band of Mission Indians - Lee Clauss; Santa Rosa Tachi Yokut Tribe - Greg Cuara and Robert G. Jeff; Table Mountain Rancheria - Robert Pennell and Sara Lane Barnett; Tejon Indian Tribe - Colin Rambo; Tule River Tribe of California - Kerri Vera	April 2018 construction update sent to all consulting party tribes.
Email	4/13/2018	Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers and Kanyon Sayers-Roods	Tribe becomes formal consulting party under section 106 for the San Francisco to San Jose and San Jose to Merced Project Sections.
Email	5/1/2018	Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers and Kanyon Sayers-Roods	Indian Canyon submits Designated Tribal Monitors form

Action	Date	Tribal Representative	Summary
Email	5/2/2018	Amah Mutsun Tribal Band - Valentin Lopez; California Valley Miwok Tribe - Silvia Burley; Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers; Ohlone Indian Tribe - Andrew Galvan; Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Kanyon Sayers-Roods; Cold Springs Rancheria of Mono Indians - Jeffery Lee; Chowchilla Tribe of Yokuts - Bart Topping; Kern Valley Indian Community - Robert "Bob" Robinson; North Fork Mono Tribe - Ron Goode; North Fork Rancheria of Mono Indians of California - Christina McDonald; Picayune Rancheria of Chukchansi Indians - Tara Estes-Harter; Santa Rosa Tachi Yokut Tribe - Robert G. Jeff; Table Mountain Rancheria - Robert Pennell; Tejon Indian Tribe - Colin Rambo; Tule River Tribe of California - Kerri Vera; Wuksachi Indian Tribe/Eshom Valley Band - Kenneth Woodrow; Barbareño/Ventureño Band of Mission Indians - Patrick "Pat" Tumamait; Fernandeño Tataviam Band of Mission Indians - Jairo Avila; Gabrieleño Band of Mission Indians Kizh Nation - Andrew "Andy" Salas; Gabrielino/Tongva Nation - Sam Dunlap; Juaneno Band of Mission Indians Acjachemen Nation - Joyce Perry; Pechanga Band of Luiseño Indians - Ebru Ozdil; San Manuel Band of Mission Indians - Lee Clauss; Soboba Band of Luiseño Indians - Joseph Ontiveros	Emails sent to NorCal, Central Valley, and SoCal Tribal Consulting Parties regarding the Federal Railroad Administration (FRA) notice in the Federal Register soliciting public review and comment on the State of California's application to participate in the Surface Transportation Project Delivery Program (commonly known as NEPA Assignment). Comment period ends 6/1/2018.
Meeting	7/25/2018	Chowchilla Tribe of Yokuts – Jerry Brown; Picayune Rancheria of Chukchansi Indians - Tara Estes-Harter, Gaylan Hammond; Santa Rosa Tachi Yokut Tribe – Shana Powers, Robert G. Jeff, Dakota Jeff; Table Mountain Rancheria - Robert Pennell, Cristina Gonzalas, Donovan E. Velásquez; Tejon Indian Tribe – Tommy Gonzales, Colin Rambo; Tule River Tribe of California – Gayline Hunter, Kaelin Manuel	Yokuts Coalition + Chowchilla Tribe of Yokuts Meeting to discuss all project sections Coalition is consulting on, topics included monitoring, WEAP training, paleontology/geology, AER reports under review, and isolates.
Email	1/11/2019	North Valley Yokuts - Katherine Erolinda Perez	Ms. Perez requests project update specifically for FJ, JM, CV Wye, and MF. Authority responded 1/25/2019.
Phone call, Email	1/28/2019	North Valley Yokuts - Katherine Erolinda Perez	Ms. Perez requests additional project information.
Email	2/12/2019	Picayune Rancheria of Chukchansi Indians – Heather Airey	Ms. Airey updates Designated Tribal Monitor form.

Action	Date	Tribal Representative	Summary
Phone call; Letter	2/26/2019	North Valley Yokuts - Katherine Erolinda Perez	The Authority invites Ms. Perez to formally consult under Section 106 and provides participation and monitoring factsheets.
Email	3/28/2019	Amah Mutsun Tribal Band – Valentin Lopez; Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers and Kanyon Sayers-Roods	Transmittal of the draft San Jose to Merced ASR for BOR Fee Lands, comments from Ms. Sayers-Roods received 4/25/2019.
Email	4/11/2019	Amah Mutsun Tribal Band – Valentin Lopez	In response to transmittal of the draft JM ASR for BOR Fee Land, Mr. Lopez requested a meeting with the Authority (meeting held 5/20/19).
Letter	4/22/2019	North Valley Yokuts - Katherine Erolinda Perez	Draft San Jose to Merced ASR sent to tribe for review and comment, comments received 5/10/2019
Letter	4/22/2019	Amah Mutsun Tribal Band – Valentin Lopez	Transmittal of draft San Jose to Merced Project Section Draft ASR for review and comment. ASR was discussed during meeting on 5/20/19.
Letter	4/23/2019	Amah Mutsun Tribal Band – Valentin Lopez; Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Ann-Marie Sayers and Kanyon Sayers-Roods	Draft San Jose to Merced ASR sent to tribe for review and comment.
Email	4/25/2019	Indian Canyon Mutsun Band of Costanoan (Costanoan Indian Research, Inc.) - Kanyon Sayers-Roods	Ms. Sayers-Roods comments in response to the draft San Jose to Merced ASR for BOR Fee Lands and states that area is sensitive for cultural resources and Native American monitoring should be implemented during all ground disturbance.
Phone Call	4/25/2019	Amah Mutsun Tribal Band of Mission San Juan Bautista—Irenne Zwierlein	Ms. Reynolds provides project update, Ms. Zwierlein confirms interest in consulting on FJ and JM project sections.
Meeting	5/7/2019	North Valley Yokuts - Katherine Erolinda Perez	Meeting to discuss project overview, participation and monitoring policies, ASRs.
Letter	5/10/2019	North Valley Yokuts - Katherine Erolinda Perez	Comments received on the Draft San Jose to Merced ASR, Authority formally responds on 6/18/19.
Meeting	5/20/2019	Amah Mutsun Tribal Band – Valentin Lopez and Edward Ketchum	Project update meeting, discussed alignment alternatives through Pacheco Pass.
Meeting	6/13/2019	North Fork Rancheria of Mono Indians of California - Elaine Bethel-Fink, Fred Beihn, Christina McDonald, Mr. Gaylen D. Lee, Jacquie Van Huss, Katie Parra, Leora "Lou" Beihn, Maryann McGovran	Meeting requested by Tribe to update newly elected tribal council members on project status.

Action	Date	Tribal Representative	Summary
Letter; Email	3/25/2021	Tamien Nation of the Greater Santa Clara County – Quirina Luna Geary	Tribe formally requests notification of the agency's proposed projects, in accordance with Public Resources Code Section 21080.3.1. Authority formally responds on 3/25/2021.
Letter and Participation Form	3/29/2021	Tamien Nation of the Greater Santa Clara County – Quirina Luna Geary	Section 106 consulting party participation form signed by Quirina Luna Geary as the Chairperson of the Tamien Nation.

APPENDIX 3.17-C: ARCHAEOLOGICAL AND BUILT RESOURCES

Appendix 3.17-C includes a map set containing overview maps for potentially affected archaeological resources and potentially affected historic built resources locations, as well as individual historic built resource maps that show project alternative alignments, project footprint boundaries, and potentially affected historic property boundaries. The built resource maps include the identification numbers assigned to individual resources located in the APE. A description of the project scope and evaluation of impacts at each resource are included in Chapter 3.17-C, *Cultural Resources*, and are organized by these resource identification number. Individual archaeological site maps are not included, because the location of such resources is protected from public disclosure under state and federal law.

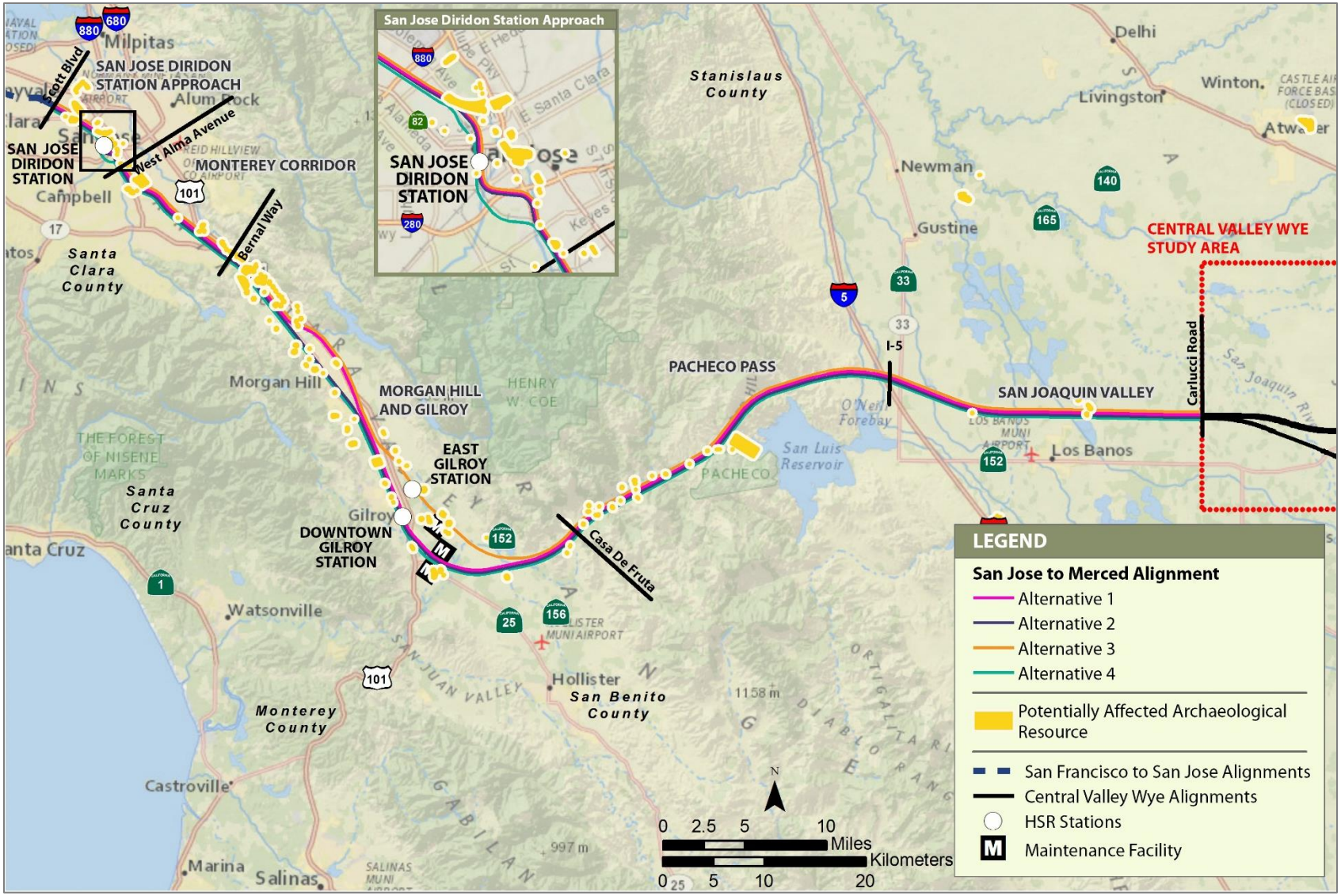


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Figure 1 Overview of Potentially Affected Archaeological Resources

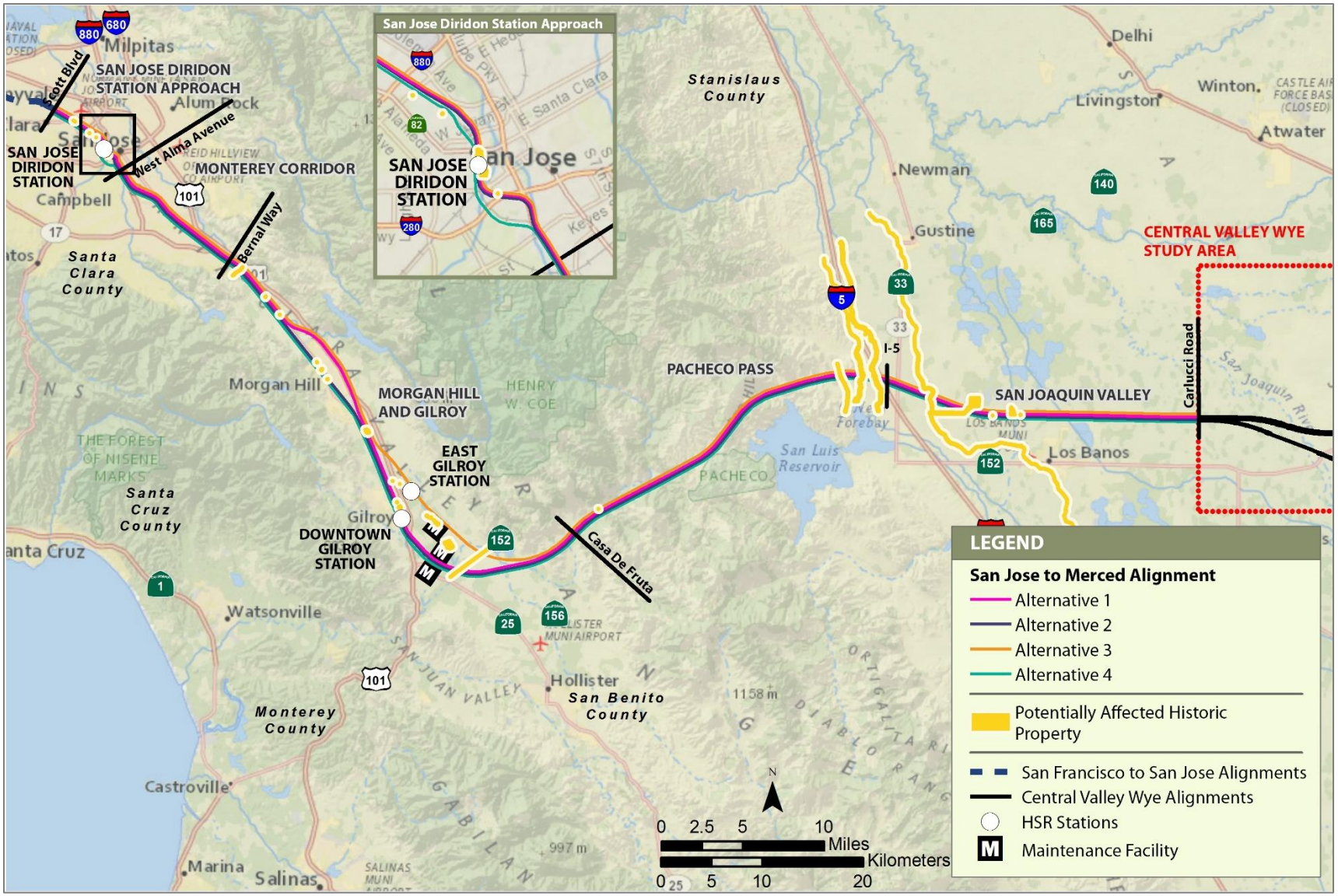

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Figure 2 Overview of Potentially Affected Historic Built Resources

APRIL 2019

Figure 3 Built Resource Site 106

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Figure 4 Built Resource Site 111

APRIL 2019

Figure 5 Built Resource Site 141

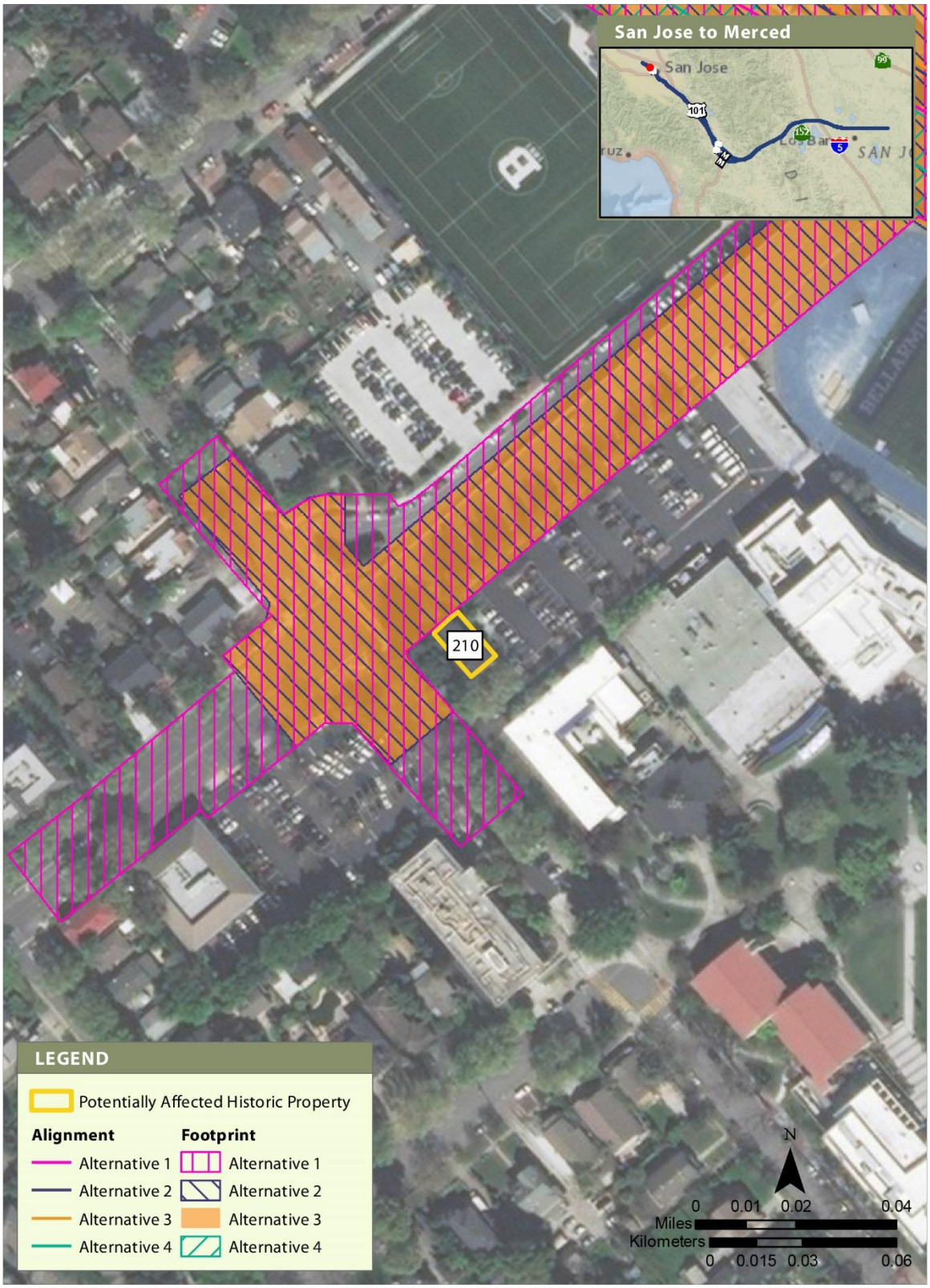

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Figure 6 Built Resource Site 210

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Figure 7 Built Resource Site 304

APRIL 2019

Figure 8 Built Resource Site 495

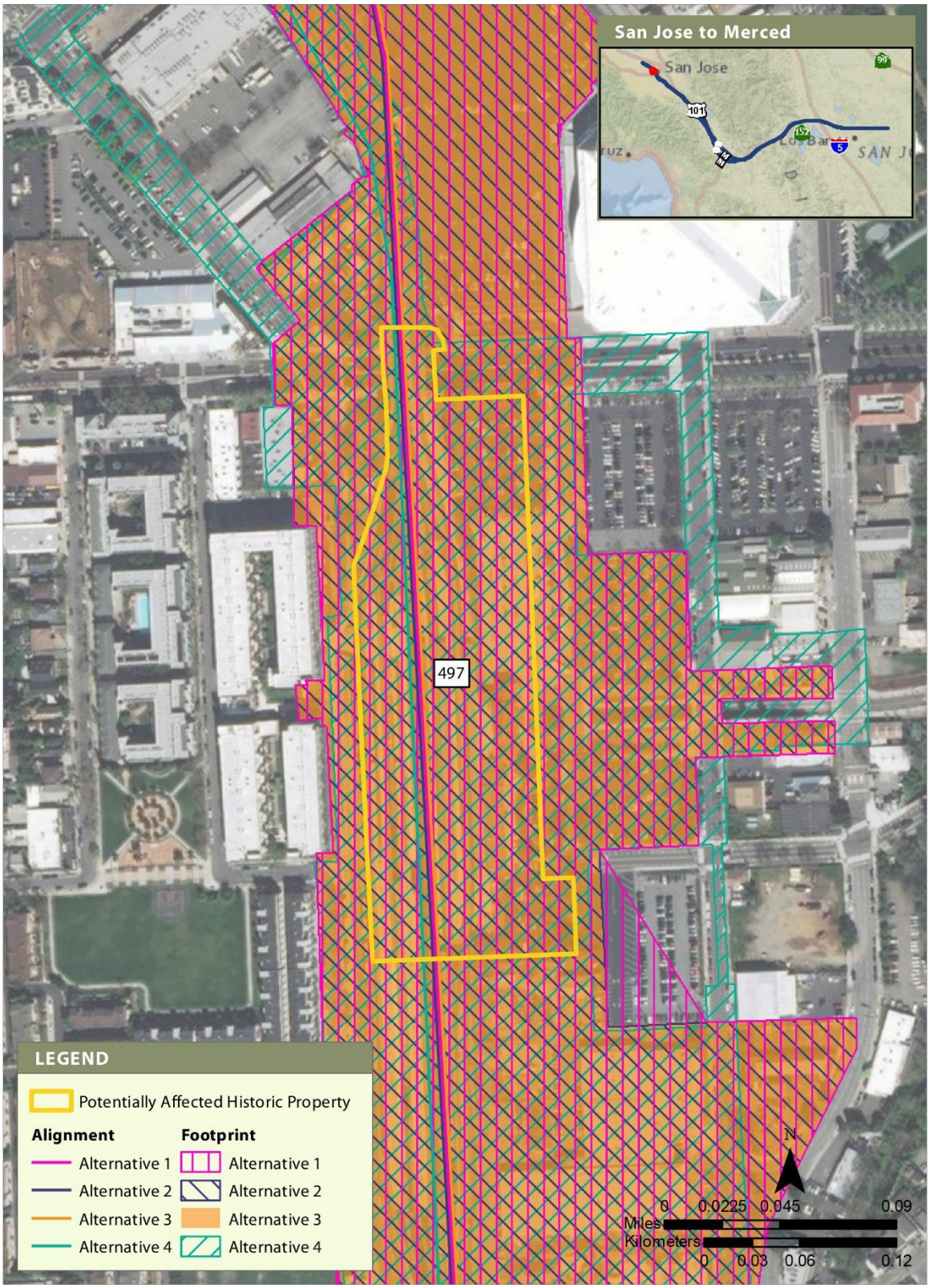

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Figure 9 Built Resource Site 497

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Figure 10 Built Resource Site 522

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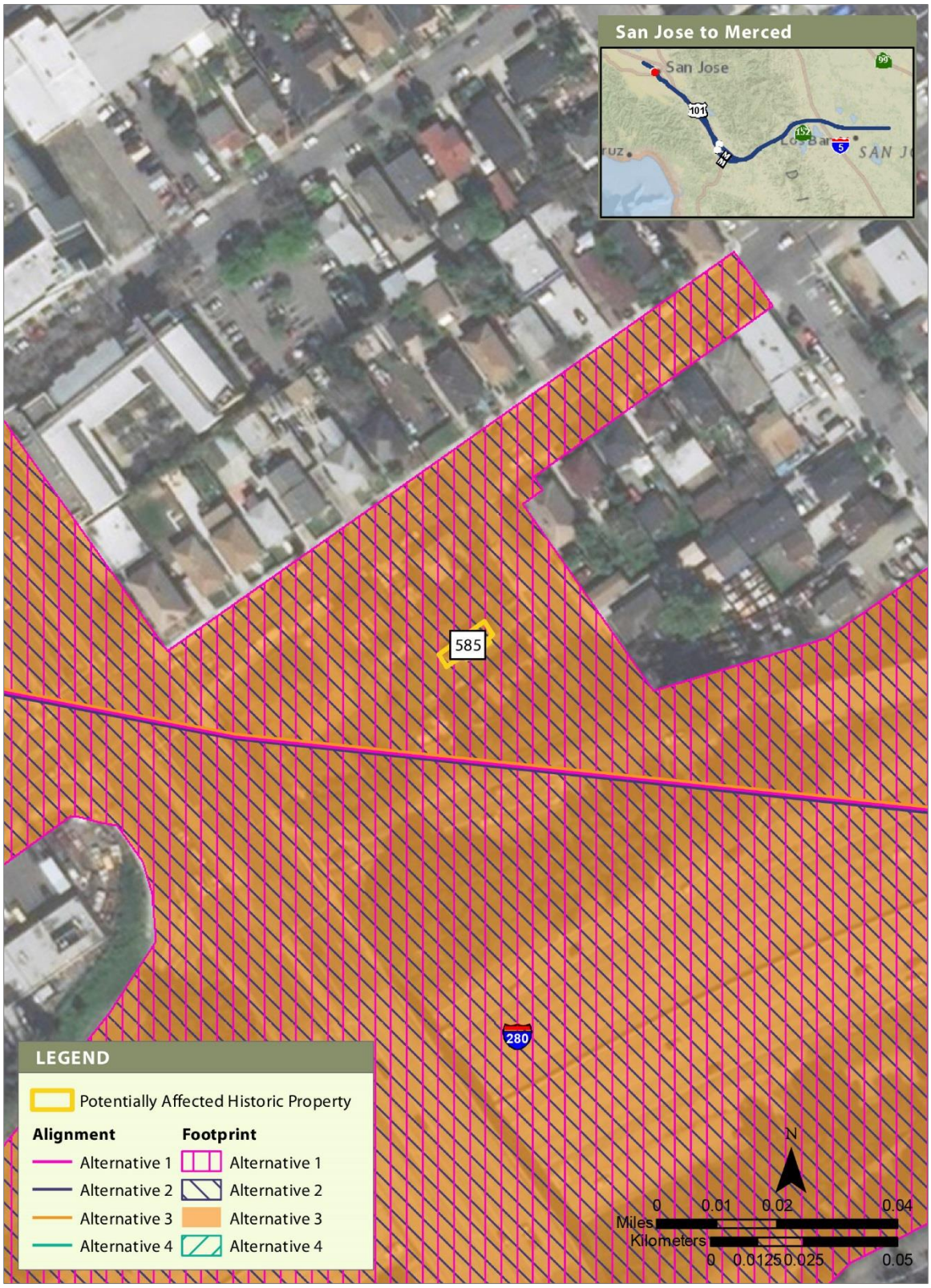
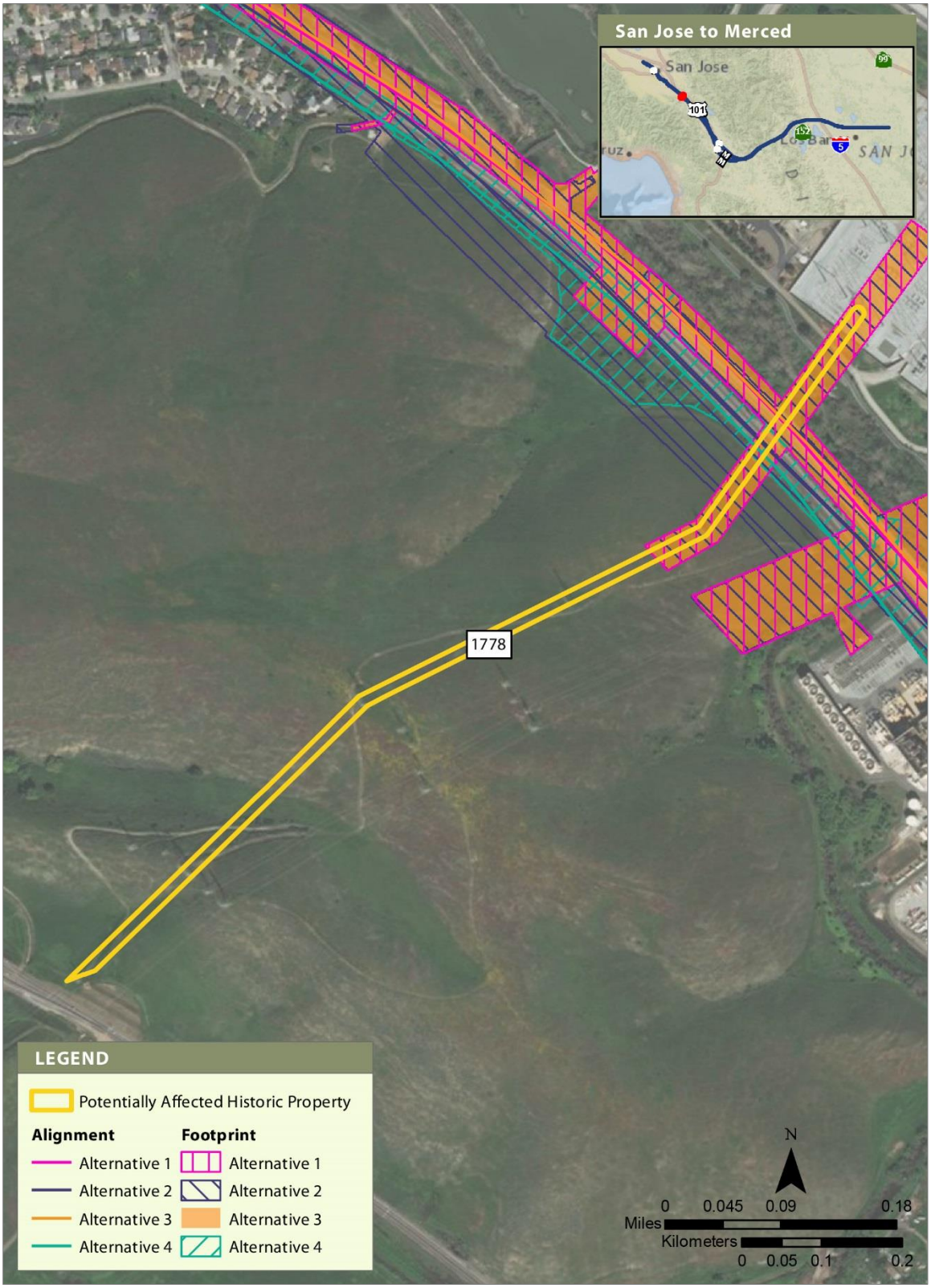
Figure 11 Built Resource Site 566



APRIL 2019

Figure 12 Built Resource Site 585



APRIL 2019

Figure 13 Built Resource Site 1778 (500-kV Moss Landing-Metcalf Transmission Line)

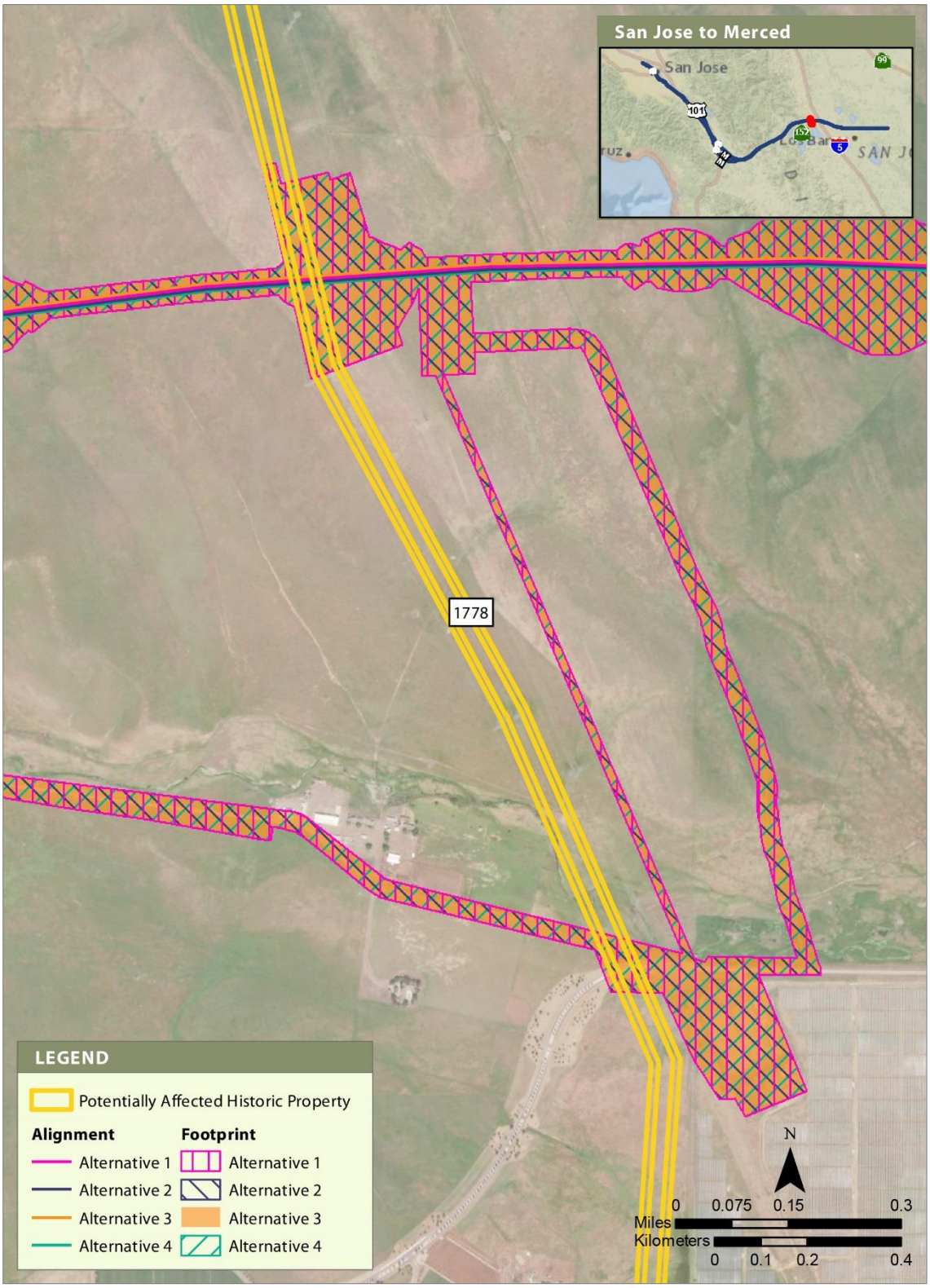


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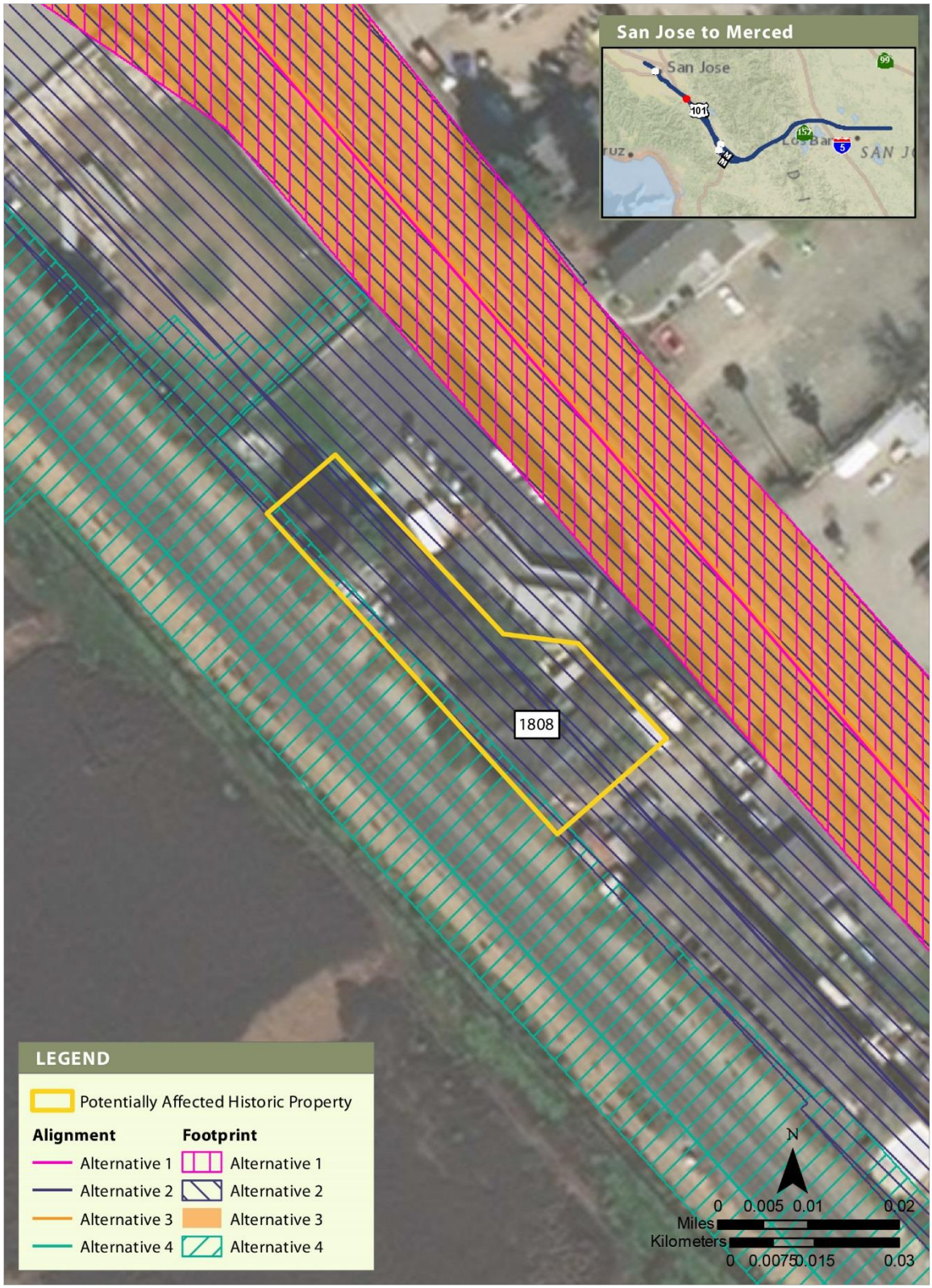
Figure 14 Built Resource Site 1778 (500-kV Tesla-Los Banos No. 1 and 500-kV Tracy-Los Banos Transmission Lines)

APRIL 2019

Figure 15 Built Resource Site 1805



APRIL 2019

Figure 16 Built Resource Site 1808

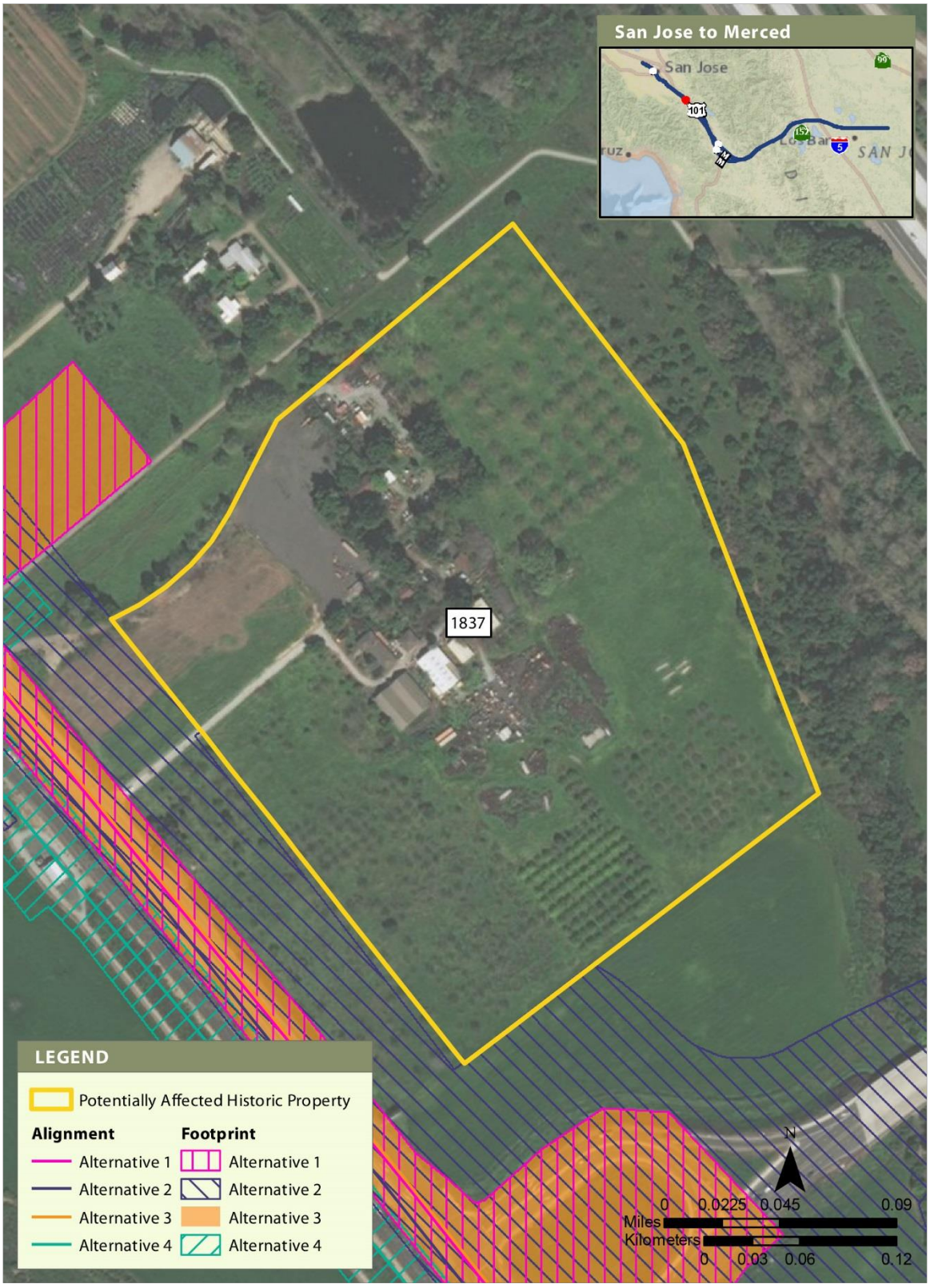


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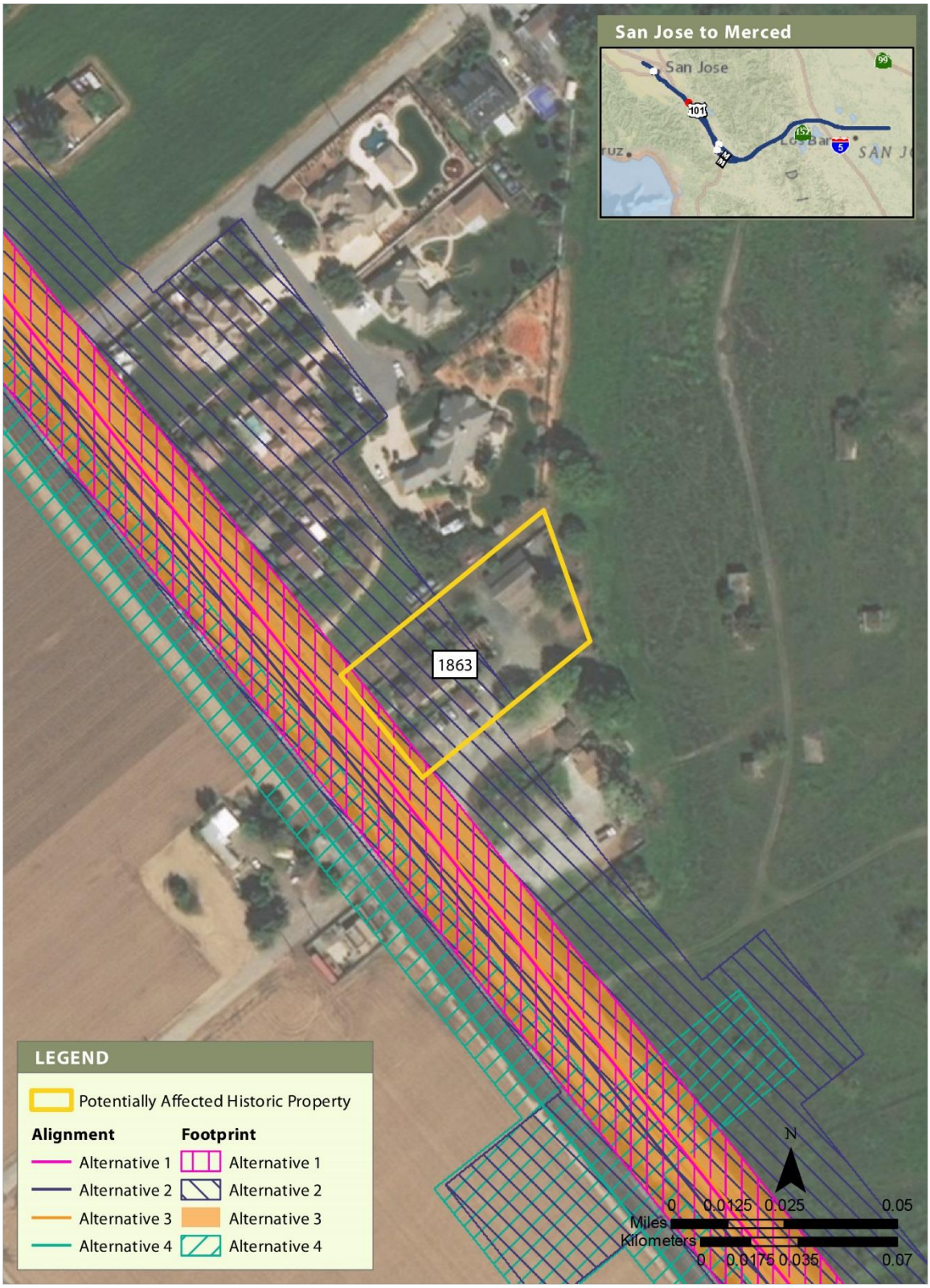
Figure 17 Built Resource Site 1837



APRIL 2019

Figure 18 Built Resource Site 1863

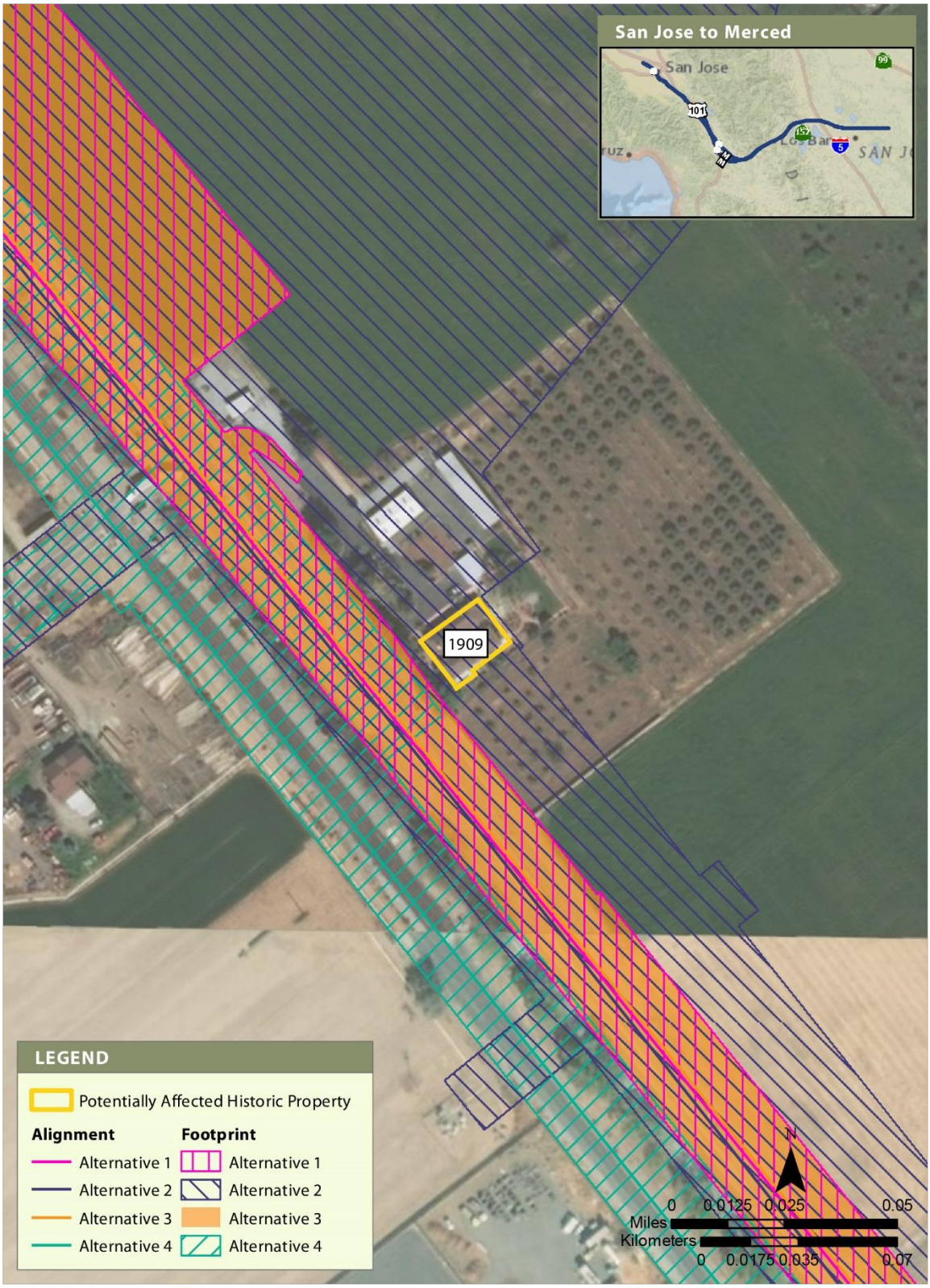


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Figure 19 Built Resource Site 1909

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Figure 20 Built Resource Site 2044

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Figure 21 Built Resource Site 2127

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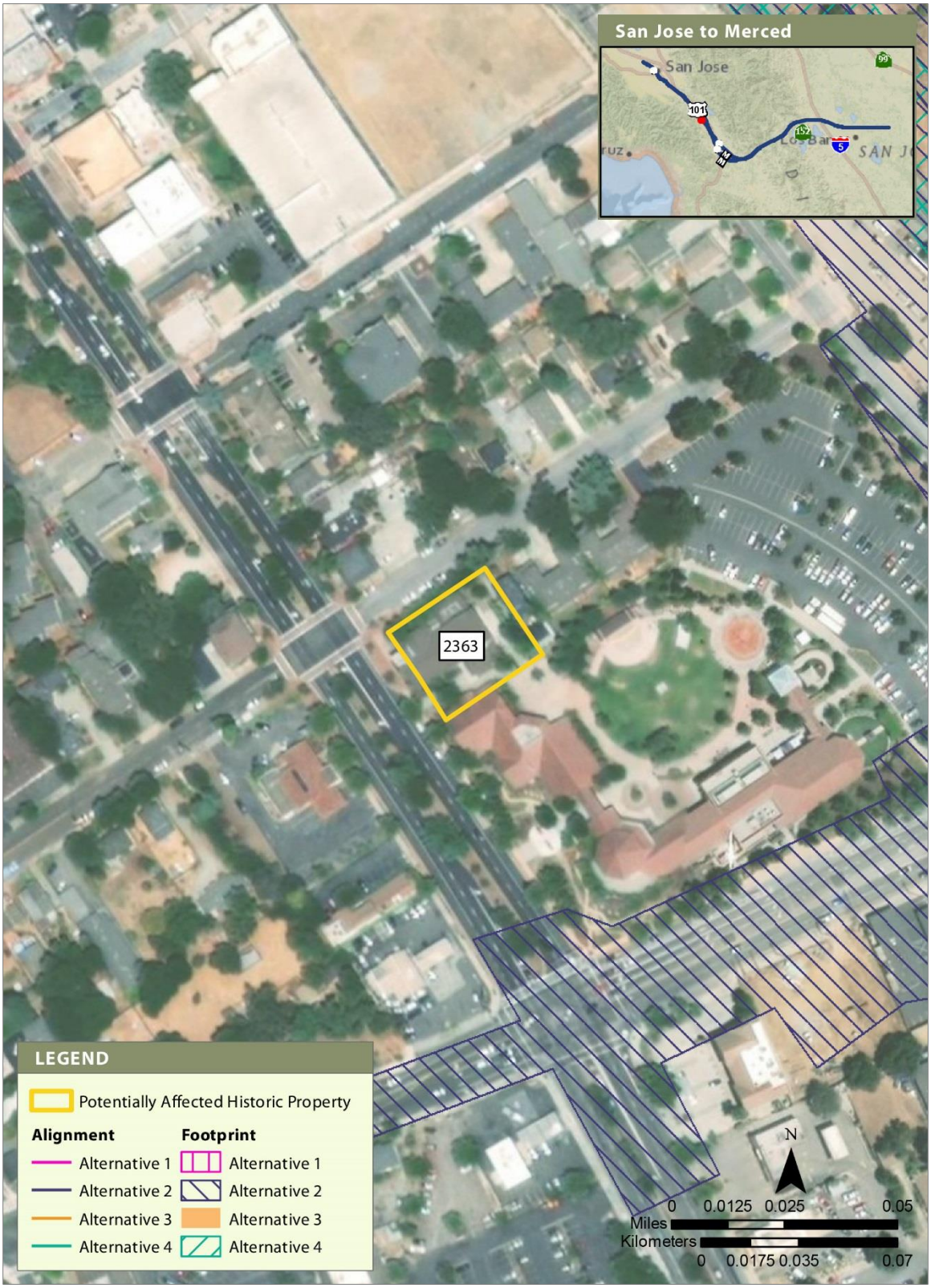
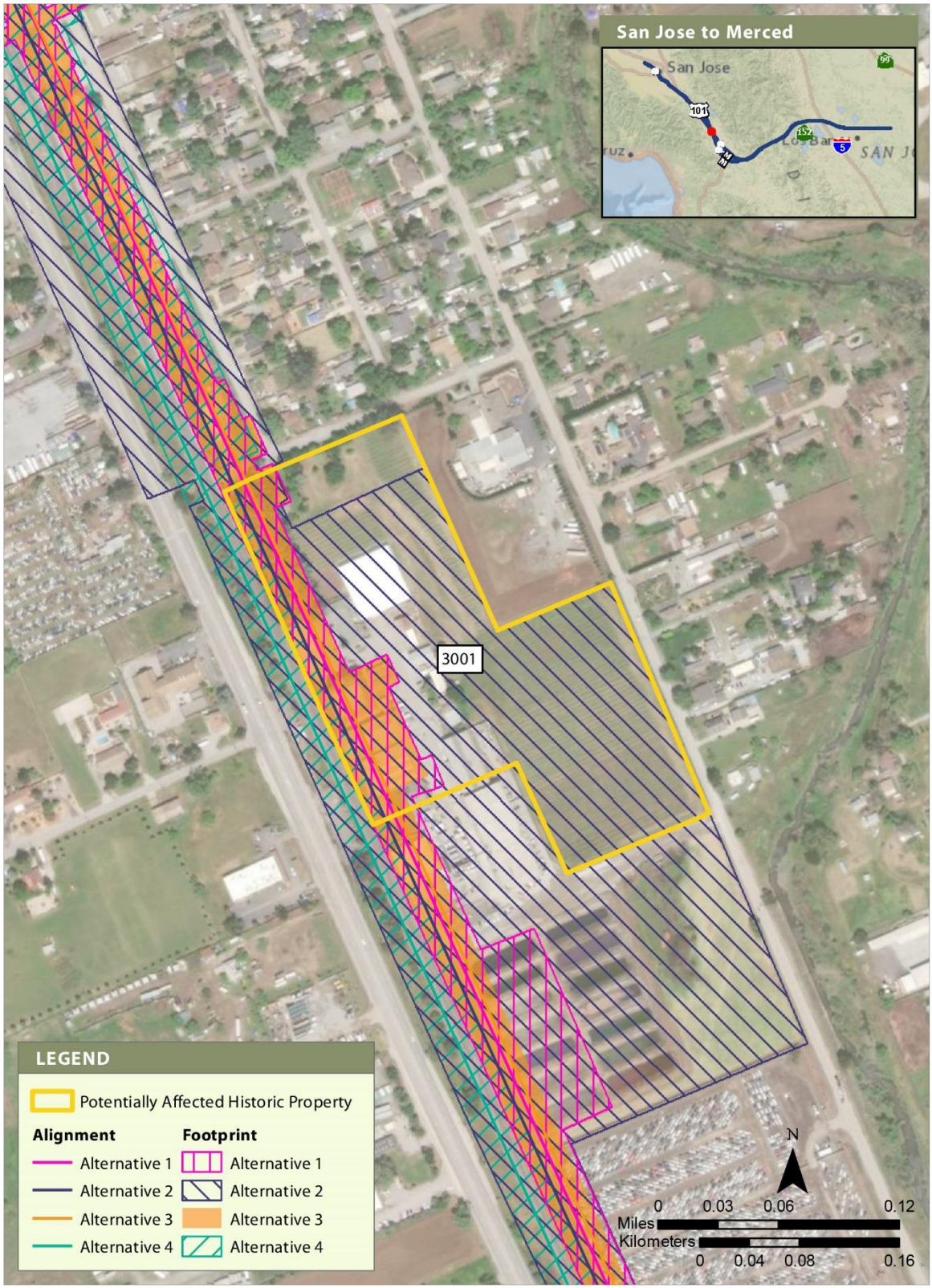
Figure 22 Built Resource Site 2194



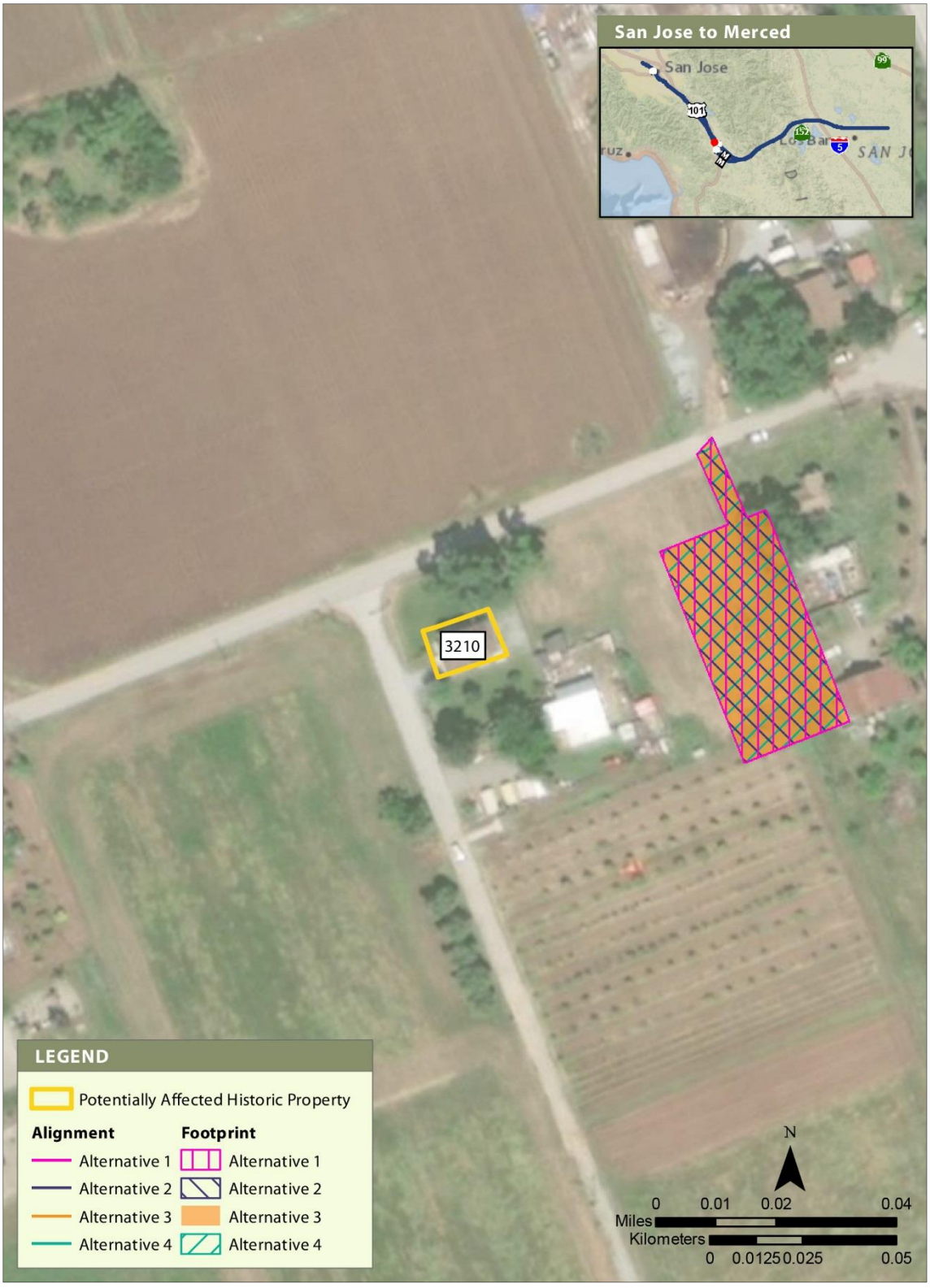
APRIL 2019

Figure 23 Built Resource Site 2363



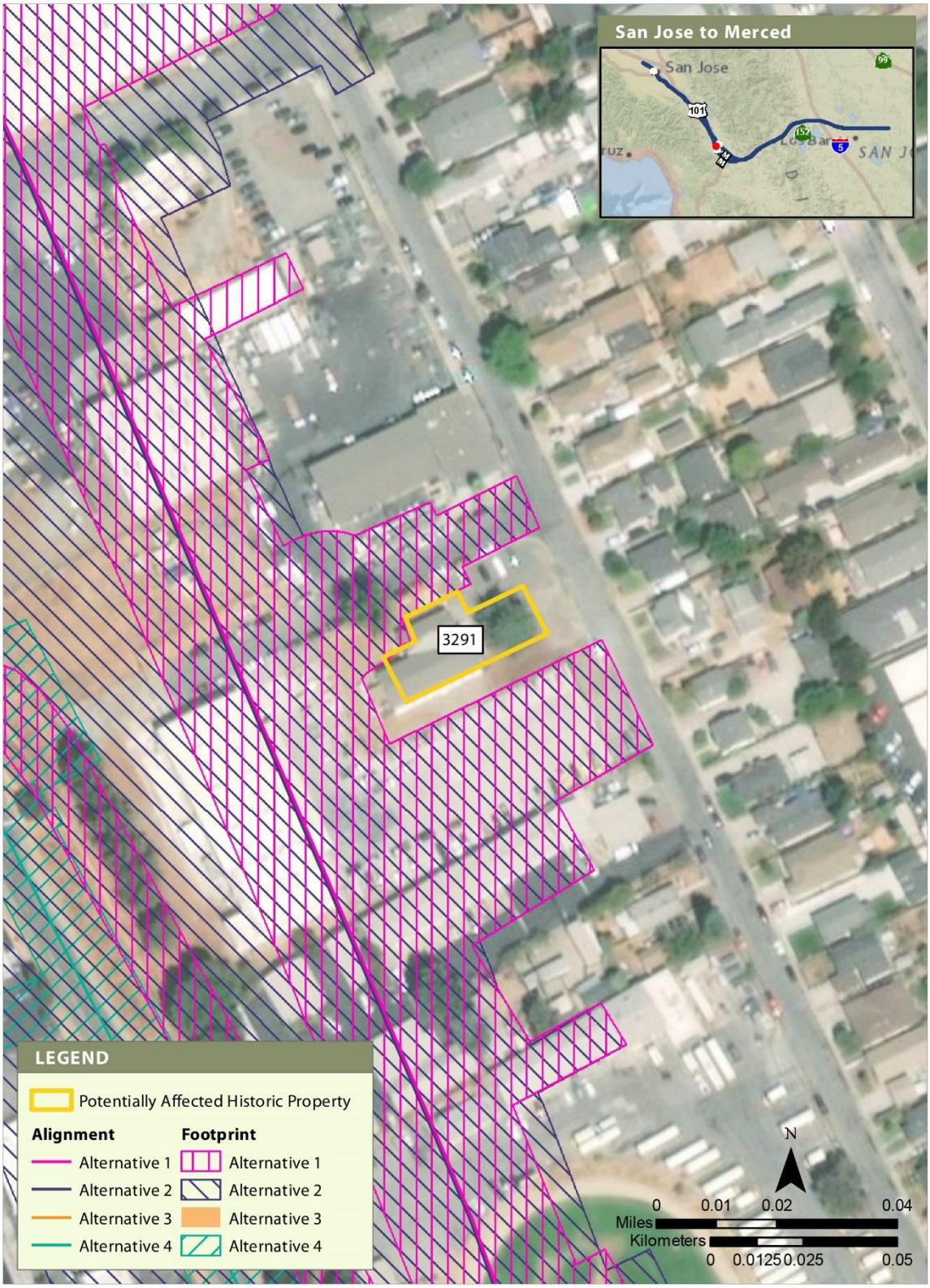
APRIL 2019

Figure 24 Built Resource Site 3001



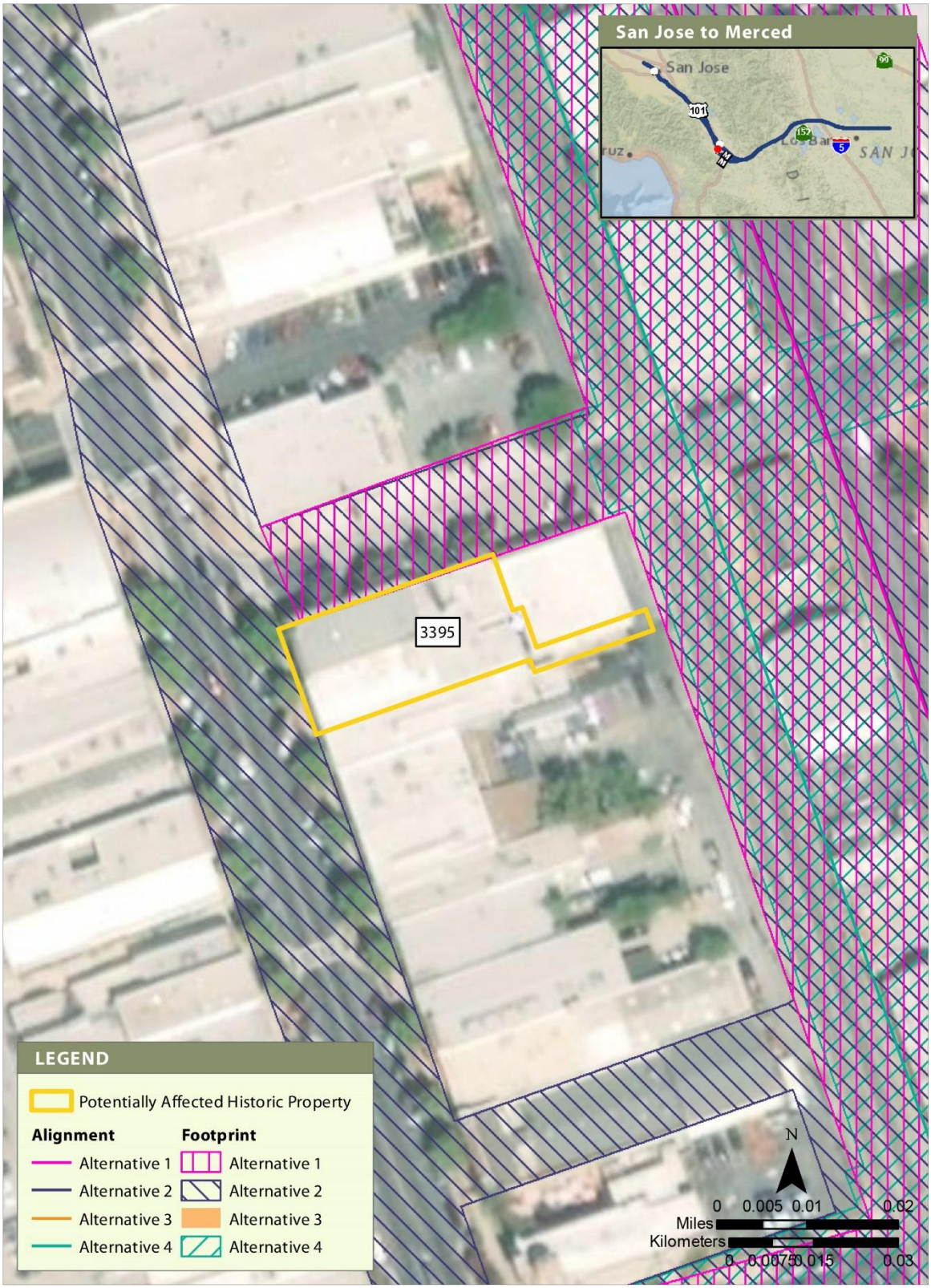
APRIL 2019

Figure 25 Built Resource Site 3210



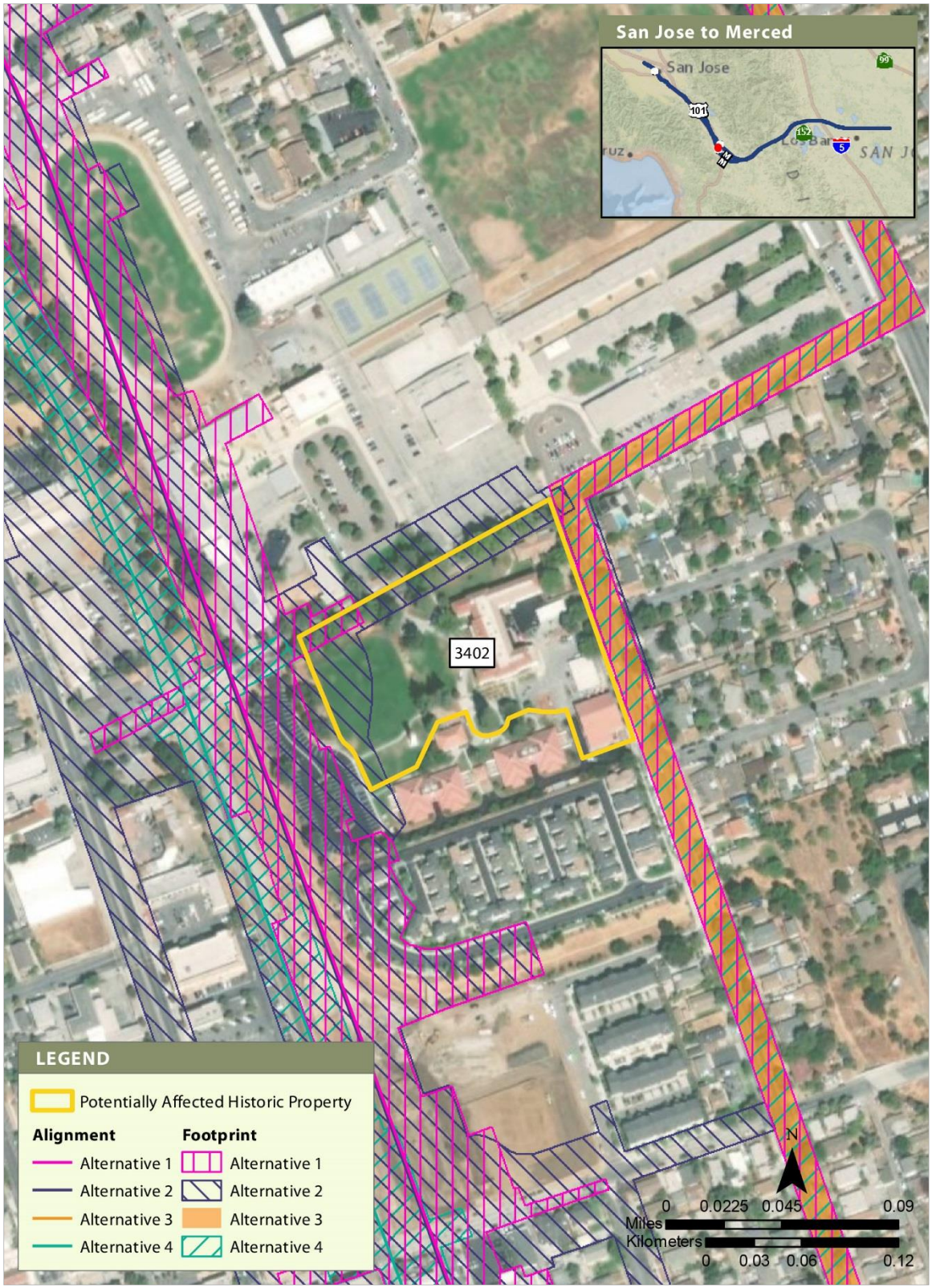
APRIL 2019

Figure 26 Built Resource Site 3291



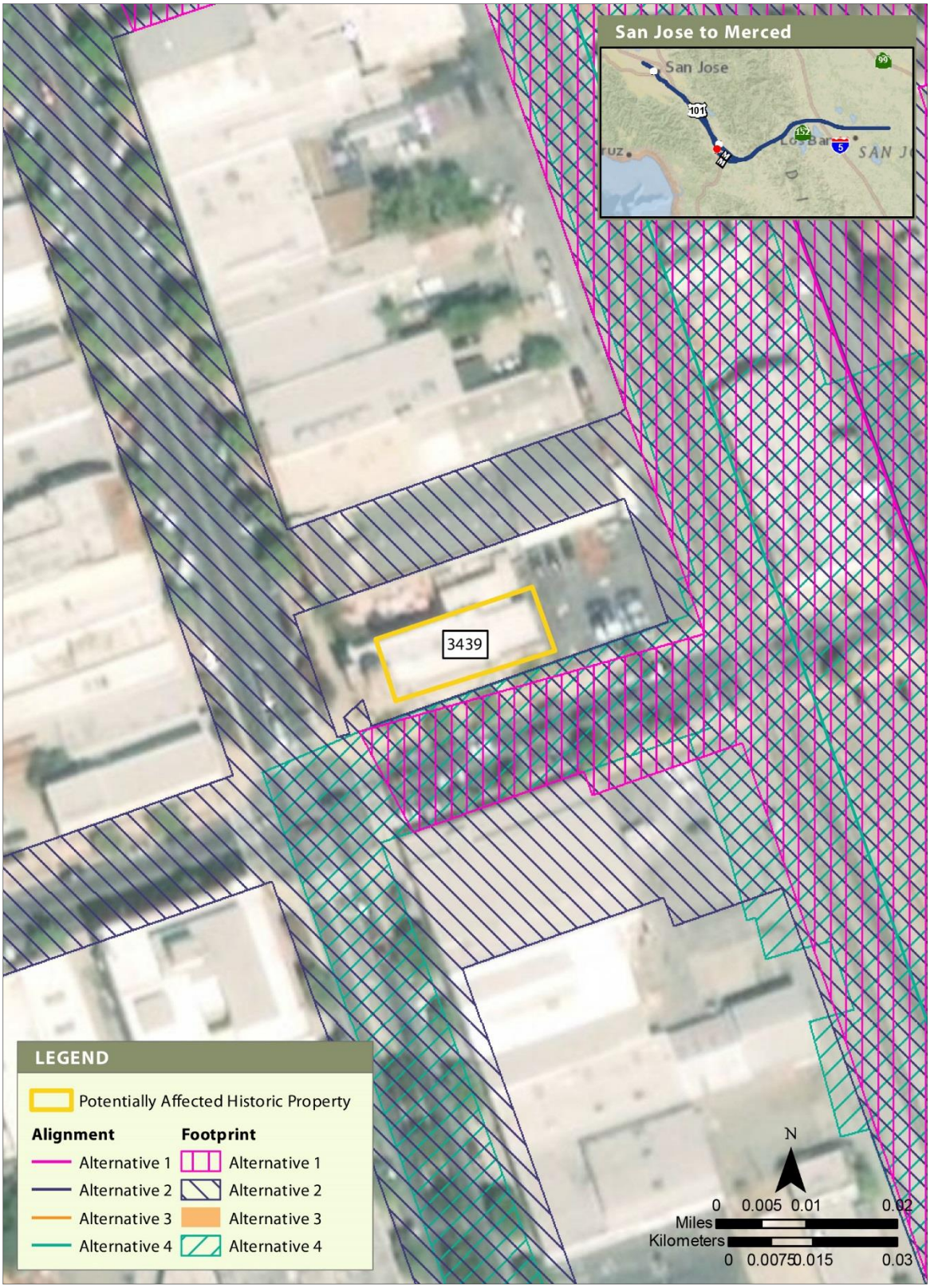
APRIL 2019

Figure 27 Built Resource Site 3395



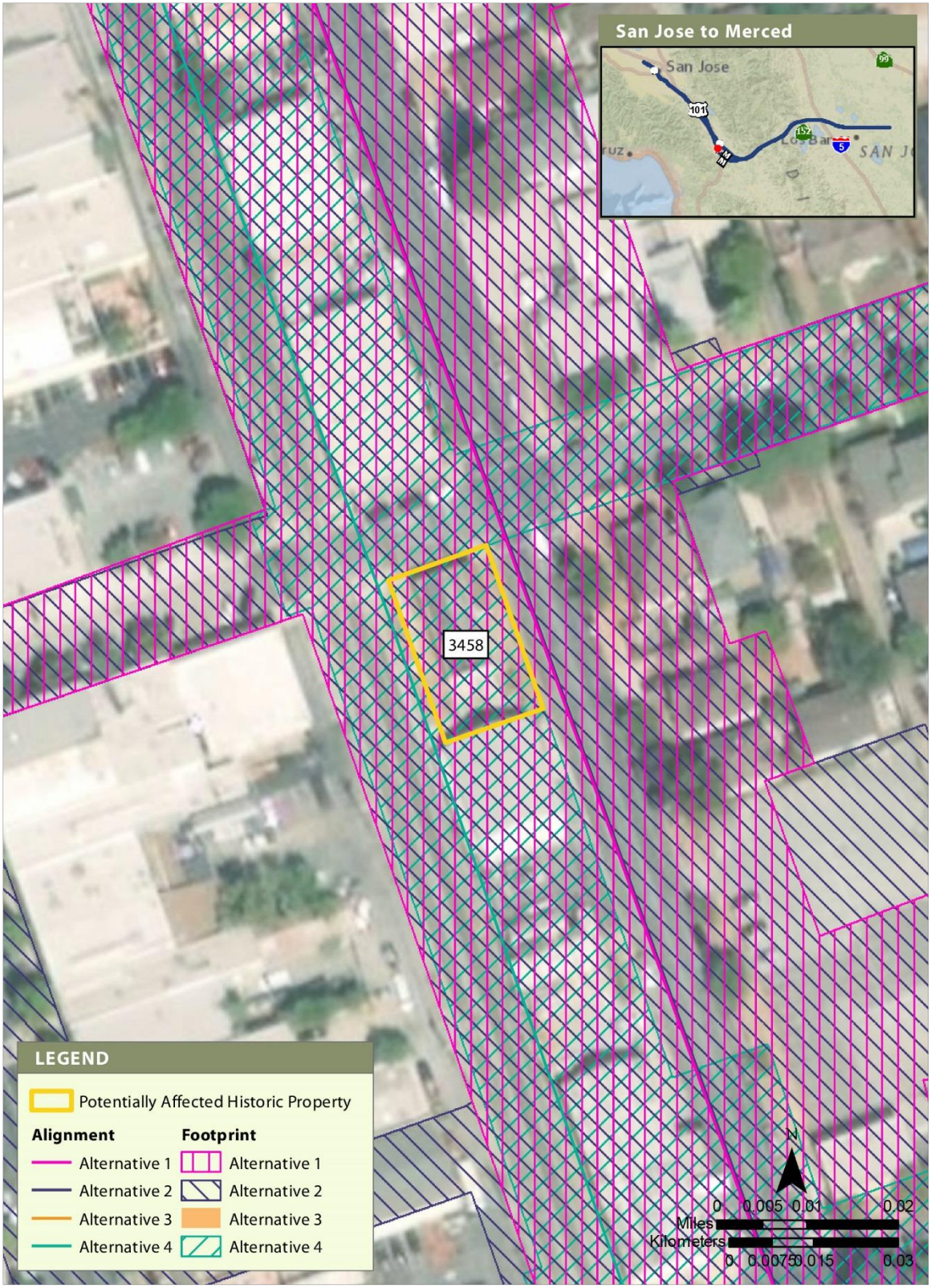
APRIL 2019

Figure 28 Built Resource Site 3402



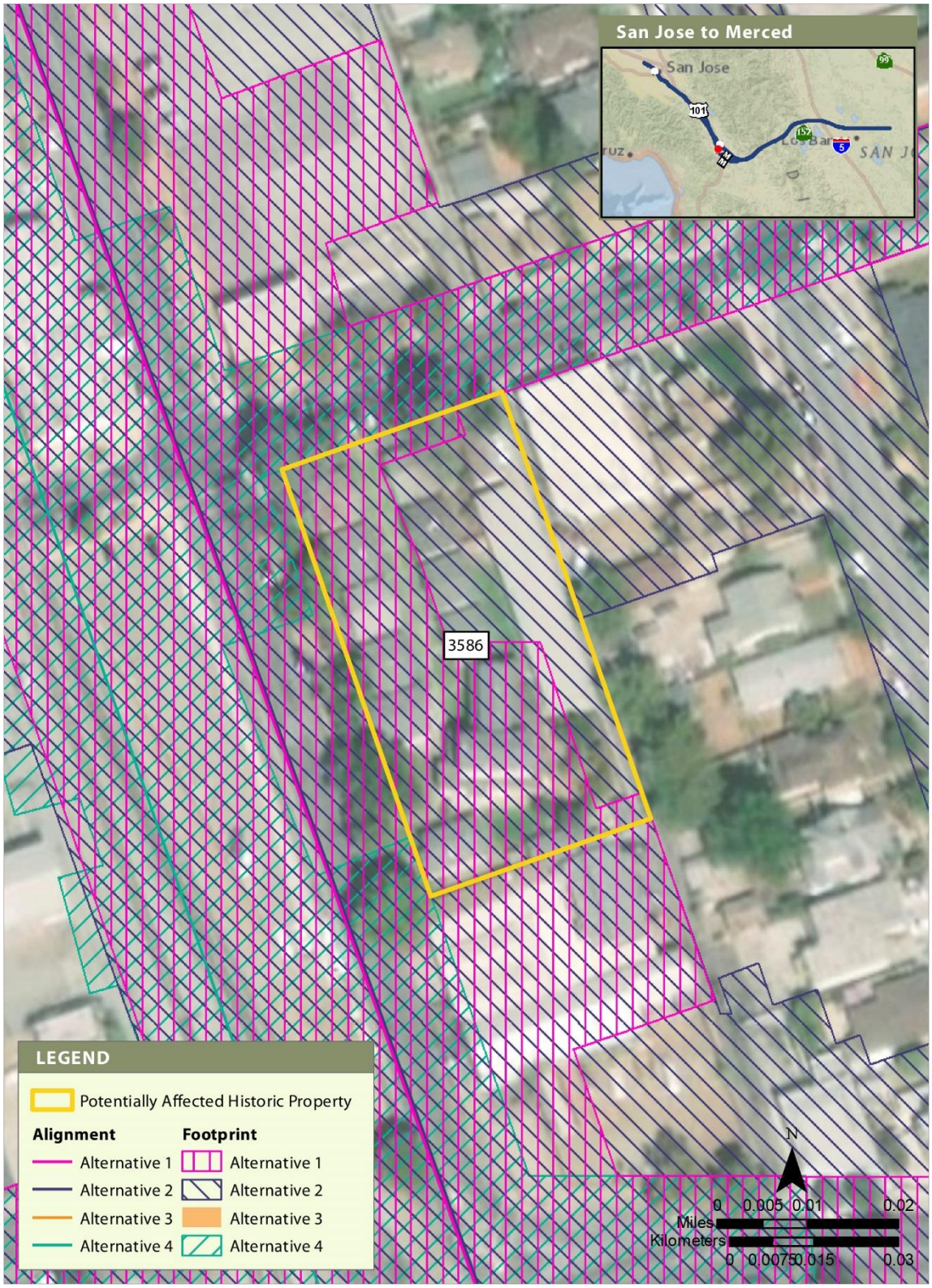
APRIL 2019

Figure 29 Built Resource Site 3439



APRIL 2019

Figure 30 Built Resource Site 3458

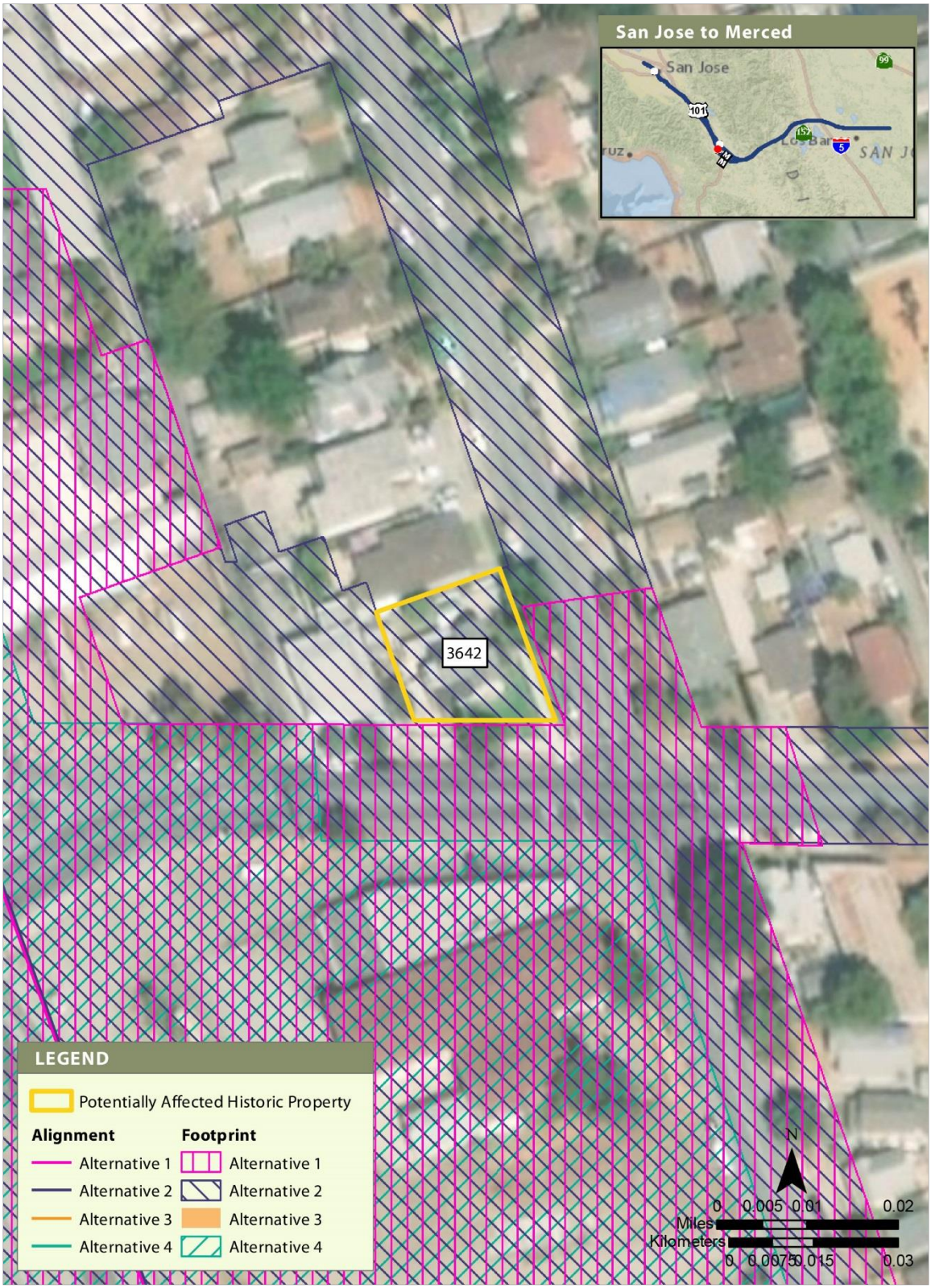


APRIL 2019

Figure 31 Built Resource Site 3586

APRIL 2019

Figure 32 Built Resource Site 3610



APRIL 2019

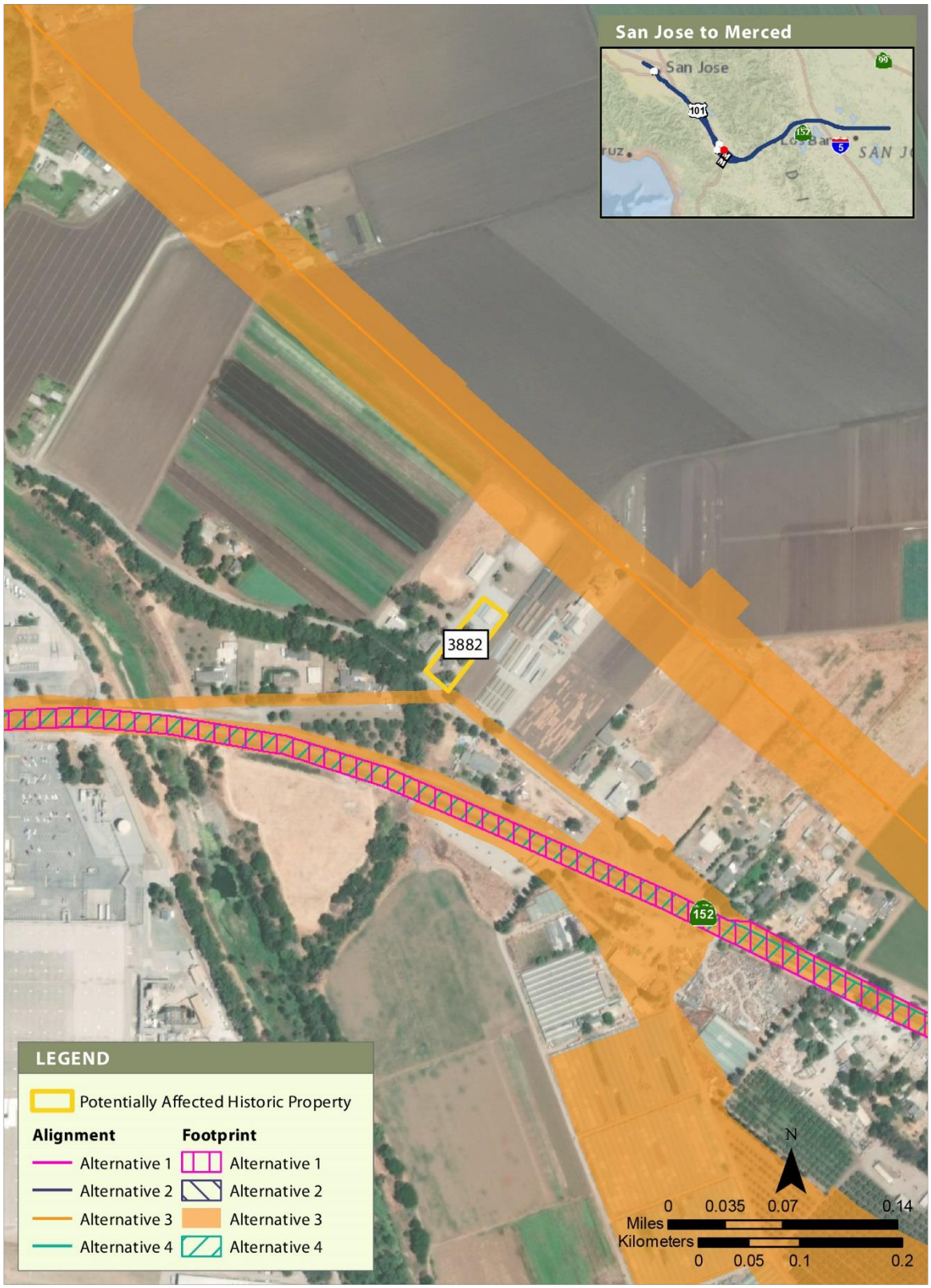
Figure 33 Built Resource Site 3642

APRIL 2019

Figure 34 Built Resource Site 3855

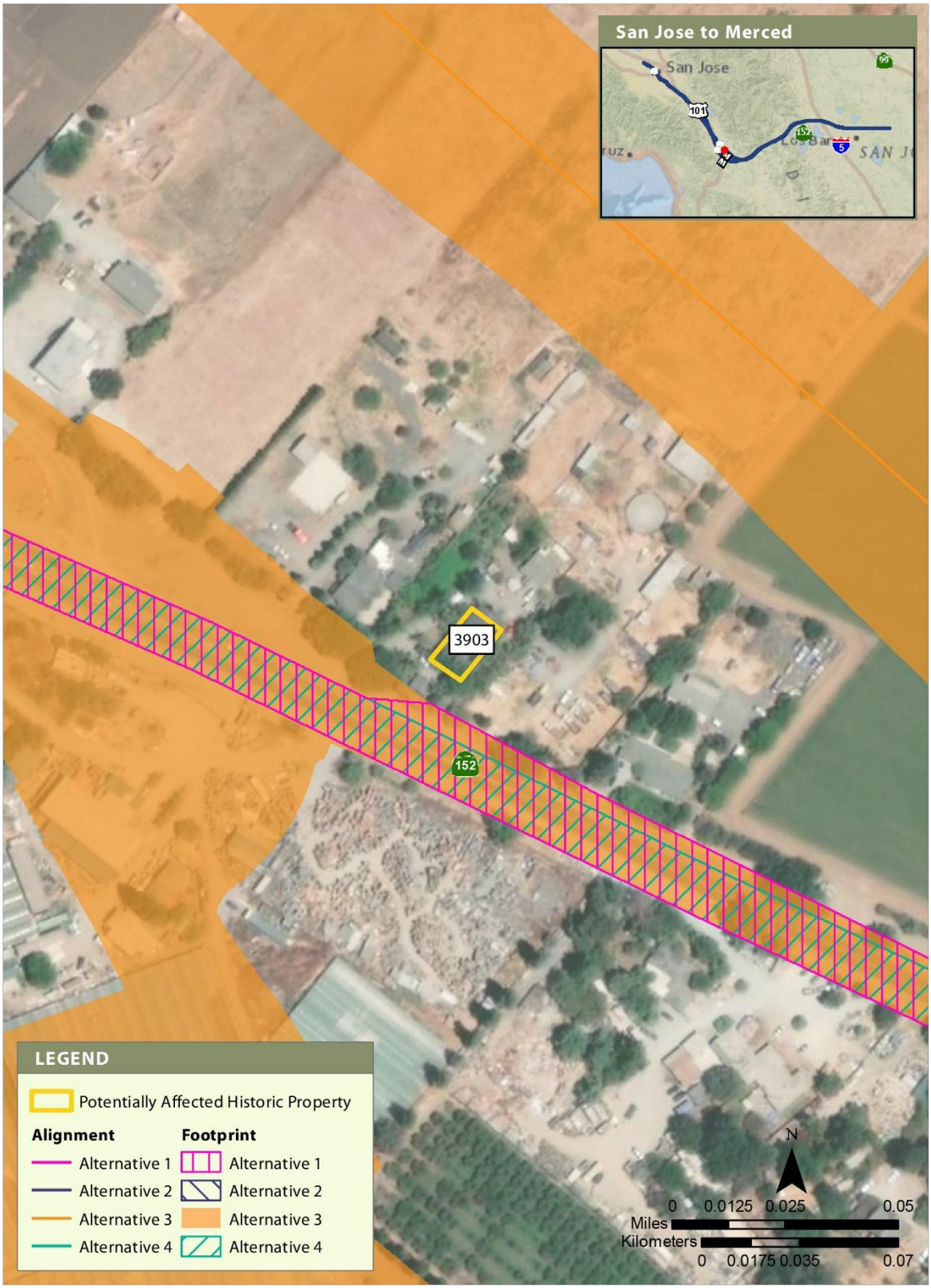
APRIL 2019

Figure 35 Built Resource Site 3871



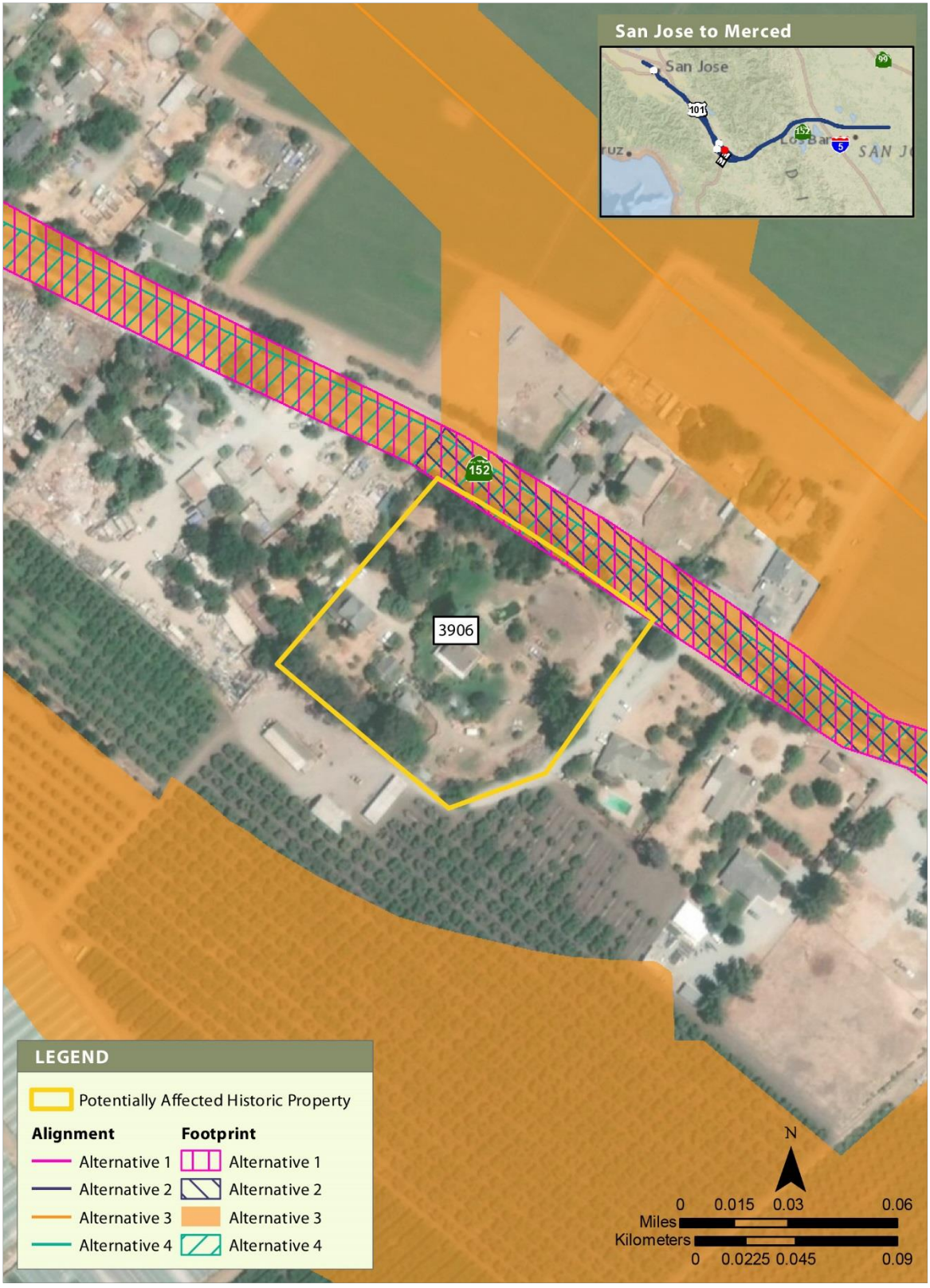
APRIL 2019

Figure 36 Built Resource Site 3882



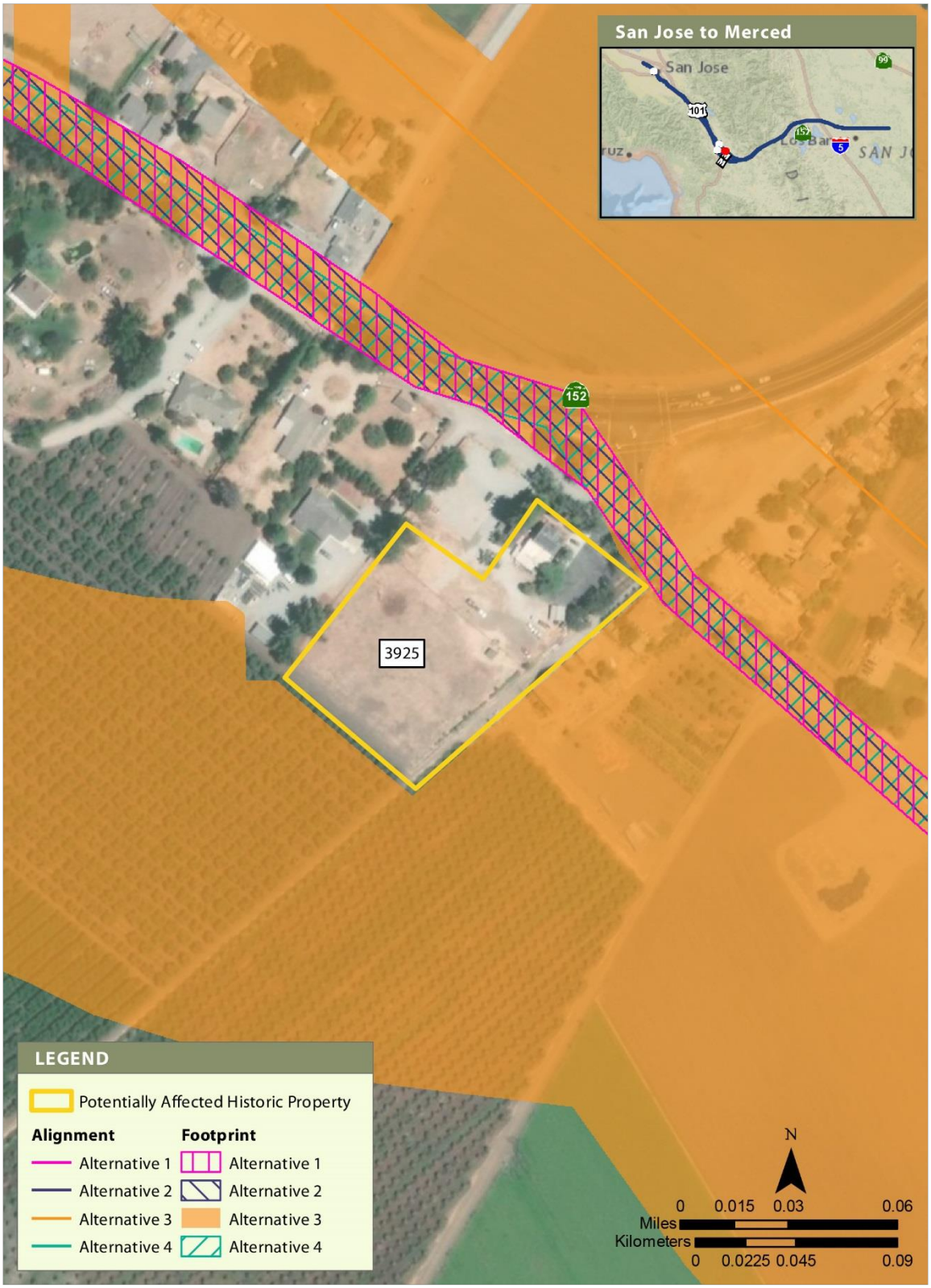
APRIL 2019

Figure 37 Built Resource Site 3903



APRIL 2019

Figure 38 Built Resource Site 3906



APRIL 2019

Figure 39 Built Resource Site 3925

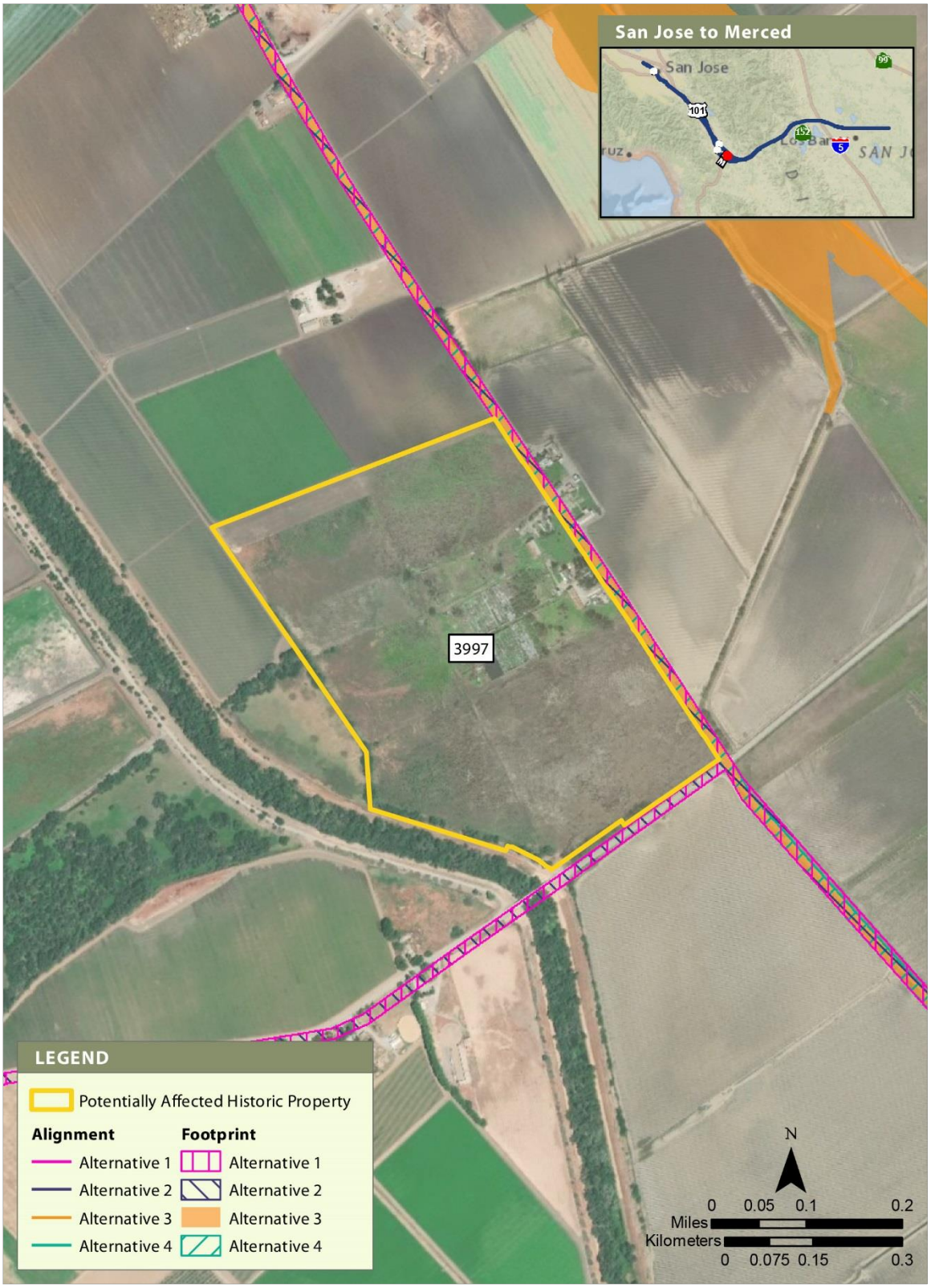


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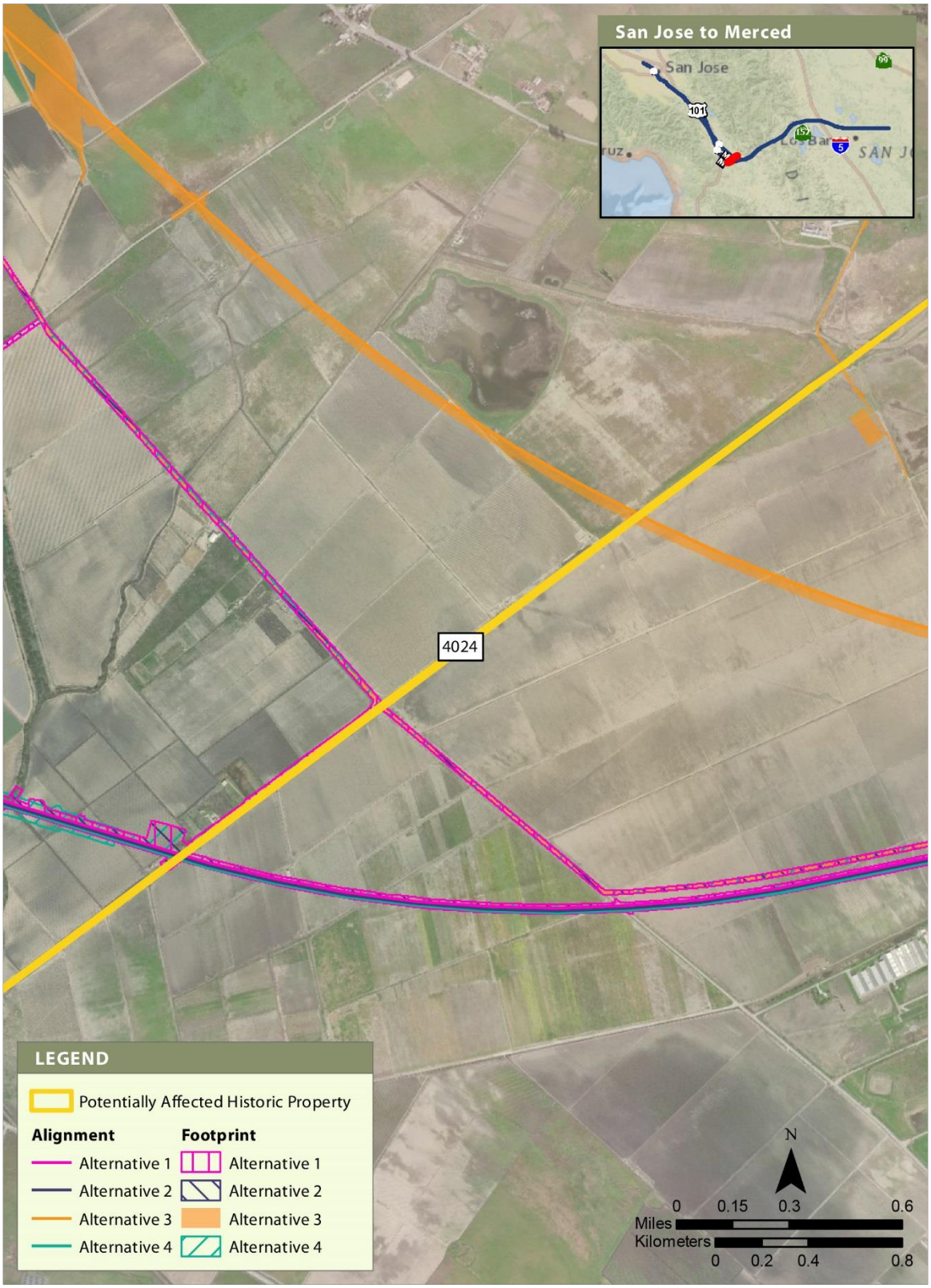
Figure 40 Built Resource Site 3997



APRIL 2019

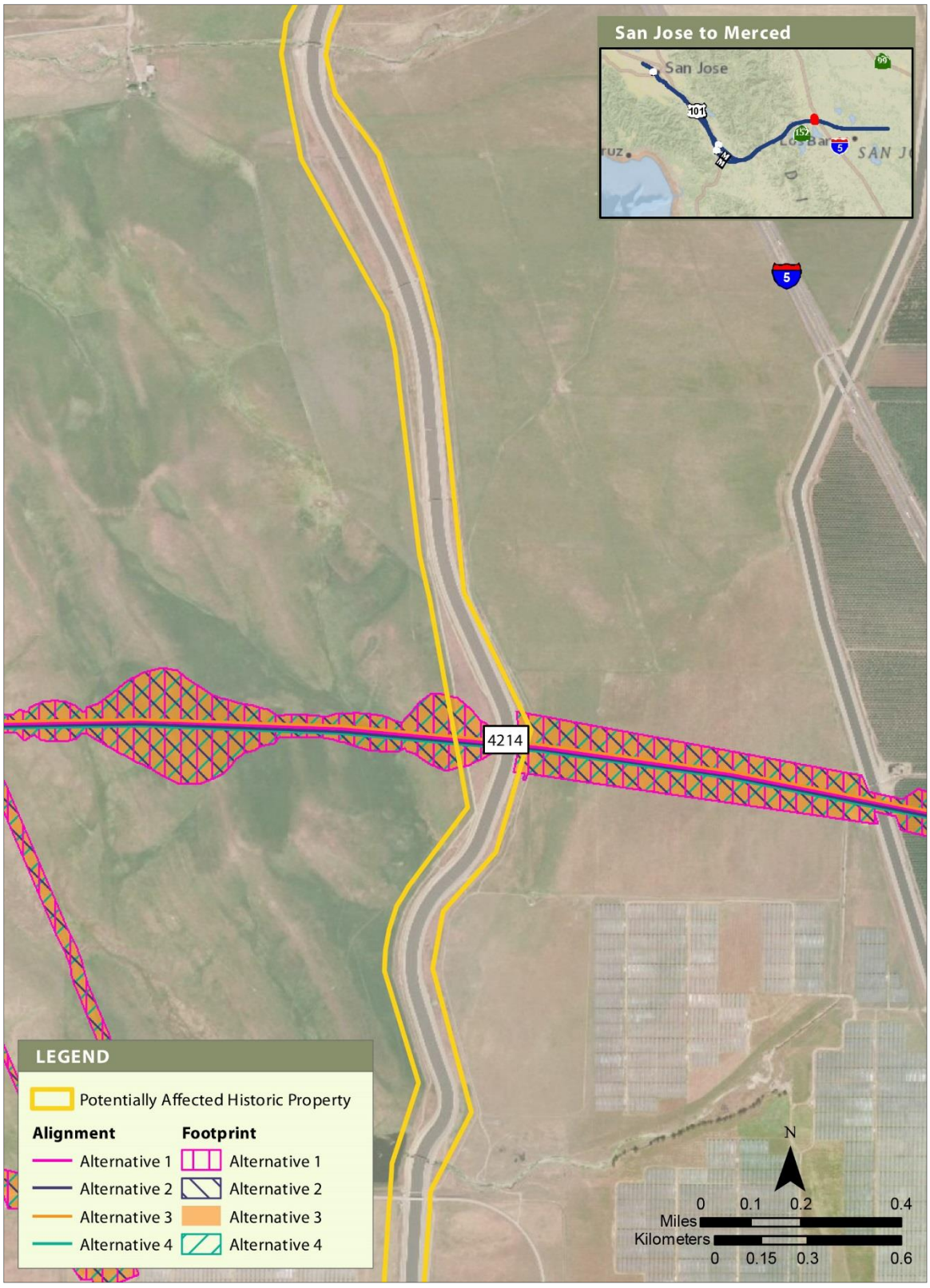
Figure 41 Built Resource Site 4024

APRIL 2019

Figure 42 Built Resource Site 4100

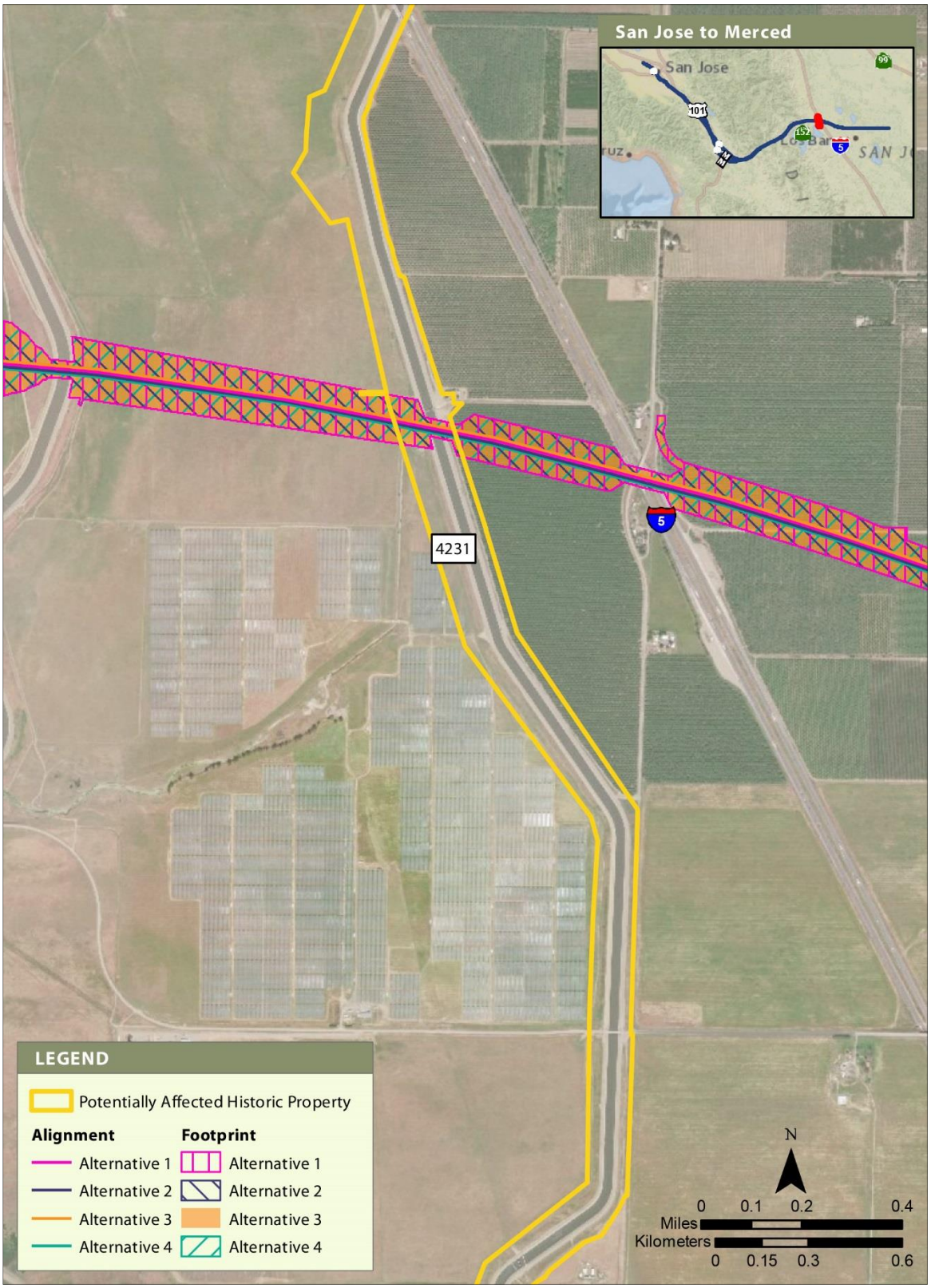
APRIL 2019

Figure 43 Built Resource Site 4140



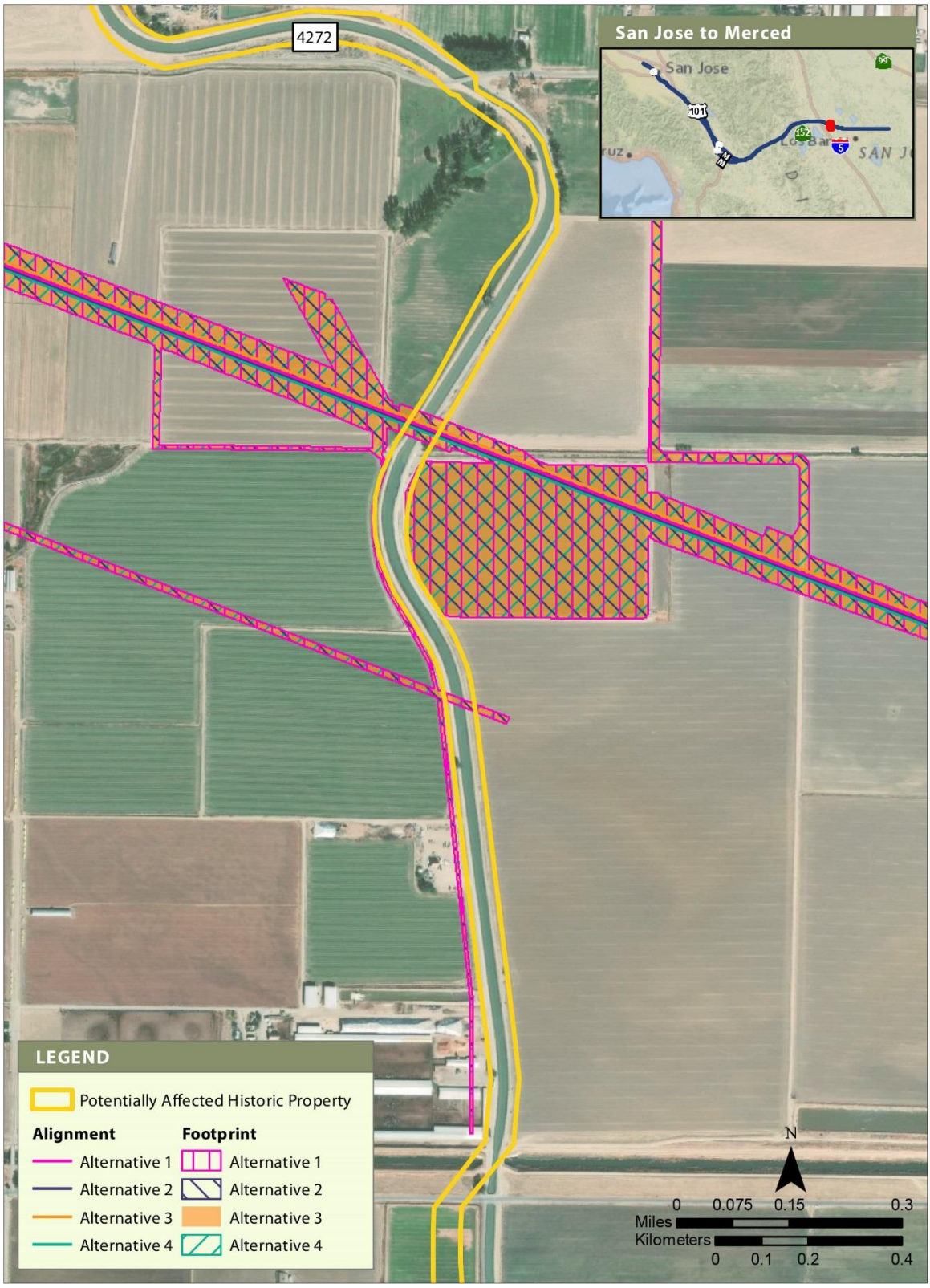
APRIL 2019

Figure 44 Built Resource Site 4214



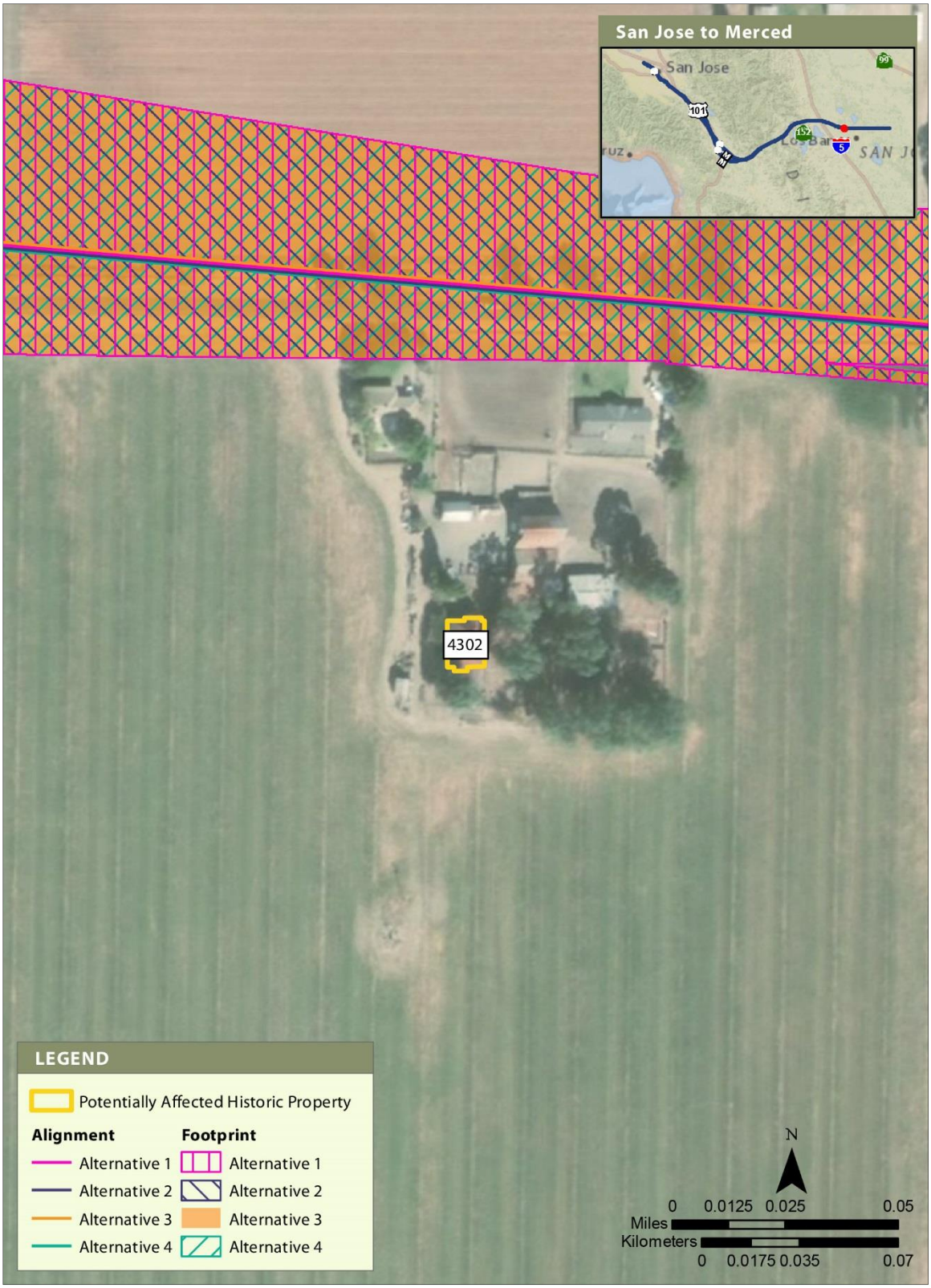
APRIL 2019

Figure 45 Built Resource Site 4231



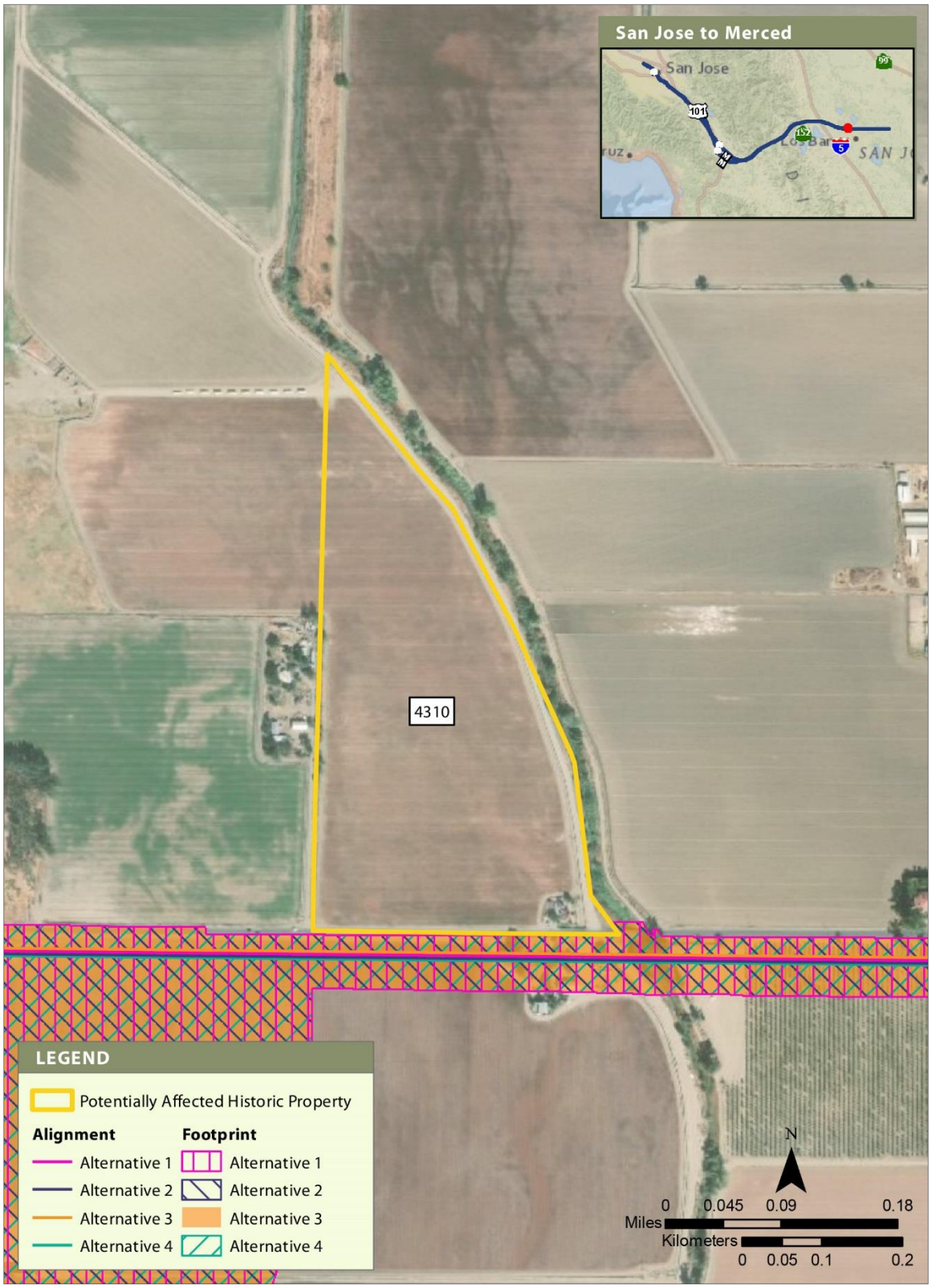
APRIL 2019

Figure 46 Built Resource Site 4272



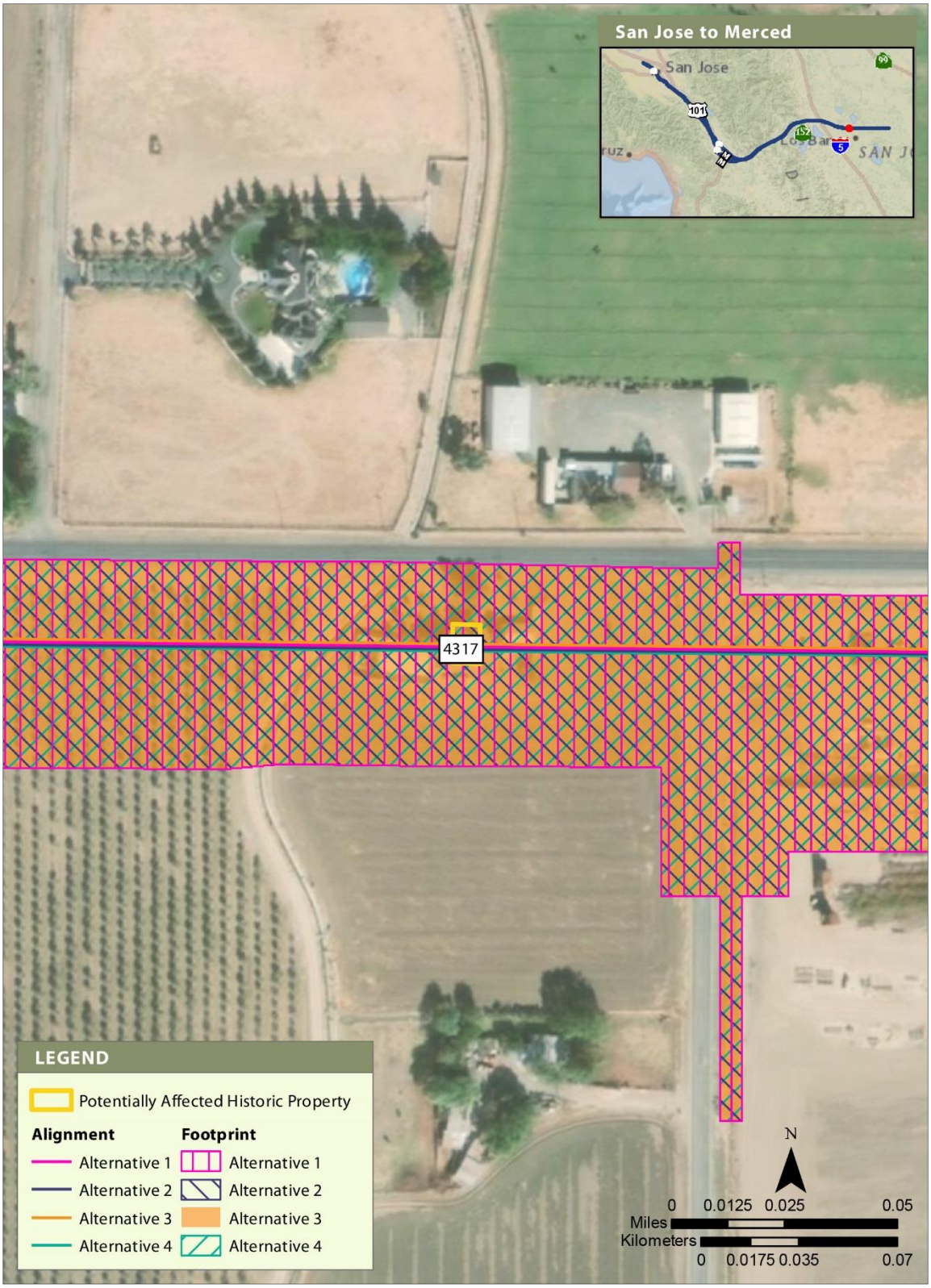
APRIL 2019

Figure 47 Built Resource Site 4302



APRIL 2019

Figure 48 Built Resource Site 4310



APRIL 2019

Figure 49 Built Resource Site 4317

APRIL 2019

Figure 50 Built Resource Site 4594

APRIL 2019

Figure 51 Built Resource Site 4652

APPENDIX 3.17-D: PROGRAMMATIC AGREEMENT AMONG THE FRA, THE ACHP, THE SHPO, AND THE AUTHORITY REGARDING COMPLIANCE WITH SECTION 106 OF THE NHPA, AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED RAIL PROJECT

FIRST AMENDMENT TO THE PROGRAMMATIC AGREEMENT AMONG THE FEDERAL RAILROAD ADMINISTRATION, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY REGARDING COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED TRAIN PROJECT

WHEREAS, the Federal Railroad Administration (FRA), the Advisory Council on Historic Preservation (ACHP or the Council) the California State Historic Preservation Officer (SHPO), and the California High-Speed Rail Authority (Authority) are parties to the *Programmatic Agreement Among the Federal Railroad Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the California High-Speed Train Project*, effective July 22, 2011 (Agreement); and

WHEREAS, the Agreement governs compliance with Section 106 of the National Historic Preservation Act, as amended (54 USC § 306108), and its implementing regulations, 36 CFR part 800 (collectively, Section 106) for nine separate undertakings that are individual project sections (each, an Undertaking as defined in the Agreement, and collectively, the Undertakings) of the California High-Speed Rail (HSR) System (previously referred to in the Agreement as the California High-Speed Train System); and

WHEREAS, subsequent to the execution of the Agreement, the Authority separated the Palmdale to Los Angeles project section into two smaller project sections, Palmdale to Burbank and Burbank to Los Angeles, for the purposes of analysis under the National Environmental Policy Act (NEPA) and Section 106, and each of the smaller project sections are considered Undertakings under the Agreement; and

WHEREAS, consistent with Stipulation XVII.E of the Agreement, the FRA, the ACHP, SHPO, and the Authority have assessed the Agreement and determined it is effective and have decided to extend its duration, with appropriate revisions identified in this First Amendment to the Agreement (First Amendment); and

WHEREAS, on April 18, 2013, and June 13, 2013, the Surface Transportation Board (STB) determined that it has jurisdiction over the California HSR System under 49 USC § 10501(a)(2)(A) of the Interstate Commerce Act, as amended, and, on January 18, 2018, the STB requested that it be added as an invited signatory to the Agreement to fulfill its obligations under Section 106; and on June 23, 2021 the STB designated the Authority as lead Federal agency for Section 106; and

WHEREAS, the FRA, the ACHP, SHPO, and the Authority agreed to invite the STB to sign the Agreement as an invited signatory by executing this First Amendment; and

WHEREAS, the Surface Transportation Project Delivery Program, authorized by 23 USC § 327, allows the Secretary of Transportation, through the FRA, to assign, and the State of California to assume, the FRA's responsibilities for environmental review, consultation, and other actions required under Federal environmental laws, including Section 106, for railroad and multimodal projects; and

WHEREAS, the State of California requested that the FRA assign its responsibilities for compliance with NEPA and other Federal environmental laws, including Section 106, with respect to the implementation of the California HSR System; and

WHEREAS, on July 23, 2019, the State of California, acting through its California State Transportation Agency and the Authority, and the FRA entered into a Memorandum of Understanding (MOU) pursuant to which the FRA assigned, and the State of California assumed, FRA's responsibilities for environmental review, consultation, or other action required or arising under certain Federal environmental laws for certain railroad projects relating to the California HSR System; and

WHEREAS, the projects described in 3.3.1.A of the MOU include the Undertakings; and

WHEREAS, such assigned and assumed responsibilities include Section 106 except to the extent 23 CFR § 773.105(b)(4) requires the FRA to retain responsibility for government-to-government consultation with Indian tribes (referred to as Indian tribes in 36 CFR Part 800, 23 CFR § 773.105(b)(4) and the MOU, and as Native American tribes in the Agreement and the remainder of this First Amendment); and

WHEREAS, prior to July 23, 2019, and at the time the Agreement took effect, the FRA was responsible for compliance with Section 106 for the Undertakings; and

WHEREAS, consistent with Sections 3.4.1 and 6.1 of the MOU and 23 USC § 327(e), the Authority is deemed to be acting as the FRA for, and is solely responsible and solely liable for carrying out, compliance with Section 106 for the Undertakings; and

WHEREAS, pursuant to Section 5.1.1 of the MOU and 23 USC § 327(a)(2)(C), in assuming the FRA's responsibilities as set forth in the MOU, the Authority is subject to the same procedural and substantive requirements that apply to the FRA in carrying out the terms of the Agreement and other interagency agreements such as programmatic agreements, memoranda of understanding, memoranda of agreement, and other similar documents that relate to the environmental review process; and

WHEREAS, consistent with Section 5.3.2 of the MOU and 36 CFR § 800.2(a), the Authority has consulted with FRA, the ACHP, and SHPO to enter into this First Amendment to identify the Authority as the Agency Official responsible for ensuring that the Undertakings are implemented in compliance with Section 106, except to the extent 23 CFR § 773.105(b)(4) requires the FRA to retain responsibility for government-to-government consultation with Native American tribes; and

WHEREAS, the FRA requested, and the ACHP, SHPO, and the Authority agreed, to change the FRA's status under the Agreement from a signatory to an invited signatory; and

WHEREAS, the Authority will notify the public and consulting parties, including Native American tribes, following execution of this First Amendment;

NOW, THEREFORE, in accordance with Stipulation XVII.B of the Agreement, the FRA, the ACHP, SHPO, the STB, and the Authority agree to amend the Agreement as follows:

1. Add new Stipulation XVIII, Definitions, to the Agreement as follows:

A. The term signatory or Signatory (or, collectively, signatories or Signatories), as used in the Agreement (as amended by this First Amendment), means the ACHP, SHPO, and the Authority.

B. The term Invited Signatory (or, collectively, Invited Signatories), as used in the Agreement (as amended by this First Amendment), means the FRA and the STB.

2. Amend Stipulations II.A. and II.B. so they are both stricken in their entirety and replaced with the following:

> *"A. FRA*
> *FRA is responsible for government-to-government consultation with Native American tribes for the Undertakings as provided in Stipulation IV, Consultation with Federally-Recognized Native American Tribes and Non-Federally-Recognized Native American Groups.*
>
> *B. Authority*
> *The Authority is responsible for ensuring that the Undertakings are implemented in compliance with Section 106, except to the extent 23 CFR § 773.105(b)(4) requires the FRA to retain responsibility for government-to-government consultation with Native American tribes. The Authority has primary responsibility pursuant to 36 CFR 800.2(a)(2) to ensure that the provisions of this Agreement are carried out. The Authority will execute MOAs for each of the Undertaking sections and participate in the resolution of disputes. The Authority is responsible for all determinations of eligibility and effect of the undertakings. Consistent with the requirements of 36 CFR 800.2(a) and 800.2(c)(4), the Authority is legally responsible for ensuring that the terms of this Agreement are carried out and for all findings and determinations made pursuant to this Agreement.*

3. Amend all references to "FRA" in the Agreement's Stipulations so that "FRA" is stricken and replaced with "Authority," except for Stipulation V.A. and Stipulation XVI and except as otherwise provided in this First Amendment.

4. Amend the third sentence of Stipulation VI.B.1 of the Agreement so it is stricken in its entirety and replaced with the following:

> "*Findings shall be made by the Authority based on National Register of Historic Places (NRHP) criteria (36 CFR 60.4) and evaluated in accordance with provisions of 36 CFR §800.4(c).*"

5. Amend the first sentence of Stipulation VI.C.1 of the Agreement so it is stricken in its entirety and replaced with the following:

> "*The Authority will submit a Draft HPSR to the Signatories, STB, and identified consulting parties, including Native American tribes, upon request prior to the public circulation of the draft environmental impact statement (DEIS) for each Undertaking, and such Draft HPSR will include documentation of all properties in the APE that are listed in the NRHP, were previously determined eligible for the NRHP, were found eligible for the NRHP by QIs, or appear ineligible for the NRHP but meet one of the conditions in Stipulation VI.B.4.*"

6. Amend the first sentence of Stipulation VI.C.4 of the Agreement so it is stricken in its entirety and replaced with the following:

> "*If, after the submission of the Final HPSR, there are changes to the APE that includes additional properties not exempt from evaluation or information is received that there may be additional historic properties within the APE, the Authority will prepare a*

Supplemental HPSR and distribute it to the SHPO and all parties who received the Final HPSR for a review and comment period of 30 days."

7. Amend the last paragraph of Stipulation VI.D of the Agreement so it is stricken in its entirety and replaced with the following:

"*Should a member of the public disagree with any NRHP eligibility determinations, the Authority shall immediately inform the other Signatories and STB in writing and take the objection into account. The Authority shall consult with the objecting party and, if the objecting party so requests, with any or all of the other Signatories for no more than 30 days. The Authority shall document such consultation efforts. Within 14 days following closure of the consulting period, the Authority shall render a decision regarding the objection and notify all parties of this decision in writing. In reaching the decision, the Authority shall take comments from all parties into account and make a good faith effort to resolve the dispute. The Authority's decision regarding resolution of the objection from a member of the public will be final.*"

8. Amend Stipulation VII.A of the Agreement so it is stricken in its entirety and replaced with the following:

"*A. If historic properties are identified within an Undertaking, the Authority shall assess adverse effects in accordance with 36 CFR 800.5 and prepare a Findings of Effect report (FOE) for each Undertaking where historic properties were identified within the APE. The FOE shall describe the assessment of potential adverse effects to historic properties that would result from the construction or operation of the project, and identify mitigation measures that would eliminate or minimize effects to be incorporated into the design and construction documents of the Undertaking. The Authority shall distribute the FOEs to the Signatories, STB, and other consulting parties, including Native American tribes, identified as a result of Stipulations IV.C and V.B, who shall have a 30-day review and comment period. The Authority shall ensure that comments are considered prior to finalizing the FOE(s) for submission to the SHPO for final review and concurrence. The SHPO shall have an additional 30 days for review and concurrence with the final FOE(s).*"

9. Amend Stipulation XI.A of the Agreement so it is stricken in its entirety and replaced with the following:

"*A. The Authority shall ensure that all operations for the portion of the Undertaking with the potential to affect an historic property are immediately ceased upon unanticipated resource discovery.*"

10. Amend the first sentence of Stipulation XI.B of the Agreement so it is stricken in its entirety and replaced with the following:

"*The Authority shall make a determination of the NRHP eligibility of the historic property and the potential for the Undertaking to adversely affect the resource.*"

11. Amend the first sentence of Stipulation XI.D of the Agreement so it is stricken in its entirety and replaced with the following:

"*The Authority shall implement the avoidance, minimization, or treatment plan and advise the other Signatories and STB of the satisfactory completion of the approved work.*"

12. Amend Stipulation IV of the Agreement so it is stricken in its entirety and replaced with the following:

"*IV. CONSULTATION WITH FEDERALLY-RECOGNIZED NATIVE AMERICAN TRIBES AND NON-FEDERALLY-RECOGNIZED NATIVE AMERICAN GROUPS*

A. FRA

1. Consistent with 23 CFR 773.105(b)(4) and Sections 3.2.1 and 3.2.4 of the MOU, the FRA is responsible for conducting government-to-government consultation with Federally-recognized Native American tribes for the Undertakings.

2. Notwithstanding any other provision of this Agreement, the FRA shall honor the request of any Federally-recognized Native American tribe for government-to-government consultation regarding an Undertaking covered by this Agreement. If a request for government-to-government consultation comes to the Authority, the Authority shall promptly inform the FRA. If any Federally-recognized Native American tribe requests government-to-government consultation with the FRA, the FRA shall conduct the government-to-government consultation and, if the tribe agrees, involve the Authority in that consultation process.

B. The Authority

1. The Authority shall consult with Federally-recognized Native American tribes as described in this Stipulation IV. The Authority is responsible for consultation with non-Federally-recognized Native American groups.

2. The Authority shall ensure that consultation with Federally-recognized Native American tribes and non-Federally-recognized Native American groups is initiated early in the project development process for each Undertaking to identify cultural, confidentiality, or other concerns, including concerns about historic properties, and to allow adequate time for consideration of such concerns whenever they may be expressed.

3. The Authority shall ensure that on-going consultation with Federally-recognized Native American tribes and non-Federally-recognized Native American groups continues throughout the Section 106 compliance process and whenever such groups express a concern about the Undertaking or about historic properties that may be affected by an Undertaking.

4. In accordance with 36 CFR §§ 800.2(c)(2) and 800.2(c)(5), respectively, Federally-recognized Native American tribes and non-Federally-recognized Native American groups may be identified as consulting parties in subsequent memoranda of agreement (MOAs) that are prepared for an Undertaking covered by this Agreement as described further in Stipulation VIII.A.

C. Consultation for Each Undertaking

1. The Authority shall identify Federally-recognized Native American tribes and non-Federally-recognized Native American groups who will participate in the Undertaking as a consulting party and shall consider future written requests to participate as consulting parties in an Undertaking.

2. *The Authority shall hold informal informational meetings with both Federally-recognized Native American tribes and non-Federally-recognized Native American groups specific to each Undertaking to help provide project updates and to identify potential consulting parties for an MOA.*
3. *The Authority shall consult with Federally-recognized Native American tribes and non-Federally-recognized Native American groups identified as consulting parties that attach religious and cultural significance to historic properties that may be affected by an Undertaking at key milestones in the Section 106 and NEPA processes to gain input from tribal governments. The Native American consultation will follow a process depicted in Attachment E and includes the following Native American consultation points:*
    (i) *During identification of historic properties, to confirm the historic properties identified.*
    (ii) *During assessment of adverse effects, (a) to provide requested site records of historic properties adversely affected for review, (b) to determine when and where tribal monitors may be needed during ground disturbing activities in previously identified sensitive areas or known sites, and (c) to develop avoidance, minimization and treatment measures for adverse effects to both archaeological and built resources.*
    (iii) *During resolution of adverse effects, (a) to develop and finalize treatment plans for archaeological and built resources, (b) to develop and execute MOAs, and (c) to determine when and where tribal monitors may be needed during treatment plan implementation or construction.*
    (iv) *During treatment plan and MOA implementation, (a) to provide for tribal monitors where agreed upon, (b) to review and comment on the Programmatic Agreement annual report, including input on treatment plan and MOA implementation.*
4. *Consultation with Federally-recognized Native American tribes shall continue throughout the development of subsequent Undertakings regardless of whether such tribes have chosen to concur with this Agreement.*"

13. Amend Stipulation XVII of the Agreement in its entirety so it is stricken and replaced with the following:

"*XVII. ADMINISTRATIVE STIPULATIONS*

A. Dispute Resolution

1. *Should any Signatory or Invited Signatory to this Agreement object within 30 days to any action proposed or any document provided for review pursuant to this Agreement, the Authority shall consult with the objecting party to resolve the objection. If the Authority determines that the objection cannot be resolved within 15 days, the Authority shall forward all documentation relevant to the dispute, including the Authority's proposed resolution, to the ACHP. The Authority will also provide a copy to all Signatories, Invited Signatories, and consulting parties for the Undertaking. The ACHP shall provide the Authority with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Authority shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the Signatories, Invited Signatories, and consulting parties, including Native American tribes, and provide them with a copy of this written response. The Authority will then*

proceed according to its final decision. If the ACHP does not provide its advice regarding the dispute within 30 days, the Authority may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Authority shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatories, Invited Signatories, and consulting parties for the Undertaking, and provide them and the ACHP with a copy of such written response.

2. *Should a consulting party or member of the public disagree with findings made pursuant to this Agreement, the Authority shall immediately inform the Signatories and Invited Signatories in writing and take the objection into account. The Authority shall consult with the objecting party and, if the objecting party so requests, with any or all of the other Signatories and Invited Signatories for no more than 30 days. Within 14 days following closure of the consulting period, the Authority shall render a decision regarding the objection and notify all parties of this decision in writing. In reaching the decision, the Authority shall take comments from all parties into account. The Authority's decision regarding resolution of the objection will be final.*
3. *The Authority's responsibility to carry out all other actions under this Agreement that are not subject to dispute will remain unchanged.*

B. Amendment

1. *The Signatories and Invited Signatories to this Agreement may request that it be amended, whereupon the Signatories and Invited Signatories will consult to consider such amendment. This Agreement, including any attachment to this Agreement, may be amended only upon written concurrence of all Signatories and Invited Signatories.*
2. *To address minor changes in an Undertaking or the treatment of historic properties affected by an Undertaking, the Authority may propose revisions to the treatment plans rather than to this Agreement. Upon the written concurrence of the Signatories, the Authority may revise the treatment plans to incorporate the agreed-upon changes without executing a formal amendment to this Agreement.*
3. *Revisions to an attachment to this Agreement would be implemented through consultation and include any necessary revisions to the Agreement itself that may result from modification of an attachment*

C. Review and Reporting

1. *The Signatories, Invited Signatories, and consulting parties, including Native American tribes, may review activities carried out by the Authority pursuant to this Agreement. The Authority shall facilitate this review by compiling specific categories of information to document the effectiveness of this Agreement and by making this information available in the form of a written annual Programmatic Agreement report. Categories of information shall include, but are not limited to, a summary of actions taken under this Agreement, including all findings and determinations, public objections, and inadvertent effects or foreclosures. The range and type of information included by the Authority in the written report and the manner in which this information is organized and presented must be such that it facilitates the ability of the reviewing parties to assess accurately the degree to which the Agreement and its manner of implementation constitute an efficient and effective program under 36 CFR Part 800.*

2. *The Authority shall prepare the written report of these findings annually following execution of this Agreement. The Authority shall submit the annual reports to the Signatories and Invited Signatories no later than three (3) months following the end of the State fiscal year until all treatment is completed. There will be a 30-day period to review and comment on the report. The Annual Programmatic Agreement Report will be finalized within 30 days of receipt of comments.*
3. *The Authority shall make the annual report available for public inspection. The Authority shall send copies of the report to the Signatories, Invited Signatories, and consulting parties, including Native American tribes, of this Agreement and any subsequent MOAs, and make a copy available to members of the public for comment, upon request.*
4. *In conjunction with the review of the annual reports prepared by the Authority, the Signatories and Invited Signatories shall consult in an annual teleconference to review the overall effectiveness and benefits of this Agreement, determine if its requirements are being met, decide if amendments to the Agreement are warranted, review the reporting format and categories for adequacy, and identify any other actions that may be needed in order to take into account the effects of the Undertakings on historic properties in California.*

D. Termination

Any Signatory or Invited Signatory may terminate this Agreement by providing 30 days written notice to the other Signatories and Invited Signatories. The Signatories and Invited Signatories shall consult during the 30-day period prior to termination to seek agreement on amendments or other actions that would avoid termination. Should such consultation result in an agreement on an alternative to termination, the Signatories and Invited Signatories shall proceed in accordance with that agreement. Should a Signatory or Invited Signatory propose termination of this Agreement, it will notify the other Signatories and Invited Signatories in writing. If any of the Signatories or Invited Signatories individually terminates its participation in the Agreement, then the Agreement is terminated in its entirety. In the event of termination, then the Authority shall either consult in accordance with 36 CFR 800.14(b) to develop a new programmatic agreement or request the comments of the ACHP pursuant to 36 CFR 800. Beginning with the date of termination, the Authority shall ensure that until and unless a new Agreement is executed for the actions covered by this Agreement, the Undertakings shall be reviewed individually in accordance with 36 CFR 800.4–800.6.

E. Duration of this Agreement

This Agreement shall remain in effect until expiration or termination of the MOU. If the MOU is renewed beyond July 23, 2024, this Agreement shall be amended accordingly. If the Agreement is effective and its duration needs to be extended, the signatories can decide to extend the duration of the Agreement. If this Agreement expires, the Authority shall notify the Signatories and Invited Signatories in writing. If the Authority or a Federal agency party to this Agreement chooses to continue with the Undertaking after this Agreement expires, it shall review the Undertaking in accordance with 36 CFR Part 800.

F. Execution and Implementation of the Agreement

1. *This Agreement, including its attachments, shall take effect upon execution by all the Signatories. Additional amendments to this Agreement shall take effect upon execution by all the Signatories and Invited Signatories.*

2. *Execution of this Agreement by the Signatories and implementation of its terms evidence that the Authority has taken into account the effects of the Undertakings on historic properties and afforded the ACHP an opportunity to comment.*"

14. Effect of Agreement. All provisions of the Agreement that are not amended by this First Amendment remain in effect.

15. Effective Date. This First Amendment shall take effect upon execution by the ACHP, SHPO, and the Authority.

FIRST AMENDMENT TO THE PROGRAMMATIC AGREEMENT AMONG THE FEDERAL RAILROAD ADMINISTRATION, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY REGARDING COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED TRAIN PROJECT

SIGNATORY:

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: July 21, 2021

Reid J. Nelson
Acting Executive Director

FIRST AMENDMENT TO THE PROGRAMMATIC AGREEMENT AMONG THE FEDERAL RAILROAD ADMINISTRATION, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY REGARDING COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED TRAIN PROJECT

SIGNATORY:

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: July 20, 2021

Julianne Polanco

State Historic Preservation Officer

FIRST AMENDMENT TO THE PROGRAMMATIC AGREEMENT AMONG THE FEDERAL RAILROAD ADMINISTRATION, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY REGARDING COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED TRAIN PROJECT

SIGNATORY:

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

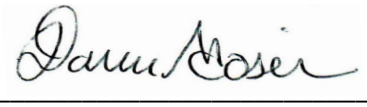
By: Brian P. Kelly Date: 7/12/21

Brian P. Kelly
Chief Executive Officer

FIRST AMENDMENT TO THE PROGRAMMATIC AGREEMENT AMONG THE FEDERAL RAILROAD ADMINISTRATION, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY REGARDING COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED TRAIN PROJECT

INVITED SIGNATORY:

SURFACE TRANSPORTATION BOARD



By: _____ Date: _July 20, 2021_____
Danielle Gosselin
Acting Director, Office of Environmental Analysis

FIRST AMENDMENT TO THE PROGRAMMATIC AGREEMENT AMONG THE FEDERAL RAILROAD ADMINISTRATION, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY REGARDING COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED TRAIN PROJECT

INVITED SIGNATORY:

FEDERAL RAILROAD ADMINISTRATION

MARLYS A OSTERHUES Digitally signed by MARLYS A OSTERHUES Date: 2021.07.16 17:55:28 -04'00'

By: _____ Date: _____

Marlys Osterhues
Chief, Environment and Project Engineering Division
Office of Infrastructure Investment

PROGRAMMATIC AGREEMENT AMONG
THE FEDERAL RAILROAD ADMINSTRATION,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND
THE CALIFORNIA HIGH-SPEED RAIL AUTHORITY
REGARDING
COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT,
AS IT PERTAINS TO THE CALIFORNIA HIGH-SPEED TRAIN PROJECT

WHEREAS, The California High Speed Rail Authority (Authority), an agency of the State of California, proposes to construct and operate a Statewide High Speed Train (HST) System comprised of nine independent sections between major metropolitan areas of California. The following HST System sections (see map, Attachment A) comprise the nine separate undertakings covered by this Programmatic Agreement (hereafter, Agreement), which are subject to review under Section 106 of the National Historic Preservation Act and its implementing regulations, 36 Code of Federal Register (CFR) Part 800:

- San Francisco to San Jose.
- San Jose to Merced.
- Merced to Sacramento.
- Merced to Fresno.
- Fresno to Bakersfield.
- Bakersfield to Palmdale.
- Palmdale to Los Angeles.
- Los Angeles to Anaheim.
- Los Angeles to San Diego.

WHEREAS, in 2005 the Federal Railroad Administration (FRA), acting as the Federal agency, and the Authority completed a Statewide Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) in accordance with the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) as the first phase of the tiered environmental review process. In 2008 the FRA and the Authority completed a second program EIR/EIS on the Central Valley to Bay Area portion of the HST System. The Record of Decision (ROD) for the Statewide Program EIR/EIS indicated that project-level environmental analysis would be conducted for sections of the Statewide HST System as the next phase of environmental review and project approval; and

WHERAS, pursuant to the requirements of CEQA and NEPA, the Authority and the FRA conducted a public and agency involvement program as part of the program environmental review process for the Statewide Program EIR/EIS. As part of this outreach, information was provided to 15,500 federal, state, and local agency representatives; elected officials; property owners; interested persons; and interested organizations. Approximately 25 informal and formal public meetings were held statewide during the Program EIR/EIS process. The Authority and the FRA convened staff representatives from 27 interested federal and state agencies to provide input on the environmental review process. Targeted interested groups included non-governmental organizations, community planning organizations, and public interest discussion/research groups; and

WHEREAS, for the Statewide Program EIR/EIS, the FRA and the Authority initiated consultation with Native American groups and sent letters providing information about the proposed project alternatives and requesting information about any traditional cultural properties that could be affected by the project. The FRA and Authority also contacted the California Native American Heritage Commission for a search of their Sacred Lands files and to provide a list of Native American tribes or groups for Section 106 consultation.

WHEREAS, in addition to consultation with the Federally-recognized Native American tribes, and other federal, state, regional, and local agencies, as appropriate, the FRA, as the Federal agency, and the Authority, as a responsible state agency, consulted with the Advisory Council on Historic Preservation (Council) and the State Historic Preservation Officer (SHPO) on the historic properties identified in the Program EIR/EIS and on measures to avoid, minimize, and mitigate potentially significant impacts; and

WHEREAS, the FRA has determined that each of the nine independent sections of the proposed HST System that include rail lines, associated structures, maintenance and ancillary facilities, construction easements, and staging areas, is an undertaking of this Agreement that may have an effect upon historic properties included on or eligible for inclusion on the National Register of Historic Places (NRHP); and

WHEREAS, the construction schedule is different for each undertaking, and Section 106 of the National Historic Preservation Act (16 U.S.C. §470f, hereafter Section 106) may be conducted and concluded at different times for each undertaking; and

WHEREAS, the purpose of this Agreement is to provide statewide consistency in consultation procedures, documentation standards, and federal agency oversight in compliance with Section 106 of the National Historic Preservation Act for each undertaking, each of which would be subject to an individualized consultation process under the terms of the PA; and

WHEREAS, the Authority has received a grant from the FRA though the High-Speed Intercity Passenger Rail Program funded in part through the American Recovery and Reinvestment Act (ARRA), to construct a section of the California High-Speed Train consisting of portions of the Merced to Fresno and Fresno to Bakersfield undertakings, and this Agreement streamlines the Section 106 compliance process, thereby expediting the obligation of ARRA funds; and

WHEREAS, the FRA has a statutory obligation, as the federal agency, to fulfill the requirements of Section 106 (36 CFR 800). The FRA, in consultation and cooperation with the Authority, shall ensure that the measures in the following stipulations are carried out. The FRA authorizes the Authority to initiate consultation with the SHPO pursuant to 36 CFR 800.14(b)(1)(iii) for the undertakings covered by this Agreement; and

WHEREAS, pursuant to 36 CFR 800.14, the FRA delegates major decision-making responsibility to the Authority including identification of historic resources, findings of eligibility, findings of effect, consultation, and the development and implementation of individual Memoranda of Agreement (MOAs) and treatment plans for each undertaking. The Authority will submit documents specified in this Agreement to the SHPO on behalf of the FRA: and

WHEREAS, the FRA and the Authority will jointly prepare environmental studies of the HST Projects (undertakings) in accordance with NEPA, including cultural resource studies required for Section 106, to coordinate the NEPA and Section 106 processes to the maximum extent possible; and

WHEREAS, the FRA, the Council, the Authority, and the SHPO are signatories pursuant to 36 CFR 800.6(c)(1) and have authority to execute, amend, or terminate this Agreement; and

WHEREAS, the FRA and the authority will continue to consult with Federally recognized Native American Tribes, concerning properties of traditional religious and cultural significance, and the Pechanga and Soboba Band of Luiseno Indians have requested to be concurring tribes under this Agreement; and

WHEREAS, all of the signatories to this Agreement accede to implement the procedure and measures described herein for each undertaking in keeping with the following stipulations; and

NOW, THEREFORE, the signatories agree that the proposed undertakings covered by this Agreement shall be implemented in accordance with the following stipulations in order to consider the effect of each undertaking on historic properties and that these stipulations shall govern compliance of the proposed HST System with Section 106 of the NHPA until this Agreement expires or is terminated.

STIPULATIONS

I. APPLICABILITY

A. This Agreement shall apply to all the FRA and Authority undertakings administered under the HST Project for which the FRA is the Federal agency.

B. This Agreement shall not apply to undertakings that occur on or affect tribal lands as defined in Section 301(14) of the NHPA. While no use of tribal land is anticipated, if such undertakings occur, the FRA shall follow the procedures in 36 CFR Part 800.

C. In the event that the Authority applies for additional federal funding or approvals for the undertakings from another agency that is not party to this agreement and the undertakings as described herein remain unchanged, such funding or approving agency may comply with Section 106 by agreeing in writing to the terms of this Agreement and notifying and consulting with SHPO and Council. Any necessary modifications will be considered in accordance with Stipulation XVII.B of this Agreement.

II. ROLES AND RESPONSIBILITIES

A. FRA

As the Federal agency, the FRA has primary responsibility pursuant to 36 CFR 800.2(a)(2) to ensure that the provisions of this Agreement are carried out. The FRA will conduct government-to-government consultation with Federally-recognized Native American tribes, execute MOAs for each of the Undertaking sections, and participate in the resolution of disputes. The FRA is responsible for all determinations of eligibility and effect of the undertakings. Consistent with the requirements of 36 CFR 800.2(a) and 800.2(c)(4), the FRA remains legally responsible for ensuring that the terms of this Agreement are carried out and for all findings and determinations made pursuant to this Agreement.

B. Authority

The FRA has delegated to the Authority responsibility for the implementation of the following provisions of this Agreement: Consult with non-Federally-recognized Native American groups, other consulting parties and the public; conduct Section 106 reviews in a timely manner; delineate and change the APE as needed and inform signatories of the change; prepare documentation for the SHPO and the FRA including determinations of eligibility and effect; circulate comments from signatories; maintain documentation of the Section 106 compliance for each Undertaking; develop a prototype MOA for each Undertaking; invite local agencies, Native American groups, interested non-governmental organizations, and individuals to participate in the development of each Undertaking MOA to agree upon means to avoid, minimize, and/or mitigate adverse effects to historic properties; develop and implement MOAs for each Undertaking; develop a built-environment treatment plan and an archaeological treatment plan prototype to be used for each Undertaking; develop and implement the individual Undertaking treatment plans, as provisions in the MOAs for each Undertaking; and ensure project information is available to consulting parties and the public in concert with the CEQA/NEPA process for each undertaking.

C. SHPO

The SHPO shall be responsible for reviewing project documentation in a timely manner and participating in consultation as set forth in this PA.

D. Council

The Council shall be responsible for providing technical guidance, participating in dispute resolutions if needed, and monitoring the effectiveness of this Agreement.

III. PROFESSIONAL QUALIFICATIONS STANDARDS

All actions prescribed by this Agreement that involve the identification, evaluation, analysis, recording, treatment, monitoring, or disposition for historic properties, or that involve reporting or documentation of such actions in the form of reports, forms, or other records, shall be carried out by or under the direct supervision of a person or persons who meet, at a minimum, the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-44739) (Appendix A to 36 CFR Part 61) in the appropriate discipline. Hereinafter, such persons shall be referred to as Qualified Investigators (QIs). The Authority shall ensure that the work outlined in this Agreement is conducted by staff meeting these qualifications standards. However, nothing in this stipulation may be interpreted to preclude the FRA or the Authority or any agent or contractor thereof from using the services for persons who are not QIs, as long as their activities are overseen by QIs.

IV. ON-GOING CONSULTATION WITH NATIVE AMERICAN TRIBES

A. FRA

1. As the Federal agency with responsibility for Section 106 compliance, the FRA is responsible for all government to government consultation with federally-recognized tribes. A list of federally-recognized Native American tribes contacted can be found in Attachment (F).

2. The FRA initiated government-to-government consultation by letter to all Federally-recognized Native American tribes that could be affected by the undertakings. Tribal Representatives have also been contacted by telephone.

3. The FRA shall ensure that on-going consultation with Federally-recognized Native American tribes continues early in the project development process for each undertaking to identify cultural, confidentiality, or other concerns including those about historic properties, and to allow adequate time for consideration of such concerns whenever they may be expressed.

4. The FRA provided the draft Agreement to Federally-recognized Native American tribes for review and comment. Federally-recognized Native American tribes were provided a 30 calendar day opportunity to comment. All comments received by Federally-recognized Native American tribes were considered by the signatory parties and where appropriate incorporated herein.

5. In accordance with 36 CFR 800.2(c)(2), Federally-recognized Native American tribes may be identified as consulting parties for individual undertakings and in subsequent MOAs that are prepared for an undertaking covered by this Agreement as described further in Stipulation VIII.A.

6. Consultation with Federally-recognized Native American tribes shall continue throughout the development of subsequent undertakings regardless of whether such tribes have chosen to concur with this Agreement.

7. The FRA shall identify tribes who will participate in an undertaking as a consulting party and shall consider future written requests to participate as consulting parties in an undertaking.

B. The Authority

1. The Authority may consult informally with the federally recognized tribes and will coordinate such consultation with the FRA. The Authority is responsible for consultation with non-federal recognized Native American groups. A list of non-federally-recognized Native American groups contacted can be found in Attachment (F).

2. Authority shall ensure that consultation with non-Federally-recognized Native American groups, as appropriate, is initiated early in the project planning process for each undertaking to identify cultural, confidentiality, or other concerns and to allow adequate time for consideration of such concerns.

3. The Authority sent letters to all non-Federally-recognized Native American groups to begin consultation. Tribal Representatives have also been contacted by telephone.

4. The Authority shall ensure that consultation continues with non-federally–recognized Native American groups respectively throughout the Section 106 compliance process and whenever such groups express a concern about the undertaking or about historic properties that may be affected by an undertaking.

5. In accordance with 36 CFR 800.2(c)(2), non-Federally-recognized Native American groups may be identified as consulting parties in subsequent MOAs that are prepared for an undertaking covered by this Agreement as described further in Stipulation VIII.A.

6. The FRA and the Authority shall ensure that consultation continues with non-federally–recognized Native American groups respectively throughout the Section 106 compliance process and when such groups express a concern about an undertaking or about historic properties that may be affected by an undertaking.

7. The Authority provided the draft Agreement to non-Federally-recognized Native American groups. Native American groups were provided 30 calendar days to comment on the document.

C. Consultation for each Undertaking

1. The Authority shall hold informal informational meetings with both Federally-recognized Native American tribes and non-Federally-recognized Native American groups specific to each undertaking to help provide project updates and to identify potential consulting parties for an MOA.

2. The FRA shall consult on a government to government basis with Federally-recognized Native American tribes identified as consulting parties that attach religious and cultural significance to historic properties that may be affected by an undertaking at key milestones in the Section 106 and NEPA processes to gain input from Tribal governments. The Authority shall consult with all other involved Native American groups. The Tribal consultation will follow a process depicted in Attachment E and includes the following Native American consultation points:

   i. During identification of historic properties, to confirm the historic properties identified.

   ii. During assessment of adverse effects, (a) to provide requested Site Records of historic properties adversely affected for review, (b) to determine when and where tribal monitors may be needed during ground disturbing activities in previously identified sensitive areas or known sites, and (c)

to develop avoidance, minimization and treatment measures for adverse effects to both archaeological and built resources.

iii. During resolution of adverse effects, (a) to develop and finalize treatment plans for archaeology and built resources, (b) develop and execute MOAs, and (c) to determine when and where tribal monitors may be needed during treatment plan implementation or construction.

iv. During treatment plan and MOA implementation, (a) to provide for Tribal Monitors where agreed upon, (b) to review and comment on the Programmatic Agreement Annual Report, including input on the treatment plan and MOA implementation.

V. PARTICIPATION OF OTHER CONSULTING PARTIES AND THE PUBLIC

A. Public Involvement

Public involvement in planning and implementation of undertakings covered by this Agreement shall be governed by the FRA's and the Authority' environmental compliance procedures, as set forth by the Authority's environmental analysis methods, and any advice and guidance documents. Historic resources will be identified and effects will be disclosed to the extent allowable under 36 CFR 800.2(d)(1-2), 800.3(e), and 800.11(c)(1 and 3) and Stipulation XII of this Agreement. Consistent with Section 106, the public and consulting parties will have an opportunity to comment and have concerns taken into account on findings identified in Section 106 survey and effects documents via attendance at public meetings where they can submit comments on the information presented, as well as access the Section 106 documents via email requests to the Authority's web site. Project information and announcements are posted on the Authority's web site (www.cahighspeedrail.ca.gov). Public involvement and the release of information hereunder shall be consistent with 36 CFR 800.2(d)(1-2), 800.3(e), and 800.11(c)(1 and 3), the Freedom of Information Act, 49 CFR. part 7, and Section 6254.10 of the California Government Code.

The FRA and the Authority have contacted local groups and individuals known to have interests in historic properties regarding the identification of historic properties in each section. Public meetings specific to historic properties and the effects of the project and treatment of these properties will be held in communities within each section. These interest groups and interested individuals will be invited to comment on the treatments proposed and those with demonstrated interest in the project will be invited to participate as consulting parties to the individual section MOAs Public involvement and the release of information hereunder shall be consistent with 36 CFR 800.2(d)(1-2), 800.3(e), and 800.11(c)(1 and 3), the Freedom of Information Act, 49 CFR. part 7, and Section 6254.10 of the California Government Code.

B. Consulting Parties

Consulting parties shall participate in undertakings covered by this Agreement in accordance with 36 CFR 800.2(c)(3) through (5) and 800.3(f). Consulting parties may include other federal, state, regional, or local agencies that may have responsibilities for historic properties and may want to review reports and findings for an undertaking within their jurisdiction.

The Authority shall submit to the ACHP and SHPO a list of consulting parties for each undertaking and a summary of coordination efforts and comments received. The SHPO shall submit comments, including recommendations for additional parties to the Authority within 30 days. The Authority shall revise and update this information as necessary based on SHPO's comments, and re-submit them to SHPO as part of the reports to be prepared under Stipulation VI. The Authority and FRA shall also consider individuals' written requests to participate as consulting parties in the development of measures to avoid, minimize and mitigate adverse effects to historic properties. Pursuant to 36 CFR

800.11(e) through (g), views of the public will be included in documentation of project effects to historic properties and the individual section MOAs

VI. IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES

A. Area of Potential Effects

The Area of Potential Effects (APE) for each undertaking will be determined by the Authority in accordance with the APE Delineation guidelines (Attachment B). As described in Attachment B, throughout the design process, the Authority will determine if revisions to an undertaking require modifications to the APE. If an APE requires revisions, the Authority is responsible for informing the signatories, consulting Federally-recognized Native American tribes, and other consulting parties within 15 days of identification of the needed changes.

B. Identification of Historic Properties

1. The signatories to this Agreement along with the concurring tribes agree that the Authority will identify historic properties and prepare documentation in accordance with Attachment C. As appropriate, these methods may be modified for undertaking-specific needs in consultation with the signatories and in accordance with QI review and current professional standards. Findings shall be made by the Authority to the FRA based on National Register of Historic Places (NRHP) criteria (36 CFR 60.4) and evaluated in accordance with provisions of 36 CFR §800.4(c). Evaluation methods and criteria shall be consistent with the Secretary of the Interior's Standards and Guidelines for Evaluation (48 Federal Register 44729-44738) (36 CFR §63) and shall be completed by QIs qualified in the appropriate discipline: archaeology, architectural history, or history.

2. Historic properties shall be identified to the extent possible within the APE for each of the nine undertakings that comprise the California HST System and will be documented in the Project EIR/EIS and the Historic Property Survey Report (HPSR) as described in Attachment C. The content, methodology, level of effort, and documentation requirements for the HPSR shall follow federal and state guidelines and instructions, and are provided in detail in Attachment C. The identification effort and ineligible properties shall be documented in separate technical reports for archaeological properties and historic architectural properties, the drafts of which will be submitted for review by the signatories and other consulting parties including tribal historic preservation officers (THPOs) and tribal representatives who have expressed an interest in the undertaking.

   i. Archaeological properties include prehistoric and historic archaeological sites, properties identified as per 800.4(a)(4), objects and districts. Evaluations shall be made by QIs fully qualified in the discipline of archaeology. Archaeological properties within the APE that are identified by QIs as historic properties or presumed to be historic properties shall be documented in the HPSR. Archaeological properties evaluated as ineligible for the NRHP by QIs shall be documented in Archaeological Survey Reports (ASR). The content, methodology, level of effort, and documentation requirements for the ASR are provided in detail in Attachment C. A list of archaeological resources exempt from evaluation is provided in Attachment D.

   ii. Historic architectural properties include historic buildings, structures, objects, sites, landscapes and districts. Evaluations shall be made by QIs. Historic architectural properties within the APE that are identified by QIs as historic properties shall be documented in the HPSR. Historic architectural properties evaluated as ineligible for the NRHP by QIs shall be documented in Historic Architectural Survey Reports (HASR). The content, methodology, level of effort, and documentation requirements for the HASR are provided in detail in Attachment C. A list of historic architectural property types exempt from evaluation is provided in Attachment D.

3. Other categories of properties that do not warrant evaluation, including those that are minor, fragmentary, or do not meet age or integrity requirements, are exempt from evaluation in the HPSR, ASR, or HASR, and are identified in Attachment D.

4. A property less than 50 years old with potential exceptional significance or a property greater than 50 years old with characteristics indicating potential eligibility for the NRHP that is determined by a QI as ineligible for the NRHP that is not among the exempt property types identified in Attachment D shall be evaluated and documented in the HPSR if it meets one of the following conditions:

   i. The property was identified as significant in a state, regional, or local survey of historic properties.

   ii. The property was designated under a state, regional, or local ordinance with criteria for evaluating properties with historic or architectural significance.

   iii. The property was identified by the SHPO, THPO, or any party identified as a result of Stipulations IV and V.

   iv. The property would be acquired, destroyed, demolished, or substantially altered as a result of the undertaking.

C. Evaluation of Historic Properties

1. Upon review and concurrence of the findings by the FRA, a Draft HPSR would be submitted by the Authority to the signatories and identified consulting parties, including Native American tribes, upon request prior to the public circulation of each project DEIS, and would include documentation of all properties in the APE that are listed in the NRHP, previously determined eligible for the NRHP, found eligible for the NRHP by QIs, or that appear ineligible for the NRHP but meet one of the conditions in B.4. of this stipulation. Known archaeological properties that cannot be evaluated prior to approval of an undertaking will be presumed NRHP eligible. Where archaeological testing to determine NRHP eligibility is feasible, project-specific MOAs may include a provision for treatment plans that include archaeological testing or use of a combined archaeological testing and data recovery program.

2. The Authority shall submit its findings in the HPSR to the signatories and consulting parties, including Native American tribes, identified as a result of Stipulations IV.C and V.B, who shall have 30-days to review the HPSR findings and provide their recommendations for changes to the findings based on National Register criteria. If no objection is made, consistent with Stipulation VI.D, within the 30-day period, the findings for those historic properties would become final.

3. Other non-eligible properties not already reported in the HPSR within the APE will be evaluated by QIs, documented for each undertaking in an ASR and/or HASR, and submitted to the SHPO for review and concurrence at the same time as the HPSR or no later than the end of the comment period of the DEIS. If the SHPO, agency reviewer, consulting Native American tribe, or other consulting party asks for additional information or a re-evaluation of a property, that property and the updated finding of eligibility or non-eligibility shall be included in the Final HPSR. Comments received from the SHPO, the THPO, agency reviewer(s), consulting Native American Tribe(s), and other consulting parties will be considered and may be incorporated into a Final HPSR.

4 If, after the submission of the Final HPSR, there are changes to the APE that includes additional properties not exempt from evaluation or information is received that there may be additional historic properties within the APE, a Supplemental HPSR will be prepared, and distributed following review by the FRA, to the SHPO and all parties who received the Final HPSR for a review and comment period of 30 days. If no objection is made, consistent with Stipulation VI.D, within the 30-day period, the findings for those historic properties in the Supplemental HPSR would become final.

D. Eligibility Disagreements

Should a disagreement arise regarding the NRHP eligibility of a property in the APE for an undertaking, the FRA shall forward a Determination of Eligibility documentation to the Keeper of the National Register (Keeper) for resolution in accordance with 36 CFR 800.4(c)(2) if:

1. The SHPO or a federal agency with jurisdiction over the involved lands objects in writing within 30 days to a finding of eligibility, or

2. A Native American tribe or group that ascribes traditional religious and cultural significance to a property objects in writing within 30 days to a Finding of Eligibility regarding that property; and

3. The FRA is not able to resolve that objection through consultation with the SHPO and the objecting party as provided for in Stipulation XVII.A.

Should a member of the public disagree with any NRHP eligibility determinations, the Authority shall immediately inform the other signatories in writing and take the objection into account. The Authority shall consult with the objecting party and, if the objecting party so requests, with any or all of the other signatories for no more than 30 days. The Authority shall document such consultation efforts and submit the findings to the FRA for review. Within 14 days following closure of the consulting period, the FRA shall render a decision regarding the objection and notify all parties of this decision in writing. In reaching the decision, the FRA shall take comments from all parties into account and make a good faith effort to resolve the dispute. The FRA's decision regarding resolution of the objection from a member of the public will be final.

E. Phased Identification

In accordance with 36 CFR 800.4(b)(2), phased identification may occur in situations where identification of historic properties cannot be completed. In these cases, subsequent MOAs will provide a provision for the development and implementation of a post-review identification and evaluation effort as applicable to the undertaking.

VII. ASSESSMENT OF ADVERSE EFFECTS

A. If historic properties are identified within an undertaking, the Authority shall assess adverse effects in accordance with 36 CFR 800.5 and distribute a Findings of Effect report (FOE) to the FRA for review, for each undertaking where historic properties were identified within the APE. The FOE shall describe the assessment of potential adverse effects to historic properties that would result from the construction or operation of the project, and identify mitigation measures that would eliminate or minimize effects to be incorporated into the design and construction documents of the undertaking. Following the FRA review and concurrence, the Authority shall distribute the FOEs to the signatories, and other consulting parties, including Native American tribes, identified as a result of Stipulations IV.C and V.B, who shall have a 30-day review and comment period. The Authority shall ensure that comments are considered prior to finalizing the FOE(s) for submission to the SHPO for final review and concurrence. The SHPO shall have an additional 30 days for review and concurrence with the final FOE(s).

B. FRA will notify and invite the Secretary of the Interior (represented by the National Park Service regional office's program coordinator) when any project section may adversely affect a National Historic Landmark (NHL) pursuant to 36 CFR 800.10 and Section 110(f) of the NHPA.

C. Consistent with 36 C.F.R. § 800.5(b) and (d)(1), the FRA may determine that there is no adverse effect on historic properties within the APE for an undertaking when the effects of the undertaking would not meet the Criteria of Adverse Effect at 36 CFR 800.5(a)(1), the undertaking is modified to avoid adverse effects, or if conditions agreed upon by SHPO are imposed, such as subsequent review of plans for rehabilitation by the SHPO/THPO to ensure consistency with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines, to avoid adverse effects. Any conditions would be included in the DEIS or Final EIS (FEIS).

VIII. TREATMENT OF HISTORIC PROPERTIES

A. Memoranda of Agreement

1. A MOA will be developed by the Authority for each undertaking where the FRA determines there would be an adverse effect to historic properties or when phased identification is necessary and adverse effects would occur.

2. Each MOA will include avoidance, minimization, and protective measures for eligible properties identified in the HPSRs such as preservation-in-place; processes for addressing project design changes or refinements after the HPSRs, FOEs and project EISs are completed, incomplete identification of buried resources, and unanticipated discoveries.

3. The FRA will notify the Council of any findings of adverse effect and invite the Council to participate in the development of the MOAs pursuant to 36 CFR 800.6(a)(1)(i)(c) as appropriate.

4. Should Native American tribes or groups decline to participate as signatories to an MOA, they will not be provided documentation regarding treatment that is called for in this Agreement or in subsequent MOAs unless they expressly request such information. Native American tribes and groups will continue to receive information on the undertakings as part of the NEPA process and may request to consult on an undertaking, or request additional coordination with the Authority or the FRA.

5. Pursuant to 36 CFR 800.11(e) through (g), views of the public will be considered and included where appropriate in individual section MOAs.

6. Upon review, concurrence, and execution of the MOA, Section 106 will be considered concluded for that undertaking.

B. Treatment Plans

1. Prototype treatment plans will be developed by the Authority. Two treatment plans will be developed by the Authority for each undertaking: a Built Environment Treatment Plan and an Archaeological Treatment Plan.

   i. The Built Environment Treatment Plan (BETP) will provide detailed descriptions of treatment measures for eligible buildings, structures, objects, landscapes and districts that will be affected by the undertaking. The BETP will also include descriptions of measures to be taken to protect historic properties and to avoid further adverse effects to historic properties.

   ii. The Archaeological Treatment Plan (ATP) will provide detailed descriptions of protection measures for archaeological resources and resources of importance to Federally Recognized Native American Tribes or Native American groups because of cultural affinity. The ATP could include but is not limited to the establishment of environmentally sensitive areas (ESAs), use of preconstruction archaeological excavation, preservation-in-place, avoidance, minimization, monitoring during construction where appropriate, procedures to be followed when unanticipated

discoveries are encountered, processes for evaluation and data recovery of discoveries, responsibilities and coordination with Federally Recognized Native American Tribes, Native American groups, NAGPRA compliance, and curation of recovered materials.

2. Each treatment plan will address historic properties adversely affected and set forth means to avoid, protect, or develop treatment measures to minimize the undertaking's effects where the Authority, in consultation with the appropriate agencies, the SHPO, and other MOA signatories, determines that adverse effects cannot be avoided. The Treatment Plans will conform to the principles of the Council's Treatment of Archaeological Properties: A Handbook Parts I and II, the "Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation" (Federal Register, Vol. 48, September 29, 1983, pp. 44716–44742) and appropriate SHPO Guidelines. The Authority will take into consideration the concerns of the consulting parties in determining the measures to be implemented.

3. Each treatment plan will include, but not be limited to; the content outlined in Attachment C for treatment plans. The consultative procedure through which a treatment plan is developed will address the adverse effect of any undertaking on historic properties and indicate that the treatment plan will be incorporated into an MOA.

C. Treatment Plan Reviews

1. Signatory Review

The Authority shall provide the treatment plans to the MOA signatories and MOA concurring parties for a 30-day review and comment period. Based on comments received, treatment plans will be revised and resubmitted for a final 30-day review. If the MOA signatories and/or MOA concurring parties fail to comment within 30-days of receiving the treatment plan, the Authority shall confirm with the MOA signatories and/or MOA concurring parties that no comments will be made and may then proceed with the undertaking. Treatment plans can be amended by the Authority without amending the MOAs. Disputes will be resolved in accordance with the Dispute Resolution clause in Stipulation XVII.A.

2. Public Participation

The Authority shall take reasonable steps to provide opportunities for members of the public to express their views on the Treatment Plans. Opportunities for public input may include the distribution of treatment plans consistent with 36 CFR 800.2(d)(1-2), 800.3(e), and 800.11(c)(1 and 3). Where appropriate, the Authority will hold informational meetings with the public to explain the treatment plans and obtain comment. Any public comments received will be considered and incorporated into the treatment plans as appropriate.

D. Treatment Plan Implementation

1. Upon execution of each MOA and prior to the commencement of construction activities, each related treatment plan will be implemented. Depending upon the nature of the treatment, the treatment may not be completed until after the undertaking is completed. Termination of the project after initiation of the treatment plans will require completion of any work in progress, and amendment of each treatment plan as described below. Amendments to the treatment plans will be incorporated by written agreement among the signatories to the MOA. Each MOA will outline appropriate reporting processes for the treatment plans.

2. Dispute Resolution

The parties participating in the development and implementation of the Treatment Plans will come to agreement on the treatment prescribed in and the implementation of the Treatment Plan in the MOA. If the parties are unable to come to agreement on the treatment of adverse effects in the MOA, the procedures outlined in XVII.A will be followed to resolve the dispute.

IX. CHANGES IN ANCILLARY AREA/CONSTRUCTION RIGHT-OF-WAY

The Authority will notify the MOA signatories and consulting parties of changes in the size or location of ancillary areas or the construction right-of-way that result in changes to the APE, or effects to historic properties (see Attachment B) as appropriate by undertaking. If any changes result in the use of unsurveyed areas, the Authority will ensure that these areas are subject to survey in order to locate any potentially significant cultural resources and that those resources are evaluated for NRHP eligibility. The Authority will consult with the MOA signatories and consulting parties regarding any newly identified historic properties that cannot be avoided. Protective and/or mitigation measures will be developed and the treatment plans will be amended and implemented in accordance with Stipulation VIII. All such changes will be documented in the annual Programmatic Agreement report.

X. CONSTRUCTION APPROVAL

Upon the completion of the pre-construction activities prescribed in the treatment plans, the Authority may authorize construction within portions of the APE after conclusion of treatment plan implementation where adverse impacts would occur and in accordance with the provisions of the applicable MOA, or where no historic properties were identified. If concurrence of the approval to proceed cannot be reached among the signatories, the dispute will be resolved in accordance with Stipulation XVII.A.

XI. DISCOVERIES, UNANTICIPATED ADVERSE EFFECTS, UNANTICIPATED DAMAGE

In accordance with 36 CFR 800.13(a)(2), the Authority will ensure that treatment plans prepared prior to implementation of the undertaking include measures to be completed in the event of a discovery or unanticipated adverse effect or damage. If a previously undiscovered archaeological, historical, or cultural property is encountered during construction, or previously known properties will be affected or have been affected in an unanticipated adverse manner, all activity will cease within 50 feet of the property to avoid or minimize harm to the property until the Authority in consultation with the MOA signatories can determine the resource's eligibility, identify the effects, determine if adverse effects can be avoided by alteration of construction methods or the installation of protective measures, and, if not mitigate impacts to the new discoveries or newly affected properties in accordance with the stipulations of project-specific MOAs and treatment plans.

At a minimum, the treatment plan developed for each undertaking as part of the development of each MOA will outline the process to be followed if historic properties are discovered or there are unanticipated effects on historic properties located within a project's APE after the undertaking has been initiated. The Authority will implement the following procedures:

A. The Authority shall ensure that all operations for the portion of the undertaking with the potential to affect an historic property are immediately ceased and will contact the FRA upon unanticipated resource discovery;

B. The Authority shall make a preliminary determination of the National Register eligibility of the historic property and the potential for the undertaking to adversely affect the resource and shall forward that finding to FRA who will make the final eligibility determination. If adverse effects to the resource can be avoided, no consultation with MOA signatories and consulting parties is necessary. If adverse effects cannot be avoided, the Authority will consult with the MOA signatories and propose treatment measures to minimize the effects.

C. The Authority shall notify Federally-recognized Native American tribes of any discoveries that have the potential to adversely affect properties of religious or cultural significance to them within 24 hours of the discovery. After reviewing such discoveries, the Native American tribes can request further consultation on the project by notifying the Authority, in writing or other documented means within 48 hours, as feasible. For interested Native American groups that are not Federally-recognized, the Authority shall notify them of any discoveries that have the potential to adversely affect properties of religious or cultural significance to them within 24 hours of the discovery. After reviewing such discoveries, such interested Native American groups can request further consultation on the project by notifying the Authority in writing within 48 hours, as feasible; and

D. The Authority shall implement the avoidance, minimization, or treatment plan and advise the FRA and other signatories of the satisfactory completion of the approved work. Once the approved work is completed, the activities that were halted to address the discovery situation may resume; and

E. Any treatment to damaged properties will follow the Secretary of the Interior's Standards for the treatment of historic properties. If the Authority determines damaged property should be repaired after construction is completed, then stabilization measures that will prevent and not cause further damage will be installed; and

F. If a National Historic Landmark is affected, the Authority shall include the Secretary of the Interior represented by the National Park Service regional office's program coordinator) and the Council in the notification process.

XII. CONFIDENTIALITY

All parties to this Agreement shall ensure that shared data, including data concerning the precise location and nature of historic properties and properties of religious and cultural significance are protected from public disclosure to the greatest extent permitted by law, including conformance to Section 304 of the NHPA, as amended and Section 9 of the Archaeological Resource Protection Act and Executive Order on Sacred Sites 13007 FR 61-104 dated May 24, 1996.

XIII. HUMAN REMAINS

A. Notification and Treatment

1. If human remains are inadvertently discovered during construction activities, all construction will cease within 100 feet in all directions of human remains and the Authority will immediately notify the appropriate parties in accordance with the project specific Treatment Plan. Human remains and grave goods will be treated in accordance with the Treatment Plan.

2. Federal agencies party to this Agreement will be responsible for curation of all records and other archaeological items resulting from identification and data recovery efforts on Federal lands within the agency's jurisdiction. This includes ensuring that the disposition of any human remains and associated funerary objects of Native American origin encountered on federal land during any action subject to this Agreement complies with § 3(c)(d) of the Native American Graves Protection and Repatriation Act and its implementing regulations codified at 43 CFR Part 10.

3. Any human remains and funerary objects discovered on non-federal land during the implementation of the terms of this Agreement and during the implementation of the undertaking itself will be treated by the Authority, in accordance with the requirements of § 7050.5(b) of the California Health and Safety Code. If, pursuant to § 7050.5(c) of the California Health and Safety Code, the county coroner/medical examiner determines that the human remains are or may be of Native American

origin, the discovery shall be treated in accordance with the provisions of §§ 5097.98 (a) - (d) of the California Public Resources Code. The Authority will ensure that to the extent permitted by applicable law and regulation, the views of the Most Likely Descendant(s) are taken into consideration when the Authority makes decisions about the disposition of Native American human remains and funerary objects, and will further ensure the respectful treatment of each such set of remains and funerary objects.

B. Final Disposition of Human Remains

The FRA and Authority will ensure that every effort is taken to avoid disturbing known human burial sites. Where avoidance is not possible, and in consultation with appropriate tribal representatives and if applicable, Federal land management agencies with jurisdiction, burials will be removed prior to construction and treated in accordance with applicable federal and state laws and as outlined in the treatment plan developed for each undertaking.

XIV. CURATION

A. Collections from Federal Lands

Federal agencies party to this Agreement will be responsible for curation of all records and other archeological items resulting from identification and data recovery efforts on Federal lands is completed in accordance with 36 CFR Part 79, and if the archaeological materials are determined to be of Native American origin, the agencies will follow NAGPRA regulations and procedures set forth in 43 CFR Part 10. The Authority shall ensure that documentation of the curation of these materials is prepared and provided to the affected parties to this Agreement within 10 days of receiving the archaeological materials.

B. Collections from Private Lands

Private landowners will be encouraged to curate archeological materials recovered from their lands in accordance with 36 CFR Part 79 and the provisions of 43 CFR Part 10. Materials from private lands to be returned to the private landowners after completion of the undertaking shall be maintained in accordance with 36 CFR Part 79, and 43 CFR Part 10 if the archaeological materials are determined to be of Native American origin, until all necessary analysis has been completed. The Authority shall document the return of materials to private landowners or alternate curation facilities and submit copies of this documentation to the affected parties to this Agreement. Landowners will be encouraged to rebury items close to their original location.

C. State Lands

The Authority will ensure that all cultural materials discovered on state lands will be curated in accordance with 36 CFR Part 79, the provisions of 43 CFR 10 if the archaeological materials are determined to be of Native American origin, and California Guidelines for the Curation of Archeological Collections (May 7, 1993). The Authority will encourage state land agencies to consult with Native American tribes and groups, affiliated with the cultural materials, on repatriation. Appropriate treatment and disposition may occur through onsite reburial of the cultural materials recovered from state lands. In the event that the state agencies and consulting tribes cannot agree, the FRA will ensure that all cultural materials discovered on state lands will be curated in accordance with the project MOA and Treatment Plan.

XV. DOCUMENTATION STANDARDS

A. All documentation that supports the findings and determinations made under this Agreement shall be consistent with 36 CFR 800.11 and shall be in accordance with the Authority's requirements and its subsequent revisions or editions and with attachments to this Agreement. Documentation shall be submitted to the Authority and prepared by QIs who, at a minimum, meet the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-44739) (Appendix A to 36 CFR Part 61). The Authority shall review the documentation for adequacy, and transmit all documentation cited herein as stipulated by this Agreement.

B. All documentation prepared under this Agreement shall be kept on file at the Authority and the FRA and made available to the public without the inclusion of culturally sensitive information that may jeopardize confidentiality as stipulated by this Agreement, consistent with applicable confidentiality requirements and Federal records management requirements.

XVI. AUTHORITIES

Compliance with the provisions of this Agreement does not relieve the FRA or other federal agencies of their responsibilities to comply with other legal requirements, including those imposed by the NAGPRA (25 U.S.C. Section 3001 and 43 CFR 10), the ARPA (16 U.S.C. Section 470 aa-47011), and the NEPA (42 U.S.C. Section 4321-4347), and applicable Executive Orders.

XVII. ADMINISTRATIVE STIPULATIONS

A. Dispute Resolution

1. Should any signatory to this Agreement object within 30 days to any action proposed or any document provided for review pursuant to this Agreement, the FRA shall consult with the objecting signatory to resolve the objection. If the FRA determines that the objection cannot be resolved within 15 days, the FRA shall forward all documentation relevant to the dispute, including the FRA's proposed resolution, to the Council. The FRA will also provide a copy to all signatories and consulting parties for the undertaking. The Council shall provide the FRA with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the FRA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the signatories and consulting parties, including Native American tribes, and provide them with a copy of this written response. The FRA will then proceed according to its final decision.

   If the Council does not provide its advice regarding the dispute within 30 days, the FRA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the FRA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and consulting parties for the undertaking, and provide them and the Council with a copy of such written response.

2. Should a consulting party or member of the public disagree with findings, made pursuant to this Agreement, the Authority shall immediately inform the signatories in writing and take the objection into account. The Authority shall consult with the objecting party and, if the objecting party so requests, with any or all of the other signatories for no more than 30 days. Within 14 days following closure of the consulting period, the FRA shall render a decision regarding the objection and notify all parties of this decision in writing. In reaching the decision, the FRA shall take comments from all parties into account. The FRA's decision regarding resolution of the objection will be final.

3. The FRA's and the Authority's responsibility to carry out all other actions under this Agreement that are not subject to dispute will remain unchanged.

B. Amendment

1. The signatories to this Agreement may request that it be amended, whereupon the signatories will consult to consider such amendment. This agreement may be amended only upon written concurrence of all signatory parties.

2. To address minor changes in the undertaking or the treatment of historic properties affected by the undertaking, the Authority may propose revisions to the treatment plans rather than to this Agreement. Upon the written concurrence of the signatories, the FRA may revise the treatment plans to incorporate the agreed upon changes without executing a formal amendment to this agreement.

3. Revisions to an attachment to this Agreement would be implemented through consultation and include any necessary revisions to the Agreement itself that may result from modification of an attachment.

C. Review and Reporting

1. The signatories and consulting parties, including Native American tribes, may review activities carried out by the Authority pursuant to this Agreement. The Authority shall facilitate this review by compiling specific categories of information to document the effectiveness of this Agreement and by making this information available in the form of a written annual Programmatic Agreement report. Categories of information shall include, but are not limited to, a summary of actions taken under this Agreement, including all findings and determinations, public objections, and inadvertent effects or foreclosures. The range and type of information included by the Authority in the written report and the manner in which this information is organized and presented must be such that it facilitates the ability of the reviewing parties to assess accurately the degree to which the Agreement and its manner of implementation constitute an efficient and effective program under 36 CFR Part 800.

2. The Authority shall prepare the written report of these findings annually following execution of this Agreement. The Authority shall submit the annual reports to the FRA, the SHPO, and the Council no later than three (3) months following the end of the State fiscal year until all treatment is completed. There will be a 30-day period to review and comment on the report. The Annual Programmatic Agreement Report will be finalized within 30 days of receipt of comments.

3. The Authority shall provide that the report herein prescribed is available for public inspection. The report will be sent to signatories and consulting parties, including Native American tribes, of this Agreement and any subsequent MOAs, and a copy available to members of the public for comment, upon request.

4. In conjunction with the review of the reports prepared by the Authority, the signatory parties shall consult in an annual teleconference to review the overall effectiveness and benefits of this Agreement, determine if its requirements are being met, decide if amendments to the Agreement are warranted, review the reporting format and categories for adequacy, and identify any other actions that may be needed in order to take into account the effects of the undertakings on historic properties in California.

D. Termination

The FRA, the Council, the SHPO, or the Authority may terminate this Agreement by providing 30 days written notice to the other signatories; the signatories shall consult during the 30-day period prior to

termination to seek agreement on amendments or other actions that would avoid termination. Should such consultation result in an agreement on an alternative to termination, the signatory parties shall proceed in accordance with that agreement. Should a signatory party propose termination of this Agreement, they will notify the other parties in writing. If any of the signatories individually terminates their participation in the Agreement, then the Agreement is terminated in its entirety. In the event of termination, then the FRA shall either consult in accordance with 36 CFR 800.14(b) to develop a new Agreement or request the comments of the Council pursuant to 36 CFR 800. Beginning with the date of termination, the FRA shall ensure that until and unless a new Agreement is executed for the actions covered by this Agreement, such undertakings shall be reviewed individually in accordance with 36 CFR 800.4-800.6.

E. Duration of this Agreement

In the event that the terms of this Agreement are not carried out within 10 years, this Agreement shall be assessed by the signatories to determine if it is working well, or whether it should be terminated. If the Agreement is effective and its duration needs to be extended, the signatories can decide to extend the duration of the Agreement. If the signatories determine that the Agreement is effective, but needs revisions appropriate revisions based on evaluation of patterns in the implementation of the Agreement over the first 10 years will be made. In the event the signatories determine that the Agreement is not effective and cannot be amended to address concerns, the Agreement shall be considered null and void, memorialized in a letter to the signatories from the FRA. If the FRA or another Federal agency party to this agreement chooses to continue with the undertaking, it shall re-initiate review of the undertaking in accordance with 36 CFR Part 800. Otherwise, the FRA and all other appropriate signatories shall comply with 36 CFR 800 Subpart B with regard to individual actions covered by this Agreement.

F. Execution and Implementation of the Agreement

This Agreement and its attachments shall take effect following execution by the Council. Additional attachments or amendments to this Agreement shall take effect on the dates they are fully executed by the FRA, the SHPO, the Council, and the Authority.

Execution of this Agreement by the FRA, the Authority, SHPO, and the Council and implementation of its terms evidence that the FRA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment.

SIGNATORY PARTIES

Federal Railroad Administration

By: _____ Date: 7/15/11

California State Historic Preservation Officer

By: _____ Date: 14 JUL 2011

California High-Speed Rail Authority

By: _____ Date: 6/28/2011

Advisory Council on Historic Preservation

By: _____ Date: 7/22/11

CONCURRING PARTY

Pechanga Band of Luiseno Mission Indians

By: _____ Date: 8/2/11

Mark Macarro, Tribal Chairman

CONCURRING PARTY

Soboba Band of Luiseno Indians

By: _____ Date: _____

ATTACHMENT A

High-Speed Train System Map

ATTACHMENT B

AREA OF POTENTIAL EFFECTS DELINEATION

In accordance with Stipulation VI.A. of this Agreement, The Authority shall establish the Area of Potential Effects (APE) for undertakings covered by this Agreement. The Authority using Qualified Investigators (QIs) would be responsible for describing and establishing the APE and will sign any maps or plans that define or redefine an APE.

As defined in 36 CFR 800.16(d), an APE is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

Different APEs may be established for archeological properties and historic architectural properties:

Archaeological Properties

For archeological properties, an APE is typically established based on an undertaking's potential for direct effects from ground-disturbing activities. On occasion, archeological sites may also have qualities that could be affected indirectly.

The APE for archaeological properties is the area of ground proposed to be disturbed during construction of the undertaking, including grading, cut-and-fill, easements, staging areas, utility relocation, borrow pits, and biological mitigation areas, if any.

Traditional cultural properties and cultural landscapes are more likely to be subject to indirect, as well as direct, effects, thus the APE for such properties is usually broader than the archeological APE in order to include the potential for such effects. For instance, the first row of potential properties beyond the right-of-way may be subject to such effects and thus included in an indirect APE when warranted.

Historic Architectural Properties

The APE for historic architectural properties includes all properties that contain buildings, structures or objects more than 50 years of age at the time the intensive survey is completed by the QIs, as follows:

1. Properties within the proposed right-of-way;
2. Properties where historic materials or associated landscape features would be demolished, moved, or altered by construction;
3. Properties near the undertaking where railroad materials, features, and activities *HAVE NOT* been part of their historic setting and where the introduction of visual or audible elements may affect the use or characteristics of those properties that would be the basis for their eligibility for listing in the National Register; and
4. Properties near the undertaking that were either used by a railroad, served by a railroad, or where railroad materials, features, and activities *HAVE* long been part of their historic setting, but only in such cases where the undertaking would result in a substantial change from the historic use, access, or noise and vibration levels that were present 50 years ago, or during the period of significance of a property, if different.

For the California High-Speed Train Project, a key phrase in the APE definition in the Section 106 regulations contained within 36 CFR 800.16(d) is "may...cause alterations in the character or use of historic properties" because many of the undertakings involve the construction of high speed rail alongside existing railroads. In such cases, potential historic properties near the proposed undertaking

historically had railroad features, materials, and activities within their setting that contributed to their character, or may even have been used by or served by the railroad. For example:

- the character and use of a historic railroad passenger or freight depot or railroad bridge *would not change* unless it would be put out of service, destroyed, altered, or moved for the undertaking;
- the character and use of an industrial building next to existing railroad tracks *would not change*, unless freight railroad service was an important association and the spur lines or loading areas would be removed by the undertaking;
- The character and use of buildings *would not change* if they would be separated from the undertaking by an existing railroad; however,
- the character of a non-railroad or non-industrial building *would likely change* if the building is visually sensitive and the proposed undertaking introduces an elevated grade separation or other large building or structure;
- the use of a non-railroad or non-industrial building *would likely change* if the building is sensitive to noise, like a school, museum or library, and the frequency of noise or vibration events from passing trains is increased over historic-era railroad events.

However, some sections of an undertaking may be introducing rail service where none existed during the historic era, for example along a highway or through agricultural fields. For such sections, the undertaking is more likely to change the character or use of a historic property, and the APE would take into account changes to its setting and the introduction of visible or audible elements that are out of character with the property. Other effects to be considered when delineating the APE may include, but are not limited to, physical damage or destruction of all or part of a property; physical alterations; moving or realigning a historic property; isolating a property from its setting; visual, audible, or atmospheric intrusions; shadow effects; damage from vibrations; and change in access or use.

When delineating the APE, the QIs shall follow the identification methodology in Stipulation VI.B., which are different for archaeological properties and historic architectural properties. The QIs shall take into account the nature of the proposed undertaking and whether or not it has the potential to affect the characteristics that might qualify the property for eligibility to the NRHP. Whenever an undertaking is revised (e.g., design changes, utility relocation, or additional off-site mitigation areas), the QIs will determine if changes require modifying the APE. If an APE proves to be inadequate, the Authority is responsible for informing consulting parties in a timely manner of needed changes. The APE should be revised commensurate with the nature and scope of the changed potential effects.

ATTACHMENT C

HST PROGRAM DOCUMENTATION AND FORMAT GUIDELINES

PURPOSE

The purpose of the HST program method for evaluation of cultural resources is to describe, in greater detail, how the FRA and the Authority will implement the Section 106 process for each HST section and ensure that the identification and evaluation of cultural resources is conducted in accordance with the *Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation (Standards and Guidelines) (48 CFR 44716-44742) and* 36 CFR 800.4.

The historic properties that should be identified include any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP) maintained by the Secretary of Interior. This includes artifacts, records, and remains which are related to such district, site, building, structure, or object (16 U.S.C. Section 470(w)(5)). The term includes properties of traditional religious and cultural importance to an Indian Tribe or organization that meet the National Register criteria. Properties eligible for inclusion in the National Register can be properties that are formally determined as such in accordance with regulations of the Secretary of Interior and all other properties that meet the National Register criteria. The level of identification needed varies depending on the nature of the property or property type, the nature of the agency's authority, and the nature of the proposed undertaking's possible effects on the property. Properties that the QIs may find exempt from evaluation are described in Stipulation VI.B.3 and Attachment D.

METHODOLOGY FOR IDENTIFICATION OF HISTORIC PROPERTIES

The Area of Potential Effects (APE) would be delineated as described in Stipulation VI.A and Attachment B, using the best professional judgment of the QIs and taking into account historic property sensitivity and the effects that would occur from construction and operation of the undertaking. An APE Map showing the most current engineering available for the undertaking and the boundary delineated by QIs would be submitted to SHPO with the Historic Property Survey Report (HPSR) or separately if SHPO concurrence with adequacy of the APE is desired prior to the HPSR. The APE maps would be on an aerial base at a scale of 1″=250′ in urban areas and 1″=400′ in rural areas and indicate whether the project is at-grade, elevated, or in tunnel configuration.

In consultation with the SHPO and other parties to the Section 106 process, including Native American tribes, FRA and the Authority will identify resources, determine eligibility, and treat any adverse effects, as outlined in 36 CFR Part 800 following guidance developed by the National Park Service and in conformance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation 1983 (48 FR 44716, as amended) as enumerated below:

- To identify known locations of historic properties within the APE, review the records for previously recorded archaeological properties and historic architectural properties at the local Information Center (IC) of the California Historical Resources Information System (CHRIS). While at the IC, collect information on recorded sites within the APE, for the range of alternative HST project alignments. Review previous survey technical reports conducted within the APE for historic contexts, bibliography, and determination of significance of sites. Review historic USGS maps. Review properties listed in the National Register of Historic Places and the California Register of Historical Resources, the California Historical Landmarks and Points of Historical Interest lists, Land Grant maps, Online Archive of California, Government Land Office Plat Maps, and Sanborn Fire Insurance Maps for urban areas as appropriate.

- Review survey findings conducted by local governments, historical societies, or historic preservation organizations, local historic landmark or monument designations, and any other inventories that may help identify or establish the significance of historic properties.
- Review subdivision maps, assessor maps, county/city directories, utility records, building permits, photographs, newspapers, diaries/journals, architectural drawings, Agency Records, Residential- and Commercial-Building Records, oral histories, thesis/dissertations, and preferred local and credible history studies. Research should be conducted with the appropriate agencies, knowledgeable individuals, local and regional historical societies, archives, and libraries.
- Develop relevant historic themes and contexts for the identification and evaluation efforts of historic properties within the APE. Use National Register Bulletin No. 15 for guidance.
- Employ standard archaeological inventory methods. Conduct presence/absence testing, if necessary, in areas where subsurface remains may be present. For resources that cannot be avoided conduct test excavations to determine resource significance in accordance with the research design.
- Consult with interested Native American Tribe(s) and other cultural groups to identify and evaluate any potential TCPs and cultural landscapes that could be affected by the project following the methods outlined in the National Register Bulletin 38 and the Secretary of the Interior's Standards for the Treatment of Historic Properties, respectively.
- Perform an intensive survey to identify, record, and evaluate architectural properties adjacent to the proposed alignment, stations and support facilities built within the time period identified in the plan to document and inventory all historic buildings, structures, objects, districts, and cultural landscapes in sufficient detail to permit evaluation for the NRHP (per Section 106 of the NHPA) and the California Register of Historic Resources (CRHR) (per California Public Resources Code Section 5024.1 and 21084.1). Use field maps at 1" = 250' scale that have delineated parcel boundaries, APE boundaries, Assessor Parcel Numbers (APNs), street names, prominent natural and man-made features, and previously recorded sites. Based on the number of historic properties within the APE, a field database may be required. Documentation and evaluation efforts will follow the guidelines of National Register Bulletin No. 15 and the California Office of Historic Preservation (OHP) Instructions for Recording Historic Properties (DPR 523 series forms). Private spaces (i.e., building interiors), suburban backyards, and restricted areas will not be surveyed. Surveys will occur from public vantage points, and if access is infeasible, then the property will be evaluated solely on available information or right-of-entry will be coordinated by the Authority.

TECHNICAL REPORTS

- After completion of the archaeological and historic architectural research, inventories and evaluations, and tribal consultations prepare reports to document the findings and identification effort, and if any historic properties are identified for an undertaking, prepare a report to analyze the effects of the undertaking. Technical reports will be submitted to SHPO in both hard copy and electronic format, and the evaluations made on DPR 523 forms will also be submitted in a data format that is compatible for uploading to SHPO's historical resource inventory database. At a minimum, the technical reports shall follow the following format and content requirements.

A. Historic Property Survey Report (HPSR)

The HPSR would include documentation of all properties in the APE that are:

1. listed in the NRHP,
2. previously determined eligible for the NRHP,
3. found eligible for the NRHP by QIs,
4. presumed eligible for the NRHP by QIs, or
5. that are ineligible for the NRHP and meet one of the following conditions:
    a. The property was identified as significant in a state, regional, or local survey of historic properties.
    b. The property was designated under a state, regional, or local ordinance with criteria for evaluating properties with historic or architectural significance.
    c. The property was identified by the SHPO, THPO, or any party identified as a result of Stipulations IV and V.
    d. The property is not exempt from evaluation as identified in Attachment D and would be acquired, destroyed, demolished, or substantially altered as a result of the undertaking.

The HPSR would *NOT* include documentation of:

1. Properties that are exempt from evaluation as identified in Attachment D.
2. Non-exempt and non-NRHP eligible properties with the exception of Section A.5, above. Such properties would be documented in the Archaeological Survey Report (ASR) or Historic Architectural Survey Report (HASR).

The HPSR format and content is as follows:

1. Description of the Undertaking

    This section shall summarize the description of the undertaking, its location, and any alternatives being considered. If alternatives have been developed to avoid or minimize effects on historic properties, those alternatives may be described here or in the Findings of Effect report.

2. Summary of Findings

    This section should include findings for historic properties identified in the APE, and for any non-eligible properties for which SHPO concurrence on ineligibility is needed early in the environmental process.

3. Consulting Parties, Public Participation

    This section shall summarize the coordination efforts and public comments received to date from federal, state, and local government agencies, Native American groups, historical societies, or other interest groups. The summary should include outreach done specifically for Section 106 as well as for NEPA.

4. Summary of Identification Effort

   Include inventories, facilities, groups, and persons consulted to identify previously determined and potential historic properties.

5. Historic Context

   Include those historic contexts developed to evaluate the historic properties identified. Other historic contexts that were developed may be listed in the HPSR, and reported in the ASR or HASR.

6. Historic Properties Identified

   Provide a list of historic properties identified within the APE, and a brief description of their significance, including the applicable NRHP criterion or criteria, and level, period, and area of significance. Include, as appropriate:

   a. Historic properties listed in the NRHP.
   b. Historic properties previously determined eligible for the NRHP.
   c. Historic properties determined eligible for the NRHP for which SHPO concurrence is requested.
   d. Archaeological properties that are currently being evaluated and are presumed eligible for the NRHP
   e. Properties evaluated as not eligible for the National Register, for which SHPO concurrence is needed early in the NEPA process.

7. Findings

   Summarize the findings for historic properties identified within the APE for which SHPO concurrence is sought.

8. References

   Include bibliographic references used for the historic contexts and any literature, inventories or surveys used to identify or evaluate historic properties.

9. Preparer qualifications

   List the QIs and their qualifications who prepared the HPSR and evaluated the historic properties.

Attachments to the HPSR:

1. Project location and vicinity maps

2. Area of Potential Effects Map

3. Letters from historical societies, Native American groups, local governments, other special interest groups, etc.

4. DPR 523 forms supporting the findings for historic properties in the HPSR. The DPR 523 forms shall be prepared in accordance with the California Office of Historic Preservation's *Instructions for Recording Historical Resources* (March 1995) for intensive survey level of effort.

B. Archaeological Survey Report (ASR)

The ASR includes all documentation for the identification and evaluation of archaeological resources not submitted to SHPO in the HPSR. This includes those resources that are not eligible for the NRHP and are non-exempt according to Attachment D. The ASR may be submitted as an attachment to the HPSR or as a subsequent document in support of the overall Section 106 findings. The ASR format and content is as follows:

1. Introduction

    a. This section should include a discussion about the PA and how it was followed in this document.

2. Summary of Findings

    a. This section should include The Authority's findings for any archaeological properties evaluated and determined not eligible for the NRHP for which SHPO concurrence is being requested within 30 days of receipt of the ASR.

    b. For reference, this section should include a summary of those archaeological properties reported to SHPO in the HPSR.

3. Description of the Undertaking

    a. This section shall summarize the description of the undertaking, its location, and any alternatives being considered.

4. Description of the APE

    a. This section should include a description of the APE, the application of the PA guidance and how the boundary was determined.

5. Summary of Identification Effort

    a. Include inventory and field methodologies (including a description of any sub-surface investigation, if appropriate), results of archival research including Sanborn mapping as appropriate, and involvement of the public including Native American groups, and individuals.

6. Historic and Geomorphic Context

    a. Include those historic contexts developed to evaluate the archaeological resources to determine if they are historic properties eligible for the National Register of Historic Places. The report should also describe the geomorphology of the project area and assess the potential for previously unrecorded buried archaeological resources.

7. Findings

    a. Summarize the findings for properties determined eligible for the NRHP, that were identified within the APE and for which SHPO concurrence is sought. Provide a

description of properties found not eligible for the NRHP within the APE, and a description of the property, its location, and why it lacked significance.

8. References

    a. Include bibliographic references used for the historic contexts and any literature, inventories or surveys used to help evaluate the properties according to NRHP criteria.

9. Preparer qualifications.

    a. List the QIs and their qualifications, that prepared the ASR and evaluated the properties ineligible for the NRHP.

Attachments to the ASR:

1. Project location and vicinity maps
2. Area of Potential Effects Map
3. Letters from Native American groups, local governments, historical societies, other special interest groups, etc.
4 DPR 523 forms supporting the findings for properties ineligible for the NRHP in the ASR. The DPR 523 forms shall be prepared in accordance with the California Office of Historic Preservation's *Instructions for Recording Historical Resources* (March 1995) for intensive survey level of effort.

C. Historic Architectural Survey Report (HASR)

The HASR includes the documentation for evaluating historic architectural properties that are not eligible for the NRHP, are non-exempt according to Attachment D, and were not reported in the HPSR. The HASR may be submitted as an attachment to the HPSR or as a subsequent document. The HASR format and content is as follows:

1. Introduction

    a. A discussion about the PA and how it was followed in this document.

2. Summary of Findings

    a. This section should include The Authority's findings for any non-eligible properties for which SHPO concurrence is requested within 30 days of receipt of the HASR, but which were not submitted in the HPSR.

    For reference, this section should include a summary of those historic architectural properties reported to SHPO in the HPSR.

3. Description of the Undertaking

    a. This section shall summarize the description of the undertaking, its location, and any alternatives being considered.

4. Description of the APE

a. Description of the APE, the application of the PA guidance and how the boundary was determined.

5. Summary of Identification Effort

    a. Include inventories, facilities, groups, and persons consulted to identify previously determined and potential historic properties not reported in the HPSR.

6. Historic Context

    a. Include those historic contexts developed to evaluate the properties evaluated in the HASR that are not eligible for the NRHP.

7. Properties Identified as Not Eligible for the NRHP,

    a. Provide a list of properties found not eligible for the NRHP within the APE, and a brief description of that describes the property, its location, and why it lacked significance. This may be done in a simple table format.

8. Findings

    a. Summarize the findings for properties not eligible for the NRHP that were identified within the APE and for which SHPO concurrence is sought.

9. References

    a. Include bibliographic references used for the historic contexts and any literature, inventories or surveys used to help evaluate the properties according to NRHP criteria.

10. Preparer qualifications

    a. Identify and list the qualifications of the QIs who prepared the HASR and evaluated the properties ineligible for the NRHP.

Attachments to the HASR:

1. Project location and vicinity maps

2. Area of Potential Effects Map

3. Letters from historical societies, Native American groups, local governments, other special interest groups, etc.

4. DPR 523 forms supporting the findings for properties ineligible for the NRHP in the HASR. The DPR 523 forms shall be prepared in accordance with the California Office of Historic Preservation's *Instructions for Recording Historical Resources* (March 1995) for intensive survey level of effort.

5. Streamlined documentation format for *substantially altered* properties constructed more than 50 years ago will be provided as follows:

    a. Address

b. Year constructed

c. List of substantial alterations and/or lost aspects of integrity

d. Photograph (may be less than 3"x5", but legible)

e. Date surveyed

f. Optional information. The following documentation may be provided, but is optional at the discretion of the QI:

i. Construction or historical information to understand the historic context (*e.g.,* original use, original owner, architect, engineer, builder, and/or historic resident/tenant/user.)

ii. Historic contexts considered, if any, or state "no important historic context"

6. Streamlined documentation format for tract homes and pre-fabricated homes more than 50 years old that are *NOT* eligible for the National Register but are *NOT substantially altered.*

a. Tract homes within the APE that are part of the same tract may be treated as a group with a common construction history and evaluated on a Primary Record (DPR 523A), District Record (DPR 523 D), and Continuation sheets (DPR 523L) that have photographs of representative house models.

b. Pre-fabricated homes that are not associated with permanent buildings or a historic district of pre-fabricated homes will be provided:

i. Address

ii. Photograph (may be less than 3"x5", but legible)

iii. Date surveyed

iv. Optional information. The following documentation may be provided, but is optional at the discretion of the QI:

a) Approximate year fabricated

b) Name of fabricator or model

D. Findings of Effect (FOE)

The Findings of Effect (FOE) report documents the application of the Section 106 criteria for adverse effect (36 CFR 800.5) for each historic property identified within the APE, including all properties reported in the HPSR. The FOE also includes any avoidance alternatives, mitigation measures, or treatment plan as needed for each historic property or property type being adversely affected. Such mitigation and treatment would form the basis for the stipulations in the subsequent MOAs. The FOE should be organized to report on the following findings for an undertaking:

- No effect on historic properties.
- No adverse effect on historic properties (with no mitigation or after standard mitigation).
- Adverse effect on historic properties.

The FOE format and content is as follows:

1. Summary of Findings of Effect

This section should include a summary of findings for any historic properties identified, and whether the effect on them would be negative, not adverse, or adverse, and how the effect is taken into account.

2. Description of the Undertaking

   This section shall summarize the description of the undertaking, its location, and any alternatives being considered.

3. Public Participation

   Discuss consultation about effects and mitigation with federal, state, and local government agencies, Native Americans, historical societies, or other interest groups. The summary should include outreach done specifically for Section 106 as well as for NEPA. Identify any parties who would be consulting parties in the subsequent MOA.

4. Description of Historic Properties

   Using information developed in the HPSR, summarize the historic properties identified in the APE, and describe the essential physical features that comprise the characteristics that qualify each property for the NRHP.

5. Application of the Criteria of Adverse Effect

   Discuss the application of the Criteria of Adverse Effect for each historic property. State the most relevant of the criteria and describe in detail the nature of the effect on its essential physical features and how it is adverse or not adverse.

6. Conditions Proposed

   Discuss in detail any conditions proposed to avoid adverse effect to each historic property. Present separate sub-sections for any alternatives proposed, or design changes that would be a condition to mitigate the adverse effect, including design considerations to ensure meeting the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR part 68). With SHPO concurrence on the FOE, such mitigation would form the basis for stipulations in a subsequent MOA for the undertaking.

E. Treatment Plans

All Treatment Plans for the independent undertakings of the HST Project will include, but not be limited to:

1. Specification of all historic properties to be affected by the project, including a description of the nature of the effects.

2. A detailed description of the treatments proposed for historic properties or portions of historic properties eligible for the NRHP under 36 CFR Part 60.4 criteria (a), (b), (c) or (d), with an explanation or rationale provided for the choice of the proposed treatments. These treatments will take into account the setting, including but not limited to, visual and atmospheric elements, and vibration, as appropriate, and be responsive to the qualities that contribute to the significance of the affected properties.

3. Provisions for the creation of a popular account for disseminating the results of the Treatment Plans to the general public, consistent with the Archaeological Resources Protection Act (ARPA), Executive Order on Sacred Sites, the Freedom of Information Act and Section 304 of the NHPA (16 U.S.C. 4702-3).

4. The archaeological Treatment Plan will, at a minimum, include:

   A. The Authority's intent to recover a reasonable sample of the intact archaeological deposits from eligible archaeological sites that the agency determines, through the process set out in Stipulation VII of the Agreement, that may be adversely affected by the implementation of the Undertaking;

   B. Specify the research issues/questions to be addressed through the recovery of data, and provide for a process whereby the research issues/questions will be refined to reflect the information that the Authority gathers as a result of the investigation set out in Stipulation VII of the Agreement;

   C. Explain why it is in the public interest to address those research issues;

   D. Explain how data from the historic property will address those research issues/questions;

   E. Specify the methods to be used in fieldwork and analysis, and explain how these methods are relevant to the research issues/questions;

   F. Specify the methods to be used in data management and data dissemination;

   G. Indicate how recovered materials and records will be curated, taking into account the expressed wishes of the consulting Native Americans;

   H. Include a schedule for providing the consulting Native American Tribes with periodic updates on implementation of the data recovery plan;

   I. Include a curation agreement that ensures that all materials (other than Native American human remains and grave associated materials) and records are maintained in accordance with 36 CFR 79. Materials recovered from privately owned lands, other than Native American human remains and grave-associated materials that are to be returned to their owners, will be maintained in accordance with 36 CFR 79 until their analysis is completed; and

   J. Specify the manner in which human remains and grave associated artifacts recovered during data recovery will be treated according to applicable laws and regulations, and in consultation with the wishes of the consulting Native Americans.

ATTACHMENT D

PROPERTIES EXEMPT FROM EVALUATION

Section 106 regulations require a "reasonable and good faith effort" to identify historic properties (36 CFR 800.4[b][1]). The procedures in this attachment concentrate the Authority's efforts on properties that have the potential to be historic properties. A property should be evaluated only if QIs reasonably determine that the property has a demonstrable potential for historic significance. Evidence of such potential consists of associations with significant historic events or individuals (NRHP Criteria A or B); engineering, artistic, design, or aesthetic values (NRHP Criterion C); information value (NRHP Criterion D); the presence of community concerns; or inclusion as a potential contributing element within a larger property requiring evaluation, such as a historic or cultural landscape, traditional cultural property, or historic district. This attachment defines categories of properties that do not warrant evaluation unless deemed otherwise in the professional judgment of QIs. Exempted properties do not require documentation.

ARCHEOLOGICAL PROPERTIES (PREHISTORIC AND HISTORIC) EXEMPT FROM EVALUATION

The following properties are exempt from evaluation, based on the professional judgment of QIs qualified in the area of archaeology:

- Isolated prehistoric finds consisting of fewer than three items per 100 square meters
- Isolated historic finds consisting of fewer than three artifacts per 100 square meters (e.g., several fragments from a single glass bottle are one artifact)
- Refuse scatters less than 50 years old (scatters containing no material that can be dated with certainty as older than 50 years old)
- Features less than 50 years old (those known to be less than 50 years old through map research, inscribed dates, etc.)
- Isolated refuse dumps and scatters over 50 years old that lack specific associations
- Isolated mining prospect pits
- Placer mining features with no associated structural remains or archeological deposits
- Foundations and mapped locations of buildings or structures more than 50 years old with few or no associated artifacts or ecofacts, and with no potential for subsurface archeological deposits
- Building and structural ruins and foundations less than 50 years old.

QIs qualified in California archaeology shall apply professional judgment as to the level of identification effort, in consultation with consulting Native American Tribe(s) where appropriate. This exemption process does not include archeological sites, traditional cultural properties, or other cultural remains or features that may qualify as contributing elements of districts or landscapes.

HISTORIC ARCHITECTURAL PROPERTIES EXEMPT FROM EVALUATION

QIs qualified in the disciplines of history or architectural history may find the following types of historic architectural properties exempt from evaluation and documentation, or have a lesser level of documentation in the HASR:

1. Properties less than 50 years old at the time of the intensive survey unless they may have achieved exceptional significance in accordance with NRHP Bulletin 22.
2. Properties moved within the past 50 years unless they are among the exceptions noted in "Criteria Consideration B: Moved Properties" of National Register Bulletin 15.

The historical architectural property types listed below are exempt from evaluation and will not require documentation, based on the professional judgment of QIs qualified in the disciplines of history or architectural history.

Railroad Related Features:

- Railroad maintenance facilities
- Railroad communication and signaling systems
- Switching and crossing equipment
- Railroad structures such as grade separations, pedestrian overcrossings and underpasses
- Railroad culverts and drainage systems
- Railroad fencing and other right-of-way features
- Access roads for railroads
- Railroad maintenance materials (e.g., ties, track, ballast, etc.)
- Railroad grades converted to other uses, such as roads, levees, or bicycle/pedestrian paths

Water Conveyance and Control Features:

- Natural bodies or water providing a water source, conveyance, or drainage
- Modified natural waterways
- Concrete-lined canals less than 50 years old and fragments of abandoned canals
- Roadside drainage ditches and secondary agricultural ditches
- Small drainage tunnels
- Flood storage basins
- Reservoirs and artificial ponds
- Levees and weirs
- Gates, valves, pumps, and other flow control devices
- Pipelines and associated control devices
- Water supply and waste disposal systems

Recent Transportation or Pedestrian Facilities:

- Light rail systems, including shelters, benches, and platforms
- Bus shelters and benches
- Airstrips and helicopter landing pads
- Vista points and rest stops
- Toll booths
- Truck scales and inspection stations
- City streets, alleys, and park strips
- Sidewalks, curbs, berms, and gutters
- Bike paths, off-road vehicle trails, equestrian trails, and hiking trails
- Parking lot and driveways

Highway and Roadside Features:

- Isolated segments or bypassed or abandoned roads
- Retaining walls
- Curbs, gutters, and walkways
- Highway fencing, soundwalls, guard rails, and barriers
- Drains and culverts, excluding culverts assigned a Caltrans bridge number
- Cattle crossing guards
- Roadside, median, and interchange landscaping and associated irrigation systems
- Street furniture and decorations
- Signs and reflectors
- Parking meters
- Street lighting and controls
- Traffic lights and controls
- Highway operation control, maintenance, and monitoring equipment

- Telecommunications services, including towers, poles, dishes, antennas, boxes, lines, cables, transformers, and transmission facilities
- Utility services, including towers, poles, boxes, pipes, lines, cables, and transformers
- Oil and gas pipelines and associated control devices

Adjacent Features:

- Prefabicated buildings less than 50 years old not associated with permanent buildings or a historic district
- Fences, walls, gates, and gateposts
- Isolated rock walls and stone fences
- Telephone booths, call boxes, mailboxes, and newspaper receptacles
- Fire hydrants and alarms
- Markers, monuments, signs, and billboards
- Fragments of bypassed or demolished bridges
- Temporary roadside structures, such seasonal vendors' stands
- Pastures, fields, crops, and orchards
- Corrals, animal pens, and dog runs
- Open space, including parks and recreational facilities

Movable or Minor Objects:

- Movable vehicles
- Stationary vehicles less than 50 years old or moved within the last 50 years
- Agricultural, industrial, and commercial equipment and machinery
- Sculpture, statuary, and decorative elements less than 50 years old or moved within the last 50 years.

The exemption does not apply to properties 50 years old or older that could be important, nor does it apply to properties that may contribute to the significance of larger historic properties such as districts or landscapes.

Compliance with Section 106 of the National Historic Preservation Act for the California High Speed Train System

Establish Programmatic Approach

- FRA initiates Govt. to Govt. consultation and invites Federally recognized Native American Tribes to participate in the 106 process
- Authority initiates consultation with Native American groups and consulting parties and invites them to participate in the Section 106 process, notifies SHPO
- Authority initiates information gathering, for each Undertaking
- Develop Draft Programmatic Agreement
- **CONSULTATION POINT**
  Consultation with Native American Tribes or groups, and other parties
- Execute Programmatic Agreement

Approach for Each Undertaking

Initiate Section 106 Process

Identify Historic Properties

- **CONSULTATION POINT**
  Define the APE in consultation with SHPO, THPO or other official from Federally recognized Native American Tribes
- Identify potentially eligible historic properties by survey or site testing, as appropriate.
- Evaluate properties for eligibility
- **CONSULTATION POINT**
  Confirm historic properties : Provide requested List of Historic Properties

Assess Adverse Effects

- Identify historic properties that will be adversely affected by the Undertaking
- **CONSULTATION POINT**
  Provide requested Site Records for review to Native American Tribes and other applicable parties per 36 CFR Part 800 .11(c)

  Determine when and where Tribal Monitors may be needed during ground disturbing activities in previously identified sensitive areas or known sites

  Develop Avoidance, Minimization, and Treatment Measures for Adverse Effects to both archaeological and built resources

Resolve Adverse Effects

- Develop Treatment Plans for Archaeology and Built Resources
- **CONSULTATION POINT**
  Determine Native American Tribes or groups and other parties who will participate in the development of and sign as concurring parties to the Memorandum of Agreement

  Determine when and where Tribal Monitors may be needed during Treatment Plan Implementation or Construction
- Finalize Treatment Plans
- Execute Memorandum of Agreement

Implement Treatment Plans & Construction

- **CONSULTATION POINT**
  Include Native American Tribes or groups and other parties who are participating as concurring parties in implementation of treatment as defined in the Treatment Plans

  Provide for Tribal Monitors during Treatment Plan Implementation or Construction, where agreed upon

  Review and comment on Programmatic Agreement Annual Report

ATTACHMENT F- FEDERALLY RECOGNIZED NATIVE AMERICAN TRIBES

Barona Group of the Capitan Grande
Big Sandy Rancheria of Mono Indians
Buena Vista Rancheria of Me-Wuk Indians of California
Cahuilla Band of Indians
California Valley Miwok Tribe
Cold Springs Rancheria of Mono Indians
Inaja Band of Diegueno Mission Indians of the Inaja and Cosmit Reservation
Ione Band of Miwok Indians of California
Jamul Indian Village
Pala Band of Luiseno Mission Indians
La Jolla Band of Luiseno Mission Indians
La Posta Band of Diegueno Mission Indians
Los Coyotes Band of Cahuilla & Cupeno Indians
Mesa Grande Band of Diegueno Mission Indians
Morongo Band of Mission Indians
Northfork Rancheria of Mono Indians of California
Pauma Band of Luiseno Mission Indians
Pechanga Band of Luiseno Mission Indians
Picayune Rancheria of Chuckchansi Indians of California
Ramona Band of Cahuilla Mission Indians
San Manuel Band of Mission Indians
San Pasqual Band of Diegueno Mission Indians
Santa Rosa Rancheria
Santa Ysabel Band of Diegueno Mission Indians
Shingle Springs Band of Miwok Indians, Shingle Springs Rancheria
Soboba Band of Luiseno Indians
Sycuan Band of the Kumeyaay Nation
Table Mountain Rancheria
Tule River Indian Tribe
United Auburn Indian Community of the Auburn Rancheria
Viejas Band of Capitan Grande Band of Mission Indians
Wilton Rancheria

ATTACHMENT F- NON-FEDERALLY RECOGNIZED NATIVE AMERICAN GROUPS

Amah Mutsun Tribal Band
Choinumni Tribe
Choinumni Tribe of Yokuts
Choinumni Tribe, Choinumni/Mono
Choinumni, Foothill Yokut
Chowchilla Tribe of Yokuts
Chumash
Chumash (San Fernando Band of Mission Indians)
Chumash Council of Bakersfield
Chumash, Fernandeno, Tatavianm Shoshone, Paiute and Yaqui
Costanoan Indian Canyon Mutsun Band of Costanoan/Ohlone
Costanoan Band of Carmel Mission Indians
Duma/Foothill/Pomo
Dumna: Foothill
Dumna Foothill, Yokuts, Mono
Dumna Tribal Government
Dumna Wo-Wah Tribal Government
Dumna, Kechayi, Yokuts
Dumna/Foothill, Choinumni
Dunlap Band of Mono Indians
El Dorado Miwok Tribe
El Dorado Miwok Tribe (Miwok Tribe Office of the El Dorado Rancheria)
Eshohm Valley Band of Indians
Fernandeno Taaviam Band of Mission Indians
Foothill Yokuts, Choinumni
Foothill Yokuts, Mono
Gabrieleno Band of Mission Indians
Gabrieleno/Tongva San Gabriel Band of Mission Indians
Gabrieleno Ti'At Society
Gabrieleno Tongva
Gabrieleno Tongva Indians of California tribal Council
Gabrieleno-Tongva Tribe
Indian Canyon Mutsun Band of Costanoan Indians
Inter-Tribal Water Commission of California
Juaneno Band of Mission Indians
Juaneno Band of Mission Indians Acjachemen Nation
Kawaiisu Tribe
Kern Valley Indian Community
Kern Valley Indian Council
Kern Valley Paiute Tribe
Kings River Choinimni Farm Tribe
Kitanemuk
Kitanemuk & Yowlumne Tejon Indians
Kumeyaay
Kumeyaay Cultural Heritage preservation
Kumeyaay Cultural Historic Committee
Kumeyaay Cultural Repatriation Committee
Kwaaymii Laguna Band of Mission Indians
LA City/County Native American Indian Committee
Los Angeles City and County Native American Indian Commission

Maidu/Washoe
Miwok, Paitute and Northern Valley Yokut
Mono: Cold Springs Rancheria of Mono Indians
Muwekma Ohlone Tribe of the SF Bay Area
Nashville-El Dorado Miwok
Nisena-So Maidu, Konkow Washoe
North Fork Mono Tribe
North Fork Rancheria
North Valley Yokuts
North Valley Yokuts Tribe
Ohlone – Costanoan, Bay Miwok, Plains Miwok, Patwin
Ohlone Indian Tribe
Ohlone/Costanoan
Ohlone/Costanoan Northern Valley Yokuts
Ohlone/Costanoan Northern Valley Yokuts Bay Miwok
Paiute, Yokuts & Tubatulabal Tribes
Salinan
San Fernando Band of Mission Indians
San Luis Rey Band of Mission Indians
Serrano Nation of Indians
Serrano Tribe
Sierra Nevada Native American Coalition
Sierra Tribal Consortium
Southern Sierra Miwok Nation
Tache, Tachi, Yokut
Tatavian
Tehachapi Indian Tribe
Tejon Indian tribe
Ti'At Society
Tinoqui-Chalola Council of Kitanemuk & Yowlumne Tejon Indians
Tongva Ancestral Territorial Tribal Nation
Traditional Choinumni Tribe
Trina Marine Ruano Family
Tubatulabal, Kawaiisu, Koso & Yokuts Tribes
Tubatulabals of Kern Valley
Western Mono Sandy Rancheria of Mono Indians
Wukchumni Council
Wukchumni Tribe
Wukchumni, Tachi, Yowlumni
Yokuts

APPENDIX 3.18-A: RIMS II MODELING DETAILS

APPENDIX 3.18-A: RIMS II MODELING DETAILS

Summary of Findings

This appendix presents the results of the Regional Input-Output Modeling System (RIMS II) modeling analysis supporting the analysis presented in Section 3.18, Regional Growth. Overall, this study finds that development and operation of the California High-Speed Rail (HSR) System in the San Jose to Central Valley Wye Project Extent (project extent or project) would have a positive economic effect on the regional resource study area (RSA) composed of Santa Clara, San Benito, and Merced Counties. The results reported herein are those obtained at the time the analysis was completed and reflect the estimates of costs, projected construction schedule and other modeling inputs for the project available at that time, including those provided in Appendix 6-A, San Jose to Merced Project Section: PEPD Record Set Capital Cost Estimate Report, July 2019.

The estimate of total economic effect, including direct and multiplier effects from the construction phase, is approximately $7.33 billion to $10.43 billion in this region, depending on the project alternative, measured in constant 2018 dollars. Alternative 3 would yield the highest regional economic impact, roughly 42 percent greater than Alternative 4, which would have the lowest cost and employment impact. The estimate for direct spending for construction labor and materials ranges from $5.21 billion to $7.42 billion, and the remaining spending represents indirect spending on labor and materials by companies in the supply chain for construction (e.g., wholesalers of concrete or lessors of construction equipment), as well as induced spending in industries required to serve the households of construction and indirect labor workers (e.g., retail, entertainment, healthcare). During the peak year of construction (2024), direct spending is estimated to support between 5,110 and 7,990 construction-related job-years,[1] depending on the project alternative.

By 2040, the ongoing project operations would support an estimated $210 million per year in economic activity within the regional economy. Again, this economic activity would represent direct spending by the California High-Speed Rail Authority (Authority) on labor and materials for operations and maintenance, as well as indirect spending by supply-chain industries and induced spending in household-serving industries. Phase I project operations are projected to support 1,110 jobs annually in the RSA, including 600 workers directly employed by the Authority or its vendors. Spending and employment associated with operations would not vary substantially among the project alternatives because of similar guideway lengths and the same number of stations and types of maintenance facilities.

Analysis Framework and Approach

The economic impacts calculated and reported in this appendix are directly linked to spending attributable to the project and are considered using the accepted economic metrics of economic output, employment, and employee compensation. Project-related expenditures on goods and services from within the regional economy would create a multiplier effect as local and regional businesses that supply inputs to production generate successive rounds of spending. Employment supported by HSR would also generate a multiplier effect through household spending in the regional economy.

Input-Output Analysis Overview

Input-Output (I/O) analysis is based on the concept that industries in a geographic region are interdependent and thus the total contribution of any one establishment's activity is larger than its individual (direct) output or employment. Consequently, an establishment's economic activity has a multiplier effect that generates successive rounds of spending and output in other economic sectors within a particular region. For example, construction firms purchase goods from producers, who in turn purchase raw materials from suppliers. Thus, an increase or decrease in

[1] One job-year is equivalent to one job held by one person over one year's duration.

the demand for construction supplies would stimulate an increase or decrease in output and employment in interdependent secondary industries.

Regional economic impact analysis and I/O models in particular provide a means to quantify economic effects stemming from a particular industry or economic activity. I/O models produce quantitative estimates of the magnitude of regional economic activity resulting from some initial activity. I/O models rely on economic multipliers that mathematically represent the relationship between the initial change in one sector of the economy and the effect of that change on employment, income, economic output, and value added in other regional industries. These economic data provide a quantitative estimate of the magnitude of shifts in jobs and revenues within a regional economy.

The analysis begins with an estimate of the initial economic input associated with project expenditures on capital investment and operations in the regional economy. These initial inputs are referred to as the direct effect. Next the I/O model quantifies the impacts associated with the multiplier effects that result from that initial economic input. Multiplier effects include indirect or induced effects. Indirect effects represent economic impacts on suppliers while induced effects represent economic impacts on household income and spending. In this report, direct, indirect, and induced effects are defined as follows:

- **Direct effect**—The economic value of the initial input of spending into the economy made by the Authority
- **Indirect effect—**The economic value of "upstream" industry-to-industry transactions that supply inputs to the production of goods and services consumed by the Authority
- **Induced effect—**The economic value of labor income that recirculates in the economy as a result of the initial expenditures made by the Authority
- **Total impact**—The sum of the direct, indirect, and induced effects. The total impact measures the overall impact of project activities within the regional economy

This analysis measures economic significance using common economic metrics, including employment, employee compensation, economic output, and job-year as defined below:

- **Employment**—Equivalent to jobs, a headcount that includes part-time and full-time workers.
- **Employee compensation**—Payments to labor in the form of income (i.e., wages and salaries) and fringe benefits paid by the employer (e.g., health insurance), as well as proprietor income.
- **Economic output**—Economic activity, calculated as production value including intermediate inputs (i.e., the goods and services used in the production of final products). Output includes spending on employee compensation as well as the production value of each intermediate input, such as equipment, supplies, insurance, rents, utilities, communication services, printing, and other goods and services.
- **Job-years**—A combined measure of total jobs and the length of time of those jobs. One job-year is defined as equivalent to one job held by one person over one year's duration. As an example, one job held by one worker for three years would constitute three job-years; three jobs held by three workers for one year's duration would also constitute three job-years.

It should be noted that a portion of the impacts reported in this analysis may not be entirely net new. For example, it is plausible that the State of California would have spent a portion of its HSR budget on other projects elsewhere in the state if the HSR project did not occur.

RIMS II Multipliers

To measure the economic effects of the project in the RSA, this I/O analysis relies on RIMS II multipliers acquired from the U.S. Bureau of Economic Analysis (BEA 2013). The multipliers are the most current available at the time the analysis was conducted, that is, those based on 2007 national input-output data and 2016 regional data. The multipliers were acquired from the Bureau

on October 12, 2018, and are specific to the regional economy composed of Santa Clara, San Benito, and Merced Counties. The multipliers are produced as tables organized both by selected detailed industries, as defined under the North American Industry Classification System (NAICS), and by NAICS industry aggregations or sectors, as defined by the U.S. Bureau of Economic Analysis.

RIMS II multipliers in two industry aggregations are most directly relevant to the construction phase and the operations and maintenance phase of the project. For the construction phase, Industry Aggregation #7 Construction (NAICS Industry Sector 23) multipliers are the most generally applicable to local construction cost estimates for RSA, and are shown in Table 1.

Table 1 RIMS II Multipliers Relevant to Project Construction in the Resource Study Area

Industry	Multiplier					
	Final Demand				Direct Effect	
	Output[1] (dollars)	Earnings[2] (dollars)	Employment[3] (jobs)	Value-Added[4] (dollars)	Earnings[5] (dollars)	Employment[6] (jobs)
7. Construction	1.4061	0.3586	6.3204	0.7725	1.3591	1.5117

Source: BEA 2018

[1] Represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

[2] Represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

[3] Represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2016 data, the output delivered to final demand should be in 2016 dollars.

[4] Represents the total dollar change in value added that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

[5] Represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

[6] Represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

Note: Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2016 regional data.

For the operations and maintenance phase, Industry Aggregation 33 Rail Transportation (NAICS Industry Sector 482) multipliers are the most generally applicable to operations and maintenance (O&M) cost estimates for the RSA. These multipliers are shown in Table 2.

Dollar inputs for analysis models using RIMS II multipliers should be indexed to the same year as the multipliers applied. Analysts used Construction Cost Index developed for the Authority's *2016 Business Plan Capital Cost Basis of Estimate Report* (Authority 2016) to adjust the capital and construction cost estimates for this analysis, which were provided in 2018 dollars (Authority 2019), to the 2016 dollars pertinent to the RIMS II multipliers.. An inflation factor of 2.25 percent per annum is assumed to pertain between Fiscal Year 2016/2017 and Fiscal Year 2024/2025 for the Construction Cost Index, and has been applied as necessary to convert 2018 dollars to 2016 dollars for analysis and to use 2018 dollars for uniform reporting.

Table 2 RIMS II Multipliers Relevant to Project Operations and Maintenance in the Resource Study Area

Industry	Multiplier					
	Final Demand				Direct Effect	
	Output[1] (dollars)	Earnings[2] (dollars)	Employment[3] (jobs)	Value-Added[4] (dollars)	Earnings[5] (dollars)	Employment[6] (jobs)
33. Rail Transportation	1.3389	0.2602	3.5442	0.7250	1.4597	1.8531

Source: BEA 2018

[1] Represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

[2] Represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

[3] Represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2016 data, the output delivered to final demand should be in 2016 dollars.

[4] Represents the total dollar change in value added that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

[5] Represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

[6] Represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

Note: Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2016 regional data

Construction Cost Estimates

In addition to RIMS II data, this analysis relies on detailed capital cost estimates. Capital cost estimates for RIMS II modeling were assembled from data provided in the capital cost estimates for the four project alternatives. These sources itemize costs using the Authority's refinement of the Federal Railroad Administration's (FRA) standard cost categories, which establish a consistent format for the reporting, estimating, and managing capital costs.[2]

As shown in Table 3, the project alternatives are estimated to have total capital costs ranging from approximately $16.48 billion to $23.31 billion (2018$), including the costs of right-of-way and land acquisitions, but excluding the cost of HSR trains (train sets, support and maintenance vehicles, and parts), and finance charges. These exclusions are not anticipated to have a significant effect on regional job creation or system-wide costs. The development budget analyzed for the regional economic impacts reflects the total construction costs. These construction costs include "hard" development costs, but exclude the costs of right-of-way and land acquisitions and further exclude professional services as many or most of the design, administrative, consulting, monitoring, and accounting services may be conducted outside of the RSA.

The hard costs include all aspects of construction, including site work, track construction, bridge construction, maintenance facility development, and other construction requirements. These estimated total construction costs range from $12.71 billion to $18.09 billion (2018$), depending on the project alternative. The total capital cost estimates include unallocated contingency budgets that are about 3.8 percent of the sum of all other costs for Alternatives 1, 2, and 3 and about 3.7 percent of all other costs for Alternative 4. The same ratios of unallocated contingency costs, have been assumed in calculations of total construction costs and local construction costs, by project alternative.

[2] The *San Jose to Merced Project Section: PEPD Record Set Capital Cost Estimate Report* provides estimates capital costs for the project section alternatives (Appendix 6-A). These capital cost estimates are limited to SCC groups 10 to 60, and 80 to 90, which include most of the SCC cost categories directly related to the labor and materials involved in construction of the rail system and support facilities. Total construction costs for the project section correspond to cost estimates for SCC Groups 10 to 60 and a share of Group 90 Costs, and exclude 40.07-Right-of-Way Purchase and Land Costs.

Local construction costs are estimates of the development budget expenditures within the three-county RSA of Santa Clara, San Benito, and Merced Counties. For a project of the scale and specialized requirements of the HSR, a substantial amount of manufacturing and fabrication of the system's construction components would likely occur outside of the RSA. The amount of project-related manufacturing and fabrication that occurs within the RSA, and the amount of money spent within the RSA to hire construction workers, is calculated as portions of the local construction costs. For the project, the overall local percentage capture ratio has been estimated at 41 percent of total construction costs.[3] The estimated local construction costs thus range from $5.21 billion to $7.42 billion (2018$), depending on the project alternative. The great majority of those costs are for the guideway construction, with the small remainder for the construction of the station and maintenance facilities.

Construction of the project's guideway, stations, and maintenance facilities is planned for the years 2022 through 2028, with 2024 identified as the peak year of construction activity. As shown in Table 4, this construction schedule has been used to spread the estimated local construction costs for the project alternatives based on general anticipated expenditures associated with construction activities.

[3] The analysis assumed local construction expenditures in the RSA would equal about 41 percent of total construction costs, based on review of U.S. Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) historical data for the RSA, California and the nation and upon analysts' professional judgement. Total construction costs correspond to cost estimates for SCC Groups 10 to 60 and a share of Group 90 Costs, and exclude costs for 40.07-Right-of-Way Purchase and Land Costs.

Table 3 Project Alternatives' Costs by Standard Cost Category (2018$[4])

Standard Cost Category[1]/Alternative	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Total Capital Costs	Total Construction Costs	Total Capital Costs	Total Construction Costs	Total Capital Costs	Total Construction Costs	Total Capital Costs	Total Construction Costs
10 track structures & track[2]	$13,271,520,000	$13,271,520,000	$9,865,455,000	$9,865,455,000	$13,473,346,000	$13,473,346,000	$8,678,042,000	$8,678,042,000
20 Stations, terminals, intermodal[3]	$830,279,000	$830,279,000	$819,713,000	$819,713,000	$873,691,000	$873,691,000	$698,399,000	$698,399,000
30 Support facilities: yards, shops, administrative buildings	$240,091,000	$240,091,000	$240,091,000	$240,091,000	$281,953,000	$281,953,000	$262,779,000	$262,779,000
40 Sitework, existing improvements	$4,111,065,000	$1,623,830,000	$5,798,280,000	$2,581,723,000	$4,065,164,000	$1,816,182,000	$3,282,675,000	$1,633,274,000
50 Communications & signaling	$362,257,000	$362,257,000	$347,835,000	$347,835,000	$352,090,000	$352,090,000	$387,038,000	$387,038,000
60 Electric traction	$645,328,000	$645,328,000	$672,801,000	$672,801,000	$641,774,000	$641,774,000	$597,759,000	$597,759,000
70 Vehicles	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
80 Professional services	$2,710,861,000	$0	$2,306,446,000	$0	$2,777,205,000	$0	$1,981,346,000	$0
90 Unallocated contingency	$836,614,000	$640,469,000	$762,569,000	$552,517,000	$844,168,000	$655,301,000	$590,574,000	$455,615,000
100 Finance charges	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total costs[1]	$23,008,015,000	$17,613,775,000	$20,813,189,000	$15,080,135,000	$23,309,392,000	$18,094,338,000	$16,478,610,000	$12,712,905,000
Local construction costs[2,3]		$7,221,648,000		$6,182,855,000		$7,418,679,000		$5,212,291,000

Sources: Authority 2018
N/A = Not applicable
SCC = standard cost category
[1] Capital Cost estimates are exclusive of costs for Standard Cost Categories (SCC) 70-Vehicles and 100-Finance Charges. Construction Cost estimates are exclusive of costs for SCC 40.07-Right-of-Way Purchase and Land Costs .
[2] Cost estimates for SCC Categories 10, 40, 50, and 60 plus proportional share of SCC Category 90-Unallocated Contingency is assumed to be track construction costs. Cost estimates for SCC Categories 20–30 plus proportional share of SCC Category 90 assumed to be station and maintenance facility construction costs.
[3] Local Construction Expenditures assumed as 41 percent of total construction costs.
[4] The Construction Cost Index (CCI) developed for the Authority's 2016 Business Plan Capital Cost Basis of Estimate Report (Authority 2016) has been applied to adjust capital and construction cost estimates for the project, which were provided in 2018 dollars, to the 2016 dollars pertinent to the RIMS II multipliers. The CCI inflation factor of 2.25 percent per annum is assumed to pertain between Fiscal Year 2016/2017 and Fiscal Year 2024/2025 for the Construction Cost Index, and has been applied to convert 2018 dollars to 2016 dollars for RIMS II modeling, and to convert RIMS II model outputs in 2016 dollars to 2018 dollars for uniform reporting.

Table 4 Project Alternatives' Costs by Construction Year (2018$)

Alternative / Cost	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Capital costs [1]	$23,008,015,000	$20,813,189,000	$23,309,392,000	$16,478,610,000
Total construction costs [2]	$17,613,775,000	$15,080,135,000	$18,094,338,000	$12,712,905,000
Local construction costs [3]	$7,221,648,000	$6,182,855,000	$7,418,679,000	$5,212,291,000
Local construction costs during 2022	$1,009,965,000	$860,581,000	$981,296,000	$750,117,000
Local construction costs during 2023	$1,500,862,000	$1,262,451,000	$1,553,870,000	$1,036,101,000
Local construction costs during 2024 (peak year)	$1,927,656,000	$1,613,336,000	$1,998,840,000	$1,278,919,000
Local construction costs during 2025	$1,429,269,000	$1,182,656,000	$1,472,046,000	$1,039,469,000
Local construction costs during 2026	$634,992,000	$544,982,000	$645,479,000	$461,283,000
Local construction costs during 2027	$556,152,000	$580,173,000	$597,838,000	$527,295,000
Local construction costs during 2028	$162,750,000	$138,676,000	$169,310,000	$119,108,000

Sources: Authority 2017c, 2018
[1] Capital Cost estimates are exclusive of costs for Standard Cost Categories (SCC) 70-Vehicles and 100-Finance Charges. Construction Cost estimates are exclusive of costs for SCC 40.07-Right-of-Way Purchase and Land Costs.
[2] Cost estimates for SCC Categories 10, 40, 50, and 60 plus a proportional share of SCC Category 90-Unallocated Contingency is assumed to be track construction costs. Cost estimates for SCC Categories 20–30 plus a proportional share of SCC Category 90 assumed to be stations and maintenance facility construction costs.
[3] Local construction assumed equal to 41% of total construction.

Economic Impacts from Construction

This analysis assumes that approximately 41 percent of the total construction expenditures for the project would be made in the regional economy; that is, in the three-county RSA. As shown in Table 5, the direct employment for construction is projected at between 5,110 and 7,990 jobs in the peak year 2024 depending on the project alternative. Table 5 presents the estimated total one-time economic impact of construction of the project on the RSA.

Table 5 Total One-Time Economic Impact of Construction (2018$)

Alternative/Sector	Output (2018$)[1]	Employment (Job-Years)[1]	Employee Compensation (2018$)[1]
Alternative 1			
Direct impact	$7,221,648,000	28,880	$1,905,440,000
Indirect/induced impact	$2,932,711,000	14,780	$684,243,000
Total impact	$10,154,359,000	43,660	$2,589,683,000
2024 Peak year direct jobs	N/A	7,710	N/A
2024 Peak year direct, indirect and induced jobs	N/A	11,650	N/A
Alternative 2			
Direct impact	$6,182,855,000	24,730	$1,631,353,000
Indirect/induced impact	$2,510,858,000	12,650	$585,819,000
Total impact	$8,693,713,000	37,380	$2,217,172,000
2024 Peak year direct jobs	N/A	6,450	N/A
2024 Peak year direct, indirect and induced jobs	N/A	9,750	N/A

Alternative/Sector	Output (2018$)[1]	Employment (Job-Years)[1]	Employee Compensation (2018$)[1]
Alternative 3			
Direct impact	$7,418,679,000	29,670	$1,957,426,000
Indirect/induced impact	$3,012,725,000	15,180	$702,912,000
Total impact	$10,431,404,000	44,850	$2,660,338,000
2024 Peak year direct jobs	N/A	7,990	N/A
2024 Peak year direct, indirect and induced jobs	N/A	12,080	N/A
Alternative 4			
Direct impact	$5,212,291,000	20,840	$1,375,269,000
Indirect/induced impact	$2,116,711,000	10,670	$493,859,000
Total impact	$7,329,002,000	31,510	$1,869,128,000
2024 Peak year direct jobs	N/A	5,110	N/A
2024 Peak year direct, indirect and induced jobs	N/A	7,730	N/A

Sources: Authority 2018, 2019 2017b; BEA 2018
[1] All numbers have been rounded to the nearest 1,000 for output and employee compensation and to the nearest 10 for employment.
N/A = Not applicable.

Consideration of Overlapping HSR Project Section Construction Schedules and Construction Worker Commute Sheds

The project is just one of several HSR project sections expected to be constructed within a relatively short timeframe and in relative proximity. The RSA for the project includes Santa Clara County, which is also one of the counties in the RSA for the San Francisco to San Jose Project. The San Francisco to San Jose Project Section construction period (2021–2025) is anticipated to overlap the construction period anticipated for this project (2022–2028). The Central Valley Wye Project also has a construction period (2019–2023) that is anticipated to partially overlap the construction period anticipated for this project (2022–2028). Construction workers experienced on any of these adjacent project sections would provide valuable labor resources for the others, and the estimated daily commute sheds for the different project sections would also overlap. Approximately 55,300 (or 55 percent) of the 100,400 employed residents who were primarily employed as construction workers in 2017 and living within the 90-minute commute shed for the San Francisco to San Jose Project Section were also residing within the commute shed for this project. Approximately 5,630 (or about 10 percent) of the 54,900 employed residents who were primarily employed as construction workers in 2017 and living within the 90-minute commute shed for the Central Valley Wye Project were also residing within the commute shed for this project. (U.S. Census Bureau 2019a, 2019b; Attachment 1 to this appendix).

Economic Impacts from Operations

The analysis of operations is based on data obtained from the Authority, including estimated system-wide operating and maintenance costs (Authority 2017a). In addition, the analysis relied on detailed program data to allocate costs to the project.[4] Specifically, the analysis used

[4] Project route miles within Santa Clara, San Benito, and Merced Counties were estimated using the length of the midline of Alternatives 1, 2, 3 and 4 (per GIS shapefile set: JM_SingleCenterline_AllAlts_ZipFinal_20181008.zip) The length of the alternatives' midline may differ from route miles for the individual alternatives and from the project mileage estimates in the Authority's *2018 Business Plan Capital Cost Basis of Estimate Report* (Authority 2018a).

personnel estimates and route miles as the primary metric through which operations costs are allocated from HSR system-wide totals to specific HSR project sections.

In 2040, the Authority anticipates that the total operating budget for the Phase I system will be approximately $874 million (2015$ millions) (Authority 2017a). Total operating and maintenance (O&M) staffing for the entire Phase I system in 2040 is projected by the Authority at 3,540 jobs (Authority 2017c). The number of staff associated with each project section will ultimately depend on final decisions regarding the locations of the maintenance facilities, the operation and control center, and the California High-Speed Rail Headquarters. Interim estimates of the San Jose to Central Valley Wye project O&M staffing in 2040 used in this analysis is 600 jobs or about 17 percent of the Phase I estimate for total jobs systemwide, based on a pro-rata allocation of the systemwide O&M jobs by ratio of the project's centerline route miles to total route miles systemwide (Authority 2018).

The same ratio of the project's centerline route miles to total route miles systemwide is applied to allocate Phase 1 O&M cost estimates to the individual Phase 1 project sections.[5] About $147 million (2015$), or about 17 percent of the projected operating budget, is estimated for the San Jose to Central Valley Wye project. The operations expenses include regional spending on employee compensation and goods and services. The operations and maintenance employment would include train operations, dispatching, maintenance of equipment, track, and systems, station and train cleaning, and general and administrative positions associated with the tracks, stations in San Jose and Gilroy and rail yards and maintenance facilities. Other operating budget costs would involve commercial activities, insurance, and contingency funds. No heavy maintenance facilities are proposed for the project.

Analysts used the Construction Cost Index developed for the Authority's 2016 Business Plan Capital Cost Basis of Estimate Report (Authority 2016) to adjust operations and maintenance expense estimates made in 2015 dollars to the 2016 dollars pertinent to the RIMS II multipliers described previously. An inflation factor of 2.00 percent per annum is assumed to pertain between Fiscal Year 2015/2016 to Fiscal Year 2016/2017 in the Construction Cost Index, and has been applied as necessary to convert 2015 dollars to 2016 dollars for analysis.

Approximately 600 O&M jobs are estimated as direct impacts of the project as part of Phase 1 operations, which is forecast to create approximately 3,540 permanent O&M jobs system-wide by 2040 (Authority 2017a). The direct O&M jobs would include train operations and dispatching, infrastructure and equipment maintenance, station and train cleaning, ticketing and other commercial activities, and administration. Approximately 510 additional permanent jobs are estimated for the RSA, as indirect and induced impacts of the direct O&M employment and expenditures. The indirect and induced jobs would include additional employment supporting, servicing, or supplying train operation, administration and dispatching, infrastructure and equipment maintenance, station and train cleaning, ticketing and other commercial activities, and other occupations, such as security, operations of concessions, provision of goods and services to riders entering and leaving the HSR system.

The total direct, indirect and induced annual employment impact of operations and maintenance would be 1,110 jobs. Table 6 shows the estimated total recurring economic impact of project operations. Most of the anticipated occupations for these project O&M jobs would be in service sectors of the economy. The California Employment Development Department (CEDD) estimated 515,600 service jobs in the RSA in 2015; California Department of Transportation (Caltrans) projects 717,280 service jobs in the RSA by 2040 (Caltrans 2015). The addition of 1,110 O&M-related service jobs would represent increments of only about 0.22 percent and 0.15 percent of the existing (2015) and future (2040) estimates of the No Project Alternative service-sector

[5] Analysts used O&M Phase I 2040 Medium Cost Scenario estimates (Authority 2017a) in conjunction with estimates of route miles by project section (Authority 2018a). The Construction Cost Index developed for the Authority's 2016 Business Plan Capital Cost Basis of Estimate Report (Authority 2016) to adjust the operating cost estimates for this analysis, which were provided in 2015 dollars (Authority 2017a), to the 2016 dollars pertinent to the RIMS II multipliers and for RIMS II calculations.

employment in the RSA. The California Employment Development Department and Caltrans projections of total employment for the RSA are 1,125,900 jobs (2015) and 1,387,360 jobs (2040), respectively. The addition of 1,110 O& M-related jobs would represent increments of about 0.10 percent and 0.08 percent of the existing (2015) and future (2040) estimates of No Project Alternative total employment in the RSA.

Table 6 Total Recurring Economic Impact of Stabilized Project Operations (2018$)

Sector	Output (2018$) [1]	Employment (Job-Years) [2]	Employee Compensation (2018$)
Direct impact	$157,212,900	600	$42,599,400
Indirect/induced impact	$53,279,500	510	$19,582,900
Total impact	$210,492,400	1,110	$62,182,300

Sources: Authority 2017a; BEA 2018
[1] Direct output is based on the project's estimated $147 million (2015$) share, based on proportional route miles, of the estimated annual systemwide operations and maintenance costs under the O&M Phase I 2040 Medium Cost Scenario. The project's Phase 1 direct operations and maintenance jobs are estimated at about 600 of approximately 3,540 total jobs systemwide in 2040.
[2]. Calculated by application of RIMS II Direct Effect Employment Multipliers for Industry Aggregation 33 Rail Transportation

In aggregate, as shown in Table 7, direct, indirect and induced employment gains associated with operations and maintenance of the HSR system would represent a very small addition to the expected growth in the entire RSA—less than 0.1 percent more total employment by 2040 than projected under the No Project Alternative.

Table 7 Operations-Related Employment Growth

Region	Year 2015 Existing	No Project Alternative 2015–2040 Growth	No Project Alternative 2040 Baseline Forecast	Project Phase I O&M Direct, Indirect & Induced Growth	Project Total O&M Growth Inducement
RSA	1,125,900	261,500	1,387,400	1,110	0.08%

Sources: CEDD 2016; CDOF 2016; Authority 2017a, 2017c.
CEDD = California Employment Development Department
CDOF = California Department of Finance
O&M = operations and maintenance
HSR = High-Speed Rail
RSA = resource study area
[1] Regional O&M direct employment is projected at about 1,110 by 2040, based on the project extent's approximate share of systemwide route miles and Authority 2017a.

References

California Employment Development Department (CEDD). 2016. *Employment by Industry.* June 2016. www.labormarketinfo.edd.ca.gov/data/employment-by-industry.html (accessed November 28, 2016).

California Department of Finance (CDOF). 2016. *E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2016 with 2010 Census Benchmark*. May 2016. www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/ (accessed November 29, 2016).

California Department of Transportation (CALTRANS). 2015. *California County-Level Economic Forecast 2015-2040.* www.dot.ca.gov/hq/tpp/offices/eab/docs/Full%20Report%202015.pdf (accessed November 29, 2016) and individual county-level Excel tables for 2015–2040 Economic Forecast www.dot.ca.gov/hq/tpp/offices/eab/index_files/2015/ 2015 [County Name] Forecast Data.xlsx (accessed October 6, 2015).

California High-Speed Rail Authority (Authority). 2016. *Capital Cost Basis of Estimate Report: 2016 Business Plan: Technical Supporting Document*. April 2016. www.hsr.ca.gov/docs/about/business_plans/2016_Business_Plan_Basis_of_Estimate.pdf (accessed November 10, 2016).

———. 2017a. *Operations and Maintenance Cost Memorandum to Regional Consultant Teams: High-Speed Rail Operating and Maintenance Cost for Use in EIR/EIS Project-Level Analysis.* February 6, 2017.

———. 2017b. *Regional Growth Analysis Memorandum: Calculating Construction Job Impacts.* March 28, 2017. Accessed March 29, 2017.

———. 2017c. *Regional Employment Growth Methodology Guidelines Memorandum: Updated Environmental Methodology Guidelines for Regional Growth Estimates for Long-Term Employment and Population Increases*. February 14, 2017.

———. 2018. *Capital Cost Basis of Estimate Report: 2018 Business Plan: Technical Supporting Document.* June 1, 2018. www.hsr.ca.gov/docs/about/business_plans/2018_Business_Plan_Basis_of_Estimate.pdf (accessed October 7, 2018).

U.S. Bureau of Economic Analysis (BEA). 2013. *RIMS II: An Essential Tool for Regional Developers and Planners*. December 2013. https://www.bea.gov/regional/pdf/rims/rimsii_user_guide.pdf (accessed February 15, 2017).

———. 2018. *RIMS II Multipliers (2007/2016):* Table 2.5 Total Multipliers for Output, Earnings, Employment, and Value Added by Industry Aggregation for the Project Region [Santa Clara, San Benito, and Merced Counties] (Type II). Obtained October 12, 2018.

U.S. Census Bureau. 2019a. Home Area Profile: *2017 All Workers, Primary Jobs, for FJ Isochrone_PM_PEAK_90*. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. http://onthemap.ces.census.gov/ (accessed August 29, 2019).

———. 2019b. *Home Area Profile: 2017 All Workers, Primary Jobs, for JM Isochrone__PM_PEAK_90*. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. http://onthemap.ces.census.gov/ (accessed August 29, 2019).

APPENDIX 3.18-A: ATTACHMENT 1 - RIMS II MODELING DETAILS

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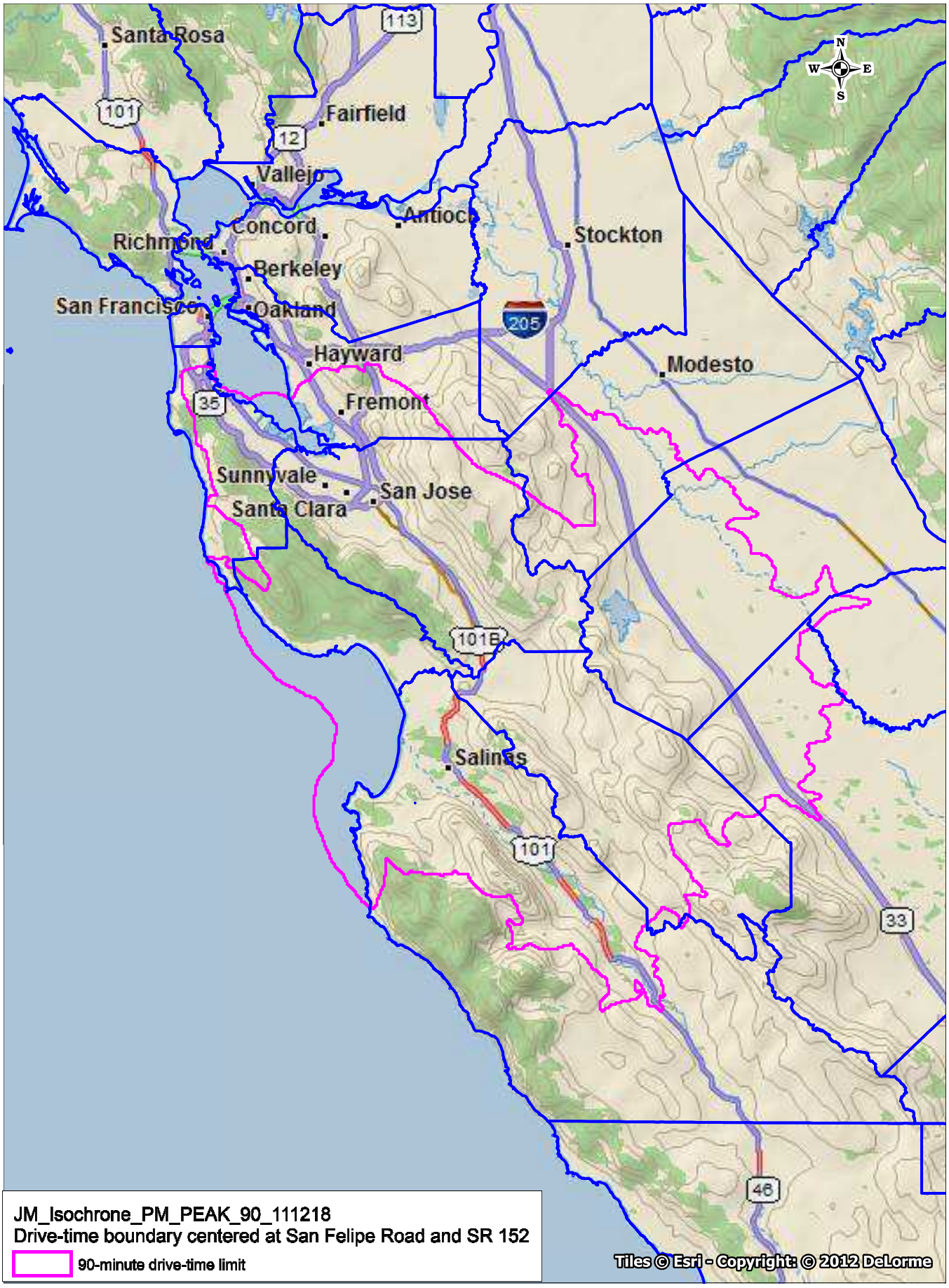

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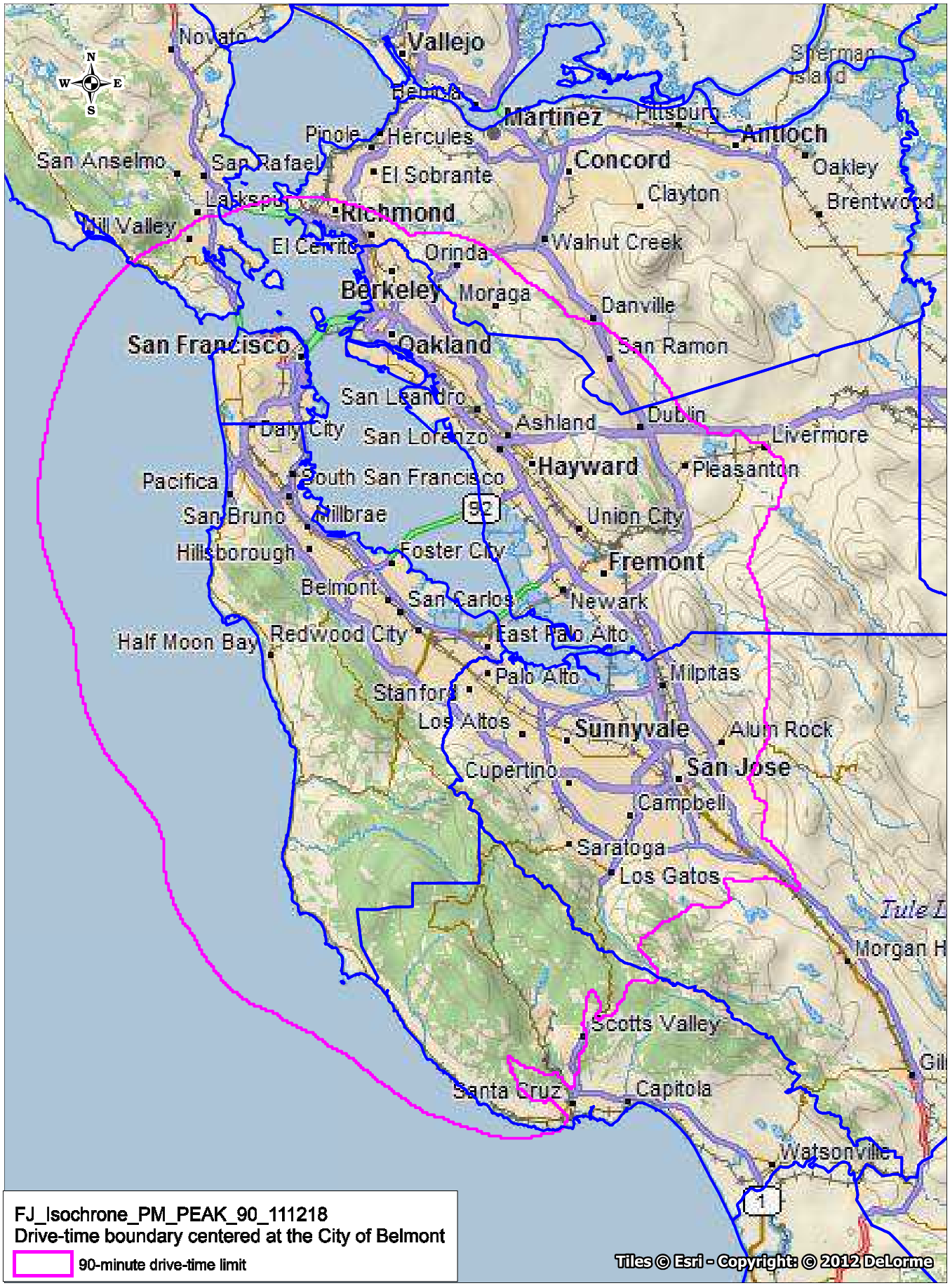

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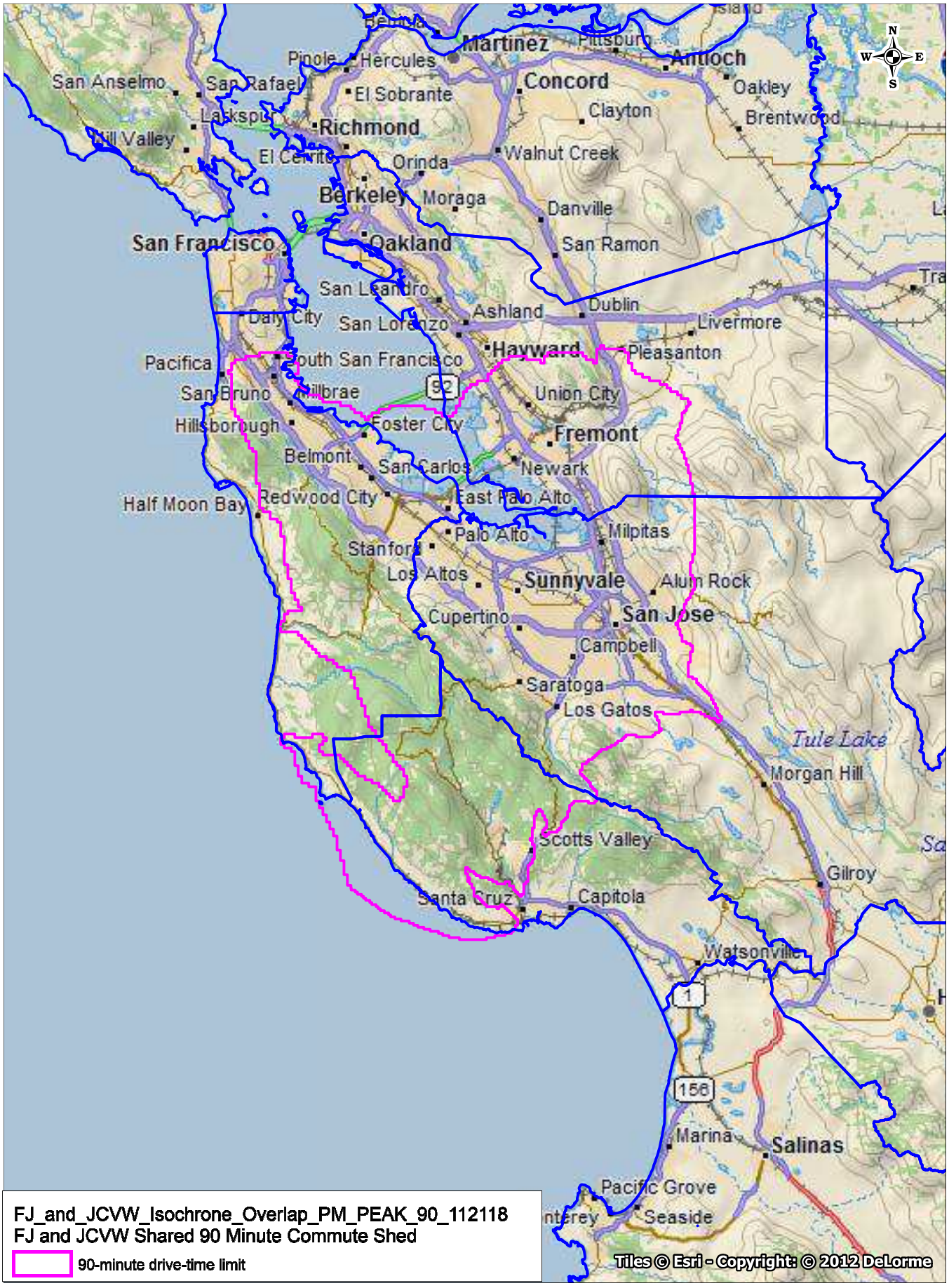

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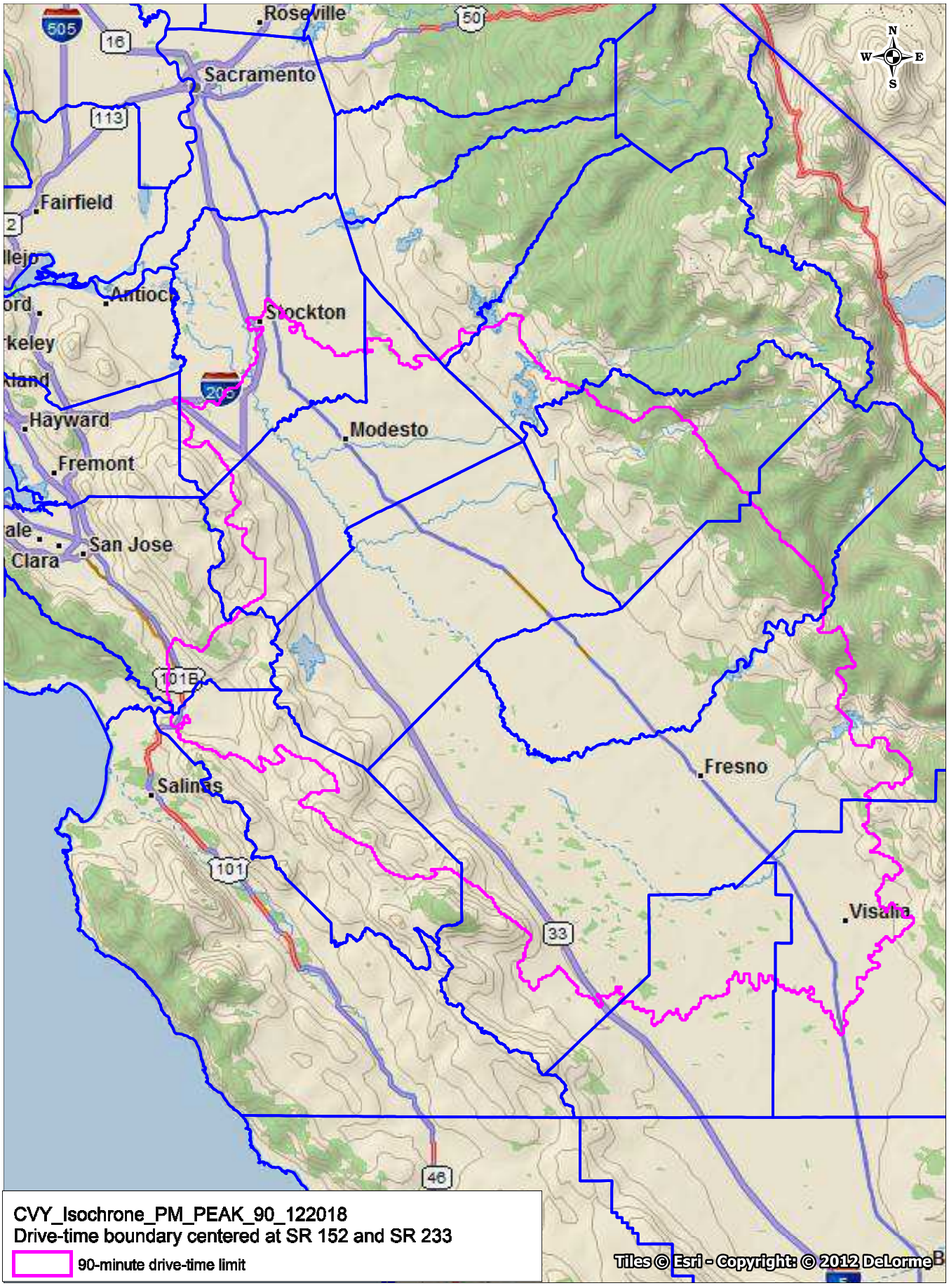

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Figure EPS 2018e:
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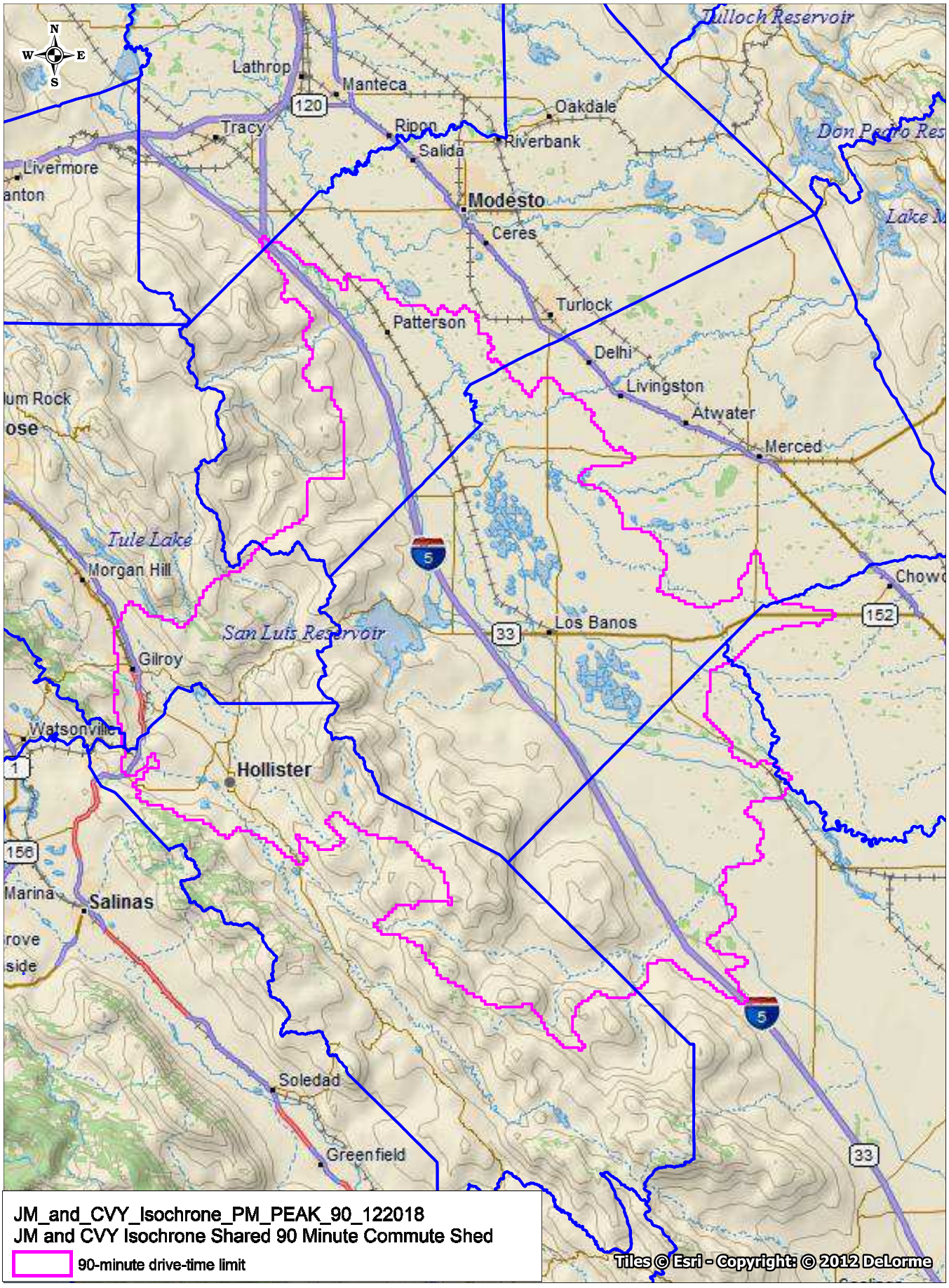

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APPENDIX 3.19-A: CUMULATIVE NONTRANSPORTATION PLANS AND PROJECTS LISTS

Since publication of the Draft Environmental Impact Report/Environmental Impact Statement, the following substantive changes have been made to this appendix:

- The status of cumulative nontransportation plans and projects, including the Downtown West Mixed-Use Plan, B.F. Sisk Dam Safety of Dams Modification Project, and B.F. Sisk Dam Raise and Reservoir Expansion Project, was updated in Tables 1 through 6.

Table 1 Santa Clara County Nontransportation Plans and Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
1	Santa Clara County General Plan[1]	Plan to promote managed, balanced growth; livable communities; responsible resource conservation; and social and economic well-being.	Land use plan	Adopted 12/20/1994; Housing Element adopted June 10, 2014; Health Element adopted August 25, 2015; Land Use Map updated 2013	None	Unincorporated areas and 15 cities of Santa Clara County
2	Santa Clara Valley Habitat Plan[2]	Plan to protect, enhance, and restore natural resources in specific areas of Santa Clara County, while improving and streamlining the environmental permitting process for impacts on threatened and endangered species	Habitat conservation plan	Adopted August 2012	None	"specific areas of Santa Clara County, plus City of San Jose, City of Morgan Hill, City of Santa Clara"
3	Pacheco Pass Landfill Composting Facility Expansion[3]	Increase the total SWFP permitted boundary from 18.3 acres to 46 acres. The permitted boundary will be expanded to include existing ancillary facilities such as the scale house, retention ponds, and pipelines that serve South Valley Organics compost operations. Composting activities remain restricted to the existing western compost pad and eastern expansion area. Increase permitted traffic volume from 260 vehicles per day to 341 vehicles per day.	Landfill expansion project	Permit issued July 31, 2015	None	3675 Pacheco Pass Road, in the southern portion of unincorporated Santa Clara County
4	Sargent Quarry[4]	Proposed sand and gravel mining operation construction and operation of aggregate processing facilities, on 320 acres of the approximately 6,400-acre Sargent Ranch property currently used for cattle grazing.	Mining operation	Draft EIR to be published fall 2020	Aesthetics; air quality; biological resources; cultural resources; energy; geology and soils; GHG; hazards; hydrology and water quality; land use; noise; public services; transportation; utilities and service systems	APNs 810-38-014, -016, and -017 approximately four miles south of the City of Gilroy, west of Highway 101 in Santa Clara County
5	Cordoba Center[5]	Proposed religious and cultural institution (Cordoba Center) would include a mosque, a community building for education, recreation and assembly, an ancillary graveyard, and youth camp. Facilities have been designed to accommodate up to 300 persons for scheduled religious services with greater anticipated capacity for occasional special events.	Religious and cultural center	Approved by Planning Commission in spring 2020	Aesthetics; cultural resources; hydrology and water quality; noise; transportation and circulation; utilities and energy	15.8-acre site fronting on Monterey Road just north of California Avenue, San Martin (14065 Monterey Road, APN: 779-06-002)

[1] Santa Clara County. 1994. *Santa Clara County General Plan Book A*. Available: https://www.sccgov.org/sites/dpd/DocsForms/Documents/GP_Book_A.pdf. Accessed: May 9, 2016; Santa Clara County. 1994. *Santa Clara County General Plan Book B*. Available: https://www.sccgov.org/sites/dpd/DocsForms/Documents/GP_Book_B.pdf. Accessed: July 14, 2016.

[2] Santa Clara County. 2012. *Final Santa Clara Valley Habitat Plan*. Available: http://scv-habitatagency.org/178/Final-Habitat-Plan. Accessed: May 9, 2016.

[3] CalRecycle. 2015. *Permitting & Assistance Branch Staff Report, Revised Solid Waste Facilities Permit for the South Valley Organics Composting Facility*. Available: http://www.calrecycle.ca.gov/Actions/Documents%5C20%5C20152015%5C1375%5CSWFP%20Staff%20Report.pdf. Accessed: August 22, 2016.

[4] Santa Clara County. 2016. *Notice of Preparation of an Environmental Impact Report for the Sargent Quarry Project*. Available: https://www.sccgov.org/sites/dpd/DocsForms/Documents/10747_SargentRanch_20160721_NOP.pdf. Accessed: February 13, 2017.

[5] Santa Clara County. 2016. *Notice of Preparation of an Environmental Impact Report for the Cordoba Center Project*. Available: https://www.sccgov.org/sites/dpd/DocsForms/Documents/2145_NOP_Final.pdf. Accessed: February 12, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
6	Plan Bay Area 2040[6]	Plan is a limited and focused strategic update of the region's previous integrated regional transportation and land use plan, Plan Bay Area, adopted in 2013. Plan Bay Area 2040 guides the nine-county region in meeting the requirements of California's landmark 2008 Senate Bill 375, which calls on each of the state's 18 metropolitan planning organizations to develop a Sustainable Communities Strategy (SCS) as part of their long-range Regional Transportation Plan (RTP). The joint RTP/SCS must accommodate future population growth while reducing per-capita carbon dioxide emissions from cars and light trucks – performance targets achieved by Plan Bay Area 2040.	Land use plan	Adopted July 26, 2017	None	The entire Bay Area, including the nine counties and the 101 cities and towns that make up the region.
7	Anderson Dam Seismic Retrofit[7]	Project objectives include stabilizing the dam embankment for the maximum credible earthquakes, modify or replace the outlet works to protect against potential fault rupture risk from the maximum credible earthquake on the Coyote Creek-Range Front fault zone, and to incorporate other measures to address safety deficiencies, including potential spillway modifications that are determined to be necessary.	Water/ supply project	Started FY 2014; to be completed FY 2028	Geology, soils, and seismicity, hydrology and water resources	Located 18 miles southeast of San Jose, California. The dam lies 1 mile from the Calaveras Fault and on top of the Coyote Creek-Range Front Fault Zone.
8	Pacheco Conduit Inspection and Rehabilitation[8]	This project plans, designs, and constructs major repairs and improvements to the District's pipelines and tunnels to accomplish the following objectives: perform internal inspections, maintenance, and repair activities as required, replace old valves, flow meters, pipeline appurtenance assemblies, and piping as appropriate, upgrade pipeline air valve venting in accordance with CA Department of Public Health (CDPH) guidelines, and modify failure prone pipeline appurtenance connections.	Water supply project	Complete	Hydrology and water resources	Pipeline located in Santa Clara County, from San Luis Reservoir southwest to San Benito County, then running northwest parallel with US 101.
9	Pacheco Reservoir Expansion Project[9]	The Santa Clara Valley Water District, Pacheco Pass Water District and the San Benito County Water District are working to secure funding for a $1 billion project that will increase Pacheco Reservoir's storage capacity and deliver water supply, water quality and ecosystems benefits to the region and the Sacramento-San Joaquin Delta. On the north folk of Pacheco Creek, the expanded reservoir project includes the construction of an earthen dam made of rock and other soil materials located within the footprint of the existing reservoir. The project will increase the reservoir's capacity from 5,500 to 140,000-acre feet, enough water to supply 1.4 million residents for a year	Water supply project	Construction to begin in 2027; construction anticipated to be complete in 2029; operation anticipated to begin in 2029	Hydrology and water resources, geology, soils, and seismicity	Located 60 miles southeast of San Jose and sits north of Highway 152.
10	Upper Llagas Creek Flood Protection[10]	This project continues a Clean, Safe Creeks project in partnership with the U.S. Army Corps of Engineers (USACE) and the state to plan, design, and construct improvements along 13.9 miles of channel. The federally authorized preferred project protects the urban area of Morgan Hill from a 1% (or 100-year) flood, and reduces the frequency of flooding in surrounding areas. Construction includes channel modifications and replacement of road crossings. The District continues to work with Congress to aggressively pursue federal funds to bring this project to full fruition. In 2012, project limits were extended 2,700 feet upstream to Llagas Road to address public concerns.	Flood risk management project	Construction of Phase 1 began in summer 2020; construction anticipated to be complete in 2024	Hydrology and water resources, land use, biological resources, noise, parks, recreation, and open spaces, agricultural and forest resources, socioeconomics, public utilities and energy	13.9 miles of Llagas Creek from Buena Vista Avenue to Wright Avenue, including West Little Llagas Creek in downtown Morgan Hill.

APN = Assessor's Parcel Number
NOP = Notice of Preparation

[6] Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments. (ABAG) 2017. Plan Bay Area 2040. Adopted July 26, 2017. Available: http://2040.planbayarea.org/reports. Accessed February 11, 2018.
[7] Santa Clara Valley Water District. 2019. *C1: Anderson Dam Seismic Retrofit.* Available: https://www.valleywater.org/anderson-dam-project. Accessed: April 15, 2019.
[8] Santa Clara Valley Water District. 2018. *2018-2022 Five-Year Capital Improvement Program.* https://www.valleywater.org/sites/default/files/2018-01/Chapter%202%20-%20Water%20Supply.pdf. Accessed: April 15, 2019.
[9] Santa Clara Valley Water District. 2019. *Pacheco Reservoir Expansion Project.* https://www.valleywater.org/project-updates/dam-reservoir-projects/pacheco-reservoir-expansion-project-proposed. Accessed: April 15, 2019.
[10] Santa Clara Valley Water District. 2014. *Upper Llagas Creek Project Environmental Impact Report.* Available: https://s3.us-west-2.amazonaws.com/assets.valleywater.org/9%20Upper%20Llagas%20Compiled%20FEIR_05192014%20FINAL.pdf. Accessed: April 15, 2019.

Table 2 City of San Jose Nontransportation Plans and Projects Project List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
1	Envision 2040[11]	General plan for the City of San Jose	Land use plan	Adopted 11-1-11; revised 3-16-2020	None	City of San Jose
2	Communications Hill Specific Plan[12]	Mixed use development for up to 2,200 residential units (single-family and multi-family), up to 67,500 square feet of commercial/retail uses, 55 acres of industrial park uses, public parks, open space, trails, streets, stormwater facilities, and associated infrastructure on approximately 332 acres within the Communications Hill Specific Plan Area.	Land use plan	Adopted 4-7-92; amended through 2014	Aesthetics, air quality, transportation	332 acres bounded by Curtner Avenue to the north, Monterey Road to the east, Capitol Expressway, Snell Avenue, and Hillside Avenue to the south, and SR 87 to the west
3	Diridon Station Area Plan[13]	Land use plan for a 250-acre area including Diridon Station and the surrounding area in response to the planned extension of BART and HSR service to San Jose	Land use plan	Adopted June 17, 2014	Transportation	250 acres bounded by Lenzen Avenue and the UPRR tracks to the north, Interstate 280 to the south, the Guadalupe River and Delmas Avenue to the east, and Sunol Avenue and the Diridon Station commuter rail tracks to the west
4	San Jose Downtown Strategy 2000[14]	Long-range conceptual program for revitalizing the Downtown by allowing high density infill development and replacement of underutilized uses, and expanding the Greater Downtown Core Area and land use intensities to the west and north into areas that are presently undeveloped and underutilized	Land use plan	Adopted June 2005; amended October 2014 and July 2016	Air quality, cultural resources, transportation	Area generally bounded by Coleman Avenue and the extension of Washington Street on the north, 4th Street through 7th Street to the east, Interstate 280 on the south, and White street and Stockton Avenue on the west
5	San Jose Downtown Strategy 2040 (final)[15]	Update of *Downtown Strategy 2000*, including an update of residential capacity and revised development phasing to extend the horizon (buildout) year to 2040. The proposed Downtown Strategy 2040 will maintain the office, retail, and hotel room capacities of the Downtown Strategy 2000 (11.2 million sq. ft. office, 1.4 million sq. ft. retail, and 3,600 hotel rooms), but would increase the residential capacity the downtown area by up to 4,000 additional units (from 10,360 in the Envision San Jose 2040 General Plan up to 14,360 units). This update would also explore other changes to the Downtown Strategy, including an increase in the area covered by the Strategy to include two blocks on the east side of N. 4th Street between Julian Street and St. John Street and the identification of Jobs Priority Areas to prioritize the development of commercial and office uses near the proposed Downtown BART station.	Land use plan	Final EIR published December 2018	Land use, transportation, noise and vibration, air quality, biological resources, public utilities and energy, aesthetics and visual resources, socioeconomics	Area generally bounded by Coleman Avenue and the extension of Washington Street on the north, 4th Street through 7th Street to the east, Interstate 280 on the south, and White street and Stockton Avenue on the west
6	Market/Almaden Neighborhood Improvement Plan[16]	Through a series of meetings, Market-Almaden residents identified a list of specific strategies (actions) that would most contribute toward positive change in the neighborhood. The goals presented form the foundation of a plan that includes 29 specific actions to improve the neighborhood.	Land use plan	Approved March, 2003	N/A	Five block area bounded on the north by The San Jose McEnery Convention Center, on the west by Almaden Boulevard, on the south by I-280, and on the east by San Jose's South First Area

[11] City of San Jose. 2011. *Envision San Jose 2040 General Plan*. Available: http://www.sanjoseca.gov/DocumentCenter/Home/View/474. Accessed: June 3, 2016.
[12] City of San Jose. 1992. *Communications Hill Specific Plan*. Amended 2014. Available: http://www.sanjoseca.gov/index.aspx?nid=3897. Accessed: May 26, 2016.
[13] City of San Jose. 2014. *Diridon Station Area Plan, Final Plan Report*. Available: http://www.sanjoseca.gov/index.aspx?NID=4404. Accessed: July 17, 2016.
[14] City of San Jose. 2001. *Downtown Strategy 2000*. Available: https://www.sanjoseca.gov/DocumentCenter/View/55573. Accessed: July 19, 2016.
[15] City of San Jose. 2015. *Notice of Preparation of a Draft Environmental Impact Report for the Downtown Strategy 2040 Project*. Available: http://www.sanjoseca.gov/DocumentCenter/View/46911. Accessed: July 19, 2016.
[16] City of San Jose. 2003. *Market Almaden Neighborhood Improvement Plan*. Available: https://www.sanjoseca.gov/DocumentCenter/View/4862. Accessed: May 26, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
7	Samaritan Medical Center Master Plan[17][18]	Two distinct but related medical office development proposals, including demolition of all existing medical office buildings and improvements on the 13-acre project site, and redevelopment of the site with five new buildings containing 475,250 sf of medical offices and related uses. Three 6-story, 120,000 sf medical office buildings are proposed on the 9-acre Samaritan Drive Project Area. Two three-story medical office buildings proposed for the 4-acre Samaritan Court Project Area would be approximately 69,250 and 46,000 sf, respectively. Overall, the proposed project would result in a net increase of 364,726 sf of space on the site.	Medical office development project	Draft EIR issued May, 2016, amended October, 2016	Greenhouse gases, noise, transportation	Samaritan Drive and Samaritan Court, east of Bascom Avenue-Los Gatos Boulevard
8	237 @ First Homewood Suites Hotel[19]	Construction of a 4-story hotel with 145 rooms and 150 parking spaces on a 3.5-acre site	Hotel development project	Complete	Air quality, biological resources, transportation	Northwest corner of SR 237 and North First Street
9	The 237 Industrial Center Project[20]	Two development options for a 66.5-acre site: approximately 1,197,700 square feet of light industrial development or an approximately 2.35 million square foot data center up to four stories tall. The project would require rezoning from A(PD) – Agricultural Planned Development to LI Light Industrial.	Light industrial development project	Amended Draft EIR published September 2017; Final EIR in preparation	Land use, transportation, noise and vibration, air quality, public utilities and energy, aesthetics and visual resources, socioeconomics	North of Highway 237 between Zanker Road and Coyote Creek
10	St. James Park Capital Vision and Levitt Pavilion Project[21]	Physical and programmatic changes to St. James Park, a seven-acre urban park in downtown San Jose, including development of an outdoor performing arts pavilion (Levitt Pavilion) with an amplified sound and lighting system to be used for about 50 family-friendly music concerts per year	Park/performing arts facility project	Draft EIR published July 2020; Final EIR in preparation	N/A	St. James Park, bordered by East St. James Street to the north, East St. John Street to the south, North 1st Street to the west, and North 3rd Street to the east
11	Edenvale Area Development Policy[22]	Guidance for the buildout of the Edenvale Redevelopment Project Area with approximately 7.88 million sf of additional industrial uses and associated infrastructure	Development project	Adopted 1976, updated through 2014 most recently as part of the Great Oaks Mixed Use Project	Air quality, biological resources, cultural resources, noise, land use, transportation	Old Edenvale: east of Cottle Road, north of Santa Teresa Boulevard, northwest of Bernal Road, and southwest of Monterey Road New Edenvale: generally bounded by US 101 and Coyote Creek to the west, Hellyer Avenue and the east foothills to the northeast, and Silicon Valley Boulevard to the south
12	Equinix Data Centers – Great Oaks Mixed Use Site[23]	Development of an 11.15-acre site on the eastern portion of the 76-acre Great Oaks Mixed Use property, previously approved for 260,000 square feet of office uses, with two, 193,000 square foot data center buildings	Mixed use development project	Complete	Aesthetics, air quality, transportation	11.15-acre project site (APN 706-09-117 and part of 706-09-118) within the 76-acre Great Oaks property adjacent to and just north of SR 85, and south of Monterey Highway

17 City of San Jose. 2016. *Environmental Impact Report, Samaritan Medical Center Master Plan*. Available: http://www.sanjoseca.gov/DocumentCenter/View/56789. Accessed: August 25, 2016.

18 City of San Jose. 2016. *Second Amendment to the Samaritan Medical Center Master Plan EIR*. Available: http://www.sanjoseca.gov/DocumentCenter/View/61908. Accessed: February 14, 2017.

19 City of San Jose. 2014. *237 @ First Homewood Suites: Addendum to the Final Environmental Impact Report for the Cisco Systems, Inc. Site 6 Project (SCH# 99082003), the Final Environmental Impact Report for the North San Jose Development Policies Update (SCH#2004102067), and the Final Program Environmental Impact Report for the Envision San José 2040 General Plan (SCH# 2009072096)*. Available: http://www.sanjoseca.gov/DocumentCenter/View/34680. Accessed: May 26, 2016.

20 City of San Jose. 2016. *Notice of Preparation of a Draft Environmental Impact Report for the 237 Industrial Center Project*. Available: http://www.sanjoseca.gov/DocumentCenter/View/56986. Accessed: May 26, 2016.

21 City of San Jose. 2016. *Notice of Preparation of a Draft Environmental Impact Report for the St. James Park Capital Vision and Levitt Pavilion*. Available: http://www.sanjoseca.gov/DocumentCenter/View/57052. Accessed: August 22, 2016.

22 City of San Jose. 2016. *City of San Jose Planning, Building and Code Enforcement: Edenvale Area Development Policy*. Available: http://www.sanjoseca.gov/index.aspx?NID=4972. Accessed: May 26, 2016.

23 City of San Jose. 2016. *Addendum to the Great Oaks Mixed Use Project EIR*. Available: http://www.sanjoseca.gov/DocumentCenter/View/54009. Accessed: May 26, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
13	Gateway Tower Mixed Use Development[24]	Removal of the existing commercial building and parking lot at 493 South First Street and construction of a 25-story building, with 308 residential apartment units, 8,000 square feet of ground floor commercial space, and a parking garage with approximately 285 vehicular parking spaces and 75 motorcycle spaces. Retention and incorporation of the commercial building facades for 455 South First Street/460 South Market Street and 465-467 South First Street/470-480 South Market Street into the proposed building with the remainder of the existing buildings removed as part of the proposed redevelopment of the 0.5-acre site.	Mixed use development project	Amended Draft EIR published October 2019; Final EIR in preparation	Aesthetics, cultural resources	455 to 493 South First Street
14	Cannery Park/Hanover[25]	Proposed PD rezoning to allow development of up to 403 apartments, approximately 5,000 square feet of commercial retail space, surface parking, some residential amenities, and common areas on an 11.4-acre site. The revised PD zoning would maintain the existing historic 60,000 square foot Continental Can Company warehouse building and the Gordon Biersch Brewery building, but would change the allowed land uses in both buildings to include all uses allowed in the CIC Combined Industrial/Commercial zone district plus ministorage facilities in the Continental Can Company building with the approval of a Planned Development Permit. In addition, the project proposes to dedicate 0.74 acres of the site to the City as public parkland. The proposed mixed use building would be approximately four stories and would not exceed 65 feet in height.	Mixed use development project	Complete	None	Northwest corner of North 10th Street and East Taylor Street, at 357 – 395 East Taylor Street and 401 – 775 North 10th Street (APNs 249-07-006 and 249-09-001)
15	Flea Market General Plan Amendment and Rezoning Project[26]	General Plan amendment and rezoning of a 120-acre site to allow development up to 215,622 square feet of commercial and/or industrial buildings north of Berryessa, up to 150,000 square feet of commercial space south of Berryessa, and a combined total of 2,818 dwelling units north and south of Berryessa. A maximum of 1,000 dwelling units could be constructed north of Berryessa and a maximum of 2,300 dwelling units could be constructed south of Berryessa, but in no circumstances would the total exceed 2,818 dwelling units.	Mixed use development project	Draft EIR December 2006; Addendum 2012	Air quality, cultural resources, hazardous materials, transportation	1590 Berryessa Road
16	Garden City Rezoning Project[27]	Rezoning from the CG Commercial General and CN Commercial Neighborhood zoning districts to the CG(PD) Planned Development Zoning District to allow up to 400,000 sf of office space, up to 871 residential units, approximately 15,500 sf of retail/commercial space, and a 1.5-acre public park on a 16.7-acre site	Office, commercial, residential development project	Draft EIR published July 2019; Final EIR in preparation	Parks and Recreation, air quality and greenhouse gases, transportation and traffic, aesthetics and visual resources, public utilities and energy, noise and vibration	Southeast corner of Saratoga Avenue and Stevens Creek Boulevard. The site is bounded by the Saratoga Avenue to the west, Stevens Creek Boulevard to the north, Northlake Drive to the east, and Kiely Boulevard to the south (APNs 303-25-012, 303-25-013, 303-25-016, 303-25-022, 303-25-023, 303-25-044, and 303-25-052).
17	Baseball Stadium in the Diridon/Arena Area[28]	Proposed professional baseball stadium with a maximum seating capacity of 36,000, and a maximum height of 155 feet above finished grade on an approximately 23.1-acre site, and three off-site parking structure options. The project includes realignment of South Autumn Street and South Montgomery Street near their intersection with Park Avenue.	Stadium development project	Final EIR 2010; resolution adopted June 2014	Climate change, noise, traffic	area generally bounded by Autumn Street, Bird Avenue and Los Gatos Creek to the east and south, railroad tracks to the west, and Julian Street to the north

[24] City of San Jose.
[25] City of San Jose. 2015. *Initial Study/Mitigated Negative Declaration, Cannery Park Hanover Planned Development Zoning & General Plan Amendment*. Available: https://www.sanjoseca.gov/DocumentCenter/View/46365. Accessed: August 25, 2016.
[26] City of San Jose. 2006. *Draft Environmental Impact Report, San Jose Flea Market General Plan Amendment and Planned Development Rezoning*. Volume I of II: EIR Text. Available: http://www.sanjoseca.gov/DocumentCenter/View/6301. Accessed: August 29, 2016.
[27] City of San Jose. 2016. *Notice of Preparation of a Draft Environmental Impact Report for the Garden City Mixed-Use Project*. Available: http://www.sanjoseca.gov/DocumentCenter/View/56083. Accessed: May 26, 2016.
[28] City of San Jose. 2010. *First Amendment to Supplemental Environmental Impact Report (Response to Comments), Baseball Stadium in the Diridon/Arena Area (Modified Project) Supplemental Environmental Impact Report*. Available: http://planning.sanjoseca.gov/planning/eir/pre-2010/Ballpark_PP05-214/SJ_Ballpark_First_Amendment_to_SEIR_050510.pdf. Accessed: May 26, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
18	Midpoint at 237 Office and Industrial Project[29]	Development of two 2-story office buildings approximately 83,000 sf each, two 3-story office buildings approximately 124,500 sf each, and three one-story industrial buildings approximately 233,520 sf, 167,700 sf, and 162,540 sf, respectively, and surrounding surface parking on a 57-acre site	Office and industrial development project	Complete	Air quality, biological resources, traffic	APNs 015-44-011, -014, -016, -017, east of North First Street and north of Nortech Parkway
19	North San Pedro Tower 3 Residential Project[30]	Development of an 18-story tower with 313 residential units, approximately 2,000 sf of commercial space and three levels of above-grade parking on an approximately 1.52-acre site.	Residential development project	Under construction; anticipated completion fall 2020	None	APNs 259-24-008, -020, and -039 located at the northwest corner of Old West Julian Street and Terraine Street, bounded by Bassett Street to the north and SR 87 to the west
20	Orchard Parkway Properties[31]	Development of up to 4,151,350 sf of industrial uses, including office, research and development, manufacturing, and other related and supporting uses on an approximately 86.35-acre site	Industrial office/R&D and commercial development project	Complete	Air quality, biological resources, traffic	APNs. 101-02-011, 101-03-004, 101-03-007, 101-03-008, 101-02-016, and 101-02-017 on both sides of Orchard Parkway, west of North First Street and east of the Guadalupe River, along Atmel Way
21	363 Delmas Residential Project[32]	Demolition of three single-family residences and accessory buildings, removal of five ordinance sized trees, and construction of a 5-story multi-family residential building with up to 120 units, an alternating use parking arrangement, and Transportation Demand Management (TDM) measures to reduce parking; and, a Vesting Tentative map to consolidate four lots into one lot, and allow up to 120 residential condominiums on an approximately 0.8 gross acre site located within the Downtown and Diridon Urban Village Plan growth areas	Residential development project	Approved June, 2016; Construction pending	Air quality, cultural resources, noise, population and housing, traffic	341, 363, 365 Delmas Avenue, on the westerly side of Delmas Avenue, approximately 290 feet northerly of Auzerais Avenue (APN 264-26-006, 007, 008, 009)
22	Westfield Valley Fair Shopping Center Expansion[33]	Demolition of two stores and internal mall space to accommodate construction of approximately 685,000 sf of new retail space, including a 10-theater cinema, underground parking, and a new 6-story parking structure within the existing shopping center's 70-acre site. The project site is located in both San Jose (52 acres) and Santa Clara (18 acres).	Commercial development project	Complete	Air quality, population and housing, traffic, utilities	On Stevens Creek Boulevard, bounded by Monroe Street and U.S. Interstate 880 to the east, Forest Avenue and single-family housing to the north, and North Winchester Boulevard and commercial development to the west
23	740/750 West San Carlos Street Mixed Use Project[34]	Replacement of the current uses on the 1.06-acre 740 West San Carlos site with 95 multi-family residential units and 2,885 sf of ground floor retail space	Mixed use development project	Approved January, 2016	Air quality, greenhouse gases, noise, population and housing, traffic	740 and 750 West San Carlos Street
24	777/815 West San Carlos Street Mixed Use Project[35]	Rezone to allow a 7-story mixed use development with up to 110 multi-family residential units and approximately 3,000 sf of commercial space on the 1.3-acre site at 777 and 815 West San Carlos Street	Mixed use development project	Approved January, 2016	Air quality, greenhouse gases, noise, population and housing, traffic	777 and 815 West San Carlos Street
25	Bay 101 Casino and Mixed Use Project[36]	A mixed-use redevelopment proposal for relocation of an existing cardroom and associated uses, two new hotels with up to 470 total rooms, and a 1,644-space parking structure and off-street parking facility on approximately 19.8 acres.	Mixed use development project	Complete	Air quality, biological resources, hydrology and water quality, hazards and hazardous materials	southeast corner of North First Street and Highway 101, APNs 235-01-019 & -020

[29] City of San Jose. 2014. *Midpoint at 237 Office and Industrial Project: Addendum to the Final Environmental Impact Report for the Cisco Systems, Inc. Site 6 Project, the Final Environmental Impact Report for the North San Jose Development Policies Update, and the Final Program Environmental Impact Report for the Envision San José 2040 General Plan*. Available: http://www.sanjoseca.gov/DocumentCenter/View/28912. Accessed: May 26, 2016.

[30] City of San Jose. 2015. *Addendum: North San Pedro Tower 3 Residential Project*. Available: https://www.sanjoseca.gov/DocumentCenter/View/45062. Accessed: May 26, 2016.

[31] City of San Jose. 2015. Orchard Parkway Properties: *Addendum to the Final Program Environmental Impact Report for the North San José Development Policies Update and the Final Program Environmental Impact Report for the Envision San José 2040 General Plan and the Final EIR for the BEA Development Project*. Available: http://www.sanjoseca.gov/DocumentCenter/View/53053. Accessed: May 26, 2016.

[32] City of San Jose. 2016. *363 Delmas Residential Project: Addendum to the San José Downtown Strategy 2000 Final Environmental Impact Report, the Diridon Station Area Plan Final Environmental Impact Report, and the Envision San José 2040 General Plan Final Environmental Impact Report.* Available: http://www.sanjoseca.gov/DocumentCenter/View/56132. Accessed: May 26, 2016.

[33] City of San Jose. 2015. 740 & 777 *West San Carlos Development Project Community Risk Assessment San José, California*. Available: http://www.sanjoseca.gov/DocumentCenter/View/53453. Accessed: May 26, 2016.

[34] City of San Jose. 2016. *Addendum to the Valley Fair Shopping Center Expansion Project Final Environmental Impact Report*. Available: http://www.sanjoseca.gov/DocumentCenter/View/55124. Accessed: May 26, 2016.

[35] City of San Jose. 2016. *Addendum to the Diridon Station Area Plan Final Environmental Impact Report and the Envision San Jose 2040 General Plan Supplemental Environmental Impact Report*. Available: http://www.sanjoseca.gov/DocumentCenter/View/53402. Accessed: May 26, 2016.

[36] City of San Jose. 2014. *Bay 101 Casino and Mixed Use Project Environmental Impact Report*. Available: http://www.sanjoseca.gov/DocumentCenter/View/31359. Accessed: February 13, 2018.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
26	641 North Capitol Avenue Mixed Use Project[37]	A Signature Project for a Mixed Use development project that would allow two development scenarios: (1) up to 188 residential units, a minimum of 108,000 square feet of commercial space, and an approximately 43,583 square feet publicly accessible park or (2) should the planned amount of jobs be reduced in the Urban Village for which the site is located then allow up to 493 residential units, a minimum of 38,360 square feet of commercial space, and an approximately 43,583 square feet publicly accessible park, on a 10.6 gross acre site.	Mixed use development project	Under construction	None	641 North Capitol Avenue
27	Newby Island Sanitary Landfill and Recyclery[38]	The subject Planned Development Permit would effectuate the Planned Development Zoning (File No. PDC07-071, approved in 2012) and allow a vertical expansion to the existing landfill to increase the maximum height from 150 feet to 245 feet and an increase of the landfill capacity by 15.12 million cubic yards.	Landfill expansion project	Approved 2015	None	1601 Dixon Landing Road
28	Tamien Station Transit Oriented Development[39]	Construction of up to 569 residential units and up to 3,000 square feet of commercial space	Residential development project	Construction anticipated 2022 through 2024	None	Adjacent to Caltrain Tamien Station
29	Downtown West Mixed-Use Plan (Google Project)[40]	General Plan Amendment, Planned Development Rezoning, and Planned Development Permit for the development on an 81-acre site of up to 5,900 residential units; up to 7,300,000 gross sf of office space; up to 500,000 gross sf of active uses such as retail, cultural, arts; up to 300 hotel rooms; up to 800 rooms of limited-term corporate accommodations; up to two event and conference centers totaling up to 100,000 gross sf; logistics/warehouse(s) totaling approximately 100,000 gross sf; and approximately 15 acres of open space. The project also includes infrastructure, transportation, and public realm improvements.	Mixed-use development plan	Approved May 2021; construction anticipated for 2022 through 2028	Air quality, cultural resources, land use, noise, population, and housing	Mostly within Diridon Station Area Plan area (including APNs 259-28-031, 259-28-041, 259-28-044, a portion of 259-28-043, 261-34-002 through -006, 261-34-011, 261-34-023, 261-35-002, and 261-35-030)

sf = square foot
EIR = environmental impact report
NOP = Notice of Preparation

Table 3 City of Morgan Hill Nontransportation Plans and Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
1	Morgan Hill 2035 General Plan[41]	Plan update concerning land use, neighborhood form, housing, economic development, healthy communities, transportation, natural resources, and safety and security. An added emphasis on policies and actions that will help meet City climate change goals and regional growth management goals.	Land use plan	Adopted July 27, 2016	Agriculture; air quality; noise; transportation and traffic	City of Morgan Hill
2	Morgan Hill Downtown Specific Plan[42]	Plan outlines increased residential density, development standards for new commercial spaces, coordination of a parking strategy with realistic growth projects, examination of circulation patterns, and creating a plan for public investment.	Land use plan	Adopted November 4, 2009	Land use	Approximately 110 acres in downtown Morgan Hill, centered on Monterey Road and bounded by Main Avenue, Butterfield Boulevard, Dunne Avenue, and Del Monte Avenue

37 City of San Jose. 2016. *641 North Capitol Avenue Mixed-Use Project Initial Study/Draft Mitigated Negative Declaration*. Available: http://www.sanjoseca.gov/DocumentCenter/View/61324. Accessed February 13, 2018.
38 City of San Jose. 2009. *Newby Island Sanitary Landfill and Recyclery Rezoning Project Draft Environmental Impact Report.* Available: http://www.sanjoseca.gov/DocumentCenter/View/2172. Accessed: February 13, 2018.
39 City of San Jose. 2020. Key Economic Projects. Available: https://www.sanjoseca.gov/home/showdocument?id=52147. Accessed: March 5, 2020.
40 City of San Jose. 2020. *Downtown West Mixed-Use Plan Draft Environmental Impact Report*. Available: https://www.sanjoseca.gov/Home/ShowDocument?id=65361. Accessed: November 5, 2020.
41 City of Morgan Hill. 2016. *Morgan Hill 2035 General Plan*. Available: http://morganhill2035.org/wp-content/uploads/2016/08/MorganHill2035_GeneralPlan_Adopted2.pdf. Accessed: August 23, 2016.
42 City of Morgan Hill. 2009. *Morgan Hill Downtown Specific Plan*. Available: https://www.morgan-hill.ca.gov/DocumentCenter/View/3195. Accessed February 12, 2018.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
3	Belle Noci[43]	Proposed 8-unit, 3-story affordable housing complex with a parking garage on the first level	Residential development project	Complete	None	Southwest corner of Monterey Road and Ciolino Avenue
4	Butterfield – Keenan[44]	Development of up to 409 residential units on a 19-acre site	Residential development project	Final EIR published November 2014	Transportation	Three parcels (APNs 726-25-061, -078, and -079) on approximately 19.5 acres generally located southwest of the intersection of Butterfield Boulevard and Jarvis Drive
5	Cochrane – Borello[45]	Development of a gated residential community consisting of 244 single-family homes, up to 180 secondary units, a private recreation center, private streets, approximately 23 acres of private open space, private sparks, and surrounding landscaping. The project includes the realignment of the Peet Road intersection with Half Road which will include portions of 4 parcels on the south side of Peet Road.	Residential development project	Complete	Noise	East of Peet Road, north of Half Road, east of Cochrane Road, adjacent to the south side of the Santa Clara Valley Water District pump facility
6	Cochrane – Standard Pacific[46]	Development of a 135-unit single-family residential subdivision on a 40-acre site, with a 2.8-acre common open space area that includes a biotreatment and infiltration area and a hydromodification basin, and six smaller (0.06 to 1.2 acres) common open space areas	Residential development project	Complete	None	1365 Cochrane Road and 1465 Cochrane Road, on the west side of Cochrane Road adjacent to the Cochrane Road and Mission View Drive intersection
7	Condit – Evergreen[47]	Development of up to 381 residential units on an 18-acre site	Residential development project	Under construction	Transportation	Southwest of the Condit Road and San Pedro Avenue intersection (APNs 817-12-006 and 817-12-009)
8	Dunne – EAH (Belle Allori)[48]	Demolition of existing structures and construction of a three-story, 14-unit, multi-family, affordable apartment complex with a private community space and approximately 1,200 sf of commercial space on a 0.584-acre site	Mixed-use development project	Approved Improvement Agreement November, 2016	None	40 East Dunne Avenue
9	Diamond Creek Villas[49]	Demolition of existing structures and creation of two commercial parcels (0.9 and 1.3 acres) to accommodate commercial buildings of about 16,000 and 11,000 square feet, up to 101 condominium units, six townhome buildings with a total of 29 units, a daycare facility, and private streets, parking, landscaping, and private recreational use. Residential development would occupy about 6.5 acres and the streets would occupy slightly more than one acre on a 9.75-acre site.	Residential development project	Complete	None	Southwestern side of Monterey Road about 800 feet northwest of Watsonville Road
10	Belle Salici[50]	Development of 19 affordable, below market rate, multi-family apartments, as well as a 2,100-square-foot (sf) private community space, and an approximately 1,000-sf office / commercial space	Residential development project	Complete	None	16170 and 16180 Monterey Road
11	Main – Glenrock[51]	Subdivision and development of 12 lots and improvements to an existing open space area on an approximately 3.64-acre site	Residential development project	Approved Improvement Agreement December, 2015	None	APN 726-20-053, bordered by single-family residences to the north and south, East Main Avenue to the east and Calle Siena to the west

[43] City of Morgan Hill. 2015. *Belle Noci Project: Addendum to the Adopted Joint Initial Study / Environmental Assessment for the Ciolino General Plan Amendment and Rezone* Project. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/17329. Accessed: February 14, 2017.
[44] City of Morgan Hill. 2014. *Public Review Draft Environmental Impact Report, Butterfield - Keenan General Plan Amendment Project*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/13907. Accessed: February 14, 2017.
[45] City of Morgan Hill. 2013. *Final Environmental Impact Report, Cochrane-Borello Residential Development Project*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/6564. Accessed: May 18, 2016.
[46] City of Morgan Hill. 2015. *Mitigated Negative Declaration, Cochrane Standard Pacific Project*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/16697. Accessed: February 14, 2017.
[47] City of Morgan Hill. 2014. *Draft Environmental Impact Report, Condit-Evergreen General Plan Amendment and Rezoning Project.* Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/13892. Accessed: February 14, 2017.
[48] City of Morgan Hill. 2015. *Initial Study, Dunne – EAH (Belle Allori)*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/17303. Accessed: February 14, 2017.
[49] City of Morgan Hill. 2012. *Diamond Creek Villas Residential Project Mitigated Negative Declaration*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/6380. Accessed: February 14, 2017.
[50] City of Morgan Hill. 2015. *Initial Study, Monterey – EAH (Belle Salici)*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/17297. Accessed: February 14, 2017.
[51] City of Morgan Hill. 2013. *Main – Glenrock Residential Project Mitigated Negative Declaration*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/11662. Accessed: February 14, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
12	West Dunne – Gera[52]	Demolition of two dwellings and various outbuildings, including three garages and a barn, subdivision of the project site into 19 lots to accommodate the development of 14 residential lots with 8 rowhouse units, one duet unit, three new single-family residences, and preservation of one existing single-family residence, and creation of one lot for open space and flood hazard buffer area	Residential development project	Under construction	None	Four parcels (APNs 767-08-035 through 767-08-038) west of West Dunne Avenue and Monterey Road intersection
13	Monterey – Central/ECA[53]	Development of a 0.9-acre site with 8 2-story residential buildings and 6 3-story residential buildings consisting of a total of 14 single-family attached units	Residential development project	Approved Development Agreement July, 2016	None	APN 726-23-020, east of the intersection of East Central Avenue and Monterey Road, bordered on the east by McLaughlin Avenue
14	Monterey – Young[54]	Development of 37 attached residences, common space amenities/open space area, and related improvements on approximately 6 acres of a 9.35-acre site. The remaining 3.4 acres would remain undeveloped with no future use proposed.	Residential development project	Approved Development Agreement May, 2016	None	15335 Monterey Road, west of Monterey Road and north of Watsonville Road
15	Laurel – DeRose[55]	Development of 50 multi-family dwelling units in two-story townhouse style buildings and 15 two-story single-family detached units on a 6.94-acre site	Residential development project	Approved Development Agreement July, 2016	None	APN 726-01-008, on the north side of Laurel Road, east of Walnut Grove Drive
16	Walnut Grove/Diana Subdivision[56]	Development of up to 20 residential units on a 4.7-acre site	Residential development project	Approved Development Agreement, December 2016	None	APNs 726-07-021, -023, -024, and -089 at southeast of the intersection of Diana Avenue and Walnut Grove Drive, immediately west of US 101

APN = Assessor's Parcel Number
EIR = environmental impact report

Table 4 City of Gilroy Nontransportation Plans and Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
1	Gilroy 2002/2020 General Plan[57]	Plan update that provides a long-range vision and direction focused on community design and development, housing, transportation, public facilities, and community resources and hazards.	Land use plan	Approved June, 2002	Agricultural lands; air quality; noise; energy	City of Gilroy
2	Gilroy Trails Master Plan[58]	Provides a long-range blueprint for a comprehensive citywide trails system	Land use plan	Approved May 2, 2005	None	City of Gilroy
3	City of Gilroy Parks and Recreation System Master Plan[59]	Plan update to population projections, calculation of park preservation standards, facility inventories, and recommendations on the number of community centers. Implementation plans have also been added.	Land use plan	Approved June 13, 2002; updated September, 2004	None	City of Gilroy
4	Hecker Pass Specific Plan[60]	Specific plan for the 423-acre Hecker Pass Special Use District, including 521 residential units on 163 acres, 98 acres of parks and recreational facilities, 47 acres of open space, and 115 acres of agriculture and agriculture-related uses	Land use plan	Approved January 18, 2005; Amended August 3, 2009 and May 18, 2015	Air quality; cultural resources	Within the City of Gilroy near the western city limit. West of Santa Teresa Blvd, north and south of Hwy 152.

[52] City of Morgan Hill. 2016. *Draft Mitigated Negative Declaration, West Dunne – Gera Residential Project*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/17455. Accessed: February 14, 2017.
[53] City of Morgan Hill. 2016. *Initial Study/Mitigated Negative Declaration, Monterey – Central/ECA*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/17491. Accessed: February 14, 2017.
[54] City of Morgan Hill. 2016. *Initial Study, Monterey Road – Young*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/17607. Accessed: February 14, 2017.
[55] City of Morgan Hill. 2016. *Laurel – DeRose Residential Project Mitigated Negative Declaration Addendum*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/17724. Accessed: February 14, 2017.
[56] City of Morgan Hill. 2016. *Initial Study, Walnut Grove/Diana Subdivision*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/19721. Accessed: February 14, 2017.
[57] City of Gilroy. 2002. *Gilroy 2002-2020 General Plan*. Available: http://www.cityofgilroy.org/274/2020-General-Plan. Accessed: May 9, 2016.
[58] City of Gilroy. 2005. *City of Gilroy Trails Master Plan*. Available: http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5260. Accessed: May 18, 2016.
[59] City of Gilroy. 2002. *City of Gilroy Parks and Recreation System Master Plan*. Updated September, 2004. Available: http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5253. Accessed: May 18, 2016.
[60] City of Gilroy. 2005. *Hecker Pass Specific Plan*. Amended August, 2009 and May, 2015. Available: http://www.cityofgilroy.org/277/Hecker-Pass-Specific-Plan. Accessed: May 9, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
5	Glen Loma Ranch Specific Plan[61]	Specific plan for an approximately 359-acre site with up to 1,643 residential units, 145 acres of parks and open space, and a trail system	Land use plan	Approved 2005	Aesthetic/Visual, Agricultural Land, Air Quality, Archaeologic-Historic, Land use, Noise, Public Services, Recreation/Parks, Traffic/Circulation, Vegetation, Wetland/Riparian, Wildlife	The site is within the city of Gilroy, bounded by Uvas Creek to the north, Santa Teresa Boulevard to the west and south, and existing development to the east
6	Downtown Gilroy Specific Plan[62]	Specific plan for approximately 160 acres in central Gilroy, including up to 1,576 multi-family dwelling units and approximately 994,495 square feet of nonresidential structures potentially including retail, restaurants, entertainment, lodging, offices, commercial, research and development, and civic uses.	Land use plan	Approved November 21, 2005	Air quality; cultural resources; hazards; noise; traffic	The site extends from the Leavesley Road/Welburn Avenue intersection in the north to Luchessa Avenue in the south. The eastern boundary is generally the alley on the east side of Railroad Street, and the western boundary is the alley between Eigleberry and Church streets, with a portion extending westward to Dowdy Street between Sixth Street and Seventh Street.
7	Kroeger Subdivision[63]	Proposed subdivision on 2.67 acres for the creation and development of six single-family residential lots that vary in size from 7,900 to 11,050 square feet, related utilities infrastructure, and private streets connecting to existing Eagle Ridge Court. The proposed project also includes the creation of three open space parcels; a 0.97-acre parcel that maintains an existing 100-foot scenic easement, within which a new detention basin is proposed, a 0.02-acre parcel adjacent to the new street access, and a 0.12-acre parcel for a second detention basin	Residential development project	Approved August 2016	Aesthetics; biological resources; cultural resources; geology and soils	South of Santa Teresa Boulevard within the Eagle Ridge Planned Unit Development, approximately 200 feet south of the intersection of Ballybunion Drive and Santa Teresa Boulevard.
8	Wren Avenue Gilroy Unified School District Residential Project[64]	Subdivision of a 10.12-acre parcel into 70 single-family residential lots, 1.2 acres of private open space, and 2.71 acres of private streets and drives, with landscape walking paths and open spaces for residents	Residential development project	Approved March 21, 2016	Air quality; cultural resources; noise; transportation and traffic	8450 Wren Avenue, Gilroy
9	Santa Teresa Boulevard Townhouse Project[65]	Proposed 205 dwelling unit multi-family residential development with 472 onsite parking spaces and approximately 3 acres of open space	Residential development project	Under construction	Air quality; biological resources; hazards; hydrology and water quality; noise; transportation/traffic	Three parcels totaling 10.83 acres on the southeast corner of the Santa Teresa Boulevard and First Street (Hecker Pass Highway) intersection, Gilroy
10	Downtown Gilroy Station Area Plan[66]	Update to the existing 2005 Downtown Specific Plan and a continuation of the Gilroy High Speed Train visioning process, the plan will guide private development and public improvements in Downtown over the next 25 years with a focus on the area near the future HST station and railroad tracks.	Land Use Plan	Draft Alternatives Analysis Report June, 2016	N/A	Includes area covered in 2005 Downtown Specific Plan plus adjacent areas including the industrial areas located south of Old Gilroy Street and east of the rail line; and west of Swanston Lane and south of Leavesley Road, adjacent to South Valley Middle School.

[61] City of Gilroy. 2005. *Glen Loma Ranch Specific Plan*. Revised May, 2014. Available: http://www.cityofgilroy.org/DocumentCenter/View/1345. Accessed: May 18, 2016.
[62] City of Gilroy. 2005. *Downtown Gilroy Specific Plan*. Available: http://www.cityofgilroy.org/271/Downtown-Specific-Plan. Accessed: May 18, 2016.
[63] City of Gilroy. 2016. *Mitigated Negative Declaration, Kroeger Subdivision*. Available: http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5888. Accessed: February 13, 2017.
[64] City of Gilroy. 2016. *Initial Study, Wren Avenue Gilroy Unified School District Residential Project (Former Las Animas School Site).* Available: http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5753. Accessed: February 13, 2017.
[65] City of Gilroy. 2015. *Final Initial Study and Mitigated Negative Declaration, Santa Teresa Boulevard Townhouse Project*. Available: http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5657. Accessed: February 13, 2017.
[66] City of Gilroy. 2016. *Downtown Gilroy Station Area Plan Alternatives Analysis Report, Public Review Draft*. Available: http://www.gilroyhighspeedtrain.org/wp-content/uploads/2016/06/DTGilroy_AltsAnalysis_PublicReviewDraft_061516.pdf. Accessed: February 15, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
11	Monterey Gateway Senior Apartments[67]	Construction of a four-story apartment complex with 75 affordable senior units on a 1.86-acre site in the downtown district, including 60 one-bedroom units and 15 two-bedroom units, with 89 percent of the units low income and eleven percent very low income	Residential development project	Approved November, 2015	N/A	East side of Monterey Road across from Ervin Court
12	North Gilroy Neighborhood Districts Urban Service Area Amendment[68]	Amendment to the City's USA boundary to include an approximately 721-acre project site, plus a conceptual development plan with a maximum of about 4,000 residential units, about 40 acres of commercial land, two school sites, and community and neighborhood parks. No development proposed as part of the amendment.	Planning area amendment, residential and commercial development	Approved 2015; status affected by LAFCO action and voter approval of Measure H	Agricultural resources; noise; transportation and traffic	The project site is bounded (generally) by Monterey Road on the east, the existing city limits on the south, Santa Teresa Boulevard on the west, and Fitzgerald Avenue on the north. Several areas within these general boundaries are excluded from the project site.
13	South County Regional Wastewater Authority Maintenance Building[69]	Construction of a new maintenance building, loading dock and vehicle wash station at the wastewater treatment plant.	Public facility development	Initial Study/Proposed Negative Declaration July 2016	Agricultural land	Unincorporated Santa Clara County, east of U.S. Highway 101 and south of State Route 152/Pacheco Pass Highway, at 1500 Southside Drive, Gilroy
14	Hampton Inn and Suites[70]	Development of a 4-story, 65,120 sf 100-room hotel with an outdoor pool and an adjacent property (5955 Travel Park Circle) which contains a vacant restaurant. Parking for the new hotel will be shared between the two properties and will contain 128 spaces.	Hotel development	Complete	Biological resources; cultural resources; geology and soils; noise; transportation/traffic	East of U.S. Highway 101 and southeast of the Monterey Road and Travel Park Circle Intersection in south Gilroy

CUP = conditional use permit
EIR = environmental impact report
USA = urban service area

Table 5 San Benito County Nontransportation Plans and Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
1	San Benito County 2035 General Plan[71]	Plan update that started in 2009. Plan elements, in order of community importance: land use, housing, agriculture, economic growth, transportation and infrastructure, natural resource protection, health and sustainability, and regional coordination.	Land Use Plan	Adopted July 21, 2015	Aesthetics; agricultural lands; air quality; biological resources; climate change; hydrology; noise; transportation	San Benito County
2	Comprehensive Land Use Plan, Frazier Lake Airpark[72]	This Comprehensive Land Use Plan seeks to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities adversely affect navigable airspace. The aviation activity forecasts for the Airport were updated to reflect the existing (1998) aviation activity and provide at least a 20-year forecast of activity. The updated aviation activity forecasts formed the basis for preparation of 2020 aircraft noise contours. The Airport Layout Plan and updated aviation activity forecasts and 2020 aircraft noise contours formed the basis for preparation of this CLUP.	Land Use Plan	Adopted November 15, 2001	Noise and vibration	San Benito County

[67] City of Gilroy. 2015. *RDO HE 14- 02 (# 14100052), Gateway Apartments RDO Housing Exemption Located on the east side of Monterey Road across from Erwin* [sic] *Court*. Available: http://gilroy.granicus.com/MetaViewer.php?view_id=19&clip_id=1383&meta_id=124290. Accessed: February 15, 2017.
[68] City of Gilroy. 2015. *Final Environmental Impact Report, North Gilroy Neighborhood Districts Urban Service Area Amendment*. Available: http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5669. Accessed: February 13, 2017.
[69] City of Gilroy. 2016. *South County Regional Wastewater Authority Maintenance Building Initial Study/Proposed Negative Declaration*. Available: http://www.ci.gilroy.ca.us/DocumentCenter/View/6032. Accessed: February 13, 2017.
[70] City of Gilroy. 2016. *Proposed Mitigated Negative Declaration, Hampton Inn & Suites*. Available: http://www.ci.gilroy.ca.us/DocumentCenter/Home/View/5746. Accessed: February 13, 2017.
[71] San Benito County. 2015. *San Benito County 2035 General Plan*. Available: http://cosb.us/wp-content/uploads/Adopted-2035-GPU.pdf. Accessed: May 16, 2016.
[72] San Benito County Airport Land Use Commission. 2001. *Comprehensive Land Use Plan, Frazier Lake Airpark*. Available: http://www.sanbenitocog.org/clup/FLA_CLUP.pdf. Accessed: May 16, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
3	Hollister Municipal Airport Land Use Compatibility Plan[73]	Plan is to promote compatibility between Hollister Municipal Airport and the land uses surrounding it to the extent that these areas have not already been devoted to incompatible uses. The plan accomplishes this function through establishment of a set of compatibility criteria applicable to new development around the airport.	Land Use Plan	Adopted June 21, 2012	N/A	San Benito County
4	Panoche Valley Solar Farm Project[74]	Proposed 247-Megawatt (MW) solar energy generation facility on 2,506 acres. The proposed project would deliver electricity to the regional transmission system by interconnecting to the PG&E Moss-Panoche/Coburn-Panoche 230 kilovolt (kV) transmission line on site.	Solar Project	Complete	Aesthetics; noise	2 miles north of the intersection of Panoche Road and Little Panoche Road, and approximately 15 miles west of Interstate 5 in southeastern San Benito County
5	San Benito River Parkway and Regional Park Master Plan[75]	Master Plan for a 20-mile River Parkway along the San Benito River and Tres Pinos Creek, a focused plan for Parkway Reach Three along the San Benito River, and a park master plan for a new regional park adjacent to San Benito High School in the city of Hollister	Master Plan and park project	Draft Master Plan 2013	N/A	20-mile corridor along the northern San Benito River and a segment of Tres Pinos Creek in San Benito County
6	Del Webb at San Juan Oaks Specific Plan[76]	Proposed age-restricted retirement development including 1,084 homes, up to 65,000 sf of neighborhood commercial, a 200-room resort hotel, a 4-acre assisted living/skilled nursing/memory care facility with up to 100 beds, 6.6 acres of neighborhood parks, 16.8-acre community park, 114 acres of open space, 41 acres of agricultural preserve and a 1,243-acre permanent wildlife habitat preserve	Land Use Plan	Project on hold after developer canceled July, 2016	Aesthetics; biological resources; greenhouse gases; noise; transportation and circulation	3825 Union Road, approximately 3 miles southwest of the city of Hollister, 3.5 miles southeast of the city of San Juan Bautista and 1 mile south of SR 156 in San Benito County
7	Sunnyside Estates Project[77]	Development of an approximately 44.4-acre site with 200 single-family residential units, as well as on- and off-site improvements to serve the residential uses	Residential Development Project	Complete	Aesthetics; agricultural resources; greenhouse gases; noise; transportation and circulation	Approximately 0.5 mile south of the city of Hollister (outside the city's sphere of influence), 0.5 mile west of State Route (SR) 25, and 2.25 miles south of SR 156 in San Benito County

CUP = conditional use permit
PG&E = Pacific Gas and Electric Company

Table 6 Merced County Nontransportation Plans and Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
1	Liberty Packing Company[78]	Expansion of existing tomato processing facility including expanding several buildings, expanding cooling and settling ponds, 5 small additional buildings, extension of rail spur, expansion of outdoor product storage, and expansion of truck and trailer storage.	Agricultural Facility	Complete	Agricultural Lands, Air Quality, Water Quality, Noise and Vibration, Transportation	Merced County

[73] San Benito County Airport Land Use Commission. 2012. *Hollister Municipal Airport Land Use Compatibility Plan*. Available: http://www.sanbenitocog.org/pdf/ADOPTED%20%20ALUCP%20-June%202012.pdf. Accessed: May 16, 2016.

[74] San Benito County. 2015. *Panoche Valley Solar Project Final Supplemental Environmental Impact Report.* Available: http://www.cosb.us/county-departments/resource-management-agency/building-planning/planning-land-use-division/panoche-valley-solar-project-final-supplemental-environmental-impact-report/#.WKIdOaWD42w. Accessed: February 13, 2017.

[75] San Benito County. 2013. *Draft San Benito River Parkway Master Plan*. Available: http://cosb.us/wp-content/uploads/SB-Parkway-MP-6-4-13.pdf. Accessed: February 13, 2017.

[76] San Benito County. 2015. *San Benito County Del Webb at San Juan Oaks Specific Plan, Draft Subsequent Environmental Impact Report*. Available: http://www.cosb.us/county-departments/resource-management-agency/building-planning/planning-land-use-division/san-benito-county-del-webb-at-san-juan-oaks-specific-plan/#.WKIjXaWD42w. Accessed: February 13, 2017.

[77] San Benito County. 2015. *Draft Environmental Impact Report, Sunnyside Estates Project*. Available: http://cosb.us/wp-content/uploads/San-Benito-Sunnyside-Estates-Project-DEIR.pdf. Accessed: February 13, 2017.

[78] Merced County. 2014. *Draft Initial Study/Mitigated Negative Declaration, Liberty Packing Company*. Available: http://web2.co.merced.ca.us/pdfs/env_docs/initial_studies/morningstar_publicdraft_is_mnd_web.pdf. Accessed: February 14, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
2	Long-Term North to South Water Transfer Program[79]	Water management program for water transfers that would be purchased by CVP contractors in areas south of the Delta or in the San Francisco Bay Area and conveyed through the Delta using CVP or SWP pumps, or local facilities.	Water Management Program	NOD March, 2016	Hydrology and Water Resources	Colusa, Butte, Glenn, Merced, Placer, Sacramento, Shasta, Solano, Sutter, Tehama, Yolo, Or Yuba counties. The transfer buyers could be in Alameda, Contra Costa, Fresno, Kings, Merced, San Benito, San Joaquin, Santa Clara, or Stanislaus countries.
3	25-Year Water Transfer Program for the San Joaquin River Exchange Contractors Water Authority (2014–2038)[80]	Water Transfer Agreement with the San Luis & Delta-Mendota Water Authority makes available up to 80,000 acre feet of water conserved through tailwater recapture or other conservation measures for transfer for use by certain members of the San Luis & Delta-Mendota Water Authority for irrigation and M&I purposes. The M&I use is capped at 5,000 acre feet. Transfers are on a year by year basis available during non-critical years when the Exchange Contractors receive full Central Valley Project supplies and are subject to annual approvals. The quantity transferred for irrigation or M&I use cannot exceed full CVP contract supply to the recipient Water Authority members.	Water Management Program	NOD February 15, 2016	Hydrology and Water Resources	Merced County
4	George Reed, Inc. Merced Quarry Project and Reclamation Plan[81]	Modification of the current CUP to allow for mining below grade level, into the perched-water zone (to a depth of approximately 25 feet below grade}, to operate an asphalt batch plant and a PCC batch plant, and to change the current reclamation plan's end use from agricultural to open space with wildlife and natural-occurring vegetation. The proposed project would also amend the County General Plan land use designation of an approximately 70-acre portion of the property from Snelling RRC No. 1, Residential to Agricultural and to rezone the property from Agricultural Residential (A-R) to General Agricultural (A-1).	Mining Project	NOP December, 2009	Aesthetics, Agriculture Resources, Air Quality, Biological Resources, Hazards & Hazardous Materials, Hydrology/Water Quality, Noise, Transportation/Traffic, Greenhouse Gas Emissions	Approximately 2 miles west of Snelling and 15 miles north of Merced
5	Highway 99 Truck Stop Project at Harvey Pettit Road[82]	General Plan Amendment General Plan to establish a Highway Interchange Center (HIC) at the project site by changing the land use designation from Agricultural to Highway Interchange Center Commercial. Zone Change No. ZC11-001 would change the zoning from A-1 (General Agricultural) to H-I-C (Highway Interchange Center). Conditional Use Permit No. CUP11-011 would bring the existing uses on site into conformance with the Zoning Code, and permit the construction of a one-story tire repair shop and the re-opening of the existing restaurant. With the establishment of the HIC General Plan land use designation and acquisition of proper zoning and permits, the existing truck stop facilities would be in conformance with Merced County zoning and land use requirements. The H-I-C boundary would match the boundary of the existing truck stop and would not include any productive agricultural land.	Commercial Development Project	IS/MND December, 2012	None	Approximately four miles northwest of the City of Chowchilla and five miles southwest of the community of Le Grand

[79] U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region and San Luis and Delta-Mendota Water Authority. 2014. *Long-Term Water Transfers Environmental Impact Statement/Environmental Impact Report*. Available: https://www.usbr.gov/mp/cvp/long-term.html. Accessed: February 15, 2017.

[80] U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region. 2013. *Water Transfer Program for the San Joaquin River Exchange Contractors Water Authority, 2014–2038, Final Environmental Impact Statement / Environmental Impact Report*. Available: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=12137. Accessed: February 15, 2017.

[81] Merced County. 2009. *Notice of Preparation of an Environmental Impact Report for the George Reed, Inc. Merced Quarry Project and Reclamation Plan*. Available: http://web2.co.merced.ca.us/pdfs/env_docs/eir/Reed_NOP.pdf. Accessed: February 14, 2017.

[82] Merced County. 2012. *Initial Study for the Highway 99 Truck Stop Project at Harvey Pettit Road*. Available: http://web2.co.merced.ca.us/pdfs/env_docs/initial_studies/Harvey_Pettit_IS-MND_121112F.pdf. Accessed: February 14, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
6	Buena Vista Subdivision[83]	Development of a 45.7-acre residential subdivision consisting of 211 single-family residential lots ranging from 5,000 to 6,000 square feet in size, a 2.21-acre park, and a 14.3-acre business park.	Residential Development Project	Approved June, 2015	Aesthetics; Agricultural Resources; Global Climate Change; Hydrology and Water Quality; Noise; Population and Housing; Public Services, Utilities, and Recreation	The proposed project is located to the east of the City of Merced in southeastern Merced County. The proposed project site is bounded by Plainsburg Road, Childs Avenue, the Burlington Northern Santa Fe (Railroad line to the north, and agricultural lands on the west.
7	Yosemite Ranch Estates[84]	Construction of approximately 287 new single-family homes in southeastern Merced County	Residential Development Project	Draft EIR July, 2008	Aesthetics, agriculture, biological resources, hydrology and water quality, land use, noise, population and housing,	Approximately 8 miles east of SR 99 and 15 miles southeast of the city of Merced, bounded by McKee Street on the west, Fresno Road on the east, existing single-family development on the north, and agricultural lands on the south
8	Merced County Airport Land Use Compatibility Plan[85]	Land use plan to promote compatibility between each airport and the land uses which surround them to the extent that these areas have not already been devoted to incompatible uses. Contains individual compatibility plans for Castle Airport, Gustine Municipal Airport, Los Banos Municipal Airport, Merced Regional Airport, and Turlock Municipal Airport.	Land Use Plan	Adopted June, 2012	N/A	Castle Airport, Gustine Municipal Airport, Los Banos Municipal Airport, Merced Regional Airport, and Turlock Municipal Airport in Merced County
9	Planada Community Plan Update[86]	Long-range land use strategy for development within the unincorporated community of Planada. The Update to the 2003 Planada Community Plan will revise several internal features of the Plan rather than change the Community growth boundaries or propose additional development.	Land Use Plan	Draft EIR December, 2016	Not applicable	Approximately 4 miles east of the City of Merced
10	Redevelopment Plan for the Castle Airport Aviation and Development Center[87]	The Redevelopment Plan satisfy local community needs by replacing previously lost jobs and revenue with new economic opportunities.	Land Use Plan	Approved November, 2011	Air quality, biological resources, hydrology and water quality, land use, noise, population and housing, transportation	Approximately 7 miles northwest of the City of Merced and approximately 66 miles northwest of the City of Fresno in the northeastern San Joaquin Valley
11	San Luis Reservoir State Recreation Area Resource Management Plan / General Plan[88]	The Resource Management Plan and General Plan (RMP/GP) addresses resource management alternatives for the Plan Area as appropriate for water quality and for natural, cultural, and recreational resource management opportunities.	Resource Management/Land Use Plan	ROD November, 2013	Water Quality, Biological Resources, Water Quality and Supply, Recreation, Cultural Resources	Includes surfaces of San Luis Reservoir, O'Neill Forebay, Los Banos Creek Reservoir, and adjacent recreation lands.
12	George Simmons Minor Subdivision and Don Chapin Company Concrete Batch Plant Project[89]	Minor subdivision (26.9 acres) to be sold for future industrial and commercial development. Construct a batch plant, bulk cement storage silos, portable cement silo, storage and fuel tanks, casting area, pump house, truck wash area, related collection facilities, and parking area	Industrial Project	Final EIS December, 2014	Aesthetics, Agricultural Land, Air Quality, Archeo-historic, Biological Resources, Drainage/Absorption, Noise, Septic System, Soil, Traffic, Vegetation, Water Quality, Water Supply, Wetland/Riparian, Land Use, Cumulative Effects	Volta Road and Ingomar Grade in Merced County

[83] Merced County. 2009. Draft Environmental Impact Report, Buena Vista I Subdivision. Available: http://web2.co.merced.ca.us/pdfs/commissionarchive/2015/06-24/draft_eir_buena_vista_i_subdivision_oct_2009.pdf. Accessed: February 15, 2017.

[84] Merced County. 2008. *Draft Environmental Impact Report, Yosemite Ranch Estates*. Available: https://www.co.merced.ca.us/DocumentCenter/Home/View/1220. Accessed: February 15, 2017.

[85] Merced County. 2012. *Merced County Airport Land Use Compatibility Plan*. Available: http://web2.co.merced.ca.us/pdfs/planning/aluc/merced.pdf. Accessed: February 15, 2017.

[86] Merced County. 2016. *Draft Environmental Impact Report for the Planada Community Plan Update*. Available: http://web2.co.merced.ca.us/pdfs/env_docs/eir/Planada-Draft-EIR-Dec-2016.pdf. Accessed: February 15, 2017.

[87] Merced County. 2011. *CEQA Findings of Fact and Statement of Overriding Considerations of Merced County for the Castle Airport Master Plan*. Available: http://mymercedcounty.com/pdfs/env_docs/castle/CAED/castle_master_plan_eir_findings_final_11_18_11.pdf. Accessed: February 14, 2017.

[88] Merced County. 2014. *Record of Decision, San Luis Reservoir State Recreation Area Resource Management Plan / General Plan*. Available: http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=17263 . Accessed: February 13, 2017.

[89] Merced County. 2014. *Final Environmental Impact Report for Minor Subdivision No. MS07-027 and Administrative Permit No. AA08-033, George Simmons Minor Subdivision and Don Chapin Company Concrete Batch Plant Project*. Available: http://web2.co.merced.ca.us/pdfs/env_docs/simmonschapinproject/16040051_Chapin_Concrete_DEIR_Part1.pdf. Accessed: February 14, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
13	Fox Hills Community Specific Plan Update[90]	Specific Plan update for development of 3,460 residential units, including 2,098 deed-restricted units for active adult use.	Residential Project	Final EIR 2006; some infrastructure completed; project on hold	Aesthetics, agriculture, biological resources, hydrology and water quality, land use, noise, population and housing.	Interstate 5 forms most of the western boundary; a parcel of about 88 acres is located on the west side of Interstate 5. The San Luis Canal forms the eastern boundary, Pioneer Road forms the northern boundary, and a parcel line is the southern boundary.
14	Sunset Hills Development Tentative Tract Map[91]	General Plan Amendment and Zone Change to redesignate seven (7) parcels on approximately 1.2 acres from Professional Office to Medium Density Residential and to subdivide the project site into eleven (11) residential lots, ranging in size from 4,600 square feet to 5,562 square feet. The proposed lots will be subdivided and developed in accordance with Title 9, Chapter 3, Article 7, of the Los Banos Zoning Ordinance.	Residential Project	Initial Study/Mitigated Negative Declaration February 10, 2017	Aesthetics, agriculture, biological resources, hydrology and water quality, land use, noise, population and housing.	The Project site is located within the City of Los Banos, County of Merced on an approximate 1.2-acre site on the east side of Delaware Avenue between Pine Street and Madrone Street.
15	San Luis Estates[92]	Tentative Tract Map for an approximately 5.5-acre parcel into twenty-five (25) single-family residential lots, ranging from 6,000 square feet to 9,519 square feet.	Residential Project	Complete	Aesthetics, agriculture, biological resources, hydrology and water quality, land use, noise, population and housing.	The Project site is located within the City of Los Banos, County of Merced on an approximate 5.5-acre site on the south side of San Luis Street and approximately 850 feet east of Mercy Springs Road (SR 165).
16	The Villages of Laguna San Luis Community Plan[93]	6,200-acre Specific Urban Development Plan (SUDP)area including 15,895 residential units, 1.4 million square feet of commercial, 2.9 million square feet of office, three schools, fire station, and wastewater treatment plant.	Mixed-Use Plan	EIR approved	Aesthetics, agriculture, biological resources, hydrology and water quality, land use, noise, population and housing,	West of Interstate 5 (I-5) along State Route 152 (SR-152) and State Route 33 (SR-33) in western Merced County. The Villages CP is located adjacent to and south of the Santa Nella CP; adjacent and northwest of the Fox Hill CSP and approximately eight miles west of the City of Los Banos
17	San Luis Reservoir Low Point Improvement Project[94]	The objective of the SLLPIP is to optimize the water supply benefit of San Luis Reservoir while reducing additional risks to water users by: Avoiding supply interruptions when water is needed by increasing the certainty of meeting the requested delivery schedule throughout the year to south-of-Delta contractors dependent on San Luis Reservoir, increasing the reliability and quantity of yearly allocations to south-of-Delta contractors dependent on San Luis Reservoir, and announcing higher allocations earlier in the season to south-of Delta contractors dependent on San Luis Reservoir without sacrificing accuracy of the allocation forecasts.	Water supply project	Draft Feasibility Report published April 2019. Construction expected to begin in 2024 and be completed in 2029.	Hydrology and water resources, biological resources	San Luis Reservoir in Merced County
18	San Luis Reservoir Seismic Retrofit: B.F. Sisk Dam[95]	Structural and operational modifications to B.F. Sisk Dam that would prevent destabilization of the dam embankment, reduce safety concern, and maintain water supply deliveries to state and federal water contractors during a seismic event.	Water supply project	Construction anticipated to begin summer 2021	Hydrology and water resources, geology, soils, and seismicity, traffic and transportation, air quality and GCC, biological resources, noise	B.F. Sisk Dam is located on the west side of California's Central Valley between Los Banos and Gilroy.

[90] Merced County. 2006. *Fox Hills Community Specific Plan.* Available: https://www.co.merced.ca.us/1720/Fox-Hills. Accessed May 30, 2017.
[91] Los Banos. 2017. *Sunset Hills Development Initial Study/Mitigated Negative Declaration.* Available: http://losbanos.org/wp-content/uploads/2013/09/sunset_hills_dev_initial_study.pdf. Accessed May 25, 2017.
[92] Los Banos. 2016. *San Luis Estates Initial Study/Mitigated Negative Declaration.* Available: http://losbanos.org/wp-content/uploads/2013/09/san_luis_estates_initial_study.pdf. Accessed May 25, 2017.
[93] Merced County. 2008. *The Villages of Laguna San Luis Community Plan.* Available: https://www.co.merced.ca.us/pdfs/planning/cplan/completed/laguna/laguna_san_luis_community_plan.pdf. Accessed May 26, 2017.
[94] U.S Department of the Interior, Bureau of Reclamation. 2019. *San Luis Low Point Improvement Project Draft Feasibility Report*. Available: https://www.usbr.gov/mp/sllpp/docs/sllpip-draft-feasibility-report.pdf. Accessed: April 15, 2019.
[95] U.S. Department of the Interior, Bureau of Reclamation and California Department of Water Resources. 2019. *B.F. Sisk Dam Safety of Dams Modification Project Draft EIS/EIR.* Available: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=38121. Accessed: April 15, 2019.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts (if available)	Location
19	B.F. Sisk Dam Safety of Dams Modification Project[96]	The project includes the addition of shear keys and downstream stability berms and raises the dam crest by 12 feet to provide seismic stability for the embankment during a large earthquake. This alternative reduces risk significantly below Public Protection Guidelines and provides the most confidence of any alternative in the estimate of risk reduction.	Dam project	ROD signed in December 2019 Construction began September 2020 and is anticipated to be complete in December 2028	Water resources, geology, soils, and seismicity	San Luis Reservoir, an offstream storage facility located on San Luis Creek and Cottonwood Creek approximately 12 miles west of Los Banos, California
20	B.F. Sisk Dam Raise and Reservoir Expansion Project[97]	The project involves raising the Sisk Dam 12 feet to increase storage capacity in San Luis Reservoir to provide greater operational flexibility and water supply reliability for South-of-Delta CVP and SWP water contractors. Increased capacity and reserved supply within San Luis Reservoir would only be used to help meet existing demands and would not serve any new demands in the South-of-Delta CVP and SWP service areas.	Dam project	Draft EIR/Supplemental EIS published	Water resources, geology, soils, and seismicity	San Luis Reservoir, an offstream storage facility located on San Luis Creek and Cottonwood Creek approximately 12 miles west of Los Banos, California

CUP = conditional use permit
CVP = Central Valley Project
EIR = environmental impact report
EIS = environmental impact statement
ROD = Record of Decision
SWP = State Water Project

[96] U.S. Department of the Interior, Bureau of Reclamation. 2020. *B.F. Sisk Dam Safety of Dams Modification Project.* Available: https://www.usbr.gov/mp/sod/projects/sisk/. Accessed: October 15, 2020.
[97] U.S. Department of the Interior, Bureau of Reclamation. 2020. *B.F. Sisk Dam Raise and Reservoir Expansion Project.* Available: https://sldmwa.org/sisk-project/. Accessed: October 15, 2020.

APPENDIX 3.19-B: CUMULATIVE TRANSPORTATION PROJECTS LISTS

Since publication of the Draft Environmental Impact Report/Environmental Impact Statement, the following substantive changes have been made to this appendix:

- The status of cumulative transportation projects was updated.

Table 1 Santa Clara County Transportation Plans and Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
1	California High-Speed Rail Project, San Francisco to San Jose Section	Construction of high-speed rail alignment connecting the Transbay Transit Center in San Francisco to San Jose Diridon Station	New transportation facility (high-speed rail)	Environmental review in progress	Noise and Vibration, Aesthetics, Cultural Resources, Transportation	San Francisco, San Mateo County, Brisbane, South San Francisco, San Bruno, Millbrae, Burlingame, San Mateo, Belmont, San Carlos, Redwood City, Menlo Park, Santa Clara County, Palo Alto, Mountain View, Sunnyvale, Santa Clara, San Jose
2	Santa Clara Valley Transportation Authority VTP2040: The Long-Range Transportation Plan for Santa Clara County[1]	VTP 2040 is the long-range transportation plan for Santa Clara County. VTP 2040 provides a framework for the development and maintenance of VTA's transportation system, including policy guidance and identifies programs and projects for all travel modes, over the next 25 years.	Transportation Plan	Adopted 2014	N/A	Santa Clara County
3	Metropolitan Transportation Commission Transportation Improvement Program 2017[2]	Comprehensive four-year regional plan, required by federal law, which includes major regional state- and locally-funded projects, as well as all transportation programs and projects expected to require any action by a federal agency. Types of projects covered by the TIP include highways, bridges, local streets and roads, transit, bicycle, pedestrian, and freight movement projects.	Transportation Plan	Adopted November, 2016	N/A	Nine-county San Francisco Bay Area region: Alameda, Contra Costa, Marin, Napa, Santa Clara, San Francisco, San Mateo, and Solano
4	Plan Bay Area[3]	Plan Bay Area is a long-range plan combining the Bay Area's Regional Transportation Plan and Sustainable Communities Strategy. Plan Bay Area provides a strategy for meeting the region's anticipated future housing needs through the use of Priority Development Areas (PDAs) within walking distance of transit and other amenities.	Regional Transportation Plan/Sustainable Communities Strategy	Adopted 2013	Agricultural and forest resources; air quality; biological resources; cultural resources; hazards; land use; noise; public services and recreation; public utilities and facilities; sea level rise flooding; transportation; visual resources	Nine-county San Francisco Bay Area region: Alameda, Contra Costa, Marin, Napa, Santa Clara, San Francisco, San Mateo, and Solano
5	VTA Bus Rapid Transit Strategic Plan[4]	The BRT Strategic Plan provides policy direction and establishes a framework for implementation of a countywide BRT network.	Transportation plan	Adopted 2009	N/A	Santa Clara County
6	Capitol Expressway LRT Extension-Phase 2[5]	Extension of light rail from the existing Alum Rock Light Rail Station to the Eastridge Transit Center. Light rail will operate primarily in the center of Capitol Expressway, with elevated track structures crossing Capitol Avenue, Story Road, and Tully Road, and new LRT stations at Story Road (aerial), Ocala (optional), and Eastridge (at-grade).	Transit expansion	Final second addendum to Final SEIR-2 published January 2020; construction 2021 through 2025	None	Capitol Expressway from Alum Rock LRT station to new Eastridge Transit Center

[1] Santa Clara Valley Transportation Authority. 2014. *VTP2040: The Long-Range Transportation Plan for Santa Clara County*. Available: http://vtaorgcontent.s3-us-west-1.amazonaws.com/Site_Content/VTP2040_final_hi%20res_030315.pdf. Accessed: August 11, 2016.
[2] Metropolitan Transportation Commission. 2016. *Transportation Improvement Program 2017*. Available: http://mtc.ca.gov/our-work/fund-invest/transportation-improvement-program-tip/2017-tip. Accessed: January 3, 2017.
[3] Metropolitan Transportation Commission. 2013. *Plan Bay Area*. Available: http://mtc.ca.gov/our-work/plans-projects/plan-bay-area-2040/plan-bay-area. Accessed: May 24, 2016.
[4] Santa Clara Valley Transportation Authority. 2009. *VTA Bus Rapid Transit Strategic Plan*. Available: http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001FcGdIAK. Accessed: May 26, 2016.
[5] Santa Clara Valley Transportation Authority. 2017. *Capitol Expressway Light Rail Project*. Available: http://www.vta.org/projects-and-programs/transit/capitol-expressway-light-rail-project. Accessed: January 3, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
7	LRT Extension Winchester Station to Vasona Junction[6]	A 1.6-mile extension of the existing Mountain View to Winchester line from the Winchester Station in Campbell to Los Gatos. The project would be implemented in two phases based on funding and projected ridership. Phase 1 would include construction of a double set of light rail tracks at the existing Winchester Station, expansion of parking capacity at the Winchester Station, construction of a new Vasona Junction Station with a Park & Ride lot and end-of-the-line facilities, and lengthening of six existing station platforms along the Vasona Corridor alignment (Winchester, Campbell, Hamilton, Bascom, Fruitdale, and Race) to accommodate longer trains. Phase 2 would consist of construction of a new Hacienda Light Rail Station with an optional Park & Ride lot.	Transit expansion	RFP issued in August 2017; VTA Board awarded conceptual study contract in May 2018; conceptual study completed June 2019.	None identified in SEIR/EA	Campbell and Los Gatos, Santa Clara County
8	Stevens Creek Corridor BRT Improvements[7]	Provision of bus rapid transit service, in addition to the existing local route, for 8.5 miles from De Anza College to the Transit Mall in downtown San Jose using San Carlos Avenue and Stevens Creek Boulevard.	Transit improvements	Complete		San Jose and Cupertino
9	Light Rail Track Crossovers and Switches[8]	Installation of track crossovers and power switches at several locations along the existing LRT corridors to improve trackway maintenance and increase operational flexibility.	Transit improvements	Complete	N/A	Santa Clara County
10	ACE*forward*[9]	Near-term and longer-term improvements including increased service to 6 daily round-trips by 2019 and 10 daily round-trips by 2023), safety improvements such as grade crossings and additional track in key locations, and extension of ACE service to Manteca, Modesto, Turlock, and Merced, and is investigating potential stations in West Tracy, downtown Tracy, Ripon, Ceres, Livingston or Atwater, and a new Lathrop station at River Islands or a new Lathrop/Manteca stations location on the existing line.	Transit expansion and improvements	Environmental review suspended in 2017; no date for completion of environmental review; no funding obtained to date.	Aesthetics, biological resources, land use, noise, transportation	Alameda, Santa Clara, Merced, San Joaquin, Stanislaus counties
11	Capitol Corridor Joint Powers Authority Oakland to San Jose Phase 2 Double Track (Segment 2A)[10]	Construct a second mainline track, platforms and modifications to existing tracks between the cities of Oakland and San Jose, on the Union Pacific Railroad (UPRR).	Transit improvements	Environmental review of Oakland – Newark expected in 2019 - 2021. Construction timing TBD. Timing for environmental review and funding of Newark to San Jose uncertain.	N/A	Between the cities of Oakland and San Jose, on the Union Pacific Railroad (UPRR) Niles subdivision from Mile Post (MP) 6 to MP 35, and the Coast subdivision MP 13 to MP 35, and on the Caltrain Right of Way MP 44 to MP 48.
12	Mineta San Jose International Airport People Mover[11]	Dedicated guideway connection from the San Jose International Airport to the Caltrain, BRT, and future BART stations at the Santa Clara Transit Center and the VTA LRT on North First Street.	Transit expansion and improvements	Conceptual technology analysis completed; conceptual alternatives analysis 2017-2018; RFI issued July 2019	N/A	San Jose and Santa Clara

[6] Santa Clara Valley Transportation Authority. 2017. *Vasona Light Rail Extension Project Environmental Process*. Available: http://www.vta.org/projects-and-programs/transit/vasona-light-rail-extension-project. Accessed: February 9, 2017.
[7] Santa Clara Valley Transportation Authority. 2014. Fact Sheet: Transit. Stevens Creek Bus Rapid Transit (BRT) Project. Available: http://www.vta.org/sfc/servlet.shepherd/document/download/069A0000001HhbeIAC. Accessed: February 9, 2017.
[8] Santa Clara Valley Transportation Authority. 2015. *Santa Clara Valley Transportation Authority Adopted Biennial Budget, Fiscal Years 2016 and 2017*. Available: http://vtaorgcontent.s3-us-west-1.amazonaws.com/Site_Content/AdoptedBudgetBook.pdf. Accessed: February 9, 2017.
[9] San Joaquin Regional Rail Commission. 2018. AceForward: Altamont Corridor Express. Available: http://www.acerail.com/About/Public-Projects/ACEforward. Accessed: February 26, 2018.
[10] Capitol Corridor Joint Powers Authority. 2016. *Capitol Corridor Joint Powers Authority Meeting of the Board of Directors, Wednesday November 16, 2016*. Available: Accessed: February 9, 2017.
[11] Santa Clara Valley Transportation Authority. 2016. *VTA 2000 Measure A Semi-Annual Report, June 2016*. Available: http://www.vta.org/sfc/servlet.shepherd/document/download/069A0000001ELnuIAG. Accessed: December 6, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
13	I-680 Northbound HOV/HOT lane from SR 237 in Santa Clara County to SR 84 in Alameda County[12]	Addition of a carpool/express lane in the northbound direction on I-680 from south of State Route 237 (SR 237) to north of SR 84 (approximately 15 miles), within Santa Clara and Alameda Counties in and near the cities of Milpitas, Fremont, Pleasanton, and the community of Sunol. The project will increase the efficiency of the transportation system by expanding and optimizing freeway capacity to reduce congestion and accommodate existing and future travel demands.	Express lane construction	Under construction	None identified.	Santa Clara and Alameda counties; in or near the cities of Milpitas, Fremont, and Pleasanton, and the community of Sunol.
14	SR 85 Express Lanes and Auxiliary Lane, I-280 to SR 87[13]	Conversion of existing HOV lanes on SR 85 to express lanes and addition of second express lane in both directions between SR 87 and I-280.	Express lane and auxiliary lane construction	Under construction; anticipated operation in fall 2021	None	Santa Clara County, San Jose, Cupertino, Campbell
15	US 101/Montague Expressway Interchange[14]	Construction of interchange at US 101 and Montague Expressway.	New interchange construction	Conceptual	N/A	Santa Clara
16	US 101 Express Lane Conversion, San Mateo/Santa Clara County Line to Cochrane Road[15]	Conversion of existing northbound and southbound high occupancy vehicle (HOV) lanes (a single lane in each direction) to high occupancy toll (HOT) lanes (express lanes), widening the freeway to add a second express lane in both directions from Cochrane Road in Morgan Hill to SR 85 in San Jose, and from Blossom Hill Road in San Jose to North Fair Oaks Avenue in Sunnyvale to create a dual express lane facility in these segments. The Project would also convert the US 101/SR 85 HOV direct connectors in Mountain View to express lane connectors. Auxiliary lanes would be added in both directions on US 101 between Great America Parkway and Lawrence Expressway, in the northbound direction on US 101 between Lawrence Expressway and North Fair Oaks Avenue, and in the northbound direction on US 101 between Old Bayshore Highway and North First Street. The Project also proposes to add new retaining walls in several areas. The Project length is 36.55 miles on US 101 and 1.1 miles on SR 85, for a total of 37.65 miles.	Express lanes	Phase II under construction	None	Santa Clara County from Palo Alto to Morgan Hill
17	New SR 152 Alignment[16]	Construct new alignment of SR 152 from SR 156 to US 101 in Santa Clara and San Benito counties	New highway alignment	Not yet funded	N/A	San Benito and Santa Clara counties
18	State Route 237 Express Lanes Project[17]	Construction of new HOV/express lanes to extend the length of the SR 237 express lanes from North First Street to US 101 in Sunnyvale, in both directions.	HOV and express lanes	Complete		SR237 from North First Street in San Jose to US 101 in Sunnyvale
19	Central Expressway Improvements[18]	Provision of auxiliary lanes from Lawrence Expressway to Mary Avenue and widening to six lanes from Lawrence Expressway to San Tomas Expressway. Possible HOV Lane conversion to general purpose lane, Central Expressway between San Tomas and De La Cruz.	Auxiliary lanes and widening	Construction began 2019		Santa Clara County

[12] California Department of Transportation. 2015. *I-680 Northbound HOV/Express Lane Project, Santa Clara and Alameda Counties, California Final Environmental Impact Report/Environmental Assessment (EIR/EA) with Finding of No Significant Impact.* Available: http://www.dot.ca.gov/d4/documents-environmental/680nbhovlane/680final/Report-I-680_NB_Express_Lane_FED_July2015.pdf. Accessed: February 9, 2017.

[13] California Department of Transportation. 2015. *State Route 85 Express Lanes Project, Initial Study with Negative Declaration/Environmental Assessment with Finding of No Significant Impact.* Volume 1: Text and Appendices A–G. Accessed: February 9, 2017.

[14] County of Santa Clara Roads and Airports Department. 2013. *Montague Expressway Fact Sheet: Existing Conditions and Accomplishments*. Available: https://www.sccgov.org/sites/rda/plans/expyplan2040/Documents/Project_Fact_Sheets_Montague_FEB26.pdf. Accessed: February 9, 2017.

[15] Metropolitan Transportation Commission. 2015. *US 101 Express Lanes Project in Santa Clara County Summary of Environmental Documents*. Available: http://planbayarea.org/pdf/US_101_Express_Lane_Settlement_Summary_Final.pdf. Accessed: February 14, 2017.

[16] Santa Clara Valley Transportation Authority. 2012. *Fact Sheet: Highways, State Route (SR) 152 Trade Corridor Project*. Available: http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001Fbxs. Accessed: May 26, 2016.

[17] Santa Clara Valley Transportation Authority. 2017. *State Route 237 Express Lanes Project*. Available: http://www.vta.org/projects-and-programs/highway/vta-express-lanes-sr-237-express-lanes-project. Accessed: February 15, 2017.

[18] County of Santa Clara Roads and Airports Department. 2013. *Central Expressway Fact Sheet*. Available: https://www.sccgov.org/sites/rda/plans/expyplan2040/Documents/Project_Fact_Sheets_Central_FEB4.pdf. Accessed: February 16, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
20	Montague Expressway Improvements[19]	Widening to 8 lanes Guadalupe River to Trade Zone Blvd (by San Jose), widening to 8 lanes Trade Zone to Great Mall and Great Mall to I-680, widening to 6 lanes I-680 to Park Victoria (includes widening of I-680 overpass), reconfiguring US 101/ Montague interchange, construction of Trimble flyover, construction of interchanges at McCarthy-O'Toole, Mission College, and Great Mall/Capitol Expressway, modification of I-680 interchange, and construction of Montague/US 101 and Montague/I-880 HOV direct connector ramps. Upcoming design for US 101/ Montague interchange improvements with at-grade improvements at Mission College, design study for I-680 interchange modifications, and installation of bicycle detection and implementation of bicycle adaptive signal timing.	Road widening and interchange improvements	Pending funding		Montague Expressway in Santa Clara County and San Jose
21	San Tomas Expressway Widening, El Camino Real to Williams Road[20]	Widen San Tomas Expressway from six to eight lanes between El Camino Real in the north and Williams Road in the south	Road widening	Complete		Santa Clara and San Jose
22	Isabel Bridge Replacement, San Antonio Valley Road[21]	Replacement of the Isabel Creek Bridge at San Antonio Valley Road with a new bridge on a new alignment meeting all current design standards	Bridge replacement and widening	Approved December 2016	None	Isabel Creek at San Antonio Valley Road
23	Santa Clara Caltrain Station Pedestrian Undercrossing[22]	VTA is currently building an extension to the current Santa Clara Station undercrossing and a new approach ramp, which will allow pedestrians and cyclists to access the Caltrain/ACE/Capitol Corridor platform and El Camino Real from Brokaw Road. Similar to a tunnel, the planned undercrossing extension will be approximately 80 feet long, and will run under three Union Pacific Railroad (UPRR) tracks. In conjunction with the planned underpass extension, an open-air ramp of approximately 250 feet long will connect Brokaw Road to the tunnel structure.	Extension of grade-separated pedestrian tunnel	Complete	None	Santa Clara
24	Caltrain Peninsula Corridor Electrification Project[23]	Electrification of the Caltrain corridor from the 4th and King station in San Francisco to approximately the Tamien Station in San Jose. Includes conversion of diesel-hauled trains to electric multiple unit (EMU) trains and increased service up to six trains per peak hour per direction.	Transit improvement	In construction; first electric trains expected to be in service in 2022.	Aesthetics; flooding and sea level rise; noise; transportation and traffic	Caltrain corridor from 4th and King streets in San Francisco to Tamien Station in San Jose
25	2008 Countywide Bicycle Plan[24]	Countywide plan that guides the development of major bicycling facilities by identifying Cross County Bicycle Corridors and other projects of countywide or intercity significance. The CBP complements Member Agencies' bicycle plans, which focus on improvements at the local level, and incorporates other regional bike projects including the Bay Trail and the Bay Area Ridge Trail.	Transportation plan	Adopted 2008		Santa Clara County
26	SR 87 HOV conversion, SR 85 to US 101[25]	Conversion of HOV lanes to express lanes	Express lanes	Design and engineering complete in summer 2021; construction anticipated summer 2021–2023		Santa Clara County
27	I-280 Express Lane Conversion[26]	Conversion of HOV lanes to express lanes, three segments: Magdalena Avenue to Leland Avenue, US 101 to Leland Avenue, and El Monte Road to Magdelena Avenue	Express lanes	Conceptual		Santa Clara County
28	Caltrain Double-Track, Segments between San Jose and Gilroy[27]	Installation of 8 miles of double tracking on the existing Union Pacific Railroad (UPRR) corridor between San Jose and Gilroy to increase Caltrain capacity.	Transit improvements	2021 completion		Santa Clara County

[19] County of Santa Clara Roads and Airports Department. 2013. *Montague Expressway Fact Sheet*. Available: https://www.sccgov.org/sites/rda/plans/expyplan2040/Documents/Project_Fact_Sheets_Montague_FEB26.pdf. Accessed: February 16, 2017.

[20] County of Santa Clara Roads and Airports Department. 2013. *San Tomas Expressway Improvement Projects between Homestead Rd. and El Camino Real.* Available: https://www.sccgov.org/sites/rda/projects/stexpy/Documents/San%20Tomas%20Expressway%20Improvement%20Projects%20-%20tree%20mtg%20.pdf. Accessed: February 15, 2017.

[21] County of Santa Clara Board of Supervisors. 2016. *The County of Santa Clara California Construction Document 83631*. Available: http://sccgov.iqm2.com/Citizens/Detail_LegiFile.aspx?Frame=&MeetingID=7205&MediaPosition=&ID=83631&CssClass. Accessed: February 16, 2017.

[22] Santa Clara Valley Transportation Authority. 2017. *Santa Clara Pedestrian Undercrossing*. Available: http://www.vta.org/projects-and-programs/santa-clara-pedestrian-undercrossing. Accessed: February 16, 2017.

[23] Caltrain. 2018. *Pennsylvania Corridor Electrification Project*. Available: http://www.caltrain.com/projectsplans/CaltrainModernization/Modernization/PeninsulaCorridorElectrificationProject.html. Accessed: February 26, 2018.

[24] Santa Clara Valley Transportation Authority. 2008. *2008 Santa Clara Countywide Bicycle Plan*. Available: http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001FZYt. Accessed: February 16, 2017.

[25] California Department of Transportation. 2016. *Transportation Concept Report, State Route 87*. Available: http://www.dot.ca.gov/dist4/systemplanning/docs/sr-87-tcr.pdf. Accessed: February 16, 2017.

[26] California Department of Transportation. 2013. *Transportation Concept Report, State Route 237*. Available: http://www.dot.ca.gov/dist4/systemplanning/docs/tcr/I280draft_final_tcr_signed_07162013_nr_ig.pdf. Accessed: February 16, 2017.

[27] Santa Clara Valley Transportation Authority. 2015. *Caltrain–Capacity Improvements & Electrification.* Available: http://vtaorgcontent.s3-us-west-1.amazonaws.com/Site_Content/Improving_Caltrain_double-tracking.pdf. Accessed: February 14, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
29	SR 237 Westbound to SR 85 Southbound Connector Ramp Widening and Improvements[28]	Improve SR 237 Westbound to SR 85 Southbound Connector Ramp Widening and Improvements and Southbound Auxiliary Lane Construction, SR 237 to SR 85/El Camino Real Interchange	Ramp improvements and auxiliary lane construction	Conceptual		Santa Clara County
30	Almaden Expressway Widening[29]	Almaden Expressway widening to 8 Lanes from Coleman Road to Blossom Hill Road and to 6 lanes from Camden Road to Redmond	Road widening	Under construction		Santa Clara County
31	Lawrence Expressway Widening[30]	Widening Lawrence Expressway from 6 to 8 lanes between Moorpark Avenue/Bollinger Road and south of Calvert Court	Road widening	Under construction		Santa Clara County
32	Lawrence Expressway Medians[31]	Modify medians on Lawrence Expressway, including those at Lochinvar Avenue, De Sota Avenue, Golden State Drive, Buckley Street and St. Lawrence Drive/Lawrence Station Road, for limited access	Road median reconfiguration	Under construction		Santa Clara County
33	Lawrence Expressway Grade Separation Project[32]	Study looking at the intersections at Reed Avenue/Monroe Street, Kifer Road, and Arques Avenue to address traffic congestion	New interchange	Final report published September 30, 2014		Santa Clara County
34	SR 85/Cottle Road Interchange[33]	Improve the SR 85/Cottle Road interchange	Interchange reconfiguration	Not yet funded		Santa Clara County
35	Capitol Expressway ITS and Bike/Pedestrian Improvements[34]	Installation of ITS infrastructure along Capitol Expressway from Excalibur Drive to SR 87 ramp providing for traffic responsive signal timing and adaptive bicycle and pedestrian signal timing, and fill in sidewalk gaps along Capitol Expressway.	Traffic operations improvements	Complete		Santa Clara County
36	Capitol Corridor Extension to Salinas[35]	Extension of passenger rail service from Santa Clara County south to Salinas with two daily round trips initially and up to six daily round trips at buildout between San Jose and Salinas. Kick-start phase includes a downsized Salinas station, track improvements in Gilroy to allow through-service and minor station improvements in Morgan Hill, Gilroy, and Tamien Stations.	Transit extension	February 2013, Principles of Agreement (POA) approved by TAMC and CCJPA for Salinas rail service to operate as a Capitol Corridor extension, with two daily round trips beginning in 2019-2020 assuming infrastructure improvements are completed and operating funds are secured, and dependent on the expansion of existing Capitol Corridor service to San Jose. Construction anticipated in 2020	None	Gilroy, Santa Clara County, San Benito County, Monterey County, Pajaro, Castroville, Salinas

ACE = Altamont Commuter Express
ADA = Americans with Disabilities Act
BART = Bay Area Rapid Transit
BRT = bus rapid transit
CCJPA = Capital Corridor Joint Powers Board
HOT = high occupancy/toll
HOV = high occupancy vehicle
I-280 = Interstate 280
I-680 = Interstate 680
I-880 = Interstate 880
LRT = light rail transit
MTC = Metropolitan Transportation Commission

[28] California Department of Transportation. 2013. *State Route 237 Transportation Concept Report*. Available: http://www.dot.ca.gov/dist4/systemplanning/docs/tcr/sr237_tcr.pdf. Accessed: February 16, 2017.
[29] County of Santa Clara Roads and Airports Department. 2013. *Almaden Expressway Fact Sheet*. Available: https://www.sccgov.org/sites/rda/plans/expyplan2040/Documents/Project_Fact_Sheets_Almaden_FEB4.pdf. Accessed: February 16, 2017.
[30] County of Santa Clara Roads and Airports Department. 2013. *Lawrence Expressway Fact Sheet*. Available: https://www.sccgov.org/sites/rda/plans/expyplan2040/Documents/Project_Fact_Sheets_Lawrence_FEB11.pdf. Accessed: February 16, 2017.
[31] County of Santa Clara Roads and Airports Department. 2013. *Lawrence Expressway Fact Sheet*. Available: https://www.sccgov.org/sites/rda/plans/expyplan2040/Documents/Project_Fact_Sheets_Lawrence_FEB11.pdf. Accessed: February 16, 2017.
[32] County of Santa Clara Roads and Airports Department. 2016. *Lawrence Expressway Grade Separation Project*. Available: https://www.sccgov.org/sites/rda/plans/Lawrence/Pages/LEGS.aspx. Accessed: February 16, 2017.
[33] Santa Clara Valley Transportation Authority. 2011. *VTP 2040 Highway Projects*. Preliminary Financially Constrained Project List. Available: http://www.vta.org/sfc/servlet.shepherd/document/download/069A0000001EO9UIAW. Accessed: February 26, 2018.
[34] Metropolitan Transportation Commission. 2017. *Capitol Expressway ITS Infrastructure and Sidewalk*. Available: http://completestreets.mtc.ca.gov/checklists/421. Accessed: February 16, 2017.
[35] Transportation Agency of Monterey County. 2013. *Addendum, Capitol Corridor Extension to Monterey County Environmental Impact Report*. Available: http://www.tamcmonterey.org/wp-content/uploads/2015/09/CapitolCorridorExtension-Addendum_FINAL2.pdf. Accessed: June 7, 2016.

RFI = request for information
RFP = request for proposal
SEIR = Supplemental Environmental Impact Report
SR = State Route
TAMC = Transportation Agency for Monterey County
TOS = Traffic Operations System
UC = undercrossing
UPRR = Union Pacific Railroad
US = United States Highway
VTA = Santa Clara Valley Transportation Authority
VTP = Valley Transportation Plan
ZEB = zero emissions bus

Table 2 City of San Jose Transportation Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
1	BART Silicon Valley Extension[36]	Two-phase project extending BART service to Silicon Valley. Phase I includes the 10-mile, two-station Berryessa Extension. Phase II includes a 5-mile-long subway tunnel through downtown San Jose and will extend the BART system from the planned Berryessa Extension terminus for approximately six miles, ending at-grade in Santa Clara near the Caltrain Station.	Transit expansion	Phase I operational June 2020; Phase II in design and engineering, anticipated operation by 2035	Air quality, greenhouse gases, noise, transportation and traffic	San Jose
2	Parking Capital Program[37]	Program focused on projects that will adequately maintain the City's parking facilities in a safe and operational manner, upgrade the Revenue Control System within key garages, expand meter upgrade to Smart Meters, support LED lighting and security program upgrades, provide for multi-modal improvement projects in the greater Downtown and Diridon Areas, provide for temporary parking facilities to support SAP Center events to mitigate the loss of existing parking due to pending development, and provide preliminary evaluation and planning for a parking garage to serve the greater Downtown Area. Major projects include: arena area parking development; downtown event parking dynamic message sign; greater downtown area multi-modal/streetscape improvements; and greater downtown parking garage.	Parking and transit improvement program	2020–2024		San Jose
3	Construct US 101/Mabury Road/Taylor Street Interchange[38]	Construction of new interchange at US 101/Mabury Road/Taylor Street in San Jose	New interchange	Complete		San Jose
4	US 101/Blossom Hill Road Interchange Improvement Project[39]	Project includes installation of a bicycle/pedestrian path from Monterey Road to the Coyote Creek Trail, construction of a bridge structure over US 101 between two existing Blossom Hill Road bridge decks to accommodate the addition of one lane in each direction, and modification of US 101 northbound and southbound on/off ramps	Interchange improvements including a bridge over US 101	Out for bid in May 2020		San Jose
5	I-680 Soundwalls from Capitol Expressway to Mueller Avenue	Construction of new soundwalls along I-680 between Capitol Expressway and Mueller Avenue in San Jose	Soundwall construction	Soundwall design and construction planned for FY 2020–2021		San Jose
6	Extend Charcot Avenue over I-880	Construction of a new 2-lane east/west connection of Charcot Avenue over I-880, extending the existing Charcot Avenue approximately 0.25 mile, with bicycle and pedestrian improvements to connect to North San Jose employment center	Road extension	Final EIS and NOD published in June 2020		San Jose
7	US 101/Buena Vista Avenue Interchange	Construction of a new freeway interchange at US 101 and Buena Vista Avenue in San Jose	New interchange	Conceptual		San Jose
8	Coleman Avenue Widening	Widening of Coleman Avenue from 4 to 6 lanes from I-880 to Taylor Street	Road widening	Complete		San Jose
9	Snell Avenue Widening[40]	Widening of Snell Avenue from Branham Lane to Chynoweth Avenue	Road widening	Complete		San Jose
10	Branham Lane Widening[41]	Widening of Branham Lane from Vista Park Drive to Snell Avenue (includes bicycle and pedestrian facilities	Road widening	Funded in May 2019		San Jose
11	Autumn Parkway	Extension of Autumn Parkway from Julian Street to San Carlos Street	Road widening, partial realignment, and extension	Complete		San Jose

[36] Santa Clara Valley Transportation Authority. 2017. *BART Environmental Documents*. Available: http://www.vta.org/bart/environmentaldocuments. Accessed: February 9, 2017.
[37] City of San Jose. 2016. *City of San Jose 2016-2017 Proposed Capital Budget, 2017-2021 Capital Improvement Program*. Available: https://www.sanjoseca.gov/DocumentCenter/View/55966. Accessed: February 14, 2017.
[38] City of San Jose. 2016. *City of San Jose 2016-2017 Proposed Capital Budget, 2017-2021 Capital Improvement Program*. Available: https://www.sanjoseca.gov/DocumentCenter/View/55966. Accessed: February 14, 2017.
[39] City of San Jose. 2015. *Memorandum: US 101/Blossom Hill Road Interchange Improvement Project*. Available: http://sanjose.granicus.com/MetaViewer.php?view_id=&event_id=1475&meta_id=544236. Accessed: February 16, 2017.
[40] City of San Jose. 2016. *City of San Jose 2016-2017 Proposed Capital Budget, 2017-2021 Capital Improvement Program*. Available: https://www.sanjoseca.gov/DocumentCenter/View/55966. Accessed: February 14, 2017
[41] City of San Jose. 2016. *City of San Jose 2016-2017 Proposed Capital Budget, 2017-2021 Capital Improvement Program*. Available: https://www.sanjoseca.gov/DocumentCenter/View/55966. Accessed: February 14, 2017

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
12	US 101 Zanker Road/North 4th Street/Skyport Drive Interchange Improvements[42]	Construction of a new interchange connecting Zanker Road and Old Bayshore Highway with North 4th Street and Skyport Drive on US 101 in San Jose. Proposed improvements include: •constructing a new interchange and overcrossing bridge across US 101 to connect Zanker Road and Old Bayshore Highway with North 4th Street and Skyport Drive; modifying existing on- and off-ramps at North 1st Street/E. Brokaw, North 4th Street and Old Bayshore Highway; modifying existing local street intersections in the area; and constructing retaining walls as needed.	Interchange improvements, addition of connection between Zanker Road and Skyport Drive and Fourth Street	Project approved; construction anticipated to be complete 2021		San Jose
13	Bay Trail Reach 9 & 9B[43]	Development of Reach 9 and 9B of the Bay Trail to permit travel from downtown San Jose to Sunnyvale and western reaches of the Bay Trail along existing, paved trails	Pedestrian improvements	Pending funding		San Jose
14	St. John Street Multi-Modal Improvements - Phase 1[44]	Pedestrian and bicycle improvements on St. John Street	Pedestrian and bicycle improvements	Complete		San Jose
15	San Jose Bike Plan 2020[45]		Transportation plan	Adopted November, 2009		San Jose

BART = Bay Area Rapid Transit
EIS = environmental impact statement
FY = fiscal year
HOV = high occupancy vehicle
I/C = interchange
I-680 = Interstate 680
I-880 = Interstate 880
ITS = intelligent transportation system
NOD = Notice of Determination
SR = State Route
SRTS = Safe Routes to School program
TIP = transportation improvement program
UPRR = Union Pacific Railroad
US = United States Highway
VTA = Valley Transportation Authority
VTP = Valley Transportation Plan
ZEB = zero emissions bus

[42] Santa Clara Valley Transportation Authority. 2017. *US 101/Zanker Road Interchange.* Available: http://www.vta.org/projects-and-programs/highway/101-zanker. Accessed: February 16, 2017.
[43] City of San Jose. No Date. *Bay Trail Fact Sheet*. Available: https://www.sanjoseca.gov/DocumentCenter/View/11602. Accessed: February 16, 2017.
[44] City of San Jose. 2016. Memorandum: *St. John Street Bikeway and Pedestrian Improvements Project*. Available: http://sanjose.granicus.com/MetaViewer.php?view_id=&event_id=2660&meta_id=603019. Accessed: February 16, 2017.
[45] City of San Jose. 2009. *San Jose Bike Plan 2020*. Available: http://www3.sanjoseca.gov/clerk/Agenda/20091117/20091117_0602att.pdf. Accessed: February 16, 2017.

Table 3 City of Morgan Hill Transportation Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
1	Hale Avenue Extension[46]	The proposed roadway project would be constructed in two phases, Phase I and Phase II. Phase I is the extension of Hale Avenue from West Main Avenue to the Dewitt/Spring Avenue intersection. Phase II is the realignment and widening of the Santa Teresa Corridor from the Dewitt/Spring Avenue intersection to Watsonville Road.	Road extension	Construction anticipated fall 2020 pending funding	None	Phase I is entirely within Morgan Hill; half of Phase II is in unincorporated Santa Clara County
4	US 101 Express Lanes Project Phase 4[47]	Conversion of 36 miles of US 101 to express lanes and add a second express lane for the majority of the corridor from Dunne Avenue in Morgan Hill to the San Mateo County line. The second express lane will provide a two-lane facility within urbanized segments. The US 101 express lanes will connect with the SR 85 express lanes in San Jose and convert US 101/SR 85 HOV direct connectors in Mountain View to express lane connectors.	Express lane construction	Construction anticipated summer 2021–2023		Morgan Hill
5	US 101/Tennant Avenue Interchange Improvements	Interchange expansion and reconfiguration and road widening at US 101/Tennant Avenue interchange.	Interchange improvements	Conceptual		Morgan Hill

IS = Initial Study
EA – Environmental Assessment

[46] City of Morgan Hill. 2016. *Draft Environmental Impact Report, Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment*. Available: http://www.morgan-hill.ca.gov/DocumentCenter/View/20132. Accessed: February 14, 2017.
[47] Santa Clara Valley Transportation Authority. 2017. *State Route 85 and US 101 Express Lanes Projects*. Available: http://www.vta.org/projects-and-programs/vta-express-lanes-85-101-project. Accessed: February 14, 2017.

Table 4 City of Gilroy Transportation Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
6	Capitol Corridor Extension to Salinas[48]	Extension of passenger rail service from Santa Clara County south to Salinas with two daily round trips initially and up to six daily round trips at buildout between San Jose and Salinas. Kick-start phase includes a downsized Salinas station, track improvements in Gilroy to allow through-service and minor station improvements in Morgan Hill, Gilroy, and Tamien Stations.	Transit extension	February 2013, Principles of Agreement (POA) approved by TAMC and CCJPA for Salinas rail service to operate as a Capitol Corridor extension, with two daily round trips beginning in 2019–2020 assuming infrastructure improvements are completed and operating funds are secured, and dependent on the expansion of existing Capitol Corridor service to San Jose. Construction anticipated in 2020	None	Gilroy, Santa Clara County, San Benito County, Monterey County, Pajaro, Castroville, Salinas
7	SR 152/Frazier Lake Road Intersection[49]	Improve ramp/intersection on SR 152 eastbound at Frazier Lake Road by installation of traffic signals, construction of a right lane and installation of advance warning signs.	Road reconfiguration	Complete		Gilroy
8	Ballybunion at Santa Teresa[50]	Construction of new bridge as part of road extension.	Intersection improvement	Complete		Gilroy
9	Cameron at Princeville Channel[51]	Construction of new bridge as part of road extension.	Bridge project	Complete		Gilroy
10	Cameron and Luchessa Intersection[52]	Construction of new intersection.	Intersection improvement	Construction anticipated for FY 2020–2021		Gilroy
11	Cohansey at Church[53]	Construction of new intersection.	Intersection improvement	Complete		Gilroy
12	Cohansey at Monterey Road Improvements[54]	Road improvements.	Road improvements	2020 to 2021		Gilroy
13	Gourmet Alley Pedestrian Enhancements[55]	Pedestrian improvements.	Pedestrian improvements	Complete		Gilroy
14	Kern at Welburn[56]	Construction of new intersection.	Intersection improvement	Complete		Gilroy
15	Las Animas Avenue Overcrossing at US 101	Construction of new overcrossing.	Construction of new overcrossing	Complete		Gilroy

[48] Transportation Agency of Monterey County. 2013. *Addendum, Capitol Corridor Extension to Monterey County Environmental Impact Report*. Available: http://www.tamcmonterey.org/wp-content/uploads/2015/09/CapitolCorridorExtension-Addendum_FINAL2.pdf. Accessed: June 7, 2016.
[49] California Department of Transportation. 2016. *State Route 152 in Gilroy near Frazier Lake Road Intersection*. Available: http://www.cityofgilroy.org/DocumentCenter/View/6143. Accessed: February 16, 2017.
[50] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[51] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[52] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[53] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[54] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[55] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[56] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
16	Lions Creek Trail Gap Closure	Construction of new intersection.	Trail construction	Complete		Gilroy
17	Luchessa from Greenfield to Santa Teresa[57]	Extend West Luchessa Avenue from Greenfield Drive to Santa Teresa Boulevard	Road extension	Construction in progress		Gilroy
18	Luchessa at Uvas Creek - 2 Pedestrian Bridges[58]	Bridges will be replaced to accommodate two 12-foot lanes of traffic and two 8-foot shoulders to accommodate bicycles and pedestrians. Bridges 37C0094 and 96 will be in the same road alignment. Bridge 37C0095 will be in a new alignment. Projects will be constructed in stages to accommodate the traffic and bicycles.	Pedestrian improvements	Construction anticipated 2021 to 2022		Gilroy
19	Mantelli at Hirasaki[59]	Construction of new intersection.	Intersection improvement	Complete		Gilroy
20	Santa Teresa at Fitzgerald[60]	Construction of new intersection.	Intersection improvement	Complete		Gilroy
21	Santa Teresa and SR 152 at First Street[61]	Construction of new intersection.	Intersection improvement	Complete		Gilroy
22	Tenth Street at Uvas Park[62]	Construction of new intersection.	Intersection improvement	2021		Gilroy
23	Tenth Street, Uvas to Santa Teresa[63]		Roadway extension	2021		Gilroy
24	Transportation Agency of Monterey County 10th Street Improvements[64]	Multiple street improvement projects.	Street improvement	Complete		Gilroy
25	Wren and Welburn Roundabout [65]	Construction of roundabout at existing intersection.	Intersection improvement	2020 to 2021		Gilroy

CCJPA = Capital Corridor Joint Powers Board
FY = fiscal year
TAMC = Transportation Agency for Monterey County

[57] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[58] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[59] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[60] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[61] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[62] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[63] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[64] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.
[65] City of Gilroy. 2016. *City of Gilroy FY 2016 and FY 2017 Operating Budget and FY 2016-2021 Capital Improvement Budget*. Available: http://ca-gilroy.civicplus.com/569/Budget. Accessed: June 7, 2016.

Table 5 San Benito County Transportation Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
1	On The Move: 2035 San Benito Regional Transportation Plan[66]	Regional transportation plan	Transportation Plan	Adopted June, 2014	N/A	San Benito County
2	San Benito County Local Transportation Authority Final Short Range Transit Plan[67]	Plan to improve and enhance regional public transportation in THE San Benito Local Transportation Authority service area	Transportation Plan	Adopted February, 2016	N/A	San Benito County
3	SR 25 Widening Project and Route Adoption Hollister to Gilroy[68]	Route adoption.	Road widening and route adoption	Under trial route, construction pending funding	Agriculture, noise	Near Hollister and Gilroy on SR 25 in San Benito and Santa Clara counties
4	San Benito SR 156 Improvement Project[69]	Construction of a 4-lane expressway	Road construction	Construction fall 2020 to winter 2022, open to public 2022	Agriculture	near San Juan Bautista from The Alameda to 0.2 mile east of 4th Street near Hollister
5	SR 25 La Gloria Road Super Elevation Adjustment and Culvert Extension[70]	Elevation adjustment and culvert extension/curve correction	Curve correction	Complete	None	from La Gloria Road north
6	SR 25 Operational Enhancements[71]	Construct passing lanes	Road improvements	2020	N/A	San Benito County
7	SR 156/Fairview Road Intersection Improvements[72]	Construct new turn lanes at intersection of SR 156 and Fairview Road	Road improvements	2025	N/A	SR 156 and Fairview Road intersection
8	Fairview Road Widening[73]	Widen Fairview Road to 4-lane arterial	Road widening	2025	N/A	Northeast of Hollister
9	SR 25 4-Lane Widening – Phase I[74]	Widen to 4-lane expressway, San Felipe Road to Hudner Lane (west of Hollister Airport)	Road widening	Not yet funded	N/A	SR 25 from San Felipe Road to Hudner Lane, Hollister area
10	SR 25 4-Lane Widening – Phase II[75]	Widen from 2-4 Lanes from Hudner Lane to County Line	Road widening	Not yet funded	N/A	SR 25 from Hudner Lane to Santa Clara County line
11	Memorial Drive Construction - Santa Ana to Flynn Road[76]	New 4-lane roadway construction/extension	New road	Not yet funded	N/A	Between Santa Ana Road and Flynn Road, north of Hollister

66 San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
67 San Benito County Local Transportation Authority. 2016. *Future Horizons for San Benito County Short- and Long-Range Transit Plan Final Report*. Available: http://sanbenitocog.org/pdf/San_Benito_SLRTP_FINAL_Report_160216.pdf. Accessed:
68 California Department of Transportation. 2017. *Project Update – San Benito County*. Available: http://www.dot.ca.gov/dist05/paffairs/sanbenito/sbtcog.pdf. Accessed: February 13, 2017.
69 California Department of Transportation. 2017. *Project Update – San Benito County*. Available: http://www.dot.ca.gov/dist05/paffairs/sanbenito/sbtcog.pdf. Accessed: February 13, 2017.
70 California Department of Transportation. 2017. *Project Update – San Benito County*. Available: http://www.dot.ca.gov/dist05/paffairs/sanbenito/sbtcog.pdf. Accessed: February 13, 2017.
71 San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
72 San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
73 San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
74 San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
75 San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
76 San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
12	Fairview Road/San Felipe Road East-West Arterial (New Road)[77]	New roadway construction north of McCloskey Road	New road	Not yet funded	N/A	San Benito County
13	Fairview Road/Memorial Drive East-West Collector (New Road)[78]	New roadway construction south of McCloskey Road	New road	Not yet funded	N/A	San Benito County
14	New SR 152 Alignment: SR 156 to US 101[79]	Construct new alignment of SR 152 from SR 156 to US 101	New highway alignment	Not yet funded	N/A	San Benito and Santa Clara counties
15	Regional Transit – Gilroy Caltrain[80]	Regional transit connection to Gilroy Caltrain Station	New transit route	Operation anticipated for 2035		San Benito County

SR = State Route
US = United States Highway

[77] San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
[78] San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
[79] San Benito Council of Governments. 2014. *On The Move: 2035, San Benito Regional Transportation Plan*. Available: http://www.sanbenitocog.org/pdf/2014RTP/Final/Final%20RTP.pdf. Accessed: May 26, 2016.
[80] VTA. 2012. Fact Sheet: Highways: State Route (SR) 152 Trade Corridor Project. Available: http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001Fbxs. Accessed: February 20, 2018.

Table 6 Merced County Transportation Projects List

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
1	California High-Speed Rail Project, Merced to Fresno Section[81]	Construction of high-speed rail alignment connecting Merced Station to Fresno Station.	New transportation facility (high-speed rail)	Under construction	Agricultural Lands, Noise and Vibration, Parks, Recreation and Open Space, Aesthetics and Visual Resources, Cultural and Paleontological Resources, Cumulative	Merced County, Madera County, City of Chowchilla, City of Madera Acres, City of Fresno
2	California High-Speed Rail Project, Central Valley Wye[82]	Construction of high-speed rail junction connecting trains to and from Gilroy, Merced, and Fresno	New transportation facility (high-speed rail)	Supplemental Environmental Studies pending		Merced County, Madera County, City of Chowchilla
3	Merced County 2018 Regional Transportation Plan[83]	County-wide planning document which provides the framework for transportation infrastructure investments in the county for the next 25 years. Provides a plan to comply with SB375 to reduce GHG. (MCAG 2014)	Transportation Plan	Adopted August 16, 2018	Air Quality and Global Climate Change, Transportation and Circulation, and Land Use	Merced County
4	Livingston Northbound Median Widening Project[84]	Construction of one freeway lane within the median in the northbound direction on SR-99, beginning just south of the Hammatt Avenue Overcrossing, and ending just past the Merced/Stanislaus County line in Merced County.	Median, road widening	Under construction, complete in spring 2021	Land Use, Air Quality, Noise and Vibration, Natural Communities, Wetlands, Animal Species, Threatened and Endangered Species, Traffic and Transportation and Construction	SR 99 between Hammatt Avenue and the Stanislaus/Merced County Line
5	Livingston Southbound Median Widening Project[85]	Construction of one freeway lane within the median in the southbound direction on SR-99, beginning just south of Hammatt Avenue Overcrossing, and ending just past the Merced/Stanislaus County line in Merced County	Median, road widening	Construction anticipated summer 2022, complete in winter 2024	Land Use, Air Quality, Noise and Vibration, Natural Communities, Wetlands, Animal Species, Threatened and Endangered Species, Traffic and Transportation and Construction	SR 99 between Hammatt Avenue and the Stanislaus/Merced County Line
6	SR 99 Hilmar-Turlock Interchange and Bypass[86]	Construct new interchange between Bradbury Road and SR 165, serving Hilmar/Turlock region. Construct an alternative route around Hilmar with connection to new interchange.	New interchange	Construction pending Project Initiation Document approval	Land Use, Air Quality, Noise and Vibration, Natural Communities, Animal Species, Traffic and Transportation and Construction	SR 99: Bradbury Road and Highway 165
7	SR 152 Los Banos Bypass Phase1[87]	Construction of a new 4 lane expressway bypassing the City of Los Banos to relieve inner-city congestion and improve flow of interregional traffic.	New freeway bypass	Final EIR June 2007; funding approved in May 2019	Land Use, Air Quality, Noise and Vibration, Natural Communities, Animal Species, Traffic and Transportation and Construction	Between SR-165 and will tie-in with existing SR-152 signalized I/S in Los Banos from SR165 to SR-152 near Santa Fe Rd. Merced County
8	SR 152 Los Banos Bypass Segment 2	Construction of a new 4 lane expressway bypassing the city of Los Banos, from West of Volta Road to SR 165 south of Henry Miller Road.	Construction of three interchanges	Final EIR June 2007; funding approved in May 2019	Land Use, Air Quality, Noise and Vibration, Natural Communities, Animal Species, Traffic and Transportation and Construction	Around the city of Los Banos between HWY 165 and W HWY 152 Merced County

81 California High Speed Rail Authority. 2012. *Final Environmental Impact Report/Statement: Merced to Fresno*. Available: http://www.hsr.ca.gov/Programs/Environmental_Planning/final_merced_fresno.html. Accessed: October 4, 2016.

82 California High Speed Rail Authority. 2017. *Central Valley Wye*. Available: http://www.hsr.ca.gov/programs/statewide_rail_modernization/project_sections/central_valley_wye.html. Accessed: February 14, 2017.

83 Merced County Association of Governments. 2014. *2014-2040 Regional Transportation Plan / Sustainable Communities Strategy for Merced County*. Amended May, 2016. Available; http://www.mcagov.org/DocumentCenter/View/789. Accessed: February 14, 2017.

84 California Department of Transportation. 2013. *Livingston Median Widening Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*. Available: http://www.dot.ca.gov/dist10/environmental/projects/LivingstonWidening/docs/LivingstonWideningDraftED.pdf. Accessed: February 14, 2017.

85 California Department of Transportation. 2013. *Livingston Median Widening Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*. Available: http://www.dot.ca.gov/dist10/environmental/projects/LivingstonWidening/docs/LivingstonWideningDraftED.pdf. Accessed: February 14, 2017.

86 California Department of Transportation. 2017. *Status of Projects, Central Region, District 10, January 2017*. Available: http://www.dot.ca.gov/dist10/docs/D10SOP.pdf. Accessed: February 14, 2017.

87 California Department of Transportation. 2005. *Los Banos Bypass Draft Environmental Impact Statement/Environmental Impact Report and Section 4(f) Evaluation*. Available: http://www.dot.ca.gov/dist6/environmental/envdocs/d10/sr152_losbanos_bypass.pdf. Accessed: February 14, 2017.

ID No.	Project Name	Description	Project Type	Status/Timing	Potential significant unavoidable impacts	Location
9	SR 152 Los Banos Bypass Segment 3	Freeway conversion from Santa Clara County line to Madera County line with construction of 3 new interchanges at West SR 152, SR 165 and East SR 152	Install ADA curb ramps, sidewalk extensions	Final EIR June 2007; funding approved in May 2019	Land Use, Air Quality, Noise and Vibration, Natural Communities, Construction, Recreation, Safety and Disability Accessibility, Transportation	W HWY 152, HWY 165 and E HWY 152. Merced County
10	SR 165/Fowler Avenue Left-Turn Channelization[88]	Installation of a left-turn channelization on SR 165 at Fowler Avenue near Turlock	Off-ramp improvements	Complete	Land Use, Air Quality, Noise and Vibration, Natural Communities, Animal Species, Transportation and Traffic and Construction	Intersection of SR 165 and Fowler Avenue
11	SR 165/Westside Boulevard Curve Correction[89]	Improving curve radius, super elevation, widening the shoulder and installing rumble strips on SR 165	Left-turn channelization	Complete	Land Use, Air Quality, Noise and Vibration, Natural Communities, Animal Species, Transportation and Traffic and Construction	Between Merced River Bridge and 0.2 mile south of Westside Boulevard

I-5 = Interstate 5
ROW = right-of-way
SR = State Route

[88] California Department of Transportation. 2017. *Status of Projects, Central Region, District 10, January 2017*. Available: http://www.dot.ca.gov/dist10/docs/D10SOP.pdf. Accessed: February 14, 2017.
[89] California Department of Transportation. 2017. *Status of Projects, Central Region, District 10, January 2017*. Available: http://www.dot.ca.gov/dist10/docs/D10SOP.pdf. Accessed: February 14, 2017.

APPENDIX 4-A: CONCURRENCE LETTER

CALIFORNIA
High-Speed Rail Authority
Northern California Regional Office

September 21, 2021

Jon Cicirelli, Director
City of San Jose Department of Parks, Recreation & Neighborhood Services
200 E. Santa Clara Street
San Jose, CA 95113

Dear Mr. Cicirelli:

On April 24, 2020, the California High-Speed Rail Authority (Authority) released a Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the San Jose to Merced Project Section of the statewide California High-Speed Rail (HSR) System in accordance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). This Draft EIR/EIS documents engineering, environmental analysis, public and agency involvement, and ensuring compliance with state and federal environmental laws and regulations for the proposed project. One federal law, Section 4(f), is the subject of this concurrence request. The Draft EIR/EIS also detailed preliminary determinations for Fuller Park, a Section 4(f) resource located in the City of San Jose. The Authority is currently preparing an Administrative Final EIR/EIS, which includes responses to comments received on the Draft EIR/EIS (including those received from the city) and updated Section 4(f) evaluations.

In addition, on July 10, 2020, the Authority released a Draft EIR/EIS for the San Francisco to San Jose Project Section of the California HSR System also in accordance with CEQA and NEPA. The San Francisco to San Jose Project Section alternatives are divided into geographic subsections. The fifth subsection is the San Jose Diridon Station Approach Subsection between Scott Boulevard in Santa Clara and West Alma Avenue in San Jose. To support a station-to-station analysis with logical termini for the San Francisco to San Jose Project Section, the analysis of the San Jose Diridon Station Approach Subsection was incorporated into San Francisco to San Jose Project Section Draft EIR/EIS. The San Jose Diridon Station Approach Subsection was fully analyzed as part of the San Jose to Merced Project Section Draft EIR/EIS and corresponding technical reports. As a result of incorporating the subsection analysis in both project sections, Section 4(f) resources including Fuller Park in the City of San Jose, are also included in the San Francisco to San Jose Project Section Draft EIR/EIS analysis.

The Authority's Preferred Alternative for the San Jose to Merced Project Section is Alternative 4, which is the same as Alternative A for the San Francisco to San Jose Project Section in the San Jose Diridon Station Approach Subsection. Alternative A is the Authority's Preferred Alternative for that project section. Thus, the Section 4(f) findings under both project sections for each resource are the same, and the Authority is requesting concurrence from the City for these resources for both project sections.

Section 4(f) of the United States Department of Transportation Act of 1966, as amended, and codified in 49 United States Code (U.S.C.) Section 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges and historic sites." The Authority is responsible for Section 4(f) compliance for the HSR Program pursuant to 23 U.S.C. Section 237, under the NEPA Assignment Memorandum of Understanding (MOU) between the Federal Railroad Administration and the State of California, effective July 23, 2019, the Authority is the federal lead agency and is responsible for compliance with NEPA and other federal environmental laws, including Section 4(f) (49 U.S.C. § 303) and related U.S. Department of Transportation orders and guidance. In general, Section 4(f) specifies that the Authority may only approve a project that "uses" the resources mentioned above, if (1) there is no prudent and feasible alternative that avoids the use of Section 4(f) resources, and (2) the project includes all possible planning to minimize harm to those resources. In lieu of making these findings, the Authority also can approve the use of a Section 4(f) resource if it determines that the project will have a "*de minimis*" impact on that resource and the official with jurisdiction over the resource concurs in that determination. For parks, recreation areas, and refuges, the official with jurisdiction (OWJ) is the agency (or agencies) that owns or administers the property.

Additionally, the Authority may approve the temporary occupancy of a Section 4(f) property as minimal and not a use, if the "temporary occupancy" of the property meets the criteria under 23 U.S.C § 774.13(d): it would be of shorter duration than construction; there would be no change in ownership of the land; the scope of the work would be minor; there would be no temporary or permanent adverse changes to the activities, features, or attributes of the property; the property would be fully restored to a condition at least as good as it was prior to the project, that the temporary use would not interfere with the protected activities of the park; and the official with jurisdiction over the resource concurs in that determination.

The Authority has determined that Fuller Park located within the City of San Jose is a Section 4(f) resource; is within the resource study areas of both project sections; and that your agency is the OWJ with respect to this resource. The purpose of this letter is to request concurrence with findings the Authority has made with respect to the *de minimis* finding for Fuller Park, and the minimal nature of the temporary occupancy for Fuller Park. The basis for these findings was originally detailed in Chapter 4, Section 4(f)/6(f) of the San Jose to Merced and San Francisco to San Jose Project Section Draft EIR/EISs[1] and which have been subsequently revised in the Administrative Final EIR/EISs for both project sections based on written and oral comments received on the

[1] Chapter 4, Section 4(f)/6(f), of the San Jose to Merced Project Section Draft EIR/EIS is available at the Authority's website: https://hsr.ca.gov/programs/environmental/eis_eir/draft_san_jose_merced.aspx and Chapter 4, Section 4(f)/6(f), of the San Francisco to San Jose Project Section Draft EIR/EIS is available at: https://hsr.ca.gov/programs/environmental-planning/project-section-environmental-documents-tier-2/san-francisco-to-san-jose-project-section-draft-environmental-impact-report-environmental-impact-statement/.

April 2020 and July 2020 Draft EIR/EISs. A summary of the Authority's findings is set forth below. As noted, the Authority's Preferred Alternative is Alternative 4 for San Jose to Merced and Alternative A for San Francisco to San Jose, which is the same for both project sections in the San Jose Diridon Station Approach Subsection. For simplicity, in the following discussions, references to findings for the Preferred Alternative apply to and are the same for both project sections.

Fuller Park *De Minimis* and Temporary Occupancy Exception Findings

The Preferred Alternative would be at grade and on an embankment adjacent to the park, permanently affecting 0.03 acre (2.6 percent) of the park as shown on Figure 1. The area permanently affected would be acquired by the Authority and includes 0.02 acre currently used for UPRR operations located west of Delmas Avenue. The 0.02 acre contains the existing train control site and an unpaved access road from Fuller Avenue. The Preferred Alternative would shift the existing site approximately 20 feet west and provide a new access road from Fuller Avenue. The Authority would also use this area for a train control site. This permanent easement would maintain public passage when not in use for service vehicles or maintenance of the train control site. This portion of the park does not contain any recreational facilities and is currently used for train operations. East of Delmas Avenue, 0.01 acre of the park adjacent to the current Caltrain right-of-way would be incorporated into the HSR right-of-way. This area is on the northeastern edge of the park, directly adjacent to the existing right-of-way, and does not contain any recreational facilities (Figure 1).

Preferred Alternative construction in these areas would not require closure of the park and the park would remain open for continued use during construction and operations. Access to the park from Fuller Street would not be temporarily or permanently affected. Existing vegetation and/or landscaping within the construction area would be temporarily disturbed, but the affected portions would be restored to pre-construction conditions. Prior to any ground-disturbing activities at the park, a restoration plan would be prepared by the Authority addressing specific actions, sequence of implementation, parties responsible for implementation, and successful achievement of restoration for temporary impacts, such as replanting trees and vegetation that would be removed. Before beginning construction, the contractor would submit the restoration plan for review and obtain Authority approval. The Authority would provide the restoration plan to the City of San Jose Department of Parks, Recreation & Neighborhood Services for review and comment before implementation.

Also, east of Delmas Avenue, another 0.01 acre would be used as an access temporary construction easement (TCE). This area is also on the northeastern edge of the park adjacent to the existing right-of-way and does not contain any recreational facilities (Figure 1). The Authority has determined that the temporary occupancy of Fuller Park under the Preferred Alternative meets the criteria for temporary occupancy that are so minimal so as to not constitute a use (i.e., occupancy would be of shorter duration than construction; there would be no change in ownership of the land; scope of the work would be minor such that both the nature and magnitude of changes to the Section 4(f)

The permanent and temporary occupancy impacts under the Preferred Alternative on Fuller Park would not adversely affect the protected activities, features, or attributes that qualify the park for protection under Section 4(f). Therefore, with the City of San Jose Department of Parks, Recreation & Neighborhood Service's concurrence, the Authority has concluded that the permanent impacts on Fuller Park under the Preferred Alternative would be *de minimis* and intends to approve the determination that the temporary occupancy exception meets the criteria for a temporary occupancy that is "so minimal so as to not constitute a use" pursuant to 23 C.F.R. 774.13(d).

Based on the information set forth above, the Authority has determined that the Preferred Alternative would not adversely affect or otherwise restrict the public's use of the trail or park, nor would it adversely affect the features, attributes, or activities that make the resources eligible for Section 4(f) protection. The Authority seeks your concurrence in this determination. A concurrence clause is provided at the end of this letter for this purpose.

We respectfully request your reply to this matter within 30 days of receipt of this letter. We look forward to continuing our successful working relationship with you as we work to deliver the nation's first HSR project.

Please return a scanned copy of this letter by email to Brett.Rushing@hsr.ca.gov.

Sincerely,

Brett Rushing
Supervising Environmental Planner
Brett.Rushing@hsr.ca.gov

CONCURRENCE:

Based on the information set forth in this letter and on the documents referenced herein, the City of San Jose Department of Parks, Recreation & Neighborhood Services concurs with the Authority's determinations that the San Jose to Merced Project Section and the San Francisco to San Jose Project Section would not adversely affect the activities, features, or attributes that make Fuller Park eligible for Section 4(f) protection. Therefore, the City of San Jose Department of Parks, Recreation & Neighborhood Services concurs in the Authority's determinations that the San Jose to Merced Project Section as well as the San Francisco to San Jose Project Section, would have *de minimis* impact on Fuller Park, and that the temporary occupancy of Fuller Park would be so minimal so as to not constitute a use in accordance with Section 4(f) of the U.S. Department of Transportation Act of 1966.

09/28/2021

Jon Cicirelli, Director
City of San Jose Department of Parks,
Recreation & Neighborhood Services

Date

Note: The Authority's Preferred Alternative (Alternative 4 and Alternative A) are the same for the San Jose to Merced Project Section and the San Francisco to San Jose Project Section, respectively in the San Jose Diridon Station Approach Subsection.

Figure 1 Fuller Park

APPENDIX 5-A: ENVIRONMENTAL JUSTICE OUTREACH PLAN

California High-Speed Rail Project Draft EIR/EIS

San Jose to Merced Project Section **Environmental Justice Outreach Plan**

Prepared by:

Kearns & West Inc.

October 2017

Table of Contents

APPENDIX 5-A: ENVIRONMENTAL JUSTICE OUTREACH PLAN 1-1

1 HIGH-SPEED RAIL AND ENVIRONMENTAL JUSTICE 1
- 1.1 Overview 1
- 1.2 Regulatory Setting 2
  - 1.2.1 U.S. Presidential Executive Order 12898 2
  - 1.2.2 U.S. Presidential Executive Order 13166 3
  - 1.2.3 U.S. Department of Transportation Order 5610.2(a) 3
- 1.3 Project Section Demographics 3

2 ENVIRONMENTAL JUSTICE ADVOCACY AND COMMUNITY GROUPS 7

3 ENVIRONMENTAL JUSTICE OUTREACH 9
- 3.1 Outreach Strategy 9
- 3.2 Outreach Activities 10
- 3.3 Outreach Implementation 11
  - 3.3.1 Public Meetings 12
  - 3.3.2 Environmental Justice Group Events and Meetings 13
  - 3.3.3 Digital Engagement 13
  - 3.3.4 Environmental Justice Organizations and Community Working Group Engagement 14
  - 3.3.5 Deliverables 14

4 REFERENCES 15

ATTACHMENT 1: ADVOCACY AND COMMUNITY GROUPS SERVING LOW-INCOME AND MINORITY POPULATIONS 17

LIST OF TABLES

Table 1 Resource Study Area Ethnic Composition in 2014 5
Table 2 Demographic Characteristics in the Resource Study Area 6
Table 3 Environmental Justice and Transportation Advocacy and Community Groups Active in the Resource Study Area 7
Table 4 Public Participation and Outreach Examples 11

LIST OF FIGURES

Figure 1 Proposed San Jose to Merced Project Section 4
Figure 2 Draft Milestone Schedule for San Jose to Merced Project Section 12

1 HIGH-SPEED RAIL AND ENVIRONMENTAL JUSTICE

In compliance with U.S. Presidential Executive Order (USEO) 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* requiring the avoidance or mitigation of disproportional health and environmental effects on environmental justice populations, the California High-Speed Rail Authority (Authority) develops environmental justice outreach plans for each High Speed Rail (HSR) Project Section. Title VI of the Civil Rights Act of 1964, as amended, states that "no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefit of, or be subjected to discrimination under any program or activity that receives Federal financial assistance." Environmental justice, as mandated by USEO 12898, falls under the umbrella of Title VI. USEO 12898 states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States." USEO 12898 has been adopted as a planning process requirement for all Authority efforts (Authority 2016).

The Authority's definition and application of the term "environmental justice" as it relates to the HSR system is as follows:

> *"Environmental Justice (EJ) is the fair treatment of people of all races, cultures, and income with respect to the development, adoption, implementation and enforcement of environmental laws and policies. Implementation of environmental justice principles in how the Authority plans, designs, and delivers the high-speed rail projects means that [the Authority] recognizes the potential social and environmental impacts that project activities may have on certain segments of the public. [The Authority] recognizes how important provisions of existing environmental, civil rights, civil, and criminal laws may be used to help reduce environmental impact in all communities and environmental justice on the human element. The Authority has included environmental justice considerations in its planning for the statewide high-speed train system since 2000, when it commenced a programmatic environmental review process"* (Authority 2015).

1.1 Overview

This *Environmental Justice Outreach Plan* is prepared to support the environmental study for the San Jose to Merced Project Section (Project Section) of the California HSR program. It is intended to guide the Authority[1] in engaging low-income and minority populations in the resource study area (RSA)[2] to communicate project information, listen to and respond to community thoughts and concerns, and identify potential actions to mitigate any disproportionately high and adverse human health and environmental effects, including social and economic effects, on low-income and minority populations.

The *San Jose to Merced Project Section Draft EIR/EIS* will be a stand-alone, second-tier, project environmental document. The report focuses on the portion of the Project Section between San Jose and Carlucci Road (San Jose to Central Valley Wye project extent, or simply project extent). The San Jose to Central Valley Wye project extent has a length of approximately 91 miles. Beginning at Scott Road, north of San Jose Diridon Station, the corridor primarily follows Monterey Road, U.S. 101, and SR 152 through Pacheco Pass. Desktop research, field surveys, and impact analyses in resource-specific technical reports for this project extent would terminate at Carlucci Road. The Draft EIR/EIS will summarize and include the analysis in the Central Valley Wye Project Section and the Ranch Road Re-examination to extend the corridor to Merced.

The infrastructure and systems of the HSR system would consist of trains (rolling stock), tracks, stations, train control, power systems, and maintenance facilities. The design includes a double-track rail system to accommodate planned project operational needs for uninterrupted rail movement. The system would be

[1] In the context of this plan, *Authority* refers to the California High-Speed Rail Authority or its consultants.

[2] The San Jose to Merced Project Section extends from Scott Boulevard in Santa Clara on the Caltrain Corridor to Carlucci Road and Henry Miller Road in central San Joaquin Valley, northeast of Los Banos. The resource study area (RSA) for environmental justice is concurrent with this area. See Figure 1 for a map of the RSA.

grade-separated from all other transportation systems, with two exceptions: the at-grade alternative at Auzerais Avenue and the at-grade alternative at Virginia Street, both in the San Jose Diridon Station Subsection.

The conceptual design of the station areas (Santa Clara, Diridon, and Gilroy) provides connectivity for different types of transit, drop-off facilities, an entry plaza, a station house area for ticketing and support services, an indoor station room where passengers wait and access the HSR, and parking facilities. Station design has not progressed beyond the conceptual stage, but two locations have been identified near Gilroy to accommodate two proposed corridor alignments. One co-located light maintenance facility (LMF)/maintenance of infrastructure facility (MOIF) would be located in the Gilroy area, and a maintenance of wayside (MOWS) would be located west of Turner Springs Road in the Central Valley.

Surveys and environmental assessments of the San Jose to Merced Project Section were initiated in 2010, and administrative draft reports were completed; however, work on the Project Section was suspended prior to completing the technical reports and the administrative Draft EIR/EIS. Since that time, the Authority has continued to refine the alternatives and limits of construction for this Project Section. The Authority identified the project footprint in summer 2016. From this footprint, the Authority has developed a concise project definition. Technical analysis, station design, and outreach was ongoing through 2016 and the EIR/EIS analysis is underway.

The Authority requires that an environmental justice outreach plan be developed and implemented as part of the Draft EIR. This *Environmental Justice Outreach Plan* provides the following information:

- Summarizes demographics in the RSA and community groups that are stakeholders in the project.
- Describes the strategy for reaching out to, engaging, and gathering input from low-income and minority populations.
- Identifies the specific methods that will be used to implement this strategy, such as digital media, information booths, and presentations to and listening posts with environmental justice advocacy and community groups.
- Lists the documents that will be prepared to document the environmental justice outreach efforts.

The process and guidelines described in this plan are provide a consistent method for sharing information with low-income and minority populations during the environmental review process for this project extent.

1.2 Regulatory Setting

The Authority has a strong commitment to ensuring that no person shall, on the grounds of race, color, national origin, sex, age or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity in the design, construction and operation of the high-speed rail system. Accordingly, the Authority adopted a Title VI programmatic policy that pays careful attention to the needs of limited English proficiency (LEP) and environmental justice populations (Authority 2016).

The following text details additional applicable regulations, requirements, and federal efforts that govern and inform the development and implementation of an environmental justice outreach plan.

1.2.1 U.S. Presidential Executive Order 12898

According to USEO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, projects that receive federal funding should “ensure the full and fair participation by all potentially affected communities in the decision-making process; to avoid/mitigate disproportionately high human health or environmental effects, including social and economic effects, on low-income and minority populations; to prevent the denial of, reduction in, or significant delay in the receipt of benefit by minority populations and low-income populations.” Environmental justice populations, as identified by USEO 12898, comprise Black, Asian American, Native American, Hispanic/Latino (regardless of race), and low-income persons.

To emphasize the importance of USEO 12898, the Obama Administration facilitated a multi-agency signing of the Memorandum of Understanding on Environmental Justice and USEO 12898 in 2011

(Environmental Justice MOU). On the 20th anniversary of the original executive order, President Obama issued a Presidential Proclamation further solidifying the Administration's commitment to environmental justice. The document states that communities historically burdened by pollution—particularly minority, low income and tribal communities—merit protection from environmental and health hazards, access to the federal decision-making process, and access to a healthy environment in which to live, learn, and work. The environmental justice MOU increases federal agency accountability to environmental justice populations and outlines processes to aid overburdened communities and facilitate community engagement in agency decisions.

1.2.2 U.S. Presidential Executive Order 13166

In 2000, President Clinton issued USEO 13166, which provided additional federal guidance about providing information and services to LEP persons. Under USEO 13166, each federal agency is required to examine the services it provides and develop and implement a system by which LEP persons can meaningfully access those services consistent with, and without unduly burdening, the fundamental mission of the agency. Each federal agency must also work to ensure that recipients of federal financial assistance provide meaningful access to their LEP applicants and beneficiaries. To assist the agencies with this endeavor, the Department of Justice has issued general guidance on compliance standards that recipients must follow to ensure that the programs and activities they normally provide in English are accessible to LEP persons and do not discriminate on the basis of national origin in violation of Title VI of the Civil Rights Act of 1964, as amended, and its implementing regulations.

According to the December 2015 USEO 13166 accomplishment report (LEP.gov 2015), federal agencies continue to improve implementation of the USEO 13166 with new tools, training, and resources; stronger coordination; integrated use of data and technology; increased technical assistance; and improved outreach and education.

Accordingly, the Authority provides LEP access, at a minimum, to individuals who are representative of more than 5 percent of the population in California or the county in which the Authority is providing an activity or service.

1.2.3 U.S. Department of Transportation Order 5610.2(a)

The U.S. Department of Transportation (USDOT) Order 5610.2(a) is used by USDOT to comply with USEO 12898. USDOT Order 5610.2 generally describes the process that the Office of the Secretary, and each operating administration within the USDOT, will use to incorporate environmental justice principles (as embodied in USEO 12898) into existing programs, policies, and activities. The order requires the Office of the Secretary, and each operating Administration within USDOT, to develop specific procedures to incorporate the goals of USDOT Order 5610.2 and USEO 12898 with the programs, policies, and activities that they administer or implement.

1.3 Project Section Demographics

For this Project Section, the Authority would provide HSR service between San Jose Diridon Station in downtown San Jose, to a Gilroy station in either downtown Gilroy or east of Gilroy, and a station in downtown Merced. The San Jose to Central Valley Wye project extent would connect San Jose to the Central Valley portion of the HSR system at the Central Valley Wye in Merced County, which in turn connects to the portion of the system running north to Merced and south to Fresno and southern California (Figure 1).

Because the portion of the Project Section between Merced and Carlucci Road has been analyzed in the *Merced to Fresno Section Final EIR/EIS* (Authority and FRA 2012) and the *Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR/EIS* (Authority and FRA no date), the analysis in this document focuses on the project extent between Scott Boulevard and Carlucci Road (San Jose to Central Valley Wye project extent).

Source: Authority and FRA 2016 JULY 2017

Figure 1 Proposed San Jose to Merced Project Section

Based on the 2010-2014 American Community Survey 5-year estimates for Santa Clara, San Benito, and Merced counties, San Benito County had the highest Hispanic/Latino population of the three counties. In Gilroy, more than half of the population was Hispanic/Latino. In 2014, Morgan Hill and San Martin were predominantly white while Gilroy and San Jose had the largest minority populations—approximately 68.5 and 72.5 percent minority, respectively. Morgan Hill was the least racially and ethnically diverse city, with only 50.7 percent minority representation. Table 1 shows the ethnic composition of the three-county region in 2014.

Table 2 shows other regional characteristics regarding income, age, and households. To account for the high regional cost of living in Santa Clara County, the poverty level metric that defines low-income populations for Santa Clara County and its cities has been set at 200 percent of the federal poverty level. As a result, all of the cities identified in Table 2 have a higher rate of low-income individuals than the 16.4 percent statewide average. Within the three-county region, Gilroy has the highest percentage of individuals below poverty level.

Table 1 Resource Study Area Ethnic Composition in 2014

Geographic Area	2014 Population	Percentage of Population (%)							
		Hispanic or Latino	Not Hispanic or Latino						
			White	African American	Native American	Asian	Native Hawaiian/Pacific Islander	Other Race	Two or More Races
California	38,066,920	38.2	39.2	5.7	0.4	13.3	0.4	0.2	2.7
Counties									
Santa Clara	1,841,569	26.7	34.1	2.4	0.2	32.9	0.3	0.2	3.1
San Benito	56,888	57.4	37.1	0.8	0.4	1.9	0.1	0.0	2.1
Merced	261,609	56.3	30.5	3.3	0.4	7.4	0.2	0.2	1.6
Cities and Communities in the RSA									
Santa Clara	119,525	19.1	34.5	3.4	0.3	38.9	0.2	0.2	3.3
San Jose	986,320	33.1	27.5	2.9	0.2	32.9	0.3	0.1	3.0
Morgan Hill	39,875	33.0	49.3	2.6	0.0	10.3	0.3	0.1	4.4
San Martin	7,081	40.4	42.7	0.2	0.7	9.8	4.0	0.2	2.0
Gilroy	50,776	59.0	31.5	1.8	0.0	5.7	0.5	0.0	1.6
Volta	257	19.1	34.5	3.4	0.3	38.9	0.2	0.2	3.3

Source: U.S. Census Bureau 2014
RSA = resource study area.

Table 2 Demographic Characteristics in the Resource Study Area

Geographic Area	Percent Low-Income Individuals	Population Age 65 and Older (%)	Number of Occupied Households	Median Household Income	Percent of Households w/ Limited English Proficiency
California [a]	16.4	12.1	12,617,280	$61,489	9.6
Counties					
Santa Clara [b]	23.3	11.7	614,714	$93,854	11.3
San Benito [a]	12.1	10.5	17,121	$67,874	9.2
Merced [a]	25.6	10.0	76,516	$43,066	13.2
Cities and Communities in the Resource Study Area					
Santa Clara [b]	22.2	10.0	42,751	$93,840	10.0
San Jose [b]	27.6	10.9	310,584	$83,787	13.6
Morgan Hill [b]	24.4	10.5	12,879	$96,232	5.0
San Martin [b]	21.3	15.6	2,033	$107,966	10.0
Gilroy [b]	35.5	8.6	14,922	$81,056	7.4
Volta [a]	9.7	14.8	79	$42,464	17.5

Source: U.S. Census Bureau ACS 2010–2014
[a] For this geography, the low-income level is set at the federal poverty level.
[b] For this geography, to account for the high cost of living, the low-income level is set at 200% of the federal poverty level.

2 ENVIRONMENTAL JUSTICE ADVOCACY AND COMMUNITY GROUPS

The following lists inform the outreach efforts to low-income and minority persons.

- Environmental justice and transportation advocacy groups that are active regionally or on a statewide scale (Table 3).
- Stakeholders and community organizations that provide services to or represent low-income and minority persons in the RSA (Attachment 1).

These organizations and groups advocate on behalf of low-income and minority populations in the RSA and are potential audiences for targeted outreach efforts. Table 3 lists organizations specifically dedicated to environmental justice and transportation, whereas Attachment 1 presents a more inclusive list of low-income and minority populations and organizations that serve those populations. As outreach continues, additional groups may be identified and added to either outreach list. An environmental justice database will be developed and updated periodically to track organizational contacts and outreach efforts.

Many of the environmental justice organizations shown in Table 3 advance environmental justice causes and advocate for minority or low-income populations in the RSA in addition to serving a broader geography. As such, several organizations are headquartered outside of the RSA.

Table 3 Environmental Justice and Transportation Advocacy and Community Groups Active in the Resource Study Area

Organization Name	Description	Website
California Endowment	State-wide grant-making organization that promotes fundamental improvements in the health status of all Californians	http://www.calendow.org/
California Environmental Justice Alliance	Statewide, community-led alliance that works to achieve environmental justice by advancing policy solutions	http://caleja.org/about-us/vision-and-history/
California Pan-Ethnic Health Network	State-wide network that promotes health equity by advocating for public policies and sufficient resources to address the health needs of communities of color	http://cpehn.org/
California Rural Legal Assistance	State-wide environmental justice and legal aid program that provides low-income rural Californians with free legal assistance	http://www.crla.org/
California Wellness Foundation	State-wide grant-making organization that addresses the particular health needs of traditionally underserved populations, including low-income individuals, people of color, youth and residents of rural areas	http://www.calwellness.org/
Center on Race, Poverty, and the Environment	San Joaquin Valley-focused environmental justice organization that seeks to achieve environmental justice and healthy, sustainable communities through collective action and the law	http://www.crpe-ej.org
Central California Environmental Justice Network	San Joaquin Valley-focused environmental justice network focusing on uniting activists and working with community members and stakeholders at local, regional, state and federal levels to eliminate environmental degradation in Valley Communities	http://ccejn.wordpress.com/

Organization Name	Description	Website
Central Coast Alliance United for a Sustainable Economy	Community organizing and advocacy organization that seeks to build grassroots power to invoke social, economic and environmental justice for the people of California's Central Coast Region	https://causenow.org
Central Valley Air Quality Coalition	San Joaquin Valley-focused coalition that works to ensure that all communities, of all races, cultures, class or creed, have the opportunity to be involved in the policy development and regulatory processes improving regional health	http://www.calcleanair.org/
Greenbelt Alliance	Bay Area-focused organization that seeks to protect natural and agricultural lands and shape the rules that govern growth around the San Francisco Bay Area	http://www.greenbelt.org/
Leadership Counsel for Justice and Accountability	San Joaquin Valley-focused, community-organizing advocacy group that seeks to affect land use and transportation planning, public investment priorities, environmental policy, and the provision of basic infrastructure and services	http://www.leadershipcounsel.org/
Policy Link	National research and action institute that advances economic and social equity by “Lifting Up What Works”	http://www.policylink.org/
Rural Community Assistance Corporation	State-wide organization that provides training, technical/financial resources and advocacy for rural communities	http://www.rcac.org/home
The City Project	National organization that works to ensure that all people have access to healthy, livable communities	http://www.cityprojectca.org/
TransForm	Transportation organization that seeks to transform communities and transportation with new solutions, smarter investments, and better planning as well as improve community access, health, justice, and sustainability	http://www.transformca.org/
United Farmworkers	A national farmworker’s union and social justice organization that seeks to provide farm workers and other working people with the inspiration and tools to share in society's bounty	http://www.ufw.org/
Valley Improvement Projects	San Joaquin Valley-focused organization that seeks to improve the quality of life for underrepresented and marginalized residents of California’s Central Valley by promoting social and environmental justice issues through youth outreach, education, technology, and art	https://valleyimprovementprojects.org/
Voices from the Valley	San Joaquin Valley-focused organization that offers a centralized media outlet for Central Valley activist organizations	http://www.voicesfromthevalley.org/

3 ENVIRONMENTAL JUSTICE OUTREACH

In locations where low-income and minority populations could be affected by construction or operations of the project extent, outreach activities will be conducted to solicit community views on the project's potential impacts. The purposes of these outreach activities are to inform local community members of the project and its status; solicit input on thoughts and concerns; and gain an understanding of potentially adverse project effects on low-income and minority communities.

The Authority used demographic and income information to identify minority and/or low-income populations in the RSA. As discussed in Section 1.3, Project Section Demographics, the RSA includes substantial low-income and minority, particularly Hispanic, populations. According to the National Center for Health Statistics (2015), low-income and specific minority populations such as Hispanics are more likely to be dependent on smartphones than on landlines. Similarly, according to the Pew Research Center (2015), low-income and Hispanic populations are more likely to rely on smartphones over computers for internet connectivity.

In order to engage low-income and minority groups in the RSA in the development of the environmental analysis, higher-resolution demographic data have been analyzed to identify key low-income and minority populations and interview environmental justice advocacy and community groups to inform the outreach techniques used to engage these populations. Outreach activities are documented as they occur for inclusion in the Draft EIR/EIS Environmental Justice chapter.

Continued outreach[3] will be needed in low-income and minority populations to provide information about the HSR decisions currently under consideration (Section 1.1, Overview), as well as to address any potential impacts on low-income and minority populations. The low-income and minority populations will also be provided with updates on the entire statewide system, including key milestones and progress. This environmental justice outreach will serve to open lines of communication to gather environmental justice population input and insights on project actions, potential ramifications, and potential mitigation strategies. This information will then be used to inform key decision-making.

3.1 Outreach Strategy

The Authority is committed to implementing a comprehensive outreach program that reaches a broad array of interests throughout the RSA. The Authority will follow the Department of Justice LEP guidance to confirm that information about the project is accessible to LEP persons in the RSA.

The outreach strategy outlined below will be used to engage key environmental justice stakeholders during the project development and environmental review processes. All outreach efforts will be conducted in coordination with the Authority's Northern California Regional Director and the Authority's Offices of Communication and Legislation.

Following are the key strategic objectives of this environmental justice outreach plan:

- Identify and actively engage environmental justice advocacy and community groups and elected officials representing low-income and minority populations throughout the RSA. Provide structured and unstructured opportunities for these groups and officials to provide input.
- Provide clear, concise, and accurate information, in appropriate languages, regarding this Project Section and the development of the environmental impact report (EIR)/environmental impact statement (EIS).
- Identify and address any potential environmental impacts disproportionately borne by low-income and minority populations throughout the RSA.

[3] From 2008 to 2010, the Authority conducted an extensive series of stakeholder meetings in the study area to discuss the project's scoping phase. The stakeholder meetings included minority and low-income populations, and several stakeholder workshops offered translation services and presentations in Spanish.

- Develop and implement multiple avenues of communication for environmental justice stakeholders to receive project information and submit questions and comments (e.g., public meetings, group presentations, activity centers, project website, bilingual hotline).
- Facilitate constructive dialogue between key environmental justice stakeholders and the Authority. Communicate back to low-income and minority populations how feedback has been reflected in the process.
- Communicate the vision, purpose, and benefits of the California HSR system.
- Accurately document and respond to all public input received and meet all CEQA and National Environmental Policy Act (NEPA) requirements.

To achieve the above strategic objectives, the Authority will adhere to the following outreach best practices:

- Proactivity: outreach to low-income and minority populations should happen “early and often” to identify and address environmental justice concerns as far in advance of potential effects as possible.
- Inclusivity: offer early and continuous opportunities for input on project advancements to as broad a spectrum of impacted or interested stakeholders as is feasible.
- Sensitivity: be informed and aware of low-income and minority population sensitivities and historical experiences and relationships; consider these sensitivities in information sharing approaches and techniques.
- Consistency: ensure all presentations, written/visual messaging, and informal conversations are presenting the same information.
- Accessibility: ensure meeting times and locations are accessible to target audiences, prioritizing locations where low-income and minority populations frequent and feel most comfortable and times when they are available, and tailor outreach materials and distribution methods to maximize target audience reach by offering translation services that meet or exceed LEP standards.
- Follow-Through: follow up with stakeholder comments and concerns to the best extent feasible.

3.2 Outreach Activities

Table 4 outlines potential outreach activities the Authority could conduct to engage low-income and minority populations in this project extent. Activities will be vetted before implementation by both Authority staff and environmental justice advocacy and community groups to confirm that they will reach the intended audiences.

Table 4 Public Participation and Outreach Examples

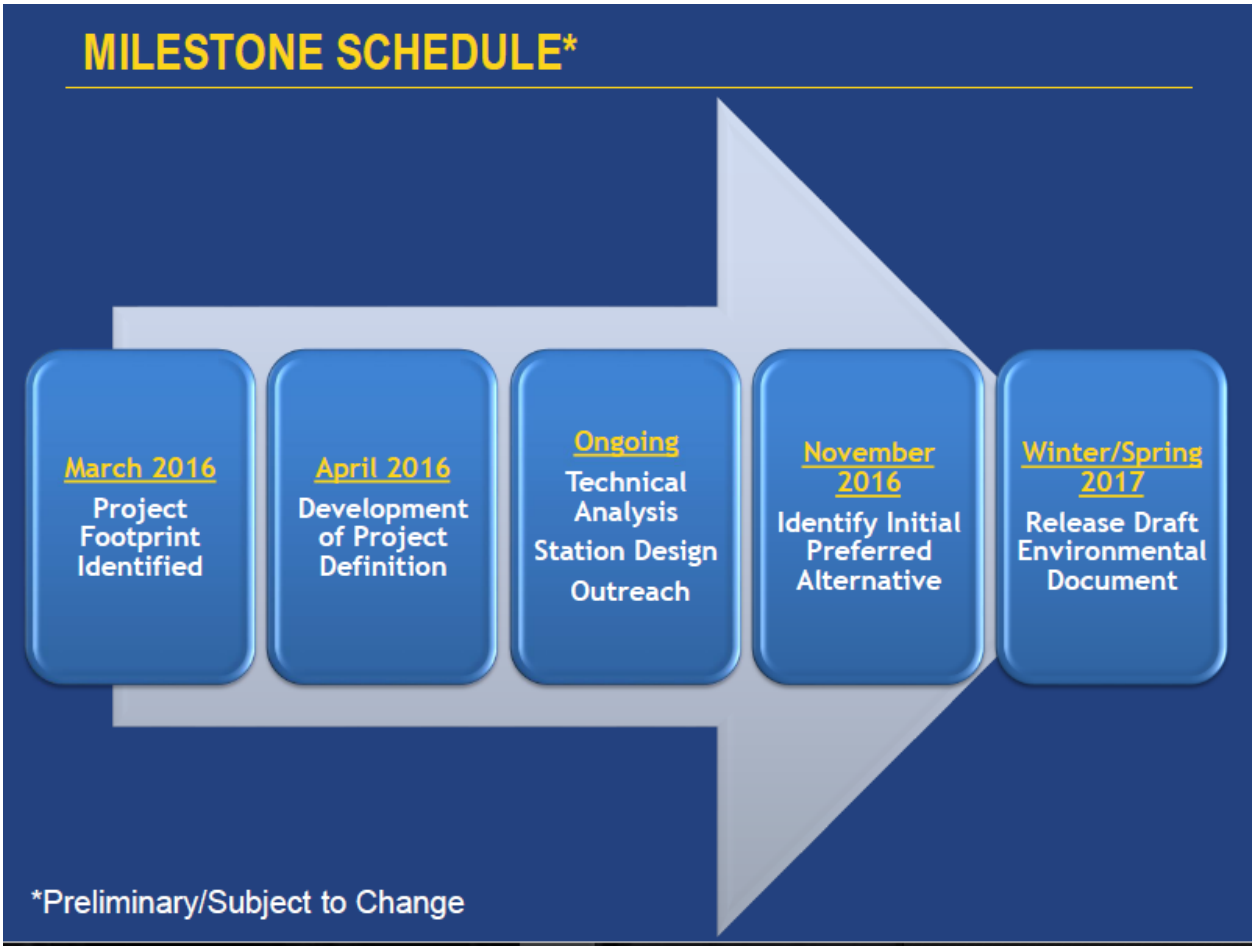
Example Outreach Category	Target Audience	Example Outreach Activity	Intended Outcome
Public meetings	All HSR stakeholders	Host periodic public meetings on the EIR/EIS HSR process in the RSA and solicit public comment	Disseminate key Authority EIR/EIS updates and receive suggestions and feedback via conventional public meetings
Organizational stakeholder contact	Environmental/social justice organizations	Connect with environmental justice advocacy and community groups to gauge their interest in scheduling meetings to offer project suggestions and inform stakeholder outreach processes	Establish a direct line of communication and a credible reputation with influential environmental justice advocacy and community groups who work in the RSA; gather valuable local insights on environmental justice challenges
Local stakeholder contact	RSA stakeholders, especially low-income and minority populations	Provide HSR tables and booths at local fairs and community events	Directly engage members of low-income and minority populations in HSR conversations to share relevant information, answer questions, and listen to perspectives; establish a two-way line of HSR communication in affected communities
Group stakeholder meetings	Multiple stakeholder agencies/ organizations	Organize meetings with multiple RSA advocacy and community groups and host collaborative, round-table discussions on HSR planning and key decisions	Gather and record topical HSR information as it pertains to low-income and minority populations to inform HSR processes
Digital engagement	RSA stakeholders, especially low-income and minority populations	Provide opportunities to participate, learn and provide input via online and mobile options	Directly engage members of low-income and minority populations in HSR without requiring in-person participation or home/office Internet access

HSR = high=speed rail
EIR/EIS = environmental impact report/environmental impact statement
RSA = resource study area

3.3 Outreach Implementation

The following sections present a general implementation approach for the environmental justice outreach strategy. Section 3.3.1, Public Meetings, reviews San Jose to Merced-specific events, or other relevant events organized and hosted by the Authority in which low-income and minority populations or organizations are invited to participate, receive updates, and/or offer feedback. Section 3.3.2, Environmental Justice Group Events and Meetings, reviews an approach to scheduling outreach events at which an HSR outreach representative would share relevant information with target low-income and minority population groups and gather insights from event attendees through any number of activities, such as tabling at public events or presenting to local organizations. Information gathered during these events will inform the HSR decision-making process.

Project milestones, illustrated on Figure 2, include project definition, scoping, technical analysis, identification of preferred alternative, and release of draft environmental document. Outreach efforts will be coordinated to meet these project milestones. Importantly, an environmental justice outreach implementation plan will be developed in concert with this document that will detail outreach specifics including targeted environmental justice populations, calendared events, outreach objectives, and strategies by environmental justice population and event, and outreach tracking and metrics. The implementation plan will be informed by higher-resolution demographics data as well as insights from environmental justice advocacy and community groups.



Source: Authority 2016

Figure 2 Draft Milestone Schedule for San Jose to Merced Project Section

3.3.1 Public Meetings

The Authority and its outreach team will schedule, coordinate, and facilitate public meetings, open houses and environmental review milestone meetings. These meetings will specifically include environmental justice advocacy and community groups to discuss any potential environmental impacts to low-income and minority populations in the RSA.

Meeting notifications may be distributed to the established list of environmental justice advocacy and community groups via email distribution and social media outlets. Advertisements may be placed in local non-English newspapers as determined by local demographics, and mail invitations may be distributed.

The Authority and its outreach team will secure all venues and coordinate logistics for each public meeting. Project fact sheets, welcome sheets, comment sheets and graphic displays will be developed and made available at every meeting.

All public meetings will be advertised and hosted per the requirements and best practices set forth by the Authority, including Title VI and LEP requirements (Authority 2016). These practices include offering translation services at public participation events. The Authority will provide translations of key documents such as comment cards and the draft EIS/EIR for LEP individuals who represent a significant population percentage of the geography in which the Authority is providing an activity or service. LEP regulation requires translation services to be offered when 5 percent of the county or state population being served is an LEP language population. The Authority will evaluate LEP needs at a finer population scale for local

and regional events to adhere to or exceed LEP guidelines as is sufficient to meet local language needs. Specific HSR summary documents and fact sheets for the project extent have been translated into Spanish, Vietnamese, and Chinese. To the extent that these documents are current with project advancements, they will continue to be made available to and advertised to low-income and minority populations. The Authority will develop and translate additional materials as deemed important to outreach efforts.

At the conclusion of each public meeting, meeting notes summarizing public comments and feedback will be prepared for use in further refining project details. The Authority will also develop and maintain a calendar of public outreach meetings and document meeting happenings by producing public meeting summaries that concisely capture key take-away messages from both the Authority and the environmental justice stakeholders in attendance

3.3.2 Environmental Justice Group Events and Meetings

In addition to coordinating Authority-hosted public meetings, the Authority will identify on-the-ground outreach opportunities through which they will increase their communication and engagement with low-income and minority populations in the RSA. These outreach opportunities will be coordinated with project milestones to share and gather timely and relevant information. The Authority will develop and maintain a calendar of potential environmental justice events and update the calendar periodically with upcoming events. The Authority will send advance notification of outreach events to environmental justice advocacy and community groups to allow environmental justice stakeholders to schedule accordingly. An HSR outreach representative will attend each of the approved identified events to share with and receive relevant information from the target environmental justice audience using the most relevant outreach strategy for the identified event (e.g., tabling at public events, presenting to local organizations, speaking on a webinar). The Authority will provide information about the process in a format that environmental justice organizations and elected officials representing low-income and minority populations can easily distribute to their constituents, such as in-language constituent newsletters and community news items.

In addition to public outreach, the Authority will coordinate with cultural resources specialists to ensure that historical resources that might be associated with well-established ethnic or other groups are identified. Such properties have the potential to be eligible for the National Register of Historic Places as traditional cultural properties. These properties can be defined generally as those that are eligible for inclusion in the National Register of Historic Places because they are associated with cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community. "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. The following examples of properties are those that possess such significance:

- A location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world.
- A rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents.
- An urban neighborhood that is the traditional home of a particular cultural group, and that reflects its beliefs and practices.
- A location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice.
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historic identity.

3.3.3 Digital Engagement

The Authority will develop ways for environmental justice stakeholders to learn about the project and provide input via smartphones and other mobile devices. For example, using mobile polling at community

events and public meetings or providing project information accessible via smartphones. The Authority will identify digital engagement opportunities that allow busy people to engage outside of work hours, do not require travel, and require an hour or less of participation. The Authority will use social media and digital outreach to provide information about broader engagement opportunities. All potential digital engagement approaches will be vetted by environmental justice advocacy and community groups to confirm each approaches potential for effective engagement and to leverage increased participation.

3.3.4 Environmental Justice Organizations and Community Working Group Engagement

The Authority will conduct quarterly community working group meetings in San Jose, Morgan Hill, Gilroy, and Los Banos over the course of the environmental review as a key venue for collaborative problem-solving and as a way to inform and shape the environmental review. Community working groups provide feedback from local communities and elected officials, insight on a wide variety of key considerations related to the environmental review, best methods to reach and engage constituency groups, and perceptions and feedback received from broader constituencies. The Authority will identify two to three environmental justice organizations to participate in each community working group. In addition, the Authority will conduct periodic check-ins with environmental justice groups to seek advice and input on the outreach effort. These environmental justice groups will be selected based on each groups' history of engagement with affected environmental justice populations and interest and willingness to communicate with the Authority. If there is greater interest on the part of the environmental justice organizations than there is capacity to communicate with each consistently, the Authority will narrow selected environmental justice partners based on maximum outreach potential.

3.3.5 Deliverables

The implementation of the outreach strategy and outreach activities detailed previously will lead to the following deliverables that will inform, among other items, project refinements, environmental mitigation plans, and future outreach activities:

- **Environmental justice database**: a database tool that records organizational contacts and tracks outreach efforts over time, including participation of environmental justice organizations, elected officials and stakeholders in community working group meetings, open houses, environmental milestone meetings and other venues and forums.
- **Environmental justice outreach implementation plan**: a detailed plan for environmental justice outreach implementation that specifies outreach strategies and techniques for each targeted environmental justice population, outreach objectives and tracking metrics, level of effort by project milestone, and outreach documentation.
- **External outreach meeting schedule**: a calendar of external outreach meetings or events at which an Authority representative will be present; this schedule will be reviewed and approved by Authority staff prior to implementation.
- **Internal outreach meeting schedule**: a calendar of outreach meetings or events hosted by the Authority.
- **Meeting agendas and notes**: draft agendas, internal and public meeting summaries, and feedback documentation for all environmental justice outreach-related internal and external meetings.
- **Meeting materials**: invitations, notices, signage, handouts, displays, staffing guides, and other relevant meeting/event materials; translated meeting materials will be provided for LEP populations in accordance with LEP regulation.
- **Digital content:** draft language for key environmental justice outreach and engagement efforts (e.g., social media pushes, mobile polls, website updates)

4 REFERENCES

California High-Speed Rail Authority (Authority). 2015. *Title VI Limited English Proficiency& Environmental Justice Annual Accomplishments Report*.

———. 2016. *Title VI Program*. http://hsr.ca.gov/Programs/title_VI_program.html (accessed May 31, 2016).

California High-Speed Rail Authority and Federal Railroad Administration (Authority and FRA). 2012. *Merced to Fresno Section Project Final Environmental Impact Report/Environmental Impact Statement.* April 2012.

———. 2017. *Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR/EIS* (available at http://www.hsr.ca.gov/Programs/Environmental_Planning/draft_merced_fresno.html

LEP.gov. 2015. Federal Interagency Website. *Executive Order 13166: LEP Accomplishment Report - Advancing Meaningful Access for Limited English Proficient Persons (December 18, 2015)*. www.lep.gov/13166/20151218_EO_13166_accomplishment_report.pdf (accessed March 30, 2016).

National Center for Health Statistics. 2015. *Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, January–June 2015.* http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201512.pdf (accessed March 31, 2016).

Pew Research Center. 2015. *U.S. Smart Phone Use in 2015.* http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/ (accessed March 31, 2016).

U.S. Census Bureau. 2014. *2010-2014 American Community Survey 5-Year Estimates*. ACS Demographic and Housing Estimates, Poverty Status in the Past 12 Months, Population 65 Years and Over in the United States**,** and Median Household Income Tables*.* http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml (accessed March, 2016).

Attachment 1: Advocacy and Community Groups Serving Low-income and minority Populations

The following list of organizations serve minority and/or low-income communities in the resource study area. This list will be periodically updated to reflect organizational changes or additions.

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Acacia Mobile Home Park	Mobile home park	Morgan Hill		18055 Monterey Rd, Morgan Hill, CA 95037		(408) 778-0177
Adams Broadwell Joseph & Cardozo (Attorneys)	Law Firm working on behalf of the labor movement to give a voice to workers and their families in their struggle to secure safe and sustainable jobs and communities	Sacramento	Daniel L. Cardozo	520 Capitol Mall # 350, Sacramento, CA 95814	dcardozo@adamsbroadwell.com	(916) 444-6201
Almaden Seniors Association	501 (C)(3) non-profit corporation that supports the City of San Jose Senior Program	San Jose, CA	Dominique Pacolba	6445 Camden Ave	dominique.pacolba@sanjoseca.gov	(408) 268-1133
Breathe California	Lung health organization that works in the Bay Area to fight lung disease in all its forms and works with its communities to promote lung health	Bay Area, San Benito County, Merced County	Ramya Chitatoor	1469 Park Ave. San Jose, CA 95126	ramya@lungsrus.org	(408) 998-5865
San Jose District 6 Leadership Group	Self-directed group of independent nonpartisan neighborhood association, neighborhood business, school and community leaders group organized to improve communication, research issues, that make recommendations and hold educational meetings to improve the District 6 community and San Jose	San Jose, CA				
Gavilan College	Local community college and administrator of the Gavilan Joint Community College District with campuses in Gilroy and Coyote Creek	Gilroy, CA	Jan Bernstein Chargrin	5055 Santa Teresa Boulevard Gilroy, CA 95020	jbchargin@gavilan.edu	(408) 848-4724

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Gilroy Economic Development Corporation	501 (C) (3) non-profit corporation that offers a business assistance model for site selection services, rich data, workforce support and training, and assistance on permitting and development processes	Gilroy, CA	Tammy Brownlow	7471 Monterey Street, Gilroy, CA 95020	president@gilroyedc.org	(408) 847-7611
Gilroy Growing Smarter	Coalition of Gilroy residents who promote good stewardship of Gilroy and its land resources	Gilroy, CA	Connie Rogers	7690 Santa Theresa Drive, Gilroy, CA 95020		
Grassland Environmental Educational Center	Center that depicts the many significant contributions that wildlife managers, the agricultural community, sportsmen and environmentalists make in conserving San Joaquin Valley wetland and farmland resources	Los Banos, CA	Candace Sigmond	18110 Henry Miller Ave, Los Banos, CA 93635		(209) 704-4772
Lenders of Community Development (LCD) of San Jose	Development organization that assists families in becoming homeowners, offers small business loans to low-income individuals, finances the construction of affordable housing, and provides loans for community facilities	San Jose, CA		111 W. St. John Street, Suite 800, San Jose, CA	info@opportunityfund.org	(408) 297-0204
Madera County Economic Development Commission	Commission that assists with business recruitment, expansion and retention with a particular focus on new job creation	Madera County, CA	Bobby Kahn	2425 West Cleveland Avenue, Suite 101, Madera, CA	bkahn@maderacountyedc.com	(559) 675-7768
Oak Grove School District	School district serving southern Santa Clara County	Southern Santa Clara County, CA	Laura Phan	6578 Santa Teresa Blvd. San Jose, CA 95119-1204	business_support_services@ogsd.net	(408) 227-8300, ext. 100216
San Jose Downtown Residents Association	Residents association representing a diverse socio-economic group of residents in the downtown San Jose core that promotes partnerships with the city government and neighborhood businesses	San Jose, CA	Steve Barkley	PO Box 90264, San Jose, CA 95113-9998	info@sjpeople.org	

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
San Jose Strong Neighborhoods Initiative	Partnership between the City of San Jose, the Redevelopment Agency and San Jose's residents and business owners to strengthen the city's neighborhoods by building clean, safe and strong neighborhoods with independent, capable, and sustainable neighborhood organizations	San Jose, CA	Steve McHarris	200 E. Santa Clara Street, 3rd Floor, San Jose, CA 95113	customerservice@sanjoseca.gov	(408) 535-3555
San Jose Unified School District - River Glen	School district serving the City of San Jose	San Jose, CA	Nancy Albarran	855 Lenzen Avenue, San Jose, CA 95126	nalbarran@sjusd.org	(408) 535-6000
San Jose Word of Faith Christian Center	Faith organization working to foster economic vitality in San Jose	San Jose, CA		873 Delmas Ave, San Jose, CA 95125	General1@sjwofcc.org	(408) 295-0877
Santa Teresa Citizen Action Group	Citizen group that educates residents about neighborhood issues					
Silicon Valley Land Conservancy	Conservancy that maintains and promotes the downtown San Jose core as a livable, family-oriented community with a high quality of life	San Jose, CA	Craig Edgerton	117 Bernal Rd, # 70-181 San Jose, CA 95119	cedgerton@siliconvalleylc.org	(408) 460-1102
Silicon Valley Leadership Group	Leadership group that provides an open and transparent view of where local candidates for office in Silicon Valley stand on key issues that impact our local economy and quality of life	San Jose, CA	Chris O'Connor	2001 Gateway Place, Suite 101E, San Jose, CA 95110	coconnor@svlg.org	(408) 501-7884
South Bay Labor Council	Labor Council representing 97 unions and over 100,000 union members in Santa Clara and San Benito counties	South Bay	David Urhausen	2102 Almaden Road, Suite 114 San Jose, California 95125	David@southbaylabor.org	(408) 606-2060
Southside Community Center	Community center that offers classes to local residents	San Jose, CA		5585 Cottle Rd. San Jose, CA, 95123		(408) 629-3336

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Templo La Hermosa	Church in San Jose	San Jose, CA		59 South Montgomery St. San Jose, CA 94103, United States	info@tlahermosa.org	(408) 293-4406
Train Riders Association of California	Association that helps in community engagement for transportation planning and advocacy for Bay Area transit			1025 9th St, Sacramento, CA 95814		(916) 557-1667
Transportation Solutions Defense and Education Fund	Blog that covers transportation news specifically related to CA HSR; offers a repository of ideas for how to achieve a better future by shifting transportation funding	Bay Area		P.O. Box 151439 San Rafael, CA 94915	info@transdef.org	(415) 331-1982
United Neighborhoods of Santa Clara County	A coalition of neighborhood associations and homeowners associations in Santa Clara County	Santa Clara County	Ken Podgorsek	P.O. Box 90430 San Jose, CA 95109	execdir@unscc.org	
United Way Silicon Valley	Organization focused on community resources for families and individuals in San Jose, specifically for education and raising children	San Jose, CA	Sandra Miley	1400 Parkmoor Ave, Suite 250 San Jose, CA 95126	Sandra.Miley@uwsv.org	(408) 345-4302
USDA Natural Resource Conservation Service	Service supporting farmers and ranchers with financial assistance to improve the environment and agricultural operations	National; offices in Half Moon Bay/Santa Rosa/Salinas	Carlos Suarez	430 G Street #4164 Davis, CA 95616-4164	Carlos.Suarez@ca.usda.gov	(530) 792-5600
Vistapark, Encore and Echo Valley, Parkview Valley Community Association	Community association enabling participation in neighborhood activities	San Jose, CA (Vista Park)		Meetings in Vista Park		
Village of the Four Seasons Mobile Home Community	Mobile home community			200 Ford Road San Jose, CA 95138		(408) 225-7255

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Santa Clara Valley Transportation Authority Riders Union	Group that advocates for those who use mass transit in Santa Clara County	Santa Clara, CA	Eugene Bradley, Founder		info@vtaridersunion.org	
Washington Area Community Coalition	Coalition committed to improving living conditions in neighborhoods facing injustices	San Jose, CA			waccgroup@yahoogroups.com	
Wilderness Society	Conservation organization protecting wildlands and associated benefits (e.g. air and water quality)	San Francisco, CA	Adam Bad Wound	250 Montgomery St Suite 210, San Francisco, CA 94104	Badwound@tws.org	(415) 398-1111 x104
Winchester Neighborhood Action Committee	Social network for the Winchester area to RSVP to neighborhood meetings and learn about meeting agendas	San Jose, CA (Winchester)				

APPENDIX 5-B: ENVIRONMENTAL JUSTICE ENGAGEMENT SUMMARY REPORT

California High-Speed Rail Authority

San Jose to Merced Project Section

Environmental Justice Engagement Summary Report

February 2022

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

TABLE OF CONTENTS

1 INTRODUCTION 1-1

2 FEDERAL AND STATE LAWS, REGULATIONS, AND ORDERS 2-1
2.1 Federal 2-1
2.1.1 Title VI of the Civil Rights Act of 1964 2-1
2.1.2 U.S. Presidential Executive Order 12898 and Accompanying Presidential Memorandum 2-1
2.1.3 U.S. Department of Transportation Order 5610.2C 2-1
2.1.4 Federal Transit Administration Circular 4703.1 2-1
2.1.5 U.S. Presidential Executive Order 13166 2-2
2.1.6 Americans with Disabilities Act (42 U.S.C. §§ 12101–12213) 2-2
2.1.7 Uniform Relocation Assistance and Real Property Acquisition Act (42 U.S.C. § 61) 2-2
2.2 State 2-2
2.2.1 California Government Code 65040.12(e) 2-2
2.2.2 California Relocation Assistance Act (Gov. Code, § 7260 et seq.) 2-3
2.2.3 California Government Code Section 11135(a), 11136 2-3
2.2.4 California Global Warming Solutions Act of 2006 (SB 535) (De León) 2-3
2.3 Authority Commitment 2-3

3 MINORITY POPULATIONS AND LOW-INCOME POPULATIONS 3-1
3.1 Definition of Reference Community and Resource Study Area 3-1
3.2 Methods for Identification of Minority Populations and Low-Income Populations 3-1
3.3 Minority Populations and Low-Income Populations within the Reference Community and RSA 3-1

4 OUTREACH TO MINORITY POPULATIONS AND LOW-INCOME POPULATIONS 4-1
4.1 Early Project Phase Public and Agency Outreach 4-2
4.1.1 Project Scoping and Notice of Preparation (December 2008 to March 2009) 4-2
4.1.2 Alternatives Analysis Agency and Public Participation (September 2009 to May 2010) 4-2
4.1.3 Issues Raised during Early Project Phase Outreach 4-3
4.2 Outreach Efforts during the Design Phase 4-4
4.2.1 Environmental Justice Outreach Plan 4-4
4.2.2 Outreach Methods and Technology 4-4
4.3 Outreach Efforts After the Release of the Draft EIR/EIS 4-18
4.3.1 Environmental Justice Outreach Not Related to Community Improvements 4-18
4.3.2 Environmental Justice Community Improvements Outreach 4-19
4.4 Key Issues Identified during Stakeholder Engagement 4-22
4.4.1 Prior to the Publication of the Draft EIR/EIS 4-22
4.4.2 After Publication of the Draft EIR/EIS 4-24

5 ONGOING ENVIRONMENTAL JUSTICE ENGAGEMENT ACTIVITIES 5-1

6 REFERENCES 6-1

Tables

Table 1 Minority Populations and Low-Income Populations (2014 Estimates) 3-2
Table 2 Organizations Contacted 4-6
Table 3 Interviews with Stakeholder Organizations Conducted in 2016 4-8
Table 4 Interviews with Stakeholder Organizations Conducted in 2018 and 2019 4-9
Table 5 Interviews with Stakeholder Organizations Conducted between November 2019 and April 2020 4-12

Figures

Figure 1 Locations of Environmental Justice Outreach Activities 4-14

Attachments

Attachment A: Environmental Justice Outreach Plan
Attachment B: List of Outreach Meetings Held for Project
Attachment C: Biannual Environmental Justice Outreach Reports
Attachment D: Environmental Justice Outreach, September 2021

ACRONYMS AND ABBREVIATIONS

ACS	American Community Survey
ADA	Americans with Disabilities Act
Authority	California High-Speed Rail Authority
CEQA	California Environmental Quality Act
EIR	environmental impact report
EIS	environmental impact statement
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
Gov. Code	California Government Code
HSR	high-speed rail
I-	Interstate
LEP	limited English proficiency
NEPA	National Environmental Policy Act
Outreach Plan	Environmental Justice Outreach Plan
project	San Jose to Central Valley Wye Project Extent
Project Section	San Jose to Merced Project Section
RSA	resource study area
SB	Senate Bill
SR	State Route
UPRR	Union Pacific Railroad
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Act
US	U.S. Highway
USDOT	U.S. Department of Transportation
USEO	U.S. (Presidential) Executive Order
U.S.C.	United States Code

1 INTRODUCTION

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix:

- References to older versions of U.S. Department of Transportation (USDOT) Order 5610.2C, issued May 14, 2021, were updated to Order 5610.2C in this appendix.
- Demographic data was updated in Table 1, based on confirmation with the original data sources. Text discussing the content of Table 1 was updated.
- Section 4.2.2.4, Interviews Related to Environmental Justice, was updated to include interviews conducted between November 2019 and April 2020, including new Table 5 and updated Figure 1.
- Section 4.2.2.5, Environmental Justice–Focused Meetings and Other Events, was updated to include outreach events between January and April 2020.
- Section 4.2.2.6, Group Stakeholder and Community Working Group Meetings, was updated.
- Section 4.3, Outreach Efforts After the Release of the Draft EIR/EIS, and Section 4.4.2, After Publication of the Draft EIR/EIS, were added.
- Chapter 5, Ongoing Environmental Justice Engagement Activities, was updated to state the California High-Speed Rail Authority's (Authority) commitment to ongoing engagement with communities and individuals that would be affected by the project after release of the Final EIR/EIS and adoption of the Record of Decision.
- Attachment D, Environmental Justice Outreach, September 2021, was added.

Environmental justice is the fair treatment of people of all races, cultures, and income with respect to the development, adoption, implementation, and enforcement of environmental laws and policies. The roots of environmental justice are in Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color, and national origin, including the denial of meaningful access for persons with limited English proficiency, in programs and activities receiving federal financial assistance. The Authority is committed to incorporating environmental justice considerations into its program, policies, and activities, and complies with federal, state, and other laws and regulations relevant to environmental justice.

U.S. Presidential Executive Order (USEO) 12898 (1994), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to "ensure the full and fair participation by all potentially affected communities in the decision-making process; to avoid/mitigate disproportionately high and adverse human health and environmental effects, including interrelated social and economic effects of their programs, policies and activities on low-income and minority populations; and to prevent the denial of, reduction in, or significant delay in the receipt of benefits to low-income and minority populations." A key component of compliance with USEO 12898 is outreach to potentially affected minority populations and low-income populations. Minority populations and low-income populations are defined by USDOT Order 5610.2C (May 2021) as follows:

- A *minority population* means any readily identifiable group or groups of minority persons who live in geographic proximity and, if circumstances warrant, geographically dispersed or transient persons (such as migrant workers, students, or Native Americans). Minority includes persons who are Black, Hispanic or Latino, Asian American, American Indian and Alaska Native, and Native Hawaiian and other Pacific Islander.
- *Low-income* means a person whose median household income is at or below the U.S. Department of Health and Human Services poverty guidelines. A locally developed threshold or a percentage of median income for the area may also be used, provided that the threshold is at least as inclusive as the poverty guidelines. A *low-income population* means any readily identifiable group of low-income persons who live in geographic proximity and, if

circumstances warrant, geographically transient persons (such as migrant workers, students, or Native Americans).

Additionally, USEO 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP), issued in 2000, requires that federal agencies take reasonable steps to make sure that LEP persons have meaningful access to information about the agency's programs and activities (including projects) and states that "each Federal agency shall prepare a plan to improve access to its federally conducted programs and activities by eligible LEP persons."

This *San Jose to Merced Project Section Environmental Justice Engagement Summary Report* provides an overview of the identification of minority populations and low-income populations in the vicinity of the San Jose to Merced Project Section (Project Section) of the California High-Speed Rail (HSR) System. The report focuses on the portion of the Project Section between San Jose and Carlucci Road (San Jose to Central Valley Wye Project Extent, or simply project). It documents and summarizes engagement activities undertaken to involve members of minority populations and low-income populations in communities along the project alignment during the planning and design of the HSR project. It focuses on outreach and communication with these populations and documents successful efforts to engage individuals and community groups in an open dialog about project benefits and impacts, and to work cooperatively in refining the design of the project alternatives. This report does not provide an exhaustive discussion of the substantial outreach and coordination during the development of the HSR program. Additional information on the outreach and engagement activities, particularly materials related to public outreach and scoping, can be accessed via the Authority's website, www.hsr.ca.gov.

2 FEDERAL AND STATE LAWS, REGULATIONS, AND ORDERS

This chapter provides an overview of the applicable federal and state laws, regulations, orders, and plans that are relevant to the analysis of environmental justice.

2.1 Federal

2.1.1 Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act (42 United States Code [U.S.C.] § 2000(d) et seq.) was enacted as part of the landmark Civil Rights Act of 1964. It prohibits discrimination based on race, color, and national origin in programs and activities receiving federal financial assistance.

2.1.2 U.S. Presidential Executive Order 12898 and Accompanying Presidential Memorandum

USEO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs recipients and subrecipients of federal financial funding or other assistance to develop an agency-wide strategy to achieve environmental justice in its planning and project delivery. The Presidential Memorandum accompanying USEO 12898 emphasizes the importance of existing laws, such as Title VI of the Civil Rights Act of 1964 and the National Environmental Policy Act (NEPA) of 1969, that can assist with implementation of the principles of the order. The memorandum provides that, in accordance with Title VI, "each Federal agency shall ensure that all programs or activities receiving Federal assistance that affect human health or the environment do not directly, or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin." It calls for specific actions to be directed in NEPA-related activities. They include:

- Analyzing environmental effects, including human health, economic, and social effects on minority populations and low-income populations when such analysis is required by NEPA.
- Making sure that mitigation measures outlined or analyzed in environmental assessments, EISs, and Records of Decision, whenever feasible, address disproportionately high and adverse environmental effects or proposed actions on minority populations and low-income populations.
- Providing opportunities for community input in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving accessibility to public meetings, official documents, and notices to affected communities.

2.1.3 U.S. Department of Transportation Order 5610.2C

The USDOT issued Order 5610.2C, Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, on May 14, 2021. This order reaffirms the USDOT's commitment to environmental justice and clarifies aspects of the 1997 Environmental Justice Order. It describes how the objectives of environmental justice will be integrated into planning and programming, rulemaking, and policy formulation. The order sets forth steps to prevent disproportionately high and adverse effects on minority populations and low-income populations through environmental justice analyses conducted as part of federal transportation planning and NEPA provisions. It also describes the specific measures to be taken to address instances of disproportionately high and adverse effects and sets forth relevant definitions.

2.1.4 Federal Transit Administration Circular 4703.1

The Federal Transit Administration (FTA) Circular 4703.1, Environmental Justice Policy Guidance for Federal Transit Administration Recipients, provides guidance on incorporating environmental justice principles into transportation plans, projects, and activities that receive financial assistance from the FTA. It provides recommendations on how to fully engage minority populations and low-income populations in the public transportation planning and decision-making process; how to

determine whether minority populations and low-income populations would be subjected to disproportionately high and adverse effects; and how to avoid, minimize, or mitigate these effects.

2.1.5 U.S. Presidential Executive Order 13166

USEO 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP), requires each federal agency to make sure that recipients of federal financial assistance are provided meaningful access to their programs and activities, including applicants and beneficiaries with limited English proficiency. It requires that agencies examine the services they provide, identify needs for services to those with limited English proficiency, and develop and implement systems to provide those services.

2.1.6 Americans with Disabilities Act (42 U.S.C. §§ 12101–12213)

The Americans with Disabilities Act (ADA) of 1990 prohibits discrimination against persons with disability and requires equal opportunity in employment, state and local government services, public accommodations, commercial facilities, and transportation.

2.1.7 Uniform Relocation Assistance and Real Property Acquisition Act (42 U.S.C. § 61)

The Uniform Relocation Assistance and Real Property Acquisition Act (Uniform Act) of 1970 stipulates that persons displaced from homes, businesses, and farms as a result of a federal action or by an undertaking involving federal funds must be treated fairly, consistently, and equitably. This protects people so that they will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

The objectives of the Uniform Act are to:

- Provide uniform, fair, and equitable treatment of persons whose real property is acquired or who are displaced in connection with federally funded projects.
- Make certain relocation assistance is provided to displaced persons to lessen the emotional and financial impact of displacement.
- Make certain that no individual or family is displaced unless decent, safe, and sanitary housing is available within the displaced person's financial means.
- Help improve the housing conditions of displaced persons living in substandard housing.
- Encourage and expedite acquisition by agreement and without coercion.

2.2 State

An environmental justice analysis is required by federal law but is not explicitly required by the State of California. The California Environmental Quality Act (CEQA) focuses on whether a project would have a significant impact on the physical environment and whether the environmental impacts of a project would cause substantial adverse impacts on human beings. Although specific provisions of CEQA require consideration of how the environmental and public health burdens of a project would affect certain communities (e.g., through consideration of the environmental setting and the assessment of cumulative impacts of a project), CEQA does not directly address environmental justice or the fair treatment of individuals and communities, and, as a result, CEQA determinations are not included in this report. Nevertheless, the well-established CEQA principles and provisions of California Government Code Section 11135 impose environmental justice obligations that local governments must consider when approving specific projects and planning for future development.

2.2.1 California Government Code 65040.12(e)

California Government Code (Gov. Code) Section 65040.12(e) defines *environmental justice* as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.”

2.2.2 California Relocation Assistance Act (Gov. Code, § 7260 et seq.)

In parallel with the federal law, the California Relocation Assistance Act requires state and local governments to provide relocation assistance and benefits to displaced persons because of projects undertaken by state and local agencies that do not involve federal funds. However, because the HSR system receives federal funding, the Uniform Relocation Assistance and Real Property Acquisition Act takes precedence.

2.2.3 California Government Code Section 11135(a), 11136

California Government Code Section 11135(a) prohibits discrimination or the denial of full and equal access to benefits of any program or activity operated or funded by the state or a state agency based on race, national origin, ethnic group identification, religion, age, sexual orientation, color, or disability. This provision requires local agencies to consider fairness in the distribution of environmental benefits and burdens. It is enforced through Section 11136, which reduces or eliminates state funding of local government agencies determined to be in violation of Section 11135(a).

2.2.4 California Global Warming Solutions Act of 2006 (SB 535) (De León)

The California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund requires a CEQA analysis to identify disadvantaged communities for investment opportunities, as specified. The bill requires the California Department of Finance, when developing a specified 3-year investment plan, to allocate 25 percent of the available moneys in the Greenhouse Gas Reduction Fund to projects that provide benefits to disadvantaged communities, as specified, and to allocate a minimum of 10 percent of the available moneys in the Greenhouse Gas Reduction Fund to projects in disadvantaged communities. The bill requires the California Department of Finance, when developing funding guidelines, to include guidelines for how administering agencies should maximize benefits for disadvantaged communities. Senate Bill (SB) 535 also requires that the administering agencies report to the California Department of Finance, which in turn, provides a description of how these agencies have fulfilled specified requirements relating to projects providing benefits to, or located in, disadvantaged communities to the Legislature in a specified report.

2.3 Authority Commitment

The Authority has included environmental justice considerations in its planning for the California HSR System since 2000, when it commenced a programmatic environmental review. The Authority's Environmental Justice Guidance follows the best practices of the FTA Circular 4703.1 and is guided by a commitment to provide equal protection under the laws to all people.

In August 2012, the Chief Executive Officer of the Authority, Jeff Morales, signed the Policy Directive Number Poli-SB-02 related to environmental justice. The directive stated:

> *The California High-Speed Rail Authority (Authority) promotes Environmental Justice into its programs, policies, and activities to avoid, minimize or mitigate disproportionately high human health, environmental effects, including social and economic effects on minority [populations] and low-income populations. It is the policy of the Authority to duly emphasize the fair and meaningful involvement of all regardless of race, color, national origin or income with respect to the high-speed rail project planning, development, operations and maintenance. This policy directs the Authority to appropriately engage the public through public participation forums so that decisions are mitigated and reflects environmental justice for all communities. This commitment strives to inspire environmental justice and equal access.*

Consistent with this directive, in August 2012 the Authority also published guidance that listed relevant federal and state policies and guidelines on environmental justice and provided instructions on how these policies and guidance should be interpreted and implemented in HSR

environmental analysis documents. According to the guidance, there are three fundamental environmental justice principles:

- To avoid, minimize, or mitigate disproportionately high human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To promote the full and fair participation by all affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

Based on this guidance, for individual Project Sections, the identification and documentation of efforts to assess the impact of the HSR project on minority populations and low-income populations is to be included in the environmental justice chapter of each project-level EIR/EIS. The environmental justice chapter must document outreach events held to engage minority populations and low-income populations. The chapter must conclude with a determination of whether the project would result in disproportionately high and adverse effects on minority populations and low-income populations and provide for mitigation so that the project meets the Authority's commitments regarding environmental justice.

3 MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

Environmental justice effects are evaluated by determining whether there is a potential for disproportionately high and adverse effects from the project on minority populations and low-income populations. In addition to minority populations and low-income populations, the environmental justice analysis also examines the distribution of sensitive populations, such as linguistically isolated, disabled, or elderly persons. This section defines the reference community and resource study area (RSA) for the analysis, summarizes the methods for identification of minority populations and low-income populations, and provides an overview of the minority populations and low-income populations within the reference community and RSA.

3.1 Definition of Reference Community and Resource Study Area

The reference community for the environmental justice analysis is the three-county region of Santa Clara, San Benito, and Merced Counties. This area represents the general population that could be affected adversely and beneficially by the project alternatives. Information for these three counties provides context and allows for comparison and contrast between communities within the RSA and the surrounding areas.

The RSA for direct and indirect effects on minority populations and low-income populations is defined as the census tracts partially or fully within the project alternatives' footprints and a 0.5-mile buffer zone from the project footprint for each of the project alternatives. Potentially affected communities within the RSA include portions of Santa Clara, San Jose, Morgan Hill, San Martin, Gilroy, Santa Nella, Volta, and Los Banos.

3.2 Methods for Identification of Minority Populations and Low-Income Populations

Census tract data on minority populations and low-income populations within the reference community and environmental justice RSA were collected from the U.S. Census Bureau 2010–2014 American Community Survey (ACS). The populations were mapped along the project alignment using geographic information systems, and census tracts with high percentages of minority individuals and low-income individuals were identified.

The definition of minority populations is consistent with the USDOT Order 5610.2C, as described in Chapter 1, Introduction. Minorities include persons who are Black, Hispanic or Latino, Asian American, American Indian and Alaska Native, and Native Hawaiian and other Pacific Islander. For the purposes of this analysis, low-income populations in San Benito and Merced Counties are defined as persons whose household income is at or below the U.S. Department of Health and Human Services poverty guidelines. For populations in Santa Clara County, a locally developed threshold is used to account for the substantially higher household incomes in the San Francisco Bay Area relative to other California counties. This analysis defines low-income populations within Santa Clara County to be persons with household incomes at or below 200 percent of the poverty guidelines.[1]

3.3 Minority Populations and Low-Income Populations within the Reference Community and RSA

Table 1 shows the percent minority populations and percent low-income populations in the three-county reference community and in the cities and communities within the environmental justice RSA. Chapter 5, Environmental Justice, of the *San Jose to Merced Project Section Final EIR/EIS* (Final EIR/EIS) provides a detailed discussion and mapping of the minority populations and low-income populations with the potential to be affected by the project.

[1] This is consistent with the approach adopted by the Metropolitan Transportation Commission.

Table 1 Minority Populations and Low-Income Populations (2014 Estimates)

Characteristics	Population	Percent Minority	Percent Low-Income
Counties			
Santa Clara County	1,841,569	62.8	23.3
San Benito County	56,888	60.8	12.1
Merced County	261,609	67.8	25.6
Reference Community Total	**2,160,066**	**63.4**	**23.3**
Cities and Communities within the Resource Study Area			
Santa Clara	119,525	62.2	22.2
San Jose	986,320	69.6	27.6
Morgan Hill	39,875	46.3	24.4
San Martin	7,081	55.3	21.3
Gilroy	50,776	67.0	35.5
Volta	257	61.9	9.7
Los Banos	36,626	75.5	24.5

Sources: U.S. Census Bureau ACS 2010–2014a, 2010–2014b

As Table 1 shows, 23.3 percent of the population within the reference community is low-income, and 66.3 percent is minority (U.S. Census Bureau ACS 2010–2014a, 2010–2014b). Santa Clara and Merced Counties have higher rates of low-income populations than San Benito County, while the concentrations of minority populations are very similar among the three counties. The racial and ethnical makeup of the reference community varies—Asians are the largest minority group in Santa Clara County (33 percent), while Hispanics and Latinos make up the largest minority group in San Benito and Merced Counties (57 and 56 percent, respectively).

The economic conditions in the cities and communities within the RSA vary, and the percent low-income population ranges from a low of 9.7 percent low-income in Volta to a high of 35.5 percent low-income in Gilroy (Table 1). Gilroy has the highest percent low-income population, which exceeds that of the reference community by 12 percent. The percent minority ranges from 46.3 percent in Morgan Hill to 75.5 percent in Los Banos. Based on available census information and the proximity of the project alternatives, the following areas within the RSA have been identified as having concentrations of minority populations and low-income populations, or both, that are greater than the reference community:

- Santa Clara
  - Industrial area bounded by Lawrence Expressway on the west, Norman Y. Mineta International Airport on the east, U.S. Highway (US) 101 to the north, and the existing Caltrain tracks to the south, and a residential area bound by Scott Boulevard and El Camino Real, which consists of 77 percent minority and 39 percent low-income residents.
  - Residential area south of the existing Caltrain tracks, bounded by El Camino Real to the north, Pierce Street and Winchester Boulevard to the west, Newhall Street to the south, and Park Avenue and Alviso Street to the east, which ranges from 40 to 50 percent low-income residents.
- San Jose
  - Residential neighborhoods bounded by Interstate (I-) 880 to the north, Curtner Avenue to the south, State Route (SR) 87 to the west, and 10th Street and Senter Road to the east

that include Hyde Park, Jackson/Taylor, Ryland, Hensley, Horace Mann, North Campus, South Campus, East Campus, Naglee Park, Paseo, Market/Almaden, East Virginia, Spartan/Keys, Lakehouse, Park/Lorraine, Auzerais/Josefa, Gardner, Washington/Guadalupe, Tamien, Goodyear/Mastic, Alma, Monticello, Guadalupe/Almaden, Almaden/Clara Filice, Evans, and Guadalupe Canoas neighborhoods. These neighborhoods generally consist of census tracts with concentrations of minority populations more than 75 percent, with the highest concentrations in the Tamien and Goodyear/Mastic neighborhoods (94 percent minority) and the Market/Almaden and Washington/Guadalupe neighborhoods (86 percent minority). These neighborhoods also have high concentrations of low-income populations, typically more than 35 percent. The greatest concentrations of low-income populations occur in the Tamien and Goodyear/Mastic neighborhoods (58 percent low-income), Market/Almaden, Washington/Guadalupe, Spartan/Keys, and East Virginia neighborhoods (56 percent low-income), and Guadalupe/Almaden, Almaden/Clara Filice, Evans, and Guadalupe Canoas neighborhoods (52 percent low-income).

  - Residential neighborhoods bounded by Curtner Avenue to the north, Blossom Hill or SR 85 to the south, Monterey Road or Snell Avenue on the west, and Senter Road or US 101 to the east. East of the Caltrain right-of-way are the neighborhoods of Kenwood, Hillsdale, Rancho, Los Arboles, Seven Trees, San Ramon, Riverview, Danna Rock, Davis, Edenvale, Sunspring, and Silver Leaf. West of the Caltrain right-of-way are the Woods, Berry Park, and Deer Run neighborhoods. The highest concentrations of minority populations occur in the neighborhoods of Los Arboles and Seven Trees (97 percent minority), while the greatest concentrations of low-income populations occur in Edenvale (58 percent low-income) and Seven Trees (52 percent low-income).

- Morgan Hill
  - Residential areas in downtown and southern Morgan Hill, located west of Monterey Road between Llagas Road and Tennant Avenue, and east of Monterey Road between Dunne Avenue to the north and Maple Avenue or Crowner Avenue to the south. These areas contain 36 to 45 percent low-income households and include a mobile home community along Monterey Road.
- Gilroy
  - Residential areas in downtown Gilroy, bounded by Buena Vista Avenue to the north, Mesa Road to the south, US 101 on the east, and Wren Avenue or Miller Avenue to the west. The highest concentrations of minority populations and low-income populations are between Las Animas Avenue, Monterey Road, and US 101 in downtown Gilroy, where between 61 and 69 percent of residents are low-income, and more than 85 percent are minority.
  - Rural agricultural areas east of Gilroy have low-income populations of approximately 40 percent.
- Merced County
  - Residential portions of northern Los Banos and rural agricultural areas north and east of Los Banos, bounded by Henry Miller Road to the north, SR 33 to the south, Badger Flat Road to the west, and Delta Road to the east. Minority population concentrations in these areas are more than 81 percent.

4 OUTREACH TO MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

The Authority has conducted early and continued public and agency outreach throughout the environmental review and alternatives development processes. As part of these efforts, the Authority held the following types of meetings and outreach events, which provided opportunities for engagement with the public, including minority populations and low-income populations, sensitive populations, and regulatory agencies:

- Interagency technical working group meetings
- Community working group meetings
- Public information meetings
- Informal meetings with key community leaders, select members of the public, and local/resource agency staff
- Informal resource-specific agency meetings
- Informational open houses and informal presentations to community organizations and groups
- Letter, email, and phone requests for information and informal consultation
- Distribution of public notices, fact sheets, and a Frequently Asked Questions document with project information and updates on the ongoing studies

Chapter 9, Public and Agency Involvement, of the Final EIR/EIS provides a detailed account of the public engagement work undertaken by the Authority and the FRA to date. In total, over 800 such meetings and public and agency involvement activities were initiated by the Authority or attended by representatives of the HSR project within the vicinity of the San Jose to Merced Project Section between December 2008 and December 2018.

The Authority also conducted targeted outreach to minority populations and low-income populations (see Chapter 5 of the Final EIR/EIS for information on the geographic concentrations of these populations). The purpose of targeted outreach is to understand and address the unequal environmental burden often borne by minority populations and low-income populations. Understanding the location and makeup of minority populations and low-income populations near the project allowed the Authority to tailor outreach activities for effective public participation and access to information. In addition, the outreach provides these populations with early and ongoing opportunities to provide input on the HSR project and assist in identifying social, economic, and environmental effects as well as potential mitigation measures that could be used to avoid or minimize adverse effects.

The Authority has conducted this outreach to minority populations and low-income populations with the understanding that these efforts are most effective when done from the earliest opportunity and maintained over the course of the project. Outreach was also coordinated with trusted individuals and organizations, such as faith-based organizations, neighborhood associations, community centers, and schools. This approach provides a bridge between the community and the project and provides a forum to gain the input of leaders and members of communities with minority populations and low-income populations who are able to provide insights that may not otherwise be apparent. The resulting input is used to make sure the project would not result in disproportionately high and adverse effects on minority populations and low-income populations relative to the potential benefit gained by those populations from the project.

Outreach undertaken as part of the Project Section is relevant to the San Jose to Central Valley Wye Project Extent. The San Jose to Merced Project Section Draft EIR/EIS process began in 2008 and continued with public discussions through 2012 about the range of alternatives for evaluation. Various alignment and profile design options were considered in the *San Jose to Merced Section High-Speed Rail EIR/EIS, Preliminary Alternatives Analysis Report* (Preliminary

Alternatives Analysis Report) published in June 2010 and *San Jose to Merced Section High-Speed Rail EIR/EIS, Supplemental Alternatives Analysis Report* (Supplemental Alternatives Analysis Report) published in May 2011 (Authority and FRA 2010, 2011). Additional consultation with stakeholders and regulatory agencies through 2019 continued to inform the range of project alternatives being considered. During this time, a variety of outreach activities were conducted, the results of which can be reviewed in the public documents noted in this section.

4.1 Early Project Phase Public and Agency Outreach

4.1.1 Project Scoping and Notice of Preparation (December 2008 to March 2009)

The Authority initiated prescoping public outreach activities in December 2008, including the development of project information materials, establishment of a project information phone line, early engagement with interested parties, and media communications. On February 23, 2009, the Authority distributed a Notice of Preparation announcing preparation of an EIR for the Project Section. The Federal Railroad Administration (FRA) published a Notice of Intent in the *Federal Register* on March 16, 2009, announcing the preparation of an EIS for the Project Section.

The Authority and the FRA initiated scoping in March 2009, and the Authority held scoping meetings in Merced, San Jose, and Gilroy. More than 300 residents, property and business owners, agency representatives, elected officials, members of the media, and other interested parties participated in these meetings. The Authority provided information about the history of the HSR project to date, the *Final Program EIR/EIS for the Proposed California High-Speed Train System* (Authority and FRA 2005), and the environmental review process, including alternatives development and analysis.

4.1.2 Alternatives Analysis Agency and Public Participation (September 2009 to May 2010)

The Authority conducted a number of meetings throughout the alternatives analysis phase with agencies, the public, and small groups. These meetings included a series of technical working group meetings in Gilroy and Merced, eight public information meetings, a community workshop and panel discussion, and a Gilroy City Council study session, all held between September 2009 and May 2010. The purposes of these meetings were to explain the alternatives analysis process, share the results of preliminary studies, and receive feedback.

4.1.2.1 Preliminary Alternatives Analysis and Public Participation (June 2010 to March 2011)

Following the release of the Preliminary Alternatives Analysis Report on June 3, 2010, the Authority and its consultants held more than 80 meetings with elected officials and staff, other key stakeholders, and the public. These meetings included technical working group meetings in Gilroy and Merced. The San Jose to Merced Project Section team hosted meetings in Merced with representation and participation from the Merced to Fresno Project Section team. The Authority also held five public information meetings, a variety of stakeholder meetings, and two rounds of additional public outreach meetings in Gilroy and Morgan Hill between June 2010 and March 2011. More than 870 participants attended these public meetings.

4.1.2.2 Supplemental Alternatives Analysis and Public Participation (May 2011 to June 2011)

The Authority released the Supplemental Alternatives Analysis Report on May 5, 2011. This report documented additional and refined alignments and design options for the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections developed in response to comments received on the Preliminary Alternatives Analysis Report.

Following issuance of the Supplemental Alternatives Analysis Report, the team held interagency meetings in Merced (May 2011) and Morgan Hill (June 2011). Public information meetings to review the report were also held in Gilroy, Merced, and Los Banos in May and June 2011.

4.1.3 Issues Raised during Early Project Phase Outreach

The following issues were consistently raised in these meetings (via verbal and written comments):

- **Consultation and outreach.** Commenters wanted to know with which local agencies the Authority was consulting. Commenters were interested in how public and agency input would be elicited and incorporated, including what type of comments were being solicited at the current stage of the study and how public and agency comments would be incorporated. Some commenters expressed concern that the engagement effort in Gilroy (particularly east of US 101), Morgan Hill, and the surrounding unincorporated area needed to be more comprehensive.
- **Support or opposition.** Commenters generally expressed support for HSR; however, some were concerned about the potential impact on homes. Some commenters expressed concern over the need for a HSR project. Some commenters indicated the Altamont Pass alignment would be a shorter route, would preserve more existing infrastructure, and would be less expensive than the route over Pacheco Pass.
- **Business plan (funding, ridership, and schedule).** Commenters expressed concerns about overall project funding, the decision-making timeline, and the age of the ridership figures. In addition, commenters wanted more information about the anticipated funding from the federal government and the cost differential of the various vertical profiles (tunnel, trench, at-grade, aerial) and horizontal profiles.
- **Right-of-way.** Commenters wanted to know the anticipated right-of-way acquisition requirements and planned coordination for right-of-way acquisition for the project as a whole.
- **Project operations.** Commenters asked for information about train operations, including hours of operation, frequency, and speed.
- **Alternatives.** In the San Jose area, commenters wanted to know the plan for coordinating the San Jose to Merced and San Francisco to San Jose Project Sections for planning and analysis of the San Jose Diridon Station. Additionally, commenters asked whether the Draft EIR/EIS would identify a preferred alternative. Commenters questioned the feasibility of the Altamont Pass crossing. Commenters requested consistency in the approach to addressing rail crossings in the San Jose to Merced Project Section and Merced to Fresno Project Section environmental documents.
- **Traffic impacts.** Commenters requested information on traffic impacts and the magnitude of the access road and temporary construction easements that would be required.
- **Environmental impacts and impacts on agricultural lands.** Commenters wanted to make sure that impacts on agricultural lands and operations would be addressed in environmental review. They expressed further concerns about impacts on wildlife and the environment.
- **Noise and vibration impacts.** Meeting attendees expressed concerns about noise and vibration impacts from both construction and operation of the project. Commenters discussed impacts of sound and electromagnetic waves on the environment and on animals.

The cities and communities along the project alignment expressed different concerns and priorities during these meetings. A summary of these concerns by city or community follows:

- San Jose
  - Noise and vibration impacts
  - Visual impacts
  - Impacts of local road closures on road network connectivity, access, and the proposed narrowing of Monterey Road
  - Eminent domain and impacts on property values

- Morgan Hill
  - Impacts on local roads, connectivity, access, and right-of-way, including specific inquiries as to whether Depot Street would be closed for the proposed grade separation between Dunne Avenue and Main Street
- Gilroy
  - Impacts on downtown Gilroy and neighborhoods
  - Impacts on local roads, connectivity, access, and right-of-way
- East of Gilroy
  - Visual impacts and changes in community character
  - Impacts on homes and quality of life
  - Impacts on agricultural lands
  - Reduced access to properties, decreased property values, eminent domain, and the property acquisition process
  - Noise mitigation
- Pacheco Pass (unincorporated Merced County)
  - Impacts on local roads, connectivity, access, and right-of-way
  - Construction impacts on Cottonwood Creek and Cottonwood Bay
- San Joaquin Valley (unincorporated Merced County)
  - Impacts on local roads, connectivity, access, and right-of-way
  - Impacts on agricultural lands and associated irrigation infrastructure
  - Impacts on dairy operations

4.2 Outreach Efforts during the Design Phase

Public outreach efforts were largely slowed between 2012 and 2016 as the Authority shifted priorities from the entire Project Section to accelerating a smaller subset—the Central Valley Wye Project Extent. Public outreach and targeted outreach to minority populations and low-income populations continued on the Central Valley Wye Project Extent, while limited outreach continued for the San Jose to Central Valley Wye Project Extent. The following section describes the engagement efforts during the current design phase, which was reinitiated in 2016.

4.2.1 Environmental Justice Outreach Plan

The Environmental Justice Outreach Plan (Outreach Plan) was created at the beginning of the current design phase in 2016 to "guide the Authority in engaging minority populations and low-income populations in the project study area to communicate project information, listen to and respond to community thoughts and concerns, and identify potential actions to mitigate any disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations." The Outreach Plan is provided in Attachment A, Environmental Justice Outreach Plan.

4.2.2 Outreach Methods and Technology

In locations where minority populations, low-income populations, and other sensitive populations may be affected by the project, a variety of outreach activities were conducted to inform local community members of the project and its status; solicit the thoughts and concerns of the community regarding project impacts; and gain an understanding of the potentially adverse effects of the project on minority populations and low-income populations. These outreach efforts

used many formats, including public meetings, advertising and mailing of public notices, digital engagement, and direct outreach to stakeholders and community organizations through open houses, meetings, small group working sessions, and interviews. Additionally, the Authority set up information tables at community centers or events to answer community questions and sign up people to receive regular information about the project.

These outreach efforts considered all recommendations and factors for outreach included in the Authority's Title VI and environmental justice guidance, including:

- Consideration of the time, location, and accessibility of all meetings. This effort also includes encouraging meaningful participation of sensitive populations by using other means for engagement besides meetings, such as interviews, briefings, and the use of audio devices to record comments. In addition, all meetings include multiple notification methods, provision of interpreters, venue locations that are accessible (i.e., ADA compliant) and formats that provide for different ways to learn about the project alternatives and share feedback.
- Reaching people within their own communities and during existing meetings schedules using existing community groups and their knowledge of the community to more effectively reach minority populations, low-income populations, and sensitive populations. This effort includes selecting meeting locations that are culturally sensitive.
- Provision of interpreters to support persons with limited English proficiency at meetings. This includes provision of Spanish-speaking interpreters and translated meeting materials at Open House meetings hosted by the Authority, as well as notices in Spanish, Mandarin, Vietnamese, and Tagalog indicating interpreters can be made available by request.
- Presentations focused to specific interest groups.
- Placement of meeting announcements and flyers through different types of media and advertisement of meeting notices in Mandarin, Spanish, Vietnamese, and Tagalog to reach populations with limited English proficiency.
- Cultural sensitivity to minority and Native American tribal groups.
- Identification of barriers to public participation and ways to overcome those barriers.

4.2.2.1 Public Meetings

Numerous outreach events for the project have been held since the beginning of 2016. Outreach activities included presentations at public and stakeholder group meetings. Meeting locations were determined using the following approach:

- Coordinating with partners in the community who help with outreach and notification, and serve as a co-convener for the meeting
- Using a venue that community members are familiar with, that is accessible by sensitive populations, and where they feel comfortable, such as neighborhood centers and community facilities
- Identifying a venue close to the HSR alignment(s) and the impacted communities
- Targeting minority populations and low-income populations by referencing census data and overlaying it with the proposed alignments/areas of anticipated impacts

These outreach meetings have taken many different formats, including providing project updates to local elected officials during their meetings (e.g., City Council meetings), open houses, and presentations to neighborhood organizations. Many of these meetings were located in minority areas and low-income areas. Open house meetings were advertised with flyers providing information in multiple languages, including English, Mandarin, Spanish, Vietnamese, and Tagalog. A complete list of all public outreach meetings where information on the project was provided by the Authority can be found in Attachment B, List of Outreach Meetings Held for Project.

4.2.2.2 Digital Technology

One of the most successful ways to engage community members in discussions about a project is the use of high-definition aerial maps that show the proximity of different project elements to areas that are important to community members, such as their homes, businesses, and recreation areas. During the Authority-led open houses held in late April and early May 2017, freestanding digital terminals allowed community members to type in their addresses and look at the proximity of the different project alternatives.

4.2.2.3 Targeted Outreach to Stakeholder and Community Organizations

To inform the outreach efforts to minority populations and low-income populations, the Outreach Plan identified environmental justice and transportation advocacy groups that are active regionally or on a statewide scale, as well as stakeholders and community organizations that provide services to or represent minority populations and low-income populations in the environmental justice RSA. As such, several organizations that are headquartered outside of the RSA participated.

Table 2 shows the organizations specifically dedicated to environmental justice and transportation that were contacted during the reinitiated design phase. Attachment 1 of the Outreach Plan (Attachment A) presents a more extensive list of minority populations and low-income populations and organizations that serve those populations.

Table 2 Organizations Contacted

Organization Name	Description	Website
California Endowment	Statewide grant-making organization that promotes fundamental improvements in the health status of all Californians	http://www.calendow.org/
California Environmental Justice Alliance	Statewide, community-led alliance that works to achieve environmental justice by advancing policy solutions	http://caleja.org/about-us/vision-and-history/
California Pan-Ethnic Health Network	Statewide network that promotes health equity by advocating for public policies and sufficient resources to address the health needs of communities of color	http://cpehn.org/
California Rural Legal Assistance	Statewide environmental justice and legal aid program that provides low-income rural Californians with free legal assistance	http://www.crla.org/
California Wellness Foundation	Statewide grant-making organization that addresses the particular health needs of traditionally underserved populations, including low-income individuals, people of color, youth and residents of rural areas	http://www.calwellness.org/
Center on Race, Poverty, and the Environment	San Joaquin Valley-focused environmental justice organization that seeks to achieve environmental justice and healthy, sustainable communities through collective action and the law	http://www.crpe-ej.org

Organization Name	Description	Website
Central California Environmental Justice Network	San Joaquin Valley-focused environmental justice network focusing on uniting activists and working with community members and stakeholders at local, regional, state and federal levels to eliminate environmental degradation in local communities	http://ccejn.wordpress.com/
Central Coast Alliance United for a Sustainable Economy	Community organizing and advocacy organization that seeks to build grassroots power to invoke social, economic and environmental justice for the people of California's Central Coast Region	https://causenow.org
Central Valley Air Quality Coalition	San Joaquin Valley-focused coalition working to ensure that all communities, of all races, cultures, class or creed, have the opportunity to be involved in the policy development and regulatory processes improving regional health	http://www.calcleanair.org/
Leadership Counsel for Justice and Accountability	San Joaquin Valley-focused, community-organizing advocacy group that seeks to impact land use and transportation planning, public investment priorities, environmental policy, and the provision of basic infrastructure and services	http://www.leadershipcounsel.org/
Policy Link	National research and action institute advancing economic and social equity by 'Lifting Up What Works'	http://www.policylink.org/
Rural Community Assistance Corporation	Statewide organization that provides training, technical/financial resources and advocacy for rural communities	http://www.rcac.org/home
The City Project	National organization working to ensure that all people have access to healthy, livable communities	http://www.cityprojectca.org/
TransForm	Transportation organization that seeks to transform communities and transportation with new solutions, smarter investments, and better planning as well as improve community access, health, justice, and sustainability	http://www.transformca.org/
United Farmworkers	A national farmworker's union and social justice organization that seeks to provide farm workers and other working people with the inspiration and tools to share in society's bounty	http://www.ufw.org/
Valley Improvement Projects	San Joaquin Valley-focused organization that seeks to improve the quality of life of underrepresented and marginalized residents of California's Central Valley by promoting social and environmental justice issues through youth outreach, education, technology, and art	https://valleyimprovementprojects.org/

Organization Name	Description	Website
Voices from the Valley	San Joaquin Valley-focused organization that offers a centralized media outlet for Central Valley activist organizations	http://www.voicesfromthevalley.org/

4.2.2.4 Interviews Related to Environmental Justice

An initial series of interviews was conducted in July and August 2016 with stakeholder organizations serving minority populations and low-income populations in the environmental justice RSA to inform the Authority's outreach efforts to these populations. The primary objectives of the interviews were to:

- Better understand the interests and concerns of minority populations and low-income populations and how they relate to the HSR project
- Inform the Authority's strategy for meaningfully engaging with minority populations, low-income populations, or both, including anticipating and responding to potential challenges
- Identify specific environmental justice outreach opportunities (e.g., events, meetings, neighborhood groups) and additional stakeholders with whom to partner moving forward

Table 3 shows the stakeholders that were interviewed. Interviewees noted that because minority populations and low-income populations have historically been burdened with disproportionately high and adverse effects from infrastructure projects in comparison to other communities, causing mistrust of government and doubts as to whether community input is being taken into consideration, a certain degree of mistrust of the Authority, as a government agency, is expected. They also highlighted that much of the project information is not provided in the first language of community members, and that members of minority populations and low-income populations often do not have the ability to participate in public engagement processes because of other, higher-priority life demands. The locations of these interviews in relation to the percent minority populations and low-income populations are mapped on Figure 1.

Table 3 Interviews with Stakeholder Organizations Conducted in 2016

Organization	Focus Community	Date
Asian Americans for Community Involvement	San Jose	August 4, 2016
California Environmental Protection Agency[1]	Project Section	August 5, 2016
City of Gilroy	Gilroy	July 26, 2016
City of San Jose District Three	San Jose	August 4, 2016
Delmas Park Neighborhood Association	San Jose	August 4, 2016
Sierra Health Foundation	Project Section	July 28, 2016

[1] While not specifically an environmental justice organization, California Environmental Protection Agency has an environmental justice program and provides guidance documents and grants for related work. The agency also provides information about minority populations and low-income populations in coordination with California Office of Environmental Health Assessment in the CalEnviroScreen tool.

Results of 2016 stakeholder interviews informed the Authority's strategy to engage minority populations and low-income populations in the environmental justice RSA in 2018 and 2019. To achieve a broader reach to focus communities along the project alignment, the outreach team engaged community-based service providers representing the interests of more than 46,000 community members, with the objectives of gathering feedback on impacts the project had on the

focus communities, and increasing community awareness and knowledge about the project. Stakeholders also offered suggestions on how to effectively engage communities along the project. These engagement suggestions included conducting in-language gatherings, neighborhood walks, and door-to-door canvassing in some neighborhoods; using social media and public service announcements on Spanish-language radio stations to engage Spanish-speaking residents; and providing incentives such as food and childcare at evening and weekend meetings.

These recommendations were incorporated into and continued to shape the targeted environmental justice outreach efforts conducted throughout 2018 and 2019. Authority staff made efforts to provide accommodations to address the stakeholders' suggestions and provide enhanced outreach whenever feasible by partnering with local organizations. For example:

- Authority staff joined local community leaders to conduct neighborhood walks and canvass door-to-door in select minority communities and low-income communities to answer community members' questions and provide information about the project. In San Jose's Gardner neighborhood, for example, the Authority coordinated the planning of an in-language community meeting with the neighborhood association. In advance of the early evening meeting held at the local community center, Authority staff canvassed in the neighborhood and informed members of the public that children and other family members were welcome. The neighborhood association provided refreshments.
- The Authority opted not to provide public service announcements on Spanish-language radio stations, but Authority staff enlisted local community organizations to translate and share information about events on the community organizations' social media postings, via emails and newsletters, and on their websites. For example, a large Vietnamese community foundation in San Jose hosted a presentation by Authority staff. They prepared a flyer about the event in Vietnamese and also provided a meal at the event to encourage participation.
- Multilingual flyers, in-language posters and newspaper ads, and community organizations' social media postings invited members of the public to the summer 2019 open houses regarding the preferred alternative. Based on stakeholder feedback, the outreach consulting team provided family-friendly snacks and a number of children accompanied adult members to these informal events.

Commencing in 2018, direct engagement with community members was coordinated with stakeholders serving minority populations and low-income populations with the intent of increasing awareness and participation in outreach activities conducted for HSR. Service providers served as partners and co-hosts for community outreach meetings and presentations. Several meetings included in-language material and translation services based on community members' needs as indicated by the service providers. In addition, the Authority focused outreach in communities where interviews with service providers indicated that community members lacked awareness of the project (e.g., in Gardner).

As a result of the addition of Alternative 4 in 2018, and the resulting interest from the relevant communities, a second series of interviews were conducted beginning in October 2018 and continuing through December 2019 with stakeholders serving minority populations, low-income populations, and sensitive populations in the environmental justice RSA to continue the Authority's outreach efforts to these populations. Table 4 identifies the stakeholders that were interviewed in 2018 and 2019.

Table 4 Interviews with Stakeholder Organizations Conducted in 2018 and 2019

Organization	Focus Community	Date
Alexander Station	Gilroy	April 18, 2019
Better Tomorrow: San Jose	San Jose	October 29, 2019

Organization	Focus Community	Date
Biblioteca Latinoamericana	San Jose	October 29, 2018
Biblioteca Latinoamericana	San Jose	November 9, 2018
Bill Wilson Center	San Jose	June 25, 2019
Centennial Recreation Center	Morgan Hill	November 14, 2018
Charities Housing (property manager for HomeSafe Santa Clara)	Santa Clara County	December 9, 2019
Charities Housing (property manager for HomeSafe Santa Clara)	Santa Clara County	December 16, 2019
City of Los Banos Community Center	Los Banos	December 10, 2018
City of Morgan Hill (Office of the City Manager, Planning, and Economic Development)	Morgan Hill	November 14, 2018
City of Morgan Hill, Older Adult Services	Morgan Hill	November 14, 2018
City of San Jose Environmental Services Department	San Jose	October 18, 2019
Community Agency for Resources, Advocacy, and Services (CARAS) South County	Gilroy	February 7, 2019
Community Solutions	Santa Clara County	December 18, 2018
Compassion Center, Gilroy	Gilroy	February 28, 2019
DeBug Community and Advocacy Group	Santa Clara County	June 26, 2019
Family & Children Services of Silicon Valley	Santa Clara County	October 17, 2019
Gardner Academy	San Jose	October 29, 2019
Gardner Community Center, San Jose	San Jose	December 3, 2018
Gavilan College	Gilroy	November 8, 2018
Gilroy Compassion Center	Gilroy	February 28, 2019
Gilroy High School	Gilroy	March 14, 2019
Gilroy Unified School District	Gilroy	November 8, 2018
Gilroy Unified School District and Gilroy High School	Gilroy	March 14, 2019
Gilroy Unified School District and Gilroy Prep/Navigator School	Gilroy	December 19, 2019
Gilroy Unified School District and South Valley Middle School	Gilroy	December 3, 2018
Glen View Elementary, Gilroy	Gilroy	February 12, 2019
Guadalupe Washington Neighborhood Association	San Jose	October 29, 2019
Hope Services	Gilroy	January 29, 2019
International Children Assistance Network (ICAN)	Santa Clara County	October 24, 2019
Kings View, Los Banos	Los Banos	December 10, 2018
La Raza Radio	San Jose	December 3, 2019

Organization	Focus Community	Date
La Raza Radio	San Jose	December 13, 2019
Learning and Loving Education Center	Morgan Hill	December 5, 2018
Los Banos Community Center	Los Banos	December 20, 2019
Maple Leaf Recreational Vehicle Park	Morgan Hill	November 20, 2019
Merced Community Action Agency	Merced County	November 27, 2018
Morgan Hill Community Adult School	Morgan Hill	December 5, 2018
Morgan Hill Unified School District	Morgan Hill	November 20, 2019
Navigator Schools, Gilroy	Gilroy	December 14, 2018
Next Door Solutions	Santa Clara County	December 17, 2019
PARS Equality Center	Santa Clara County	October 30, 2019
Pacific Gas & Electric	San Francisco Bay Area and Central Valley	October 2, 2019
Rebekah Assembly	Gilroy	December 4, 2018
Rebekah Children's Services	Gilroy	December 20, 2018
Refugee and Immigrant Forum of Santa Clara County	Santa Clara County	October 16, 2019
Rocca's Market	San Martin	November 20, 2019
Sacred Heart Nativity School	San Jose	December 13, 2019
Salvation Army Family Services, San Jose	San Jose	November 27, 2018
Salvation Army's Emmanuel House	San Jose	December 4, 2018
San Andreas Regional Center	Santa Clara County	December 21, 2018
San Jose City College	San Jose	December 12, 2019
San Jose Downtown Residents Association	San Jose	February 14, 2019
San Martin/Gwinn K-8 School	San Martin	November 4, 2019
San Martin Lions Club	San Martin	February 19, 2019
Santa Clara County Department of Family and Children's Services	Santa Clara County	December 18, 2019
Santa Clara County Office of Education, Head Start	Santa Clara County	January 8, 2019
Santa Clara County Office of Immigrant Relations	Santa Clara County	February 6, 2019, February 28, 2019
Santa Clara County Office of Supporting Housing	Santa Clara County	October 31, 2018
Santa Clara County Social Services	Santa Clara County	November 14, 2018
Santa Maria Urban Ministry	San Jose	November 12, 2018
St. Joseph's Family Center	Gilroy and San Martin	April 22, 2019
St. Mary Parish	Gilroy	November 9, 2018

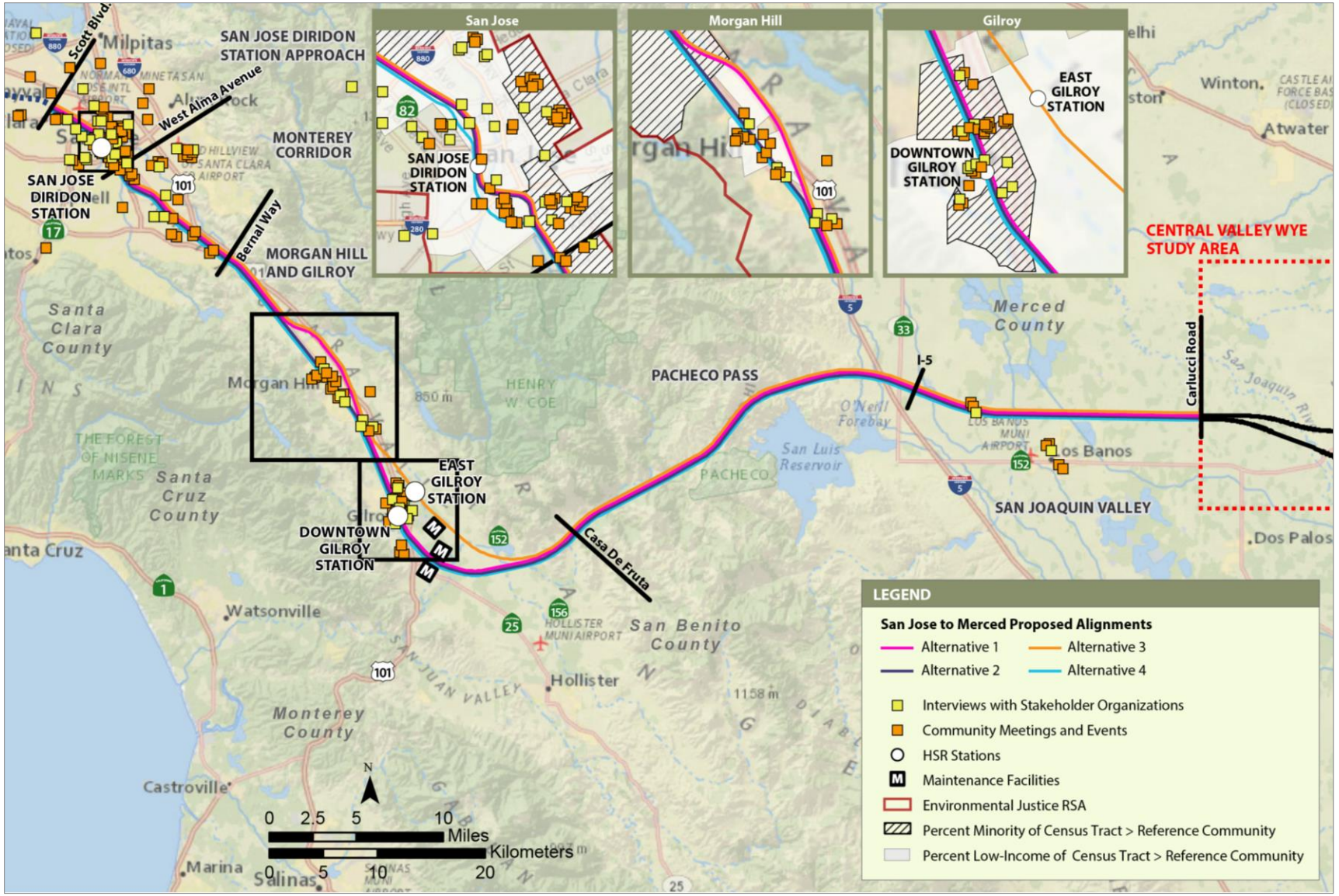
Organization	Focus Community	Date
The Cordoba Center: South Valley Islamic Community	San Martin	November 29, 2018
Univision	San Francisco Bay Area	December 9, 2019
Univision	San Francisco Bay Area	December 13, 2019
UStar Productions	San Jose	September 10, 2019
UStar Productions	San Jose	October 4, 2019
Vietnamese Voluntary Organization (VIVO)	San Jose	November 15, 2018
Volta Elementary School	Los Banos	December 10, 2018
Volta Elementary School	Los Banos	December 19, 2019
West Valley Community Services	San Jose	February 12, 2019

Between November 2019 and April 2020, the Authority conducted 52 stakeholder/service provider interviews. Table 5 identifies the stakeholders that were interviewed in 2019 and 2020.

Table 5 Interviews with Stakeholder Organizations Conducted between November 2019 and April 2020

Organization	Focus Community	Date
San Martin/Gwinn K-8 Academy	San Martin	11/4/2019
Better Tomorrow	San Jose	11/6/2019
Morgan Hill Unified School District	Morgan Hill	11/20/2019
Rocca's Market	San Martin	11/20/2019
Maple Leaf RV Park	Morgan Hill/San Martin	11/20/2019
HomeSafe/Charities Housing	Santa Clara	12/9/2019
Univision	Santa Clara County	12/9/2019, 12/13/2019
San Jose City College	San Jose	12/12/2019
La Raza Radio	San Jose	12/13/2019
Charities Housing	Santa Clara	12/16/2019
Next Door Solutions	Santa Clara	12/17/2019
Santa Clara County Family & Children Services	Gilroy	12/18/2019
Volta Elementary	San Joaquin Valley	12/19/2019
Gilroy Unified School District	Gilroy	12/19/2019
Los Banos Community Center	Los Banos	12/20/2019
West Valley Community Services	San Jose Diridon	1/8/2020
Morgan Hill Unified School District & CARE	Morgan Hill	1/15/2020
Gilroy High School	Gilroy	1/15/2020
City of Morgan Hill	Morgan Hill	1/15/2020

Organization	Focus Community	Date
Gavilan College	Gilroy	1/15/2020
Santa Clara Unified School District	Santa Clara	1/16/2020
Sacred Heart Nativity	San Jose	1/16/2020
Family & Children's Services of Silicon Valley, County of Santa Clara	South San Jose	1/17/2020
Guadalupe-Washington Safety Coalition	Guadalupe Washington	1/22/2020
San Jose City College	San Jose	1/23/2020
African American Community Services Agency	San Jose	1/23/2020
Go Kids (formerly Estrella Family Services)	San Jose	1/23/2020
San Jose Unified School District	San Jose	1/23/2020
San Jose Unified School District	Gardner/San Jose Diridon/Guadalupe Washington	1/28/2020
Los Banos Unified School District	Los Banos	1/29/2020
Rocketship Public Schools	Alma	1/29/2020
East Side Union High School District	San Jose	1/30/2020
Voices Charter Academy	San Jose	1/30/2020
City of San Jose Parks/Trails	San Jose	2/3/2020
Homeless Service Providers	Santa Clara/San Jose	2/6/2020
Oak Grove Elementary School District	San Jose	2/6/2020
Washington Elementary	San Jose	2/6/2020
Council on American Islamic Relations (CAIR)	Santa Clara/San Jose	2/7/2020
San Jose Word of Faith Christian Center Board	San Jose	2/7/2020
ICAN Family Resource Center	San Jose	2/7/2020
NextDoor Solutions	Santa Clara	2/10/2020
Mission College	Santa Clara	2/10/2020
Center for Employment Training (CET)	San Jose	2/20/2020
Rocketship Mateo Sheedy Elementary	San Jose	2/26/2020
Next Door Solutions/Home Safe	Santa Clara	2/26/2020
HomeFirst Service Area Assessment	Santa Clara/San Jose	2/27/2020
South Bay Islamic Association (SBIA)	Santa Clara/San Jose	2/28/2020
Tamien Community Organizer	San Jose	3/10/2020
Vietnamese American Round Table	San Jose	3/12/2020
Vietnamese Voluntary Foundation	San Jose	3/12/2020



APRIL 2021

Figure 1 Locations of Environmental Justice Outreach Activities

4.2.2.5 Environmental Justice-Focused Meetings and Other Events

The Authority scheduled and attended a number of meetings and events specifically intended to engage minority populations and low-income populations near the project to gather input on project alternatives. As a result of the addition of Alternative 4 in 2018, and the stakeholder service provider interviews detailed in Section 4.2.2.4, Interviews Related to Environmental Justice, the Authority refocused its efforts to reach minority populations and low-income populations beginning in mid-2018. The Authority also organized on-the-ground outreach, such as information tables and booths at local fairs and community events frequented by local residents. These locations were identified as an effective means to reach the minority populations and low-income populations in the environmental justice RSA and included locations such as flea markets, public libraries, and neighborhood meetings. The Authority provided the following outreach events:

- August 20, 2016: Information table at Gardner Community Flea Market, San Jose
- September 18, 2016: Information table at Viva CalleSJ community event with bilingual staff, San Jose
- October 20, 2016: Presentation to Gilroy Eliot School Community meeting, Gilroy
- October 27, 2016: Presentation at San Jose District 2 (Monterey Road area) Community Meeting, San Jose
- November 14, 2016: Meeting with local residents and City of Gilroy staff to discuss outreach strategies to communities and businesses in the downtown Gilroy area, Gilroy
- November 29, 2016: Information table at Edenvale Public Library, San Jose
- December 7, 2016: Presentation to Edenvale Great Oaks Plan Implementation Coalition, San Jose
- December 19, 2016: Information table at Gilroy Downtown Library, Gilroy
- February 1, 2017: Presentation to Seven Trees Neighborhood Association at regular meeting, San Jose
- February 13, 2017: Presentation to Gardner Neighborhood Association at regular meeting, San Jose
- March 8, 2017: Presentation to Goodyear-Mastic and Alma Neighborhood Associations at their joint meeting; the Tamien Neighborhood Association was also invited to attend, San Jose
- April 6, 2017: Information table at Gilroy Downtown Library with English-speaking staff and Spanish language translator, Gilroy
- April 17, 2017: Information table at Arteaga's Super Save Market with English-speaking staff and Spanish-language interpreter, Gilroy
- July 19, 2017: Presentation to the Gilroy Community & Neighborhood Revitalization Committee, Gilroy
- September 9, 2017: Presentation to United Neighborhoods of Santa Clara County Neighborhood Development Conference, San Jose
- September 11, 2017: Presentation to Senter Monterey Neighborhood Association, San Jose
- September 18, 2017: Presentation to Gardner Neighborhood Association, San Jose
- June 8, 2018: Gilroy right-of-way workshop, Gilroy
- July 2, 2018: Oak Grove Neighborhood Association meeting, San Jose
- August 14, 2018: Morgan Hill morning community meeting, Morgan Hill

- August 14, 2018: Morgan Hill evening community meeting, Morgan Hill
- September 20, 2018: Gilroy small business workshop, Gilroy
- September 24, 2018: Gilroy Unified School District and City Council Meeting, Gilroy
- October 18, 2018: San Martin Neighborhood Alliance meeting, San Martin
- October 23, 2018: Delmas Park Neighborhood Association meeting, San Jose
- March 6, 2019: Vietnamese Voluntary Organization (VIVO) (Vietnamese translation provided), San Jose
- March 26, 2019: Volta Elementary School Community Meeting (Spanish translation provided), Los Banos
- May 13, 2019: Gardner Neighborhood Association, Gardner
- May 28, 2019: Gilroy Community Meeting (Spanish translation provided), Gilroy
- May 31, 2019: Homeless Walks with HomeFirst along the Monterey Corridor, San Jose
- June 13, 2019: St. Joseph's Family Center Homeless Dinner, Gilroy
- June 14, 2019: Homeless Walks with PATH around Diridon Station, San Jose
- July 5, 2019: Morgan Hill Chamber of Commerce Music in the Park, Morgan Hill
- August 1, 2019: Presentation to the Good Morning Morgan Hill Chamber of Commerce Breakfast, Morgan Hill
- August 9, 2019: Information table at the Downtown San Jose Farmers Market, San Jose
- September 20-21, 2019: Information table at the Vietnamese Moon Festival, San Jose
- October 16, 2019: Ground-truthing (observing) outreach in communities around the Tamien Caltrain and Santa Clara Stations, San Jose and Santa Clara
- November 6, 2019: Community meeting with Better Tomorrow: San Jose
- December 13, 2019: Presentation at Gardner Academy, San Jose
- December 13, 2019: Gardner Neighborhood Walk, San Jose

The locations of these meetings are mapped on Figure 1.

Between January and April 2020, the Authority participated in 13 outreach events. As a result of the COVID-19 global pandemic, all meetings conducted in March and April 2020 were held virtually.

- January 28, 2020: Gilroy Unified School District Presentation
- February 1, 2020: Shasta Hanchett Park Neighborhood Association Fair
- February 1, 2020: Meet the Black Authors and Artists Event
- February 6, 2020: Santa Clara Unified School District Principals
- February 20, 2020: Guadalupe Washington Safety Coalition Community Walk
- February 20, 2020: Guadalupe Washington Neighborhood Association Presentation
- February 21, 2020: Family Fun Friday
- February 24, 2020: Emergency Assistance Network Presentation
- March 4, 2020: Oak Grove High School Latino Parents Meeting
- April 16, 2020: Franklin-McKinley School District Webinar

- April 19, 2020: Muslim Community Association Community Webinar
- April 21, 2020: Edenvale Great Oaks Plan Implementation Coalition Community Webinar
- April 23, 2020: Madre-A-Madre Community Webinar

4.2.2.6 Group Stakeholder and Community Working Group Meetings

The Authority reconvened community working groups (CWG) to discuss and gather input on project alternatives with community members representing a broad range of local interests. Each of the groups includes representatives of minority populations and low-income populations in the environmental justice RSA.

On September 13, 2016, Authority and consultant staff participated in a small group meeting with San Jose District 2 staff and City of San Jose staff to discuss outreach to residents along the Monterey Road corridor. Throughout 2017, Authority and consultant staff continued to meet regularly with City of San Jose staff to discuss public outreach.

As the Authority expanded environmental justice outreach efforts in 2018 and 2019, Authority staff coordinated with CWG members on how to best engage with minority populations and low-income populations in their communities. The topic of coordination served as a discussion prompt at some CWG meetings, and CWG members offered advice on coordination partners or advocated for activities and events to be conducted in specific neighborhoods.

As a result of this input, Authority staff worked closely with CWG members representing specific population groups to collaborate on environmental justice outreach activities targeting minority populations and low-income populations. For example, in San Jose, a CWG member facilitated the door-to-door canvassing and scheduling of a community meeting in the Gardner neighborhood. Another CWG member organized a meeting with representatives from the Vietnamese community.

To ensure CWGs reflect the diversity of stakeholders in the region, the Authority continues to add new CWG members by inviting contacts established through the environmental justice outreach process. As Authority staff engage with stakeholder organizations representing minority populations, low-income populations, and other marginalized populations, leaders of these organizations are invited to join the CWGs.

During the reporting period, the Authority conducted the following community working group meetings:

- April 14, 2016: Morgan Hill-Gilroy CWG
- April 18, 2016: Los Banos CWG
- August 9, 2016: Gilroy-Los Banos Technical Working Group (note: members of the Los Banos Community Working Group were invited to participate as members of this group)
- August 11, 2016: Morgan Hill-Gilroy CWG
- August 17, 2016: San Jose CWG
- January 23, 2017: San Jose CWG
- January 26, 2017: Morgan Hill-Gilroy CWG
- May 31, 2017: San Jose CWG
- July 12, 2017: San Jose CWG
- August 2, 2017: San Jose CWG
- August 30, 2017: San Jose CWG

- September 27, 2017: San Jose CWG
- October 26, 2017: San Jose CWG
- May 1, 2018: Business Plan Webinar with NorCal CWGs
- May 2, 2018: San Jose CWG
- August 16, 2018: San Jose CWG
- November 7, 2018: Morgan Hill-Gilroy CWG
- November 28, 2018: San Jose CWG
- February 21, 2019: San Jose CWG
- March 5, 2019: Morgan Hill-Gilroy CWG
- April 22, 2019: Morgan Hill-Gilroy CWG
- May 2, 2019: San Jose CWG
- July 10, 2019: Morgan Hill-Gilroy CWG
- July 16, 2019: San Jose CWG

While the Authority convened several CWGs along the San Jose to Merced Project Section between November 2019 and April 2020, these meetings were not focused on environmental justice topics, and they did not target environmental justice communities.

4.3 Outreach Efforts After the Release of the Draft EIR/EIS

The Authority published the San Jose to Merced Project Section Draft EIR/EIS on April 24, 2020. Since then, the Authority has conducted approximately 110 outreach meetings and events. As a result of the COVID-19 global pandemic, all meetings conducted between March 2020 and July 2021 were held virtually. The Authority did not host any in-person meetings during this time.

4.3.1 Environmental Justice Outreach Not Related to Community Improvements

Between the release of the Draft EIR/EIS and April 2021, the Authority conducted the following engagement and outreach activities not related to the community improvements planning process, which is discussed separately below.

4.3.1.1 Meetings During Draft EIR/EIS Public Review Period

During the public review period for the Draft EIR/EIS in April and May of 2020, the Authority met with several stakeholders and agencies, as listed in Table 5-12 of Final EIR/EIS Chapter 5, in addition to public webinars that were attended by members of the general public, as well as minority persons and low-income persons.

4.3.1.2 Public Meetings After the Draft EIR/EIS Public Review Period

While the Authority hosted three virtual public open houses and a virtual public hearing along the San Jose to Merced Project Section between May and October 2020, these events were not focused on environmental justice topics, and they did not target environmental justice communities. There were no Authority-hosted public meetings in the San Jose to Merced Project Section between November 2020 and April 2021.

4.3.1.3 Group Stakeholder Meetings

While the Authority convened several CWGs along the San Jose to Merced Project Section between May 2020 and April 2021, these meetings were not focused on environmental justice topics, and they did not target environmental justice communities.

4.3.1.4 Individual Stakeholder Meetings

Between the release of the Draft EIR/EIS and April 2021, the Authority conducted two meetings with the following people/organizations that covered topics related to environmental justice impacts and analysis that were not related to community improvements.

- August 12, 2020: San Jose City Councilmember Maya Esparza
- September 10, 2020: Santa Clara Unified School District

4.3.2 Environmental Justice Community Improvements Outreach

The environmental justice planning process includes several rounds of outreach related to improvements. The following sections describe the Authority's community improvements outreach efforts since December 2020, the results of which have been incorporated into the Final EIR/EIS.

4.3.2.1 Community Improvement Outreach, Phase One

After initial community improvement concept development, a first phase of improvements-focused outreach was conducted. The goals of this first phase of outreach (Outreach Phase One) were as follows:

- Expand the Authority's understanding of the needs of minority populations and low-income populations.
- Promote understanding of the environmental justice analysis and the process.
- Gather minority community and low-income community ideas for improvements.
- Obtain feedback on the initial list of improvements.

Presentations were made between December 2019 and March 2020 to a multitude of local minority community organizations and low-income community organizations, including community-based service providers, school leaders, community groups, neighborhood associations, churches and other faith-based organizations, and community leaders and representatives, along with public agency representatives. Participants were identified from the stakeholder database, and additional outreach was added as initial contacts led to subsequent and new contacts.

These first engagements were to provide information and data and to provide a process through which local minority community improvement concepts and low-income community improvement concepts would be developed. Information about the requirements for a federal environmental justice EIR/EIS analysis, finding of disproportionate effects, and subsequent need to identify minority community improvement concepts and low-income community improvement concepts was explained. Data about the identification, boundaries, and initial naming of the minority communities and low-income communities was shown graphically. The proposed improvements process with a structure for identifying, developing, and prioritizing improvement concepts across an 85-mile alignment was described. Other materials provided for review and consideration included the following:

- Sample community improvement concepts from national examples, the Authority's own factfinding as memorialized in the Connecting Community Strategy (CCS), and San Jose's Strong Neighborhood Initiative (SNI), of improvement implementation
- A template outlining the minimum data requirements for each improvement concept
- A preliminary list of criteria that ties the improvement concept to the USEO goals and objectives, accounts for engineering as well as cost feasibility, links potential partners, and bounds the improvement concept exercise to federal environmental justice requirements
- A preliminary list of community concept types, as well as specific concepts that were included in planning documents, capital improvement lists, and unfunded priorities
- Explanation of the goals of the improvements process to engage local minority communities and low-income communities to develop improvement concepts

- Criteria for rating the concepts were also presented because the criteria would allow the Authority to rank improvements across a 90-mile geography with a solid basis for differentiating among improvement concepts.

During this phase of outreach, which occurred between December 2019 and March 2020, the Authority conducted a total of 48 meetings, including calls and in-person meetings with potential partners and community presentations. Outreach during this phase included gathering feedback from potential implementing partners (i.e., those entities potentially able to partner with the Authority on improvement implementation). Potential implementing partners included school districts, cross-jurisdictional agencies, municipalities, and a few selected community organizations across the affected communities.

4.3.2.2 Community Improvement Development and Evaluation

Development and evaluation of potential improvements began following completion of Outreach Phase One and continued through June 2020. Improvements were developed based on input from potential partners and community stakeholders to ensure that improvements carried forward for funding and implementation would meet community needs and priorities. After development of improvements based on initial concepts gathered during Outreach Phase One, potential improvements were evaluated based on the set of established evaluation criteria.

Community Improvement Development

As part of preparation of the draft analysis, potential improvements in the initial concept development phase were developed, refined, consolidated, or in some cases eliminated to determine a set of improvements to be evaluated. Refinements included expanding potential improvement ideas by gathering additional information from existing local and regional plans where certain improvements were described more fully. Improvement development also assessed the benefits to minority populations and low-income populations, the relationship of each potential improvement to project effects, and the consistency of potential improvements with local plans and policies. Preliminary cost estimates were also prepared for each potential improvement. Further, to help gauge the extent to which a given improvement would benefit minority populations and low-income populations within a given community, each improvement was mapped relative to the location of the minority populations and low-income populations along the HSR alignment.

Evaluation of Community Improvements

After developing profiles for potential improvements, the improvements were evaluated relative to the refined set of evaluation criteria, described in Appendix 5-C, Environmental Justice Development of Community Improvements, of the Final EIR/EIS. The improvements evaluation informed the identification of potential community improvements address residual disproportionately high and adverse effects on minority populations or low-income populations.

4.3.2.3 Community Improvement Outreach, Phase Two

After completing the initial screening and evaluation of the improvement concepts and ideas gathered during Outreach Phase One, the Authority undertook a second phase of outreach to gather feedback from potential implementing partners on specific improvements to ensure that the improvement profiles correctly represent the input gathered during Outreach Phase One and collect any additional information pertinent to the potential improvements, such as the roles and responsibilities of the agencies and entities who would be involved in design and implementation of the improvements. Feedback was also sought on the scoring of the potential improvements, the ranking of improvements relative to local priorities, and the preliminary cost estimates included in the improvement profiles. During this phase of outreach, which occurred between July and September 2020, the Authority conducted a total of 17 meetings, including calls and in-person meetings with potential partners and community presentations. Feedback gathered during Outreach Phase Two was then incorporated into the revised analysis, which is included in the Final EIR/EIS.

To solicit this feedback, local jurisdictions and agencies and certain other nongovernmental organizations were presented with the improvement profiles pertinent to their communities, jurisdictions, or areas of focus, along with the preliminary scoring and evaluation of each improvement. The Authority scheduled meetings with potential implementing partners to discuss their perspectives on the improvement evaluation, to gather feedback, and to better understand local priorities. The Authority met with the following jurisdictions, agencies, and groups during Outreach Phase Two:

- City of Santa Clara
- City of San Jose (including the Parks and Recreation Department and the Department of Transportation)
- City of Morgan Hill
- City of Gilroy
- Local school districts (for school improvements in San Jose, Morgan Hill, Gilroy, and Los Banos)
- Santa Clara County Parks and Recreation Department (for County parks)
- Rebekah Children's Services (for improvements to the organization's facility)
- Rocketship Public Charter School (for improvements at a Rocketship Mateo Sheedy School)
- Valley Transportation Authority (for transit and certain other transportation improvements)
- Center for Employment Training, Mission College, Gavilan College (for the potential cross-community job training improvement and other improvements specific to these institutions)
- African American Community Service Agency (for improvements at the organization's facility)
- Santa Clara County Health and Human Services and HomeFirst (for homeless services and housing initiatives)

4.3.2.4 Draft Environmental Justice Improvements Analysis

Input gathered during Outreach Phase Two was incorporated into revised analysis in the Final EIR/EIS, which incorporates internal review, community partner feedback, and improvement evaluation results to present a list of potential improvement priorities. In particular, feedback related to the improvement profiles was considered to revise the descriptions of the potential improvements and to revise the scoring of each improvement to reflect partner input, priorities, and evidence of agreement.

4.3.2.5 Community Improvement Outreach, Phase Three

In the month of September 2021, the Authority conducted a total of 26 virtual meetings with Implementing Partners, Community Organizations, and Interested Parties and Other Stakeholders in eight communities, within the San Jose to Merced Project Section, including Santa Clara/North San Jose, San Jose Diridon, Gardner/North Willow Glen, Guadalupe/Washington/Tamien/Alma/Almaden, South San Jose, Morgan Hill, Gilroy, and San Joaquin Valley, where the EIR/EIS analysis had indicated that low-income populations and minority populations may be subject to disproportionately high and adverse effects from the project alternatives. Generally, the objectives of these meetings were to:

- Explain the updated environmental justice analysis for the EIR/EIS, including updated and new mitigations, consideration of benefits, and potential community improvements.
- Share preliminary conclusions related to the updated analysis.
- Gain feedback on the updated analysis, preliminary conclusions, and potential community improvements.

The Authority classified stakeholders engaged into three general categories: (1) Implementing Partners, (2) Community Stakeholders, and (3) Interested Parties and Other Stakeholders within each of the affected communities to share and discuss the analysis and provide an opportunity for feedback (See Attachment D for definitions of each category).

The Authority communicated closely with Partners, Stakeholders, and Others before the meeting series, sharing flyers, accommodation surveys, and proposed content. Each of the eight

communities received a community-specific and comprehensive packet of materials (in both Spanish and Vietnamese and were ADA-compliant) related to the environmental justice analysis, including:

- Community Survey
- Environmental Justice Analysis Process Summary
- Summary of Updates to the EIR/EIS Environmental Justice Analysis
- Environmental Justice Community Summary
- Meeting Agenda and Presentation

The Authority requested all review the materials and provide feedback via electronic survey, letter, or other written form by October 1, 2021. The feedback gathered during this phase has been evaluated and incorporated into the Final EIR/EIS. A detailed summary of outreach, outreach materials, and copies of the input from this outreach cycle are presented in Attachment D.

4.4 Key Issues Identified during Stakeholder Engagement

4.4.1 Prior to the Publication of the Draft EIR/EIS

The following issues and concerns were recurring during engagement efforts, including in areas with minority populations and low-income populations:

- **HSR alignments—**Participants provided input on how different project alternatives would avoid or adversely affect different neighborhoods and communities. Additional alignment preferences, such as an at-grade alignment through downtown San Jose, an alignment along US 101, or an alignment predominately in trench, tunnel, or along existing rail tracks, were suggested to minimize property impacts and community displacements.
- **Vertical profile—**Participants noted preferences for different vertical profiles and structure types for each project alternative. For example, residents noted that retained or elevated viaducts would reduce property acquisitions related to sloped embankments. Some stakeholders expressed preference for the aerial option approaching San Jose Diridon Station as a means of reducing potential noise and traffic effects, while others raised concerns regarding aesthetic changes and loss of privacy caused by aerial structures. Some San Jose participants suggested that the Authority consider “active uses” for underpasses of aerial structures, with the potential to provide community benefits and prevent homeless encampments.
- **Project-related noise—**Participants noted concerns about operation and construction-related noise impacts and asked about the location of noise barriers. Noise was raised as a key concern in most of the communities along the project, and was particularly important to residents in San Jose, who already experience noise effects because of Caltrain operations and the Norman Y. Mineta San Jose International Airport.
- **Traffic and transportation—**Participants noted concerns about traffic congestion resulting from project construction and operations. These concerns were raised most frequently in Santa Clara and San Jose, communities most affected by current commute traffic conditions. In San Jose, the primary traffic concern was associated with the lane reduction of Monterey Road, and resulting delays and diversion of local traffic. In Los Banos, community members reported the project construction and operations impacts were of most concern for the Volta Elementary School community. As there are only two access roads (e.g., Ingomar Grade and Henry Miller Avenue) for families to access the school, any road closures would disrupt school attendance and access to emergency services and any noise or other operations-related effects would interfere with the learning environment.
- **Safety and security—**Universally, participants raised concerns regarding safety associated with train speeds, road crossings, and pollution. In San Jose and Gilroy, particular concern

was expressed with regards to the safety of school children crossing the respective sections of Monterey Road; some individuals expressed the need for additional safety precautions. Issues of safety and security were also a concern for communities in the context of increased homeless encampments and illicit activities around the tracks and station areas. In many instances, there was concern for safety of families crossing tracks to access community and health services.

- **Aesthetic effects—**Participants, particularly those in San Jose, noted concern about visually dominant project elements and potential for graffiti on facilities, aerial structures, and noise barriers.
- **Community cohesion and connectivity—**Participants in the Newhall neighborhood of Santa Clara, the Willow Glen, Gardner, Edenvale, and Delmas Park neighborhoods of San Jose, Morgan Hill, San Martin, and Gilroy expressed concern that the project alignment would erode community cohesion and connectivity, as well as the existing community character.
- **Community resources—** San Jose residents voiced concern regarding effects on community resources, such as the segmentation and accessibility of parks and trails, including Fuller Park and Los Gatos Creek Trail, and noise effects at Gardner Elementary School. Residents in Morgan Hill and Gilroy were interested in property effects on schools located in minority areas and low-income areas within the environmental justice RSA (including the Charter School of Morgan Hill, Gilroy Preparatory School [a public charter school in the Gilroy Unified School District with both minority student percentages and low-income student percentages higher than the reference community], and South Valley Middle School). Residents in Gilroy were also concerned about potential effects of project-induced growth on Gilroy schools. Some Gilroy residents were concerned with effects on downtown Gilroy's historic district (under Alternatives 1 and 2), while others were concerned with effects on historic resources in Old Gilroy (under Alternative 3).
- **Displacements—**Participants voiced concerns related to the number and type of residential displacements, particularly in San Jose, Morgan Hill, and Gilroy. Participants raised concerns regarding the displacement of low-income rental housing, particularly in Gilroy and Morgan Hill, and the ability of low-income or unemployed community members who rent their housing to relocate if affected by HSR. Others expressed concern about whether adequate replacement housing and other zoned properties exist to relocate those affected. The Gilroy community is particularly concerned about Alternatives 1 and 3 impacts of complete displacement of schools, community and health resources and city facilities on IOOF Avenue, off of Monterey Road. The community has made efforts to find real estate to relocate the schools, resources, and facilities, and was unable to find suitable locations.
- **Affordable housing**—Gilroy and San Jose participants raised concerns regarding the effect of HSR on housing prices in the vicinity of stations and encouraged the Authority to adopt policies that protect and advocate for affordable housing in station areas.
- **Gilroy station location options**—Some Gilroy area residents were concerned with potential urban sprawl and induced-growth associated with a station in east Gilroy, which would have the potential to change the community character in the station area.
- **Construction effects on downtown Gilroy businesses—**A key concern raised by community members in downtown Gilroy was that construction effects would result in negative effects on the operation and margins of businesses in downtown Gilroy.
- **Property values—**Participants in all communities expressed concerns regarding project effects on property values and appropriate relocation compensation.
- **Agricultural business and employment effects—**Participants in unincorporated Santa Clara and Merced Counties expressed concern regarding the loss of useable farmland, parcel severance, and effects on farm operations and infrastructure (e.g., wells and irrigation systems). Concern was also expressed for the corresponding loss of agricultural employment opportunities because of the projects' effects on agriculture.

- **Cumulative neighborhood effects—**Participants expressed concerns over neighborhoods that have been historically affected by other transportation projects (e.g., the Gardner and Auzerais/Josefa neighborhoods and the construction of I-880 and US 101 freeways and subsequent widening; and the Silver Leaf and Sunspring neighborhoods, which are bordered by the Caltrain/Union Pacific Railroad (UPRR) railway and US 101). Morgan Hill participants expressed concern that the safety, noise, access to transportation and services and other impacts on the City's priority development areas or affordable housing projects built around the existing Caltrain station, greatly outweigh the benefits that the project would offer the community given that there is no station. This is especially the case for the Morgan Hill community, as one of the eligibility criteria for residents of Morgan Hill's priority development areas is that they are a no-vehicle household and are wholly reliant on public transportation for their mobility.

4.4.2 After Publication of the Draft EIR/EIS

The following issues and concerns were recurring during engagement efforts, including in areas with minority populations and low-income populations, after the public had an opportunity to review the Draft EIR/EIS:

- **Project Timeline/Sequencing/ Process—**Interest in project timeline (e.g., alternative selection, implementation, and project phases).
- **General Impacts**
  - Based on the September 2021 survey, project impacts on average identified as being moderately concerning (construction and operational traffic, bus transit delay, residential displacements, emergency vehicle response delays, operational noise) and a few project impacts on average identified as being somewhat concerning (visual aesthetics, commercial displacements, and partial acquisition of park/play areas). The highest rated impact of concern was traffic delay during construction. The lowest rated impact of concern was visual aesthetics.
- **Displacement/Property Impacts**
  - Concern regarding loss of homes, parks, and churches to the project.
  - Interest in understanding the property acquisition process and options that owners have.
  - Concern that displacement challenges would hit lowest income families the hardest.
  - Concern that property, owned by the Authority and neighbors, would be tagged and lead to heightened gang activity.
- **Coordination with External Agencies and Organizations**
  - Recommendation for the Authority to partner with local community-based organizations (e.g., homeless response teams, Complete Streets programs) on programs.
  - Recommendation for the Authority to partner with community members on beautification efforts (e.g., tree planting).
  - Interest in the relationship and coordinating logistics between the Authority and other transportation providers, especially UPRR and Caltrain.
- **Funding—**Interest in understanding how the project moves forward while funding is still pending.
- **Noise/Vibration**
  - Concern regarding noise and vibration impacts of train operation and construction.
  - Interest in approaches to and effectiveness of noise mitigation.

  - Concern regarding potential repetition of past transportation projects' unfulfilled promises to produce sound walls.

- **Train Stations—**Concern regarding traffic congestion and availability of parking near stations.
- **Traffic**
  - Interest in potential project outcomes that lead to reduced traffic congestion.
  - Concern about increased traffic impacts on safety and accessibility.
- **Mitigation Measures**
  - Concern about effects unable to be mitigated (e.g., displacement, environmental degradation).
  - Interest in understanding mitigation timeline, requirements, and process.
  - Concern, based on reported past experience with other agencies, that Authority may plan but not deliver mitigation.
- **Community Improvements**
  - Interest in improvements projects (e.g., traffic calming features, such as pedestrian crossing signs, crosswalks, bike lanes; freeway ramps; fences; playgrounds; school improvements; parks; riverside paths).
  - Concern that project impacts and improvements benefits cannot fully be understood when projects in the vicinity are still being planned.
  - Concern that there will be unintended consequences of improvements (i.e., new fences to tag resulting in heightened gang activity).
  - Concern about criteria used to define "environmental justice" communities along the alignment.
  - Different community improvements than those on the Authority's September 2021 "potential improvements" list were proposed by close to half of the partners and stakeholders; some explained reasons for justifying improvements as a result of a close relationship to the impacts based on the updated analysis, and others proposed reasons that would serve their community better than the ones on the potential list.
  - Concerns that more should be done than is currently being proposed to address noise, traffic, and emergency response effects.
  - Consistent concerns about the project's effect on homeless encampments, specifically in the Tamien/SR 87 area.
  - Urged consideration of actionable/sustainable improvements to show understanding and responsiveness to community.
  - Concern that improvements may not be implemented sooner, prior to project construction.
- **Project Benefits and Equity**
  - Concern that the environmental process does not necessarily focus on prioritizing communities and protecting the interests of residents.
  - Interest in project benefits, especially improved air quality, access to lower cost housing, traffic reduction, job access, and the connection of families.
  - On average, based on the September 2021 survey, project benefits were seen as moderately beneficial for most highlighted benefits in the survey (train travel; access to

jobs, goods, and services; integration with transit; reduction of highway traffic; upgrades to railroad safety and signaling systems; reduced air pollution and greenhouse gas emissions; construction and operational spending and employment; and support for transit-oriented development near stations) with one benefit (reduced need for airport and highway expansion) rated as somewhat beneficial. The highest rated benefits were reduced air pollution and greenhouse gas emissions. The lowest rated benefit was the reduced need for airport and highway expansion (which was still 3.2 on a 5-point scale).

- **Community Cohesion/Separation/Connectedness**
  - Concern about community isolation.
  - Interest in project benefit of increased mobility that will keep families connected.
- **Public Awareness/Outreach Engagement**
  - Concern regarding a perceived lack of responsiveness by the Authority to community concerns.
  - Concern regarding the community's lack of awareness or limited knowledge about the project.
  - Interest in learning about commuter fares, requirements to ride (i.e., identification), and train schedules and volumes.
  - Interest in the activities and logistics (e.g., open houses, access for those with technological constraints) and methods for engaging stakeholders for the Draft EIR/EIS comment period.
- **Safety**
  - Interest in collaborating with homeless response teams to abate the homeless population and activities along the tracks.
  - Concern regarding emergency vehicle response times and ensuring public safety personnel have direct access to communities.
  - Interest in developing and maintaining safety features (e.g., grade separations, pedestrian overcrossings, traffic safety, pedestrian crossing signs and lights, secure fencing around tracks, lights near new structures).
- **Alternatives**
  - Interest expressed for underground alternatives.
  - Interest in understanding cost differences and displacement effects of each alternative.

For more information about these public engagement meetings and activities, see Attachment C, Biannual Environmental Justice Outreach Reports, which contains twice-yearly reports summarizing these meetings and Attachment D, Environmental Justice Outreach, September 2021.

5 ONGOING ENVIRONMENTAL JUSTICE ENGAGEMENT ACTIVITIES

The Authority has been engaging and is continuing to engage with minority populations and low-income populations as well as services that serve these populations to identify the concerns of individuals about the effects of the project. The Authority will continue to engage with communities and individuals that would be affected by the project after release of the Final EIR/EIS and after adoption of the Record of Decision to implement commitments made during the NEPA and CEQA review process, to manage construction and operational effects on minority populations and low-income populations, and to ensure equitable participation in the benefits of the HSR project.

6 REFERENCES

California High-Speed Rail Authority (Authority) and Federal Railroad Administration (FRA). 2005. *Final Program Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System*. Vol. 1, Report. August 2005. Sacramento, CA, and Washington, DC:

———. 2010. *San Jose to Merced Preliminary Alternatives Analysis Report*. Prepared by Parsons. June 2010.

———. 2011. *Executive Summary Supplemental San Jose to Merced Alternatives Analysis Report.* Prepared by Parsons. May 2011. www.hsr.ca.gov/docs/programs/statewide_rail/proj_sections/SanJose_Merced/San_Jose_to_Merced_Supplemental_Alternatives_Analysis_Report_5_6_12.pdf (accessed November 9, 2017).

Kearns & West, Inc. 2016. *San Jose to Merced Project Section, Environmental Justice Outreach Plan.*

U.S. Census Bureau American Community Survey (U.S. Census Bureau ACS). 2010–2014a. *B030002. Hispanic or Latino Origin by Race*.

———. 2010–2014b. S17021. *Poverty Status in the Past 12 Months*.

APPENDIX 5-B, ATTACHMENT A: ENVIRONMENTAL JUSTICE OUTREACH PLAN

California High-Speed Rail Project Draft EIR/EIS

San Jose to Merced Project Section **Environmental Justice Outreach Plan**

Prepared by:

Kearns & West Inc.

October 2017

Table of Contents

APPENDIX 5-A: ENVIRONMENTAL JUSTICE OUTREACH PLAN 1-1

1 HIGH-SPEED RAIL AND ENVIRONMENTAL JUSTICE 1
- 1.1 Overview 1
- 1.2 Regulatory Setting 2
  - 1.2.1 U.S. Presidential Executive Order 12898 2
  - 1.2.2 U.S. Presidential Executive Order 13166 3
  - 1.2.3 U.S. Department of Transportation Order 5610.2(a) 3
- 1.3 Project Section Demographics 3

2 ENVIRONMENTAL JUSTICE ADVOCACY AND COMMUNITY GROUPS 7

3 ENVIRONMENTAL JUSTICE OUTREACH 9
- 3.1 Outreach Strategy 9
- 3.2 Outreach Activities 10
- 3.3 Outreach Implementation 11
  - 3.3.1 Public Meetings 12
  - 3.3.2 Environmental Justice Group Events and Meetings 13
  - 3.3.3 Digital Engagement 13
  - 3.3.4 Environmental Justice Organizations and Community Working Group Engagement 14
  - 3.3.5 Deliverables 14

4 REFERENCES 15

ATTACHMENT 1: ADVOCACY AND COMMUNITY GROUPS SERVING LOW-INCOME AND MINORITY POPULATIONS 17

LIST OF TABLES

Table 1 Resource Study Area Ethnic Composition in 2014 5
Table 2 Demographic Characteristics in the Resource Study Area 6
Table 3 Environmental Justice and Transportation Advocacy and Community Groups Active in the Resource Study Area 7
Table 4 Public Participation and Outreach Examples 11

LIST OF FIGURES

Figure 1 Proposed San Jose to Merced Project Section 4
Figure 2 Draft Milestone Schedule for San Jose to Merced Project Section 12

1 HIGH-SPEED RAIL AND ENVIRONMENTAL JUSTICE

In compliance with U.S. Presidential Executive Order (USEO) 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* requiring the avoidance or mitigation of disproportional health and environmental effects on environmental justice populations, the California High-Speed Rail Authority (Authority) develops environmental justice outreach plans for each High Speed Rail (HSR) Project Section. Title VI of the Civil Rights Act of 1964, as amended, states that "no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefit of, or be subjected to discrimination under any program or activity that receives Federal financial assistance." Environmental justice, as mandated by USEO 12898, falls under the umbrella of Title VI. USEO 12898 states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States." USEO 12898 has been adopted as a planning process requirement for all Authority efforts (Authority 2016).

The Authority's definition and application of the term "environmental justice" as it relates to the HSR system is as follows:

> *"Environmental Justice (EJ) is the fair treatment of people of all races, cultures, and income with respect to the development, adoption, implementation and enforcement of environmental laws and policies. Implementation of environmental justice principles in how the Authority plans, designs, and delivers the high-speed rail projects means that [the Authority] recognizes the potential social and environmental impacts that project activities may have on certain segments of the public. [The Authority] recognizes how important provisions of existing environmental, civil rights, civil, and criminal laws may be used to help reduce environmental impact in all communities and environmental justice on the human element. The Authority has included environmental justice considerations in its planning for the statewide high-speed train system since 2000, when it commenced a programmatic environmental review process"* (Authority 2015).

1.1 Overview

This *Environmental Justice Outreach Plan* is prepared to support the environmental study for the San Jose to Merced Project Section (Project Section) of the California HSR program. It is intended to guide the Authority[1] in engaging low-income and minority populations in the resource study area (RSA)[2] to communicate project information, listen to and respond to community thoughts and concerns, and identify potential actions to mitigate any disproportionately high and adverse human health and environmental effects, including social and economic effects, on low-income and minority populations.

The *San Jose to Merced Project Section Draft EIR/EIS* will be a stand-alone, second-tier, project environmental document. The report focuses on the portion of the Project Section between San Jose and Carlucci Road (San Jose to Central Valley Wye project extent, or simply project extent). The San Jose to Central Valley Wye project extent has a length of approximately 91 miles. Beginning at Scott Road, north of San Jose Diridon Station, the corridor primarily follows Monterey Road, U.S. 101, and SR 152 through Pacheco Pass. Desktop research, field surveys, and impact analyses in resource-specific technical reports for this project extent would terminate at Carlucci Road. The Draft EIR/EIS will summarize and include the analysis in the Central Valley Wye Project Section and the Ranch Road Re-examination to extend the corridor to Merced.

The infrastructure and systems of the HSR system would consist of trains (rolling stock), tracks, stations, train control, power systems, and maintenance facilities. The design includes a double-track rail system to accommodate planned project operational needs for uninterrupted rail movement. The system would be

[1] In the context of this plan, *Authority* refers to the California High-Speed Rail Authority or its consultants.

[2] The San Jose to Merced Project Section extends from Scott Boulevard in Santa Clara on the Caltrain Corridor to Carlucci Road and Henry Miller Road in central San Joaquin Valley, northeast of Los Banos. The resource study area (RSA) for environmental justice is concurrent with this area. See Figure 1 for a map of the RSA.

grade-separated from all other transportation systems, with two exceptions: the at-grade alternative at Auzerais Avenue and the at-grade alternative at Virginia Street, both in the San Jose Diridon Station Subsection.

The conceptual design of the station areas (Santa Clara, Diridon, and Gilroy) provides connectivity for different types of transit, drop-off facilities, an entry plaza, a station house area for ticketing and support services, an indoor station room where passengers wait and access the HSR, and parking facilities. Station design has not progressed beyond the conceptual stage, but two locations have been identified near Gilroy to accommodate two proposed corridor alignments. One co-located light maintenance facility (LMF)/maintenance of infrastructure facility (MOIF) would be located in the Gilroy area, and a maintenance of wayside (MOWS) would be located west of Turner Springs Road in the Central Valley.

Surveys and environmental assessments of the San Jose to Merced Project Section were initiated in 2010, and administrative draft reports were completed; however, work on the Project Section was suspended prior to completing the technical reports and the administrative Draft EIR/EIS. Since that time, the Authority has continued to refine the alternatives and limits of construction for this Project Section. The Authority identified the project footprint in summer 2016. From this footprint, the Authority has developed a concise project definition. Technical analysis, station design, and outreach was ongoing through 2016 and the EIR/EIS analysis is underway.

The Authority requires that an environmental justice outreach plan be developed and implemented as part of the Draft EIR. This *Environmental Justice Outreach Plan* provides the following information:

- Summarizes demographics in the RSA and community groups that are stakeholders in the project.
- Describes the strategy for reaching out to, engaging, and gathering input from low-income and minority populations.
- Identifies the specific methods that will be used to implement this strategy, such as digital media, information booths, and presentations to and listening posts with environmental justice advocacy and community groups.
- Lists the documents that will be prepared to document the environmental justice outreach efforts.

The process and guidelines described in this plan are provide a consistent method for sharing information with low-income and minority populations during the environmental review process for this project extent.

1.2 Regulatory Setting

The Authority has a strong commitment to ensuring that no person shall, on the grounds of race, color, national origin, sex, age or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity in the design, construction and operation of the high-speed rail system. Accordingly, the Authority adopted a Title VI programmatic policy that pays careful attention to the needs of limited English proficiency (LEP) and environmental justice populations (Authority 2016).

The following text details additional applicable regulations, requirements, and federal efforts that govern and inform the development and implementation of an environmental justice outreach plan.

1.2.1 U.S. Presidential Executive Order 12898

According to USEO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, projects that receive federal funding should “ensure the full and fair participation by all potentially affected communities in the decision-making process; to avoid/mitigate disproportionately high human health or environmental effects, including social and economic effects, on low-income and minority populations; to prevent the denial of, reduction in, or significant delay in the receipt of benefit by minority populations and low-income populations.” Environmental justice populations, as identified by USEO 12898, comprise Black, Asian American, Native American, Hispanic/Latino (regardless of race), and low-income persons.

To emphasize the importance of USEO 12898, the Obama Administration facilitated a multi-agency signing of the Memorandum of Understanding on Environmental Justice and USEO 12898 in 2011

(Environmental Justice MOU). On the 20th anniversary of the original executive order, President Obama issued a Presidential Proclamation further solidifying the Administration's commitment to environmental justice. The document states that communities historically burdened by pollution—particularly minority, low income and tribal communities—merit protection from environmental and health hazards, access to the federal decision-making process, and access to a healthy environment in which to live, learn, and work. The environmental justice MOU increases federal agency accountability to environmental justice populations and outlines processes to aid overburdened communities and facilitate community engagement in agency decisions.

1.2.2 U.S. Presidential Executive Order 13166

In 2000, President Clinton issued USEO 13166, which provided additional federal guidance about providing information and services to LEP persons. Under USEO 13166, each federal agency is required to examine the services it provides and develop and implement a system by which LEP persons can meaningfully access those services consistent with, and without unduly burdening, the fundamental mission of the agency. Each federal agency must also work to ensure that recipients of federal financial assistance provide meaningful access to their LEP applicants and beneficiaries. To assist the agencies with this endeavor, the Department of Justice has issued general guidance on compliance standards that recipients must follow to ensure that the programs and activities they normally provide in English are accessible to LEP persons and do not discriminate on the basis of national origin in violation of Title VI of the Civil Rights Act of 1964, as amended, and its implementing regulations.

According to the December 2015 USEO 13166 accomplishment report (LEP.gov 2015), federal agencies continue to improve implementation of the USEO 13166 with new tools, training, and resources; stronger coordination; integrated use of data and technology; increased technical assistance; and improved outreach and education.

Accordingly, the Authority provides LEP access, at a minimum, to individuals who are representative of more than 5 percent of the population in California or the county in which the Authority is providing an activity or service.

1.2.3 U.S. Department of Transportation Order 5610.2(a)

The U.S. Department of Transportation (USDOT) Order 5610.2(a) is used by USDOT to comply with USEO 12898. USDOT Order 5610.2 generally describes the process that the Office of the Secretary, and each operating administration within the USDOT, will use to incorporate environmental justice principles (as embodied in USEO 12898) into existing programs, policies, and activities. The order requires the Office of the Secretary, and each operating Administration within USDOT, to develop specific procedures to incorporate the goals of USDOT Order 5610.2 and USEO 12898 with the programs, policies, and activities that they administer or implement.

1.3 Project Section Demographics

For this Project Section, the Authority would provide HSR service between San Jose Diridon Station in downtown San Jose, to a Gilroy station in either downtown Gilroy or east of Gilroy, and a station in downtown Merced. The San Jose to Central Valley Wye project extent would connect San Jose to the Central Valley portion of the HSR system at the Central Valley Wye in Merced County, which in turn connects to the portion of the system running north to Merced and south to Fresno and southern California (Figure 1).

Because the portion of the Project Section between Merced and Carlucci Road has been analyzed in the *Merced to Fresno Section Final EIR/EIS* (Authority and FRA 2012) and the *Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR/EIS* (Authority and FRA no date), the analysis in this document focuses on the project extent between Scott Boulevard and Carlucci Road (San Jose to Central Valley Wye project extent).

Source: Authority and FRA 2016 JULY 2017

Figure 1 Proposed San Jose to Merced Project Section

Based on the 2010-2014 American Community Survey 5-year estimates for Santa Clara, San Benito, and Merced counties, San Benito County had the highest Hispanic/Latino population of the three counties. In Gilroy, more than half of the population was Hispanic/Latino. In 2014, Morgan Hill and San Martin were predominantly white while Gilroy and San Jose had the largest minority populations—approximately 68.5 and 72.5 percent minority, respectively. Morgan Hill was the least racially and ethnically diverse city, with only 50.7 percent minority representation. Table 1 shows the ethnic composition of the three-county region in 2014.

Table 2 shows other regional characteristics regarding income, age, and households. To account for the high regional cost of living in Santa Clara County, the poverty level metric that defines low-income populations for Santa Clara County and its cities has been set at 200 percent of the federal poverty level. As a result, all of the cities identified in Table 2 have a higher rate of low-income individuals than the 16.4 percent statewide average. Within the three-county region, Gilroy has the highest percentage of individuals below poverty level.

Table 1 Resource Study Area Ethnic Composition in 2014

Geographic Area	2014 Population	Percentage of Population (%)							
		Hispanic or Latino	Not Hispanic or Latino						
			White	African American	Native American	Asian	Native Hawaiian/Pacific Islander	Other Race	Two or More Races
California	38,066,920	38.2	39.2	5.7	0.4	13.3	0.4	0.2	2.7
Counties									
Santa Clara	1,841,569	26.7	34.1	2.4	0.2	32.9	0.3	0.2	3.1
San Benito	56,888	57.4	37.1	0.8	0.4	1.9	0.1	0.0	2.1
Merced	261,609	56.3	30.5	3.3	0.4	7.4	0.2	0.2	1.6
Cities and Communities in the RSA									
Santa Clara	119,525	19.1	34.5	3.4	0.3	38.9	0.2	0.2	3.3
San Jose	986,320	33.1	27.5	2.9	0.2	32.9	0.3	0.1	3.0
Morgan Hill	39,875	33.0	49.3	2.6	0.0	10.3	0.3	0.1	4.4
San Martin	7,081	40.4	42.7	0.2	0.7	9.8	4.0	0.2	2.0
Gilroy	50,776	59.0	31.5	1.8	0.0	5.7	0.5	0.0	1.6
Volta	257	19.1	34.5	3.4	0.3	38.9	0.2	0.2	3.3

Source: U.S. Census Bureau 2014
RSA = resource study area.

Table 2 Demographic Characteristics in the Resource Study Area

Geographic Area	Percent Low-Income Individuals	Population Age 65 and Older (%)	Number of Occupied Households	Median Household Income	Percent of Households w/ Limited English Proficiency
California [a]	16.4	12.1	12,617,280	$61,489	9.6
Counties					
Santa Clara [b]	23.3	11.7	614,714	$93,854	11.3
San Benito [a]	12.1	10.5	17,121	$67,874	9.2
Merced [a]	25.6	10.0	76,516	$43,066	13.2
Cities and Communities in the Resource Study Area					
Santa Clara [b]	22.2	10.0	42,751	$93,840	10.0
San Jose [b]	27.6	10.9	310,584	$83,787	13.6
Morgan Hill [b]	24.4	10.5	12,879	$96,232	5.0
San Martin [b]	21.3	15.6	2,033	$107,966	10.0
Gilroy [b]	35.5	8.6	14,922	$81,056	7.4
Volta [a]	9.7	14.8	79	$42,464	17.5

Source: U.S. Census Bureau ACS 2010–2014
[a] For this geography, the low-income level is set at the federal poverty level.
[b] For this geography, to account for the high cost of living, the low-income level is set at 200% of the federal poverty level.

2 ENVIRONMENTAL JUSTICE ADVOCACY AND COMMUNITY GROUPS

The following lists inform the outreach efforts to low-income and minority persons.

- Environmental justice and transportation advocacy groups that are active regionally or on a statewide scale (Table 3).
- Stakeholders and community organizations that provide services to or represent low-income and minority persons in the RSA (Attachment 1).

These organizations and groups advocate on behalf of low-income and minority populations in the RSA and are potential audiences for targeted outreach efforts. Table 3 lists organizations specifically dedicated to environmental justice and transportation, whereas Attachment 1 presents a more inclusive list of low-income and minority populations and organizations that serve those populations. As outreach continues, additional groups may be identified and added to either outreach list. An environmental justice database will be developed and updated periodically to track organizational contacts and outreach efforts.

Many of the environmental justice organizations shown in Table 3 advance environmental justice causes and advocate for minority or low-income populations in the RSA in addition to serving a broader geography. As such, several organizations are headquartered outside of the RSA.

Table 3 Environmental Justice and Transportation Advocacy and Community Groups Active in the Resource Study Area

Organization Name	Description	Website
California Endowment	State-wide grant-making organization that promotes fundamental improvements in the health status of all Californians	http://www.calendow.org/
California Environmental Justice Alliance	Statewide, community-led alliance that works to achieve environmental justice by advancing policy solutions	http://caleja.org/about-us/vision-and-history/
California Pan-Ethnic Health Network	State-wide network that promotes health equity by advocating for public policies and sufficient resources to address the health needs of communities of color	http://cpehn.org/
California Rural Legal Assistance	State-wide environmental justice and legal aid program that provides low-income rural Californians with free legal assistance	http://www.crla.org/
California Wellness Foundation	State-wide grant-making organization that addresses the particular health needs of traditionally underserved populations, including low-income individuals, people of color, youth and residents of rural areas	http://www.calwellness.org/
Center on Race, Poverty, and the Environment	San Joaquin Valley-focused environmental justice organization that seeks to achieve environmental justice and healthy, sustainable communities through collective action and the law	http://www.crpe-ej.org
Central California Environmental Justice Network	San Joaquin Valley-focused environmental justice network focusing on uniting activists and working with community members and stakeholders at local, regional, state and federal levels to eliminate environmental degradation in Valley Communities	http://ccejn.wordpress.com/

Organization Name	Description	Website
Central Coast Alliance United for a Sustainable Economy	Community organizing and advocacy organization that seeks to build grassroots power to invoke social, economic and environmental justice for the people of California's Central Coast Region	https://causenow.org
Central Valley Air Quality Coalition	San Joaquin Valley-focused coalition that works to ensure that all communities, of all races, cultures, class or creed, have the opportunity to be involved in the policy development and regulatory processes improving regional health	http://www.calcleanair.org/
Greenbelt Alliance	Bay Area-focused organization that seeks to protect natural and agricultural lands and shape the rules that govern growth around the San Francisco Bay Area	http://www.greenbelt.org/
Leadership Counsel for Justice and Accountability	San Joaquin Valley-focused, community-organizing advocacy group that seeks to affect land use and transportation planning, public investment priorities, environmental policy, and the provision of basic infrastructure and services	http://www.leadershipcounsel.org/
Policy Link	National research and action institute that advances economic and social equity by “Lifting Up What Works”	http://www.policylink.org/
Rural Community Assistance Corporation	State-wide organization that provides training, technical/financial resources and advocacy for rural communities	http://www.rcac.org/home
The City Project	National organization that works to ensure that all people have access to healthy, livable communities	http://www.cityprojectca.org/
TransForm	Transportation organization that seeks to transform communities and transportation with new solutions, smarter investments, and better planning as well as improve community access, health, justice, and sustainability	http://www.transformca.org/
United Farmworkers	A national farmworker’s union and social justice organization that seeks to provide farm workers and other working people with the inspiration and tools to share in society's bounty	http://www.ufw.org/
Valley Improvement Projects	San Joaquin Valley-focused organization that seeks to improve the quality of life for underrepresented and marginalized residents of California’s Central Valley by promoting social and environmental justice issues through youth outreach, education, technology, and art	https://valleyimprovementprojects.org/
Voices from the Valley	San Joaquin Valley-focused organization that offers a centralized media outlet for Central Valley activist organizations	http://www.voicesfromthevalley.org/

3 ENVIRONMENTAL JUSTICE OUTREACH

In locations where low-income and minority populations could be affected by construction or operations of the project extent, outreach activities will be conducted to solicit community views on the project's potential impacts. The purposes of these outreach activities are to inform local community members of the project and its status; solicit input on thoughts and concerns; and gain an understanding of potentially adverse project effects on low-income and minority communities.

The Authority used demographic and income information to identify minority and/or low-income populations in the RSA. As discussed in Section 1.3, Project Section Demographics, the RSA includes substantial low-income and minority, particularly Hispanic, populations. According to the National Center for Health Statistics (2015), low-income and specific minority populations such as Hispanics are more likely to be dependent on smartphones than on landlines. Similarly, according to the Pew Research Center (2015), low-income and Hispanic populations are more likely to rely on smartphones over computers for internet connectivity.

In order to engage low-income and minority groups in the RSA in the development of the environmental analysis, higher-resolution demographic data have been analyzed to identify key low-income and minority populations and interview environmental justice advocacy and community groups to inform the outreach techniques used to engage these populations. Outreach activities are documented as they occur for inclusion in the Draft EIR/EIS Environmental Justice chapter.

Continued outreach[3] will be needed in low-income and minority populations to provide information about the HSR decisions currently under consideration (Section 1.1, Overview), as well as to address any potential impacts on low-income and minority populations. The low-income and minority populations will also be provided with updates on the entire statewide system, including key milestones and progress. This environmental justice outreach will serve to open lines of communication to gather environmental justice population input and insights on project actions, potential ramifications, and potential mitigation strategies. This information will then be used to inform key decision-making.

3.1 Outreach Strategy

The Authority is committed to implementing a comprehensive outreach program that reaches a broad array of interests throughout the RSA. The Authority will follow the Department of Justice LEP guidance to confirm that information about the project is accessible to LEP persons in the RSA.

The outreach strategy outlined below will be used to engage key environmental justice stakeholders during the project development and environmental review processes. All outreach efforts will be conducted in coordination with the Authority's Northern California Regional Director and the Authority's Offices of Communication and Legislation.

Following are the key strategic objectives of this environmental justice outreach plan:

- Identify and actively engage environmental justice advocacy and community groups and elected officials representing low-income and minority populations throughout the RSA. Provide structured and unstructured opportunities for these groups and officials to provide input.
- Provide clear, concise, and accurate information, in appropriate languages, regarding this Project Section and the development of the environmental impact report (EIR)/environmental impact statement (EIS).
- Identify and address any potential environmental impacts disproportionately borne by low-income and minority populations throughout the RSA.

[3] From 2008 to 2010, the Authority conducted an extensive series of stakeholder meetings in the study area to discuss the project's scoping phase. The stakeholder meetings included minority and low-income populations, and several stakeholder workshops offered translation services and presentations in Spanish.

- Develop and implement multiple avenues of communication for environmental justice stakeholders to receive project information and submit questions and comments (e.g., public meetings, group presentations, activity centers, project website, bilingual hotline).
- Facilitate constructive dialogue between key environmental justice stakeholders and the Authority. Communicate back to low-income and minority populations how feedback has been reflected in the process.
- Communicate the vision, purpose, and benefits of the California HSR system.
- Accurately document and respond to all public input received and meet all CEQA and National Environmental Policy Act (NEPA) requirements.

To achieve the above strategic objectives, the Authority will adhere to the following outreach best practices:

- Proactivity: outreach to low-income and minority populations should happen “early and often” to identify and address environmental justice concerns as far in advance of potential effects as possible.
- Inclusivity: offer early and continuous opportunities for input on project advancements to as broad a spectrum of impacted or interested stakeholders as is feasible.
- Sensitivity: be informed and aware of low-income and minority population sensitivities and historical experiences and relationships; consider these sensitivities in information sharing approaches and techniques.
- Consistency: ensure all presentations, written/visual messaging, and informal conversations are presenting the same information.
- Accessibility: ensure meeting times and locations are accessible to target audiences, prioritizing locations where low-income and minority populations frequent and feel most comfortable and times when they are available, and tailor outreach materials and distribution methods to maximize target audience reach by offering translation services that meet or exceed LEP standards.
- Follow-Through: follow up with stakeholder comments and concerns to the best extent feasible.

3.2 Outreach Activities

Table 4 outlines potential outreach activities the Authority could conduct to engage low-income and minority populations in this project extent. Activities will be vetted before implementation by both Authority staff and environmental justice advocacy and community groups to confirm that they will reach the intended audiences.

Table 4 Public Participation and Outreach Examples

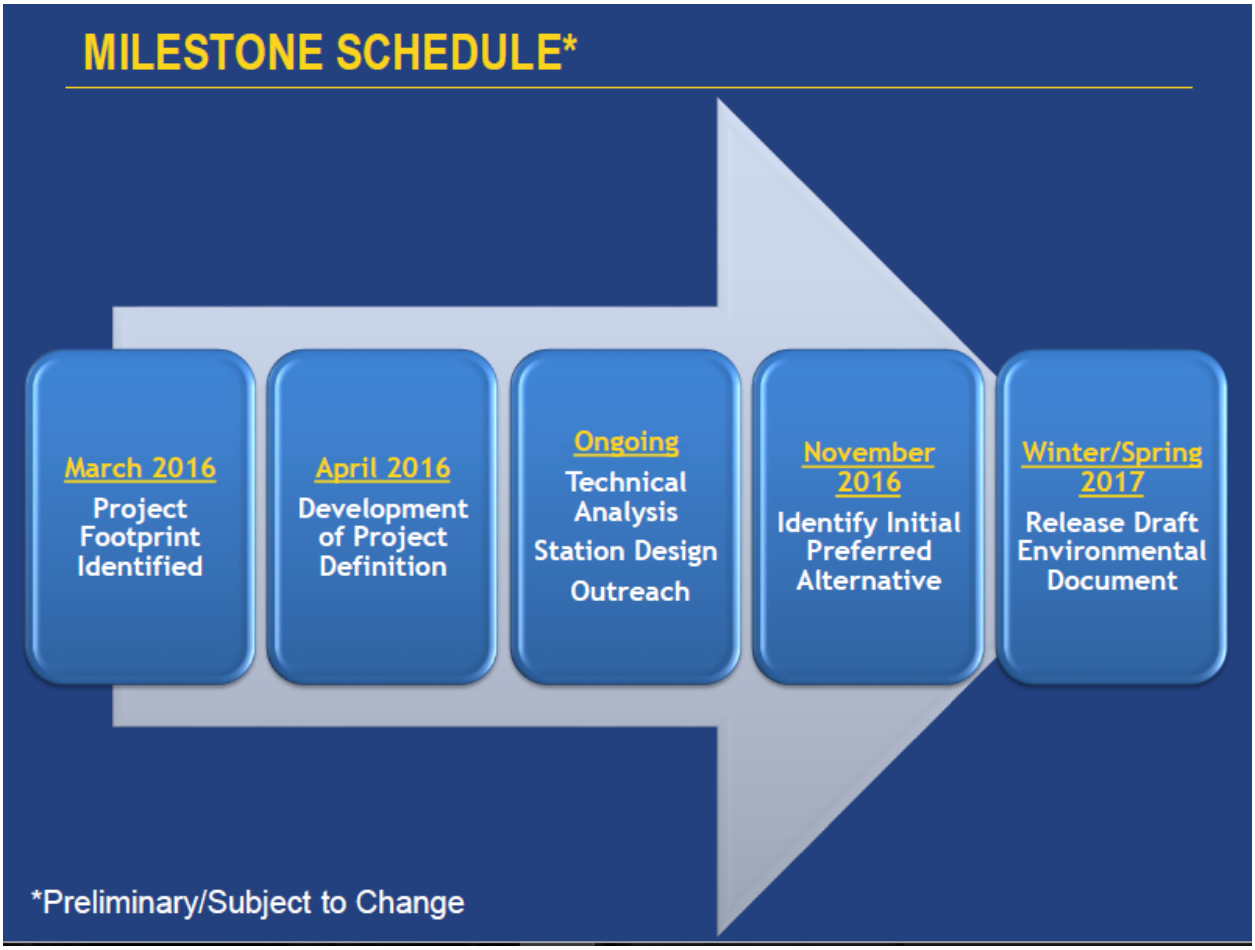
Example Outreach Category	Target Audience	Example Outreach Activity	Intended Outcome
Public meetings	All HSR stakeholders	Host periodic public meetings on the EIR/EIS HSR process in the RSA and solicit public comment	Disseminate key Authority EIR/EIS updates and receive suggestions and feedback via conventional public meetings
Organizational stakeholder contact	Environmental/social justice organizations	Connect with environmental justice advocacy and community groups to gauge their interest in scheduling meetings to offer project suggestions and inform stakeholder outreach processes	Establish a direct line of communication and a credible reputation with influential environmental justice advocacy and community groups who work in the RSA; gather valuable local insights on environmental justice challenges
Local stakeholder contact	RSA stakeholders, especially low-income and minority populations	Provide HSR tables and booths at local fairs and community events	Directly engage members of low-income and minority populations in HSR conversations to share relevant information, answer questions, and listen to perspectives; establish a two-way line of HSR communication in affected communities
Group stakeholder meetings	Multiple stakeholder agencies/ organizations	Organize meetings with multiple RSA advocacy and community groups and host collaborative, round-table discussions on HSR planning and key decisions	Gather and record topical HSR information as it pertains to low-income and minority populations to inform HSR processes
Digital engagement	RSA stakeholders, especially low-income and minority populations	Provide opportunities to participate, learn and provide input via online and mobile options	Directly engage members of low-income and minority populations in HSR without requiring in-person participation or home/office Internet access

HSR = high=speed rail
EIR/EIS = environmental impact report/environmental impact statement
RSA = resource study area

3.3 Outreach Implementation

The following sections present a general implementation approach for the environmental justice outreach strategy. Section 3.3.1, Public Meetings, reviews San Jose to Merced-specific events, or other relevant events organized and hosted by the Authority in which low-income and minority populations or organizations are invited to participate, receive updates, and/or offer feedback. Section 3.3.2, Environmental Justice Group Events and Meetings, reviews an approach to scheduling outreach events at which an HSR outreach representative would share relevant information with target low-income and minority population groups and gather insights from event attendees through any number of activities, such as tabling at public events or presenting to local organizations. Information gathered during these events will inform the HSR decision-making process.

Project milestones, illustrated on Figure 2, include project definition, scoping, technical analysis, identification of preferred alternative, and release of draft environmental document. Outreach efforts will be coordinated to meet these project milestones. Importantly, an environmental justice outreach implementation plan will be developed in concert with this document that will detail outreach specifics including targeted environmental justice populations, calendared events, outreach objectives, and strategies by environmental justice population and event, and outreach tracking and metrics. The implementation plan will be informed by higher-resolution demographics data as well as insights from environmental justice advocacy and community groups.



Source: Authority 2016

Figure 2 Draft Milestone Schedule for San Jose to Merced Project Section

3.3.1 Public Meetings

The Authority and its outreach team will schedule, coordinate, and facilitate public meetings, open houses and environmental review milestone meetings. These meetings will specifically include environmental justice advocacy and community groups to discuss any potential environmental impacts to low-income and minority populations in the RSA.

Meeting notifications may be distributed to the established list of environmental justice advocacy and community groups via email distribution and social media outlets. Advertisements may be placed in local non-English newspapers as determined by local demographics, and mail invitations may be distributed.

The Authority and its outreach team will secure all venues and coordinate logistics for each public meeting. Project fact sheets, welcome sheets, comment sheets and graphic displays will be developed and made available at every meeting.

All public meetings will be advertised and hosted per the requirements and best practices set forth by the Authority, including Title VI and LEP requirements (Authority 2016). These practices include offering translation services at public participation events. The Authority will provide translations of key documents such as comment cards and the draft EIS/EIR for LEP individuals who represent a significant population percentage of the geography in which the Authority is providing an activity or service. LEP regulation requires translation services to be offered when 5 percent of the county or state population being served is an LEP language population. The Authority will evaluate LEP needs at a finer population scale for local

and regional events to adhere to or exceed LEP guidelines as is sufficient to meet local language needs. Specific HSR summary documents and fact sheets for the project extent have been translated into Spanish, Vietnamese, and Chinese. To the extent that these documents are current with project advancements, they will continue to be made available to and advertised to low-income and minority populations. The Authority will develop and translate additional materials as deemed important to outreach efforts.

At the conclusion of each public meeting, meeting notes summarizing public comments and feedback will be prepared for use in further refining project details. The Authority will also develop and maintain a calendar of public outreach meetings and document meeting happenings by producing public meeting summaries that concisely capture key take-away messages from both the Authority and the environmental justice stakeholders in attendance

3.3.2 Environmental Justice Group Events and Meetings

In addition to coordinating Authority-hosted public meetings, the Authority will identify on-the-ground outreach opportunities through which they will increase their communication and engagement with low-income and minority populations in the RSA. These outreach opportunities will be coordinated with project milestones to share and gather timely and relevant information. The Authority will develop and maintain a calendar of potential environmental justice events and update the calendar periodically with upcoming events. The Authority will send advance notification of outreach events to environmental justice advocacy and community groups to allow environmental justice stakeholders to schedule accordingly. An HSR outreach representative will attend each of the approved identified events to share with and receive relevant information from the target environmental justice audience using the most relevant outreach strategy for the identified event (e.g., tabling at public events, presenting to local organizations, speaking on a webinar). The Authority will provide information about the process in a format that environmental justice organizations and elected officials representing low-income and minority populations can easily distribute to their constituents, such as in-language constituent newsletters and community news items.

In addition to public outreach, the Authority will coordinate with cultural resources specialists to ensure that historical resources that might be associated with well-established ethnic or other groups are identified. Such properties have the potential to be eligible for the National Register of Historic Places as traditional cultural properties. These properties can be defined generally as those that are eligible for inclusion in the National Register of Historic Places because they are associated with cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community. "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. The following examples of properties are those that possess such significance:

- A location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world.
- A rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents.
- An urban neighborhood that is the traditional home of a particular cultural group, and that reflects its beliefs and practices.
- A location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice.
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historic identity.

3.3.3 Digital Engagement

The Authority will develop ways for environmental justice stakeholders to learn about the project and provide input via smartphones and other mobile devices. For example, using mobile polling at community

events and public meetings or providing project information accessible via smartphones. The Authority will identify digital engagement opportunities that allow busy people to engage outside of work hours, do not require travel, and require an hour or less of participation. The Authority will use social media and digital outreach to provide information about broader engagement opportunities. All potential digital engagement approaches will be vetted by environmental justice advocacy and community groups to confirm each approaches potential for effective engagement and to leverage increased participation.

3.3.4 Environmental Justice Organizations and Community Working Group Engagement

The Authority will conduct quarterly community working group meetings in San Jose, Morgan Hill, Gilroy, and Los Banos over the course of the environmental review as a key venue for collaborative problem-solving and as a way to inform and shape the environmental review. Community working groups provide feedback from local communities and elected officials, insight on a wide variety of key considerations related to the environmental review, best methods to reach and engage constituency groups, and perceptions and feedback received from broader constituencies. The Authority will identify two to three environmental justice organizations to participate in each community working group. In addition, the Authority will conduct periodic check-ins with environmental justice groups to seek advice and input on the outreach effort. These environmental justice groups will be selected based on each groups' history of engagement with affected environmental justice populations and interest and willingness to communicate with the Authority. If there is greater interest on the part of the environmental justice organizations than there is capacity to communicate with each consistently, the Authority will narrow selected environmental justice partners based on maximum outreach potential.

3.3.5 Deliverables

The implementation of the outreach strategy and outreach activities detailed previously will lead to the following deliverables that will inform, among other items, project refinements, environmental mitigation plans, and future outreach activities:

- **Environmental justice database**: a database tool that records organizational contacts and tracks outreach efforts over time, including participation of environmental justice organizations, elected officials and stakeholders in community working group meetings, open houses, environmental milestone meetings and other venues and forums.
- **Environmental justice outreach implementation plan**: a detailed plan for environmental justice outreach implementation that specifies outreach strategies and techniques for each targeted environmental justice population, outreach objectives and tracking metrics, level of effort by project milestone, and outreach documentation.
- **External outreach meeting schedule**: a calendar of external outreach meetings or events at which an Authority representative will be present; this schedule will be reviewed and approved by Authority staff prior to implementation.
- **Internal outreach meeting schedule**: a calendar of outreach meetings or events hosted by the Authority.
- **Meeting agendas and notes**: draft agendas, internal and public meeting summaries, and feedback documentation for all environmental justice outreach-related internal and external meetings.
- **Meeting materials**: invitations, notices, signage, handouts, displays, staffing guides, and other relevant meeting/event materials; translated meeting materials will be provided for LEP populations in accordance with LEP regulation.
- **Digital content:** draft language for key environmental justice outreach and engagement efforts (e.g., social media pushes, mobile polls, website updates)

4 REFERENCES

California High-Speed Rail Authority (Authority). 2015. *Title VI Limited English Proficiency& Environmental Justice Annual Accomplishments Report*.

———. 2016. *Title VI Program*. http://hsr.ca.gov/Programs/title_VI_program.html (accessed May 31, 2016).

California High-Speed Rail Authority and Federal Railroad Administration (Authority and FRA). 2012. *Merced to Fresno Section Project Final Environmental Impact Report/Environmental Impact Statement.* April 2012.

———. 2017. *Merced to Fresno Section: Central Valley Wye Draft Supplemental EIR/EIS* (available at http://www.hsr.ca.gov/Programs/Environmental_Planning/draft_merced_fresno.html

LEP.gov. 2015. Federal Interagency Website. *Executive Order 13166: LEP Accomplishment Report - Advancing Meaningful Access for Limited English Proficient Persons (December 18, 2015)*. www.lep.gov/13166/20151218_EO_13166_accomplishment_report.pdf (accessed March 30, 2016).

National Center for Health Statistics. 2015. *Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, January–June 2015.* http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201512.pdf (accessed March 31, 2016).

Pew Research Center. 2015. *U.S. Smart Phone Use in 2015.* http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/ (accessed March 31, 2016).

U.S. Census Bureau. 2014. *2010-2014 American Community Survey 5-Year Estimates*. ACS Demographic and Housing Estimates, Poverty Status in the Past 12 Months, Population 65 Years and Over in the United States**,** and Median Household Income Tables*.* http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml (accessed March, 2016).

Attachment 1: Advocacy and Community Groups Serving Low-income and minority Populations

The following list of organizations serve minority and/or low-income communities in the resource study area. This list will be periodically updated to reflect organizational changes or additions.

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Acacia Mobile Home Park	Mobile home park	Morgan Hill		18055 Monterey Rd, Morgan Hill, CA 95037		(408) 778-0177
Adams Broadwell Joseph & Cardozo (Attorneys)	Law Firm working on behalf of the labor movement to give a voice to workers and their families in their struggle to secure safe and sustainable jobs and communities	Sacramento	Daniel L. Cardozo	520 Capitol Mall # 350, Sacramento, CA 95814	dcardozo@adamsbroadwell.com	(916) 444-6201
Almaden Seniors Association	501 (C)(3) non-profit corporation that supports the City of San Jose Senior Program	San Jose, CA	Dominique Pacolba	6445 Camden Ave	dominique.pacolba@sanjoseca.gov	(408) 268-1133
Breathe California	Lung health organization that works in the Bay Area to fight lung disease in all its forms and works with its communities to promote lung health	Bay Area, San Benito County, Merced County	Ramya Chitatoor	1469 Park Ave. San Jose, CA 95126	ramya@lungsrus.org	(408) 998-5865
San Jose District 6 Leadership Group	Self-directed group of independent nonpartisan neighborhood association, neighborhood business, school and community leaders group organized to improve communication, research issues, that make recommendations and hold educational meetings to improve the District 6 community and San Jose	San Jose, CA				
Gavilan College	Local community college and administrator of the Gavilan Joint Community College District with campuses in Gilroy and Coyote Creek	Gilroy, CA	Jan Bernstein Chargrin	5055 Santa Teresa Boulevard Gilroy, CA 95020	jbchargin@gavilan.edu	(408) 848-4724

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Gilroy Economic Development Corporation	501 (C) (3) non-profit corporation that offers a business assistance model for site selection services, rich data, workforce support and training, and assistance on permitting and development processes	Gilroy, CA	Tammy Brownlow	7471 Monterey Street, Gilroy, CA 95020	president@gilroyedc.org	(408) 847-7611
Gilroy Growing Smarter	Coalition of Gilroy residents who promote good stewardship of Gilroy and its land resources	Gilroy, CA	Connie Rogers	7690 Santa Theresa Drive, Gilroy, CA 95020		
Grassland Environmental Educational Center	Center that depicts the many significant contributions that wildlife managers, the agricultural community, sportsmen and environmentalists make in conserving San Joaquin Valley wetland and farmland resources	Los Banos, CA	Candace Sigmond	18110 Henry Miller Ave, Los Banos, CA 93635		(209) 704-4772
Lenders of Community Development (LCD) of San Jose	Development organization that assists families in becoming homeowners, offers small business loans to low-income individuals, finances the construction of affordable housing, and provides loans for community facilities	San Jose, CA		111 W. St. John Street, Suite 800, San Jose, CA	info@opportunityfund.org	(408) 297-0204
Madera County Economic Development Commission	Commission that assists with business recruitment, expansion and retention with a particular focus on new job creation	Madera County, CA	Bobby Kahn	2425 West Cleveland Avenue, Suite 101, Madera, CA	bkahn@maderacountyedc.com	(559) 675-7768
Oak Grove School District	School district serving southern Santa Clara County	Southern Santa Clara County, CA	Laura Phan	6578 Santa Teresa Blvd. San Jose, CA 95119-1204	business_support_services@ogsd.net	(408) 227-8300, ext. 100216
San Jose Downtown Residents Association	Residents association representing a diverse socio-economic group of residents in the downtown San Jose core that promotes partnerships with the city government and neighborhood businesses	San Jose, CA	Steve Barkley	PO Box 90264, San Jose, CA 95113-9998	info@sjpeople.org	

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
San Jose Strong Neighborhoods Initiative	Partnership between the City of San Jose, the Redevelopment Agency and San Jose's residents and business owners to strengthen the city's neighborhoods by building clean, safe and strong neighborhoods with independent, capable, and sustainable neighborhood organizations	San Jose, CA	Steve McHarris	200 E. Santa Clara Street, 3rd Floor, San Jose, CA 95113	customerservice@sanjoseca.gov	(408) 535-3555
San Jose Unified School District - River Glen	School district serving the City of San Jose	San Jose, CA	Nancy Albarran	855 Lenzen Avenue, San Jose, CA 95126	nalbarran@sjusd.org	(408) 535-6000
San Jose Word of Faith Christian Center	Faith organization working to foster economic vitality in San Jose	San Jose, CA		873 Delmas Ave, San Jose, CA 95125	General1@sjwofcc.org	(408) 295-0877
Santa Teresa Citizen Action Group	Citizen group that educates residents about neighborhood issues					
Silicon Valley Land Conservancy	Conservancy that maintains and promotes the downtown San Jose core as a livable, family-oriented community with a high quality of life	San Jose, CA	Craig Edgerton	117 Bernal Rd, # 70-181 San Jose, CA 95119	cedgerton@siliconvalleylc.org	(408) 460-1102
Silicon Valley Leadership Group	Leadership group that provides an open and transparent view of where local candidates for office in Silicon Valley stand on key issues that impact our local economy and quality of life	San Jose, CA	Chris O'Connor	2001 Gateway Place, Suite 101E, San Jose, CA 95110	coconnor@svlg.org	(408) 501-7884
South Bay Labor Council	Labor Council representing 97 unions and over 100,000 union members in Santa Clara and San Benito counties	South Bay	David Urhausen	2102 Almaden Road, Suite 114 San Jose, California 95125	David@southbaylabor.org	(408) 606-2060
Southside Community Center	Community center that offers classes to local residents	San Jose, CA		5585 Cottle Rd. San Jose, CA, 95123		(408) 629-3336

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Templo La Hermosa	Church in San Jose	San Jose, CA		59 South Montgomery St. San Jose, CA 94103, United States	info@tlahermosa.org	(408) 293-4406
Train Riders Association of California	Association that helps in community engagement for transportation planning and advocacy for Bay Area transit			1025 9th St, Sacramento, CA 95814		(916) 557-1667
Transportation Solutions Defense and Education Fund	Blog that covers transportation news specifically related to CA HSR; offers a repository of ideas for how to achieve a better future by shifting transportation funding	Bay Area		P.O. Box 151439 San Rafael, CA 94915	info@transdef.org	(415) 331-1982
United Neighborhoods of Santa Clara County	A coalition of neighborhood associations and homeowners associations in Santa Clara County	Santa Clara County	Ken Podgorsek	P.O. Box 90430 San Jose, CA 95109	execdir@unscc.org	
United Way Silicon Valley	Organization focused on community resources for families and individuals in San Jose, specifically for education and raising children	San Jose, CA	Sandra Miley	1400 Parkmoor Ave, Suite 250 San Jose, CA 95126	Sandra.Miley@uwsv.org	(408) 345-4302
USDA Natural Resource Conservation Service	Service supporting farmers and ranchers with financial assistance to improve the environment and agricultural operations	National; offices in Half Moon Bay/Santa Rosa/Salinas	Carlos Suarez	430 G Street #4164 Davis, CA 95616-4164	Carlos.Suarez@ca.usda.gov	(530) 792-5600
Vistapark, Encore and Echo Valley, Parkview Valley Community Association	Community association enabling participation in neighborhood activities	San Jose, CA (Vista Park)		Meetings in Vista Park		
Village of the Four Seasons Mobile Home Community	Mobile home community			200 Ford Road San Jose, CA 95138		(408) 225-7255

Organization Name	Description	Geography	Point of Contact	Address	Email	Phone
Santa Clara Valley Transportation Authority Riders Union	Group that advocates for those who use mass transit in Santa Clara County	Santa Clara, CA	Eugene Bradley, Founder		info@vtaridersunion.org	
Washington Area Community Coalition	Coalition committed to improving living conditions in neighborhoods facing injustices	San Jose, CA			waccgroup@yahoogroups.com	
Wilderness Society	Conservation organization protecting wildlands and associated benefits (e.g. air and water quality)	San Francisco, CA	Adam Bad Wound	250 Montgomery St Suite 210, San Francisco, CA 94104	Badwound@tws.org	(415) 398-1111 x104
Winchester Neighborhood Action Committee	Social network for the Winchester area to RSVP to neighborhood meetings and learn about meeting agendas	San Jose, CA (Winchester)				

APPENDIX 5-B, ATTACHMENT B: LIST OF OUTREACH MEETINGS HELD FOR THE PROJECT

PUBLIC AND AGENCY MEETINGS

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this attachment:

- This attachment was updated to include information on engagement concerning community improvements and other engagement following the public circulation of the Draft EIR/EIS and to include meetings with Grasslands Ecological Area stakeholders that had been omitted in error.

The Authority and FRA participated in meetings with the public and with representatives of federal, state, regional, and local agencies throughout the environmental review process. These meetings, which have occurred since 2008, are summarized in Table 1.

Table 1 Public and Agency Meetings

Date	Organization/Individual	Topic
12/18/2008	City of San Jose	Project definition and environmental process
1/12/2009	Delmas Park Neighborhood Action Committee	Project definition and environmental process
2/18/2009	City of Gilroy	Project definition and environmental process
2/18/2009	City of Morgan Hill	Project definition and environmental process
2/19/2009	City of Los Banos	Project definition and environmental process
2/23/2009	Silverleaf, San Jose Neighborhood Association	Project definition and environmental process
2/25/2009	Gardner Advisory Council, San Jose	Project definition and environmental process
2/26/2009	Grassland Water District	Project definition and environmental process
2/28/2009	City of San Jose District 2 Town Hall	Project definition and environmental process
3/3/2009	Committee for Green Foothills, Greenbelt Alliance, TNC, Silicon Valley Land Trust, Audubon, Sierra Club	Project definition and environmental process
3/18/2009	Merced EIR/EIS Scoping Meeting	Statewide HSR system, environmental review process, project alternatives, areas of environmental analysis, potential key issues
3/24/2009	North Willow Glen, San Jose Neighborhood Association	Project definition and environmental process
3/25/2009	San Jose EIR/EIS Scoping Meeting	Statewide HSR system, environmental review process, project alternatives, areas of environmental analysis, potential key issues
3/26/2009	Gilroy EIR/EIS Scoping Meeting	Statewide HSR system, environmental review process, project alternatives, areas of environmental analysis, potential key issues
3/26/2009	TAMC	Project definition and environmental process
4/14/2009	City of Morgan Hill Planning Commission	Project definition and environmental process
4/29/2009	Greater Gardner, San Jose community meeting (Spanish and English)	Project definition and environmental process

Date	Organization/Individual	Topic
9/3/2009	TWG Meeting #1 (Gilroy)	Project schedule and study process, alternatives analysis effort, summary of scoping comments, review of current alignment alternatives, review of alternatives analysis and key design objectives
9/10/2009	TWG Meeting #1 (Merced)	Project schedule and study process, alternatives analysis effort, summary of scoping comments, review of current alignment alternatives, review of alternatives analysis and key design objectives
9/12/2009	Diridon Station Area Plan Visioning Workshop	PAA—environmental review process and alternative alignments
9/17/2009	City of Gilroy	PAA—environmental review process and alternative alignments
9/23/2009	USACE, USFWS, RWQCB, CDFG	PAA—environmental review process and alternative alignments
10/5/2009	City of San Jose	PAA—environmental review process and alternative alignments
10/5/2009	USEPA/USACE	PAA—environmental review process and alternative alignments
10/6/2009	Alternatives Analysis Public Meeting, San Jose	Alignment alternatives, impacts on neighborhoods and local roads, concerns about eminent domain and property values, impacts on agriculture
10/7/2009	City of Morgan Hill	PAA—environmental review process and alternative alignments
10/7/2009	The Nature Conservancy	PAA—environmental review process and alternative alignments
10/8/2009	Alternatives Analysis Public Meeting, Merced	Alignment alternatives, impacts on neighborhoods and local roads, concerns about eminent domain and property values, impacts on agriculture
10/12/2009	Alternatives Analysis Public Meeting, Gilroy	Alignment alternatives, impacts on neighborhoods and local roads, concerns about eminent domain and property values, impacts on agriculture
10/12/2009	City of San Jose	PAA—environmental review process and alternative alignments
10/14/2009	Caltrans	PAA—environmental review process and alternative alignments
10/28/2009	Diridon Station Working Group	PAA—environmental review process and alternative alignments
11/2/2009	Gilroy City Council (Study Session)	PAA—environmental review process and alternative alignments
11/12/2009	FRA	PAA—environmental review process and alternative alignments
11/12/2009	HP Pavilion (now SAP Center)	PAA—environmental review process and alternative alignments

Date	Organization/Individual	Topic
11/13/2009	Gilroy Chamber of Commerce Government Relations Committee	PAA—environmental review process and alternative alignments
11/13/2009	VTA	PAA—environmental review process and alternative alignments
11/17/2009	Grassland Water District	PAA—environmental review process and alternative alignments
11/18/2009	South San Jose residents	PAA—environmental review process and alternative alignments
11/18/2009	UPRR	PAA—environmental review process and alternative alignments
11/24/2009	Rotary Club of Gilroy	PAA—environmental review process and alternative alignments
12/1/2009	DWR	PAA—environmental review process and alternative alignments
12/7/2009	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
12/14/2009	TWG Meeting #2 (Merced)	Alternatives analysis process, current alignment alternatives, right-of-way requirements, impacts on biological and water resources, effects on residents
12/15/2009	City of Gilroy	PAA—environmental review process and alternative alignments
12/15/2009	City of San Jose Department of Transportation	PAA—environmental review process and alternative alignments
12/16/2009	TWG Meeting #2 (Gilroy)	Alternatives analysis process, current alignment alternatives, right-of-way requirements, impacts on biological and water resources, effects on residents
12/17/2009	Open House Meeting, Merced	Ongoing alternatives analysis results
12/18/2009	UPRR	PAA—environmental review process and alternative alignments
1/4/2010	California Department of Conservation	PAA—environmental review process and alternative alignments
1/5/2010	City of San Jose	PAA—environmental review process and alternative alignments
1/5/2010	City of San Jose Department of Transportation and Redevelopment Agency	PAA—environmental review process and alternative alignments
1/5/2010	NMFS	PAA—environmental review process and alternative alignments
1/8/2010	City of San Jose	PAA—environmental review process and alternative alignments
1/11/2010	Open House Meeting, Gilroy	Ongoing alternatives analysis results
1/12/2010	Open House Meeting, San Jose	Ongoing alternatives analysis results

Date	Organization/Individual	Topic
1/12/2010	VTA	PAA—environmental review process and alternative alignments
1/14/2010	Peninsula Rail Program	PAA—environmental review process and alternative alignments
1/20/2010	SCVWD	PAA—environmental review process and alternative alignments
1/20/2010	Soap Lake Floodplain Representatives	PAA—environmental review process and alternative alignments
1/30/2010	Shasta-Hanchett Park Neighborhood Association Annual Meeting	PAA—environmental review process and alternative alignments
2/1/2010	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
2/1/2010	Gilroy City Council (Study Session)	PAA—environmental review process and alternative alignments
2/1/2010	Santa Clara County District 1 Supervisor Don Gage	PAA—environmental review process and alternative alignments
2/8/2010	San Jose District 2 Constituents	PAA—environmental review process and alternative alignments
2/9/2010	UPRR	PAA—environmental review process and alternative alignments
2/10/2010	USEPA/USACE	PAA—environmental review process and alternative alignments
2/12/2010	Gilroy Chamber of Commerce Government Relations Committee	PAA—environmental review process and alternative alignments
2/22/2010	Authority Chairman Pringle's Mayors Meeting	PAA—environmental review process and alternative alignments
3/2/2010	Alternatives Analysis Community Workshop, San Jose	Alignment alternatives in the south of Diridon Station to Tamien Station area
3/2/2010	City of San Jose	PAA—environmental review process and alternative alignments
3/3/2010	City of Gilroy	PAA—environmental review process and alternative alignments
3/10/2010	City of Morgan Hill	PAA—environmental review process and alternative alignments
3/17/2010	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
3/27/2010	Diridon Station Area Plan Community Workshop	PAA—environmental review process and alternative alignments
3/29/2010	DWR	PAA—environmental review process and alternative alignments
4/5/2010	TAMC Rail Policy Committee	PAA—environmental review process and alternative alignments

Date	Organization/Individual	Topic
4/9/2010	Merced County	PAA—environmental review process and alternative alignments
4/14/2010	City of Gilroy	PAA—environmental review process and alternative alignments
4/29/2010	SPUR City Trip to San Jose	PAA—environmental review process and alternative alignments
5/3/2010	Gilroy City Council Study Session	Program-level EIR/EIS and the alternatives analysis process
5/5/2010	Open House Meeting, Gardner Community Center, San Jose	South of Diridon Station to Coyote Creek Alternatives Analysis Informational Open House
5/6/2010	Open House Meeting, Santa Teresa Public Library, San Jose	South of Diridon Station to Coyote Creek Alternatives Analysis Informational Open House
5/18/2010	Cities of Los Banos and Dos Palos	PAA—environmental review process and alternative alignments
5/26/2010	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
6/10/2010	Santa Clara County Roads and Airports Department	SAA—presentation on the alternatives analysis
6/10/2010	Santa Clara County Supervisor Don Gage	SAA—Briefing on the alternatives analysis regarding Santa Clara County
6/10/2010	South County Joint Planning Advisory Committee	SAA—presentation on the alternatives analysis, particularly as it affects Morgan Hill, San Martin, and Gilroy
6/15/2010	Los Banos Community Open House	SAA—alignment alternatives and station location options
6/15/2010	Madera County Board of Supervisors	SAA—Avenue 21 and 24 alignment design options through Madera County
6/17/2010	Dos Palos Community Open House	SAA—alignment alternatives and station location options
6/17/2010	Los Banos Unified School District	SAA—impacts of the project on Volta Elementary School
6/17/2010	TWG meeting #3: Merced	SAA—alignment alternatives, station location and design options
6/21/2010	Caltrans	SAA meeting—alternative alignments and overall system summary
6/23/2010	Caltrain	SAA meeting—proposed alignments
6/28/2010	City of Gilroy Police and Fire Chiefs	SAA—safety measures related to train operations and stations
6/28/2010	Gilroy Community Open House	SAA—alignment alternatives and station location options
6/28/2010	TWG meeting #3: Gilroy	SAA meeting—alignment alternatives, station location, and design options
7/6/2010	Chowchilla Water District	SAA—district's irrigation distribution system
7/7/2010	CCID	SAA—district's irrigation distribution system
7/7/2010	Panoche Water and Drainage District	SAA—district's irrigation distribution system

Date	Organization/Individual	Topic
7/9/2010	Gilroy Chamber of Commerce Government Relations Committee	SAA—update on project progress and next steps, with focus on the Morgan Hill and Gilroy area
7/13/2010	San Martin Neighborhood Alliance	SAA—project information in the Morgan Hill/San Martin/Gilroy area
7/15/2010	Merced Community Open House	SAA—alignment alternatives and station location options
7/19/2010	Gilroy City Council Study Session	SAA—update to the Mayor and Council about studies conducted in the Gilroy area
7/20/2010	HP Pavilion (now SAP Center)	SAA—update on the status of the San Francisco to San Jose and San Jose to Merced Project Sections' EIR/EIS processes and their interface at Diridon Station
7/21/2010	San Jose Community Open House	SAA—alignment alternatives and station location options
7/22/2010	Merced County Farm Bureau Board of Directors	SAA—project status report and discussion of alternative alignments
7/29/2010	VTA Executive Briefing	SAA—presentation of the alternatives analysis, with a focus on Caltrain service, BART impacts, and Gilroy alignments
8/16/2010	Santa Clara County Roads and Airports and Planning Departments staff	SAA—project status report and discussion of alternative alignments
8/28/2010	Greenbelt Alliance	SAA—project status report and discussion of alternative alignments
8/30/2010	CDFG, NMFS, USFWS	SAA—project status report and discussion of alternative alignments
9/7/2010	Gilroy Chamber of Commerce and Business Association	SAA—Board member Rod Diridon, Sr., gave a presentation on Gilroy area alignment options
9/9/2010	South County Joint Planning Advisory Committee	SAA—South County HSR alternative alignments
9/14/2010	San Jose City Council	SAA—Dan Leavitt presented a statement regarding development of a Cooperative Agreement
9/15/2010	Preserve Our Heritage	Preliminary and Supplemental AA reports
9/17/2010	Diridon Station Joint Policy Advisory Board	Station Area Development principles
9/28/2010	City of Gilroy Administrator Tom Haglund	SAA—project status report and discussion of alternative alignments
10/5/2010	Caltrain	SAA—in-progress 15% plans and proposed relocation of Caltrain/UPRR tracks
10/7/2010	Gene Zanger, property owner	SAA—Property owner meeting in Casa de Fruta/Pacheco Pass area for project status report and discussion of alternative alignments
10/13/2010	VTA	SAA—VTA support in Gilroy station planning
10/14/2010	San Benito County staff/Airport Land Use Commission	SAA—project status report and habitat mitigation plans
10/18/2010	City of Gilroy staff	SAA—impacts on local roads and traffic

Date	Organization/Individual	Topic
10/20/2010	City of Morgan Hill staff	SAA—Design
10/21/2010	Reclamation	SAA—Overview of the corridor focusing on areas that may affect Reclamation facilities
10/27/2010	City of San Jose Department of Transportation	Project status update and preparation for November 4 community town hall meeting
11/3/2010	Morgan Hill City Council Study Session	SAA—project update regarding alignments being studied in Morgan Hill
11/4/2010	City of San Jose Community Town Hall on HSR	SAA—project update and responses to community questions, as well as information on the Cooperative Agreement between the City and Authority
11/17/2010	Santa Clara County Roads & Airports Department staff with City of Morgan Hill and Gilroy staff	SAA—road connections/realignments being proposed related to road closures
11/18/2010	California Society of Professional Engineers, Monterey Bay Branch	SAA—project status report and discussion of alternative alignments
11/18/2010	SCVWD	SAA—alignment alternatives and flood control facilities within Santa Clara County
11/29/2010	SCVWD, USACE	SAA—top of rail profile grade
12/10/2010	Caltrans Districts 4 and 10	SAA—project status report and discussion of alternative alignments
12/10/2010	Santa Clara County Parks Department	SAA—UPRR alignment alternative, US 101–Downtown Gilroy alignment alternative, countywide trails
12/15/2010	Morgan Hill and Gilroy joint HSR task force	SAA—Introduction of Roelof as HSR CEO, discussion of Morgan Hill and Gilroy concerns regarding alignments and station amenities (including parking)
12/16/2010	City of Gilroy staff	SAA—HSR passenger station concepts
12/20/2010	City of Gilroy staff	SAA—project status report and discussion of alternative alignments
12/20/2010	City of Morgan Hill staff	SAA—US 101 to East Gilroy alignment impacts
12/20/2010	Pacheco Pass Property Owners	SAA—alignments studied in the Pacheco Pass
12/22/2010	Caltrans District 4	SAA—I-280/SR 87 aerial structure
12/23/2010	Santa Clara County	SAA—cross-street grade separations through San Martin
12/28/2010	City of Gilroy staff	SAA—grade separations for at-grade HSR alignment option
1/3/2011	City of Morgan Hill staff	SAA—downtown Morgan Hill at-grade vertical profile option
1/4/2011	Caltrans District 10	SAA—encroachments and Caltrans expectations for future documentation
1/14/2011	City of Morgan Hill staff	SAA—road network and proposed modifications
1/14/2011	City of San Jose staff	SAA—plans for the aesthetics and design process

Date	Organization/Individual	Topic
1/14/2011	Gilroy Chamber of Commerce Government Relations Committee	SAA—economic development opportunities and HSR in South Santa Clara County
1/19/2011	Santa Clara County District 1 Supervisor Mike Wasserman, Santa Clara County Roads & Airports Department	SAA—project updates and south county residents' concerns
1/20/2011	Millpond Mobile Homes Community Briefing	SAA—project status report and discussion of alternative alignments
1/25/2011	Morgan Hill and Gilroy joint HSR task force	SAA—Morgan Hill and Gilroy concerns regarding proposed alignments and station amenities (including parking)
1/25/2011	South Santa Clara County Community Engagement Workshop #1, Gilroy	SAA—information on the evolution of the project in south Santa Clara County, including alignment development
1/27/2011	South Santa Clara County Community Engagement Workshop #1, Morgan Hill	SAA—information on evolution of the project in south Santa Clara County, including alignment development
2/17/2011	City of Gilroy staff	SAA—refined HSR passenger station
2/23/2011	City of Morgan Hill staff	SAA—latest downtown Morgan Hill at-grade vertical profile option
3/7/2011	San Jose Visual Design Guidelines CWG North meeting #1	Visual design guidelines being prepared by the Authority and City of San Jose
3/8/2011	Santa Clara County	SAA—latest downtown San Martin at-grade vertical profile option
3/10/2011	San Jose Visual Design Guidelines CWG South meeting #1	Visual design guidelines being prepared by the Authority and City of San Jose
3/14/2011	Campbell United Methodist Church Men's Club	SAA—updates on the statewide project and the San Francisco to San Jose and San Jose to Merced Project Sections
3/22/2011	City of Gilroy staff	SAA—Direction for downtown Gilroy at-grade vertical profile option
3/22/2011	Preserve Our Heritage	Alternative alignments
3/22/2011	South Santa Clara County Community Meeting (hosted by District 1 Supervisor Mike Wasserman)	SAA—information on the HSR project in south county, including the environmental review process, project status, and eminent domain/property acquisition process
3/29/2011	South Santa Clara County Community Engagement workshop #2, Gilroy	SAA—methodology for evaluating sound and visual impacts and approaches to mitigation
3/30/2011	South Santa Clara County Community Engagement workshop #2, Morgan Hill	SAA—methodology for evaluating sound and visual impacts and approaches to mitigation
4/11/2011	San Jose Visual Design Guidelines CWG North meeting #2	HSR visual design guideline process for San Jose
4/14/2011	San Jose Visual Design Guidelines CWG South meeting #2	Visual design guideline process for San Jose
4/22/2011	Morgan Hill and Gilroy mayors	Discussion with Roelof van Ark on Gilroy station area planning process

Date	Organization/Individual	Topic
4/22/2011	Morgan Hill and Gilroy joint HSR task force	Follow-up on proposed alignments and station amenities (including parking)
5/4/2011	Silicon Valley Economic Development Alliance	Project status report and discussion of alternative alignments
5/5/2011	McCarthy Business Park	Project status report and discussion of alternative alignments
5/6/2011	Congresswoman Zoe Lofgren's staff	Discussion of small and Hispanic business opportunities
5/14/2011	San Jose Visual Design Guidelines CWG North and South meeting #3	Visual design guideline process for San Jose
5/17/2011	Preserve Our Heritage	Concerns regarding alignments under evaluation
5/19/2011	Open House, Gilroy Senior Center	SAA, environmental review process, alternative alignments
5/23/2011	San Jose Visual Design Guidelines CWG North meeting #4	
5/25/2011	Open House, Merced Senior Center	SAA, environmental review process, alternative alignments
5/26/2011	San Jose Visual Design Guidelines CWG South meeting #4	Visual design guideline process for San Jose
5/27/2011	Preserve Our Heritage	SR 152 required Caltrans setbacks for HSR and Preserve Our Heritage's proposed alternative paralleling SR 152
6/13/2011	Open House, Los Banos Community Center	SAA, environmental review process, alternative alignments
6/16/2011	South Santa Clara County Community Engagement Workshop #3, Morgan Hill	Review station design and new at-grade alignments
6/23/2011	South Santa Clara County Community Engagement Workshop #3, Gilroy	Review station design and new at-grade alignments
6/24/2011	Preserve Our Heritage	AA—east-west alignment with SR 152 and Preserve Our Heritage's alternative proposed on 5/27/2011
6/25/2011	Silver Leaf Neighborhood Association "Spring Fling/Festival in the Park" community event (booth)	Project overview and alternative alignments
6/28/2011	San Jose Visual Design Guidelines CWG meeting #5	Visual design guideline process for San Jose
7/18/2011	San Jose Visual Design Guidelines CWG meeting #6	Visual design guideline process for San Jose
8/1/2011	TAMC Rail Policy Committee	Update on SAA Report
8/5/2011	Santa Clara County Fair (booth at weekend event 8/5/11-8/7/11)	Project overview and alternative alignments
9/24/2011	Taste of Morgan Hill (booth at two day event 9/24/11-9/25/11)	Project overview and alternative alignments
9/28/2011	City of Gilroy Mayor and staff	Tour in San Carlos

Date	Organization/Individual	Topic
9/29/2011	South Santa Clara County Community Engagement Workshop # 4, Morgan Hill	Review station design and alignments
10/11/2011	South Santa Clara County Community Engagement Workshop # 4, Gilroy	Review station design and alignments
11/7/2011	Gilroy Unified School District staff	Statewide HSR program, key documents and milestones, alignment maps, vertical and horizontal alignments under consideration
11/7/2011	Spanish-speaking group, San Jose	Project overview and alternative alignments
12/8/2011	San Jose Town Hall	Project updates, visual design guidelines, findings from evaluation of a modified tunnel option
1/9/2012	Joint San Jose to Merced/Merced to Fresno Stakeholder Meeting, Chowchilla	Preferred alignment approved by the HSR Board, potential impacts, project teams
1/17/2012	Gilroy South County Sunrise Rotary	Environmental review process and alternative alignments
1/26/2012	Salinas Valley Chamber of Commerce	Environmental review process and alternative alignments
3/27/2012	Policy aides for Supervisor Ken Yeager of Santa Clara County	Environmental review process and alternative alignments
4/23/2012	Morgan Hill and Gilroy City Managers Tom Haglund and Ed Tewes	Environmental review process and alternative alignments
4/25/2012	Kevin Maitski, Santa Clara County Supervisor Wasserman's office	Environmental review process and alternative alignments
4/26/2012	Quarterly TWG Meeting (webinar)	Environmental review process and alternative alignments
5/16/2012	Caltrans NAAC	HSR program update and tribal involvement overview
5/16/2012	San Jose Chamber of Commerce	Environmental review process and alternative alignments
5/18/2012	San Jose Chamber of Commerce	Environmental review process and alternative alignments
6/9/2012	Silver Leaf Neighborhood Association/Spring Fling Festival (booth)	Environmental review process and alternative alignments
6/11/2012	Meeting with Environmental Groups, San Jose	Environmental review process and alternative alignments
6/13/2012	Caltrans NAAC	HSR program update and tribal involvement overview
6/13/2012	NAHC	Overview and status of the HSR program and tribal involvement were presented to commissioners and public
6/15/2012	Diridon Station Joint Policy Advisory Board	Environmental review process and alternative alignments
6/28/2012	Kevin Maitski, Santa Clara County Supervisor Wasserman's office	Environmental review process and alternative alignments

Date	Organization/Individual	Topic
6/28/2012	Local Agency Formation Commission of Santa Clara County	Environmental review process and alternative alignments
6/29/2012	San Jose Chamber of Commerce	Environmental review process and alternative alignments
7/25/2012	Bay Area Council, Silicon Valley Leadership Group, and San Mateo County Economic Development Association	Environmental review process and alternative alignments
8/1/2012	Caltrans NAAC	HSR statewide project presentation at Quarterly NAAC meeting—HSR program update and tribal involvement overview
8/15/2012	Quarterly TWG meeting (webinar)	Project updates including environmental review process and Central Valley Wye
9/5/2012	Holsclaw Road meeting with historical society, local tribal members, and Holsclaw Road residents, Gilroy	Holsclaw Road options
9/20/2012	San Martin Stakeholder Meeting	Environmental review process and alternative alignments
11/16/2012	Diridon Station Joint Policy Advisory Board	Environmental review process and alternative alignments
12/6/2012	Morgan Hill Unified School District staff	Statewide HSR program, key documents and milestones, alignment maps, vertical and horizontal alignments under consideration
12/21/2012	Santa Clara County Supervisor Wasserman, policy aide Kevin Maitski, and Dawn Cameron	County roads
1/24/2013	Gilroy Mayor Don Gage and City Manager Tom Haglund	Environmental review process, alternative alignments, Gilroy station planning
2/4/2013	TAMC Rail Policy Committee	Status of Central Valley bids, coordination with TAMC, local community outreach
2/4/2013	TAMC staff meeting	Environmental review process, alternative alignments, Gilroy station planning, and TAMC rail projects. Status of Central Valley bids, coordination with TAMC, and local community outreach
2/7/2013	San Benito Council of Government	Environmental review process and alternative alignments
2/8/2013	Caltrain Electrification Team	Caltrain coordination
2/12/2013	Congressman Jeff Denham's staff	Environmental review process, alternative alignments, and ACE project
2/13/2013	Bay Area/MTC Peninsula Working Group	Environmental review process and alternative alignments
2/13/2013	International Right of Way Agents (East Bay Chapter)	Environmental review process and alternative alignments

Date	Organization/Individual	Topic
2/14/2013	California State Rail Plan Open House (information table)	Environmental review process and alternative alignments
2/15/2013	ACE and Capitol Corridor representatives	Environmental review process and alternative alignments
2/16/2013	United Architects of the Philippines	Environmental review process and alternative alignments
2/19/2013	VTA staff	Environmental review process, alternative alignments, and San Jose Diridon Station planning
2/28/2013	Mineta Transportation Institute Student Group	Environmental review process and alternative alignments
3/4/2013	Caltrain Electrification Scoping Meeting	Discuss and receive public comments for the Caltrain Modernization Program, which would be compatible with future HSR blended service
3/20/2013	Caltrans NAAC	Presentation at the Caltrans Quarterly NAAC meeting providing an update on tribal involvement, status of the HSR project
3/20/2013	MTC Commissioner & Santa Clara County Supervisor Dave Cortese	Role of MTC and HSR blended system
4/3/2013	International Right-of-Way Agents Association, San Jose Chapter	Environmental review process and alternative alignments
4/12/2013	City of Gilroy (Tripousis, Mason, Naor, Gimpel)	Environmental review process and alternative alignments
5/1/2013	Dos Palos cotton gin	Potential relocation of cotton gin
5/1/2013	Lower San Joaquin Levee District	Section 408 permitting and infrastructure impacts
5/8/2013	Caltrans NAAC	Presentation at the Caltrans Quarterly NAAC meeting providing an update on tribal involvement, status of the HSR project
6/11/2013	South Bay Transportation Officials Association	Environmental review process and alternative alignments
7/31/2013	Caltrans NAAC	Presentation at the Caltrans Quarterly NAAC meeting providing an update on tribal involvement, status of the HSR project
8/2/2013	Caltrain	2018 Unified Service Modeling
8/20/2013	UPRR	Environmental review process and alignments between San Jose, Gilroy, and Stockton
10/23/2013	Caltrans NAAC	Authority Small Business Advocate, Robert Padilla, gave a presentation about Small/Disadvantaged Business and employment opportunities on the HSR project
11/12/2013	USEPA and USACE (teleconference)	Checkpoint B documents
11/26/2013	USEPA and USACE (teleconference)	Socioeconomic issues associated with Checkpoint B
12/3/2013	USEPA and USACE (teleconference)	Responses to agency comments on Checkpoint B
1/17/2014	California NAHC	HSR program update made at quarterly meeting

Date	Organization/Individual	Topic
3/12/2014	Caltrans NAAC	Update/status of the HSR project for NAAC members
5/28/2014	Caltrans NAAC	Update/status of the HSR project for NAAC members
8/27/2014	Caltrans NAAC	Update/status of the HSR project, systemwide overview of the project
10/17/2014	Caltrans NAAC	Presentation to the Commissioners of the NAHC during public session of their quarterly meeting
11/12/2014	Caltrans NAAC	Overview and update of the HSR program
11/19/2014	San Jose to Merced Project Section Agency Tour	Alignment tour
2/18/2015	Caltrans NAAC	Overview and update of the HSR program
5/13/2015	Caltrans NAAC	Overview and update of the HSR program
8/12/2015	Caltrans NAAC	Overview and update of the HSR program
9/15/2015	San Jose Open House	Alignment alternatives, blended system, planning, environmental review
9/23/2015	Morgan Hill Open House	Alignment alternatives, blended system, planning, environmental review
11/18/2015	Caltrans NAAC	Overview and update of the HSR program
12/17/2015	City of San Jose Planning Department, San Jose Historical Landmarks Commission	Best practices regarding historic preservation
2/9/2016	San Jose Mayor Liccardo	Diridon Station planning
3/9/2016	Caltrans NAAC	Overview of HSR program and status update/schedule of various project sections
3/28/2016	San Jose–Morgan Hill TWG	Purpose of TWG, presentation on 2016 Business Plan, updates on HSR statewide and project section, Q&A
3/29/2016	Gilroy TWG	Purpose of TWG, presentation on 2016 Business Plan, updates on HSR statewide and project section, Q&A
4/12/2016	San Jose CWG	CWG roles, membership, and responsibilities; presentation on 2016 Business Plan; updates on HSR statewide and Project Section; Q&A
4/13/2016	NorCal Legislative Briefing	Briefing covering awareness of the San Francisco to San Jose and San Jose to Merced Project Sections and San Francisco to San Jose section scoping notification
4/14/2016	Morgan Hill–Gilroy CWG	CWG roles, membership, and responsibilities; presentation on 2016 Business Plan; updates on HSR statewide and Project Section; Q&A
4/15/2016	San Jose Walking Tour	Alignment tour
4/18/2016	Los Banos CWG	CWG roles, membership, and responsibilities; presentation on 2016 Business Plan; updates on HSR statewide and Project Section; Q&A

Date	Organization/Individual	Topic
5/3/2016	VTA Meet the Primes, San Mateo	Briefing covering awareness of the San Francisco to San Jose and San Jose to Merced Project Sections and San Francisco to San Jose section scoping notification
5/10/2016	City of San Jose	Development of alternatives in the San Jose area
5/16/2016	Los Banos Open House	HSR statewide overview, San Francisco to San Jose and San Jose to Merced project section updates, environmental review process, right-of-way and permission-to-enter, community involvement
5/17/2016	San Jose Open House	HSR statewide overview, San Francisco to San Jose and San Jose to Merced project section updates, environmental review process, right-of-way and permission-to-enter, community involvement
5/19/2016	Gilroy Open House	HSR statewide overview, San Francisco to San Jose and San Jose to Merced project section updates, environmental review process, right-of-way and permission-to-enter, community involvement
6/1/2016	Morgan Hill City Council	Environmental review process and alternatives refinement
6/6/2016	City of San Jose Transportation and Environment Committee Meeting	San Jose to Merced Project Update: Alignment discussion
6/6/2016	San Jose–Gardner Community Open House	HSR statewide overview, San Jose to Merced project section updates, Diridon station planning, environmental review process
6/7/2016	City of Morgan Hill	Development of alternatives in Morgan Hill Area, including East of UPRR, the Monterrey Viaduct alternative, and the various alternatives along US 101
6/7/2016	San Jose City Council District 6	Environmental review process and alternatives refinement
6/8/2016	City of San Jose	Environmental review process and alternatives refinement in the San Jose area
6/10/2016	Caltrain Blended Infrastructure Working Group	Environmental review process updates and San Francisco to San Jose project scoping
6/10/2016	San Jose Mayor Sam Liccardo and Carl Guardino, Silicon Valley Leadership Group	Environmental review process, alternatives refinement, station planning in the San Jose area
6/13/2016	Santa Clara VTA Event	Small business outreach event
6/14/2016	International Transportation and Health Conference	Project update, milestones and next steps
6/14/2016	South Bay Transportation Officials Association (SBTOA)	Presentation on HSR program, Q&A
6/15/2016	City/County Staff Coordinating Group	Caltrain electrification, HSR project status, state funding update
6/17/2016	Diridon Station Joint Policy Advisory Board	Project update, milestones and next steps

Date	Organization/Individual	Topic
6/20/2016	Congresswoman Zoe Lofgren	Project update and overview of alternatives
6/22/2016	City of San Jose Staff	Development of alternatives in the San Jose area
6/23/2016	City of Gilroy Staff	Development of alternatives in the Gilroy area
6/23/2016	City of Morgan Hill staff	Development of alternatives in the Morgan Hill area
6/24/2016	Caltrain Blended Infrastructure Working Group	Ridership forecasting, station design, curve modifications, environmental review process
6/30/2016	Morgan Hill Downtown Visioning Summit	Information table to collect comments and provide information on statewide program and Project Section
7/5/2016	Merced County District 5 Supervisor Jerry O'Banion	Project update and overview of alternatives
7/13/2016	City of San Jose	Development of alternatives in the San Jose area
7/13/2016	Grassland Water District	Reimbursement agreement and impacts on biological resources, including waterfowl
7/14/2016	City of Morgan Hill	Development of alternatives in the Morgan Hill area
7/18/2016	General Services Administration	Project definition and environmental review process
7/20/2016	Peninsula City Managers Meeting	General briefing on project scope
7/20/2016	Sons in Retirement Branch 32	Environmental review process and alternatives refinement
7/22/2016	Caltrain Blended Infrastructure Working Group	Joint safety/security working group report, status of HSR environmental schedule, station footprints, Caltrain permission-to-enter concerns, curve modifications, passing tracks, curve straightening, station planning
7/23/2016	Small Business Event	HSR presentation and certification session for small and disadvantaged businesses
7/26/2016	Silicon Valley Business Journal event	Project update, milestones and next steps
7/27/2016	City of Gilroy	Scope of work and status of the station area planning effort
7/27/2016	City of San Jose	Development of alternatives in the San Jose area
7/28/2016	Caltrain/Transbay Joint Powers Authority	Coordination efforts
7/28/2016	Capitol Corridor	Diridon operations coordination
7/28/2016	Transportation Authority of Monterey County	Coordination of future rail service to Gilroy
8/2/2016	City of Morgan Hill	Development of alternatives in the Morgan Hill area
8/2/2016	Congresswoman Zoe Lofgren	Project briefing
8/5/2016	City of Gilroy	Status of station area planning
8/5/2016	Diridon/JPA Management Meeting	Attended public meeting to hear items related to future of Diridon Station

Date	Organization/Individual	Topic
8/9/2016	Gilroy–Los Banos TWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/10/2016	City of San Jose	Development of alternatives in the San Jose area
8/11/2016	Gilroy–Morgan Hill CWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/17/2016	San Jose CWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/17/2016	San Jose–Morgan Hill TWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/18/2016	Reclamation	Status of the alternatives crossing the San Luis Reservoir
8/20/2016	Gardner Flea Market, San Jose	Information table to collect comments and provide information on HSR
8/23/2016	City of San Jose	Development of alternatives in the San Jose area
8/23/2016	Small Business Workshop, Menlo Park	HSR presentation and certification session for small and disadvantaged businesses
8/24/2016	City of Morgan Hill	Development of alternatives in the Morgan Hill area
8/24/2016	City of San Jose	Development of alternatives in the San Jose area
8/31/2016	Diridon Communications Working Group	Develop messaging strategies for public outreach
9/7/2016	Morgan Hill Community Presentation	Update on development of alternatives in the Morgan Hill area
9/8/2016	Diridon Station Full Group Working Meeting	Information exchange with agency partners on parking, station area planning, outreach and infrastructure planning
9/9/2016	City of San Jose	Development of alternatives in the San Jose Area, including at-grade, aerial, and tunnel alternatives at Diridon Station
9/12/2016	Gilroy City Council	Project update to City Council
9/13/2016	City of San Jose Councilmember Ash Kalra, City of San Jose staff Ray Salvano and Stacey Lu	Monterey Highway community outreach
9/13/2016	Gilroy Downtown Business Association	Project update presentation
9/14/2016	City of San Jose	Development of alternatives in the San Jose area
9/18/2016	Viva CalleSJ	Information table to collect comments and provide information on HSR
9/20/2016	Morgan Hill Downtown Business Association	Presentation
9/21/2016	City of San Jose	Development of alternatives in the San Jose area

Date	Organization/Individual	Topic
9/27/2016	Morgan Hill Community Meeting with City officials and the public	Updates on statewide HSR program, 2016 Business Plan, Project Section focus on Morgan Hill/Gilroy area, opportunity to provide written comments
9/28/2016	City of San Jose	Development of alternatives in the San Jose area
10/5/2016	California State Assemblymember Evan Low and staff	Update on the Project Section and a schedule update
10/5/2016	San Jose City Council member Raul Peralez	Update on the Project Section and a schedule update
10/5/2016	Southern Pacific Retired Executives Club	Environmental review process, alternatives refinement, and station planning, Q&A
10/6/2016	California State Senator Jim Beall	Project update and overview of alternatives
10/7/2016	Diridon/JPA	Project update at management meeting
10/11/2016	Rail~Volution	Walking tour of Diridon Station area
10/12/2016	Rail~Volution conference	Environmental review process, alternatives refinement, station planning
10/13/2016	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #1: Orientation to the Species Working Group, Species Modeling Methods memo, initial list of species to be included in BA/Section 2081 permit
10/13/2016	Willow Glen Neighborhood Association	Development of alternatives in the San Jose area
10/19/2016	City/County Staff Coordinating Group	Caltrain electrification, HSR project status, State funding update
10/20/2016	City of Gilroy	Gilroy station planning and alignment alternatives
10/20/2016	Gilroy Eliot School Community Meeting	Environmental review process and alternatives refinement in the Gilroy area
10/24/2016	Resource agencies: FRA, CDFW, DWR, SWRCB, NMFS, STB, USACE, USEPA, USFWS	Alignment tour
10/25/2016	City of San Jose Staff Working Group	Station Area Planning funding agreements with City of San Jose and VTA
10/25/2016	SPUR Presentation	HSR statewide program overview, Northern California section updates, small business program
10/27/2016	Office of San Jose Councilmember Ash Kalra and members of the public	Project and schedule update for Monterey Road community members
10/27/2016	USFWS	Permitting needs and various project features
10/28/2016	Caltrain Corridor Engineering	Meeting with Caltrain engineering staff
11/8/2016	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #2: Revisions to the Species Modeling Methods memo and Data Integration memo, review agency comments and responses from October 13, 2016 meeting
11/9/2016	City of San Jose	Development of alternatives in the San Jose area

Date	Organization/Individual	Topic
11/9/2016	Gilroy Station Area Planning Citizens Advisory Committee	Gilroy station area planning
11/10/2016	Morgan Hill Mayor Steve Tate	Alignment alternatives through Morgan Hill
11/10/2016	Pacheco Pass landowners	Permit-to-enter process and geotechnical investigations
11/14/2016	Community leaders in Eliot School Neighborhood, City of Gilroy staff, and Gilroy residents and business owners	Community outreach strategies for downtown Gilroy
11/15/2016	Santa Clara County Board of Supervisors	Updates on statewide program and San Jose to Merced Project Section focusing on unincorporated areas of Santa Clara County, Q&A
11/16/2016	Caltrans NAAC	HSR program updates
11/16/2016	Morgan Hill City Council Meeting	Authority staff provided a project update and discussed concerns from the City Council
11/16/2016	San Jose State University, regional transportation planning class	Updates on statewide program, San Francisco to San Jose and San Jose to Merced Project Sections, Q&A
11/18/2016	#iwillride students from University of California at Berkeley, California State University Fresno, and Fresno City College	Overview of the engineering, environmental and outreach efforts for the statewide program
11/22/2016	City of San Jose	Monterey Corridor project features
11/29/2016	California State Senator Bill Monning	Project update
11/29/2016	Edenvale Public Library, San Jose	Informational table with handouts about HSR statewide program, alignments in the local area, Q&A
12/6/2016	Walnut Grove neighborhood group	Updates on statewide program; ROW acquisition and compensation
12/7/2016	City of San Jose Staff Working Group	Project update, coordinate scope of station area planning funding agreements
12/7/2016	Edenvale Great Oaks Plan Implementation Coalition, Monterey Road (San Jose) community members	Updates on statewide program and San Jose to Merced Project Section, Q&A
12/8/2016	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #3: Unresolved comments on Species Modeling Methods memo, species model description format, tutorial on use of Data Basin to view species models
12/9/2016	City of San Jose Staff	Caltrain blended infrastructure
12/15/2016	San Jose Mayor Sam Liccardo	Diridon Station and Monterey Road alternatives
12/15/2016	San Martin community meeting	Statewide program, 2016 Business Plan, Project Section, Q&A
12/16/2016	California Department of Fish and Wildlife	Project updates
12/16/2016	San Jose Diridon Joint Policy Advisory Board Meeting	Project update, coordinate scope of station area planning funding agreements

Date	Organization/Individual	Topic
12/19/2016	Gilroy Public Library	Information table to collect comments and provide information on the statewide program and local alignment alternatives
12/21/2016	City of San Jose Staff Working Group	Monterey corridor alignment alternatives
12/21/2016	Pajaro River Watershed Flood Prevention Authority	Permitting requirements, flood plain modeling, mitigation strategies
1/17/2017	Councilmember Sergio Jimenez	Monterey corridor
1/17/2017	Gilroy City Council Study Session	Project alternatives
1/19/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS (two day event 1/19/17-1/20/17)	Species Working Group meeting #4: Workshop to review species models and model descriptions
1/20/2017	Gilroy Unified School District	Project update, impacts on schools
1/20/2017	San Jose SAP Center	Project update, alternatives development in San Jose
1/20/2017	Reclamation	Project coordination
1/23/2017	Congresswoman Zoe Lofgren's staff	Project briefing
1/23/2017	San Jose CWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section, Q&A
1/23/2017	San Jose–Morgan Hill TWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section
1/25/2017	City of San Jose	Development of alternatives in San Jose area, including review of At-Grade Diridon—East Expansion, Monterey Road, and North of Diridon
1/26/2017	Gilroy Sons in Retirement	Statewide program update, Project Section, outreach update
1/26/2017	Gilroy-Los Banos TWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section, Q&A
1/26/2017	Morgan Hill–Gilroy CWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section, Q&A
1/27/2017	UPRR	Review of proposed environmental documents
1/31/2017	City of San Jose	Development of alternatives in the San Jose area
1/31/2017	FRA	Alignment tour
2/1/2017	International Right-of-Way Association (San Jose)	Project update, milestones and next steps
2/1/2017	Seven Trees Neighborhood Association	Updates on statewide program, Project Section, range of alternatives, Q&A
2/2/2017	County of Santa Clara–San Martin Community Meeting	Project update, milestones and next steps
2/3/2017	Diridon Technical Advisory Group	Project update, milestones and next steps
2/4/2017	Los Paseos Neighborhood Association Community Meeting	HSR statewide overview, Project Section update, Los Paseos neighborhood concerns, upcoming community outreach activities

Date	Organization/Individual	Topic
2/8/2017	City of San Jose	Development of alternatives in the San Jose area
2/9/2017	Caltrans District 10	Project update, milestones and next steps
2/9/2017	Santa Clara County Staff, including Roads, Parks, Planning, and Airport Departments	Impact of project on County facilities
2/9/2017	Santa Clara Joint Planning Advisory Committee	Statewide program update, project section update, community priorities review, outreach update
2/13/2017	Gardner Neighborhood Association	Updates on statewide program, Project Section range of alternatives for the proposed Diridon Station approach and the Gardner area, community outreach
2/13/2017	VTA/BART Phase II Open House	Information table
2/17/2017	Reclamation Working Group	Romero Ranch realignment
2/21/2017	City of Gilroy staff	Gilroy Station and alignment through downtown Gilroy
2/22/2017	City of San Jose staff Working Group	Alignment options in the San Jose area
2/23/2017	Caltrain staff	Environmental review process, alternatives refinement, station planning
2/23/2017	Caltrans District 4	Updates on statewide program and San Francisco to San Jose and San Jose to Merced Project Sections
2/23/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #5: Review agency comment responses, revisions to models and model descriptions
2/23/2017	VTA/BART	Discussion of potential impacts on BART alignment
2/24/2017	CDFW Central Region	Webinar to discuss HSR footprints between San Jose and Carlucci Road
3/8/2017	City of Gilroy	Alignment review, project coordination, schedule discussion
3/8/2017	Goodyear-Mastic Neighborhood Association	Project updates and range of alternatives
3/9/2017	Caltrans District 10	Alignment review and project update
3/10/2017	Gilroy Chamber of Commerce	Project briefing, construction impacts
3/10/2017	Small Business Workshop	HSR presentation and certification session for small and disadvantaged businesses
3/14/2017	Henry Miller Reclamation District, San Joaquin Valley Landowners	San Joaquin Valley PTE landowner meeting
3/14/2017	NorCal FRA Check-In	Engineering and environmental check-in
3/14/2017	Old Quad Residents Association	Updates on statewide program, range of alternatives for San Francisco to San Jose and San Jose to Merced Project Sections, Q&A
3/18/2017	San Jose District 2 including Mayor Liccardo, Councilmember Sergio Jimenez, city staff, and residents	Safety, noise, traffic impacts on Monterey Road; tunneling/trenching through San Jose; potential construction of a commuter lane on Monterey Road

Date	Organization/Individual	Topic
3/22/2017	City of San Jose Staff Working Group	Monterey Road alignment review
3/23/2017	Caltrans District 4	Affected structures in Caltrans ROW; design exceptions
3/24/2017	CDFW	Title transfers
3/24/2017	City of San Jose	Planning for additional outreach and CWG meetings
3/28/2017	Northern California Legislative Briefing with representatives of federal and state officials	Updates on statewide program, range of alternatives for both San Francisco to San Jose and San Jose to Merced Project Sections, Q&A
3/29/2017	Los Paseos/Metcalf Neighbors	Project update, environmental review schedule, review of alternatives
3/30/2017	San Jose City Council Study Session	Project update, milestones and next steps
4/6/2017	Gilroy Public Library	Information tables to collect comments and provided information on the HSR project
4/7/2017	BART staff	Design discussion including Newhall Yard area for both short and long viaducts, Diridon Station area, and Caltrain stations south of Tamien
4/11/2017	SCVWD	Hydrological resources
4/12/2017	City of Gilroy staff	Alternatives and potential impacts
4/12/2017	City of San Jose Staff Working Group	Alignment options including Monterey Road underground options and at-grade alignments at Diridon Station
4/13/2017	Caltrans District 10	Discussion of Los Banos Bypass and potential traffic impacts
4/17/2017	Arteaga's Food Center	Information tables to collect comments and provide information on HSR
4/18/2017	Gilroy Open House, Irmandade da Festa do Divino Espirito Santo Lodge	Project updates, range of alternatives, environmental update, maps of alignments, opportunities to ask questions and provide comments
4/18/2017	Reclamation	Tour of and alignment considerations for: San Luis Wasteway; San Luis Drain; Delta Mendota Canal; roadside stop (sectionalizing valve); conduit
4/20/2017	San Jose Open House, Southside Community Center	Project updates, range of alternatives, environmental update, maps of alignments, opportunities to ask questions and provide comments
4/20/2017	SPUR	Diridon Station options and their impacts
4/21/2017	Morgan Hill Unified School District	Alignment through Morgan Hill, impacts on school facilities
4/25/2017	Geotechnical and Tunneling Advisory Group	Pacheco Pass-San Joaquin Valley tour
4/25/2017	Los Banos Open House, Los Banos Community Center	Project updates, range of alternatives, environmental update, maps of alignments, opportunities to ask questions and provide comments

Date	Organization/Individual	Topic
4/25/2017	NorCal FRA Check-In	Engineering and environmental check-in, status of project definition, agency coordination, review of updated schedule
4/25/2017	Reclamation	Alignment tour
4/26/2017	City of San Jose Staff Working Group	Alignment options, including scheduling a meeting focused on tunnel option, potential cross-overs from Monterey Road to US 101 (at Blossom Hill and SR-85), HSR outreach process
4/26/2017	Santa Clara County staff	Engineering design and alignment options through Santa Clara County
4/27/2017	Caltrans District 4	Meeting to identify the Caltrans Environmental Oversight team and receive early assessment of Caltrans comments and early information related to environmental review
4/28/2017	TransportCA at Mineta Transportation Institute	Authority staff participated in panel discussing Transportation and Triple Bottom Line at Mineta Transportation institute
5/1/2017	Morgan Hill Open House, Morgan Hill Community and Cultural Center	Updates on project, range of alternatives, status of environmental clearance, environmental issues under study, roll-out maps of alignments, opportunities to ask questions and provide written or verbal comments
5/2/2017	NMFS	Fish and Aquatic Resources Working Group meeting #1: Project status to date, project schedule, informal consultation process, review of draft steelhead model
5/3/2017	City of San Jose staff	Public outreach
5/5/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #6: species impact analysis approach, Wildlife Corridor Assessment Focal Species Selection memo
5/8/2017	San Jose City Council	Diridon Station tunnel alternatives
5/9/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day lookahead for San Francisco to San Jose and San Jose to Merced Project Sections
5/10/2017	City of San Jose staff	Public outreach
5/10/2017	City of San Jose Staff Working Group	Cost estimate for Monterey Road, including viaduct, cut/cover, and bored tunnel options
5/11/2017	Caltrans District 10 and California Highway Patrol	Weigh station along I-5, impacts of noise and vibration on the scales
5/11/2017	Central Valley Mitigation Stakeholders, including Grasslands Water District	Presentation of alignment alternatives, regional habitat conservation priorities, and mitigation
5/17/2017	City of San Jose staff	Public outreach
5/22/2017	UC Berkeley Symposium	Update on the statewide program
5/23/2017	NorCal FRA Check-In	Status of project definition, agency coordination, and schedule

Date	Organization/Individual	Topic
5/24/2017	City of Gilroy staff	PEPD Station design including Downtown Gilroy Station and East Gilroy Station
5/24/2017	City of San Jose staff	Public outreach
5/24/2017	Morgan Hill City Council meeting	Updates on statewide program, range of alternatives for Morgan Hill to Gilroy Subsection, Q&A
5/24/2017	NorCal FRA/Resource Agency Coordination	Update on technical deliverables
5/24/2017	SCVWD	Irrigation access workshop focused on SCVWD facilities, primarily conduits/pipelines extending from Pacheco Pass to San Jose and pipeline failures
5/25/2017	VTA/BART	Phase II coordination, including project updates and Newhall Yard area
5/31/2017	City of San Jose staff	Public outreach
5/31/2017	San Jose CWG	Range of alternatives, environmental review process, input from CWG members on topic areas where more information is needed and areas for improved communications
5/31/2017	SLDMWA, San Benito County Water District, CCID, Henry Miller Reclamation District	Irrigation access workshop: SLDMWA, CCID, and Henry Miller Reclamation District facilities along Henry Miller Road and SBCWD interface at Casa de Fruta
6/1/2017	Diridon Intermodal Working Group	Station access memoranda
6/7/2017	City of San Jose staff	Public outreach
6/13/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day look-ahead for San Francisco to San Jose and San Jose to Merced project sections, coordination on process for sharing preliminary 4(f) results for San Jose to Merced Project Section
6/14/2017	City of San Jose staff	Public outreach
6/14/2017	City of San Jose Staff Working Group	Communication protocols, Monterey Corridor cost estimate and alternatives, Diridon At-Grade—East Expansion Exhibit, PEPD, and Hedding St. bridge
6/14/2017	Central Valley Mitigation Stakeholders, including USFWS, Defenders of Wildlife, Audubon Society, The Nature Conservancy, Ducks Unlimited, Grasslands Water District, California Waterfowl, USDA, and Environmental Defense Fund	Regional conservation efforts and mitigation priorities
6/15/2017	NMFS	Fish and Aquatic Resources Working Group meeting #2: Meeting schedule, Steelhead and Chinook Salmon Habitat Suitability memo, steelhead species model
6/15/2017	SAP Center	Project update, Diridon Station development opportunities, impacts on SAP Center parking

Date	Organization/Individual	Topic
6/20/2017	FRA and USDOT	Tour of alignment and discussion of HSR history and outreach
6/21/2017	Central Valley Mitigation Stakeholders, including USFWS, Defenders of Wildlife, Audubon Society, The Nature Conservancy, Ducks Unlimited, Grasslands Water District, California Waterfowl, USDA, Point Blue, and Environmental Defense Fund	Avian protection measures
6/21/2017	City of San Jose staff	Public outreach
6/21/2017	Megaregional Rail Leadership Workshop hosted by Capitol Corridor JPA	Project update, milestones and next steps
6/22/2017	VTA and City of San Jose	VTA needs for running bus service and roadway options along Monterey Road, City of San Jose shared the 100-ft boulevard concept
6/22/2017	VTA/BART	Phase II coordination, including project updates on proposed staging and alternative concepts, and VTA on Newhall Yard area
6/24/2017	Morgan Hill City Council Meeting	Alignment alternatives, community impacts, ROW compensation
6/27/2017	NorCal FRA Check-In	Status of project definition, agency coordination, and 90-day look-ahead for San Francisco to San Jose and San Jose to Merced project sections, review agenda and presentation for next monthly resource agency coordination meeting
6/27/2017	SPUR: How Should High-Speed Rail Travel Through San Jose	Alignments through San Jose and Diridon station
6/28/2017	City of San Jose Staff Working Group	City's request for 100-ft Monterey Road cross section, anticipated ROW requirements for at-grade and aerial alternatives, status of HSR traffic analysis, City comments on the PEPD of City facilities
6/28/2017	NorCal FRA/Resource Agency Coordination	Update on technical deliverables, wildlife crossing overview
6/30/2017	Pacific Gas & Electric	Traction power
6/30/2017	San Jose Councilmember Jimenez	Tunnel and aerial alignments and underground stations
7/7/2017	City of San Jose staff	Public outreach
7/10/2017	City of Gilroy	Conceptual alignments adjacent to US 101
7/11/2017	Morgan Hill Unified School District—teleconference/webinar	Alignment options and impacts on Morgan Hill schools: Enical School, Ann Sobrato High, Barrett Elementary School, and San Martin/Gwinn Elementary School
7/12/2017	City of San Jose staff	Public outreach

Date	Organization/Individual	Topic
7/12/2017	San Jose CWG	Project Section updates, environmental process and evaluation criteria, range of alternatives for Monterey Corridor subsection
7/15/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #7: Project footprint and wildlife corridor analysis
7/19/2017	City of San Jose staff	Public outreach
7/19/2017	Gilroy Community & Neighborhood Revitalization Committee	Updates on Statewide Program, environmental process and evaluation criteria, range of alternatives for Monterey Corridor subsection, future meeting dates and topics, Q&A
7/20/2017	San Martin Neighborhood Alliance	Updates on Project Section, range of alternatives for Morgan Hill to Gilroy subsection, responses to questions submitted to Authority prior to meeting
7/25/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day lookahead for San Francisco to San Jose and San Jose to Merced Project Sections, San Jose to Merced Checkpoint B Addendum process, environmental review process, alternatives refinement, and station planning
7/26/2017	City of San Jose staff	Public outreach
7/27/2017	Caltrans District 4	Traffic impacts along Monterey Road, design exceptions at I-280/SR 87
7/28/2017	SPUR: Urban Innovation Council—Silicon Valley	San Jose State University's expanding campus
8/1/2017	Senator Jim Beall	Central Valley construction tour
8/2/2017	City of Gilroy staff	US 101 alignments
8/2/2017	City of Morgan Hill staff	Reviewed Project Schedule and Draft PEPD plans
8/2/2017	City of San Jose staff	Public outreach
8/2/2017	San Jose CWG	Project Section updates, range of alternatives for the San Jose downtown/Diridon subsection, and review of Hwy 101 alignment elimination
8/2/2017	SPUR Study Tour	Diridon station tour, project integration
8/7/2017	NMFS	Fish and Aquatic Resources Working Group meeting #3: Effects matrix for steelhead, sprint-run Chinook salmon, fall-run Chinook salmon, essential fish habitat
8/8/2017	NorCal FRA Check-In	San Jose to Merced Checkpoint B Addendum comment backcheck, environmental review process, alternatives refinement, station planning
8/9/2017	CCID and Henry Miller Reclamation District	Irrigation access workshop with an overview of design updates in consideration of maintenance access for Henry Miller Reclamation District and CCID facilities
8/9/2017	City of San Jose staff	Public outreach
8/9/2017	City of San Jose Staff Working Group	City generated at-grade alignment concept

Date	Organization/Individual	Topic
8/10/2017	Caltrans District 10	I-5 weigh station and Caltrans initiation of the Draft PEPD
8/16/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #8: Short project description, BA outline, wildlife corridor analysis
8/16/2017	City of San Jose staff	Public outreach
8/22/2017	NorCal FRA Check-In	Status of project definition, agency coordination, and 90-day lookahead for FJ and JM project sections, JM Checkpoint B Addendum Workshop logistics, Environmental review process, alternatives refinement, and station planning
8/23/2017	City of San Jose staff	Public outreach
8/23/2017	NorCal FRA/Resource Agency coordination: CDFW, SGC, STB, USACE, Reclamation, and USEPA	Update on technical report deliverables, NEPA assignment status
8/29/2017	NMFS	Fish and Aquatic Resources Working Group meeting #4: Short project description, BA outline, preliminary compensatory mitigation plan outline, effects matrix for steelhead
8/29/2017	Santa Clara County Board of Supervisors	Approach to Diridon Station, project updates, schedule
8/30/2017	City of Gilroy staff	Alignment alternatives, including US 101
8/30/2017	City of San Jose staff	Public outreach
8/30/2017	Grasslands Water District	Project Section updates, discussion of Draft PEPD in relation to district facilities
8/30/2017	San Jose CWG	Permission-to-enter and ROB processes, construction mitigation, noise impacts, next steps
9/6/2017	City of San Jose staff	Public outreach
9/6/2017	City of San Jose Staff Working Group	Details of City-generated at-grade alignment concept
9/7/2017	Caltrans District 4	Draft PEPD and tunnel construction assumptions
9/8/2017	Caltrain/VTA coordination meeting	Newhall Yard, review of VTA-owned stations, environmental review process, alternatives refinement, station planning
9/9/2017	United Neighborhoods of Santa Clara County Neighborhood Development Conference	San Jose to Merced Project Section and statewide updates
9/11/2017	Senter Monterey Neighborhood Association	Noise, commute, houses, and other impacts along Monterey Road
9/11/2017	Silicon Valley Chamber Coalition	Small business program update
9/12/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day lookahead for San Francisco to San Jose and San Jose to Merced, San Jose to Merced wildlife corridor crossing study
9/14/2017	Caltrans District 10	Section report, project coordination

Date	Organization/Individual	Topic
9/18/2017	Gardner Neighborhood Association	Statewide program overview, Project Section update, review of San Jose Diridon approach alternatives, review of community input, Q&A
9/20/2017	City of San Jose staff	Public outreach
9/20/2017	City of San Jose Staff Working Group	City-generated at-grade alignment concept
9/25/2017	Caltrain, VTA, City of San Jose	Downtown Intermodal Rail Station engineering, design, outreach, legislation
9/26/2017	NorCal FRA Check-In	Project update, outreach update
9/27/2017	City of San Jose staff	Public outreach
9/27/2017	NorCal FRA/Resource Agency Coordination	Agency participation, Project Section status, results of wildlife crossing studies
9/27/2017	San Jose CWG	Overview of and mitigation measures for noise impacts and path of sounds, potential discussion topics for remaining 2017 CWG meetings
9/28/2017	Grasslands Water District	Geographic Information Systems/mapping data
9/28/2017	Station Cities meeting: SPUR, Integral Group	Station area grant review and project update
10/4/2017	City of San Jose staff	Public outreach
10/4/2017	City of San Jose Staff Working Group	City-generated at-grade alignment concept
10/4/2017	SLDMWA	Site tour to review project interface with district facilities
10/10/2017	NorCal FRA Check-In	Project update, outreach update
10/11/2017	City of San Jose staff	Public outreach
10/12/2017	Morgan Hill Unified School District	Project Section update
10/18/2017	City of San Jose staff	Public outreach
10/19/2017	Caltrans District 10	I-5 weigh station
10/24/2017	NorCal FRA Check-In	Project update, outreach update
10/26/2017	Caltrans District 4	?
10/26/2017	City of San Jose staff	Public outreach
10/26/2017	San Jose CWG	Flyover and visual simulations of HSR through San Jose, future meeting schedule and topics
11/1/2017	City of San Jose	Meeting with City of San Jose staff to discuss public outreach
11/1/2017	City of San Jose Staff Working Group	Responses to HSR comments regarding City-generated at-grade alignment concept
11/7/2017	NorCal FRA Check-In	Environmental Review process, alternatives refinement, station planning
11/9/2017	Caltrans District 10	Project update, impacts on I-5 weigh station and temporary access to SR 152
11/15/2017	Morgan Hill City Council Workshop	Project update, outreach update, impacts on Morgan Hill

Date	Organization/Individual	Topic
12/5/2017	NorCal FRA Check-In	Environmental Review process, alternatives refinement, station planning
12/6/2017	City of San Jose staff	Public outreach
12/6/2017	Gilroy City Council Meeting	Project update, outreach update, impacts to City of Gilroy
12/13/2017	City of San Jose	Meeting with City of San Jose staff to discuss public outreach
12/13/2017	Grasslands Water District	Geographic Information Systems/mapping data
12/14/2017	Caltrans District 10	Project update, impacts on I-5 weigh station and temporary access to SR 152
12/19/2017	NorCal FRA Check-In	Environmental Review process, alternatives refinement, station planning
1/4/2018	SCVWD	Responses to SCVWD comments for Draft Floodplain Technical Analysis and Modeling, Llagas Creek, revisions to available hydrologic and hydraulic data, coordination with floodplain managers
1/9/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
1/10/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Northern Wildlife Movement Continuing Preliminary Design Workshop focused on wildlife movement in the Soap Lake area
1/11/2018	Willow Glen Neighborhood Association	Project section update, range of alternatives in Willow Glen community
1/17/2018	CHP and Caltrans	Santa Nella platform scale
1/24/2018	Los Banos Landowners Meeting: Merced County Farm Bureau, San Luis Canal Company, and CCID	Project update, responding to questions regarding ROW
1/31/2018	City of Morgan Hill staff	City's proposed alignment east of US 101, administrative and contracting topics
2/13/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
2/13/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Coyote Valley wildlife crossing webinar
2/14/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Northern Wildlife Movement Continuing Preliminary Design Workshop focused on wildlife movement in the Soap Lake area
2/21/2018	Grassland Water District	Engineering review

Date	Organization/Individual	Topic
2/22/2018	LPMG	Executive leadership appointments, 2018 Business Plan schedule, state legislative audit, NEPA assignment, San Francisco to San Jose Project Section update, project management funding agreement with Caltrain, environmental review process, alternatives refinement, station planning
2/23/2018	Community Floodplain Administrators Meeting with SCVWD, City of Morgan Hill, Santa Clara County Planning Department, City of Gilroy, City of San Jose	Proposed structures and typical sections; floodplain study sources; overview of floodplain crossings
2/28/2018	NorCal FRA Check-In	San Jose to Merced Checkpoint B Addendum, NEPA assignment update, update on wildlife crossing studies, San Jose to Merced geotechnical investigations
2/28/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Workshop on the initial draft of mitigation measures for wildlife crossings and impacts on habitats and species
3/13/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
3/14/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Workshop on the initial draft of mitigation measures for wildlife crossings and impacts on habitats and species
3/15/2018	Romero Ranch Landowners and California Strategic Growth Council	Input on wildlife movement, sensitive habitat, and conserved lands management; ranch input on operations and uses; HSR update on proposed alignment, preliminary design and environmental processes, permission to enter for field reconnaissance
3/23/2018	Grassland Water District	Refined preliminary cost estimates for tunnel guideway beneath Mud Slough, assessment of wildlife impacts, status of property inventory for potential agricultural easement purchases
4/10/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
4/18/2018	City/County Staff Coordinating Group	Caltrain and HSR business plans
4/18/2018	Morgan Hill City Council	2018 Business Plan
4/19/2018	SPUR	2018 Business Plan
4/24/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
4/26/2018	City of Gilroy staff	Revised preliminary engineering for HSR within the city, request review and comments to HSR

Date	Organization/Individual	Topic
4/26/2018	LPMG	HSR Draft Business Plan/Caltrain Business Plan, Caltrain Electrification Project, Caltrain Positive Train Control Project, Public Comment
4/26/2018	NFIP Floodplain Administrators and Managers	Latest preliminary design at floodplain and floodway encroachments, preliminary hydraulic model results, next steps for reviews and feedback
4/27/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Latest preliminary design of HSR wildlife crossing features and request review and comments to HSR
5/1/2018	Northern California CWGs and TWGs	2018 Business Plan
5/2/2018	Caltrans District 2	Latest preliminary design of HSR wildlife crossing features, opportunities for collaboration on wildlife crossing improvements and other complementary mitigation efforts
5/2/2018	San Jose CWG	City-generated option, Caltrain Business Plan, 2018 Business Plan
5/3/2018	San Jose City Councilmember Raul Peralez	Outreach planning for Councilmember Peralez's district, including the Gardner neighborhood
5/8/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
5/18/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Update on 2018 Business Plan, preliminary engineering, wildlife movement and crossings
5/22/2018	Mineta Transportation Institute Seminar: High-Speed Technologies on Railway Systems	2018 Business Plan
5/22/2018	San Jose City Council	2018 Business Plan
5/22/2018	SCVHA	Kick off SCVHA's SR 152 Pacheco Pass Wildlife Permeability and Hazards Study
5/29/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Preliminary engineering and wildlife crossing features, issues of concern, recommended topics for analysis, data sharing
6/4/2018	San Jose City Councilmember Peralez's staff	San Jose District 3 public outreach
6/5/2018	Caltrain	Communications and outreach coordination, design review with Caltrain and local elected officials
6/6/2018	SCVHA	Preliminary engineering and wildlife crossing features, issues of concern, recommended topics for analysis, data sharing, approaches and opportunities for collaborating on HSR mitigation and complementary conservation activities

Date	Organization/Individual	Topic
6/8/2018	Gilroy Mayor Roland Valasco, Gilroy City Administrator Gabriel Gonzalez, Gilroy Chamber of Commerce	2018 Business Plan, Overview of ROW process
6/10/2018	Picnic with San Jose City Councilmember Raul Peralez	Information Table
6/12/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
6/13/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Results of preliminary design refinements for wildlife crossing features, crossing configuration issues, update on 2018 Business Plan implementation
6/14/2018	Los Paseos Neighborhood Association	City-generated Option, 2018 Business Plan
6/15/2018	City of Morgan Hill	2018 Business Plan
6/20/2018	City/County Staff Coordinating Group	Caltrain electrification, milestones and technical analysis, 2018 Business Plan, Connecting Communities Strategy
6/26/2018	City of Morgan Hill staff	UPRR alternative review and updated
6/26/2018	FRA Northern California check-in	Environmental review process, alternatives refinement, station planning
6/26/2018	Gilroy Chamber of Commerce	Planning for an ROW workshop
6/26/2018	Gilroy Unified School District	Blended service between San Jose and Gilroy, impacts on schools
6/27/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Lands for agricultural or open space conservation easements, approaches to evaluate potential noise or vibration impacts on waterfowl, wildlife corridor analysis, methods for evaluating bird movement
6/27/2018	NorCal FRA/Resource Agency Coordination	Agency participation, Project Section status, Business Plan 2018 implementation
6/28/2018	LPMG	Caltrain Business Plan, Electrification Project, HSR updates, public comments, LPMG member comments/requests including a grade separation toolkit
6/28/2018	Morgan Hill Chamber of Commerce	Planning for Morgan Hill Caltrain station, planning an ROW workshop
7/2/2018	Oak Grove Neighborhood Association	City-generated option, 2018 Business Plan
7/5/2018	Caltrain	Communications and outreach coordination, PEPD review, restarting CWG, Caltrain Business Plan
7/10/2018	SCVHA	2018 Business Plan; mitigation measures and collaborative implementation, preliminary results of Pacheco Pass wildlife movement analysis
7/12/2018	City of Morgan Hill	Morgan Hill and UPRR right-of-way coordination
7/17/2018	Caltrans District 10	Preliminary design for HSR features near I-5 and state highways in San Joaquin Valley

Date	Organization/Individual	Topic
7/18/2018	City/County Staff Coordinating Group	Environmental review process, PEPD, alternatives refinement, station planning, Caltrain updates on Business Plan and electrification
7/18/2018	SAP Center	Implications for SAP Center resulting from changes to Diridon, including parking plan/analysis
7/18/2018	SCVWD	Preliminary design of UP alternative, 2018 Business Plan
7/18/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Results of preliminary design refinements for HSR wildlife crossing features, reconfiguration of the Gilroy maintenance-of-way facility, preliminary design of 2018 Business Plan study alternative
7/19/2018	Santa Clara County	Preliminary design refinements, reconfiguration of the Gilroy maintenance-of-way facility, initial preliminary design of the 2018 Business Plan study alternative
7/20/2018	Caltrans District 4	Impacts on I-5 crossing and weigh station
7/20/2018	City of Gilroy	UPRR alignment
7/20/2018	Morgan Hill Chamber of Commerce	Planning for upcoming Morgan Hill Day events
7/24/2018	Caltrain and VTA	Caltrain Business Plan, DISC, initial preliminary design of 2018 Business Plan study alternative
7/24/2018	NorCal FRA Check-In	Environmental review process, alternatives refinement, station planning
7/24/2018	North Willow Glen Neighborhood leaders	Neighborhood visit with neighborhood leaders
7/26/2018	LPMG	Environmental milestones and review process, alternatives refinement, station planning, upcoming activities and outreach, Caltrain electrification, 2018 Business Plan
7/27/2018	Gardner Neighborhood leaders	Neighborhood visit with neighborhood leaders
8/1/2018	Caltrain and VTA	Communication and outreach coordination, City/County Staff Coordinating Group and LPMG coordination, Caltrain Business Plan Outreach and Activities, PEPD city review, restarting CWG
8/1/2018	San Jose City Councilmembers Davis and Peralez's staff	Planning meeting for August 8, 2018 meeting with Councilmembers
8/2/2018	City of San Jose	City-generated option, planning for upcoming CWG
8/8/2018	Diridon	Review each agency's outreach plans
8/8/2018	San Jose City Councilmembers Davis and Peralez	Outreach to neighborhoods in Councilmembers' districts
8/9/2018	City of San Jose	Review San Jose CWG Meeting presentation
8/10/2018	San Jose Mayor Liccardo	Interface of HSR and DISC planning
8/14/2018	Morgan Hill Day	2018 Business Plan, Range of Alternatives
8/14/2018	NorCal FRA check-in	Environmental review process, alternatives refinement, station planning

Date	Organization/Individual	Topic
8/15/2018	City of Morgan Hill	Design review of Alternatives 1–3 refinement
8/15/2018	City/County Staff Coordinating Group	2018 Sustainability Report, PEPD update, San Jose to Merced Project Section update
8/15/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Program and project specific mitigation related to crossing Grasslands Ecological Area
8/16/2018	San Jose CWG	CWG Reaffirmation Process, San Jose to Merced Project Section Update, update on Caltrain Business Plan, integration and collaboration of projects and processes, update on HSR alternatives
8/21/2018	Mineta Transportation Institute	Future of Diridon, DISC, and the Caltrain Business Plan
8/22/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Accommodation of wildlife movement in Santa Clara Valley
8/23/2018	Caltrain	Communications and outreach coordination
8/23/2018	LPMG	Updates on 2018 Sustainability Report, PEPD process, San Jose to Merced Project Section, and outreach; environmental review process, alternatives refinement, station planning
8/23/2018	SCVWD	Design review meeting
8/24/2018	City of Gilroy	Review of at-grade blended alternative
8/28/2018	NorCal FRA check-in	Environmental review process, alternatives refinement, station planning
8/29/2018	San Jose City Councilmembers Davis and Peralez's staff	San Jose CWG Membership and Reaffirmation process
9/5/2018	Caltrain	Communications and outreach coordination, PEPD city review, restarting CWG, July City/County Staff Coordinating Group topics, Caltrain's Business Plan
9/7/2018	San Jose City Councilmember Sergio Jimenez	At-grade blended alternative
9/11/2018	Mineta Transportation Institute National HSR Leadership Summit	Information table covering statewide program and Project Section updates
9/12/2018	Global Climate Action Summit	Statewide program and Project Section updates
9/12/2018	Mineta Transportation Institute National HSR Leadership Summit	Information table covering statewide program and Project Section updates
9/13/2018	Global Climate Action Summit	Statewide program and Project Section updates
9/13/2018	Mineta Transportation Institute National HSR Leadership Summit	Information table covering statewide program and Project Section updates
9/19/2018	City/County Staff Coordinating Group	Connecting Communities Strategy, project section update, October CWG meetings, outreach update

Date	Organization/Individual	Topic
9/19/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Program and project-specific mitigation related to crossing Grasslands Ecological Area
9/21/2018	City of Morgan Hill	Connecting Communities Strategy, review California climate investment opportunities to identify local projects supportive of HSR ridership
9/24/2018	Assemblymember Low State of the District	Project Update, 2018 Business Plan, Range of Alternatives
9/24/2018	Gilroy City Council and Gilroy Unified School District	Project update, blended at-grade alternative, 2018 Business Plan
9/27/2018	Caltrain	Communications and outreach coordination
10/3/2018	Morgan Hill Realtors	Project update, blended at-grade alternative, ROW process
10/11/2018	Los Paseos Neighborhood	Neighborhood visit, concerns regarding range of alternatives
10/11/2018	SPUR Station Symposium	Lunch panel on the role of train stations in a changing mobility ecosystem
10/17/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Information sharing on stakeholder efforts to inform HSR preliminary design, environmental impact analyses, and potential mitigation actions associated with the Grasslands Ecological Area
10/18/2018	San Martin Neighborhood Alliance	Range of alternatives, Alternative 4 detail, project update
10/23/2018	Delmas Park Neighborhood Association	Update on 2018 Business Plan and alternatives under consideration in San Jose
10/23/2018	NorCal FRA Check-In	Environmental review process, alternatives refinement, station planning
10/25/2018	Caltrain	Outreach coordination meeting
11/7/2018	Gilroy–Los Banos TWG	Project update, alignment alternatives, community engagement and outreach, CWG activity on community resources
11/7/2018	Morgan Hill–Gilroy CWG	Program Updates, San Jose to Merced Project Section, community engagement and outreach, CWG input on community resources
11/28/2018	FRA	Comments on San Francisco to San Jose Draft PEPD
11/28/2018	San Jose CWG	Statewide project update; review of alignment alternatives; outreach and engagement; introduction to CWG activity on community resources, community outreach, project interfaces and integration

Date	Organization/Individual	Topic
11/28/2018	San Jose–Morgan Hill TWG	Statewide project update; review of alignment alternatives; outreach and engagement; introduction to CWG activity on community resources, community outreach, project interfaces and integration
11/29/2018	Caltrain	Communications and outreach coordination
11/29/2018	LPMG	Connecting communities strategy, Project Section update, October CWG meetings, October board meeting, outreach update, Statewide Update, Northern California Update, Environmental Justice Outreach
12/3/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Information sharing on stakeholder efforts to inform HSR preliminary design, environmental impact analyses, and potential mitigation actions associated with the Grasslands Ecological Area
12/14/2018	Diridon Joint Policy Advisory Board	Project update and milestones
12/18/2018	NorCal FRA Check-In	Environmental review process, alternatives refinement, station planning
12/20/2018	Caltrain	Authority and Caltrain communications and outreach coordination meeting
1/4/2019	Santa Clara County Supervisors Chavez and Wasserman, VTA, City of Morgan Hill, City of Gilroy, Caltrain	South Santa Clara County issues: Caltrain service in Santa Clara, Caltrain Business Plan, HSR Business Plan, funding sources for Measure B (fourth Caltrain train)
1/10/2019	VTA	PEPD designs for Alternative 4, project update, project timeline, property impacts
1/11/2019	City of Gilroy	PEPD designs for Alternative 4, project update, project timeline, property impacts
1/14/2019	CDFW Central	Project status, potential impacts in Grasslands Ecological Area, property suitability analysis for Authority's conservation easement obligation
1/14/2019	Los Banos stakeholders: Los Banos Unified School District, City of Los Banos, Grasslands Water District, Henry Miller Reclamation District	Update on Project Section, timeline, property impacts
1/16/2019	ASV Wineries	Project interface with ASV Winery property in San Martin
1/17/2019	City of Morgan Hill	PEPD comment review of designs for Alternative 4, project update, timeline, and property impacts
1/18/2019	City of San Jose	PEPD comment review of designs for Alternative 4, project update, timeline, and property impacts
1/24/2019	Legislative Briefing: Offices of United States Senate, United States Congress, California State Senate, California State Assembly	Why HSR, construction updates, NEPA assignment, ARRA spending, audit, 2018 Business Plan, Northern California Project Sections, UPRR alternative, collaboration with partner agencies, recent and upcoming outreach, Q&A
1/29/2019	Caltrain	Communications and outreach coordination

Date	Organization/Individual	Topic
1/30/2019	SPUR Meeting	CWG process and topics
2/2/19	Shasta/Hanchett Park Neighborhood Association	
2/4/19	South Santa Clara County	Caltrain Business Plan, expansion of Caltrain service to south Santa Clara County
2/12/19	City of Morgan Hill	Responses to City of Morgan Hill's questions regarding the extent of the ROW acquisition required and potential access issues for Alternative 2
2/13/2019	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Information sharing on stakeholder efforts to inform HSR preliminary design, environmental impact analyses, and potential mitigation actions associated with the Grasslands Ecological Area
2/19/2019	San Jose to Merced TWGs	Webinar
2/19/2019	Santa Clara City Council study session	Alternatives and timing of San Francisco to San Jose and San Jose to Merced environmental documents
2/20/2019	City/County Staff Coordinating Group	Rationale and process for identifying the State's Preferred Alternative, role of the early train operator, upcoming Environmental Justice events and CWG meetings
2/21/2019	San Jose CWG	Rationale and process for identifying the State's Preferred Alternative, role of the early train operator, updated flyover video, project benefits, outreach update
2/28/2019	Caltrain	Communications and outreach coordination
2/28/2019	LPMG	Caltrain Business Plan, Caltrain Electrification Project, HSR Updates, Staff Recommended State's Preferred Alternative, early train operator, outreach update, grade Separation toolkit
3/5/2019	Morgan Hill–Gilroy CWG	Rationale and process for identifying the Staff Recommended State's Preferred Alternative, role of the early train operator, updated flyover video, project benefits, outreach update
3/6/2019	City of Morgan Hill	Responses to City of Morgan Hill's questions regarding the extent of the ROW acquisition required and potential access issues for Alternative 2
3/6/2019	Vietnamese Voluntary Foundation (VIVO) Community Meeting	Vietnamese community outreach in San Jose, project update, input on alternatives
3/7/2019	Congresswoman Anna Eshoo staff briefing	Briefing on statewide and project section updates
3/11/2019	Senator Caballero briefing	Briefing on statewide and project section updates
3/20/2019	City/County Staff Coordinating Group	Central Valley construction update; Winter 2019 CWG key themes; recent and upcoming Environmental Justice outreach events

Date	Organization/Individual	Topic
3/26/2019	Volta Community Meeting	Statewide Updates, Governor's State-of-the-State, Status of Federal Funding, San Jose to Merced Project Section updates; community outreach and environmental milestones update, Q&A open house and sharing of project maps
3/28/2019	LPMG	Caltrain Business Plan, Caltrain Electrification Project, key themes from CWGs and Environmental Justice outreach
3/29/2019	Gilroy Mobility Partnership (VTA and Council of San Benito County Governments)	Project coordination between the Authority and SR 152; HSR project update (Gilroy focused) and alternatives
4/9/2019	NorCal FRA Check-In	San Jose to Merced Project Section PEPD footprint validation workshop
4/9/2019	NorCal Legislative Briefing	State of the State, USDOT/FRA letter and HSR response, recap of California State Senate Transportation Committee hearing, construction overview, economic update, 2019 program update report, Staff Recommended State's Preferred Alternative, UPRR negotiation, outreach update, DISC
4/11/2019	West San Jose Kiwanis Club	Statewide and Project Section update, recent and upcoming community outreach
4/17/2019	TWG Webinar	Safety and security characteristics of a high-speed rail system; preview of the format and types of information that will be shared about the Staff Recommended State's Preferred Alternative in summer 2019 and overview of the proposed process for CWG feedback on the Staff Recommended State's Preferred Alternative
4/22/2019	Morgan Hill–Gilroy CWG	Safety and security characteristics of a high-speed rail system; preview of the format and types of information that will be shared about the Staff Recommended State's Preferred Alternative in summer 2019 and overview of the proposed process for CWG feedback on the Staff Recommended State's Preferred Alternative
4/25/2019	Caltrain	Communications and outreach coordination meeting on upcoming City/County Staff Coordinating Group/LPMG meeting topics, HSR visualization approval from Caltrain
4/25/2019	LPMG	Environmental Justice methodology, safety characteristics, outreach update
5/2/2019	San Jose CWG	Safety and security characteristics of a high-speed rail system; preview of the format and types of information that will be shared about the Staff Recommended State's Preferred Alternative in summer 2019 and overview of the proposed process for CWG feedback on the Staff Recommended State's Preferred Alternative
5/7/2019	NorCal FRA	Environmental and Engineering Check-In

Date	Organization/Individual	Topic
5/13/2019	Gardner Neighborhood Association	Spanish-language meeting with the Gardner community discussing coordination between Authority and Caltrain, Union Pacific, and Diridon Integrated Station Concept Plan; mitigation of noise/disruption through municipal quiet zones; property impacts of Alternative 4; project safety features; State's Preferred Alternative selection criteria
5/23/2019	Caltrain	Communications and outreach meeting on upcoming City/County Staff Coordinating Group/LPMG meeting planning
5/23/2019	Los Paseos Neighborhood Association	Environmental milestones and process, roll plan map walkthrough of Alternatives 1, 2, 3, and 4, with specific focus on Los Paseos area
5/28/2019	Gilroy Community Meeting, South Valley Middle School	Statewide update; Project Section overview; outreach and environmental milestones update
5/31/2019	HomeFirst Homeless Walk, Monterey Corridor	Provided project information to and soliciting concerns from homeless providers and homeless community
6/13/2019	Diridon Station Pop Up	Provided DISC information to commuters at Diridon Station
6/13/2019	Homeless Community Dinner, St. Joseph's Family Center, Gilroy	Provided project information to and solicited concerns from homeless providers and homeless community
6/14/2019	PATH Homeless Walk, Diridon Station	Provided project information to and solicited concerns from homeless providers and homeless community
6/19/2019	City/County Staff Coordinating Group	Key themes from CWG meetings on the State's Preferred Alternative, Environmental Justice outreach update
6/25/2019	NorCal Professional Environmental Marketing Association	Statewide Program updates, economic update, Northern California Project Section updates, and schedule/upcoming outreach updates
6/27/2019	Caltrain	Communications and outreach coordination
6/27/2019	LPMG	Staff Recommended State's Preferred Alternative and process for identifying the State's Preferred Alternative
7/2/2019	Northern California Legislative Briefing	Third quarter legislative briefing covering Statewide Program updates, alternatives refinement, identifying the State's Preferred Alternative and its technical analysis, and upcoming outreach
7/5/2019	Music in the Park, Morgan Hill	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
7/8/2019	San Jose–Morgan Hill TWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment

Date	Organization/Individual	Topic
7/8/2019	Gilroy–Los Banos TWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment
7/10/2019	Santa Clara Valley and Pacheco Pass wildlife stakeholders	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming open house meetings
7/10/2019	Morgan Hill–Gilroy CWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment
7/15/2019	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming Open House
7/16/2019	San Jose CWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment
7/17/2019	City/County Staff Coordinating Group	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming Open House
7/17/2019	City of Morgan Hill	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming Open House
7/24/2019	Bay Area Council Transportation Committee	Statewide Program update
7/24/2019	NorCal FRA/Resource Agency Coordination	San Francisco to San Jose and San Jose to Merced project section status updates; San Francisco to San Jose Staff Recommended State's Preferred Alternative; San Jose to Merced Staff Recommended State's Preferred Alternative
7/25/2019	Caltrain	Communications and outreach coordination
7/25/2019	LPMG	Northern California Project Section updates, outreach update, identification of Staff Recommended State's Preferred Alternative and rationale
8/1/2019	Morgan Hill Chamber of Commerce Breakfast	Project updates including construction in the Central Valley, the Governor's building block approach to completing the project, Caltrain electrification, the alternative alignments and the State's Preferred Alternative

Date	Organization/Individual	Topic
8/8/2019	Transbay Joint Powers Authority Board Meeting	Statewide Program update, Staff Recommended State's Preferred Alternative, Brisbane land use, environmental schedule, upcoming outreach
8/9/2019	USACE and USEPA	Review of data supporting the Staff Recommended State's Preferred Alternative and LEDPA
8/9/2019	San Jose Farmers Market	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
8/15/2019	SPUR, City of San Jose, Caltrain, VTA	Diridon Year in Review, DISC next steps
8/15/2019	San Jose Open House	Update on the statewide program, including the Authority's 2019 Project Update Report, jobs and economic activity generated by the project, alternative alignments, and rationale for the State's Preferred Alternative
8/17/2019	Gilroy Car Show	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
8/20/2019	San Jose City Council	Statewide Program update, Staff Recommended State's Preferred Alternative, Brisbane land use, environmental schedule, upcoming outreach
8/21/2019	City/County Staff Coordinating Group	Caltrain Business Plan
8/21/2019	Los Banos Open House	Update on the statewide program, including the Authority's 2019 Project Update Report, jobs and economic activity generated by the project, alternative alignments and rationale for the State's Preferred Alternative
8/22/2019	LPMG	Caltrain Business Plan and electrification, release of Staff Recommended State's Preferred Alternative, differentiating factors and rationale for selection
8/22/2019	Gilroy Open House	Update on the statewide program, including the Authority's 2019 Project Update Report, jobs and economic activity generated by the project, alternative alignments, and rationale for the State's Preferred Alternative
8/22/2019	SAAG Meeting	Update on the city-wide anti-displacement strategy, presentation on Google's conceptual mixed-use framework
9/3/2019	San Jose State University	Presentation on the background and history of California HSR, status of Northern California project sections, delivery timeline
9/4/2019	Santa Clara City Council	Staff-recommended State's Preferred Alternatives for the San Francisco to San Jose and San Jose to Merced project sections

Date	Organization/Individual	Topic
9/10/2019	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced Project Section updates, NEPA assignment team updates, general updates
9/17/2019	Authority Board Meeting	Consideration for concurrence with the Staff Recommended State's Preferred Alternatives for the San Jose to Merced Project Section Draft EIR/EIS and San Francisco to San Jose Project Section Draft EIR/EIS; other Authority business as noticed on meeting agenda
9/20/2019	San Jose Moon Festival	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
9/23/2019	International Conference on Ecology and Transportation, Sacramento, CA	Panel discussion on designing the San Jose to Merced Project Section of California's HSR system to support wildlife movement
9/24/2019	NorCal FRA NEPA Assignment Check-In	San Francisco to San Jose and San Jose to Merced Project Section updates, NEPA assignment team updates, general updates
9/25/2019	NorCal FRA/Resource Agency Coordination	Summary of public outreach feedback for San Francisco to San Jose and San Jose to Merced Project Sections, schedule for cooperating agency review and agency technical report review
9/30/2019	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Point Blue, Grassland Water District, CDFW, California Waterfowl Associates,	Update on guideway design across Grasslands Ecological Area Important Bird Areas, conservation priority scenario final products, next steps
10/2/2019	Santa Clara County Supervisor Cortese's Chief of Staff	General briefing and status update on Northern California program
10/3/2019	Santa Clara County Supervisor Chavez	General briefing and status update on Northern California program
10/7/2019	Asian Pacific Islander (API) Council	Presentation on HSR background and project updates
10/8/2019	PEPD Walkthrough	Walkthrough of PEPD drawings
10/16/2019	City/County Staff Coordinating Group	Share community feedback and Authority Board concurrence on the San Francisco to San Jose Project Section and San Jose to Merced Project Section State's Preferred Alternatives
10/16/2019	Refugee and Immigrant Forum of Santa Clara County	Project Section and schedule updates
10/18/2019	Central Valley Community Foundation	The Future is Fresno event: statewide and Central Valley program updates
10/24/2019	Caltrain	Communications and outreach coordination
10/24/2019	LPMG	Report on Authority Board concurrence on the State's Preferred Alternatives, 2019 Sustainability Report

Date	Organization/Individual	Topic
10/24/2019	Northern California Legislative Briefing	Fourth quarter legislative briefing covering Statewide Program updates, 2019 Sustainability Report, report on Authority Board concurrence on the San Francisco to San Jose Project Section and San Jose to Merced Project Section State's Preferred Alternatives, schedule update
11/6/2019	Better Tomorrow - Oak Grove High School Community Forum, San Jose	Presentation to provide general project information and updates
11/8/2019	San Jose Councilmember Raul Peralez	Briefing update on the San Jose to Merced Project Section and activities leading to the public release of the Draft EIR/EIS
11/12/2019	Congressmember Ro Khanna's staff	Briefing update on Central Valley construction, status of environmental clearance process, NEPA assignment, MOU advancing work on LA Union Station, 2019 Sustainability Report, and Board concurrence of Preferred Alternatives for the San Francisco to San Jose and San Jose to Merced Project Sections
11/13/2019	Morgan Hill Unified School District Superintendent Steve Betando	Design review workshop of four alignments under study
11/13/2019	San Jose Councilmember Sergio Jimenez	Briefing update on the San Jose to Merced Project Section and activities leading to the public release of the Draft EIR/EIS
11/19/2019	Assemblymember Evan Low	Briefing update on Central Valley construction, status of environmental clearance process, NEPA assignment, MOU advancing work on LA Union Station, 2019 Sustainability Report, Board concurrence of Preferred Alternatives for the San Francisco to San Jose and San Jose to Merced Project Sections, and the San Jose Diridon Integrated Station Concept
11/27/2019	NorCal FRA/Resource Agency Coordination	Overview of agency participation and section status, introduction to San Jose to Merced Administrative Draft EIR/EIS
12/9/2019	California State Senator Bill Monning	General briefing and status update on Northern California program
12/10/2019	NorCal FRA Check-in	Updates on Northern California Project Section environmental documents and updates from FRA
12/11/2019	Congresswoman Zoe Lofgren's staff	Briefing with focus on Greater Gardner Area in San Jose
12/12/2019	Los Banos Unified School District	General Northern California project updates, past and planned engagement in Los Banos
12/12/2019	Pacific Gas & Electric	Informational presentation to PG&E environmental remediation team
12/13/2019	Gardner Academy PTO meeting and community walk	Spanish-language meeting to introduce the project and walk around the community to identify neighborhood impacts
12/13/2019	Sacred Heart Nativity, San Jose	Informational meeting to discuss project impacts
12/13/2019	La Raza Radio	Project impacts and outreach to Hispanic community

Date	Organization/Individual	Topic
12/13/2019	Univision	Project impacts and outreach to Hispanic community
12/18/2019	Reddit Ask Me Anything (AMA)	Online public forum to answer questions about statewide HSR program
12/19/2019	TWG webinar	Informational webinar to lay out disproportionate effects analysis and offsets process
12/19/2019	Gilroy Unified School District	Community improvements for disproportionate Environmental Justice impacts
12/20/2019	Los Banos Community Center	Community improvements for disproportionate Environmental Justice impacts
1/7/2020	Gilroy Mayor Roland Velasco and staff	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
1/7/2020	Morgan Hill Mayor Rich Constantine and staff	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
1/8/2020	San Jose Councilmember Sergio Jimenez	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
1/8/2020	City of San Jose staff	Project updates, Noise & Vibration and Aesthetics & Visual Quality analysis preview
1/8/2020	West Valley Community Services Meeting	Authority representatives met with representatives of West Valley Community Services to solicit input on potential community improvement opportunities that may provide local community benefits that could help to offset residual disproportionately high and adverse effects.
1/15/2020	City/County Staff Coordinating Group	Project updates, 2019 year in review, and update on track and systems procurement
1/15/2020	Morgan Hill Unified School District and CARE	Project updates and community improvements discussion
1/15/2020	Principal of Gilroy High School	Project overview and update
1/15/2020	Morgan Hill Housing Manager	Project overview and community improvements discussion
1/16/2020	Gavilan College	Environmental Justice community improvements and workforce development
1/16/2020	Santa Clara Unified School District	Project overview and community improvements discussion
1/16/2020	Sacred Heart Nativity, San Jose	Project overview and community improvements discussion
1/23/2020	LPMG	Project updates, schedule update, 2019 year in review, and update on track and systems procurement
1/23/2020	Santa Clara County Parks	TWG follow-up, Environmental Justice improvements discussion
1/23/2020	San Jose City College	Environmental Justice community improvements
1/23/2020	African American Community Services Agency	Project overview, Environmental Justice community improvements

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1/23/2020	Go Kids (formerly Estrella Family Services)	Project overview, environmental justice impacts
1/23/2020	San Jose Unified School District	Environmental Justice community improvements
1/28/2020	Gilroy Unified School District	Environmental Justice community improvements
1/28/2020	City of Gilroy staff	Environmental Justice community improvements
1/29/2020	Los Banos Unified School District	Environmental Justice community improvements
1/30/2020	East Side Union High School District	Project overview, environmental justice impacts
1/30/2020	Voices Charter Academy	Project overview, environmental justice impacts
1/30/2020	Santa Clara County Planning Improvement Meeting	Project overview, environmental justice impacts
1/30/2020	Danny Garza	Project overview briefing
1/30/2020	Celeste Walker	Project overview briefing
2/1/2020	Shasta Hanchett Park Neighborhood Association Fair	Tabling event to inform the public about project updates
2/1/2020	Meet the Black Authors and Artists Event at African American Community Services Agency	Tabling event to inform the public about project updates
2/3/2020	City of San Jose Parks/Trails	Environmental Justice community improvements
2/6/2020	Homeless Service Providers	Environmental Justice community improvements
2/6/2020	Oak Grove Elementary School District	Project overview, Environmental Justice community improvements
2/6/2020	Washington Elementary	Environmental Justice community improvements
2/6/2020	Santa Clara Unified School District Principals	Project overview, Environmental Justice community improvements
2/7/2020	Council on American Islamic Relations (CAIR)	Project overview, Environmental Justice community improvements
2/7/2020	San Jose Word of Faith Christian Center Board	Project overview, Environmental Justice community improvements
2/7/2020	ICAN Family Resource Center	Environmental Justice community improvements
2/12/2020	Morgan Hill Unified School District	Project updates and community improvements discussion
2/19/2020	City/County Staff Coordinating Group	Project updates, upcoming CWG/TWG dates, Draft 2020 Business Plan
2/20/2020	SPUR High-Speed Rail Forum	Statewide overview, NorCal 2019 review and 2020 update, 2020 Draft Business Plan release
2/20/2020	Guadalupe Washington Safety Coalition Community Walk	Community impacts, Environmental Justice community improvements
2/20/2020	Center for Employment Training	Project overview, Environmental Justice community improvements, workforce development

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2/20/2020	Guadalupe Washington Neighborhood Association	Project overview, Environmental Justice community improvements
2/21/2020	Concord Rotary Club	Economic benefits of high-speed rail, with a Bay Area focus
2/21/2020	Family Fun Friday at African American Community Services Agency	Tabling event to inform the public about project updates
2/24/2020	Emergency Assistance Network	Project overview, Environmental Justice community improvements
2/26/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, Cooperating and Participating Agency review status, and Draft 2020 Business Plan
2/26/2020	Rocketship Mateo Sheedy Elementary Site Tour	Environmental Justice community improvements
2/26/2020	Next Door Solutions/Home Safe Site Tour	Project overview, community impacts, Environmental Justice community improvements
2/27/2020	LPMG	Project updates, upcoming CWG/TWG dates, Draft 2020 Business Plan
2/27/2020	HomeFirst Service Area Assessment	Community impacts, Environmental Justice community improvements
2/28/2020	South Bay Islamic Association (SBIA)	Project overview, environmental justice community improvements
2/29/2020	Diridon Station Joint Policy Advisory Board	Presentation on the 2020 Draft Business Plan
3/2/2020	Santa Clara County Parks	Design coordination including Creek Trail Network Master Plan
3/4/2020	Northern California Legislative Briefing	Business Plan and Draft EIR/EIS
3/4/2020	San Jose Fire Department	Project overview, environmental justice community improvements
3/4/2020	Oak Grove High School Latino Parents	Project overview, environmental justice community improvements
3/5/2020	TWG Webinar	Meeting to share the Draft 2020 Business Plan, the Draft EIR/EIS, and the process for providing public comment
3/6/2020	Congresswoman Zoe Lofgren	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/6/2020	Assemblymember Kansen Chu	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/6/2020	Mayor Sam Liccardo	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/6/2020	Diridon Station Joint Policy Advisory Board	Presentation on Draft 2020 Business Plan
3/9/2020	Morgan Hill–Gilroy CWG	Meeting to share the Draft 2020 Business Plan, the Draft EIR/EIS, and the process for providing public comment

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3/10/2020	South Bay Transportation Officials Association	Project overview and update
3/10/2020	Tamien Community Walk	Briefing and community walk
3/11/2020	San Jose Councilmember Maya Esparza	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/11/2020	San Jose Councilmember Sergio Jimenez	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/11/2020	City of San Jose Brown Act Group	Briefing on Business Plan and Draft EIR/EIS
3/11/2020	City of Santa Clara	Project overview, Environmental Justice community improvements
3/11/2020	San Jose CWG	Meeting to share the Draft 2020 Business Plan, the Draft EIR/EIS, and the process for providing public comment
3/25/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule and the summary of agency comments and Authority consideration on the Draft EIR/EIS
4/8/2020	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Point Blue, Grassland Water District, CDFW, California Waterfowl Associates	Project briefing, Draft 2020 Business Plan, Prep for Draft EIR/EIS, outreach update
4/8/2020	Santa Clara Valley and Pacheco Pass Stakeholders: San Benito Land Trust, Santa Clara Valley Open Space Authority, Santa Clara County, Santa Clara Valley Habitat Agency	Project briefing, Draft 2020 Business Plan, Prep for Draft EIR/EIS, outreach update
4/8/2020	American Society of Civil Engineers San Jose Branch	Project overview and update
4/15/2020	Monterey Corridor Working Group	Project overview and update
4/16/2020	Franklin-McKinley School District, San Jose	Project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/17/2020	Gavilan College 1st Annual Economic Symposium	Roundtable discussion on transportation, housing, and education
4/19/2020	Muslim Community Association	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/21/2020	Edenvale Great Oaks Plan Implementation Coalition	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/22/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, Draft 2020 Business Plan, stakeholder publication primer for Draft EIR/EIS, and outreach update
4/23/2020	Madre-A-Madre	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment

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4/24/2020	Congressman Jim Costa	Project briefing, Draft 2020 Business Plan, Prep for Draft EIR/EIS, outreach update
4/28/2020	San Jose Word of Faith Christian Center	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/29/2020	City of Morgan Hill Draft EIR/EIS Workshop #1	Draft EIR/EIS Q&A workshop with City staff
4/29/2020	City of Gilroy Draft EIR/EIS Workshop #1	Draft EIR/EIS Q&A workshop with City staff
4/30/2020	DISC Outreach Committee	Diridon Station Concept Plan outreach check-in
4/30/2020	San Jose Councilmember Dev Davis	Project briefing, Draft 2020 Business Plan, Prep for Draft EIR/EIS, outreach update
5/1/2020	City of San Jose Draft EIR/EIS Workshop #1	Draft EIR/EIS Q&A workshop with City staff
5/5/2020	Morgan Hill Unified School District Board	Update on 2020 Business Plan, Morgan Hill alternatives, Draft EIR/EIS
5/6/2020	Silicon Valley Leadership Group	Update on 2020 Business Plan and status of environmental clearance in Northern California
5/7/2020	Streetblog - Talking Headways Recording	Recorded interview to discuss project overview, status, benefits, and the Draft EIR/EIS
5/11/2020	Open House Webinar #1	Webinar providing an opportunity for public to ask questions of technical staff regarding general topics, Draft EIR/EIS, and project alternatives
5/11/2020	Draft EIR/EIS Office Hours	One-on-one call with public to discuss Draft EIR/EIS
5/13/2020	City of Morgan Hill Draft EIR/EIS Workshop #2	Draft EIR/EIS Q&A workshop with City staff
5/14/2020	Open House Webinar #2	Webinar providing an opportunity for public to ask questions of technical staff regarding general topics, Draft EIR/EIS, and project alternatives
5/15/2020	HNTB Mega Project Planning Brown Bag	Discussion on Mega Project planning in times of uncertainty (COVID-19)
5/15/2020	Santa Clara Valley and Pacheco Pass Wildlife Stakeholders: San Benito Land Trust, Santa Clara Valley Open Space Authority, The Nature Conservancy, Santa Clara County, Santa Clara Valley Habitat Agency	Draft EIR/EIS Q&A workshop
5/18/2020	Open House Webinar #3	Webinar providing an opportunity for public to ask questions of technical staff regarding general topics, Draft EIR/EIS, and project alternatives
5/20/2020	City/County Staff Coordinating Group	Presentation on Draft 2020 Business Plan, Draft EIR/EIS, construction update
5/20/2020	Draft EIR/EIS Office Hours	One-on-one call with public to discuss Draft EIR/EIS

Date	Organization/Individual	Topic
5/21/2020	CWG Webinar	Webinar providing an opportunity for CWG members to ask questions of technical staff regarding general topics, Draft EIR/EIS, and project alternatives
5/26/2020	City of San Jose Draft EIR/EIS Workshop #2	Draft EIR/EIS Q&A workshop with City staff
5/27/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, a public outreach update for the Draft EIR/EIS
5/27/2020	Draft EIR/EIS Public Hearing	Webinar providing an opportunity for verbal public comment
5/27/2020	Draft EIR/EIS Office Hours	One-on-one call with public to discuss Draft EIR/EIS
5/28/2020	LPMG	Northern California Project Section updates, outreach update, Draft EIR/EIS
6/4/2020	City of Gilroy Draft EIR/EIS Workshop #2	Draft EIR/EIS Q&A workshop with City staff
6/10/2020	Mobility Partnership	Update on San Jose to Merced Project Section environmental clearance and Draft EIR/EIS outreach
6/17/2020	City/County Staff Coordinating Group	Update on 2020 Business Plan, San Jose to Merced Project Section Draft EIR/EIS, San Francisco to San Jose Project Section Draft EIR/EIS
6/17/2020	SAAG Meeting	Planning update on Diridon Station Area Plan and Google Downtown West Mixed-Use Plan, updated Civic Engagement Plan, overview of results from Spring 2020 online outreach and survey
6/17/2020	Santa Clara County Refugee and Immigrant Forum	Consultant staff provided a project update to this service provider collaborative (comprised of 10+ environmental justice-focused community based organizations) regarding environmental justice community improvement process and the Draft EIR/EIS process.
6/23/2020	DISC Outreach Sub-Committee	Diridon Station Concept Plan outreach check-in
6/24/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, summary of agency comments and Authority consideration for the San Francisco to San Jose Project Section Draft EIR/EIS
6/25/2020	LPMG	Northern California Project Section updates: outreach, Draft EIR/EIS, Final Business Plan (December 2020)
7/1/2020	Northern California Legislative Briefing	Statewide program update (2020 Business Plan, COVID-19 impacts, legislative hearings, construction update, track and systems procurement) and NorCal update (downtown rail extension MOU, environmental document preparation process, environmental milestones, San Jose to Merced Project Section Draft EIR/EIS outreach summary, San Francisco to San Jose Project Section lookahead)
7/15/2020	City/County Staff Coordinating Group	Update on 2020 Business Plan, San Francisco to San Jose Project Section Draft EIR/EIS

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7/16/2020	Young Professionals in Infrastructure: Future of Rail Event	Discussion of 2020 Business Plan, Northern California environmental work and project development stages, 4000 workers milestone
7/20/2020	Morgan Hill Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas, and evaluation of the ideas
7/22/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables, Draft EIR/EIS, and schedule
7/22/2020	City of Morgan Hill	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas, and evaluation of the ideas
7/23/2020	LPMG	Northern California Project Section updates: San Francisco to San Jose Project Section Draft EIR/EIS navigation, Final Business Plan (December 2020), Meet/Map HSR NorCal walkthrough
7/23/2020	Santa Clara County Parks & Recreation Department	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/24/2020	Rebekah Children's Services	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/27/2020	San Jose Councilmember Dev Davis	Provided an update on the high-speed rail program
7/27/2020	African American Community Services Agency	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/27/2020	Gavilan College	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/27/2020	San Jose Downtown Residents Association	Project overview and update
7/28/2020	Bay Area Council Transportation Committee HSR Event	Northern California Project Section updates: Draft EIR/EIS, Final Business Plan (December 2020), COVID-19's impact on project timeline and workforce
7/28/2020	City of Gilroy	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/28/2020	City of Santa Clara	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/29/2020	Los Banos Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/29/2020	Gilroy Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas

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7/30/2020	Center for Employment Training (CET)	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/30/2020	City of San Jose and San Jose Department of Parks & Recreation	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/30/2020	VTA	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/31/2020	Transbay Joint Powers Authority	Downtown rail extension U-wall conflict with mainline tracks
7/31/2020	Homeless Service Providers	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
7/31/2020	San Jose Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community improvement ideas and evaluation of the ideas
8/12/2020	San Jose City Councilmember Maya Esparaza	Draft EIR/EIS comment period update, environmental justice update, Monterey Corridor Working Group
8/19/2020	City/County Staff Coordinating Group	Comment period extension, public hearing
8/27/2020	LPMG	Comment period extension, public hearing
8/27/2020	Silicon Valley Leadership Group CEO Ahmad Thomas	Briefing on the high-speed rail program
8/28/2020	California State Assembly Candidate Alex Lee	Briefing on the high-speed rail program
9/2/2020	DISC Technical Working Group	Walk through of rail alignment at San Jose Diridon Station, agency coordination
9/2/2020	CalWORKS Advisory Council	Presentation to share project updates
9/3/2020	Garden Alameda Village Association	Presented on the San Francisco to San Jose Project Section Draft EIR/EIS public review period, and environmental topics as they relate to the community
9/10/2020	Santa Clara Unified School District	Briefing to update the Superintendent on environmental justice improvement process prior to presenting before the Board of Trustees
9/17/2020	Construction Management Association of America NorCal Chapter	Statewide program and Northern California HSR updates
9/22/2020	Hispanic Chamber of Commerce Silicon Valley	Project update and overview of the CWG
9/23/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables, Draft EIR/EIS and schedule
9/24/2020	Santa Clara Unified School District Board	Presentation on Northern California project updates and Santa Clara County–specific improvements

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9/30/2020	Northern California Legislative Briefing	Statewide program updates, the 2020 Sustainability Report, and updates on the Northern California Region
10/14/2020	NorCal Resource Agency Coordination	Update on technical deliverables, Draft EIR/EIS and schedule, and San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS limited recirculation overview and schedule
10/14/2020	American Society of Civil Engineers-Golden Gate Branch	Project overview presentation
10/14/2020	Stanford University	Class lecture on key decisions taken over last 30 years with California HSR, challenges, and what comes next
10/20/2020	Congressman Josh Harder	Briefing to share project updates
10/29/2020	San Jose State University Institute of Transportation Engineers	Presentation to students on the program and engineering topics
11/4/2020	SPUR San Jose	Briefing to share project updates
11/5/2020	San Jose City Councilmember Raul Peralez	Briefing to share project updates
11/11/2020	Hispanic Chamber of Commerce Silicon Valley	Project update to the Board
11/18/2020	Northern California Resource Agency	Meeting to discuss technical deliverables and the Cooperating and Responsible Agency Review Kickoff for the San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS
11/18/2020	City/County Staff Coordinating Group	Presentation on outreach survey and international blended systems
11/18/2020	CWG Webinar	Meeting to share project updates, the 2020 Sustainability Report, the Early Train Operators survey primary research, international examples of blended service operations and the results of the Northern California Outreach Survey
11/19/2020	LPMG	Presentation on outreach survey and international blended systems
12/17/2020	Northern California Legislative Briefing	Presentation on 2020 Business Plan, new administration, construction progress, and end of year review
1/5/2021	VTA	Meeting to discuss VTA's plans to develop a transit-oriented development, the Authority's request to match grant funding for the Station Area Plan, and right-of-way needs
1/13/2021	San Jose Councilmember Sergio Jimenez	Briefing to share project updates
1/20/2021	City/County Staff Coordinating Group	Verbal update provided on project updates
1/22/2021	Briefing with State Senator Dave Cortese	Briefing to share project updates
1/28/2021	LPMG	Verbal update on construction and Draft 2020 Business Plan

Date	Organization/Individual	Topic
1/28/2021	San Jose Councilmember Dev Davis	Project update and overview of the Draft 2020 Business Plan
2/8/2021	Valley Christian High School	Presentation on project and NorCal updates and I Will Ride
2/11/2021	Mineta Transportation Institute Student Association	Presentation on project and NorCal updates and I Will Ride
2/17/2021	City/County Staff Coordinating Group	Verbal update on the Draft 2020 Business Plan update, San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS recirculation, and Final EIR/EIS and ROD Schedule
2/18/2021	Gilroy City Councilmembers Armendariz and Hilton	Project update and overview of the Draft 2020 Business Plan
2/24/2021	Sierra Club Conservation Committee Presentation	Presentation on sustainability and Envision Award
2/24/2021	NorCal Legislative Briefing	Presentation on the Draft 2020 Business Plan, San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS, Final EIR/EIS ROD schedule
2/24/2021	California High-Speed Rail Authority NorCal Resource Agency Coordination	Presentation on program updates and briefing on the San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS
2/24/2021	Gilroy Mayor Blankley and City Administrator Forbis	Project update and overview of the Draft 2020 Business Plan
2/25/2021	LPMG	Verbal update on the Draft 2020 Business Plan, San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS, Final EIR/EIS ROD schedule
2/25/2021	TWG Webinar	Presentation on the Draft 2020 Business Plan and Funding 101
2/26/2021	JPA Board	Presentation on the Draft 2020 Business Plan
3/1/2021	City of San Jose Transportation and Environment Committee	Presentation on the Draft 2020 Business Plan
3/2/2021	SPUR HSR Lunchtime Forum	Presentation on the Draft 2020 Business Plan
3/3/2021	CWG Webinar	Presentation on the Draft 2020 Business Plan and Funding 101
3/9/2021	San Mateo County Economic Development Association HLUT Committee	Revised Draft 2020 Business Plan
3/10/2021	Mobility Partnership	Presentation on the environmental process and revised Draft 2020 Business Plan
3/17/2021	City/County Staff Coordinating Group	Verbal update provided on project updates
3/24/2021	NorCal Resource Agency Coordination	Presentation on San Francisco to San Jose and San Jose to Merced project section updates

Date	Organization/Individual	Topic
3/25/2021	Independence High School/Engineering Academy	Presentation geared to engineering pathway freshmen at Independence High School on project overview, sustainability, operations, engineering, and careers
3/25/2021	LPMG	Verbal update provided on project updates
4/22/2021	LPMG	Update on Revised/Supplemental Draft EIR/EIS and Business Plan
6/24/2021	LPMG	USDOT agreement and Revised/Supplemental Draft EIR/EIS end
7/22/2021	LPMG	San Francisco to San Jose Project Section EIR/EIS recirculation, Congressional call for dedicated HSR funding, and Burbank to Palmdale Final EIR/EIS
8/26/2021	LPMG	Millbrae meeting brief overview. Comment period update. Photos from tabling. August construction update. Burbank to Palmdale Final EIR/EIS.
9/7/2021	City of Morgan Hill, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/8/2021	Los Banos Unified School District, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/8/2021	Gilroy Unified School District, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/9/2021	City of San Jose, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/10/2021	City of Gilroy, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/13/2021	Rocketship Schools Meeting, Other Interested Party Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/13/2021	African American Community Services Agency, Other Interested Party Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/13/2021	Guadalupe Washington Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/14/2021	City of Santa Clara, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/14/2021	Gardner Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback

Date	Organization/Individual	Topic
9/15/2021	Santa Clara County Agencies, Interested Parties	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/15/2021	Santa Clara Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/16/2021	San Jose Unified School District, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/16/2021	Gavilan College, Other Interested Party Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/17/2021	Franklin McKinley School District, Other Interested Party Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/20/2021	San Jose Diridon Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/21/2021	Morgan Hill Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/22/2021	Los Banos Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/22/2021	Santa Clara County Office of Supportive Housing/Homeless services, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/23/2021	Sacred Heart, Other Interested Party Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/23/2021	Oak Grove School District, Other Interested Party Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/23/2021	South San Jose Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/24/2021	Rebekah Children's Services, Implementing Partner Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/28/2021	Center for Employment Training (CET), Other Interested Party Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback
9/28/2021	Gilroy Community Meeting	Explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback

Date	Organization/Individual	Topic
9/29/2021	Morgan Hill Unified School, Interested Parties Meeting	Provide overview of project, explain/present on updates to environmental justice analysis, mitigations, benefits, and community improvements, gain feedback

AA = alternatives analysis
ACE = Altamont Corridor Express
Authority = California High-Speed Rail Authority
BART = Bay Area Rapid Transit
Caltrans = California Department of Transportation
CCID = Central California Irrigation District
CDFG = California Department of Fish and Game (to 12/13/2012)
CDFW = California Department of Fish and Wildlife (from 1/1/2013)
CEO = Chief Executive Officer
CWG = community working group
DISC = Diridon Integrated Station Concept
DWR = California Department of Water Resources
EIR = environmental impact report
EIS = environmental impact statement
FRA = Federal Railroad Administration
HSR = high-speed rail
I- = Interstate
JPA = joint powers authority
LPMG = Local Policy Maker Group
MOU = memorandum of understanding
MOWF = maintenance of way facility
MTC = Metropolitan Transportation Commission
NAAC = Native American Advisory Committee
NAHC = Native American Heritage Commission
NEPA = National Environmental Policy Act
NFIP = National Flood Insurance Program
NMFS = National Marine Fisheries Service
NorCal = Northern California
PAA = Preliminary Alternatives Analysis
PEPD = preliminary engineering for project definition
PTO = Parent Teacher Organization
Project Section = San Jose to Merced Project Section
Q&A = questions and answers
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
ROD = Record of Decision
ROW = right-of-way
RWQCB = Regional Water Quality Control Board
SAA = Supplemental Alternatives Analysis
SAAG = Station Area Advisory Group
SBCWD = San Benito County Water District
SBTOA = South Bay Transportation Officials Association
SCHVA = Santa Clara Valley Habitat Agency
SCVOSA = Santa Clara Valley Open Space Authority
SCVWD = Santa Clara Valley Water District
SLDMWA = San Luis and Delta Mendota Water Authority
SPUR = San Francisco Bay Area Planning and Urban Research Association
SR = State Route
STB = Surface Transportation Board
SWRCB = State Water Resources Control Board
TAMC = Transportation Agency for Monterey County
TNC = The Nature Conservancy
TWG = technical working group
UPRR = Union Pacific Railroad
US = U.S. Highway
USACE = U.S. Army Corps of Engineers
USDA = U.S. Department of Agriculture
USDOT = U.S. Department of Transportation
USEPA = U.S. Environmental Protection Agency
USFWS = U.S. Fish and Wildlife Service
VTA = (Santa Clara) Valley Transportation Authority

APPENDIX 5-B, ATTACHMENT C: BIANNUAL ENVIRONMENTAL JUSTICE OUTREACH REPORTS

SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
April 16 – October 15, 2016

Overview

The following report summarizes environmental justice[i] outreach activities conducted for the California High-Speed Rail Authority San Jose to Merced Project Section between April 16 and October 15, 2016. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

Similar to the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Organizational stakeholder contact
- Stakeholder group meetings
- Local stakeholder contact

I. Public Meetings

During the reporting period, the Authority conducted four public meetings in the San Jose to Merced Project Section, including:

Date	City	Meeting Location
May 16, 2016	Los Banos	Los Banos Community Center
May 17, 2016	San Jose	Berryessa Community Center
May 18, 2016	Gilroy	Gilroy Senior Center
June 6, 2016	San Jose	Gardner Community Center

Each of these cities includes substantial low-income and limited English-proficient (LEP) populations. For each of the public meetings, the Authority provided interpreters for languages commonly spoken (i.e., 5% or more of the population speaks the language as its first language) in each respective community (Spanish for Gilroy and Los Banos; Spanish and Vietnamese for San Jose). The meeting invitation flyer was translated and made available in the following languages: English, Spanish, Mandarin, Vietnamese and Tagalog (note: these are the five most commonly spoken languages in the San Jose to Merced Project Section). In addition, several factsheets were available in Spanish at the meetings.

Title VI[ii] reports were submitted to the Title VI Coordinator within 5 days after each public meeting.

II. Organizational Stakeholder Contact

A series of interviews was conducted in July and August of 2016 with stakeholders serving environmental justice populations along the San Jose to Merced Project Section to inform the Authority's outreach efforts to these populations. The primary objectives of the interviews were to:

- Better understand the interests and concerns of low-income and minority populations and how they relate to the High-Speed Rail project;
- Inform the Authority's strategy for meaningfully engaging low-income and/or minority stakeholders, including anticipating and responding to potential challenges; and
- Identify specific environmental justice outreach opportunities (events, meetings, neighborhood groups, etc.) and additional stakeholders with whom to partner moving forward.

The following stakeholders were interviewed for the San Jose to Merced Project Section:

Organization	Point of Contact
Asian Americans for Community Involvement	Cam Vu and Anne Marie Tran
California Environmental Protection Agency	Arsenio Mataka
City of Gilroy	David Bischoff
City of San Jose District Three	Lucila Ortiz and Heidi Sickler
Delmas Park Neighborhood Association	Andrew Tubbs and Bert Weaver
Greenbelt Alliance	Brian Schmidt
Sierra Health Foundation	Manuel Alvarado
TransForm	Chris Lepe

The following high-level themes emerged from the interviews:

- Building **credibility and trust** within an environmental justice community is essential to effective engagement. This can be accomplished by partnering with local community organizations and thought leaders to share information and co-convene meetings, and demonstrating an understanding of their interests and concerns. Environmental justice communities often have an acute mistrust of government agencies, and while this can be overcome, it will take time and commitment.
- Environmental justice communities have varying degrees of familiarity with the HSR project. To build understanding, project information should be communicated in **simple, non-technical terms and translated in-language**, and graphics and visuals should be used to explain complex topics.
- To ensure constructive interactions with environmental justice stakeholders, the Authority should provide **comfortable, convenient, and culturally relevant opportunities for stakeholder participation**. This approach includes leveraging existing community meetings and gatherings, and engaging residents where they live, shop and play.
- Environmental justice stakeholders often do not attend Authority-convened events because they have **competing, higher-priority needs**. By addressing these needs through providing food and childcare, and holding meetings at times convenient to residents, the Authority can demonstrate it values their time and wants to make the process as convenient as possible.
- When engaging environmental justice communities, the Authority should frame the project more as a **quality of life issue** than exclusively a transportation issue, which will make it more relatable to local needs and priorities. If the Authority can demonstrate that the HSR project can help improve the overall quality of their lives by alleviating current community challenges (e.g.,

poor air quality, traffic congestion, poverty) while providing tangible benefits (e.g., job creation, economic development, improved mobility and accessibility), residents of these communities are more likely to want to participate in the process.

The *Summary of Interviews with Environmental Justice Stakeholders – San Francisco to San Jose and San Jose to Merced Project Sections* report was developed to capture and summarize these interviews.

III. Group Stakeholder Meetings

The Authority convened Community Working Groups (CWGs) in the San Jose to Merced Project Section to discuss and gather input on project alternatives with community members representing a broad range of local interests. Each of the CWGs includes representatives of environmental justice communities in the project section. During the reporting period, the Authority conducted the following CWG meetings:

- April 18, 2016: Los Banos CWG
- August 9, 2016: Gilroy-Los Banos Technical Working Group (note: members of the Los Banos CWG were invites to participate as members of this group)
- August 11, 2016: Morgan Hill-Gilroy CWG
- August 17, 2016: San Jose CWG

Title VI reports were submitted to the Title VI Coordinator for each CWG meeting.

IV. Local Stakeholder Contact

In addition to hosting public meetings and CWG meetings, the Authority and/or regional consultant staff also attended community events in the San Jose to Merced Project Section to provide project information and gather stakeholder input from stakeholders in environmental justice communities, including:

- August 20, 2016: Gardner Community Flea Market (San Jose)
- September 18, 2016: VivaCalle San Jose
- October 9, 2016: Day on the Bay Multicultural Festival (Alviso)

Title VI reports were submitted to the Title VI Coordinator for each outreach event.

In addition, Authority and/or consultant staff participated in the following small group meetings and briefings with representatives of environmental justice communities:

- June 7, 2016: Meeting with San Jose District 6 neighborhood residents
- September 12, 2016: Presentation to Gilroy City Council
- September 13, 2016: Meeting with San Jose District 2 staff and City of San Jose staff to discuss outreach to residents along Monterey Highway corridor

[i] The Authority's definition and application of the term "environmental justice" as it relates to the High Speed Rail project is as follows: *"Environmental Justice (EJ) is the fair treatment of people of all races, cultures, and income with respect to the development, adoption, implementation and enforcement of environmental laws and policies. Implementation of environmental justice principles in how the Authority plans, designs, and delivers the high-speed rail projects means that the Authority recognizes the potential social and environmental impacts that project activities may have on certain segments of the public."* (HSR Authority, Title VI Report, 2013)

[ii] Title VI of the Civil Rights Act of 1964, as amended, states that "no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefit of, or be subjected to discrimination under any program or activity that receives Federal financial assistance" (Civil Rights Act of 1964, Title VI).

SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
October 16, 2016 – April 30, 2017

Overview

The following report summarizes environmental justice[i] (Title VI) public involvement activities conducted for the California High-Speed Rail San Jose to Merced Project Section between October 16, 2016 and April 30, 2017. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

Similar to the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Stakeholder group meetings
- Local stakeholder contact

• Public Meetings

During the reporting period, the Authority conducted three public meetings in the San Jose to Merced Project Section, including:

Date	City	Meeting Location
April 18, 2017	Gilroy	I.F.D.E.S. Lodge-Portuguese Hall
April 20, 2017	San Jose	Southside Community Center
April 25, 2017	Los Banos	Los Banos Community Center

Each of the cities where the public meetings were held includes substantial low-income and limited English-proficient (LEP) populations. For each of the public meetings, the Authority provided interpreters for languages commonly spoken (i.e., 5% or more of the population speaks the language as its first language) in each respective community (Spanish for Gilroy and Los Banos; Spanish and Vietnamese for San Jose). The meeting invitation flyer was translated and made available in the following languages: English, Spanish, Mandarin, Vietnamese and Tagalog. In addition, several factsheets were available in Spanish at the meetings.

Kearns & West developed Title VI[ii] reports for each public meeting and they are available on the California High-Speed Rail project SharePoint site. Title VI reports were submitted to the Title VI Coordinator within 5 days after each public meeting.

- **Group Stakeholder Meetings**

The Authority convened Community Working Groups (CWGs) in the San Jose to Merced Project Section to discuss and gather input on project alternatives with community members representing a broad range of local interests. Each of the CWGs includes representatives of environmental justice communities in the project section. During the reporting period, the Authority conducted the following CWG meetings:

- January 23, 2017: San Jose CWG (Edenvale Public Library)
- January 26, 2017: Morgan Hill-Gilroy CWG (I.F.D.E.S. Lodge-Portuguese Hall in Gilroy)

Kearns & West developed Title VI reports for each CWG meeting and they are available on the California High-Speed Rail project SharePoint site.

- **Local Stakeholder Contact**

In addition to hosting public meetings and CWG meetings, the Authority and/or regional consultant staff also hosted information tables at community gathering locations in the San Jose to Merced Project Section to provide project information and gather stakeholder input from stakeholders in environmental justice communities, including:

- November 29, 2016: Edenvale Public Library (San Jose)
- December 19, 2016: Gilroy Downtown Library
- April 6, 2017: Gilroy Downtown Library
- April 17, 2017: Arteaga's Market (Gilroy)

In addition, Authority and/or consultant staff participated in the following small group meetings and briefings with representatives of environmental justice communities:

- October 27, 2016: Meeting with San Jose residents at the Edenvale Public Library. The meeting was hosted by San Jose District 2 City Councilmember Ash Kalra.
- November 14, 2016: Meeting with Gilroy neighborhood representatives to discuss outreach to residents of environmental justice communities in Gilroy.
- December 7, 2016: Meeting with Edenvale Great Oaks Plan Implementation Coalition (EGOPIC) at the Edenvale Community Center in San Jose.
- February 1, 2017: Meeting with the Seven Trees Neighborhood Association at the Seven Trees Community Center in San Jose.
- February 13, 2017. Meeting with the Gardner Neighborhood Association at the Gardner Community Center in San Jose.
- March 8, 2017: Meeting with the Goodyear-Mastic and Alma Neighborhood Associations at the Alma Senior Center in San Jose.

Kearns & West developed Title VI reports for each local stakeholder outreach event and they are available on the project SharePoint site.

The following items emerged from the environmental justice outreach events:

- Questions and concern about impacts to property value and how compensation would occur

- Questions and concerns about noise impacts from train operation and construction
- Concerns about traffic impacts from train operation and construction
- Concerns about increased graffiti on aerial structures and sound walls
- Concern about urbanization in East Gilroy
- Questions and concerns about the reliability of funding for High-Speed Rail
- Concern about amount of right of way available along Monterey Corridor
- Questions about the timeline for construction
- Questions about the choice of station locations
- Questions about the cost of tickets and speed of trains

[i] The Authority's definition and application of the term "environmental justice" as it relates to the High Speed Rail project is as follows: *"Environmental Justice (EJ) is the fair treatment of people of all races, cultures, and income with respect to the development, adoption, implementation and enforcement of environmental laws and policies. Implementation of environmental justice principles in how the Authority plans, designs, and delivers the high-speed rail projects means that the Authority recognizes the potential social and environmental impacts that project activities may have on certain segments of the public."* (HSR Authority, Title VI Report, 2013)

[ii] Title VI of the Civil Rights Act of 1964, as amended, states that "no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefit of, or be subjected to discrimination under any program or activity that receives Federal financial assistance" (Civil Rights Act of 1964, Title VI).

SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
May 1, 2018 – October 31, 2018

Overview

The following report summarizes environmental justice[i] outreach activities conducted for the California High-Speed Rail Authority San Jose to Merced Project Section between May 1, 2018 and October 31, 2018. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

Similar to the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Stakeholder group meetings
- Local stakeholder contact

I. Public Meetings

During the reporting period, there were no Authority-hosted public meetings in the San Jose to Merced Project Section.

II. Group Stakeholder Meetings

The Authority convened three meetings with Community Working Groups (CWGs) across the San Jose to Merced project section to discuss and gather input on the 2018 Business Plan and project alternatives with community members representing a broad range of local interests. Each of the CWGs includes representatives of environmental justice communities in the project section. During the reporting period, the Authority conducted the following CWG meeting:

- May 1: Business Plan Webinar with NorCal Community Working Groups
- May 2: San Jose CWG
- August 16: San Jose CWG

The following items emerged from the CWG meetings:

- Concern regarding impacts to existing infrastructure (e.g., Diridon Station, Monterey Highway, historic structures).
- Questions about the feasibility of tunneling and aerial approaches.
- Questions about the process/rationale for selecting a preferred alternative and which crossings will have grade separations.
- Concern regarding noise, vibration, aesthetic and pollution impacts and potential mitigations during construction and operation.
- Concern about connections to local transit.

- Concern that blended service will result in slower trains, longer travel times and increased traffic congestion.
- Concern regarding the increase in the number of trains and people in the Diridon station area.
- Concern that the community lacks awareness of the project.
- Concern about lack of coordination with other agencies and external planning efforts.

III. Local Stakeholder Contact

During the reporting period, the San Jose to Merced Project Section's outreach consultant participated in eight local outreach events, conducted zero neighborhood canvasses and two stakeholder/service provider interviews.

Outreach Events

- June 8: Gilroy Right-of-Way Workshop
- July 2: Oak Grove Neighborhood Association Meeting
- August 14: Morgan Hill Morning Community Meeting
- August 14: Morgan Hill Evening Community Meeting
- September 20: Gilroy Small Business Workshop
- September 24: Gilroy Unified School District and City Council Meeting
- October 18: San Martin Neighborhood Alliance Meeting
- October 23: Delmas Park Neighborhood Association Meeting

Stakeholder/Service Provider Interviews

- October 29: Beatriz Sanchez (Biblioteca Latinoamericana, San Jose)
- October 31: Ky Le (Santa Clara County Office of Supportive Housing, Santa Clara County)

The following items emerged from the environmental justice outreach activities:

- Concern about impacts to local businesses during construction.
- Concern about property acquisition and receiving fair compensation.
- Concern about noise, vibration and visual impacts.
- Concern that more train crossings will increase traffic congestion and reduce parking availability.
- Concern about the project's viability in terms of whether there is sufficient funding to see it through.
- Concern regarding coordination with other projects.
- Questions about relative cost of various alternatives.
- Concern regarding safety at crossings.

[i] The Authority's definition and application of the term "environmental justice" as it relates to the High Speed Rail project is as follows: *"Environmental Justice (EJ) is the fair treatment of people of all races, cultures, and income with respect to the development, adoption, implementation and enforcement of environmental laws and policies. Implementation of environmental justice principles in how the Authority plans, designs, and delivers the high-speed rail projects means that the Authority recognizes the potential social and environmental impacts that project activities may have on certain segments of the public."* (HSR Authority, Title VI Report, 2013)

SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
November 1, 2018 – April 30, 2019

Overview

The following report summarizes environmental justice[i] outreach activities conducted for the California High-Speed Rail Authority (Authority) San Jose to Merced Project Section between November 1, 2018 and April 30, 2019. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

In keeping with the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Stakeholder group meetings
- Local stakeholder contact

I. Public Meetings

During the reporting period, there were no Authority-hosted public meetings in the San Jose to Merced Project Section.

II. Group Stakeholder Meetings

The Authority convened five meetings with Community Working Groups (CWGs) along the San Jose to Merced project section to discuss and gather input on the 2018 Business Plan and project alternatives with community members representing a broad range of local interests. Each of the CWGs includes representatives of environmental justice communities in the project section. During the reporting period, the Authority conducted the following CWG meetings:

Meeting	Date	Location	# of Attendees	Purpose
Morgan Hill–Gilroy CWG	11/7/2018	Gilroy	20	Program Updates, San Jose to Merced Project Section, community engagement and outreach, CWG input on community resources
San Jose CWG	11/28/2018	San Jose	18	Statewide project update; review of alignment alternatives; outreach and engagement; introduction to CWG activity on community resources, community outreach, project interfaces and integration

Meeting	Date	Location	# of Attendees	Purpose
San Jose CWG	2/21/2019	San Jose	29	Rationale and process for identifying Preferred Alternative, role of the early train operator, updated flyover video, project benefits, outreach update
Morgan Hill–Gilroy CWG	3/5/2019	Morgan Hill	8	Rationale and process for identifying Preferred Alternative, role of the early train operator, updated flyover video, project benefits, outreach update
Morgan Hill-Gilroy CWG	4/22/2019	Gilroy	12	Build understanding of the safety and security characteristics of a high-speed rail system. Preview the format and types of information that will be shared about the Staff Recommended Preferred Alternative in Summer 2019. Provide an overview of the proposed process for CWG feedback on the Staff Recommended Preferred Alternative.

The following items emerged from the CWG meetings:

- Concerns regarding the relationship of the Authority to other agencies, projects and planning efforts.
    - The status of Caltrain electrification and its relation to the High-Speed Rail project.
    - Concern regarding interagency coordination and connection to other projects (e.g., Diridon Station planning).
    - Concern regarding the status of negotiations with Union Pacific and the potential impact on the selection of a preferred alternative.
    - Questions regarding the role of the Early Train Operator and its relationship to the Authority.
- Concerns regarding High-Speed Rail's potential impacts.
    - Parking and traffic
        - Concerns regarding impacts to parking availability.
        - Concerns regarding the impact of at-grade crossings on traffic congestion, neighborhood separations, emergency vehicle access, and connectivity.
    - Property
        - Concern regarding impacts to agricultural land in San Martin (especially in Alternative 3).
        - Concern regarding potential impacts to existing infrastructure depending on which alternative is selected.
        - Concern that a viaduct would significantly impact many neighborhoods.
    - Safety
        - Concerns that more frequent trains pose a greater safety risk.
        - Concern regarding the consistency and efficacy of pedestrian crossings across the corridor.
        - Concern regarding the vulnerability of High-Speed Rail to terrorist attacks.

        - Concerns regarding the design, operation and efficacy of safety features (including fencing, quad gates, Automatic Train Control, barrier skirt)
    - Noise and vibration
- Concerns regarding methodology.
    - Concern regarding the metrics being used for evaluating impacts to buildings and agricultural land.
    - Interest in the methodology used for traffic analysis in the environmental document.
    - Concern that safety is not considered a differentiating factor in comparing alternatives.
- Concerns regarding project viability.
    - Concern regarding levels of funding and responsibility for grade separation projects.
    - Concern about the project status given the 2019 State of the State address.
    - Concern about project schedule, delays, and funding.
- Concerns regarding public input.
    - Recommendation to expand outreach efforts and to provide more opportunities for input (i.e., a process for providing comments on the Staff-Recommended Preferred Alternative).
    - Interest in how public input is being incorporated and concern that CWG members' opinions will not be considered.

III. Local Stakeholder Contact

During the reporting period, the San Jose to Merced Project Section's outreach consultant participated in two local outreach events, conducted two canvasses, and led 36 stakeholder/service provider interviews.

Outreach Events

Meeting	Date	Location	# of Attendees	Purpose	Resource Partners/ Advocacy Groups
VIVO In-Language Meeting	3/6/2019	San Mateo County	30	The event purpose was to engage, for the first time, the Vietnamese community in Santa Clara County, provide updates on the project, and solicit input on the alternatives.	Vietnamese Voluntary Foundation
Volta Elementary School In-language meeting	3/26/2019	Los Banos	20	Engage the Volta Elementary School and broader community in Los Banos, provide basic information and updates on the project, and solicit input on impacts to the community.	Volta Elementary School

Neighborhood Canvasses

Meeting	Date	Location	# of Attendees	Purpose
Centennial Recreation Senior Center Canvass	11/14/2018	Morgan Hill	3	Solicit input from senior citizens living in Morgan Hill on potential impacts from High-Speed Rail.
Gardner Community Center Canvass	12/3/2018	Gardner, San Jose	4	Solicit input from community members at the Gardner Community Center regarding potential impacts from High-Speed Rail.

Stakeholder/Service Provider Interviews

Meeting	Date	Location	Organization
Kathleen Rose	11/8/2018	Gilroy	Gavilan College
Oscar Hernandez	11/9/2018	Gardner, San Jose	Biblioteca Latinoamericana
Rose Barry	11/9/2018	Gilroy	Saint Mary Parish
Deborah Flores	11/9/2018	Gilroy	Gilroy Unified School District
Kathleen Cordova	11/12/2018	Gardner, San Jose	Santa Maria Urban Ministry
Debbie Vasquez	11/14/2018	Morgan Hill	City of Morgan Hill
Joe Cuevas	11/14/2018	San Martin	Santa Clara County Social Services
Leslie Little, Tiffany Brown & Edith Ramirez	11/15/2018	Morgan Hill	City of Morgan Hill
Quyen Mai	11/15/2018	San Jose	Vietnamese Voluntary Foundation (VIVO)
Cythina Sutter-Tkel	11/20/2018	San Jose	Salvation Army Family Services
Brenda Callahan-Johnson	11/27/2018	Merced	Merced County Community Action Agency
Sal Ahkter	11/29/2018	San Martin	The Cordoba Center: South Valley Islamic Community
Patricia Mondragon	12/4/2018	Gilroy	South Valley Middle School in Gilroy
Karolinne Livingston	12/4/2018	Gilroy	Rebekah Assembly
Shannon Lane	12/4/2018	Morgan Hill	Morgan Hill Community Adult School
Cindy Reeves	12/4/2018	Morgan Hill	Learning and Loving Center
Daniel Guhl	12/4/2018	San Jose	Salvation Army Emmanuel House
Matthew Thomas	12/10/2018	Los Banos	Volta Elementary School
Joe Heim	12/10/2018	Los Banos	Los Banos Community Center
Irma Torres	12/10/2018	Los Banos	Kings View
Kevin Sved	12/14/2018	Gilroy	Navigator Schools (Gilroy Prep School)
Erin O'Brien	12/18/2018	Santa Clara County	Community Solutions
Chris Rebboah	12/20/2018	Gilroy	Rebekah Children's Services
Jeff Darling	12/21/2018	Santa Clara County	San Andreas Regional Center
Sinthia Sazio	1/8/2019	Gilroy	Head Start Program

Meeting	Date	Location	Organization
Greg Dinsmore	1/29/2019	Gilroy	Hope Services
Sally Armendariz	2/7/2019	Gilroy	CARAS South County
Christine Vasquez	2/12/2019	Gilroy	Glen View Elementary
Josh Selo	2/12/2019	San Jose	West Valley Community Services
Paul Escobar	2/14/2019	San Jose	San Jose Downtown Residents Association
Jane Stevens	2/19/2019	San Martin	San Martin Lions Club
Jan Bernstein-Chargin	2/28/2019	Gilroy	Compassion Center
Milina Jovanovic	2/28/2019	Santa Clara County	Santa Clara County Office of Immigrant Relations
Marco Sanchez	3/14/2019	Gilroy	Gilroy High School
Laura Cortez	4/18/2019	Gilroy	Alexander Station
Vicki Martin	4/22/2019	Gilroy	St. Joseph's Family Center

The following items emerged from the environmental justice outreach activities:

- Potential Impacts
    - Concern regarding neighborhood separations and the separation of communities from the services upon which they rely.
    - Concern regarding noise and vibration and the aesthetic impact of sound barriers.
    - Displacement
        - Concern that High-Speed Rail will exacerbate the lack of affordable housing and further raise housing costs.
        - Concern regarding property acquisition that may be necessary depending on the alternative selected.
    - Traffic and parking
        - Interest in how the alignment will impact congestion on local roadways.
    - Safety
        - Concern regarding security at train stations and on-board trains.
        - Concern regarding safety at grade crossings (especially near schools).
        - Concern regarding the proximity of High-Speed Rail to homeless individuals in the rail right-of-way.
- Potential Community Benefits
    - Interest in more information regarding mitigation measures to lessen impacts in environmental justice communities.
    - Concern regarding the affordability of fares and whether low-income individuals will be able to make use of High-Speed Rail.
    - Optimism that High-Speed Rail will result in additional customers for local businesses (due to increased traffic at stations).
    - Optimism that High-Speed Rail will lead to improved access to jobs and higher education (shorter commutes and reduced traffic congestion).
    - Optimism that High-Speed Rail will lead to the preservation of agricultural land (depending on the alternative selected).
- Public Engagement

    - Interest in varied modes of engagement because some populations have limited access to technology.
    - Concern that there is a lack of awareness about the project in environmental justice communities.
- Project Costs and Operation
    - Concern that taxpayer money should be spent judiciously (especially in regard to the demolition of recently constructed buildings and infrastructure).
    - Interest in fair labor practices.
    - Concern regarding project timeline, availability of funds, and viability.
    - Concern regarding the lack of funding for grade separation projects (and the associated financial burden placed on local jurisdictions).
- Connectivity
    - Concern regarding the speed and frequency of train service and connectivity to other forms of transit.
    - Concern regarding safe bicycle and pedestrian access.

[i] The Authority's definition and application of the term "environmental justice" as it relates to the High Speed Rail project is as follows: *"Environmental Justice (EJ) is the fair treatment of people of all races, cultures, and income with respect to the development, adoption, implementation and enforcement of environmental laws and policies. Implementation of environmental justice principles in how the Authority plans, designs, and delivers the high-speed rail projects means that the Authority recognizes the potential social and environmental impacts that project activities may have on certain segments of the public."* (HSR Authority, Title VI Report, 2013)

SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
May 1, 2019 – October 31, 2019

Overview

The following report summarizes environmental justice[i] outreach activities conducted for the California High-Speed Rail Authority (Authority) San Jose to Merced Project Section between May 1, 2019 and October 31, 2019. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

In keeping with the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Stakeholder group meetings
- Local stakeholder contact

I. Public Meetings

During the reporting period, there were no Authority-hosted public meetings in the San Jose to Merced Project Section. The Authority hosted open houses (focused on the selection of a preferred alternative), but these are not being included as they neither focused on environmental justice nor did they target environmental justice communities.

II. Group Stakeholder Meetings

While the Authority convened several Community Working Groups (CWGs) along the San Jose to Merced Project Section during this time period, these meetings were not focused on environmental justice topics and they did not target environmental justice communities.

III. Local Stakeholder Contact

During the reporting period, the San Jose to Merced Project Section's outreach consultant participated in 11 outreach events and also led 11 stakeholder/service provider interviews.

Outreach Events

Meeting	Date	Location	# of Attendees	Resource Partners/ Advocacy Groups
Gardner Community Meeting	5/13/2019	San Jose	17	Gardner Neighborhood Association
Gilroy Community Meeting	5/28/2019	Gilroy	4	Gilroy Unified School District

HomeFirst Homeless (Monterey Corridor)	5/31/2019	San Jose	12	
Homeless Dinner	6/13/2019	Gilroy	20	St Joseph's Family Center
PATH Homeless (Diridon)	6/14/2019	San Jose	8	
Morgan Hill Music	7/5/2019	Morgan Hill	50	Morgan Hill Chamber of Commerce
Good Morning Morgan Hill Chamber Breakfast	8/1/2019	Morgan Hill	75	Morgan Hill Chamber of Commerce
Downtown San Jose Farmers Market	8/9/2019	San Jose	60	
Gilroy Car Show	8/17/2019	Gilroy	80	
Refugee and Immigrant Forum of Santa Clara County	10/16/2019	San Jose	15	
Vietnamese Moon Festival	9/20/2019 - 9/21/2019	San Jose	90	

The following items emerged from these environmental justice outreach events:

- **Project Timeline/Sequencing/Process**
    - Interest in the project timeline (e.g., the sequencing of construction phases, coordination with local infrastructure projects, and the timing of property acquisitions) and the process for selecting a preferred alternative.
    - Concern regarding news reports of project delays, mismanagement and cost overruns.
- **Displacement/Property Impacts**
    - Interest in pinpointing the specific homes that will be affected by the project and acquired by the Authority.
    - Concern regarding potential impacts to historic buildings and public spaces (e.g., Fuller Park) and relief that the preferred alternative may minimize such displacement.
    - Concern that the project may raise housing prices.
- **Coordination with External Agencies**
    - Interest in the logistics of how the Authority will coordinate service with other transportation agencies (e.g., Union Pacific, Caltrain, Amtrak, BART, local buses)
    - Interest in how the High-Speed Rail timeline relates to the development of the Diridon Integrated Station Concept.
- **Funding**
    - Concern regarding the availability of funding to complete the project given the lack of Federal funding forthcoming.
    - Concern that additional funding will necessitate raising taxes and suggestions that support should come from technology companies in Silicon Valley (especially those providing shuttles for employees).
- **Noise**
    - Concern regarding noise impacts of train operation and interest in mitigations including quiet zones and sound walls.

- **Train Stations**
    - Interest in the location and construction timeline of train stations (including East Gilroy Station and Diridon).
    - Disappointment that there are no plans for a station in Morgan Hill.
- **Traffic**
    - Concern regarding traffic congestion at at-grade intersections, especially given the higher frequency of trains.
    - Optimism that the project may benefit all commuters by relieving traffic congestion (specifically in the Peninsula Corridor).
- **Project Benefits and Equity**
    - Concern that project benefits will not be distributed equitably and that individuals and communities with the least social/political capital will bear the greatest negative impacts.
    - Optimism regarding potential project benefits (e.g., economic opportunities for downtown Gilroy, increased commuting options especially for non-drivers, job opportunities, more investment in Gilroy, alternative means of travelling to Southern California).
- **Community Cohesion/Separation/Connectedness**
    - Optimism regarding greater access to other cities across California.
    - Concern that the project is dividing the community "both physically and spiritually."
- **Public Awareness/Outreach/Engagement**
    - Interest in having outreach materials translated into additional languages and distributed to non-English speaking communities.
    - Widespread belief that the project had been canceled.
    - Concern that the public isn't being sufficiently engaged in the process.
    - Concern that youth lack awareness of the project.
- **Homeless**
    - Concern regarding the use and proximity of high-speed rail infrastructure (e.g., train stations, tracks, tunnels, archways) to numerous existing homeless encampments; the difficulty of relocating homeless individuals, and the potential future development of similar encampments.
    - Concern for the safety of homeless individuals who cross the train tracks as part of their daily routine.
- **Safety**
    - Interest in safety features and other infrastructure that might mitigate risks, including pedestrian bridges, ramps, walls, gates, fences and caged entrance systems to the public (especially vulnerable populations such as children and the homeless).
    - Concern with safety impacts to at-risk youth living near tracks who may attempt to inflict self-harm (specifically regarding those alternatives going through downtown Gilroy that will be adjacent to Rebekah Children's Services).
    - Concern regarding safety impacts from electrification and at-grade crossings.
- **Alternatives**
    - General
        - Interest in whether there will be a single alternative for the entire project section, or if elements of different alternatives can be combined.
    - Support for Alternative 4

        - Belief that Alternative 4 would have the smallest impact on properties (including homes and historic buildings).
        - Belief that using existing tracks is the most efficient, cost-effective solution and would cause the fewest disruptions.
    - Opposition to Alternative 4
        - Concern that Alternative 4 will contribute to the Mexican community's segregation as it will serve as a barrier from the rest of Gilroy.
        - Concern with safety issues along the alignment, especially regarding schools and their proximity to tracks.
        - Concern that Alternative 4 poses the greatest risk to the Gilroy community because of the many educational institutions along the alignment.
        - Concern regarding the speed of trains under Alternative 4.
    - Opposition to Other Alternatives
        - Concern that Alternative 3 will negatively impact farmers.
        - Concern that a viaduct may disrupt traffic along Monterey Road and thereby negatively impact businesses in Gilroy and Morgan Hill.
        - Concern about the cost associated with constructing a viaduct.
    - Support for Other Alternatives
        - Preference for a viaduct in the median of Highway 101 to mitigate safety concerns.

Stakeholder/Service Provider Interviews

Meeting	Date	Location	Organization
Desarie Abeyta	6/25/2019	San Jose	Bill Wilson Center
Elizabeth Gonzalez	6/26/2019	San Jose	De-Bug
Rosalinda Aguilar & Ray Moreno	10/29/2019	San Jose	Guadalupe Washington Neighborhood Association
Mags Petkewicz	10/29/2019	Gardner	Gardner Academy
Brandon Quintanilla	10/29/2019	San Jose	Better Tomorrow
Nastaran Nazarian	10/30/2019	San Jose	PARS Equality Center
Adrienne Keel	10/17/2019	San Jose	Family and Children Services of Silicon Valley (LGBTQ Youth Program)
Vy Nguyen	10/18/2019	San Jose	San Jose Environmental Services Communications Division
Susan Norris	10/2/2019	San Jose	PG&E
Quyen Vuong	10/24/2019	San Jose	International Children Assistance Network
Jody Ngo	10/4/2019	San Jose	UStar Productions

The following items emerged from these environmental justice outreach interviews:

- **Safety**
    - Concern regarding people crossing the tracks (e.g., students accessing schools, children accessing libraries, adjacent homeless encampments, and community members who do not have cars and therefore rely on walking and bicycling).

    - Concern regarding adequate fencing and barriers.
    - Concern regarding adequate signage and the need for a public awareness campaign to warn people of danger (especially given the substance abuse and mental health issues in the homeless community).
- **Homeless Issues**
    - Concern regarding the proximity of homeless encampments to the tracks and associated safety risks and displacement.
- **Noise**
    - Concern regarding noise impacts (both during construction and once service begins).
- **Displacement**
    - Concern about increased property values leading to community members losing their homes.
- **Air Quality**
    - Concern regarding air quality impacts during construction.
- **Access/Affordability**
    - Concern that the benefits of high-speed rail will not be equitably shared if the service does not offer an affordable mode of travel.
- **Traffic**
    - Concern regarding the impact on traffic congestion, especially during school drop-off and pick-up times.
- **Project Benefits**
    - Optimism that the project will provide constituent communities with greater access to Southern California.
- **Public Outreach**
    - Concern that local EJ populations are not aware of the project.
    - Concern that materials should be translated into additional languages (e.g., Farsi).
    - Concern that EJ communities must have a voice in the process.
    - Concern that the youth have not been adequately engaged.
    - Recommendations for how best to reach various EJ communities (including collaborating with trusted local service providers, cultural events, local in-language media outlets, and door-to-door communication).

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SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
November 1, 2019 – April 30, 2020

Overview

The following report summarizes environmental justice[i] outreach activities conducted for the California High-Speed Rail Authority (Authority) San Jose to Merced Project Section between November 1, 2019 and April 30, 2020. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

In keeping with the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Stakeholder group meetings
- Local stakeholder contact

I. Public Meetings

During the reporting period, there were no Authority-hosted public meetings in the San Jose to Merced Project Section.

II. Group Stakeholder Meetings

While the Authority convened several Community Working Groups (CWGs) along the San Jose to Merced Project Section during this time period, these meetings were not focused on environmental justice topics and they did not target environmental justice communities.

III. Local Stakeholder Contact

During the reporting period, the San Jose to Merced Project Section's outreach consultant participated in 15 outreach events and led 52 stakeholder/service provider interviews.

Outreach Events

Meeting	Date	Location	# of Attendees	Resource Partners/ Advocacy Groups
Gardner Elementary PTO Meeting and Community Walk	12/13/2019	San Jose	5	
Gilroy Unified School District Presentation	1/28/2020	Gilroy	4	Gilroy Unified Schools, South Valley Middle & Rebekah Children's Services

Meeting	Date	Location	# of Attendees	Resource Partners/ Advocacy Groups
Shasta Hanchett Park Neighborhood Association Fair	2/1/2020	San Jose	60	
Meet the Black Authors and Artists Event	2/1/2020	San Jose	75	African American Community Services Agency
Santa Clara Unified School District Principals	2/6/2020	Santa Clara, San Jose	8	
Guadalupe Washington Safety Coalition Community Walk	2/20/2020	San Jose	9	
Guadalupe Washington Neighborhood Association Presentation	2/20/2020	San Jose	8	
Family Fun Friday	2/21/2020	San Jose	40	African American Community Services Agency
Emergency Assistance Network Presentation	2/24/2020	San Jose	7	
Oak Grove High School Latino Parents Meeting	3/4/2020	San Jose	14	
Franklin-McKinley School District Webinar	4/16/2020	Webinar	7	
Muslim Community Association Community Webinar	4/19/2020	Webinar	9	
Edenvale Great Oaks Plan Implementation Coalition Community Webinar	4/21/2020	Webinar	6	
Madre-A-Madre Community Webinar	4/23/2020	Webinar	10	
San Jose Word of Faith Christian Center Community Webinar	4/28/2020	Webinar	5	

The following issues were identified by participants in these environmental justice outreach events:

- **Project Timeline/Sequencing/ Process**
  - Interest in project timeline (e.g., alternative selection, implementation, and project phases).
- **Displacement/Property Impacts**
  - Concern regarding loss of homes, parks, and churches to the project.
  - Interest in understanding the property acquisition process and options that owners have.
  - Concern that displacement challenges will hit lowest income families the hardest.
  - Concern that property, owned by the Authority and neighbors, will be tagged and lead to heightened gang activity.
- **Coordination with External Agencies and Organizations**
  - Recommendation for the Authority to partner with local community-based organizations (CBOs, such as homeless response teams, Complete Streets programs) on programs.

    - Recommendation for the Authority to partner with community members on beautification efforts (e.g., tree planting).
    - Interest in the relationship and coordinating logistics between the Authority and other transportation providers, especially Union Pacific and Caltrain.
- **Funding**
    - Interest in understanding how the project moves forward while funding is still pending.
- **Noise/Vibration**
    - Concern regarding noise and vibration impacts of train operation and construction.
    - Interest in approaches to and effectiveness of noise mitigation.
    - Concern regarding potential repetition of past transportation projects' unfulfilled promises to produce sound walls.
- **Train Stations**
    - Concern regarding traffic congestion and availability of parking near stations.
- **Traffic**
    - Interest in potential project outcomes that lead to reduced traffic congestion.
    - Concern about increased traffic impacts on safety and accessibility.
- **Mitigation Measures**
    - Concern about effects unable to be mitigated (e.g., displacement, environmental degradation).
    - Interest in understanding mitigation timeline, requirements, and process.
    - Concern, based on reported past experience with other agencies, that Authority may plan but not deliver mitigation.
- **Environmental Enhancements**
    - Interest in enhancements projects (e.g., traffic calming features (pedestrian crossing signs, crosswalks, bike lanes), freeway ramps, fences, playgrounds, school improvements, parks, riverside paths).
    - Concern that project impacts and enhancements benefits cannot fully be understood when projects in the vicinity are still being planned.
    - Concern that there will be unintended consequences of enhancements (i.e., new fences to tag resulting in heightened gang activity).
    - Concern about criteria used to define "environmental justice" communities along the alignment.
- **Project Benefits and Equity**
    - Concern that the environmental process does not necessarily focus on prioritizing communities and protecting the interests of residents.
    - Interest in project benefits, especially improved air quality, access to lower cost housing, traffic reduction, job access, and the connection of families.
- **Community Cohesion/Separation/Connectedness**
    - Concern about community isolation.
    - Interest in project benefit of increased mobility that will keep families connected.
- **Public Awareness/Outreach Engagement**
    - Concern regarding a perceived lack of responsiveness by the Authority to community concerns.
    - Concern regarding the community's lack of awareness or limited knowledge about the project.
    - Interest in learning about commuter fares, requirements to ride (i.e., identification), and train schedules and volumes.

- Interest in the activities and logistics (e.g., open houses, access for those with technological constraints) and methods for engaging stakeholders for the Draft EIR/EIS comment period.

- **Safety**
  - Interest in collaborating with homeless response teams to abate the homeless population and activities along the tracks.
  - Concern regarding emergency vehicle response times and ensuring public safety personnel have direct access to communities.
  - Interest in developing and maintaining safety features (e.g., grade separations, pedestrian overcrossings, traffic safety, pedestrian crossing signs and lights, secure fencing around tracks, lights near new structures).
- **Alternatives**
  - Interest expressed for underground alternatives.
  - Interest in understanding costs differences and displacement effects of each alternative.

Stakeholder/Service Provider Interviews

Meeting	Date	Location	Organization
Claudia Olaciregui	11/4/2019	San Martin	San Martin/Gwinn K-8 Academy
Brandon Quintanilla	11/6/2019	San Jose	Better Tomorrow
Steve Betando	11/20/2019	Morgan Hill	Morgan Hill Unified School District
Dan Keith & Dan Rocca	11/20/2019	San Martin	Rocca's Market
Jim Di Vittorio	11/20/2019	Morgan Hill/San Martin	Maple Leaf RV Park
Kathy Robinson	12/9/2019	Santa Clara	HomeSafe/Charities Housing
Jose Rojo & Jose Serrano	12/9/2019 & 12/13/2019	Santa Clara County	Univision
Thong Vang	12/12/2019	San Jose	San Jose City College
Erick Morales & Christian de le Cruz	12/13/2019	San Jose	La Raza Radio
Kathy Robinson	12/16/2019	Santa Clara	Charities Housing
Aparna Dhoraje	12/17/2019	Santa Clara	Next Door Solutions
Tony Cuevas	12/18/2019	Gilroy	Santa Clara County Family & Children Services
Matthew Thomas	12/19/2019	San Joaquin Valley	Volta Elementary
Alvaro Meza, Guillermo Ramos & Kevin Sved	12/19/2019	Gilroy	Gilroy Unified School District
Joe Heim	12/20/2019	Los Banos	Los Banos Community Center
Sujatha Venkatraman	1/8/2020	San Jose Diridon	West Valley Community Services
Victoria Sorensen & Jessie Swift	1/15/2020	Morgan Hill	Morgan Hill Unified School District & CARE
Martin Enriquez	1/15/2020	Gilroy	Gilroy High School

Meeting	Date	Location	Organization
Rebecca Garcia, Edith Ramirez & Tiffany Brown	1/15/2020	Morgan Hill	City of Morgan Hill
Kathleen Rose & Denée Pescarmona	1/15/2020	Gilroy	Gavilan College
Stella Kemp & Jennifer Derrico	1/16/2020	Santa Clara	Santa Clara Unified School District
Deacon Ruben Solorio	1/16/2020	San Jose	Sacred Heart Nativity
Adrienne Keel	1/17/2020	South San Jose	Family & Children's Services of Silicon Valley, County of Santa Clara
Josue Fuentes & Hugo Meza	1/22/2020	Guadalupe Washington	Guadalupe-Washington Safety Coalition
Blake Balajadia	1/23/2020	San Jose	San Jose City College
Milan Balinton	1/23/2020	San Jose	African American Community Services Agency
Kristine Nguyen	1/23/2020	San Jose	Go Kids (formerly Estrella Family Services)
Ben Spielberg	1/23/2020	San Jose	San Jose Unified School District
Corrin Reynolds	1/28/2020	Gardner/San Jose Diridon/Guadalupe Washington	San Jose Unified School District
Amer Iqbal & Matthew Thomas	1/29/2020	Los Banos	Los Banos Unified School District
Janine Ramirez & Ernest Alnas	1/29/2020	Alma	Rocketship Public Schools
Chris Funk & Chris Jew	1/30/2020	San Jose	East Side Union High School District
Juan Carlos Villasenor & Mari de Solorzano	1/30/2020	San Jose	Voices Charter Academy
Yves Zsutty	2/3/2020	San Jose	City of San Jose Parks/Trails
Michelle Covert, Serge Lilavois, Frances Hernandez & Beatriz Ramos	2/6/2020	Santa Clara/San Jose	Homeless Service Providers
Jose Manzo & Laura Phan	2/6/2020	San Jose	Oak Grove Elementary School District
Maricela Alcala Franco	2/6/2020	San Jose	Washington Elementary
Aliza Kazmi	2/7/2020	Santa Clara/San Jose	Council on American Islamic Relations (CAIR)
Glenna Williams & Hezekiah Alexander	2/7/2020	San Jose	San Jose Word of Faith Christian Center Board
Quyen Vuong	2/7/2020	San Jose	ICAN Family Resource Center
Esther Peralez-Dieckmann	2/10/2020	Santa Clara	NextDoor Solutions
Daniel Peck	2/10/2020	Santa Clara	Missing College
Hermelinda Sapien	2/20/2020	San Jose	Center for Employment Training (CET)
Janine Ramirez, Ernest Alnas, Justin White, Adiagha Mbonisi, Debesay Teklemariam, Ana Velasquez & Leticia Bermudez	2/26/2020	San Jose	Rocketship Mateo Sheedy Elementary

Meeting	Date	Location	Organization
Aparna Dhoraje, Maria Rosas & Daniela Maldonado	2/26/2020	Santa Clara	Next Door Solutions/Home Safe
Frances Hernandez, Michael Freyer & Catalina Lopez	2/27/2020	Santa Clara/San Jose	HomeFirst Service Area Assessment
Athar Siddiqee	2/28/2020	Santa Clara/San Jose	South Bay Islamic Association (SBIA)
Brett Bymaster	3/10/2020	San Jose	Tamien Community Organizer
Philip Nguyen	3/12/2020	San Jose	Vietnamese American Round Table
Peter Nguyen	3/12/2020	San Jose	Vietnamese Voluntary Foundation (VIVO)

The following issues were identified by participants in these environmental justice outreach interviews:

- **Safety**
  - Concern regarding potential hazards of local tracks (e.g., children accessing school, older adults, unhoused populations, those looking to self-harm).
  - Recommendation to consult neighborhoods before adding barriers to prevent unintended consequences (i.e., gang activity could increase with new fences/walls).
  - Interest in measures to mitigate the impacts of natural hazards.
  - Concern regarding emergency vehicle response times and ensuring public safety personnel have direct access to communities.
- **Homelessness**
  - Concern regarding the displacement of homeless encampments that are currently located within close proximity of high-speed rail infrastructure (e.g., train stations, tracks, tunnels, archways).
  - Concern regarding the creation of new homeless encampments (e.g., Coyote Valley Wildlife, below bridges) and an increase in crime associated with encampments (i.e., an uptick in illicit drugs and theft).
  - Interest in the provision of housing for unhoused communities living along the corridor.
- **Noise & Vibration**
  - Concern regarding noise and vibration impacts of train operation and interest in mitigation measures.
- **Displacement/Property Impacts**
  - Interest in understanding the extent to which properties will be impacted.
  - Concern regarding gentrification and its impact on communities, especially low-income residents and students.
  - Concern regarding the potential for vandalism and graffiti as a result of the installation of barriers like sound walls.
- **Partnerships**
  - Interest in project partnerships (i.e., schools and workforce training programs that could be cosponsored by the Authority).
- **Funding**
  - Concern regarding the availability of funding to complete construction of the project.
- **Project Benefits and Equity**
  - Concern about the potential lack of social and economic investment in disadvantaged communities, especially Black and Latino communities.

    - Optimism that the project will hire locally and improve quality of life through access to affordable housing.
- **Community Cohesion/Separation/Connectedness**
    - Concerns regarding potential impacts to community cohesion and access to jobs on either side of high-speed rail tracks.
    - Concern that there will be disruptions to businesses during construction.
- **Public Awareness/Outreach/Engagement**
    - Concern that Latinx communities in the Bay Area are not aware of the project.
    - Recommendations for how best to reach various EJ communities: incentivizing members and businesses to provide feedback and referrals, contracting local nonprofits for consultation services to participate in outreach, and developing materials specific to each community.
- **Access/Affordability**
    - Optimism that the project will increase access to services and businesses throughout California.
    - Interest in what the fare will be.
    - Interest in train schedules and their relationship to peak travel times.
- **Traffic & Parking**
    - Concern regarding the impact on traffic congestion during peak hours (e.g., school drop-off and pick-up times).
    - Concern regarding the availability of parking, which is already seen as limited.
    - Concern regarding disruption to bus routes, including school bus routes, during both construction and operation.
- **Alternatives**
    - General
        - Interest in the selection process for Alternative 4 as the Preferred Alternative.
    - Support for Alternative 4
        - Belief that Alternative 4 would have the lowest impact on residential properties and businesses.
        - Concern about the viaduct in other Alternatives.
    - Opposition to Alternative 4
        - Concern that Alternative 4 may negatively impact some residential areas.
    - Support for Other Alternatives
        - Preference for Alternative 1 through Morgan Hill to avoid downtown and reduce disruption of bus routes.
- **Environmental Enhancements**
    - Interest in environmental enhancements, including safety barriers, noise/vibration mitigation, public transportation improvements, active transportation infrastructure (e.g., bikes lanes, sidewalks, pedestrian crossings, lights and bridges), affordable housing for unhoused communities, better access to services (e.g., signage for emergency services, vouchers for hotel stays, mobile showers program, mobile health clinics), subsidized transit fares, training and employment opportunities, public space improvements, and property improvements.
    - Interest in the enhancements process., including types of enhancements, selection criteria, and rating system.
    - Interest in improved public spaces and investment in new spaces

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SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
May 1, 2020 – October 30, 2020

Overview

The following report summarizes environmental justice[i] outreach activities conducted for the California High-Speed Rail Authority (Authority) San Jose to Merced Project Section between May 1, 2020 and October 30, 2020. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

In keeping with the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Stakeholder group meetings
- Local stakeholder contact

I. Public Meetings

While the Authority hosted three virtual public open houses and a virtual public hearing along the San Jose to Merced Project Section during this time period, these events were not focused on environmental justice topics and they did not target environmental justice communities.

II. Group Stakeholder Meetings

While the Authority convened several Community Working Groups (CWGs) along the San Jose to Merced Project Section during this time period, these meetings were not focused on environmental justice topics and they did not target environmental justice communities.

III. Local Stakeholder Contact

During the reporting period, the San Jose to Merced Project Section's outreach consultant participated in 6 outreach events and led 16 stakeholder/service provider community enhancements engagements.

Outreach Events

Meeting	Date	Location	# of Attendees	Resource Partners/ Advocacy Groups
Franklin-McKinley School District Webinar	4/16/2020	Webinar	7	
Muslim Community Association Community Webinar	4/19/2020	Webinar	9	

Meeting	Date	Location	# of Attendees	Resource Partners/ Advocacy Groups
Edenvale Great Oaks Plan Implementation Coalition Community Webinar	4/21/2020	Webinar	6	
Madre-A-Madre Community Webinar	4/23/2020	Webinar	10	
San Jose Word of Faith Christian Center Community Webinar	4/28/2020	Webinar	9	
Santa Clara County Refugee and Immigrant Forum Announcement	6/17/2020	Webinar	N/A	

The following issues were identified by participants in these environmental justice outreach events:

- **Project Timeline/Sequencing/ Process**
  - Interest in project timeline (e.g., alternative selection, implementation, and project phases).

- **Coordination with External Agencies and Organizations**
  - Interest in the relationship between the Authority and other transportation providers, especially Union Pacific.

- **Noise/Vibration**
  - Concern regarding noise and vibration impacts of train operation and construction.
  - Interest in approaches to and effectiveness of noise mitigation such as sound walls, especially in areas around public institutions (e.g., schools and churches).

- **Traffic**
  - Concern about increased traffic impacts on safety and accessibility.
  - Concern about congestion owning to the closure of car lanes during construction.

- **Public Awareness/Outreach Engagement**
  - Interest in learning about commuter fares, requirements to ride (i.e., identification), and train schedules and volumes.
  - Interest in the activities and logistics (e.g., open houses, access for those with technological constraints) and methods for engaging stakeholders for the Draft EIR/EIS comment period.
- **Safety**
  - Concern regarding potential hazards of at-grade intersections.
  - Safety in communities adjacent to tracks.

Stakeholder/Service Provider Community Enhancements Meetings

Meeting	Date	Location	Organization
Fouad Khatib	4/10/2020	Webinar	Muslim Community Association
Steve Betando & Kirsten Perez	7/20/2020	Webinar	Morgan Hill Unified School District

Meeting	Date	Location	Organization
Tiffany Brown & Edith Ramirez	7/22/2020	Webinar	City of Morgan Hill
Antoinette Romeo & Jeremy Farr	7/23/2020	Webinar	Santa Clara County Parks & Recreation Department
Christophe Rebboah	7/24/2020	Webinar	Rebekah Children's Services
Milan Balinton	7/27/2020	Webinar	African American Community Service Agency
Kathleen Rose, Denee Pescarmona, Michael Renzi & Jan Chargin	7/27/2020	Webinar	Gavilan College
Kraig Tambornini, Julie Wyrick, Gary Heap, Girum Awoke & Cindy McCormick	7/28/2020	Webinar	City of Gilroy
Michael Liw	7/28/2020	Webinar	City of Santa Clara
Amer Iqbal, Alejandra Garibay & Matt Thomas	7/29/2020	Webinar	Los Banos Unified School District
Alvaro Mesa & Guillermo Ramos	7/29/2020	Webinar	Gilroy Unified School District
Hermelinda Sapien & Rosa Maritza Ontiveros	7/30/2020	Webinar	Center for Employment Training (CET)
Yves Zsutty, Brian Stanke, Stacey Lu & Tala Fatolahzadeh	7/30/2020	Webinar	City of San Jose & San Jose Department of Parks & Recreation
David Lovato, Jason Kim & John Sighamony	7/30/2020	Webinar	Santa Clara VTA
Beatriz Ramos & Michelle Covert	7/31/2020	Webinar	Homeless Service Providers
Ben Spielberg & Brian Stanke	7/31/2020	Webinar	San Jose Unified School District

The following issues were identified by participants in these environmental justice community enhancements engagements:

- **Safety**
  - Concern regarding potential hazards of at-grade intersections.

- **Noise & Vibration**
  - Concern regarding noise impacts of train operation.

- **Environmental Enhancements**
  - Concern regarding funding, particularly the possibility of a delay in the distribution of funds leading to a misalignment with stakeholder needs at that time.
  - Optimism about the benefits of enhancement projects on the broader community (e.g., increased access to technology and recreational space as well as improved safety).
  - Uncertainty about prioritizing feedback and defining roles, particularly for multi-agency projects.
  - Recommendations to edit sections of the enhancement profiles provided by the Authority (clarify, update and/or correct important terms, needs and requests).

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SAN JOSE TO MERCED PROJECT SECTION
ENVIRONMENTAL JUSTICE OUTREACH SUMMARY
November 1, 2020 – April 30, 2021

Overview

The following report summarizes environmental justice[i] outreach activities conducted for the California High-Speed Rail Authority (Authority) San Jose to Merced Project Section between November 1, 2020 and April 30, 2021. These activities are consistent with the overall approach and specific strategies outlined in the San Jose to Merced Environmental Justice Outreach Plan and the High-Speed Rail Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines, Version 5 (or, EMGv5).

In keeping with the San Jose to Merced Environmental Justice Outreach Plan, the activities in this report are organized into the following outreach categories:

- Public meetings
- Stakeholder group meetings
- Local stakeholder contact

I. Public Meetings

During the reporting period, there were no Authority-hosted public meetings in the San Jose to Merced Project Section.

II. Group Stakeholder Meetings

While the Authority convened several Community Working Groups (CWGs) along the San Jose to Merced Project Section during this time period, these meetings were not focused on environmental justice topics, and they did not target environmental justice communities.

III. Local Stakeholder Contact

During the reporting period, the San Jose to Merced Project Section's outreach consultant participated in 1 outreach event and led no stakeholder/service provider interviews.

Outreach Events

Meeting	Date	Location	# of Attendees	Resource Partners/ Advocacy Groups
Independence High School/Engineering Academy meeting	3/25/2021	Webinar	30	N/A

Participants in the above outreach event were given the opportunity to ask questions about California High-Speed Rail but did not raise any concerns about the project.

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APPENDIX 5-B, ATTACHMENT D: ENVIRONMENTAL JUSTICE OUTREACH, SEPTEMBER 2021

ENVIRONMENTAL JUSTICE OUTREACH, SEPTEMBER 2021

Overview

In September 2021, the California High-Speed Rail Authority (Authority) conducted a total of 26 virtual meetings (Figure 1) with Implementing Partners, Community Organizations, and Interested Parties and Other Stakeholders in eight communities within the San Jose to Merced Project Section, including Santa Clara/North San Jose, San Jose Diridon, Gardner/North Willow Glen, Guadalupe/Washington/Tamien/Alma/Almaden, South San Jose, Morgan Hill, Gilroy, and San Joaquin Valley, where the San Jose to Merced Project Section Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) analysis had indicated that low-income populations and minority populations may be subject to disproportionately high and adverse effects (DHAE) from the project alternatives. A schedule of these meetings is provided in Attachment D1, Schedule of September 2021 Meetings. Generally, the objectives of these meetings were to:

- Explain the updated environmental justice analysis for the San Jose to Merced Project Section EIR/EIS, including updated and new mitigations, consideration of benefits, and potential community improvements
- Share preliminary conclusions related to the updated environmental justice analysis
- Gain feedback on the updated environmental justice analysis, preliminary conclusions, and potential community improvements.

Stakeholders Engaged

The Authority classified stakeholders engaged into three general categories: (1) Implementing Partners, (2) Community Stakeholders, and (3) Interested Parties and Other Stakeholders, based on the level of anticipated feedback and role in implementing the potential community improvements, described by community as follows:

- *Implementing Partners*: The Authority met one-on-one and in small groups with eight entities (below) able to partner with the Authority on specific potential community improvement implementation. Feedback from Partners was anticipated to be focused on updated potential community improvements.
    1. City of Santa Clara
    2. City of San Jose
    3. San Jose Unified School District
    4. City of Morgan Hill
    5. Morgan Hill Unified School District
    6. City of Gilroy
    7. Gilroy Unified School District
    8. Los Banos Unified School District
- *Community Stakeholders*: The Authority scheduled eight virtual community forums to meet with community members, groups, and representatives (below) experiencing project DHAEs and who had interest in how mitigation, benefits, and improvements are applied based on updated environmental justice analysis and conclusions. Implementing Partners (above), organizations representing multiple communities, and Interested Parties and Other Stakeholders (below) were invited to their respective community meeting(s). All meetings were conducted with either Spanish and/or Vietnamese interpretation and closed captioning accommodations. Feedback from community stakeholders was focused on the list of potential community improvements. The following groups were invited to the community forums; only some of the invitees attended. As compared to Phase One, when all community groups listed below actively participated in meetings and provided feedback, only a few of those groups attended meetings in Phase Three.

Santa Clara/North San Jose

1. Santa Clara Unified School District
2. Charities Housing/HomeSafe
3. Council on American Islamic Relations (CAIR)
4. Muslim Community Association (MCA)
5. Next Door Solutions
6. South Bay Islamic Association (SBIA)

San Jose Diridon

7. Delmas Park Neighborhood Association
8. Minority Business Consortium
9. PATH
10. Silicon Valley De-Bug
11. SIREN

Gardner

12. San Jose Word of Faith Christian Center
13. Gardner Elementary School
14. Gardner Neighborhood Association
15. GoKids
16. Danny Garza, Community Leader

Guadalupe Washington

17. Guadalupe Washington Neighborhood Association
18. Guadalupe Washington Neighborhood Safety Coalition
19. Washington Elementary School
20. Sacred Heart Nativity Middle School and Parish
21. Brett Bymaster, Community Leader
22. Madre a Madre
23. Biblioteca Latinoamericana

South San Jose

24. East Side Union High School District
25. Franklin McKinley School District
26. Better Tomorrow, San Jose
27. Edenvale Library
28. ECOPIC Neighborhood Action Coalition
29. Family & Children Services of Santa Clara County
30. PARS Equality Center
31. Roundtable Neighborhood Association
32. Vietnamese American Roundtable
33. Vietnamese Voluntary Organization

Morgan Hill

34. Coordinated Advocacy & Resources for Education (CARE)
35. Morgan Hill Unified School District Community
36. Voices Charter School

Gilroy

37. CARAS South County
38. Gilroy Prep School (elementary)
39. South Valley Middle School
40. Gilroy High School
41. Alexander Station

San Joaquin Valley

42. Los Banos Community Center
43. Volta Elementary School

Cross Community

44. HomeFirst
45. Silicon Valley Rising
46. Refugee and Immigrant Forum

- *Interested Parties and Other Stakeholders*: The Authority met one-on-one and in small groups with entities (below) who have direct or representative interest in potential community improvements or other improvements considered but not necessarily a partnership role. Similar to Partners, feedback from these entities was anticipated to be focused on updated potential community improvements, also considering their feedback in Phase Two on the list of other improvements considered.

San Jose Diridon

1. African American Community Services Agency (AACSA)

Guadalupe Washington

2. Rocketship Elementary School – Mateo Sheedy

South San Jose

3. Oak Grove School District

Gilroy

4. Rebekah Children's Services

Cross Community

5. Center for Employment Training (CET)
6. Gavilan College
7. Mission College
8. San Jose City College
9. Santa Clara County Office of Supportive Housing
10. Santa Clara County, Parks and Recreation
11. Santa Clara Valley Transportation Authority (VTA)
12. Congressmember Zoe Lofgren, 19th District
13. Councilmember Raul Peralez, District 6

Communication, Outreach Materials, and Presentation

In mid-summer 2021, the Authority initiated Phase Three with several rounds of email communications to environmental justice stakeholders (described above) regarding the September 2021 outreach effort. These communications included save-the-date flyers, accommodations surveys, and proposed content to be presented. On September 3, 2021, all environmental justice stakeholders received a comprehensive packet of materials related to the updated environmental justice analysis specific to their community via a unique website link, including information illustrated in Figure 1 (see Attachment D2, Copy of Outreach Materials Distributed, for a copy of the materials). The Authority requested stakeholders review the materials and provide feedback via electronic survey, letter, or other written form by October 1, 2021. All materials were translated into Spanish and/or Vietnamese and were ADA compliant.

- *Community Survey*. This survey contains a series of questions about stakeholder views on project effects, direct mitigation, project benefits, the offsetting value of project benefits and community improvement impacts, and preliminary conclusions of the updated environmental justice analysis.
- *Environmental Justice Analysis Process Summary.* This summary included a glossary of key terms and an environmental justice process graphic and description.
- *Summary of Updates to the EIR/EIS Environmental Justice Analysis*. This summary included information about the environmental justice analysis, mitigation, project benefits, and potential community improvements. The list of community improvements included potential improvements identified by the Authority to advance and other improvements the Authority had considered prior to the updated analysis.
- *Environmental Justice Community Summary*. This summary included a summary of project effects on environmental justice populations, evaluation of project benefits and potential community improvements, preliminary conclusions, and a community study area visual.
- *Meeting Agenda and Presentation.* The Authority presented on the following topics at each meeting, with the goal of providing detailed explanation and clarification on the outreach materials provided:
    - Environmental Justice Requirements
    - Environmental Justice Analysis Process
    - Updated Environmental Justice Analysis
    - Community Effects Review
    - Community Survey
    - Next Steps

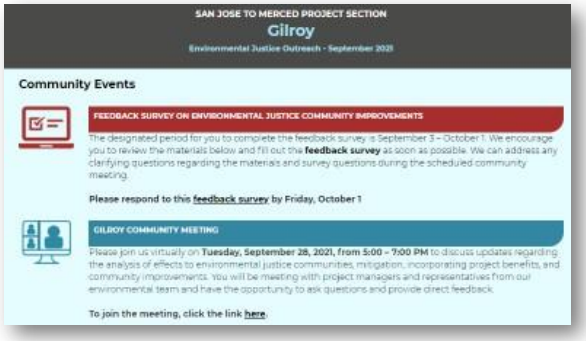
  A PowerPoint presentation for each meeting was uploaded to the respective community website after each meeting.

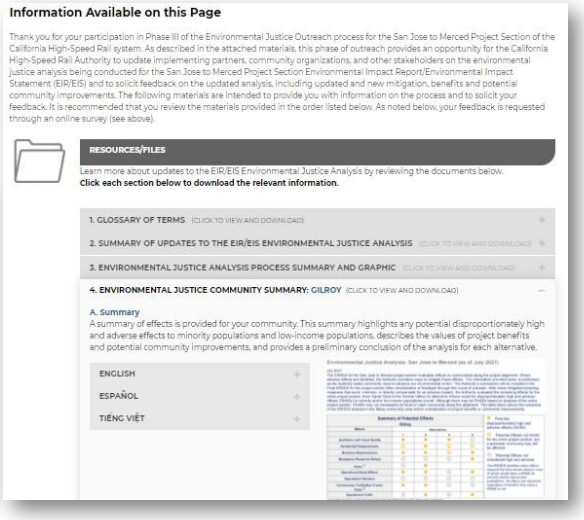
Figure 1

HOW TO PROVIDE FEEDBACK

MEET HSR NORCAL WEBSITE

- Using the link: https://www.meethsrnorcal.com/jm environmental-justice-gilroy-2021-85823529172.html
- Entering this password: HSR_EJ2021





Community Feedback Results and Documentation

The Authority catalogued all feedback that environmental justice stakeholders provided during the meetings, through the community survey, and by other written means. A synthesis of Phase Three feedback follows.

Feedback Results. Phase Three outreach activities concluded in late September 2021, and on October 1, 2021, the Authority received feedback responses as follows:

- Three comment letters from the City of San Jose, the City of Morgan Hill, and Gilroy Unified School District (see Attachment D3, Comments Submitted During September 2021 Outreach Period).
- 24 feedback responses via the electronic survey (raw data and synthesized details are provided in Attachment D4, Survey Results and Survey Forms Submitted):
    - 19 from representatives/agencies
    - 5 from individuals

The following is a high-level summary of key themes from the community feedback.

- *Impacts of concern.*
    - Impacts of concern were rated on a 5-point scale (not concerned, slightly concerned, somewhat concerned, moderately concerned, very concerned).
    - Project impacts were on average identified in the survey as being moderately concerning (construction and operational traffic, bus transit delay, residential displacements, emergency vehicle response delays, operational noise), and a few project impacts were on average identified as being somewhat concerning (visual aesthetics, commercial displacements, and partial acquisition of park/play areas).
        - The highest rated impact of concern was traffic delay during construction.

        - The lowest rated impact of concern was visual aesthetics (which was still 3.1 on a 5-point scale).

- *Value of project benefits.*
    - Benefits were rated on a 5-point scale (not beneficial, slightly beneficial, somewhat beneficial, moderately beneficial, very beneficial).
    - On average, project benefits were seen as moderately beneficial for most highlighted benefits in the survey (train travel; access to jobs, goods, and services; integration with transit; reduction of highway traffic; upgrades to railroad safety and signaling systems; reduced air pollution and greenhouse gas emissions; construction and operational spending and employment; and support for transit-oriented development near stations), with one benefit (reduced need for airport and highway expansion) rated as somewhat beneficial.
        - The highest rated benefits were reduced air pollution and greenhouse gas emissions.
        - The lowest rated benefit was the reduced need for airport and highway expansion (which was still 3.2 on a 5-point scale).
- *Concurrence with environmental justice conclusions regarding DHAEs that were presented.*
    - After application of mitigation only, slightly more respondents agreed than disagreed, but half neither agreed nor disagreed, with the preliminary conclusions concerning DHAEs presented in the updated EIR/EIS analysis. One respondent elaborated on their position:
        - The Gilroy Unified School District stated that the safety risks at crossings due to the high speed of the train remain disproportionately high and adverse for students and elderly community members even after application of the quad gates, other project safety measures, and site-specific traffic mitigation measures. The district supported the site-specific traffic mitigation measures in and of themselves, though they did not fully address the safety issues for the schools without the potential pedestrian/bike overcrossing at IOOF Avenue.
    - After application of mitigation, benefits, and community improvements, more respondents agreed than disagreed with the preliminary conclusions concerning DHAEs presented in the updated EIR/EIS analysis, but many neither agreed nor disagreed or skipped the question. Several respondents elaborated on their positions:
        - The City of Morgan Hill stated that Alternative 4 will have safety impacts on emergency vehicle response times caused by traffic delay or road closures, that the noise treatments for residences along U.S. Highway (US) 101 would not help offset noise effects along the downtown alignment of Alternative 4, and that the proposed community benefits are not addressing the main concerns the community has.
        - The City of San Jose concurred with the community noise improvements for the four communities in San Jose and requested the Authority work with existing community organizations to do outreach to the most disadvantaged residents to assist them in applying for and receiving noise insulation improvements.
        - The City of San Jose stated that they think the DHAEs related to noise, traffic, and emergency vehicle response delays did not fully address cumulative effects, which they opined could only be adequately addressed through grade separations at the five at-grade crossings in San Jose.
- *Concurrence on traffic impacts addressed by traffic mitigation.*

- After application of site-specific traffic mitigation only, approximately half of the respondents disagreed, a few agreed, and the rest neither agreed nor disagreed with the impact conclusions presented in the updated EIR/EIS analysis.
    - The City of Morgan Hill specifically questioned why no community improvements were proposed for traffic and disagreed that traffic effects would be offset by project transportation benefits.
    - Morgan Hill Unified School District said that the addition of high-speed rail (HSR) trains will increase school bus travel times.
    - The City of Gilroy noted that additional trains will create a significant amount of gate-down time.

- *Agreement with the potential list of community improvements or other improvements proposed.*
    - Twelve respondents proposed different community improvements than the ones on the potential lists. One respondent elaborated on the reason they disagreed with the potential improvement and why their proposed improvement would best serve their community's interest:
        - Oak Grove School District in San Jose asserted that an improvement to their recreational facilities, an important community hub, would be of greater and longer-term benefit to the school community and the public in that area than the proposed noise treatments at individual residences.
    - A summary of the alternative community improvements proposed by community members or agencies and why they were suggested is provided in Table 1.

- *Consistent comments in specific geographic areas.*
    - In San Jose, Morgan Hill, and Gilroy, noise, traffic, and emergency response effects were most commonly the focus of concern for comments expressing opinions that more should be done than is currently being proposed.
    - In Washington/Guadalupe, there was a consistent concern about the project's effect on homeless encampments (Tamien/State Route 87). More specifically, concerns were expressed by Sacred Heart, the Office of Supportive Housing, and in the community meeting, and support was expressed for the Authority partnering with service agencies in regard to potential displacement.

- *Other general comments on implementation of community improvements.*
    - One community organization urged the Authority to think about who is getting hurt the most when projects like this take place. This same organization urged the Authority to consider actionable/sustainable improvements that can be made to show that the Authority understands and listens to what the community actually wants.
    - The City of Gilroy stated they would like to see some of these improvements implemented sooner, prior to construction of the HSR facilities.

- *Feedback on the Authority's outreach/engagement process.*
    - Most respondents thought the survey was a helpful tool in providing feedback for the September 2021 outreach.
    - Some respondents expressed appreciation for the uthority's efforts in reaching out concerning the environmental analysis and community improvements.
    - The City of Santa Clara expressed concern that the methodology for considering community improvements appeared to have changed since mid-2020 and that many of the City's suggestions appeared to not be proposed now due to cost concerns, which may mean the City's prior efforts in developing information about potential community improvements was disregarded.

Documentation. The Authority produced an After-Action Report for the 26 meetings conducted in Phase Three, documenting the date and time of each meeting, participants, key points of concern, any preliminary feedback to directed questions, a description of questions and responses, and any next steps and follow-up actions. Copies of the After-Action Reports are included in Attachment D5, After-Action Reports for September 2021 Meetings.

Table 1 Community Improvements Suggested During September 2021 Outreach

Respondent Name	Community	Improvement Description	Reasons Proposed	Reasons Cited As Better Addressing Concerns in the Community
Center for Employment Training (CET)	Multiple	The Authority should partner with local nonprofits and community-serving agencies in filling the construction and operations jobs that this project will create.	This would support the economic development of the local community and increase support for the project.	N/A
Santa Clara County Office of Supportive Housing Sacred Heart Washington/Guadalupe Community Meeting (previous input from other community service organizations)	Multiple (but especially San Jose in Washington, Guadalupe, Tamien, and South San Jose)	Provide flexible financial assistance for people experiencing homelessness to assist with their relocation.	People experiencing homelessness will be displaced by the proposed project, especially at areas with high concentration of homeless encampments along SR 87 (adjacent to Gardner/North Willow Glen, Washington, Guadalupe) and in South San Jose but also likely elsewhere.	Santa Clara County has a housing crisis, which is a priority issue for the County to address.
City of Santa Clara	Santa Clara	Multimodal improvements such as suggested by the City of Santa Clara DPW and listed as "Other Improvements Considered": El Camino and Benton Street Safety Improvements; El Camino Real Class IV Bikeway; Pedestrian safety improvements (included sidewalk gap closure and pothole repair), Streetscape Improvements, Newhall Street Bicycle/Pedestrian Crossing.	These improvements will improve quality of life for residents and stakeholders in the affected area.	The local improvements would help community residents more readily and safely access Caltrain and HSR in the future, and current congestion levels prevent them doing this more readily.

Respondent Name	Community	Improvement Description	Reasons Proposed	Reasons Cited As Better Addressing Concerns in the Community
African American Community Services Association (AACSA)	San Jose Diridon	Reestablish the Inez Jackson Library at the AACSA community center in San Jose.	When significant changes are made to communities, underserved populations are hit the hardest and are the slowest to recover. Many will be affected throughout the high-speed rail development process, so improving the Inez Jackson Library at the very least will show we care and understand the needs of our community. The library could provide a "quiet space" for community members to help offset noise effects from existing noise and from the train.	Reestablishment of the Inez Jackson Library is necessary because it serves our at-risk populations. I just want to stress again the importance of reestablishing the Inez Jackson Library. Many youth programs have operated out of that location, and it plays a significant role in their development and gives parents a hub to bring their children.
City San Jose	San Jose Diridon, Washington/Guadalupe, South San Jose	The Authority should negotiate an agreement with Caltrain to not sound horns at the Diridon, Tamien, Capitol, and Blossom Hill Caltrain Stations.	Reducing noise effects	N/A
City San Jose	San Jose Diridon	Grade separation at Auzerais separately or through DISC. The Authority should commit to participate in and proportionally fund DISC.	Reduce noise, traffic, and safety (including emergency vehicle response) effects on community.	Grade separation would remove noise effects associated with increased at-grade horn sounding at Auzerais.
City San Jose	Gardner/North Willow Glen	Grade separation at West Virginia separately or through DISC. The Authority should commit to participate in and proportionally fund DISC.	Reduce noise, traffic, and safety (including emergency vehicle response) effects on community.	Grade separation would remove noise effects associated with increased at-grade horn sounding at West Virginia.
City San Jose	Gardner/North Willow Glen	Fuller Park/Fuller Avenue recreational amenities	Would offset community concerns, build trust, and alignment with commitments from the City to ensure that visual conditions are no worse, and ideally are better than today, even with train volume increase. Community highly concerned with Fuller Park and does not agree to EIR/EIS analysis of effects on Fuller Park.	N/A

Respondent Name	Community	Improvement Description	Reasons Proposed	Reasons Cited As Better Addressing Concerns in the Community
City San Jose	Gardner/North Willow Glen	The Authority should coordinate Gardner Elementary School noise improvements with VTA's sound wall project nearby.	Help offset noise effects on community.	N/A
Rocketship	Washington, Guadalupe, Tamien, Alma, Almaden	Improvements at/adjacent to Rocketship Matteo Sheedy School: 1. New playground or playground enhancements. 2. Building repairs such as new roof or repairs in order to provide a proper space for the students and community. 3. New PA system. 4. Building and community aesthetics (e.g., trees, new grass, or turf). 5. Pedestrian and traffic safety remedies, such as “STOP AHEAD” painted on Virginia before the stop sign, more School Zone signs, speed bump, etc.	1. Provide community with better experience during and after school hours. 2. Mitigate some of the noise problems that will arise during construction and after with the increase of traffic. 3. Improve community aesthetics.	N/A
Individual	Washington, Guadalupe, Tamien, Alma, Almaden	Fund murals by local artists for any project noise walls or structures with paintable surfaces.	To reduce vandalism and potential violence due to gang graffiti. Guadalupe Washington is a gang hot spot in San Jose, classified as such by the City government. Any blank walls (without murals) will get vandalized. Please consider paying for wall art by LOCAL muralists. I emphasize local because the mural also needs to be respected by the residents and gangs, so it doesn't get vandalized.	N/A
City of San Jose	South San Jose	Grade separations at Skyway, Branham, Chynoweth.	Reduce noise, traffic, safety (including emergency vehicle response), and quality of life effects on community.	Pedestrian/bike overcrossings help to address pedestrian/bike safety but do not address traffic delays, horn sounding, or emergency vehicle delays due to increased gate-down times.

Respondent Name	Community	Improvement Description	Reasons Proposed	Reasons Cited As Better Addressing Concerns in the Community
City of San Jose	South San Jose	Allow for funding of pedestrian/bike overcrossings at Skyway, Branham, Chynoweth to be used for grade separation projects.	Reduce noise, traffic, safety (including emergency vehicle response), and quality of life effects on community.	Pedestrian/bike overcrossings help to address pedestrian/bike safety but do not address traffic delays, horn sounding, or emergency vehicle delays due to increased gate-down times.
Oak Grove School District	South San Jose	Caroline Davis Intermediate School all weather turf and track.	Caroline Davis Intermediate School provides green open space for the community in the area and not just students. School serves the entire South San Jose environmental justice community area assessed by the Authority. Extensive gathering space before and during COVID-19 emergency shows importance of space to community.	The new track would allow free public access to a community exercise venue and gathering space, which increases community cohesion and connection. Nearly all residences with intermediate age children have them attend Caroline Davis, so the improvement touches most residents through students as well as through community use of the space. Creates sense of community. While Authority method of doing "like for like" is logical, the Authority should consider improvements more broadly from the perspective of value to the community overall.
City of Morgan Hill	Morgan Hill	The Authority should fund a 30% design for grade separations at Tilton Avenue, East Dunne Avenue, and Tennant Avenue.	Impacts on public safety, emergency vehicle response times, circulation impacts, and quality of life.	Circulation and safety are the primary concerns in the community. Grade separations would alleviate this concern.
City of Morgan Hill	Morgan Hill	The Authority should fund a 30% design for a master plan of the pedestrian underpass and train station.	Impacts on public safety, circulation impacts, and access.	N/A
City of Morgan Hill	Morgan Hill	Install "purple pipe" for recycled water along Tennant Ave.	To support water conservation.	N/A

Respondent Name	Community	Improvement Description	Reasons Proposed	Reasons Cited As Better Addressing Concerns in the Community
City of Morgan Hill	Morgan Hill	Install telecommunication conduits to provide internet access to those within the environmental justice community along Tennant Ave.	To provide internet access to environmental justice community.	N/A
Morgan Hill Unified School District	Morgan Hill	School bus route study in Morgan Hill.	Identify the impacts and suggest routing alternatives/bus crossings to minimize the impact on student transit times.	Mitigate the potential negative impact to school bus transit as a result of Alternatives 1–4.
Gilroy Unified School District	Gilroy	The Authority should select Alternative 4 but should fund ALL potential community improvements for Gilroy.	To mitigate impacts of Alternative 4 on the disadvantaged communities.	N/A
Rebekah Children's Services	Gilroy	New secure gate and fence at the RCS facility in Gilroy.	Would improve facility safety since safety is one of the residual effects of Alternative 4 in Gilroy.	N/A

AACSA = African American Community Services Agency
Authority = California High-Speed Rail Authority
DISC = Diridon Station Integrated Concept
DPW = Department of Public Works
HSR = high-speed rail
N/A = not applicable
PA = public address
RCS = Rebekah Children's Services
SR = State Route
VTA = (Santa Clara) Valley Transportation Authority

APPENDIX 5-B, ATTACHMENT D-1: SCHEDULE OF SEPTEMBER 2021 MEETINGS

California High-Speed Rail
Environmental Justice Phase 3 Outreach Meetings
September 2021

Kanban

Monday | 4	Tuesday | 6	Wednesday | 7	Thursday | 6	Friday | 3
Week 1 | 5 **6 - Labor Day**	**7** IMP: Morgan Hill (City)	**8** IMP: Los Banos USD IMP: Gilroy USD	**9** IMP: San Jose (City)	**10** IMP: Gilroy (City)
Week 2 | 10 **13** ITP: Rocketship Schools OTS: African American Community Services Agency CMT: Guadalupe Washington	**14** IMP: Santa Clara (City) CMT: Gardner	**15** ITP: SCC Agencies CMT: Santa Clara	**16** IMP: San Jose USD ITP: Gavilan College	**17** ITP: Franklin-McKinley SD
Week 3 | 8 **20** CMT: San Jose Diridon	**21** CMT: Morgan Hill	**22** IMP: SCC Office of Supportive Housing/Homeless Services CMT: Los Banos	**23** IMP: Sacred Heart ITP: Oak Grove SD CMT: South San Jose	**24** ITP: Rebekah Children's Services
Week 4 | 3 **27**	**28** OTS: CET Workforce Development CMT: Gilroy	**29** OTS: Morgan Hill Unified	**30**	**End of Comment Period 10/1**

Key:
IMP: Implementing Partner Meetings
ITP: Interested Parties Meetings
OTS: Other Stakeholder Meetings
CMT: Community Meetings

APPENDIX 5-B, ATTACHMENT D-2: COPY OF OUTREACH MATERIALS DISTRIBUTED

Updated Environmental Justice Analysis for the Final EIR/EIS: San Jose to Merced Project Section

(September 2021)

Summary of Environmental Justice Requirements

The California High-Speed Rail Authority (Authority), has prepared an environmental justice analysis pursuant to requirements of state and federal law. Under federal law, agencies must analyze whether actions would result in disproportionately high and adverse effects to minority and low-income populations, identify feasible ways to avoid or reduce those effects, engage with affected communities and disclose the analysis and findings in the National Environmental Policy Act (NEPA) documentation. The Authority continues to consider how the project will affect communities and as part of the ongoing outreach the Authority is considering potential updates to the analysis as noted below.

Updates to Analysis

In consideration of comments on the Draft EIR/EIS, review of the environmental justice analysis, and guidance, the Authority has made the following updates to the analysis:

- The **methodology** section was clarified to match the definition of disproportionately high and adverse effects in the most recent US Department of Transportation guidance. Clarifications did not substantially change the overall conclusions.
- The **summary of environmental justice engagement** is being updated to include additional outreach and engagement since circulation of the Draft EIR/EIS.
- The **Assessment of Effects** is being updated to reflect the following:
  - Full consideration of project benefits.
  - Additional or updated mitigation measures for traffic, construction bus transit delay, emergency vehicle response, residential displacements and noise.
  - Refined analysis of traffic, construction bus transit delay, emergency vehicle response, displacements, noise and vibration.
- **Community Improvements**. The Authority has been evaluating community improvements in collaboration with affected communities since late 2019. The Authority is now considering implementation of certain potential community improvements where they would offset residual disproportionately high and adverse effects after consideration of mitigation and project benefits.
- **Preliminary Conclusions**. The conclusions are now being refined considering the updated analysis, new and updated direct mitigation, project benefits, potential community improvements, and the views and concerns of affected minority and low-income populations along the project corridor.

Next Steps

The Authority is currently seeking public input. Please submit any feedback by October 1, 2021 (see cover letter for details as to where to submit feedback). The Authority will consider input from affected communities during outreach in September 2021 and will incorporate such feedback into the Final EIR/EIS, as appropriate.

California High Speed Rail Project
San Jose to Merced Project Section
Environmental Justice Analysis Process

The Authority has engaged with environmental justice communities along the San Jose to Merced Project Section for many years, conducted analysis of potential effects to these communities, and developed potential mitigation and community improvements considering community input throughout:

Initial EJ Outreach (2016-2019): Extensive outreach throughout the EIR/EIS development process included targeted outreach to potentially affected minority populations and low-income populations. Initial environmental justice outreach activities included presentations at public and stakeholder group meetings, interviews with local stakeholders, informational tabling at various types of community events, and online community webinars, through which feedback was obtained from environmental justice organizations, community leaders, and community members during community events. The purpose of these outreach efforts was to provide opportunities for meaningful participation and input into the project design, identification of disproportionately high and adverse effects, and development of mitigations.

Draft EIR/EIS EJ Analysis (2017-2020): Chapter 5, *Environmental Justice*, of the EIR/EIS contains the analysis of the project's effects on minority populations and low-income populations. The chapter describes the existing conditions related to the environmental justice communities in the project study area; summarizes the environmental justice engagement and key issues and concerns; analyzes the potential effects of the project alternatives on environmental justice communities; and identifies whether the project alternatives would have a disproportionately high and adverse effect. The analysis considered the application of mitigation and generally considered project benefits that could reduce disproportionately high and adverse project effects. The Draft EIR/EIS was published for public review and comment in April 2020.

Community Improvements Outreach Phase I (December 2019-March 2020): Community Improvements Outreach Phase I consisted of stakeholder interviews, community meetings, and focus groups with a total of 44 meetings. Presentations were to a multitude of local minority and low-income community organizations, including community-based service providers, school leaders, community groups, neighborhood associations, churches and other faith-based organizations, and community leaders and representatives, along with public agency representatives and elected officials representing relevant areas. During this engagement, the Authority solicited input for potential improvement concepts to be considered and identified potential partner agencies or entities that would be involved with implementing each improvement concept. Potential implementing partners include jurisdictions, agencies (e.g., school districts), and other organizations who would be the entities that would work with the Authority to implement specific improvements.

Development and Evaluation of Community Improvement Concepts (February-June 2020): The list of potential improvements developed by the Authority based on identified past plans and projects was expanded during Outreach Phase I to include the improvements suggested by cities, agencies, community organizations, and community representatives. This expanded list was then subject to another round of screening to determine which improvements would be developed and considered in greater detail. The improvements carried forward were refined based on input from potential partners and community stakeholders to ensure that they would meet community needs and priorities. The improvements were then evaluated based on the set of established evaluation criteria such as feasibility and relative benefit to minority populations and low-income populations.

Public Review of the Draft EIR/EIS (April-June 2020): The Draft EIR/EIS was distributed to agencies, stakeholders, organizations, and the public for their review and comment. The Draft EIR/EIS includes the analysis of environmental justice in Chapter 5 of the document. Numerous agencies, stakeholders, organizations, and individuals submitted comments on the project's alternatives, potential effects, the environmental justice analysis, and proposed mitigations.

Community Improvements Outreach Phase II (July-August 2020): After development and evaluation of the improvement concepts collected and refined during Outreach Phase I, the Authority undertook a second phase of outreach to gather feedback from potential implementing partners. The Authority shared the evaluation of the improvements that were advanced for detailed evaluation with potential implementing partners through a series of 12 meetings as well as follow up email and phone communications. The potential partners provided input on the improvements that were a priority for them, the methodology being used for the evaluation, the description of the improvements, and in some cases new concepts for improvements.

Refinements of Potential Community Improvements (October 2020-July 2021): Following public review of the Draft EIR/EIS, the Authority considered comments provided from local community members, organizations, and agencies. The Authority developed a potential list of community improvements it is considering implementing based on the list of community improvements that would offset residual disproportionately high and adverse effects of the project alternatives.

Outreach Phase III (September 2021): During this (**current**) phase of outreach, the Authority is presenting our latest assessment of impacts and project benefits that environmental justice communities could experience as a result of the project and the community improvements the Authority is considering implementing to address these impacts. Meetings are being held with implementing partners, community organizations, stakeholders, and representatives of local communities with the goal of obtaining feedback on our impact assessment, evaluation of project benefits, and the community improvements under consideration. Meetings are being held with agency partners and community stakeholders in each of the affected communities. The feedback gathered during this phase will be evaluated and incorporated into the Authority's Final EIR/EIS, as appropriate. **Feedback for this phase is being requested by no later than October 1, 2021.**

Final EIR/EIS (October 2021-February 2022): After Outreach Phase III, the EIR/EIS will be revised, as appropriate, to reflect the feedback gathered from implementing partners, community organizations, and stakeholders regarding the project effects, project benefits, potential community improvements, and the preliminary conclusions. The Final EIR/EIS will include the Authority's environmental justice analysis, findings, and conclusions for Board consideration in deciding whether to approve this project section.

2016 – 2019
Initial EJ Outreach

Draft EIR/EIS EJ Analysis
2017 – 2019

Initial Development of Community Improvements Concepts
Nov 2019

Dec 2019 – March 2020
Outreach Phase 1: Input on Concepts

Development and Evaluation of Concepts
Feb – June 2020

Draft EIR/EIS Public Review
Apr – June 2020

Jul - Aug 2020
Outreach Phase 2: Concept Refinement

Updated EJ Impact Assessment and Identification of Potential Community Improvements
Oct 2020 - Jul 2021

Sep 2021
Outreach Phase 3: Updated EJ Impact Assessment and Potential Community Improvements

Final EIR/EIS Preparation
Oct 2021 – Feb 2022

California High Speed Rail
San Jose to Merced Project Section
Environmental Justice Outreach (September 2021)
GLOSSARY OF KEY TERMS

- **Disproportionately High and Adverse Effects** = The focus of the environmental justice analysis is to determine whether the project would result in high and adverse effects that disproportionately affect minority populations or low-income populations.
- **Direct Mitigation** = Measures in the EIR/EIS that directly avoids, minimizes, reduces, or compensates for identified adverse effects.
- **Project Benefits** = As explained in the EIR/EIS, the high-speed rail project would result in a number of benefits including the following: quick and efficient travel in California; access to jobs, goods, and services; integration with local transit connections and services; reduction of highway traffic; upgrades to railroad safety and signaling systems; reduced need for airport and highway expansion; reduced air pollution; reduced greenhouse gas emissions; construction Spending and employment; operational spending and employment; and support for transit-oriented development near stations.
- **Community Improvements** = Any upgrading of an existing community facility, structure, function or action, or addition of a facility, structure, function, or action that is made solely for the benefit of the local community, including an increase in the capacity, capability, efficiency, duration, function, or action over existing conditions. Community improvements do not include the following: proposed elements of the high-speed rail project; feasible direct mitigation to address significant adverse environmental effects as defined in the project EIR/EIS; improvements mandated by existing local, state, or federal mandates; or improvements fully funded by dedicated existing funding sources. At present, the Authority is only considering community improvements that have a close relationship between a disproportionately high and adverse effect and the benefits of the community improvement. For example, a community improvement that promotes community safety would have a close relation to residual safety effects.
- **HSR** = high-speed rail
- **CHSRA or Authority** = California High Speed Rail Authority
- **NEPA =** National Environmental Policy Act, which requires federal agencies to analyze the environmental effects of their actions, including effects on minority populations and low-income populations, consider ways to reduce adverse effects, disclose their findings in environmental documents, and provide opportunities for the public to provide input on the agency evaluation.
- **CEQA = California Environmental Quality Act**, which requires state agencies to analyze the environmental effects of their actions, identify feasible mitigation to address significant impacts, disclose their findings in environmental documents, and provide opportunities for the public to provide input on the agency evaluation.
- **Environmental Impact Report/Environmental Impact Statement (EIR/EIS)** = A report disclosing the environmental impacts of the high-speed rail project, prepared in accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

California High Speed Rail
San Jose to Merced Project Section
Gardner/Willow Glen Community Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
GWG-IMP#1: Gardner Elementary Noise Insulation or Soundwalls	School noise improvements offsets noise DHAE in Gardner/Willow Glen area	Improvement to educational environment	4
GWG-IMP#2: Noise Insulation for certain Residential Buildings adjacent to the west side of SR 87 (between W. Virginia St. and Brown St.)/adjacent to the south side of I-280 (between Spencer Ave. and Los Gatos Creek) to Address Existing Noise	Community noise improvements offsets noise DHAE in Gardner/Willow Glen area	Noise abatement, improved livability, health benefits	4

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
Fuller Park/Fuller Avenue Recreational Amenities	Recreation, community cohesion, livability	1
Biebrach Park Improvements	Recreation, health, livability	2
West Virginia Railroad Crossing Warning Lights	Safety, community cohesion	3
Delmas Avenue Streetscape and Crossings	Safety, visual quality, livability, community cohesion	4
Bird Avenue North-South improvements	Safety, connectivity, transportation	5
West Virginia Streetscape and Pedestrian Crossings	Safety, visual quality, livability, community cohesion	6
Neighborhood Lighting	Visual quality, safety	7
Three Creeks Trail Extension Crossing of SR 87/Caltrain/HSR	Recreation, safety, connectivity, health, livability	8
National Night Out Contribution	Safety, community cohesion	9
West Virginia Ave Pedestrian/Bicycle Crossing	Safety, livability, community cohesion, connectivity, health, recreation	10
Community Art	Visual quality, community connection/identity	11
Guadalupe River Trail Pedestrian Crossing at Willow Street	Recreation, safety, connectivity, health	12
Guadalupe River Trail Extension (Virginia to Curtner)	Health, livability, health, connectivity, community cohesion	13
Biebrach Park Connection to Fuller Park	Safety, community cohesion, connectivity, health, recreation	14
West Virginia Pocket Park at Prevost South of West Virginia Street	Health, recreation, livability	14
Jerome/Illinois to Bird Avenue Pedestrian Pathway	Safety, health, connectivity, community cohesion	15
West Virginia Pocket Park South of West Virginia Railroad Crossing	Health, recreation, livability	16

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

California High Speed Rail,
San Jose to Merced Project Section
Washington, Guadalupe, Tamien, Alma, Almaden Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
WGTA-IMP#1: Community Art	Community aesthetic/character improvement partially offsets visual aesthetics DHAE in Washington, Guadalupe, Tamie, Alma, Almaden	Enhanced neighborhood visual quality, identify, and livability	1,2,3
WGTA-IMP#2: Streetscape Improvements (Goodyear, Humboldt, Floyd)	Investment in community aesthetics partially offsets visual aesthetics DHAE in Washington, Guadalupe, Tamien, Alma, Almaden	Visual quality, safety, and livability	1,2,3
WGTA-IMP#3: Noise insulation for certain residential buildings adjacent to the east side of SR 87 (between Virginia St. and Shadowgraph Drive) to address existing noise	Community noise improvements offsets noise DHAE in Washington, Guadalupe, Tamien, Alma, Almaden	Noise abatement, improved livability, health benefits	4

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
Tamien Park Westside Fencing along Railroad	Safety, recreation, health	1
Washington School Recreation Improvements	Recreation, health, livability	2
Rocketship Mateo Sheedy Elementary School Play Fields/Landscaping	Safety, recreation, livability	3
Alma Community Center and Teen Center Improvements	Recreation, education	4
Washington Elementary School Pedestrian and Bicycle Safety Improvements	Safety, health, recreation, community cohesion, livability	5
Pedestrian and Bicycle Crossing Safety Improvements	Safety, recreation, health, community cohesion	6
Oak/Almaden Pocket Park	Recreation, livability	7
Bellevue Park Improvements.	Recreation, health, livability	8
Traffic Calming	Safety, connectivity, livability	9
Healing Grove Health Center Sports/Outdoor Activity/Arts Programs	Recreation, health, livability	10
Rocketship Mateo Sheedy Elementary School Circulation and Safety Improvements	Safety	11
Guadalupe River Trail Pedestrian Crossing at Willow Street	Recreation, safety, connectivity, health	12
Three Creeks Trail Extension Crossing of SR 87/Caltrain/HSR	Recreation, safety, connectivity, health, livability	13
Guadalupe River Trail Extension (Virginia to Curtner)	Health, livability, health, connectivity, community cohesion	14

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

California High Speed Rail,
San Jose to Merced Project Section
Morgan Hill Community Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
Morgan Hill			
MH-IMP#1: Park/Trail Under Viaduct (Cochrane Road to Tennant Ave.)	Park and trail improvements would partially offset visual aesthetic DHAE in Morgan Hill	Visual quality, connectivity, and general livability	2
MH-IMP#2: Railroad Avenue Complete Streets	Complete Streets includes landscaping which would partially offset visual aesthetic DHAE in Morgan Hill	Visual quality, connectivity, and general livability	2
MH-IMP#3: Noise insulation for residences immediately adjacent to the west side of US 101 from approximately 0.35 north of East Main Avenue to Diana Avenue and from San Pedro Avenue to Barret Avenue	Community noise improvements offsets noise DHAE in Morgan Hill	Noise abatement, improved livability, health benefits	4

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
Morgan Hill and Gilroy			
MH/G- IMP#1: Affordable Housing Investment (Morgan Hill & Gilroy)	Helps to offset affordable housing adverse effects due to Alternative 2 in Morgan Hill and Gilroy where there is inadequate residential relocation availability (Residential Displacements DHAE)	Increased availability of affordable housing and related services	2

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
School Bus Route Study	Safety, connectivity	1
Downtown Pedestrian/Bicycle Railroad Overcrossings	Safety, connectivity, community cohesion	2
New Park South of Butterfield Avenue	Recreation, health, livability, visual aesthetics	3
Monterey Road Pedestrian and Bicycle Intersection Improvements	Safety, recreational, connectivity	4
Bus Transit stop amenities	Transportation, livability	5
Caltrain Station Access	Safety, connectivity, livability	6
Tennant Sidewalk Improvement	Safety, connectivity, community cohesion	7
Bike Lane Upgrades	Recreation, transportation, safety, livability	8
Coyote Creek Low-Flow Crossings Replaced with Bridges	Safety, recreation	9
New High School Site Acquisition	Education	10
Butterfield Road Pedestrian and Bicycle Intersection Improvements	Safety, connectivity, community cohesion	11
Perry's Hill Staging Area, Coyote Creek Parkway County Park	Health, recreational, livability	12
New Park North of El Toro Fire Station	Recreation, visual aesthetics	13
Llagas Creek Trail (Santa Theresa Boulevard to East San Martin Avenue)	Transportation, safety, recreation, health, connectivity	14
Monterey Corridor Express Bus route and stops	Transportation	15
Senior Shuttles	Transportation, livability	16

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

California High Speed Rail
San Jose to Merced Project Section
Gilroy Community Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
Gilroy			
G-IMP#1: Sidewalk and Curb improvement (within the Gilroy Neighborhood Revitalization Strategy Area nominally along the HSR alignment between Las Animas Ave. on the north and US 101 on the south)	Safety improvement offsets emergency vehicle response time DHAE in Gilroy	Safety, connectivity, and community cohesion	4
G-IMP#2: Bikeway Improvements (IOOF Ave., Monterey Road, 6th Street, 4th Street, Alexander Street)	Safety improvement offsets emergency vehicle response time DHAE in Gilroy	Safety, health benefits, improved circulation, and community cohesion	4
G-IMP#3: Neighborhood Street Lighting (within the Gilroy Neighborhood Revitalization Strategy Area nominally along the HSR alignment between Las Animas Ave. on the north and US 101 on the south)	Safety improvement offsets emergency vehicle response time DHAE in Gilroy	Safety and quality of life	4

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
G-IMP#4: Murray Avenue Sidewalk Gap Closure Project	Safety improvement offsets emergency vehicle response time DHAE in Gilroy	Safety, connectivity, community cohesion, and accessibility	4
G-IMP#5: IOOF Bicycle/Pedestrian Overcrossing and Complete Streets	Safety improvement offsets emergency vehicle response time DHAE in Gilroy	Safety, accessibility, connectivity, health, and community cohesion	4
G-IMP#6: Noise Barriers or Noise Insulation for certain Residences and/or sound walls in Gilroy adjacent to the west side of US 101 from south of Las Animas Avenue to Leavesley Road, from Adams Court to San Ysidro Park, and from San Ysidro Park to north of East 7th Street	Community noise improvements offset noise DHAE in Gilroy	Noise abatement, improved livability, health benefits	1, 2, 4
G-IMP#7: South Valley Middle School Recreational Amenities	Recreational amenities partially offset for loss of part of school track/field	Educational, recreational, and community livability	2
Morgan Hill and Gilroy			
MH/G-IMP#1: Affordable Housing Investment (Morgan Hill & Gilroy)	Helps to offset affordable housing adverse effects due to Alternative 2 in Morgan Hill and Gilroy where there is inadequate residential relocation availability (Residential Displacements DHAE)	Increased availability of affordable housing and related services	2

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
San Ysidro Park Improvements	Recreation, health, livability	1
Forest Street Park Expansion Project	Recreation, health, livability	2
Rebekah Children's Services Improvements	Health, recreation, visual quality, livability	3
Bicycle/Pedestrian Overcrossings (Leavesley Road, 10th Street)	Safety, connectivity, community cohesion	4
Gavilan College Low-Income Student Housing	Livability, economic, education	5
Gavilan College: Bicycle Connection and Wayfinding from Downtown	Safety, connectivity, health, community cohesion	6
Lead Service Line Replacement Project	Health, safety	7
West Branch Llagas Creek Trail	Recreation, health	8
Lions Creek Trail Extension	Recreation, health	9

Juan Bautista de Anza Trail	Recreation, health	10
Marcella Avenue Trail	Recreation, health	11
Student Transit Pass Program Initial Funding	Transportation, education	12
VTA Express Bus Service Gilroy to Diridon	Transportation, connectivity	13
Bikeshare Program	Access, connectivity, health	14

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

California High Speed Rail
San Jose to Merced Project Section
San Jose Diridon Community Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Community Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
SJD-IMP#1: Streetscape Improvements to Delmas Neighborhood	Investment in community aesthetics partially offsets visual aesthetics DHAE in San Jose Diridon area	Visual quality, community cohesion, livability, enhanced connectivity	1, 2, 3
SJD-IMP#2: Noise insulation for certain residential buildings adjacent to the west side of SR 87 (between San Fernando St. and Auzerais Ave.)/adjacent to the north side of I-280 (between Delmas Ave and Los Gatos Creek to address existing noise	Community noise improvements offsets noise DHAE in San Jose Diridon area	Noise abatement, improved livability, health benefits	4

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
Re-establish Inez C. Jackson Library	Education, technology, identity	1
Cahill Park Improvements	Recreation, livability	2
Los Gatos Creek Trail Extension and Crossings	Recreational opportunities, health, connectivity	3
Los Gatos Creek Trail Lighting Improvements Under I-280	Safety, connectivity, livability	4
Auzerais Railroad Crossing Warning Lights	Safety	5
Auzerais Pedestrian/Bicycle Crossing	Safety, community cohesion, connectivity	6
Improved Pedestrian Route to Gardner Academy and Biebrach Park.	Safety, connectivity, community cohesion	7
Park/Trail under HSR Viaduct from Los Gatos Creek to Bird Avenue	Recreational opportunities, health, community cohesion, connectivity	8

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

California High Speed Rail
San Jose to Merced Project Section
South San Jose Community Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
SSJ-IMP#1: Landscaping improvement elements of Monterey Highway Grand Blvd.	Landscaping improvements to partially offset visual aesthetic DHAE in South San Jose	Visual quality	1, 2, 3
SSJ-IMP#2a: Monterey Road ped/bike overpass at Skyway	Safety improvement offsets emergency vehicle response time DHAE in South San Jose	Traffic/transportation, safety, connectivity, and community cohesion	4
SSJ-IMP#2b: Monterey Road ped/bike overpass at Branham	Safety improvement offsets emergency vehicle response time DHAE in South San Jose	Traffic/transportation, safety, connectivity, and community cohesion	4
SSJ-IMP#2c: Monterey Road ped/bike overpass at Chynoweth	Safety improvement offsets emergency vehicle response time DHAE in South San Jose	Traffic/transportation, safety, connectivity, and community cohesion	4
SSJ-IMP#3: Noise insulation for up to 20 residential buildings along the west side of US 101 from Blossom Hill Road to SR 85, including the southbound exit ramp to SR 85;	Community noise improvements offsets noise DHAE in South San Jose	Noise abatement, improved livability, health benefits	4

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
Caroline Davis Intermediate School All Weather Turf and Track	Recreation, health, livability	1
Monterey Road Grand Boulevard (other than landscaping)	Transportation, recreation, connectivity, community cohesion	2
Cottonwood and Parkway Lakes Fish Screens and Supporting Improvements	Recreation, livability, education	3
Capitol and Blossom Hill Caltrain Stations Access Improvements	Transportation, safety, connectivity	4
Coyote Creek Trail-Fisher Creek Trail Connection	Recreation, health	5

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

California High Speed Rail
San Jose to Merced Project Section
Santa Clara/North San Jose Community Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Community Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
SC/NSJ-IMP#1: Noise insulation for certain Residential Buildings immediately adjacent to the west side of the Caltrain Corridor (between the Santa Clara Caltrain Station and I-880)	Community noise improvement offsets noise DHAE in Southern Santa Clara/Northern San Jose	Noise abatement, improved livability, health benefits	1,4

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
El Camino and Benton Street Safety Improvements	Safety, connectivity, livability	1
El Camino Real Class IV Bikeway	Safety, connectivity	2
Pedestrian safety improvements (included sidewalk gap closure and pothole repair)	Safety, livability, community cohesion, improved visual quality	3
Streetscape Improvements	Safety, community cohesion, livability	4
Newhall Street Bicycle/ Pedestrian Crossing	Safety, connectivity, community cohesion	5

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

California High Speed Rail
San Jose to Merced Project Section
San Joaquin Valley Community Area
Potential Community Improvements (September 2021)

The Authority is seeking community input on the importance or value of community improvements to community members. These improvements were considered and evaluated during the community improvements planning process from November 2019 through July 2021 (See separate handout describing that process).

The Authority is considering implementation of the potential improvements listed in the first table below because they have a close relationship to the potential residual disproportionately high and adverse effects (DHAEs) in this community area and would help to offset those effects.

The other improvements considered are listed in the second table and are not currently being considered for implementation because they lack a close relationship to potential residual disproportionately high and adverse effects in this community.

The Authority may consider changes in potential community improvements after consideration of community input through outreach in September 2021.

Potential Improvements	Relationship to potential residual DHAEs for HSR Alternatives	Benefits	Alternatives
SJV-IMP#1: Volta School Improvements	School improvements help to offset noise DHAE and partially offset visual aesthetic DHAE in Volta area	Health, safety, educational, and recreational benefits	1, 2, 3 (noise, visual aesthetic DHAE), (noise only DHAE) 4
SJV-IMP#2: Volta Elementary School: Acquire Property For/Construct Recreation/Community Park	Community park helps to partially offset visual aesthetic DHAE in Volta area	Recreation, health, safety	1, 2, 3 (visual aesthetic DHAE), and 4 (to address adverse visual effects).

Other Improvements Considered	Benefits	Ranking[1] (Among Other Improvements Considered)
Pedestrian/Bicycle Improvements at Volta	Health, connectivity, safety, community cohesion	1
Los Banos to Gilroy and Merced HSR Station Shuttles	Transportation, connectivity	2

[1] The ranking of the other improvements was completed in summer 2020 using the following evaluation criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness. The ranking provides a general sense of how these other improvements measure up against each other against a broad set of criteria.

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

GARDNER/WILLOW GLEN

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the Gardner/Willow Glen community area before consideration of project benefits or community improvements.

Summary of Potential Effects
Gardner/Willow Glen

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	○	○	○	○
Residential Displacements				◎
Business Displacements [1]				
Emergency Response Delays [1]				
Parks [2]				○
Operational Noise Effects				●
Operational Vibration				◎
Construction Traffic/Bus Transit Delay				○
Operational Traffic				○

● Potential disproportionately high and adverse effects (DHAE).

◎ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine shown above), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1] No business displacements or emergency response delays in community. [2] Alternative 4 would require acquisition of a small portion (.03 ac) of Fuller Park, but this effect is not considered high and adverse because it would not compromise recreational use of the park.

GARDNER/WILLOW GLEN (p. 2)

As shown in the table above, in the Gardner/Willow Glen community area, with direct mitigation, there would be the following residual DHAEs:

- **Operational Noise:** The adverse operational noise effects with Alternative 4 are related to at-grade train operations.

Consideration of Project Benefits and Potential Community Improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.
- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.
- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.
- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.
- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the Gardner/Willow Glen community was evaluated as follows:

- **Operational Noise:** While the project would reduce adverse noise effects associated with airport and highway expansion, this would not fully offset the adverse noise effects with Alternative 4 in this community area.

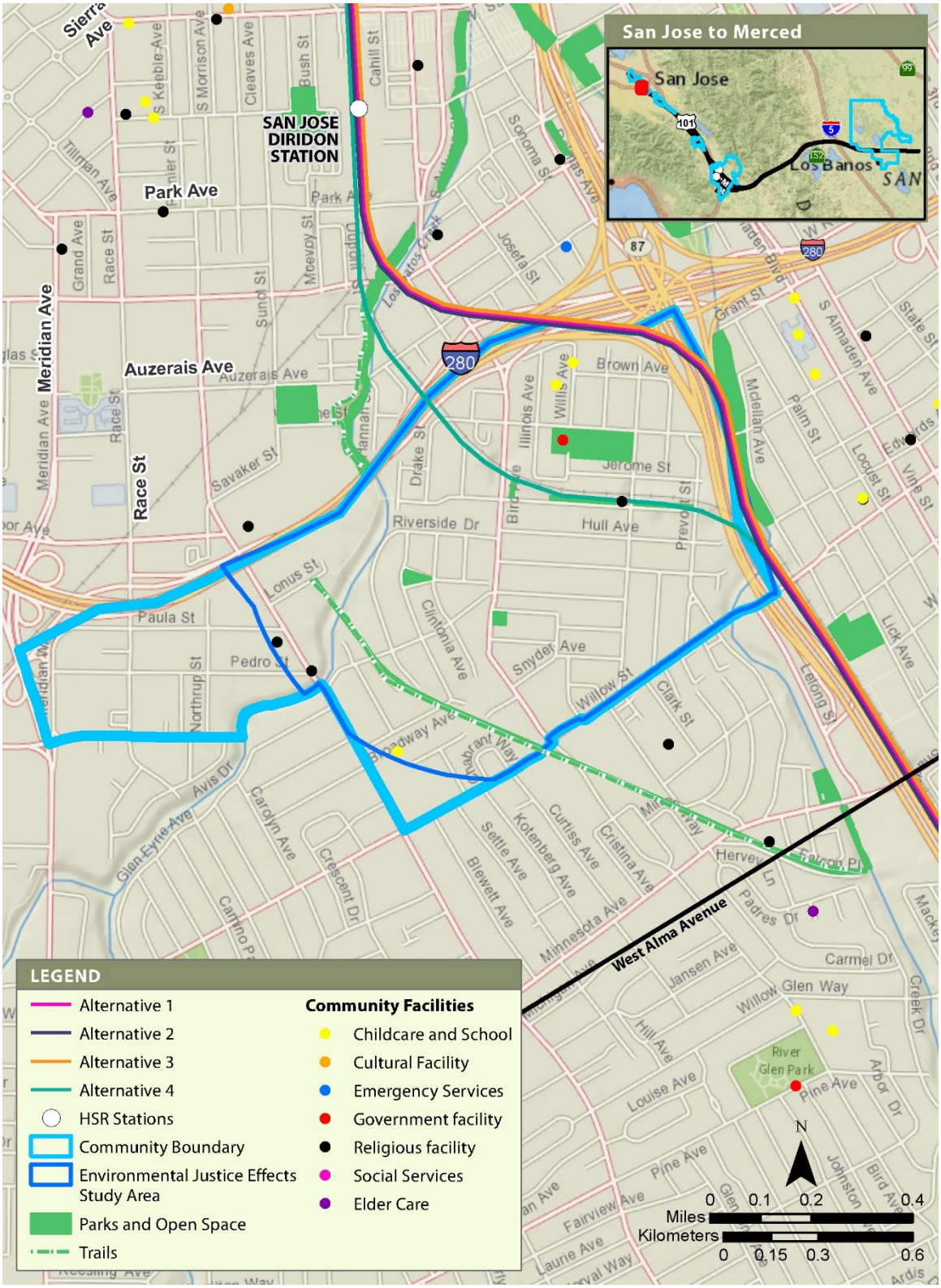
The Authority has identified the following community improvements:

- **Alternative 4:**
  - The Authority would install noise insulation for existing residences immediately adjacent to the west side of SR 87 (between W. Virginia St. and Brown St.) and to the south side of I-280 (between Spencer Ave. and Los Gatos Creek) to reduce noise effects from existing highway traffic.
  - The Authority would provide funding to the San Jose Unified School District to provide noise treatments to benefit the Gardner Elementary School.

These measures would reduce community noise effects sufficient to offset the DHAEs related to noise with Alternative 4 in this community area.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects with any of the alternatives in the Gardner/Willow Glen community area.



Gardner/Willow Glen Community Area

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

WASHINGTON/GUADALUPE/TAMIEN/ALMA/ALMADEN

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the Washington/Guadalupe/Tamien/Alma/Almaden community area before consideration of project benefits or community improvements.

Summary of Potential Effects
Washington/Guadalupe/Tamien/Alma/Almaden

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	●	●	●	○
Residential Displacements [1]				
Business Displacements	○	○	○	
Emergency Response Delays [1]				
Parks [2]	○	○	○	○
Operational Noise Effects	○	○	○	●
Operational Vibration	○	○	○	○
Construction Traffic/Bus Transit Delay	○	○	○	○
Operational Traffic [1]				

● Potential disproportionately high and adverse effects (DHAE).

○ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine shown above), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1] No residential displacements, emergency response delays, or operational traffic adverse effects in community. [2] There would be acquisition of a portion of the SR 87 Bikeway north and the planned location of the three creek trails, but the trails would be relocated after construction. For Alternatives 1, 2 and 3, there would also be acquisition of a portion of the sports field adjacent to the Tamien Station for a viaduct footing, but the permanent encroachment would only be underground.

WASHINGTON/GUADALUPE/TAMIEN/ALMA/ALMADEN (p. 2)

As shown in the table above, in the Washington/Guadalupe/Tamien/Alma/Almaden community area, with direct mitigation, there would be the following residual DHAEs:

- **Aesthetics and Visual Quality:** The adverse visual effects for Alternatives 1, 2, and 3 are related to the aerial viaduct, which will be observable to residents along the high-speed rail alignment.
- **Operational Noise:** The adverse operational noise effects with Alternative 4 are related to at-grade train operations.

Consideration of Project Benefits and Potential Community Improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.
- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.
- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.
- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.
- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the Washington/Guadalupe/Tamien/Alma/Almaden community was evaluated as follows:

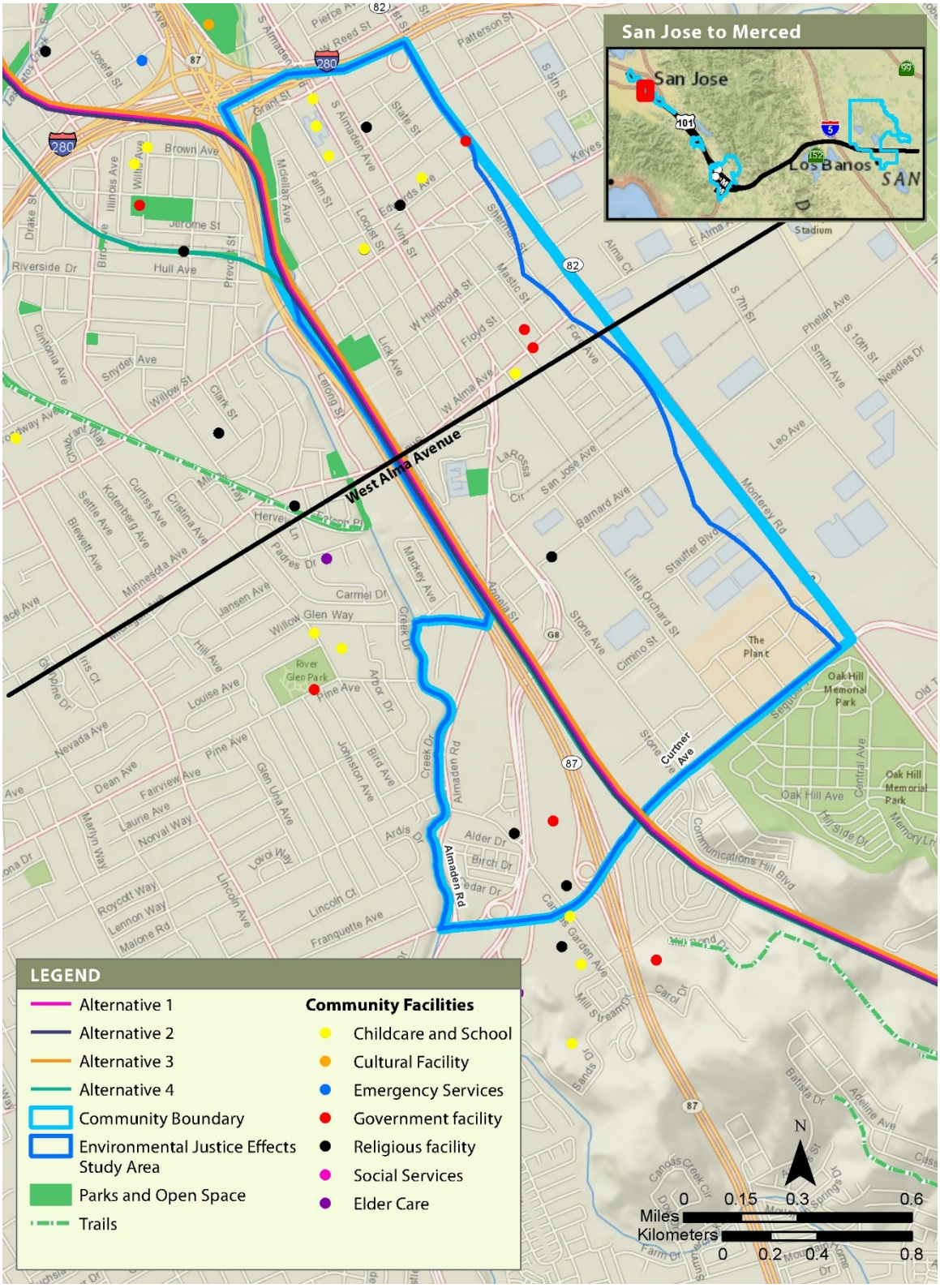
- **Aesthetics and Visual Quality/Operational Noise**: While the project would reduce adverse visual effects and noise effects associated with airport and highway expansion, this would not fully offset the adverse visual effects for Alternatives 1, 2, and 3 or the adverse noise effects with Alternative 4 in this community area.

The Authority has identified the following community improvements:

- **Alternatives 1, 2, and 3:**
  - The Authority would provide funding for the City of San Jose to implement streetscape improvements along Goodyear Street, Humboldt Street, and Floyd Street to improve both visual aesthetics and safety for local residents.
  - The Authority would provide funding, in partnership with local artists, community organizations and the City of San Jose, to support community art installations in the local community, which will also help to improve visual aesthetics and a sense of community.
  - While the streetscape and community art measures will help improve community aesthetics, they are not considered sufficient to offset the DHAEs of the aerial viaduct with Alternatives 1, 2 and 3 in this community area.
- **Alternative 4:** The Authority would install noise insulation for residential buildings immediately adjacent to the east side of SR 87 (between Virginia St. and Shadowgraph Drive) to reduce noise effects from existing highway traffic. This measure would reduce community noise effects sufficient to offset the adverse noise effects with Alternative 4 in this community area.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially remain disproportionately high and adverse effects with Alternatives 1, 2 and 3 due to the aerial viaduct. After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects with Alternative 4 in the Washington/Guadalupe/Tamien/Alma/Almaden community area.



Washington/Guadalupe/Tamien/Alma/Almaden Community Area

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

GILROY

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the Gilroy community area before consideration of project benefits or community improvements.

Summary of Potential Effects
Gilroy

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	●	●	●	○
Residential Displacements	◎	●	◎	◎
Business Displacements	●	●	◎	●
Emergency Response Delays	○	○	○	●
Parks [1]	○	●		
Operational Noise Effects	●	●	○	●
Operational Vibration	○	○	○	○
Construction Traffic/Bus Transit Delay [2]	●	●	○	○
Operational Traffic	○	●	○	●

● Potential disproportionately high and adverse effects (DHAE).

◎ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine shown above), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1] Acquisition of portion of school play area at the South Valley Middle School. [2] Bus delays during construction.

GILROY (p. 2)

As shown in the table above, in the Gilroy community area, with direct mitigation, there would be the following residual DHAEs:

- **Aesthetics and Visual Quality:** The adverse visual effects for Alternatives 1, 2, and 3 are related to either the aerial viaduct (Alternative 1 and 3) or the elevated embankment (Alternative 2), which will be observable to residents along the high-speed rail alignment.
- **Residential/Business Displacement:** The adverse residential displacement (Alternative 2) and business displacement effects (Alternatives 1, 2 and 4) would occur because there is inadequate relocation availability in Gilroy to absorb the amount of displacements that would occur.
- **Emergency Response Delay:** The adverse emergency response delays for Alternative 4 are related to increased gate down time at the at-grade crossings. Adverse delays greater than the delay threshold could occur if the City of Gilroy chooses to not implement the improvements included in proposed direct mitigation measure SS-MM#4 based on the construction funding and partial operational funding proposed by the Authority.
- **Parks**: The adverse park effects for Alternative 2 are related to acquisition of part of the field and track for the South Valley Middle School.
- **Operational Noise:** The adverse operational noise effects with Alternatives 1, 2 and 4 are related to train operations.
- **Construction Bus Transit Delay:** The adverse bus transit delays during construction with Alternative 2 would occur on a temporary basis due to roadway modifications when there is a requirement for closure or partial closure of roadways.
- **Operational Traffic:** The adverse operational traffic effects are related to changes in roadways (Alternative 2) or due to increased gate-down time at the at-grade crossings (Alternative 4).

Consideration of Project Benefits and Community Improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.

- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.
- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.
- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.
- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the Gilroy community was evaluated as follows:

- **Construction Bus Transit Delays/Operational Traffic:** The increased travel options, transit connectivity, and regional vehicle miles travelled with the project are considered to offset both the temporary adverse bus transit delays during construction with Alternative 2 and the operational traffic delays with Alternatives 2 and 4. The long-term benefit of introducing a substantial new travel option and investment in alternatives to passenger vehicle travel is considered to offset both the temporary bus transit delays and the localized operational traffic delays in this community area.
- **Business Displacements:** The increased construction and operational spending and employment is considered to adequately offset the economic and employment effects of business displacements with Alternatives 1, 2, and 4 that may not be able to relocate in the immediate vicinity.
- **Aesthetics and Visual Quality/Operational Noise:** While the project would reduce adverse visual effects and noise effects associated with airport and highway expansion, this would not fully offset the adverse visual effects for Alternatives 1, 2, and 3 or the adverse noise effects with Alternatives 2 and 4 in this community area.
- **Parks:** There are no project benefits that would offset the DHAEs related to residential displacement or parks with Alternative 2 in this community area.

The Authority has identified the following community improvements:

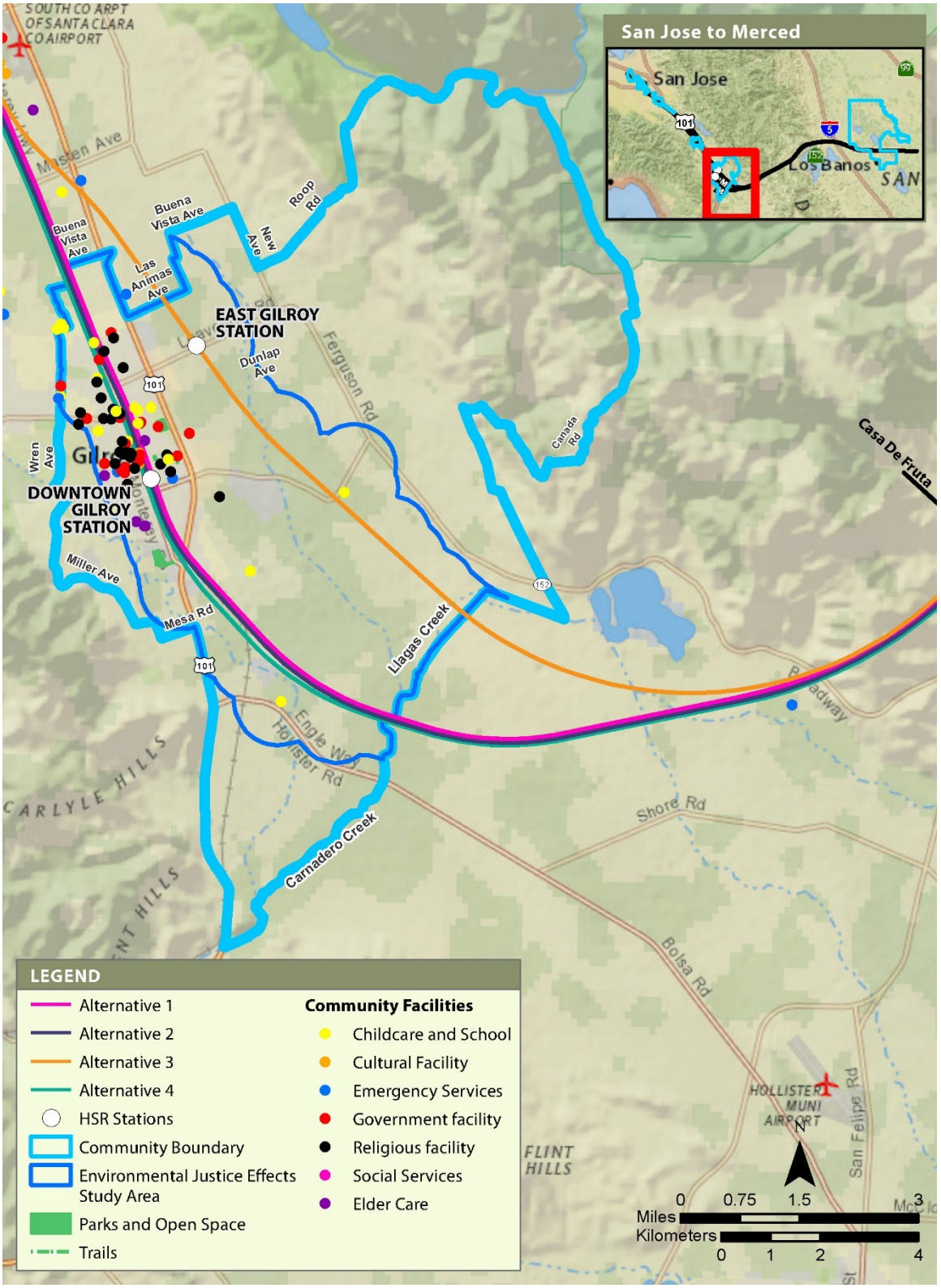
- **Alternatives 1, 2, and 4:** The Authority would install noise insulation certain residences and/or sound walls adjacent to the west side of US 101 from south of Las Animas Avenue to Leavesley Road, from Adams Court to San Ysidro Park, and from San Ysidro Park to north of East 7th Street to reduce noise from existing highway traffic. This measure would reduce community noise effects sufficient to offset the adverse noise effects with Alternatives 1, 2 and 4 in this community area.

- **Alternative 4:** The Authority would provide funding to the City of Gilroy to implement a series of investments in community safety in Gilroy, including a new pedestrian/bicycle overcrossing of the railroad at IOOF Avenue, bikeway improvements (along IOOF Ave., Monterey Road, 6th Street, 4th Street, and Alexander Street), sidewalk gap closure along Murray Avenue, and neighborhood street lighting and sidewalk and curb improvements within the Gilroy Neighborhood Revitalization Strategy Area (nominally along the high-speed rail alignment between Las Animas Ave. on the north and US 101 on the south) that, in combination with project mitigation and project safety investments, would offset the DHAEs related to emergency vehicle response times in this community area.
- **Alternative 2:**
  - The Authority would provide funding to the Gilroy Unified School District to provide recreational amenities for the South Valley Middle School. While this measure will help to provide recreational opportunities for students and the neighboring community, it is not considered sufficient to offset the DHAE related to the loss of use of a portion of the field and track at the school.
  - The Authority, in partnership with affordable housing supportive agencies and organizations, would partially fund affordable housing development at 50% of full cost of 75 new units, which corresponds to the estimated number of residential units that could not be relocated locally in Gilroy with Alternative 2. This measure, in addition to state and federal required relocation assistance and direct mitigation to help affected displaced residents, is considered adequate to offset the residential DHAEs with Alternative 2 in this community area.

No community improvements have been identified that could offset the aesthetics and visual effects relative to the aerial viaduct or elevated embankment relative to Alternatives 1, 2, and 3 in this community area.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially remain disproportionately high and adverse effects with Alternatives 1, 2 and 3 due to the aerial viaduct or elevated embankment and with Alternative 2 related to the loss of a portion of the field and track at South Valley Middle School. After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects with Alternative 4 in the Gilroy community area.



Gilroy Community Area

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

MORGAN HILL

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the Morgan Hill community area before consideration of project benefits or community improvements.

Summary of Potential Effects
Morgan Hill

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	●	●	●	○
Residential Displacements	◎	●	◎	
Business Displacements		●		◎
Emergency Response Delays [1]				◎
Parks [2]	○	◎	○	◎
Operational Noise Effects	○	○	○	●
Operational Vibration	○	○	○	◎
Construction Traffic/Bus Transit Delay [3]	○	●	○	○
Operational Traffic		○		●

● Potential disproportionately high and adverse effects (DHAE).

◎ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine shown above), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1] Emergency Response Delay > 30 seconds occurs near E. Middle Avenue east of the railroad corridor, but the affected area is not disproportionately minority or low-income.[2] Morgan Hill Community and Cultural Center– construction disruption of amphitheater use. Villa Mira Monte– construction disruption of outdoor special event use. [3] Bus transit delays during construction.

MORGAN HILL (p. 2)

As shown in the table above, in the Morgan Hill community area, with direct mitigation, there would be the following residual DHAEs:

- **Aesthetics and Visual Quality:** The adverse visual effects for Alternatives 1, 2, and 3 are related to either the aerial viaduct (Alternative 1 and 3) or the elevated embankment (Alternative 2), which will be observable to residents along the high-speed rail alignment.
- **Residential/Business Displacements:** The adverse residential and business displacement effects for Alternative 2 would occur because there is inadequate relocation availability in Morgan Hill to absorb the amount of displacements that would occur with this alternative.
- **Operational Noise/Operational Traffic:** The adverse operational noise and traffic effects with Alternative 4 are related to at-grade train operations.
- **Construction Bus Transit Delays:** The adverse bus transit delays during construction with Alternative 2 would occur on a temporary basis due to roadway modifications when there is a requirement for closure or partial closure of roadways.

Consideration of Project Benefits and Community improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.
- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.
- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.

- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.
- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the Morgan Hill community was evaluated as follows:

- **Construction Bus Transit Delays/Operational Traffic:** The increased travel options, transit connectivity, and regional vehicle miles travelled with the project are considered to offset both the temporary adverse bus transit delays during construction with Alternative 2 and the operational traffic delays with Alternative 4. The long-term benefit of introducing a substantial new travel option and investment in alternatives to passenger vehicle travel is considered to offset both the temporary bus transit delays and the localized operational traffic delays.
- **Business Displacements:** The increased construction and operational spending and employment is considered to adequately offset the economic and employment effects of business displacements with Alternative 2 that may not be able to relocate in the immediate vicinity.
- **Aesthetics and Visual Quality/ Operational Noise:** While the project would reduce adverse visual effects and noise effects associated with airport and highway expansion, this would not fully offset the adverse visual effects for Alternatives 1, 2, and 3 or the adverse noise effects with Alternative 4 in this community area.

There are no project benefits that would offset the DHAEs relative to residential displacement effects with Alternative 2 in this community area.

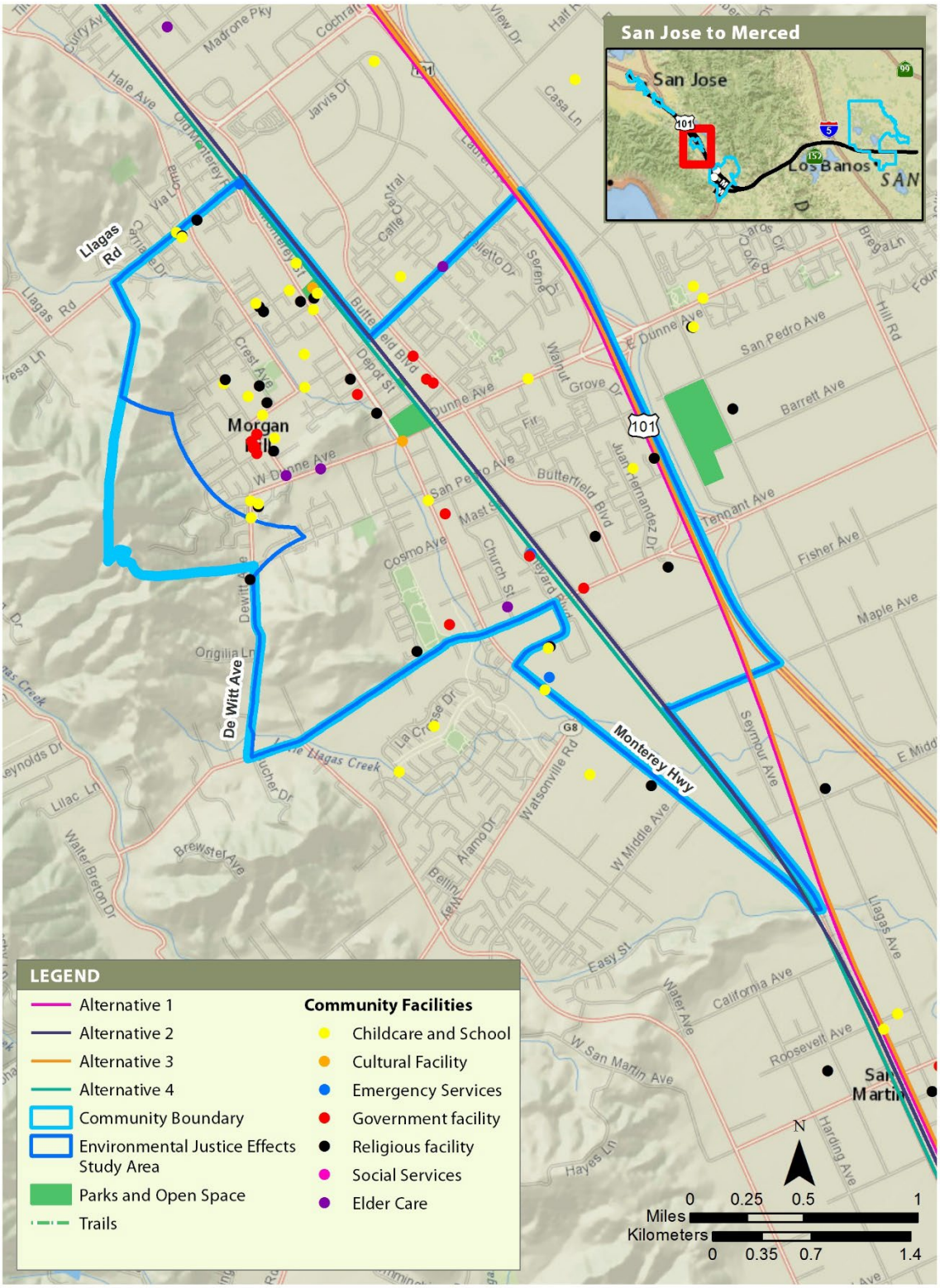
The Authority has identified the following community improvements:

- **Alternatives 1 and 3:** The Authority would provide funding to the City of Morgan Hill to implement trail and park improvements between Cochrane Road and Tennant Road under the proposed viaduct with Alternatives 1 and 3 to improve visual aesthetics. While this measure will help improve community aesthetics, it is not considered sufficient to offset the DHAEs of the aerial viaduct with Alternatives 1 and 3 in this community area.
- **Alternative 2:**
  - The Authority would provide funding to the City of Morgan Hill to implement Railroad Avenue Complete Streets improvements to improve both visual aesthetics and safety for local residents relative to Alternative 2. While this measure will help improve community aesthetics, it is not considered sufficient to offset the DHAEs of the elevated embankment with Alternative 2 in this community area.
  - The Authority would provide funding to affordable housing supportive agencies and organizations to construct affordable housing at 50% of full cost of 59 new units, which corresponds to the estimated number of residential units that could not be relocated locally in Morgan Hill with Alternative 2. This measure, in addition to state and federal required relocation assistance and direct mitigation to help affected displaced residents, is considered adequate to offset the residential displacement DHAEs with Alternative 2 in this community area.

- **Alternative 4:** The Authority would install noise insulation for existing residents along the west side of US 101 between approximately 0.35 mile north of East Main Avenue to Diana Avenue and from San Pedro Avenue to Barret Avenue where noise barriers do not already exist to reduce noise effects from existing highway traffic with Alternative 4. This measure would reduce community noise effects sufficient to offset the adverse noise effects with Alternative 4 in this community area.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially remain disproportionately high and adverse effects with Alternatives 1, 2 and 3 due to the aerial viaduct or elevated embankment. After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects with Alternative 4 in the Morgan Hill community area.



Morgan Hill Community Area

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

SAN JOAQUIN VALLEY

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the San Joaquin Valley community area before consideration of project benefits or community improvements.

Summary of Potential Effects
San Joaquin Valley

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	●	●	●	○
Residential Displacements	○	○	○	○
Business Displacements	○	○	○	○
Emergency Response Delays [1]				
Parks [1]				
Operational Noise Effects	●	●	●	●
Operational Vibration	○	○	○	○
Construction Traffic/Bus Transit Delay [1]				
Operational Traffic [1]				

● Potential disproportionately high and adverse effects (DHAE).

○ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine shown above), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1] *No high and adverse effects to emergency response times, parks, construction traffic, bus transit, or operational traffic expected.*

SAN JOAQUIN VALLEY (p. 2)

As shown in the table above, in the San Joaquin Valley community area, with direct mitigation, there would be the following residual DHAEs:

- The adverse visual effects for Alternatives 1, 2, and 3 are related to the aerial viaduct.[1]
- The adverse operational noise effects with all alternatives are related to train operations.

Consideration of Project Benefits and Potential Community Improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.
- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.
- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.
- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.
- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

[1] Note that although Alternative 4 would have the same design at the other alternatives, for the entire project section, Alternative 4 would not have a DHAE relative to visual aesthetics.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the San Joaquin Valley community was evaluated as follows:

- **Aesthetics and Visual Quality/Operational Noise:** While the project would reduce adverse visual effects and noise effects associated with airport and highway expansion, this would not offset the adverse visual effects for Alternatives 1, 2, and 3 or the adverse noise effects with all alternatives because the benefits of reducing airport and highway expansion would occur in other community areas.

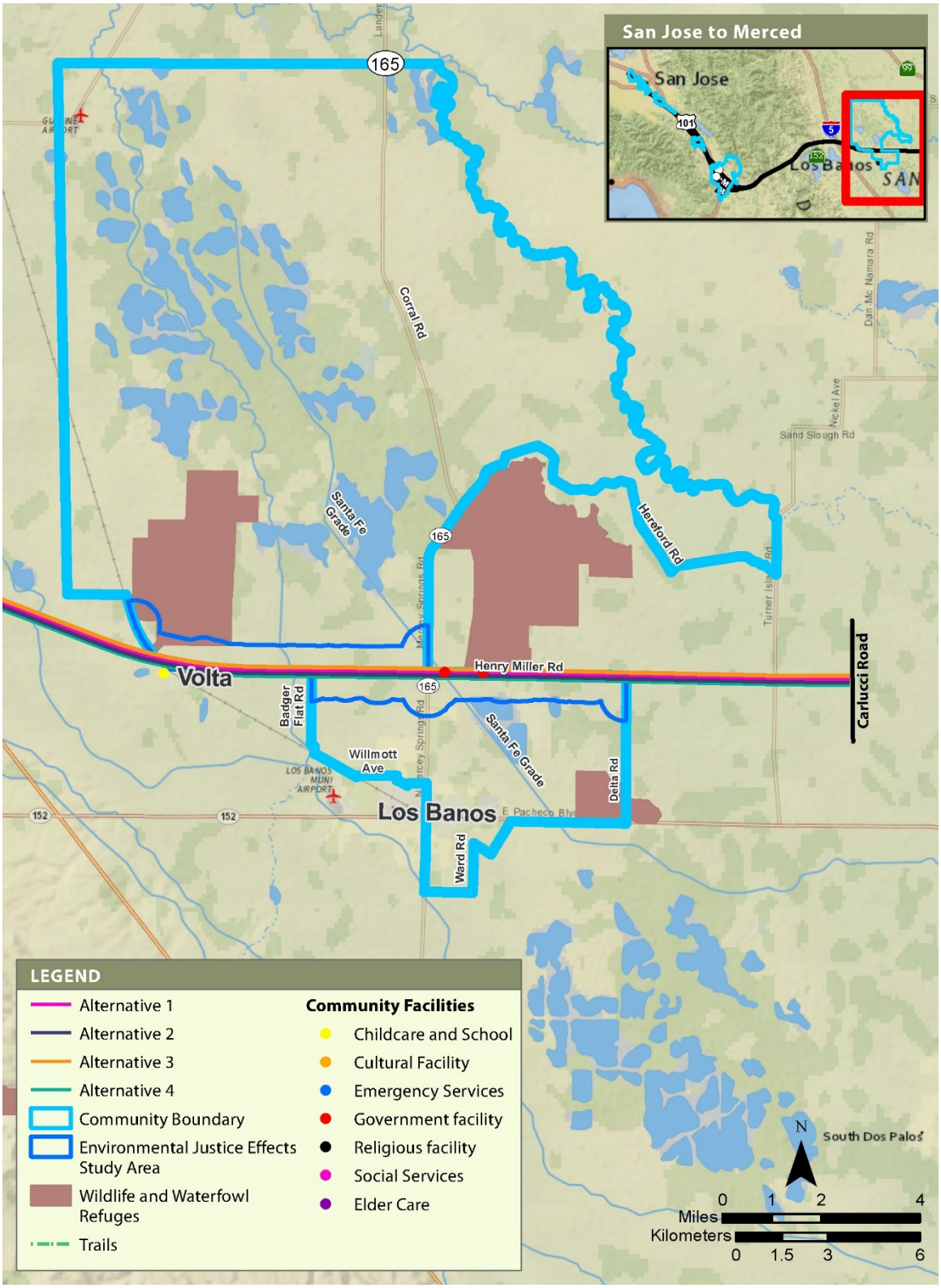
The Authority has identified the following community improvements

- All Alternatives:
    - The Authority would provide funding to the Los Banos Unified School District to provide a series of enhancements to the Volta Elementary School including improved windows and facilities which can help reduce noise levels for students, faculty, and community users of school facilities. The proposed community improvement would benefit minority and low-income residents and community members who are served by Volta Elementary School by providing enhanced education facilities and community-serving site facilities. Health, safety, educational, and recreational benefits would be provided through the provision of enhanced utilities, safety improvements, and improved educational and recreational space.
    - The Authority would provide funding to the Los Banos Unified School District and/or Merced County to support the acquisition and construction of a new community park adjacent to the Volta School that could be used for recreation by the school as well. This proposed improvement would benefit minority and low-income residents by providing additional recreational opportunities for Volta Elementary School students and for the surrounding community. The property is located between the Volta community and the elementary school, so would also provide a safe route to school for student from the community.

These community improvements, in combination with direct mitigation, project benefits, are considered sufficient to offset the adverse noise effects (for all alternatives), but not the DHAEs of the aerial viaduct with Alternatives 1, 2 and 3. Although Alternative 4 would have the same alignment design as the other Alternatives in the San Joaquin Valley subsection, for the entire project section, Alternative 4 would not have a DHAE on minority populations or low-income populations in this community area.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially remain disproportionately high and adverse effects with Alternatives 1, 2 and 3 due to the aerial viaduct. After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects on minority populations or low-income populations with Alternative 4 in the San Joaquin Valley community area.



San Joaquin Valley Community Area

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

SANTA CLARA/NORTH SAN JOSE

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the Santa Clara/North San Jose community area before consideration of project benefits or community improvements.

Summary of Potential Effects
Santa Clara/North San Jose

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	○	●	●	○
Residential Displacements		◎	◎	
Business Displacements	◎	◎	◎	◎
Emergency Response Delays [1]				
Parks [2]		○	○	
Operational Noise Effects	○	○	○	●
Operational Vibration	○	○	○	◎
Construction Traffic and/or Bus Transit Delay [3]	○	●	●	○
Operational Traffic [4]				

● Potential disproportionately high and adverse effect (DHAE).

◎ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine in this table), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1]No stations and no at-grade crossings, so no emergency response delays. [2]Limited partial acquisitions at Reed Street Dog Park and Reed and Grant Streets Sports Park. [3] Bus transit delays due to construction of crossover at De la Cruz Blvd. [4] No at-grade crossings or stations in community, so no operational traffic effects.

SANTA CLARA/NORTH SAN JOSE (p. 2)

As shown in the table above, in the Santa Clara/North San Jose community area, with direct mitigation, there would be the following residual DHAEs:

- **Aesthetics and Visual Quality**: The high-speed rail alignment for Alternatives 2 and 3 includes an aerial viaduct in this community, which will be observable to residents.
- **Construction Bus Transit Delay**: Bus transit delays during construction with Alternatives 2 and 3 would occur on a temporary basis due to the construction of overpasses when there is a requirement for closure or partial closure of roadways.
- **Operational Noise**: The adverse operational noise effects with Alternative 4 are limited to one location, a multifamily residence along the Caltrain Corridor north of the Santa Clara Caltrain Station.

Consideration of Project Benefits and Potential Community Improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.
- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.
- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.
- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.
- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the Santa Clara/North San Jose community was evaluated as follows:

- **Construction Bus Transit Delay**: The increased travel options, transit connectivity, and reduced regional vehicle miles travelled with the project are considered to offset the temporary adverse bus transit delays during construction with Alternatives 2 and 3.
- **Aesthetics and Visual Quality**: While the project would reduce adverse visual effects and noise effects associated with airport and highway expansion, this would not fully offset the adverse visual effects for Alternatives 1 and 2 or the adverse noise effects with Alternative 4 in this community.

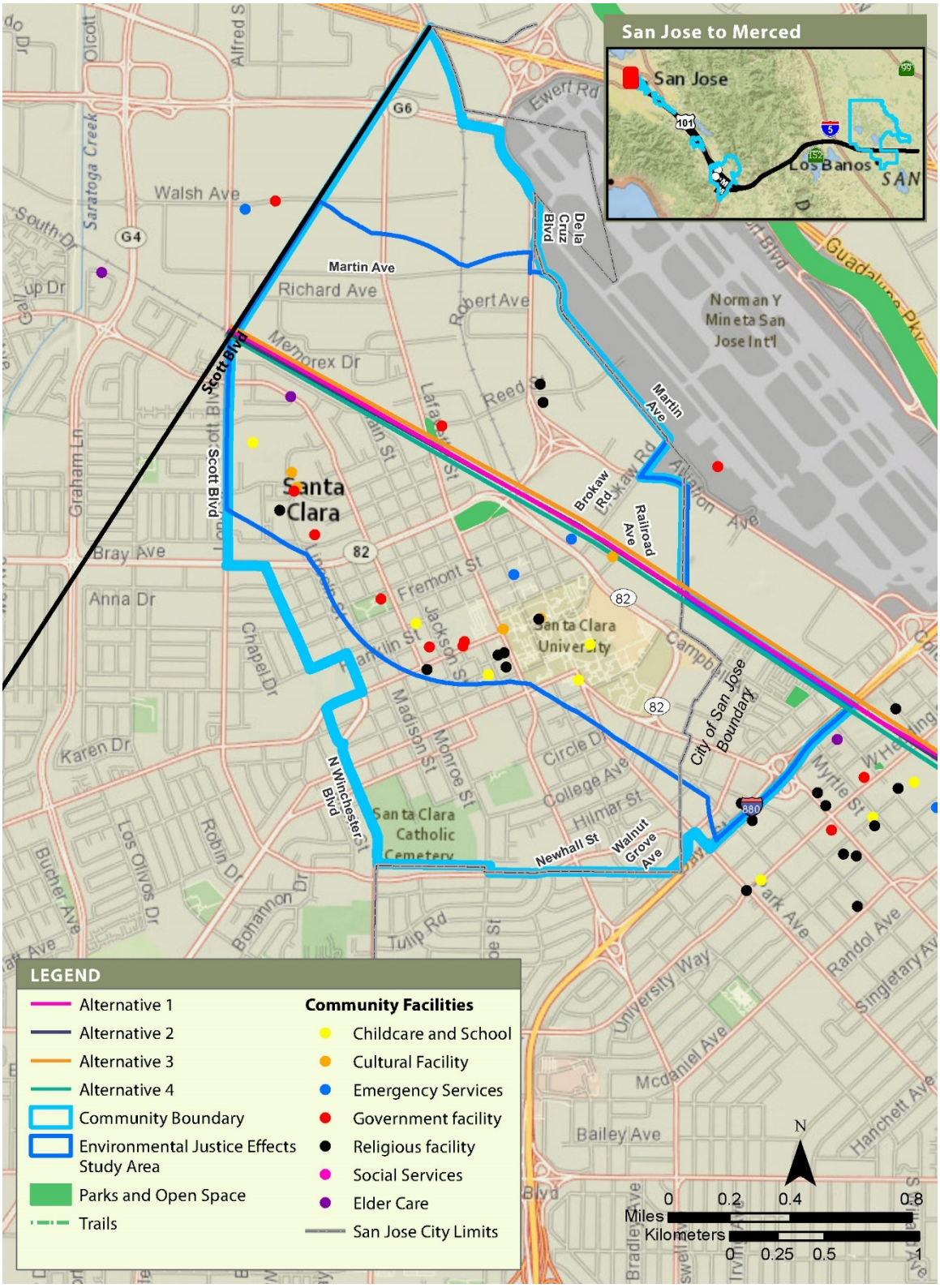
The Authority has identified the following potential community improvements:

- **Alternative 4:** The Authority would install noise insulation for up to 10 existing residences along the Caltrain Corridor between the Santa Clara Caltrain Station and I-880 to reduce noise effects from existing train traffic. This measure would reduce community noise effects sufficient to offset the adverse noise effects with Alternative 4 in this community area.

No feasible community improvements were identified to reduce the DHAE of the aerial viaduct with Alternatives 2 and 3.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially remain disproportionately high and adverse effects with Alternatives 2 and 3 due to the aerial viaduct. After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects in this Santa Clara/North San Jose with Alternatives 1 and 4.



Santa Clara/North San Jose Community Area

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

SAN JOSE DIRIDON

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the San Jose Diridon community area before consideration of project benefits or community improvements.

Summary of Potential Effects
San Jose Diridon

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	●	●	●	○
Residential Displacements	○	○	○	○
Business Displacements	○	○	○	○
Emergency Response Delays [1]	○	○	○	○
Parks	○	○	○	○
Operational Noise Effects	○	○	○	●
Operational Vibration [1]	○	○	○	○
Construction Traffic/Bus Transit Delay [2]	●	●	●	○
Operational Traffic	●	●	●	●

● Potential disproportionately high and adverse effects (DHAE).

○ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine shown above), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1] No expected adverse vibration effects after mitigation. [2] Bus transit delays due to viaduct construction.

SAN JOSE DIRIDON (p. 2)

As shown in the table above, in the San Jose Diridon community area, with direct mitigation, there would be the following residual DHAEs:

- **Aesthetics and Visual Quality**: The adverse visual effects for Alternatives 1, 2, and 3 are related to the aerial viaduct, which will be observable to residents along the high-speed rail alignment.
- **Operational Noise**: The adverse operational noise effects with Alternative 4 are related to at-grade train operations.
- **Construction Bus Transit Delay**: The adverse bus transit delays during construction with Alternatives 1, 2 and 3 would only occur on a temporary basis due to roadway modifications when there is a requirement for closure or partial closure of roadways.
- **Operational Traffic**: The adverse operational traffic delays would occur with all four alternatives, due primarily to San Jose Diridon station traffic.

Consideration of Project Benefits and Potential Community Improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.
- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.
- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.
- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.

- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the San Jose Diridon community was evaluated as follows:

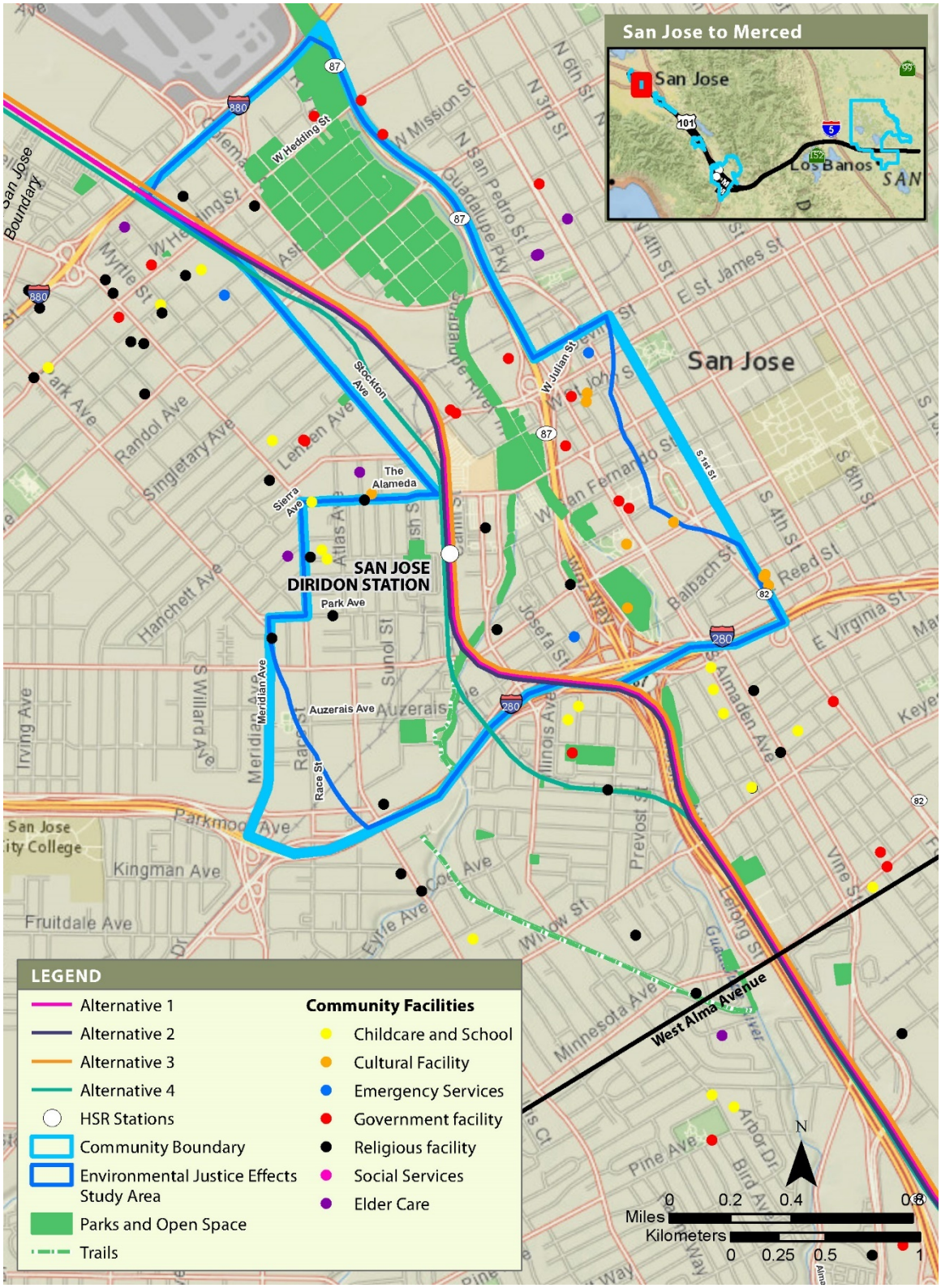
- **Construction Bus Transit Delay/Operational Traffic**: The increased travel options, transit connectivity, and regional vehicle miles travelled with the project are considered to offset both the temporary adverse bus transit delays during construction with Alternatives 1, 2 and 3 and the operational traffic delays with all four alternatives. The long-term benefit of introducing a substantial new travel option and investment in alternatives to passenger vehicle travel is considered to offset both the temporary bus transit delays and the localized operational traffic delays.
- **Aesthetics and Visual Quality/Operational Noise:** While the project would reduce adverse visual effects and noise effects associated with airport and highway expansion, this would not fully offset the adverse visual effects for Alternatives 1, 2, and 3 or the adverse noise effects with Alternative 4.

The Authority has identified the following potential community improvements:

- **Alternative 1, 2, and 3:** The Authority would provide funding to the City of San Jose to implement streetscape improvements to the Delmas neighborhood to improve both visual aesthetics and safety for local residents. While this measure will help improve community aesthetics it is not considered sufficient to offset the DHAEs of the aerial viaduct with Alternatives 1, 2 and 3.
- **Alternative 4:** The Authority would install noise insulation for existing residents immediately adjacent to the west side of SR87 (between West San Fernando Street and I-280) and the north side of I-280 (between SR 87 and Los Gatos Creek) to reduce noise effects from existing highway traffic. This measure would reduce community noise effects sufficient to offset the adverse noise effects with Alternative 4.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially remain disproportionately high and adverse effects with Alternatives 1, 2 and 3 due to the aerial viaduct. After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects of Alternative 4 in the San Jose Diridon community area.



San Jose Diridon Community Area

Environmental Justice Analysis: San Jose to Merced (as of July 2021)

SOUTH SAN JOSE

The EIR/EIS for the San Jose to Merced project section evaluates effects on communities along the project alignment. Where adverse effects are identified, the Authority considers ways to mitigate these effects. The information provided below is preliminary as the Authority seeks community input to advance our environmental review. The Authority's conclusions will be included in the Final EIR/EIS for the project section after consideration of feedback through this round of outreach. After direct mitigation(meaning measures that avoid, minimize, or directly compensate for an adverse impact), the Authority evaluated the remaining effects for the entire project section (from Santa Clara to the Central Valley) to determine if there would be disproportionately high and adverse effects (DHAEs) to minority and/or low-income populations overall. Although there may be DHAEs based on analysis of the entire project section, DHAEs may not necessarily be found in each community along the alignment. The table below shows the outcomes of the EIR/EIS analysis in the South San Jose community area before consideration of project benefits or community improvements.

Summary of Potential Effects
South San Jose

Effects	Alternatives			
	1	2	3	4
Aesthetics and Visual Quality	●	●	●	○
Residential Displacements		◎		◎
Business Displacements	◎	◎	◎	◎
Emergency Response Delays	○	○	○	●
Parks	○	○	○	○
Operational Noise Effects	○	○	○	●
Operational Vibration	○	○	○	◎
Construction Traffic/Bus Transit Delay	●	●	●	○
Operational Traffic	●	●	●	●

● Potential disproportionately high and adverse effects (DHAE).

◎ Potential Effects *not* DHAE for the entire project section, but a particular community may still be affected.

○ Potential Effects not considered high and adverse.

The EIR/EIS identifies other effects (beyond the nine shown above), none of which would have a DHAE on minority and/or low-income populations. All effects are important regardless of whether they have a DHAE or not.

[1] *Construction traffic and bus transit delays during construction due to narrowing of Monterey Road.*

SOUTH SAN JOSE (p. 2)

As shown in the table above, in the South San Jose community area, with direct mitigation, there would be the following residual DHAEs:

- **Aesthetics and Visual Quality:** The adverse visual effects for Alternatives 1 and 2 are related to the aerial viaduct, which will be observable to residents along the high-speed rail alignment.
- **Emergency Response Delay:** The adverse emergency response delays for Alternative 4 are related to increased gate down time at the at-grade crossings at Skyway Drive, Branham Lane, and Chynoweth Avenue. Adverse delays greater than the delay threshold could occur if the City of San Jose chooses to not implement the improvements included in proposed direct mitigation measure SS-MM#4 based on the construction funding and partial operational funding proposed by the Authority.
- **Operational Noise:** The adverse operational noise effects with Alternative 4 are related to at-grade train operations, including the sounding of safety horns at the at-grade crossings.
- **Construction Traffic/Bus Transit Delays:** The adverse construction traffic delays and bus transit delays during construction with Alternatives 1, 2 and 3 would occur due to the narrowing of Monterey Road.
- **Operational Traffic:** The adverse operational traffic delays would occur due to the narrowing of Monterey Road (Alternatives 1, 2 and 3) or the increased gate-down time at at-grade crossings (Alternative 4).

Consideration of Project Benefits and Potential Community Improvements

The project will have a wide range of benefits to both general populations in the project area and also to minority and low-income populations along the project alignments including the following:

- **Regional and intrastate travel options**: The high-speed rail project will provide a fast and efficient connection from San Jose and Gilroy to San Francisco, the Central Valley, and Southern California. Travel by high-speed rail is safer and faster than travel by personal vehicle.
- **Increased transit connectivity:** The high-speed rail service will be connected to other transit services in San Jose and Gilroy (and at other system stations) that allow travelers to take full advantage of transit connections. For example, between Santa Clara and Gilroy, riders can use Caltrain to connect to and from high-speed rail service from their local Caltrain stations.
- **Reduction of vehicle miles travelled on regional roadways**: The high-speed rail project will divert cars from regional highways such as I-880, US 101, I-280, SR87, SR85, and SR 152 which will benefit local residents who travel along these roadways.
- **Reduced need for expanding airports and highways:** By providing an alternative to long-distance passenger vehicle and airplane travel, the project will reduce the need to expand existing airports and highways which would otherwise affect residents adjacent to such facilities who would be affected by expansion, traffic increases, noise, and other effects.

- **Construction and operational spending and employment:** The high-speed rail project will provide jobs during construction and operation as well as spending locally on materials and supplies which will provide employment opportunities for local residents and economic welfare of local areas.
- **Improved regional air quality:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will improve regional air quality which will improve health conditions for local and regional residents.
- **Reduced greenhouse gas emissions:** By reducing onroad vehicle travel and replacing it with electrified trains operating on renewable energy, the high-speed rail project will reduce greenhouse gas emissions which will help to reduce the effects of climate change over time.

The offsetting value of these project benefits relative to the residual DHAEs noted above for the South San Jose community was evaluated as follows:

- **Construction Traffic/Construction Bus Transit Delay/Operational Traffic:** The increased travel options, transit connectivity, and regional vehicle miles travelled with the project are considered to offset the temporary adverse construction traffic and bus transit delays during construction (Alternatives 1, 2 and 3) and the operational traffic delays (all alternatives).
- **Aesthetics and Visual Quality/Operational Noise:** While the project would reduce adverse visual effects and noise effects associated with airport and highway expansion, this would not fully offset the adverse visual effects for Alternatives 1, 2, and 3 or the adverse noise effects with Alternative 4.
- **Emergency Response Delay:** While the project would provide a safer long-distance travel option compared to passenger vehicle use and Alternative 4 would provide safety improvements to the existing rail corridor through fencing, four quad safety gates, median channelization, obstacle detection, and automated train controls, these benefits would not fully offset emergency vehicle response delays.

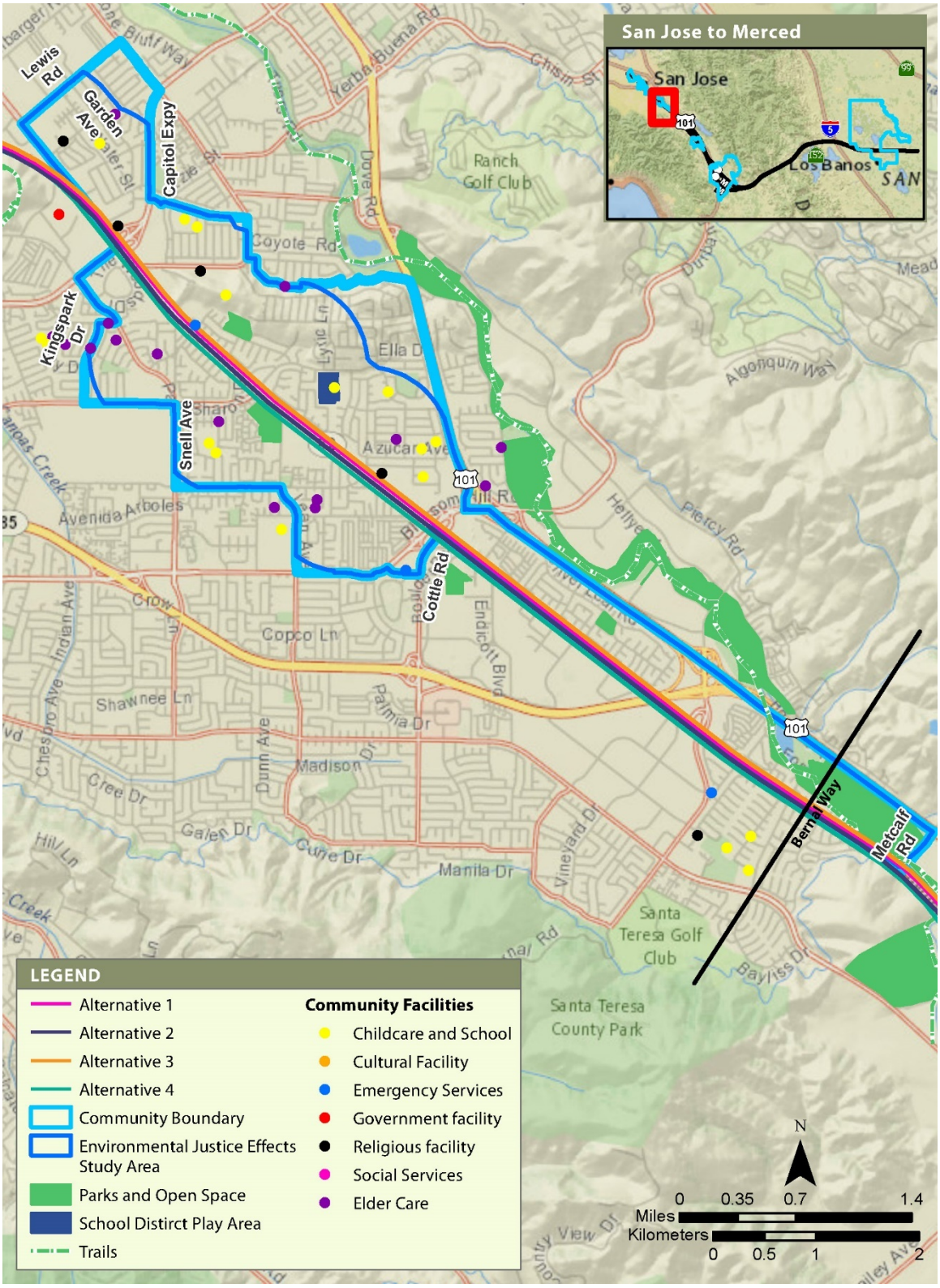
The Authority has identified the following community improvements:

- **Alternatives 1, 2, and 3:** The Authority would provide funding to the City of San Jose for landscape improvements included in City's Grand Boulevard initiative, but this measure is not considered sufficient to reduce the DHAEs of the aerial viaduct in this community area.
- **Alternative 4:**
    - The Authority would install noise insulation for up to 20 existing residences to reduce noise effects from existing traffic along the west side of US101 between Blossom Hill Road and SR 85. This measure would reduce community noise effects sufficient to offset the adverse noise effects with Alternative 4 in this community area.
    - The Authority would provide funding to the City of San Jose to construct three new pedestrian/bicycle overcrossings of Monterey Road and the railroad corridor at Skyway Drive, Branham Lane, and Chynoweth Avenue. While these measures would not avoid emergency response delays, they would enhance pedestrian and bicycle safety along Monterey Road and the railroad corridor in South San Jose, which in combination with the proposed direct mitigation and the project's benefits related to safety are together

considered sufficient to offset the emergency vehicle response delays with Alternative 4. As described in the Draft EIR/EIS, if the improvements included in proposed direct mitigation measure SS-MM#4 are implemented by the City of San Jose with the Authority's proposed funding, then adverse emergency response delays can be avoided.

Preliminary Conclusion

After consideration of direct mitigation, project benefits and potential community improvements, there would potentially remain disproportionately high and adverse effects with Alternatives 1, 2 and 3 due to the aerial viaduct. After consideration of direct mitigation, project benefits and potential community improvements, there would potentially be no disproportionately high and adverse effects with Alternative 4 in the South San Jose community area.



South San Jose Community Area

APPENDIX 5-B, ATTACHMENT D-3: COMMENTS SUBMITTED DURING SEPTEMBER 2021 OUTREACH PERIOD

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Department of Transportation
JOHN RISTOW, DIRECTOR

October 1, 2021

Boris Lipkin, Northern California Regional Director
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, CA 95814

SUBJECT: City Comments on HSR Environmental Justice Analysis and Potential Community Improvements

Dear Boris Lipkin,

On behalf of the City of San José (City), thank you for the opportunity to review and comment on the High-Speed Rail Authority's Environmental Justice analysis and conclusions for the California High-Speed Rail San José to Merced Project Section. The City looks forward to continued opportunities to partner with California High Speed Rail Authority (HSR Authority) to address the identified areas of concern, resolve the remaining issues, and collaborate in multi-agency initiatives to fully build out the stations, facilities, and infrastructure to deliver high-quality service and improved quality of life for residents along the corridor.

General Comments

The City's comments below are focused on the analysis, proposed community improvements, and conclusions for Alternative 4. The HSR Authority in 2019 identified Alternative 4 as the State's Preferred Alternative in its draft environmental analysis documents. As discussed in the August 20, 2019 City Council hearing, Alternatives 1, 2, and 3 have significant and unavoidable impacts which are significantly reduced or resolved in Alternative 4. Since late 2019, City staff have focused most of its work on Alternative 4. Therefore, we have not undertaken extensive analysis of the disproportionate impacts and proposed offsetting community improvements for Alternatives 1, 2, and 3. In the Final EIR the City asks that HSR Environmental Justice analysis revisit the impacts and proposed improvements in the Seven Trees neighborhood as part of the South San José community area.

The City concurs with the proposed noise insulation improvements for existing residents across all four community areas:

- SJD-IMP#2: Noise insulation for certain residential buildings adjacent to the west side of SR 87

- GWG-IMP# 2: Noise Insulation for certain Residential Buildings adjacent to the west side of SR 87
- WGTA-IMP#3: Noise insulation for certain residential buildings adjacent to the east side of SR 87
- SSJ-IMP#3: Noise insulation for up to 20 residential buildings along the west side of US 101

The City requests that the HSR Authority work with existing community organizations to outreach to the most disadvantaged residents in each community area and assist them in applying for and receiving noise insulation improvements.

The City reiterates its ask that the HSR Authority negotiate an agreement with the Peninsula Joint Powers Authority (Caltrain) to not sound horns when traveling through Diridon, Tamien, Capital, and Blossom Hill Caltrain stations. The HSR project is altering or rebuilding each of those stations and can add measures to the station/platforms that would allow trains to pass without blowing their horns. Avoiding the horn noise would significantly mitigate the disproportionately high and adverse effects from HSR operations in the San José Diridon, Gardner/North Willow Glen, Guadalupe/Washington, and South San José community areas.

The City believes that the above noise insulation improvements, when combined with an agreement with Caltrain, would substantially offset the disproportionately high and adverse noise impacts from HSR in the San José Diridon and Guadalupe/Washington community areas.

The disproportionate noise, traffic, and emergency response impacts examined in environmental justice analysis and the EIR do not include the cumulative impacts of future increases by HSR plus other rail operators. The City has taken the position that these can be fully mitigated only through the complete grade separation of the rail corridor through all four community areas. While the Diridon Integrated Station Concept (DISC) is not a part of the project described in the EIR, it is essential for fully resolving impacts in the Diridon and Gardner/North Willow Glen community areas. The City asks the HSR Authority, when adopting the San José to Merced project, to reaffirm its commitment to participate in, and contribute proportionately to, implementing the Diridon Integrated Station as a separate project.

Gardner/Willow Glen Community Area

The City asks HSR Authority to add the "Fuller Park/Fuller Avenue Recreational Amenities" to the HSR project. Neighborhood leaders, Caltrain, and City staff partnered to develop Fuller Park – taking underutilized rail right-of-way and transforming it into a park used by many members of this historically disadvantaged neighborhood, including low-income, minority, and other disadvantaged people. While impacts to Fuller Park have been found to be de minimis, the inclusion of Fuller Park/Fuller Avenue Recreational Amenities would offset community concerns, build trust, and align with commitments from the City and partners like High Speed Rail to ensure that visual conditions are no worse, and ideally are better than today, even as train volumes grow with improvements like High Speed Rail.

The Valley Transportation Authority is pursuing a sound wall project at Gardner Elementary. Coordinating the proposed improvement "GWG-IMP#1: Gardner Elementary Noise Insulation or Soundwalls" with the VTA project could lead to improved outcomes and/or lowered costs for both agencies.

South San José

The City continues to believe that full grade separation between rail and major intersections is the safest solution to address increased train traffic and speed, and also helps preserve quality of life and emergency vehicle access.

In its comment letter on the Draft EIR, the City asked the Authority to:

- Include grade separations at: Skyway Drive, Branham Lane, and Chynoweth Avenue in the project, or provide proportionate share contribution to that grade separation project as mitigation measure in the Final EIR.
- Begin inter-agency negotiations on an agreement on the proportionate share contributions of funding for construction of those grade separations with the City and other relevant state, regional and local agencies.

The City appreciates the investment in the South San José Community Area represented by the proposed community improvements: SSJ-IMP#2a, SSJ-IMP#2b, and SSJ-IMP#2c. The effectiveness of the proposed community improvements would be greatly improved by adding flexibility to potentially fold these improvements into full grade separations. The City asks the following language (from SS-MM#4) around in-lieu payments be add to the SSJ-IMP#2 improvements:

> As an alternative to these strategies, the Authority and a local agency may reach a mutual agreement to have the Authority make an in-lieu payment toward other infrastructure projects including nearby grade-separation projects. The in-lieu payment would be the capital contribution that the Authority would have otherwise made to one or more of the community improvements.

Again, the City continues to believe grade separations are the best way to address safety and quality of life, and that they would also offset the disproportionately high and adverse effects with Alternative 4 in the South San Jose community area.

Conclusion

In closing, we thank the HSR Authority for the opportunity to comment on the updated Environmental Justice analysis. The City is committed to the HSR program and our joint work through DISC as a full partner. We will make our staff available to work through the issues raised in this comment letter with HSR.

Sincerely,

Jessica Zenk

Jessica Zenk
Deputy Director
Department of Transportation
City of San José

CITY OF MORGAN HILL

DEVELOPMENT SERVICES CENTER

17575 Peak Avenue Morgan Hill CA 95037 (408) 778-6480 Fax (408) 779-7236
Website Address: www.morgan-hill.ca.gov

October 1, 2021

Boris Lipkin, Northern California Regional Director
Audrey Van, Deputy Project Manager of San Jose to Merced
California High Speed Rail Authority
100 Paseo De San Antonio, #206
San Jose, CA 95113

RE: CHSRA's Environmental Justice Analysis: San Jose to Merced (as of July 2021)

Dear Mr. Lipkin,

We would like to thank the Authority for the opportunity to review the proposed preliminary measures that would address adverse effects on minority populations or low-income populations within Morgan Hill. The Authority's documents identify nine (9) types of effects that may have impacts and analyzed those effects for each Alternative. The effects are ranked in level of significance from disproportionately high and adverse effects (DHAE) to potential effects not considered high or adverse. The Authority identified a DHAE for Operational Traffic effects for Alternative 4 but did not propose a measure to alleviate the adverse effect. This is a major concern for the City and we would like the Authority to consider our comments and proposed measures to assist in offsetting the adverse impacts discussed in the next few paragraphs.

CHSRA'S POTENTIAL EFFECTS PRESENTATION

Potential Community Improvements
In addition to the improvements proposed for each alternative shown on slide 17, the City previously discussed incorporation of infrastructure along the rail right-of-way that would provide "purple pipe" or recycled water opportunities to support water conservation. The City also discussed inclusion of telecommunication conduits to provide internet access to those within the mapped community of concern area. The city does not agree that the Alterative 4 proposed mitigation for *noise insulation for certain residences along 101 helps offset residual project noise effects* for the alignment within the UPRR right-of-way tracks.

Preliminary Conclusions in Morgan Hill
While the chart on slide 15 indicates Alternative 4 has DHAE level Operational Noise and Operational Traffic effects, slide 18 is contractionary in stating Alternative 4 does not have DHAE effects. The City agrees that there is a DHAE effect related to Operational Noise and Operational

Traffic effects and is concerned that the Authority has not addressed the adverse Operational Traffic effects. Alternative 4 is located within the sphere of the community of concern and without grade separations will have safety implications such as impacts to emergency response times caused by traffic delay or road closures. Alternative 4 requires modifications to the Caltrain Station access and replacement of the pedestrian at grade crossing to a pedestrian underpass. We request the Authority work with the City, VTA, and Caltrain on the preparation of a master plan for the Morgan Hill train station access and pedestrian underpass in addition to providing grade separations at Tilton Avenue, East Dunne Avenue, and Tennant Avenue if Alterative 4 is selected for implementation. **In an effort to alleviate the disproportionately high and adverse effects (DHAE) to Operational Traffic effects on Alternative 4, the City is proposing NEPA Environmental Justice Analysis include a measure for funding a 30% design for a master plan of the pedestrian underpass and train station and grade separations at Tilton Avenue, East Dunne Avenue, and Tennant Avenue.**

We would like to thank you for your consideration of these comments and concerns. We appreciate the HSR staff's willingness to clarify the project design and objectives, and to discuss and resolve issues to achieve a project that completes the HSR Authority's mandate while minimizing impacts on the communities that will have to co-exist with the operating rail system long-term.

Sincerely,

Christina Turner
City Manager
City of Morgan Hill

cc: City Attorney
Mayor
City Council

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Dr. Deborah A. Flores, Ph.D.

BOARD OF EDUCATION
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James E. Pace ◈ Linda Piceno ◈Jaime Rosso

February 7, 2018

Mr. Dan Richard, Board Chair
Board of Directors
California High-Speed Rail Authority
770 L Street, Suite 620
Sacramento, CA 95814
(916) 324-1541

Re: Gilroy Unified School District's Urgent Request for Feasibility Study & Acquisition Planning

Dear Mr. Richard:

The purpose of this letter is to bring to your attention the impact that the High-Speed Rail project in Gilroy will have on Gilroy Unified School District facilities. We have met with representatives of the HSR for about 5 years. Despite these meetings and direct communications, it appears that very little, if any, planning has been undertaken to mitigate the impact that the HSR will have on both educational and operational facilities in our school district.

The District has provided to your representative (Ben Tripousis) the attached study outlining the impacted facilities:

a. South Valley Middle School – (6-8 campus, serves 883 students)
b. Gilroy Navigator Charter School (K-8 campus serves 540 students)
c. Transportation Department - bus yard, mechanic shop, department offices
d. Maintenance & Operations – truck & heavy equipment yard
e. Facility Department- department office space

Based on Hexagon's study, and several meetings with HSR representatives – there is agreement that the Gilroy Navigator Charter School will be impacted and will need to be relocated to another piece of property somewhere in Gilroy. The process to identify a suitable location to build a school is lengthy. It involves approvals from the California Department of Education (CDE), the Department of Toxic and Substances Control (DTSC), Division of the State Architects (DSA), and the City of Gilroy, and an array of related work from consultants needing our own Governing Board approval. Typically, it takes 5 years to build a school – once the site has been identified and acquired. We know this process well, as it took our Governing Board two (2) years to identify and acquire title to a suitable location to build a new elementary site in Gilroy.

Another challenge we face, is the City of Gilroy has a local Urban Boundary Ordinance in place, which effectively controls the area in the City that can be developed. Furthermore, there is a very

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limited supply of land in Gilroy, and the HSR Authority may need to pursue imminent domain provisions to secure a site for our charter school. Additionally, our operational facilities - Maintenance, Transportation, and Facilities Departments - will all need to be moved to another location.

In short, the contents of this letter have been discussed with HSR representatives many times. We appreciate that HSR representatives have attended our Board meetings and Facility Sub Committee meetings. During these meetings, we have expressed our level of concern at the lack of planning. It is exceedingly clear that the HSR's Right-Away division needs to find potential solutions to relocate our charter school and impacted operational facilities soon.

The HSR can wait until the Final Determination is made on the alignment – but this clearly means that the stated timeline on ridership **will not** be achieved. The Gilroy Unified School District's Governing Board fully intends to seek any and all available remedies and mitigation, as provided by law, to protect its schools as well as its operational needs.

Your urgent attention to this important matter is requested. Thank you for your time.

Sincerely,

Deborah A. Flores

Dr. Deborah A. Flores, Ph.D.
Superintendent

cc: GUSD Board Members

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Dr. Deborah A. Flores, Ph.D.

BOARD OF EDUCATION
Melissa Aguirre Enrique Diaz Tuyen Fiack Mark Good
Michelle Nelson James E. Pace Linda Piceno

Thursday, September 30, 2021

Re: GUSD Feedback on the Potential Community Improvements & Site-Specific Traffic Measures with regard to the San Jose to Merced Project Section.

The Gilroy Unified School District (GUSD) would like to thank the High-Speed Rail Authority, and its representatives for keeping the District thoroughly informed of the San Jose to Merced Project Section, and the draft EIR/EIS as it moves through the approval process. The magnitude of the documents can be challenging to digest, but the HSR representatives have clearly been approachable and have met virtually with GUSD administrators to review the Potential Community Improvements, as well as highlighting the important considerations around Environmental Justice Analysis. This letter serves as GUSD's feedback on its prioritized improvements with the focus on the community and the students it serves.

- Overarching Recommendation: The District understands that the HSR Authority's "Preferred Alternative" is **Alternative 4. GUSD supports the Alternative 4 alignment of the San Jose to Merced Section above other possible alignments (1, 2, or 3).** GUSD is utterly opposed to Alternative 2, as it would have devastating impacts to District facilities, as outlined by the February 7, 2018 letter that was sent to the Authority (also attached).

The following comments represent GUSD's interest in seeing that the project, with Alternative 4 in mind, do not negatively impact the East Gilroy Community disproportionately, or have adverse effects on its community. Specifically, GUSD has 3 school campuses (Gilroy High School, South Valley Middle School, and its Navigator Charter School) that will be impacted by the HSR project and hereby conveys its feedback on the project segment.

Feedback on Potential Community Improvements

G-IMP#5: IOOF Bicycle/Pedestrian Overcrossing and Complete Streets

The South Valley Middle School campus serves about 765 students. Approximately 520 of these students fall under the economically disadvantaged category (68%). Gilroy High School (GHS) serves about 1,693 students, and approximately 1,095 of these students are low income students. The Navigator Charter School is closest to the railroad tracks and serves another 540 students. Combined, nearly 3,000 students are served between these three schools. In the view of GUSD, this project will absolutely impact the most disadvantaged community in Gilroy. **Disproportionally having adverse effects that require a proper mitigation.** Simply put, the proposed installation of quad gates at key, highly used intersections are not enough to offset the project's adverse effects.

- **GUSD prioritizes the bicycle/pedestrian overcrossing as its top priority at the location of IOOF.** Please see the attached Exhibit A, which is a plot of all current South Valley and GHS

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students. You will note the proximity to the high-speed rail project and this intersection of Monterey and IOOF. Each 'dot' on the map represents a student(s) residence. The livelihood of this community and of these students will change with high-speed rail. Ultimately, it is the mitigation factors that will determine if the change will be a positive one.

TR MM-G#1: Monterey Road/IOOF Avenue – Widen and Reconfigure Southbound

- The District supports this traffic mitigation measure. Combined with G-IMP#5 listed above, adding a turning left Southbound IOOF Avenue along with a bicycle/pedestrian overpass would be an appropriate mitigation, given the number of students and low-income community that travel this key intersection to get to our schools.

G-IMP#2: Bikeway Improvements (IOOF Ave., Monterey Road, 6th Street, 4th Street, Alexander Street)

- The District supports this community improvement. It is directly reflective in our collective efforts to create a safe walk/bike to school for our needy community in East Gilroy. Creating a safe way for kids to bike or walk to school is a direct benefit to this underserved community.

G-IMP#7: South Valley Middle School Recreational Amenities

- Alternative 2 has a disproportionally high and adverse effect on the Gilroy Unified School District. It impacts the Navigator School, South Valley, and potentially, the Maintenance Operations Yard as well as its Facilities Department and State Preschool (Swanston Ln). GUSD's concerns are documented and shared via the attached letter dated February 7, 2018.

TR-MM-G#4: Install Traffic Signal at the School Access/IOOF Avenue Intersection

A simple traffic light signal is not a proper mitigation given the disproportion impact the project has on this location. It is our understanding that not all high-speed railroad trains will stop in Gilroy. The express trains may bypass the IOOF intersection traveling at a "reduced speed" of 100 miles per hour. With Navigator Schools and South Valley Middle School within 1,200 feet of these tracks, it is imperative that the Bicycle/Pedestrian Overcrossing (G-IMP#5) improvement is actually built, offering a safe overcrossing for our community and our young students.

Residential Displacements

- The residential displacements under Alternative 2 is definitely classified as having the "potential disproportionately high and adverse effects (DHAE) to the South Valley Middle School Community and our Navigator Campus. There is no available adjacent land to relocate part of the field that the Navigator campus would lose under Alternative 2. To maintain the cohesiveness of the campus, it would require the High-Speed Rail Authority to use imminent domain on residential areas surrounding Swanston Lane and Forrest Street.

This complexity would obviously be costly and have a direct impact on GUSD's Navigator School and GUSD's obligations to provide "equitable facilities" for its charter school campus. Furthermore, Alternative 2 may also impact the location of the Transportation Department, and the Maintenance & Operations Yard, and its Facilities Department; all which support the day-to day operations of the

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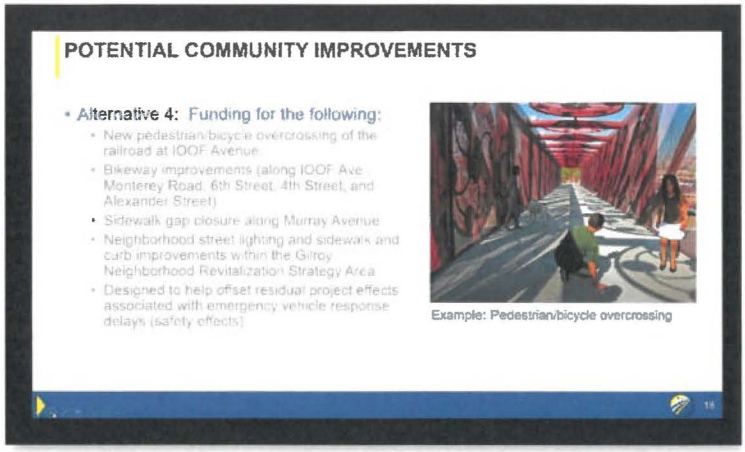
entire district and its fifteen (15) schools. For this reason, the Alternative 4 alignment is strongly preferred by GUSD.



Ultimately, GUSD strongly urges the Authority to fund ***all*** these Potential Community Improvements noted during a community outreach meeting on Tuesday, September 28, 2021. We understand these are "potential" mitigations but based upon our view, the disproportional and direct impact on the lowest income, mostly minority population in Gilroy indeed require ALL these improvements to be funded in order to properly mitigate the impact of Alternative 4 on this disadvantaged community. The pedestrian bridge depicted to the right, may be the one located on Blossom and Santa Teresa. The IOOF and Monterey Pedestrian Bridge "ornamental design" elements could be developed as part of a community/student art contest that could be incorporated into the final design of the pedestrian bridge, pending constructability. This would bring a sense of ownership and pride to our community.

GUSD submits this letter as its formal response providing feedback to the Potential Community improvements with respect to the San Jose to Merced project segment.

Respectfully yours,

Álvaro Meza
Assistant Superintendent, Business Services/C.B.O.
Gilroy Unified School District

cc:
Dr. Deborah A. Flores, Ph.D., Superintendent
Greg Kapaku, Principal, Gilroy High School
Guillermo Ramos, Principal, South Valley Middle School
Kevin Sved, CEO, Navigator Schools

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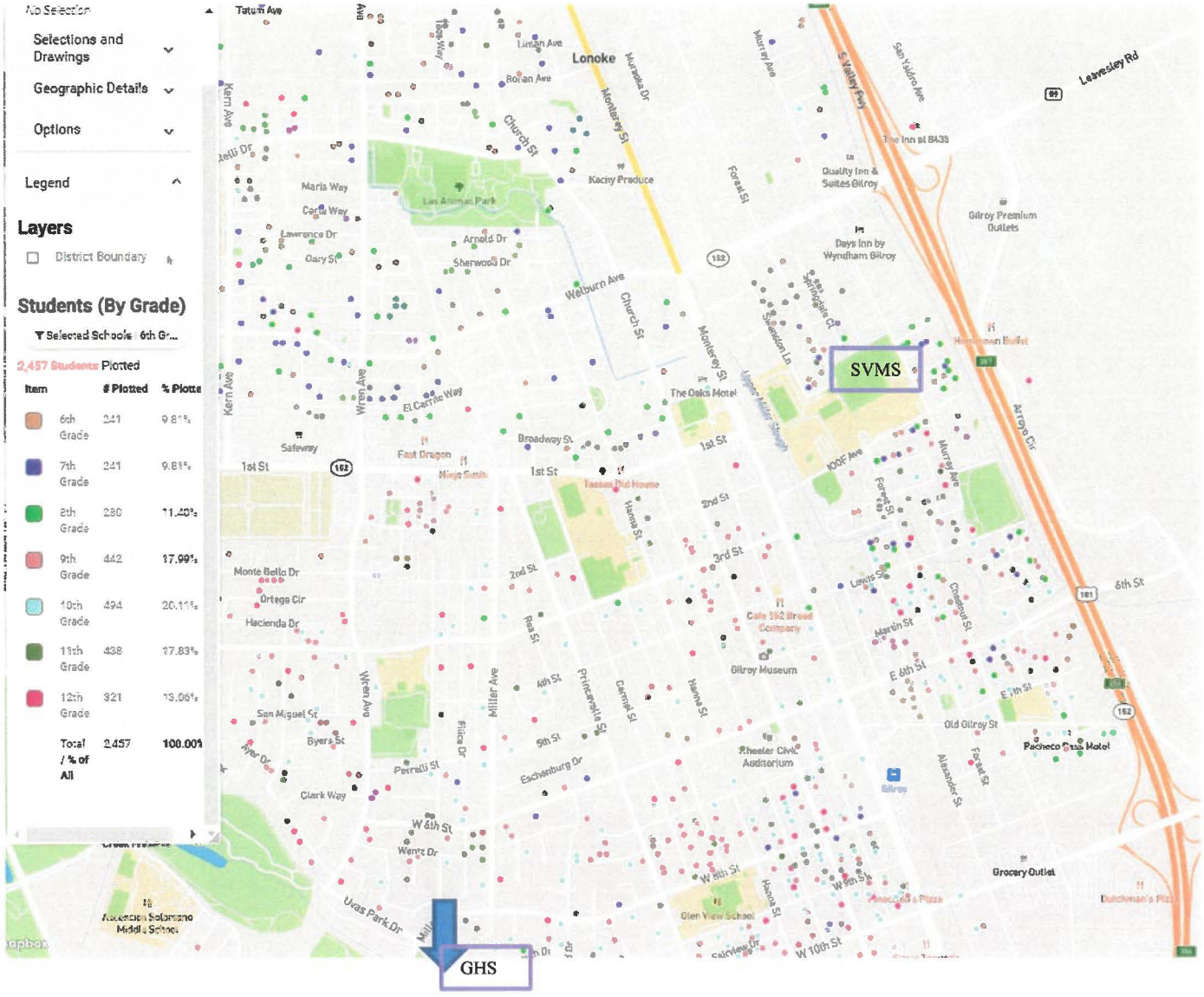
EXHIBIT A
Plot of Gilroy High and South Valley Middle School Students

(Excludes Charter Navigator School's 540 students, and excludes students currently on Virtual Learning Academy for both GHS and South Valley)



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Anisha Munshi◈ James E. Pace ◈ Linda Piceno

July 12, 2019

Mr. Lenny Mendonca, Board Chair
Board of Directors
California High Speed-Rail Authority
770 L Street, Suite 620
Sacramento, CA 95814

Re: **Support of Staff-Recommended Preferred Alternative 4,**
San Jose to Merced Project Section
With the addition of a Pedestrian Bridge at IOOF and Monterey Street

Dear Mr. Mendonca:

The purpose of this letter is to state our conditional support for the High Speed Rail (HSR) staff's recommendation of the Preferred Alternative 4 for the San Jose to Merced Project section. The Alternative 4 at-grade alignment through downtown Gilroy would minimize the impact of HSR on the District's educational facilities. However, we urge you to consider safety elements at the intersection of IOOF and Monterey Streets in Gilroy, which are detailed below.

When the HSR reaches its target ridership, it is estimated that it will have up to eight (8) trains running per hour, in each direction. The HSR Authority must adequately address the safety of seven (7) pedestrian crossings through Gilroy. However, we are particularly concerned about the intersection of IOOF & Monterey Streets. We understand that quad-gates have been proposed for this intersection. Within 1,500 feet of this intersection, there are a number of buildings that house youth: South Valley Middle School serves about 900 middle school students, many of whom are our most socially and economically disadvantaged; Gilroy Prep School (GPS) which is a charter school that serves about 540 charter school students; and Rebekah Children's Services Campus that serves youth with social, emotional, behavioral and mental health needs. While we favor the Preferred Alternative 4 option, we believe the proposed quad-gates for pedestrians would not adequately protect the many students and families who will cross this intersection daily as trains pass through at 110 mph. We fear there could be a terrible accident, injuring or killing students as they cross this intersection coming to and going from school.

We urge you to include a pedestrian bridge crossing over the rail lines at the IOOF and Monterey Street intersection. We also request that you study other traffic mitigation measures such as traffic lights, and sound mitigation and fencing for GPS, which is located immediately adjacent to the tracks. These measures will help ensure pedestrian safety and help prevent injuries and fatalities.

Lastly, we want to commend the HSR staff and consultants that have interacted with Gilroy Unified School District, specifically Mr. Boris Lipkin, Northern California Regional Director, and Mr. Gary Kennerley, Engineering Manager at WSP. They have engaged our community openly, met with our representatives multiple times, and kept us informed.

Thank you for your time. Your assistance in this matter is greatly appreciated.

Sincerely,

Deborah A. Flores

Dr. Deborah A. Flores, Ph.D.
Superintendent

cc: GUSD Board of Trustees

APPENDIX 5-B, ATTACHMENT D-4: SURVEY RESULTS AND SURVEY FORMS SUBMITTED

CALIFORNIA
High-Speed Rail Authority

California High-Speed Rail San Jose to Merced: Environmental Justice Survey

EN ESPAÑOL/IN SPANISH: Haga clic aquí para completar la encuesta en Español
TIẾNG VIỆT/IN VIETNAMESE: Nhấn vào đây để hoàn thành khảo sát bằng tiếng Việt

This survey is a tool to gather community feedback on the Environmental Justice (EJ) analysis and conclusions for the California High-Speed Rail San Jose to Merced Project Section.

The deadline to complete this survey is October 1, 2021.

The California High-Speed Rail Authority (Authority) has scheduled community-specific meetings in September 2021 to update implementing partners, community organizations, and stakeholders on the EJ analysis. This analysis is being conducted as part of the San Jose to Merced Project Section Environmental Impact Report/Environmental Impact Statement (EIR/EIS).

Your feedback is important. The survey questions address community-specific informational materials shared with you via a website link. If you did not receive the information, please contact our outreach staff below. We recommend completing this survey on a computer so you can refer to the materials.

Materials List

1. **Glossary of Key Terms**
2. **Summary of Updates to the EIR/EIS Environmental Justice Analysis**
3. **Environmental Justice Analysis Process Summary and Graphic**
4. **Environmental Justice Community Summary**
   - **Summary**
   - **Community Improvements**

For some communities, other materials about proposed mitigations may also be included.

In the community-specific meetings, we will review information about the analysis and potential improvements, and answer questions. You may also reach out with any questions and/or comments to the contacts listed below.

Your input is valued and essential to the Authority. We look forward to hearing from you.

Questions?
Contact Information:

Rickie Cleere at rcleere@kearnswest.com | p: (415) 508-4164
CeCe Horbat chorbat@kearnswest.com | p: (415) 674-5572

* 1. Please select which community you represent. Select all that apply.

- [ ] San Jose Diridon
- [ ] S. San Jose
- [ ] Morgan Hill
- [ ] Gilroy
- [ ] City of Santa Clara
- [ ] Gardner/Willow Glen
- [ ] Guadalupe/Washington/Tamien/Alma/Almaden
- [ ] San Joaquin Valley/Los Banos
- [ ] I represent an agency

If you represent an agency, identify the agency where you work:

2. Are you completing this survey based on your personal opinion or as a representative?

- ( ) My opinion
- ( ) Representative of a group or organization (List group or organization)

3. How concerned are you about the following potential high-speed rail effects on your community?

[See: **4. Environmental Justice Community Summary:** *Summary of Potential Effects*]

Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

	1 Not concerned	2 Slightly concerned	3 Somewhat concerned	4 Moderately concerned	5 Very concerned
Traffic delay during construction	○	○	○	○	○
Bus transit delay during construction	○	○	○	○	○
Traffic delays during operations	○	○	○	○	○
Visual aesthetics	○	○	○	○	○
Residential displacements	○	○	○	○	○
Commercial displacements	○	○	○	○	○
Emergency vehicle response time delays	○	○	○	○	○
Noise during operations	○	○	○	○	○
Partial acquisitioning of park/play areas	○	○	○	○	○

If other effects not listed above are concerns, please describe them and rate them on a 1-5 scale (with 1 being not concerned and 5 being very concerned)

CALIFORNIA High-Speed Rail Authority

California High-Speed Rail San Jose to Merced: Environmental Justice Survey

4. Which of the following best describes your opinion about the statement below:

Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.

[See **4C: Environmental Justice Community Summary:** *Traffic Mitigation Measures*]

- ○ Strongly disagree
- ○ Disagree
- ○ Neither agree nor disagree
- ○ Agree
- ○ Strongly agree

Please explain

CALIFORNIA
High-Speed Rail Authority

California High-Speed Rail San Jose to Merced: Environmental Justice Survey

5. Do you agree with the conclusions about disproportionately high and adverse effects **after direct mitigation only**?

[See: **4. Environmental Justice Community Summary:** *Preliminary Conclusions*]

- ○ Strongly agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

6. What **benefits** of the high-speed rail project would help your community the most?

Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

	1 Not beneficial	2 Slightly beneficial	3 Somewhat beneficial	4 Moderately beneficial	5 Very Beneficial	N/A or don't know
California travel by high-speed train	○	○	○	○	○	○
Access to jobs, goods, and services	○	○	○	○	○	○
Integration with local transit connections	○	○	○	○	○	○
Reduction of highway traffic	○	○	○	○	○	○
Upgrades to railroad safety and signaling systems	○	○	○	○	○	○
Reduced need for airport and highway expansion	○	○	○	○	○	○
Reduced air pollution	○	○	○	○	○	○
Reduced greenhouse gas emissions	○	○	○	○	○	○
Construction spending and employment	○	○	○	○	○	○
Operational spending and employment	○	○	○	○	○	○
Support for transit-oriented development near stations	○	○	○	○	○	○

Comments

7. When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

- ○ Definitely ride
- ○ Probably ride
- ○ Maybe ride
- ○ Don't know

Why or why not?

8. Do you agree with the conclusions about disproportionately high and adverse effects **after consideration of direct mitigation, project benefits and potential community improvements**?

[See: **4. Environmental Justice Community Summary**]

- ○ Strongly agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

Please explain

9. Would you propose different community improvements from the list of potential community improvements?

If yes,

Describe a different improvement

Describe why you propose this improvement

Describe how your proposed improvement(s) would better address concerns in your community

10. Please provide any other input you may have.

11. What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

12. How helpful is this survey tool for providing your feedback?

- ○ Very helpful
- ○ Somewhat helpful
- ○ Not very helpful
- ○ Not at all helpful
- ○ Not applicable/not sure

Please provide any suggestions you would have for improving such surveys in the future:

CALIFORNIA
High-Speed Rail Authority

California High-Speed Rail San Jose to Merced: Environmental Justice Survey

Personal Information

13. Are you of Hispanic, Latino, or Spanish origin?

- ○ Yes
- ○ No

14. What is your race or ethnic identification? [Check one or more]

- ☐ White
- ☐ Black/African American
- ☐ Asian or Pacific Islander
- ☐ American Indian or Alaska Native
- ☐ Other (please specify)

15. What is your total household income before taxes?

- ◯ Under $25,000
- ◯ Between $25,000 and $29,999
- ◯ Between $30,000 and $39,999
- ◯ Between $40,000 and $49,999
- ◯ Between $50,000 and $59,999
- ◯ Between $60,000 and $69,999
- ◯ Between $70,000 and $74,999
- ◯ $75,000 and Over
- ◯ Not applicable
- ◯ Prefer not to answer

16. Including yourself, how many people live in your household?

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5
- ◯ 6 or more

#3

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, September 13, 2021 5:42:23 PM
Last Modified:	Monday, September 13, 2021 5:52:20 PM
Time Spent:	00:09:56
IP Address:	165.225.242.108

Page 1

Q1

Please select which community you represent. Select all that apply.

Guadalupe/Washington/Tamien/Alma/Almaden,

If you represent an agency, identify the agency where you work::

NA

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**4 Moderately concerned**
Bus transit delay during construction	**3 Somewhat concerned**
Traffic delays during operations	**4 Moderately concerned**
Visual aesthetics	**5 Very concerned**
Residential displacements	**1 Not concerned**
Commercial displacements	**1 Not concerned**
Emergency vehicle response time delays	**3 Somewhat concerned**
Noise during operations	**5 Very concerned**
Partial acquisitioning of park/play areas	**1 Not concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Respondent skipped this question

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**4 Moderately beneficial**
Access to jobs, goods, and services	**3 Somewhat beneficial**
Integration with local transit connections	**3 Somewhat beneficial**
Reduction of highway traffic	**3 Somewhat beneficial**
Upgrades to railroad safety and signaling systems	**2 Slightly beneficial**
Reduced need for airport and highway expansion	**2 Slightly beneficial**
Reduced air pollution	**2 Slightly beneficial**
Reduced greenhouse gas emissions	**2 Slightly beneficial**
Construction spending and employment	**3 Somewhat beneficial**
Operational spending and employment	**3 Somewhat beneficial**
Support for transit-oriented development near stations	**2 Slightly beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Maybe ride

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Neither agree nor disagree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**Murals**
Describe why you propose this improvement	**Sound and blank walls will lead to graffiti/gang graffiti**
Describe how your proposed improvement(s) would better address concerns in your community	**Murals on blank walls reduce the potential for vandalism. Blank walls are otherwise a canvass for local gangs**

Q10

Please provide any other input you may have.

Guadalupe Washington is a gang hot spot in SJ, classified as such by the City government. Any blank walls (without murals) will get vandalized. Please consider paying for wall art by LOCAL muralists. I emphasize local because the mural also needs to be respected by the residents and gangs so it doesn't get vandalized.

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Any wall art adopted for new walls added should be produced by local artists, so it is representative and meaningful to the neighborhood. If it is not respected or adopted by the locals (including local gangs), it will get vandalized.

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Yes

Q14

What is your race or ethnic identification? [Check one or more]

Other (please specify):

NA

Q15

What is your total household income before taxes?

Prefer not to answer

Q16	4
Including yourself, how many people live in your household?	

#6

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, September 20, 2021 10:50:10 AM
Last Modified:	Monday, September 20, 2021 10:52:06 AM
Time Spent:	00:01:56
IP Address:	107.129.165.140

Page 1

Q1

Please select which community you represent. Select all that apply.

Gardner/Willow Glen

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**4 Moderately concerned**
Bus transit delay during construction	**3 Somewhat concerned**
Traffic delays during operations	**3 Somewhat concerned**
Visual aesthetics	**2 Slightly concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**3 Somewhat concerned**
Noise during operations	**3 Somewhat concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**

Page 2

Q4

Respondent skipped this question

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Page 3

Q5

Respondent skipped this question

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Q6

Respondent skipped this question

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

Q7

Respondent skipped this question

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Q8

Respondent skipped this question

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Q9

Respondent skipped this question

Would you propose different community improvements from the list of potential community improvements? If yes,

Q10

Respondent skipped this question

Please provide any other input you may have.

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Respondent skipped this question

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Respondent skipped this question

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#8

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, September 03, 2021 9:58:53 AM
Last Modified:	Thursday, September 23, 2021 11:16:35 AM
Time Spent:	Over a week
IP Address:	67.188.24.37

Page 1

Q1

Please select which community you represent. Select all that apply.

San Jose Diridon

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**2 Slightly concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Respondent skipped this question

Q6

Respondent skipped this question

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

Q7

Respondent skipped this question

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Q8

Respondent skipped this question

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Q9

Respondent skipped this question

Would you propose different community improvements from the list of potential community improvements? If yes,

Q10

Respondent skipped this question

Please provide any other input you may have.

Q11

Respondent skipped this question

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Q12

Respondent skipped this question

How helpful is this survey tool for providing your feedback?

Page 4: Personal Information

Q13

Respondent skipped this question

Are you of Hispanic, Latino, or Spanish origin?

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#12

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, September 28, 2021 3:31:59 PM
Last Modified:	Tuesday, September 28, 2021 3:35:58 PM
Time Spent:	00:03:59
IP Address:	73.70.155.239

Page 1

Q1

Please select which community you represent. Select all that apply.

San Jose Diridon

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**4 Moderately concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**4 Moderately concerned**
Partial acquisitioning of park/play areas	**4 Moderately concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Agree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**5 Very Beneficial**
Reduction of highway traffic	**5 Very Beneficial**
Upgrades to railroad safety and signaling systems	**5 Very Beneficial**
Reduced need for airport and highway expansion	**5 Very Beneficial**
Reduced air pollution	**5 Very Beneficial**
Reduced greenhouse gas emissions	**5 Very Beneficial**
Construction spending and employment	**4 Moderately beneficial**
Operational spending and employment	**5 Very Beneficial**
Support for transit-oriented development near stations	**5 Very Beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Definitely ride

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Agree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Very helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Yes

Q14

What is your race or ethnic identification? [Check one or more]

Other (please specify):

mexican american

Q15

What is your total household income before taxes?

Between $70,000 and $74,999

Q16

Including yourself, how many people live in your household?

2

#25

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 4:10:22 PM
Last Modified:	Friday, October 01, 2021 4:18:08 PM
Time Spent:	00:07:46
IP Address:	104.53.221.126

Page 1

Q1

Please select which community you represent. Select all that apply.

Guadalupe/Washington/Tamien/Alma/Almaden

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**4 Moderately concerned**
Residential displacements	**2 Slightly concerned**
Commercial displacements	**5 Very concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**4 Moderately concerned**
Partial acquisitioning of park/play areas	**4 Moderately concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Respondent skipped this question

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**N/A or don't know**
Reduction of highway traffic	**N/A or don't know**
Upgrades to railroad safety and signaling systems	**N/A or don't know**
Reduced need for airport and highway expansion	**N/A or don't know**
Reduced air pollution	**N/A or don't know**
Reduced greenhouse gas emissions	**N/A or don't know**
Construction spending and employment	**N/A or don't know**
Operational spending and employment	**N/A or don't know**
Support for transit-oriented development near stations	**N/A or don't know**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Probably ride,
Why or why not?:
To better understand the ease of its use

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Neither agree nor disagree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**Just to reiterate a clean & safe area surrounding HSR stations and pathways. Along with the absolute lowest possible noise restriction associated with HSR in general.**
Describe why you propose this improvement	**To keep our communities safe and residents unaffected by HSR presence nearby.**

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

It would have been nice for this project to have been completed already but understand that there is a process that takes time. As our neighborhood undergoes gentrification it would be nice to know that residents that have needed to leave the area could continue to access place of employment from other areas connected to HSR.

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Yes

Q14

What is your race or ethnic identification? [Check one or more]

White

Q15

What is your total household income before taxes?

Between $50,000 and $59,999

Q16

Including yourself, how many people live in your household?

2

#2

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, September 08, 2021 2:39:05 PM
Last Modified:	Wednesday, September 08, 2021 4:07:55 PM
Time Spent:	01:28:49
IP Address:	206.78.148.251

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

Los Banos USD

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**3 Somewhat concerned**
Residential displacements	**3 Somewhat concerned**
Commercial displacements	**3 Somewhat concerned**
Emergency vehicle response time delays	**3 Somewhat concerned**
Noise during operations	**5 Very concerned**
Partial acquisitioning of park/play areas	**2 Slightly concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Strongly disagree,

Please explain:

Trains won't reduce traffic, but increase

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**3 Somewhat beneficial**
Access to jobs, goods, and services	**3 Somewhat beneficial**
Integration with local transit connections	**3 Somewhat beneficial**
Reduction of highway traffic	**3 Somewhat beneficial**
Upgrades to railroad safety and signaling systems	**N/A or don't know**
Reduced need for airport and highway expansion	**3 Somewhat beneficial**
Reduced air pollution	**5 Very Beneficial**
Reduced greenhouse gas emissions	**5 Very Beneficial**
Construction spending and employment	**N/A or don't know**
Operational spending and employment	**N/A or don't know**
Support for transit-oriented development near stations	**5 Very Beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Why or why not?:

No, I prefer driving

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Agree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Yes

Q14

What is your race or ethnic identification? [Check one or more]

White

Q15

What is your total household income before taxes?

$75,000 and Over

Q16

Including yourself, how many people live in your household?

4

#5

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 17, 2021 2:01:48 PM
Last Modified: Friday, September 17, 2021 2:04:24 PM
Time Spent: 00:02:36
IP Address: 206.213.170.21

Page 1

Q1

Please select which community you represent. Select all that apply.

S. San Jose

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
Oak Grove School District

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**3 Somewhat concerned**
Bus transit delay during construction	**2 Slightly concerned**
Traffic delays during operations	**2 Slightly concerned**
Visual aesthetics	**2 Slightly concerned**
Residential displacements	**2 Slightly concerned**
Commercial displacements	**1 Not concerned**
Emergency vehicle response time delays	**3 Somewhat concerned**
Noise during operations	**2 Slightly concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Neither agree nor disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Respondent skipped this question

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

Respondent skipped this question

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Respondent skipped this question

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Respondent skipped this question

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Respondent skipped this question

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Respondent skipped this question

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#7

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, September 21, 2021 9:03:21 AM
Last Modified: Tuesday, September 21, 2021 9:07:20 AM
Time Spent: 00:03:59
IP Address: 205.155.154.1

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

San Jose City College

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**2 Slightly concerned**
Bus transit delay during construction	**2 Slightly concerned**
Traffic delays during operations	**3 Somewhat concerned**
Visual aesthetics	**2 Slightly concerned**
Residential displacements	**3 Somewhat concerned**
Commercial displacements	**2 Slightly concerned**
Emergency vehicle response time delays	**2 Slightly concerned**
Noise during operations	**3 Somewhat concerned**
Partial acquisitioning of park/play areas	**2 Slightly concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Respondent skipped this question

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Respondent skipped this question

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

Respondent skipped this question

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Respondent skipped this question

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Respondent skipped this question

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Respondent skipped this question

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Respondent skipped this question

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#10

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, September 24, 2021 10:57:16 AM
Last Modified:	Friday, September 24, 2021 11:01:27 AM
Time Spent:	00:04:11
IP Address:	68.113.57.210

Page 1

Q1

Please select which community you represent. Select all that apply.

Gilroy,

If you represent an agency, identify the agency where you work::

Rebekah Children's Services

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
Rebekah Children's Services

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**5 Very concerned**
Residential displacements	**4 Moderately concerned**
Commercial displacements	**3 Somewhat concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**5 Very concerned**
Partial acquisitioning of park/play areas	**5 Very concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Neither agree nor disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**5 Very Beneficial**
Reduction of highway traffic	**3 Somewhat beneficial**
Upgrades to railroad safety and signaling systems	**4 Moderately beneficial**
Reduced need for airport and highway expansion	**3 Somewhat beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**5 Very Beneficial**
Operational spending and employment	**4 Moderately beneficial**
Support for transit-oriented development near stations	**3 Somewhat beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Probably ride

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Disagree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

White

Q15

What is your total household income before taxes?

Prefer not to answer

Q16

Including yourself, how many people live in your household?

4

#11

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, September 24, 2021 10:57:16 AM
Last Modified:	Friday, September 24, 2021 11:01:27 AM
Time Spent:	00:04:11
IP Address:	68.113.57.210

Page 1

Q1

Please select which community you represent. Select all that apply.

Gilroy,

If you represent an agency, identify the agency where you work::

Rebekah Children's Services

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
Rebekah Children's Services

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**5 Very concerned**
Residential displacements	**4 Moderately concerned**
Commercial displacements	**3 Somewhat concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**5 Very concerned**
Partial acquisitioning of park/play areas	**5 Very concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Neither agree nor disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**5 Very Beneficial**
Reduction of highway traffic	**3 Somewhat beneficial**
Upgrades to railroad safety and signaling systems	**4 Moderately beneficial**
Reduced need for airport and highway expansion	**3 Somewhat beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**5 Very Beneficial**
Operational spending and employment	**4 Moderately beneficial**
Support for transit-oriented development near stations	**3 Somewhat beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Probably ride

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Disagree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

White

Q15

What is your total household income before taxes?

Prefer not to answer

Q16

Including yourself, how many people live in your household?

4

#13

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, September 28, 2021 1:18:03 PM
Last Modified:	Tuesday, September 28, 2021 1:19:20 PM
Time Spent:	00:01:17
IP Address:	71.80.229.224

Page 1

Q1

Please select which community you represent. Select all that apply.

Guadalupe/Washington/Tamien/Alma/Almaden,

If you represent an agency, identify the agency where you work::

Center for Employment Training (CET)

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
CET

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**4 Moderately concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**4 Moderately concerned**
Visual aesthetics	**3 Somewhat concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**4 Moderately concerned**
Noise during operations	**3 Somewhat concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Respondent skipped this question

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Respondent skipped this question

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

Respondent skipped this question

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Respondent skipped this question

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Respondent skipped this question

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Respondent skipped this question

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Respondent skipped this question

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#14

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, September 28, 2021 1:18:03 PM
Last Modified:	Thursday, September 30, 2021 9:13:18 AM
Time Spent:	Over a day
IP Address:	71.80.229.224

Page 1

Q1

Please select which community you represent. Select all that apply.

Guadalupe/Washington/Tamien/Alma/Almaden,

If you represent an agency, identify the agency where you work::

Center for Employment Training (CET)

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
CET

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**4 Moderately concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**4 Moderately concerned**
Visual aesthetics	**3 Somewhat concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**4 Moderately concerned**
Noise during operations	**3 Somewhat concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Respondent skipped this question

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Agree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**4 Moderately beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**4 Moderately beneficial**
Reduction of highway traffic	**4 Moderately beneficial**
Upgrades to railroad safety and signaling systems	**3 Somewhat beneficial**
Reduced need for airport and highway expansion	**3 Somewhat beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**5 Very Beneficial**
Operational spending and employment	**5 Very Beneficial**
Support for transit-oriented development near stations	**4 Moderately beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Definitely ride

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Agree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**We propose that local nonprofits and community serving agencies partner with the authority in filling the construction and operations jobs that this project will create.**
Describe why you propose this improvement	**This would support the economic development of the local community and increase support for the project.**

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Very helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Yes

Q14

What is your race or ethnic identification? [Check one or more]

American Indian or Alaska Native

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#15

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, September 30, 2021 1:00:37 PM
Last Modified:	Thursday, September 30, 2021 1:03:07 PM
Time Spent:	00:02:30
IP Address:	68.189.30.232

Page 1

Q1

Please select which community you represent. Select all that apply.

Gilroy,

If you represent an agency, identify the agency where you work::

GILROY UNIFIED SCHOOL DISTRICT

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
GILROY UNIFIED SCHOOL DISTRICT

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**4 Moderately concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**5 Very concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**3 Somewhat concerned**
Partial acquisitioning of park/play areas	**5 Very concerned**
If other effects not listed above are concerns, please describe them and rate them on a 1-5 scale (with 1 being not concerned and 5 being very concerned):	Please refer to GUSD's response letter dated September 30, 2021.

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Agree,

Please explain:

Please see our formal response letter, dated 09/30/2021

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Respondent skipped this question

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

Respondent skipped this question

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Respondent skipped this question

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Respondent skipped this question

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Respondent skipped this question

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Respondent skipped this question

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#16

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, September 30, 2021 2:04:37 PM
Last Modified:	Thursday, September 30, 2021 2:47:01 PM
Time Spent:	00:42:24
IP Address:	73.70.155.239

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

African American Community Service Agency

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
African American Community Service Agency

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**2 Slightly concerned**
Bus transit delay during construction	**3 Somewhat concerned**
Traffic delays during operations	**2 Slightly concerned**
Visual aesthetics	**2 Slightly concerned**
Residential displacements	**4 Moderately concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**2 Slightly concerned**
Noise during operations	**1 Not concerned**
Partial acquisitioning of park/play areas	**1 Not concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Strongly disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**3 Somewhat beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**4 Moderately beneficial**
Reduction of highway traffic	**3 Somewhat beneficial**
Upgrades to railroad safety and signaling systems	**2 Slightly beneficial**
Reduced need for airport and highway expansion	**3 Somewhat beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**4 Moderately beneficial**
Operational spending and employment	**4 Moderately beneficial**
Support for transit-oriented development near stations	**2 Slightly beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Probably ride,
Why or why not?:
Depends on the cost

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Strongly disagree,
Please explain:
I do not agree with potential community improvements, alternatives 1-4 that were listed

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**Re-establishment of the Inez Jackson Library**
Describe why you propose this improvement	**When significant changes are made to communities, underserved populations are hit the hardest and are the slowest to recover.**
Describe how your proposed improvement(s) would better address concerns in your community	**Re-establishment of the Inez Jackson Library is necessary because it serves our at risk populations. Many will be affected throughout the highspeed rail development process, so improving the Inez Jackson Library at the very least will show we care and understand the needs of our community,**

Q10

Please provide any other input you may have.

I just want to stress again the importance of re-establishing the Inez Jackson Library. Many youth programs have operated out of that location and it plays a significant role in their development and gives parents a hub to bring their children.

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

I urge you to think about when projects like this take place and are developed, who are the people getting hurt the most. And what are actionable/sustainable improvements when can make that show we understand and listen to what the community actually wants.

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

Black/African American

Q15

What is your total household income before taxes?

$75,000 and Over

Q16	2
Including yourself, how many people live in your household?	

#17

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, September 16, 2021 5:25:21 PM
Last Modified:	Friday, October 01, 2021 9:38:46 AM
Time Spent:	Over a week
IP Address:	143.254.2.1

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

San José Unified School District

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
San José Unified School District

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Respondent skipped this question

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Respondent skipped this question

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Respondent skipped this question

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

Respondent skipped this question

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Respondent skipped this question

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Respondent skipped this question

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

San José Unified appreciates that the High-Speed Rail Authority may provide funding to help address potential adverse operational noise effects with Alternative 4 that remain after direct mitigation. We also appreciate the flexibility we would have regarding what noise treatments we might consider. We are very unlikely to pursue a soundwall on our property, which the Authority's cost estimate is based on, and it is important to us to be able to determine the most appropriate measures based on the circumstances at the time of implementation. We understand that $588,000 is all that's likely to be available at this time, but to the extent the amount of funding could potentially be increased if the most appropriate noise mitigation measure when the High-Speed Rail project moves forward costs more than the proposed $588,000, that would be helpful as well.

Q12

How helpful is this survey tool for providing your feedback?

Respondent skipped this question

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Respondent skipped this question

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#18

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 9:37:55 AM
Last Modified:	Friday, October 01, 2021 9:43:53 AM
Time Spent:	00:05:57
IP Address:	206.213.183.3

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

Franklin-McKinley School District

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
Franklin-McKinley School District

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**3 Somewhat concerned**
Residential displacements	**1 Not concerned**
Commercial displacements	**1 Not concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**5 Very concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Disagree,
Please explain:
Our community will not be using this train line for commuting purposes so not expecting it to benefit at all.

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**2 Slightly beneficial**
Access to jobs, goods, and services	**3 Somewhat beneficial**
Integration with local transit connections	**3 Somewhat beneficial**
Reduction of highway traffic	**2 Slightly beneficial**
Upgrades to railroad safety and signaling systems	**4 Moderately beneficial**
Reduced need for airport and highway expansion	**2 Slightly beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**5 Very Beneficial**
Operational spending and employment	**5 Very Beneficial**
Support for transit-oriented development near stations	**5 Very Beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Maybe ride,
Why or why not?:
Trip with the kids just to enjoy the experience of high speed rail.

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Neither agree nor disagree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

Black/African American

Q15

What is your total household income before taxes?

$75,000 and Over

Q16

Including yourself, how many people live in your household?

4

#19

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 9:55:33 AM
Last Modified:	Friday, October 01, 2021 10:37:43 AM
Time Spent:	00:42:09
IP Address:	47.35.28.127

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

Working Partnerships USA

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
Working Partnerships USA

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**2 Slightly concerned**
Bus transit delay during construction	**3 Somewhat concerned**
Traffic delays during operations	**1 Not concerned**
Visual aesthetics	**2 Slightly concerned**
Residential displacements	**4 Moderately concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**2 Slightly concerned**
Noise during operations	**1 Not concerned**
Partial acquisitioning of park/play areas	**1 Not concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Agree,
Please explain:
This project has the opportunity to reduce traffic in specific communities and throughout the state.

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Agree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**5 Very Beneficial**
Reduction of highway traffic	**5 Very Beneficial**
Upgrades to railroad safety and signaling systems	**5 Very Beneficial**
Reduced need for airport and highway expansion	**5 Very Beneficial**
Reduced air pollution	**5 Very Beneficial**
Reduced greenhouse gas emissions	**5 Very Beneficial**
Construction spending and employment	**5 Very Beneficial**
Operational spending and employment	**5 Very Beneficial**
Support for transit-oriented development near stations	**5 Very Beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Definitely ride,
Why or why not?:
Because this project provides an unprecedented form of travel

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Agree,
Please explain:
This plan has been a long process and the authority has done thorough outreach. More work will need to follow, but the proposed mitigation measures look good to this point.

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**NA**
Describe why you propose this improvement	**NA**
Describe how your proposed improvement(s) would better address concerns in your community	**NA**

Q10

Please provide any other input you may have.

NA

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

NA

Q12

How helpful is this survey tool for providing your feedback?

Very helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Yes

Q14

What is your race or ethnic identification? [Check one or more]

Other (please specify):

Latino

Q15

What is your total household income before taxes?

$75,000 and Over

Q16

Including yourself, how many people live in your household?

2

#20

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 9:59:47 AM
Last Modified:	Friday, October 01, 2021 10:40:45 AM
Time Spent:	00:40:57
IP Address:	66.189.161.134

Page 1

Q1

Please select which community you represent. Select all that apply.

Gilroy

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
City of Gilroy

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**4 Moderately concerned**
Bus transit delay during construction	**4 Moderately concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**2 Slightly concerned**
Residential displacements	**3 Somewhat concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**4 Moderately concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Disagree,
Please explain:
Additional trains will create a significant amount of gate downtimes which will create significant delays for east/west crossings without a grade separated crossing.

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Agree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**4 Moderately beneficial**
Reduction of highway traffic	**5 Very Beneficial**
Upgrades to railroad safety and signaling systems	**5 Very Beneficial**
Reduced need for airport and highway expansion	**4 Moderately beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**3 Somewhat beneficial**
Operational spending and employment	**3 Somewhat beneficial**
Support for transit-oriented development near stations	**4 Moderately beneficial**
Comments:	High Speed Rail will provide infrastructure to increase CALTRAIN service to the City and might provide additional workforce, and better connect Gilroy residents and Valley residents to higher paying jobs in Silicon Valley, the Peninsula and Gilroy.

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Definitely ride,
Why or why not?:
faster travel along the corridor and convenience as opposed to driving.

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Agree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Respondent skipped this question

Q10

Please provide any other input you may have.

We want to see a very well designed high quality train station and structured parking for the facility.

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

We would like to see some of these improvements implemented sooner, prior to construction of the HSR facilities.

Q12

How helpful is this survey tool for providing your feedback?

Very helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

White

Q15

What is your total household income before taxes?

$75,000 and Over

Q16

Including yourself, how many people live in your household?

5

#21

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 12:06:27 PM
Last Modified:	Friday, October 01, 2021 12:20:49 PM
Time Spent:	00:14:22
IP Address:	204.88.158.220

Page 1

Q1

Please select which community you represent. Select all that apply.

Morgan Hill,

If you represent an agency, identify the agency where you work::

Morgan Hill Unified School District

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
Morgan Hill Unified School District

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**5 Very concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**2 Slightly concerned**
Residential displacements	**2 Slightly concerned**
Commercial displacements	**3 Somewhat concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**4 Moderately concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**
If other effects not listed above are concerns, please describe them and rate them on a 1-5 scale (with 1 being not concerned and 5 being very concerned):	Impact to school transit times, increasing the length of time students spend on the bus.

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Strongly disagree,
Please explain:
The addition of up to 16 trains per hour traveling through downtown Morgan Hill will cause significant increases in the time students spend on the bus, putting a strain on Morgan Hill families and their schedules.

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**3 Somewhat beneficial**
Access to jobs, goods, and services	**4 Moderately beneficial**
Integration with local transit connections	**3 Somewhat beneficial**
Reduction of highway traffic	**4 Moderately beneficial**
Upgrades to railroad safety and signaling systems	**3 Somewhat beneficial**
Reduced need for airport and highway expansion	**3 Somewhat beneficial**
Reduced air pollution	**5 Very Beneficial**
Reduced greenhouse gas emissions	**5 Very Beneficial**
Construction spending and employment	**3 Somewhat beneficial**
Operational spending and employment	**3 Somewhat beneficial**
Support for transit-oriented development near stations	**3 Somewhat beneficial**
Comments:	The benefits will only be realized to the extent the HSR network is used by residents.

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Maybe ride,
Why or why not?:
For longer distances but for work purposes I need a car to travel between job locations during my workday.

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Neither agree nor disagree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**School Bus Route Study**
Describe why you propose this improvement	**Identify the impacts and suggest routing alternatives/bus crossings to minimize the impact on student transit times.**
Describe how your proposed improvement(s) would better address concerns in your community	**Mitigate the potential negative impact to school bus transit as a result of alternatives 1-4**

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

White

Q15

What is your total household income before taxes?

$75,000 and Over

Q16	4
Including yourself, how many people live in your household?	

#22

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 12:04:48 PM
Last Modified:	Friday, October 01, 2021 12:36:16 PM
Time Spent:	00:31:27
IP Address:	172.58.35.162

Page 1

Q1

Please select which community you represent. Select all that apply.

Morgan Hill,

If you represent an agency, identify the agency where you work::

City of Morgan Hill

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
City of Morgan Hill

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**1 Not concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**5 Very concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**4 Moderately concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**5 Very concerned**
Partial acquisitioning of park/play areas	**5 Very concerned**
If other effects not listed above are concerns, please describe them and rate them on a 1-5 scale (with 1 being not concerned and 5 being very concerned):	See letter from City of Morgan Hill

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Strongly disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Strongly disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**2 Slightly beneficial**
Access to jobs, goods, and services	**2 Slightly beneficial**
Integration with local transit connections	**1Not beneficial**
Reduction of highway traffic	**3 Somewhat beneficial**
Upgrades to railroad safety and signaling systems	**5 Very Beneficial**
Reduced need for airport and highway expansion	**2 Slightly beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**1Not beneficial**
Operational spending and employment	**1Not beneficial**
Support for transit-oriented development near stations	**4 Moderately beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Definitely ride

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Strongly disagree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**grade separations for Alterative 4**
Describe why you propose this improvement	**impacts on public safety and response times, circulation impacts and quality of life**
Describe how your proposed improvement(s) would better address concerns in your community	**Circulation and Safety are the primary concerns in the community. Grade separations would elevate this concern.**

Q10

Please provide any other input you may have.

See response letter from City of Morgan Hill

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

The proposed community benefits are not addressing the main concerns the community has.

Q12

How helpful is this survey tool for providing your feedback?

Not at all helpful,
Please provide any suggestions you would have for improving such surveys in the future::
Each alignment is different and could have a different response. This survey lumps everything together.

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

Respondent skipped this question

Q14

What is your race or ethnic identification? [Check one or more]

Respondent skipped this question

Q15

What is your total household income before taxes?

Respondent skipped this question

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

#23

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 12:30:55 PM
Last Modified:	Friday, October 01, 2021 12:45:07 PM
Time Spent:	00:14:12
IP Address:	68.233.206.130

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

Rocketship Mateo Sheedy Elementary

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
Families at Rocketship Mateo Sheedy Elementary School

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**3 Somewhat concerned**
Traffic delays during operations	**4 Moderately concerned**
Visual aesthetics	**3 Somewhat concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**2 Slightly concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**5 Very concerned**
Partial acquisitioning of park/play areas	**3 Somewhat concerned**
If other effects not listed above are concerns, please describe them and rate them on a 1-5 scale (with 1 being not concerned and 5 being very concerned):	New playground or playground enhancements in order to provide the community with a better experience during an after school hours Building repairs such as new roof or repairs in order to provide a proper space for the students and community New PA system in order to mitigate some of the noise problems that will arise during construction and after with the increase of traffic Building and community aesthetics i.e trees, new grass or turf, etc Pedestrian and Traffic Safety remedies such as “STOP AHEAD” painted on Virginia before the stop sign, more School Zone signs, speed bump, etc

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Neither agree nor disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Agree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**3 Somewhat beneficial**
Access to jobs, goods, and services	**4 Moderately beneficial**
Integration with local transit connections	**4 Moderately beneficial**
Reduction of highway traffic	**5 Very Beneficial**
Upgrades to railroad safety and signaling systems	**4 Moderately beneficial**
Reduced need for airport and highway expansion	**5 Very Beneficial**
Reduced air pollution	**5 Very Beneficial**
Reduced greenhouse gas emissions	**5 Very Beneficial**
Construction spending and employment	**5 Very Beneficial**
Operational spending and employment	**5 Very Beneficial**
Support for transit-oriented development near stations	**5 Very Beneficial**
Comments:	New playground or playground enhancements in order to provide the community with a better experience during an after school hours Building repairs such as new roof or repairs in order to provide a proper space for the students and community New PA system in order to mitigate some of the noise problems that will arise during construction and after with the increase of traffic Building and community aesthetics i.e trees, new grass or turf, etc Pedestrian and Traffic Safety remedies such as “STOP AHEAD” painted on Virginia before the stop sign, more School Zone signs, speed bumb, etc

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Probably ride

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Agree

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**New playground or playground enhancements in order to provide the community with a better experience during an after school hours Building repairs such as new roof or repairs in order to provide a proper space for the students and community New PA system in order to mitigate some of the noise problems that will arise during construction and after with the increase of traffic Building and community aesthetics i.e trees, new grass or turf, etc Pedestrian and Traffic Safety remedies such as "STOP AHEAD" painted on Virginia before the stop sign, more School Zone signs, speed bumb, etc**

Q10

Please provide any other input you may have.

New playground or playground enhancements in order to provide the community with a better experience during an after school hours
Building repairs such as new roof or repairs in order to provide a proper space for the students and community
New PA system in order to mitigate some of the noise problems that will arise during construction and after with the increase of traffic
Building and community aesthetics i.e trees, new grass or turf, etc
Pedestrian and Traffic Safety remedies such as "STOP AHEAD" painted on Virginia before the stop sign, more School Zone signs, speed bumb, etc

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

New playground or playground enhancements in order to provide the community with a better experience during an after school hours
Building repairs such as new roof or repairs in order to provide a proper space for the students and community
New PA system in order to mitigate some of the noise problems that will arise during construction and after with the increase of traffic
Building and community aesthetics i.e trees, new grass or turf, etc
Pedestrian and Traffic Safety remedies such as "STOP AHEAD" painted on Virginia before the stop sign, more School Zone signs, speed bumb, etc

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful,
Please provide any suggestions you would have for improving such surveys in the future::
New playground or playground enhancements in order to provide the community with a better experience during an after school hours Building repairs such as new roof or repairs in order to provide a proper space for the students and community New PA system in order to mitigate some of the noise problems that will arise during construction and after with the increase of traffic Building and community aesthetics i.e trees, new grass or turf, etc Pedestrian and Traffic Safety remedies such as “STOP AHEAD” painted on Virginia before the stop sign, more School Zone signs, speed bumb, etc

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

Black/African American

Q15

What is your total household income before taxes?

Prefer not to answer

Q16

Including yourself, how many people live in your household?

3

#24

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 3:03:12 PM
Last Modified:	Friday, October 01, 2021 3:24:13 PM
Time Spent:	00:21:00
IP Address:	165.225.242.80

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

If you represent an agency, identify the agency where you work::

County of Santa Clara

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
County of Santa Clara

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**1 Not concerned**
Bus transit delay during construction	**1 Not concerned**
Traffic delays during operations	**1 Not concerned**
Visual aesthetics	**1 Not concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**1 Not concerned**
Emergency vehicle response time delays	**1 Not concerned**
Noise during operations	**1 Not concerned**
Partial acquisitioning of park/play areas	**1 Not concerned**
If other effects not listed above are concerns, please describe them and rate them on a 1-5 scale (with 1 being not concerned and 5 being very concerned):	Santa Clara County's Office of Supportive Housing is concerned about the potential displacement and other negative impacts on people experiencing homelessness who live in the vicinity of the project site. We rank this concern as a 5.

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Neither agree nor disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Neither agree nor disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**N/A or don't know**
Access to jobs, goods, and services	**N/A or don't know**
Integration with local transit connections	**N/A or don't know**
Reduction of highway traffic	**N/A or don't know**
Upgrades to railroad safety and signaling systems	**N/A or don't know**
Reduced need for airport and highway expansion	**N/A or don't know**
Reduced air pollution	**N/A or don't know**
Reduced greenhouse gas emissions	**N/A or don't know**
Construction spending and employment	**N/A or don't know**
Operational spending and employment	**N/A or don't know**
Support for transit-oriented development near stations	**N/A or don't know**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Don't know

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Disagree,
Please explain:
Conclusions need to consider mitigations for people experiencing homelessness.

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**Provide flexible financial assistance for people experiencing homelessness to assist with their relocation.**
Describe why you propose this improvement	**People experiencing homelessness will be displaced by the proposed project.**
Describe how your proposed improvement(s) would better address concerns in your community	**Santa Clara County has a housing crisis which is a priority issue for the County to address.**

Q10

Please provide any other input you may have.

Please feel free to contact me with any questions or comments at Michelle.Covert@hhs.sccgov.org.

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

n/a

Q12

How helpful is this survey tool for providing your feedback?

Very helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

White

Q15

What is your total household income before taxes?

Not applicable

Q16

Including yourself, how many people live in your household?

1

#26

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 4:17:12 PM
Last Modified:	Friday, October 01, 2021 4:29:27 PM
Time Spent:	00:12:15
IP Address:	165.225.242.175

Page 1

Q1

Please select which community you represent. Select all that apply.

City of Santa Clara

Q2

Are you completing this survey based on your personal opinion or as a representative?

Representative of a group or organization (List group or organization):
City of Santa Clara, Department of Public Works

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**4 Moderately concerned**
Bus transit delay during construction	**3 Somewhat concerned**
Traffic delays during operations	**2 Slightly concerned**
Visual aesthetics	**5 Very concerned**
Residential displacements	**3 Somewhat concerned**
Commercial displacements	**3 Somewhat concerned**
Emergency vehicle response time delays	**3 Somewhat concerned**
Noise during operations	**4 Moderately concerned**
Partial acquisitioning of park/play areas	**5 Very concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Respondent skipped this question

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**3 Somewhat beneficial**
Reduction of highway traffic	**3 Somewhat beneficial**
Upgrades to railroad safety and signaling systems	**4 Moderately beneficial**
Reduced need for airport and highway expansion	**5 Very Beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**5 Very Beneficial**
Construction spending and employment	**4 Moderately beneficial**
Operational spending and employment	**3 Somewhat beneficial**
Support for transit-oriented development near stations	**5 Very Beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Definitely ride,
Why or why not?:
I would like to more frequently access these areas and congestion levels current prevent me from doing this.

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Disagree,
Please explain:
The analysis does not address aesthetic and visual quality. The explanation is that there is no feasible mitigation. However, the City (PW) has offered several multimodal improvements that would improve overall quality of life for residents. Active transportation can have health benefits and can improve quality of life which in itself can help mitigate or alleviate other quality of life issues such as aesthetics and visual quality.

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**Multimodal Improvements such as suggested by the City of Santa Clara DPW and listed as "Other Improvements Considered"**
Describe why you propose this improvement	**These improvements will improve quality of life for residents and stakeholders in the affected area.**
Describe how your proposed improvement(s) would better address concerns in your community	**Same answer as listed in #7.**

Q10

Please provide any other input you may have.

I was disappointed that early in the process, the City of Santa Clara, DPW was asked to provide ideas and concepts related to multimodal improvements that could provide benefit if the EJ analysis showed impacts. These projects are listed as Other Improvements Considered and are disregarded as not providing direct benefit. This appears to be a "change" in how EJ is being analyzed and considered as compared to the original description provided by HSR Authority staff. This "change" appears to be related to budget but is not specifically stated as such. Additionally, significant time and energy was spent by City staff to provide recommendations with no reasonable explanation except that the "direction" of the overall analysis changed.

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

No comment at this time.

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13 Are you of Hispanic, Latino, or Spanish origin?	**No**
Q14 What is your race or ethnic identification? [Check one or more]	**Asian or Pacific Islander**
Q15 What is your total household income before taxes?	**Prefer not to answer**
Q16 Including yourself, how many people live in your household?	**3**

#27

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, October 01, 2021 10:21:12 AM
Last Modified:	Friday, October 01, 2021 4:58:14 PM
Time Spent:	06:37:01
IP Address:	73.162.74.113

Page 1

Q1

Please select which community you represent. Select all that apply.

I represent an agency,

S. San Jose,

If you represent an agency, identify the agency where you work::

Oak Grove School District

Q2

Are you completing this survey based on your personal opinion or as a representative?

My opinion

Q3

How concerned are you about the following potential high-speed rail effects on your community? [See: 4. Environmental Justice Community Summary: Summary of Potential Effects] Please indicate how concerned you are about each potential effect listed below. Use a scale of 1 to 5 (with 1 being not concerned and 5 being very concerned)

Traffic delay during construction	**5 Very concerned**
Bus transit delay during construction	**4 Moderately concerned**
Traffic delays during operations	**5 Very concerned**
Visual aesthetics	**4 Moderately concerned**
Residential displacements	**5 Very concerned**
Commercial displacements	**5 Very concerned**
Emergency vehicle response time delays	**5 Very concerned**
Noise during operations	**4 Moderately concerned**
Partial acquisitioning of park/play areas	**5 Very concerned**

Page 2

Q4

Which of the following best describes your opinion about the statement below: Once the trains are operating, site-specific traffic mitigations will substantially reduce traffic intersection delays.[See 4C: Environmental Justice Community Summary: Traffic Mitigation Measures]

Disagree

Page 3

Q5

Do you agree with the conclusions about disproportionately high and adverse effects after direct mitigation only? [See: 4. Environmental Justice Community Summary: Preliminary Conclusions]

Disagree

Q6

What benefits of the high-speed rail project would help your community the most? Please rate how each benefit described below would help your community on a scale of 1 to 5 (with 1 being not beneficial and 5 being very beneficial)

California travel by high-speed train	**5 Very Beneficial**
Access to jobs, goods, and services	**5 Very Beneficial**
Integration with local transit connections	**5 Very Beneficial**
Reduction of highway traffic	**4 Moderately beneficial**
Upgrades to railroad safety and signaling systems	**5 Very Beneficial**
Reduced need for airport and highway expansion	**3 Somewhat beneficial**
Reduced air pollution	**4 Moderately beneficial**
Reduced greenhouse gas emissions	**4 Moderately beneficial**
Construction spending and employment	**5 Very Beneficial**
Operational spending and employment	**5 Very Beneficial**
Support for transit-oriented development near stations	**4 Moderately beneficial**

Q7

When the high-speed rail system reaches Gilroy and San Jose (planned for 2031), do you think you would use the high-speed rail service?

Respondent skipped this question

Q8

Do you agree with the conclusions about disproportionately high and adverse effects after consideration of direct mitigation, project benefits and potential community improvements? [See: 4. Environmental Justice Community Summary]

Disagree,

Please explain:

Impact on neighborhood schools was not fully accounted for considering how schools provide the central hub for community involvement in lower wealth areas.

Q9

Would you propose different community improvements from the list of potential community improvements? If yes,

Describe a different improvement	**Caroline Davis Intermediate School All Weather Turn and Track**
Describe why you propose this improvement	**Caroline Davis Intermediate School provides green open space for the community in the area.**
Describe how your proposed improvement(s) would better address concerns in your community	**The new track would allow free public access to an exercise venue.**

Q10

Please provide any other input you may have.

Respondent skipped this question

Q11

What, if any, specific feedback do you have with regard to the scope, timing, or roles/responsibilities associated with implementation of the proposed community improvements?

Respondent skipped this question

Q12

How helpful is this survey tool for providing your feedback?

Somewhat helpful

Page 4: Personal Information

Q13

Are you of Hispanic, Latino, or Spanish origin?

No

Q14

What is your race or ethnic identification? [Check one or more]

Asian or Pacific Islander

Q15

What is your total household income before taxes?

Not applicable

Q16

Including yourself, how many people live in your household?

Respondent skipped this question

APPENDIX 5-B, ATTACHMENT D-5: AFTER-ACTION REPORTS FOR SEPTEMBER 2021 MEETINGS

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
City of Morgan Hill Implementing Partner Meeting
Date of Event
Tuesday September 7, 2021, 3:00 – 4:15pm
Recorder of Event
Rickie Cleere
Participants/Attendees

- **Representatives:** Edith Ramirez, Tiffany Brown, Christina Turner, Rebecca Garcia, Chris Ghione
- **Staff**: Audrey Van, Morgan Galli, Rich Walter, Cici Vu, Rickie Cleere

Purpose of Event

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Preliminary Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Potential Community Improvements Presented:

- Alternatives 1 and 3:
  - Funding to the City of Morgan Hill to implement trail and park improvements under the viaduct to offset visual aesthetic effects
- Alternative 2:
  - Funding to implement complete streets improvements along Railroad Avenue to offset visual aesthetic effects.
  - Partial funding for affordable housing to offset residential displacement that cannot be relocated locally based on housing market
- Alternative 4:
  - Noise insulation for certain residences along 101 helps to offset residual project noise effects

Key points of concern from partner; any preliminary feedback to directed questions:

- Noise insulation along the 101 freeway should not be considered a community improvement, as it benefits community members who mostly live in single family residences and does not mitigate impacts for community members who are the most vulnerable. Alternatively, could there be insulation for schools or other gathering points along the route?
  - R: Noise insulation for certain residences along the 101 would help to offset residual project noise effects. Sound insulation installation is proposed in the EIR/EIS for residences located along the project alignment. The community analysis assesses existing sources of noise, and the other main noise source other than the rail is the 101 freeway. The main focus of the analysis was on spaces between the freeway and adjacent to the project

- Sound walls are not included in the Morgan Hill General Plan.
    - R: Sound walls are not being proposed, but rather sound insulation for adjacent structures.
- Morgan Hill School District is concerned that train traffic experienced under Alternative 4 will impact bus routes
    - R: Four intersections in Morgan Hill would experience adverse effects. Three of these intersections would experience reduced effects with mitigation.

Questions/Responses:

- Q: We will help share the 9/21 meeting with our community. Would it be possible to provide a general HSR update as well? Our Council has requested updated info. Thank you!
    - R: That meeting will not be a general community meeting. It is for specific community representatives our team has been engaging with throughout this process. For that reason, we kindly ask that the city not share the meeting info with the broader community.
    - We can certainly provide general update at the community stakeholder meeting. The targeted audience includes school community and members of the community that the City has identified, so in this sense, it includes a subsection of the broader community.
- Q: The "Summary of Potential Effects" slide table had footnotes. What are they?
    - R: [1] Emergency Response Delay > 30 seconds occurs near E. Middle Avenue east of the railroad corridor, but the affected area is not disproportionately minority or low-income.[2] Morgan Hill Community and Cultural Center– construction disruption of amphitheater use. Villa Mira Monte– construction disruption of outdoor special event use. [3] Bus transit delays during construction.
- Q: Alternative 4 requires noise and traffic mitigations, correct?
    - R: When community benefits are considered, the transportation benefit offsets traffic impacts. However, there are still residual noise impacts that require additional mitigation.
- Q: Potential project effects are above and beyond what was identified to be mitigated within the Draft EIR correct? Are these mitigations not the same as those in the draft EIR/EIS?
    - R: Correct. The draft EIR/EIS had direct mitigations built in to address immediate effects (ex: noise road insulation). The improvements here offset residual DHAE effects after the consideration of project benefits.
- Q: Who did the ranking of the other improvements that were considered?
    - R: Authority staff and environmental consultant. The preliminary evaluation was conducted using a 120-point scale.
- Q: While the authority has identified a selection of measures to potential issues, we need to provide feedback grounded in the preferred alternative and whether additional measures could be incorporated that demonstrate a nexus to DHAE? For alternative 4, we can identify potential safety and connectivity solutions that also affect transportation.
    - R: The framing of the relationship between the project and its effects is something that you can provide feedback on as well. The analysis of effects and mitigations used by the Authority was done on a point for point mitigation basis (noise for noise, etc.). "Out-of-kind" arguments are generally more difficult to make.
- Q: Some of the measures are more general while others are more geographically focused (ex: Coyote creek). Would measures be across Morgan Hill, also going into San Martin?
    - R: The measures are specific to the Morgan Hill area, though some are further out than others.
- Q: Will there be no community improvements proposed to address traffic, only noise?
    - The transportation benefit is considered to offset the adverse traffic impacts, preventing a need for additional improvements.

- Q: Are the other improvements considered applicable to the four alternatives being analyzed?
    - R: Not all would be appropriate for every alternative based on impacted geographies. The Authority selects improvements only if they are connected to residual DHAEs. The 16 other improvements considered are not viewed as having a relationship to the residual effects at this time, though this may change if communities put forth rationale for the Authority to consider.
- Q: City Staff is tracking the HSR EIR/EIS process, but the community will want to know full set of proposed mitigations. What is schedule for notification?
    - R: The final EIR/EIS is scheduled for completion by February 2022. The Authority's Record of Decision (ROD) board meeting is scheduled for March 2022. Prior to this, meetings will be held with City staff to respond to comments received and other materials applicable to the final EIR. There will also be outreach to Community and Technical Working Groups (CWG/TWG) 1-2 weeks after the final EIR and before the ROD. There may be TWG meetings before the final EIR is released.
- Q: For Alternative 2, displacement of housing was only along 101 (the viaduct option)? This alternative will have the biggest property impacts, but residence impacts are limited?
    - R: Partial funding for affordable housing under Alternative 2 would offset residential displacement that could not be relocated locally based on the housing market. The community summary and table include details on the geographic targets for noise insulation along the 101 freeway.

Next Steps/Actions/Follow-up:

- Community Meeting: Tuesday September 21, 5:00-7:00PM
    - The Outreach team will meet with the new superintendent of Morgan Hill Unified School District prior to this meeting to identify parent/community group representatives that should attend as well.
- By COB Friday September 10.
    - The Authority will check in with City staff on an appropriate date and time to present and discuss with City Council.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
City of Gilroy Implementing Partner Meeting
Date of Event
Friday September 10, 2021, 3:00 – 4:15pm
Recorder of Event
Rickie Cleere
Participants/Attendees
• Karen Garner, Community Development Director • Daryl Jordan, Public Works Director • Kraig Tamborini, Senior Planner • **Staff:** Rich Walter, Morgan Galli, Joan Isaacson, Rickie Cleere
Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes

Key points of concern from partner; any preliminary feedback to directed questions:

- We are concerned about emergency response delay. In the summary, it states that there is emergency response delay for Alternative 4 and then there is reference to mitigation measure sfmm#4. I am not sure what that refers to.
    - Mitigation related to the potential for emergency response delays is in the draft EIR/EIS Section 3.11: Safety and Security. The mitigation is for emergency vehicle response related to station traffic and includes a range of improvements related to the gate downtime effect for Alternative 4. One solution would be to potentially include a partial station with HSR covering operation costs for 5 years. Another solution would include an at grade monitoring station separate from the train monitoring system operated by the Authority, which would be tied into police and fire dispatch. A similar system is currently used in Sugarland, Texas. A monitoring assessment may lag behind the effects, so the Authority will perform more forecasting closer to the 2031 project launch date. Because the gate downtime effect will presumably increase over time, we aim to implement the improvements proactively to address effects.

Questions/Responses:

- Q: Who are you reaching out to for the Community Meetings. Is there a list available?
    - R: Representatives of targeted EJ stakeholder groups. We will share the list.
- Q: Will the eventual outcome be the Board's final selection of an alternative after the Final EIR/EIS? Will these EJ measures be included if the project proceeds?

  - R: Correct. The Final EIR/EIS will be released in February 2022 and the Board will meet in March to certify the Final EIR/EIS including the mitigation and intent for community improvements, and to decide on an alternative.

- Q: Is there a minimum obligation for the improvements. Is the decision-making flexible?
  - R: We are proposing feasible improvements that we think offset project impacts. The findings assume and incorporate the mitigation that will be included in the Final EIR/EIS. They will become commitments at that time, and implementation will rely on the acquisition of funds for the project section.
- Q: Are we being asked to complete the survey. Will other stakeholders be providing feedback on the same materials?
  - R: Yes, that is correct.
- Q: Is the weight of feedback the same? We have a different perspective than residents may have.
  - R: We will look at all feedback provided. The survey asks respondents to indicate affiliation. As a potential partner for implementing the measures, your feedback will be weighed appropriately.
- Q: Are the mitigation measures in the EIR/EIS separate from the potential community improvements? Are those related to safety and emergency vehicle response for people living near the alignment?
  - Correct. The measure address people living near the alignment who are most impacted as well as impacts to cyclists, sidewalk users, and lighting. The improvements in downtown address gate downtime and enhance safety in environmental justice communities as a different way of offsetting impacts. The mitigations proposed in the EIR are more directly related to the impacts they are intended to address.

Next Steps/Actions/Follow-up:

- Community Meeting: Tuesday September 28, 5:00-7:00PM
- Outreach Team to provide a list of groups/organizations invited to community meeting (below, shared in follow up communication)
  - CARAS South County
  - Gilroy Prep School
  - Navigator Schools
  - Gilroy High School
  - South Valley Middle School
  - Alexander Station
  - Rebekah Children's Services
  - Santa Clara County Office of Supportive Housing
  - HomeFirst
  - Gavilan College
  - City of Gilroy
  - Gilroy Unified School District
  - Santa Clara County Parks and Recreation
  - Santa Clara Valley Transportation Authority
  - Mission College
  - Center For Employment Training
  - San Jose City College
  - Silicon Valley Rising

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Gilroy Unified School District: High-Speed Rail Environmental Justice Meeting
Date of Event
Wednesday September 8, 2021, 2:00pm – 3:15pm
Recorder of Event
Rickie Cleere
Participants/Attendees
• **Representatives:** Alvaro Meza, Guillermo Ramos, Greg Kapaku • **Staff**: Audrey Van, Rich Walter, Cici Vu
Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Potential Community Improvements Presented

- Alternatives 1, 2 and 4:
  - Noise insulation for certain residences along 101 to help offset residual project noise effects
- Alternative 2:
  - Funding of recreational amenities for the South Valley Middle School to help offset partial acquisition of track/field
  - Partial funding for affordable housing to offset residential displacement that cannot be relocated locally based on housing marke
- Alternative 4 - Funding for the following:
  - New pedestrian/bicycle overcrossing of the railroad at IOOF Avenue
  - Bikeway improvements (along IOOF Ave., Monterey Road, 6th Street, 4th Street, and Alexander Street)
  - Sidewalk gap closure along Murray Avenue
  - Neighborhood street lighting and sidewalk and curb improvements within the Gilroy Neighborhood Revitalization Strategy Area
  - Designed to help offset residual project effects associated with emergency vehicle response delays (safety effects)

Key points of concern from partner; any preliminary feedback to directed questions:

- The Superintendent stated that Alternatives 1, 2, and 3 present DHAEs for the IOOF area of Gilroy due to the partial acquisition of the track/field at South Valley Middle School. Land in Gilroy is valuable and sought after, and HSR may need to seek imminent domain. In order for Gilroy schools to remain desirable for students and their families, they need to be accessible as well as have facilities like the track/field for school recreation activities. Right now, our school is surrounded by residences, Rebekah Children's Services, and Gilroy Prep.
- The Superintendent stated that Alternative 2 is the most problematic for the School District, particularly with respect to safety and school land acquisitions.
- The Assistant Superintendent stated that he disagrees with the finding that there are no DHAEs for Alternative 4. 100 mph train crossings present safety risks and mortal danger for students and elderly community members. These risks present DHAEs, even with the incorporation of quad gates and other project safety measures at intersections along the alignment.

Questions/Responses:

- Q: How often would a train pass through Gilroy during curfew hours (10pm-6am)?
    - R: The overall service schedule is projected for 6am to 12am. During peak hours, 6-9am and 4:30-7pm, seven trains would pass through per hour in each direction in roughly 4 to 5-minute intervals. Four to five trains would likely pass through after 9pm, including non-revenue trains.
- Q: Not all trains will stop in Gilroy, right?
    - R: Correct. Some express trains would only stop at locations such as San Francisco and San Jose.
- Q: Would widening of tracks go onto campus, and by how much?
    - R: Alternative 4 is at grade and would require some additional tracks. For Alternative 2, there is some encroachment onto the track/field at South Valley Middle School and a nearby park. The preliminary engineering drawing are in the Draft EIR/EIS, and we can provide you with the pages that contain details on acquisitions for each of the alternatives.
    - R: The plan sheets for the Preferred Alternative are available here (pages 24-27 for Gilroy) and was provided in the chat during the meeting: https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V3-18_PEPD_Alternative_4_Book_4_A_Composite_Plan_Profile_and_Cross_Sections.pdf
- Q: Is Alternative 4 the Preferred Alternative?
    - Yes, currently. The Board will be making a final decision next year.
- Q: What does the traffic footprint look like around South Valley Middle School?
    - R: The IOOF crossing would still be available. Fencing would be along the ROW on both sides, and the intersection would also have quad gates, pedestrian gates, and warning devices.
- Q: Is the three-page list of Community Improvements a good summary to use for reference?
    - R: Yes, the Community Summary and Community Improvements are good resources that we would appreciate you feedback on.

Next Steps/Actions/Follow-up:

- Community Meeting: Tuesday September 28, 5:00-7:00PM
    - The District's outreach team will reach out to parent and school stakeholder groups via Square and other means for their participation in the meeting.
    - The meeting should include Spanish interpretation and a Spanish slide deck will be made available.
- By COB, Friday September 10
    - HSR Team to provide Gilroy USD with land acquisition details for Alternative 4. (Provided during the meeting.)

EJ PHASE 3 MEETINGS SEPTEMBER 2021 AFTER ACTION REPORT

Title of Event

Los Banos Unified School District

Date of Event

September 8, 2021, Start time (11:25) – End time (12:05)

Recorder of Event (Name)

CeCe Horbat

Participants/Attendees

- **Partner(s):**
  - Alejandra Garibay
  - Amer Iqbal- Assistant Superintendent
- **Staff:** Audrey Van, Cici Vu, Rich Walter, CeCe Horbat

Purpose of Event

- Meeting Objectives
  - Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
  - Share Preliminary Conclusions
  - Gain feedback on directed questions
  - Address clarifying questions on meeting materials, desired feedback and conclusions
  - Update from meeting of last year

Key Notes

Key points on community-specific presentation

- Not at this time

Potential Community Improvements

- How partnership will be structured for implementing improvements.
- Management of park and related facilities is out of school district's purview; need to partner with Merced County on park.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- None at this time

Questions/Responses:

- **Q: Window and other improvements to school facilities – how will implementation work? Does school pay and get reimbursed or does the school receive funding**
  - R: Partners would do the actual implementation and use the funds from the authority. Authority would not contract and do it. Authority would just provide funding.
    - Preliminary improvements can be forwarded and estimate was made previously and Los Banos USD can provide feedback on the improvements

Next Steps/Actions/Follow-up:

- **ICF: Send out preliminary improvements so the school district can see what the original**

estimate was for the windows (this week – by 9/10)
    - Send announcements to the school
- **Amer: Speak with lead parent groups and will check in with Volta Principal (TODAY)**
    - Possibly have a community café appearance
    - Could come into a board meeting
- **K&W: Follow up with Amer and Alejandra about parent outreach to families in SJV (1 week – 9/15)**

Updates from Internal Staff

- **Community meeting September 22nd from 5-7**
    - Cici Vu asked for a more connections to parent groups and Principal Thomas

Update from Los Banos USD

- school boundaries new of 2021 impacting families in different districts

Post Meeting Follow Up

- Rich (ICF): Recall notes Follow up with Merced County (Parks and Rec) via conference call to include Audrey, Rich and other authority staff to specific improvement (the potential new park)

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
City of San Jose
Date of Event
September 9, 2021, **Start 1:05** – **End time 2:30 pm**
Recorder of Event (Name)
CeCe Horbat
Participants/Attendees

- **City of San Jose**,
  - Brian Stanke, Rail Planning Manager, City of San Jose
  - Jessica Zenk, Deputy Director, Transportation Planning & Project Delivery
  - Stacey Lu, Stacey Lu, Engineer II, Department of Transporation
- **Staff Name**
  - Joey Goldman
  - Rich Walter
  - Bruce Fukuji
  - Boris Lipkin
  - CeCe Horbat

Purpose of Event

Meeting Objectives

- Explain/present on updates to EJ analysis, mitigations, benefits and community improvements
- Share preliminary conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Potential Community Improvements Presented (Key points on community-specific presentation)

- **San Jose Diridon**
  - *Alternatives 1, 2, and 3:*
    - Funding for Delmas Neighborhood streetscape improvements to help offset visual aesthetic effects of viaduct.
  - *Alternative 4:*
    - Noise insulation for certain residences along SR87 and I-280 helps to offset residual project noise effects.
- **Washington/Guadalupe/Tamien/Alma/Almaden**
  - *Alternatives 1, 2, and 3:*
    - Streetscape improvements along Goodyear Street, Humboldt Street, and Floyd Street to improve visual aesthetics.

        - Funding to support community art installations in the local community to improve visual aesthetics and a sense of community.
    - *Alternative 4:*
        - Noise insulation for residential buildings immediately adjacent to the east side of SR 87 to offset residual noise effects.
- **South San Jose**
    - *Alternatives 1, 2, and 3:*
        - Funding for Monterey Road Grand Blvd. landscaping improvements to help offset visual aesthetic effects of HSR structures.
    - *Alternative 4:*
        - Noise insulation for certain residences along 101 helps to offset residual project noise effects
        - Funding to City of San José for new pedestrian/bicycle overcrossings at Skyway, Branham, Chynoweth helps to improve safety.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- **Gardner/Willow Glen**
    - Suggestion to specify/change Gardner/Willow Glen to Gardner/**North** Willow Glen
- **Alt 1-3 Comment**
    - City of San Jose looks forward to having landscaping/green space additions.
        - "That's a great idea (re: Monterey Road/Grand Blvd. landscaping). Would be ideal to have green infrastructure and trees as part of that."
- **Discussion regarding overcrossing versus undercrossing**
    - The Authority would prefer overcrossings as opposed to undercrossings.
    - Overcrossing details will be modeled off existing overcrossings (i.e., Xander's Crossing). Cost estimates exist but specific design work has yet to be done. ICF works with HNTB.
    - **City of San Jose**: City of San Jose followed up with the Authority to continue working on the MOU language regarding the implementation of the bike/ped crossings in S. San Jose.
- **Representative Involvement**
    - Boris/Morgan/Authority members have been working to give a briefing to representatives/councilmembers.
        - David Tran (staffer for Councilmember Raul Peralez), requested a briefing
- **VTA's Gardner Elementary Sound Wall (Highway 280)**
    - Slow 20+ year process with CalTrans.
    - The Authority looked to see if it could do sound walls on school property as a potential way to work with VTA.
    - Jessica Zenk forwarded contacts including Cindy Chavez and Jason Nesdahl (Jason.Nesdahl@vta.org). Jason is the VTA point-person for the sound wall project.
    - Takeaway: possible points of collaboration.

Questions/Responses:

- **Q: Will additional sound walls be implemented (See Alt 4: Noise Mitigation San Jose Diridon)?**

  - **R**: Instead of sound walls along freeway, there will be noise insulation installed in affected buildings. Sound walls will impact one or two stories of a building as opposed to building insulation, which can reduce noise for the entire building. However, noise barriers in the form of sound walls will be included in EIR/EIS but not for improvements.
  - **Discussion**: City of San Jose emphasized the importance of incorporating community feedback/involvement when implementing sound insulation. City of San Jose also referenced the BART Phase 2 Noise Abatement project for the Authority to look into.

- **Q: Why is the "reference community" selected to be all of the three counties.**
  - **R**: See PowerPoint slide 4. Threshold for reference communities is adjusted based on census data and income differentials. Income is adjusted based on where populations are geographically located.

- **Q: Displacement refers to DIRECT displacement, right?**
  - **R** (From Boris in chat pod): Yes, acquisition of property needed along the rail alignment will result in direct displacement of structures adjacent to HSR).

- **Q: Is there a commitment to a program office/community staff to ensure mitigation?** Concerned about low-income, disadvantaged people trying to navigate getting the sound insultation installed.
  - **R:** In reference to the noise improvements, the Authority would be responsible for the design, implementation, hiring of contractors, and outreach for noise improvements.
  - Jessica emphasized that it is important to utilize community connections to reduce the onerous impact on low income/communities of color and ensure equitable participation in the sound insulation program.

- **Q: Can you expand on next steps surrounding SS-MM4?** See 4A pg. 2 of materials on S. San Jose Meet HSR NorCal
  - **R**: Listed below are potential revisions to the final EIR/EIS:
    1. Revisions will continue to be modified and the evaluation is ongoing. Emergency response delay times will be monitored on a rolling basis. The Authority will continue to monitor and forecast how response times will be impacted over time. If response time increases significantly, the Authority will act accordingly (see Emergency Response Delay below).
    2. Initial funding will be allocated if fire station is needed. Funding will exist for the first 5 years.
    3. The Authority is looking into a monitoring system for at-grade crossings tied into fire and police dispatch to consider real time info. about gates being down (exists in Sugarland, Texas)
  - **Emergency Response Delay**: The adverse emergency response delays for Alternative 4 are related to increased gate down time at the at-grade crossings at Skyway Drive, Branham Lane, and Chynoweth Avenue. Adverse delays greater than the delay threshold could occur if the City of San Jose chooses to not implement the improvements included in proposed direct mitigation measure SS-MM#4 based on the construction funding and partial operational funding proposed by the Authority.

- **Q: How will the Authority implement community art improvements?** The City of San Jose looks forward to having community art improvements. Community artists add a lot of goodwill and potentially pay you back in spades.
  - **R**: In terms of implementing improvements, the Authority will deal with the funding side when it comes to art. Coordination of the art project would be the City's responsibility.

Next Steps/Actions/Follow Up:

- Boris:
  - Will work with City of San Jose to incorporate MOU language.
  - Will follow up regarding Councilmember briefings, specifically David Tran (staffer for Councilmember Raul Peralez).

    - Will loop in team members accordingly after receipt of emails on VTA-Gardner Elementary sound wall email chain from Jessica Zenk.
- Jessica/Boris will coordinate on a carwash plan
    - Boris review materials from Stacey and follow up regarding information on a project "preliminary review" request for a development at 32 Stockton (the carwash site).
- Upcoming Community Meetings | September (5 – 7 pm)
    - 13th Guadalupe Washington
    - 14th Gardner
    - 20th San José - Diridon
    - 23rd South San José

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
African American Community Services Agency EJ Meeting
Date of Event
Monday September 13, 2021, 2021, 2:30-3:15
Recorder of Event
Rickie Cleere
Participants/Attendees
• **Representatives:** Milan Balinton, Rebekah Melesse, Lavere Foster, Ariadna Luna • **Staff:** Morgan Galli, Rich Walter, Cici Vu, Rickie Cleere
Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes

Questions/Responses:

- **Q:** How did you determine that there was a need for this project?
    - R: The project need goes back to a statewide environmental assessment conducted in 2000. A general system framework first developed in 2005 included termini in LA and San Francisco as well as a station in San Jose, with plans for later expansion. In 2008, Proposition 1A was put on the ballot in support of partial project funding. Since the passing of Prop 1A, the Authority has been implementing it along with additional pieces of legislation concerned with the northern sections of the project. Per legislative oversight, the Authority prepares a business plan every 2 years which to routinely reevaluate project need. The 2020 business plan confirms the project's economic viability, projected ridership, and overall benefit. Over the years, a shared understanding of the need for alternative transportation has developed in California. High-Speed rail is an opportunity to modernize and augment the existing passenger rail system with a fully electric travel alternative to intrastate car and air travel. Most research on potential benefits have focused on ridership analysis and the provision of a more environmentally friendly travel alternative. They ridership analysis has involved travel demand projections for 2031-2040, which have demonstrated a need for costly highway and airport infrastructure improvements across California. The project would by provide an electric rail option that produces fewer emissions, promoting compliance with state carbon dioxide emissions reduction goals. We will send fact sheets and additional links to our website with further information.
    - R: Sent in chat:
        - Draft environmental report (April 2020): https://hsr.ca.gov/programs/environmental-planning/project-section-environmental-documents-tier-2/san-jose-to-merced-project-section-draft-environmental-impact-report-environmental-impact-statement/
        - Draft environmental justice analysis (April 2020): https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V1-30_CH_5_Environmental_Justice.pdf

- Q: What is the project's anticipated completion date? Would low-income people be able to regularly ride?
    - Project construction is underway in the Central Valley and project operation is anticipated to begin in 2030. Expansion of project construction will begin as soon as funding become available. The full rail system may be complete by 2033, but this timeline is contingent on funding. There was an appropriation request before the legislature earlier this year and the legislature did not take action. The current bill (4.2) is still in bond and will be decided upon by the legislature in January 2022. In the meantime, the Authority is assessing how non-action will impact project delivery timelines across project sections. Regarding pricing and fares, the Authority expects the project to be competitive with airfare. Case studies in other regions across similar medium-range distances reveal a tendency for rail to outcompete airfare. The Authority and future operator will assess fares once service becomes closer to fruition.

- Q: Will the completed rail be electric-powered.
    - R: Yes.

Next Steps/Actions/Follow-up:

- In a follow up telephone call (9/13/21) with Lavere Foster to ensure understanding that HSR is planning to advance the improvements on the potential (vs. other considered) list, Lavere mentioned that he'd like to advocate that the measure to redevelop the Inez Jackson library be advanced on the potential list citing that it would serve as a sanctuary for the underserved community of San Jose from potential noise effects of the project. He indicated that many of the community members AACSA serves are unhoused or don't have stable homes and AACSA endeavors as an organization to provide a welcoming place of comfort to its members. Lavere will make sure AACSA submits a feedback survey to this effect.

- Community Meeting: Monday September 28, 5:00-7:00PM
    - **AACSA – Is there a need for Spanish Interpretation at this meeting?**
- Outreach Team to provide web resources with additional project information (below, sent in follow up communication):
    - HSR Website: https://hsr.ca.gov/
    - Fact Sheets (also attached)
        - General CA fact sheet: https://hsr.ca.gov/wp-content/uploads/docs/communication/info_center/factsheets/Connecting_California.pdf
        - Northern California Fact Sheet: https://hsr.ca.gov/wp-content/uploads/docs/communication/info_center/factsheets/Northern_California_Factsheet.pdf
        - SJ to Merced Preferred Alternative Fact Sheet: https://hsr.ca.gov/wp-content/uploads/2021/04/SJ_Merced_Project_Section.pdf
    - Business Plan: https://hsr.ca.gov/about/high-speed-rail-business-plans/2020-business-plan/
    - Draft environmental report (April 2020): https://hsr.ca.gov/programs/environmental-planning/project-section-environmental-documents-tier-2/san-jose-to-merced-project-section-draft-environmental-impact-report-environmental-impact-statement/
    - Draft environmental justice analysis (April 2020): https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V1-30_CH_5_Environmental_Justice.pdf

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Guadalupe Washington Community Meeting
Date of Event
September 13, 2021, **Start 5:00** – **End time 7:00 pm**
Recorder of Event (Name)
Vidya Bhamidi
Participants/Attendees

- **Representative Name(s)**,
  - Brian Stanke, San Jose DOT
  - Elizabeth Figueroa, (CommUniverCity SJSU) Special Programs Manager
  - Hugo Meza (District Attorney's Office)
  - Kerry Duncan, Rep. Lofgren Staff
  - Rosalinda Aguilar (GW Neighborhood Association)
  - Stacey (CSJ)
  - Maricela Alcala Franco (Principal Washington Elementary)
  - Imelda Rodriguez (CommUniverCity)
- **Staff Name**
  - Cici Vu, Facilitator
  - Rich Walter, Presenter
  - Audrey Van, Presenter
  - Rachel Bickert, Tech Support/Webinar Manager
  - Vidya Bhamidi, Documentarian

Purpose of Event

Meeting Objectives:

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Preliminary Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Key points on community-specific DHAE : Preliminary conclusions presented

- Potential disproportionately high and adverse effects (DHAE): Aesthetics and Visual Quality
- Visual and Noise Benefits: Reduced need for airport highway expansion and associated visual and noise effects. Helps to offset the adverse visual effects or noise effects.

- **Alternatives 1, 2, and 3:** Residual disproportionately high and adverse visual effects related to the elevated viaduct.
- **Alternative 4:** No disproportionately high and adverse effects.

Key points of concern from community; any preliminary feedback to directed questions:

- Impact on neighboring properties and unhoused populations
- Construction and operation related air pollution
- Timeline, details, and impact of construction
- Financial packages for businesses that will be impacted by construction

Questions/Responses:

- **Q:** A participant asked whether additional homes will be taken down on each side of the railroad tracks.
  - **R:** Only the two homes mentioned will be removed with Alt 4 (preferred alt), that too in Gardner/North Willow Glen

- **Q:** A participant asked about fossil fuels or air pollutant emissions
  - **R**: There will be diesel equipment during construction. But during operations, the train is electric so there won't be any emissions. There will be some emissions at the power plant, but the power plant is not in GW. Keep in mind that existing trains are presently operating on diesel, but Caltrain is electrifying its trains.

- **Q:** Is there a plan to mitigate those emissions?
  - **R:** In the EIR, we've looked at construction impacts as well as operational impacts. We also have some additional commitments working with the Air Districts. For example, HSRA is doing construction in Central Valley and incorporating all those mitigation measures in contracts with contractors. HSRA oversees this through a mitigation monitoring and enforcement plan.

- **Q:** What is the duration of construction of this project?
  - **R**: Overall is about 5 years where there are tunnels and 2-3 years where there aren't. Alternatives 1,2,3 will have more construction due to viaducts.

- **Q:** Could there be displacement to businesses during construction? Will parking be taken away?
  - **R**: We have requirements for impact avoidance and mitigation measures to make sure housing and businesses aren't negatively impacted.

- **Q:** How many community groups have you contacted?
  - **Cici:** We have contacted close to 300 community groups from San Francisco to Merced. Reached 200,000 community members in our EJ-focused outreach and engagement .General outreach has reached more.

- **Q:** A participant asked whether any structures will be erected in this community, because he is concerned about gang-related conflicts arising, graffiti, and the potential of related violence
  - **R:** The community art won't be on HSR structures, it will be on fencing. The intent is that it will be in other locations. Alts 1,2,3 have columns to hold up the viaduct – can follow up with specifics on whether these columns will be fenced off or open to public

- **Q**: A participant asked about sound walls in the community
  - **R**: There are no sound walls but will have to expand an existing rail bridge and create another bridge

- **Q:** What will be the impact on homeless populations? Does HSRA have plans to conduct a study?
  - **R:** For this community, the rail line follows Caltrain right of way so it will be Caltrain's responsibility. No plans to conduct our own study, will cooperate with CalTrans or Caltrain.
    - **Cici** adds that we've done on-ground outreach – we've done walks along the alignment where unhoused members are located, and have qualitative data

- **Q**: Clarification on any kind of start date?
  - **R**: The document says construction starting as soon as 2022, but doubtful that'll happen. We don't have funding and even if funding was identified tomorrow, our design is not finalized. It would still take several years.

- **Q:** Can you clarify the point about bridge widening in the area over Virginia St? Will there be any closure during the time when that work is being done?
  - **R:** Not aware of any road closures at this time. That section over the Guadalupe River is Valley Water's right of way.

- **Q:** A participant asked about slide 14: emergency response delays not having a circle
  - **R:** There is no station so there is no station traffic. There are impacts at the Diridon station for example, but those impacts don't reach the neighborhood. There are also no at grade crossings, so there are no operational delays for emergency response in this particular community.

Next Steps/Actions/Follow-up:

- Follow up with Hugo Meza regarding specifics on whether columns will be fenced off or open to public
  - RE Follow up High-Speed Rail - Question re Noise Barriers and Viaduct Columns in San Jose on Thursday, September 23, 2021 2:18 PM

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event

Rocketship Schools (Guadalupe/Washington Area) – Interested Parties

Date of Event

September 13, 2021 Start Time 10 am End Time 10:50 am

Recorder of Event (Name)

CeCe Horbat

Participants/Attendees

- **Representative Name(s)**
  - Courtney English – Principal English at Mateo Sheedy
    - Contact Information: 408-464-2472
- **Staff Name**,
  - Morgan Galli
  - Rich Walter
  - Cici Vu
  - CeCe Horbat

Purpose of Event

- Explain/Present on Updates to EJ Analysis, mitigations, benefits and community improvements
- Share preliminary conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Potential Community Improvements Presented

- Alternatives 1, 2, and 3:
  - Streetscape improvements along Goodyear Street, Humboldt Street, and Floyd Street to improve visual aesthetics.
  - Funding to support community art installations in the local community to improve visual aesthetics and a sense of community.
- Alternative 4:
  - Noise insulation for residential buildings immediately adjacent to the east side of SR 87 to offset residual noise effects.

Other improvements considered involving Rocketship Schools

- Rocketship Mateo Sheedy Elementary School play fields/landscaping
  - Benefits/Ranking: Ranking 3- safety, recreation, livability
- Rocketship Mateo Sheedy Elementary School circulation and safety improvements
  - Benefits/Ranking: Ranking 11- safety

Key points of discussion partner/community; any preliminary feedback to directed questions:

- Principal English expressed gratitude regarding transparency and inclusion in this update involving Rocketship Schools.
    - Principal English will provide an update at an upcoming school council meeting that meets with families and parents / parent groups active and interested in the project.

Next Steps/Actions/Follow-up:

- 9/13: Guadalupe Washington Community Meeting tonight 9/13 from 5-7 pm
    - Principal English will pass along invite to community stakeholders/ parent groups.
- 9/13: K&W forwarded meeting invite and flyer with zoom information for 9/13 Community Meeting.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
City of Santa Clara
Date of Event
September 13th 2021 Start time 3 pm, End 4:25 pm
Recorder of Event (Name)
CeCe Horbat
Participants/Attendees

- **City of Santa Clara**
  - Jonathan Yee, City of Santa Clara Transportation Manager (Dennis Ng was previously in the position)
  - Michael Liw, Assistant Director of Public Works/City Engineer
- **Staff Name**, Outreach Team
  - Chris Diwa, HSR
  - Rich Walter, ICF
  - Joey Goldman, K&W
  - CeCe Horbat, K&W

Purpose of Event

Meeting Objectives:

- Explain/Present on updates to EJ analysis, mitigations, benefits and, community improvements
- Share Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback, and conclusions

Key Notes

Key points on community-specific presentation

- **N/A**

Key points of concern from partner/community; any preliminary feedback to directed questions:

- **Discussion/Point of concern**: The City of Santa Clara shared that excluding some of the proposed improvements in the recent analysis was surprising and disappointing. City staff mentioned that this might not go over well with the community, and might be a point of concern resulting in pushback and loss of faith from the audience.
  - Presenters encouraged City staff to relay this feedback in the survey. The Authority wanted to leave this opportunity open-ended when first accepting improvement (formerly enhancement) proposals. However, the Authority's programmatic direction has changed, and through the survey, if there are other improvements the City wants to advocate for or add, they will be read.

- **Explanation of Operational Traffic (see *Summary of Potential Effects* dot table 4. A in Santa Clara/North San Jose Materials)**
    - The City of Santa Clara suggested explaining the long-term versus short-term impacts of operational traffic and why this part of the table is blank.

Questions/Responses:

- **Q: We had many meetings last year, and it appears there are no actual transportation impacts. How are we reconciling the work that we did in the fall of 2020? Previously the discussion was open-ended. What's going on now/how did we end up here? Additionally, how do we explain to people that last year's feedback is not moving forward?**
    - **R:** This year's direction (in 2021) was to look at relationships between effects and improvements more closely and to have a narrower scope. This moved the City of Santa Clara's improvements to "other improvements." This new analysis took the existing feedback and incorporated what they could to offset any residual effects. There are general benefits to the project. Currently, the Authority would like to hear feedback on the methodology, conclusions, and propositions presented by the Authority.
    - In 2019, the City of Santa Clara proposed a bike/pedestrian plan. Back in 2019, the direction broadly looked at community improvements. At that time, no decisions were final, and the Authority wanted to collect information on effects and benefits on a general level.
- **Q: How did the Authority designate the current division of the project? It appears that parts of Santa Clara fall into both project sections. Is there different staff for the two sections?**
    - **R**: The Authority split up the Northern California Section into two parts: San Francisco to San Jose (FJ) and San Jose to Merced (JM). While they are two separate teams, the review process is similar, and information overlaps.
    - Scott Blvd. is where the overlap roughly begins. In areas of overlap, the viaduct impacts both the JM and FJ sections. Within the station design, a viaduct might be in Santa Clara. However, the Authority needs to analyze and capture the whole impacted area in the Santa Clara region, resulting in the overlap. Overlap exists from Scott Blvd. to West Alma in San Jose and overlaps the Tamien Caltrain station.
    - The same analysis and most of the team have close communication with the larger Northern California team. Teams communicate with each other and flag items to the other team when necessary. Timelines of FJ and JM are about a month apart (range from 2-3 months). The JM section of the project is likely to advance to the final EIR/EIS before the FJ section.
- **Q: How does the Authority classify what is a DHAE?**
    - **R:** The Authority's definition of DHAE is as follows: "The focus of the environmental justice analysis is to determine whether the project would result in high and adverse effects that disproportionately affect minority populations or low-income populations." This definition looks at census data and then looks at income or race/ethnicity demographics compared to the rest of the study area and determined on an end-to-end basis. This methodology for determining Disproportionately High and Adverse Effects (DHAE) is identical to the Draft EIR/EIS.

Questions concerning alternatives 2 and 3

- **Q: Speaking from the perspective of community members after looking at the *Summary of Potential Effects* dot table (see table 4. A in Santa Clara/North San Jose Materials). What can be done to offset impacts in alternatives 2 and 3?**
    - **R:** Currently, the Authority sees that the offsetting value of project benefits are general transportation, noise, and visual benefits. The only potential community improvement included is under alternative 4.

  - If there is a disagreement about the offsets to alternatives 2 and 3, think of this prompt when giving feedback: Does the community have feedback on whether they agree with the Authority's perception of out-of-kind improvements? Are there additional ways to offset impacts or improvements that benefit the community even if they are not "directly" related? If so, the Authority would like to hear.

- **Q: Regarding alternatives 2 and 3 (parks): What are the specific potential effects and why are they not considered high and adverse? What is happening to offset these potential effects?**
  - **R**: The Summary of Potential Effects dot table states in the footnotes for parks in alternatives 2 and 3- "[2] Limited partial acquisitions at Reed Street Dog Park and Reed and Grant Streets Sports Park."
  - The Authority's updated analysis for alternatives 2 and 3 requires limited partial acquisition that can be mitigated by the Authority, avoiding DHAE status. In 2019, the City of Santa Clara provided feedback regarding impacts to these parks via a comment letter incorporated into the Authority's updated analysis and revisions.

General Project Questions

- **Q: How are you tailoring your outreach?**
  - R: Outreach is tailored to interested parties, implementing partners, and community stakeholders. All those invited to meetings have had some involvement in the high-speed rail project.
  - The City of Santa suggested reaching out to the communications department at the City, but the Authority described a more tailored approach.
- **Q: How have these meetings and this process been going with other members of the community?**
  - **R**: The Authority first met with the City and will continue to meet with interested parties and other stakeholders. The Santa Clara community meeting takes place on September 15th from 5-7 pm. The following organizations have been invited to the community meetings: Charities Housing/HomeSafe, Next Door Solutions, Council on American Islamic Relations (CAIR), HomeFirst, ImmigrantInfo.org, Muslim Community Association, Santa Clara County Emergency Assistance Network, Santa Clara County Refugee and Immigrant Forum, South Bay Islamic Association (SBIA).
- **Q: What caused the change to update the analysis?**
  - **R:** A shift in policy resulted in a more refined analysis. The perspective of what defines *out-of-kind* also changed. What was considered as an impact to the project had been resolved or mitigated, decreasing residual impacts.

Closing Remarks

- Authority: The Authority has been working on these documents since 2014/2015. Over the years, personnel, policy, and methodology changed. Our efforts in 2019-2020 allowed us to have a set of ideas and see what was feasible for the Authority. Part of this environmental process resulted in adjustments and mitigations. Some of the adjustments and mitigations resolved previous DHAEs. The Authority looks forward to community participation to help influence updating Chapter 5 for incorporation into the final EIR/EIS.

Additional Notes

- The City of Santa Clara is also working with BART regarding new station construction.
- The City of Santa Clara submitted a letter of support for the no-viaduct alternative and met with Dave Shpak and Boris Lipkin in past meetings.

Next Steps/Actions/Follow-up:

- Santa Clara Community Meeting (9/15)

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Gardner Community Meeting
Date of Event
Tuesday September 14, 2021, 5:00 – 6:20 pm
Recorder of Event (Name)
• Jennifer Vazconcelo
Participants/Attendees

• **Representative Name(s)**
  ○ Brian Stanke, San Jose Department of Transportation
  ○ Stacey Lu, City of San Jose
  ○ Kerry Duncan, Rep. Lofgren Staff
  ○ Kristine Nguyen, GoKids
  ○ Ben Leech, Preservation Action Council of San Jose
• **Staff Name**
  ○ Cici Vu, Facilitator
  ○ Rich Walter, Presenter
  ○ Chris Diwa, Presenter
  ○ Rachel Bickert, Tech Support/Webinar Manager
  ○ Jennifer Vazconcelo, Documentarian
  ○ Victor Hernandez, Spanish Interpreter

Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes

Key points on community-specific presented
• Summary of Potential effects in the Gardner/Willow Glen community
  ○ Preliminary conclusion takes into consideration direct mitigation, project benefits and potential community improvements.
  ○ Alternatives 1, 2, 3, and 4: will have effects due to Aesthetics and Visual Quality, but effects not considered high and adverse.
  ○ Alternative 4:
  ▪ Potential disproportionately high and adverse effect related to operational noise effects.
  ▪ Potential operational noise effects not disproportionately high and adverse for the entire project section, but a particular community may still be affected.
  ▪ Effects in parks, construction traffic/bus transit delay and operational traffic but these effects are not considered high and adverse.

- Effects shown are after consideration of direct mitigation, but before consideration of the offsetting value of project benefits or community improvements.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- Displacements due to expansion of the right of way
- Impacts on protected historical resources

Questions/Responses:

- **Q:** Do you have specific information on what parcels in the neighborhood would potentially be impacted with an expanded right of way?
  - **R:** There is a list of all the parcel numbers with the displacements in the DEIR/EIS appendix. The third volume of the Draft EIR/EIS is a preliminary engineering drawing; those include identifying the temporary right of way and the permanent right of way. The displacements are at the end of the neighborhood, closer to SR87 along the tracks; we're adding a track to the existing routes to handle the capacity; that is why we had to widen the right of way, which would require the acquisition of two residences in the neighborhood.
- **Q:** We have been tracking what is proposed in the DEIR/EIS regarding potential impacts to the Diridon station as a historic resource; the discussion tonight didn't seem to address the historic resources. As this process evolved, when is the next leverage point to discuss what is being considered in accommodating the station on-site?
  - **R:** The DEIR/EIS has a detailed analysis of the effects on cultural resources, like the Diridon station. We haven't identified any cultural resource impacts that would fit those definitions in the environmental justice analysis. Still, since this is a federal project, we also consult with the State Historic Preservation Office.
- **Q:** Does the analysis look at specific grade crossings? I know that there is at least one grade crossing, is that proposed to stay a grade crossing, or is there a plan to close off that street to avoid the grade crossing, or Virginia converts into Drake?
  - **R:** Within Gardner Northland, Virginia is turning into Drake, and then across on the other side is Azariah. With alternative four, which is the at grade, those are proposed to remain at grade crossings. At the grade crossing, we're going to add quad gates and fencing where needed; right now, there are two gates; the quad gates help prevent anybody from going around the gates. We're also going to be adding median channelization to stop people from going in the opposite lane. Some vehicle detections are required in the entrances to prevent cars while gates are coming down from getting trapped.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Santa Clara Community Meeting
Date of Event
September 15, 2021, **Start 5:10** – **End time 6:25 pm**
Recorder of Event (Name)
Vidya Bhamidi
Participants/Attendees

- **Representative Name(s)**, Title
  - Aparna Dhoraje, Next Door Solutions
  - Michal Healy, Santa Clara Unified School District
  - ML Work Iphone (unknown)
- **Staff Name**
  - Joan Issacson, Facilitator
  - Rich Walter, Presenter
  - Chris Diwa, Presenter
  - Rebecca, Tech Support/Webinar Manager
  - Vidya Bhamidi, Documentarian

Purpose of Event

Meeting Objectives:

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Preliminary Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Key points on community-specific presentation
- Visual and Noise Benefits
- Noise insulation for certain residences
- Residential and Business Displacements
- Construction Impacts

Key points of concern from community; any preliminary feedback to directed questions:
- No feedback

Questions/Responses:
- **Q:** Where is the link to the actual improvements to Santa Clara roads and crossings located?

- **R:** There are descriptions of changes to roadways, especially for Alt 2 and 3 that have more roadway changes. There isn't an engineering design, those are at a conceptual level. We can follow-up via email.
  - Draft environmental justice analysis (April 2020): https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V1-30_CH_5_Environmental_Justice.pdf
  -

Next Steps/Actions/Follow-up:

Follow-up via email with Michal Healy (mhealy@scusd.net)

- Re: Followup on location of Potential and Other Community Improvements in Santa Clara on Fri, Sep 17, 2021 at 5:20 PM

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Santa Clara County Agencies
Date of Event
September 15th 2021 Start time 2:05 pm, End 2:50 pm
Recorder of Event (Name)
CeCe Horbat
Participants/Attendees

- **City of Santa Clara**
  - Jeremy Farr, Parks and Recreation
- **Staff Name:** Audrey Van, Rich Walter, Joey Goldman, CeCe Horbat

Purpose of Event

Meeting Objectives:

- Explain/Present on updates to EJ analysis, mitigations, benefits, and community improvements
- Share Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback, and conclusions

Key Notes

Key points on potential community improvements in community-specific presentation

- Jeremy Farr from SCC Parks and Rec received slides and materials from South San Jose and the City of Morgan Hill communities. See previous feedback from 2020

S. San Jose

- Alternatives 1, 2, and 3:
  - Funding for landscaping improvements along Monterey Road (as part of the City of San Jose Grand Blvd. initiative) to help offset visual aesthetic effects of HSR structures.
- Alternative 4:
  - Noise insulation for certain residences along 101 helps to offset residual project noise effects
  - Funding to the City of San Jose for new pedestrian/bicycle overcrossings at Skyway, Branham, Chynoweth helps to improve safety.

City of Morgan Hill

- Alternatives 1 and 3:
  - Funding to the City of Morgan Hill to implement trail and park improvements under the viaduct to offset visual aesthetic effects
- Alternative 2:
  - Funding to implement complete streets improvements along Railroad Avenue to offset visual aesthetic effects.
  - Partial funding for affordable housing to offset residential displacement that cannot be relocated locally based on the housing market
- Alternative 4:

- Noise insulation for residences along 101 helps to offset residual project noise effects

Key points of concern from partner/community [none shared]; any preliminary feedback to directed questions:

- **No DHAES under the new analysis impacting SCC Parks and Rec in S. San Jose or City of Morgan Hill**
  - Other improvements impacting parks and recs include the following
    - S. San Jose
      - Coyote Creek Trail-Fisher Creek Trail Connection (ranked 5)
    - City of Morgan Hill
      - Coyote Creek low-flow crossings replaced with bridges
      - Perry's Hill staging area, Coyote Creek Parkway in Hellyer County Park
      - Llagas Creek Trail

- The only DHAEs impacting parks are in the City of Gilroy

- Jeremy Farr has experience with NEPA and appreciated the meeting. Jeremy understands needing to move previously discussed improvements to other improvements. Jeremy also shared reflections that many of these DHAEs don't impact these urban area communities. This reflection was a double-edged sword as many of these parks do not serve residents living in the identified dense urban areas.

Next Steps/Actions/Follow-up:

- City of Santa Clara Community Meeting 9/15
- Morgan Hill Community Meeting 9/21
- S. San Jose Community Meeting 9/23

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Interested Party: Gavilan College
Date of Event
September 16, 2021, 4 pm – 5 pm
Recorder of Event (Name)
Henry DeRuff
Participants/Attendees

Gavilan College

- **Susan Sweeney**, Interim Dean of Student Success and Workforce Pathways
- **Linda Bernabe**, Interim Director of Community and Educational Pathways
- **Not Present:** Jan Chargin, Denee Pescarmona, Kathleen Rose, Lisa Scott (who we met with in Phase 2)

Outreach Team

- **Rich Walters**, ICF
- **Audrey Van**, HSR
- **Cici Vu**, K&W
- **Henry DeRuff**, K&W

Purpose of Event

The event purpose was to:

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Preliminary Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions
- Focus in on informing the College about how the updated EJ analysis impacted the previously proposed work force development community improvement measure.

Key Notes

General points of observation:

- Susan and Linda were *briefed* on the topic, but both live in Gilroy; they had not read the materials. Dr. Rose and Denee, who attended previous meetings, were not in attendance.
- Because we met with staff new to the project, Cici & Rich gave a general overview/history of the project due to lack of prior knowledge
- Additional mention: considered additional job training at Gavilan (not on short list at present for EJ process because not a close relationship to project effects – not a lot of job loss; HSR does have a partnership with skilled craft unions, didn't want to double efforts; also not part of DHAEs)

Stakeholder response:

- Impressed with the project benefits and how it would positively impact travel.

- Clearly understood and reiterated that work force development as a community improvement measure is not on the "potential" community improvements list

Questions/Responses:

- **Q (Susan)**: This is a nice opportunity for *travel*, but not for what we asked for, and in particular for the workforce training piece. What are the next steps for Gavilan?
    - **R:** There are the three options that include Gavilan, although they are not necessarily likely: low-income housing, bike lanes, and job training. Alternative 2 involves funding for affordable housing, which could include funding for Gavilan low-income housing. I'd encourage you to provide feedback on whether any of those three are connected to the effects we've identified. If you have questions about relationships with unions, we can put you in contact with the members of our team who have worked on that. Additionally, please fill out the survey we've sent, call/email us, or come to the community meeting on 9/28. If students or other members of the Gavilan community are interested, please encourage them to attend.
- **Q (Linda):** We have a campus in Hollister. Will there be any impact or connection to the campus in Hollister?
    - **R:** Hollister is pretty far away from the alignment, so we haven't explored that yet.

Next Steps/Actions/Follow-up:

- By **9/17**: The Outreach team will send a thank-you email with relevant materials & links.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
San Jose Unified School District: EJ High-Speed Rail Implementing Partner Meeting
Date of Event
Thursday September 15, 2021, 11:00am
Recorder of Event
Rickie Cleere
Participants/Attendees
• **Representative:** Ben Spielberg – Manager of Strategic Projects • **Staff:** Chris Diwa, Rich Walter, Cici Vu, Rickie Cleere
Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes
Key points on community-specific presentation • SJ USD will consult its Director of Procurement for input on potential design elements. Their staff can think more about implementation once the funding is committed, with enough lead time. • The Authority invites input on project direction from implementing partners as long as it works to address noise impacts. **Questions/Responses:** • Q: From the District's perspective, Gardner Elementary School is most impacted. When SJ USD met with Cici Vu and Cathy Paskin 2 years ago, we developed and provided a list of ideal measures. SJ USD wanted to know what the projected funding would be for the Gardner School mitigation since the District does not have sufficient funds to implement. I appreciate the Authority's point-for-point approach to mitigating direct project directs, but it would be ideal if indirect impacts were also addressed. SJ USD will defer with the City of San Jose and the Authority on the measures that are moved forward. o R: The improvement offsets the residual impacts of the project after mitigation. Initially, Gardner Elementary had no noise improvement, only a parking and circulation improvement. The $588k projected funding for the improvement would be for barriers on the school property, adjacent sidewalk, and/or on the north side of the school on Williams Street. The cost estimate for our concept was based on a 600-feet long and at 14 feet high structure at $70 per square foot. The actual barrier will be less than 600 feet and will likely cost less than the estimate. There is also the possibility for building and window treatment for structures on the north side of the school. Site assessment would be needed on school property and along Caltrans ROW.

- Q: Due to District understaffing and the need to focus on core school services, our team will not likely enter into the process until implementation is near, what is the likely timeline for having design and implementation discussions and the use of the improvement funds?
    - R: The Authority will make a decision in its Record of Decision (ROD) in March 2022, however, project funding has not yet been secured. The timing for the improvements is contingent on securing funds, which is still uncertain. At the present time, the designs are more conceptual. The policies are going to be adopted as mitigations post ROD, and interaction with implementing partners has not yet been planned. There will need to be time to refine concepts and establish a funding timeline for planning, design, and construction. We want to know whether SJ USD would be supportive of the potential improvements. We will coordinate funding through an agreement with our implementing partners. If there are concepts you want or any concerns that you have, let us know. If there is any qualitative feedback from the school Principal, let us know.
- Q: What is the approval or audit process on reporting the use of improvement funds?
    - R: Because the improvement will be funded as a mitigation, it would have to result in noise reduction for school users. This would be ensured during design, and the Authority will conduct follow up reporting to confirm that the funds are meeting their purpose.
- Q: I'll consult our team for any other suggestions before the comment period deadline. Would feedback on soundwalks and insulation in the school cafeteria be helpful at this time?
    - R: Conceptual feedback would help, and any feedback on potential ways to address noise would be useful. We are currently creating an improvement profile and cost estimate in the EIR. Input could also inform subsequent post ROD discussions around advancing concepts further.
- Q: Should we continue to use the initial price estimate for reference in our feedback?
    - R: Any proposed costs in your feedback would need to be appropriately connected to a concept.

Next Steps/Actions/Follow-up:

- Once funding is allocated
    - The authority will return to coordinate with the school district on improvement implementation details.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Franklin McKinley School District
Date of Event
September 17th, 2021, Start 1:00 pm – End time 2:15 pm
Recorder of Event (Name)
CeCe Horbat
Participants/Attendees

• **Franklin McKinley SD Staff**
  ○ Juan Cruz, Superintendent for Franklin McKinley
  ○ Jason Vann, Assistant Superintendent for Franklin McKinley
• **Staff Name**
  ○ Joey Goldman, Rich Walter, Chis Diwa, CeCe Horbat

Purpose of Event
Meeting Objectives • Explain/present on updates to EJ analysis, mitigations, benefits and community improvements • Share preliminary conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback, and conclusions
Key Notes

Potential Community Improvements Presented (Key points on community-specific presentation)
• **South San Jose**
  ▪ Funding for Monterey Road Grand Blvd. landscaping improvements to help offset visual aesthetic effects of HSR structures.
  ○ *Alternative 4 (at grade crossing):*
  ▪ Noise insulation for certain residences along 101 helps to offset residual project noise effects
  ▪ Funding to City of San José for new pedestrian/bicycle overcrossings at Skyway, Branham, Chynoweth helps improve safety.
• **Washington Guadalupe**
  ○ *Alternatives 1, 2, and 3:*
  ▪ Streetscape improvements along Goodyear Street, Humboldt Street, and Floyd Street to improve visual aesthetics.
  ▪ Funding to support community art installations in the local area to improve visual aesthetics and build a sense of community.
  ○ *Alternative 4:*
  ▪ Noise insulation for residential buildings immediately adjacent to the east side of SR 87 to offset residual noise effects.
Key points of concern from partner/community; any preliminary feedback to directed questions:
• Areas of concern in Washington Guadalupe for Franklin-McKinley
  ○ Captain Jason M. Dahl Elementary School

- Lairon College Preparatory Academy

Questions/Responses:

- **Q: To avoid delays for emergency vehicles, what is the viability of under-the-train track options for car traffic?**
  - **R:** There is a trade-off in the San Jose corridor near Monterey Rd crossings. Due to the City's 2040 "Road Diet" Proposal, congestion and slower traffic effects occur, regardless.
  - Preferred Method
    - Current alternatives propose viaducts as they are most cost-efficient and do not impact traffic. The Authority's preferred alternative is Alternative 4.
    - The Authority explored an option parallel to 101. However, the Authority did not pursue this option due to significant displacements and curvature not ideal for high-speed rail.
  - Other methods explored
    - Tunnels/Ferry Trenches: In the beginning, tunnels and ferry trenches were ruled out early in the analysis due to cost. Tunneling solves the issues of traffic congestion; however, the cost excluded this avenue. Additionally, Downtown San Jose considered below-ground tunneling. However, high groundwater and intractability halted this option. The challenge with San Jose's possible trenches required construction ramps costing hundreds of millions of dollars. At times, trenches can be cost-efficient. However, changing the elevation of roads and rail lines requires more land and money to complete.
    - Below tunnels for cars- The challenge in south San Jose is next to Monterey Road. Tunnels for cars would require pushing down Monterey Road and constructing ramps that cost hundreds of millions of dollars. Estimates are $400+ million to $1 billion to do 3 tunnels. The closest alternative similar to the undercrossing mentioned is Alternative 2.
  - Current at-grade crossings
    - San Jose: 5 crossings
    - South San Jose: 3 crossings
    - San Jose Diridon: 2 crossings
- **Q: How will the S. San Jose DHAEs under traffic congestion impact our community?**
  - **R**: The document's reference for Guadalupe Washington contains additional figures to show where traffic effects occur after mitigation in areas south of Capitol Expressway. Specifically, south toward Skyway and Chynoweth has more significant future impacts. The Authority expressed that this will not impact commuters north of the areas listed above and shouldn't be an issue until closer to Diridon station. The portion of the Monterey Corridor that is impacted is between Skyway and Blossom Hill.
  - Franklin-McKinley administrators expressed concern about Monterey Rd.'s already high traffic congestion for Lairon, Dahl, and Franklin Elementary (located on Tully Rd.) – schools within the district. Additionally, Franklin-McKinley is worried about traffic impacts as the district constructs a new school.
- **Q: What is the current timeline for review?**
  - **R**: The Authority looks to have a decision to propose to the board by February/March of 2022 to select one of the 4 alternatives. The proposal brought forward in February/March allows for a 30-day public comment period.

Actions/Next Steps/Follow Up

- *Draft Environmental Impact Report/Environmental Impact Statement (Link to full EIR/EIS)*
  - Section 3.2 Transportation describes the various types of transportation profiles/traffic analysis
- Provided links for Washington Guadalupe Materials (see thank you email/slide deck)
- Upcoming Community Meetings | September (5 – 7 pm)
  - 23rd South San José

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
SJ Diridon Community Meeting
Date of Event
September 20, 2021, **Start 5:00** – **End time 6:15 pm**
Recorder of Event (Name)
Vidya Bhamidi
Participants/Attendees

- **Representative Name(s)**, Title
  - Brian Stanke, San Jose DOT
  - Jason Kim, VTA
  - David Tran, CSJ District 3
  - Huascar Castro, Silicon Valley Rising
  - Kerry Duncan, Assembly Member Zoe Lofgren, CA-D 19th District
  - Greg Felix, Delmas Park Neighborhood Association
  - Stacey Lu, CSJ DOT
- **Staff Name**
  - Joey Goldman, Facilitator
  - Rich Walter, Presenter
  - Bruce Fukuji, Panelist
  - Rebecca, Tech Support/Webinar Manager
  - Vidya Bhamidi, Documentarian

Purpose of Event

Meeting Objectives:

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Preliminary Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Key points on community-specific presentation

- Alternatives 1, 2, and 3: Residual disproportionately high and adverse visual effects related to the elevated viaduct.
- Alternative 4 noise effects

Key points of concern from community; any preliminary feedback to directed questions:

- Housing and business displacement
- Other community improvements considered
- Reasons for Alternative 4 being preferred
- Noise impacts

Questions/Responses:

- **Q:** An attendee asked about the difference in horn blows for at-grade versus elevated alternatives.
  - **R:** There are three locations where horns would be blown relative to Downtown SJ and nearby – at the station, at-grade crossings and also at West Virginia before it turns into Drake.
  - **R** gave a brief overview of the technical report that provides more details: Volume 2, Section 3.4-A of the EIR/EIS
    - Link was shared in chat: https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V2-16_APP_3.2-A_Transportation_Data_Roadways_Freeways_Intersections.pdf

- **Q:** An attendee asked where they could find details about specific intersections for their neighborhood. Their concern was related to noise effects.
  - **R** gave a brief overview of the comprehensive noise analysis (Volume 1, Section 3.4 of the EIR/EIS)
    - Link was shared in the chat: https://hsr.ca.gov/programs/environmental-planning/project-section-environmental-documents-tier-2/san-jose-to-merced-project-section-draft-environmental-impact-report-environmental-impact-statement/

- **Q:** An attendee asked whether there was a difference between Alt 4 vs Alt 1,2,3 when it comes to noise. They asked for more information about at-grade versus elevated alternatives.
  - **R** explained that Alternatives 1, 2 and 3 are all elevated on a viaduct in the area and don't have any at-grade crossings. They are on a dedicated viaduct track that is separate from the station area. They will still have some minimal noise of a moving train, likely along with sounding some warning as it approaches stations. But overall, they have less noise effects.
  - **R** gave a brief overview of Chapter 2, Volume 1 of EIR EIS – at grade vs elevated
    - Link was shared in the chat: https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V1-08_CH_2_Alternatives.pdf

- **Q:** An attendee asked about the potential displacement, both residential and commercial. They also asked about relocation assistance.
  - **R** gave an overview of the Community Impacts Assessment and the Draft Relocation Impact Report. He explained that an analysis of residential and business displacement was conducted for the different alternatives in the different sections. The analysis differentiates between the effect of relocating locally vs. having to move out of the community. It was found that there was adequate market availability for relocation within the community without needing to move far out.
  - **R** explained the difference between acquisition assistance and relocation assistance.
  - **R** gave a brief overview of the socioeconomic section of the EIR/EIS – Volume 1, Chapter 3, Section 3.12.

- Link was **not** shared in the chat: https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V1-20_CH_3.12_Socioeconomics_Communities.pdf
- **B** gave a brief overview of relocation assistance
- Link shared in chat: https://hsr.ca.gov/programs/private-property/

- **Q:** An attendee asked whether there is a frontrunner out of the four alternatives.
  - **R**: In summer 2019, the Authority went through a process wherein they brought the preliminary review of the environmental effects as well as community input to the Board. Alternative 4 was identified as the preferred alternative. By law and by our process, we don't make any final decision until the environmental review is complete because we go through a process of taking comments and then the Board makes the final decision. The final will be decided by Q1 2022. Still, Alternative 4 is the front runner.

- **Q:** Given that Alternative 4 is the only alternative that doesn't go over I-280 and SR 87, is that a big push/driver for it to be the preferred alternative?
  - **R**: There are a bunch of trade-offs between the alternatives, best expressed in Volume 1, Chapter 8 of the EIR/EIS.
    - Link shared in chat: https://hsr.ca.gov/wp-content/uploads/docs/programs/san_jose_merced/Draft_EIRS_JM_V1-33_CH_8_Preferred_Alternative.pdf
  - In this community, Alternative 4 being mostly at-grade and inside the existing railroad corridor. As a result, it has nowhere near the amount of displacement or disruption during construction as the others. For Alternative 4, a lot less land is required and it is the lowest cost alternative.
  - As they go into the San Joaquin Valley, all the alternatives end up on the same alignment, so there aren't any differences there.

  - **Q:** An attendee asked Rich to shed some light on the "Other Improvements Considered" ranking on page 2 of the Community Improvements Document that was uploaded to MeetHSRNorCal.
  - **R:** In 2020, we evaluated 100 different improvements based on criteria: benefit intensity, relative number of beneficiaries, practicability, defined project or action, satisfying Authority obligations, defined roles and responsibilities, evidence of agreement, and cost-effectiveness.
    - **R** went over each improvement in the "Other Improvements Considered" ranking on page 2
    - Some of the people involved in this outreach were involved in that process as well, so some of these were their ideas. This is to provide them feedback of where those are at this point.
    - We are focusing on noise because it's the only Disproportionately High and Adverse Effect (DHAE) of Alternative 4. We are taking feedback on our methodology and approach, but right now we don't have those other improvements on our list because they don't have noise effects.

Next Steps/Actions/Follow-up:

- Follow-up with Huascar about relocation assistance
  - [Follow up] High-Speed Rail - Question re Relocation Assistance, **sent:** Wednesday, September 29, 2021 3:31 PM

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Morgan Hill Community Meeting
Date of Event
September 21, 2021, 5-7pm
Recorder of Event (Name)
Henry DeRuff
Participants/Attendees

External Attendees

- **Kerry Duncan**, Staffer for Congresswoman Lofgren

Staff

- **Morgan Galli**, **Rachel Bickert**, & **Kelsey Shockley** HSR
- **Rich Walter**, ICF
- **Joan Isaacson** & **Henry DeRuff**, Kearns & West
- **Kimberly Larios**, OnPoint Language Solutions

Purpose of Event

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Key points on community-specific presentation

- Kerry Duncan was the lone participant; we answered her questions and showed the community-specific slides.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- Kerry expressed interest in learning the feedback from other meetings to inform the Congresswoman.
- She was also interested in the general attendance of these meetings, how people got access to them, and how the materials were being shared.

Questions/Responses:

- **Q: Who did you reach out to? (Kerry Duncan)**
  - **R:** We sent the invitation to 56 people, as well as reaching out to Immigrantinfo.org, CARE, SCC Emergency Assistance Network, SCC Refugee and Immigrant Forum, and Voices Charter School specifically. (Henry)
- **Q: I know there's a feedback survey. Was there a target number of responses? (Kerry Duncan)**
  - **R:** There's no specific target. (Rich)

- **Q: Is that feedback survey, and the materials password-protected, so only people with the password can access? (Kerry Duncan)**
    - **R:** Correct, although we know that people pass along the materials. (Rich)

Next Steps/Actions/Follow-up:

- By **9/22**: The Outreach Team **will send materials & Thank You note.**
- By **9/22**: Check with Rich about **what feedback to share with Kerry/the Congresswoman.**
- By **9/22**: Check with Rich/Cici Vu about **whether to share information about the meeting with City Officials.**

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Los Banos Community Meeting
Date of Event
Wednesday September 22, 2021, 5:00pm
Recorder of Event
Rickie Cleere
Participants/Attendees
No community members were present to for the meeting • **Staff:** Rich Walter, Audrey Van, Rebecca Fleischer, Joey Goldman, Rickie Cleere
Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes
Key points of concern from partner; any preliminary feedback to directed questions: • N/A **Questions/Responses:** • N/A **Next Steps/Actions/Follow-up:** • None

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Supportive Housing and Homeless Services EJ HSR Update
Date of Event
September 22, 2021 Start time 4:05 End time 5:20 pm
Recorder of Event (Name)
CeCe Horbat
Participants/Attendees

- **Representative Name(s)**,
  - Michelle Covert, Housing and Homeless Concerns Coordinator at County of Santa Clara
- **Staff Name**,
  - Rich Walter (ICF), Greta Brownlow (ICF), Bruce Fukuji (HSR), Cici Vu (K&W)

Purpose of Event

- Explain/Present on Updates to EJ Analysis, mitigations, benefits and community improvements

  Share preliminary conclusions
  Gain feedback on directed questions
  Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Potential Improvements in Morgan Hill and Gilroy Presented:

Alternative 2:

- Provide state and federal-required relocation assistance.
- Also, provide partial funding for affordable housing to offset residential displacement that cannot be relocated locally based on the housing market (@50% cost of new affordable housing unit)
  - Morgan Hill – Relocation deficit of 59 units
  - Gilroy – Relocation deficit of 75 units

Directed Questions/Responses:

- **Q: Can you explain the blue boundaries shown in the community-specific materials maps?**
  - **R:**
    - Community Boundary (light blue border): Based on census tract
    - EJ Effects Study Area (dark blue border): Communities that have higher populations of low income/communities of color
- **Q: Do the displacement numbers show on slide 16 equal the number of displacements?**
  - **R**: Yes.
- **Q: How will HSR impact the area more than Caltrain already has?**
  - **R**: DHAE's list includes displacement of business, displacement of residence, noise, visual, aesthetics, emergency response, park, and operational vibrations. Communities may face one or more of these DHAE's throughout construction and during the high-speed rail operation. Once the trains begin

running, the number of trains running through the community increases up to 100 trains in south San Jose. Traffic will increase around the Diridon Station traffic impacting noise and aesthetics in Washington Guadalupe. Some areas face delays for emergency vehicle access where there are at grade crossings.

- **Q: Who decides which Alternative is selected?**
  - **R**: The HSR Board decided in 2019 that it was the Preferred Alternative (Alternative 4). This Alternative is open to community feedback. Therefore, this alternative is preferred but not final. The steps after this phase are finalizing the Final EIR/EIS in February and the Authority Board is expected to make a decision in March 2022.
- **Q: What are other communities along this project doing with respect to the unhoused issue? Is anything differently being done?**
  - **R:** We've actually had other project section staff ask our team for insights on how to treat the issue of impacts to our unhoused community.
- **Q: When will actual construction occur?**
  - **R**: Construction ebbs and flows due to project management of various phases. Parts of the rail have begun construction in the Central Valley. Funding has also slowed down the process and impacts the timeline.
- **Q: What is the current mitigation regarding housing for those who live along the construction zone? What are we able to communicate to community advocates?**
  - **R**: HSR is a tenant in the existing agreement with the owners (Caltrain and Union Pacific). HSR is not the owner or controller of the situation and, therefore, is left up to Caltrain or Union Pacific. Any forms of relocations are mediated through the landowner and Caltrain/Union Pacific. There are instances where HSR is the owner because of the construction of new railways. These areas include the San Joaquin Valley and Pacheco Pass where there are grade separations. Abatement efforts are in the hands of Union Pacific where Union Pacific owns the railways. Execution of abatements depends on agreements made between HSR and Union Pacific.
- **Q: What is the assessment of residential displacement and relocation availability?**
  - **R**: Currently, Alternative 2 has the most significant impact on displacement. The Preferred Alternative, Alternative 4, has an even impact on EJ and non-EJ communities resulting in no DHAE

Next Steps/Actions/Follow-up:

- By 09/22: Correct and send pdf slides to Michelle Covert so that she can share with her team and the OSH Board – DONE

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Oak Grove School District
Date of Event
September 23, 2021, 2-3:30pm
Recorder of Event (Name)
Henry DeRuff
Participants/Attendees

- **José Manzo,** Superintendent
- **Laura Phan**, Interim/Retired Chief Business Officer
- **Audrey Van**, HSR
- **Rich Walter**, ICF
- **Joey Goldman** & **Henry DeRuff**, K&W

Purpose of Event

The event purpose was to:

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Key points on community-specific presentation

- The community partners emphasized that the Caroline Davis track is a community hub. Investing in it would be a greater priority than – and would endure far beyond – a noise barrier.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- Their project (Caroline Davis track) is no longer one of the primary improvements being considered. They are asking for a more holistic approach that considers the generational benefits of improving a community hub as opposed to just reducing noise.

Questions/Responses:

- **Q:** As you know, we've been involved in this engagement for the last three years. I sent a clarifying question about some of the ratings for a project we proposed as a mitigation. At some point, the project directly recommended by the Authority was taken off the table. We never were told it was taken off the table and were surprised. Your analysis makes sense (noise for noise, etc.), but with high-poverty communities, it's not as simple as putting up a barrier to stop noise. And our high-poverty communities will not be on the call this afternoon. That's why I'm advocating for this project. It's not just a recreation facility, but rather a hub for community that not only the kids, but also the families, will benefit from. The train is not going to impact these

communities positively, and I'm frankly disappointed that there was not an opportunity by the Authority to seek a greater understanding about why this is important to our community. (José)

  - **R:** This is not final. And this is our first opportunity for dialogue. The direction we got from CHSRA as a whole (not community-specific) was that mitigation must be related to the effect. I can't say that they will make that change, but you made your point clearly and holistically and we will share this feedback. The Caroline Davis project scored well, but with the shift in policy, we're headed in a different direction than where we thought we were going last year. (Rich)

- **Q:** Last year, it felt really validating to hear the Authority's interest in our project. With all the previous work and feedback, it all seemed like it was going according to plan and that we were moving along in the direction of implementation for our project, which made it even more disappointing to hear it's not a top choice anymore. What is the decision point from October 1 forward? Are there any more opportunities for input after this? (José)
  - **R:** The next step is to include this feedback (from methodology to specifics) to the Authority and decide where to go in from there. The final EIR/EIS document will be available in February and the board will decide in March. There aren't planned future feedback sessions yet, but it is possible that we will have another opportunity to sit down for follow up based on this information. (Rich)
  - **R:** Just to reiterate, we are taking notes, and we encourage you to encourage your community to attend the community meeting tonight. (Joey)
- **Q:** Looking at the different alternatives, it looks like if we go with Alternative 4, there are certain improvements considered, vs. different ones for 1, 2, 3. The reason I bring this up is that the Caroline Davis track is truly a community hub. If you go out there 7 days a week at any time, you will see not only school children but also community members walking the track. My question is, can this be tied to all 4 alternatives? (Laura)
  - **R:** That's a good piece of feedback, and the direction we will go will be determined by the Authority. (Rich)
- **R:** We know the decision-making is beyond the staff, but we want to say that we appreciate the support of the staff. (Laura)
- **R:** We will be sure to put all of this in the survey! (José)
  - **R:** One thing you could do would be to say that the track is more important than the noise abatement. (Audrey)
- **R:** Well, I understand that nexus, but this community is already so sound-polluted, people might say, "What's one more?" We're advocating from a place of community needs, not a 1:1 tradeoff. (Laura)
- **R:** The nexus-relationship thinking is short-term if it's just about noise. This track would be a generational benefit, where kids throughout generations attend this school and use this track. It would be a tremendous lost opportunity to go beyond the narrow 1:1 noise for noise. (José)

Next Steps/Actions/Follow-up:

- By **9/24**: The Outreach team will share materials and a thank you note.
- By **10/1**: The SD will complete the survey to officially write down their input.
- In **October**: The EIR/EIS team will review the feedback on the holistic benefits of the Caroline Davis project in the final EIR/EIS.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Sacred Heart EJ HSR Update Phase 3 Meeting
Date of Event
September 23, 2021, Start Time 10:23 am End Time 11:15 am
Recorder of Event (Name)
CeCe Horbat
Participants/Attendees
• **Representative Name(s)**,   ○ Principal Lorraine Shepherd • **Staff Name**, Rich Walter (ICF), Bruce Fukuji (HSR), Cici Vu (K&W)
Purpose of Event
• Explain/Present on Updates to EJ Analysis, mitigations, benefits and community improvements Share preliminary conclusions Gain feedback on directed questions Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes

Washington-Guadalupe, community specific improvements presented
Alternatives 1, 2, and 3:
• Streetscape improvements along Goodyear Street, Humboldt Street, and Floyd Street to improve visual aesthetics.
• Funding to support community art installations in the local community to improve visual aesthetics and a sense of community.
  ○ **** If Deacon Solorio has the name of an artist in mind, please feel free to pass along****
Alternative 4:
• Noise insulation for residential buildings immediately adjacent to the east side of SR 87 to offset residual noise effects.
Questions/Responses:
• **Q: Do you have any resources to help visually illustrate the design and location of the viaducts aside from slide 20 in the presentation?**
  ○ **R**: The viaducts are for alternatives 1,2,3, and at grade, crossings occur at alternative 4 (the preferred alternative). Bruce Fukuji shared additional links for Principal Shepherd in chat/thank you email https://www.meethsrnorcal.com/station-3-videos.html

- **Q: What is the estimated duration of time between Los Banos to Guadalupe Washington neighborhood?**
    - **R**: Currently, there is no station at Los Banos, which would require people to take another form of transportation to arrive at a station. Operational time from San Francisco to Los Angeles is less than 3 hours and, on average, about 3.5 hours. Travel time between Fresno and San Jose is shorter, about 1 hour if not closer to 40-45 minutes.
- **Q: What has been some themes of the general public's concerns during the project's review process?**
    - **R**: More recently, people have concerns around construction disruption, noise, visual appearances, and displacements of businesses and residences. Also, traffic continues to be a concern but not in this neighborhood (Washington/Guadalupe). Community members in and around the Diridon station within the first 4 blocks and areas around S. San Jose face increased congestion. Safety and connectivity remain an issue of concern for communities as well.
- **Q: Have you all had to address or speak about the displacement of unhoused populations? (**Principal Shepherd acknowledged the increase of encampments near the Tamien station.)
    - **R**: We've done outreach with the Office of Supportive Housing and working with the authority to adjust to discuss displacements of unhoused populations.
- **Q: Last year, you provided surveys in multiple languages. Is this the case for this year as well?**
    - **R**: Yes. Our survey can be found in English, Spanish and Vietnamese and they are all available with the materials provided on the site: meethsrnorcal.com.
- **Q- How often will these trains be running?**
    - **R**: At Diridon southbound, full service is anticipated to run 7 trains per direction at peak and 4 per hour on non-peak hours. At North of Diridon, the high-speed train will share tracks with Caltrain, with 4-8 trains at peak and 3 trains at off-peak. Trains are anticipated to arrive every 15 minutes at peak and every 20-30 minutes off-peak.

Next Steps/Actions/Follow-up:

- K&W share links from the chat with Principal Shepherd https://www.meethsrnorcal.com/station-3-videos.html.
- Principal Shepherd will pass along information to members of the Sacred Heart Nativity community.
- Deacon Solorio to share names of any community artists with whom the Authority can collaborate related to streetscape improvements mentioned in Alternative 2.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event

South San Jose Community Meeting

Date of Event

Thursday, September 23, 2021, 5:00 – 6:20 pm

Recorder of Event (Name)

- Jennifer Vazconcelo

Participants/Attendees

- **Representative Name(s)**
  - Huascar Castro, Silicon Valley Rising
  - Brian Stanke, San Jose Department of Transportation
  - Kerry Duncan, Rep. Lofgren Staff
  - Stacey Lu, City of San Jose
  - Jason Vann, Franklin McKinley School District
- **Staff Name**
  - Cici Vu, Facilitator
  - Rich Walter, Presenter
  - Chris Diwa, Presenter
  - Rachel Bickert, Tech Support/Webinar Manager
  - Jennifer Vazconcelo, Documentarian
  - Kimberly Larios, Spanish Interpreter
  - Priscilla Phoung, Vietnamese Interpreter

Purpose of Event

- Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements
- Share Preliminary Conclusions
- Gain feedback on directed questions
- Address clarifying questions on meeting materials, desired feedback and conclusions

Key Notes

Key points on community-specific presented

- Summary of Potential effects in the South San Jose community
  - Preliminary conclusion takes into consideration direct mitigation, project benefits and potential community improvements.
    - Alternatives 1, 2, and 3:
      - Funding for landscaping improvements along Monterey Road (as part of the City of San Jose Grand Blvd. initiative) to help offset visual aesthetic effects of HSR structures
      - Alternative 4:
      - Noise insulation for certain residences along 101 helps to offset residual project noise effects

        - Funding to City of San Jose for new pedestrian/bicycle overcrossings at Skyway, Branham, Chynoweth helps to improve safety.
    - Alternatives 1, 2, and 3: Residual disproportionately high and adverse visual effects related to the elevated viaduct or embankment.
    - Alternative 4: No disproportionately high and adverse effects
    - Preliminary conclusion takes into consideration direct mitigation, project benefits and potential community improvements.
  - Effects shown are after consideration of direct mitigation, but before consideration of the offsetting value of project benefits or community improvements.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- VTA had hoped for more transit and access related improvements
- Concerns with disproportionately high and adverse impacts related to emergency response

Questions/Responses:

- **Q:** VTA was hoping that the Monterey Boulevard improvements and the access improvements to the Caltrain stations would be higher up on the list of priorities in the HSR Project. I would like to know what determines which improvements are considered in each area?
  - **R:** In the outreach materials, we analyzed the process; VTA had provided some suggestions when we did outreach in 2020. The improvements are broken up into different community areas. Specific to South San Jose, we had the entire Grand Boulevard as a potential candidate in 2020 -2022. We also had some access improvements for the capital and loss unit at both locations. When we evaluated them, we considered them as related to transportation connectivity; we looked at the close relationship as we were directed by the Authority's policy of relating improvements directly to our residual effects. If we had a residual impact on transportation, we'd be looking for transportation improvements. Essentially that methodology makes things a bit different. Also, the policy came out in 2021; we didn't have that in 2020 to guide us as we do now.
- **Q:** Could you elaborate more on the nexus between emergency response and pedestrian over crossing?
  - **R:** We've identified that emergency vehicles are an issue in the safety context, and safe crossing of the rail corridor and Monterey Road is a safety improvement; that's how we're seeing the nexus and are taking feedback on it. There are two things under consideration as potential improvements to that mitigation. First, we're looking at possible funding for the first five years of any fire stations needed to address this issue. Second, we're looking for a potential at-grade railroad monitoring system. We're looking at potentially finding an independent monitoring system that would be tied into fire and police dispatch, such that they could take this into account when making calls.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Rebekah Children's Services: High-Speed Rail Environmental Justice Meeting
Date of Event
Friday September 24, 2021, 10:00am - 11:15pm
Recorder of Event
Rickie Cleere
Participants/Attendees
• **Representatives:** Christophe Rebboah • **Staff:** Audrey Van, Rich Walter, Cici Vu, Rickie Cleere
Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes

Key points of concern from partner/community; any preliminary feedback to directed questions:

- Chris indicated support for the project broadly. He added that specifically, the project will benefit the economy and provide prospective employees with alternative affordable housing options, especially if they have the option to travel from the Central Valley to Gilroy in 30 minutes. He stated that a chief concern for RCS is safety and sound impacts to sidewalks, streets, and gates, as the current fencing around the RCS campus is in disarray. He added that the project will cause traffic around the IOOF area to increase, ans that he will advocate for a pedestrian bridge and sound wall in his feedback.
- **Questions/Responses:**
- Q: The enhancement specific to RCS that we proposed is ranked third on the list, but there is no guarantee that this improvement will be implemented, correct?
    - R: Based on authority review, we are not planning on advancing those measures on the "other considered" list, including the recommendation RCS made in 2020. Instead, the potential improvements list includes the sound wall along the western side, the pedestrian/bike crossover at IOOF. Another Community Improvement that we are thinking of incorporating would be bike/ped improvements on IOOF east of the railroad tracks. The school gym, playground, updated windows, family resource center, and solar carport improvements are not being advanced because we determined, based on the updated analysis that they are not directly tied to residual safety and noise effects of the preferred alternative.
- Q: Wouldn't window enhancements be considered a mitigation to address noise?
    - R: Residual noise impacts would already be addressed by the proposed sound wall. In considering impacts to property, there are two ratings in the analysis: moderate and severe. In mitigating towards

more moderate impacts, the noise barriers mitigate the severe impacts in areas nearest to the alignment.

- Q: What is the status/trajectory of the budget/funding for the project?
    - R: We are moving forward. The Authority has requested $4B of Prop 1A funds that would be used for construction in the Central Valley, the Madera to Merced segment, and the Merced to Bakersfield segment. The state legislature has deferred these funds, which we hope to access early next year. We are examining state and federal funding sources.
- Q: To date, what percentage is the project over the original budget?
    - R: We are uncertain, as this is something that has continually changed over time.
- Q: There has been a lot of construction at South Valley Jr. High School, has this work been funded by HSR?
    - R: No, all funding is still currently in the environmental document and has not been disbursed except to fund some preliminary planning work.

Next Steps/Actions/Follow-up:

- Community Meeting: Tuesday September 28, 5:00-7:00PM

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Gilroy Community Meeting
Date of Event
Tuesday, September 28, 2021, 5:00 – 6:20 pm
Recorder of Event (Name)
• Jennifer Vazconcelo
Participants/Attendees
• **Representative Name(s)** o Alvaro Meza, Gilroy Unified School District o Kraig Tamborini, City of Gilroy o Daryl Jordan, City of Gilroy o Jason Kim, VTA o Jimmy Forbis, City of Gilroy o Kelsey Shockley, Civic Parks IGC o Marie Blankley, Mayor o Kerry Duncan, Rep. Lofgren Staff • **Staff Name** o Cici Vu, Facilitator o Rich Walter, Presenter o Morgan Galli, Presenter o Rachel Bickert, Tech Support/Webinar Manager o Jennifer Vazconcelo, Documentarian o Ana Cruz, Spanish Interpreter
Purpose of Event
• Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements • Share Preliminary Conclusions • Gain feedback on directed questions • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes
Key points on community-specific presented • Summary of Potential effects in the South San Jose community o Preliminary conclusion takes into consideration direct mitigation, project benefits and potential community improvements. ▪ Alternatives 1, 2 and 4: • Noise insulation for certain residences along 101 to help offset residual project noise effects ▪ Alternative 2:

- Funding of recreational amenities for the South Valley Middle School to help offset partial acquisition of track/field.
- Partial funding for affordable housing to offset residential displacement that cannot be relocated locally based on housing market

▪ Alternative 4: Funding for the following:

- New pedestrian/bicycle overcrossing of the railroad at IOOF Avenue,
- Bikeway improvements (along IOOF Ave., Monterey Road, 6th Street, 4th Street, and Alexander Street)
- Sidewalk gap closure along Murray Avenue
- Neighborhood street lighting and sidewalk and curb improvements within the Gilroy Neighborhood Revitalization Strategy Area
- Designed to help offset residual project effects associated with emergency vehicle response delays (safety effects)

o Effects shown are after consideration of direct mitigation, but before consideration of the offsetting value of project benefits or community improvements.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- Concerns of reaction from residents to change and how it could negatively affect the development of the project
- Support for Alternative 4
- Concerns about Alternative 2 and its impact on the charter school, navigator school, and operations transportation facilities.
- Concerns about the adverse effects on low-income residents.

Questions/Responses:

- **Q:** Can you elaborate a little bit on where the rail yard would be located? You said it was south of town, but that will be within city limits or just outside of city limits?
  - **R:** The draft environmental documents, Volume 1 Chapter 2, shows that the maintenance facility is outside of the City limits, in fact, it is further north. The maintenance facility is just east of 25 and south of Bloomfield.
- **Q:** Is there any advice on how the City of Gilroy can coordinate efforts between HSR and VTA to ensure that everybody's talking to each other?
  - **R**: HSR met with VTA as part of the community improvement planning process. In terms of knowing where the preferred alternative is and the other options that there are. As far as coordination goes, we'll continue to be coordinating with the City going forward between the City's Planning Team and HSR Planning Team. If there are plans that your team is considering, please share any developments with our High-Speed Rail team. We would certainly hope you would consider reaching out to us and talking through anything with the Authority.
- **Q**: Regarding the different Alternatives, when the Authority decides to act on the environmental document and select their preferred plan, I understand that the Preferred Alternative will be agreed on at that time as well? Also, are these concepts or ideas being proposed along the stretch, particularly in Gilroy, consolidated somewhere in a list so that people can see what's being considered?
  - **R:** To your first question, that is exactly the process that we're going through. The current direction from the Authority is where we have feasible community improvements that would have a closer relationship to our residual effects than where we're to bring them in our environmental document forward and recommend them to the Board. The Board then decides on it. Essentially, the Authority is looking at

current policies that have a close connection and are necessary to help offset. Those will be incorporated into our mitigation plan.

  - **R:** Regarding the lists of community improvements, the current list that we have and the others that we considered are in the outreach material we shared. We have been working with the City of Gilroy to identified options to advance. We have more detailed descriptions of them, and we've done some assessments to ensure that these are feasible and applicable. Those profiles are going to be included in the final document. So, when we bring that package to the HSR Board, they'll have not only a summary list, but they'll have a more detailed description of what those improvements are to help guide their later deliberation and choices.

- **Q:** I don't see many members from the communities that are impacted present in today's community meeting. I want to make sure that we're doing all that we can to reach out to them, and hopefully, other groups you reached out to have done their part in getting people involved. For example, I don't see Rebekah Children's Services in the community meeting, and I wonder whether they are still fully engaged, or is there something we can do to make sure they stay engaged in the process?

  - R: We have had meetings with Gilroy, Gilroy USD, Gavilan College, and Rebekah Children's Services. We've had one-on-one sessions with all of them this month. So those organizations are engaged, and we had robust discussions about providing input on that. Right now, we are in the third round of outreach and engagement. We had round one at the start of 2019. We talked to community members; we held a school community meeting at South Valley middle school, which the principal hosted. We've been out in the community and have talked to Alexander Station residents and the manager. We've held several partner meetings with you all. I think the low turnout today on the community side speaks to challenges everyone faces in terms of school starting, family life, and all that surrounds the public health issues. Last week, we met with Chris Rebboah from Rebekah Children's Services and invited him today and some community members. They are still very actively involved, and they will be submitting their feedback.

Next Steps/Actions/Follow-Up

- The Outreach Team provided the following web resources through the chat to participants during the community meeting.
  - Link to map on the Authority's website: https://maphsrnorcal.org/SanJose-Merced/

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
Center for Employment Training
Date of Event
September 28, 2021, 4-5 pm
Recorder of Event (Name)
Henry DeRuff
Participants/Attendees

- **Hermelinda Sapien**, President & CEO, CET
- **Rosa Ontiveros**, Executive Assistant to Hermelinda, CET
- **Bruce Fukuji**, HSR
- **Rich Walter & Greta Brownlow**, ICF
- **Joey Goldman & Henry DeRuff**, K&W

Purpose of Event

- Explain/Present on Updates to EJ Analysis, Mitigations, and Benefits
  - Emphasize direct relationship between effect and improvements
- Share Conclusions
- Gain feedback on directed questions
- Address CET-specific concerns about workforce development

Key Notes

Key points on community-specific presentation

- No DHAEs related to job loss were identified—in fact, this will create many jobs—therefore there is no nexus in the analysis right now. This was the focus of the presentation, as opposed to a focus on a specific community.

Key points of concern from partner/community; any preliminary feedback to directed questions:

- How residential, business, and employment displacements would be addressed.
- How to get involved with HSR so that when jobs become available, their graduates have the right skillset to get those jobs. They want to pursue these jobs for their graduates whether they are funded by HSR or not.

Questions/Responses:

- **Q:** Is Alternative 4 the preferred alternative? (Rosa)
  - **R:** Yes. (Rich)
- **Q:** What are the types of businesses that will be impacted? (Hermelinda)

  - **R:** This varies considerably from location to location. For some, it's an aggregated rock construction site, others are retail, others are agricultural. I don't have a specific breakdown on the types of businesses.

- **Q:** Of course, our services continue whether or not we're funded by HSR. What kind of skills should we be looking at to fill those available jobs? That's a large number of opportunities we should be looking at. (Hermelinda)
  - **R:** I would suggest a follow-up so we can talk with members of the construction arm of HSR. As I understand it, the jobs will primarily be in heavy construction, but also construction, welding, steel, electrical, and more. I will follow up with the Authority to see if they have a summary of the types of jobs created out in the Valley, since ours will be very similar. It's a mix of skilled and unskilled jobs. Operation jobs include running the trains & maintenance. One Maintenance of Infrastructure (MOI) facility will be just south of Gilroy. There will also be jobs at the stations, including ticketing, luggage, etc. There will also be a maintenance facility (LMF) in Brisbane: cleaning the cars, turning around cars in and out of the SF station. (Rich)
- **Q:** Can you speak more about the Community Benefits Agreement in the Central Valley? (Rosa)
  - **R:** I don't know the inner workings of that, but I can connect you with someone who does. (Rich)
  - **R:** Yes, please connect us with those people. We will want to reach out to them so that we know who to connect our graduates to as soon as jobs become available. (Rosa)
  - **R:** The Authority created a workforce development center in Selma that was pre-apprenticeship, so we could connect you with them. You would probably get some really good feedback on specific job training from them. (Bruce)
  - **R:** Pre-apprenticeships are where we want to go and where we're headed, especially if Biden's plan goes through, so we would love any and all connections on that. (Rosa)
  - **R:** This is a good demonstration of the fact that even though there's not a specific mitigation measure focused on CET, there are still opportunities to collaborate between CET & HSR. (Joey & Rich)
- **Q:** As a resident, what will the effects of housing displacement be in the community? (Hermelinda)
  - **R:** We found DHAEs in several of the communities we analyzed but will pay for relocation in all communities where we can. In Gilroy and Morgan Hill, we will subsidize new affordable housing. In Guadalupe-Washington, there is no residential displacement. There is some in Gardner-Willow Glen and around Diridon Station. (Rich)
- **Q:** So how does CET fit into this big picture? (Hermelinda)
  - **R:** What we found is that there's no DHAE to offset; in fact, since we'll create more jobs, it's actually a benefit. There are residual effects: noise, and for Alternatives 1-3, the visual effects of an elevated track; but no employment effect. But if you disagree or if you believe there are other needs that are more important, you can advocate for that. (Rich)
  - **R:** The goal of the Authority is to figure out if there are DHAEs and address them, so if you believe that there are effects that need to be considered, please give that feedback. (Bruce)
- **Q:** When will an alternative be chosen? (Rosa)
  - **R:** The Board will decide in March at the Board Meeting. (Rich)
- **Q:** Since Alternative 4 is at grade, how are homeless encampment displacements being considered? (Rosa)
  - **R:** We've gotten that feedback at a number of different points, so we're taking that feedback and considering it. With construction, we will likely be displacing some folks, so we're considering how to mitigate that effect. That's not part of the typical analysis but we're considering it, especially in Tamien

and along the Guadalupe River, where there are well-established homeless encampments. Thank you for bringing that up. (Rich)

- **Q:** During Gov. Brown's Administration, there was a lot of public consternation about HSR. Is the project well-supported financially? Is that part of the Biden Administration's infrastructure bill? (Hermelinda)
    - **R:** A portion in the Central Valley is funded, but there will be more funding needed to extend it into the Bay Area and Los Angeles. We release business plans every two years that consider new sources of money. Depending on which infrastructure bill makes it through Congress, we may or may not get funding. (Rich)
    - **R:** Depending on the bill, there's between $10-20 billion available that the state could compete for and HSR has an advocate in the White House in Kamala Harris. Plan Bay Area 2050 also has $7 billion to bring HSR into the Bay Area. Opportunities for maximizing the benefits of every investment are considered, which is why the tracks were extended through Gilroy and Morgan Hill, as an improved commuter rail system. (Bruce)

Next Steps/Actions/Follow-up:

- HSR **will provide CET with contacts at the Workforce Development Center in Selma,** to help CET identify job skills they should prepare candidates for.
- Rich **will follow up with HSRA to request a list of job types in the Central Valley**.

EJ PHASE 3 MEETINGS
SEPTEMBER 2021
AFTER ACTION REPORT

Title of Event
High-Speed Rail EJ Briefing - Morgan Hill Unified
Date of Event
Wednesday September 29, 2021, 3:30 – 5:00pm
Recorder of Event
Rickie Cleere
Participants/Attendees
• **Representative Name:** Dr. Carmen Garcia - Superintendent • **Staff:** Morgan Galli, Rich Walter, Cici Vu, Rickie Cleere
Purpose of Event
• Provide background information and an overview of the project • Explain/Present on Updates to EJ Analysis, Mitigations, Benefits and Community Improvements   ○ Emphasize direct relationship between effect and improvements • Share Preliminary Conclusions • Gain feedback • Address clarifying questions on meeting materials, desired feedback and conclusions
Key Notes

Key points of concern from partner/community; any preliminary feedback to directed questions:
• Dr. Carmen Garcia expressed concern about business displacements and impacts to communities of color along the alignment of Preferred Alternative 4, and prefers alternatives that would not travel through downtown Morgan Hill, based on the team's presentation of the summary of potential effects to the community.
Questions/Responses:
• Q: How did you share information about the community meeting? Who was invited?
  ○ R: A targeted invite was sent to stakeholders on in late July. Invitees included the City of Morgan Hill, Morgan Hill USD staff and the prior superintendent, leaders of district parent group, and representatives of interested community organizations.
• Q: Is the community/city largely in support of the project?
  ○ R: The City submitted a letter with their feedback that we can share with you if needed. We have worked with the city manager and assistant city manager for a long time. They have expressed the benefits of the different alternatives and some things they would want added for the Authority's consideration. They are concerned with both sets of alternatives (1 and 3, 2 and 4) with respect to community effects, displacements of residents and businesses, noise, traffic, emergency vehicle response time, and construction disruption among other considerations. Morgan Hill USD submitted a detailed technical comment letter. The City is also interested in getting more Caltrain service, and Caltrain electrification and modernization would allow for the service extension. The City opposes

Alternative 2 because it enters through downtown Morgan Hill and has a large footprint. However, they have not expressed a clear preference among the other three alternatives.

- Q: Doesn't Alternative 4, the Preferred Alternative, have the most impacts? (In the context of the Summary of Potential Effects.)
    - R: Alternative 4 has the most impacts, but the scale and context of these impacts is important to consider, as the community effects table looks at the entire project section, San Jose to Merced. Alternative 4 doesn't have aesthetics impacts and will only cause 1 business displacement, there are no substantial or disproportionate impacts to parks, and severe noise impacts will be limited to approximately 20 receptors. Alternative 4 will have no severe noise impacts to schools, no disproportionately high and adverse vibration impacts, and a traffic impact at one location after the incorporation of mitigation. There will be emergency response delays, which will impact people outside the environmental justice area in the southern part of Morgan Hill. The Authority will include mitigation to address severe impacts wherever possible.
- Q: Are the state agency and the Board the same? Do they make the final decisions on the project?
    - R: That's correct. Authority staff are currently accepting and responding to comments, which will be incorporated into the Final EIR/EIS for the project section. Once the EIR is complete in Spring 2022, the Authority Board will come to a final decision on how the project will proceed.
- Q: What happens with feedback that is received?
    - R: There could be adjustments to design, additional mitigation, or other measures taken. A record of comments received and their responses is currently being compiled for reference.

Next Steps/Actions/Follow-up:

- Comment period closing date: October 1, 2021

APPENDIX 5-C: ENVIRONMENTAL JUSTICE DEVELOPMENT OF COMMUNITY IMPROVEMENTS AS OFFSETTING MITIGATION

California High-Speed Rail Authority

San Jose to Merced Project Section

Environmental Justice Development of Community Improvements as Offsetting Mitigation

February 2022

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

TABLE OF CONTENTS

1 INTRODUCTION 1-1

2 COMMUNITY EXISTING CONDITIONS 2-1
2.1 Introduction 2-1
2.2 Overview of Affected Communities 2-1
2.2.1 Santa Clara/North San Jose 2-1
2.2.2 San Jose Diridon 2-3
2.2.3 Gardner/Willow Glen 2-6
2.2.4 Washington/Guadalupe, Tamien, and Alma/Almaden 2-8
2.2.5 South San Jose 2-11
2.2.6 Morgan Hill 2-13
2.2.7 Gilroy 2-15
2.2.8 San Joaquin Valley 2-18

3 PLANNING PROCESS AND IMPROVEMENT EVALUATION 3-1
3.1 Process Purpose 3-1
3.2 Process Goals 3-1
3.3 Improvement Definition and Selection Criteria 3-2
3.3.1 Definition of “Community Improvement” 3-2
3.3.2 Evaluation Criteria 3-2
3.4 Initial Community Improvements Concept Development 3-3
3.5 Community Improvements Outreach, Phase One 3-4
3.6 Expanded Improvements List 3-5
3.7 Concepts Screened Out 3-5
3.8 Offsets Development and Evaluation 3-6
3.8.1 Development of Potential Community Improvements 3-6
3.8.2 Evaluation of Community Improvements 3-7
3.9 Community Improvements Outreach, Phase Two 3-7
3.10 Identification of Potential Community Improvements as Offsetting Mitigation 3-7
3.11 Community Improvements Outreach, Phase Three 3-8

4 PROPOSED OFFSETTING MITIGATION MEASURES 4-1

5 OTHER COMMUNITY IMPROVEMENTS NOT PROPOSED AS OFFSETTING MITIGATION 5-1

6 REFERENCES 6-1

Tables

Table 4-1 Summary of Proposed Offsetting Mitigation Measures 4-2
Table 5-1 Community Improvements Not Proposed as Offsetting Mitigation Measures 5-2

Figures

Figure 2-1 Santa Clara/North San Jose 2-2
Figure 2-2 San Jose Diridon 2-4
Figure 2-3 Gardner/Willow Glen 2-7
Figure 2-4 Washington/Guadalupe, Tamien, and Alma/Almaden 2-9
Figure 2-5 South San Jose 2-12
Figure 2-6 Morgan Hill 2-14
Figure 2-7 Gilroy 2-16

Attachments

Attachment A: Profiles of Proposed Offsetting Mitigation Measures

ACRONYMS AND ABBREVIATIONS

Authority	California High-Speed Rail Authority
CCS	Connecting Communities Strategies
EIR	environmental impact report
EIS	environmental impact statement
GEA	Grasslands Ecological Area
HSR	high-speed rail
I-	Interstate
MHUSD	Morgan Hill Unified School District
project or project extent	San Jose to Central Valley Wye Project Extent
RDA	San Jose Redevelopment Agency
RSA	resource study area
SNI	San Jose Strong Neighborhoods Initiative
SR	State Route
UPRR	Union Pacific Railroad
US	U.S. Highway
VTA	Santa Clara Valley Transportation Authority

1 INTRODUCTION

As described in Section 5.6, Assessment of Effects, and Section 5.7, Summary of Disproportionately High and Adverse Effects Prior to Consideration of Offsetting Mitigation Measures, of the Final Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), after application of direct mitigation and consideration of project benefits, there still remain some disproportionately high and adverse effects from project alternatives on minority populations and low-income populations.

Throughout the EIR/EIS process, the California High-Speed Rail Authority (Authority) engaged with minority populations and low-income populations, as well as service and public agencies that serve these populations, to identify the concerns of individuals about the effects of the project and to identify potential community improvements that could offset residual disproportionately high and adverse effects and thus serve as offsetting mitigation measures.

The evaluation of potential community improvements followed the following process, aimed at identifying community improvements that could offset residual disproportionately high and adverse effects:

- Development of the planning process, including evaluation criteria (see Chapter 3, Planning Process and Improvement Evaluation) in November 2019.
- Initial outreach (Community Outreach, Phase One) focused on identifying needs and community improvement concepts from December 2019 through January 2020.
- Development and evaluation of potential improvements from February through June 2020, including development of community improvement profiles containing a description of each improvement, location, disproportionately high and adverse effects potentially addressed by the improvement, consistency with local plans and policies, preliminary cost estimates, summary of relevant input from communities and local agencies, evaluation against the evaluation criteria, and a figure showing the improvement location.
- Additional outreach to potential implementing partners (Community Outreach, Phase Two) in July and August 2020.
- Further refinement of analysis, definition of proposed improvements, and development of updated profiles and evaluation scoring from August 2020 through November 2020.
- Determination of nexus of potential improvements to residual disproportionately high and adverse effects and identification of potential offsetting mitigation measures for different project alternatives from May 2021 through July 2021.
- Identification of the potential for secondary physical effects on the environment due to implementation of potential community improvements in July 2021.
- Additional outreach on revised environmental justice analysis and potential community improvements in September 2021.
- Development of final recommendations of community improvements proposed as offsetting mitigation measures in the Final EIR/EIS from October 2021 through February 2022.

This process and evaluation of potential community improvements is described further in this report. The community improvements proposed as offsetting mitigation measures are further profiled in Attachment A, Profiles of Proposed Offsetting Mitigation Measures. Prior to discussion of the development process, evaluation, and selection of community improvements as offsetting mitigation measures, Chapter 2, Community Existing Conditions, describes the existing conditions in the minority communities and low-income communities that would be affected by the high-speed rail (HSR) project.

2 COMMUNITY EXISTING CONDITIONS

2.1 Introduction

The community improvements planning process focuses on the community improvements with the potential to offset a subset of project effects within the following communities: Santa Clara/North San Jose; San Jose Diridon; Gardner/Willow Glen; Washington/Guadalupe, Tamien, and Alma/Almaden; South San Jose; Morgan Hill; Gilroy; and San Joaquin Valley. These communities are comprised of those census districts wherein minority populations and low-income populations are greater than in the reference community and where these populations would experience one or more residual disproportionately high and adverse effects due to the project alternatives, prior to the consideration of community improvements as offsetting mitigation measures. The boundaries of these communities, as defined for the purpose of this report, are illustrated on Figures 2-1 through 2-8. Also illustrated on each of the figures is a 0.5-mile area from the project footprint within which project effects would be concentrated. This chapter describes the existing setting of these communities to provide context for development and consideration of potential community improvements as proposed offsetting mitigation measures.

2.2 Overview of Affected Communities

2.2.1 Santa Clara/North San Jose

Comprised of the city of Santa Clara, portions of unincorporated Santa Clara County, and a small portion of the northern part of San Jose, the Santa Clara/North San Jose community is the northernmost community of focus in this report. Minority communities and low-income communities are found within the area bounded approximately by Scott Boulevard and North Winchester Boulevard on the west, Newhall Street and Walnut Grove Avenue on the south, Interstate (I-) 880 on the southeast, and De La Cruz Boulevard and Martin Avenue on the east, bordering Norman Y. Mineta San Jose International Airport (Figure 2-1). This community is located in the San Jose Diridon Station Approach Subsection, as described in Chapter 5, Environmental Justice, of the EIR/EIS.

Located within Silicon Valley, the community is home to the headquarters of several large high-tech companies, Santa Clara University, Levi's Stadium, and Great America. The Caltrain corridor divides the community, with predominantly industrial land uses located east of the existing Caltrain corridor and single-family and high-density residential land uses to the west. A number of high-density apartment complexes are directly adjacent to and on the west side of the tracks between Scott Boulevard and Lafayette Street. Families concentrated in this area are largely minority and low income who cite noise and safety as chief concerns. Three elementary schools within 1 mile of this area serve this community. These schools' populations are 70 to 90 percent minority and 50 percent or more free and reduced lunch–eligible students. These elementary schools currently cite limited ingress and egress routes for students who travel by foot or bus from these areas, so any disruptions or changes to the current routes would affect the safe routes to school plans.

Land uses east of the tracks are primarily industrial, with a small pocket of residential north of DiGiulio Avenue at Avila Avenue. Land uses west of the tracks are predominantly residential and abut the tracks north of Warburton Avenue. There is some commercial use between Lafayette Street and De La Cruz Boulevard. South of De La Cruz Boulevard, commercial and government uses on the west side of the HSR alignment are separated from residential uses by El Camino Real, as are the sports stadium and fields south of Palm Drive.

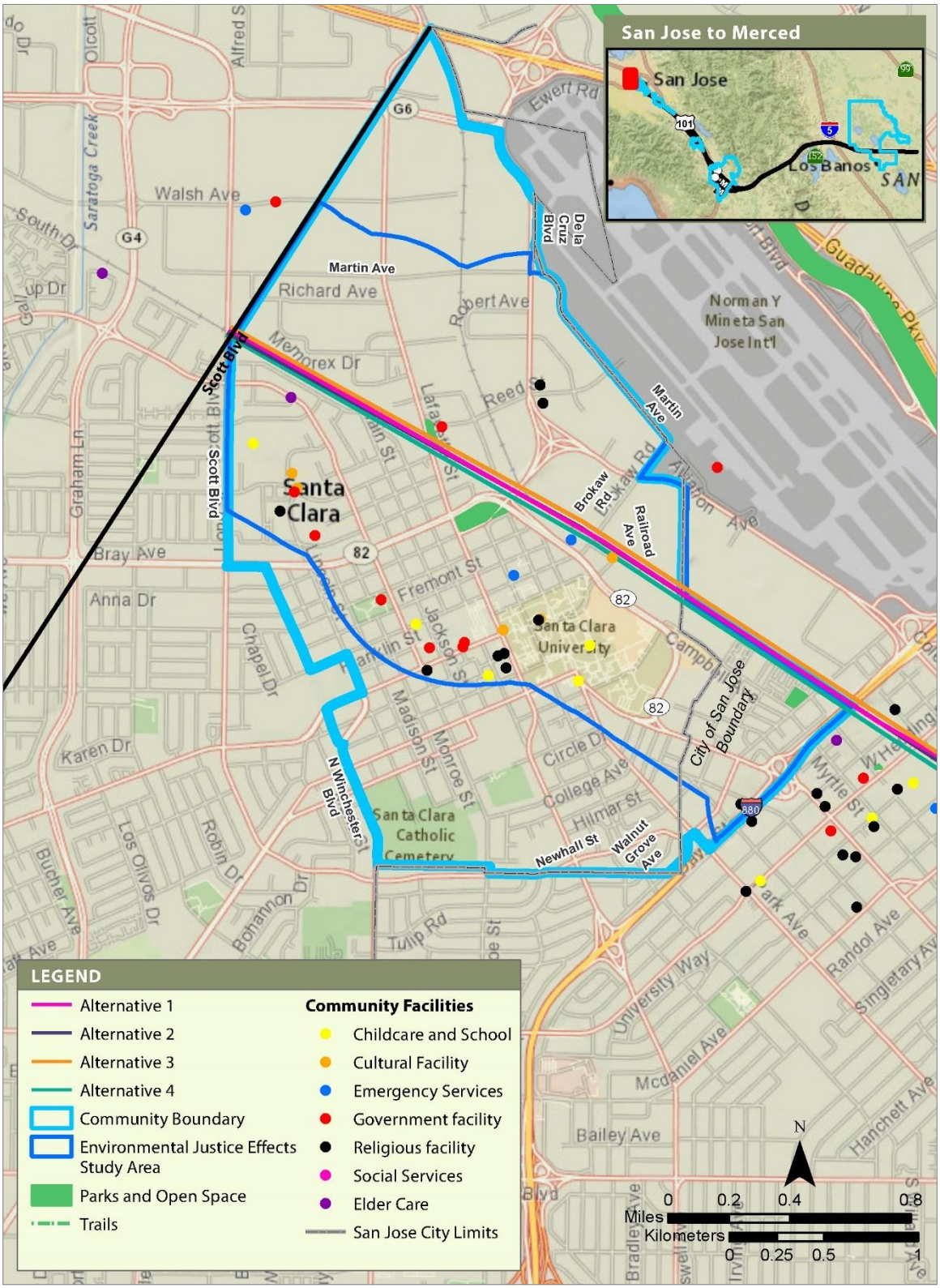


Figure 2-1 Santa Clara/North San Jose

Assets within the community include several sports venues for baseball, soccer, and swimming, as well as various parks, including Reed Street Dog Park on the east side of the HSR alignment and Larry J. Marsalli Park on the west side. Schools and places of worship are located throughout the community. Santa Clara University and Mission Santa Clara are located adjacent to the stadium complex south of Benton Street on the west side of State Route (SR) 82 (El Camino Real). There are four cultural resource facilities within the Santa Clara resource study area (RSA), including the Triton Museum of Art, Masjid Al-Noor Mosque, a Muslim Community Center, and one social service facility.

This community is primarily in the City of Santa Clara, extending into just the edges of part of North San Jose. Both cities have plans for increased housing and mixed-use developments to accommodate both business and high-density residential growth. Affordable housing remains a challenge in both cities. The City of Santa Clara requires that a percentage of housing in new developments be dedicated to low- and moderate-income residents (City of Santa Clara n.d.). The Santa Clara Station Area Plan for redeveloping the Santa Clara Transit Center area was developed by the City in cooperation with the City of San Jose and the Santa Clara Valley Transportation Authority (VTA) and incorporated into the Santa Clara General Plan (City of Santa Clara 2010). It plans for 432 acres (244 acres of which are in Santa Clara) of housing, offices, retail, hotels, restaurants, parks, and other amenities. Considered a planning “focus area,” the plan area partially overlaps or is adjacent to the census tracts that contain minority populations and low-income populations. The General Plan map also shows areas within or near these census tracts as slated for community mixed use, medium- and low-density residential development, and public or quasi-public uses.

Planning in North San Jose must align with the City’s Envision San José 2040 General Plan (adopted in 2011 and updated in 2020) (City of San Jose 2020a) and area plans and specific plans that tier from it. The North San Jose Area Development Policy (City of San Jose 2017) provides a framework for smart growth that promotes economic activity, livability, and long-term vitality for its neighborhoods. The guiding principles of the related North San Jose Area Development Policy Neighborhoods Plan (City of San Jose 2009a) prioritize parks and recreation, libraries, schools, neighborhood connectivity, walkability, and access to public transit. The City of San Jose also is in the process of drafting its Better Bike Plan 2025 (City of San Jose 2020b), which would be an update of the San Jose Bike Plan 2020 (City of San Jose 2009b). The plan will provide recommendations for increased safety, comfort, convenience, and equity for bicycle users in the City.

The Santa Clara/North San Jose community consists of 31 percent Hispanic/Latino, 4 percent Black, 22 percent Asian, and less than 1.0 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total minority population of 57 percent is less than the percentage of minorities in the three-county reference community. Low-income residents in the Santa Clara/North San Jose community represent 39 percent of the population, more than the percentage of low-income residents in the reference community.

2.2.2 San Jose Diridon

The San Jose Diridon community within the city of San Jose includes the existing San Jose Diridon Station and is a dense urban mix of neighborhood-serving commercial, parking for the station, multifamily residential, and industrial land uses. The community boundaries are I-880 on the north, Stockton Avenue on the west to the Alameda, then Sierra Avenue and Meridian Avenue to I-280 on the southern perimeter from Meridian to South First Street. The eastern border is formed mainly by SR 82 and SR 87 (Figure 2-2). This community is located in the San Jose Diridon Station Approach Subsection.

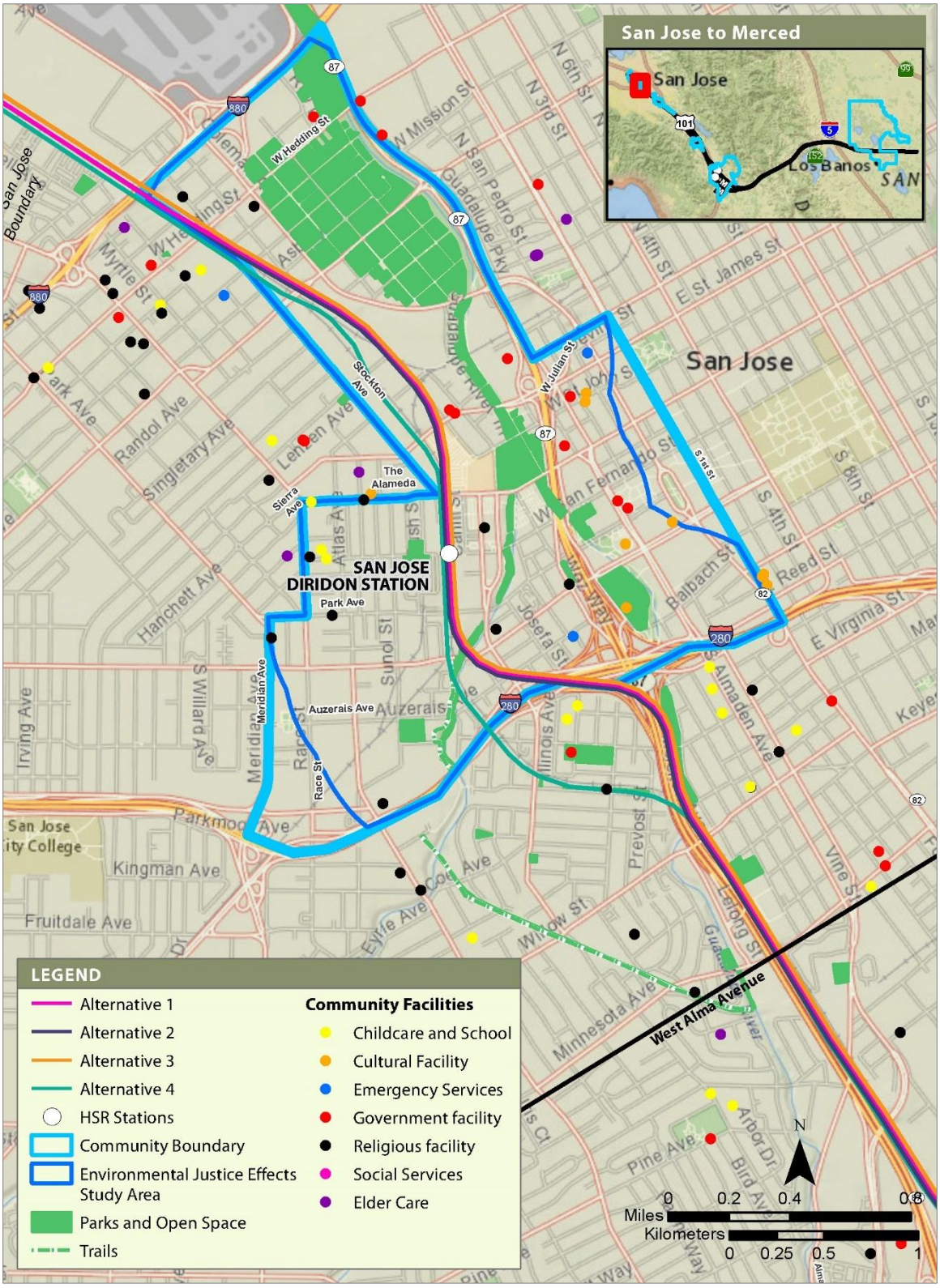


Figure 2-2 San Jose Diridon

Residential uses are concentrated on both sides of Park Avenue, a primary thoroughfare within the community. Diverse land uses—ranging from single-family and multifamily residential units to service-commercial, office, institutional, parks, and industrial uses—surround the San Jose Diridon Station. Ethnic small businesses and restaurants make up some of the commercial uses in this area, including Vietnamese sandwich shops, taquerias, and other restaurants and clothing stores. Multifamily residential buildings exist along the entire west side of San Jose Diridon Station, facing the existing tracks and platforms.

There are also some commercial uses and Cahill Park directly west of the station. East of the station and between the HSR alignment and Guadalupe River Parkway is a mix of Santa Clara County office uses, a Target store, the SAP Center that is the home of the San Jose Sharks hockey team, Arena Green East Park, and a mix of residential and commercial uses. Farther east and east of Guadalupe River Parkway is downtown San Jose, with the Tech Museum of Innovation, the San Jose Convention Center, and Children's Discovery Museum. The San Jose Fire Department Bureau of Field Operations campus is located just south of San Jose Diridon Station on the east side of the HSR alignment. Delmas Park area is a historic conservation area, where most of the residential structures have distinctive characteristics that are typical of architecture of the early 20th century. To the north of Delmas is the San Jose Center for Performing Arts, which hosts multicultural and multilingual events for the Vietnamese and Latino communities in the area. The San Jose Diridon area is also a hub for services for homeless, youth, and vulnerable and underserved populations.

In the heart of downtown San Jose is the African American Community Service Agency, which not only provides a safe haven for African American community members but also embraces everyone needing assistance regardless of their ethnic background. Some programming offered to the San Jose community broadly includes "Meet the Black Authors & Artists," "Family Fun Fridays," and "Fireman Dads and Sons."

The San Jose Diridon community assets include regional attractions such as the SAP Center and Arena Green East Park, complementing a mix of residential and commercial uses. Neighborhood-serving assets include St. Leo the Great Parish and Chinmaya Mission, which lie to the west of San Jose Diridon Station, and Shri Krishna Vrundavana Temple to the south. Primera Iglesia Bautista is southeast of the station just west of SR 87. An Elks Lodge is approximately 180 feet from SR 87 on the west side of the HSR alignment. Parks in the area include Guadalupe River Park, Guadalupe River Trail (Reach 6), Theodore Lenzen Park, Cahill Park, and the Los Gatos Creek Trail. In August 2020, the San Jose Spotlight reported on a study that found San Jose residents valued their parks but that people of color and low-income individuals in the City have more trouble accessing parks than other groups, with Blacks and Latinos reporting the most difficulty (Wipf 2020).

Like North San Jose, development in this area is guided by San José's Envision 2040 General Plan (City of San Jose 2020a), as well as the Diridon Station Area Plan, approved in 2014 (City of San Jose 2014). The planning area and subareas overlap census tracts containing low-income residents in the San Jose Diridon community (City of San Jose n.d.). Community engagement on the Diridon Station Area Plan since 2018 has included convening a Station Area Advisory Group consisting of 38 community organizations; meetings are ongoing in 2020. Along with transportation agencies and others, Station Area Advisory Group members include neighborhood and resident associations, bicycling advocates, schools, and business groups, illustrating the extent of community interest in development decisions (San Jose Diridon Station Area Community Engagement n.d.). In November 2016, Santa Clara County voters approved a $950 million Affordable Housing Bond (Measure A), which was projected to fund 120 new affordable housing developments for county residents, including $17 million toward the development of several mixed-income housing complexes within the San Jose Diridon vicinity, including Villas on the Park and West San Carlos Housing. These developments will add more than 150 housing units in this area for low-income and very low-income residents, who are also transit dependent (Santa Clara County 2018).

The San Jose Diridon community consists of 30 percent Hispanic/Latino, 8 percent Black, 20 percent Asian, and less than 1 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total minority population of 58 percent is less than the percentage of minorities in the three-county reference community. Low-income residents represent about 31 percent of the population, more than the percentage of low-income residents in the reference community.

2.2.3 Gardner/Willow Glen

The Gardner/Willow Glen community in San Jose lies southwest of the intersection of I-280 and the Guadalupe Freeway (SR 87). The northwestern boundary of the community is formed by I-280 and Meridian Avenue south of I-280. Willow Street forms the southern border, and the community is bounded by SR 87 to the northeast and east (Figure 2-3). The existing Caltrain tracks bisect the Gardner/Willow Glen neighborhood northwest to southeast predominantly north of Fuller Avenue. This community is located in the San Jose Diridon Station Approach Subsection of the RSA, as described in Chapter 5 of the EIR/EIS.

The Greater Gardner area has existed in the heart of San Jose since 1911 but was bisected by historic freeway construction, which affected neighborhood cohesion. The neighborhoods are near Downtown San Jose and public transportation and are characterized by modest single-family houses with a blend of historic and traditional architectural styles. Land uses in the Gardner/Willow Glen community are almost entirely residential and include schools and parks as well as some neighborhood-serving commercial uses in the southern portion of the neighborhood. The community also includes a limited amount of public/quasi-public uses.

Neighborhood-oriented community facilities include Gardner Academy, the Gardner Community Center, Fuller Park, and Biebrach Park, which provide a focus for the neighborhood's residents and families. The Gardner Community Center provides a variety of programs, including after-school activities and adult education. Gardner Academy also has sports fields and playground areas and is home to Go Kids, Inc. (which acquired Estrella Family Services in 2015), which provides after-school care for Gardner Academy families. Families who attend Gardner Academy and use the Community Center generally travel by foot and bicycle, and some must cross the tracks at Auzerais and West Virginia, so a concern for this community is at-grade crossing safety for the school community. The Word of Faith Christian Center is at the corner of Delmas Avenue and Fuller Avenue, directly adjacent to the tracks. In addition to its function as a house of worship, the church provides food for the needy and counseling for teens.

San Jose's Envision San José 2040 General Plan (City of San Jose 2020a) also applies to the Gardner/Willow Glen community. The Greater Gardner Neighborhood Improvement Plan (City of San Jose 2002a), prepared as part of the San Jose Strong Neighborhoods Initiative (SNI), presents a vision of and for the community. It describes a neighborhood with a unified character despite the highways, streets, and rail lines that divide it. Prior to those transportation projects, Gardner was historically part of one larger neighborhood together with Gregory Park and Washington/Guadalupe to the east. These smaller neighborhoods are still functionally connected and share a residential character. The Gardner Community Advisory Council, Gregory Plaza Neighborhood Association, and the North Willow Glen Neighborhood Association represented the area's diverse residents. These associations were active in community affairs at the time the plan was published, concurring on neighborhood concerns such as problems related to soil conditions, housing maintenance, and pedestrian safety.

The Greater Gardner Neighborhood Improvements Plan envisioned key improvements that will enhance its character, attractiveness, and livability, creating a strong neighborhood identity while integrating with the surrounding community. However, unstable wetland soils underlie the neighborhood and over time have caused deteriorated streets and structures. Past groundwater pumping exacerbated the instability by causing subsidence, although recent groundwater recharge policies have reduced this effect. Adjacent freeway traffic, aircraft, and trains contribute to noise levels above those considered acceptable by the U.S. Environmental Protection Agency. Freeway traffic during peak hours leads to congestion and delays at traffic signals (City of San Jose 2002a).

Figure 2-3 Gardner/Willow Glen

This community is faced daily with gang and criminal activity, including prostitution and drugs. This community has coped with these negative effects through strengthening of schools, community-commissioned art, and spiritual and youth-focused organizations. Recognizing this prominent issue in the community, the City of San Jose has formed a Safety Coalition that regularly monitors neighborhood streets and educates the community on ways to address the gang activity.

In December 2017, the San Jose Historic Landmarks Commission granted historic status to the Greater Gardner Neighborhood, an area encompassing North Willow Glen, Gregory Plaza, and Gardner. Sought by residents for more than a decade, the designation honors the old farmhouses that reflect the area's agricultural past and other historic and contemporary building styles found in the neighborhood (Baum 2017).

Median household income in Gardner/North Willow Glen was $66,423 in 2016, compared to $93,854 in Santa Clara County. High-school graduation rates and percentage of residents with some college or associate degree exceeded those of the county overall. Renters are 70 percent of households, and 49 percent of households pay a gross rent that is at least 30 percent of household income (Santa Clara County Public Health 2016a).

Population within the neighborhood has remained relatively constant over the last 10 years, with an increase in the percentage of residents of Hispanic origin. The population of the Gardner/Willow Glen community consists of 52 percent Hispanic/Latino, less than 1 percent Black, about 4 percent Asian, and about 1 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total minority population of about 58 percent is less than the minority percentage in the three-county reference community. Low-income residents represent 26 percent of the population in Gardner/Willow Glen, more than the percentage of low-income residents in the reference community.

2.2.4 Washington/Guadalupe, Tamien, and Alma/Almaden

The Washington/Guadalupe, Tamien, and Alma/Almaden community is bounded on the north by I-280; on the west by SR 87, the Guadalupe River, and Almaden Road; on the south by Curtner Avenue; and on the east by South First Street/Monterey Road (Figure 2-4). It is on the opposite (east) side of SR 87 from the Gardner/Willow Glen neighborhood, with which it has historic ties from before construction of the freeway. This community is located in the Monterey Corridor Subsection of the RSA, as described in Chapter 5 of the EIR/EIS.

Like Gardner/Willow Glen, the Washington/Guadalupe, Tamien, and Alma/Almaden community is predominantly residential, with some neighborhood-serving commercial uses along First Street, South Almaden Avenue, and Willow Street in the Washington/Guadalupe neighborhood. In the Tamien Caltrain Station area are some light industrial and commercial uses. The Alma/Almaden area includes residential areas for about 0.25 mile south of West Alma Avenue; the area to the south is dominated by light industrial and commercial uses.

Schools in this community include Washington Elementary School, Rocketship Matteo Sheedy Elementary School, and Sacred Heart Nativity (Middle) School. Rocketship Matteo Sheedy Elementary School is not a part of the public-school system; it is a charter school started in this community in recognition that Washington Elementary School did not have the capacity to sufficiently serve the school community in this area. Similarly, Sacred Heart Nativity Middle School was started for this community due to the absence of other middle schools serving the community. Sacred Heart was also started with private funds from community benefactors to help relieve the gang activity that is a major issue for the community. It admits fewer than 100 middle schoolers each year from the community, largely on scholarship.

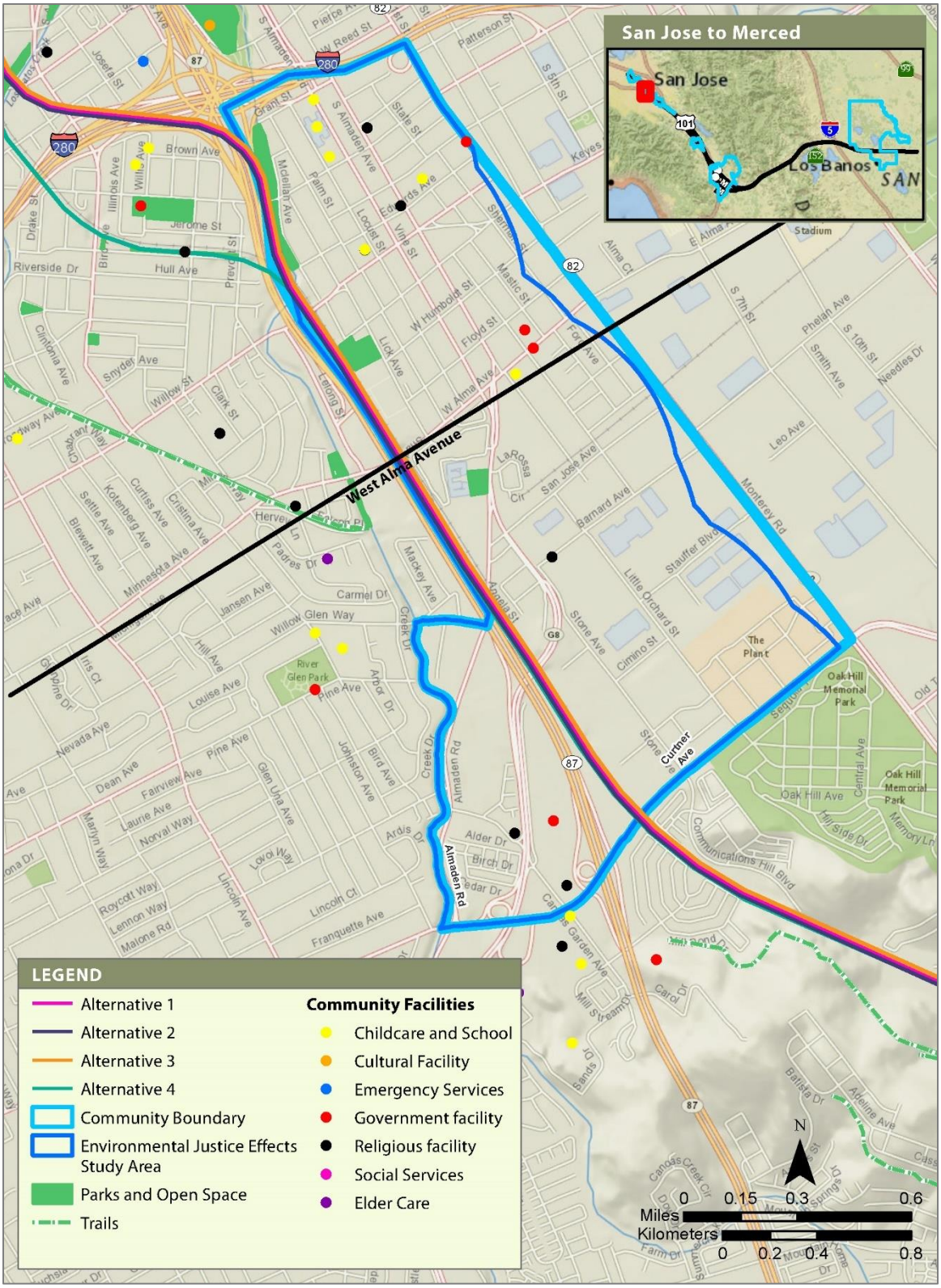


Figure 2-4 Washington/Guadalupe, Tamien, and Alma/Almaden

The community has access to the Guadalupe River Trail and will have access to the future planned Three Creeks Trail. Elementary schools provide playground areas and ball courts, as do Tamien Park, Parque de Padre Matteo Sheedy, and Bellevue Park. Biblioteca Latinoamerica is located on South First Street and encompasses the Washington United Youth Center. The Center for Employment Training, located on Vine Street, provides a variety of job training programs. Sacred Heart Church, built in 1927, provides worship and social services for both the Gardner/Willow Glen and Washington/Guadalupe, Tamien, and Alma/Almaden communities. The Alma Community Center and the Washington United Youth Center provide a variety of services for seniors and teens. A prominent community leader in this area has successfully organized a Latina mother's group, Madre A Madre, a close-knit group that is extremely active in maintaining and promoting community cohesion, education, and organization. They hold weekly in-language gatherings and organize and fundraise by selling homemade Mexican fare and treats.

The SNI supported preparation of the Washington Neighborhood Revitalization Plan Update (City of San Jose 2002b), which focused on the neighborhoods of Washington/Guadalupe, Tamien, and Alma/Almaden, along with Goodyear-Mastic and Cottage Grove. Building on a 1998 plan, the Washington Neighborhood Revitalization Plan Update identified 13 "top ten" actions to address community needs. Among those actions were plans to pursue funding to acquire additional park sites, develop an action program to fund and schedule closure of area alleys, improve recreation facilities at the Alma Senior and Teen Centers, improve storm drainage at selected locations, promote and assist property owners with curb and sidewalk repairs, improve traffic flow and safety, community identification of areas needing street lights or lighting upgrades, enhance existing sports facilities and equipment at Washington School, and underground utility lines. San José's Envision 2040 General Plan (City of San Jose 2020a) also covers these neighborhoods.

Median household income in 2016 was $44,387, less than half that of Santa Clara County as a whole. The share of the community who are high school graduates (26 percent) exceeded that of the County, but rates of college attendance and graduation were lower. Renters comprised 71 percent of households, and 66 percent of households paid rent of more than 30 percent of household income. Thirty-one percent of neighborhood households were classified as overcrowded (Santa Clara County Public Health 2016b).

The Washington/Guadalupe, Tamien, and Alma/Almaden community consists of approximately 55 percent Hispanic/Latino, 5 percent Black, 12 percent Asian, and less than 1 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total of approximately 73 percent minority residents in these neighborhoods is more than the percentage of minorities in the three-county reference community. Low-income residents represent about 50 percent of this community's population, more than the percentage of low-income residents in the three-county reference community.

2.2.5 South San Jose

The South San Jose community extends approximately 0.5 mile on either side of Monterey Road. It is bounded roughly by Lewis Road on the north, Kingspark Drive and Snell Avenue to Cottle Road and Monterey Road on the west, Metcalf Road on the south, and U.S. Highway (US) 101, Capitol Expressway, and Coyote Road to the east (Figure 2-5). This community is located in the Monterey Corridor Subsection of the RSA, as described in Chapter 5 of the EIR/EIS.

Land uses in the community are predominantly residential north of Blossom Hill Road, between Ford Road and Metcalf Road east of Monterey Road, and between Bernal Road and Metcalf Road west of Monterey Road. Commercial uses are generally located south of Blossom Hill Road, between Blossom Hill Road and Bernal Road on the west side of Monterey Road, and between Blossom Hill Road and Ford Road on the east side of Monterey Road.

Schools in the community include Valley Christian Junior High School and High School, Edenvale Elementary School, Oak Grove High School, Caroline Davis Intermediate School, and Los Pasos Elementary School. The Coyote Creek Trail/Parkway meanders to the west of US 101 south of SR 85, transitioning to the east side of US 101 at SR 85. Other parks include Cottle Park, Danna Rock Park, Ramac Park, and Metcalf Park. Other community facilities include the Boys and Girls Clubs of Silicon Valley and the Edenvale Branch Library.

South San Jose is a suburban community bordered by the Santa Cruz mountains, populated mostly by families, students, and retirees. The community provides many parks and shopping options, but public transit access and walkability are poor. Of the seven neighborhoods comprising South San Jose, the east side, including Seven Trees, Oak Grove, and Blossom Valley, are the least affluent. Similar to the Washington/Guadalupe and Tamien neighborhoods, residents in this area cope with gang activity. A youth group called “Better Tomorrow” organized out of Oak Grove High School and the City Peace Project works to help youth avoid gang activity and focus on education for a better future. Latinx and Vietnamese families reside along the Monterey Road corridor between Senter Road and Bernal Road and attend the schools mentioned above. Monterey Road is a high traffic thoroughfare and crossing this road to and from school is a chief hazard and concern for these families. This corridor is also inhabited by San Jose’s largest homeless population, some of whom are homeless youth who attend area schools.

Like other neighborhoods in San Jose, the City general plan, Envision San José 2040 (City of San Jose 2020a), and the Santa Clara County General Plan (County of Santa Clara 1994) guide development in South San Jose. Several neighborhood associations have organized in the area to bring awareness of policy, education, emergency preparedness, social and environmental issues, and activism to the communities. These organizations include Edenvale Great Oaks Plan Implementation Coalition and Roundtable Neighborhood Association.

The South San Jose community consists of about 45 percent Hispanic/Latino, 4 percent Black, 32 percent Asian, and less than 1 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total of approximately 82 percent minority population is more than the minority percentage of the three-county reference community. Low-income residents represent 35 percent of the South San Jose population, more than the percentage of low-income residents in the reference community.

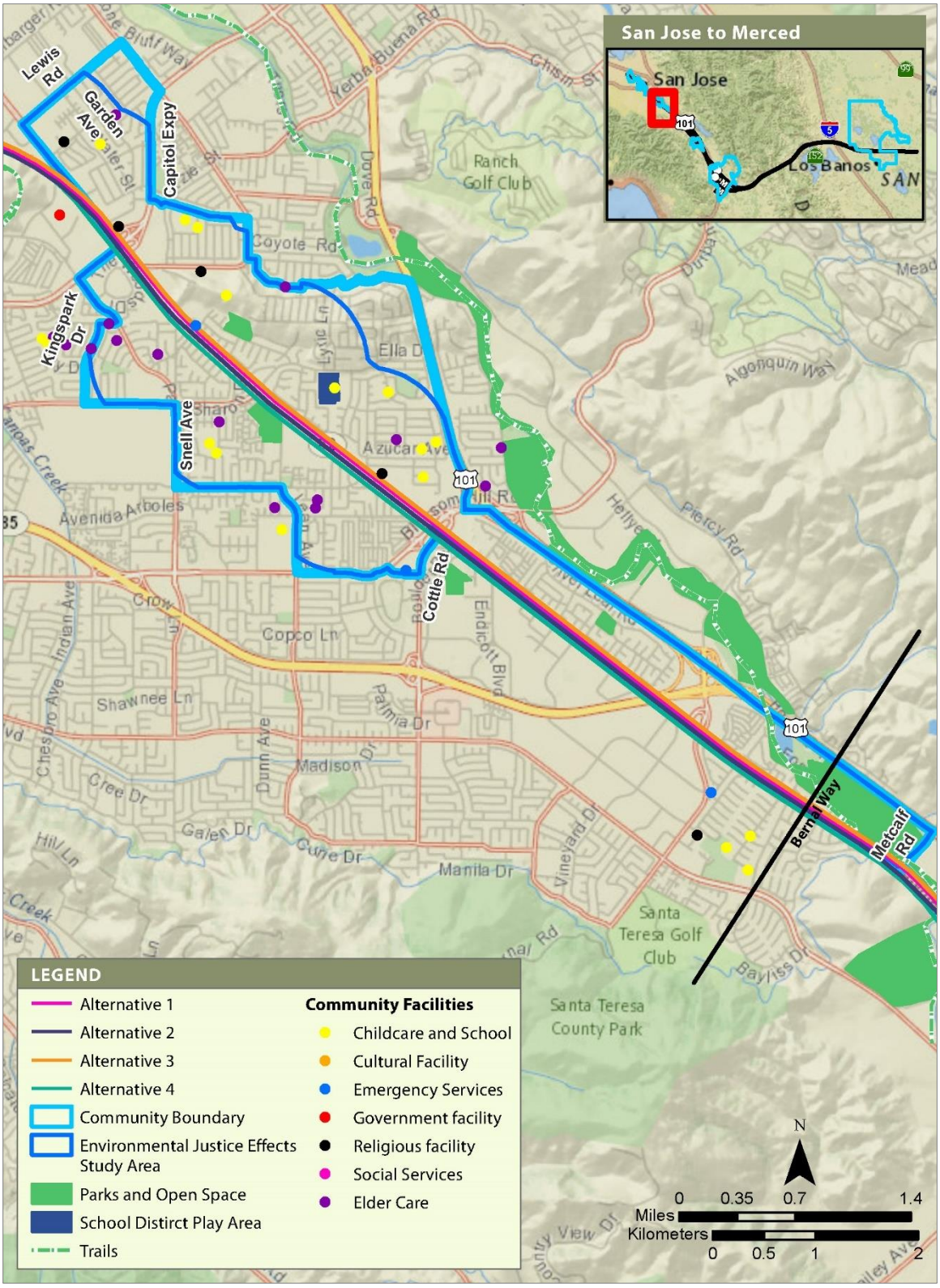


Figure 2-5 South San Jose

2.2.6 Morgan Hill

The City of Morgan Hill is south of South San Jose and the unincorporated Coyote community. The community boundary that includes low-income residents and minority residents is formed by Llagas Road on the north to the west of Monterey Road, Dewitt Avenue on the west to West Edmundson Avenue and east to Monterey Road to where the boundary turns sharply north toward Maple Avenue, to US 101 and Butterfield Boulevard on the east (Figure 2-6). This community is located in the Morgan Hill and Gilroy Subsection of the RSA, as described in Chapter 5 of the EIR/EIS.

Development in Morgan Hill is more prevalent on the west side of US 101, although there is also development on the east side. The Morgan Hill community lies west of Anderson Lake, and there are some agricultural and vacant parcels in the RSA. Morgan Hill is well known for its vineyards and winegrowing, as a part of the Santa Clara Valley designated American Viticultural Area.

Morgan Hill land uses are a mix of commercial, industrial, and residential. US 101 travels north/south on the east side of downtown Morgan Hill, while the Union Pacific Railroad (UPRR) corridor, also north/south, is between Butterfield Avenue and Monterey Road. The HSR alignment would travel through predominantly agricultural areas as it approaches Morgan Hill, transitioning to more suburban residential south of Madrone Avenue. As the HSR alignment proceeds southward under Alternatives 2 and 4, suburban development transitions to denser urban development through downtown Morgan Hill. Distinct neighborhoods have formed on each side of the UPRR corridor and are currently physically divided by the railroad. Under Alternatives 1 and 3, the HSR alignment passes through more suburban and rural areas.

Prominent community assets include the Morgan Hill Community and Cultural Center and Villa Mira Monte. The latter is listed on the National Register of Historic Places and houses the Morgan Hill Museum. Other community facilities include the Morgan Hill Sports Complex, Centennial Recreation and Senior Center, Morgan Hill Dennis Kennedy Aquatics Center, Morgan Hill Recreation Preschool, and Teen Center. Morgan Hill contains several parks, including Galvan Park and Morgan Hill Community Park.

The area includes several places of worship, such as Crossroads Christian Center with its associated school, United Methodist Church, and the Church of the Latter-Day Saints, and schools with playground areas, including Central High School, Shadow Mountain Baptist School, Barrett Elementary, Burnett Elementary, and PA Walsh Elementary. Britton Field, located at East Main Avenue and Hale Avenue, offers playing fields for soccer and baseball.

Public schools in Morgan Hill are administered by the Morgan Hill Unified School District (MHUSD). MHUSD encompasses nearly 300 square miles and serves the ethnically diverse population of Morgan Hill, San Martin, and a small portion of South San Jose. MHUSD serves approximately 8,500 students and is composed of six elementary schools (TK–5), two elementary/middle schools (K–8), one Dual Immersion magnet program (K–8), two middle schools (6–8), two comprehensive high schools (9–12), one continuation high school, and a community adult school. MHUSD provides regular bus service for 1,600 students and special education bus service for 150–200 students (MHUSD 2017).

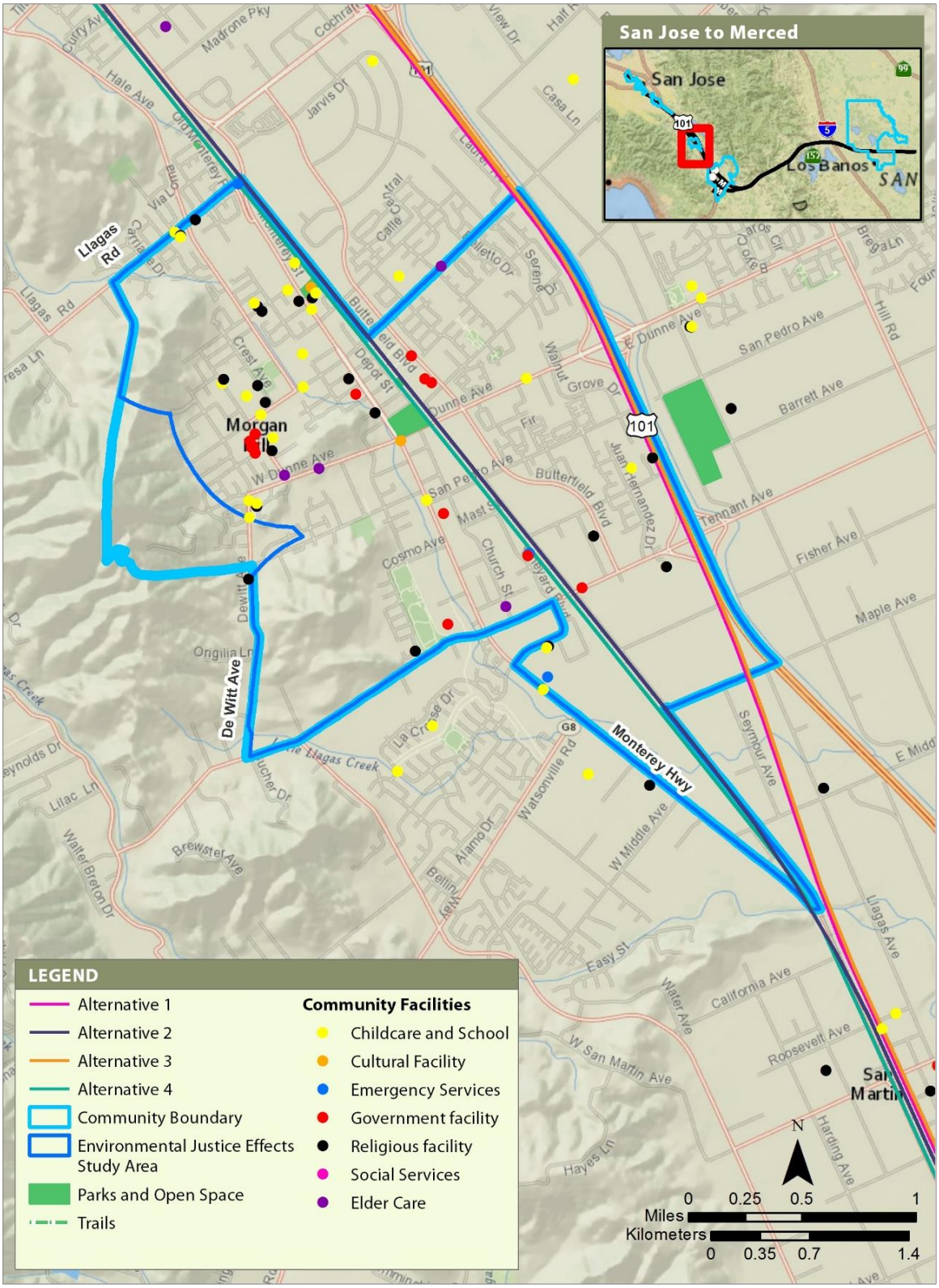


Figure 2-6 Morgan Hill

The City of Morgan Hill's 2035 General Plan (City of Morgan Hill 2016) guides development within the City's 13-square-mile area and its sphere of influence. It describes the City's "small town character, strong sense of community, abundant access to open space and recreational amenities, and ever-growing participation in the Silicon Valley economy." The City also prides itself on being a regional leader in affordable housing, open-space preservation, and environmental stewardship. Historically an agricultural town, the dominant sectors now are manufacturing, health, and educational services, although agriculture still plays an important role with wineries, tourism, u-pick, farmers markets, and other commercial ventures. City policy includes actions to protect and enhance the economic viability of agriculture (City of Morgan Hill 2016). The City also has a Bikeways, Trails, Parks and Recreation Master Plan, a community-driven tool to guide improvements and future development of these assets (City of Morgan Hill 2020a). Community engagement was also the focus of "Engage Morgan Hill," an outreach and education process the City conducted from June 2019 to June 2020 to involve the community in a conversation about services, funding, and priorities (City of Morgan Hill 2020b).

The environmental justice RSA in Morgan Hill has 26 percent of the population defined as low-income, the same as the reference community. Only 29 percent of households are occupied by renters; 60 percent of renter households pay rent of more than 30 percent of household income, a higher percentage than for the county (Santa Clara County Public Health 2016c).

Income-diverse housing is a voter-backed initiative and a fundamental value for the close-knit Morgan Hill community. In keeping with the Association of Bay Area Governments' transit-oriented housing design directives, Morgan Hill created a Priority Development Area downtown adjacent to the Caltrain tracks. The Priority Development Area has the highest density of affordable housing in the City and overlaps with a Plan Bay Area-designated "Community of Concern," defined as census tracts that have a concentration of both minority households and low-income households or that have a concentration of three or more of the eight factors: (1) minority, (2) low income (less than 200 percent federal poverty level), (3) limited English proficiency, (4) zero-vehicle household, (5) senior 75 and older, (6) people with disability, (7) single-parent family, and (8) severely rent-burdened (City of Morgan Hill 2017; Santa Clara County 2017).

The Morgan Hill community consists of about 46 percent Hispanic/Latino, 3 percent Black, 10 percent Asian, and less than 1 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total of approximately 60 percent minority residents is less than the percentage of minorities in the three-county reference community. Low-income residents represent 36 percent of the population, more than the percentage of low-income residents in the reference community.

2.2.7 Gilroy

The Gilroy community is in South Santa Clara County at the crossing of US 101 and SR 152. The boundaries of this community are formed by Buena Vista Avenue, Las Animas Avenue, and Roop Road on the north; Wren Avenue, Miller Avenue, Mesa Road, and US 101 on the west; Carnadero Creek and Llagas Creek on the southwest to Canada Road, and the hills on the east (Figure 2-7). This community is in the Morgan Hill and Gilroy Subsection of the RSA, as described in Chapter 5 of the EIR/EIS.

The 1.5-square-mile rectangle known as The Old Quad was laid out in the mid-19th century and served as the city's original city limits from its incorporation in 1870 until the first annexation in 1948. Historically, Gilroy's economy has been based on agricultural products and processing. Over the years, prunes, tomatoes, flowers, onions, and garlic have contributed to the economic health of the agricultural industries. Food processing centers have also established themselves in Gilroy, and government centers also employ many residents.

Development in Gilroy is predominantly west of US 101. Land use north of downtown Gilroy consist of single-family residential, commercial, and light industrial. In downtown Gilroy, dense urban commercial and residential uses line both sides of Monterey Road. Surrounding land uses in the downtown Gilroy area range from single-family and multifamily residential to commercial and industrial.

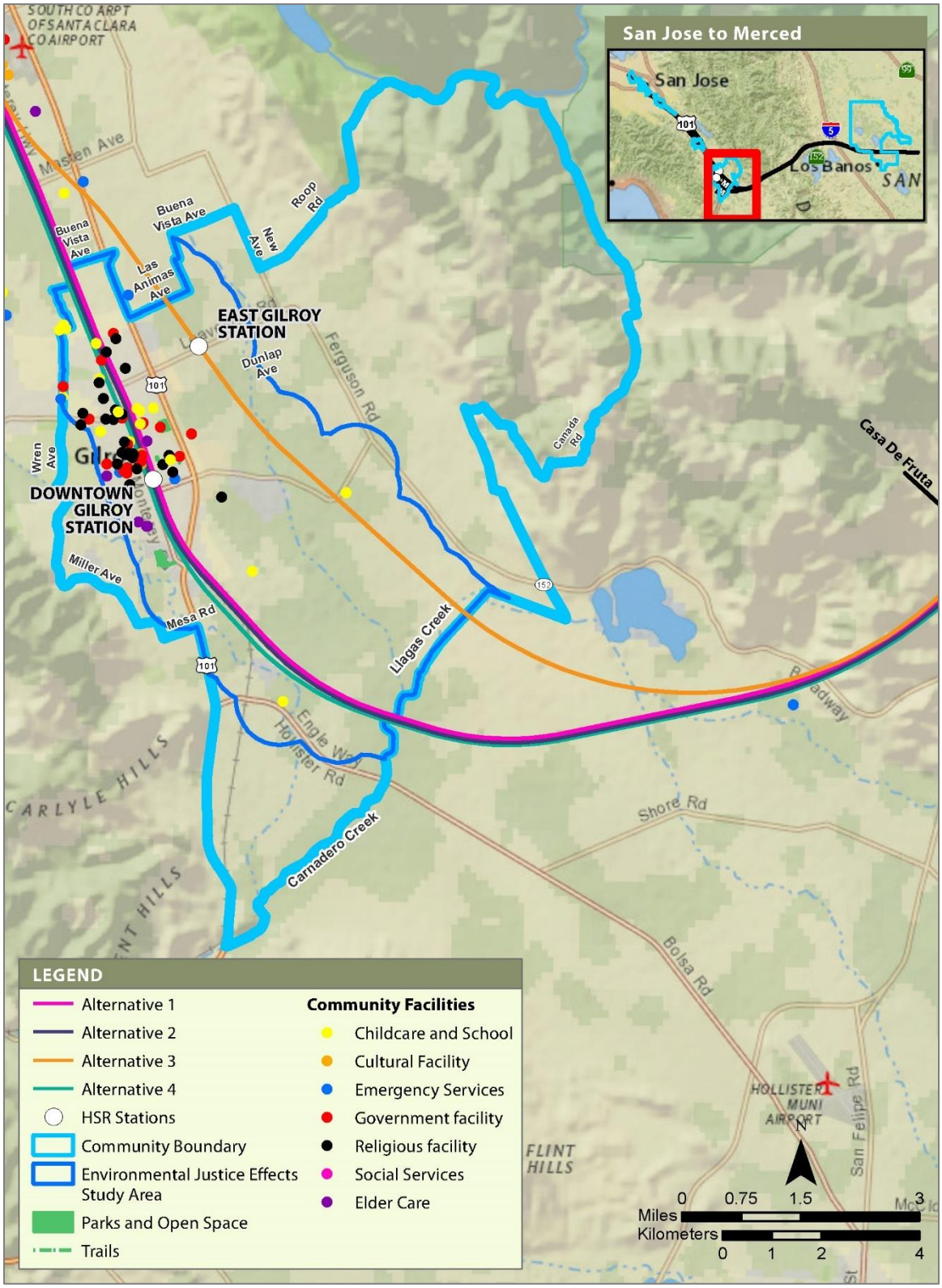


Figure 2-7 Gilroy

Gilroy has a variety of regional community facilities and resources, including St. Louise Regional Hospital, Wheeler Manor (senior residence), and the Gilroy Library. Gavilan Community College, which is set in the foothills that surround the city, serves approximately 5,500 students, 66 percent of whom are minority students (primarily Hispanic). The Outlets at Gilroy, a five-phase retail complex, draws shoppers from all over the San Francisco Bay Area and Central Coast regions. Gilroy has a number of parks ranging from 0.125 acre to 125 acres in size, including Las Animas Park, Miller Park, and San Ysidro Park. Playing fields are available at various schools in the City, including Gilroy Prep (public elementary school), South Valley Junior High School on the east side of the UPRR corridor just north of IOOF Avenue, Brownell Academy Middle School west of the tracks, Gilroy High School, and Ascension Solarsano Middle School. Rebekah Children's Center, which is also located on the east side of the UPRR corridor, north of IOOF Avenue, provides foster and mental health care and homes to children across the community and is situated on land that is registered as a City heritage site. A Head Start branch providing after-school services to children in Gilroy is located behind and to the east of South Valley Middle School. There are also numerous places of worship concentrated in downtown Gilroy, including Gilroy Bible Church; First Church of Christ, Scientist; Gilroy United Methodist Church; Church of Jesus Christ of Latter-Day Saints; and Seventh Day Adventist Church.

Gilroy is famous for its annual Garlic Festival. Agriculture remains important in Gilroy's economy, even as that economy has diversified with light manufacturing, wholesale operations, auto sales, and large retail. The rise of Silicon Valley in the 1990s brought increased home prices and land values along with decreasing unemployment. Downtown businesses, however, suffered in the face of that growth, until revitalization efforts helped bring back smaller-scale commercial activity.

Recognizing that growth and development are regional forces, Gilroy joined with Morgan Hill and Santa Clara County and developed the South County Joint Area Plan to ensure coordination among the three jurisdictions (City of Gilroy 2002). With abundant open space and a backdrop of mountains, Gilroy retains its rural and historical character, with buildings in some neighborhoods dating back to the mid-19th century.

The boundaries of the environmental justice RSA for Gilroy encompass Gilroy's downtown and east side and adjacent areas to the east and west. The demographic characteristics of the east side (which includes downtown) differ from those of Gilroy as a whole. While Gilroy overall had a 2016 median household income of more than $81,000 and unemployment of 4.9 percent, the east side's median household income was just over $36,000 and unemployment was 14 percent. In greater Gilroy, 27 percent of families were below 185 percent poverty, while on the east side, 61 percent of families were below that threshold. Renters occupied 42 percent of Gilroy households and 73 percent of households on the city's east side; similar numbers of renters pay more than 30 percent of household income in rent (57 percent in Gilroy and 60 percent on the east side). East side residents experience about twice as many violent crimes within 1 mile than in Gilroy as a whole (Santa Clara County Public Health 2016d, 2016e).

The Gilroy community consists of approximately 69 percent Hispanic/Latino, 2 percent Black, 4 percent Asian, and less than 1 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total of 75 percent minority population is more than the percentage of minorities in the three-county reference community. Low-income residents represent 44 percent of the population, more than the percentage of low-income residents in the reference community.

2.2.8 San Joaquin Valley

Because the rural population is sparsely distributed, the census tracts and portions that define the San Joaquin Valley community are quite large and encompass just a few population centers, including Volta, Los Banos, and Santa Nella. Because the study populations are concentrated in Volta and Los Banos, Figure 2-8 displays just those communities and a portion of the surrounding less-developed area. The northern community boundary extends a short distance west of Volta and for about 0.5 mile north of Henry Miller Road from Volta to SR 165. South of Henry Miller Road, which forms the north boundary of the Los Banos portion of the community, Badger Flat Road forms the west boundary. The southwest boundary is defined by Willmott Avenue to SR 165, at the south end turning east toward Ward Road, then following East Pacheco Boulevard on the south to Delta Road on the east, which ends at Henry Miller Road on the north (Figure 2-8). This community is in the San Joaquin Valley Subsection of the RSA, as described in Chapter 5 of the EIR/EIS.

Between I-5 (just north of Santa Nella Village) and Carlucci Road in Merced County, land uses are mostly agriculture-related: orchards, crops, dairy farms, and rural residential. Residential land uses are generally attached to farm and dairy operations. Downtown Los Banos, approximately 3 miles south of the HSR alignment, provides neighborhood-serving commercial opportunities.

Community recreational assets in the San Joaquin Valley community include the Volta Wildlife Area, the Grasslands Ecological Area (GEA), and the Los Banos State Wildlife Area. The HSR alignment crosses through the GEA, which is a large mosaic of freshwater marshes, alkali grassland, and riparian thickets established through collaborative conservation planning between public resource agencies and private duck hunting clubs. The GEA is a designated Important Bird Area for supporting bird populations. Numerous agricultural irrigation canals are present in this area, as are electrical transmission lines, a small substation, the San Luis Wasteway, and the main channel of the San Joaquin River. Agricultural support facilities (barns, silos, and tanks) are directly south of the proposed HSR alignment west of Carlucci Road.

Volta Elementary School is the only school close to the proposed HSR alignment in this area. It houses five permanent classrooms and 13 portable and temporary classrooms. It admits approximately 600 students a year from the Los Banos community, including children of farm workers. The student population is roughly 50 percent low-income and 30 percent English learners. Student academic performance at Volta Elementary School is consistently one of the best in the county based on statewide standardized tests, and a seat at the school is highly coveted and competitive. Due to the limited ingress and egress from the school to Los Banos, traffic and issues with access to and from school that disrupt student learning day-to-day are of chief concern for this school community. Moreover, the school is experiencing an increasing number of medically sensitive students who need quick access to emergency care in Los Banos, heightening these concerns.

The 2030 Merced County General Plan, adopted in 2013 (County of Merced 2013), guides development in the unincorporated areas of the county, such as Santa Nella and Volta. The County published a specific plan for Santa Nella in 2000 (County of Merced 2000). The Merced County Hispanic Chamber of Commerce, founded in 1947, represents and supports Hispanic businesses throughout the county with training, scholarships, networking, and business development opportunities (Merced County Hispanic Chamber of Commerce 2020).

Los Banos is an incorporated city with its own general plan. It is the second largest city in Merced County, with a 2017 population of 39,993. The top three employers are Los Banos Unified School District, Memorial Hospital, and Walmart. Twelve public schools and three private schools serve the city's children, and more than 200 acres of parks and open space provide recreational opportunities. The City's general plan goals and policies include providing an environment that encourages walking and facilitates ways to reduce dependence on auto travel by making alternate modes safer and more convenient. The Los Banos bicycle-pedestrian plan proposes a variety of bicycle and pedestrian policies, projects, and standards to fulfill these goals (City of Los Banos 2018).

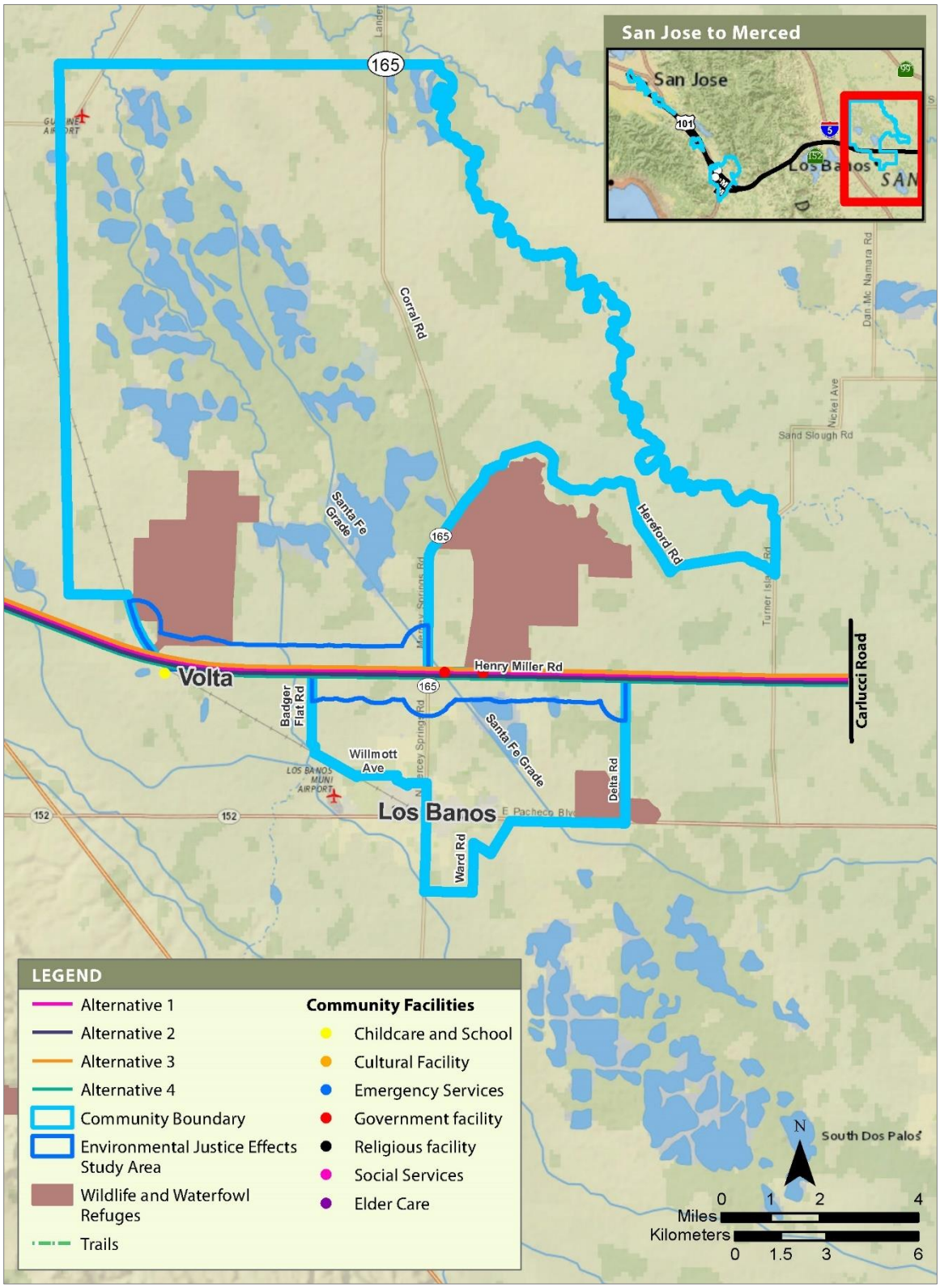


Figure 2-8 San Joaquin Valley

The Los Banos Chamber of Commerce involves itself in both the business and general community. It hosts or participates in events such as spring and fall street fairs, Dads' Night Out, Tomato Festival, and a Christmas parade (Los Banos Chamber of Commerce n.d.). The City of Los Banos Parks and Recreation Division offers youth and adult sports programs and classes; annual community events such as an Egg Hunt, Earth Day, Big Truck Day, and holiday celebrations; summer movies in the park at rotating park locations; and events for seniors (City of Los Banos 2017).

A community survey conducted in 2018 for a ballot measure found that public safety issues such as drug use and abuse, unsafe drinking water, gang violence, homelessness, and unemployment were among participants' top priorities for the City to address; repairing streets and roads was second (FM3 Research 2018).

Santa Nella is an unincorporated community in western Merced County, northwest of Los Banos. In 2000, with a population of about 800, most land in Santa Nella was undeveloped, with about half in agriculture. In 2000, the Specific Urban Development Plan called for growth of low- and medium-density residential, a golf course, and some commercial uses south of Henry Miller Road and west of I-5 (County of Merced 2000). Volta is a primarily residential community of fewer than 300 people located between Santa Nella and Los Banos. Most of the population in Los Banos and Volta are Hispanic.

The San Joaquin Valley community includes low-income populations north of Henry Miller Road, with both low-income populations and minority populations south of Henry Miller Road. Combined, the San Joaquin Valley community consists of about 70 percent Hispanic/Latino, 2 percent Black, 2 percent Asian, and less than 1 percent each Native American and Alaska Native/Hawaiian/Pacific Islander residents. The total of approximately 75 percent minority residents is more than the percentage of minorities in the three-county reference community. Low-income residents in the San Joaquin Valley, defined as persons living in households earning less than 100 percent of the poverty level, represent about 24 percent of the population, slightly more than the percentage of low-income residents in the reference community.

3 PLANNING PROCESS AND IMPROVEMENT EVALUATION

A comprehensive process was undertaken to engage local communities and identify and evaluate potential improvements that could be implemented for the benefit of minority populations and low-income populations to offset residual disproportionately high and adverse effects. This section describes the purpose and trajectory of the process and includes an overview of key steps, including outreach.

The Authority determined that the process should be transparent; arise from the concerns and input of community partners in affected communities, subject to revision and refinement; utilize objective metrics across communities; demonstrate community partner buy-in; and occur parallel to the EIR/EIS process. Specific goals for achieving this overall purpose are described in the following subsections.

3.1 Process Purpose

As discussed above, disproportionately high and adverse effects associated with the project alternatives were identified for minority populations and low-income populations in the following communities.

- Santa Clara/North San Jose
- San Jose Diridon
- Gardner/Willow Glen
- Washington/Guadalupe, Tamien, and Alma/Almaden
- South San Jose
- Morgan Hill
- Gilroy
- San Joaquin Valley

As such, the focus of this process was to identify and evaluate potential improvements within these communities that could offset residual disproportionately high and adverse effects.

3.2 Process Goals

The goals of the improvement planning process are described below.

- **Transparent Process**—The process was intended to be inclusive and to meet the needs of both affected communities and the Authority. The Authority has sought to achieve this goal by involving community partners throughout the process and soliciting their input on community improvements to be evaluated and for review and feedback on the Authority's evaluation. The Authority also shared the definitions and specific criteria to be used for the evaluation at the outset and garnered feedback on those to ensure that the entire process was transparent.
- **Engagement to Identify Improvements**—An important part of the process was to engage stakeholders in affected communities in identifying unmet needs and related potential offsets that could be incorporated into the process evaluating community improvements. Initially the Authority engaged the local cities and counties (in unincorporated areas) to identify existing minority community and low-income community representatives among local community organizations, school associations, social service providers, cultural entities, and others. Some agencies, such as Santa Clara County Health and Human Services, had relationships with local nonprofit and private social service agencies that identified minority community and low-income community representatives as well. Stakeholder input is key to the identification of potential improvements that are aligned with the priorities of affected communities.
- **Incorporate Input into Evaluation**—In addition to asking stakeholders to identify potential improvements, the Authority solicited input on specific community needs and concerns to provide context for specific potential improvements. Input was also solicited from potential implementing partners and community stakeholders on how improvements should be evaluated. Stakeholder input is essential to the evaluation of potential improvements to ensure that the improvements are defined and evaluated in a way that reflects community

needs and priorities of those populations that have historically been marginalized in the decisions around the placement and development of transportation and other facilities.

- **Propose Improvements on Objective Basis**—The evaluation of potential improvements was based on clear criteria. Evaluation criteria were developed by the Authority with input from community stakeholders. Criteria used to evaluate potential community improvements are described in detail below.
- **Foster Agreement and Support**—The process of soliciting improvement ideas and input is ultimately intended to foster agreement between the Authority, its implementing partners, and the affected communities that potential improvements are practicable and would serve prioritized community needs. The goal is also to foster support for the Authority's implementation of recommended improvements as offsetting mitigation to address residual disproportionately high and adverse effects to minority populations and/or low-income populations.

3.3 Improvement Definition and Selection Criteria

3.3.1 Definition of "Community Improvement"

To clarify the focus of the planning process and narrow the range of potential improvement types, the following definition of "community improvements" was developed by the Authority:

> Any upgrading of an existing community facility, structure, function or action, or addition of a facility, structure, function or action that is made solely for the benefit of the local community, including an increase in the capacity, capability, efficiency, duration, function, or action over existing conditions. Community improvements do not include the following: proposed elements of the HSR project; feasible direct mitigation to address significant adverse environmental effects as defined in the project EIR/EIS; improvements mandated by existing local, state, or federal mandates; or improvements fully funded by dedicated existing funding sources.

This definition helped clarify for the Authority and its potential community partners what should and should not be included in the list of potential improvements to ensure that stakeholders could focus their recommendations on those improvements of highest benefit to low-income populations and minority populations.

3.3.2 Evaluation Criteria

The following evaluation criteria were used to screen and evaluate potential community improvements that could offset disproportionately high and adverse project effects on minority populations and low-income populations. After an initial list of potential improvements was developed using the criteria described below, a more refined list of improvements was selected based on their nexus to the disproportionately high and adverse effects remaining after the application of project direct mitigation and consideration of project benefits.

Community improvements that can be supported and/or implemented by the Authority as offsetting mitigation were evaluated and prioritized based on meeting the criteria described in the following subsections.

- **Benefit Intensity**—Improvements must benefit minority populations and low-income populations within communities in a census district defined as containing low-income populations or minority populations greater than the reference community. Improvements should improve community cohesion, identity, livability, economic or educational opportunities, health, and safety. While improvements must maintain a nexus to the residual disproportionately high and adverse effects of the project, when improvements provide community cohesion, identity, livability, economic or educational opportunities, health, and safety benefits, they can help offset these effects even if they do not directly reduce some of those impacts on a one-for-one basis.

- **Relative Number of Beneficiaries**—The relative number of beneficiaries of an improvement was evaluated compared to the other improvements within a specific community.
- **Practicable**—The improvements must be practicable, which is defined as feasible considering technical feasibility, logistical feasibility and implementation, and financial feasibility.
  - Regarding technical feasibility, the improvement must be technically feasible based on available technology and common industry practices.
  - Regarding logistical feasibility and implementation, the improvements can be implemented through the Authority's construction contract(s) or through other means in partnership with local agencies or entities in an achievable time frame without undue scope, schedule, or budget risks to the Authority. For any improvements not directly related to the HSR facility, there must be a local partner to be practicable.
  - Regarding financial feasibility, the level to which the improvement will leverage the Authority's funding with funding from other sources, including other state programs, will be evaluated based on the reasonableness and amount of available other funds. The Authority's funding contributions will supplement but not supplant other available funding sources.
- **Defined Project or Action**—The nature and scope of improvement investment is defined clearly and distinctly in terms of the specific physical improvements (if relevant), beneficial outcomes, implementing mechanisms, costs, and timing.
- **Satisfy Authority Obligations**—The Authority can determine that the proposed improvements have a general relationship to overall project effects, are consistent with the Authority's mission, and are consistent with a statewide objective or program, without setting an undesirable precedent or hardship.
- **Defined Roles and Responsibilities**—This criterion is defined by the degree to which the ownership, implementation, and operation and maintenance roles and responsibilities for proposed improvements are clearly defined and acceptable to assigned entities.
- **Evidence of Agreement**—There should be evidence that the Authority, the local community, and any local responsible agencies involved agree that the improvement would be beneficial and acceptable to the community.
- **Cost-Effectiveness**—The cost-effectiveness of the improvements was evaluated by dividing the cost of the improvement by the number of potential beneficiaries. The cost-effectiveness of the individual improvements was then compared to the cost-effectiveness of the other improvements in the community, and the more cost-effective improvements were rated higher.

While the criteria above were used to evaluate the individual improvements, an additional criterion of ***proportionate*** was used to ensure that improvements should be roughly proportionate to the level of residual disproportionately high and adverse effects on minority populations or low-income populations.

3.4 Initial Community Improvements Concept Development

Initial development of potential improvements occurred in November 2019. For example, the Authority separately developed a program called Connecting Communities Strategies (CCS) aimed at identifying the ways that HSR could advance community goals. The CCS process had at its foundation a comprehensive review of community planning along the HSR corridor. By reviewing capital project lists, planning document implementation activities, and related infrastructure needs across the corridor communities, CCS provided some guidance and structure to the existing and documented needs of the corridor communities.

An initial list of potential improvements was developed drawing from the following sources.

1. **Connecting Communities Strategy**—The CCS represents a series of improvements in communities spanning the HSR alignment that the Authority had gathered during community outreach in the preparation of the Draft EIR/EIS. These improvements stemmed from a statewide planning effort aimed at connecting local communities with state cap-and-trade funding programs with the goal of increasing the competitiveness of local community applications to state grants to fund community projects in disadvantaged communities.
2. **San Jose Strong Neighborhoods Initiative**—The SNI was a partnership between the City of San Jose, the San Jose Redevelopment Agency (RDA), and San Jose's residents and business owners to strengthen the city's neighborhoods by building clean, safe, and strong neighborhoods with independent, capable, and sustainable neighborhood organizations.
3. **Prior Community Input on the Project**—Authority staff identified initial community improvements concepts based on prior engagement with and input from minority community members and low-income community members and representatives during public outreach on the program.
4. **Authority Staff Input**—Authority staff also identified potential community improvements based on knowledge of the HSR alignment, evaluation of the potential effects of each alternative on minority populations and low-income populations on a community-by-community basis, and prior experience and expertise in identifying potential offsets and improvements.

The Authority conducted initial screening of potential community improvements based on the draft evaluation criteria and examples of community improvements case studies. Based on this initial screening effort, Authority staff developed and reviewed a refined list of potential improvements. A revised list was prepared in December 2019 based on feedback from review of the initial potential improvements.

3.5 Community Improvements Outreach, Phase One

After the development of an initial list of potential improvements, a first phase of focused outreach was conducted. The goals of this first phase of outreach (Phase One) were as follows.

- Expand the Authority's understanding of the needs of minority populations and low-income populations.
- Promote understanding of the environmental justice analysis and the process.
- Gather minority community and low-income community ideas for improvements.
- Obtain feedback on the initial list of improvements.

Presentations were made between December 2019 and March 2020 to a multitude of local minority community organizations and low-income community organizations, including community-based service providers, school leaders, community groups, neighborhood associations, churches and other faith-based organizations, and community leaders and representatives, along with public agency representatives. Participants were identified from the stakeholder database, and additional outreach was added as initial contacts led to subsequent and new contacts.

These first engagements were to provide information and data and to provide a process through which local minority community improvement concepts and low-income community improvements concepts would be developed. Information about the requirements for a federal environmental justice EIR/EIS analysis, finding of disproportionately high and adverse effects, and subsequent need to identify minority community improvement concepts and low-income community improvements concepts was explained. Data about the identification, boundaries, and initial naming of the minority communities and low-income communities was shown graphically. The process, with a structure for identifying, developing, and prioritizing improvements across an 85-mile alignment, was described. Other materials provided for review and consideration included the following:

- Sample improvements from national examples, the Authority's own factfinding as memorialized in the CCS, and San Jose's SNI, of implementation
- A template outlining the minimum data requirements for each potential improvement
- A preliminary list of criteria that ties the community improvement concept to the U.S. Presidential Executive Order 12898 goals and objectives, accounts for engineering as well as cost feasibility, and links potential partners bounds the process of developing potential community improvements to federal environmental justice requirements
- A preliminary list of community concept types, as well as specific concepts that were included in planning documents, capital improvement lists, and unfunded priorities
- Explanation of the goals of the process to engage local minority communities and low-income communities to develop community improvements
- Criteria for rating the concepts were also presented because the criteria would allow the Authority to rank improvements across a 90-mile geography with a solid basis for differentiating among potential improvements

During this phase of outreach, which occurred between December 2019 and March 2020, the Authority conducted a total of 48 meetings, including calls and in-person meetings with potential partners and community presentations. Outreach during this phase included gathering feedback from potential implementing partners (i.e., those entities potentially able to partner with the Authority on community improvements implementation). Potential implementing partners included school districts, cross-jurisdictional agencies, municipalities, and a few selected community organizations across the affected communities.

3.6 Expanded Improvements List

The list of potential improvements developed internally was expanded substantially to include the improvements suggested by cities, agencies, community organizations, and community representatives during Outreach Phase One. This expanded list, which consisted of 211 potential improvements, was then subject to another round of screening using the evaluation criteria to determine which improvements would then be developed and considered in greater detail.

3.7 Concepts Screened Out

Concepts screened out and not carried forward for detailed evaluation included the following.

- **Improvements that do not meet the Authority's criteria**. Potential improvements were screened out if they were already part of the project, were potential feasible direct mitigation for project effects, were already fully funded, were already completed or would be completed soon, or otherwise fully mandated by existing requirements not related to the project.
- **Improvements that do not have the potential to meet most of the evaluation criteria**. Improvements were screened out when existing information could readily support a determination that they would not meet most of the criteria.
- **Improvements unlikely to provide benefits primarily to minority populations or low-income populations affected by the project**. Improvements that were not focused on the affected minority communities and low-income communities affected by the project or that would provide benefits so broadly that the bulk of the community improvements would accrue to communities or individuals not affected by the project were screened out. Improvements that provided a limited or unclear benefit to affected minority communities and low-income communities were screened out.
- **Improvements that would be impracticable**. Improvements that had substantial technical or logistical challenges to overcome such that they may ultimately be impracticable were screened out. Regarding financial feasibility, improvements that on their own would consume a nonproportionate share of project budget were screened out.

- **Improvements insufficiently defined to evaluate.** Improvements were screened out if they were insufficiently defined at the time of screening and/or would require lengthy amounts of time in order to define adequately to support an evaluation in a timely manner to support completion of the Final EIR/EIS.
- **Improvements that would not satisfy Authority obligations**. Improvements that were outside of or inconsistent with the Authority's mission to provide improved transportation options while offsetting project effects were screened out. Ongoing operational subsidy of public agency or private organization operations or actions was found to be inconsistent with the Authority's policies and obligations. Improvements that would set a precedent that would hinder the statewide implementation of the HSR system were screened out. Improvements that lacked a reasonable nexus to the project's disproportionately high and adverse effects on local minority populations and low-income populations were screened out.
- **Improvements that do not have clearly defined roles and responsibilities.** Improvements for which the implementing roles and responsibilities were unclear such that the path forward to implementation was uncertain were screened out.
- **Improvements that appear unlikely to have community support or agreement**. Improvements that had been previously stopped from implementation due to community concerns were screened out. Improvements that may engender substantial controversy (and thus may not be supported by most of the affected community) were screened out. Improvements not supported by potential implementing partners that would need to implement the improvement were screened out.
- **Improvements that are not proportionate to the level of effects of the project**. Improvements that, on their own, would require a level of Authority involvement or funding that was out of proportion to the project effects were screened out.
- **Improvements combined for evaluation.** Certain potential improvements were combined with others where they were closely related or duplicative to avoid redundancy and overlap.

As a result of this screening process, 104 improvements were not carried forward. Potential improvements that were carried forward for further evaluation included 107 community improvements. Of these, 38 are proposed as offsetting mitigation to offset disproportionately high and adverse effects on minority populations and low-income populations. These improvements are described in Chapter 4, Proposed Offsetting Mitigation Measures.

3.8 Offsets Development and Evaluation

Development and evaluation of 104 potential improvements began following completion of Outreach Phase One and continued through June 2020. Community improvements were developed based on input from potential partners and community stakeholders to ensure that those carried forward for funding and implementation would meet community needs and priorities. After development of community improvements based on initial concepts gathered during Outreach Phase One, potential improvements were evaluated based on the set of established evaluation criteria, as described above.

3.8.1 Development of Potential Community Improvements

After Outreach Phase One, community improvements in the initial concept development phase were developed, refined, consolidated, or in some cases eliminated to determine a set of improvements to be evaluated. Refinements included expanding potential improvement ideas by gathering additional information from existing local and regional plans where certain improvements were described more fully. Improvements development also assessed the benefits to minority populations and low-income populations, the relationship of each potential improvement to project effects, and the consistency of potential improvements with local plans and policies. Preliminary cost estimates were also prepared for each potential improvement. Further, to help gauge the extent to which a given improvement would benefit minority populations and low-income populations within a given community, each improvement was

mapped relative to the location of the minority populations and low-income populations along the HSR alignment.

3.8.2 Evaluation of Community Improvements

After profiles were developed for potential improvements, they were evaluated relative to the refined set of evaluation criteria, as listed above. The evaluation for each potential improvement against the evaluation criteria was included in each profile. The evaluation informed the identification of improvements to potentially offset residual disproportionately high and adverse effects.

3.9 Community Improvements Outreach, Phase Two

After completing the initial screening and evaluation of the community improvements vetted during Outreach Phase One, the Authority undertook a second phase of outreach to gather feedback from potential implementing partners on specific improvements to ensure that the improvement profiles correctly represent the input gathered during Outreach Phase One and collect any additional information pertinent to the potential improvements, such as the roles and responsibilities of the agencies and entities that would be involved in design and implementation of the improvements. Feedback was also sought on the scoring of the potential improvements and the ranking of improvements relative to local priorities.

To solicit this feedback, local jurisdictions and agencies and certain other nongovernmental organizations were presented with the improvement profiles pertinent to their communities, jurisdictions, or areas of focus, along with the preliminary scoring and evaluation of each community improvement. The Authority scheduled meetings with potential implementing partners to discuss their perspectives on the evaluation of improvements, to gather feedback, and to better understand local priorities. The Authority met with the following jurisdictions, agencies, and groups during Outreach Phase Two.:

- City of Santa Clara
- City of San Jose (including the Parks and Recreation Department and the Department of Transportation)
- City of Morgan Hill
- City of Gilroy
- Local school districts (for school improvements in San Jose, Morgan Hill, Gilroy, and Los Banos)
- Santa Clara County Parks and Recreation Department (for County parks)
- Rebekah Children’s Services (for improvements to the organization’s facility)
- Rocketship Public Charter School (for improvements at a Rocketship Mateo Sheedy School)
- VTA (for transit and certain other transportation improvements)
- Center for Employment Training, Mission College, and Gavilan College (for potential job training and other improvements specific to these institutions)
- African American Community Service Agency (for improvements at the organization’s facility)
- Santa Clara County Health and Human Services and HomeFirst (for homeless services and housing initiatives)

3.10 Identification of Potential Community Improvements as Offsetting Mitigation

After Outreach Phase Two, the process was paused to consider what additional direct mitigation or improvements could be incorporated into the EIR/EIS to avoid or minimize disproportionately high and adverse effects and to conduct a more thorough analysis of the effects of project

benefits. Subsequent to this additional analysis, the list of potential improvements as offsetting mitigation candidates was refined to include those community improvements with a reasonable nexus to the residual disproportionately high and adverse effects of the project that would remain after application of additional direct mitigation and consideration of project benefits. These potential improvements, as well as additional improvements identified through the Phase Three outreach (see discussion below) are listed in Chapter 4, Proposed Offsetting Mitigation Measures, and described in profiles in Attachment A.

3.11 Community Improvements Outreach, Phase Three

In September 2021, the Authority conducted a total of 26 virtual meetings with Implementing Partners, Community Organizations, and Interested Parties and Other Stakeholders in eight communities within the San Jose to Merced Project Section, including Santa Clara/North San Jose, San Jose Diridon, Gardner/North Willow Glen, Guadalupe/Washington/Tamien/Alma/Almaden, South San Jose, Morgan Hill, Gilroy, and San Joaquin Valley, where the EIR/EIS analysis had indicated that low-income populations and minority populations may be subject to disproportionately high and adverse effects from the project alternatives. Generally, the objectives of these meetings were to:

- Explain the updated environmental justice analysis for the EIR/EIS, including updated and new direct mitigations, consideration of benefits, and potential community improvements.
- Share preliminary conclusions related to the updated analysis.
- Gain feedback on the updated analysis, preliminary conclusions, and potential community improvements under consideration as offsetting mitigation.

The Authority classified stakeholders engaged into three general categories: (1) Implementing Partners, (2) Community Stakeholders, and (3) Interested Parties and Other Stakeholders within each of the affected communities to share and discuss the analysis and provide an opportunity for feedback (see Volume 2, Appendix 5-B, Environmental Justice Engagement Summary Report, Attachment D, Environmental Justice Outreach, September 2021, for definitions of each category).

The Authority communicated closely with Partners, Stakeholders, Interested Parties and Other Stakeholders before the meeting series, sharing flyers, community surveys, and proposed content. Partners, Stakeholders, Interested Parties and Other Stakeholders received a community-specific and comprehensive packet of materials (in English, Spanish and Vietnamese and that was ADA-compliant) that was sent on September 3, 2021, related to the environmental justice analysis, including:

- Community Survey
- Environmental Justice Analysis Process Summary
- Summary of Updates to the EIR/EIS Environmental Justice Analysis
- Environmental Justice Community Summary
- Meeting Agenda and Presentation

The Authority requested all review the materials and provide feedback via electronic community survey, letter, or other written form by October 1, 2021. The feedback gathered during this phase has been evaluated and incorporated into the Final EIR/EIS. A detailed summary of outreach, outreach materials, and copies of the input from this outreach cycle are presented in Volume 2, Appendix 5-B, Attachment D.

4 PROPOSED OFFSETTING MITIGATION MEASURES

The improvements listed below in Table 4-1 are proposed as offsetting mitigation measures to offset disproportionately high and adverse effects on minority populations and low-income populations due to their reasonable nexus to project effects and ability to provide substantial benefits to minority populations and low-income populations within the communities wherein these effects would occur. These improvements were chosen from the larger list of improvements, which is described in the next section. In some cases, the potential improvements were refined from prior iterations to be more targeted improvements with a greater nexus to project impacts. Profiles providing additional detail about each of these offsetting mitigation measures is included in Attachment A.

To be considered for Authority implementation as offsetting mitigation measures, potential community improvements were required to have a reasonable nexus, or relationship, to project effects. A community improvement has a "reasonable nexus" if it may reasonably offset a specific identified disproportionately high and adverse effect on the community such as but not limited to community cohesion, visual, aesthetics, or noise. Community benefits can be demonstrated through an analysis that validates the offsetting reduction in disproportionately high and adverse effects or through community agreement where the impacted community accepts the benefit of the improvement as an offsetting mitigation measure for disproportionately high and adverse effects.

Authority funding or implementation of these offsetting mitigation measures is contingent on the California High Speed Rail Authority Board approval and availability of funds for construction

Table 4-1 Summary of Proposed Offsetting Mitigation Measures

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
Southern Santa Clara/Northern San Jose	SC-NSJ-OMM#1: Noise Treatments for Up to Three Residential Buildings along Caltrain Corridor to Address Existing Noise	HomeFirst; Next Door Solutions	Existing train noise Noise disrupting an already challenging living environment	Community noise improvement offsets noise DHAE in Southern Santa Clara/Northern San Jose.	1, 4
Southern Santa Clara/Northern San Jose	SC/NSJ-OMM#2: El Camino Real and Benton Street Safety Improvements	City of Santa Clara	City of Santa Clara stated that crossing improvements are needed at this location to provide safety in pedestrian and bicycle access to the Caltrain Santa Clara Station which will provide access via Caltrain to HSR.	Improvement agreed to by community as helping to offset project effects.	1, 2, 3, 4
Southern Santa Clara/Northern San Jose	SC/NSJ-OMM#3: Streetscape Improvements	City of Santa Clara	City of Santa Clara stated that community improvements would help to offset other project effects.	Investment in community aesthetics partially offsets visual aesthetics DHAE in San Jose Diridon area (Alternatives 2, 3).	2, 3

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
San Jose Diridon	SJD-OMM#1: Streetscape Improvements to Delmas Neighborhood	Strong Neighborhood Initiative	Visual quality Unsightly streetscapes Poor condition of streets and sidewalks Lack of street lighting Bleak and uninviting street frontages Deferred maintenance Streets that dead-end at I-280 have no secure fencing, allowing easy access to unsupervised areas under the freeway	Investment in community aesthetics partially offsets visual aesthetics DHAE in San Jose Diridon area.	1, 2, 3
San Jose Diridon	SJD-OMM#2: Noise Treatments for Certain Residential Buildings along SR 87/I-280 to Address Existing Noise	Authority staff developed based on community concern re: noise	Traffic Noise and vibration	Community noise improvements offsets noise DHAE in San Jose Diridon area.	4
San Jose Diridon	SJD-OMM#3: Reestablish Inez Jackson Library at the African American Community Service Association (AACSA) Community Center and Center Amenities	AACSA	AACSA identified a need to make the library materials on civil rights accessible to the community and to improve the community center space.	Measure provides quiet space as a refuge from project and existing noise in San Jose Diridon area, a publicly accessible access to civil rights historical documents, and improved community gathering space.	1, 2, 3, 4

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
Gardner/Willow Glen	GWG-OMM#1: Gardner Elementary Noise Treatments (if VTA I-280 Soundwalls Project is not advanced)[1]	San Jose Unified School District	Existing traffic noise	School noise improvements offsets noise DHAE in Gardner/Willow Glen area	4
Gardner/Willow Glen	GWG-OMM#2: Noise Treatments for Certain Residential Buildings along SR 87/I-280 to Address Existing Noise	Representative Lofgren/Authority staff based on community concern re: noise	Existing traffic noise	Community noise improvements offsets noise DHAE in Gardner/Willow Glen area.	4
Gardner/Willow Glen	GWG-OMM#3: Fuller Park/Fuller Avenue Recreational Improvements	City of San Jose	Community concerned about the effects of the project on Fuller Park and recommend improvements to help maintain this community resource.	Measure supported by community and City of San Jose. Provided for general community welfare (no park DHAE identified in community).	4
Washington/Guadalupe/ Tamien/Alma	WGTA-OMM#1: Community Art in Community/Local Murals on Publicly Accessible Project Structures (Such as Viaduct Footings)	Community site walk	Increase enjoyment of community Improve physical appearance Promote/maintain sense of community pride	Community aesthetic/character improvement partially offsets visual aesthetics DHAE in Washington, Guadalupe, Tamien, Alma.	1, 2, 3

[1] Santa Clara VTA's I-280 Soundwalls Project is currently proposing to construct soundwalls on I-280 between State Route 87 and Los Gatos Creek including adjacent to the I-280 southbound lanes adjacent to the Gardner Elementary School. This project is scheduled to go through environmental clearance from 2020 to 2022, design and engineering in 2022 and 2023, and construction between 2023 and 2024.If the I-280 Soundwalls Project is advanced, then GWG-OMM#1 would be redundant with the soundwall project, provided a soundwall is placed adjacent to the southbound I-280 lanes such that is reduced traffic noise for the Gardner Elementary School. In that instance, GWG-OMM#1 allows for the funds for noise treatments at the school to instead be provided to VTA to support the I-280 Soundwalls Project, provided the soundwalls installed would benefit the Gardner Elementary School.

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
Washington/Guadalupe/ Tamien/Alma	WGTA-OMM#2: Streetscape Improvements (Goodyear, Humboldt, Floyd)	Strong Neighborhood Initiative/Guadalupe Washington Neighborhood Association	Pedestrian and bicycle safety Pedestrian dead zones Need for streetscape improvements	Investment in community aesthetics partially offsets visual aesthetics DHAE in Washington, Guadalupe, Tamien, Alma.	1, 2, 3
Washington/Guadalupe/ Tamien/Alma	WGTA-OMM#3: Noise Treatments for Certain Residential Buildings along SR 87 to Address Existing Noise	Authority staff based on community concerns re: noise	Noise along I-280 and SR 87 Increased traffic through neighborhood from cars traveling to and from downtown San Jose and SR 87	Community noise improvements offsets noise DHAE in Washington, Guadalupe, Tamien, Alma.	4
Washington/Guadalupe/ Tamien/Alma	WGTA-OMM#4: Rocketship Matteo Sheedy Public Address System Upgrade	Rocketship	School experiences disruption to operations due to existing noise (freeway traffic, airplane flyover).	Community noise improvement offsets noise DHAE in Washington, Guadalupe, Tamien, Alma (Alternative 4).	4
Washington/Guadalupe/ Tamien/Alma	WGTA-OMM#5: Tamien Park Sports Field Netting	City of San Jose	Ballfields adjacent to railroad right of way could result in individuals entering right of way to chase lost balls.	Measure will enhance safety for community park adjacent to right-of-way.	4
South San Jose	SSJ-OMM#1: Landscaping Improvement Elements of Monterey Highway Grand Blvd.	CCS/San Jose General Plan (City of San Jose 2020a); Authority staff based on prior City planning	Visual quality	Landscaping improvements to partially offset visual aesthetic DHAE in South San Jose.	1, 2, 3
South San Jose	SSJ-OMM#2: Monterey Road Pedestrian/Bicycle Overpasses at Skyway, Branham, and Chynoweth	Authority based on community concerns re: crossing safety	Pedestrian safety Need for additional pedestrian bridges	Safety improvement offsets emergency vehicle response time DHAE in South San Jose.	4

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
South San Jose	SSJ-OMM#3: Noise Treatments for Certain Residential Buildings along US101 to Address Existing Noise	Authority staff based on community concerns re: noise	Community concern over noise effects	Community noise improvements offset noise DHAE in South San Jose	4
South San Jose	SSJ-OMM#4: Caroline Davis Intermediate School All Weather Turf and Track	Oak Grove Unified School District	School field not only used by students but also used extensively as a community by the surrounding neighborhoods, especially during recent COVID-19 emergency. Improvement would enhance year-round recreational opportunity for students and community	Community supported improvement provides amenity for students, parents, and general community to offset general effects of project alternatives.	1, 2, 3, 4
Morgan Hill	MH-OMM#1: Park/Trail Under Viaduct	Authority staff per community concern/interest/City of Morgan Hill comment on Draft EIR/EIS	Connectivity Visual quality Community cohesions	Park/trail under viaduct helps to improve local neighborhood aesthetics and sense of place in areas with the viaduct	1, 3
Morgan Hill	MH-OMM#2: Railroad Avenue Complete Streets	Authority staff per community concern/interest	Connectivity Visual quality	Complete Streets includes landscaping which will partially offset visual aesthetic DHAE in Morgan Hill	2
Morgan Hill	MH-OMM#3: Noise Treatments for Certain Residential Buildings along US101 to Address Existing Noise	Authority staff based on community concerns re: noise	Community concern over noise effects	Community noise improvements offset noise DHAE in Morgan Hill	4

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
Morgan Hill	MH-OMM#4: Fund Master Plan Design (30%) for Caltrain Station Access and Pedestrian Undercrossing	City of Morgan Hill	City of Morgan Hill has advocated for a robust undercrossing connected to landscaping and pedestrian/bicycle approaches to foster connectivity.	Community supported study to evaluate improvements above and beyond project proposed undercrossing. If ultimately implemented, could provide transportation connectivity and community cohesion benefits.	2, 4
Morgan Hill	MH-OMM#5: Fund School Bus Route Study	Morgan Hill Unified School District	School District expressed concern about potential delays to school buses due to increased gate down time with Alternative 4.	Community supported study to evaluate ways to improve school bus transit, which can help students and schools with operations.	4
Morgan Hill	MH-OMM#6: New Park South of Butterfield	City of Morgan Hill	City of Morgan Hill expressed that Alternative 2 would have substantial effects on the character and aesthetics of Morgan Hill and requested inclusion of this measure in comments on the Draft EIR/EIS.	Community park will partially offset visual aesthetics DHAE in Morgan Hill (Alternative 2).	2
Morgan Hill	MH-OMM#7: New Park North of El Toro Fire Station	City of Morgan Hill	City of Morgan Hill expressed that Alternative 2 would have substantial effects on the character and aesthetics of Morgan Hill and requested inclusion of this measure in comments on the Draft EIR/EIS.	Community park will partially offset visual aesthetics DHAE in Morgan Hill (Alternative 2).	2

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
Morgan Hill and Gilroy	MH/G-OMM#1: Affordable Housing Investment	Santa Clara County Planning Department, Center for Employment Training, HomeFirst	Need for affordable housing Housing scarcity Increased homelessness	Helps to offset affordable housing adverse effects due to Alternative 2 in Morgan Hill and Gilroy where there is inadequate residential relocation availability (Residential Displacements DHAE)	2
Gilroy	G-OMM#1: Sidewalk and Curb Improvement	City of Gilroy	Need for enhanced safety Need for improved connectivity	Safety improvement offsets emergency vehicle response time DHAE in Gilroy.	4
Gilroy	G-OMM#2: Bikeway Improvements (IOOF Ave., Monterey Road, 6th Street, 4th Street, Alexander Street)	CCS/Gilroy Station Area planning	Need for improved bicycle and pedestrian circulation and facilities	Safety improvement offsets emergency vehicle response time DHAE in Gilroy.	4
Gilroy	G-OMM#3: Neighborhood Street Lighting	City of Gilroy	Need to replace streetlights that do not meet City standards	Safety improvement offsets emergency vehicle response time DHAE in Gilroy.	4
Gilroy	G-OMM#4: Murray Avenue Sidewalk Gap Closure Project	City of Gilroy	Need to close sidewalk gaps to improve pedestrian access	Safety improvement offsets emergency vehicle response time DHAE in Gilroy.	4
Gilroy	G-OMM#5: IOOF Bicycle/Pedestrian Overcrossing and Complete Streets	Authority staff based on prior community interest in this overcrossing	Need to enhance student safety Improve connectivity	Safety improvement offsets emergency vehicle response time DHAE in Gilroy.	4
Gilroy	G-OMM#6: Noise Reduction Program	City of Gilroy	Need to provide upgrades to existing residential structures to improve noise attenuation	Community noise improvements offset noise DHAE in Gilroy.	1, 2, 4
Gilroy	G-OMM#7: South Valley Middle School Recreational Amenities	Gilroy Unified School District	Concern over loss of part of playing field/track	Recreational amenities partially offset for loss of part of school track/field.	2

Community	Proposed Measure	Original Source for Idea	Input Provided during Outreach	Reasonable Nexus to Residual DHAEs for Project Alternatives (including consideration of location)	Alternatives
Gilroy	G-OMM#8: Rebekah Children's Services (RCS) New Security Fence and Gate	Rebekah Children's Services	RCS identified that new fencing would help the facility's mission and would be connected to offsetting safety effects.	Increased security/safety will help to offset safety effects of Alternative 4.	4
Gilroy	G-OMM#9: San Ysidro Park Enhancements	City of Gilroy	City of Gilroy identified the need to enhance this park to serve the local low-income and minority neighborhoods.	Community park will partially offset visual aesthetics DHAE in Gilroy (Alternatives 1, 2).	1, 2
Gilroy	G-OMM#10: Forest Street Park Enhancements	City of Gilroy	City of Gilroy identified the need to enhance this park to serve the local low-income and minority neighborhoods.	Community park will partially offset visual aesthetics DHAE in Gilroy (Alternatives 1, 2).	1, 2
Volta	SJV-OMM#1: Volta Elementary School Improvements	Los Banos Unified School District	Need for school site improvements Need for additional community-serving amenities	School improvements offset noise DHAE and partially offset visual aesthetic DHAE in Volta area.	1, 2, 3 (noise, visual aesthetic DHAE), (noise only DHAE) 4
Volta	SJV-OMM#2: Volta Community Park at the Volta Elementary School	Los Banos Unified School District	Lack of neighborhood park Insufficient recreational opportunity on the elementary school site	Community park partially offsets visual aesthetic DHAE in San Joaquin Valley for Alternatives 1, 2, and 3 and helps to address adverse effect for Alternative 4.	1, 2, 3, 4

AACSA = African American Community Service Association; Authority = California High-Speed Rail Authority; Ave. = Avenue; Blvd. = Boulevard; CCS = Connecting Communities Strategy; DHAE = disproportionately high and adverse effect; EIR = environmental impact report; EIS = environmental impact statement; I- = Interstate; RCS = Rebekah Children's Services; re: = regarding; SCVTA = Santa Clara Valley Transportation Authority; SR = State Route.

5 OTHER COMMUNITY IMPROVEMENTS NOT PROPOSED AS OFFSETTING MITIGATION

The improvements that were evaluated but not proposed as offsetting mitigation are listed in Table 5-1. Table 5-1 also indicates the origins of the potential improvements and community input considered in the development of each potential improvement.

Table 5-1 Community Improvements Not Proposed as Offsetting Mitigation Measures

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Santa Clara/North San Jose **Per Section 5.4, residual DHAEs = noise (Alt. 1, 4) and aesthetics (Alt. 2, 3)**				
Newhall Street Bicycle/ Pedestrian Crossing	CCS/VTA Measure B; 2008 Santa Clara Countywide Bicycle Plan (County of Santa Clara 2008)	Safety for bicyclists and pedestrians Unintended project consequences resulting in connectivity issues within and between the City of Santa Clara and the surrounding area.	Safety, connectivity, community cohesion	No safety, connectivity or community cohesion DHAEs in this area. No nexus to residual noise DHAE in Santa Clara/North San Jose (Alt. 1, 4).
Sidewalk Gap Closure and Pothole Repair	City of Santa Clara	Need for continuous/enhanced sidewalks for pedestrian safety Need for improved roadway safety	Safety, connectivity, community cohesion	No safety, connectivity or community cohesion DHAEs in this area. No nexus to residual noise DHAE in Santa Clara/North San Jose (Alt. 1, 4).
Pedestrian Safety Improvements	City of Santa Clara	Safety concerns related to pedestrian crossings Unintended project consequences resulting in connectivity issues within and between the City of Santa Clara and the surrounding area.	Safety, livability, community cohesion	No safety, livability or community cohesion DHAEs in this area. No nexus to residual noise DHAE in Santa Clara/North San Jose (Alt. 1, 4).
San Jose Diridon				
Auzerais Railroad Crossing Warning Lights	African American Community Service Agency	Safety near railroad tracks Impacts on Black community	Safety	No safety DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, and 3) in San Jose Diridon area.
Auzerais Pedestrian/Bicycle Crossing	Authority staff developed based on community concern re: safety	Safety for bicyclist and pedestrians Need for pedestrian and bicycle network connectivity	Safety, community cohesion, connectivity	No safety, connectivity or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, and 3) in San Jose Diridon area.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Los Gatos Creek Trail Extension and Crossings	CCS/Santa Clara Community Working Group; Santa Clara County Parks Trails Master Plan (County of Santa Clara 1995)	Safety Impediments to San Jose trail system through overcrossings or other structures	Recreational opportunities, health, connectivity	No recreation, health or connectivity or DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, and 3) in San Jose Diridon area.
Los Gatos Creek Trail Lighting Improvements Under I-280	City of San Jose	Connectivity Safety Gaps in trails	Safety, connectivity, livability	No safety, connectivity or livability DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, and 3) in San Jose Diridon area.
Improved Pedestrian Route to Gardner Academy and Biebrach Park	Strong Neighborhood Initiative	Safety	Safety, connectivity, community cohesion	No safety, connectivity or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, and 3) in San Jose Diridon area.
Park/Trail under HSR Viaduct from Los Gatos Creek to Bird Avenue	Authority staff developed based on prior examples for viaducts elsewhere	Safety concerns Desire for connectivity	Recreational opportunities, health, community cohesion, connectivity	No recreational, health, connectivity or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, and 3) in San Jose Diridon area.
Cahill Park Improvements	City of San Jose Recreation and Parks	Piecemeal nature of park development Lack of cohesion of amenities Existing park fails to meet some community needs	Recreation, livability	No recreation or livability DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, and 3) in San Jose Diridon area.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Auzerais Grade Separation	City of San Jose	Grade separation would avoid project noise effects with Alt. 4 due to increased train horn noise at the at-grade crossing.	Noise, safety, traffic	No safety DHAEs in this area. Due to the extensive cost of grade separations, this improvement is not considered practicable (see further discussion of the practicability of grade separations in Volume 4, Responses to Comments on the Draft Environmental Impact Report/Environmental Impact Statement and Revised/Supplemental Draft Environmental Impact Report/Environmental Impact Statement, Chapter 17, Standard Responses).
Gardner/Willow Glen				
West Virginia Railroad Crossing Warning Lights	African American Community Service Agency	Safety near railroad tracks Impacts on Black community	Safety, community cohesion	No safety or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area.
West Virginia Ave Pedestrian/Bicycle Crossing	City of San Jose	Improve traffic, pedestrian, and bicycle safety throughout the neighborhood Establish key streets as pedestrian and bicycle corridors that link major destinations	Safety, livability, community cohesion, connectivity, health, recreation	No safety, livability, connectivity, community cohesion, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
Biebrach Park Connection to Fuller Park	City of San Jose	Quiet zones have led to pedestrian deaths Neglect Homelessness Need for streetscape improvements	Safety, community cohesion, connectivity, health, recreation	No safety, connectivity, community cohesion, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Guadalupe River Trail Pedestrian Crossing at Willow Street	City of San Jose Recreation and Parks; Guadalupe River Trail Reach 6 Master Plan (City of San Jose 2004)	Need for improved pedestrian and bicycle safety throughout the neighborhood Need for improved railroad crossings	Recreation, safety, connectivity, health	No safety, connectivity, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
Guadalupe River Trail Extension (Virginia to Curtner)	CCS/San Jose to Morgan Hill TWG; Santa Clara County Parks Trails Master Plan (County of Santa Clara 1995); Guadalupe River Trail Master Plan (City of San Jose Parks, Recreation, and Neighborhood Services 2017)	Connectivity Need for additional recreational opportunities	Health, livability, connectivity, community cohesion	No livability, connectivity, community cohesion, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
Jerome/Illinois to Bird Avenue Pedestrian Pathway	Authority staff based on community concerns about connectivity	Need for better walkability Isolation of Gardner neighborhood Safety	Safety, health, connectivity, community cohesion	No safety, connectivity, community cohesion, or health DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
West Virginia Streetscape and Pedestrian Crossings	Strong Neighborhood Initiative/Authority staff based on concept in Strong Neighborhood Initiative	Visual quality Safety	Safety, visual quality, livability, community cohesion	No safety, visual, livability, community cohesion, or health DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
Delmas Avenue Streetscape and Crossings	Strong Neighborhood Initiative/Authority staff based on concept in Strong Neighborhood Initiative	Visual quality Safety	Safety, visual quality, livability, community cohesion	No safety, visual, livability, connectivity, or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Bird Avenue North-South improvements	City of San Jose/Authority staff based on community concern about safety and connectivity	Need for streetscape improvements Safety Access Inclusion	Safety, connectivity, transportation	No safety, connectivity, or transportation DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
Three Creeks Trail Extension Crossing of SR 87/Caltrain/HSR	CCS/Santa Clara County Parks Trails Master Plan (County of Santa Clara 1995)/Authority	Safety Connectivity Need to close gaps in trail system	Recreation, safety, connectivity, health, livability	No safety, livability, connectivity, health or recreation DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
West Virginia Pocket Park South of West Virginia Railroad Crossing	Connecting Communities Strategy/Authority staff based on community interest in parks	Need for additional recreational opportunities	Health, recreation, livability	No livability, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
West Virginia Pocket Park at Prevost South of West Virginia Street	San Jose Community Working Group	Need for additional recreational opportunities	Health, recreation, livability	No livability, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Biebrach Park Improvements	Authority staff based on community interest in improved parks	Need for improved bicycle and pedestrian connections to Biebrach Park Need for improved pedestrian crossing at the intersection of Willis and Virginia Streets to facilitate connection with Gardner Academy. Desire for a gateway leading visitors to a receiving plaza and connecting to a cul-de-sac at the rear of the community center. Desire for an entrance plaza near the community center providing opportunities for outdoor community events and gatherings.	Recreation, health, livability	No livability, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
Community Art	Community Working Group (Danny Garza)	Interest in art as a form of neighborhood identification Promoting art and community involvement	Visual quality, community connection/identity	No visual, connectivity, community cohesion, or identity DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
Neighborhood Lighting	Community Working Group (Danny Garza)	Need for lighting improvements Safety	Visual quality, safety	No visual or safety DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area
National Night Out Contribution	Community Working Group (Danny Garza)	Need for expansion of community support activities and neighborhood policing	Safety, community cohesion	No safety or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) in Gardner/Willow Glen area

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
West Virginia Grade Separation	City of San Jose	Grade separation would avoid project noise effects with Alt. 4 due to increased train horn noise at the at-grade crossing.	Noise, safety, traffic	No safety or traffic DHAEs in this area. Due to the extensive cost of grade separations, this improvement is not considered practicable (see further discussion of the practicability of grade separations in Volume 4, Chapter 17, Standard Responses).
Washington/Guadalupe, Tamien, and Alma/Almaden				
Pedestrian and Bicycle Crossing Safety Improvements	Guadalupe Washington Safety Committee/Guadalupe Washington Neighborhood Association; Brent Bymaster (Tamien community leader)	Safety of children and other pedestrians walking to access schools, services, and commercial areas. Increased traffic through neighborhood from cars traveling to and from downtown San Jose and SR 87 may affect safety and accessibility for residents. Pedestrian dead zones	Safety, recreation, health, community cohesion	No safety, community cohesion, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Rocketship Mateo Sheedy Elementary School Circulation and Safety Improvements	Rocketship Mateo Sheedy Elementary School staff	Idling cars during drop-off/pickup Traffic Safety	Safety	No safety DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Washington Elementary School Pedestrian and Bicycle Safety Improvements	Washington Elementary School staff	Safety for children and other pedestrians Traffic Gang activity Impacts on bus routes	Safety, health, recreation, community cohesion, livability	No safety, livability, community cohesion, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Guadalupe River Trail Extension (Virginia to Curtner)	CCS/San Jose to Morgan Hill TWG, Santa Clara County Parks Trails Master Plan 2015 (County of Santa Clara Parks and Recreation Department 2015a, 2015b), Guadalupe River Trail Master Plan (City of San Jose Parks, Recreation, and Neighborhood Services 2017)/Authority staff based on prior planning interest	Connectivity Need for additional recreational opportunities	Health, livability, connectivity, community cohesion	No livability, connectivity, community cohesion, or health DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Guadalupe River Trail Pedestrian Crossing at Willow Street	City of San Jose Recreation and Parks/Guadalupe River Trail Reach 6 Master Plan (City of San Jose 2004)	Need for improved pedestrian and bicycle safety throughout the neighborhood Need for improved railroad crossings	Recreation, safety, connectivity, health	No safety, connectivity, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Three Creeks Trail Extension Crossing of SR 87/Caltrain/HSR	CCS/Santa Clara County Parks Trails Master Plan (County of Santa Clara 1995)	Safety Connectivity Need to close gaps in trail system	Recreation, safety, connectivity, health, livability	No safety, livability, connectivity, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Bellevue Park Improvements.	Strong Neighborhood Initiative	Abandoned railway property next to Bellevue Park with no trail San Jose Parks had budgeted in the past to purchase the vacant lot but negotiations with UPRR were not successful	Recreation, health, livability	No livability, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Oak/Almaden Pocket Park	Guadalupe Washington Neighborhood Association	Loss of park space Lack of Little League field	Recreation, livability	No livability or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Traffic Calming	Community site walk	Pedestrian safety Traffic	Safety, connectivity, livability	No safety, connectivity, or livability DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Washington School Recreation Improvements	Strong Neighborhood Initiative	Lack of recreational opportunities for youth Improvements needed to existing facilities	Recreation, health, livability	No livability, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Rocketship Mateo Sheedy Elementary School Play Fields/Landscaping [NOTE: Separate improvement for Public Address system upgrade is included in potential list]	Rocketship Mateo Sheedy Elementary School	Students currently play on a dirt field; playground upgrades; instead of grass which requires maintenance and associated costs, the school would like green AstroTurf. More trees are needed	Safety, recreation, livability	No livability, safety, or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Alma Community Center and Teen Center Improvements	Strong Neighborhood Initiative/City of San Jose Recreation and Parks	Alma Community Center serves mostly disadvantaged community residents in the area City of San Jose is currently in the process of purchasing an adjacent property, and the owner has indicated that the property can be transferred to City for use as public park	Recreation, education	No education or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
Healing Grove Health Center Sports/Outdoor Activity/Arts Programs	Brent Bymaster - Tamien Community leader	Gang activity in "The Triangle" Homelessness Impacts on schools, students, and neighborhoods	Recreation, health, livability	No livability, health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4) or visual DHAE (Alt. 1, 2, 3) in Washington, Guadalupe, Tamien, Alma, Almaden.
South San Jose				
Monterey Road Grand Boulevard (other than landscaping)	CCS/San Jose General Plan (City of San Jose 2020a); Authority staff based on prior City planning	Transportation improvements needed Connectivity Visual Quality	Transportation, recreation, connectivity, community cohesion	No recreation, connectivity, or community cohesion, transportation DHAEs in area. Potential improvements include landscaping element of Monterey Road Grand Boulevard, but remainder of Grand Blvd. would not have any nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), or visual aesthetics DHAE (Alt. 1, 2, 3) in South San Jose.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Capitol and Blossom Hill Caltrain Stations Access Improvements	City of San Jose/Authority based on community interest in better access to transit	Traffic Community cohesion Safety and security	Transportation, safety, connectivity	No transportation or connectivity DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), or visual aesthetics DHAE (Alt. 1, 2, 3) in South San Jose. Although improvement would provide safety improvements through extended pedestrian overcrossings at the two stations, the two stations are located outside of any area of emergency vehicle response time adverse effects (Alt. 4).
Coyote Creek Trail-Fisher Creek Trail Connection	City of San Jose Recreation and Parks	Need to preserve trail connection through widening Recreation Gaps in trail system	Recreation, health	No health or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), or visual aesthetics DHAE (Alt. 1, 2, 3) in South San Jose.
Cottonwood and Parkway Lakes Fish Screens and Supporting Improvements	Coyote Creek Parkway County Park Integrated Natural Resources Management Plan and Master Plan (County of Santa Clara Parks and Recreation Department 2007)/Santa Clara County Parks and Recreation	Need to prevent native fish from entering the nonnative stocked waterbodies, and nonnative fish from entering Coyote Creek Gaps in park system	Recreation, livability, education	No livability, education or recreational DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), or visual aesthetics DHAE (Alt. 1, 2, 3) in South San Jose.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Grade Separation of Skyway, Branham, and Chynoweth	City of San Jose	Grade separations would avoid project noise, traffic, and emergency vehicle response delay effects with Alt. 4 related to these at-grade crossings.	Noise, safety, traffic	No traffic DHAEs in this area. Due to the extensive cost of grade separations, this improvement is not considered practicable (see further discussion of the practicability of grade separations in Volume 4, Chapter 17, Standard Responses).
Morgan Hill				
Monterey Corridor Express Bus Route and Stops	VTA, City of Morgan Hill	Connectivity	Transportation	No transportation DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3), residential displacement DHAE (Alt. 2) in Morgan Hill.
Senior Shuttles	VTA, City of Morgan Hill	Connectivity	Transportation, livability	No transportation or livability DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Bus Transit Stop Amenities	VTA	Connectivity	Transportation, livability	No transportation or livability DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Downtown Pedestrian/Bicycle Railroad Overcrossings	Authority based on community concern re: safety, connectivity	Safety Connectivity	Safety, connectivity, community cohesion	No safety, connectivity, or community cohesion DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Monterey Road Pedestrian and Bicycle Intersection Improvements	CCS/City of Morgan Hill Bikeways, Trails, Parks and Recreation Master Plan (City of Morgan Hill 2020a)	Safety Connectivity for bicycles and pedestrians	Safety, recreational, connectivity	No safety, connectivity, or recreational DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Butterfield Road Pedestrian and Bicycle Intersection Improvements	CCS/City of Morgan Hill Bikeways, Trails, Parks and Recreation Master Plan (City of Morgan Hill 2020a)	Safety Connectivity for bicycles and pedestrians	Safety, connectivity, community cohesion	No safety, connectivity, or community cohesion DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Tennant Sidewalk Improvement	City of Morgan Hill	Safety Connectivity	Safety, connectivity, community cohesion	No safety, connectivity, or community cohesion DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Bike Lane Upgrades	CCS/City of Morgan Hill Bikeways, Trails, Parks and Recreation Master Plan (City of Morgan Hill 2020a)	Need for recreational opportunities Need for transportation options Safety	Recreation, transportation, safety, livability	No transportation, safety, livability, or recreation DHAEs in environmental justice communities in this area. No nexus to residual noise (Alt. 4), emergency vehicle response time (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3).

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Llagas Creek Trail (Santa Theresa Boulevard to East San Martin Avenue)	CCS/Santa Clara County Parks Trails Master Plan 2015 (County of Santa Clara Parks and Recreation Department 2015a, 2015b)	Need for recreational opportunities Need for transportation options Safety	Transportation, safety, recreation, health, connectivity	No transportation, safety, health, connectivity or recreation DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Coyote Creek Low-Flow Crossings Replaced with Bridges	Coyote Creek Parkway County Park Integrated Natural Resources Management Plan and Master Plan (County of Santa Clara Parks and Recreation Department 2007)/Santa Clara County Parks and Recreation	Creek crossing limited to period of low flow in some locations Safety	Safety, recreation	No safety or recreation DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Perry's Hill Staging Area, Coyote Creek Parkway County Park	Coyote Creek Parkway County Park Integrated Natural Resources Management Plan and Master Plan (County of Santa Clara Parks and Recreation Department 2007)/Santa Clara County Parks and Recreation	Need for expanded recreational opportunities Gaps in park system	Health, recreational, livability	No health, livability or recreation DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
New High School Site Acquisition	Morgan Hill Unified School District	Need for additional school space	Education	No education DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill.
Recycled Water Pipe Installation along Tennant Avenue	City of Morgan Hill	Improvement would support water conservation.	Water conservation.	No water supply DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill. Possible collaboration during construction but commitment to install not required.
Install Telecommunications Conduits to Help with Internet Access	City of Morgan Hill	Improvement would help to bridge the “digital divide”.	Connectivity, access to information, education	No access to information, education or connectivity DHAEs in environmental justice communities in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3) in Morgan Hill. Possible collaboration during construction but commitment to install not required.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Grade Separation of Tilton, East Dunne, and Tennant	City of Morgan Hill	Grade separations would avoid project noise, traffic, and emergency vehicle response effects with Alt. 4.	Noise, safety, traffic	No traffic or safety DHAEs in environmental justice communities in this area. Due to the extensive cost of grade separations, this improvement is not considered practicable (see further discussion of the practicability of grade separations in Volume 4, Chapter 17, Standard Responses). In addition, Alternative 4 would not have DHAEs related to traffic or emergency vehicle response delays in low-income areas in Morgan Hill (there are emergency vehicle response delays in non-low-income areas in the southern part of Morgan Hill along Middle Ave.).
Gilroy				
VTA Express Bus Service Gilroy to Diridon	VTA	Need for improved connectivity	Transportation, connectivity	No transportation or connectivity DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Student Transit Pass Program Initial Funding	City of Gilroy	Need for transportation support	Transportation, education	No transportation or education DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.
Bicycle/Pedestrian Overcrossings (Leavesley Road, 10th Street)	Authority staff based on prior community concern re: crossing safety and connectivity	Safety Connectivity	Safety, connectivity, community cohesion	No connectivity or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy. Leavesley is outside area of emergency vehicle response DHAE. Tenth Street is in area of emergency vehicle response DHAE, but area east of Monterey and the railroad tracks is commercial in character and not a heavily used pedestrian or bicycle area compared to IOOF at-grade crossing, which serves two schools, Rebekah Children's Service, and minority neighborhoods and low-income neighborhoods.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Gavilan College: Bicycle Connection and Wayfinding from Downtown	Gavilan College	Need for enhanced transportation options for students	Safety, connectivity, health, community cohesion	No connectivity, health, or community cohesion DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4) because this improvement is primarily outside the area of concern for emergency vehicle response time delays, visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.
Bikeshare Program	Authority staff based on use of such programs elsewhere for connectivity	Need to encourage nonvehicular travel modes	Access, connectivity, health	No access, connectivity or health DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.
Lions Creek Trail Extension	CCS/Envision Silicon Valley – Resolution 2016-06-17	Enhanced recreational opportunities	Recreation, health	No health or recreation DHAEs in the area of this improvement. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
West Branch Llagas Creek Trail	CCS/Santa Clara County Parks Trails Master Plan 2015 (County of Santa Clara Parks and Recreation Department 2015a, 2015b)	Fill gaps in trail system Provide enhanced recreational amenities Improve options for active transportation	Recreation, health	No health or recreation DHAEs in the area of this improvement. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.
Marcella Avenue Trail	CCS/Santa Clara County Parks Trails Master Plan 2015 (County of Santa Clara Parks and Recreation Department 2015a, 2015b)	Fill gaps in trail system Provide enhanced recreational amenities Improve options for active transportation	Recreation, health	No health or recreation DHAEs in the area of this improvement. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.
Juan Bautista de Anza Trail	CCS/Santa Clara County Parks Trails Master Plan 2015 (County of Santa Clara Parks and Recreation Department 2015a, 2015b)	Fill gaps in trail system Provide enhanced recreational amenities Improve options for active transportation	Recreation, health	No health or recreation DHAEs in the area of this improvement. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Rebekah Children's Services Improvements (Other Than Perimeter Fencing)	Rebekah Children's Services	Various needs identified and incorporated into improvement	Health, recreation, visual quality, livability	No health, recreation, or livability DHAEs in this area. Visual aesthetic effects of Alt. 1 and 2 better addressed through improvement of two downtown public parks. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy.
Lead Service Line Replacement Project	City of Gilroy	Need to replace water lines in the City to enhance health and safety of the community by ensuring the water distribution system provides a reliable and adequate supply of safe drinking water	Health, safety	No health DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), South Valley Middle School recreational field DHAE (Alt. 2), or residential displacement DHAE (Alt. 2) in Gilroy. While alternative 4 would have DHE related to emergency vehicle response delays (safety), unlike the offsetting mitigation measures proposed in Gilroy to enhance safety, this improvement would not reduce transportation accidents like the other improvements which have much closer nexus to the project effects.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Gavilan College Low-Income Student Housing	Gavilan College	Need for affordable housing for students	Livability, economic, education	No livability, economic or education DHAEs in this area. No nexus to residual noise DHAE (Alt. 4), emergency vehicle response time DHAE (Alt. 4), visual aesthetic DHAE (Alt. 1, 2, 3), or South Valley Middle School recreational field DHAE (Alt. 2). Although there is a nexus to the residential displacement DHAE (Alt. 2) in Gilroy, the separate improvement to provide affordable housing funding support in general, as opposed to only focusing on student housing, is considered more appropriate given that Alt. 2 would have more community residential displacement.
San Joaquin Valley				
Los Banos to Gilroy and Merced HSR Station Shuttles	Authority based on prior public concerns about connectivity to HSR stations	Improved regional transit connectivity Additional commuting options for students Traffic impacts on local roads	Transportation, connectivity	No transportation or connectivity DHAEs in this area. No nexus to residual noise (all alts.), visual aesthetics DHAE (Alt. 1, 2, 3) in San Joaquin Valley.
Pedestrian/Bicycle Improvements at Volta	Authority based on observation of lack of pedestrian/bike improvements	Lack of pedestrian safety	Health, connectivity, safety, community cohesion	No health, connectivity, safety, or community cohesion DHAEs in this area. No nexus to residual noise (all alts.), visual aesthetics DHAE (Alt. 1, 2, 3) in San Joaquin Valley.

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Cross-Community				
Job Training (All Santa Clara County)	Center for Employment Training, Mission College, African American Community Service Agency, Vietnamese Voluntary Foundation, Gavilan College	Shifting job and career opportunities and need for access to new training or retraining. Jobs for minority communities Impact on availability and cost of housing for community members, particularly for low-income individuals, workers in entry-level and service-oriented jobs, and young families who might get squeezed out with an influx of higher-income workers relocating to housing in this area due to high-speed transit availability.	Economic, educational, livability	No education, economic, or livability DHAEs in this project section. The project would result in increases in employment during construction and operations, which would more than offset the loss of jobs due to business displacements, and thus there is no DHAE related to employment. However, the Authority may coordinate with the Center for Employment Training and other job training organizations moving forward to construction and operations to coordinate on potential employment opportunities with the project. No nexus to residual noise (Alt. 4), emergency vehicle response time (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3), South Valley Middle School field DHAE (Alt. 2), or residential displacement DHAE in Morgan Hill and Gilroy (Alt. 2).

Potential Improvement	Original Source for Idea	Input Provided during Outreach	Intended Benefit to Minority Communities and Low-Income Communities	Reason for Not Being Considered
Homeless Services (Cities of Santa Clara and San Jose)	Santa Clara County Office of Supportive Housing, HomeFirst, PATH, Senator Jim Beall, African American Community Service Agency, Family and Children's Services of Silicon Valley, City of San Jose Department of Transportation, San Jose Councilmember Perales, Sacred Heart Nativity School	Displacement of homeless individuals and families Homeless youth Safety for people living along the tracks Homeless encampments along highways Need for services (especially mobile) for homeless population Increase in homeless populations Safe spaces for homeless	Economic, health, livability	No nexus to residual noise (Alt. 4), emergency vehicle response time (Alt. 4), visual aesthetics DHAE (Alt. 1, 2, 3), South Valley Middle School field DHAE (Alt. 2), or residential displacement DHAE in Morgan Hill and Gilroy (Alt. 2). The Authority will coordinate with the host railroad, landowners, and community service providers if displacement of homeless encampments or individuals is required during construction or operations.
Negotiate with Caltrain to Not Sound Horns at the Diridon, Tamien, Capitol, and Hill Caltrain Stations	City of San Jose	Avoiding sounding of horns would reduce project noise effects.	Reduction of noise effects.	Sounding of horns at Caltrain Stations is not under control of the Authority, but under the control of Caltrain as the host railroad who determines safety requirements for its stations in its corridor and under the control of UPRR as the host railroad who determined safety requirement for the stations in its corridor.

Alt. = alternative; Authority = California High-Speed Rail Authority; Ave = Avenue; Blvd. = Boulevard; CCS = Connecting Communities Strategy; DHAE = disproportionately high and adverse effect; HSR = high-speed rail; I- = Interstate; re: = regarding; SR = State Route; TWG = technical working group; UPRR = Union Pacific Railroad; VTA = Valley Transportation Authority.

6 REFERENCES

Baum, J. 2017. "San Jose's Gardner Neighborhood Close to Making History." *San Jose Mercury News*. December 12. https://www.mercurynews.com/2017/12/12/gardner-neighborhood-close-to-making-history/ (accessed August 13, 2020).

City of Gilroy. 2002. *Gilroy General Plan 2002-2020*. Chapter 2, Community Setting. https://www.cityofgilroy.org/274/2020-General-Plan (accessed August 14, 2020).

City of Gilroy Bicycle Pedestrian Commission. 2017. *Strategic Plan 2017*. http://www.cityofgilroy.org/DocumentCenter/View/6799/Strategic-Plan-for-City-of-Gilroy-Bicycle-Pedestrian-Commission (accessed September 9, 2020).

City of Los Banos. 2017. *Parks and Recreation Division*. http://www.losbanos.org/city-government/departments/recreation/ (accessed August 17, 2020).

City of Los Banos. 2018. *Bicycle-Pedestrian Plan.* Approved and adopted March 21, 2018. http://www.losbanos.org/wp-content/uploads/2018/04/City-of-Los-Banos-Bicycle-Pedestrian-Plan-FINAL.pdf (accessed August 17, 2020).

City of Morgan Hill. 2016. *2035 General Plan.* Adopted July 27, 2016. https://www.morgan-hill.ca.gov/75/General-Plan (accessed August 14, 2020).

City of Morgan Hill. 2017. *Affordable Housing and Hotel/Motel Landscape*. September 15, 2017.

City of Morgan Hill. 2020a. *Bikeways, Trails, Parks and Recreation Master Plan*. Adopted July 20, 2017. https://www.morgan-hill.ca.gov/1429/Master-Plan-for-Parks-Trails-and-Bikeway (accessed August 14, 2020).

City of Morgan Hill. 2020b. *Engage Morgan Hil*l. https://www.morgan-hill.ca.gov/1805/Engage-Morgan-Hill (accessed August 14, 2020).

City of San Jose. 2002a. *Greater Gardner Neighborhood Improvement Plan*. Strong Neighborhoods Initiative. Approved January 22.

City of San Jose. 2002b. *Washington Neighborhood Improvement Plan*. Strong Neighborhoods Initiative. Approved January 22. https://www.sccgov.org/sites/phd/hi/hd/Documents/City%20Profiles/San%20Jose%20Neighborhoods/GuadalupWash_neighprofilesPDF15038.pdf (accessed August 14, 2020).

City of San Jose. 2004. *Guadalupe River Trail Reach 6 Master Plan*. https://www.sanjoseca.gov/home/showdocument?id=20603 (accessed September 9, 2020).

City of San Jose. 2009a. *North San Jose Area Development Policy Neighborhoods Plan*. November. https://www.sanjoseca.gov/home/showdocument?id=15847 (accessed August 10, 2020).

City of San Jose. 2009b. *San Jose Bike Plan 2020*. November. http://www3.sanjoseca.gov/clerk/Agenda/20091117/20091117_0602att.pdf (accessed August 17, 2021).

City of San Jose. 2014. *Diridon Station Area Plan*. https://www.sanjoseca.gov/Home/ShowDocument?id=15739 (accessed September 9, 2020).

City of San Jose. 2017. *North San Jose Area Development Policy*. As amended December 2017. https://www.sanjoseca.gov/home/showdocument?id=15839 (accessed August 10, 2020).

City of San Jose. 2020a. *Envision San José 2040 General Plan*. https://www.sanjoseca.gov/home/showdocument?id=22359 (accessed September 9, 2020).

City of San Jose. 2020b. *Draft Better Bike Plan 2025*. https://www.bikesanjose.com/draftplan (accessed September 9, 2020).

City of San Jose. No date. *Diridon Station Area Plan*. Chapter 1, Introduction, Figure 1-1, Diridon Station Area in Context. https://www.sanjoseca.gov/Home/ShowDocument?id=15693 (accessed August 11, 2020).

City of San Jose Parks, Recreation, and Neighborhood Services. 2017. *Guadalupe River Trail Master Plan: Downtown to South San José; Virginia Street to Chynoweth Avenue*. https://www.sanjoseca.gov/home/showdocument?id=20601 (accessed September 9, 2020).

City of Santa Clara. 2010. *Celebrating our Past, Present, and Future. 2010-2035 General Plan*. Adopted November 16, 2010. Chapter 6, Local and Regional Planning Context. Updated Housing and Land Use Elements approved December 9, 2014. https://www.santaclaraca.gov/our-city/departments-a-f/community-development/planning-division/general-plan (accessed August 11, 2020).

City of Santa Clara. No date. *Housing & Community Services*. https://www.santaclaraca.gov/our-city/departments-a-f/community-development/housing-community-services-division (accessed August 11, 2020).

County of Merced. 2000. *Santa Nella Community Specific Plan*. Prepared by The Planning Center, Costa Mesa, CA. https://www.co.merced.ca.us/1532/Santa-Nella (accessed August 17, 2020).

County of Merced. 2013. *2030 Merced County General Plan*. December 10, 2013. https://www.co.merced.ca.us/2018/Adopted-General-Plan (accessed August 17, 2021).

County of Santa Clara. 1994. *Santa Clara County General Plan*. https://www.santaclaraca.gov/home/showdocument?id=56139 (accessed September 9, 2020).

County of Santa Clara. 1995. *Santa Clara County Parks Trails Master Plan*. https://www.sccgov.org/sites/parks/PlansProjects/Documents/TrailsMasterPlan/Entire_Countywide_Trails_Master_Plan_Searchable.pdf (accessed September 9, 2020).

County of Santa Clara. 2008. *2008 Santa Clara Countywide Bicycle Plan*.

County of Santa Clara Parks and Recreation Department. 2007. *Coyote Creek Parkway County Park Integrated Natural Resources Management Plan and Master Plan*. https://www.sccgov.org/sites/parks/PlansProjects/Documents/Coyote-Creek-Parkway/Draft-Integrated-Plan-Report.pdf (accessed September 9, 2020).

County of Santa Clara Parks and Recreation Department. 2015a. *Countywide Trails Prioritization and Gaps Analysis*. https://www.sanjoseca.gov/home/showdocument?id=9779/ (accessed September 9, 2020).

County of Santa Clara Parks and Recreation Department. 2015b. *Santa Clara County Existing and Proposed Regional Trail Connections Map*. https://www.sccgov.org/sites/parks/PlansProjects/Documents/AlignmentStatus_August18_2015.pdf (accessed September 9, 2020).

FM3 Research. 2018. *Los Banos Community Survey*. http://www.losbanos.org/wp-content/uploads/2018/06/220-4903.Public.-Los-Banos-Community-Survey-6-13-18.pdf (accessed August 17, 2020).

Los Banos Chamber of Commerce. No date. *Los Banos Chamber of Commerce*. https://www.losbanos.com/ (accessed August 17, 2020).

Merced County Hispanic Chamber of Commerce. 2020. *About Us*. https://mercedhcc.com/ (accessed August 18, 2020).

Morgan Hill Unified School District (MHUSD). 2017. Facilities Master Plan. September. https://resources.finalsite.net/images/v1568840142/mhusdorg/yohnqm0ed8nmmgmnoa5g/MHUSD_FMP_Sept-2017-Reduced-Size.pdf (accessed August 23, 2021)

San Jose Diridon Station Area Community Engagement. No date. *Station Area Advisory Group*. https://www.diridonsj.org/saag (accessed August 11, 2020).

Santa Clara County. 2017. *Communities of Concern*. Map. Eight Variables Considered for MTC Communities of Concern. http://opendata.mtc.ca.gov/datasets/priority-development-areas-current.

Santa Clara County. 2018. *Building Homes, Changing Lives. 2016 Affordable Housing Bond Update*. https://www.sccgov.org/sites/opa/newsroom/Documents/Measure%20A%20Affordable%20Housing%20Bond%20Infosheet%202018%20FINAL.pdf (accessed August 28, 2020).

Santa Clara County Public Health. 2016a. *North Willow Glen/Gardner Profile 2016*. https://www.sccgov.org/sites/phd/hi/hd/Documents/City%20Profiles/San%20Jose%20Neighborhoods/NorthWillowGlen_neighprofilesPDF5110013.pdf (accessed August 13, 2020).

Santa Clara County Public Health. 2016b. *Guadalupe/Washington Profile 2016*. https://www.sccgov.org/sites/phd/hi/hd/Documents/City%20Profiles/San%20Jose%20Neighborhoods/GuadalupWash_neighprofilesPDF15038.pdf (accessed August 13, 2020).

Santa Clara County Public Health. 2016c. *Morgan Hill Profile 2016*. https://www.sccgov.org/sites/phd/hi/hd/Documents/City%20Profiles/MorganHill_final.pdf (accessed August 14, 2020).

Santa Clara County Public Health. 2016d. *Gilroy Profile 2016.* https://www.sccgov.org/sites/phd/hi/hd/Pages/gilroy.aspx (accessed August 14, 2020).

Santa Clara County Public Health. 2016e. *Gilroy East Side Profile 2016*. https://www.sccgov.org/sites/phd/hi/hd/Pages/gilroy.aspx (accessed August 14, 2020).

Wipf, C. 2020. “Access to San Jose’s Parks a Thing of Privilege, Study Finds.” *San Jose Spotlight*. August 20. https://sanjosespotlight.com/access-to-san-joses-parks-a-thing-of-privilege-study-finds/ (accessed August 21, 2020).

APPENDIX 5-C, ATTACHMENT A: PROFILES OF PROPOSED OFFSETTING MITIGATION MEASURES

1. OFFSETTING MITIGATION MEASURE SC/NSJ-OMM#1: NOISE TREATMENTS FOR RESIDENTIAL BUILDINGS ALONG CALTRAIN CORRIDOR TO ADDRESS EXISTING NOISE

COMMUNITY: SANTA CLARA/NORTH SAN JOSE

ALTERNATIVE: 4

Measure Description

The proposed offsetting mitigation measure will provide funding for installation of building insulation and window treatments for up to three (3) building façades affected by existing freeway noise between Santa Clara Station and Interstate (I-) 880.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionately high and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the Santa Clara/North San Jose community after the application of project noise barrier mitigation and consideration of project benefits. Alternative 4 would have severe noise impacts at one location (a suite hotel) in Santa Clara south of the Santa Clara Caltrain Station. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction and will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and/or Low-income Populations

The proposed offsetting mitigation measure will benefit low-income populations in the Santa Clara/North San Jose community by providing sound-reducing improvements at apartment buildings affected by highway noise between Santa Clara Station and I-880/State Route (SR) 82. This will provide improved livability and health for residents.

Consistency with Community Goals and Planning

The proposed offsetting mitigation measure will help achieve compliance with the indoor noise standards enforced through City of Santa Clara and City of San Jose General Plan policies.

Community Outreach Input and Relationship to DHAEs

Community concerns, as expressed by stakeholders from Next Door Solutions and from various local elementary schools, that are addressed include the following:

- Existing train noise
- Noise disrupting an already challenging living environment

This improvement will provide noise abatement benefitting residents exposed to existing noise along the Caltrain Corridor between Santa Clara Station and I-880/SR 82 by providing improved livability and health (Figure SC/NSJ-1). Because the high-speed rail (HSR) alignment is along the Caltrain corridor in this community, these same residents would experience residual DHAE noise effects under Alternative 4 after the application of project mitigation and consideration of project benefits.

Improvement Cost Estimate

Building insulation and window treatments for the first row of residential buildings, approximately three building façades between Santa Clara Station and I-880/SR 82, is estimated at $75,000. Providing building and/or window insulation is estimated at $25,000 per building.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to property owners to fund and implement this improvement and will fund the entire measure. A program implementer will need to be identified/developed to work with homeowners and building owners. The Authority will coordinate with City of Santa Clara regarding making homeowners aware of the program. The City would process any required encroachment and building permits needed for building upgrades.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	These communities are already affected by transportation noise, and this measure will provide direct benefit to these low-income populations in the community.
Relative Number of Beneficiaries	9	This measure will directly benefit low-income populations along the Caltrain corridor but not the community at large.
Practicable	15	Funding for this improvement is mostly practicable, need mechanism for implementing. Relatively low-cost request.
Defined Project or Action	15	The Authority will provide funding; need to identify implementer.
Satisfy Authority Obligations	15	Addresses noise from transportation infrastructure.
Defined Roles and Responsibilities	5	Authority will fund treatments Program implementer needs to be identified.
Evidence of Agreement	0	City of Santa Clara did not indicate support or opposition to this measure since it will be implemented by the Authority directly.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	86	

Authority = California High-Speed Rail Authority.

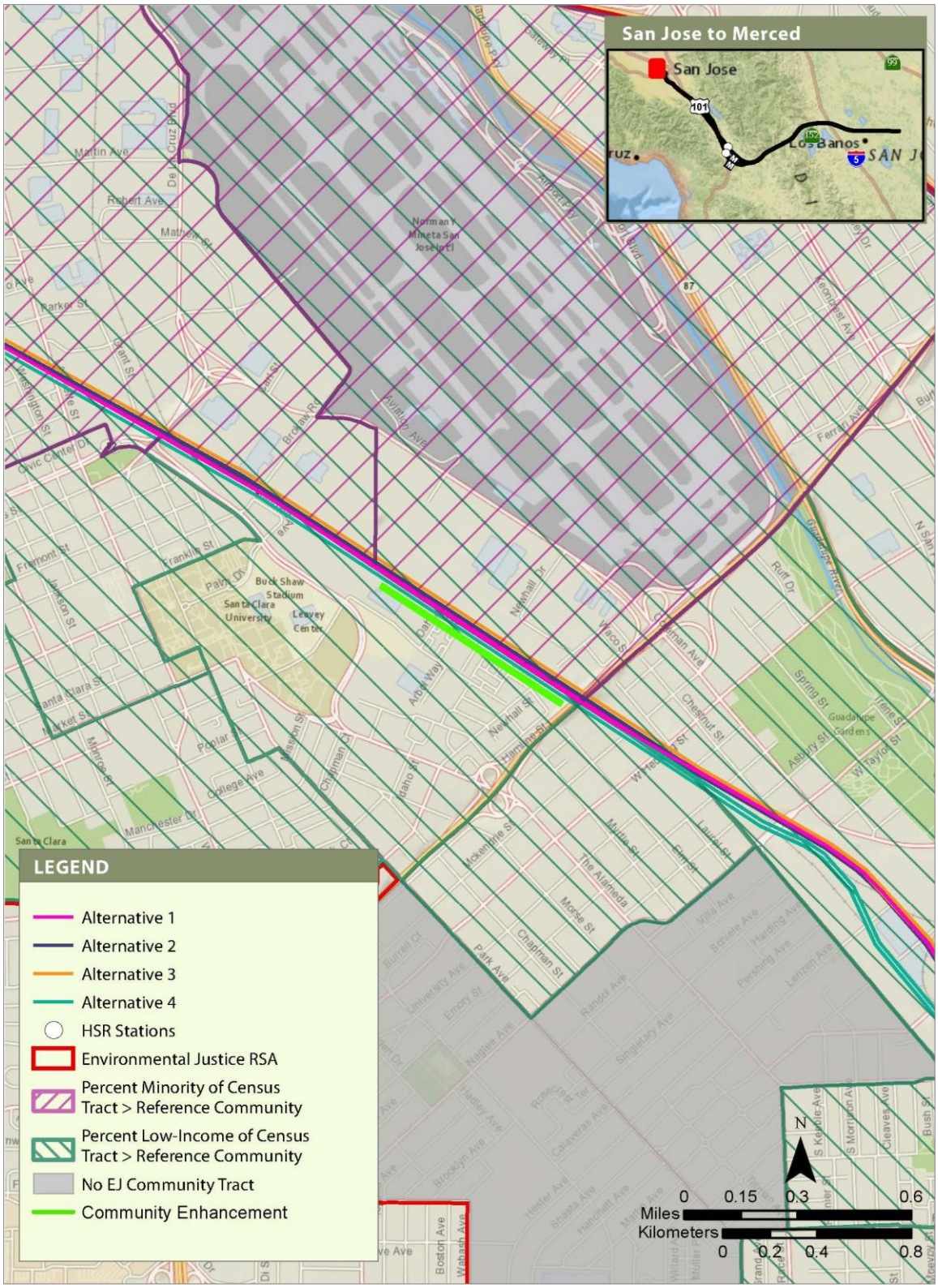


Figure SC/NSJ-1 Noise Treatments for Residential Buildings Along Caltrain Corridor to Address Existing Noise Santa Clara/North San Jose

2. OFFSETTING MITIGATION MEASURE SC/NSJ-OMM#2: EL CAMINO REAL AND BENTON STREET SAFETY IMPROVEMENTS

COMMUNITY: SANTA CLARA/NORTH SAN JOSE

ALTERNATIVES: 1, 2, 3, 4

Measure Description

The proposed improvement will provide safety improvements at the intersection of El Camino Real and Benton Street. The City of Santa Clara has identified a suite of improvements, including decorative crosswalk, curb extensions, pedestrian crosswalk motion sensor, and signal improvements (leading pedestrian interval, countdown timers, accessible pedestrian signal). The California High-Speed Rail Authority (Authority) will either contribute a portion of funding for the full suite of improvements or will fund certain discrete improvements up to the identified funding commitment level.

Nexus to Disproportionately High and Adverse Effects

The project would not result in disproportionately high and adverse effects (DHAE) on minority populations or low-income populations in Santa Clara/North San Jose related to operational railroad safety, transit access, community connectivity, or community cohesion.

Thus, this improvement is not being proposed due to a direct connection to a DHAE in Santa Clara. Instead, based on the City's identification that the Authority funding of improvements, such as this one, will help to offset the project's general effects on the community, the Authority has identified this as a general improvement.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment under all project alternatives would traverse the Santa Clara/North San Jose community, where the percentage of minority residents and low-income residents is greater than that within the reference community.

The proposed improvement will benefit minority residents and low-income residents in the Santa Clara/North San Jose community by providing increased multimodal safety and connectivity within the community and to the Santa Clara Caltrain Station. Improved safety will also improve overall livability within the community. The location of the improvement relative to the location of the HSR alignment within the Santa Clara/North San Jose community is shown in Figure SC/NSJ-2.

Consistency with Community Goals and Planning

The proposed improvement will promote the following goals of the *City of Santa Clara Bicycle Master Plan Update 2018* (Bicycle Master Plan) and the 2019 *City of Santa Clara Pedestrian Master Plan* (Pedestrian Master Plan):

- Safe: Design pedestrian environments that are accessible and reduce the risk of pedestrian-involved collisions.
- Comfortable: Identify pedestrian improvements that create an easy-to-navigate and comfortable pedestrian environment.

- Convenient: Coordinate future land use efforts that will provide more mobility options for people in Santa Clara to include walking for their utilitarian trips.
- Active: Develop lively and unique pedestrian spaces that sustain healthy communities and generate economic activity.
- Implementable: Identify, develop, and maintain a complete and convenient pedestrian network.

Community Outreach Input and Relationship to DHAEs

Concerns expressed during community outreach that are addressed include the following:

- Safety for bicyclists and pedestrians
- Connectivity between areas isolated by transportation facilities

This improvement is highlighted in both the Bicycle Master Plan and Pedestrian Master Plan as an intersection location that should be improved to enhance the user experience as a bicyclist and/or pedestrian. In the Bicycle Master Plan, this intersection is listed as a priority "Spot Improvement" location that would benefit from enhanced bicycle signal detection and tighter turning radii. The Pedestrian Master Plan lists this intersection as a high-priority location within the Downtown/University Area of Santa Clara that should be reviewed to provide pedestrian improvements, such as traffic signal improvements and curb extensions. Overall, these improvements will provide for enhanced safety and connectivity for residents east of El Camino Real at Benton Street to safely access Caltrain, future Bay Area Rapid Transit to Santa Clara, services, commerce, schools, and other facilities west of El Camino Real. Because the HSR alignment is along the Caltrain Corridor in this community, these same residents would experience various project effects under all project alternatives. Therefore, this improvement will apply under all project alternatives.

However, as noted above, the project does not result in safety, connectivity, or transit access effects due to operations, so this improvement is a general improvement and not related narrowly to a specific DHAE.

Improvement Cost Estimate

The cost of pedestrian safety improvements (rectangular flashing beacons, high-visibility crosswalk markings, and overhead crosswalk lighting) is estimated to be $2,000,000 in 2020 dollars, based on comparable projects. The Authority will fund $500,000 out of the total cost. If the City advances the entire project, the Authority's funding could be used to defray part of the total cost. If the City does not have funding for the entire project, then a smaller project could be pursued with the $500,000 provided by the Authority. In concept, that smaller project could include a decorative crosswalk and either one or more curb improvements or some of the signal improvements.

Roles and Responsibilities

The Authority will provide funding to the City of Santa Clara to implement these improvements.

Assessment Based on Selection Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	Safety improvement for surrounding minority population and low-income population.
Relative Number of Beneficiaries	12	Major roadway likely used by more than just the immediately surrounding minority population and low-income population.
Practicable	15	Technically feasible; relatively low-cost request.
Defined Project or Action	15	Project is defined.
Satisfy Authority Obligations	15	Provides safety and connectivity improvement.
Defined Roles and Responsibilities	15	Authority to provide funding to the City of Santa Clara.
Evidence of Agreement	15	City of Santa Clara in support.
Cost-Effectiveness	12	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	109	

Authority = California High-Speed Rail Authority.

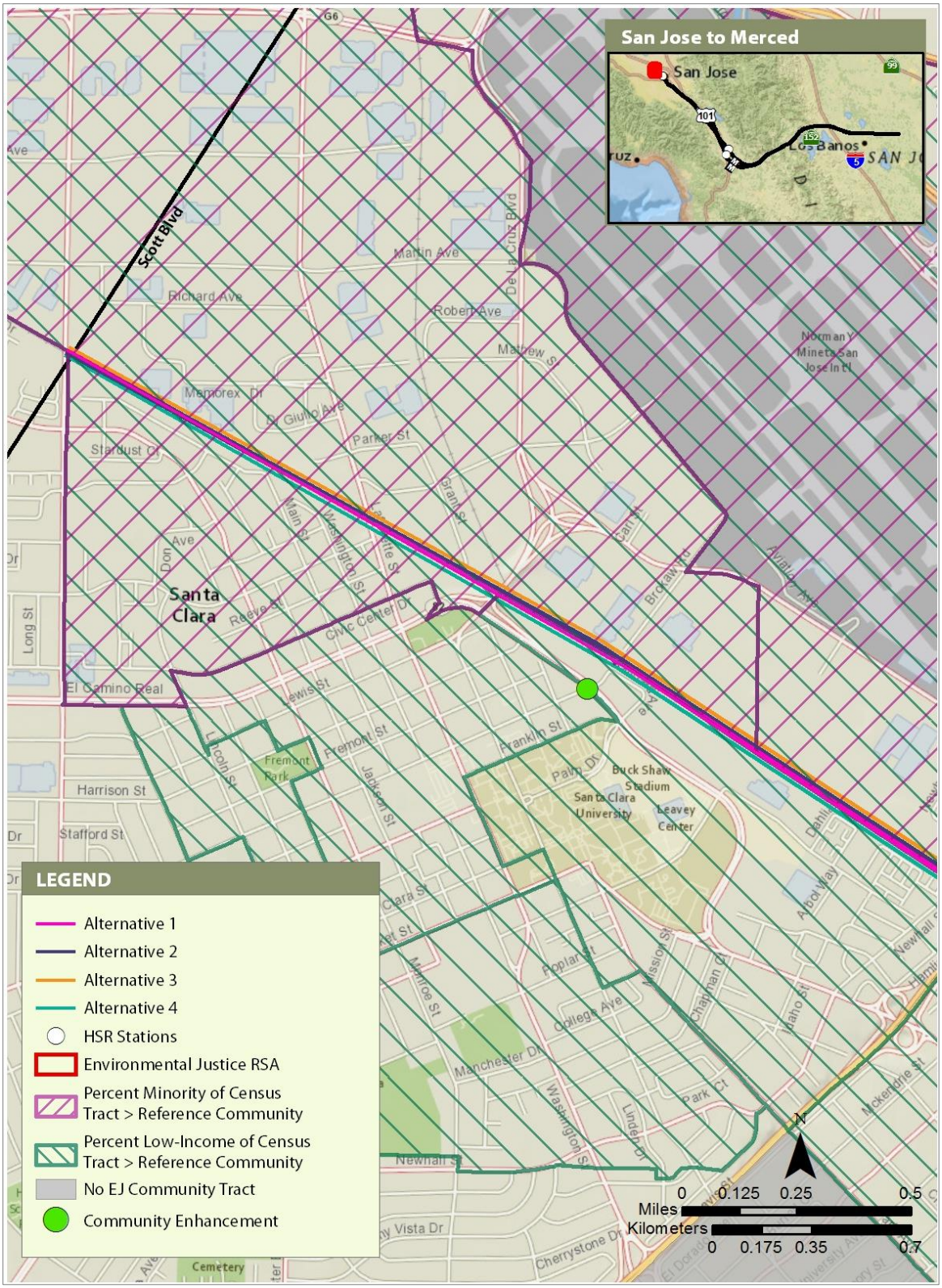


Figure SC/NSJ-2 El Camino Real and Benton Street Safety Improvements Santa Clara/North San Jose

3. OFFSETTING MITIGATION MEASURE SC/NSJ-OMM#3: STREETSCAPE IMPROVEMENTS

COMMUNITY: SANTA CLARA/NORTH SAN JOSE

ALTERNATIVES: 2, 3

Measure Description

The proposed improvement will provide streetscape improvements to promote safe, convenient, and attractive pedestrian routes. Facilities could include sidewalk improvements, bus stop amenities (e.g., shade structures, benches), landscaping (e.g., trees, planters), street crossing improvements, or American with Disabilities Act (ADA)–compliant curb ramps that increase the desirability of walking. Improvements generally will occur within one block of the high-speed rail (HSR) alignment within or adjacent to residential areas and are based on the City of Santa Clara Pedestrian Master Plan (Pedestrian Master Plan) (2019).

Nexus to Disproportionately High and Adverse Effects

Under Alternatives 2 and 3, the project would result in disproportionately high and adverse effects (DHAEs) on low-income populations related to visual quality associated with elevated viaducts and embankment. There would be residual visual impacts within the Santa Clara/North San Jose community after the application of project mitigation and consideration of project benefits due to the aerial viaduct. DHAEs would be related to permanent visual effects associated with the visibility of the proposed aerial viaduct through this community. While the proposed improvement will not directly address operational visual effects resulting from the project, it will provide improvements that will help to offset visual DHAEs in this community by providing funding for streetscape improvements.

Benefit to Minority Populations and Low-Income Populations

The HSR alignment under all project alternatives would traverse the Santa Clara community, where the percentage of minority residents and low-income residents is greater than that within the reference community.

The proposed streetscape improvements will benefit minority residents and low-income residents in the Santa Clara/North San Jose community by promoting a safer and more aesthetically pleasing pedestrian environment, thus improving overall livability and community cohesion. The location of the improvement relative to the location of the HSR alignment within the Santa Clara/North San Jose community is shown in Figure SC/NSJ-3.

Consistency with Community Goals and Planning

The proposed improvement will promote the follow goals of the Pedestrian Master Plan (2019):

- Safe: Design pedestrian environments that are accessible and reduce the risk of pedestrian-involved collisions.

- Comfortable: Identify pedestrian improvements that create an easy-to-navigate and comfortable pedestrian environment.
- Convenient: Coordinate future land use efforts that will provide more mobility options for people in Santa Clara/North San Jose to include walking for their utilitarian trips.
- Active: Develop lively and unique pedestrian spaces that sustain healthy communities and generate economic activity.
- Implementable: Identify, develop, and maintain a complete and convenient pedestrian network.

The Pedestrian Master Plan particularly notes the need for ADA-compliant curb ramps, as these features are missing in 31 percent of rights-of-way where they could be installed.

Community Outreach Input and Relationship to DHAEs

Community concerns, as identified in the Pedestrian Master Plan, that are addressed include the following:

- Safety concerns related to pedestrian injuries and deaths
- Need for improved aesthetics and visual quality
- Need for access/inclusion for disabled individuals

This improvement will provide for enhanced safety, accessibility, community cohesion, and overall livability for residents within one block of the HSR alignment within or adjacent to residential areas. Because the HSR alignment with Alternatives 2 and 3 would be on an elevated viaduct along the Caltrain Corridor in this community, these same residents would experience various DHAEs related to visual aesthetics. Therefore, this improvement will apply only to Alternatives 2 and 3.

Cost Estimate

Streetscape improvements to include shade trees, landscaping, pedestrian lighting, and other minor amenities for the length (1 mile) of City of Santa Clara adjacent residential street face abutting the railroad right-of-way along portions of Main Street and Washington Street is estimated at $500,000.[1] These funds could be used first on these identified streets then to further out streets as funds remain.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will fund projects identified in the Pedestrian Master Plan. The Authority will work with the City to identify priority projects within proximity of the project alignment that would promote maximum safety and connectivity for pedestrians. The City's Pedestrian Master Plan prioritized projects based on six criteria (safety, pedestrian comfort, destination accessibility, public-identified need, consistency with other plans, and cost). This resulted in the identification of 79 high-priority projects broken down into three categories: Spot Improvements, Curb Ramps, and Sidewalks. A complete list of projects and location details are included in Chapter 6 and Appendix A of the Pedestrian Master Plan.

Assessment Based on Selection Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

[1] Per length cost at $500,000 per mile for residential streets.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	Requested by stakeholders as critical benefit and would be used by surrounding minority population and low-income population in close proximity to railroad tracks.
Relative Number of Beneficiaries	6	Entire neighborhood for improvement benefit is minority and low-income.
Practicable	15	Technically feasible and standard design.
Defined Project or Action	10	Some design and specific locations needed.
Satisfy Authority Obligations	15	Safety, connectivity in close connection with railroad tracks.
Defined Roles and Responsibilities	15	Authority to fund and City of Santa Clara to implement.
Evidence of Agreement	15	City has agreed.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	101	

Authority = California High-Speed Rail Authority.

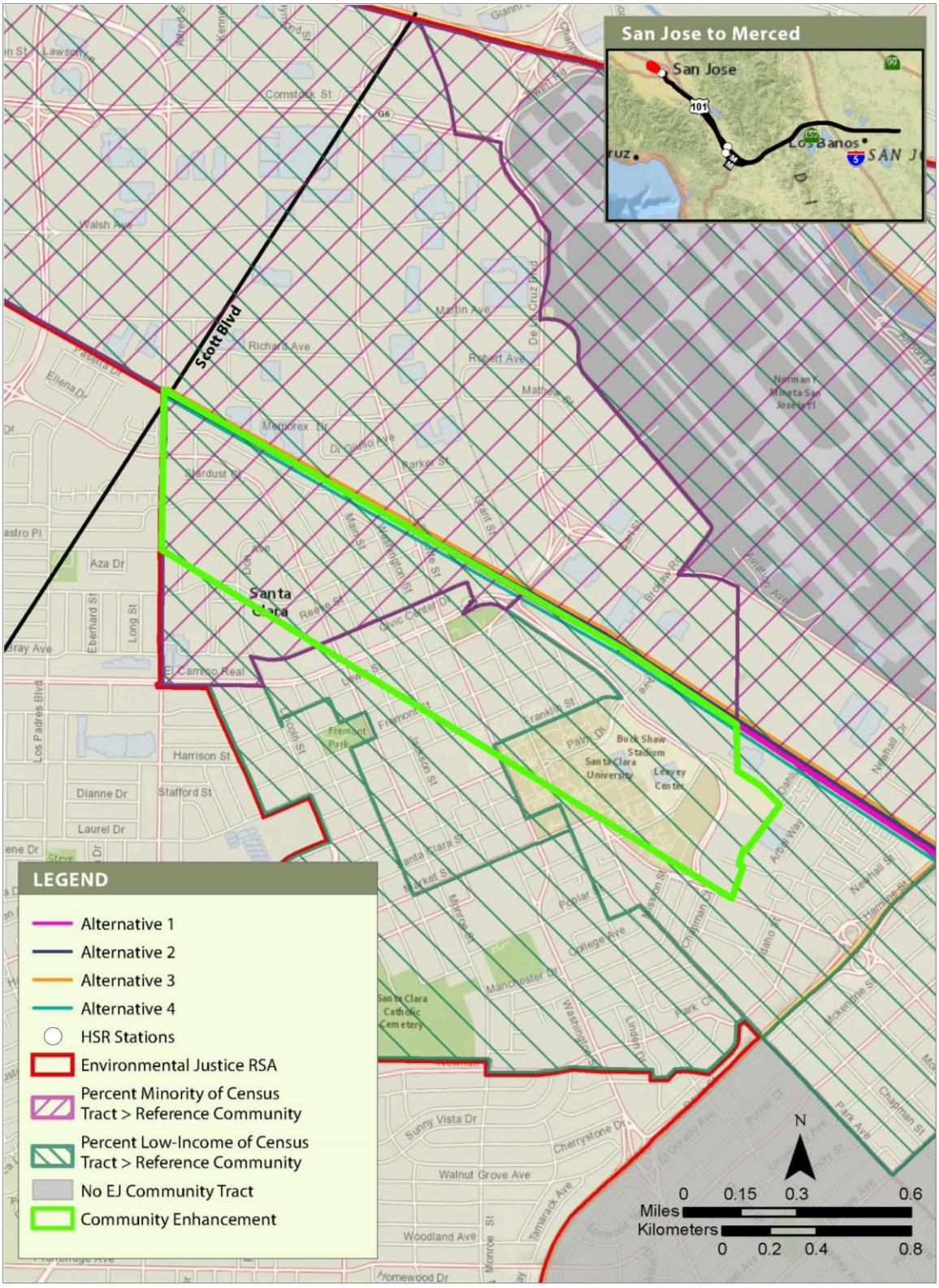


Figure SC/NSJ-3 Streetscape Improvements Santa Clara/North San Jose

4. OFFSETTING MITIGATION MEASURE SJD-OMM#1: STREETSCAPE IMPROVEMENTS TO DELMAS NEIGHBORHOOD

COMMUNITY: SAN JOSE DIRIDON

ALTERNATIVES: 1, 2, 3

Measure Description

The proposed improvement will provide streetscape improvements within the Delmas Neighborhood, specifically on Park Avenue, Auzerais Avenue, Bird Avenue, Montgomery Avenue, West San Carlos Avenue, and Gifford Avenue. Improvements could include enhanced pedestrian crossings, establishment of bicycle routes, sidewalk improvements, street lighting, street trees, and other landscaping. The scope of improvements included will be refined to be consistent with the Better Bike Plan 2025, when available.

Nexus to Disproportionately High and Adverse Effects

Under Alternatives 1, 2, and 3, the project would result in disproportionate, high, and adverse effects (DHAEs on low-income populations related to visual quality associated with elevated viaducts and embankment. There would be residual visual impacts within the San Jose Diridon community after the application of project mitigation and consideration of project benefits due to the aerial viaduct. DHAEs would be related to permanent visual effects associated with the visibility of the proposed aerial viaduct through this community. While the proposed improvement will not directly address operational visual effects resulting from the project, it will provide improvements that will help to offset visual DHAEs in this community by providing funding for streetscape improvements.

Benefit to Minority Populations and/or Low-Income Populations

The HSR alignment under Alternatives 1, 2, and 3 would traverse the San Jose Diridon community, where the percentage of low-income residents is greater than that within the reference community. The proposed improvement will improve visual quality, community cohesion, and livability and enhance connectivity for low-income residents. The location of the improvement relative to the HSR alignment within the San Jose Diridon community is shown in Figure SJD-1.

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following general goals from the Delmas Park Strong Neighborhood Initiative (SNI):

- Improve pedestrian connections to adjacent areas and facilities.
- Improve the appearance and physical condition of neighborhood streets.
- Improve conditions beneath and adjacent to freeways.

Among the SNI action items for Delmas Park are the following improvements:

- Improve West San Carlos Street Streetscape
- Improve Gifford Avenue Streetscape

- Improve Auzerais Avenue Streetscape
- Improve General Condition of Streets and Sidewalks
- Improve the Pedestrian Route to Gardner Academy

The SNI specifically recommends the establishment of the following pedestrian and bicycle streets:

- West San Carlos Street—Future neighborhood business district, major east-west bus/light rail transit (LRT) route
- Park Avenue—East/west link to downtown, residential density transition street
- Gifford Avenue—North/south link to LRT
- Bird/Montgomery Avenue—North/south link to Diridon Station
- Auzerais Avenue—East/west neighborhood collector street

These streets connect residential areas to commercial centers, public facilities, transit stations/stops, and downtown. Streetscape improvements, such as enhanced crosswalks, pedestrian scale lighting, shade trees, trash receptacles, and other elements, should be installed to enhance the safety and comfort of pedestrians.

Community Outreach Input and Relationship to DHAEs

Community concerns, as documented as part of the SNI, that are addressed include the following:

- Safety
- Visual quality
- Unsightly streetscapes
- Poor condition of streets and sidewalks
- Lack of street lighting
- Bleak and uninviting street frontages
- Deferred maintenance
- Streets that dead-end at I-280 have no secure fencing, allowing easy access to unsupervised areas under the freeway.

The City of San Jose also indicated that the Better Bike Plan 2025 designates this section of Delmas as a future bicycle boulevard and that a detailed scope would need to be defined though a planning and outreach process.

Because the HSR aerial alignments with Alternatives 1, 2, and 3 cross through this community, residents of the San Jose Diridon community would experience residual visual quality DHAEs. This improvement will provide related improvements to enhance visual quality. It will also provide general improvements in the form of improved safety, enhanced connectivity, enhanced livability, and community cohesion for residents in the San Jose Diridon community.

Improvements Cost Estimate

The SNI identifies specific improvements and associated costs for the following roadway improvements:

- West San Carlos Streetscape: $987,000 for preparation of a streetscape improvements plan; evaluation of pedestrian crossings; installation of enhanced crossings; feasibility study of center median; construction of center median; installation of frontage street trees; installation of frontage lighting; façade improvements.

- Gifford Avenue Streetscape: $286,000 for preparation of street tree and lighting improvements plans; improved pedestrian crossings; installation of street trees; installation of lighting.
- Auzerais Avenue Streetscape: $280,000 for preparation of street tree and lighting improvements plans; improved pedestrian crossings; installation of street trees; installation of lighting.
- Improve General Conditions of Streets and Sidewalks on Park and Montgomery: Assumed same approximate costs as Gifford/Auzerais above ($280,000 each) for evaluation of condition of neighborhood streets and sidewalks; street repairs; sidewalk repairs; installation of street trees.

These cost estimates are preliminary, as the SNI effort was done several years ago and improvements will need to be developed applying appropriate urban design guidelines from the City of San Jose, which may change the specific improvements proposed for the locations above.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the City of San Jose for planning and implementation of improvements. Coordination with the California Department of Transportation (Caltrans) also will be required.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	This improvement will provide connectivity, safety, and quality of life benefits to the entire local community. This improvement was specifically identified by the community as a need in prior planning.
Relative Number of Beneficiaries	3	This improvement will benefit the entire community both along the streets above and in the surrounding areas.
Practicable	15	Funding for this improvement is practicable, and the project can be constructed.
Defined Project or Action	10	The conceptual improvements are identified; specific design has yet to be done.
Satisfy Authority Obligations	15	Improvement will benefit the community directly affected by the HSR project.
Defined Roles and Responsibilities	10	The Authority will provide funding. City of San Jose would implement. Coordination with Caltrans also would be required.
Evidence of Agreement	15	City of San Jose generally supports efforts like this.
Cost-Effectiveness	3	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	81	

Authority = California High-Speed Rail Authority; Caltrans = California Department of Transportation; HSR = high-speed rail.

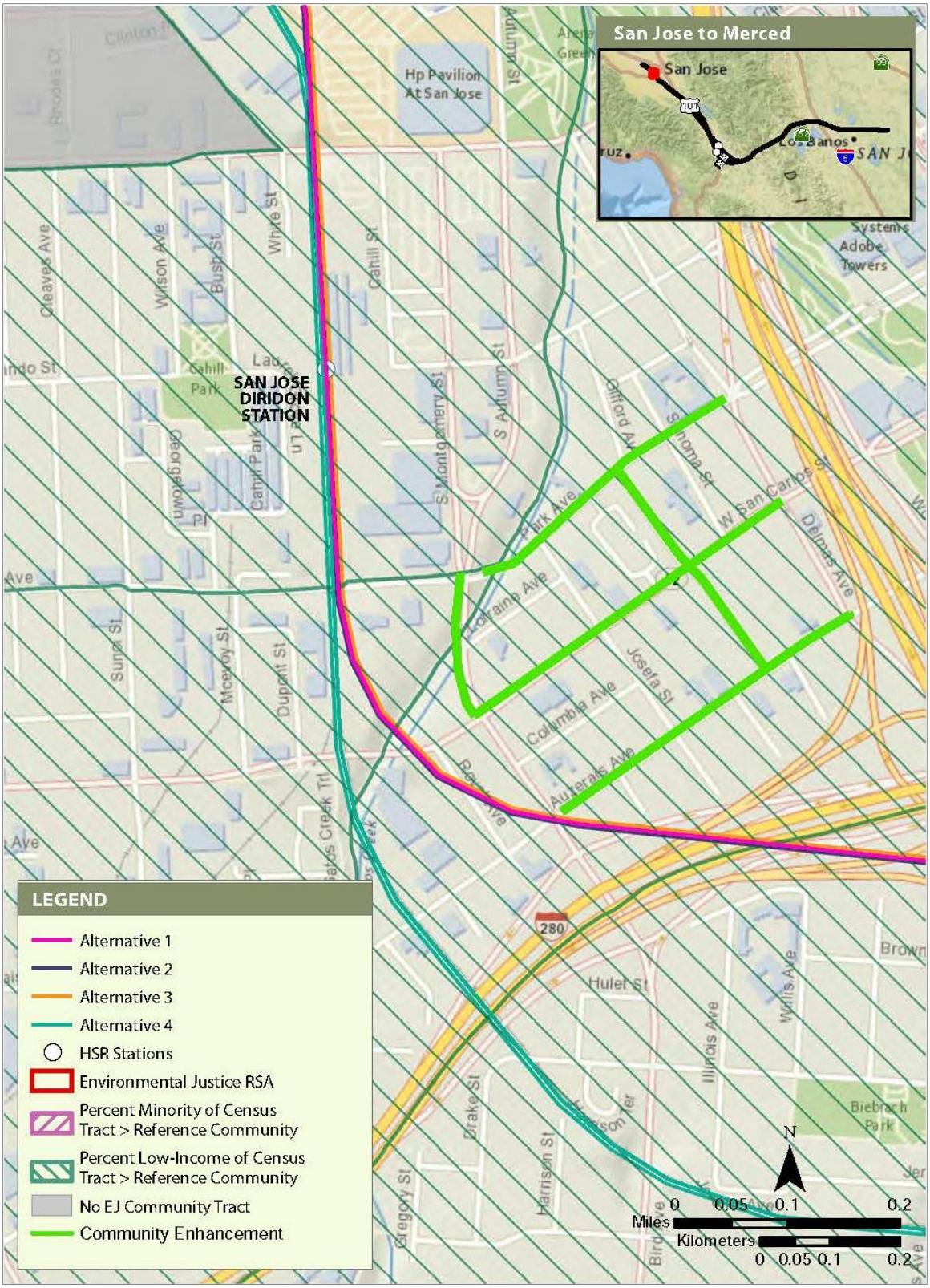


Figure SJD-1 Streetscape Improvements to Delmas Neighborhood San Jose Diridon

5. OFFSETTING MITIGATION MEASURE SJD-OMM#2: NOISE TREATMENTS FOR HOMES AFFECTED BY FREEWAY NOISE (I-280/SR 87)

COMMUNITY: SAN JOSE DIRIDON

ALTERNATIVE: 4

Measure Description

This offsetting mitigation measure will provide funding for building insulation and window treatments for homes directly adjacent to and affected by existing freeway noise adjacent to Interstate (I-) 280 and State Route (SR) 87.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the San Jose Diridon community after the application of project noise barrier mitigation and consideration of project benefits. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction and will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment under Alternative 4 would traverse the San Jose Diridon community, where the percentage of low-income residents is greater than that within the reference community. The proposed improvement will benefit the San Jose Diridon community's low-income community by reducing noise and improving health and livability (Figure SJD-2).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) was a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, residents, and business owners. The goal of SNI was to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI was funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. The Delmas Park neighborhood, which is in the San Jose Diridon community, is 1 of 20 neighborhoods designated for the SNI. The Delmas Park neighborhood is an area of low-income concentration that needs higher levels of investment to meet the needs of the community. This improvement will provide a benefit to residents living along these freeway corridors by providing building and window insulation to alleviate unwanted existing noise from the adjacent I-280 and SR 87 freeways on residential buildings.

Community Outreach Input and Relationship to DHAEs

Community concerns, as expressed by the residents and the City of San Jose, that are addressed include the following:

- Traffic

- Noise and vibration
- Safety and security

This improvement will provide noise abatement and improve health and livability for low-income residents living directly adjacent to I-280 and SR 87 in the San Jose Diridon community. Because the HSR alignments cross through this community, residents of the San Jose Diridon community would experience residual DHAE noise effects under Alternative 4.

Improvement Cost Estimate

There are approximately 41 single-family homes and 11 multifamily buildings in the Auzerais/Delmas neighborhoods directly adjacent to the north side of I-280 between Los Gatos Creek north and SR 87 and directly adjacent to the west side SR 87 from West San Fernando Street to I-280. Estimated costs are based on the average cost per property of the San Francisco International Airport noise abatement program (which is one of the largest in the country) of $12,632 per property for single-family homes. Assumed costs per multifamily building are $25,000 per building. Using these unit costs, the building and window insulation improvements for these homes would cost approximately $793,000.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to property owners to fund and implement this improvement and will fund the entire measure. A program implementer will need to be identified/developed to work with homeowners and building owners. The Authority will coordinate with City of San Jose regarding making homeowners aware of the program. The City would process any required encroachment and building permits needed for building upgrades.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This improvement will directly benefit low-income populations in the community relatively close to all alternative alignments and Diridon Station and could substantially improve the indoor noise environment by reducing noise from the existing freeways.
Relative Number of Beneficiaries	3	Only the residents with noise treatments will benefit. This will not benefit the entire community.
Practicable	10	Funding for this improvement is practicable. A program will need to be established to work with affected homeowners and building owners.
Defined Project or Action	10	Improvement is building insulation and window treatments. Exact criteria need to be developed.
Satisfy Authority Obligations	15	The improvement will provide community uplift. HSR project would result in noise effects so there is a nexus.
Defined Roles and Responsibilities	5	The Authority will fund and coordinate with homeowners through a program implementer. Program implementer needs to be identified. City of San Jose may be partner.
Evidence of Agreement	15	City supports addressing noise effects.
Cost-Effectiveness	6	Cost is high relative to estimated number of beneficiaries.
TOTAL SCORE	79	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

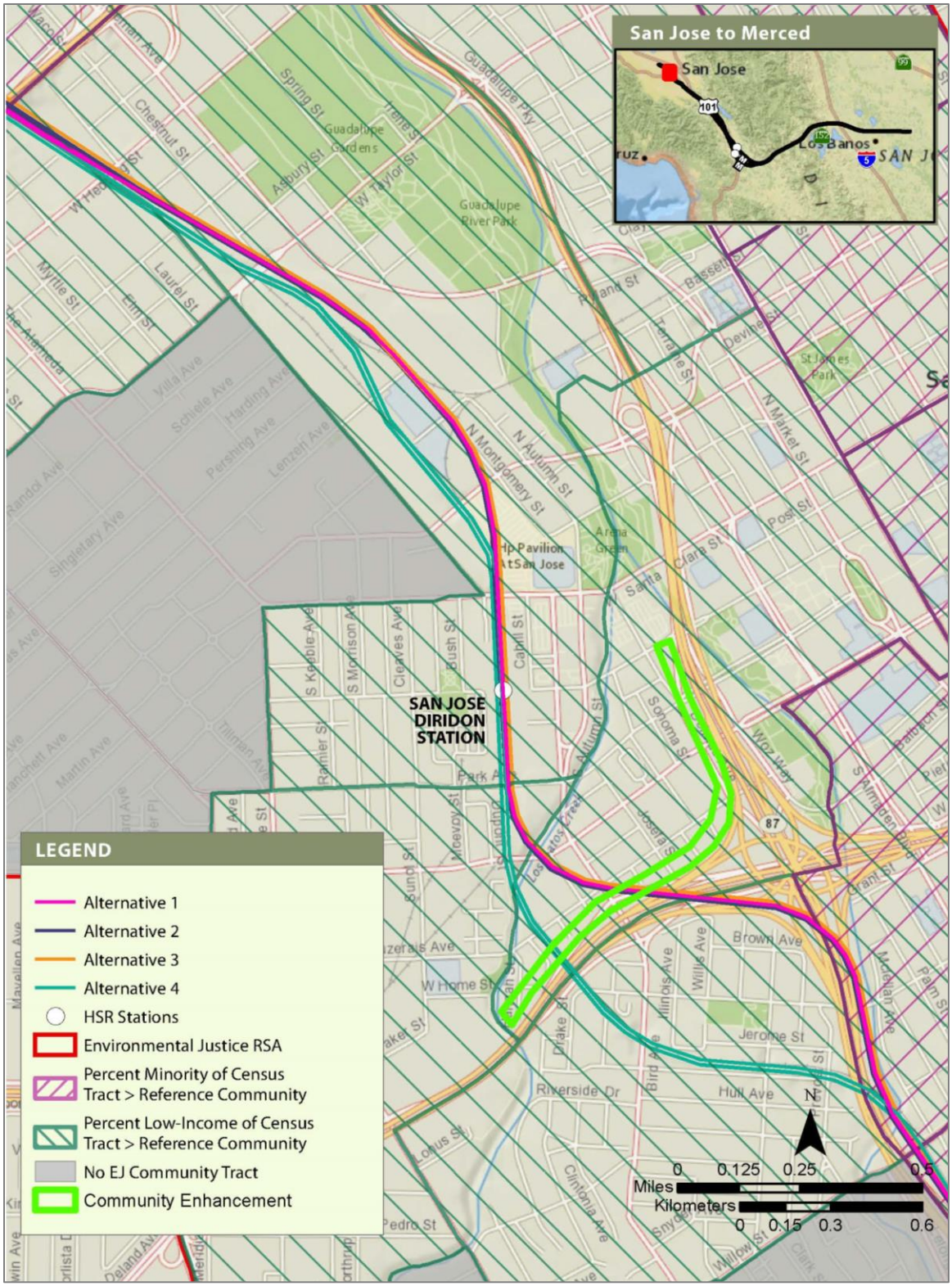


Figure SJD-2 Noise Treatments for Homes Affected by Freeway Noise (I-280/SR 87) San Jose Diridon

6. OFFSETTING MITIGATION MEASURE SJD-OMM#3: REESTABLISH INEZ C. JACKSON LIBRARY

COMMUNITY: SAN JOSE DIRIDON

ALTERNATIVE: 1, 2, 3, 4

Measure Description

The proposed improvement will provide funding for the reestablishment of the Inez C. Jackson Library space at the African American Community Service Agency (AACSA) Family Resource Center in San Jose. AACSA is willing to provide the space for the library but needs funding to renovate and modernize the space and to provide new furniture, books, computers and other electronics, and audio-visual equipment. The space would also need to be made Americans with Disabilities Act compliant.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionately high and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the San Jose Diridon community after the application of project noise barrier mitigation and consideration of project benefits. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. Additionally, under Alternatives 1, 2, and 3, the project would result in DHAEs related to visual quality associated with elevated viaducts and embankment. While the proposed improvement will not directly address operational noise or aesthetics effects resulting from the project, it will provide a quiet space for community members to help offset noise effects from existing noise and from the train. More generally, this improvement also will represent an investment in a resource that serves at-risk populations within the community.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment under all project alternatives would traverse the communities around the San Jose Diridon Station, where the percentage of minority residents and low-income residents is greater than that within the reference community. The proposed improvement will benefit minority residents and low-income residents by providing a quiet refuge from project-generated noise, by expanding educational and technological resources in a renovated community space, and by promoting a sense of community identity (Figure SJD-3).

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following San Jose General Plan goals and policies:

- Goal ES-2 Libraries Maintain and expand Library Information Services within the City to:
  - Enrich lives by fostering lifelong learning and providing every member of the San José community access to a vast array of ideas and information
  - Give all members of the community opportunities for educational and personal growth throughout their lives
  - Develop partnerships to further the educational, cultural and community missions of organizations in San José
  - Support San José State University Library's educational mission in expanding the base of knowledge through research and scholarship.
  - Locate branch libraries in central commercial areas of neighborhoods for essential public access to library resources, events, and community meeting spaces, and to stimulate economic development.

  - Maximize branch library hours of operation to facilitate daily patronage.

Policies:

- ES-2.4 Recognize the central role that libraries play in neighborhood/community building by supporting and developing partnerships, collaboration and growth of library services to support community development.
- ES-2.5 Enhance social equity by providing programs and services that contribute to cultural enrichment and understanding, connection and learning for all segments of the San José community.
- ES-2.8 Measure Library service delivery to identify the degree to which library activities are meeting the needs of San José's community.
- ES-2.9 Foster a high-performing, collaborative library system responsive to changing customer and community needs.
- ES-2.10 Maintain resources and spaces in libraries to support community meetings, social gathering and the sharing and promoting of ideas as well as spaces for reading, and quiet study.

Community Outreach Input and Relationship to DHAEs

Community concerns, as expressed by the AACSA, that are addressed include the following:

- Need for learning and research hub for community
- Displacement of low-income populations
- Need for infrastructure investment
- Need for a dedicated space for community members to seek refuge from existing and project generated noise

Because the HSR aerial alignments with Alternatives 1, 2, and 3 across through this community, residents of the San Jose Diridon community would experience residual visual quality DHAEs. Under Alternative 4, the project would result in a DHAE related to project-generated operational noise. The library could provide a "quiet space" for community members to help offset noise effects from existing noise and from the train and more generally provide for improved educational opportunities and technology benefits for residents who access the library. The improvement will also help foster a sense of community identity.

Improvement Cost Estimate

Renovation and modernization would cost approximately $100,000 per an estimate from AACSA.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding, and the improvement would be implemented by AACSA.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	The improvement will provide increased awareness of African American history and experience for the entire community, which has always been a priority but is especially a concern at this time of acute attention to inequalities for the African American community locally and nationally.
Relative Number of Beneficiaries	15	The library will be available to the entire community.
Practicable	15	Funding for this improvement is practicable, and the materials can be obtained.
Defined Project or Action	15	The improvement is fully defined.
Satisfy Authority Obligations	15	The improvement will provide increased educational resources to enhance community awareness in a community affected by the HSR project.
Defined Roles and Responsibilities	15	The Authority will provide funding. The AACSA would implement.
Evidence of Agreement	15	AACSA agrees.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	120	

AACSA = African American Community Service Agency; Authority = California High-Speed Rail Authority; HSR = high-speed rail.

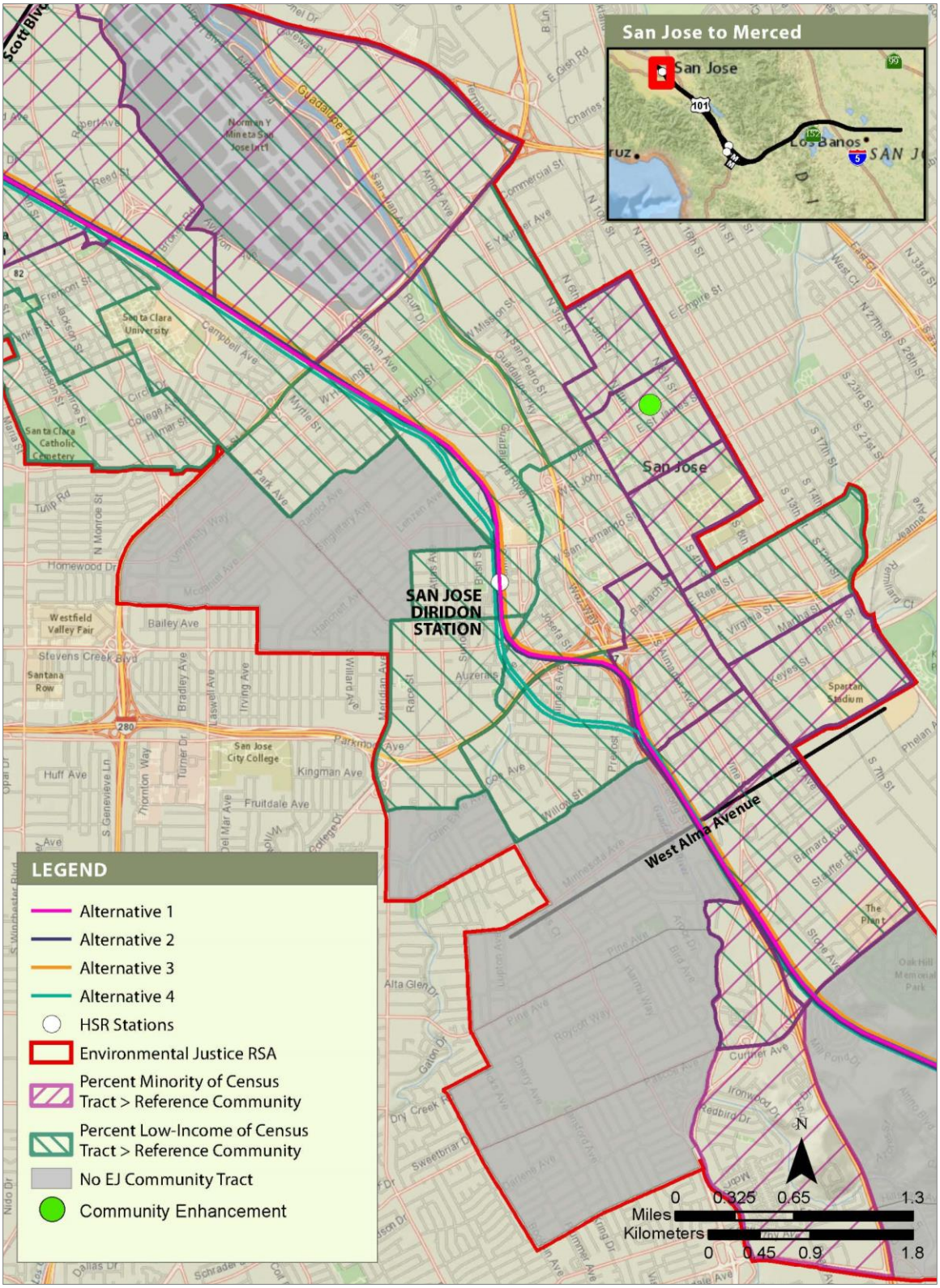


Figure SJD-3 Reestablish Inez C. Jackson Library San Jose Diridon

7. OFFSETTING MITIGATION MEASURE GWG-OMM#1: GARDNER ELEMENTARY NOISE TREATMENTS

COMMUNITY: GARDNER/WILLOW GLEN

ALTERNATIVE: 4

Measure Description

Potential improvements to improve the noise environment at Gardner Elementary could include noise treatments such as a sound wall barrier or other building and window insulation improvements to the buildings and walls adjacent to West William Street and Willis Avenue facades. Gardner Elementary (formerly Gardner Academy) is a Kindergarten–5 elementary school that currently has approximately 660 students. The school is in generally good physical condition and contains ample sports fields and playground areas. However, traffic noise from I-280 on the school is a concern.

Santa Clara VTA's I-280 Soundwalls Project is currently proposing to construct soundwalls on I-280 between State Route 87 and Los Gatos Creek including adjacent to the I-280 southbound lanes adjacent to the Gardner Elementary School. This project is scheduled to go through environmental clearance from 2020 to 2022, design and engineering in 2022 and 2023, and construction between 2023 and 2024. If the I-280 Soundwalls Project is advanced, then GWG-OMM#1 would be redundant with the soundwall project, provided a soundwall is placed adjacent to the southbound I-280 lanes such that it reduced traffic noise for the Gardner Elementary School. In that instance, this measure allows for the funds for noise treatments at the school to instead be provided to VTA to support the I-280 Soundwalls Project, provided the soundwalls installed would benefit the Gardner Elementary School and provided the San Jose to Merced HSR project section is fully funded prior to construction of the I-280 Soundwalls Project. If the project section is funded after construction of the I-280 Soundwalls Project, then the Authority would not be able to fund the Soundwalls Project. If no funding is provided to the VTA I-280 Soundwalls Project by the Authority and the soundwalls project is completed and there still remain traffic noise effects to the Gardner Elementary School, then the Authority could provide funding for school building treatments as needed to address that residual noise.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the Gardner/Willow Glen community, where Gardner Elementary School is located, after the application of project noise barrier mitigation and consideration of project benefits. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction at a sensitive receptor that already experiences traffic noise from I-280. The improvement will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment would pass through (Alternative 4) or along the northern edge of (Alternatives 1, 2, and 3) the Gardner/Willow Glen community, where the percentage of low-income residents is greater than that within the reference community. The proposed improvement will benefit the community's low-income population by improving the educational environment at Gardner Elementary. The location of the proposed improvement relative to the HSR alignment within the Gardner/Willow Glen community is shown in Figure GWG-1.

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) was a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, residents, and business owners. The goal of SNI was to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI was funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. Greater Gardner is 1 of 20 neighborhoods designated for the SNI. The proposed improvement will be consistent with the Greater Gardner Neighborhoods Improvement Plan goal to improve neighborhood conditions at Gardner Elementary. The proposed improvement also will be consistent with the San Jose City Council goal of ensuring neighborhoods benefit equally from City services.

Community Input and Relationship to DHAEs

Community concerns, as expressed by San Jose Unified School District staff, that are addressed include the following:

- Student health
- Campus physical conditions

This improvement will provide for improved sound conditions, and therefore an improved educational environment, around Gardner Elementary, which services the Gardner/Willow Glen community. Because the HSR alignment would travel through the middle of this community under Alternative 4, these same residents would experience various project effects under this alternative and would experience residual noise DHAEs under Alternative 4 after the application of project mitigation and consideration of project benefits.

Improvement Cost Estimate

This measure includes potentially providing a sound wall barrier or building and window insulation improvements to the building and windows on West William Street and Willis Avenue. The sound wall option is estimated at up to 600 feet in length, up to 14 feet high, with assumed cost of $70 per square foot, which corresponds to $588,000. The sound wall will either be: (1) on school property along the south side of W. William Street (and the northwest side of Willis Avenue) or (2) be north of W. William Street (if permission can be obtained from Caltrans/City of San Jose presuming public ownership). No right-of-way costs were presumed for the sound wall option. Estimated costs for building/window treatments are based on the average cost per property of the San Francisco International Airport noise abatement program (which is one of the largest in the country) of $25,000 per property for multifamily homes. Using these unit costs, the building and window insulation improvements for the equivalent of five multifamily homes would cost approximately $125,000. Window treatments and building insulation could be applied to buildings facing I-280 along W. William Street and the building on the northeast side of the campus along Willis Avenue.

If the I-280 Soundwalls Project is advanced, then GWG-OMM#1 would be redundant with the soundwall project, provided a soundwall is placed adjacent to the southbound I-280 lanes such that it reduced traffic noise for the Gardner Elementary School. In that instance, this measure

allows for the funds for noise treatments at the school to instead be provided to VTA to support the I-280 Soundwalls Project, provided the soundwalls installed would benefit the Gardner Elementary School.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the San Jose Unified School District for planning and implementation of this project. San Jose Unified School District controls its property. If the VTA I-280 Soundwalls Project is advanced, then the funding will be provided to VTA instead, provided the soundwalls included in that project would benefit the Gardner Elementary School.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Noise improvements will benefit Gardner Elementary schoolchildren.
Relative Number of Beneficiaries	3	This is the primary elementary school in the neighborhood and will benefit surrounding low-income populations, particularly families with school-aged children.
Practicable	10	Funding for this improvement is practicable; low-cost request.
Defined Project or Action	15	Noise improvements are defined.
Satisfy Authority Obligations	15	Improvement will provide neighborhood condition benefits to affected community.
Defined Roles and Responsibilities	15	Authority will provide funding, and San Jose Unified School District would design, maintain, and implement improvements. If the VTA I-280 Soundwalls Project is advanced, the Authority will instead provide funding to VTA provided a soundwall benefitting the Gardner Elementary School is included in that project.
Evidence of Agreement	15	San Jose Unified School District suggested this improvement. VTA is already planning for the VTA I-280 Soundwalls Project.
Cost-Effectiveness	6	Cost is high relative to estimated number of beneficiaries.
TOTAL SCORE	94	

Authority = California High-Speed Rail Authority.

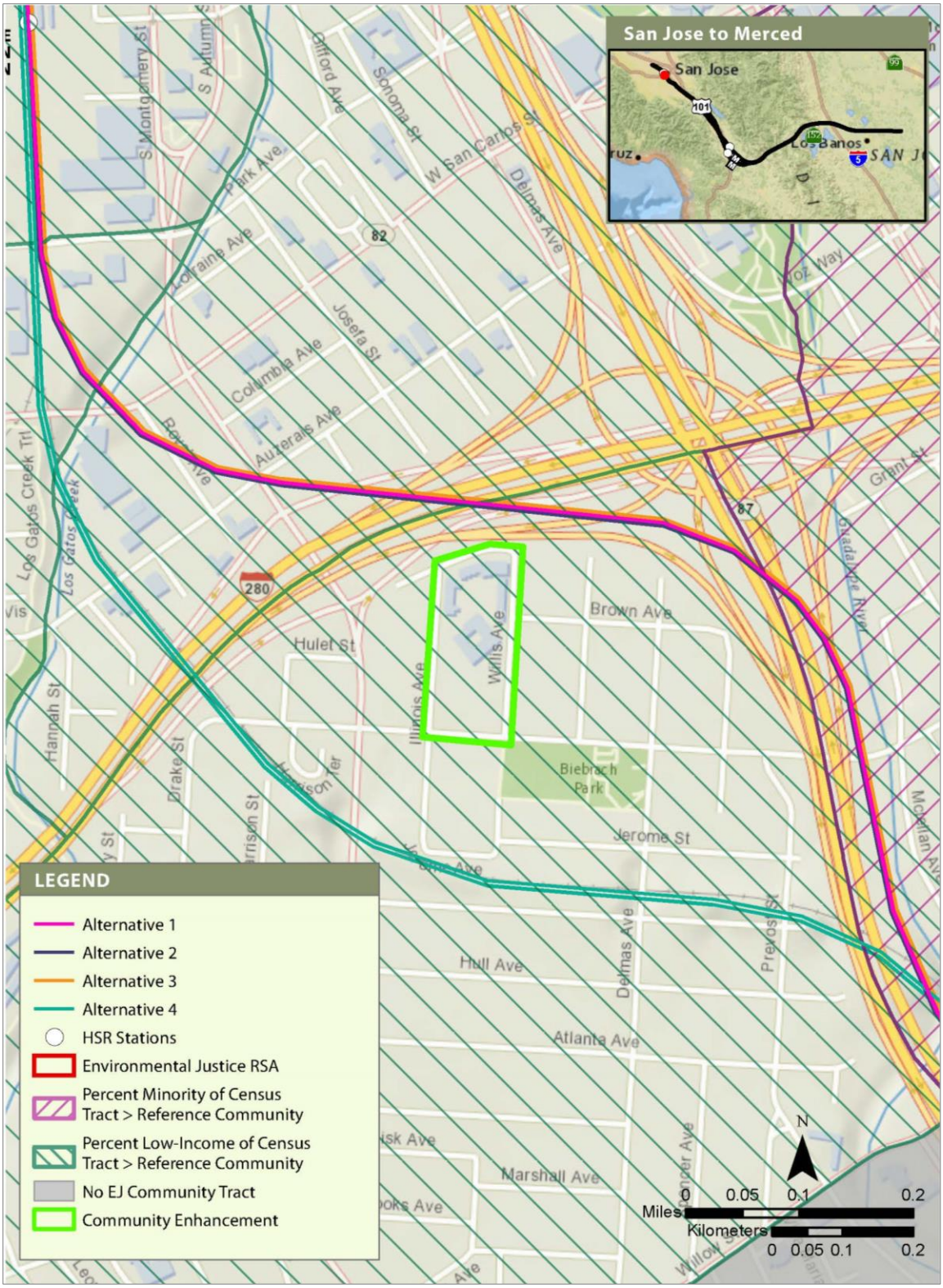


Figure GWG-1 Gardner Elementary Noise Treatment
Gardner/Willow Glen

8. OFFSETTING MITIGATION MEASURE GWG-OMM#2: NOISE TREATMENTS FOR RESIDENTIAL BUILDINGS

COMMUNITY: GARDNER/WILLOW GLEN

ALTERNATIVE: 4

Measure Description

The proposed improvement will provide funding for building insulation and window treatments for up to 43 homes affected by existing freeway noise adjacent to Interstate (I-) 280 and State Route (SR) 87. The improvement will consist of building and window insulation improvements for the homes along I-280 (at Los Gatos Creek) and SR 87 (to Willow Street).

If the Santa Clara VTA's I-280 Soundwalls Project is advanced (currently scheduled to be constructed by 2024), it would include soundwalls on the south side of I-280 between Los Gatos Creek and SR 87, which would obviate the need for building noise treatments in the neighborhood adjacent to I-280. If that happens, then this measure would only include treatments along SR 87 for up to approximately 15 homes and any homes on the south side of I-280 between Los Gatos Creek and SR 87 with residual traffic noise effects after soundwall construction (for example where gaps in soundwalls may exist.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the Gardner/Willow Glen community after the application of project noise barrier mitigation and consideration of project benefits. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction and will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment would traverse the Gardner/Willow Glen community (Alternative 4) or travel around the community, where the percentage of low-income residents is greater than that within the reference community. Low-income populations are present throughout the community in the vicinity of the alignment. The proposed improvement will benefit the community's low-income populations by providing noise reduction, health benefits, and livability improvements (Figure GWG-2).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) was a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, residents, and business owners. The goal of SNI was to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI was funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. Greater Gardner is 1of 20 neighborhoods

designated for the SNI. The Greater Gardner neighborhood is an area of low-income concentration that needs higher levels of investment to meet the needs of the community. Alternative 4 would cross through the Greater Gardner neighborhood along the Caltrain corridor. This improvement will provide a benefit to residents living along these freeway corridors by providing building and window insulation to alleviate unwanted existing noise from the adjacent I-280 and SR 87 freeways on multifamily residential buildings.

Community Outreach Input and Relationship to DHAEs

Community concerns regarding noise effects were expressed by multiple stakeholders in San Jose. Concerns regarding traffic noise were also documented in the Greater Gardner Community Plan and noted during the Gardner neighborhood walk in January 2019.

This improvement will provide noise abatement as well as livability and health benefits for low-income residents adjacent to I-280 and SR 87. Because the HSR alignment would travel through the middle of this community under Alternative 4, the community would experience residual noise DHAEs under Alternative 4 after application of project mitigation and consideration of project benefits.

Improvement Cost Estimate

There are approximately 43 single-family homes in the Gardner/Willow Glen community directly adjacent to I-280 between Los Gatos Creek and SR 87 and directly adjacent to the ramp from I-280 to SR 87 to the point where the existing noise barrier on the west side of SR 87 begins. Estimated costs are based on the average cost per property of the San Francisco International Airport noise abatement program (which is one of the largest in the country) of $12,632 per property for single-family homes. Using these unit costs, the building and window insulation improvements for these homes would cost approximately $543,000 if this measure addresses 43 homes. If the VTA I-280 Soundwalls Project is completed, then the treatments along SR 87 for up to 15 homes would have an associated cost of $190,000.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to property owners to fund and implement this improvement and will fund the entire measure. A program implementer will need to be identified/developed to work with homeowners and building owners. The Authority will coordinate with City of San Jose regarding making homeowners aware of the program. The City would process any required encroachment and building permits needed for building upgrades.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	These communities are already affected by transportation noise, and this will provide direct benefit to these low-income populations.
Relative Number of Beneficiaries	3	Improvement will directly benefit low-income populations along the freeways and not most of the community.
Practicable	15	Funding for this improvement is mostly practicable, need mechanism for implementing. Relatively low-cost request.
Defined Project or Action	10	The Authority will provide funding; need implementer.
Satisfy Authority Obligations	15	Addresses noise from transportation infrastructure.
Defined Roles and Responsibilities	5	Authority and individual property owners or California Department of Transportation.
Evidence of Agreement	15	City supports addressing noise effects.
Cost-Effectiveness	3	Cost is high relative to estimated number of beneficiaries.
TOTAL SCORE	81	

Authority = California High-Speed Rail Authority.

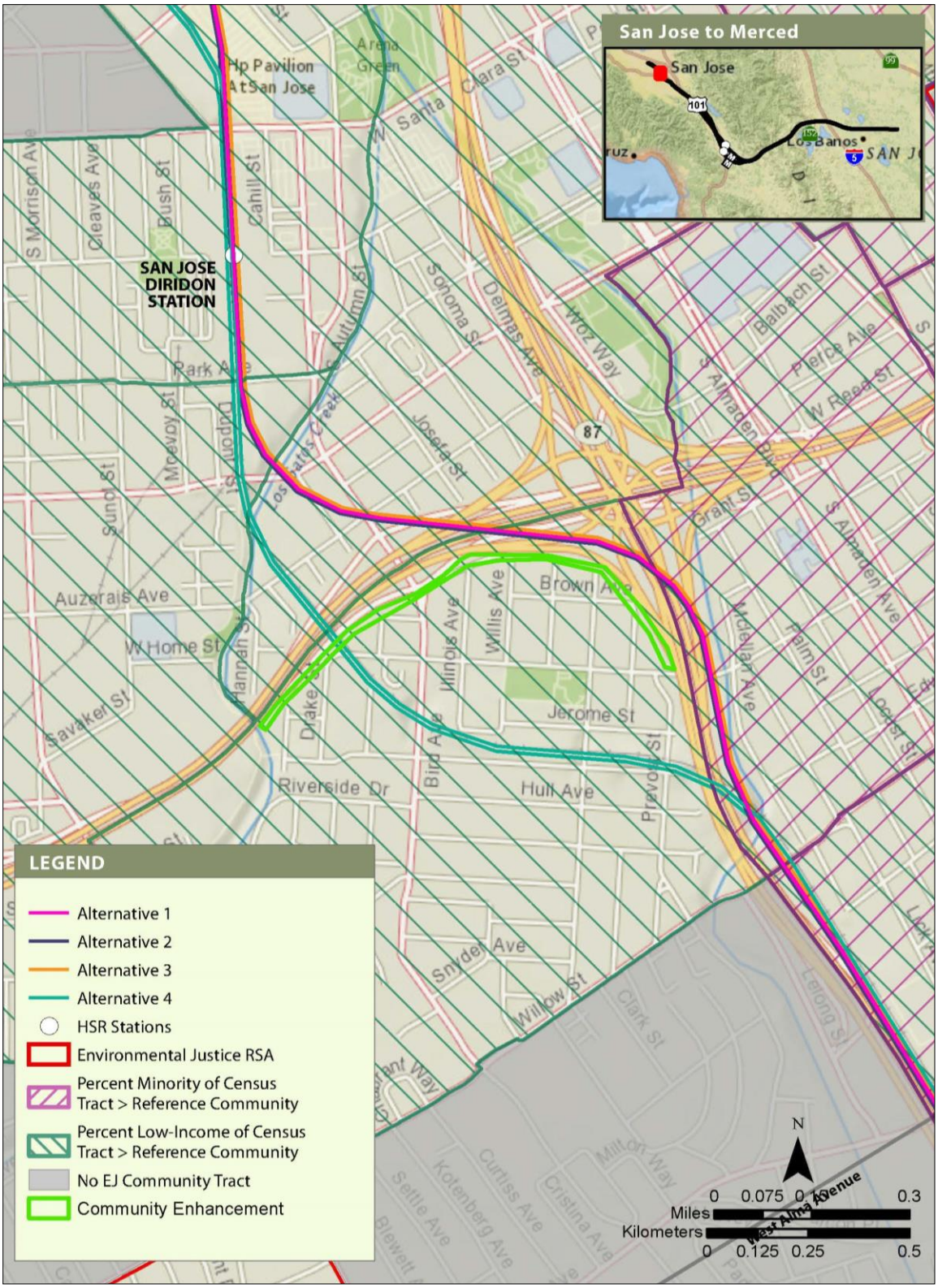


Figure GWG-2 Noise Treatments for Residential Buildings Along SR87/I-280 to Address Existing Noise

Gardner/Willow Glen

9. OFFSETTING MITIGATION MEASURE GWG-OMM#3: FULLER PARK/FULLER AVENUE RECREATIONAL AMENITIES

COMMUNITY: GARDNER/WILLOW GLEN

ALTERNATIVE: 4

Measure Description

A number of small vacant parcels are scattered throughout the Gardner/Willow Glen community, all owned by public entities. For example, a parcel adjacent to the intersection of Coe and Bird Avenues was improved by residents with landscaping, heritage lights, and a walking path some years ago. This space has fallen into disrepair but has been funded for renovation per the Greater Gardner Neighborhood Improvement Plan. Fuller Park is of specific concern given the low quality of existing material; that is, turf and fencing. Renovation of this Fuller Park site could include children's play areas with equipment, picnic benches, fitness equipment, bicycle racks, or other smaller amenities.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionately high and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the San Jose Diridon community after the application of project noise barrier mitigation and consideration of project benefits. While the proposed improvement will not address operational noise resulting from the project, it will represent an offset to project effects that will provide a quality-of-life improvement for the low-income residents who would be affected by DHAEs of the project.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment under Alternative 4 would traverse the Gardner/Willow Glen community, and under Alternatives 1, 2, and 3 the HSR alignment would go around the community where the percentage of low-income residents is greater than that within the reference community. Low-income populations are present throughout the community in the vicinity of the alignment. The proposed improvement will provide recreation, community cohesion, and livability benefits to the low-income populations in the Gardner/North Willow Glen community (Figure GWG-3).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) was a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, local residents, and business owners. The goal of SNI was to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI was funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. Greater Gardner was 1 of 20 neighborhoods designated for the SNI.

The purpose of this project is to create a pocket park in accordance with the City's Greater Gardner Neighborhood Improvement Plan, adopted in January 2002. The Greater Gardner Neighborhood Improvement Plan includes the following goals:

- Improve the overall condition of neighborhood streets and sidewalks.
- Improve and maintain the appearance and condition of community streetscapes.
- Expand and improve neighborhood open spaces to better serve the needs of the community.
- Improve and maintain current open space and develop City owned vacant properties.

This project is also consistent with the San Jose General Plan policies that include:

- PR-1.9 As Urban Village areas redevelop, incorporate urban open space and parkland recreation areas through a combination of high-quality, publicly accessible outdoor spaces provided as part of new development projects; privately or, in limited instances, publicly owned and maintained pocket parks; neighborhood parks where possible; as well as through access to trails and other park and recreation amenities.
- PR-3.1 Provide equitable access to parks, trails, open space, community centers, dog parks, skate parks, aquatics facilities, sports fields, community gardens, and other amenities to the greatest extent feasible in order to provide a high quality of life for our residents.
- PR-7.1 Encourage non-vehicular transportation to and from parks, trails, and open spaces by developing trail and other pleasant walking and bicycle connections to existing and planned urban and suburban parks facilities.

Community Input and Relationship to DHAEs

While specific community input was not received during the HSR scoping process concerning the particular remnant parcel at the end of Fuller Avenue, the lot is identified in the Greater Gardner Neighborhood Improvement Plan as an opportunity to provide additional usable open space in the City of San Jose and specifically in the Gardner neighborhood. During a neighborhood walk of the Gardner neighborhood in December 2019, members of the Gardner Neighborhood Association cited concerns about further isolation of the community and preservation of and upgrades to Fuller Park. The City of San Jose has indicated that staff is supportive of a range of recreational activities at this site and that determination of the scope of the improvement would occur via a public process. Furthermore, during Outreach #3, the City highlighted community concerns about the project's effects on the community more broadly, and on Fuller Park more specifically, and recommended this improvement as a way to offset such concerns and promote quality of life in the community.

This improvement will provide for increased recreational opportunities and improved community cohesion and livability for residents of this community. Because the HSR alignment would travel through the middle of this community under Alternative 4, these same residents would experience various project effects under this alternative. Therefore, this improvement will apply under Alternative 4.

Improvement Cost Estimate

Fuller Park extends from Bird Avenue to Prevost Street, with some interruptions for homes near Bird Avenue and a church in the middle of the linear park, for approximately 1,500 feet. As a linear park, new features will be limited to minor children's play equipment or fitness equipment, picnic benches, bicycle racks, or other smaller amenities. New equipment is estimated at $140,000; soft costs, including design and approvals, would likely require an additional $50,000; resulting in $190,000.

Roles and Responsibilities

The City of San Jose receives CDBG funding to implement projects that benefit the City's low-income neighborhoods and minority neighborhoods. The City of San Jose would implement this improvement using California High-Speed Rail Authority (Authority) funding in combination with potential CDBG funds.

Assessment Based on Selection Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This existing park serves low-income populations in the community and is centrally located.
Relative Number of Beneficiaries	6	This park serves the surrounding low-income populations.
Practicable	15	Funding and construction for this improvement is practicable; low-cost request.
Defined Project or Action	10	Site is defined, and amenities are standard.
Satisfy Authority Obligations	15	Recreation will be provided, not safety or connectivity.
Defined Roles and Responsibilities	15	Authority will provide funding, and City of San Jose would implement.
Evidence of Agreement	15	City agrees.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	106	

Authority = California High-Speed Rail Authority.

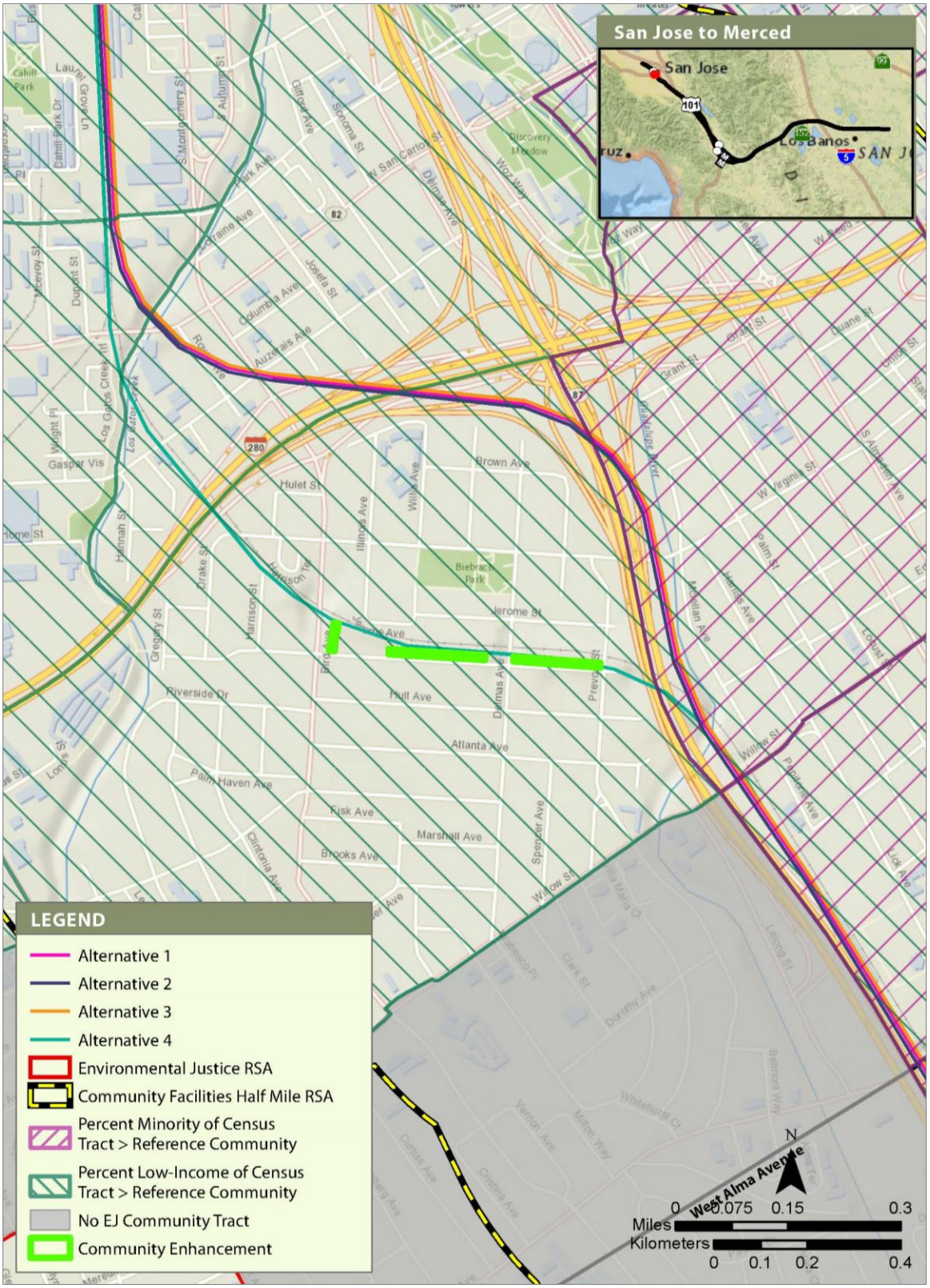


Figure GWG-3 Fuller Park/Fuller Avenue Recreational Amenities Gardner/Willow Glen

10. OFFSETTING MITIGATION MEASURE WGTA-OMM#1: COMMUNITY ART/LOCAL ART FOR STRUCTURES

COMMUNITY: WASHINGTON/GUADALUPE, TAMIEN, AND ALMA/ALMADEN

ALTERNATIVES: 1, 2, 3

Measure Description

The proposed improvement will provide funding for public art and beautification projects in the Washington/Guadalupe, Tamien, and Alma/Almaden community and for any project noise walls or other structures with paintable surfaces that may otherwise become targets for vandalism.

Nexus to Disproportionately High and Adverse Effects

Under Alternatives 1, 2, and 3, the project would result in disproportionate, high, and adverse effects (DHAE) on low-income populations related to the visual effects of project operation. There would be residual visual impacts within the Washington/Guadalupe, Tamien, and Alma/Almaden community after the application of project mitigation and consideration of project benefits. DHAEs would be related to the visual effect of the aerial alignment through this community. While the proposed improvement will not directly address the visual effects resulting from the project, it will provide a related improvement that will enhance the visual quality of this community through the provision of community art and by reducing vandalism and potential violence associated with gang-generated graffiti.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment would pass adjacent to the Washington/Guadalupe, Tamien, and Alma/Almaden community, where the percentage of minority populations and low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's minority residents and low-income residents by providing enhanced neighborhood visual quality, identity, and livability. The proposed improvement will be implemented at various locations in the community, as determined by community artists in consultation with the City and community. The proposed improvement will benefit by promoting the placement of local art on surfaces that normally may be targets for territorial vandalism and associated gang violence.

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) was a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, residents, and business owners. The goal of SNI was to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI was funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. The Washington neighborhood is 1 of 20

neighborhoods designated for the SNI. The proposed improvement will be consistent with the following goals of the Washington Neighborhood Revitalization Plan:

- The neighborhood is an enjoyable place.
- Residents can walk, play, and socialize safely and comfortably in the community.
- There are safe, attractive places for children to play and for the community to interact.
- The appearance of the neighborhood is enhanced with attractive buildings, appropriate landscaping, and street improvements.
- The sense of community pride for residents is maintained and strengthened.

The proposed improvement also will be consistent with the following San Jose General Plan goals and policies:

Goal AC-2 – High Impact Public Art

Integrate high impact public art throughout the community.

Policies – High Impact Public Art

- **AC-2.1** Site public art in key locations. Prioritize innovative public art in three regional destination areas: Downtown, North San José, and the Mineta San José International Airport. Place public art at transportation hubs: pedestrian, bike and transit improvements in pedestrian priority areas; encourage the inclusion of public art at VTA and BART stations, including Diridon Station; and integrate a broad range of art projects into the trail network to connect neighborhoods and bring people closer to nature. Integrate public art into bond-funded park, library, community facility and public safety projects. Cultivate community-based art projects that support neighborhood revitalization goals.
- **AC-2.2** Integrate planning for public art in other City planning efforts, including area specific planning processes, and Urban Village master planning processes.

Action – High Impact Public Art

- **AC-2.3** Explore opportunities to address cultural amenities as part of the private development process, including the incorporation of on or off-site public art, and facilities and activities that support art and culture through a private development funding contribution.

Goal CD-1 – Attractive City

Create a well-designed, unique, and vibrant public realm with appropriate uses and facilities to maximize pedestrian activity; support community interaction; and attract residents, business, and visitors to San José.

Policies – Attractive City

- **CD-1.2** Install and maintain attractive, durable, and fiscally- and environmentally sustainable urban infrastructure to promote the enjoyment of space developed for public use. Include attractive landscaping, public art, lighting, civic landmarks, sidewalk cafés, gateways, water features, interpretive/way-finding signage, farmers markets, festivals, outdoor entertainment, pocket parks, street furniture, plazas, squares, or other amenities in spaces for public use. When resources are available, seek to enliven the public right-of-way with attractive street furniture, art, landscaping and other amenities.
- **PR-4.6** Where feasible and appropriate, strategically incorporate public art into parks, trails, and recreation facilities, with preference given to public art that reflects the culture and identity of the surrounding community, local history, or the ecology of the area.

Additionally, the improvement will be consistent with the following guidance from the California High-Speed Rail Authority (Authority) regarding non-station structures:

- Consistent with federal, state, and local policies promoting the integration of art into public buildings and places, artistic expression should be integrated into California High Speed Train Project (CHSTP) structures when appropriate and feasible. Space may be identified by the Regional Consultants and the community for introduction of artwork underneath high-speed train aerial structures. Candidate locations for artwork shall have high potential for public visibility and public use. Artwork should enhance and reflect the unique character of the surrounding neighborhood or geographical region. Artwork may be freestanding or attached to high-speed train facilities. The Authority will engage with communities to establish a budget for public art appropriate for the high-speed train project and consistent with state and national policies.

Community Outreach Input and Relationship to DHAEs

Community input during the neighborhood site tour with the Guadalupe-Washington Safety Coalition in February 2020 expressed the desire for more public art in the community. Goals were also expressed in the Washington Neighborhood Revitalization Plan to promote improvements that make the community an enjoyable place, improve its physical appearance, and promote and maintain a sense of community pride. Local residents and community organization staff have also indicated that any new surfaces, including sound walls and other ancillary structures, could be subject to vandalism in the form of graffiti and that gang violence can occur in connection with such vandalism. Covering blank walls with murals, especially by local artists, could help curb the potential for such violence by promoting respect for and ownership of community-generated art.

This improvement will provide funding for public art and beautification projects that will benefit residents by providing visual quality, community identity, and livability improvements. Because the HSR alignment would travel adjacent to this community under Alternatives 1, 2, and 3 and the community would experience associated residual impacts, this improvement will apply to these alternatives.

Improvement Cost Estimate

The specific art installations are not defined at this time. Instead, this improvement will include $500,000 to support, develop, and implement a community art program; or provide the funding to the City's existing 1 percent for art fund.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will fund local artists to develop community art projects. Projects would be designed and implemented through collaboration between community artists, the community, and the City of San Jose. Funding will be available through grants that will support the design and implementation of public art installations within 0.5 mile of the HSR project on public land and where appropriate on publicly accessible project structures (such as viaduct footings) adjacent to the community. The program will be led by local artists that will engage local youth in the design and installation process.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	Community art will enhance a sense of community in an area adjacent to the HSR alignment.
Relative Number of Beneficiaries	3	Art installation will broadly benefit the community at large by enhancing community character.
Practicable	15	Funding for this improvement is practicable, and there are public locations (streets, parks, schools, public right-of-way) and/or accessible project structures (viaduct footings).
Defined Project or Action	10	Program development will require effort to identify local community artists, to go through planning and art development, and to involve residents in the art development and installation.
Satisfy Authority Obligations	15	Improvement will improve community aesthetics and identity in an area affected by the HSR project.
Defined Roles and Responsibilities	15	Authority could provide funding to City's existing 1% for art fund.
Evidence of Agreement	15	City supports providing opportunities for community art.
Cost-Effectiveness	12	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	95	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

11. OFFSETTING MITIGATION MEASURE WGTA-OMM#2: STREETSCAPE IMPROVEMENTS (GOODYEAR, HUMBOLDT, FLOYD)

COMMUNITY: WASHINGTON/GUADALUPE, TAMIEN, AND ALMA/ALMADEN

ALTERNATIVES: 1, 2, 3

Measure Description

This improvement will consist of streetscape improvements (crosswalks, trees, and bicycle wayfinding) to Goodyear Street, Humboldt Street, and Floyd Street from Lick Avenue to Locust Street. The improvement will be designed in alignment with the City of San Jose's Better Bike Plan 2025, and its scope will be defined through a City-led planning and outreach process.

Nexus to Disproportionately High and Adverse Effects

Under Alternatives 1, 2, and 3, the project would result in disproportionate, high, and adverse effects (DHAE) on low-income populations related to visual quality. There would be residual visual impacts within the Washington, Guadalupe, Tamien, and Alma/Almaden community after the application of project mitigation and consideration of project benefits. DHAEs would be related to permanent visual effects associated with the visibility of the proposed aerial viaduct through this community. While the proposed improvement will not directly address operational visual effects resulting from the project, it will provide offsetting mitigation measures that will offset visual DHAEs in this community by providing funding for streetscape improvements.

Benefits to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment would pass along the western edge of the Washington/Guadalupe, Tamien, and Alma/Almaden community, where the percentage of minority populations and low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's minority residents and low-income residents by providing visual quality, safety, and livability improvements in the Washington/Guadalupe, Tamien, and Alma/Almaden community. The location of the proposed improvement relative to the HSR alignments adjacent to the Washington/Guadalupe, Tamien, and Alma/Almaden community is shown graphically in Figure WGTA-2.

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) was a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, residents, and business owners. The goal of SNI was to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI was funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. The Washington neighborhood is 1 of 20 neighborhoods designated for the SNI. The proposed improvement will be consistent with the

goal of the Washington Neighborhood Revitalization Plan to foster a community where residents can walk, play, and socialize safely and comfortably in the community.

The improvement also is consistent with the City of San Jose Pedestrian Master Plan goals and recommendations and the City's General Plan Major Strategy #6, which calls for streets to be designed for people, not just cars, and to support a diverse range of urban activities and functions. The improvement will be implemented consistent with San Jose's Better Bike Plan 2025.

Community Outreach Input and Relationship to DHAEs

Community input, as expressed by members of the Guadalupe/Washington Safety Committee and documented in the Washington Neighborhood Revitalization Plan, that is addressed includes the following:

- Pedestrian and bicycle safety
- Pedestrian dead zones
- Need for streetscape improvements

Because the HSR alignments cross adjacent to this community, residents of the Washington, Guadalupe, Tamien, and Alma/Almaden community would experience residual visual quality DHAEs. This improvement will provide related improvements to enhance visual quality. It will also provide general improvements in the form of improved safety, enhanced connectivity, enhanced livability, and community cohesion for residents in the Washington, Guadalupe, Tamien, and Alma/Almaden community.

Improvement Cost Estimate

New crosswalks, bicycle sharrows, bicycle signage, and trees on Goodyear Street, Humboldt Street, and Floyd Street are estimated to cost $515,000 in 2020 dollars.

These cost estimates are preliminary, as the SNI effort was done several years ago and improvements will need to be developed applying appropriate urban design guidelines from the City of San Jose, which may change the specific improvements proposed for the locations above. The improvements will be consistent with the City's Better Bike Plan 2025.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the City of San Jose for the proposed improvement. The San Jose Department of Transportation is responsible for all streetscape design, maintenance, and improvements.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	This improvement will improve aesthetics and safety directly adjacent/nearby to the HSR alignment.
Relative Number of Beneficiaries	3	This improvement will benefit all residents adjacent to the HSR alignment.
Practicable	15	Funding for this improvement is practicable, and the improvements can be constructed.
Defined Project or Action	10	The improvements are defined but will require further design.
Satisfy Authority Obligations	15	The improvement will provide safety, accessibility, and connectivity improvements in communities affected by the HSR project.
Defined Roles and Responsibilities	15	The Authority will provide funding, and City of San Jose would provide design, maintenance, and improvements.
Evidence of Agreement	15	City supports these improvements.
Cost-Effectiveness	12	Cost is somewhat low relative to estimated number of beneficiaries.
TOTAL SCORE	95	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

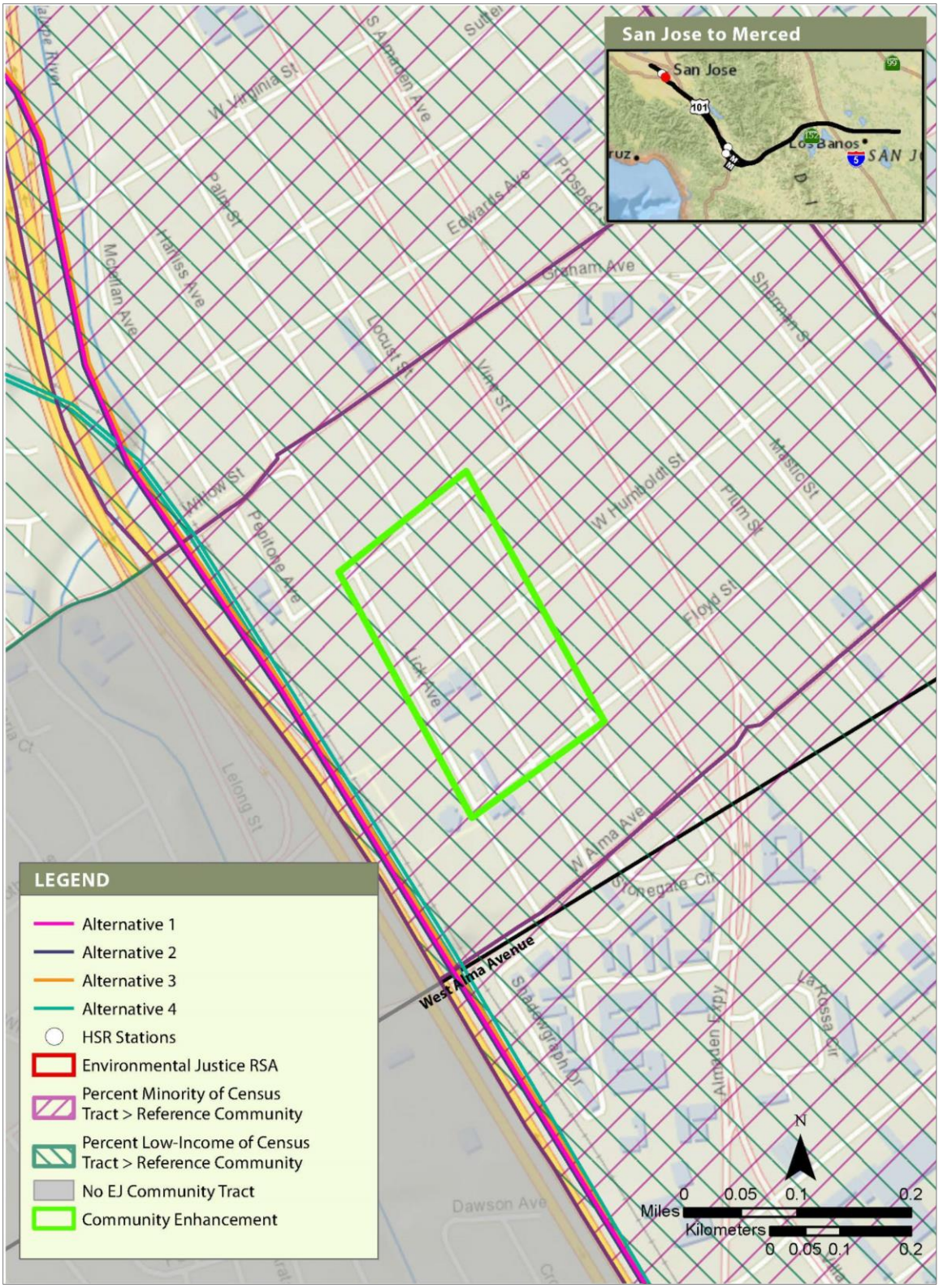


Figure WGTA-2 Streetscape Improvements (Goodyear, Humboldt, Floyd)
Washington/Guadalupe, Tamien, and Alma/Almaden

12. OFFSETTING MITIGATION MEASURE WGTA-OMM#3: NOISE TREATMENTS FOR RESIDENTIAL BUILDINGS ALONG SR 87 TO ADDRESS EXISTING NOISE

COMMUNITY: WASHINGTON/GUADALUPE, TAMIEN, AND ALMA/ALMADEN

ALTERNATIVE: 4

Measure Description

This improvement will provide funding for building insulation and window treatments for homes affected by existing freeway noise adjacent to State Route (SR) 87. The measure will consist of building and window insulation improvements for the homes along SR 87 from Interstate (I-) 280 to the Almaden Road overcrossing of SR 87.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the Washington/Guadalupe, Tamien, and Alma/Almaden community after the application of project noise barrier mitigation and consideration of project benefits. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction and will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment under all project alternatives would be adjacent to the Washington/Guadalupe, Tamien, and Alma/Almaden neighborhoods, where the percentage of minority residents and low-income residents is greater than that within the reference community. Minority populations and low-income populations are present throughout the community in the vicinity of the alignment. The proposed improvement will benefit the community's low-income community and minority community by providing noise reduction, health, and livability improvements (Figure WGTA-3).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) is a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, residents, and business owners. The goal of SNI is to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI is funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. Washington is 1 of 20 neighborhoods designated for the SNI. This neighborhood is an area of both low-income concentration and minority concentration that needs higher levels of investment to meet the needs of the community. The HSR alignment would pass along the western edge of the community.

The proposed improvement also will help achieve compliance with the indoor noise standards enforced through the City's General Plan policies.

Community Outreach Input and Relationship to DHAEs

Community input, as expressed by City of San Jose staff, that is addressed includes the following:

- Noise along I-280 and SR 87
- Increased traffic through neighborhood from cars traveling to and from downtown San Jose and SR 87

This improvement will provide for residential noise abatement adjacent to SR 87 from I-280 to the Almaden Road overcrossing of SR 87, resulting in health and livability improvements. Because the HSR alignment with Alternative 4 would travel adjacent to this community, these same residents would experience residual noise DHAEs under Alternative 4 after the application of project mitigation and consideration of project benefits.

Improvement Cost Estimate

There are approximately 59 single-family homes, 5 multifamily buildings, and 1 high-rise apartment building directly adjacent to the existing railroad alignment and SR 87 between I-280 and the Almaden Road overcrossing. Estimated costs are based on the average cost per property of the San Francisco International Airport noise abatement program (which is one of the largest in the country) of $12,632 per property for single-family homes, an assumed cost of $25,000 per multifamily building (for the side of units facing the railroad alignment only), and $75,000 for improvements to the side of the apartment building facing the railroad alignment only. Using these unit costs, the building and window insulation improvements for these homes would cost approximately $945,000.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to property owners to fund and implement this improvement and will fund the entire measure. A program implementer will need to be identified/developed to work with homeowners and building owners. The Authority will coordinate with City of San Jose regarding making homeowners aware of the program. The City would process any required encroachment and building permits needed for building upgrades.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Improvement will directly benefit minority populations and low-income populations in the community relatively close to all alternative alignments and Diridon Station and could substantially improve the indoor noise environment by reducing noise from the existing freeways.
Relative Number of Beneficiaries	3	Only the residents with noise treatments will benefit. This improvement will not benefit the entire community.
Practicable	15	Funding for this improvement is practicable. A program will need to be established to work with affected homeowners and building owners.
Defined Project or Action	10	Project is building insulation and window treatments. Exact criteria need to be developed.
Satisfy Authority Obligations	15	Improvement will provide community uplift. HSR project would result in noise effects, so there is a general nexus.
Defined Roles and Responsibilities	5	Authority will fund noise treatments. Program implementer needs to be identified. Caltrans would be consulted as needed.
Evidence of Agreement	15	City supports addressing noise.
Cost-Effectiveness	3	Cost is high relative to estimated number of beneficiaries.
TOTAL SCORE	81	

Authority = California High-Speed Rail Authority; Caltrans = California Department of Transportation; HSR = high-speed rail.

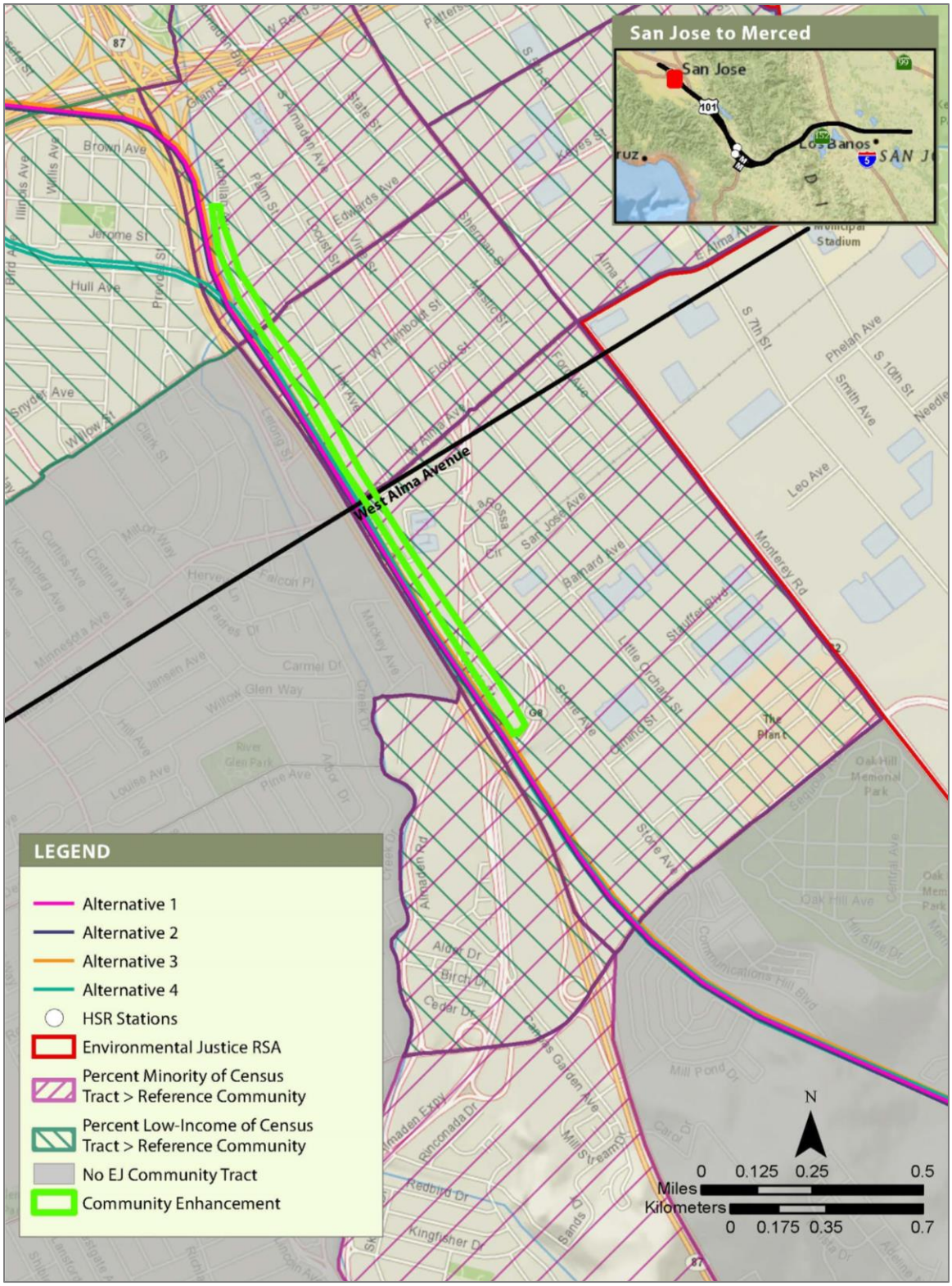


Figure WGTA-3 Noise Treatments for Residential Buildings Along SR 87 to Address Existing Noise
Washington/Guadalupe, Tamien, and Alma/Almaden

13. OFFSETTING MITIGATION MEASURE WGTA-OMM#4: ROCKETSHIP MATEO SHEEDY PUBLIC ADDRESS SYSTEM UPGRADE

COMMUNITY: WASHINGTON/GUADALUPE, TAMIEN, AND ALMA/ALMADEN

ALTERNATIVE: 4

Measure Description

The proposed improvement will include upgrade of the existing public address (PA) system within the school to help overcome disturbance from outside noise including airplane noise.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionately high and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the Washington/Guadalupe, Tamien, and Almaden/Alma community after the application of project mitigation and consideration of project benefits. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations to residences along State Route (SR) 87. The school itself would not have adverse effects due to high-speed rail (HSR) train noise. While the proposed improvement will not directly address operational noise effects resulting from the project, it will offset existing noise effects on the school (from existing freeways and airplane noise) by providing a more effective mechanism for making amplified announcements within the school.

Benefit to Minority Populations and Low-Income Populations

The HSR alignment would pass along the western edge of the Washington/Guadalupe, Tamien, and Alma/Almaden community, where the percentage of minority populations and low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's minority residents and low-income residents by providing a PA system that will enhance communication within the school facility by helping to overcome acoustical challenges related to existing external competing noise (Figure WGTA-4).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. Launched in July 2000, the Strong Neighborhoods Initiative (SNI) was a partnership between the San Jose City Council, Mayor, the Redevelopment Agency, residents, and business owners. The goal of SNI was to improve neighborhood conditions, enhance community safety, facilitate community services, and strengthen neighborhood associations. The SNI was funded through resources from the City of San Jose, San Jose Redevelopment Agency, grants, private investments, and public-private partnerships. The Washington neighborhood was 1 of 20 neighborhoods designated for the SNI.

The proposed improvement will promote a better learning environment for students and an improved teaching environment for faculty at Rocketship Mateo Sheedy Elementary School, which serves adjacent low- and moderate-income neighborhoods.

Community Outreach Input and Relationship to DHAEs

Community input, as expressed by Rocketship Mateo Sheedy Elementary School staff, that is addressed includes the following:

- Improved school experience is needed both during and after school hours.
- Concerns about noise during project construction and increased traffic noise during operation.

The project would not result in substantial noise effects on the school itself but would affect residences along the Caltrain Corridor. This improvement will improve the learning environment at the school by counteracting existing external noise. Because the HSR alignment would travel adjacent to this community under Alternative 4, residents of the Washington/Guadalupe, Tamien, and Alma/Almaden community would experience residual noise DHAEs. This improvement will provide a related improvement to address noise.

Improvement Cost Estimate

The estimated cost for a new PA system is $100,000 to $200,000.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will fund this improvement, which would be implemented by Rocketship Sheedy Mateo Elementary School.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This improvement will provide educational benefits to students and faculty.
Relative Number of Beneficiaries	6	This improvement will provide educational benefits to students and faculty from the community but not to the community as a whole.
Practicable	15	The improvements can be funded and implemented.
Defined Project or Action	10	The general character of improvements is identified but needs to be defined further.
Satisfy Authority Obligations	15	Improvement will provide benefits to students and faculty from a community adjacent to HSR alignments.
Defined Roles and Responsibilities	15	Authority will fund. Rocketship would implement.
Evidence of Agreement	15	Rocketship would accept funding.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	106	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

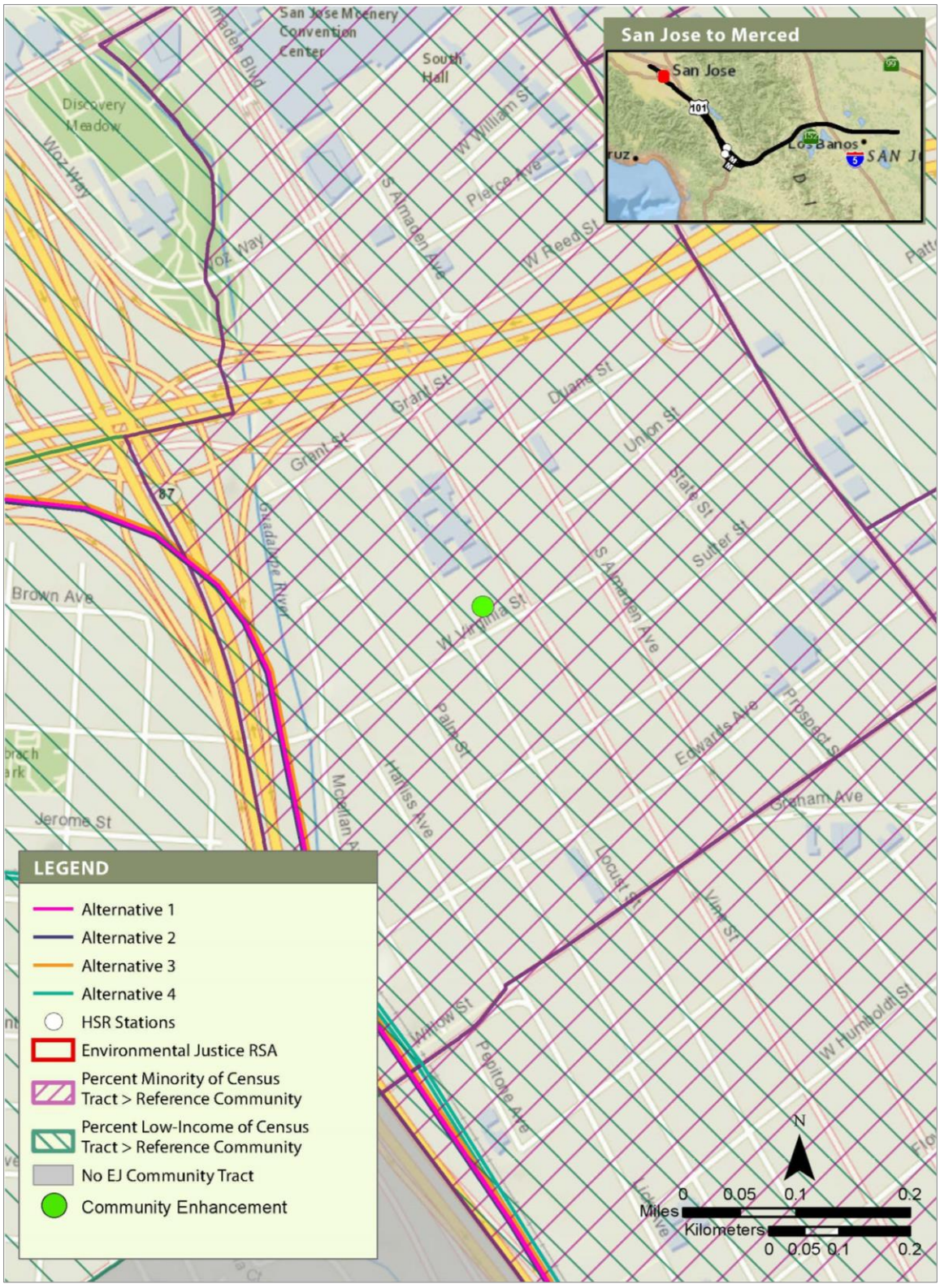


Figure WGTA-4 Rocketship Mateo Sheedy Elementary Public Address System Upgrade Washington/Guadalupe, Tamien, and Alma/Almaden

14. OFFSETTING MITIGATION MEASURE WGTA-OMM#5: TAMIEN PARK BALLFIELD NETTING

COMMUNITY: WASHINGTON/GUADALUPE, TAMIEN, AND ALMA/ALMADEN

ALTERNATIVES: 1, 2, 3, 4

Measure Description

This measure will consist of sports field ball netting along the west side of the existing park to reduce the chance of soccer balls, basketballs or other field sports balls landing in the active railroad right of way to the west of the park. This will reduce the potential for individuals to enter the railroad right of way to retrieve lost balls. The netting will be installed on the park property and not within the railroad right of way.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionately high and adverse effects (DHAE) on low-income populations related to project-generated operational noise. There would be residual severe noise impacts within the Washington/Guadalupe, Tamien, and Alma/Almaden community after the application of project mitigation and consideration of project benefits. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. Additionally, under Alternatives 1, 2, and 3, the project would result in DHAEs related to visual quality associated with the aerial alignment of the project through this community. While the proposed improvement will not directly address operational noise or aesthetics effects resulting from the project, it will address an identified community need.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment would pass along the western edge of the Washington/Guadalupe, Tamien, and Alma/Almaden community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The proposed improvement will benefit the community's minority residents and low-income residents by providing enhanced recreational opportunities, safety, and opportunities for health benefits for Tamien Park users (Figure WGTA-5).

Consistency with Community Goals and Planning

The proposed improvement is consistent with the following Tamien Specific Plan policies:

- Provide park, recreation, and trail facilities to serve the residents of the Tamien Station Area
- Identify park needs to determine how to best meet these needs

Community Outreach Input and Relationship to DHAEs

Community input, as expressed by City of San Jose Parks and Recreation staff and members of the Guadalupe/Washington Safety Committee, that is addressed includes the following:

- Need for expanded/improved parks
- Neglect
- Homelessness
- Safety

This improvement will provide for improved recreational safety for residents utilizing Tamien Park.

Improvement Cost Estimate

The improvement will include new ball netting along the multi-sports field and along the basketball courts. The length of the netting is assumed to be up to 250 feet (180 feet for the multi-sports field and 70 feet for the basketball courts) and up to 30 feet high. Net costs are assumed to be up to $3.20/linear foot for the net for an estimated cost of up to $16,000.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the City of San Jose for the proposed improvement. The City of San Jose would install and maintain the netting.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This park serves the community directly adjacent to the HSR alignment, and the improvement will increase safety for park users.
Relative Number of Beneficiaries	9	This improvement will primarily benefit those who participate in active sports at the park (like soccer, basketball, and frisbee).
Practicable	15	Funding for this improvement is practicable, as is construction.
Defined Project or Action	15	The improvement is fully defined.
Satisfy Authority Obligations	15	Improvement will provide safety and recreation benefits to a community directly along the HSR alignment.
Defined Roles and Responsibilities	15	Authority will fund. The city of San Jose would install and maintain the netting.
Evidence of Agreement	15	City agrees.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	114	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

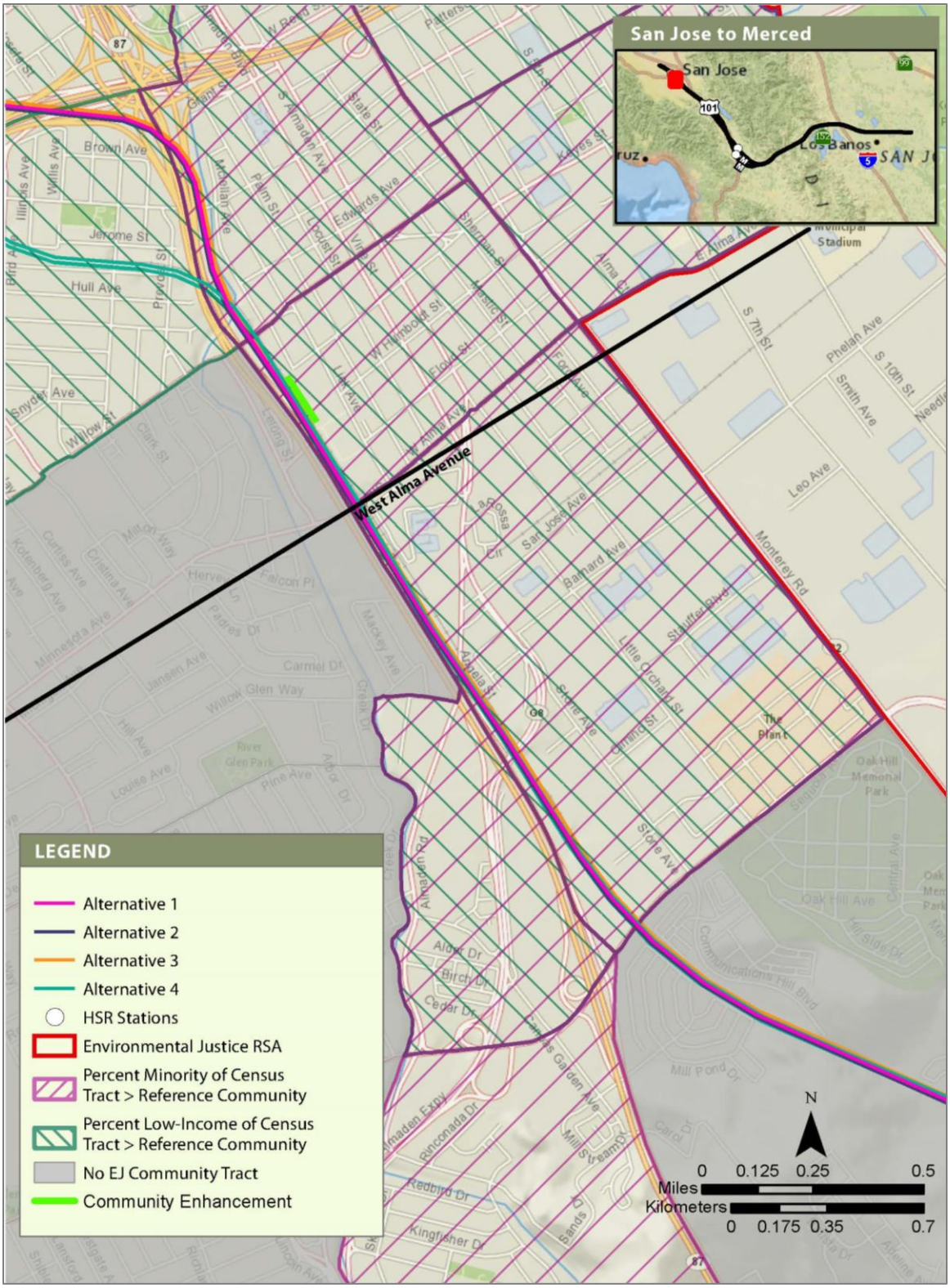


Figure WGTA-5 Tamien Park Field Netting
Washington/Guadalupe, Tamien, and Alma/Almaden

15. OFFSETTING MITIGATION MEASURE SSJ-OMM#1: MONTEREY ROAD GRAND BOULEVARD LANDSCAPING IMPROVEMENTS

COMMUNITY: SOUTH SAN JOSE

ALTERNATIVES: 1, 2, 3

Measure Description

The proposed improvement will include landscaping improvements on Monterey Road. The scope of the improvement will be clarified in consultation with the City of San Jose and will be designed consistent with the City's Complete Streets Design Standards.

Nexus to Disproportionately High and Adverse Effects

Under Alternatives 1, 2, and 3, the project would result in disproportionate, high, and adverse effects (DHAE) on minority populations and low-income populations related to the visual effects of project operation. There would be residual severe visual impacts within the South San Jose community after the application of project mitigation and consideration of project benefits. DHAEs would be related to train operation, including spillover night lighting, lighting from nighttime station operation, and areas of elevated alignments. While the proposed improvement will not directly address operational visual effects resulting from the project, it will provide a related offset representing an investment in visual quality within the community affected by the DHAEs.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment would traverse the South San Jose community, where the percentage of minority populations and low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's minority residents and low-income residents by providing aesthetic improvements. The location of the proposed improvement relative to the HSR alignment within the South San Jose community is shown in Figure SSJ-1.

Consistency with Community Goals and Planning

The proposed improvement is included in HSR's Connecting Communities Strategy for Monterey Corridor and Coyote Valley. The improvement also is consistent with the San José General Plan's vision of Monterey Road as a "Grand Boulevard" with the potential to contribute to the City's overall identity through cohesive design. As described in the General Plan, these Grand Boulevards play an important role in shaping the City's image for its residents, workers, and visitors because of their importance and location as major transportation routes, the land uses they support, and the potential to act as major urban design elements at a citywide scale. The Grand Boulevards require extra attention and improvement, including special measures within the public right-of-way, such as enhanced landscaping. Improvements will be designed and implemented consistent with the San Jose Complete Streets Design Standards and Guidelines.

Community Outreach Input and Relationship to Overall Project Effects

This improvement was included in HSR's Connecting Communities Strategy and identified as a need in the City General Plan. This improvement will provide aesthetics improvements benefitting community members utilizing Monterey Road. Because the HSR alignment would travel through

this community under Alternatives 1, 2, and 3, this community would experience the resulting residual aesthetic effects, and will benefit from this improvement.

Improvement Cost Estimate

A preliminary placeholder budget for potential landscaping improvements along Monterey Road Grand Boulevard is estimated at $4 million based on an assumed 10% of Grand Boulevard costs overall. This improvement includes planting and installation of irrigation but no ongoing maintenance costs.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding for planning studies and partial funding for implementation of proposed improvements. San Jose Department of Transportation would design, maintain, and implement improvements.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	Beneficial to minority populations and low-income populations and non-minority and low-income populations.
Relative Number of Beneficiaries	15	Beneficial to minority populations and low-income populations and non-minority and low-income populations.
Practicable	15	Improvements are expensive.
Defined Project or Action	10	Some limited design required.
Satisfy Authority Obligations	15	Helps to improve aesthetics in area of effects of aerial viaduct or elevated embankment with Alternatives 1,2 and 3.
Defined Roles and Responsibilities	15	Authority will provide funding and City will implement improvements.
Evidence of Agreement	15	Monterey Grand Blvd. is a priority for the City.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	110	

Authority = California High-Speed Rail Authority.

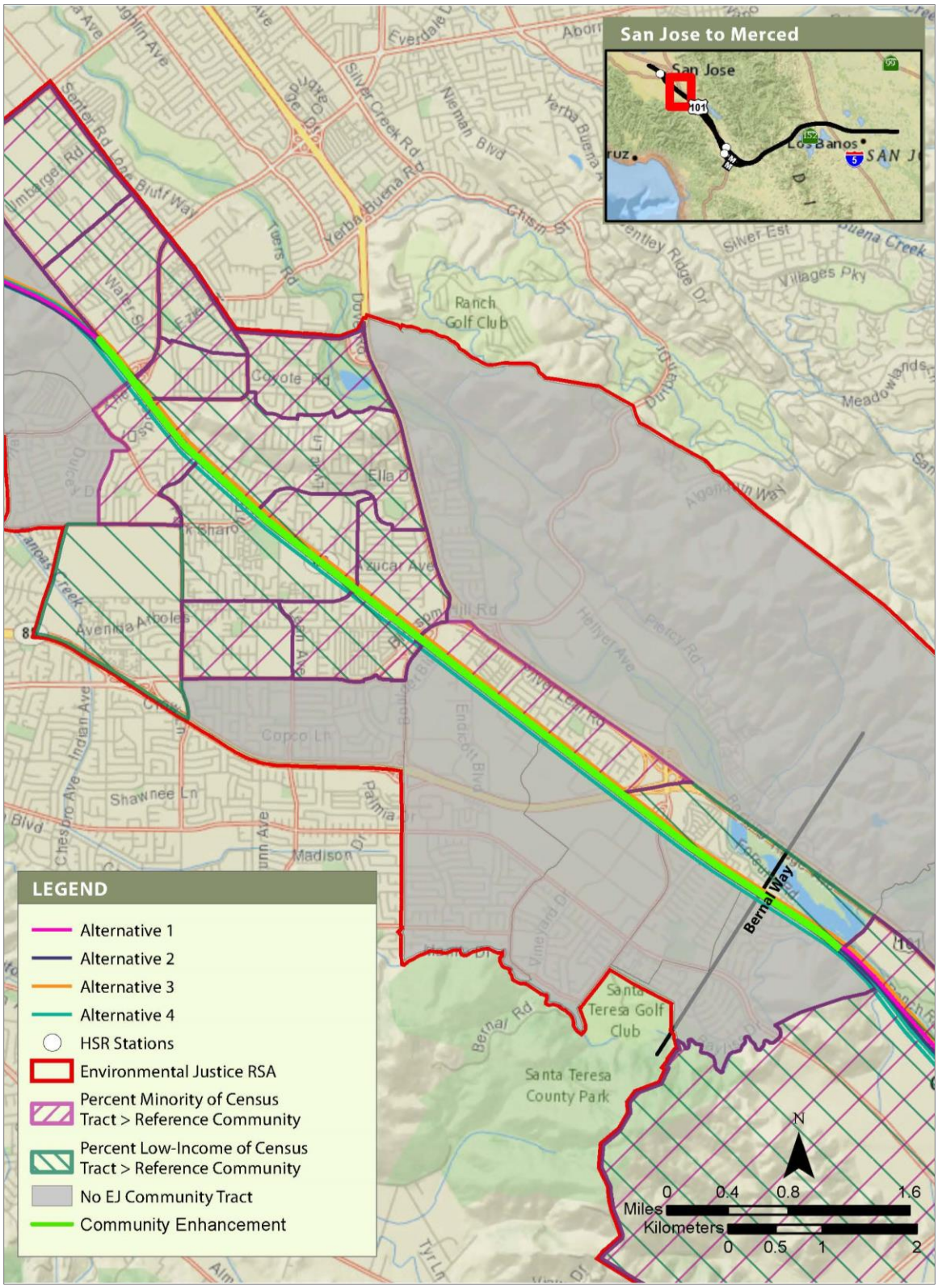


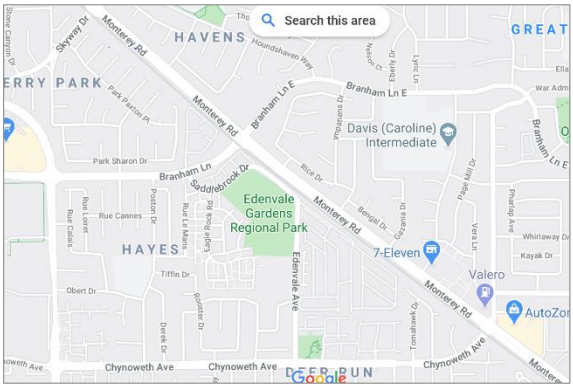
Figure SSJ-1 Monterey Road Grand Boulevard Landscaping Improvements South San Jose

16. OFFSETTING MITIGATION MEASURE SSJ-OMM#2: MONTEREY ROAD PEDESTRIAN OVERCROSSINGS AT SKYWAY, BRANHAM, AND CHYNOWETH

COMMUNITY: SOUTH SAN JOSE

ALTERNATIVE: 4

Measure Description



The proposed improvement will include pedestrian overcrossings of Monterey Road at Skyway Drive, Branham Lane, and Chynoweth Avenue. The improvement will provide an east-west connection under Alternative 4, which will improve safety for students, pedestrians, and bicyclists.

The California High-Speed Rail Authority (Authority) will provide funding for these overcrossings, and the City of San Jose would implement. The City is considering potential grade separations of the railroad crossings at these three locations. If grade separations are realized, then the underlying residual safety effect related to emergency vehicle response times will be avoided. Consequently, if the City is advancing the grade separations toward completion by the time the high-speed rail (HSR) project would become operational (nominally 2031 based on the Authority's 2020 Revised Business Plan) or within several years of commencement of HSR service between San Jose and Gilroy, then, provided there is agreement of both the Authority and the City, the Authority could instead provide the equivalent funding that would have gone to the pedestrian overcrossings to fund the grade separation project(s).

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAE) on low-income populations related to emergency vehicle response delay related to increased gate-down time at Skyway Drive, Branham Lane, and Chynoweth Avenue. Under Alternative 4, there would be residual safety effects related to emergency vehicle response times after the application of project mitigation and consideration of project benefits. DHAEs would be related to safety conditions in the South San Jose community. While the proposed improvement will not directly address emergency response delay resulting from the project, it will provide a related safety offset with a nexus to the emergency response vehicle delay DHAE in the same community where effects would occur. If the Authority provided funds to help realize grade separations, as described above, that would directly help to address emergency response delays.

Benefit to Minority Populations and/or Low-Income Populations

The HSR alignment would traverse the South San Jose community, where the percentage of minority populations and low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's low-income residents by providing traffic/transportation, safety, connectivity, and community cohesion improvements in an area where there are safety concerns related to at-grade crossings. The location of the proposed improvement relative to the location of HSR alignment within the South San Jose community is shown in Figure SSJ-2.

Consistency with Community Goals and Planning

The improvement will be consistent with the San José General Plan's vision of Monterey Road as a "Grand Boulevard" with the potential to contribute to the City's overall identity through cohesive design. As described in the General Plan, these Grand Boulevards play an important role in shaping the City's image for its residents, workers, and visitors because of their importance and location as major transportation routes, the land uses they support, and the potential to act as major urban design elements at a citywide scale. The Grand Boulevards require extra attention and improvement, including special measures within the public right-of-way, such as enhanced landscaping, additional attractive lighting, wider and comfortable sidewalks, and identification banners.

Community Outreach Input and Relationship to DHAEs

Community input, as expressed by Eastside Union High School District staff, that is addressed includes the following:

- Pedestrian safety
- Need for additional pedestrian bridges

Additionally, the City of San Jose has indicated that while it does not support at-grade crossings along the HSR project alignment, the grade separation of the entire cross streets is a superior alternative to separate pedestrian overcrossings.

This improvement will provide for enhanced safety and connectivity for residents in this area. The HSR alignment would traverse through this community under all project alternatives; however residual emergency vehicle response DHAEs after application of project mitigation and consideration of project benefits will only occur with Alternative 4. Therefore, this improvement will apply only under Alternative 4.

Improvement Cost Estimate

The three overcrossings under Alternative 4 are estimated to cost $36.4 million.

Roles and Responsibilities

The Authority will provide funding for this improvement; the City of San Jose would design, maintain, and implement the improvements. As noted above, under certain conditions, the Authority could provide this funding toward the realization of City desire to grade separate the subject crossings.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Beneficial to bicycle-riding and walking minority populations and low-income populations.
Relative Number of Beneficiaries	12	Beneficial to bicycle-riding and walking minority populations and low-income populations; this is in the middle of minority populations/low-income populations.
Practicable	15	Improvements are expensive but practicable.
Defined Project or Action	15	Design is mostly completed.
Satisfy Authority Obligations	15	Transit mobility improvements, safety, connectivity.

Defined Roles and Responsibilities	15	Authority will provide funding and Caltrain, UPRR, and the City of San Jose would collaborate on implementing improvements.
Evidence of Agreement	0	City supports pedestrian/bicycle crossings over busy roadways and railroads in general but would strongly prefer grade separations for vehicles as well.
Cost-Effectiveness	9	Cost is somewhat high relative to estimated number of beneficiaries.
TOTAL SCORE	96	

Authority = California High-Speed Rail Authority; UPRR = Union Pacific Railroad.

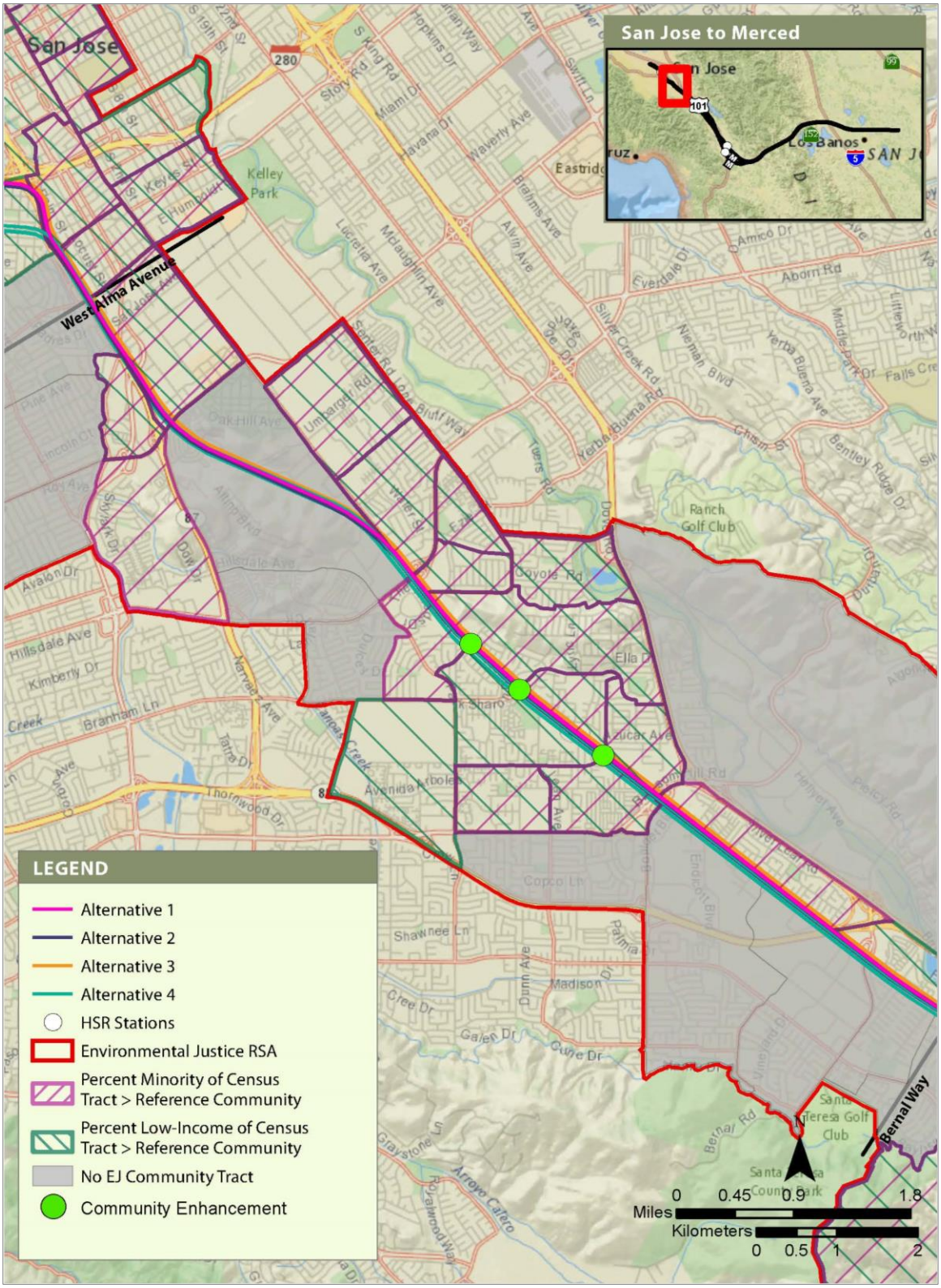


Figure SSJ-2 Monterey Road Pedestrian Overcrossings at Skyway, Branham, and Chynoweth
South San Jose

17. OFFSETTING MITIGATION MEASURE SSJ-OMM#3: NOISE TREATMENTS FOR RESIDENTIAL BUILDINGS ALONG US 101 TO ADDRESS EXISTING NOISE

COMMUNITY: SOUTH SAN JOSE

ALTERNATIVE: 4

Measure Description

Alternative 4 would result in a total of 20 severe noise impacts with noise barrier mitigation and 8 severe noise impacts with noise barrier mitigation with implementation of quiet zones (if the City of San Jose decides to implement them in South San Jose). This proposed offsetting mitigation measure will upgrade existing residential structures to improve noise attenuation along certain portions of U.S. Highway (US) 101in areas with low-income populations greater than the reference community to promote a healthier community and improve the quality of life in the neighborhood and to offset the residual severe noise impacts in the low-income areas of the community affected by Alternative 4. This measure will apply to up to 20 residential units along the west side of US 101 from Blossom Hill Road to SR 85, including the southbound exit ramp to SR 85.

Noise barriers already exist in most of these residential areas adjacent to US 101. These barriers have been built as part of roadway improvement projects for noise abatement purposes and provide acoustical shielding at outdoor use areas and at ground-level facades of buildings. Accordingly, the proposed offsetting mitigation measure will instead focus on addressing indoor noise level through retrofitting up to 20 homes with noise reduction features, including upgraded windows and insulation.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to the project's operational noise impacts after the consideration of mitigation and project benefits. Alternative 4 would extend through South San Jose where there would be up to 20 residual severe noise impacts after the application of proposed noise barrier mitigation. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction at sensitive receptors that already experience traffic noise from US 101. The improvement will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment would traverse the South San Jose community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The proposed offsetting mitigation measure will benefit the community's minority populations and low-income populations by providing health and livability improvements under Alternative 4 (Figure SSJ-3).

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following goals and policies from the *Envision San Jose 2040 General Plan:*

- Goal EC-1, Community Noise Levels and Land Use Compatibility. Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies.

- Policy H-1.1, Through the development of new housing and the preservation and rehabilitation of existing housing, facilitate the creation of economically, culturally, and demographically diverse and integrated communities.
- Policy H-3.4, Promote the conservation and rehabilitation of existing viable housing stock.
- Policy H-3.5, Prioritize housing resources to assist those groups most in need, or to those geographic locations in the City that most require investment in order to improve neighborhood blight conditions.

Community Outreach Input and Relationship to DHAEs

Noise was raised as a key concern of residents in San Jose. Community input provided by the City of San Jose indicated the need to address noise impacts.

This improvement will improve the health and quality of life for South San Jose residents in targeted areas. Because the HSR alignment would travel through South San Jose where there would be residual severe noise impacts after the application of proposed noise barrier mitigation under Alternative 4, this improvement will apply under Alternative 4.

Improvement Cost Estimate

The cost of retrofitting individual homes is based on an estimated $12,632 per single-family home and $25,000 per multifamily building. Assuming up to 20 total units, this would result in an estimated retrofit cost of $253,000 to $500,000.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to property owners to fund and implement this improvement and will fund the entire measure. A program implementer will need to be identified/developed to work with homeowners and building owners. The Authority will coordinate with the City of San Jose regarding making homeowners aware of the program. The City would process any required encroachment and building permits needed for building upgrades.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Improvement will directly benefit minority populations and low-income populations in the community relatively close to all alternative alignments and Diridon Station and could substantially improve the indoor noise environment by reducing noise from the existing freeways.
Relative Number of Beneficiaries	3	Only the residents with noise treatments will benefit. This improvement will not benefit the entire community.
Practicable	15	Funding for this improvement is practicable. A program will need to be established to work with affected homeowners and building owners.
Defined Project or Action	10	Project is building insulation and window treatments. Exact criteria need to be developed.
Satisfy Authority Obligations	15	Improvement will provide community uplift. HSR project would result in noise effects, so there is a general nexus.
Defined Roles and Responsibilities	5	Authority will fund noise treatments. Program implementer needs to be identified. Caltrans would be consulted as needed.
Evidence of Agreement	15	City supports addressing noise effects.
Cost-Effectiveness	3	Cost is high relative to estimated number of beneficiaries.
TOTAL SCORE	81	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

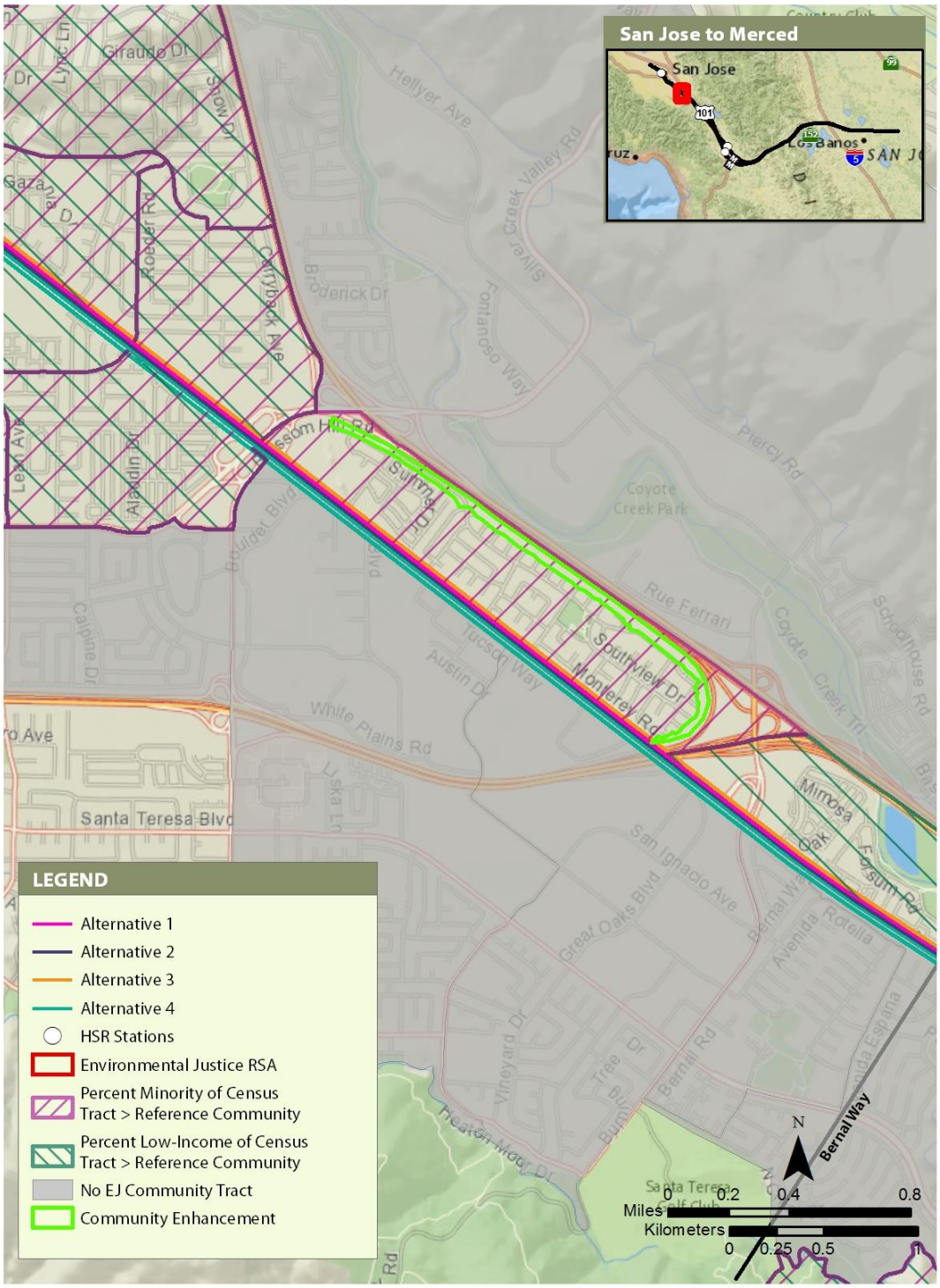


Figure SSJ-3 Noise Treatments for Residential Properties Along US 101 to Address Existing Noise, South San Jose

18. OFFSETTING MITIGATION MEASURE SSJ-OMM#4: (CAROLINE) DAVIS INTERMEDIATE SCHOOL ALL-WEATHER TURF AND TRACK

COMMUNITY: SOUTH SAN JOSE

ALTERNATIVES: 1, 2, 3, 4

Measure Description

The proposed improvement will include upgrade of an existing natural turf to an all-weather turf and all-weather track at (Caroline) Davis Intermediate School. This will ensure year-round use for students, the community, and for sporting activities. This could include light standards, goal posts, striping, seating, turf, and track. Other improvements are being constructed as Davis Intermediate serves local schools and provides after-school services as well as community recreational opportunities.

Nexus to Disproportionately High and Adverse Effects

Under Alternatives 1, 2, and 3, the project would result in disproportionately high and adverse effects (DHAE) on minority populations and low-income populations related to the visual effects of project operation. There would be residual severe visual impacts within the South San Jose community after the application of project mitigation and consideration of project benefits. DHAEs would be related to train operation, including spillover night lighting, lighting from nighttime station operation, and areas of elevated alignments. Additionally, under Alternative 4, the project would result in DHAEs on low-income populations related to emergency vehicle response delay and noise. DHAEs would be related to noise, aesthetics, and safety conditions in the South San Jose community.

While the proposed improvement will not directly address operational visual effects, operational noise, or emergency response delay resulting from the project alternatives, it will provide a benefit to minority residents and low-income residents in this community by responding to a community need for recreational opportunities in the area for students as well as the community at large.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment would traverse the South San Jose community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The proposed improvement will benefit the community's minority residents and low-income residents by providing recreation improvements to enhance community health and well-being (Figure SSJ-4). The Edenvale Roundtable community suffers from a significant lack of access to health services as well as after-school and weekend recreational centers where it is safe for students, young adults, and community members to have access to recreational activities or organized sports. Upgrades to the all-weather field and track are part of a comprehensive upgrade to the school to provide community service facilities to the community that will allow the school to program activities in the after-hours and weekends.

Consistency with Community Goals and Planning

The improvement will provide recreational improvements at Caroline Davis Intermediate School. The proposed improvement will be consistent with the following City of San José General Plan goals and policies:

- Goal PR-3 – Provide an Equitable Park System. Create a balanced park system that provides all residents access to parks, trails, open space, community centers, dog parks, skate parks, aquatics facilities, sports fields, community gardens, and other amenities.

- PR-8.7 Actively collaborate with school districts, utilities, and other public agencies to provide for appropriate recreation uses of their respective properties and rights-of-ways. Consideration should be given to cooperative efforts between these entities and the City to develop parks, pedestrian and bicycle trails, sports fields and recreation facilities.
- PR-8.8 Collaborate with the public land agencies and other appropriate jurisdictions to direct the expenditure of their funds to provide parks and other open space lands and recreation resources within, or in close proximity to, the urban population.
- PR-8.9 Work cooperatively with local school districts in identifying and evaluating surplus school sites for potential parkland acquisition.
- PR-8.10 Encourage the development of private/commercial recreation facilities that are open to the public to help meet existing and future demands (i.e., plazas, swimming pools, fitness centers and gardens).

Community Outreach Input and Relationship to DHAEs

Community input, as expressed by the Oak Grove School District Superintendent, that is addressed includes the following:

- Significant lack of access to after-school and weekend recreational centers where it is safe for students, young adults, and community to have access to recreational activities or organized sports
- Davis Intermediate serves three of the impacted elementary school communities and is also one of the schools identified for high impact.

This improvement will provide for enhanced recreational opportunities for Caroline Davis Intermediate School students and for two additional school communities, as well as additional open space for the larger community.

Improvement Cost Estimate

Upgrade of the existing natural turf field to all-weather turf field and all-weather track is estimated at $1,250,000. This will include replacing the turf and resurfacing the track.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the Oak Grove School District for the proposed improvement.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Health and wellness benefits to surrounding minority population and low-income population and community, especially schoolchildren and particularly with no COVID-19 restrictions.
Relative Number of Beneficiaries	6	Located within minority community and low-income community and serves surrounding minority communities and low-income communities.
Practicable	15	Benefit complements existing funding by recipient.

Defined Project or Action	15	Improvement is designed and will provide wraparound service for existing investments.
Satisfy Authority Obligations	15	Provides park and community space for minority population and low-income population at affected school and two additional school communities, approximately 2,000 schoolchildren.
Defined Roles and Responsibilities	15	Authority will provide funding, and Oak Grove School District would implement.
Evidence of Agreement	15	Oak Grove School District is in strong support.
Cost-Effectiveness	12	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	108	

Authority = California High-Speed Rail Authority.

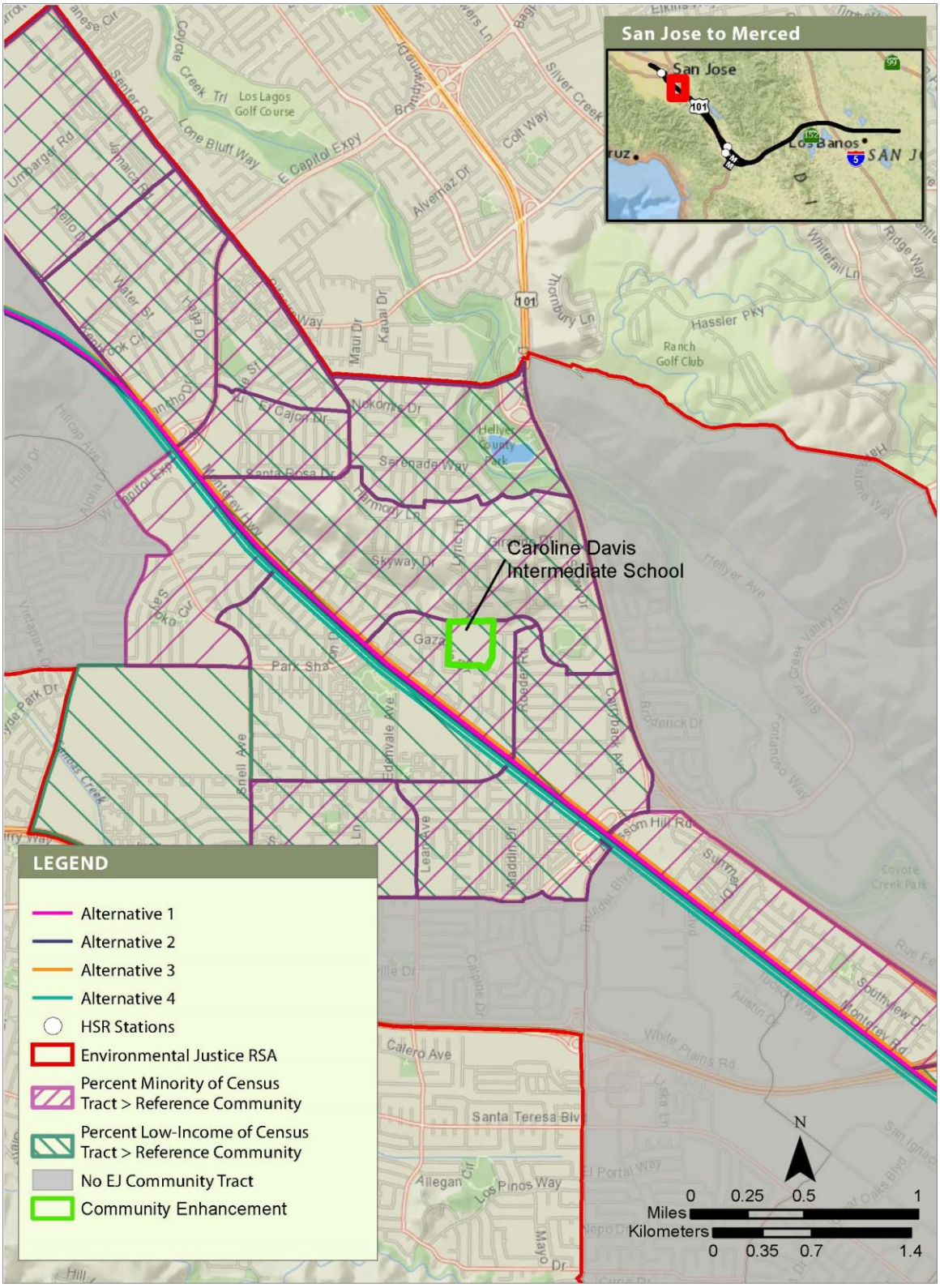


Figure SSJ-4 (Caroline) Davis Intermediate School All-Weather Turf and Track South San Jose

19. OFFSETTING MITIGATION MEASURE MH-OMM#1: PARK/TRAIL UNDER VIADUCT

COMMUNITY: MORGAN HILL

ALTERNATIVES: 1, 3

Measure Description

The proposed improvement will install bicycle trails and park/open space under the viaduct from Cochrane Road to Tennant Avenue under Alternatives 1 and 3. A bicycle trail will extend from the existing bike trail along Cochrane Road southward to the existing bike lane along Tennant Avenue. The improvement will also include a park/open space improvement along Walnut Grove Drive near Diana Avenue in the area of residential displacements with Alternatives 1 and 3. The improvement will also include landscaping along the trail.

Nexus to Disproportionately High and Adverse Effects

Alternatives 1 and 3 would result in adverse visual aesthetic effects on low-income populations related to the proposed aerial viaduct in Morgan Hill. Alternatives 1 and 3 would result in disproportionately high and adverse effects (DHAEs) relative to visual aesthetics on an end-to-end basis. While the proposed offsetting mitigation measure will not directly address the visual effects of the elevated rail alignment, it will provide indirect aesthetic benefits by creating a trail and park and will provide a sense of place for the affected neighborhoods.

Benefit to Minority Populations and Low-income Populations

The HSR alignment under Alternatives 1 and 3 would be on a viaduct through the neighborhoods along the west side of US 101, where the percentage of minority residents and low-income residents is greater than that within the reference community. The proposed improvement will provide recreation and connectivity benefits to the minority populations and low-income populations in these areas.

The project location and location of the preferred HSR alignment within the Morgan Hill community are shown graphically in Figure MH-1.

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following City of Morgan Hill policies:

- Policy CNF-12.2 Well-connected Neighborhood Centers. Provide for safe and convenient pedestrian and bicycle connections as well as transit access to support existing neighborhood centers, including shopping centers, medical offices, sports fields, and the Centennial Recreation Center.
- GOAL HC-3 Usable, complete, well-maintained, safe, and high-quality activities and amenities, including active and passive parks and recreational facilities, community gardens, and trails that are accessible to all ages, functional abilities, and socio-economic groups.
- Policy TR-8.6 Multi-Use Trail Accessibility. All multi-use bicycle/pedestrian trails shall comply with State and federal accessibility codes and standards, such as those established by the Americans with Disability Act (ADA) and California Access Code (Title 24, California Code of Regulation).

Community Input and Relationship to DHAEs

Community concerns, as expressed by City of Morgan Hill in comments about the Draft EIR/EIS, that are addressed include the following:

- "The aerial structure would remove….homes and landscaping from the streetscape, affecting highly sensitive residential viewers and diminishing the residential character of the view, reducing the visual quality…from moderate to low."
- "The City….requests design improvements and additional landscaping that would be helpful in reducing the visual effects of the aerial viaduct on this neighborhood….the [Authority]…should consider a landscaped neighborhood park that connects to City trails….consistent with the Bikeways, Trails, Parks and Recreation Master Plan for the City of Morgan Hill."

This improvement will provide for recreational opportunities and connectivity for residents in the vicinity. Because the HSR alignment is on an aerial viaduct in this area, residents in the community would have adverse aesthetic effects due to the presence of the overhead alignment.

Improvement Cost Estimate

Where Alternatives 1 and 3 are on viaduct with two columns, between Cochrane Road and Tennant Ave, the project would include property acquisition that would result in space beneath the viaduct that would be available to construct a bike trail using the right-of-way beneath the viaduct and between the two columns. There may also be possibilities to establish small "pocket" parks or landscaped open space. This improvement will include a bicycle and pedestrian trail, crosswalks, and landscaping and is estimated to cost $2 million in 2020 dollars.

Roles and Responsibilities

The Authority will provide funding. The City of Morgan Hill would design and construct the proposed improvements. Since the park/trail would be under the viaduct, the Authority and the City of Morgan Hill would need to coordinate during design to ensure that the requirements and needs of both the Authority and the City are met.

Assessment Based on Evaluation Criteria

Based on the screening criteria presented in this report, the following assessment has been completed for this improvement:

Evaluation

Criteria	Ranking 1-15	Justification
Benefit Intensity	15	This improvement will benefit the neighborhood that would be directly affected by the HSR project, particularly as there are no parks in the improvement area.
Relative Number of Beneficiaries	12	This improvement will be useable by the entire community.
Practicable	10	The improvement is conceptually practicable but requires further design.
Defined Project or Action	10	The improvement is only generally conceived; requires design.
Satisfy Authority Obligations	15	This improvement will directly benefit the residents most affected by the HSR project with Alternatives 1 and 3.
Defined Roles and Responsibilities	15	The Authority will fund this improvement. The City of Morgan Hill would implement. The Authority and the City would coordinate during design and construction to ensure that the requirements and needs of both parties are met.
Evidence of Agreement	10	The City of Morgan Hill proposed a trail and park/open space improvements under/along the viaduct between Diana Avenue and East Main Avenue in their comments on the Draft EIR/EIS.
Cost-Effectiveness	12	The cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	99	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

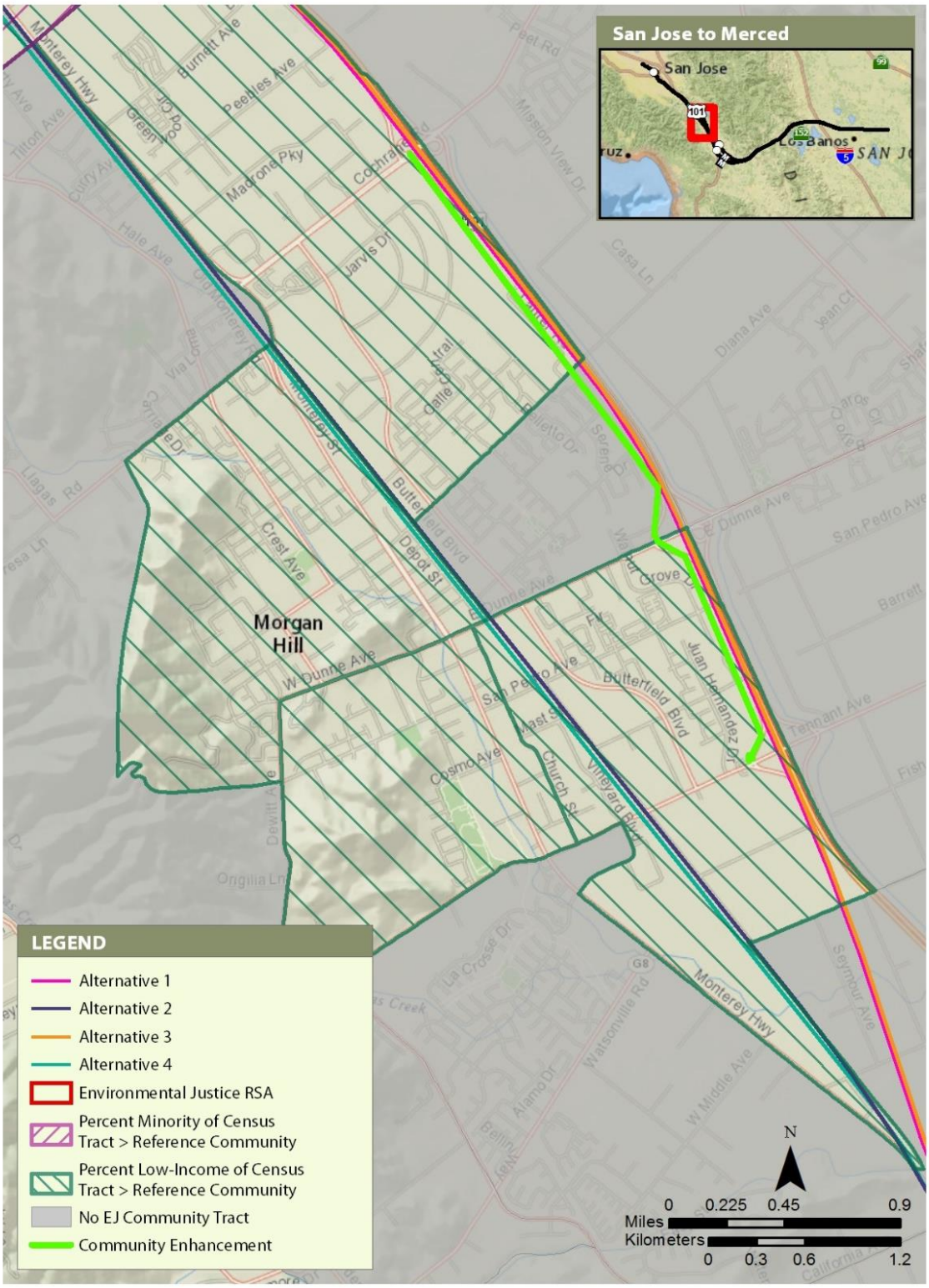


Figure MH-1 Park/Trail Under Viaduct
Morgan Hill

20. OFFSETTING MITIGATION MEASURE MH-OMM#2: RAILROAD AVENUE COMPLETE STREETS

COMMUNITY: MORGAN HILL

ALTERNATIVE: 2

Measure Description

With this improvement, Railroad Avenue will be reconstructed with complete streets improvements, landscaping, sidewalks, and curb and gutters.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 2, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to visual effects. There would be residual visual impacts within the Morgan Hill community after the application of project mitigation and consideration of project benefits. DHAEs would be related to the visual effects associated with the elevated embankment that would be constructed within this community. While the proposed improvement will not directly address visual effects resulting from the project, it will provide improvements that will offset visual DHAEs in this community by providing funding for complete streets improvements.

Benefit to Minority Populations and/or Low-income Populations

Under Alternative 2, the high-speed rail (HSR) alignment would pass through the Morgan Hill community, where the percentage of low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's low-income community by providing complete streets improvements to increase visual quality, as well as connectivity and general livability, in areas where low-income populations would be affected by the project's residual visual quality DHAEs. The location of the proposed improvement relative to the HSR alignment within the Morgan Hill community is shown graphically in Figure MH-2.

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following City of Morgan Hill policies:

- Policy CNF-12.2 Well-connected Neighborhood Centers. Provide for safe and convenient pedestrian and bicycle connections as well as transit access to support existing neighborhood centers, including shopping centers, medical offices, sports fields, and the Centennial Recreation Center.
- Policy TR-1.3 Transportation Safety. Implement strategies to ensure safe and appropriate operation of all components of the transportation system for all users, such as programs to lower crash rates and reduce the number of transportation-related injuries in the city through education, enforcement, engineering strategies, physical improvements, and operational systems. Prioritize strategies that improve safety for students, pedestrians, and bicyclists.
- Policy TR-6.A Bus Shelters from Private Development. Require developers to install bus shelters compatible with City architectural standards, where appropriate.

- Policy TR-8.6 Multi-Use Trail Accessibility. All multi-use bicycle/pedestrian trails shall comply with State and federal accessibility codes and standards, such as those established by the Americans with Disability Act (ADA) and California Access Code (Title 24, California Code of Regulation).
- Policy TR-9.3 Pedestrian System for Diverse Users. The trails and pedestrian system shall recognize and reflect the needs and abilities of pedestrians with a diverse range of age and ability.
- Policy TR-9.6 Pedestrian Facility Accessibility. All trails and pedestrian access shall comply with State and Federal accessibility codes and standards, such as those established by the Americans with Disability Act (ADA) and California Access Code (Title 24, California Code of Regulation).

Community Outreach Input and Relationship to DHAEs

This improvement will address the community need identified by City of Morgan Hill staff for complete streets, landscaping, and other improvements along, and adjacent to, the railway corridor.

This improvement will provide for visual enhancement and connectivity for pedestrians and improved livability for residents. Because the HSR alignment would run through this community, these same residents would experience residual visual quality DHAEs under Alternative 2 after the application of project mitigation and consideration of project benefits. This improvement will address community needs by providing for increased connectivity for bicycles and pedestrians, as well as enhanced visual quality.

Improvement Cost Estimate

Reconstruction of Railroad Avenue is estimated to cost $3.4 million.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the City of Morgan Hill for design and implementation of this improvement.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria presented in this appendix, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	Very beneficial to local low-income populations in this area.
Relative Number of Beneficiaries	3	Beneficial to high-density downtown low-income population.
Practicable	15	Improvements are practicable and already designed.
Defined Project or Action	10	Design is completed.
Satisfy Authority Obligations	15	Transit mobility improvements along the corridor.
Defined Roles and Responsibilities	15	Authority will provide funding, and City would implement.
Evidence of Agreement	15	Morgan Hill supports.
Cost-Effectiveness	6	Cost is high relative to estimated number of beneficiaries.
TOTAL SCORE	89	

Authority = California High-Speed Rail Authority.

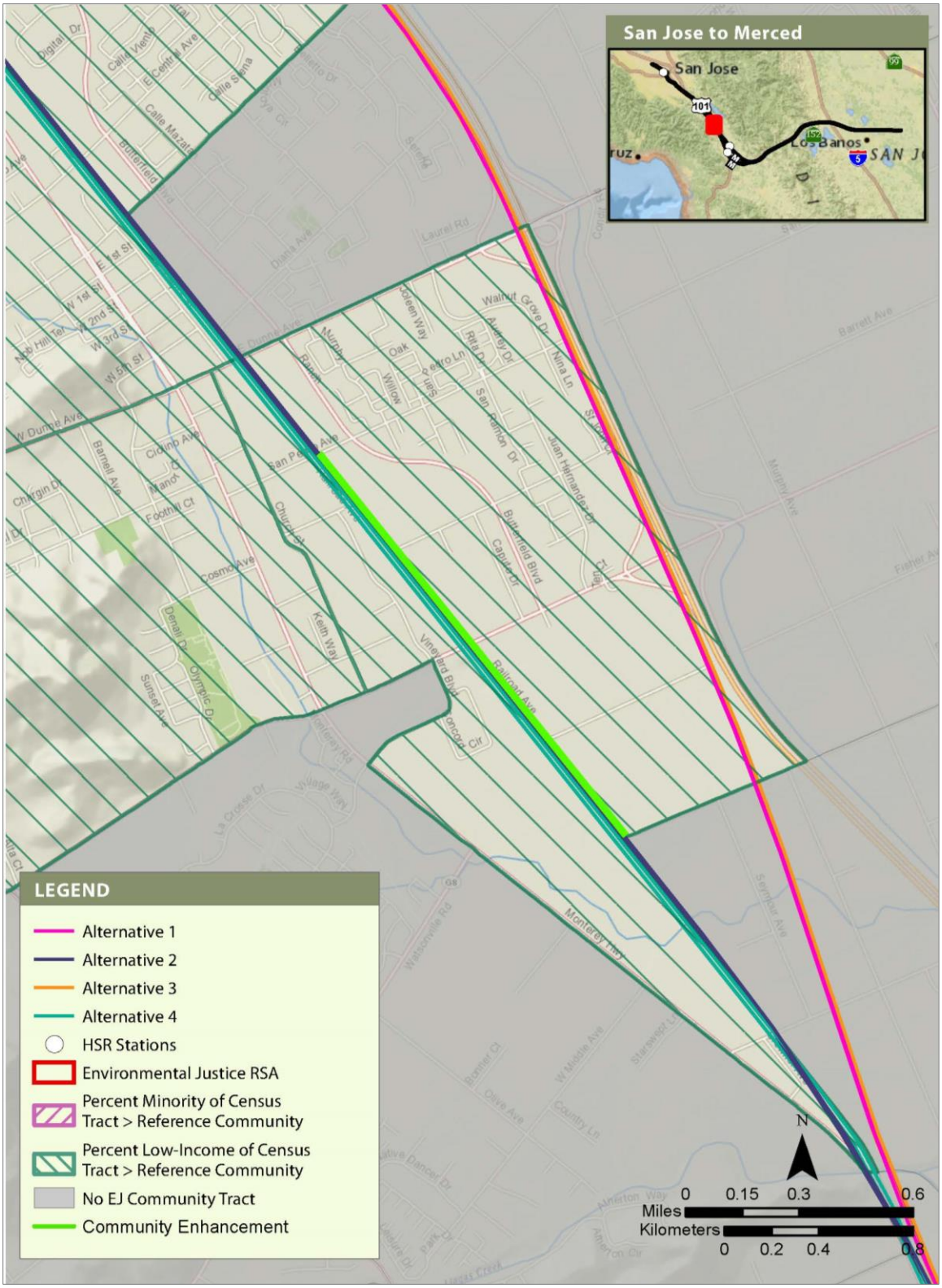


Figure MH-2 Railroad Avenue Complete Streets
Morgan Hill

21. OFFSETTING MITIGATION MEASURE MH-OMM#3: NOISE TREATMENTS FOR RESIDENTIAL BUILDINGS ALONG US 101 TO ADDRESS EXISTING NOISE

COMMUNITY: MORGAN HILL

ALTERNATIVE: 4

Measure Description

The proposed offsetting mitigation measure will upgrade existing residential structures to improve noise attenuation along US 101 to promote a healthier community and improve the quality of life in the neighborhood. Residences in Morgan Hill are adjacent to the west side of US 101 from approximately 0.35 mile north of East Main Avenue to Diana Avenue and from San Pedro Avenue to Barret Avenue. Noise barriers already exist along approximately one-third of the length of these residential areas adjacent to US 101. The proposed offsetting mitigation measure will provide resources to retrofit homes with noise reduction features, including upgraded windows and insulation.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to the project's operational noise impacts after the consideration of mitigation and project benefits. Alternative 4 would have 33 severe operational noise impacts after noise barrier mitigation alone. With noise barrier mitigation and quiet zone implementation, then Alternative 4 would not have severe operational noise impacts, but quiet zones can only be implemented by local jurisdictions, so are not guaranteed. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction at sensitive receptors that already experience traffic noise from US 101. The improvement will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and/or Low-Income Populations

The HSR alignment would traverse the Morgan Hill community, where the percentage of low-income population is greater than that within the reference community. The proposed offsetting mitigation measure will benefit the community's minority populations and low-income populations by providing health and livability improvements under Alternative 4 (Figure MH-3).

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following goals and policies from the *Morgan Hill 2035 General Plan:*

- Goal SSI-8, Prevention of noise from interfering with human activities or causing health problems.
- Goal SSI-9, Protection from noise associated with motor vehicles and railroad activity.
- Goal HE-2, Preservation and rehabilitation of the existing housing supply.

Community Outreach Input and Relationship to DHAEs

Community input provided by the City of Morgan Hill expressed concern about project noise effects.

This improvement will improve the health and quality of life for Morgan Hill residents in targeted areas. Because the HSR alignment would travel through Morgan Hill where there would be residual severe noise impacts after the application of proposed noise barrier mitigation under Alternative 4, this improvement will apply under Alternative 4.

Improvement Cost Estimate

The preliminary cost estimate is based on the lesser cost of implementation of one of these two options:

- Cost of retrofitting the first single-family or multifamily residences along the west side of US 101 in the areas noted above. The cost of retrofitting individual homes is based on an estimated $12,500 per single-family home and $25,000 per multifamily building. Based on aerial photography, there are an estimated 44 single-family homes in the areas noted above, which would result in an estimated retrofit cost of $550,000 to $1.1 million.
- Sound walls along US 101 where residences are present adjacent to the west side of the freeway in the areas noted above. The cost of sound walls is based on a unit cost of $70 per square foot (from the Final EIR/EIS, Volume 2, Appendix 3.4-B), assumed sound wall height of 14 feet, and an estimated 3,635 linear feet of sound walls—for a total cost of $3.6 million.

Based on these estimates, retrofitting individual homes would be more cost-effective than constructing sound walls and sound walls are not included in this measure.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to property owners to fund and implement this improvement and will fund the entire measure. A program implementer will need to be identified/developed to work with homeowners and building owners. The Authority will coordinate with the City of Morgan Hill regarding making homeowners aware of the program. The City would process any required encroachment and building permits needed for building upgrades.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Improvement will directly benefit minority populations and low-income populations in the community relatively close to all alternative alignments and Diridon Station and could substantially improve the indoor noise environment by reducing noise from the existing freeways.
Relative Number of Beneficiaries	3	Only the residents with noise treatments will benefit. This improvement will not benefit the entire community.
Practicable	15	Funding for this improvement is practicable. A program will need to be established to work with affected homeowners and building owners.
Defined Project or Action	10	Project is building insulation and window treatments. Exact criteria need to be developed.
Satisfy Authority Obligations	15	Improvement will provide community uplift. HSR project would result in noise effects, so there is a general nexus.
Defined Roles and Responsibilities	5	Authority will fund noise treatments. Program implementer needs to be identified. Caltrans would be consulted as needed.
Evidence of Agreement	15	City supports addressing noise effects
Cost-Effectiveness	3	Cost is high relative to estimated number of beneficiaries.
TOTAL SCORE	81	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

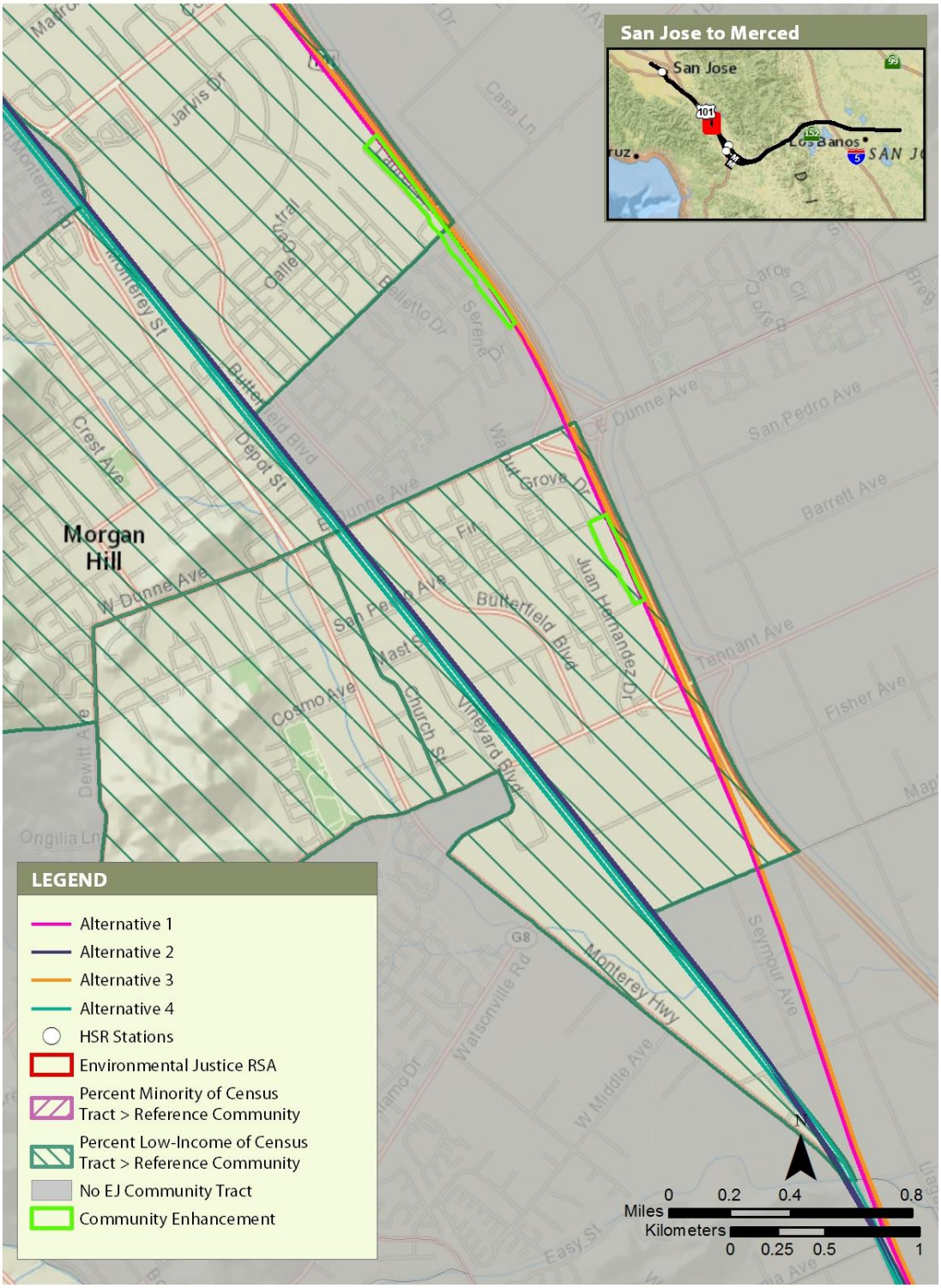


Figure MH-3 Noise Treatments for Residential Properties Along US 101 to Address Existing Noise, Morgan Hill

22. OFFSETTING MITIGATION MEASURE MH-OMM#4: MASTER PLAN DESIGN: CALTRAIN STATION ACCESS AND UNDERPASS

COMMUNITY: MORGAN HILL

ALTERNATIVES: 2, 4

Measure Description

The proposed improvement will be the California High-Speed Rail Authority (Authority) funding of the 30 percent design for a Master Plan for Caltrain Station and Access in Morgan Hill. This improvement will help the City, Caltrain, and Santa Clara Valley Transportation Authority (VTA) advance planning for access.

Nexus to Disproportionately High and Adverse Effects

Under Alternatives 2 and 4, the project would not result in disproportionately high and adverse effects (DHAE) on minority populations or low-income populations related to operational railroad safety, transit access, community connectivity, or community cohesion within Morgan Hill. While there would be some effect on emergency vehicle access response times in the southern part of the City along Middle Avenue, the affected area is not disproportionately minority or low-income.

Thus, this improvement is not being proposed due to a direct connection to a DHAE in Morgan Hill. Instead, based on the City's identification that the Authority funding of this Master Plan design will help to offset the project's general effects, the Authority has identified this as a general improvement.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment would pass through downtown Morgan Hill with Alternatives 2 and 4, where the percentage of low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's low-income residents by providing funding for Master Plan design of improved access and a pedestrian undercrossing at the Caltrain Station. The location of the proposed improvement, relative to the location of HSR alignment within the Morgan Hill community, is shown in Figure MH-4.

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the Morgan Hill Station Area Plan. The plan provides that transportation, planning, and design tools presented throughout the Station Area Master Plan are intended to build upon and update the Multi-Modal Circulation and Streetscapes chapters contained within the Downtown Specific Plan and support officials, transit providers, Morgan Hill residents, businesses, and property owners, as well as other stakeholders making decisions to improve and enhance the quality of the multimodal transportation environment throughout the Priority Development Area and downtown. All tools and recommendations are supplemental to already adopted plans, policies, and initiatives applicable in the area, including the Morgan Hill 2035 General Plan, the 2009 Downtown Specific Plan, the 2008 Bikeways Master Plan, the Downtown Placemaking Strategy, and the City of Morgan Hill's Street Standards.

Community Outreach Input and Relationship to DHAEs

The City of Morgan Hill requested this funding support from the Authority during September 2021 outreach concerning environmental justice. Access improvements, if advanced by the City, Caltrain, and/or VTA, would provide for enhanced safety, connectivity, and livability for pedestrians and bicyclists using the Morgan Hill Caltrain Station. However, as noted above, the project does not result in safety, connectivity, or transit access effects due to operations, so this improvement is a general improvement and not related narrowly to a specific DHAE.

Improvement Cost Estimate

This improvement only included funding for the Master Plan 30 percent design and does not include further design or construction costs. The 30 percent design is estimated to cost $500,000 based on other similar improvements. This improvement does not include Authority funding for improvements that may be identified in the Master Plan.

Roles and Responsibilities

The Authority will provide funding to the City of Morgan Hill for the 30 percent design of the Master Plan.

Assessment Based on Selection Criteria

Based on the screening criteria, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	Beneficial to low-income populations using the train station.
Relative Number of Beneficiaries	9	Beneficial to low-income populations north of Butterfield.
Practicable	15	Improvements are practicable and included in a plan.
Defined Project or Action	15	General character of design study understood.
Satisfy Authority Obligations	15	Transit mobility improvements.
Defined Roles and Responsibilities	15	Authority will provide funding, and Morgan Hill would implement (likely in coordination with Caltrain and VTA).
Evidence of Agreement	15	Morgan Hill is in strong support.
Cost-Effectiveness	12	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	106	

Authority = California High-Speed Rail Authority; VTA = Santa Clara Valley Transportation Authority.

Figure MH-4 Master Plan Design (30%) for Caltrain Station Access and Pedestrian Underpass
Morgan Hill

23. OFFSETTING MITIGATION MEASURE MH-OMM#5: SCHOOL BUS ROUTE STUDY

COMMUNITY: MORGAN HILL

ALTERNATIVE: 4

Measure Description

This measure includes Authority funding of a study to be prepared to evaluate and recommend potential enhancements to Morgan Hill Unified School District's (MHUSD) bus routes. The study will focus on the effects of the institution of at-grade high-speed rail (HSR) service through the City of Morgan Hill. Using the locations of MHUSD's students and school sites, the current route structure will be reviewed and assessed. Alternative route structures and service patterns will be developed and tested to assess if modifications could be made that would reduce the effects (delay) of additional gate-down time on bus service. As part of the study, the local community, stakeholders, and school officials will be engaged so their input can be heard and incorporated into the work.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionately high and adverse effects (DHAE) on low-income populations related to the project's operational noise impacts after the consideration of mitigation and project benefits. With noise barrier mitigation and quiet zone implementation, then Alternative 4 would not have severe operational noise impacts, but quiet zones can only be implemented by local jurisdictions, so are not guaranteed.

While the proposed improvement will not directly address visual or noise effects resulting from Alternative 4, it will address a general community need to enhance school bus service and could help minimize potential delays to school bus transit times resulting from gate-down times associated with project operation.

Benefit to Minority Populations and Low-Income Populations

Under Alternative 4, the HSR alignment would pass through the Morgan Hill community, where the percentage of low-income populations is greater than that within the reference community. The proposed improvement will benefit the community's minority residents and low-income residents by potentially supporting the development of improved safety and circulation for school buses crossing the rail corridor (Figure MH-5).

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following City of Morgan Hill policies:

- Policy TR-7.3. Rail Crossings. The City recognizes that rail crossings are essential to provide connections from neighborhoods to destinations such as schools, parks, and services. The convenience of rail crossings shall be balanced with the need to minimize safety and circulation impacts.

Community Outreach Input and Relationship to DHAEs

This improvement will address the community need identified by MHUSD for a study of school bus routes in the district to improve the safety of rail crossings. While this improvement will not directly address a DHAE, it will address the potential for bus delay and study ways to increase safety for students and bus drivers.

Improvement Cost Estimate

The cost for preparation of the study would be approximately $60,000, which is sufficient to study the catchment area for the Morgan Hill low-income community area. This improvement does not include any funding for additional buses, bus operation, or infrastructure improvements.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the MHUSD to conduct a bus route study for the Morgan Hill low-income community area. Implementation of any recommendations included in the study would be the responsibility of the school district.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	10	Beneficial to low-income student population attending Ann Sobrato Elementary School.
Relative Number of Beneficiaries	15	Beneficial to students of Ann Sobrato Elementary School.
Practicable	15	The study can be completed.
Defined Project or Action	15	Design of the study is straightforward.
Satisfy Authority Obligations	15	Transit mobility improvements; only a study.
Defined Roles and Responsibilities	15	Authority will provide funding directly to the school district to design and implement the study.
Evidence of Agreement	15	MHUSD supports the study.
Cost-Effectiveness	15	Cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	115	

Authority = California High-Speed Rail Authority; MHUSD = Morgan Hill Unified School District.

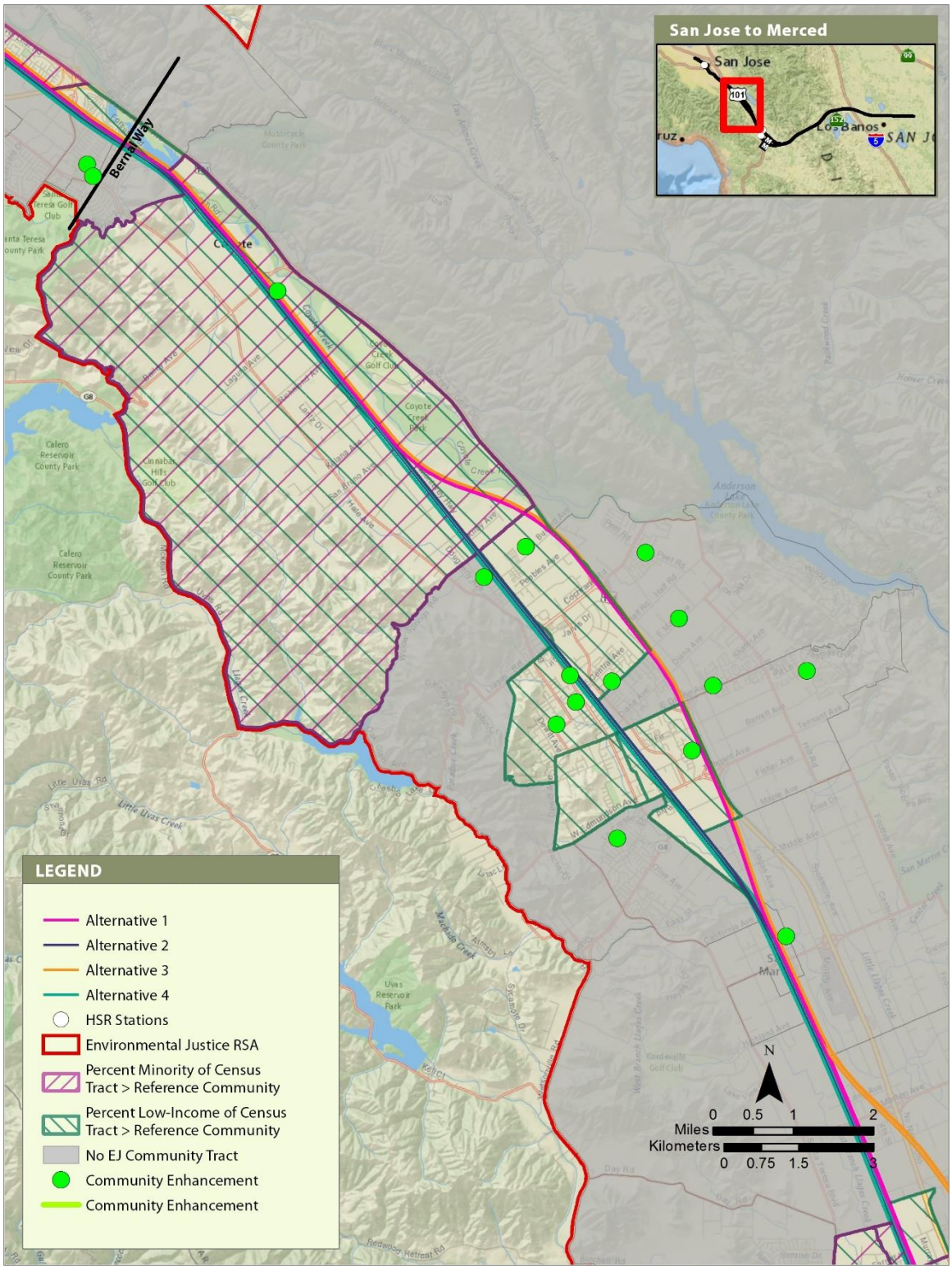


Figure MH-5 School Bus Route Study
Morgan Hill

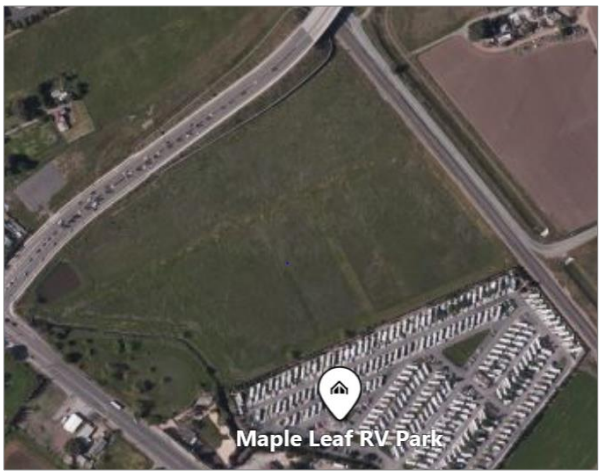
24. OFFSETTING MITIGATION MEASURE MH-OMM#6: NEW PARK SOUTH OF BUTTERFIELD BOULEVARD

COMMUNITY: MORGAN HILL

ALTERNATIVE: 2

Measure Description

The proposed improvement will involve conversion of an existing vacant property into a public park. The 8-acre property, which is bounded by Butterfield Boulevard to the north and Railroad Avenue to the east, is located north of, and adjacent to, the Maple Leaf Recreational Vehicle Park. This community-planned park includes a baseball field, an open sports turf area, a walking path, multigenerational fitness equipment, picnic areas, a community room, and bicycle pump tracks.



Nexus to Disproportionately High and Adverse Effects

Under Alternative 2, the project would result in disproportionately high and adverse effects (DHAEs) on low-income populations related to visual effects. There would be residual visual impacts within the Morgan Hill community after the application of project mitigation and consideration of project benefits. DHAEs would be related to the visual effects associated with the elevated embankment that would be constructed within this community. While the proposed improvement will not directly address visual effects resulting from the project, it will provide offsetting benefits that will offset visual DHAEs in this community by providing funding for a new park, which will improve the visual quality of this existing vacant lot and provide needed additional recreational amenities for community use.

Benefit to Minority Populations and Low-Income Populations

Under Alternative 2, the high-speed rail (HSR) alignment would pass through the Morgan Hill community, where the percentage of low-income individuals is greater than that within the reference community.

The proposed improvement will benefit the community's low-income residents by providing additional recreational opportunities, health benefits, and improved visual quality and livability (Figure MH-6). The park will be on a public transportation route, Bus Route 68, which will allow surrounding local low-income communities to travel there.

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following Morgan Hill General Plan goal:

- GOAL HC-3 Usable, complete, well-maintained, safe, and high-quality activities and amenities, including active and passive parks and recreational facilities, community gardens, and trails that are accessible to all ages, functional abilities, and socio-economic groups.

Community Outreach Input and Relationship to DHAEs

Community input, as expressed by City of Morgan Hill staff, that is addressed includes the following:

- Need for additional park space

This improvement will provide for increased recreational opportunities, health benefits, and enhanced visual quality and livability for Morgan Hill residents. Because the HSR alignment would run through this community, these same residents would experience residual visual quality DHAEs under Alternative 2 after the application of project mitigation and consideration of project benefits. This improvement will address community needs by providing additional park space, as well as enhanced visual quality.

Improvement Cost Estimate

Southwest of Butterfield Boulevard and Railroad Avenue is an approximately 8-acre undeveloped property that could include development of a new community planned park. Improvements to this site include a baseball field, an open sports turf area, a walking path, multigenerational fitness equipment, picnic areas, a community room, and bicycle pump tracks for $10 million. The site has already been acquired. The improvement is eligible for State Park grant funding, as well as grants from Santa Clara Valley Open Space Authority, Santa Clara County Park, and Valley Water Grant funding. It is also eligible for city park impact funds.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the City of Morgan Hill for design and implementation of this improvement.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Very beneficial to multigenerational low-income populations.
Relative Number of Beneficiaries	12	Beneficial to the local RV park and other local low-income populations.
Practicable	15	Improvements are practicable, as the project has been approved for construction.
Defined Project or Action	15	Design has been approved for construction.
Satisfy Authority Obligations	15	Recreation improvements near rail is not safety or connectivity.
Defined Roles and Responsibilities	15	Authority will provide funding, and City would implement.
Evidence of Agreement	15	Morgan Hill has completed permits, approvals, and a community process.
Cost-Effectiveness	9	Cost is somewhat high relative to estimated number of beneficiaries.
TOTAL SCORE	111	

Authority = California High-Speed Rail Authority; RV = recreational vehicle.

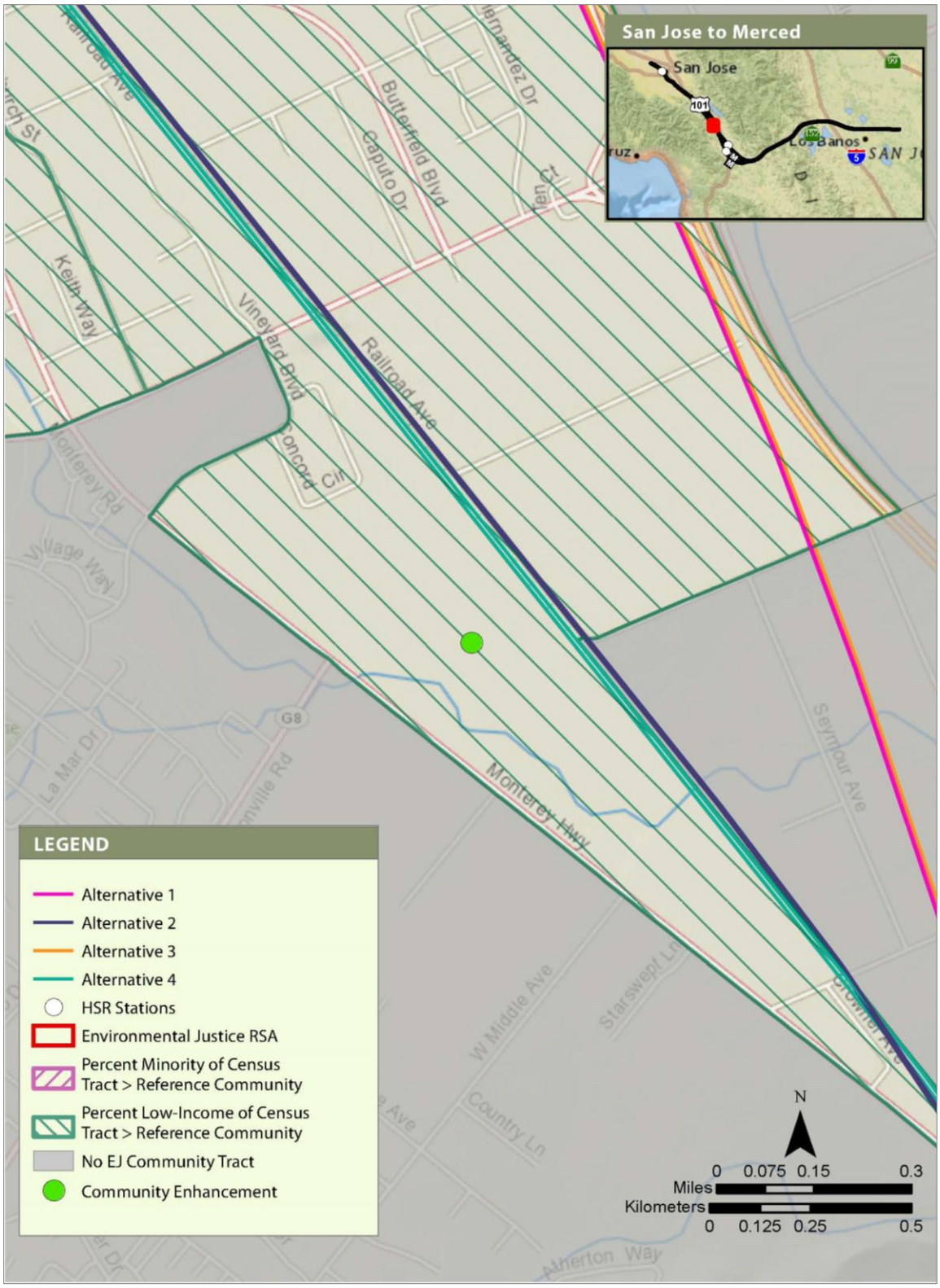


Figure MH-6 Purchase New Park South of Butterfield Boulevard Morgan Hill

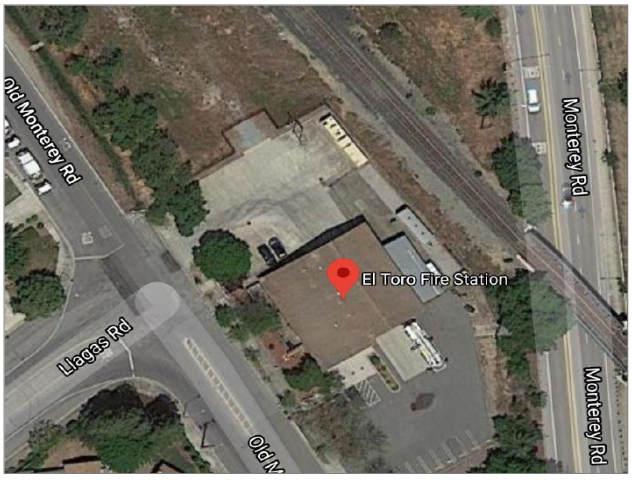
25. OFFSETTING MITIGATION MEASURE MH-OMM#7: NEW PARK NORTH OF EL TORO FIRE STATION

COMMUNITY: MORGAN HILL

ALTERNATIVE: 2

Measure Description

This measure will include the Authority providing funding for the open space to the north of El Toro Fire Station to be repurposed as a new park including landscaping improvements.



Nexus to Disproportionately High and Adverse Effects

Under Alternative 2, the project would result in disproportionately high and adverse effects (DHAEs) on low-income populations related to visual effects. There would be residual visual impacts within the Morgan Hill community after the application of project mitigation and consideration of project benefits. DHAEs would be related to the visual effects associated with the elevated embankment that would be constructed within this community. While the proposed improvement will not directly address visual effects resulting from the project, it will provide offsetting mitigation measures that will offset visual DHAEs in this community by providing funding for a new park, which will improve the visual quality of this existing vacant lot and provide needed additional recreational amenities for community use.

Benefit to Minority Populations and Low-Income Populations

Under Alternative 2, the high-speed rail (HSR) alignment would pass through the Morgan Hill community, where the percentage of low-income populations is greater than that within the reference community.

The proposed improvement will benefit the community's minority residents and low-income residents by providing enhanced recreational opportunities and visual improvements (Figure MH-7).

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following Morgan Hill General Plan goal:

- GOAL HC-3 Usable, complete, well-maintained, safe, and high-quality activities and amenities, including active and passive parks and recreational facilities, community gardens, and trails that are accessible to all ages, functional abilities, and socio-economic groups.

The site is not identified in the City's Parks Master Plan.

Community Outreach Input and Relationship to DHAEs

This improvement addresses community needs expressed by the Santa Clara County Parks and Recreation Department and the City of Morgan Hill for additional park space and the desire of the County to find partners to fill gaps in the park system. This improvement will provide for increased recreational opportunities, health benefits, and enhanced visual quality and livability for Morgan Hill residents. Because the HSR alignment would run through this community, these same residents would experience residual visual quality DHAEs under Alternative 2 after the application of project mitigation and consideration of project benefits. This improvement will address community needs by providing additional park space, as well as enhanced visual quality.

Improvement Cost Estimate

Conversion of the area to a park space is estimated to cost $1.8 million based on other similar size park spaces and passive uses, such as picnic tables and shade structures.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding to the City of Morgan Hill for design and implementation of this improvement.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Beneficial to low-income residential populations looking for park space.
Relative Number of Beneficiaries	3	The site is not in a low-income area but is low-income adjacent and likely would draw from the south low-income population; low-income populations to the east would need to cross the railroad tracks.
Practicable	5	The site is relatively small for community needs.
Defined Project or Action	10	Design is simple and not require much effort.
Satisfy Authority Obligations	10	Recreation improvements, not safety or connectivity.
Defined Roles and Responsibilities	15	Authority will provide funding, and City would implement.
Evidence of Agreement	15	Morgan Hill recommended this measure in their comments on the Draft EIR/EIS
Cost-Effectiveness	9	Cost is somewhat high relative to estimated number of beneficiaries.
TOTAL SCORE	82	

Authority = California High-Speed Rail Authority; EIR = environmental impact report; EIS = environmental impact statement.

Figure MH-7 New Park North of El Toro Fire Station
Morgan Hill

26. OFFSETTING MITIGATION MEASURE G-OMM#1: SIDEWALK AND CURB IMPROVEMENTS

COMMUNITY: GILROY

ALTERNATIVE: 4

Measure Description

The proposed offsetting mitigation measure will improve sidewalks and curb ramps throughout the City of Gilroy in accordance with the results of the upcoming Citywide Sidewalk Condition Assessment Project. Currently, there are several sidewalks throughout the City that have gaps in the pedestrian network, damaged sidewalks, and curb ramps that are not compliant with current Americans with Disability Act (ADA) standards. The offsetting mitigation measure will make such improvements to the sidewalks and curb ramps identified in the assessment to improve pedestrian circulation and safety throughout the City.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to emergency vehicle response delay. Under Alternative 4, there would be residual safety effects related to emergency vehicle response times that would affect several locations with low-income populations after the application of project mitigation and consideration of project benefits. DHAEs would be related to safety conditions in Gilroy under Alternative 4. While the proposed improvement will not directly address emergency response delay resulting from the project, it will provide a related safety offset with a nexus to the emergency response vehicle delay DHAE in the same community where effects would occur.

Benefit to Minority Populations and Low-Income Populations

The HSR alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The offsetting mitigation measure will benefit the City's minority communities and low-income communities under Alternative 4 by providing safety, connectivity, and community cohesion improvements (Figure G-1).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. A Neighborhood Revitalization Strategy Area (NRSA) is an area targeted for revitalization by improvements funded through the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The proposed Sidewalk and Curb Improvement Project is located within the City of Gilroy's NRSA, an area of both minority concentration and low-income concentration that needs higher levels of investment to meet the needs of the community. The proposed offsetting mitigation measure will be consistent with the following *Gilroy 2040 General Plan* goals and policies:

Policy 12.02, System Function and Neighborhood Protection: Ensure that the existing and proposed highways, streets, bikeways and pedestrian paths serve the functions they are intended to serve, while protecting the character of residential neighborhoods.

- Goal 14, Bicycle and Pedestrian Circulation: Bicycling and walking as significant transportation modes, promoting personal health and recreational enjoyment while minimizing energy consumption and environmental degradation.
  - Policy 14.03, Bicycle and Pedestrian Paths and Facilities: Correct deficiencies, expand existing facilities, and provide for the design of safer, convenient and attractive bicycle and pedestrian facilities whenever possible. Proposed roadways will be planned to accommodate bicycle traffic in accordance with the bikeway designations set forth in the City's Bicycle Transportation Plan. Similarly, greenbelts, linear parks, public easements and drainages reserved in public open space will be planned to accommodate bike and pedestrian traffic if they are so designed in the Bicycle Transportation plan.

In addition, the proposed offsetting mitigation measure will be consistent with the Gilroy City Council goal of ensuring that neighborhoods benefit equally from City services.

Community Outreach Input and Relationship to DHAEs

Community outreach input from the City of Gilroy indicated the need for sidewalk and curb ramp improvements to enhance safety, connectivity, and community cohesion for Gilroy residents. The proposed offsetting mitigation measure will provide benefits to students at nearby schools by providing improved pedestrian connectivity to schools, downtown Gilroy, and the HSR station area.

This offsetting mitigation measure will provide improvements that will construct new sidewalks and repair existing sidewalks to close gaps in the pedestrian network and upgrade and/or construct curb ramps in compliance with ADA standards. Because the HSR alignment would travel through the developed areas of Gilroy (including downtown) under Alternative 4, and the community would experience residual safety effects, this offsetting mitigation measure will apply to Alternative 4.

Improvement Cost Estimate

The proposed project would cost approximately $500,000, including design and construction costs, construction management and inspection, as well as contingencies.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. The City of Gilroy could partner with the California High-Speed Authority (Authority) to implement this project and seek to combine CDBG funds with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This offsetting mitigation measure will enhance safety and quality of life in Gilroy neighborhoods generally.
Relative Number of Beneficiaries	12	This offsetting mitigation measure will benefit multiple neighborhoods.
Practicable	15	This offsetting mitigation measure can be funded and constructed.
Defined Project or Action	15	The City has defined the improvements; the locations are to be determined.
Satisfy Authority Obligations	15	This offsetting mitigation measure will provide safety, accessibility, and quality of life benefits to neighborhoods directly and indirectly affected by the HSR project.
Defined Roles and Responsibilities	15	The Authority will contribute funding. The City of Gilroy would implement and maintain the project.
Evidence of Agreement	15	The community improvement is a priority for the City.
Cost-Effectiveness	15	The cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	117	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

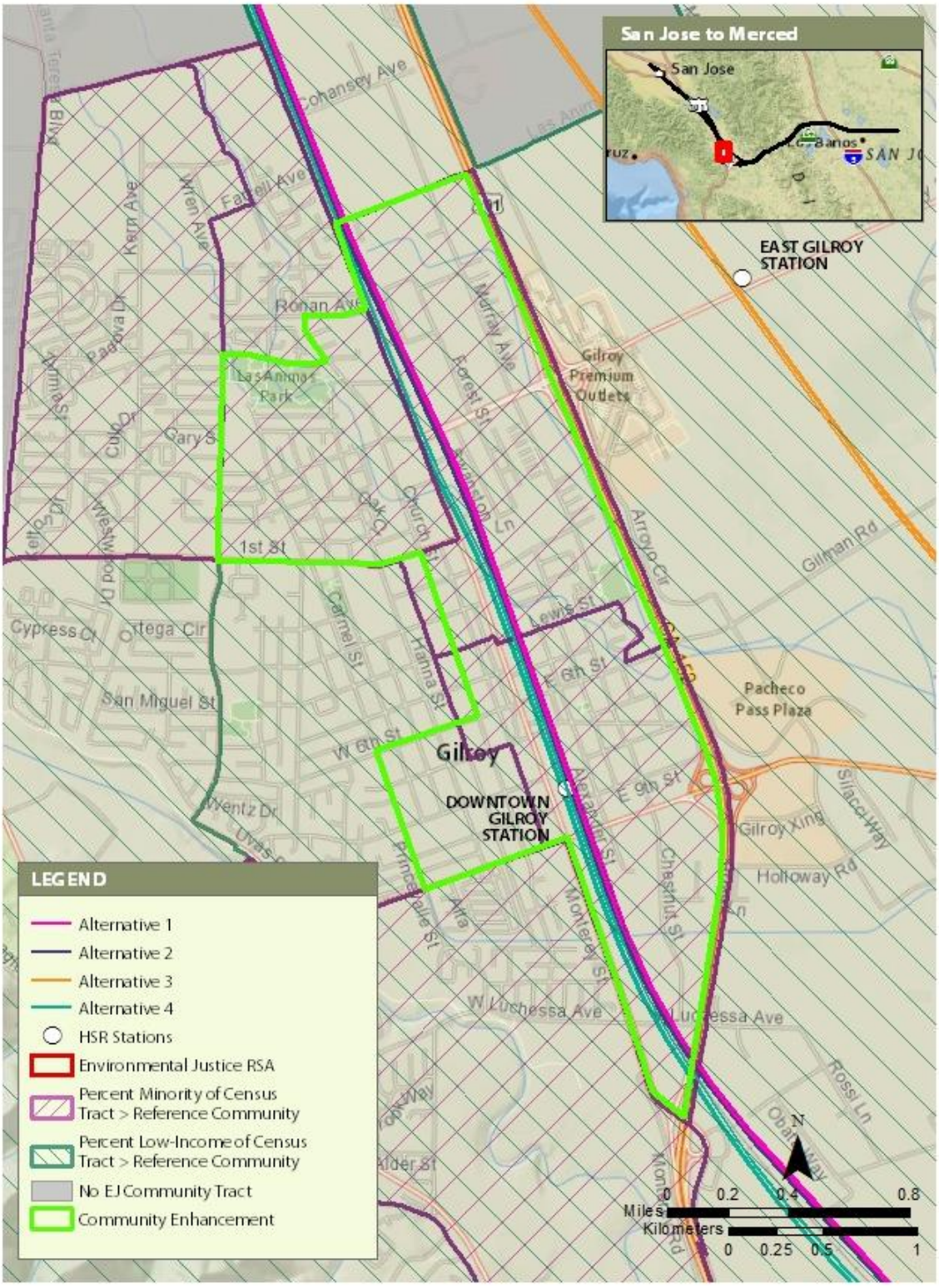


Figure G-1 Sidewalk and Curb Improvement Area Gilroy

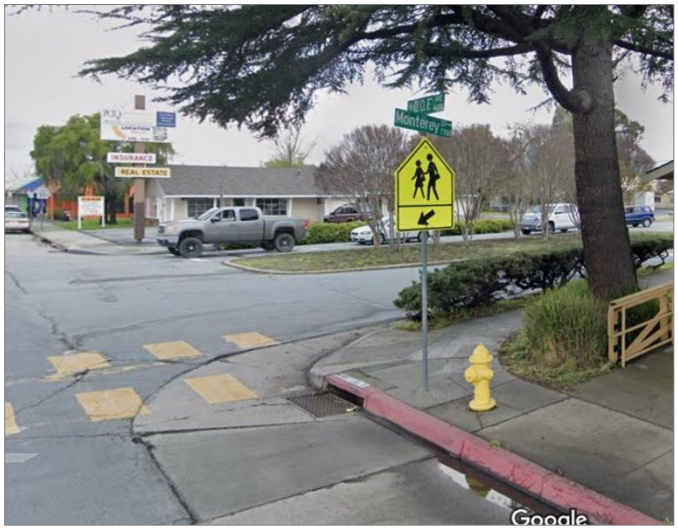
27. OFFSETTING MITIGATION MEASURE G-OMM#2: BIKEWAY IMPROVEMENTS (IOOF AVENUE, MONTEREY ROAD, 6TH STREET, 4TH STREET, AND ALEXANDER STREET)

COMMUNITY: GILROY

ALTERNATIVE: 4

Measure Description

This improvement will include bikeway enhancements to five roads within the City of Gilroy (IOOF Avenue, Monterey Road, 6th Street, 4th Street, and Alexander Street) in accordance with the *Gilroy Station Area Plan* and the City of Gilroy's *Bicycle/Pedestrian Transportation Plan* as follows:



- IOOF Avenue: Class II bike lanes along IOOF Avenue between Monterey Road and Murray Avenue.
- Monterey Road: Class II bike lanes between the northern Gilroy City limit and 3rd Street.
- 6th Street: Additional bicycle markings between Chestnut Street and Camino Arroyo.
- 4th Street: A bike boulevard along 4th Street between Monterey Road and Miller Avenue.
- Alexander Street: Bike lanes between Lewis Street and Chestnut Street.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to emergency vehicle response delay, as there would be residual safety effects that would affect several locations with low-income populations after the application of project mitigation and consideration of project benefits. DHAEs would be related to safety conditions in Gilroy under Alternative 4. While the proposed improvement will not directly address emergency response delay resulting from the project, it will provide a related safety offset with a nexus to the emergency response vehicle delay DHAE in the same community where effects would occur.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community.

The proposed improvement under Alternative 4 will benefit the minority residents and low-income residents by providing infrastructure improvements that will enhance safety for pedestrians and bicyclists through five of the City's roads. The improvement also will provide health benefits and improve circulation and cohesion throughout the area.

The location of the proposed improvement relative to the HSR alignment within the Gilroy community is shown graphically in Figure G-2.

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. A Neighborhood Revitalization Strategy Area (NRSA) is an area targeted for revitalization by improvements funded through the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The proposed improvements along the five roads are located within, or would cross through, the City's NRSA, an area of both minority concentration and low-income concentration that needs higher levels of investment to meet the needs of the community. The proposed improvement will be consistent with the following goals and policies from the *Gilroy 2040 General Plan*:

- Goal 14, Bicycle and Pedestrian Circulation: Bicycling and walking as significant transportation modes, promoting personal health and recreational enjoyment while minimizing energy consumption and environmental degradation.
  - Policy 14.03, Bicycle and Pedestrian Paths and Facilities: Correct deficiencies, expand existing facilities, and provide for the design of safer, convenient and attractive bicycle and pedestrian facilities whenever possible. Proposed roadways will be planned to accommodate bicycle traffic in accordance with the bikeway designations set forth in the City's Bicycle Transportation Plan. Similarly, greenbelts, linear parks, public easements and drainages reserved in public open space will be planned to accommodate bike and pedestrian traffic if they are so designed in the Bicycle Transportation plan.

In addition, the proposed improvement is also consistent with the following goals of the City's *Bicycle/Pedestrian Transportation Plan*:

1: Improve bicycle circulation

2: Increase use of bicycling for short- and long-range trips, and in turn reduce the use of motor vehicles.

3: Design the streets and roads to be "bicycle friendly" to equally accommodate both motorized and non-motorized modes of transportation.

Furthermore, the proposed improvement will be consistent with the improvements laid out in the *Gilroy Station Area Plan*, and with the Bicycle/Pedestrian Transportation Plan's goal of building a downtown network that encourages biking and walking.

Community Outreach Input and Relationship to DHAEs

This improvement incorporates community input provided through the City's Connecting Communities Strategy and the Bicycle/Pedestrian Transportation Plan regarding the need for improved bicycle and pedestrian circulation and facilities.

This improvement will provide bicycle facility improvements resulting in enhanced safety, community cohesion, health, and connectivity for Gilroy residents. Because the HSR alignment would travel through developed areas of Gilroy (including downtown Gilroy), and the community would experience residual safety effects under Alternative 4, this offsetting mitigation measure will apply under Alternative 4.

Improvement Cost Estimate

Bicycle improvements on IOOF Avenue, Monterey Road, 6th Street, 4th Street, and Alexander Street are estimated to cost $550,000.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. The City of Gilroy could partner with the California High-Speed Rial Authority (Authority) in funding this project and could seek to combine CDBG funds with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This improvement will help provide bicycling connections throughout the City of Gilroy, including for minority populations and low-income populations.
Relative Number of Beneficiaries	12	This improvement will help bicyclists in Gilroy, but not all residents utilize bicycles.
Practicable	15	This improvement could be funded and built.
Defined Project or Action	10	The general nature of the bikeway improvements is understood; further design is necessary.
Satisfy Authority Obligations	15	This improvement will provide connections and enhance safety in the community affected by the HSR project.
Defined Roles and Responsibilities	15	The Authority will provide funding; the City of Gilroy would implement the improvements.
Evidence of Agreement	15	The City is in support of the improvement's intent.
Cost-Effectiveness	15	The cost is low relative to estimated number of beneficiaries
TOTAL COST	112	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

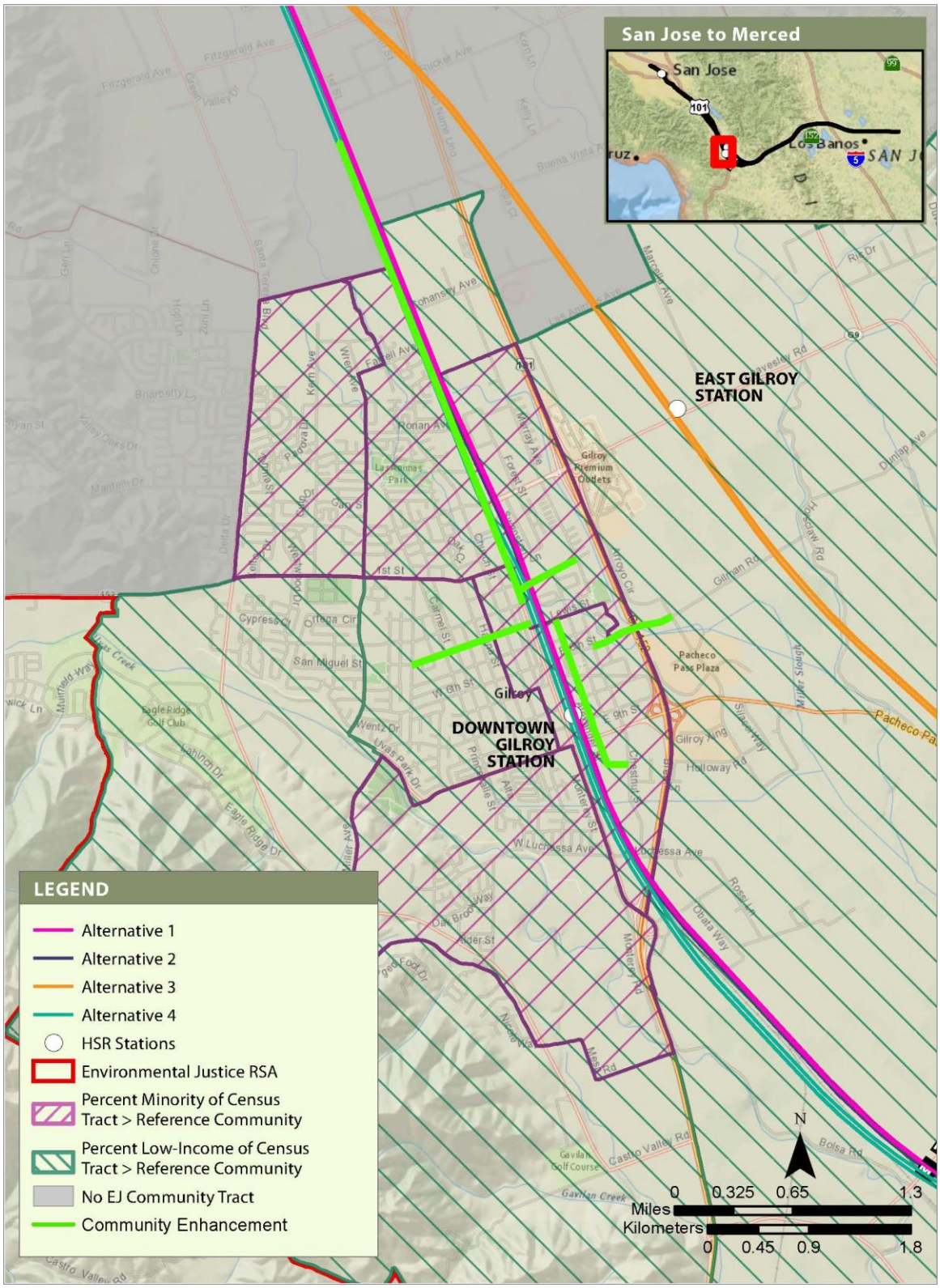


Figure G-2 Bikeway Improvements (IOOF Avenue, Monterey Road, 6th Street, 4th Street, and Alexander Street) Gilroy

28. OFFSETTING MITIGATION MEASURE G-OMM#3: NEIGHBORHOOD STREET LIGHTING

COMMUNITY: GILROY

ALTERNATIVE: 4

Measure Description

The proposed offsetting mitigation measure will install new streetlights in areas where the streetlights do not currently meet the City of Gilroy's minimum standards for streetlight spacing. The measure will provide much-needed safety and quality of life improvements.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to emergency vehicle response delay. Under Alternative 4, there would be residual safety effects associated with emergency vehicle response delay that would affect several locations with low-income populations after the application of project mitigation and consideration of project benefits. DHAEs would be related to safety conditions in Gilroy under Alternative 4. While the proposed improvement will not directly address emergency response delay resulting from the project, it will provide a related safety offset with a nexus to the emergency response vehicle delay DHAE in the same community where effects would occur.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The offsetting mitigation measure will benefit the community's minority residents and low-income residents by implementing safety and quality of life improvements (Figure G-3).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. A Neighborhood Revitalization Strategy Area (NRSA) is an area targeted for revitalization by improvements funded through the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The proposed Neighborhood Street Lighting Project is located within the City of Gilroy's NRSA, an area of both low-income concentration and minority concentration that needs higher levels of investment to meet the needs of the community. The proposed offsetting mitigation measure is consistent with the following policy from the *Gilroy 2040 General Plan*:

- Policy 3.27, Downtown Pedestrian Environment: Encourage and/or undertake design improvements in the Downtown area to create a safe, convenient, and pleasant pedestrian environment. Improvement—on an area-wide or project-specific basis—might include pedestrian-oriented amenities such as lighting, wider sidewalks, clearly marked pedestrian crossings, benches, landscaping, signage, and sidewalk seating areas. Design and manage

roadway and pedestrian facilities to reduce conflicts between automobiles, pedestrians, and bicyclists.

In addition, the proposed offsetting mitigation measure is consistent with the Gilroy City Council goal of ensuring that neighborhoods benefit equally from City services.

Community Outreach Input and Relationship to DHAEs

Community outreach input provided by the City of Gilroy indicated a need for new streetlights in areas of the City where streetlights do not meet the City's minimum standards. This neighborhood currently has inadequate lighting and is on the east side of the railroad right-of-way, which would be further separated from the downtown commercial and residential areas with implementation of the preferred project alignment.

This offsetting mitigation measure will provide improved safety and quality of life for Gilroy residents in targeted areas. Because the HSR alignment would travel through developed areas of Gilroy (including downtown Gilroy), and the community would experience residual safety effects under Alternative 4, this offsetting mitigation measure will apply under Alternative 4.

Improvement Cost Estimate

The cost of the neighborhood streetlighting project is approximately $250,000, including the design and construction costs, as well as construction management and inspection, and contingencies.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. The City of Gilroy could partner with the California High-Speed Rail Authority (Authority) to implement this project and could seek to combine CDBG funds with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This offsetting mitigation measure will enhance safety and quality of life in Gilroy neighborhoods generally.
Relative Number of Beneficiaries	12	Benefits will apply to neighborhoods generally.
Practicable	15	This offsetting mitigation measure can be funded and constructed.
Defined Project or Action	10	The City has defined the improvements; the locations are to be determined.
Satisfy Authority Obligations	15	The offsetting mitigation measure will provide safety, aesthetics, and quality of life benefits to neighborhoods directly and indirectly affected by the HSR project.
Defined Roles and Responsibilities	15	The Authority will provide funding. The City of Gilroy would implement.
Evidence of Agreement	15	The community improvement is a priority for the City.
Cost-Effectiveness	15	The cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	112	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

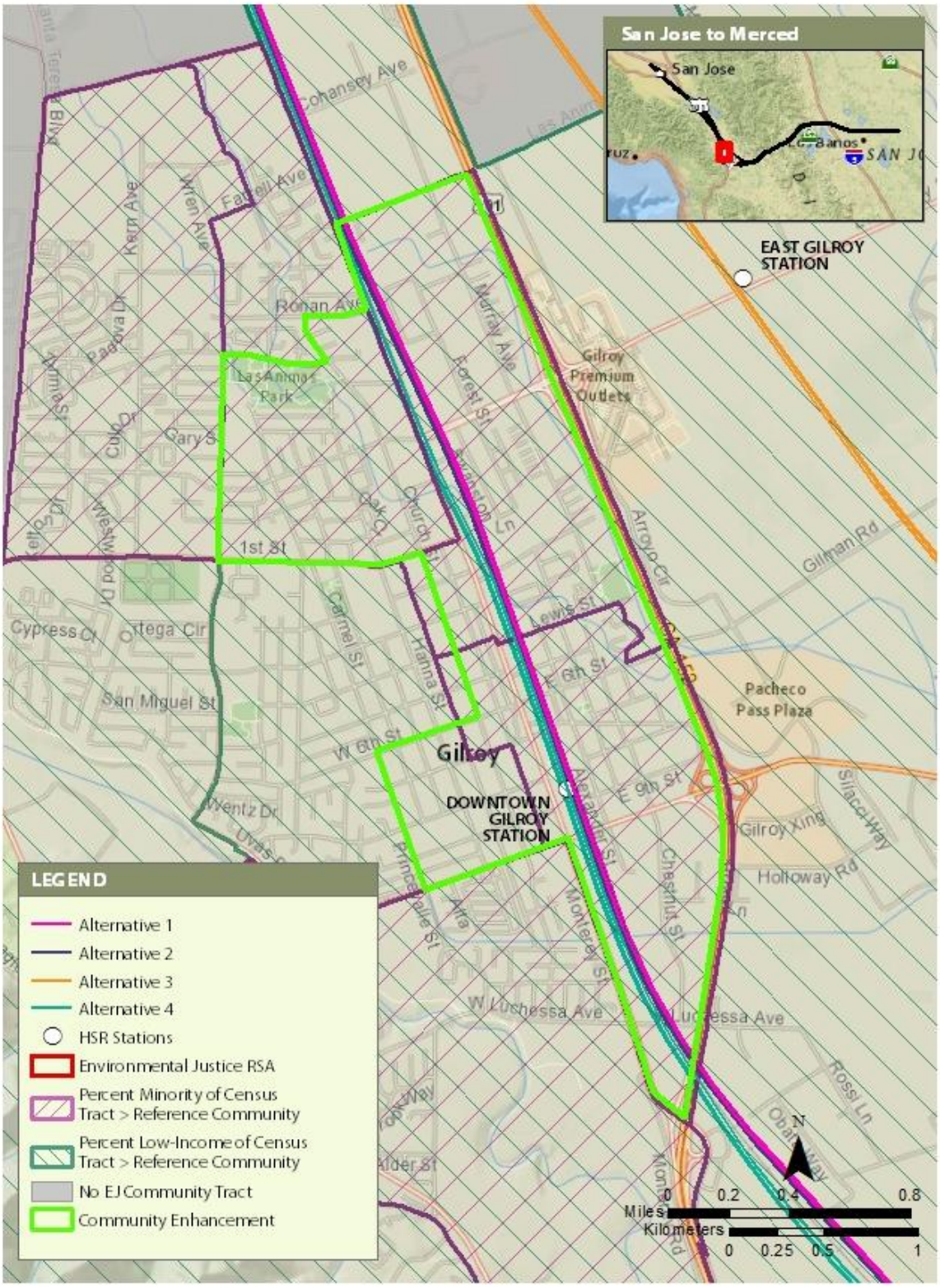


Figure G-3 Neighborhood Street Lighting Improvement Area

29. OFFSETTING MITIGATION MEASURE G-OMM#4: MURRAY AVENUE SIDEWALK GAP CLOSURE PROJECT

COMMUNITY: GILROY

ALTERNATIVE: 4

Measure Description

The proposed offsetting mitigation measure will construct approximately 2,000 linear feet of sidewalk on the west side of Murray Avenue between Kishimura Drive and Leavesley Road. The measure will promote the safety of residents and businesses on this segment of road by completing the pedestrian network and providing continuous pedestrian access.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to emergency vehicle response delay. Under Alternative 4, there would be residual safety effects related to emergency vehicle response times that would affect several locations with low-income populations after the application of project mitigation and consideration of project benefits. DHAEs would be related to safety conditions in Gilroy under Alternative 4. While the proposed improvement will not directly address emergency response delay resulting from the project, it will provide a related safety offset with a nexus to the emergency response vehicle delay DHAE in the same community where effects would occur.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The Murray Avenue Sidewalk Gap Closure Project will benefit the community's minority populations and low-income populations by providing safety, connectivity, community cohesion, and accessibility improvements. The location of the proposed offsetting mitigation measure relative to the HSR alignment within the Gilroy community is shown graphically in Figure G-4.

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. A Neighborhood Revitalization Strategy Area (NRSA) is an area targeted for revitalization by improvements funded through the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The proposed Murray Avenue Sidewalk Gap Closure Project is located within the City of Gilroy's NRSA, an area of both minority concentration and low-income concentration that needs higher levels of investment to meet the needs of the community. The purpose of this project is to provide safety improvements on a specific segment of Murray Avenue within the City of Gilroy to enhance pedestrian safety and accessibility. Additionally, the proposed offsetting mitigation measure is consistent with the following *Gilroy 2040 General Plan* goals and policies:

- Goal 14, Bicycle and Pedestrian Circulation: Bicycling and walking as significant transportation modes, promoting personal health and recreational enjoyment while minimizing energy consumption and environmental degradation.
  - Policy 14.03, Bicycle and Pedestrian Paths and Facilities: Correct deficiencies, expand existing facilities, and provide for the design of safer, convenient and attractive bicycle and pedestrian facilities whenever possible. Proposed roadways will be planned to accommodate bicycle traffic in accordance with the bikeway designations set forth in the City's Bicycle Transportation Plan. Similarly, greenbelts, linear parks, public easements and drainages reserved in public open space will be planned to accommodate bike and pedestrian traffic if they are so designed in the Bicycle Transportation plan.

This community improvement is proposed to be included in the City's 5-year Capital Improvement Program.

Community Outreach Input and Relationship to DHAEs

Community outreach input provided by City of Gilroy staff indicated the need for sidewalk gap closures on Murray Avenue so that pedestrian access will be provided on both sides of the street.

This offsetting mitigation measure will provide improved safety, connectivity, community cohesion, and access for Gilroy residents in this area. Because the HSR alignment would travel through developed areas of Gilroy (including downtown Gilroy), and the community would experience residual safety effects under Alternative 4, this offsetting mitigation measure will apply under Alternative 4.

Improvement Cost Estimate

It is estimated that the improvement total cost would be approximately $1,235,000. Future additional development costs may be incorporated as the project scope is refined and completed.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. The City of Gilroy could partner with the California High-Speed Rail Authority (Authority) in implementing this project and may be able to combine CDBG funds with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This offsetting mitigation measure will provide some safety improvement for the local neighborhood for pedestrians.
Relative Number of Beneficiaries	6	This offsetting mitigation measure will benefit one neighborhood but not the entire community.
Practicable	15	This offsetting mitigation measure can be funded and constructed.
Defined Project or Action	15	The City has defined the improvements.
Satisfy Authority Obligations	15	This offsetting mitigation measure will increase safety and access for a neighborhood adjacent to the HSR alignment and in a location with utility upgrades for the HSR project.
Defined Roles and Responsibilities	15	The Authority will fund. The City of Gilroy would implement.
Evidence of Agreement	15	The City is in support.
Cost-Effectiveness	12	The cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	108	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

Figure G-4 Murray Avenue Sidewalk Gap Closure Project Gilroy

30. OFFSETTING MITIGATION MEASURE G-OMM#5: IOOF AVENUE BICYCLE AND PEDESTRIAN OVERCROSSING AND COMPLETE STREETS

COMMUNITY: GILROY

ALTERNATIVE: 4

Measure Description

The offsetting mitigation measure includes a bicycle and pedestrian overcrossing at IOOF Avenue as well as additional complete street improvements, such as high visibility crosswalks, Americans with Disability Act (ADA) curb ramps, Class II bike lanes, and rectangular rapid flashing beacons on IOOF Avenue in the vicinity of Gilroy Prep School, South Valley Middle School, and Rebekah Children's Services.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to emergency vehicle response delay, as there would be residual safety effects that would affect several locations with low-income populations after the application of project mitigation and consideration of project benefits. DHAEs would be related to safety conditions in Gilroy under Alternative 4. While the proposed improvement will not directly address emergency response delay resulting from the project, it will provide a related safety offset with a nexus to the emergency response vehicle delay DHAE in the same community where effects would occur.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community.

The proposed offsetting mitigation measure under Alternative 4 will benefit the community's low-income populations and minority populations by providing safety, accessibility, connectivity, and community cohesion improvements on IOOF Avenue in the vicinity of South Valley Middle School and Gilroy Prep School (a public charter school), both of which serve primarily Hispanic/Latino students; Rebekah Children's Services, which serves minority children and families and low-income children and families in Gilroy; and the neighborhood between US 101 and Monterey Road. The offsetting mitigation measure also could provide health benefits by providing multi-modal transportation options. The location of the proposed offsetting mitigation measure relative to the HSR alignment within the Gilroy community is shown graphically in Figure G-5.

Consistency with Community Goals and Planning

South Valley Middle School, the Gilroy Prep School, and Rebekah Children's Services are in the City of Gilroy's Neighborhood Revitalization Strategy Area (NRSA), an area targeted for revitalization by improvements funded through the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. The U.S. Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The NSRA is an area of both minority concentration and low-income concentration that needs higher levels of investment

to meet the needs of the community. The proposed offsetting mitigation measure will be consistent with the following *Gilroy 2040 General Plan* goals and policies:

- Goal 14, Bicycle and Pedestrian Circulation: Bicycling and walking as significant transportation modes, promoting personal health and recreational enjoyment while minimizing energy consumption and environmental degradation.
  - Policy 14.03, Bicycle and Pedestrian Paths and Facilities: Correct deficiencies, expand existing facilities, and provide for the design of safer, convenient and attractive bicycle and pedestrian facilities whenever possible. Proposed roadways will be planned to accommodate bicycle traffic in accordance with the bikeway designations set forth in the City's Bicycle Transportation Plan. Similarly, greenbelts, linear parks, public easements and drainages reserved in public open space will be planned to accommodate bike and pedestrian traffic if they are so designed in the Bicycle Transportation plan.
  - Policy 14.04, Crossings: Design street crossings to provide for the safety needs of bicyclists and pedestrians. River and other crossing by bridges will be designed to accommodate bike lanes or paths in accordance with the designations set forth in the Bicycle Transportation Plan. Bridges for the exclusive use of pedestrians and bicycles should be considered whenever barriers exist which impede convenient and safe access.

In addition, the proposed offsetting mitigation measure will also be consistent with the goals of the City's Safe Routes to Schools project, which seeks to promote, educate, and encourage safe walking and bicycling practices for schoolchildren and residents of every ability within the City of Gilroy.

Community Outreach Input and Relationship to DHAEs

Community outreach input provided by South Valley Middle School, Gilroy Prep School, and Rebekah Children's Services Center indicated the need for a bicycle/pedestrian overcrossing at IOOF Avenue to enhance student safety.

This offsetting mitigation measure will provide safety, accessibility, community cohesion, and connectivity for students at these schools along with other Gilroy residents. Because the HSR alignment would travel through developed areas of Gilroy (including downtown Gilroy) and the community would experience residual safety effects under Alternative 4, this offsetting mitigation measure will apply under Alternative 4.

Improvement Cost Estimate

It is estimated that the project total cost would be approximately $13.2 million.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. The City could partner with the California High-Speed Rail Authority (Authority) to implement this project and could seek to combine CDBG funds with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This offsetting mitigation measure will improve access and provide for a safe route to two schools and RCS and the adjacent neighborhood, which would be affected by the HSR project and involve minority populations and low-income populations.
Relative Number of Beneficiaries	15	This offsetting mitigation measure will benefit students, parents, faculty, RCS staff and clients, and the adjacent neighborhood.
Practicable	15	This offsetting mitigation measure could be funded and constructed. The City of Gilroy would need to fund ongoing maintenance.
Defined Project or Action	10	Improvements are defined but will require further design.
Satisfy Authority Obligations	15	The offsetting mitigation measure will provide safety and access improvements to a community affected by the project.
Defined Roles and Responsibilities	10	The Authority will provide funding and right-of-way coordination (working with Union Pacific Railroad). The City of Gilroy would implement and maintain.
Evidence of Agreement	15	Priority for Gilroy Unified School District (South Valley Middle School, Gilroy Prep School), RCS, and City of Gilroy.
Cost-Effectiveness	9	Cost is somewhat high relative to the estimated number of beneficiaries.
TOTAL SCORE	104	

Authority = California High-Speed Rail Authority; HSR = high-speed rail; RCS = Rebekah Children's Services.

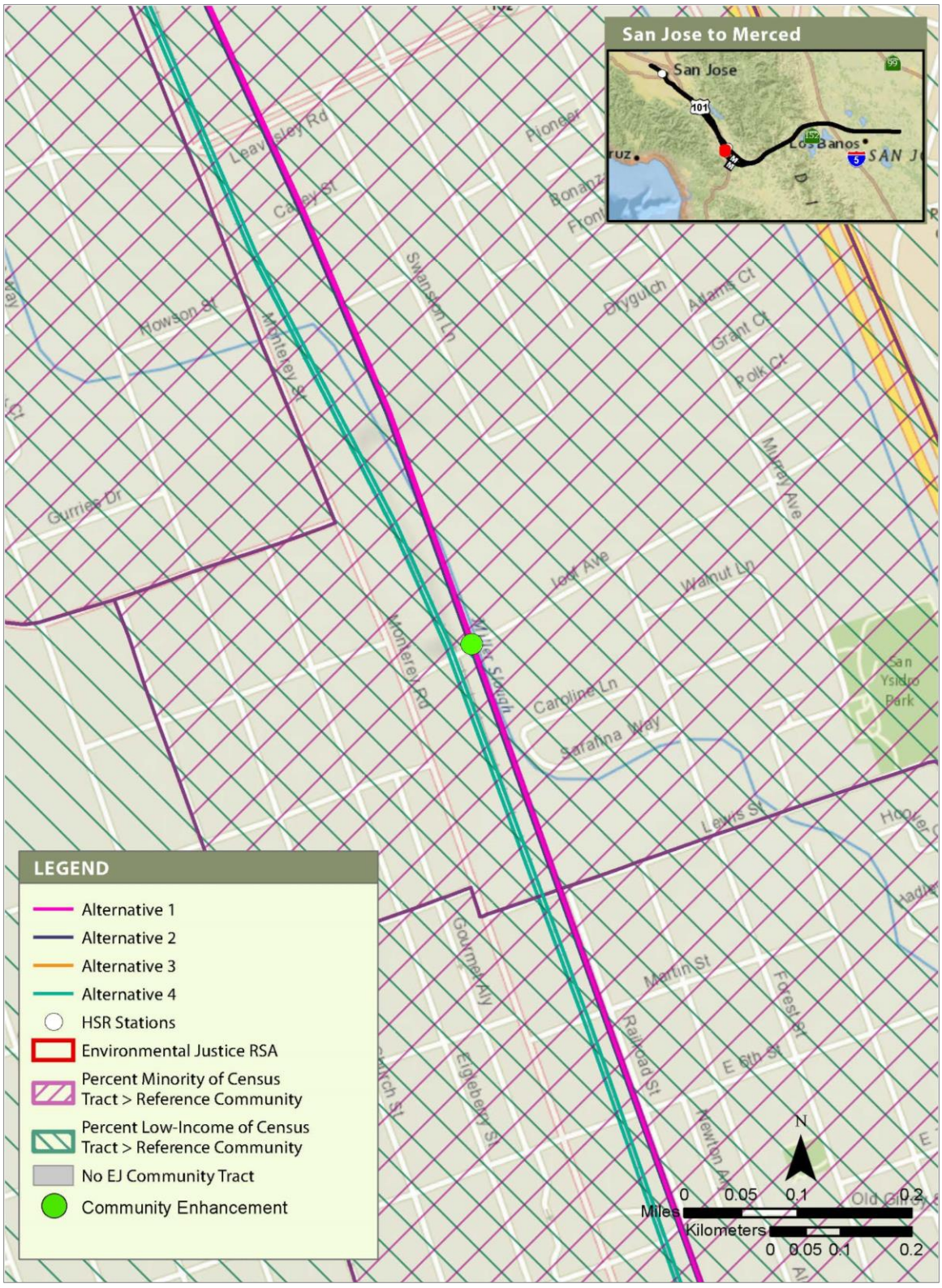


Figure G-5 IOOF Avenue Bicycle and Pedestrian Overcrossing and Complete Streets Gilroy

31. OFFSETTING MITIGATION MEASURE G-OMM#6: NOISE REDUCTION PROGRAM

COMMUNITY: GILROY

ALTERNATIVES: 1, 2, 4

Measure Description

The proposed offsetting mitigation measure will upgrade existing residential structures to improve noise attenuation along US 101 to promote a healthier community and improve the quality of life in the neighborhood. Residences in Gilroy are adjacent to the west side of US 101 from south of Las Animas Avenue to Leavesley Road, from Adams Court to San Ysidro Park, and from San Ysidro Park to north of East 7th Street.

The proposed offsetting mitigation measure will provide resources to implement one of these options:

- Provide resources to retrofit homes with noise reduction features, including upgraded windows and insulation, or
- Pursue construction of sound walls between US 101 and adjacent residential neighborhoods.

Nexus to Disproportionately High and Adverse Effects

All four project alternatives would result in disproportionately high and adverse effects (DHAEs) on low-income populations related to the project's operational noise impacts after the consideration of mitigation and project benefits. Alternatives 1, 2, and 4 would extend through downtown Gilroy, where there would be residual severe noise impacts after the application of proposed noise barrier mitigation. DHAEs would be related to project-generated noise levels above existing ambient levels because of train operations. With noise barrier mitigation, Alternative 1 would have 7 severe noise impacts, Alternative 2 would have 10 severe noise impacts, and Alternative 4 would have 46 severe noise impacts. With noise barrier mitigation and quiet zone implementation, impacts with Alternatives 1 and 2 would have the same impacts as with noise barriers alone and Alternative 4 would have 16 severe noise impacts, but quiet zone implementation can only be done by local jurisdictions, so is not guaranteed. While the proposed improvement will not directly address operational noise effects resulting from the project, it will provide a related offset representing an investment in community noise reduction at sensitive receptors that already experience traffic noise from US 101. The improvement will reduce noise levels in the same community affected by project noise.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The proposed offsetting mitigation measure will benefit the community's minority populations and low-income populations by providing health and livability improvements (Figure G-6).

Consistency with Community Goals and Planning

The proposed improvement will be consistent with the following goals and policies from the *Gilroy 2040 General Plan:*

- Goal H-3, Housing Preservation and Rehabilitation. Maintain and conserve the existing stock in a sound, safe, and sanitary condition.
  - Policy H-3.1: The City shall promote the maintenance and rehabilitation of structures in poor condition and take cation to prevent poorly maintained properties from further deterioration.

- Policy 21.01, “Sensitive Receptors.” Use land use planning and project siting to separate air pollution sources (such as freeways, arterials, industrials sites, etc.) from residential areas and other “sensitive receptors” (such as schools, hospitals, and nursing homes) that would be adversely affected by close proximity to air pollutants.
- Noise Goal: Protection of Gilroy residents from exposure to excessive noise and its effects through appropriate mitigation measures and responsive land use planning, especially regarding noise-sensitive land uses such as schools, hospitals, and housing for seniors.

In addition, the improvement is consistent with the Gilroy City Council goal of ensuring that neighborhoods benefit equally from City services.

Community Input and Relationship to DHAE

Community input provided by the City of Gilroy indicated the need to provide upgrades to existing residential structures to improve noise attenuation, particularly along the US 101 corridor.

This improvement will improve the health and quality of life for Gilroy residents in targeted areas. Because the HSR alignment would travel through developed areas of Gilroy (including downtown) under Alternatives 1, 2, and 4, residents in this area would experience various project effects under these project alternatives. Therefore, this improvement will apply under Alternatives 1, 2, and 4.

Improvement Cost Estimate

The preliminary cost estimate is based on the lesser cost of implementation of one of these two options:

- Cost of retrofitting the first two single-family or multifamily residences along the west side of US 101 in the areas noted above. The cost of retrofitting individual homes is based on an estimated $12,500 per single-family home and $25,000 per multifamily building. Based on aerial photography, there are an estimated 59 single-family homes and 36 multifamily homes in the areas noted above, which would result in an estimated retrofit cost of $1.637 million if all were done. However, as noted above, Alternative 1 would have up to 7 severe noise impacts, Alternative 2 would have up to 10 severe noise impacts, and Alternative 4 would have up to 46 severe noise impacts. Thus, this measure will only require an equivalent amount of noise abatement proportionate to the impact. Assuming all abatement is to multifamily homes, then this measure could cost up to $175,000 (Alternative 1), $250,000 (Alternative 2), or $1.15 million (Alternative 4).
- Sound walls along US 101 where residences are present adjacent to the west side of the freeway in the areas noted above. The cost of sound walls is based on a unit cost of $70 per square foot (from the Final EIR/EIS, Volume 2, Appendix 3.4-B), assumed sound wall height of 14 feet, and an estimated 5,800 linear feet of sound walls—for a total cost of $5.7 million.

Based on these estimates, retrofitting individual homes would be more cost-effective than constructing sound walls.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City’s minority neighborhoods and low-income neighborhoods. The City of Gilroy could partner with the California High-Speed Rail Authority (Authority) to implement this improvement and could seek to combine CDBG funds with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Individual residents will receive substantial benefit.
Relative Number of Beneficiaries	12	The offsetting mitigation measure will benefit individual minority residents and low-income residents but will not benefit the entire community.
Practicable	15	Funding for this offsetting mitigation measure is practicable.
Defined Project or Action	10	The Authority will provide funding to a program for the subject residents/owners for the individual house retrofits to windows and insulation.
Satisfy Authority Obligations	10	Offsetting mitigation measure will provide community uplift and recreation benefits. The HSR project would result in noise effects, so there is a general nexus (although the benefitted homes would not be affected by HSR noise). However, the benefitted homes are not adjacent to the HSR alignments, so the beneficiaries would not be the most affected by the project.
Defined Roles and Responsibilities	10	The Authority will provide funding. The City of Gilroy would implement.
Evidence of Agreement	15	The community improvement is a priority for the City.
Cost-Effectiveness	12	The cost is low relative to estimated number of beneficiaries.
TOTAL SCORE	99	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

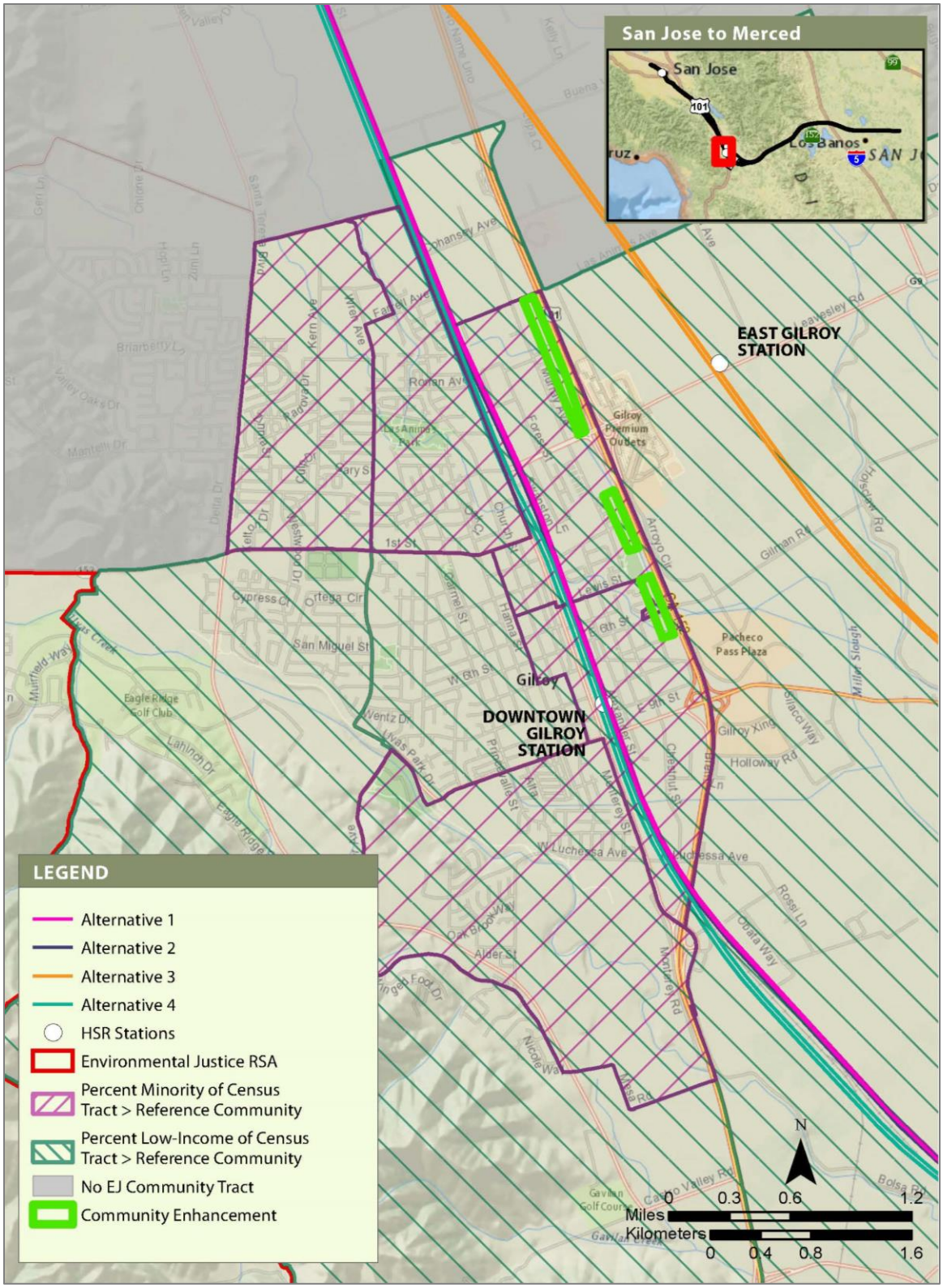


Figure G-6 Noise Reduction Program Gilroy

32. OFFSETTING MITIGATION MEASURE G-OMM#7: SOUTH VALLEY MIDDLE SCHOOL RECREATIONAL AMENITIES

COMMUNITY: GILROY

ALTERNATIVE: 2

Measure Description

The proposed offsetting mitigation measure will improve and modernize the existing South Valley Middle School related to recreational facilities in accordance with the Gilroy Unified School District's (GUSD) Measure E, which was passed in June 2016, and is a measure to issue bonds to fund school renovation and construction. Modernization of the middle school was slated to begin once the measure was passed; however, due to the uncertainty of the high-speed rail (HSR) project design at the time and its potential impact on the middle school, the modernization was delayed. The modernization project is currently in the design phase, and GUSD expects to have completed a substantial modernization of the campus by the end of 2023. Additional funding provided for this offsetting mitigation measure will help fill future buildout needs identified by GUSD during the design phase.

The existing middle school is outdated, and many aspects of the school need repair or replacement, such as the HVAC system, damaged ceilings and walls, the fire system, worn and aged roofs that are leaking, locker rooms that currently lack hot water, and grass fields needing renovations. The existing middle school needs many improvements to provide a quality education to its students, including many minority students and low-income students. Many of the required improvements, including construction of a new gym, a new multipurpose unit, parking lots, and sports fields, would be completed by the GUSD before California High-Speed Rail Authority (Authority) funding available. Additional future buildout needs included in this offsetting mitigation measure could include a community pool or other recreational amenities that will benefit both the school and the entire community. The pool would be separate from the campus, with its own parking lot and secured entrance, allowing it to be open to the public for recreational purposes even when school is not in session.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 2, permanent acquisition of approximately 12 percent of the South Valley Middle School play area and track would preclude the use of the resource or result in diminished capacity for use. Since the South Valley Middle School is in a minority area and low-income area, the diminishment of play function would result in disproportionately high and adverse effects (DHAEs). The provision of funding for additional recreational amenities at South Valley Middle School will not directly address residual impacts related to the loss of a portion of the school's play area and track but will provide enhanced recreational resources for the students and the public.

Benefit to Minority Populations and/or Low-Income Populations

The HSR alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The offsetting mitigation measure will benefit the City's minority community and low-income community by providing educational, recreational, and community livability improvements. The

location of the proposed offsetting mitigation measure relative to the HSR alignment within the Gilroy community is shown graphically in Figure G-7.

Consistency with Community Goals and Planning

The US Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. A Neighborhood Revitalization Strategy Area (NRSA) is an area targeted for revitalization by improvements funded through the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The proposed South Valley Middle School Recreational Amenities project is located within the City of Gilroy's NRSA, an area of both minority concentration and low-income concentration that needs higher levels of investment to meet the needs of the community. The proposed offsetting mitigation measure is consistent with the following goals and policies from the *Gilroy 2040 General Plan*:

- Goal 17, Educational Facilities: Coordination between new residential development and the development of new educational facilities; educational excellence in support of community and economic development; and community improvement of the role of schools as a community resource.
  - Policy 17.06, School Sites: Coordinate and provide high quality school sites (based on size, location, and terrain) to optimize educational goals. In areas of new residential development, ensure that sites are identified and dedicated as a condition of development approval, incorporated as part of the Neighborhood District planning process whenever feasible. Site location considerations include adjacency to planned open space corridors, neighborhood park sites, and bike and pedestrian pathways.

In addition, the proposed offsetting mitigation measure is consistent with the Gilroy City Council goal of ensuring that neighborhoods benefit equally from City services.

Community Outreach Input and Relationship to DHAE

Community outreach input from the Gilroy Unified School District indicated concern about the delay in implementation of planned improvements at South Valley Middle School due to construction of the HSR project. These improvements are needed to enhance the educational and recreational experience of the school's students and to improve the school as a community resource, thus providing improved livability.

This offsetting mitigation measure will provide funding for needed improvements to the school to update and enhance educational and recreational facilities. Because Alternative 2 would permanently acquire approximately 12 percent of the South Valley Middle School play area and track, resulting in the diminished capacity for use of this recreational resource, this offsetting mitigation measure will apply to Alternative 2.

Improvement Cost Estimate

Modernization of South Valley Middle School, including contingency and soft costs, would cost approximately $90 million, based on a GUSD estimate. This offsetting mitigation measure would include a partial funding contribution by the Authority to GUSD's ongoing modernization effort. Funding of this entire amount is disproportionate to HSR effects on schools, and thus the Authority's potential contribution is evaluated at $5 million. As noted below, GUSD has identified other sources of funding.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. In addition, GUSD set aside approximately $90 million under Measure E (General Obligation Bonds) to modernize the South Valley Middle School. The City of Gilroy could partner with the Authority and the School District in implementing

this project and could seek to combine CDBG funds, as well as GUSD funds received from Measure E, with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This offsetting mitigation measure will improve a school serving local neighborhoods and minority populations and low-income populations.
Relative Number of Beneficiaries	15	This offsetting mitigation measure will benefit students in an affected neighborhood but will only benefit students directly.
Practicable	15	This offsetting mitigation measure could be funded and constructed.
Defined Project or Action	10	Improvements are defined but will require further design.
Satisfy Authority Obligations	15	The offsetting mitigation measure will provide educational, safety, and community benefits for a school and neighborhoods directly affected by the HSR project. In addition, uncertainty about HSR design has resulted in a delay of implementation of the modernization.
Defined Roles and Responsibilities	15	The Authority will provide funding. GUSD would implement.
Evidence of Agreement	15	GUSD opposes Alternative 2 and supports Alternative 4 but has long-term modernization needs, and, if Alternative 2 were advanced and track/field effects cannot be avoided, then additional recreational funding will help the school in its mission.
Cost-Effectiveness	9	This community improvement is a priority for GUSD.
TOTAL SCORE	109	

Authority = California High-Speed Rail Authority; GUSD = Gilroy Unified School District; HSR = high-speed rail.

Figure G-7 South Valley Middle School Recreational Amenities Gilroy

33. OFFSETTING MITIGATION MEASURE G-OMM#8: REBEKAH CHILDREN'S SERVICES CENTER PERIMETER FENCE

COMMUNITY: GILROY

ALTERNATIVE: 4

Proposed Improvement

The proposed improvement will install fencing around the perimeter of the Rebekah Children's Services (RCS) facility. The existing services center is a crucial community resource for the City of Gilroy and larger Santa Clara County.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 4, the project would result in disproportionately high and adverse effects (DHAEs) on low-income populations related to emergency vehicle response delay. Under Alternative 4, there would be residual safety effects related to emergency vehicle response times that would affect several locations with low-income populations after the application of project mitigation and consideration of project benefits. DHAEs would be related to safety conditions in Gilroy under Alternative 4. While the proposed improvement will not directly address emergency response delay resulting from the project, it will provide a related safety offset with a nexus to the emergency response vehicle delay DHAE in the same community where effects would occur.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The proposed improvement will benefit the community's minority residents and low-income residents by providing safety improvements (Figure G-8).

Consistency with Community Goals and Planning

The RCS is located in the City of Gilroy's Neighborhood Revitalization Strategy Area (NRSA), an area targeted for revitalization by improvements funded through the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. The U.S. Department of Housing and Urban Development administers the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The NRSA is an area of both low-income concentration and minority concentration that needs higher levels of investment to meet the needs of the community. The proposed improvement will be consistent with the following *Gilroy 2040 General Plan* goals and policies:

- Goal 15, Civic and Community Facilities: Adequate, varied and high-quality public facilities and programs to meet residents' current and future needs and contribute to a high quality of life.

– Policy 15.04, Partnering: Seek opportunities to partner or form joint ventures with commercial and nonprofit organizations to facilitate the development of community facilities, programs and services.

In addition, the proposed improvement is consistent with the Gilroy City Council goal of ensuring that neighborhoods benefit equally from City services.

Community Outreach Input and Relationship to DHAEs

Community outreach input provided by the RCS identified the need for various improvements to serve youth in the Gilroy community.

This improvement will improve safety for youth served by this agency. Because the HSR alignment would travel through developed portions of Gilroy (including downtown) under Alternative 4, residents in this area would experience various project effects under this project alternative. Therefore, this improvement will apply under Alternative 4.

Improvement Cost Estimate

Assuming a perimeter fence length of 2,000 feet for northern, eastern, and southern sides (western side assumed to be sound wall), at a cost of $50 per linear foot (for wrought iron), the cost of this improvement would be approximately $100,000.

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding for RCS to implement this improvement.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This improvement will support the mission and programs of RCS, which benefit the minority populations and low-income populations of Gilroy.
Relative Number of Beneficiaries	9	The entire community will benefit due to the services provided by RCS.
Practicable	15	Funding for this improvement is practicable, and the improvements can be constructed.
Defined Project or Action	10	The improvement is reasonably defined.
Satisfy Authority Obligations	15	The improvement will provide benefits to the minority populations and low-income populations served by RCS, who would be affected by the HSR project.
Defined Roles and Responsibilities	15	The Authority will provide funding; RCS would construct and maintain improvements at the RCS facility.
Evidence of Agreement	15	RCS requested funding for a suite of improvements, one of which is perimeter fencing, and thus agreed with this improvement.

Criteria	Ranking 1–15	Justification
Cost-Effectiveness	9	The cost is somewhat high relative to estimated number of beneficiaries.
TOTAL SCORE	103	

Authority = California High-Speed Rail Authority; HSR = high-speed rail; RCS = Rebekah Children's Services.

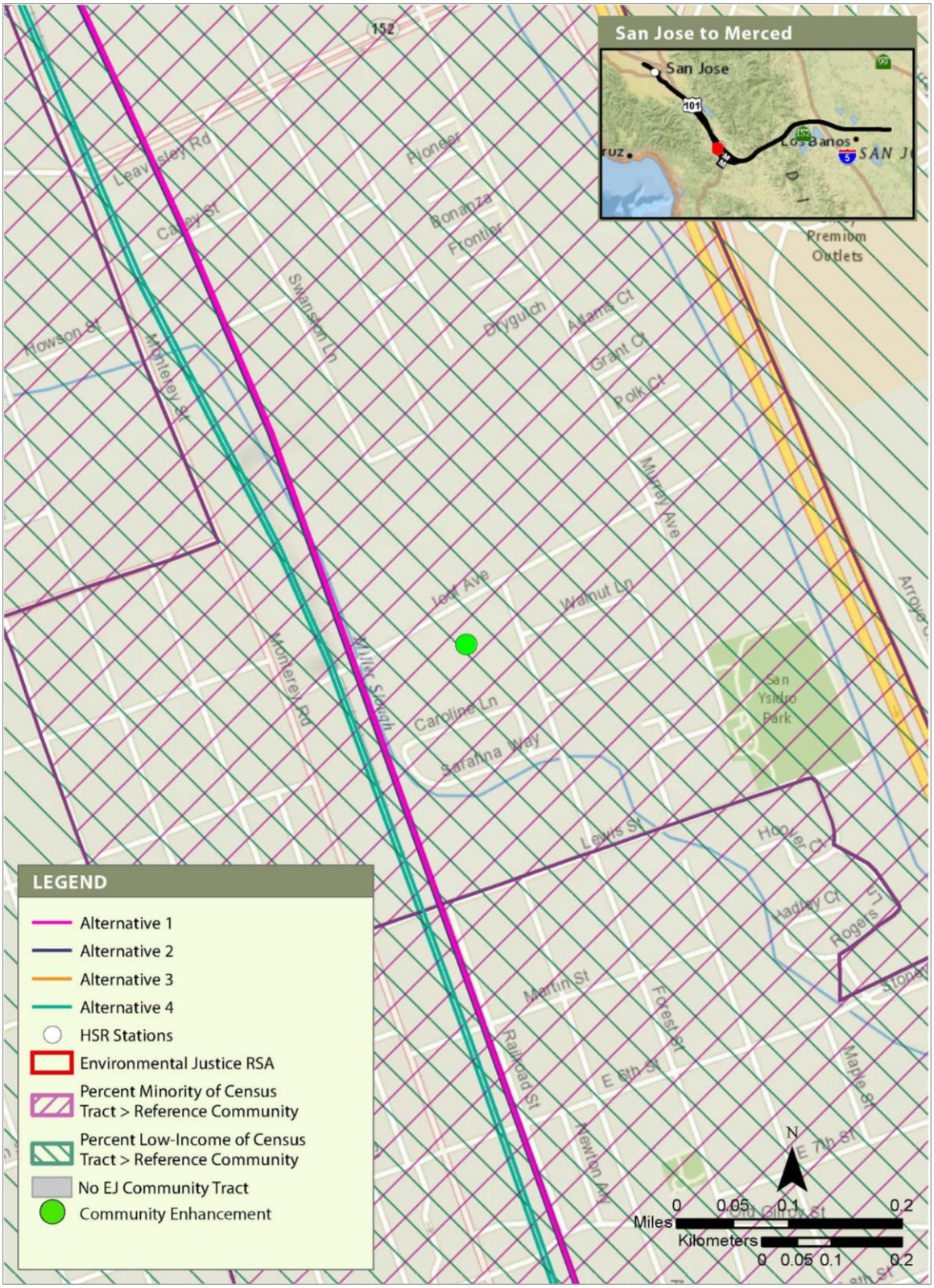


Figure G-8 Rebekah Children's Services Improvement Gilroy

34. OFFSETTING MITIGATION MEASURE G-OMM#9: SAN YSIDRO PARK ENHANCEMENTS

COMMUNITY: GILROY

ALTERNATIVES: 1, 2

Measure Description

The proposed improvement will expand San Ysidro Park's recreational amenities in accordance with the City of Gilroy's approved Parks and Recreation Master Plan, with the intent of promoting a healthier community and improving the quality of life in the neighborhood. The improvement could include new recreational features, such as new playground equipment, paved trail, welcome kiosk, distance markers on the paved trail, games etched into the sidewalk, exercise equipment, new volleyball equipment, new picnic barbeque grills, bottle filler station/ water fountain, lighting, public art, and a drought-resistant garden.

Nexus to Disproportionately High and Adverse Effects

Alternatives 1 and 2 would extend through downtown Gilroy, resulting in adverse visual aesthetic effects on minority populations and low-income populations in the downtown area related to either an elevated aerial viaduct (Alternative 1) or an elevated embankment and grade separations (Alternative 2). Alternatives 1 and 2 would result in disproportionately high and adverse effects (DHAEs) relative to visual aesthetics on an end-to-end basis. While the proposed offsetting mitigation measure will not directly address the visual effects of the elevated rail alignment, it will provide indirect aesthetic benefits by expanding and improving a park, providing additional recreational amenities, and improving the visual quality of the park site.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The proposed improvement will benefit the community's minority residents and low-income residents by providing recreational improvements within walking distance of a large residential neighborhood. Associated health, livability, and visual quality benefits also will be provided (Figure G-9).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. A Neighborhood Revitalization Strategy Area (NRSA) is an area targeted for revitalization by improvements funded through the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local infrastructure. The proposed improvement will be undertaken within the City of Gilroy's NRSA, an area of both minority concentration and low-income concentration that needs higher levels of

investment to meet the needs of the community. In addition, the proposed improvement is consistent with the following goal from the *Gilroy 2040 General Plan*:

- Goal 16, Parks and Recreation: A comprehensive and coordinated system of convenient, efficient, and high-quality park and recreation facilities to meet the current and future needs of Gilroy residents, integrating important natural features and contributing to the City's identity and livability.

In addition, this improvement is consistent with the Gilroy *Parks and Recreation System Master Plan* goal of providing safe and well-maintained parks. Furthermore, the improvement is consistent with the Gilroy City Council goal of ensuring that neighborhoods benefit equally from City services.

Community Outreach Input and Relationship to DHAEs

Community outreach input from the City of Gilroy indicated the need for a series of improvements at San Ysidro Park to enhance recreational opportunities and overall quality of life for Gilroy community residents.

This improvement will provide recreational enhancements at the park, such as those described above, as well as health benefits, improved livability for local residents, and improved visual quality at the park site. This park is located within walking distance of a residential neighborhood along the HSR alignment. Because the HSR alignment would travel through the developed areas of Gilroy (including downtown) under Alternatives 1 and 2, residents in this area would experience various project effects under these project alternatives. Therefore, this improvement will apply to Alternatives 1 and 2.

Improvement Cost Estimate

The City submitted a Proposition 68 Grant Application for approximately $3.2 million to the California Department of Parks and Recreation Office of Grants and Local Services to provide new recreation opportunities at the San Ysidro Park. The City will be notified in 2020 regarding the results of the Proposition 68 Grant. If the City receives the grant, it is estimated that an additional $500,000 would be needed for offsite improvements at the park.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. The City of Gilroy would partner with the California High-Speed Rail Authority (Authority) to implement this improvement and would seek to combine CDBG funds and Proposition 68 Grant funds with funding provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	San Ysidro Park serves the neighborhoods adjacent to the HSR alignment and the Gilroy HSR station. The improvement will improve recreational opportunities, aesthetics, and community identity.
Relative Number of Beneficiaries	6	The park will serve residents throughout downtown Gilroy who are affected by the HSR project. Parks are used by a broad cross-section of the community.

Criteria	Ranking 1–15	Justification
Practicable	15	The improvement can be funded and implemented.
Defined Project or Action	10	The City of Gilroy has defined the improvements needed; specific design to be completed.
Satisfy Authority Obligations	15	San Ysidro Park serves the neighborhoods adjacent to the HSR alignment and the Gilroy HSR station. The improvement will improve recreational opportunities, aesthetics, and community identity.
Defined Roles and Responsibilities	15	The Authority will contribute capital funding. The City of Gilroy would improve and maintain the park.
Evidence of Agreement	15	The City recommended this measure.
Cost-Effectiveness	15	The improvement is a priority for the City.
TOTAL SCORE	106	

Authority = California High-Speed Rail Authoriy; HSR = high-speed rail.

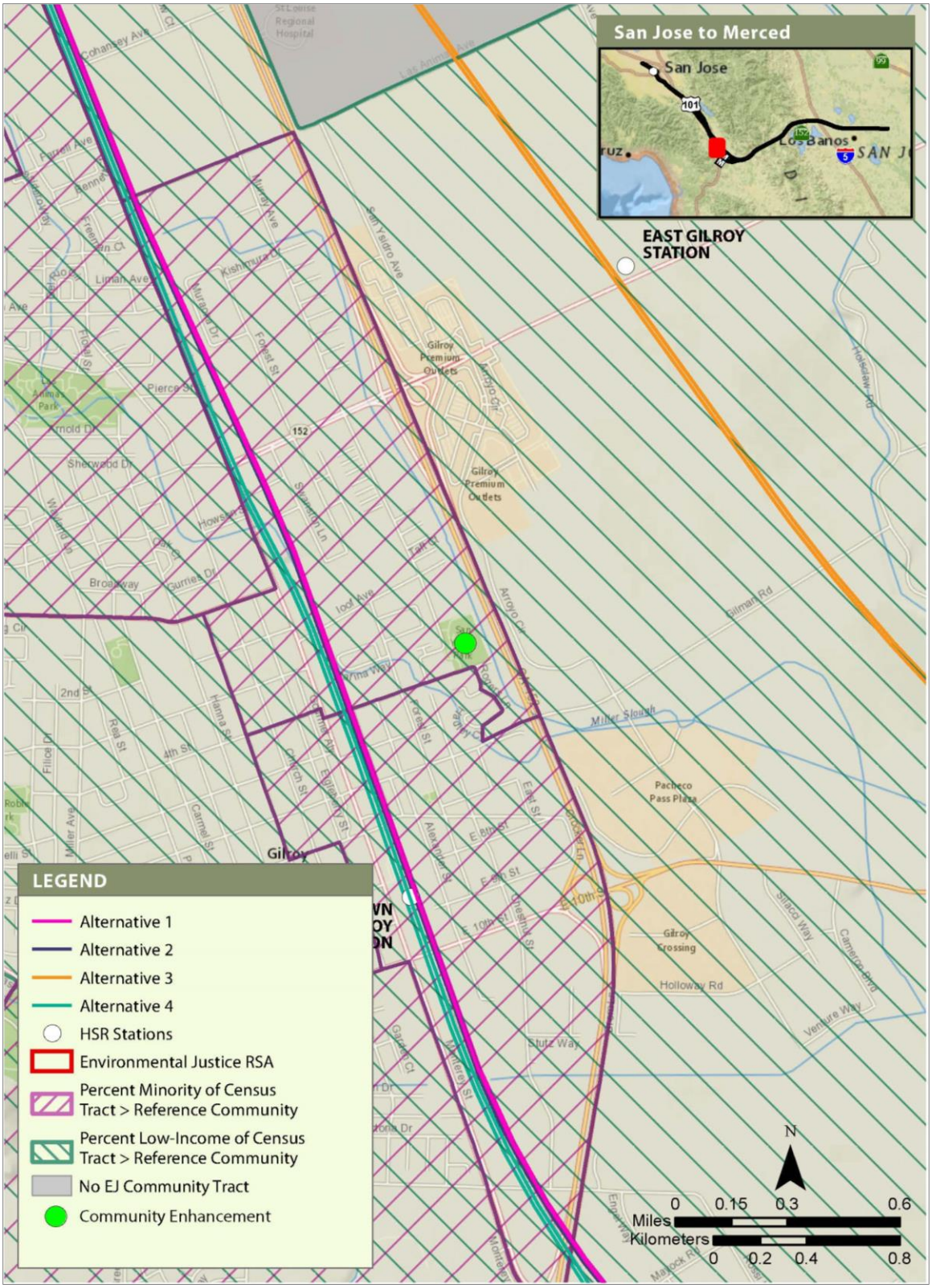


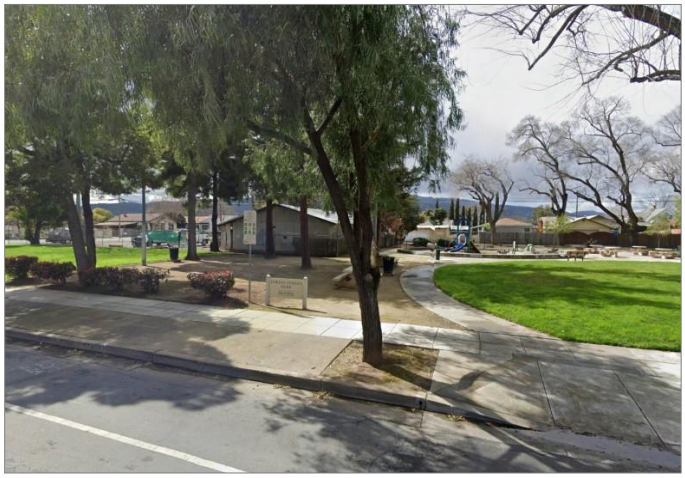
Figure G-9 San Ysidro Park Enhancements
Gilroy

35. OFFSETTING MITIGATION MEASURE G-OMM#10: FOREST STREET PARK EXPANSION PROJECT

COMMUNITY: GILROY

ALTERNATIVES: 1, 2

Measure Description



The improvement will expand the City of Gilroy's Forest Street Park in accordance with the City's approved *Forest Street Park Master Plan*, with the intent of promoting a healthier community and improving the quality of life and property values in the neighborhood. The existing park has a children's play area and a small picnic area. The expanded park could include bocce ball courts and horseshoe pits. The project includes the acquisition of the adjacent property just south of the park, which is currently occupied by a commercial building. This is the second of two parcels needed to complete the approved master plan. The first parcel has already been acquired. Significant soil testing and anticipated mitigation of soil contamination is anticipated. Upon completion of property acquisition and soil mitigation, installation of the proposed improvements will be completed. The commercial property south of the existing park is currently for sale, and its acquisition is recommended as soon as possible to avoid losing the opportunity to acquire the park's expansion area.

Nexus to Disproportionately High and Adverse Effects

Alternatives 1 and 2 would extend through downtown Gilroy, resulting in adverse visual aesthetic effects on minority populations and low-income populations in the downtown area related to either an elevated aerial viaduct (Alternative 1) or an elevated embankment and grade separations (Alternative 2). Alternatives 1 and 2 would result in disproportionately high and adverse effects (DHAEs) relative to visual aesthetics on an end-to-end basis. While the proposed offsetting mitigation measure will not directly address the visual effects of the elevated rail alignment, it will provide indirect aesthetic benefits by expanding and improving a park, providing additional recreational amenities, and improving the visual quality of the park site.

Benefit to Minority Populations and Low-Income populations

The high-speed rail (HSR) alignment traverses the Gilroy community, where the percentage of minority populations and low-income populations is greater than that within the reference community. The proposed improvement will benefit the community's minority population and low-income population by providing health, recreation, quality of life, and visual quality improvements (Figure G-10).

Consistency with Community Goals and Planning

The U.S. Department of Housing and Urban Development administers the Community Development Block Grant (CDBG) Program, which is used to provide affordable housing, foster economic development, and improve the quality of life in primarily low- and moderate-income communities. A Neighborhood Revitalization Strategy Area (NRSA) is an area targeted for revitalization by improvements funded through the CDBG Program, which funds local community development efforts to provide affordable housing, reduce poverty, and enhance local

infrastructure. The proposed expansion of Forest Street Park is located within the City of Gilroy's NRSA, an area of both minority concentration and low-income concentration that needs higher levels of investment to meet the needs of the community.

The purpose of this improvement is to expand the Forest Street Park in accordance with the City's approved *Forest Street Park Master Plan*. In addition, the proposed improvement is consistent with the following goal from the *Gilroy 2040 General Plan*:

- Goal 16, Parks and Recreation: A comprehensive and coordinated system of convenient, efficient, and high-quality park and recreation facilities to meet the current and future needs of Gilroy residents, integrating important natural features and contributing to the City's identity and livability.

Furthermore, the improvement is consistent with the Gilroy City Council's goal of ensuring that neighborhoods benefit equally from City services.

Community Outreach Input and Relationship to DHAEs

Community outreach input, as expressed by City of Gilroy staff, that is addressed in this improvement includes the following:

- Area of impact is in need of a higher level of investment.
- Park expansion in accordance with the City's *Forest Street Park Master Plan*.

This improvement will provide for recreational opportunities, health benefits, and improved livability for residents in the Gilroy community. The improvement also provides indirect aesthetic benefits by expanding and improving a park. In particular, this improvement will benefit residents of a nearby neighborhood that is adjacent to the project alignment. Because the HSR alignment would travel through downtown Gilroy under Alternatives 1 and 2, residents in this area would experience various project effects under these project alternatives. Therefore, this improvement will apply under Alternatives 1 and 2.

Improvement Cost Estimate

Purchase of the property is estimated at $600,000. Mitigation of soil contamination should be negotiated to be completed by the seller, as a condition of sale. Future additional development costs will be determined when the final scope of the park is known. The Authority's funding commitment is capped at the identified level.

Roles and Responsibilities

The City of Gilroy receives CDBG funding to implement projects that benefit the City's minority neighborhoods and low-income neighborhoods. The City of Gilroy would implement this project, using both CDBG funds and funds provided by the Authority.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	The improvement will improve recreational opportunities, aesthetics, and community identity.
Relative Number of Beneficiaries	6	As a public local park, this improvement will benefit a broad cross-section of residents in neighborhoods affected by the HSR project.

Criteria	Ranking 1–15	Justification
Practicable	15	The improvement can be funded and implemented.
Defined Project or Action	10	The City of Gilroy has defined the improvements needed, but complete design is still necessary.
Satisfy Authority Obligations	15	Forest Park serves the neighborhoods adjacent to the HSR alignment and the Gilroy HSR station. The improvement will improve recreational opportunities, aesthetics, and community identity.
Defined Roles and Responsibilities	15	The Authority will provide funding. The City of Gilroy would improve the park.
Evidence of Agreement	15	The improvement is a priority for the City.
Cost-Effectiveness	15	The cost is low relative to the estimated number of beneficiaries.
TOTAL SCORE	106	

Authority = California High-Speed Rail Authority; HSR = high-speed rail.

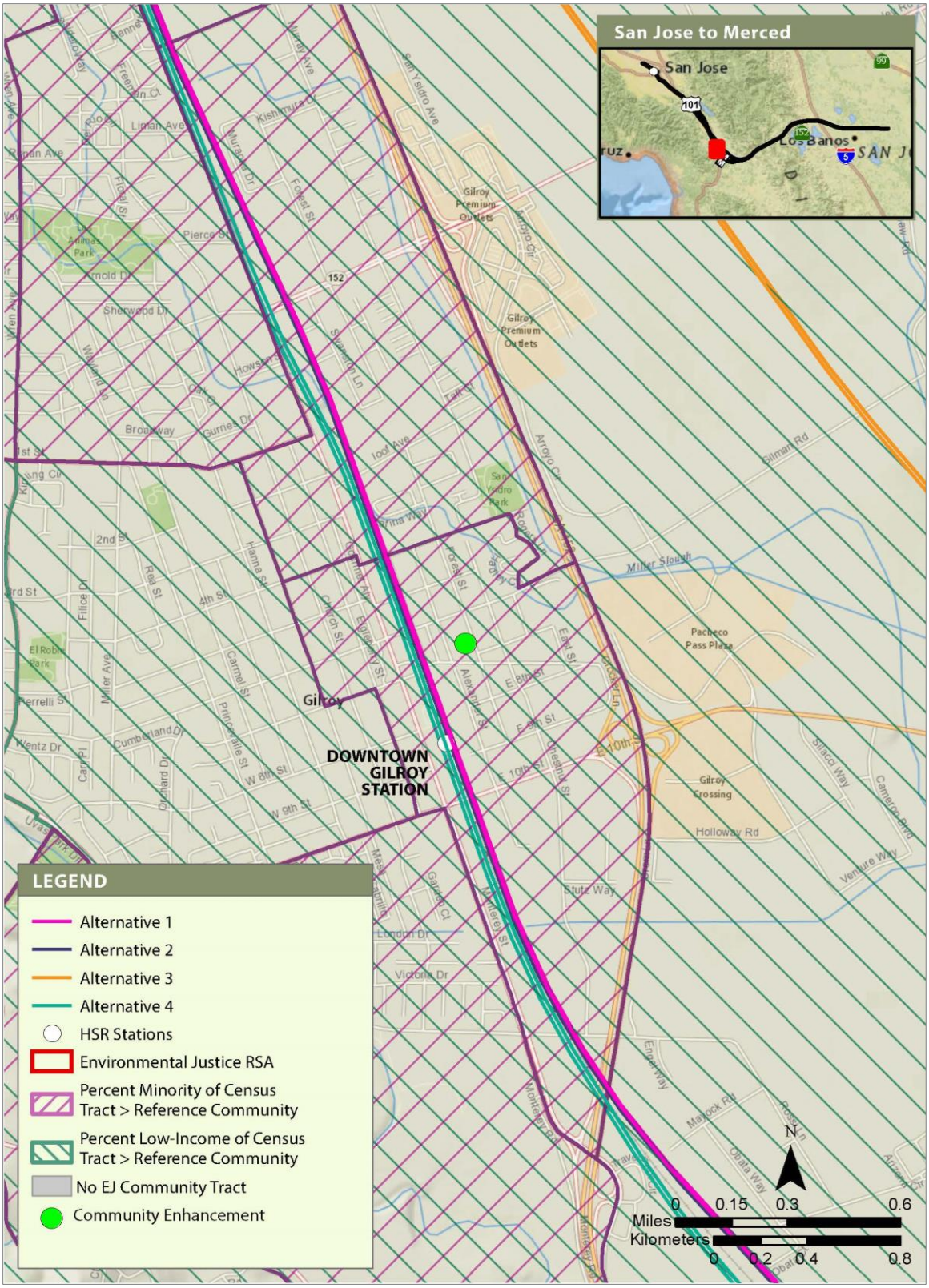


Figure G-10 Forest Street Park Expansion Project Gilroy

36. OFFSETTING MITIGATION MEASURE MH/G-OMM#1: AFFORDABLE HOUSING INVESTMENT

COMMUNITY: MORGAN HILL AND GILROY

ALTERNATIVE: 2

Measure Description

This offsetting mitigation measure will provide funding support for local housing initiatives that provide affordable housing opportunities for the general population and special-needs groups. Funding will be provided to cover 50 percent of the cost of approximately 59 affordable housing units in Morgan Hill and 75 affordable units in Gilroy.

Nexus to Disproportionately High and Adverse Effects

Under Alternative 2, the project would result in disproportionate, high, and adverse effects (DHAEs) on low-income populations related to residential displacement resulting from the project. There would be residual displacement impacts within the Morgan Hill and Gilroy communities after the application of relocation mitigation and consideration of project benefits. DHAEs would be related to the disproportionate displacement of low-income residents where there is insufficient residential relocation availability in Morgan Hill and Gilroy. The estimated deficit of available residential units relative to Alternative 2 is 59 units in Morgan Hill and 75 units in Gilroy. The provision of funding to support replacement affordable units will directly address residual impacts related to the displacement of housing and will address community needs by contributing to the development of affordable housing.

Benefit to Minority Populations and/or Low-Income Populations

The high-speed rail (HSR) alignment under Alternative 2 would result in residential displacements in Morgan Hill and Gilroy, where the percentage of minority residents and low-income residents is greater than that within the reference community. The proposed improvement will provide funding for affordable housing development to organizations serving minority populations and low-income populations in these communities and/or public entities with affordable housing programs. These organizations/entities provide affordable and/or transitional housing as well as associated services related to physical and economic health as well as overall quality of life benefits.

Consistency with Community Goals and Planning

This proposed improvement will be consistent with the following *Morgan Hill General Plan* Housing Element policies and *Gilroy 2040 General Plan* Housing Element policies:

Morgan Hill

- Policy HE-1h: Affordable Housing Strategy Implementation. Encourage the creation of rental housing, including housing for extremely low-income households, through available funds, banked land and community partnerships.
- Policy HE-1i: Flexible Housing. Allow flexibility to encourage alternative housing solutions that support affordable and intergenerational housing, including attached or detached accessory dwelling suites, home sharing and cohousing.

- Policy HE-1j: New Market Rate Developments. Promote and encourage provision of housing within new market rate development that is affordable to extremely low, very low, low, median, and moderate-income households.
- Policy HE-1q: Affordable Housing. Encourage the production and preservation of affordable housing units.
- Policy HE-1r: Funds for Affordable Units. When available, continue to make housing funds available to finance affordable projects, including housing for extremely low-income households. Consider assistance to below market rate ownership housing where a financing gap can be demonstrated.
- Policy HE-1s: Rental Housing Incentives. Continue to assist market rate and nonprofit developers in developing affordable rental housing.

Gilroy

- Policy H-2.1 The City shall encourage the provision of new affordable housing.
- Policy H-2.2 The City shall provide incentives for affordable housing, including but not limited to the density bonus ordinance, expedited project review, and Affordable Housing Exemption in the Residential Development Ordinance.
- Policy H-2.3 The City shall support homeownership opportunities for low- and moderate-income households.
- Policy H-2.4 The City shall encourage partnerships between non-profit and for-profit housing developers to encourage affordable housing production.
- Policy H-2.5 The City shall continue to require 15 percent of new housing in the Neighborhood District to be affordable to very low-, low-, and moderate-income households.
- Policy H-2.6 The City shall consider the development of single-room occupancy units, studio apartments, and other similar unit types that are affordable to extremely low-income residents in higher-density areas of the city.
- Policy H-2.7 The City shall continue to participate in programs that assist lower- and moderate-income households to secure affordable housing, such as the County's Mortgage Credit Certificate program, Section 8 rental voucher programs, and the Housing Trust Fund of Santa Clara County.

This improvement is also consistent with the following *Santa Clara County General Plan* Housing Element strategies and associated policies:

- Strategy #1: Plan for a balanced countywide housing supply. Support every Santa Clara County jurisdiction in developing housing to meet needs of all household types, affordable housing development goals, State General Plan Housing Element requirements, and regional land use and transportation planning objectives.
- Strategy #2: Promote cooperation and collaboration on residential development. The County and cities are encouraged to explore every feasible opportunity to assist home builders in getting affordable housing built. By working with neighborhood residents and community organizations to promote a diverse housing supply, and by working with each other, as well as the private sector, we can capitalize on all the ideas, the expertise, and untapped resources we have in this county.
- Strategy #3: Provide financial assistance for extremely low-income housing. Any type of housing is expensive to build in this county and not likely to become less so. If we are to ensure that the housing needs of all residents are met, we will have to work with home builders to help curtail their costs and to contribute in some fashion to making their projects financially feasible.

- Strategy #6: Provide for Special Needs Households. To be successful, our efforts to create a balanced housing supply must include housing suitable for households with extraordinary needs. These would include housing for people of all ages, who may have physical or emotional challenges, or those with extremely low or no incomes. The policies pertaining to housing for special needs households encourage a closer partnership between homebuilders and the County and cities to ensure that appropriate and affordable housing is built.
- Strategy #7: Reduce Homelessness Consistent with Housing First Principles. The needs of the homeless shall be met through methods intended to place them in permanent housing as soon as possible. Homeless shelters shall be supported by service providers providing the full range of assistance needed by the homeless. Temporary emergency shelters shall be used only as part of a continuum of care that leads to permanent housing.
- Strategy #8: Maintain and Expand the Supply of Farm Worker Housing. Housing for farm workers is considered by the State to be one form of special needs housing. However, the shortage of farm worker housing and its relationship to a viable agricultural economy and healthy communities is so important to Santa Clara County that it is appropriate for the County to designate a strategy that specifically targets this housing need.

Community Outreach Input and Relationship to DHAEs

Input from various community organizations and government/educational entities—including the Santa Clara County Planning Department, Center for Employment Training, and HomeFirst—that is addressed by this improvement identified the following concerns regarding housing needs within Santa Clara and the San Jose communities:

- Need for affordable housing for students.
- Need for housing for farm workers.
- Housing scarcity.
- Increased homelessness.

This improvement, which will apply under Alternative 2, will provide funding and/or land for affordable housing development to organizations and/or public entities serving minority populations or low-income populations in these communities, providing support for the replacement of affordable housing and relief to address a more general shortage of affordable housing within these communities and the County as a whole.

Improvement Cost Estimate

A total of $40.2 million will be allocated to this improvement. This assumes co-financing (Authority will contribute 50 percent) related to construction of 59 affordable housing units in Morgan Hill and 75 affordable housing units in Gilroy at a per-unit cost of $600,000 (Authority contribution at $300,000 per unit).

Roles and Responsibilities

The California High-Speed Rail Authority (Authority) will provide funding for organizations and public entities providing services related to affordable housing opportunities. Funding will be issued through a grant program, with priority of funding given to those organizations and entities filling priority needs, as identified by the Cities of Morgan Hill and Gilroy and the County of Santa Clara. The following are examples of local organizations/initiatives providing such services:

- Habitat for Humanity Silicon Valley: develops affordable ownership housing for low-income families with between 30 and 50 percent of the area’s median income, offering 0 percent interest mortgages, for nine single-family homes in Santa Clara.
- MidPen Housing: develops affordable housing; manages affordable properties; provides family, senior, and supportive housing services.
- Bridge Housing: affordable housing developer.

- Gavilan College: provides affordable housing for low-income students.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this improvement.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	Minority populations and low-income populations in need of affordable housing will benefit.
Relative Number of Beneficiaries	15	Affordable housing will benefit a broad number of Santa Clara and San Jose residents.
Practicable	10	Funding for this improvement is practicable; however, sufficient funds will need to be dedicated to this improvement for organizations and public entities to receive adequate funding for implementation of housing projects.
Defined Project or Action	10	The Authority will provide funding; specific organizations and/or public entities to be funded/housing opportunities to be constructed is to be determined.
Satisfy Authority Obligations	15	This improvement will provide community uplift and economic benefits.
Defined Roles and Responsibilities	5	Community partners are to be defined (potential partners identified above).
Evidence of Agreement	15	No specific feedback was received on this improvement, but this is a priority for the County and potential partner organizations.
Cost-Effectiveness	5	Cost is high relative to estimated number of beneficiaries
TOTAL SCORE	90	

Authority = California High-Speed Rail Authority.

37. OFFSETTING MITIGATION MEASURE SJV-OMM#1: VOLTA ELEMENTARY SCHOOL ENHANCEMENTS

COMMUNITY: SAN JOAQUIN VALLEY

ALTERNATIVES: 1, 2, 3, 4

Measure Description

The proposed offsetting mitigation measure will contribute funds to improve and expand Volta Elementary School. These funds could be used for tree planting and other landscaping; window replacement; insulation installation; and construction of permanent classrooms to replace the portables, a parking area, or a community room at Volta Elementary School. Funds also could be used for water supply improvements and other critical safety features required for school expansion.

Nexus to Disproportionately High and Adverse Effects

All four project alternatives would result in disproportionately high and adverse effects (DHAEs) on low-income populations related to the project's operational noise impacts after the consideration of mitigation and project benefits. There would be residual severe noise impacts in the San Joaquin Valley after the application of proposed noise barrier mitigation. While the proposed offsetting mitigation measure will not directly address operation noise impacts resulting from the project, it will provide a targeted community improvement for a facility that is vital to facilitating civic engagement among residents and maintaining a close-knit community.

Benefit to Minority Populations and Low-Income Populations

The high-speed rail (HSR) alignment under all alternatives would traverse the San Joaquin Valley community, where the percentage of minority residents and low-income residents is greater than that within the reference community.

The proposed offsetting mitigation measure will benefit minority residents and low-income residents and community members who are served by Volta Elementary School by providing enhanced education facilities and community-serving site facilities. Health, safety, and educational benefits will be provided through the provision of enhanced utilities, safety improvements, and improved educational space. The location of the offsetting mitigation measure relative to the location of the HSR alignment within the San Joaquin Valley community is shown graphically in Figure SJV-1.

Consistency with Community Goals and Planning

This offsetting mitigation measure will be consistent with Los Banos Unified School District (LBUSD) planning.

Community Outreach Input and Relationship to DHAEs

Input from LBUSD that is addressed by this offsetting mitigation measure indicated the need for school site improvements to modernize and enhance facility functionality and for additional community space for Volta residents.

This offsetting mitigation measure will provide improvements to Volta Elementary School that will improve the educational environment and provide additional community-serving facilities, thus

providing educational, health, and safety benefits. Because the HSR alignment would travel through the community under all project alternatives, residents would experience various project effects under all alternatives. This offsetting mitigation measure will apply under all alternatives.

Improvement Cost Estimate

The California High-Speed Rail Authority (Authority) proposes a $5 million contribution toward Volta Elementary School to improve its facilities and expand its capacity. This is only a rough estimate due to the preliminary nature of conceptual design.

Construction of permanent classrooms to replace all the portables that are currently at the Volta Elementary School will essentially require construction of a new school. School expansions and new schools constructed in the greater vicinity had costs ranging from $7 million for an expansion project to $25 million for new junior high and new elementary schools. An overall cost for improving the school was assumed to be approximately $15 million as a mid-point based on what was spent on other schools in the area. Since this improvement is intended to offset noise impacts only and not address all needs at the school, conceptually it is proposed that the Authority will contribute one-third of the overall school improvement cost, or $5 million.

Roles and Responsibilities

The Authority will provide funding for the proposed improvements at Volta Elementary School. Los Banos Unified School District would implement the improvements.

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Evaluation

Criteria	Ranking 1–15	Justification
Benefit Intensity	15	This offsetting mitigation measure will provide educational benefits for Volta Elementary School students and social benefits for members of the local Volta community.
Relative Number of Beneficiaries	12	The Volta Elementary School is the primary community asset in the Volta community. Improving the school will benefit the entire community as a result.
Practicable	15	Authority contribution is feasible. LBUSD could implement improvements using the funding.
Defined Project or Action	15	Authority contribution is defined, and LBUSD has identified a suite of likely improvements, but further design of the new classrooms is needed.
Satisfy Authority Obligations	15	This offsetting mitigation measure will provide educational benefits for Volta Elementary School students and social benefits for the local Volta community, which is directly affected by the HSR project.
Defined Roles and Responsibilities	15	Authority will provide capital funding. LBUSD would implement and fund lifecycle costs.
Evidence of Agreement	15	Community improvement is a priority for LBUSD.
Cost-Effectiveness	6	Cost is relatively high relative to number of beneficiaries.
TOTAL SCORE	108	

Authority = California High-Speed Rail Authority; HSR = high-speed rail; LBUSD = Los Banos Unified School District.

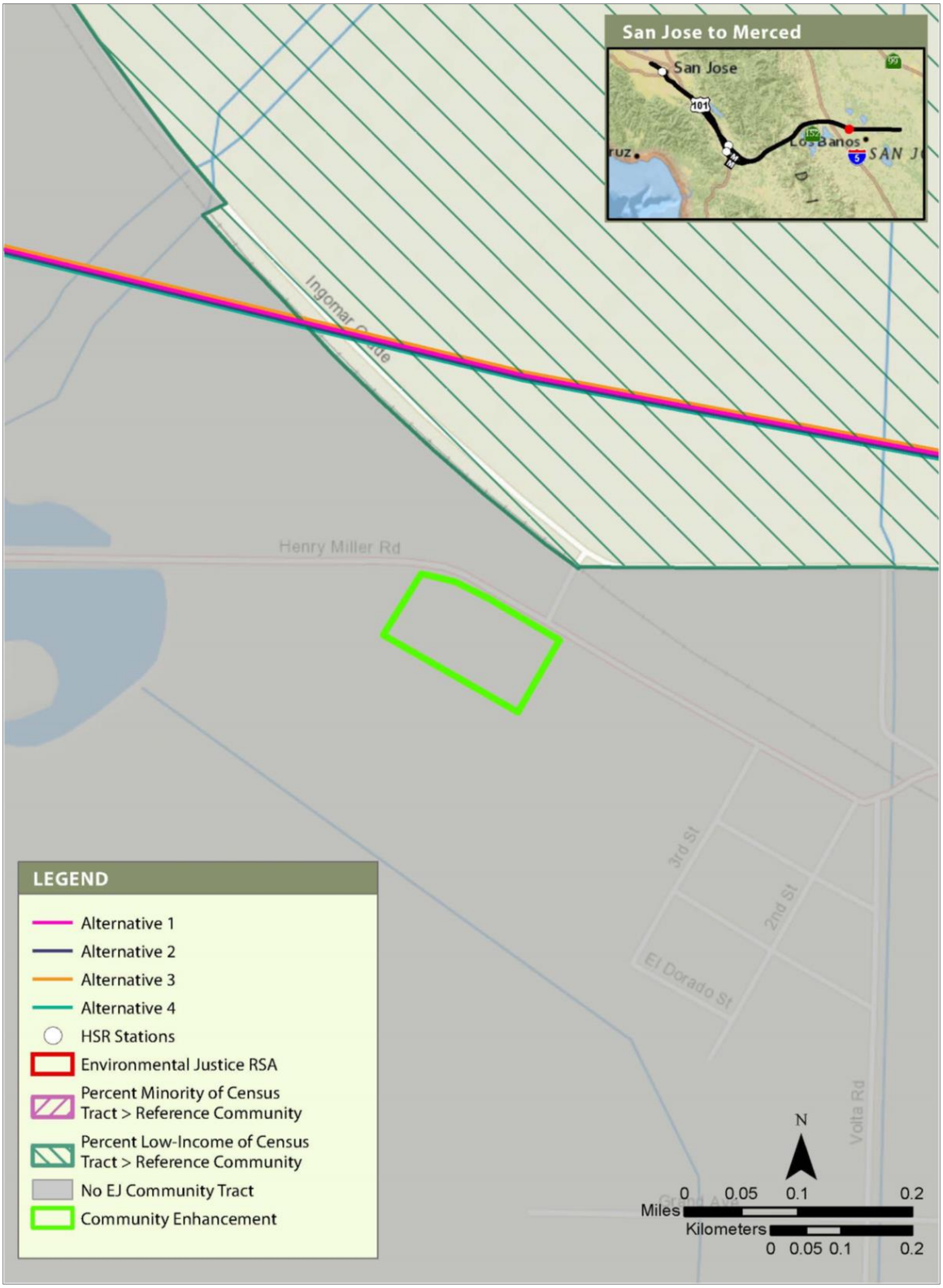


Figure SJV-1 Volta Elementary School Enhancements
San Joaquin Valley

38. OFFSETTING MITIGATION MEASURE SJV-OMM#2: VOLTA COMMUNITY PARK AT VOLTA ELEMENTARY SCHOOL

COMMUNITY: SAN JOAQUIN VALLEY

ALTERNATIVES: 1, 2, 3, 4

Measure Description

The proposed improvement will provide funding for development at the Volta Elementary School campus for use as a community park. The park could include a combination of turf, ball courts, shade structures, picnic tables, and play equipment and will be accessible to the broader community. This measure will also include fencing (to separate the park from the school for potential after hours use) and a small parking lot. This improvement will apply to all alternatives.

Nexus to Disproportionately High and Adverse Effects

All four project alternatives would result in adverse visual aesthetic effects on low-income populations related to the proposed aerial viaduct and elevated embankment in the San Joaquin Valley Subsection after direct mitigation. Alternatives 1, 2, and 3 would result in disproportionately high and adverse effects (DHAEs) relative to visual aesthetics on an end-to-end basis. Although Alternative 4 would not result in DHAEs relative to visual aesthetics on an end-to-end basis, it would have the same design as the other alternatives in the San Joaquin Valley Subsection and the same adverse visual effects and thus this improvement is also recommended for Alternative 4. While the proposed offsetting mitigation measure will not directly address the visual effects of the elevated rail alignment, it will provide indirect aesthetic benefits by creating a community park, recreational fields, and provide a sense of place in Volta that will promote civic engagement among residents and help to maintain a close-knit community by providing a safe place for student and community recreation and gathering.

Benefit to Minority Populations and Low-Income Populations

The HSR alignment under all alternatives would traverse the San Joaquin Valley community, where the percentage of minority residents and low-income residents is greater than that within the reference community.

This proposed improvement will benefit minority residents and low-income residents by providing additional recreational opportunities for Volta Elementary School students and for the surrounding community. The location of the improvement relative to the HSR alignment within the San Joaquin Valley community is shown graphically in Figure SJV-2.

Consistency with Community Goals and Planning

This improvement will be consistent with the guiding policy of the Merced County General Plan for high-quality park systems in the County. It will also further the Los Banos Unified School District objective to promote use of school facilities after school hours.

Community Input and Relationship to Overall Project Effects

Input that is addressed by this improvement included the following concerns:

- Lack of neighborhood park

- Insufficient recreational opportunity on the elementary school site

This improvement will support the School District to develop an area at the Volta Elementary School for use as a community park. Because the HSR alignment would travel through the community under all alternatives, residents would experience various project effects under all alternatives. This improvement will apply under all alternatives.

Improvement Cost Estimate

The exact mix of shade structures, picnic tables, playground equipment, basketball court, and playing fields would be determined later. For the purposes of a cost estimate, the following national average costs were identified from the North Carolina State University Extensions' Cost Analysis for Improving Park Facilities to Promote Park-based Physical Activity.[2]

- Shade structure – This element was assumed to be a medium shelter (avg. size 1,100 sf) with a cost to construct of $48,100
- Picnic area - This element was assumed to be a medium picnic area (avg. size 6,700 sf) with a cost to construct of $9,700.
- Playground - This element was assumed to be a medium playground (avg. size 5,900 sf) with a cost to construct of $267,100.
- Basketball court – This element was assumed to be a medium court (7,000 sf) with a cost to construct of $32,100.
- Play field – This element was assumed to be a small softball/baseball field (avg. size 20,100 sf) with a cost to construct of $213,700.

The total of these elements based on the national average costs is $570,700. The study costs were based on 2012 construction cost data. In order to account for increase in construction costs over time, these costs were inflated to $2020 by multiplying by 23 percent. In order to account for the differences in California labor, materials, and other costs relative to national averages, the costs were multiplied by 50 percent. The total estimated costs for the park improvements using these assumptions would be $1,054,000.

The following additional improvements are presumed:

- Site fencing (estimated cost of $50/sf, total of 1,000 feet, cost $50,000) to separate the playground area from school property for potential after hours use.
- A small parking lot (up to 20 spaces) will also be provided (estimated 350sf per space, $7/sf construction, 20 spaces for a total of $49,000).

Based on the above estimates, total costs are estimated as $1,153,000.

Roles and Responsibilities

The Authority will provide funding to the Los Banos Unified School District to develop the community park at the Volta Elementary School. The School District would implement this measure.

[2] North California State Extension. 2015. *Cost Analysis for Improving Park Facilities to Promote Park-based Physical Activity*. https://content.ces.ncsu.edu/cost-analysis-for-improving-park-facilities-to-promote-park-based-physical-activity (accessed November 21, 2021).

Assessment Based on Evaluation Criteria

Based on the evaluation criteria developed by the Authority, the following assessment has been completed for this offsetting mitigation measure.

Criteria	Ranking 1-15	Justification
Benefit Intensity	15	This improvement will provide recreational and community aesthetics to both the Volta Elementary School and the Volta community, which would be directly affected by the HSR project.
Relative Number of Beneficiaries	6	This improvement will benefit the entire Volta community, since there are no municipal parks in or near the community.
Practicable	15	The property is controlled by the school district and the types of improvements are common park/playground improvements.
Defined Project or Action	15	The general improvements are understood. The specific improvements have yet to be designed.
Satisfy Authority Obligations	15	This improvement will provide recreational and community aesthetic benefits to both the Volta Elementary School and the Volta community, which would be directly affected by the HSR project.
Defined Roles and Responsibilities	15	Authority will provide capital funding. LBUSD would implement and maintain the improvements.
Evidence of Agreement	10	LBUSD suggested this measure and has been involved in the development of the concepts.
Cost-Effectiveness	15	Cost is relatively low relative to number of beneficiaries.
TOTAL SCORE	106	

Authority = California High-Speed Rail Authority; HSR = high-speed rail; LBUSD = Los Banos Unified School District.

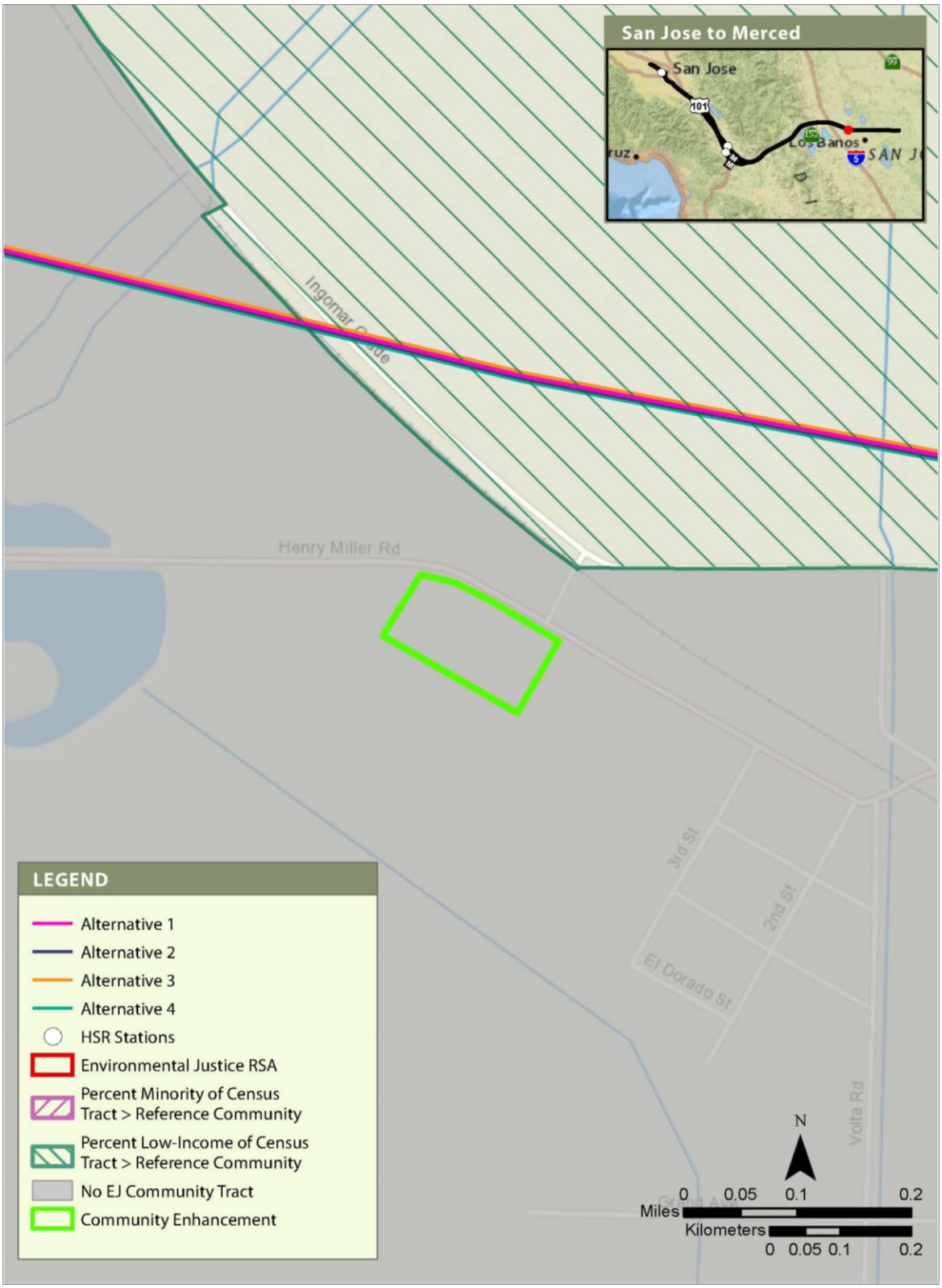
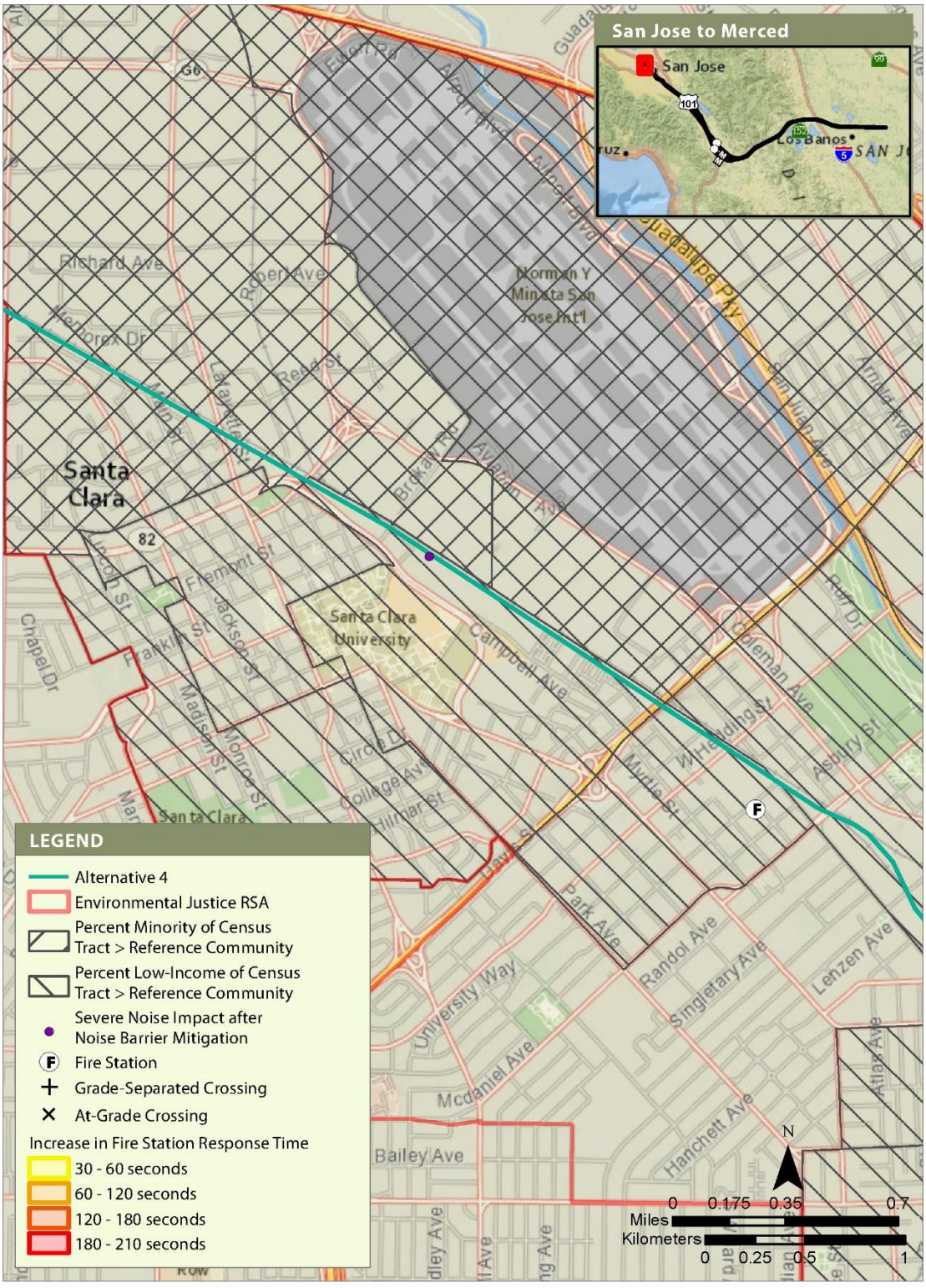


Figure SJV-2 Volta Community Park at Volta Elementary School
SAN JOAQUIN VALLEY

APPENDIX 5-D: PREFERRED ALTERNATIVE, MAPS OF DISPROPORTIONATELY HIGH AND ADVERSE EFFECTS BEFORE CONSIDERATION OF COMMUNITY IMPROVEMENTS

This appendix provides figures showing the disproportionately high and adverse effects on minority populations and low-income populations for Alternative 4 after consideration of direct mitigation and project benefits but before the consideration of the offsetting value of potential community improvements. Consequently, as explained in Chapter 5, Environmental Justice, Figures 5-D-1 through 5-D-37 show the locations of severe noise impacts (after implementation of noise barriers) and the locations where emergency vehicle response delay may be greater than 30 seconds. As described in Chapter 5, significant impacts associated with emergency vehicle response times with Alternative 4 are only expected if local jurisdictions do not implement the necessary improvements included in Mitigation Measure SS-MM#4 with the funding provided by the California High-Speed Rail Authority for capital improvements and for the first 5 years of operations of any new fire stations necessary to reduce impacts to a less-than-significant level. The figures also show the census tracts where minority populations or low-income populations constitute a greater percentage of the population in the census tract than the share of minority populations or low-income populations in the three-county reference community (Santa Clara, San Benito, and Merced Counties).

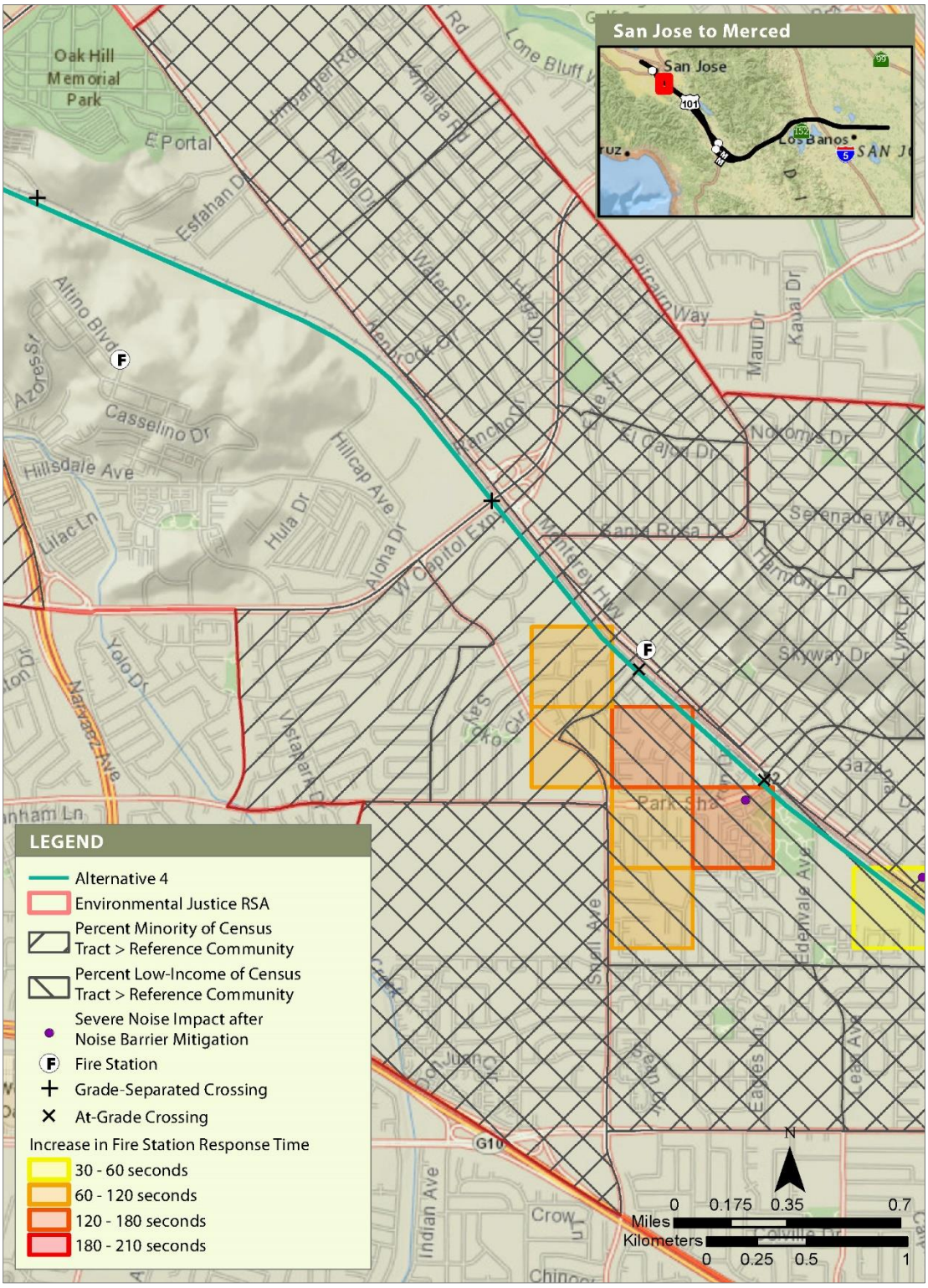


1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-1 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (1 of 37)

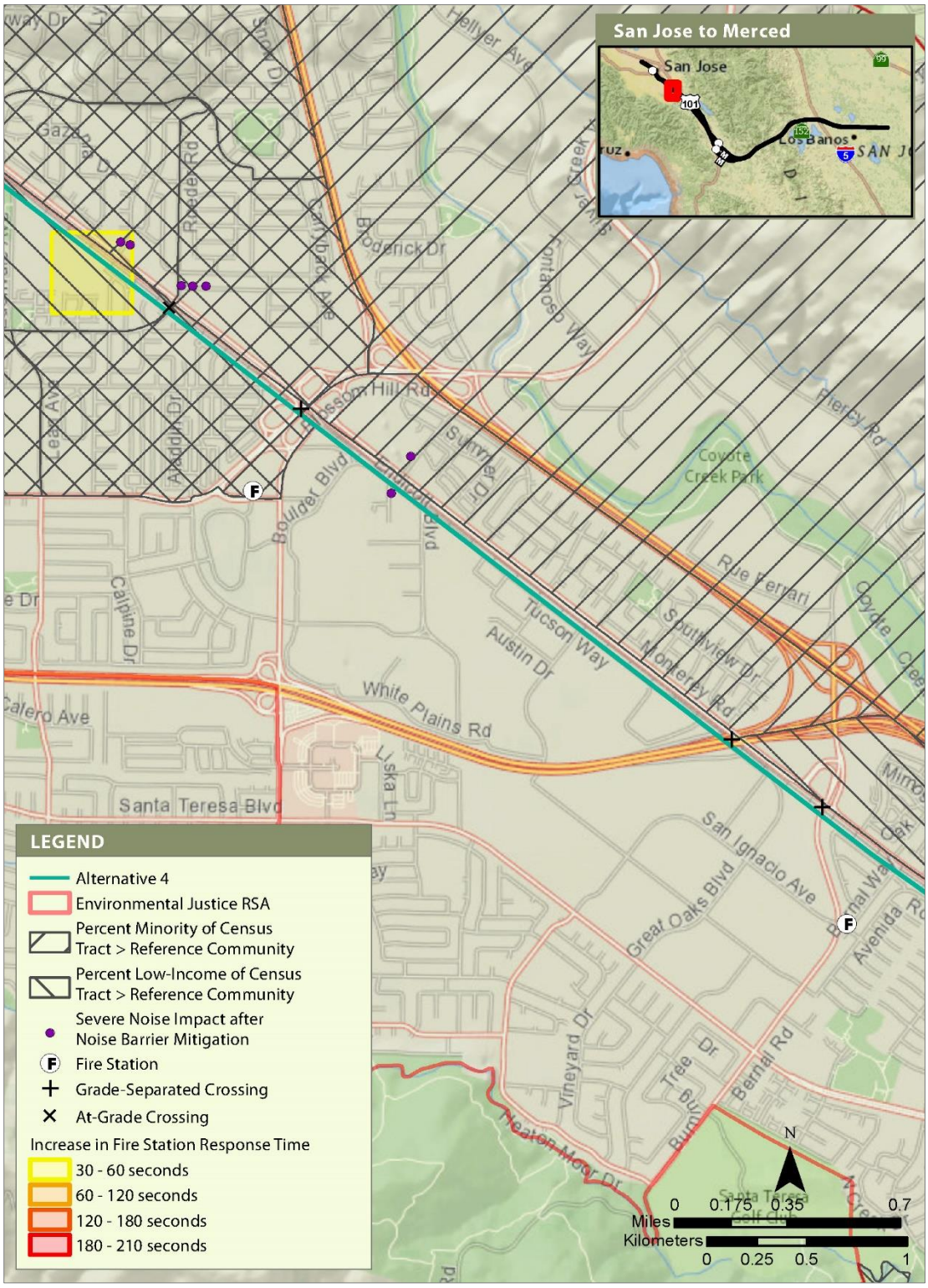
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-2 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (2 of 37)



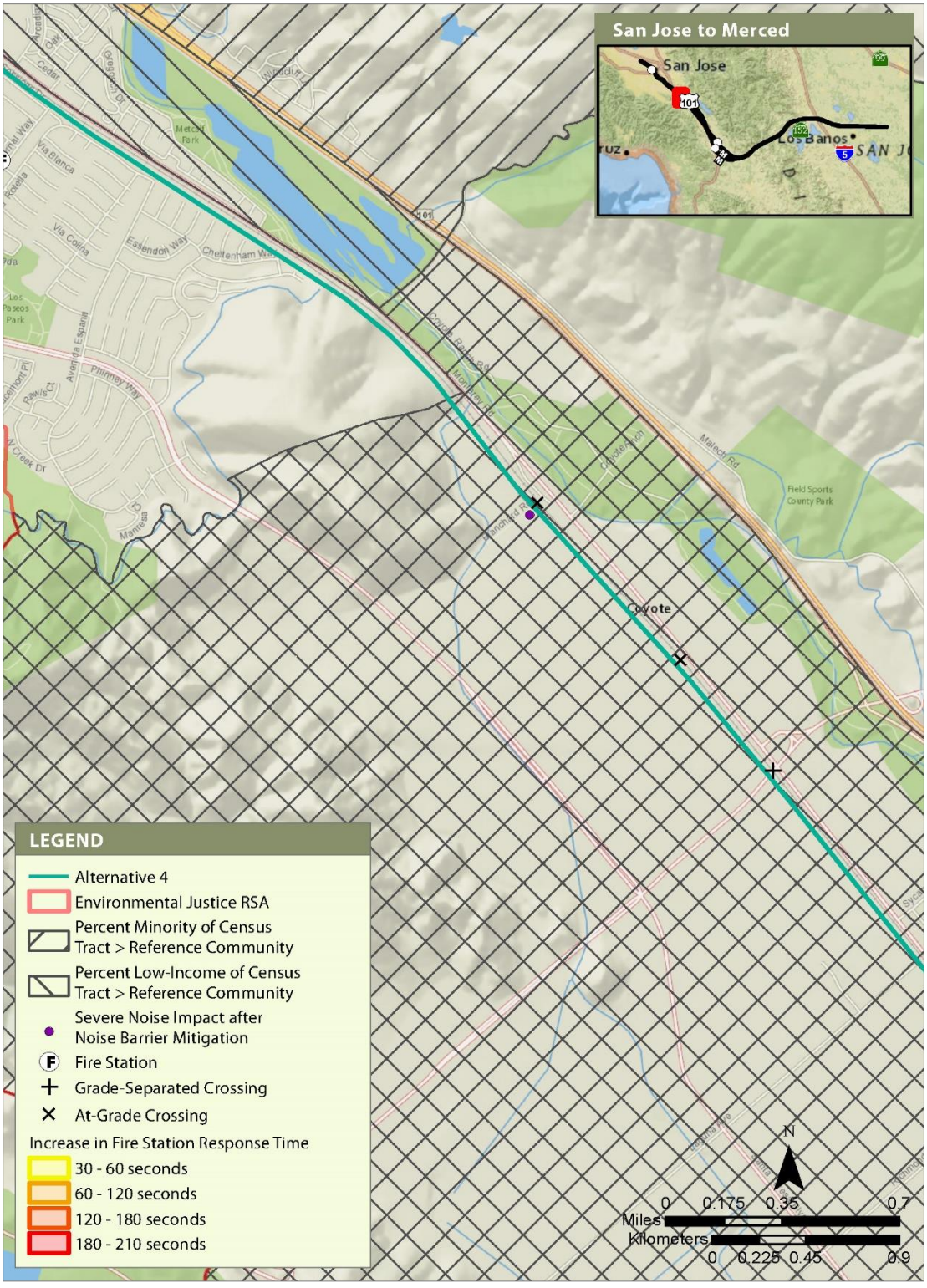
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-3 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (3 of 37)



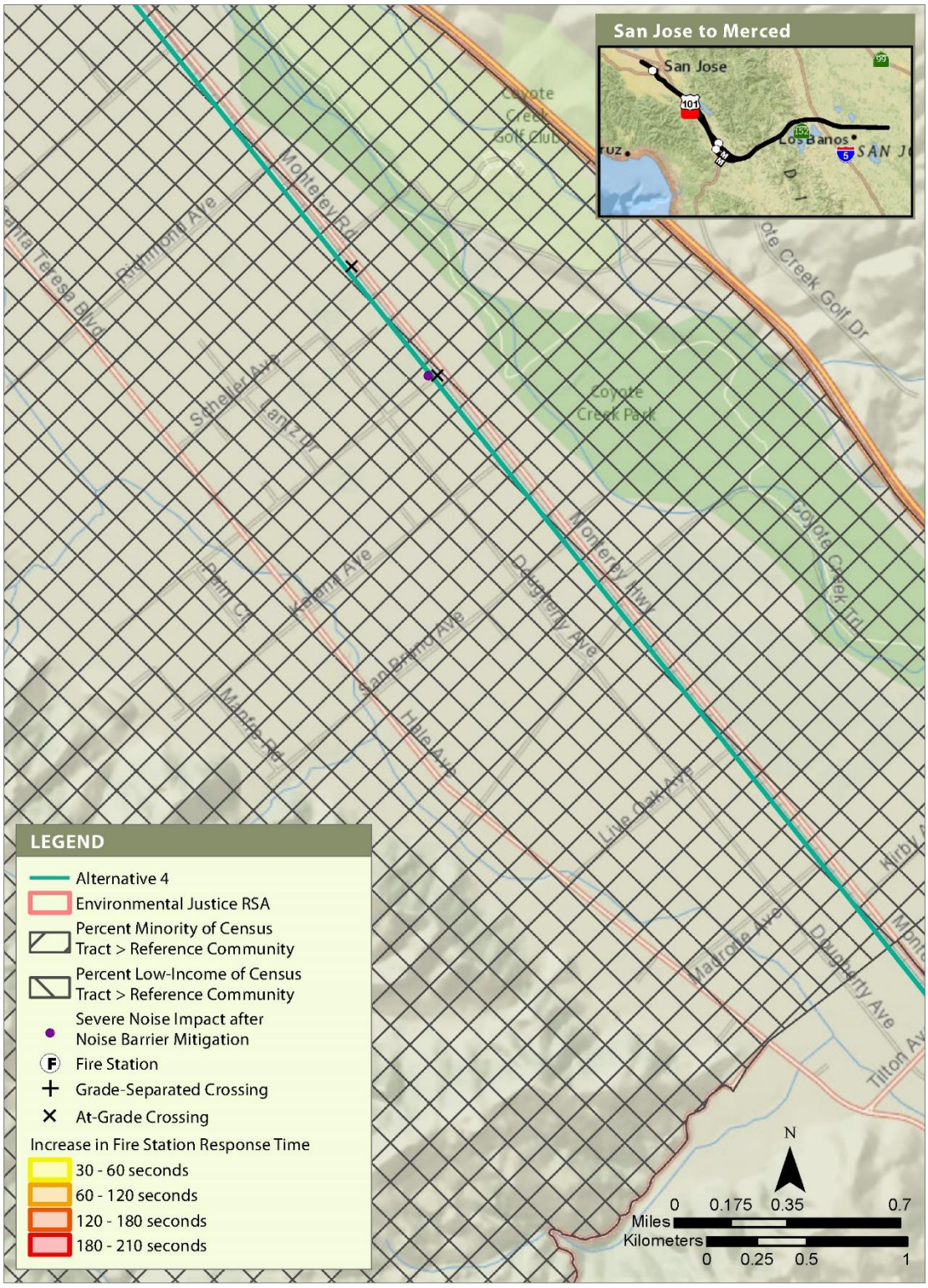
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-4 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (4 of 37)



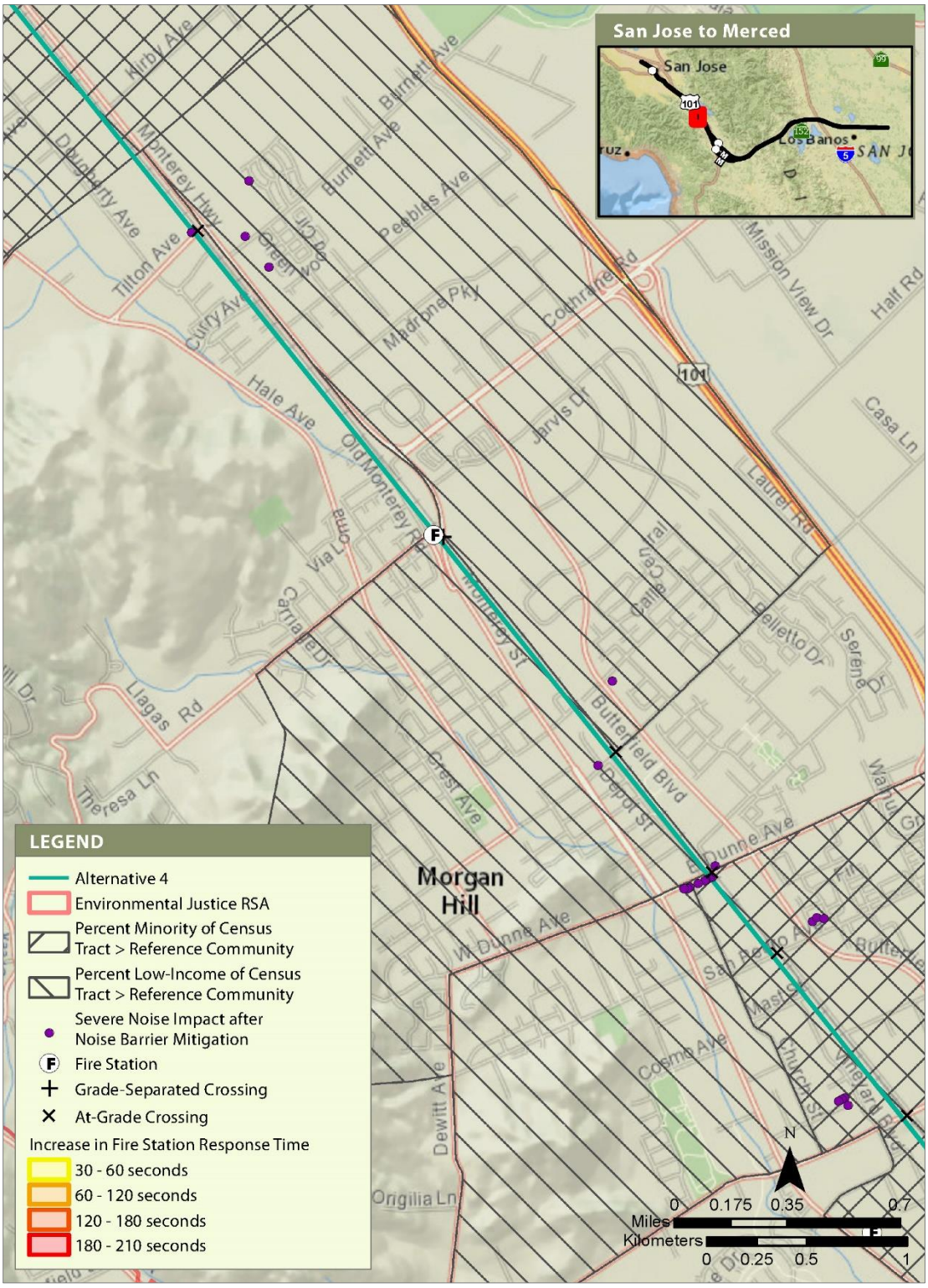
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-5 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (5 of 37)



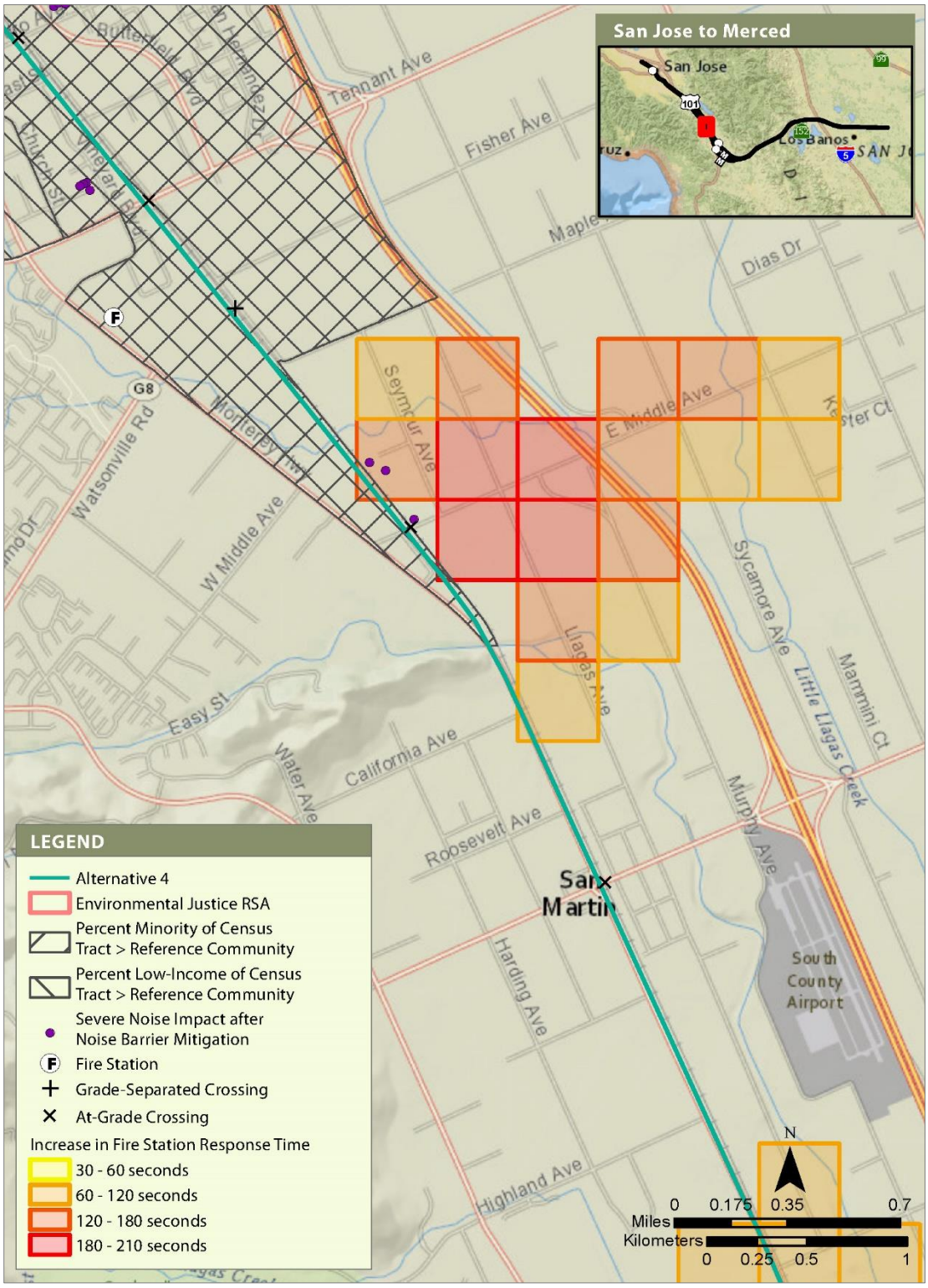
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-6 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (6 of 37)



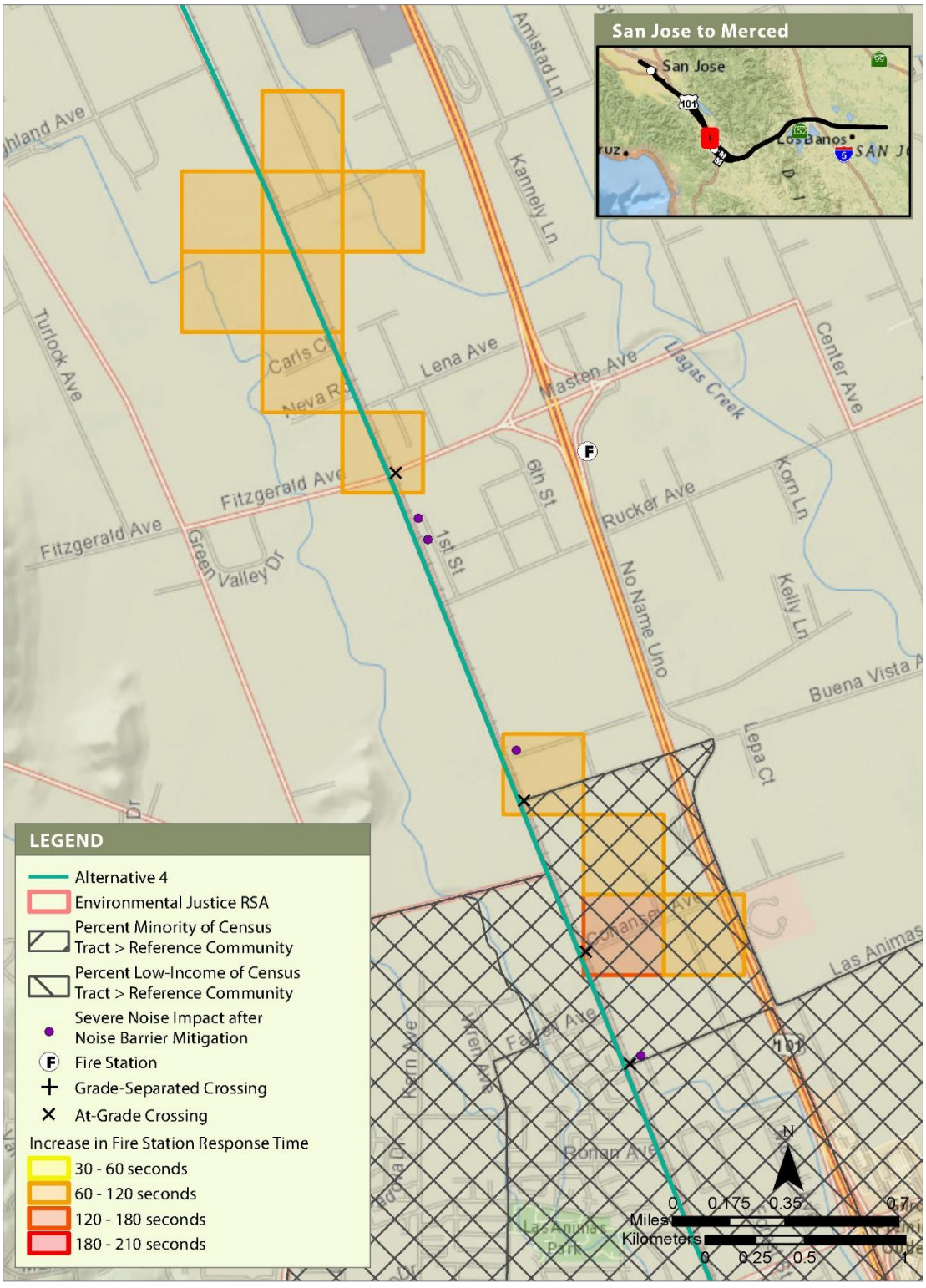
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-7 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (7 of 37)



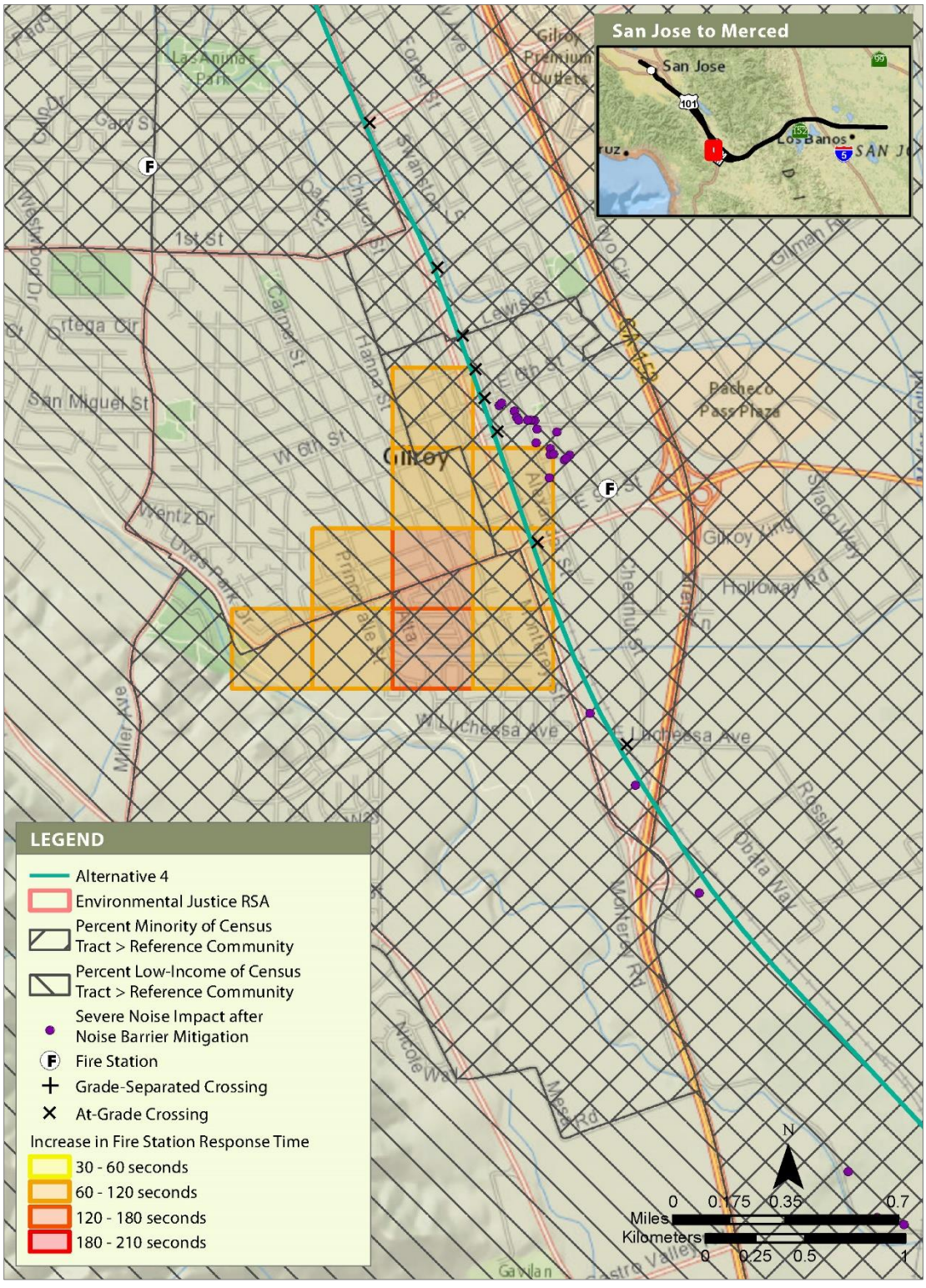
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-8 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (8 of 37)



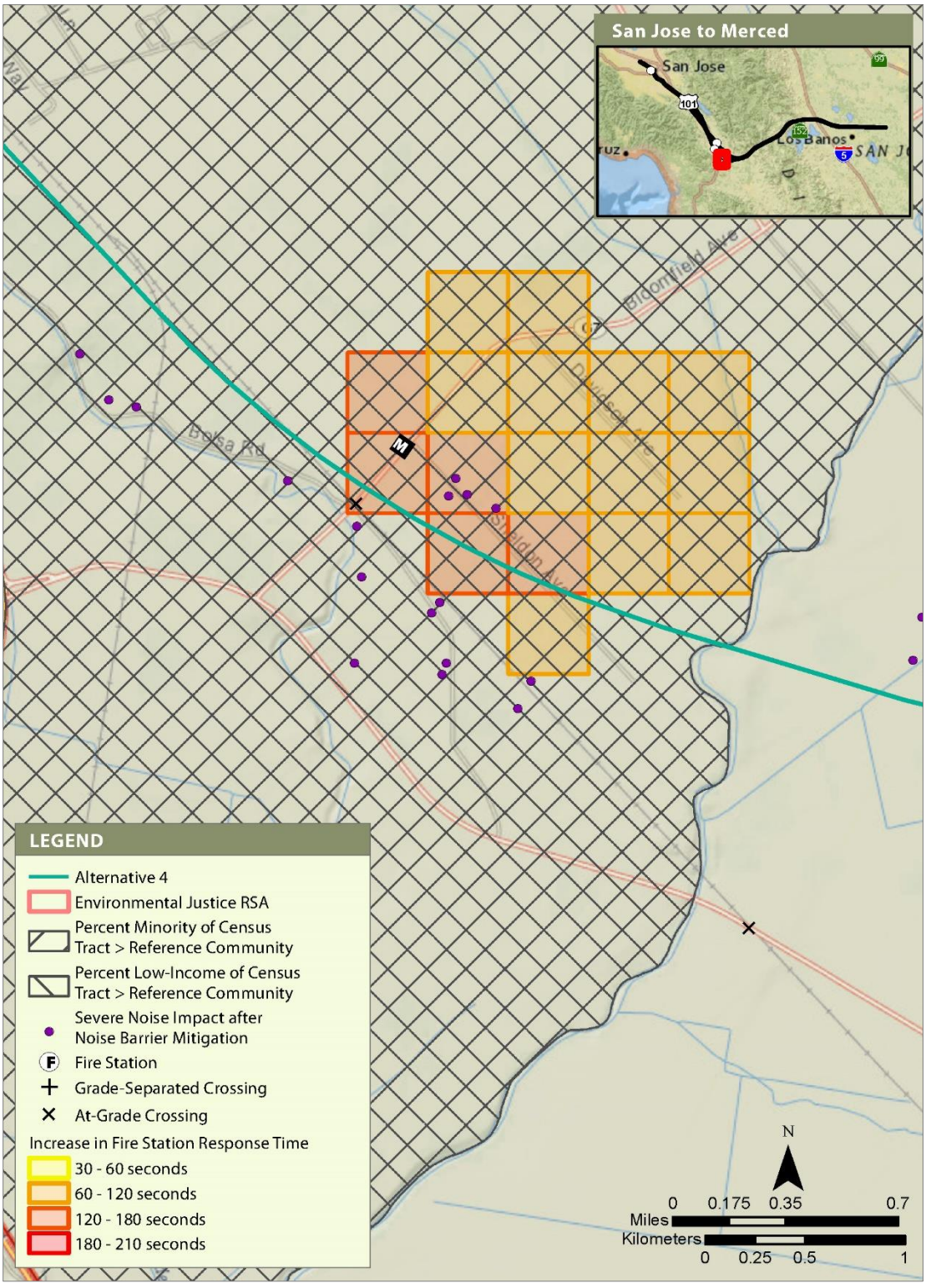
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-9 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (9 of 37)



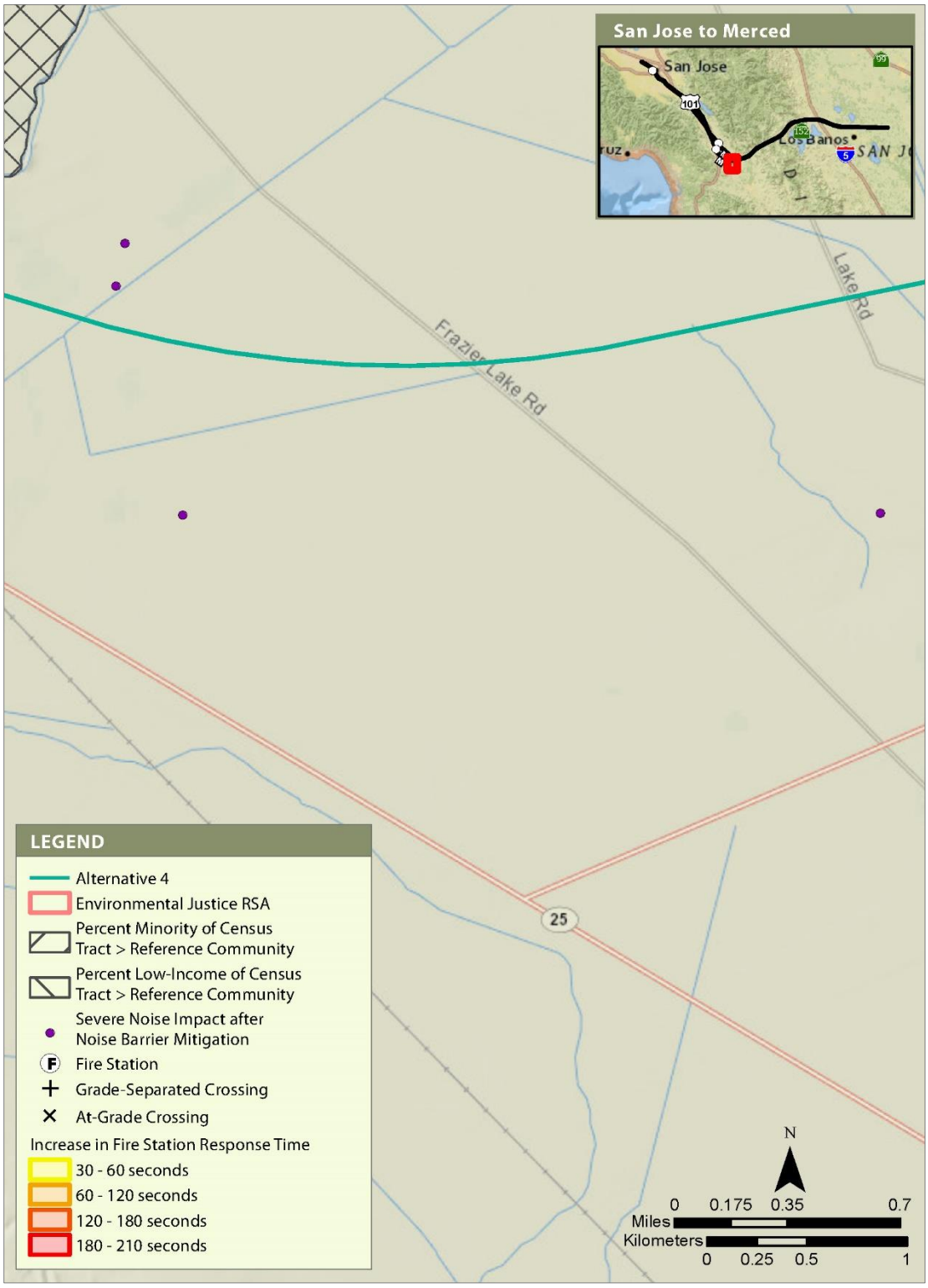
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-10 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (10 of 37)



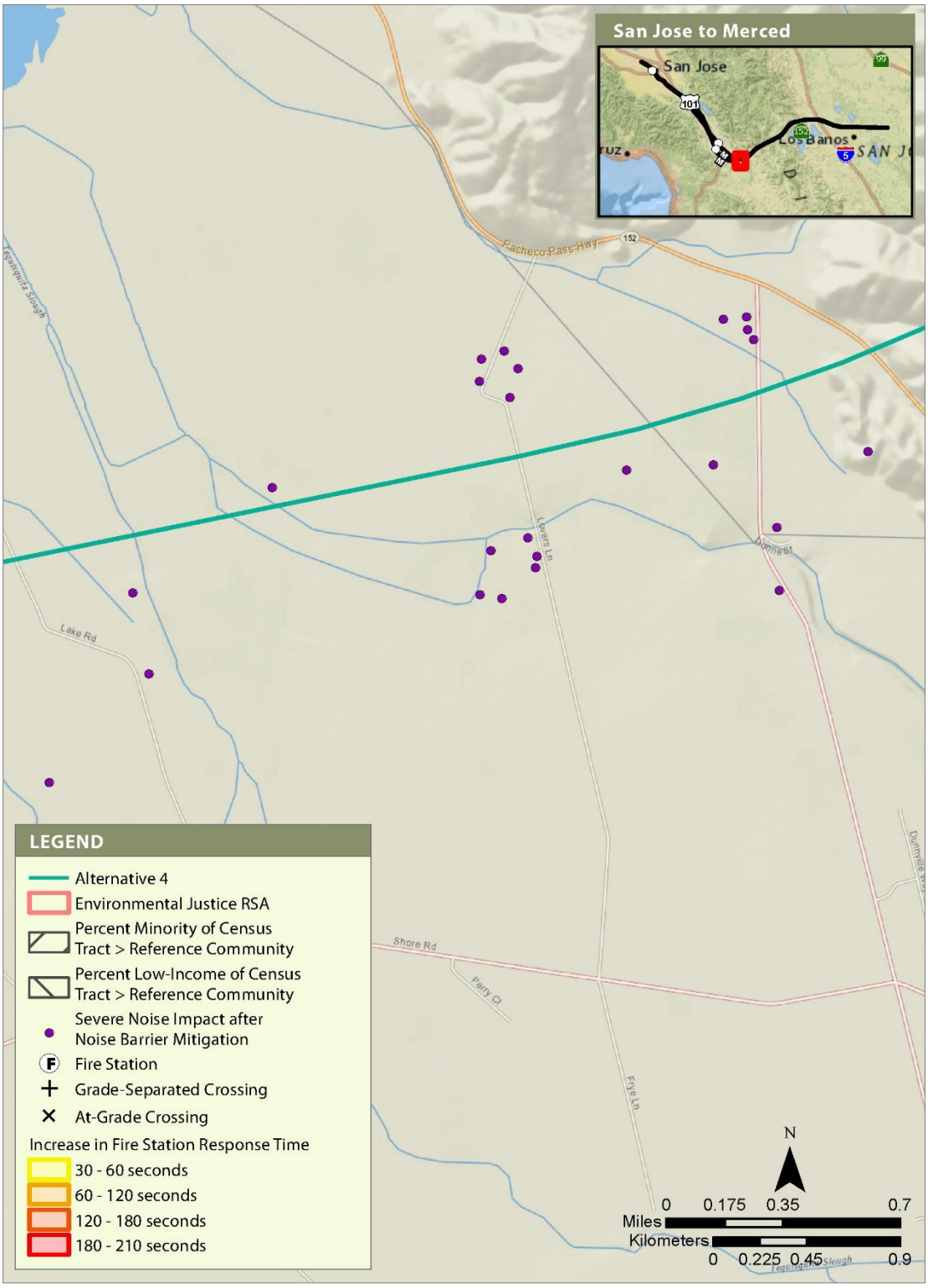
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-11 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (11 of 37)



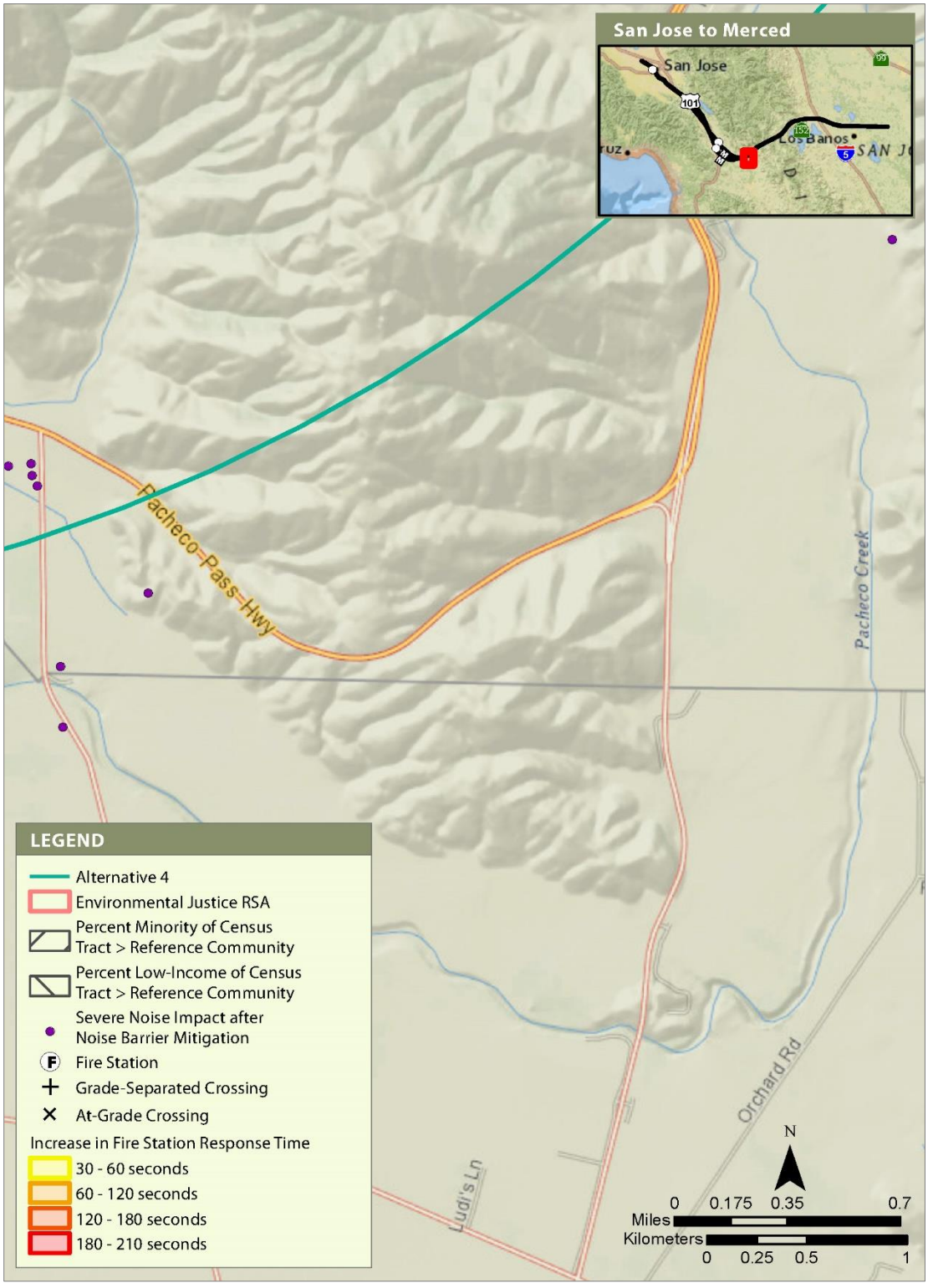
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-12 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (12 of 37)



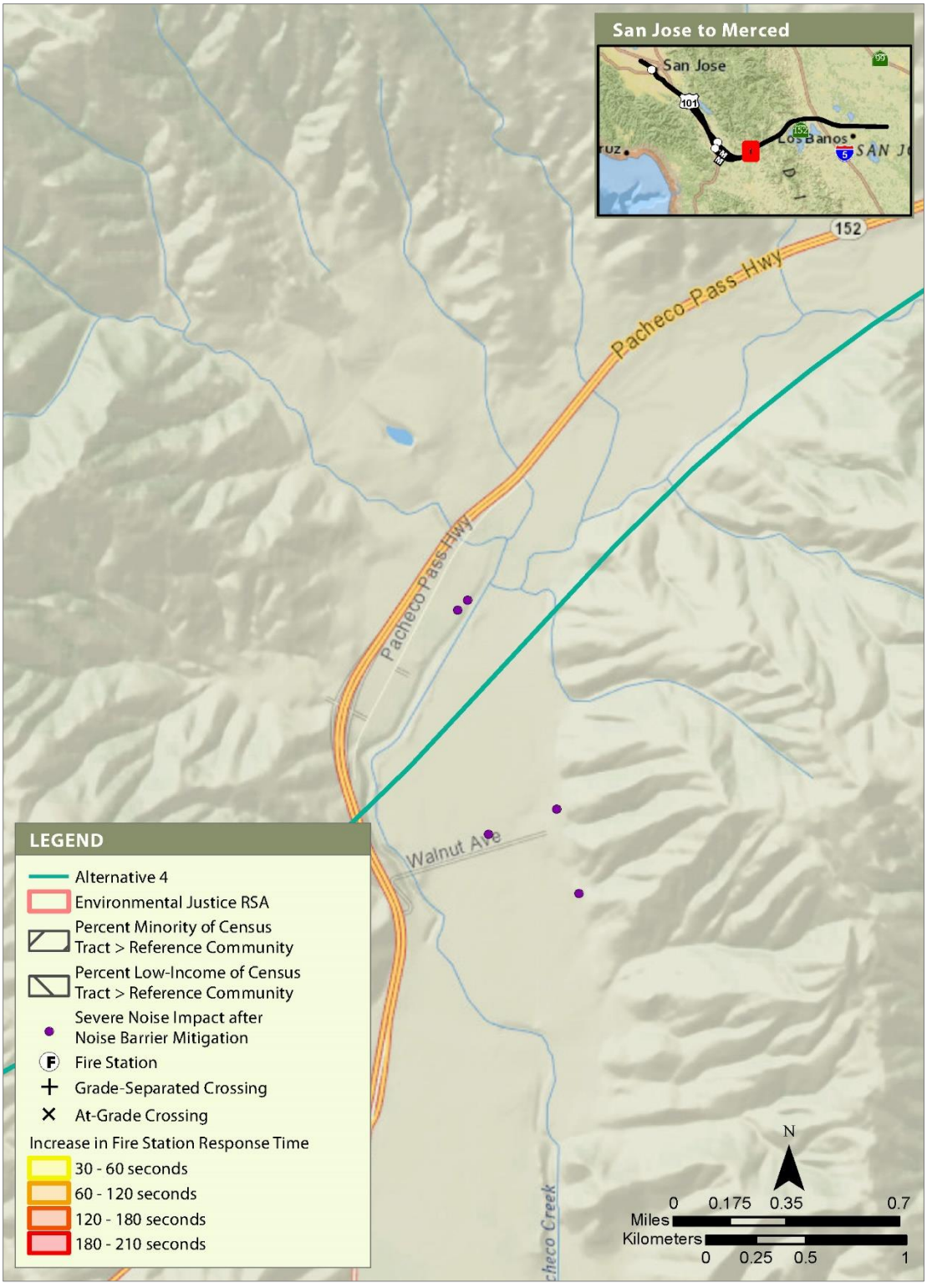
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-13 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (13 of 37)



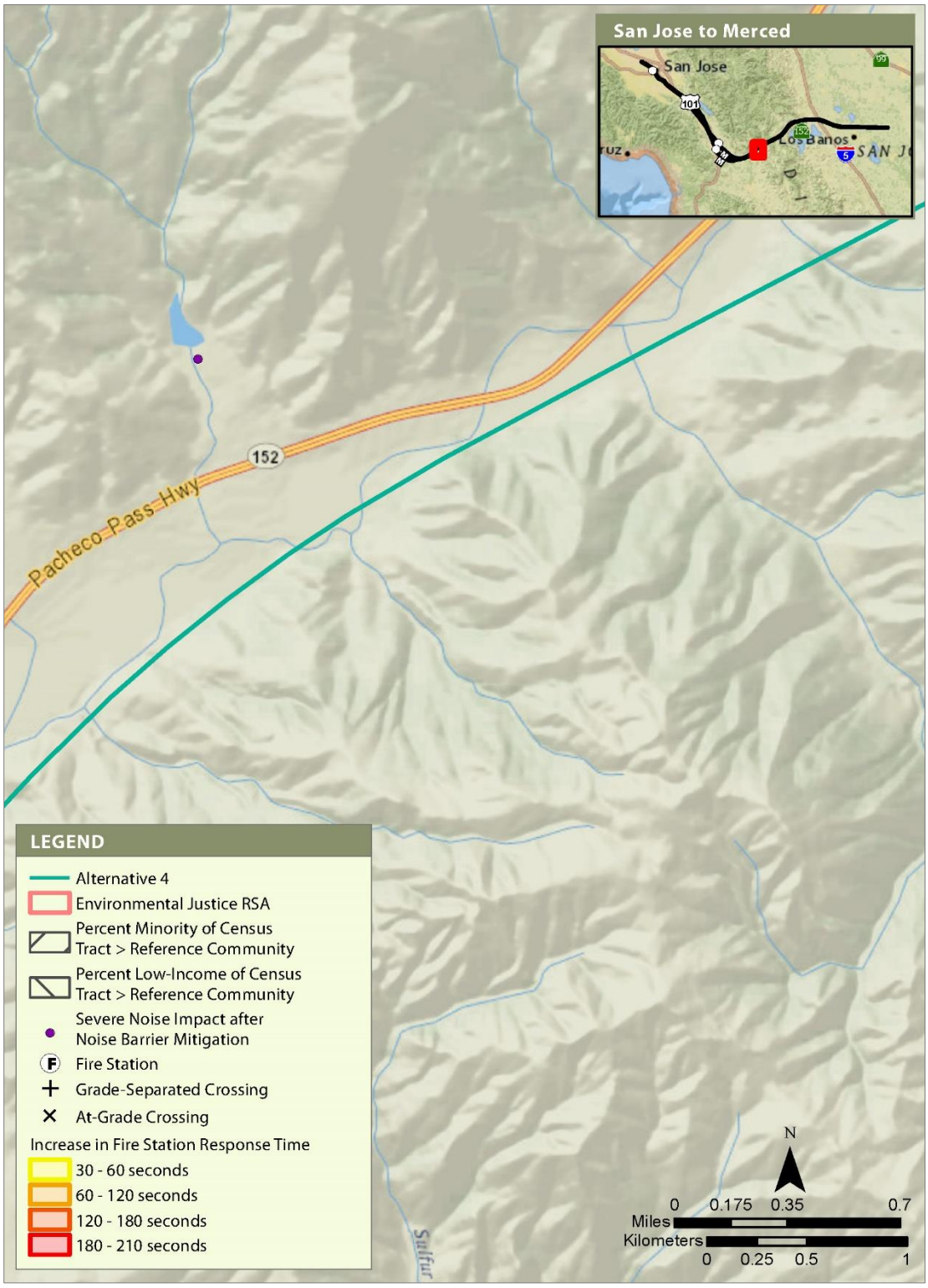
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-14 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (14 of 37)



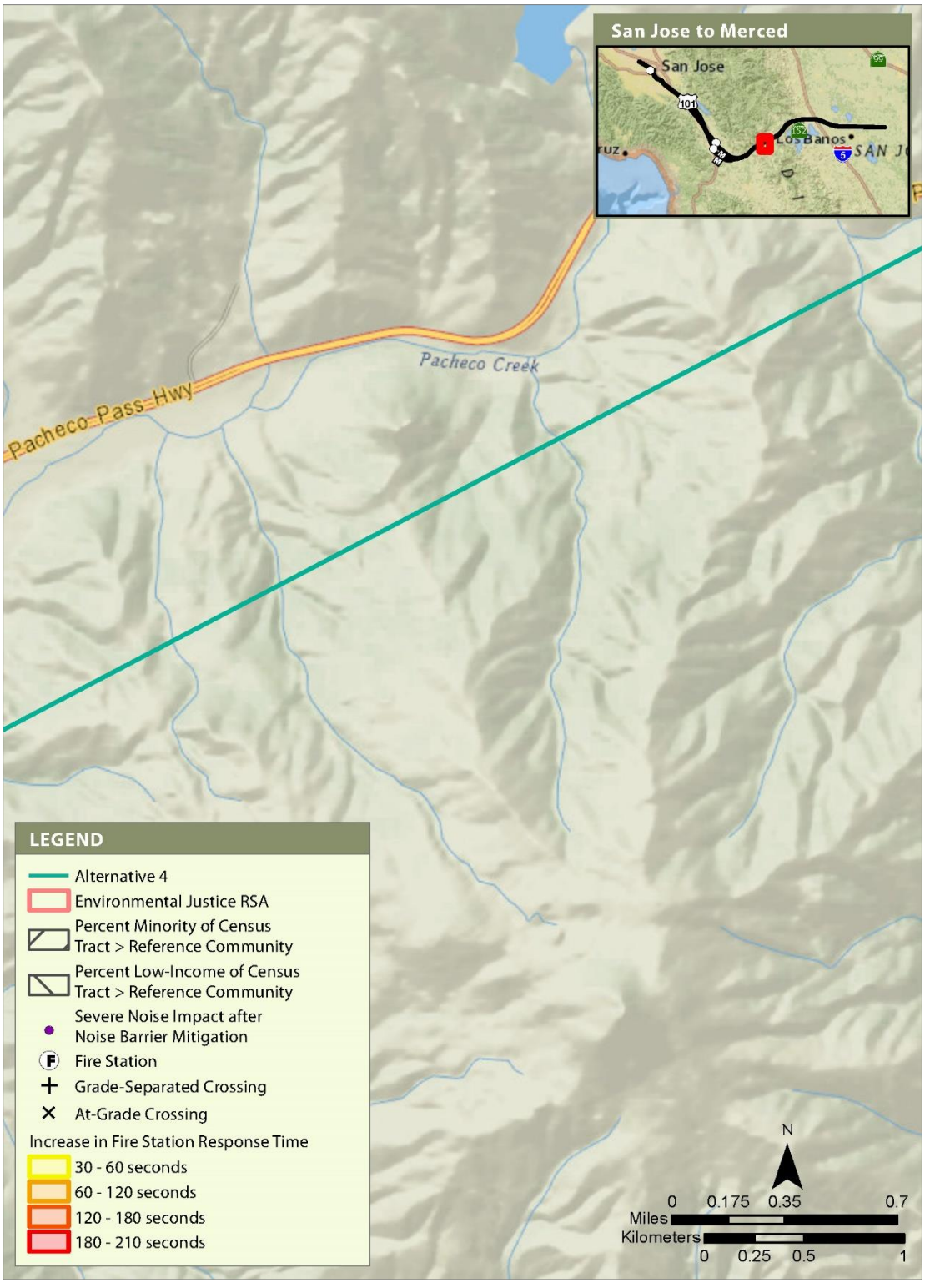
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-15 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (15 of 37)



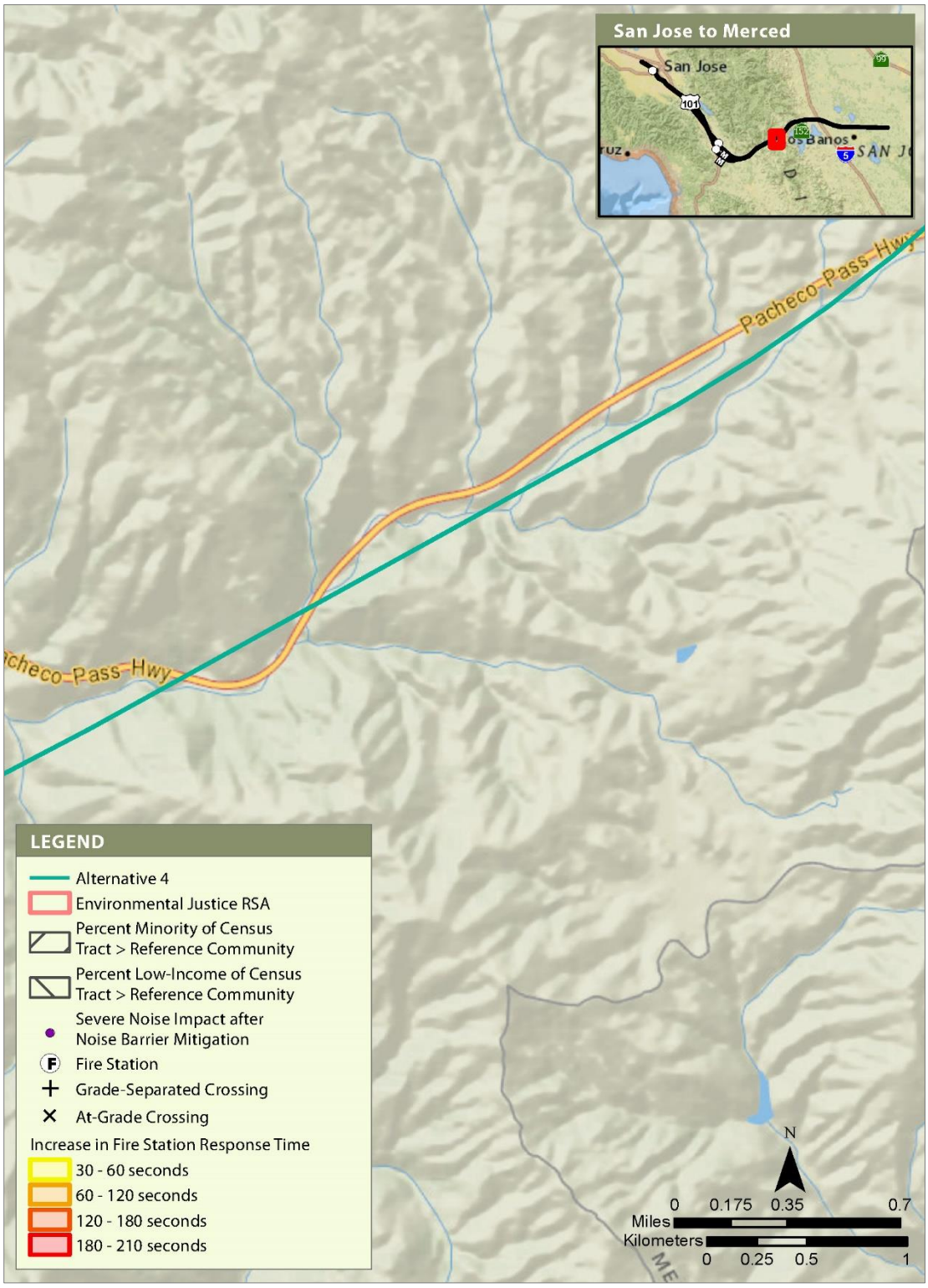
1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-16 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (16 of 37)



1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-17 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (17 of 37)



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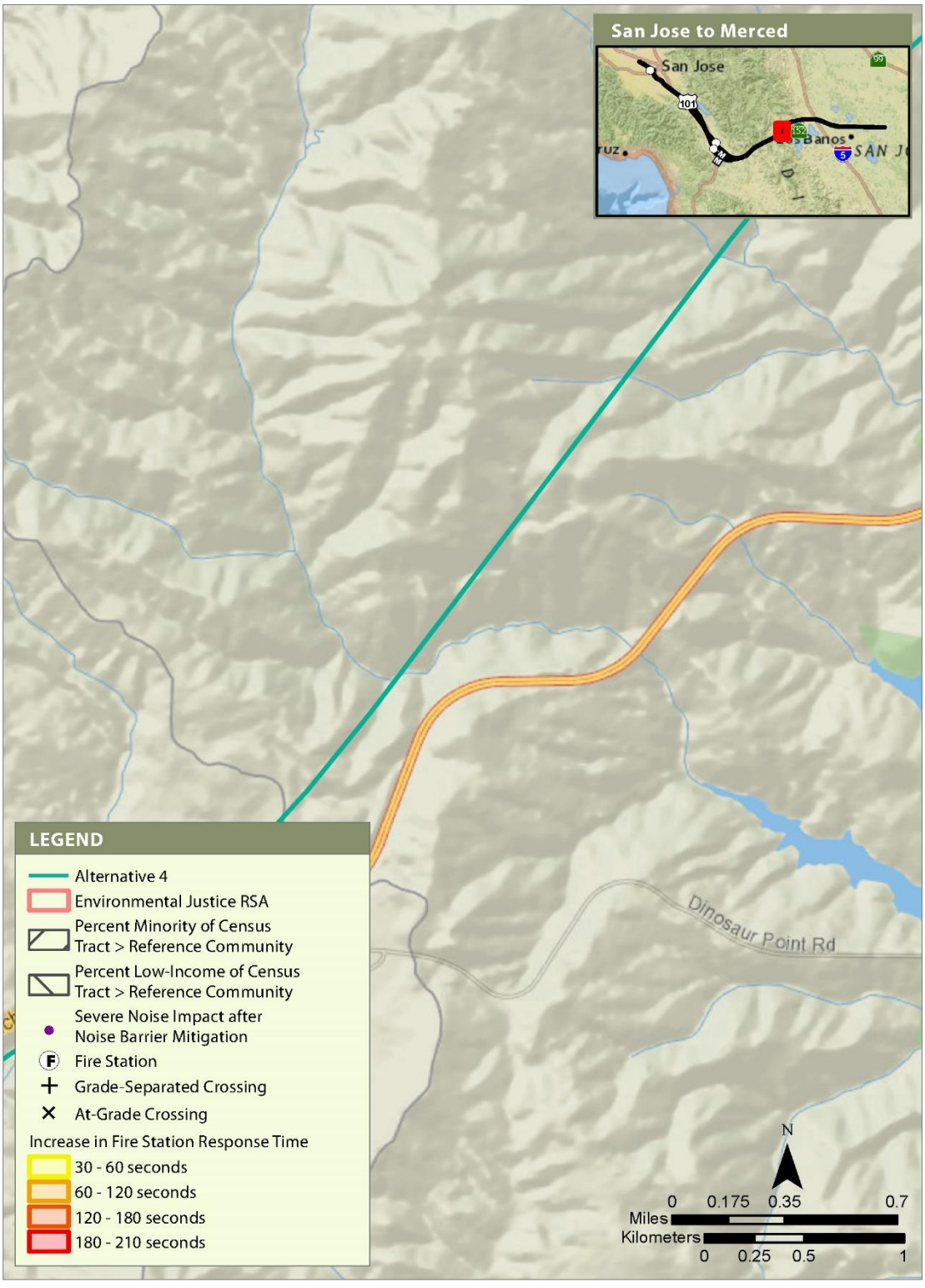
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-18 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (18 of 37)



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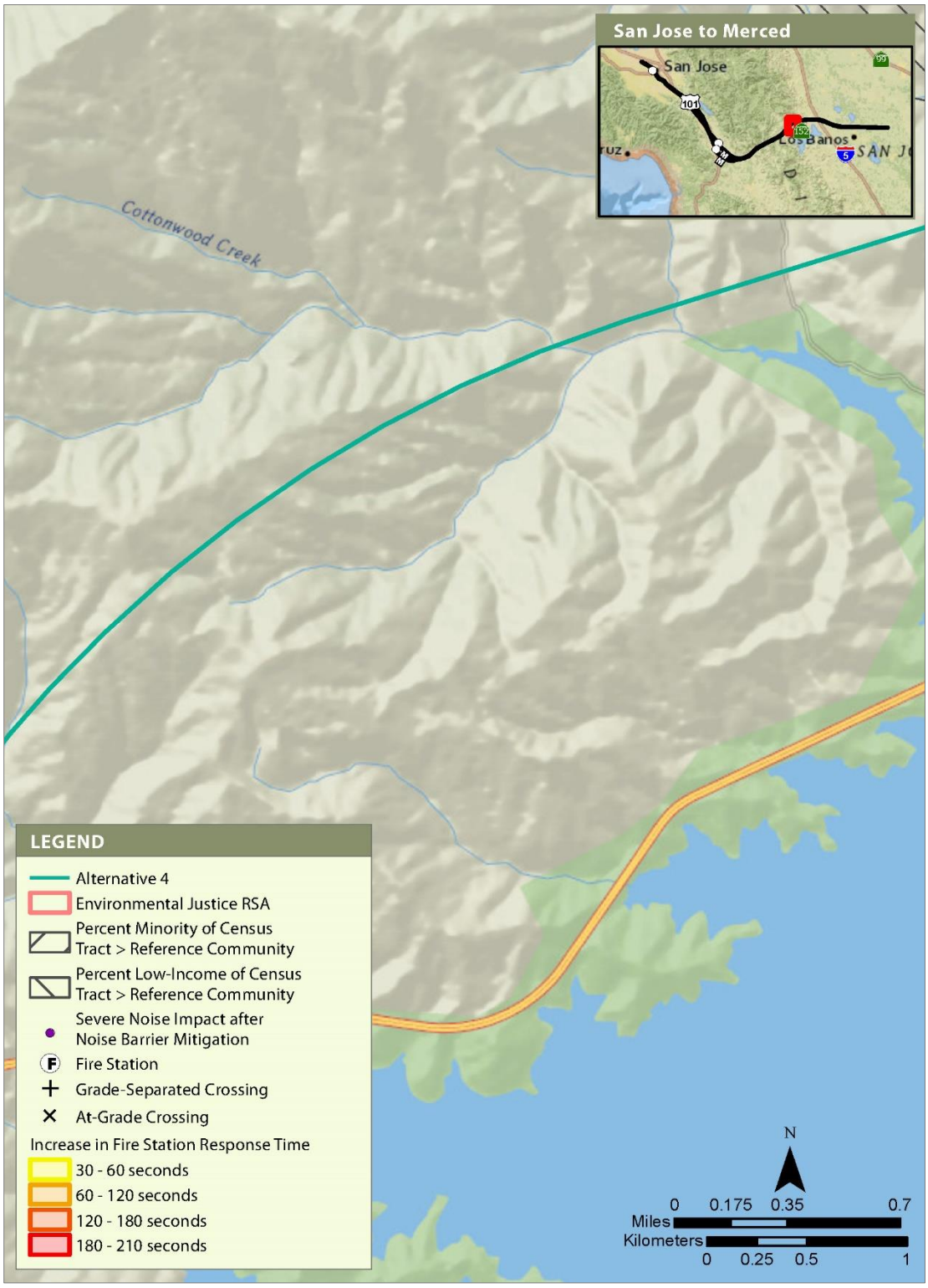
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-19 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (19 of 37)



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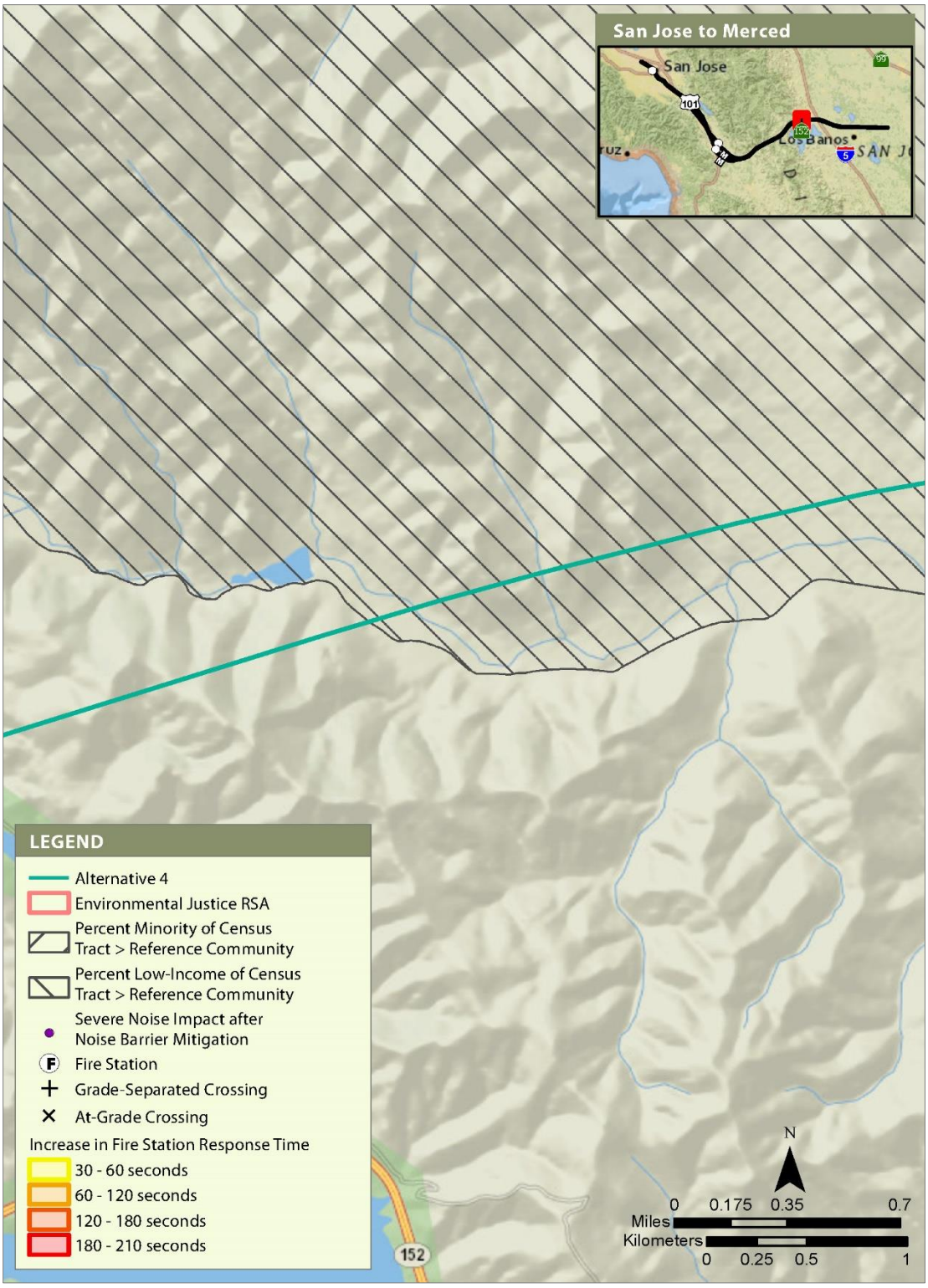
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-20 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (20 of 37)



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2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-21 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (21 of 37)

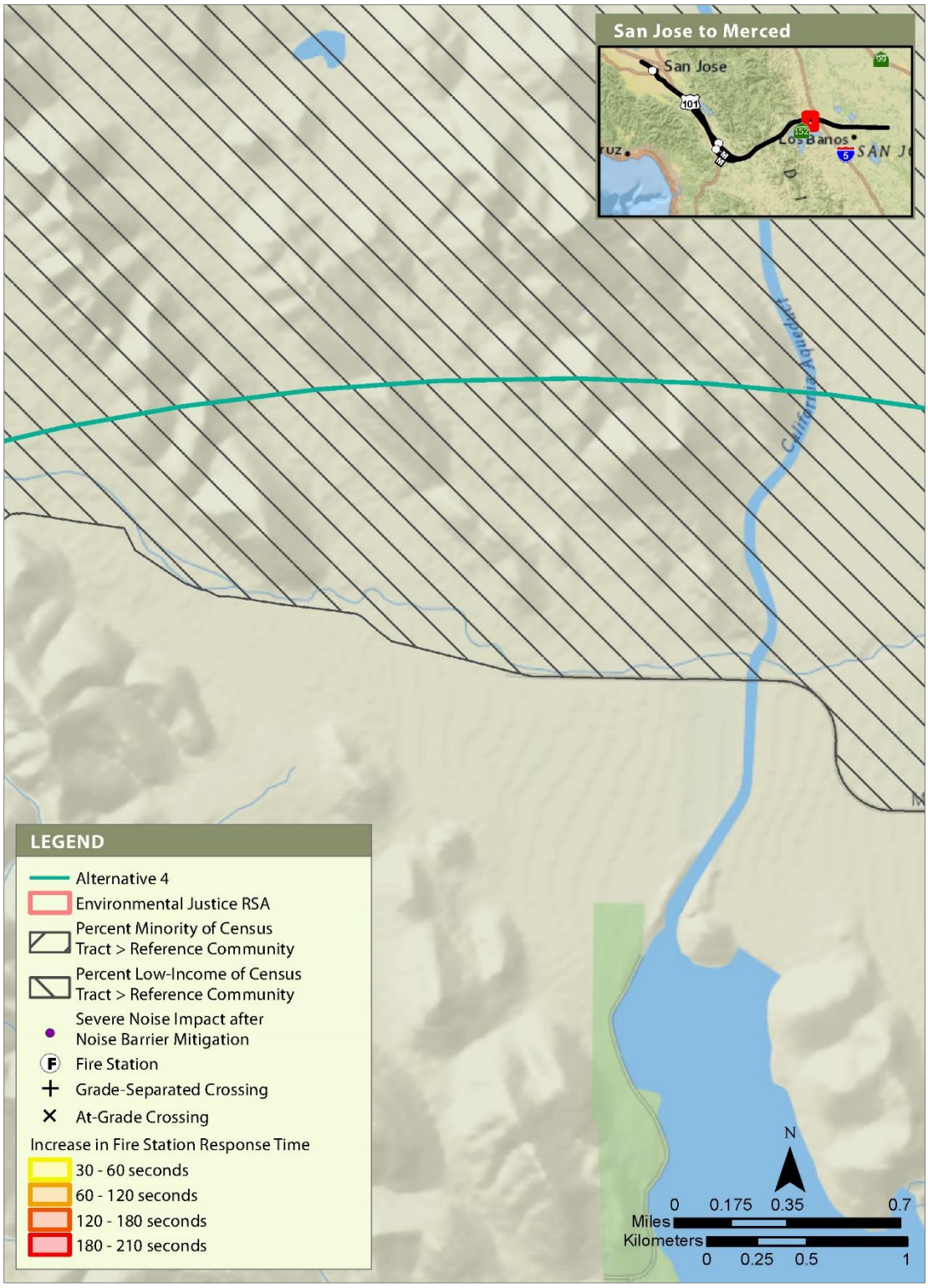

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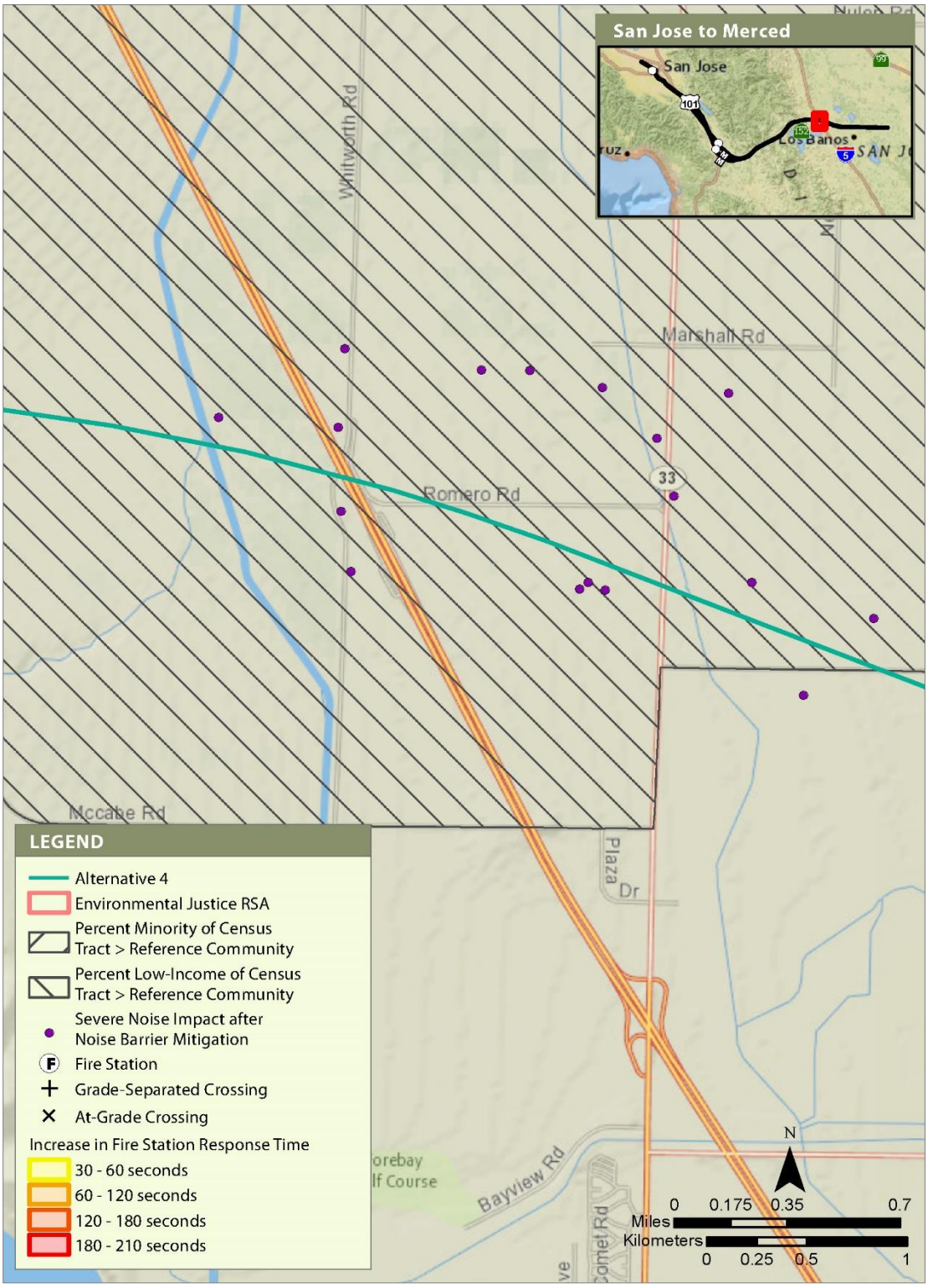
Figure 5-D-22 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (22 of 37)



1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-23 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (23 of 37)

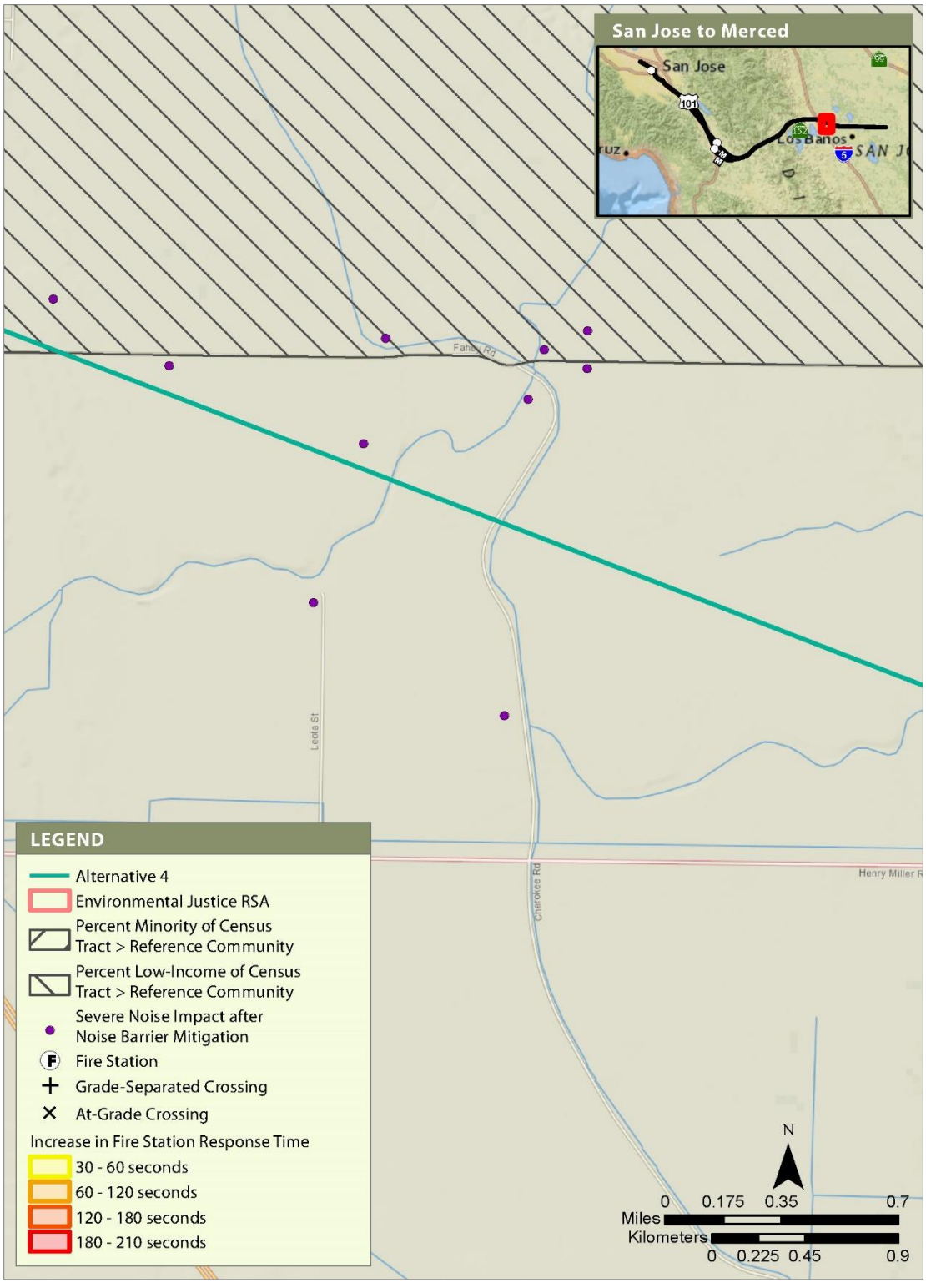


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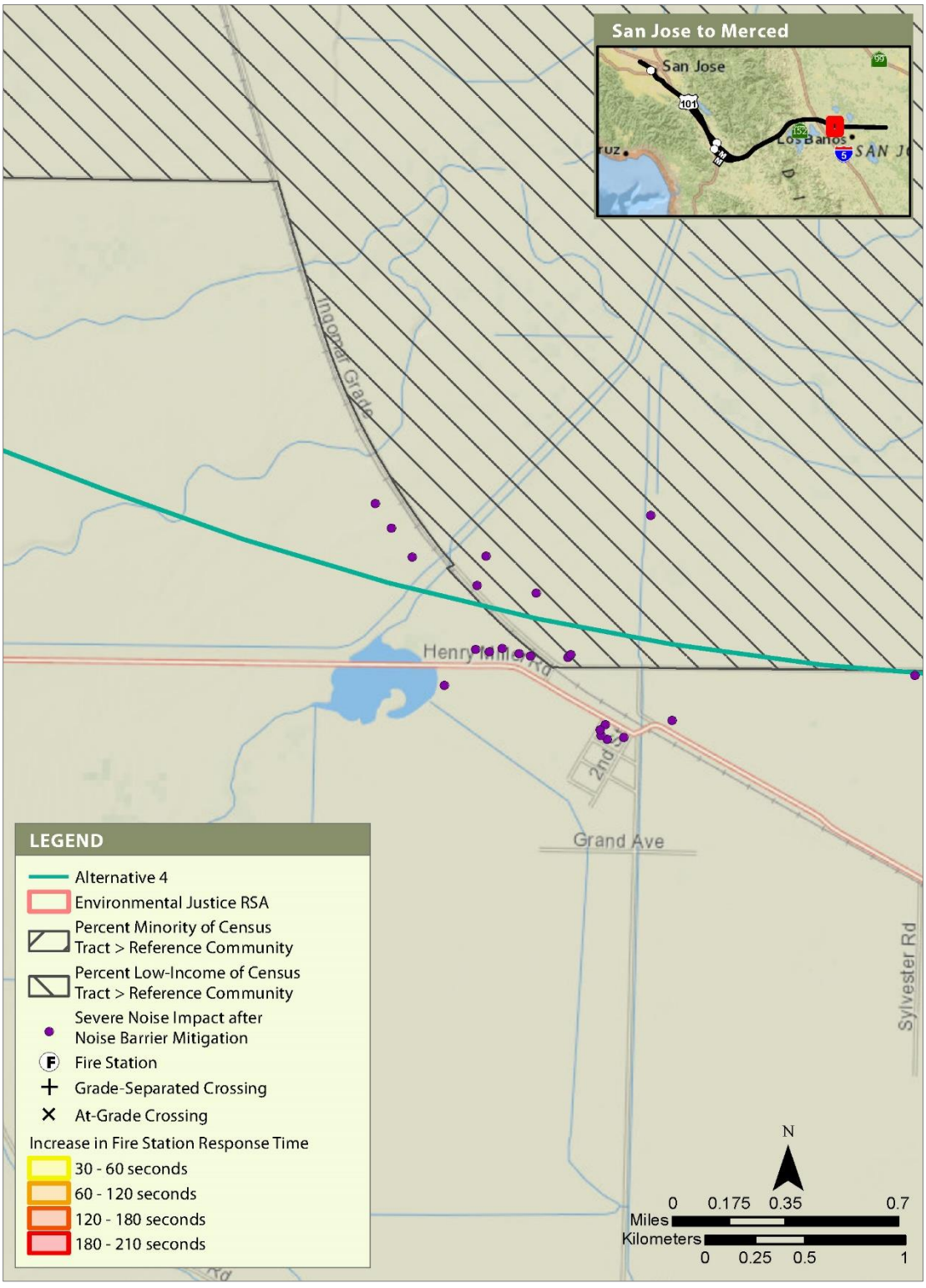
Figure 5-D-24 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (24 of 37)



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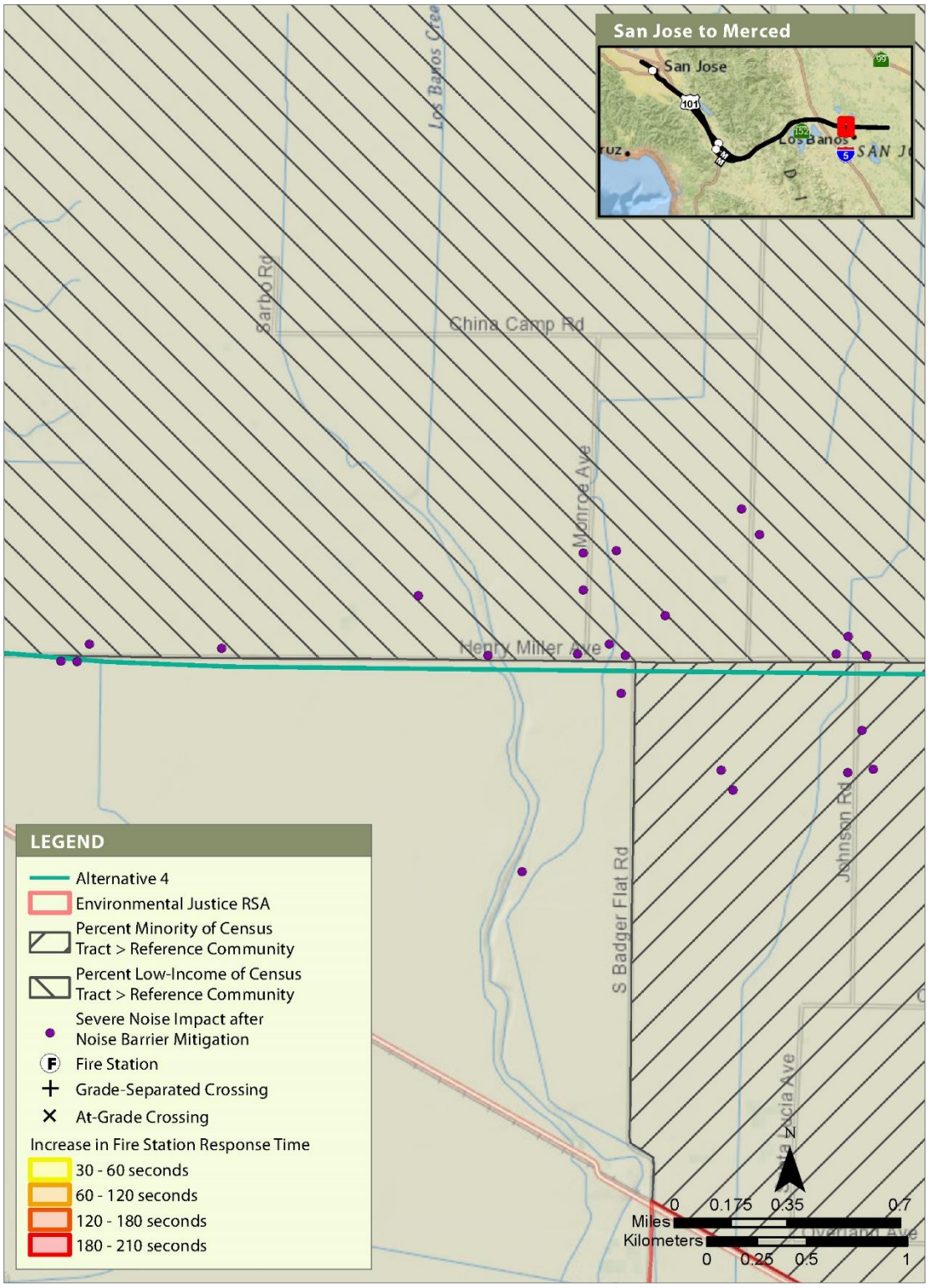
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-25 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (25 of 37)



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2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-26 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (26 of 37)

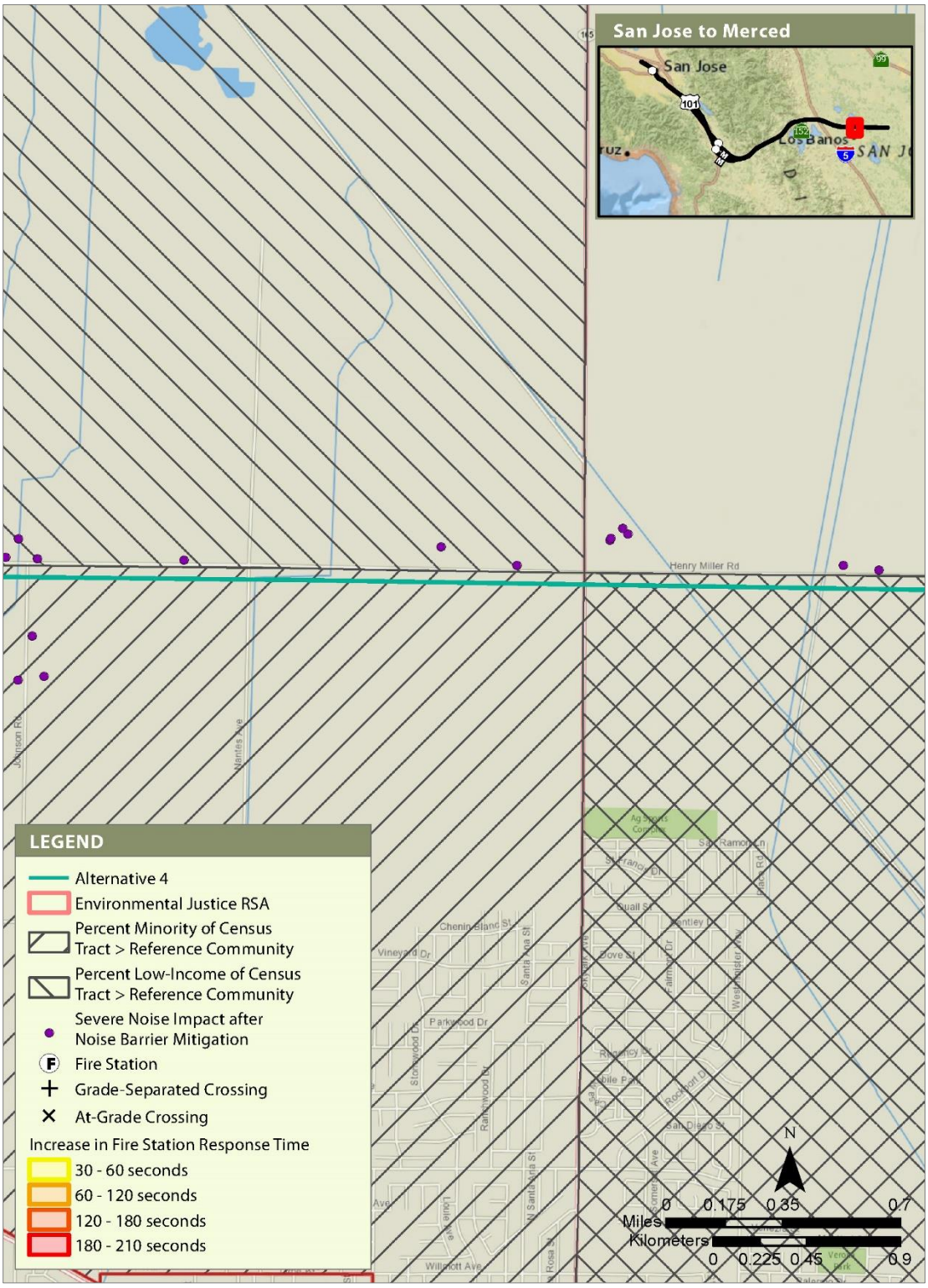

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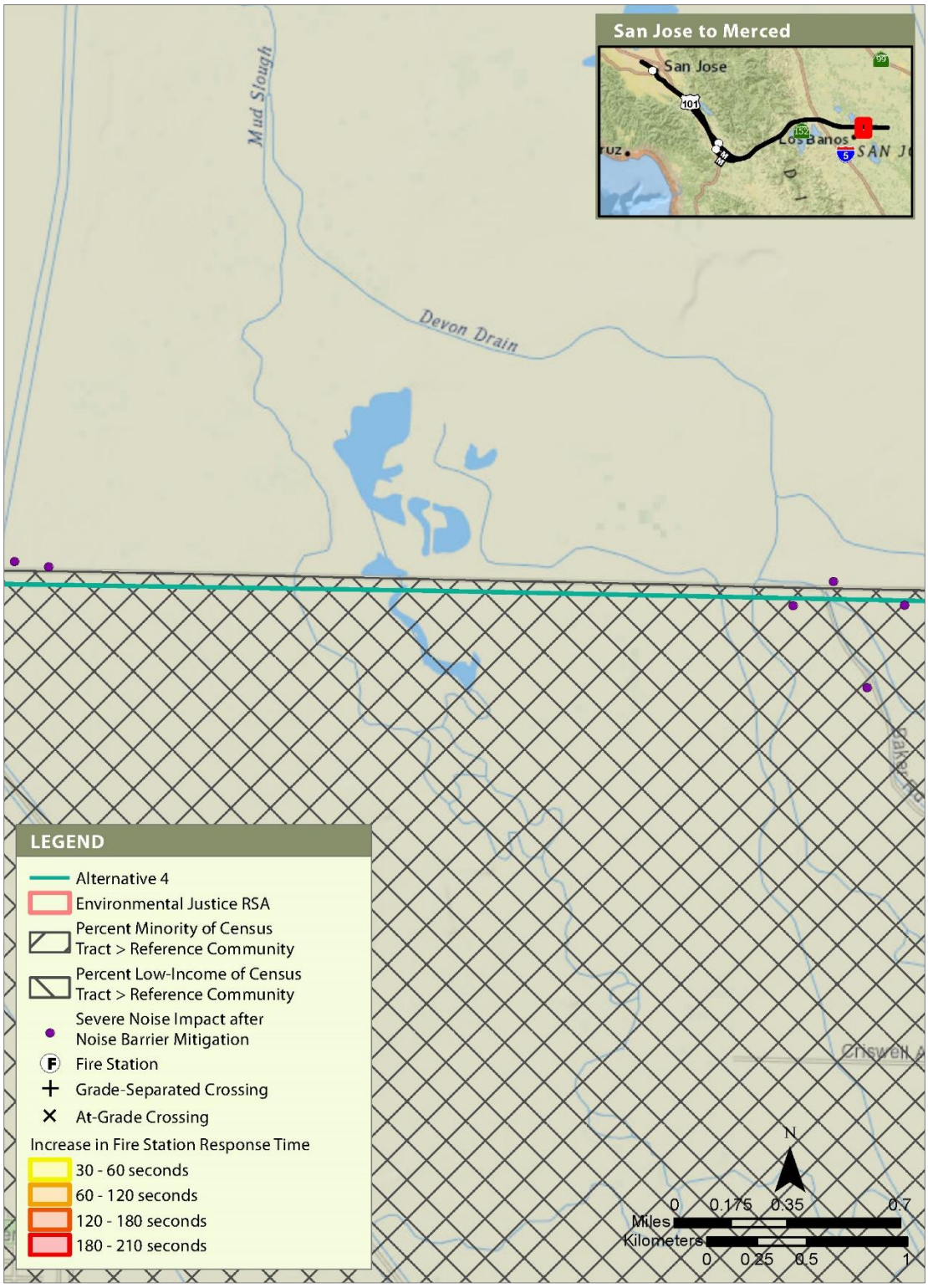
Figure 5-D-27 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (27 of 37)



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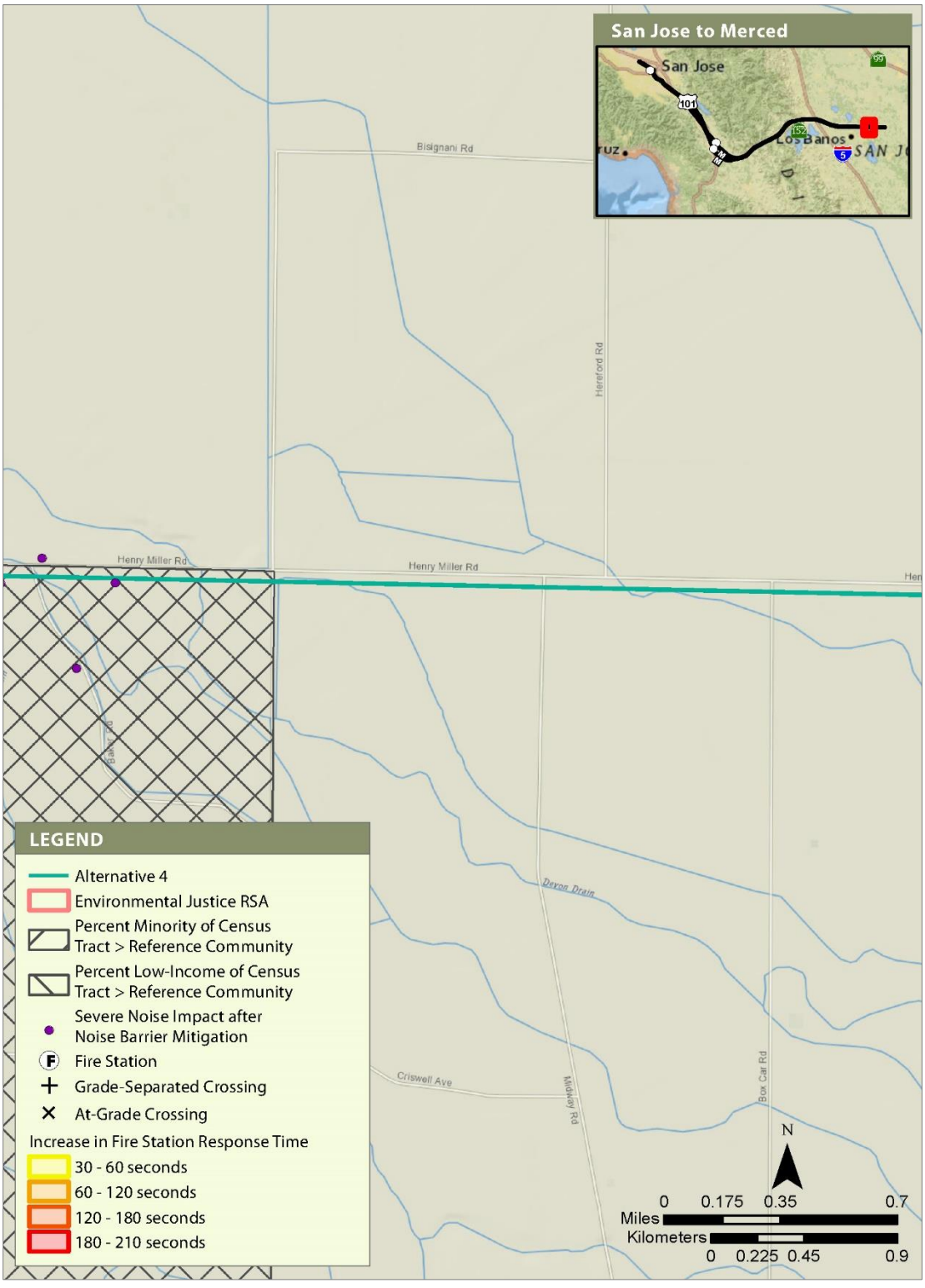
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-28 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (28 of 37)



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2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-29 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (29 of 37)

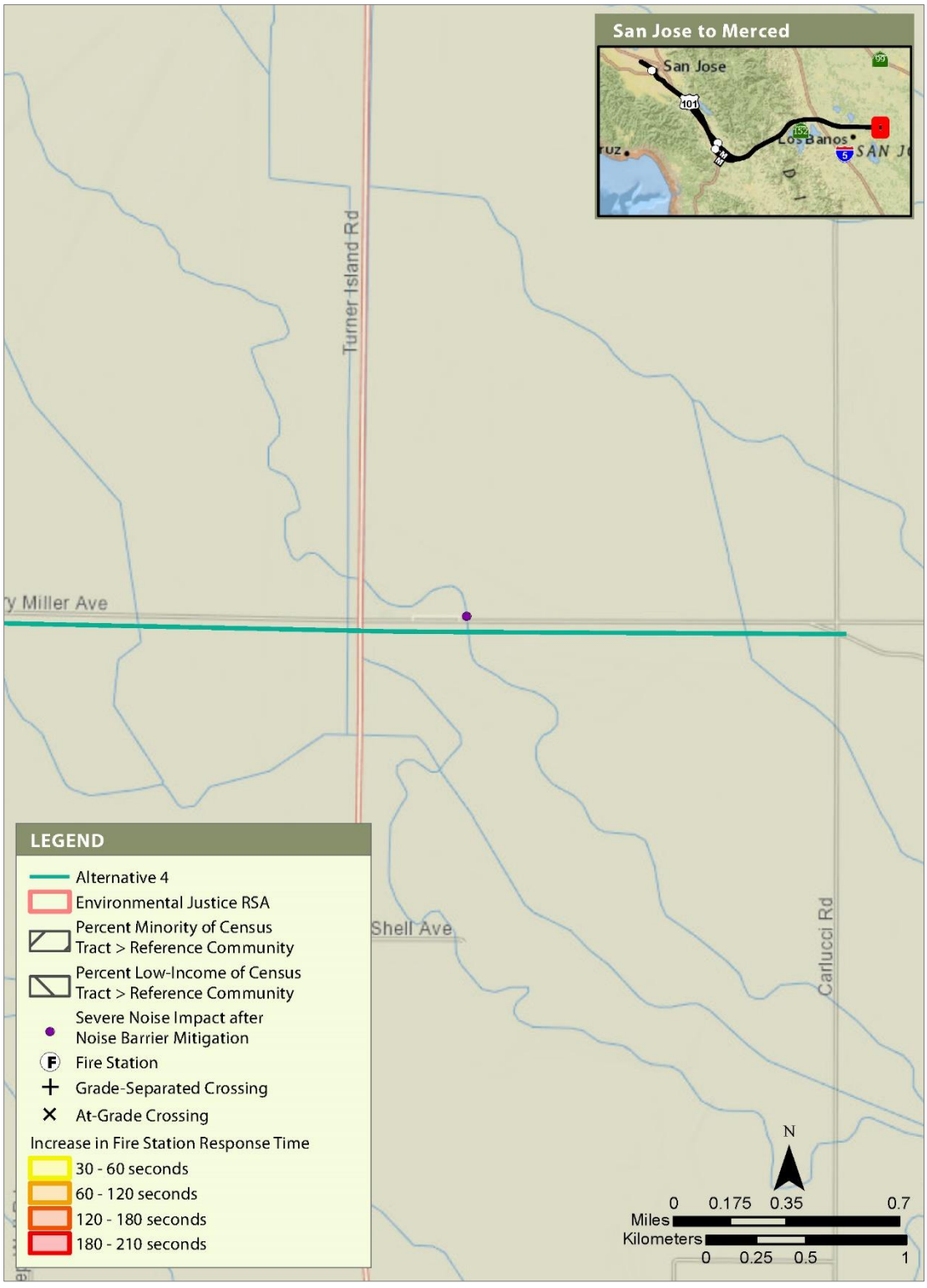

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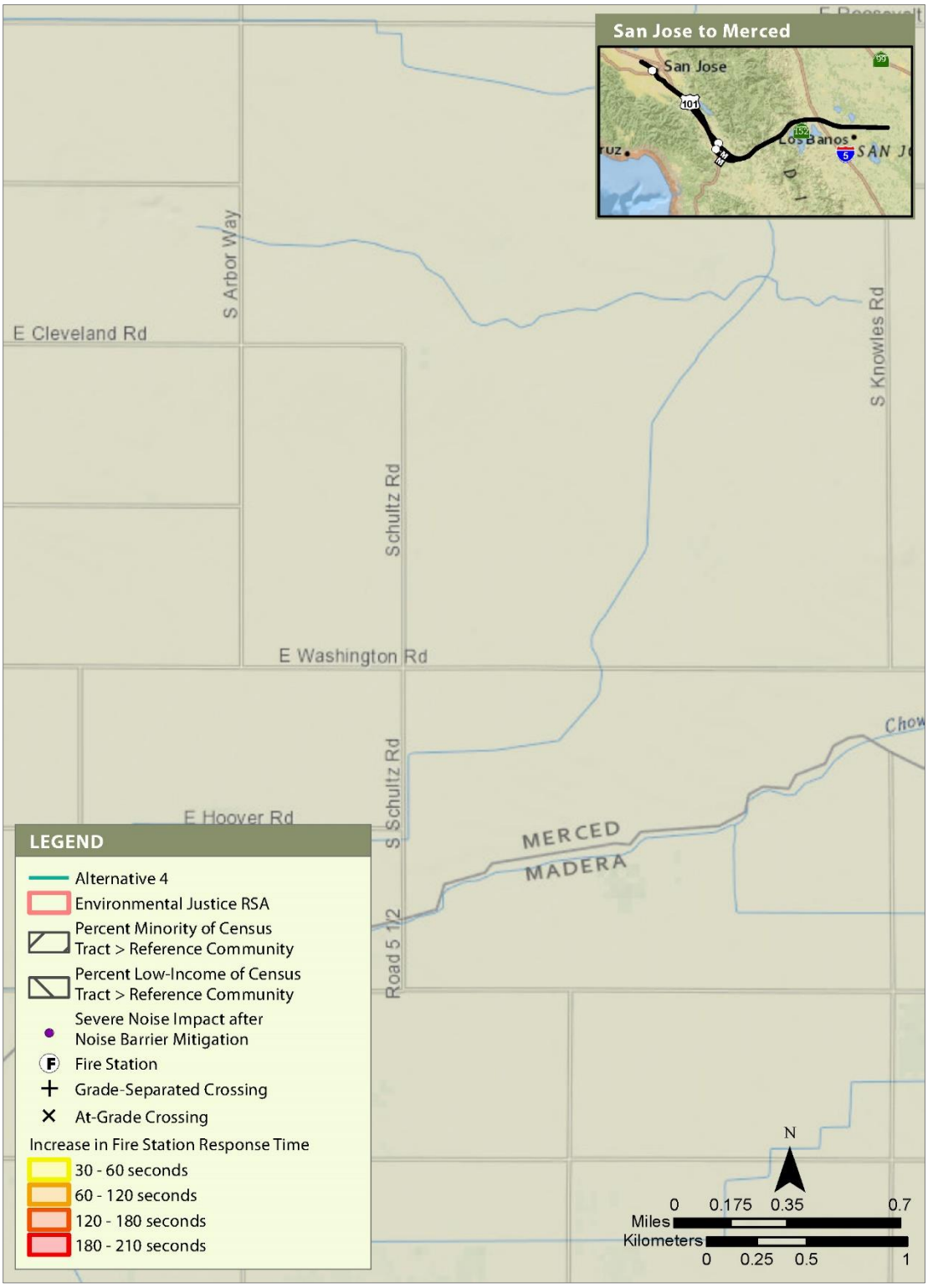
Figure 5-D-30 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (30 of 37)



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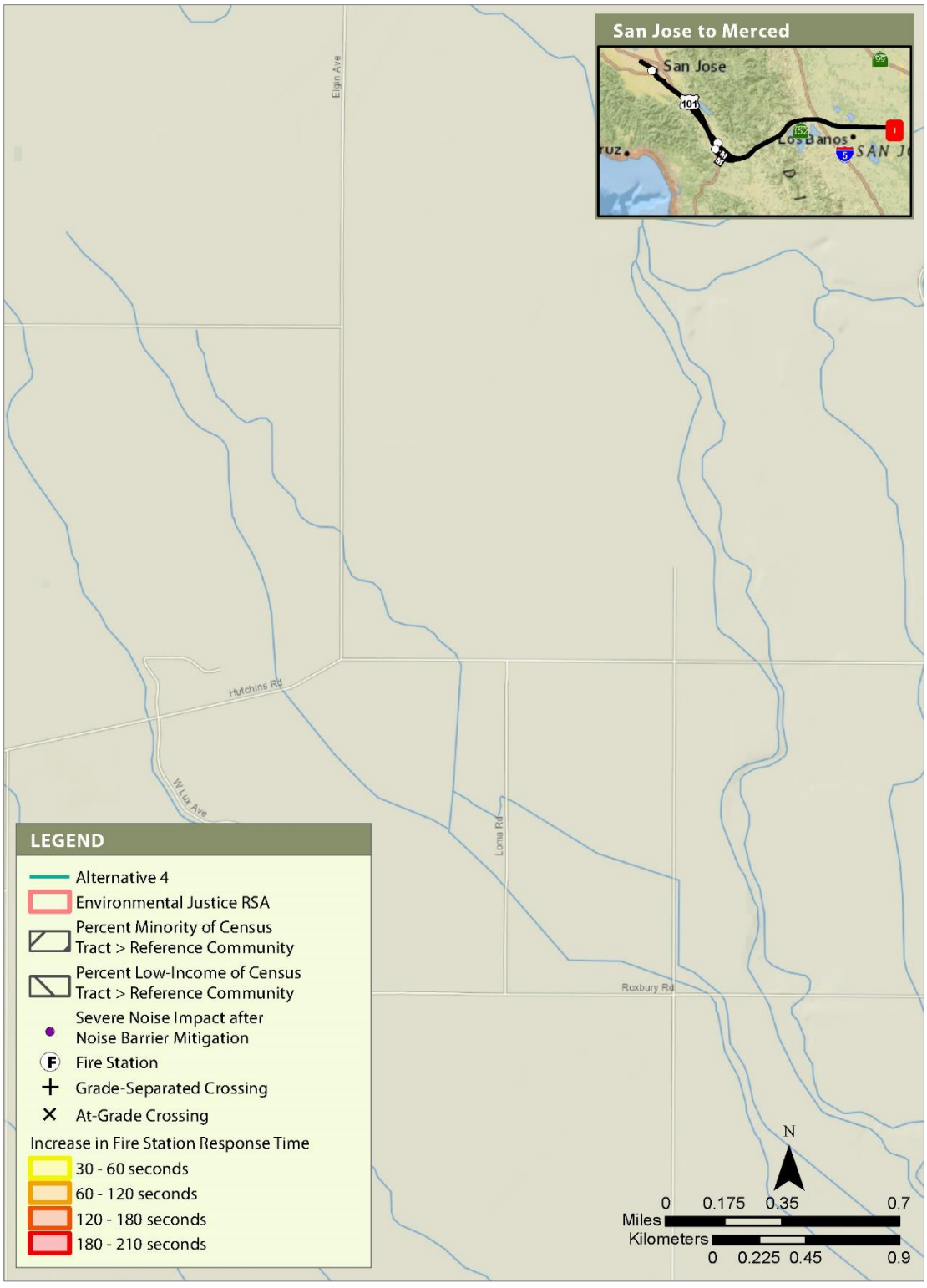
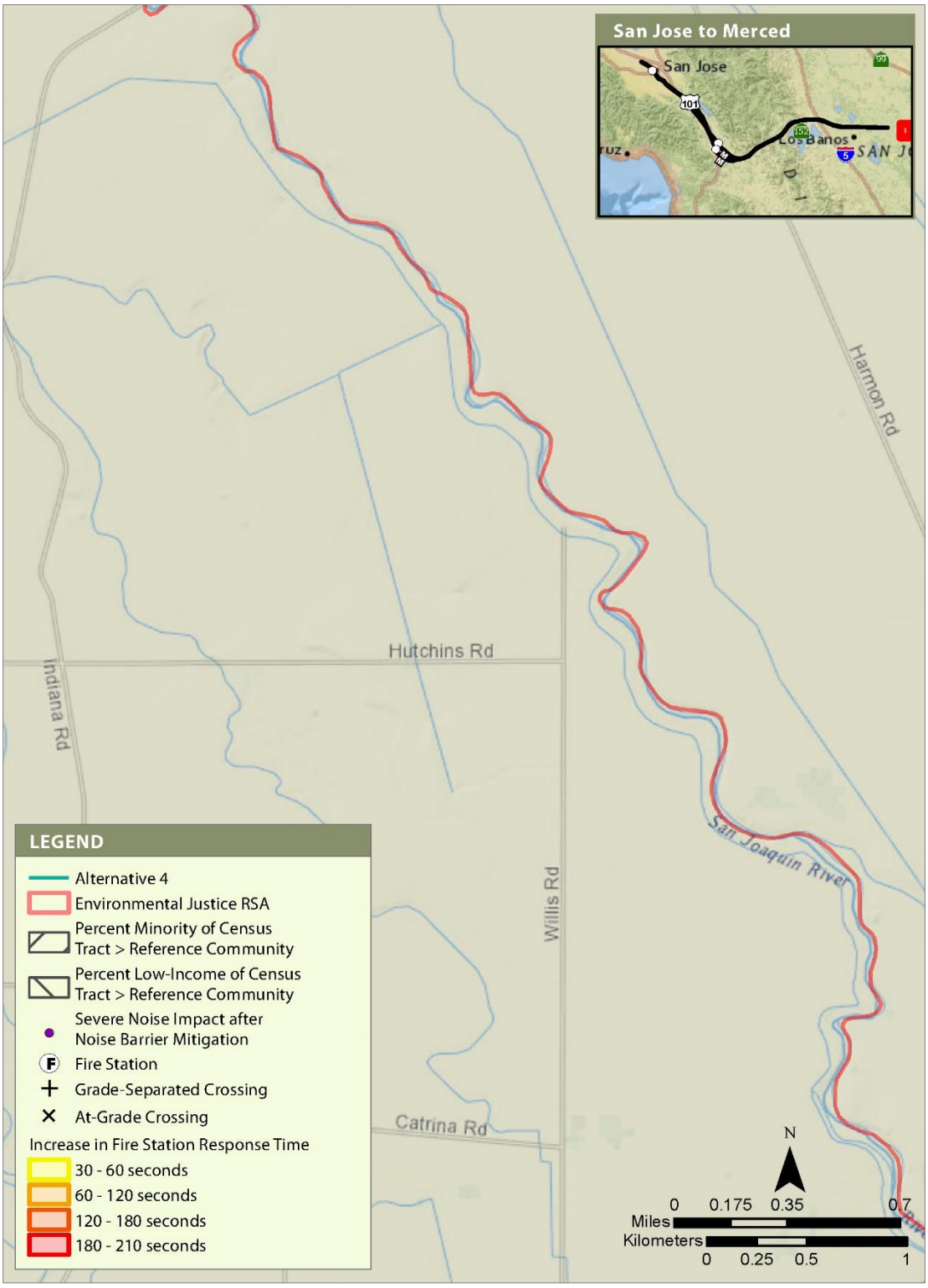
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-31 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (31 of 37)



1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-32 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (32 of 37)



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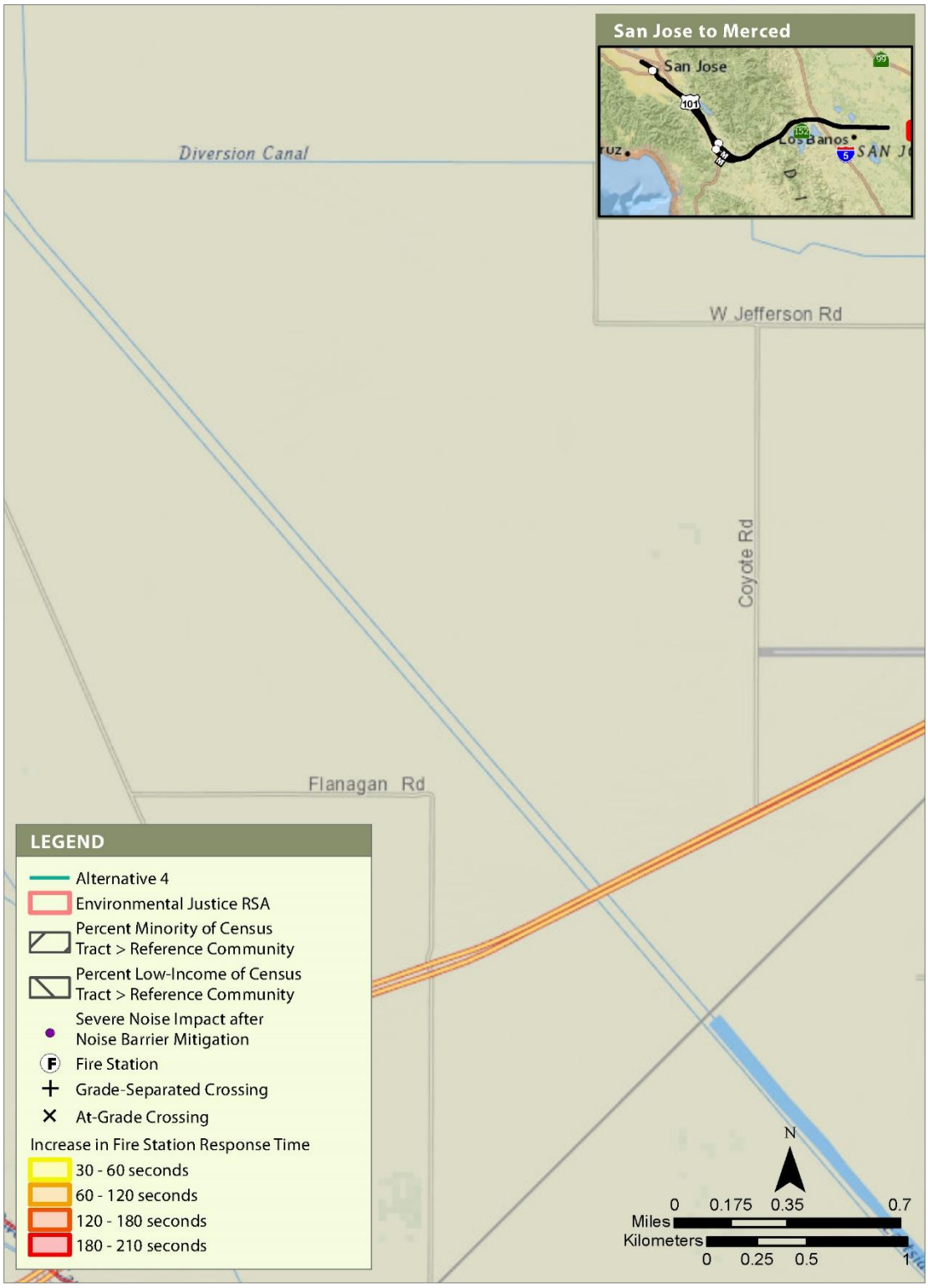
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-33 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (33 of 37)



1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-34 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (34 of 37)

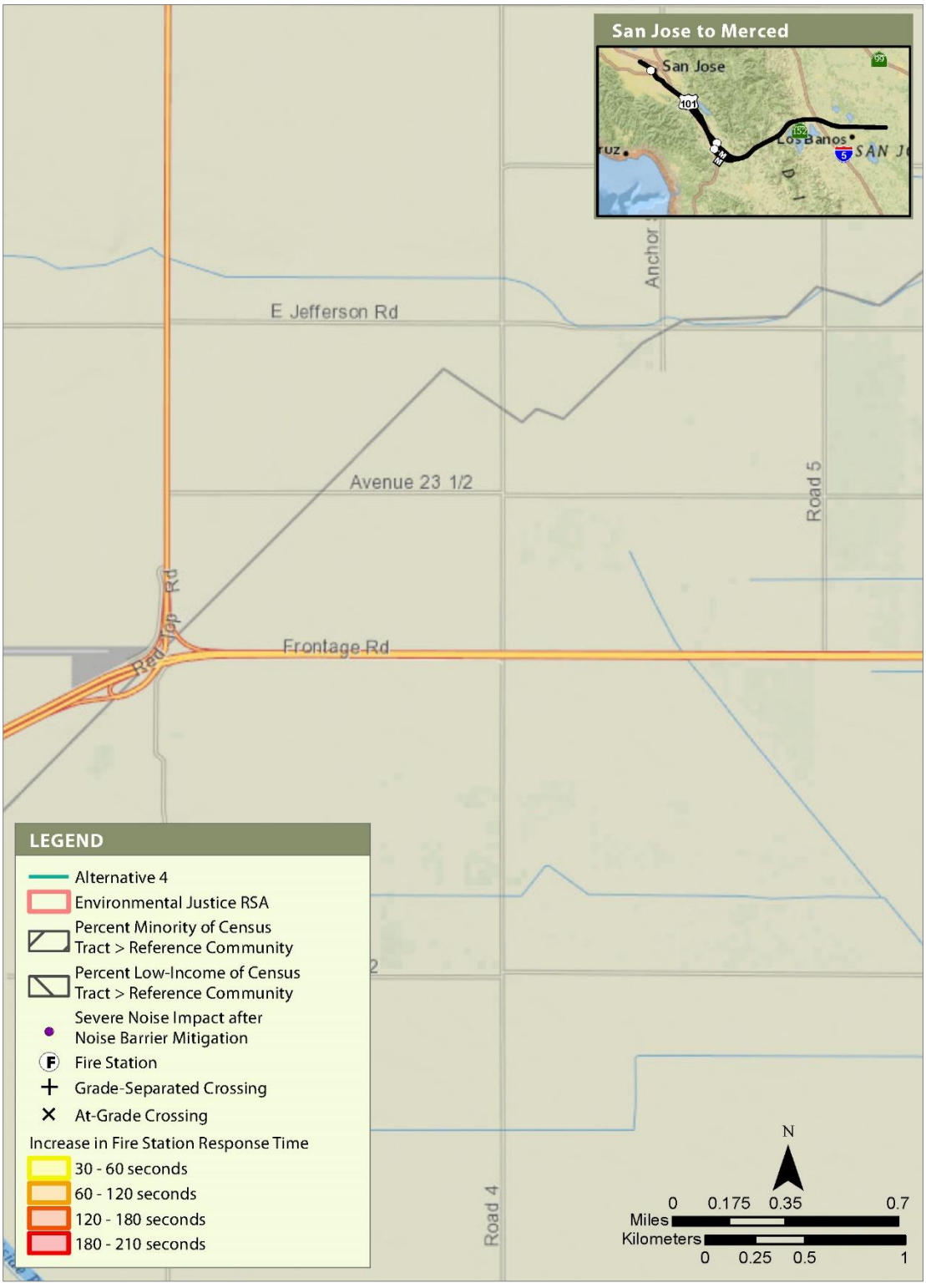


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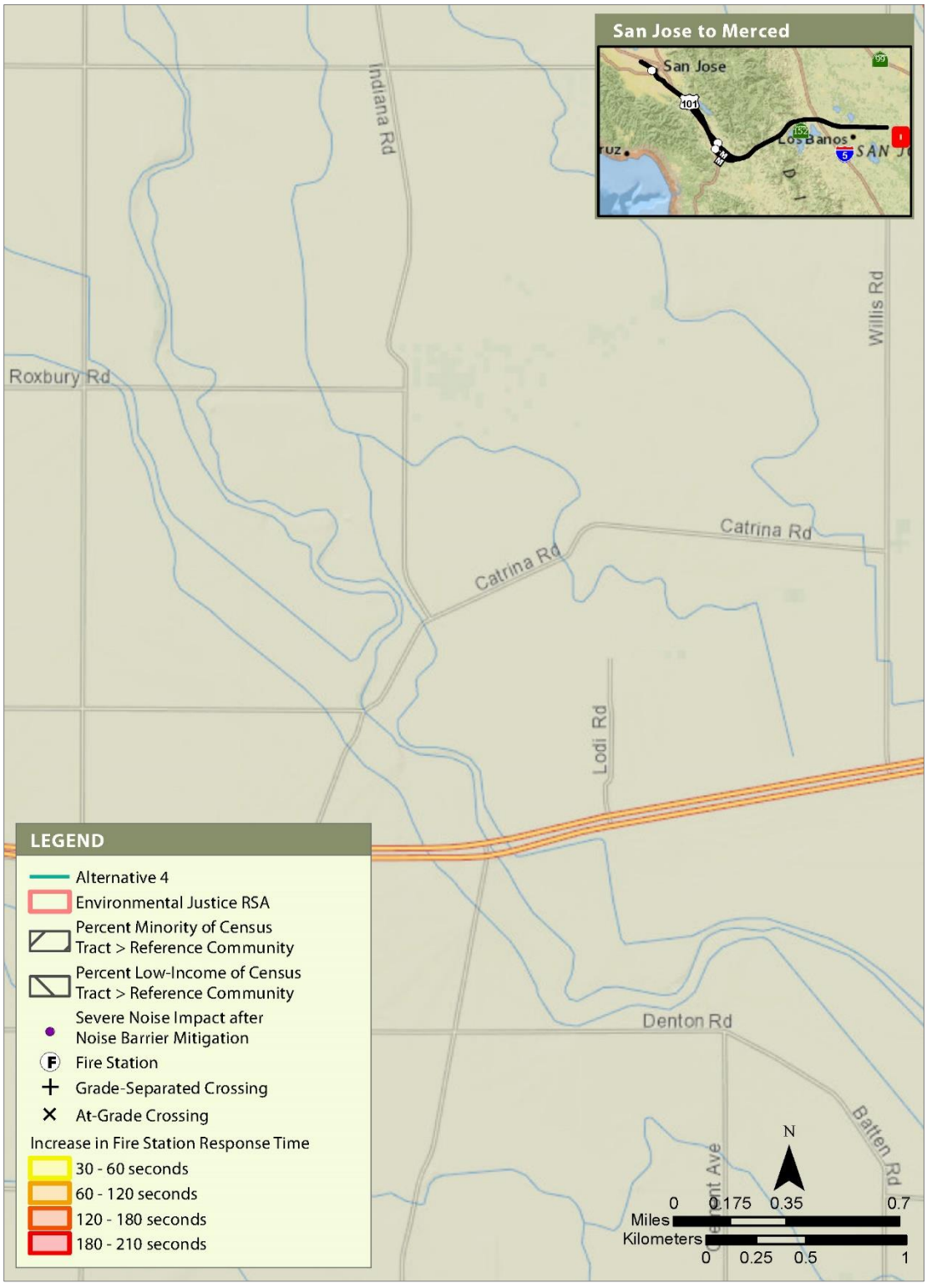
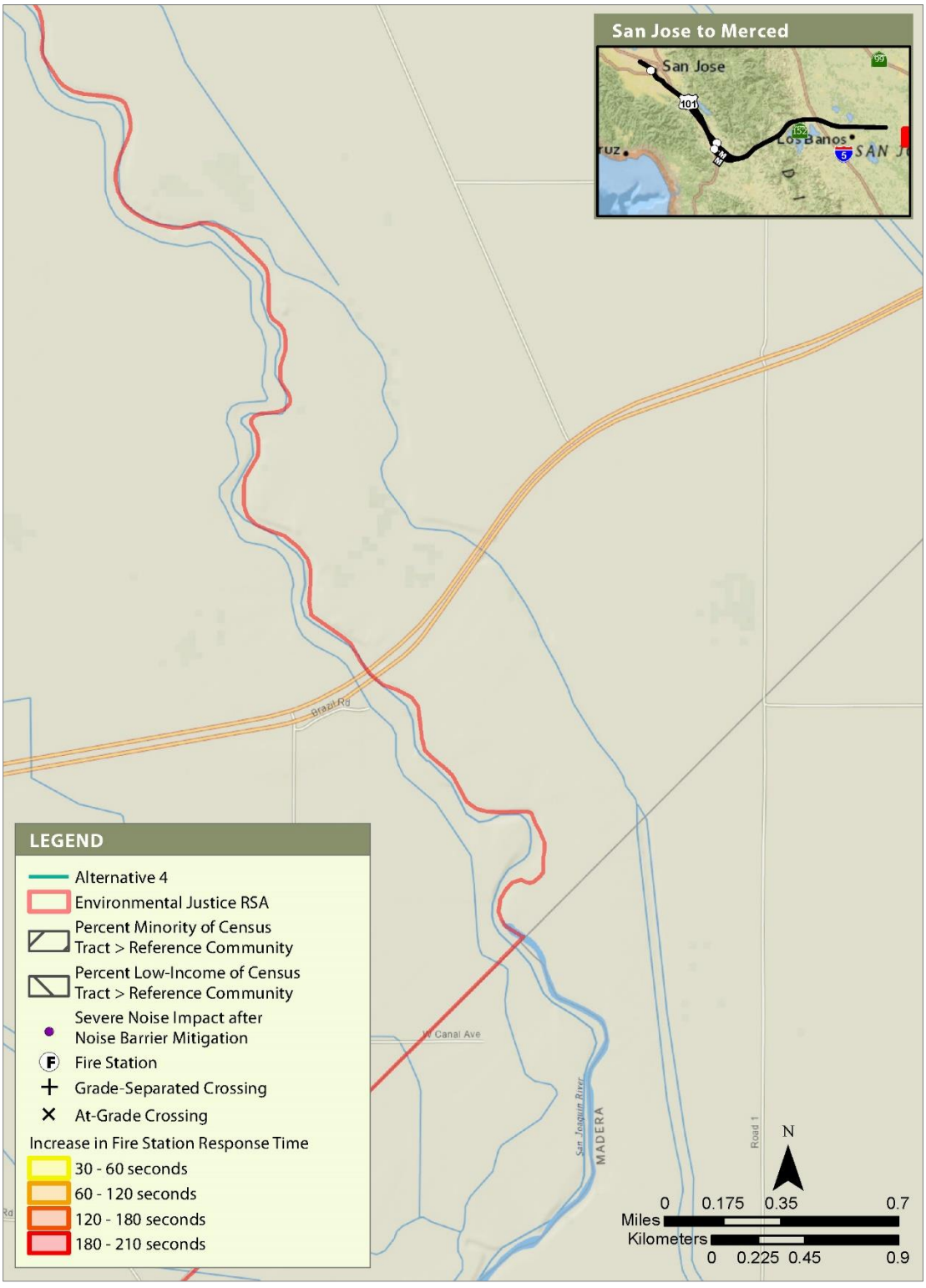
Figure 5-D-35 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (35 of 37)



1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-36 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (36 of 37)



1. Noise impacts shown are locations of severe noise impacts after noise barrier mitigation (see discussion in Section 3.4, Noise and Vibration).
2. Emergency Response Vehicle Delays shown are areas with greater than 30 seconds delay based on worst-case analysis assuming all gates are down at the same time (see discussion in Section 3.11, Safety and Security).

Figure 5-D-37 Locations of Disproportionately High and Adverse Noise and Emergency Vehicle Response Delays before Consideration of Offsetting Community Improvements, Alternative 4 (37 of 37)

APPENDIX 6-A: SAN JOSE TO MERCED PROJECT SECTION: PEPD RECORD SET CAPITAL COST ESTIMATE REPORT

California High Speed Rail Authority

San Jose to Merced Project Section

PEPD Record Set Capital Cost Estimate Report

December 2021

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Purpose and Scope 1
1.2 Statement of Technical Issue 1
1.3 General Information 2
1.3.1 Definition of Terms 2
1.3.2 Units 2

2.0 CAPITAL COST ESTIMATING METHODOLOGY 3
2.1 Estimating Format 3
2.2 Estimating Software 3
2.3 FRA Standard Cost Category (SCC) 3
2.3.1 Work Breakdown Structure (WBS) 4
2.3.2 Estimated Unit Costs 4
2.3.3 Quantity Takeoffs 5
2.3.4 Allocated and Unallocated Contingencies 5
2.3.5 Environmental Mitigation 7
2.3.6 Right-of-Way Cost Estimate 7
2.3.7 Vehicle Estimate 7
2.3.8 Program Implementation/Professional Services Add-ons 8
2.3.9 Escalation 8
2.3.10 Finance Charge 8
2.4 Estimate Validation 8
2.5 Estimate Reconciliation 8
2.6 Estimate Assumption and Exclusions 8

APPENDIX A WORK BREAKDOWN STRUCTURE (WBS) 10
WORK BREAKDOWN STRUCTURE (FRA STANDARD COST CATEGORIES) 10

APPENDIX B TYPICAL UNIT COST ELEMENTS 13

APPENDIX C DETAILED COST BUDGET 23

APPENDIX D LIST OF DOCUMENTS 141

1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of this report is to present the Capital Cost Estimating Methodology (CCEM) in the preparation of reasonably reliable and accurate capital cost estimates for the PEPD Design level.

This document describes the methodology for preparation of estimated capital cost for the California High-Speed Rail Project (CHSRP) San Jose to Merced PEPD document. In addition, it presents the summary of Capital Cost Estimates along with detailed FRA Standard Cost Categories (SCC) and sub-categories or cost elements. Refinement of these cost estimates will be on-going during the advancement of engineering during subsequent project development phases.

The primary objectives of this report are:

- Identify the methods and processes used to develop the capital cost estimate during PEPD Design Level Phase;
- Identify the source documents and/or methodology used for pricing work;
- Specify how estimating assumptions have been documented during the course of the estimate development;
- Describe Unit Price Elements;
- Define the approach and methodology with respect to FRA Standard Cost Categories (SCC);
- Present estimates have been developed for each complete alignment alternative for the San Jose to Merced Project Section.

The estimating approach has been done in a manner that (1) allows consistent application to each alternative to facilitate comparisons; (2) provides the proper foundation for more detailed estimates as selected alternative(s) are further evaluated; and (3) provides the basis for subsequent construction package procurement level estimates with additional guidelines for a more detailed capital cost estimate.

Considering CHSRP's size, complexity, phased design, and number of participants, it is important that the CCEM is flexible enough to be applied at each point in the project development process to appropriately support the tracking, monitoring and control of cost changes through each of the program's design and implementation phases. This document addresses only the capital cost estimating requirements for the PEPD Design level. Additional guidelines have been developed for the preparation of capital cost estimates for subsequent phases of the CHSRP.

1.2 Statement of Technical Issue

The document is intended to address the preparation of a program cost estimate, including construction, acquisition of right-of-way, vehicles, and professional services during execution of the project.

The CCEM is intended to provide guidelines for accurately and consistently estimating the costs of capital infrastructure and systems for the PEPD Design level. It also provides a framework for defining the scope and technical basis for the estimates, the roles and responsibilities for specific estimating tasks among the project participations, and the structure, organization, and format for reporting capital costs for all geographic sections of CHSRP.

1.3 General Information

1.3.1 Definition of Terms

Technical terms, acronyms, or other cost estimating terminology specifically used for capital cost estimating purposes, unless otherwise indicated, will follow the standard definition of terms published by the Association for the Advancement of Cost Engineering (AACE) International in their Recommend Practice No. 10S-90 – Cost Engineering Terminology.

The following acronyms used in this document have specific connotations with regard to California High Speed Rail system.

Acronyms

AACE	Association for the Advancement of Cost Engineering
CCEM	Capital Cost Estimating Methodology
Authority	California High-Speed Rail Authority
CHSRP	California High-Speed Rail Project
ENR	Engineering News Record
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HST	High Speed Train
LCCA	Life Cycle Cost Analysis
O&M	Operating and Maintenance
PMT	Program Management Team
RC	Regional Consultant(s)
SCC	Standard Cost Categories
TM	Technical Memorandum
WBS	Work Breakdown Structure

1.3.2 Units

The California High-Speed Rail Project is based on U.S. Customary Units consistent with guidelines prepared by the California Department of Transportation and defined by the National Institute of Standards and Technology (NIST). U.S. Customary Units are officially used in the United States and are also known in the US as “English” or “Imperial” units. In order to avoid confusion, all formal references to units of measure shall be made in terms of U.S. Customary Units.

Guidance for units of measure terminology, values, and conversions can be found in the Caltrans Metric Program Transitional Plan, Appendice B U.S. Customary General Primer (http://www.dot.ca.gov/hq/oppd/metric/TransitionPlan/Appendice-B-US-Customary-General-Primer.pdf). Caltrans Metric Program Transitional Plan, Appendice B can also be found as an attachment to the CHSRP Mapping and Survey Technical Memorandum.

2.0 CAPITAL COST ESTIMATING METHODOLOGY

Estimating methodologies are not static and must be flexible enough to adjust to the needs of the project's stage in the development process. The development process is described by the overall level of engineering design associated with the major development stages defined for the CHSRP:

Development Stage	Engineering Design Completion
Programmatic EIR/S	
Project EIR/S	
PEPD Design Level	
Procurement Level	
Design-Build	
	0 15% 30% 90% 100%

Each development stage is represented by a range of engineering design completion and influenced by ongoing updates to the ridership demand forecast and associated revisions to estimated system capacity, service design and operating plans. Because of this variability, the appropriate estimating methods or procedures at a given milestone will be based on the actual levels of project engineering and scope definition present at that time. Because the program will be designed in multiple segments, the level of engineering design completed for major high-speed rail system elements will be at different levels at any point in time. The goal of using established estimating methodologies is to assure that project estimates are prepared in a consistent and uniform manner, organized and standardized in methods, and formatted in order to facilitate estimate review and reporting.

2.1 Estimating Format

A consistent format is developed for the reporting, estimating, and managing of the project's capital costs. This document recommends using standard cost categories (SCC) established by the Federal Railroad Administration (FRA) as part of American Recovery and Reinvestment Act (ARRA) grant application requirements. Preparation of capital costs in SCC format is adopted throughout the PEPD Design phase.

2.2 Estimating Software

Commercially available database software systems are used depending on the type of work elements. For example, Timberline is used for surface heavy construction work elements and HCSS is used for underground work elements. However, in order to provide uniformity between numerous work elements and sections of the corridor and to provide consistent platform for reporting and analysis requirements, the cost data are exported to Microsoft Excel. This will better enable the review, edit consolidation and reporting of estimate components over the course and provide more flexibility to make adjustments.

2.3 FRA Standard Cost Category (SCC)

The methodology used for generating capital cost estimates has been consistent with FRA guidelines for estimating capital costs. The heart of the FRA guidance is the SCC, which enables FRA-funded projects to develop budget baselines that summarize to the SCC. This cost structure is used for capital cost detail and summary sheets and is described below. Where the level of design does not support quantity measurements, parametric estimating techniques were utilized.

2.3.1 Work Breakdown Structure (WBS)

This involves the development of the Work Breakdown Structure (WBS) that is applied to cost estimating and cost reporting. The WBS for estimating includes a coding system that is used for estimating elements. The WBS for reporting includes the development of a coding system that allows the cost estimates to be sorted and presented by categories and subcategories as prescribed by the FRA.

The WBS for capital cost estimates for the PEPD Design level is based upon the FRA Standard Cost Categories is presented in Appendix A.

The primary WBS for quantities and unit prices are Unit Price Element's (UPE's). UPE's were originally developed as an estimating tool to assist in the development of conceptual level cost estimates and provide a method for translating typical construction items into a unit-based unit of measurement. The scope and definition of UPE's are developed by the Regional Consultant based on the unique design present in their project section.

2.3.2 Estimated Unit Costs

The development of construction unit costs for each of the construction activities that is identified and quantified from the design documents. The development of individual or composite estimated unit costs is accomplished through the use of historical bid data and by unit cost analysis, as appropriate, using labor, equipment and material rates. Unit costs are expressed in current year dollars and are adjusted to reflect any regional variations.

These methods are used either individually or in combination. For the PEPD Design level, when limited engineering details are available, the historical bid price method is typically used.

2.3.2.1 Historical Bid Price Method

Historical bid prices are typically used to develop costs for common construction elements. When using this method, the time of bid and conditions of the historical project used for pricing is considered and factors applied as needed:

- Adjust bid prices where the bid date is older than 12 months from the current date by using an appropriate escalation factor
- Adjust bid prices to reflect conditions of the project, such as type of terrain, geographical location, soil, traffic and other related factors. For location factor adjustments, the City Cost Index as published by RS Means is used.

Sources for historical bid prices that are used may come from local, regional, statewide and national levels, as well as from international high-speed rail projects with unique high-speed elements. Historical unit prices that are used for the CHSRP will be verified for appropriateness and documented as to their source as well as any adjustments for site, escalation or location factors.

2.3.2.2 Unit Cost Analysis Method

The estimated unit cost analysis method is typically used to develop costs for complex construction elements including but not limited to viaducts, retained earth systems, tunneling and underground structures. This method allows for unit costs to be developed based on current local construction and market conditions, such as changes which might affect productivity or the cost of labor or materials. The following steps are required in order to develop a unit price using this method:

- Analyze the proposed construction conditions
- Estimate production rates where applicable
- Obtain materials prices using local available sources
- Determine labor and equipment rates where applicable
- Calculate direct unit price using the above factors

The following sources are used to obtain basic cost data that is input into the database estimating program in order to develop any needed construction unit prices:

- Labor Rates – RS Means national wages adjusted by City Cost Index factor, Federal Davis-Bacon Wage Determination and/or California Department of Industrial Relations Prevailing Wage Determinations.
- Equipment Rates – RS Means and/or Corp of Engineers Construction Equipment Ownership and Operating Expense Schedule, Region VII.
- Material Prices - Material and supply prices for locally available material are obtained from local supplier quotes, if possible. Secondary sources of material cost data may be taken from RS Means, Engineering News-Report (ENR) or other published resource.

A list of prototypical work elements and the units of measure are estimated for PEPD Design level with corresponding estimated unit cost. Appendix A presents the list of variable cost elements within each FRA SCC 10's to 60's series. When required, additional project-specific work elements reflecting unique site conditions and configurations are identified and their estimated costs are developed in addition to prototypical unit costs. Examples of these project-specific unit costs include very high and/or long span iconic bridge structures, grade separations, specific roadway improvements, unique utility relocations, staged construction to accommodate existing rail or vehicular traffic, or restrictive site access conditions in urban areas.

2.3.3 Quantity Takeoffs

The task of quantity takeoffs involves preparation of estimated quantities either by direct measurement and calculation of construction elements that are shown in design drawings, sketches, electronically calculated from CADD files or established as an allowance quantity based on professional experience and judgment. Quantity take-offs have been prepared by the Regional Consultant and are presented in the San Jose to Merced PEPD quantities document "JM 2021_PEPD_AppA-Qty-v11_20211108."

2.3.4 Allocated and Unallocated Contingencies

Contingency, in the statistical sense, is the estimated percentage by which a calculated value may differ from its true or final value and is typically included in an estimate as an allowance for the level of engineering design completion or to address imperfections in the estimating methods used at the various project development stages. Contingency is typically added to a particular item or group of items by the use of percentage multipliers. Contingency is generally greatest for the early stage of project development and decreases with advancement in the level of engineering design and pricing detail. During the preliminary design of the high-speed rail project, the limited level of design information that is available requires the use of contingency allowances that are allocated against specific construction or procurement cost categories. The percentage selected for a given cost category are generally based on level of definition of the scope of work involved and substantiated by professional judgment and experience relative to level of uncertainty and historical cost variability typically seen for work within a particular cost category. For the purposes of this estimating program, contingency is assigned into two major categories – allocated and unallocated.

Allocated contingency is added to each cost category based on an assessment of the quality of design information; means and methods; and site accessibility available for individual items of work. This contingency typically falls in a range of 10% to 25%. The exact percentage selected for each cost category is based on professional judgment and experience related to the cost variability typically seen for items of work within a particular cost category. The contingency is generally higher for underground elements reflecting the additional exposure for unknowns as well as the construction complexity. It is also higher for stations, terminals, storage yard facilities and utilities since their design progress is still in the conceptual level and identification of all the utilities are not determined. The percentages shown in Table 2-1 are the values that are normally used; however, slightly higher or lower values are used if a project-specific condition warrant.

Unallocated contingency is typically included to address uncertainties that are more global in nature like schedule delays, changes in contracting environment, or other such issues that are not associated with individual construction activities. Unallocated contingencies will be estimated at 5 percent of the total construction costs.

Table 2-1 Allocated Contingency Percentages by Cost Category

Cost Category No.	Description	Allocated Contingency Percentage
10 Track Structures and Track		
10.01	Track structure: Viaduct	15%
10.02	Track structure: Major/Movable bridges	15%
10.03	Track structure: Under grade bridges	15%
10.04	Track structure: Culverts and drainage structures	15%
10.05	Track structure: Cut and Fill (> 4' height/depth)	20%
10.06	Track structure: At-grade (grading and subgrade stabilization)	10%
10.07	Track structure: Tunnel	25%
10.08	Track structure: Retaining walls and systems	15%
10.09	Track new construction: Conventional ballasted	15%
10.10	Track new construction: Non-ballasted	15%
10.11	Track rehabilitation: Ballast and surfacing	15%
10.12	Track rehabilitation: Ditching and drainage	15%
10.13	Track rehabilitation: Component replacement (rail, ties, etc)	15%
10.14	Track: Special track work (switches, turnouts, insulated joints)	15%
10.15	Track: Major interlocking	15%
10.16	Track: Switch heaters (with power and control)	15%
10.17	Track: Vibration and noise dampening	15%
10.18	Other linear structures including fencing, sound walls	15%
20 Stations, Terminals, Intermodal		25%
30 Support Facilities: Yards, Shops, Admin. Bldgs		25%
40 Sitework, Right of Way, Land, Existing Improvements		
40.01	Demolition, clearing, site preparation	25%
40.02	Site utilities, utility relocation	25%
40.03	Hazardous material, contaminated soil removal/mitigation, ground water treatments	15%
40.04	Environmental mitigation: wetlands, historic/archeology, parks	20%
40.05	Site structures including retaining walls, sound walls	25%
40.06	Temporary facilities and other indirect costs during construction	10%

40.07	Purchase or lease of real estate	40%
40.08	Highway/pedestrian overpass/grade separations	20%
40.09	Relocation of existing households and businesses	0%
50 Communications & Signaling		15%
60 Electric Traction		15%
70 Vehicles		0%
80 Professional Services		0%

2.3.5 Environmental Mitigation

An allowance to account for the cost of environmental mitigation that relates to hydrology and water resources; wetland impact; hazardous material and waste; historic/archeology; safety and security; noise, vibration and air quality during construction and permanent aesthetic is included in the total capital cost. This allowance is based on 3% of the total cost of track structures, track work, station buildings, roadway modification and highway grade separation.

2.3.6 Right-of-Way Cost Estimate

This involves preparing estimated quantities of impacted properties, either permanent takes or temporary easements, which result from construction, operation, and maintenance of proposed high-speed rail alignment alternatives. In order to arrive at the estimated cost, professional experience and judgment in the area of property valuation, business damages, and legal and administrative issues as they relate to the estimation of right-of-way costs have been applied. The values used in the cost estimate were developed by the Regional consultant to reflect the design changes “JM-ENG-RS-RPRT-RW-20211011.”

2.3.7 Vehicle Estimate

The costs for the San Jose to Merced section do not include acquisition of high-speed train vehicles. Acquisition of trainsets is considered to be a system-wide procurement and is not associated with construction of individual sections of the CHSRP System. Consistent with the Revised 2016 Business Plan, the cost of vehicles was determined by using publicly available data regarding recent sales of comparable equipment to other CHSRP projects around the world and by informal consultations with the manufacturers.

2.3.8 Program Implementation/Professional Services Add-ons

Program Implementation costs are included to represent the costs of engineering, project and construction management, contract administration, permits and fees, training/start-up/testing and any force account work. These add-on costs are calculated as a percentage of construction costs only (applied individually and not cumulatively and excluding vehicle procurement and right-of-way costs) and presented under Professional Services cost category in the estimate. The management and administration cost associated with right-of-way and rolling stock are included with the respective items.

Preliminary Engineering	2.0%
Program Management	3.0%
Final Design	6.0%
Construction Management	4.0%
Agency Costs	0.5%
Total	15.5%

In addition, an allowance for system start-up and pre-revenue testing is added to the Professional Services cost category in the amount of 6% of the Train Controls, Communications and Electrification construction costs.

2.3.9 Escalation

Estimates are prepared in Base Year dollars with the Base Year defined as the current calendar year. Unit costs are updated annually or as required. For cost estimates with a base year that is older than the current calendar by one or more years, actual historical construction cost index values are used to calculate the escalation rate to be applied to bring a cost from the period in question to the present.

2.3.10 Finance Charge

Finance charges are not included in the capital cost estimates.

2.4 Estimate Validation

Following preparation of the PEPD Design level estimates, cost estimates are subjected to a validation process including reviews by subject matter experts in the areas of engineering and construction.

2.5 Estimate Reconciliation

Reconciliations are made between current cost estimates and cost estimates that were developed in previous design phases. The goal of reconciliation is to identify and document significant changes that may have occurred since the preparation of the prior capital cost estimate. Significant changes are identified in the reconciliation under one of three categories that best reflects the cause for the change: Quantity, Unit Price, or Scope, as applicable.

2.6 Estimate Assumption and Exclusions

- All costs are in 2021$ Q4.
- Allocated Contingency is included in all costs.
- ROW costs have been included based on current ROW report as referenced in the list of documents from the RC. A high value is taken into consideration for the estimate.
- ROW costs do not include costs for an agreement or procurement of ROW with railroads within the shared corridor.

- Subsection SS99 Complete contains alternative wide elements that cannot be assigned to a specific subsection such as professional services, ROW, systems, and unallocated contingency in the Appendix C detailed estimate tables.

APPENDIX A WORK BREAKDOWN STRUCTURE (WBS)

WORK BREAKDOWN STRUCTURE (FRA STANDARD COST CATEGORIES)

10 TRACK STRUCTURES & TRACK	
10.01	Track structure: Viaduct
10.02	Track structure: Major/Movable bridge
10.03	Track structure: Under grade Bridges
10.04	Track structure: Culverts and drainage structures
10.05	Track structure: Cut and Fill (> 4' height/depth)
10.06	Track structure: At-grade (grading and subgrade stabilization)
10.07	Track structure: Tunnel
10.08	Track structure: Retaining walls and systems
10.09	Track new construction: Conventional ballasted
10.10	Track new construction: Non-ballasted
10.11	Track rehabilitation: Ballast and surfacing
10.12	Track rehabilitation: Ditching and drainage
10.13	Track rehabilitation: Component replacement (rail, ties, etc)
10.14	Track: Special track work (switches, turnouts, insulated joints)
10.15	Track: Major interlockings
10.16	Track: Switch heaters (with power and control)
10.17	Track: Vibration and noise dampening
10.18	Other linear structures including fencing, sound walls
20 STATIONS, TERMINALS, INTERMODAL	
20.01	Station buildings: Intercity passenger rail only
20.02	Station buildings: Joint use (commuter rail, intercity bus)
20.03	Platforms
20.04	Elevators, escalators
20.05	Joint commercial development
20.06	Pedestrian / bike access and accommodation, landscaping, parking lots
20.07	Automobile, bus, van accessways including roads
20.08	Fare collection systems and equipment
20.09	Station security

30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	
30.01	Administration building: Office, sales, storage, revenue counting
30.02	Light maintenance facility
30.03	Heavy maintenance facility
30.04	Storage or maintenance-of-way building/bases
30.05	Yard and yard track
40 SITEWORK, RIGHT OF WAY, LAND, EXISTING IMPROVEMENTS	
40.01	Demolition, clearing, site preparation
40.02	Site utilities, utility relocation
40.03	Hazardous material, contaminated soil removal/mitigation, ground water treatments
40.04	Environmental mitigation: wetlands, historic/archeology, parks
40.05	Site structures including retaining walls, sound walls
40.06	Temporary facilities and other indirect costs during construction
40.07	Purchase or lease of real estate
40.08	Highway/pedestrian overpass/grade separations
40.09	Relocation of existing households and businesses
50 COMMUNICATIONS & SIGNALING	
50.01	Wayside signaling equipment
50.02	Signal power access and distribution
50.03	On-board signaling equipment
50.04	Traffic control and dispatching systems
50.05	Communications
50.06	Grade crossing protection
50.07	Hazard detectors: dragging equipment high water, slide, etc.
50.08	Station train approach warning system
60 ELECTRIC TRACTION	
60.01	Traction power transmission: High voltage
60.02	Traction power supply: Substations
60.03	Traction power distribution: Catenary and third rail
60.04	Traction power control
70 VEHICLES	
70.00	Vehicle acquisition: Electric locomotive
70.01	Vehicle acquisition: Non-electric locomotive

70.02	Vehicle acquisition: Electric multiple unit
70.03	Vehicle acquisition: Diesel multiple unit
70.04	Vehicle acquisition: Loco-hauled passenger cars w/ ticketed space
70.05	Vehicle acquisition: Loco-hauled passenger cars w/o ticketed space
70.06	Vehicle acquisition: Maintenance of way vehicles
70.07	Vehicle acquisition: Non-railroad support vehicles
70.08	Vehicle refurbishment: Electric locomotive
70.09	Vehicle refurbishment: Non-electric locomotive
70.10	Vehicle refurbishment: Electric multiple unit
70.11	Vehicle refurbishment: Diesel multiple unit
70.12	Vehicle refurbished: Passenger loco-hauled car w/ ticketed space
70.13	Vehicle refurbished: Non-passenger loco-hauled car w/o ticketed space
70.14	Vehicle refurbishment: Maintenance of way vehicles
70.15	Spare parts
80 PROFESSIONAL SERVICES (applies to Cats. 10 60)	
80.01	Service Development Plan/Service Environmental
80.02	Preliminary Engineering/Project Environmental
80.03	Final design
80.04	Project management for design and construction
80.05	Construction administration & management
80.06	Professional liability and other non-construction insurance
80.07	Legal; Permits; Review Fees by other agencies, cities, etc.
80.08	Surveys, testing, investigation
80.09	Engineering inspection
80.10	Start up
90 UNALLOCATED CONTINGENCY	
100 FINANCE CHARGES	

APPENDIX B TYPICAL UNIT COST ELEMENTS

No.	DESCRIPTION	UNIT
10.01	**Track structure: Viaduct**	
10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht)	Route Mile
10.01.123	Elevated Structure - 1 Track (30' Avg. Pier Ht)	Route Mile
10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	Route Mile
10.01.125	Elevated Structure - 1 Track (50' Avg. Pier Ht)	Route Mile
10.01.126	Elevated Structure - 1 Track (60' Avg. Pier Ht)	Route Mile
10.01.127	Elevated Structure - 1 Track (70' Avg. Pier Ht)	Route Mile
10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	Route Mile
10.01.223	Elevated Structure - 2 Track (30' Avg. Pier Ht)	Route Mile
10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	Route Mile
10.01.225	Elevated Structure - 2 Track (50' Avg. Pier Ht)	Route Mile
10.01.226	Elevated Structure - 2 Track (60' Avg. Pier Ht)	Route Mile
10.01.227	Elevated Structure - 2 Track (70' Avg. Pier Ht)	Route Mile
10.01.242	Elevated Structure - 4 Track (20' Avg. Pier Ht)	Route Mile
10.01.243	Elevated Structure - 4 Track (30' Avg. Pier Ht)	Route Mile
10.01.244	Elevated Structure - 4 Track (40' Avg. Pier Ht)	Route Mile
10.01.245	Elevated Structure - 4 Track (50' Avg. Pier Ht)	Route Mile
10.01.246	Elevated Structure - 4 Track (60' Avg. Pier Ht)	Route Mile
10.01.247	Elevated Structure - 4 Track (70' Avg. Pier Ht)	Route Mile
10.01.322	Elevated Structure (LS) - 1 Track (20' Avg. Pier Ht)	Route Mile
10.01.323	Elevated Structure (LS) - 1 Track (30' Avg. Pier Ht)	Route Mile
10.01.324	Elevated Structure (LS) - 1 Track (40' Avg. Pier Ht)	Route Mile
10.01.325	Elevated Structure (LS) - 1 Track (50' Avg. Pier Ht)	Route Mile
10.01.326	Elevated Structure (LS) - 1 Track (60' Avg. Pier Ht)	Route Mile
10.01.327	Elevated Structure (LS) - 1 Track (70' Avg. Pier Ht)	Route Mile
10.01.422	Elevated Structure (LS) - 2 Track (20' Avg. Pier Ht)	Route Mile
10.01.423	Elevated Structure (LS) - 2 Track (30' Avg. Pier Ht)	Route Mile
10.01.424	Elevated Structure (LS) - 2 Track (40' Avg. Pier Ht)	Route Mile
10.01.425	Elevated Structure (LS) - 2 Track (50' Avg. Pier Ht)	Route Mile
10.01.426	Elevated Structure (LS) - 2 Track (60' Avg. Pier Ht)	Route Mile
10.01.427	Elevated Structure (LS) - 2 Track (70' Avg. Pier Ht)	Route Mile
10.01.431	Elevated Structure (LS-Tall) - 2-Single Tracks (110' Avg. Pier Ht)	Route Mile

No.	DESCRIPTION	UNIT
10.01.432	Elevated Structure (LS-Tall) - 2-Single Tracks (120' Avg. Pier Ht)	Route Mile
10.01.512	Elevated Structure Straddle over 2 RR - 1 Track (20' Avg. Pier Ht)	Route Mile
10.01.513	Elevated Structure Straddle over 2 RR - 1 Track (30' Avg. Pier Ht)	Route Mile
10.01.514	Elevated Structure Straddle over 2 RR - 1 Track (40' Avg. Pier Ht)	Route Mile
10.01.515	Elevated Structure Straddle over 2 RR - 1 Track (50' Avg. Pier Ht)	Route Mile
10.01.522	Elevated Structure Straddle over 2 RR - 2 Track (20' Avg. Pier Ht)	Route Mile
10.01.523	Elevated Structure Straddle over 2 RR - 2 Track (30' Avg. Pier Ht)	Route Mile
10.01.524	Elevated Structure Straddle over 2 RR - 2 Track (40' Avg. Pier Ht)	Route Mile
10.01.525	Elevated Structure Straddle over 2 RR - 2 Track (50' Avg. Pier Ht)	Route Mile
10.01.612	Elevated Structure Straddle over 4 RR - 1 Track (20' Avg. Pier Ht)	Route Mile
10.01.613	Elevated Structure Straddle over 4 RR - 1 Track (30' Avg. Pier Ht)	Route Mile
10.01.614	Elevated Structure Straddle over 4 RR - 1 Track (40' Avg. Pier Ht)	Route Mile
10.01.615	Elevated Structure Straddle over 4 RR - 1 Track (50' Avg. Pier Ht)	Route Mile
10.01.622	Elevated Structure Straddle over 4 RR - 2 Track (20' Avg. Pier Ht)	Route Mile
10.01.623	Elevated Structure Straddle over 4 RR - 2 Track (30' Avg. Pier Ht)	Route Mile
10.01.624	Elevated Structure Straddle over 4 RR - 2 Track (40' Avg. Pier Ht)	Route Mile
10.01.625	Elevated Structure Straddle over 4 RR - 2 Track (50' Avg. Pier Ht)	Route Mile
10.01.944	Elevated Structure - 2 Track w/ 2 Single Trenches	Route Mile
10.02	**Track structure: Major/Movable bridge**	
10.02.013	Bridge Structure - 3 span with 1 Track	Route Mile
10.02.023	Bridge Structure - 3 span with 2 Track	Route Mile
10.02.043	Bridge Structure - 3 span with 4 Track	Route Mile
10.05	**Track structure: Cut and Fill (> 4' height/depth)**	
10.05.111	At-Grade Track-bed in Cut - 1 Track (5' Avg. Exc Depth)	Route Mile

No.	DESCRIPTION	UNIT
10.05.112	At-Grade Track-bed in Cut - 1 Track (10' Avg. Exc Depth)	Route Mile
10.05.113	At-Grade Track-bed in Cut - 1 Track (15' Avg. Exc Depth)	Route Mile
10.05.114	At-Grade Track-bed in Cut - 1 Track (20' Avg. Exc Depth)	Route Mile
10.05.121	At-Grade Track-bed in Cut - 2 Track (5' Avg. Exc Depth)	Route Mile
10.05.122	At-Grade Track-bed in Cut - 2 Track (10' Avg. Exc Depth)	Route Mile
10.05.123	At-Grade Track-bed in Cut - 2 Track (15' Avg. Exc Depth)	Route Mile
10.05.124	At-Grade Track-bed in Cut - 2 Track (20' Avg. Exc Depth)	Route Mile
10.05.126	At-Grade Track-bed in Cut - 2 Track (40' Avg. Exc Depth)	Route Mile
10.05.128	At-Grade Track-bed in Cut - 2 Track (60' Avg. Exc Depth)	Route Mile
10.05.130	At-Grade Track-bed in Cut - 2 Track (80' Avg. Exc Depth)	Route Mile
10.05.132	At-Grade Track-bed in Cut - 2 Track (100' Avg. Exc Depth)	Route Mile
10.05.211	At-Grade Track-bed in Fill - 1 Track (5' Avg. Fill Ht)	Route Mile
10.05.212	At-Grade Track-bed in Fill - 1 Track (10' Avg. Fill Ht)	Route Mile
10.05.213	At-Grade Track-bed in Fill - 1 Track (15' Avg. Fill Ht)	Route Mile
10.05.214	At-Grade Track-bed in Fill - 1 Track (20' Avg. Fill Ht)	Route Mile
10.05.221	At-Grade Track-bed in Fill - 2 Track (5' Avg. Fill Ht)	Route Mile
10.05.222	At-Grade Track-bed in Fill - 2 Track (10' Avg. Fill Ht)	Route Mile
10.05.223	At-Grade Track-bed in Fill - 2 Track (15' Avg. Fill Ht)	Route Mile
10.05.224	At-Grade Track-bed in Fill - 2 Track (20' Avg. Fill Ht)	Route Mile
10.05.226	At-Grade Track-bed in Fill - 2 Track (40' Avg. Fill Ht)	Route Mile
10.05.228	At-Grade Track-bed in Fill - 2 Track (60' Avg. Fill Ht)	Route Mile
10.05.230	At-Grade Track-bed in Fill - 2 Track (80' Avg. Fill Ht)	Route Mile
10.05.232	At-Grade Track-bed in Fill - 2 Track (100' Avg. Fill Ht)	Route Mile
10.06	**Track structure: At-grade (grading and subgrade stabilization)**	
10.06.210	At-Grade Track-bed with Closed Drainage - 1 Track	Route Mile
10.06.220	At-Grade Track-bed with Closed Drainage - 2 Track	Route Mile
10.06.230	At-Grade Track-bed with Closed Drainage - 3 Track	Route Mile
10.06.240	At-Grade Track-bed with Closed Drainage - 4 Track	Route Mile
10.07	**Track structure: Tunnel**	
10.07.101	TBM Single Track Twin Tunnel 30ft ID Unpressurized TBM in hard rock	Route Mile
10.07.102	TBM Single Track Twin Tunnel 30ft ID Slurry TBM in hard rock	Route Mile
10.07.103	TBM Single Track Twin Tunnel 30ft ID in soft ground	Route Mile
10.07.104	TBM Double Track Tunnel 50ft ID in soft ground	Route Mile

No.	DESCRIPTION	UNIT
10.07.105	TBM Double Track Tunnel 40ft ID in soft ground	Route Mile
10.07.201	D&B Single Track Twin Tunnel 30ft ID in hard rock	Route Mile
10.07.202	D&B Single Track Twin Tunnel 30ft ID in rock	Route Mile
10.07.203	D&B Double Track Tunnel 40ft ID in hard rock	Route Mile
10.07.204	D&B Double Track Tunnel 40ft ID in rock	Route Mile
10.07.205	D&B Double Track Tunnel 50ft ID in hard rock	Route Mile
10.07.206	D&B Double Track Tunnel 50ft ID in rock	Route Mile
10.07.301	SEM Single Track Twin Tunnel 30ft ID in soft ground	Route Mile
10.07.302	SEM Single Track Twin Tunnel 30ft ID in soft ground	Route Mile
10.07.303	SEM Double Track Tunnel 40ft ID in soft ground	Route Mile
10.07.304	SEM Double Track Tunnel 40ft ID in soft ground	Route Mile
10.07.305	SEM Double Track Tunnel 50ft ID in soft ground	Route Mile
10.07.306	SEM Double Track Tunnel 50ft ID in soft ground	Route Mile
10.07.401	RH Single Track Twin Tunnel 30ft ID in soft rock	Route Mile
10.07.402	RH Single Track Twin Tunnel 30ft ID in soft rock	Route Mile
10.07.403	RH Double Track Tunnel 40ft ID in soft rock	Route Mile
10.07.404	RH Double Track Tunnel 40ft ID in soft rock	Route Mile
10.07.405	RH Double Track Tunnel 50ft ID in soft rock	Route Mile
10.07.406	RH Double Track Tunnel 50ft ID in soft rock	Route Mile
10.07.207	D&B Cross Passage conservative cost in rock	Linear Feet
10.07.407	RH Cross Passage conservative cost in soft rock	Linear Feet
10.07.501	Cross Passage in Soft Ground	Linear Feet
10.07.502	Cross Passage in Soft Ground, including jet grout	Linear Feet
10.07.114	Cut & Cover Box - 1 Track/ 1 Box (40' Avg. Exc Depth)	Route Mile
10.07.115	Cut & Cover Box - 1 Track/ 1 Box (50' Avg. Exc Depth)	Route Mile
10.07.116	Cut & Cover Box - 1 Track/ 1 Box (60' Avg. Exc Depth)	Route Mile
10.07.214	Cut & Cover Box - 2 Track / 1 Box (40' Avg. Exc Depth)	Route Mile
10.07.215	Cut & Cover Box - 2 Track / 1 Box (50' Avg. Exc Depth)	Route Mile
10.07.216	Cut & Cover Box - 2 Track / 1 Box (60' Avg. Exc Depth)	Route Mile
10.07.224	Cut & Cover Box - 2 Track/ 2 Box (40' Avg. Exc Depth)	Route Mile
10.07.225	Cut & Cover Box - 2 Track / 2 Box (50' Avg. Exc Depth)	Route Mile
10.07.226	Cut & Cover Box - 2 Track / 2 Box (60' Avg. Exc Depth)	Route Mile
10.07.414	Cut & Cover Box - 4 Track / 1 Box (40' Avg. Exc Depth)	Route Mile
10.07.415	Cut & Cover Box - 4 Track / 1 Box (50' Avg. Exc Depth)	Route Mile
10.07.416	Cut & Cover Box - 4 Track / 1 Box (60' Avg. Exc Depth)	Route Mile

No.	DESCRIPTION	UNIT
10.07.801	Ventilation Shaft	VF
10.07.802	Mid-Line Ventilation Structure	LS
10.07.803	Tunnel Portal Structure	LS
10.07.805	Emergency Access Shaft	VF
10.07.850	Pumping Station	EA
10.07.901	Mechanical & Electrical Allowance for Underground (Single)	Route Mile
10.07.902	Mechanical & Electrical Allowance for Underground (Double)	Route Mile
10.07.920	Ventilation Equipment Allowance	EA
10.07.922	Double Deck - 2 Track Trench on Top of 2 Track C&C Box	Route Mile
10.07.950	Allowance for Construction Monitoring	Route Mile
10.08	**Track structure: Retaining walls and systems**	
10.08.211	Retained Cut, Trench - 1 Track (10' Avg. Exc Depth)	Route Mile
10.08.212	Retained Cut, Trench - 1 Track (20' Avg. Exc Depth)	Route Mile
10.08.213	Retained Cut, Trench - 1 Track (30' Avg. Exc Depth)	Route Mile
10.08.221	Retained Cut, Trench - 2 Track (10' Avg. Exc Depth)	Route Mile
10.08.222	Retained Cut, Trench - 2 Track (20' Avg. Exc Depth)	Route Mile
10.08.223	Retained Cut, Trench - 2 Track (30' Avg. Exc Depth)	Route Mile
10.08.241	Retained Cut, Trench - 4 Track (10' Avg. Exc Depth)	Route Mile
10.08.242	Retained Cut, Trench - 4 Track (20' Avg. Exc Depth)	Route Mile
10.08.243	Retained Cut, Trench - 4 Track (30' Avg. Exc Depth)	Route Mile
10.08.344	Retained Cut, Staged Trench - 4 Track (40' Avg. Exc Depth)	Route Mile
10.08.346	Retained Cut, Staged Trench - 4 Track (60' Avg. Exc Depth)	Route Mile
10.08.411	Retained Fill, Walls Both Sides - 1 Tracks (10' Avg. Wall Ht)	Route Mile
10.08.412	Retained Fill, Walls Both Sides - 1 Tracks (20' Avg. Wall Ht)	Route Mile
10.08.413	Retained Fill, Walls Both Sides - 1 Tracks (30' Avg. Wall Ht)	Route Mile
10.08.421	Retained Fill, Walls Both Sides - 2 Tracks (10' Avg. Wall Ht)	Route Mile
10.08.422	Retained Fill, Walls Both Sides - 2 Tracks (20' Avg. Wall Ht)	Route Mile
10.08.423	Retained Fill, Walls Both Sides - 2 Tracks (30' Avg. Wall Ht)	Route Mile
10.09	**Track new construction: Conventional ballasted**	
10.09.110	Ballasted Track - 1 Track	Route Mile
10.09.112	Ballasted Track (Track Laying Machine) - 1 Track	Route Mile
10.09.120	Ballasted Track - 2 Track	Route Mile
10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	Route Mile
10.09.240	Ballasted Track - 2 Track (Station Track)	Route Mile
10.09.810	Ballasted Freight Track - 1 Track	Route Mile

No.	DESCRIPTION	UNIT
10.09.820	Ballasted Freight Track - 2 Track	Route Mile
10.09.910	Ballasted Track Relocation - 1 Track (Temporary)	Route Mile
10.09.920	Ballasted Track Relocation - 1 Track (Permanent)	Route Mile
10.10	**Track new construction: Non-ballasted**	
10.10.110	Direct Fixation Track - 1 Track	Route Mile
10.10.120	Direct Fixation Track - 2 Track	Route Mile
10.10.140	Direct Fixation Track - 4 Track	Route Mile
10.10.210	Independent Dual Block Track - 1 Track	Route Mile
10.10.220	Independent Dual Block Track - 2 Track	Route Mile
10.10.240	Independent Dual Block Track - 4 Track	Route Mile
10.14	**Track: Special track work (switches, turnouts, insulated joints)**	
10.14.100	Direct Fixation Turnout (60 MPH)	EA
10.14.105	Direct Fixation Turnout (80 MPH)	EA
10.14.110	Direct Fixation Turnout (110 MPH)	EA
10.14.115	Direct Fixation Turnout (150 MPH)	EA
10.14.130	Direct Fixation Crossover (60 MPH)	EA
10.14.135	Direct Fixation Crossover (80 MPH)	EA
10.14.140	Direct Fixation Crossover (110 MPH)	EA
10.14.145	Direct Fixation Crossover (150 MPH)	EA
10.14.200	Ballasted Turnout (60 MPH)	EA
10.14.205	Ballasted Turnout (80 MPH)	EA
10.14.210	Ballasted Turnout (110 MPH)	EA
10.14.215	Ballasted Turnout (150 MPH)	EA
10.14.300	Ballasted Crossover (60 MPH)	EA
10.14.305	Ballasted Crossover (80 MPH)	EA
10.14.310	Ballasted Crossover (110 MPH)	EA
10.14.315	Ballasted Crossover (150 MPH)	EA
10.14.400	Terminal - Bumping Post	
20.01	**Station buildings: Intercity passenger rail only**	
20.01.105	Millbrae Station	LS
20.01.105	Millbrae Station - Site Elements	LS
20.02.200	Redwood/Palo Alto Station	LS
20.02.201	Redwood/Palo Alto Station - Site Elements	LS
20.02.215	Gilroy Station	LS

No.	DESCRIPTION	UNIT
20.02.216	Gilroy Station - Site Elements	LS
20.02.225	San Jose Station	LS
20.02.226	San Jose Station-Site Elements	LS
20.01.100	Artic Station	LS
20.01.110	LA Union Station	LS
20.02.205	Norwalk Station	LS
20.02.206	Norwalk Station - Site Elements	LS
20.02.210	Tulare Station	LS
20.02.211	Tulare Station - Site Elements	LS
20.02.220	Burbank Station	LS
20.02.221	Burbank Station - Site Elements	LS
20.02.230	Merced Station	LS
20.02.231	Merced Station - Site Elements	LS
20.02.235	Fresno Station	LS
20.02.236	Fresno Station - Site Elements	LS
20.02.240	Bakersfield Station	LS
20.02.241	Bakersfield Station - Site Elements	LS
20.02.245	Palmdale Station	LS
20.02.246	Palmdale Station - Site Elements	LS
20.02.250	Sylmar Station	LS
20.02.251	Sylmar Station - Site Elements	LS
20.06	**Pedestrian / bike access and accommodation, landscaping, parking lots**	
20.06.120	Pedestrian Access (Cut & Cover)	LF
20.06.140	Pedestrian Plaza	SF
20.06.160	Pedestrian Access, Vertical Structure, 30' Height	EA
20.06.210	Parking - At Grade	STL
20.06.250	Parking - Structured (Above Grade)	STL
20.06.800	Landscaping Allowance	SF
20.06.810	Landscaping Allowance, Guideway	Route Mile
20.07	**Automobile, bus, van accessways including roads**	
20.07.010	Roadway Modification, New AC Paving	SF
20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	SF
20.07.710	Permanent Service/Emergency Access Road (20' Wide)	Route Mile

No.	DESCRIPTION	UNIT
20.07.715	Access Road Entrance Point	EA
20.07.800	Streetscaping Allowance	ESF
30.02	**Light maintenance facility**	
30.02.010	Light Maintenance Facility (LMF)	EA
30.03	**Heavy maintenance facility**	
30.03.010	Heavy Maintenance Facility (HMF)	EA
30.04	**Storage or maintenance-of-way building/bases**	
30.04.010	Maintenance of Way Facility (MOWF)	EA
30.05	**Yard and yard track**	
30.05.110	Ballasted Track - Yard Track	Route Mile
30.05.200	Ballasted Turnout, No. 15	EA
30.05.210	Ballasted Diamond Crossover, No. 15	EA
30.05.250	Heavy Duty Rubber Grade Crossing	TF
40.01	**Demolition, clearing, site preparation**	
40.01.010	Demolition Allowance, Bridge	SF
40.01.050	Demolition Allowance, Building (1 Story)	SF
40.01.060	Demolition Allowance, Building (2 Story)	SF
40.01.110	Demolition Allowance, Asphalt Pavement	SY
40.01.140	Demolition Allowance, Concrete Curb	LF
40.01.150	Demolition Allowance, Concrete Sidewalk	SY
40.01.810	Demolition Allowance, Remove Railroad Track	Route Mile
40.01.900	Miscellaneous Excavation & Support Items	LS
40.02	**Site utilities, utility relocation**	
40.02.001	Utility Relocation Allowance, Level 1	Route Mile
40.02.002	Utility Relocation Allowance, Level 2	Route Mile
40.02.003	Utility Relocation Allowance, Level 3	Route Mile
40.02.004	Utility Relocation Allowance, Level 4	Route Mile
40.02.005	Utility Relocation Allowance, Level 5	Route Mile
40.02.050	Site Utility Allowance	Route Mile
40.03	**Hazardous material, contaminated soil removal/mitigation, ground water treatments**	
40.03.100	Hazardous Material Removal Allowance, Light	Route Mile
40.03.105	Hazardous Material Removal Allowance, Medium	Route Mile
40.03.110	Hazardous Material Removal Allowance, Heavy	Route Mile
40.03.150	Removal of Contaminated Soil	CF

No.	DESCRIPTION	UNIT
40.04	**Environmental mitigation: wetlands, historic/archeology, parks**	
40.04.100	Environmental Mitigation Allowance, Light	Route Mile
40.04.105	Environmental Mitigation Allowance, Medium	Route Mile
40.04.110	Environmental Mitigation Allowance, Heavy	Route Mile
40.05	**Site structures including retaining walls, sound walls**	
40.05.012	Retaining Wall - 1 Wall (12' Avg. Height)	LF
40.05.111	Containment (Crash) Wall - 1 Wall (6' Avg. Height Above Rail)	LF
40.05.120	Blast Wall (At Stations) - 1 Wall (20' Avg. Height Above Platform)	LF
40.05.211	Sound Wall - 1 Wall (8' Avg. Height)	LF
40.05.310	Intrusion Protection Berm	LF
40.06	**Temporary facilities and other indirect costs during construction**	
40.07	**Purchase or lease of real estate**	
	Right-of-Way Required for Segment	
40.07.100	Dense Urban	Acre
40.07.101	Urban	Acre
40.07.102	Dense Suburban	Acre
40.07.103	Suburban	Acre
40.07.104	Farmland	Acre
40.07.105	Undeveloped	Acre
	Right-of-Way Required for Stations and Maintenance Facilities	
40.07.200	Dense Urban	Acre
40.07.201	Urban	Acre
40.07.202	Dense Suburban	Acre
40.07.203	Suburban	Acre
40.07.204	Undeveloped	Acre
40.08	**Highway/pedestrian overpass/grade separations**	
40.08.322	Roadway Overcrossing HSR - 2 lane retained fill roadway over 2 tracks	EA
40.08.324	Roadway Overcrossing HSR - 4 lane retained fill roadway over 2 tracks	EA
40.08.326	Roadway Overcrossing HSR - 6 lane retained fill roadway over 2 tracks	EA

No.	DESCRIPTION	UNIT
40.08.342	Roadway Overcrossing HSR - 2 lane retained fill roadway over 4 tracks	EA
40.08.344	Roadway Overcrossing HSR - 4 lane retained fill roadway over 4 tracks	EA
40.08.346	Roadway Overcrossing HSR - 6 lane retained fill roadway over 4 tracks	EA
40.08.422	Roadway Overcrossing HSR - 2 lane roadway on embankment over 2 tracks	EA
40.08.424	Roadway Overcrossing HSR - 4 lane roadway on embankment over 2 tracks	EA
40.08.426	Roadway Overcrossing HSR - 6 lane roadway on embankment over 2 tracks	EA
50.01	**Wayside signaling equipment**	
50.01.010	Train Controls (ATC)	Route Mile
50.01.020	Wayside Protection System	Route Mile
50.01.030	Train Control, Wayside Facility Site Work	EA
50.05	**Communications**	
50.05.010	Communications (w/Fiber Optic Backbone)	Route Mile
60.02	**Traction power supply: Substations**	
60.02.100	Traction Power Supply	Route Mile
60.02.010	Traction Power, Supply Station Site Work	EA
60.02.020	Traction Power, Switching Station Site Work	EA
60.02.030	Traction Power, Paralleling Station Site Work	EA
60.03	**Traction power distribution: Catenary and third rail**	
60.03.100	Traction Power Distribution	Route Mile

APPENDIX C DETAILED COST BUDGET

Detail Cost Budget Data

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
01			Alternative 01					
	SS1		San Jose Diridon Sta Approach: Viaduct to I-880 (Scott to Diridon Sta)					
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	0.04	RM	200,136,594.25	/RM	8,005,464
		10.01.223	Elevated Structure - 2 Track (30' Avg. Pier Ht, 90' Span)	0.02	RM	202,498,578.00	/RM	4,049,972
		10.01.225b	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 110' Spacing	0.33	RM	223,965,402.39	/RM	73,908,583
		10.01.226a	Elevated Structure - 2 Track (60' Avg. Pier Ht, 90' Span)	0.03	RM	304,188,495.00	/RM	9,125,655
		10.01.226c	Elevated Structure - 2 Track (60' Avg. Pier Ht) - 110' Spacing	0.04	RM	241,240,256.75	/RM	9,649,610
		10.01.226d	Elevated Structure - 2 Track (60' Avg. Pier Ht, 120' Span)	0.05	RM	197,175,132.20	/RM	9,858,757
		10.02.044	Scott-Diridon - 4 Trk over 3 Trk (60' Avg. Pier Ht) - 120' Spacing	0.29	RM	773,052,862.69	/RM	224,185,330
		10.02.045	Scott-Diridon - Diridon-Tamien - 4 Trk	0.19	RM	856,527,020.84	/RM	162,740,134
		10.02.048	Scott-Diridon - BC -160-220-160 Span - Taylor St	0.10	RM	145,875,957.00	/RM	14,587,596

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.051	Scott-Diridon - BC -180-180 span - SJ City Market, Wye S Trk	0.07	RM	124,084,888.43	/RM	8,685,942
		10.02.052	Scott-Diridon - 4 Trk BC-150-240-150 Span - Santa Clara Street	0.10	RM	318,439,484.20	/RM	31,843,948
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	3.11	RM	4,096,042.18	/RM	12,738,691
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	3.00	RM	7,153,487.57	/RM	21,460,463
		10.06.230	At-Grade Track-Bed With Closed Drainage - 3 Track	0.68	RM	7,449,992.63	/RM	5,065,995
		10.06.240	At-Grade Track-Bed With Closed Drainage - 4 Track	0.85	RM	7,740,488.34	/RM	6,579,415
		10.08.421	Ret Fill, Walls Both Sides - 2 Trk (10' Avg. Wall Ht)	0.13	RM	15,302,317.08	/RM	1,989,301
		10.08.422	Retained Fill, Wall Both Sides - 2 Trks (20¦Avg. Wall Ht)	0.09	RM	28,101,146.56	/RM	2,529,103
		10.09.112	Ballasted Track (Track Laying Machine) - 1 Track	3.11	RM	1,564,808.30	/RM	4,866,554
		10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	3.23	RM	3,073,829.09	/RM	9,928,468
		10.09.132	Ballasted Track (Track Laying Machine) - 3 Track	0.68	RM	4,709,633.37	/RM	3,202,551
		10.09.142	Ballasted Track (Track Laying Machine) - 4 Track	0.85	RM	6,272,123.49	/RM	5,331,305
		10.10.120	Direct Fixation Track - 2 Track	0.68	RM	4,520,631.81	/RM	3,074,030
		10.10.140	Direct Fixation Track - 4 Track	0.58	RM	9,058,582.22	/RM	5,253,978

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.201	Ballasted Turnout #9	2.00	EA	127,172.82	/EA	254,346
		10.14.202	Ballasted Turnout #10	2.00	EA	138,477.07	/EA	276,954
		10.14.203	Ballasted Turnout #11 & #14	4.00	EA	155,433.44	/EA	621,734
		10.14.204	Ballasted Turnout #15	2.00	EA	211,954.70	/EA	423,909
		10.14.206	Ballasted Turnout #20	2.00	EA	339,127.52	/EA	678,255
		10.14.321	Ballasted Crossover #10	3.00	EA	720,645.97	/EA	2,161,938
		10.14.400	Terminal - Bumping Post	2.00	Ea	45,217.00	/Ea	90,434
		20.02.225	San Jose (Diridon) Sta	1.00	LS	307,339,406.31	/LS	307,339,406
		20.06.173	Ped Brdg Undercrossing HSR & Ramps/Stairs (College Park Sta):	1.00	EA	23,682,109.48	/EA	23,682,109
		20.06.210	Parking, at Grade	207.00	stl	8,589.07	/stl	1,777,938
		20.07.010	Roadway Modification, New AC Paving	60,800.00	SF	170.36	/SF	10,357,586
		20.07.715	Access Road Entrance Point	1.00	EA	48,632.72	/EA	48,633
		40.02.002	Natural Gas/Oil, 9"-16"	1,890.00	LF	194.54	/LF	367,686
		40.02.003	Potable Water, 10"-16"	3,267.00	LF	307.18	/LF	1,003,559
		40.02.005	Utility Relocation Allowance, Level 5 Urban	1,233.00	LF	197.11	/LF	243,040
		40.02.006	Sanitary Sewer, 37"-48"	1,964.00	LF	399.33	/LF	784,294
		40.02.008	Storm Drain, 42"-54"	2,295.00	LF	348.65	/LF	800,159
		40.02.011	Pump Station (Storm)	2.00	EA	383,975.90	/EA	767,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	2,301.00	LF	282.95	/LF	651,077
		40.02.020	Electric OH, 115 kV	6,753.00	LF	244.82	/LF	1,653,294
		40.02.022	Electirc OH, unknown	153.00	LF	194.31	/LF	29,729

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.100.v	Rdwy Overxing HSR (West Hedding): 2-Ln Rdwy Over 2 Trk	1.00	EA	28,884,706.55	/EA	28,884,707
		40.08.200.ad	Rdwy Underxing HSR (West Taylor): 2-Ln Rdwy Under 3 Trk	1.00	EA	4,371,515.23	/EA	4,371,515
		40.08.200.ad1	Rdwy Underxing Rail- 3 Trk (Main) Over 4 Ln Rdwy	1.00	EA	7,004,091.63	/EA	7,004,092
		40.08.200.ad2	Trench Base Slab - Taylor	1.00	EA	21,388,093.22	/EA	21,388,093
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn					
		10.01.001	Topsoil	270,683.00	CY	4.24	/CY	1,146,709
		10.01.002	Cut	4,432,073.00	CY	13.42	/CY	59,477,076
		10.01.004	Overbreak In Embankment	178,617.00	CY	19.79	/CY	3,534,450
		10.01.005	Embankment	1,866,629.00	CY	22.60	/CY	42,191,483
		10.01.006	Overbreak Fill In Cut	55,866.00	CY	19.79	/CY	1,105,468
		10.01.007	Overbreak Fill In Embankment	178,617.00	CY	19.79	/CY	3,534,450
		10.01.008	Subballast	38,915.00	CY	59.35	/CY	2,309,595
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	0.11	RM	130,484,442.45	/RM	14,353,289
		10.01.123	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 110' Spacing	0.06	RM	133,704,872.83	/RM	8,022,292
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.25	RM	139,750,142.12	/RM	34,937,536

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.125	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 110' Spacing	0.03	RM	130,446,730.67	/RM	3,913,402
		10.01.126	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 110' Spacing	1.71	RM	152,272,694.35	/RM	260,386,307
		10.01.127	Elevated Structure - 1 Track (70' Avg. Pier Ht) - 110' Spacing	0.07	RM	148,443,679.00	/RM	10,391,058
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	0.20	RM	206,586,823.40	/RM	41,317,365
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	2.00	EA	191,832.26	/EA	383,665
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	4.00	EA	983,616.75	/EA	3,934,467
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	6.00	EA	2,864,326.53	/EA	17,185,959
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	1.00	EA	295,126.59	/EA	295,127
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	2.00	EA	1,513,256.52	/EA	3,026,513
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	1.57	RM	216,837,944.13	/RM	340,435,572
		10.07.207	D&B Cross Passage Conservative Cost In Rock	1,000.00	lf	33,583.85	/lf	33,583,852
		10.07.950	Allowance For Construction Monitoring	1.57	RM	271,616.00	/RM	426,437
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.04	RM	2,350,177.49	/RM	9,494,717
		10.09.120	Ballasted Track - 2 Track	0.84	RM	4,644,098.76	/RM	3,901,043
		10.10.110	Direct Fixation Track - 1 Track	3.74	RM	2,267,324.30	/RM	8,479,793
		10.16.100	Drainage	59.00	EA	192,878.77	/EA	11,379,848
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	124,230.00	SF	170.36	/SF	21,163,205
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	550.00	lf	3,839.76	/lf	2,111,867
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	582.00	LF	7,679.52	/LF	4,469,479
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	275.00	LF	9,215.42	/LF	2,534,241
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	240.00	LF	10,751.33	/LF	2,580,318
		40.05.028	Retaining Wall In Fill - 1 Wall (50' Avg. Height)	345.00	LF	12,287.23	/LF	4,239,094
		40.05.052	Retaining Wall In Cut - 1 Wall (30' Avg. Exc Depth)	684.00	LF	9,215.42	/LF	6,303,348

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	587.00	LF	12,297.69	/LF	7,218,747
		40.08.100.b	Rdwy Overxing HSR (Bloomfield Ave): 2-Ln Rdwy Over MF	1.00	EA	79,140,313.63	/EA	79,140,314
	SS14		Pacheco Pass Deep Tunnel					
		10.01.001	Topsoil	842,251.83	CY	4.24	/CY	3,568,083
		10.01.002	Cut	15,347,083.00	CY	13.42	/CY	205,953,215
		10.01.004	Overbreak In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.005	Embankment	8,679,515.00	CY	22.60	/CY	196,160,767
		10.01.006	Overbreak Fill In Cut	72,100.00	CY	19.79	/CY	1,426,706
		10.01.007	Overbreak Fill In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.008	Subballast	143,484.00	CY	59.35	/CY	8,515,772
		10.01.122a	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 150' Spacing	0.58	RM	154,200,922.48	/RM	89,436,535
		10.01.123a	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 150' Spacing	0.11	RM	156,620,053.00	/RM	17,228,206
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.08	RM	148,498,029.38	/RM	11,879,842
		10.01.124a	Elevated Structure - 1 Track (40' Avg. Pier Ht) - 150' Spacing	0.93	RM	168,597,657.13	/RM	156,795,821
		10.01.125a	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 150' Spacing	2.38	RM	176,322,161.81	/RM	419,646,745

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.126a	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 150' Spacing	0.02	RM	170,351,049.00	/RM	3,407,021
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	0.07	RM	151,524,442.71	/RM	10,606,711
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.12	RM	171,400,316.42	/RM	20,568,038
		10.01.224b	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 150' Spacing	0.11	RM	186,079,494.18	/RM	20,468,744
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.27	RM	196,606,822.63	/RM	53,083,842
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.27	RM	204,995,325.78	/RM	55,348,738
		10.01.227c	Elevated Structure - 2 Track (70' Avg. Pier Ht, 150' Span)	0.73	RM	210,460,755.11	/RM	153,636,351
		10.02.034	BC - 250-500-250 Span - Cal Aqueduct	0.19	RM	210,576,875.53	/RM	40,009,606
		10.02.035	BC - 160-320-160 Span - Delta Mendota	0.12	RM	203,677,321.58	/RM	24,441,279
		10.02.054	BC-150-240-120 Span - Ccid Outside Canal	0.10	RM	210,836,926.40	/RM	21,083,693
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	4.00	EA	191,832.28	/EA	767,329
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	18.00	EA	983,616.76	/EA	17,705,102
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	20.00	EA	2,864,326.53	/EA	57,286,531

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	4.00	EA	295,126.56	/EA	1,180,506
		10.05.320	Transition Wedge 1 Trk Embankment- Slab	4.00	EA	9,600.28	/EA	38,401
		10.05.321	Transition Wedge 1 Trk Embankment-Cut	4.00	EA	11,513.90	/EA	46,056
		10.05.322	Transition Wedge 2 Trk Embankment-Cut	4.00	EA	14,027.54	/EA	56,110
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	13.61	RM	216,837,944.12	/RM	2,951,164,419
		10.07.207	D&B Cross Passage Conservative Cost In Rock	9,000.00	lf	33,583.85	/lf	302,254,665
		10.07.850	Pumping Sta	1.00	EA	339,520.00	/EA	339,520
		10.07.920	Ventilation Equipment Allowance (INCLUDED w/10.07.902)	4.00	EA	173,849,447.78	/EA	695,397,791
		10.07.950	Allowance For Construction Monitoring	13.61	RM	271,616.00	/RM	3,696,694
		10.07.970	Fault Chamber	2.00	EA	166,409,372.86	/EA	332,818,746
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.24	RM	2,350,177.49	/RM	9,964,753

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.09.120	Ballasted Track - 2 Track	13.30	RM	4,644,098.77	/RM	61,766,514
		10.10.110	Direct Fixation Track - 1 Track	31.00	RM	2,267,324.31	/RM	70,287,054
		10.10.120	Direct Fixation Track - 2 Track	0.24	RM	4,520,631.83	/RM	1,084,952
		10.15.101	Wildlife Crossing	10.00	EA	71,301.56	/EA	713,016
		10.16.100	Drainage	2.00	EA	192,878.78	/EA	385,758
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	777,970.00	SF	170.36	/SF	132,531,103
		40.02.020	Electric OH, 115 kV	455.00	LF	244.82	/LF	111,395
		40.02.021	Electric OH, 230 kV	1,340.00	LF	194.31	/LF	260,369
		40.02.022	Electirc OH, unknown	1,925.00	LF	194.31	/LF	374,037
		40.02.025	Potable Water, 120"	3,800.00	LF	7,679.52	/LF	29,182,168
		40.02.043	Drainage Canal, All Sizes	785.00	LF	502.07	/LF	394,121
		40.02.045	Electric OH & Telecom OH on JP, Unknown	415.00	LF	194.31	/LF	80,637
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	1,629.00	lf	3,839.76	/lf	6,254,967
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	951.00	LF	9,215.42	/LF	8,763,866
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	677.00	LF	10,751.33	/LF	7,278,647
		40.05.029	Retaining Wall In Fill - 1 Wall (60' Avg. Height)	990.00	LF	13,823.13	/LF	13,684,901
		40.05.030	Retaining Wall In Fill - 1 Wall (70' Avg. Height)	1,056.00	LF	18,430.84	/LF	19,462,970

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	3,089.84	LF	12,287.23	/LF	37,965,571
		40.08.200.al	Rdwy Modification (Romero Rd), New AC Paving	1.00	EA	725,071.17	/EA	725,071
		40.08.200.am	Rdwy Modification (Fahey), Restriping	1.00	EA	9,101.36	/EA	9,101
		40.08.200.an	Rdwy Modification (CA152), Restriping	1.00	EA	41,939.95	/EA	41,940
	SS16		San Joaquin Valley					
		10.01.001	Topsoil	447,415.00	CY	4.24	/CY	1,895,411
		10.01.002	Cut	23,638.00	CY	13.42	/CY	317,217
		10.01.004	Overbreak In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.005	Embankment	2,531,377.00	CY	22.60	/CY	57,216,798
		10.01.006	Overbreak Fill In Cut	1,701.00	CY	19.79	/CY	33,657
		10.01.007	Overbreak Fill In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.008	Subballast	128,198.00	CY	59.35	/CY	7,608,550
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	2.71	RM	180,812,350.63	/RM	490,001,470
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	1.63	RM	189,953,839.66	/RM	309,624,759
		10.01.224a	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 120' Spacing	0.67	RM	198,211,318.33	/RM	132,801,583
		10.02.036	BC - 150-275-150 - Cherokee	0.11	RM	224,216,722.09	/RM	24,663,839
		10.02.037	BC - 200-350-200 - San Luis	0.14	RM	178,203,214.64	/RM	24,948,450

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.038	BC - 120-220-120 Span - Los Banos	0.09	RM	262,414,325.78	/RM	23,617,289
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	8.00	EA	1,513,256.54	/EA	12,106,052
		10.09.110	Ballasted Track - 1 Track	0.55	RM	2,350,177.49	/RM	1,292,598
		10.09.120	Ballasted Track - 2 Track	12.75	RM	4,644,098.78	/RM	59,212,259
		10.10.120	Direct Fixation Track - 2 Track	5.37	RM	4,501,074.99	/RM	24,170,773
		10.14.206	Ballasted Turnout #20	3.00	EA	339,127.52	/EA	1,017,383
		10.14.300	Ballasted Crossover (60 MPH)	2.00	EA	2,119,546.96	/EA	4,239,094
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.51	/EA	3,204,755
		10.14.400	Terminal - Bumping Post	1.00	Ea	45,217.00	/Ea	45,217
		10.15.101	Wildlife Crossing	67.00	EA	71,301.56	/EA	4,777,205
		10.16.100	Drainage	42.00	EA	192,878.77	/EA	8,100,909
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	746,920.00	SF	170.36	/SF	127,241,579
		30.04.010c	MOIF Siding	1.00	EA	3,611,952.25	/EA	3,611,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	5,295.00	LF	282.95	/LF	1,498,241
		40.02.014	Telecom/Fiber Optic OH, All Sizes	6,255.00	LF	282.95	/LF	1,769,876
		40.02.019	Electric OH, 51-114 kV	3,770.00	LF	129.63	/LF	488,708
		40.02.022	Electirc OH, unknown	23,930.00	LF	194.31	/LF	4,649,723
		40.02.035	Potable Water Storage Tank	1.00	EA	76,795.17	/EA	76,795

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.043	Drainage Canal, All Sizes	29,515.00	LF	502.07	/LF	14,818,454
		40.02.045	Electric OH & Telecom OH on JP, Unknown	12,265.00	LF	194.31	/LF	2,383,153
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	0.66	lf	3,839.76	/lf	2,534
		40.08.100.d	Rdwy Overxing HSR (Henry Miller Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	51,328,605.99	/EA	51,328,606
		40.08.100.e	Rdwy Overxing HSR (Mercey Springs Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	28,529,153.87	/EA	28,529,154
		40.08.100.f	Rdwy Overxing HSR (Delta Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	26,999,657.46	/EA	26,999,657
		40.08.100.g	Rdwy Overxing HSR (Turner Island Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	27,497,062.74	/EA	27,497,063
		40.08.100.j	Rdwy Overxing HSR (Carlucci Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwys	1.00	EA	30,740,316.48	/EA	30,740,316
	SS3		San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to					
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.14	RM	197,484,535.43	/RM	27,647,835
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.11	RM	209,654,303.45	/RM	23,061,973
		10.02.040	Diridon-Tamien - 2 Track	1.06	RM	198,673,112.12	/RM	210,593,499

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.041	Diridon-Tamien - 4 Track	0.52	RM	482,156,229.21	/RM	250,721,239
		10.10.120	Direct Fixation Track - 2 Track	1.35	RM	4,495,391.82	/RM	6,068,779
		10.10.140	Direct Fixation Track - 4 Track	0.49	RM	9,005,693.22	/RM	4,412,790
		10.14.150	Direct Fixation Crossover #15	1.00	EA	2,548,376.01	/EA	2,548,376
		20.06.211	Bike Path Realignment (Almaden Expy)	1.00	EA	22,305,800.86	/EA	22,305,801
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	9,800.00	SF	170.36	/SF	1,669,479
		40.02.005	Utility Relocation Allowance, Level 5 Urban	750.00	LF	197.11	/LF	147,834
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	2,040.00	LF	282.95	/LF	577,226
		40.02.020	Electric OH, 115 kV	1,400.00	LF	244.82	/LF	342,753
		40.02.024	Transmission Tower	1.00	EA	614,361.43	/EA	614,361
	SS4		San Jose to Monterey Corridor:Alma Ave to Communication Hill					
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.20	RM	177,019,979.55	/RM	35,403,996
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	0.28	RM	4,050,193.61	/RM	1,134,054
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	2.16	RM	7,163,896.40	/RM	15,474,016
		10.06.230	At-Grade Track-Bed With Closed Drainage - 3 Track	0.27	RM	7,317,025.74	/RM	1,975,597

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.08.421	Ret Fill, Walls Both Sides - 2 Trk (10' Avg. Wall Ht)	0.14	RM	15,224,244.29	/RM	2,131,394
		10.08.422	Retained Fill, Wall Both Sides - 2 Trks (20¦Avg. Wall Ht)	0.28	RM	27,466,208.21	/RM	7,690,538
		10.09.112	Ballasted Track (Track Laying Machine) - 1 Track	0.28	RM	1,547,292.68	/RM	433,242
		10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	2.59	RM	3,075,034.35	/RM	7,964,339
		10.09.132	Ballasted Track (Track Laying Machine) - 3 Track	0.27	RM	4,622,418.04	/RM	1,248,053
		10.10.120	Direct Fixation Track - 2 Track	0.19	RM	4,531,584.53	/RM	861,001
		10.14.201	Ballasted Turnout #9	2.00	EA	127,172.82	/EA	254,346
		10.14.203	Ballasted Turnout #11 & #14	1.00	EA	155,433.45	/EA	155,433
		10.14.320	Ballasted Crossover	1.00	EA	593,473.15	/EA	593,473
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	53,020.00	SF	170.36	/SF	9,032,224
		40.02.002	Natural Gas/Oil, 9"-16"	1,480.00	LF	194.54	/LF	287,923
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	16,040.00	LF	282.95	/LF	4,538,580
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	2,520.00	LF	244.82	/LF	616,956
		40.08.100.r	Rdwy Overxing HSR (Curtner Ave): 4-Ln Rdwy Over 4 Trk	1.00	EA	16,901,318.52	/EA	16,901,319
		40.08.100.s	Rdwy Overxing HSR (Almaden Expr): 4-Ln Rdwy Over 4 Trk	1.00	EA	12,090,542.80	/EA	12,090,543

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.ai	Rdwy Underxing HSR (SR87): 1-Ln Rdwy Under Eight-Ln Highway	1.00	EA	434,561.14	/EA	434,561
		40.08.200.aj	Rdwy Underxing HSR (Almaden Rd): 2-Ln Rdwy Under 4 Trk	1.00	EA	2,145,737.04	/EA	2,145,737
		40.08.200.aj1	HSR Underpass	1.00	EA	9,261,833.85	/EA	9,261,834
		40.08.200.aj2	Caltrain & UPRR Underpass	1.00	EA	2,150,156.81	/EA	2,150,157
	SS67		Morgan Hill & Gilroy: Viaduct (Com Hill. to D.Gilroy)					
		10.01.001	Topsoil	25,218.00	CY	4.24	/CY	106,834
		10.01.002	Cut	12,217.00	CY	13.42	/CY	163,948
		10.01.004	Overbreak In Embankment	32,019.00	CY	19.79	/CY	633,584
		10.01.005	Embankment	157,306.00	CY	22.60	/CY	3,555,588
		10.01.006	Overbreak Fill In Cut	6,300.00	CY	19.79	/CY	124,655
		10.01.007	Overbreak Fill In Embankment	32,019.00	CY	19.79	/CY	633,584
		10.01.008	Subballast	7,424.00	CY	59.35	/CY	440,603
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	1.77	RM	192,509,396.50	/RM	340,741,632
		10.01.223	Elevated Structure - 2 Track (30' Avg. Pier Ht, 90' Span)	0.09	RM	237,498,371.33	/RM	21,374,853
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	7.05	RM	201,892,892.46	/RM	1,423,344,892
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	0.05	RM	151,524,443.00	/RM	7,576,222
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.04	RM	177,019,974.50	/RM	7,080,799

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	3.72	RM	211,660,245.99	/RM	787,376,115
		10.01.224a	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 120' Spacing	0.16	RM	204,737,338.25	/RM	32,757,974
		10.01.224b	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 150' Spacing	0.11	RM	182,229,568.36	/RM	20,045,253
		10.01.225	Elevated Structure - 2 Track (50' Avg. Pier Ht)	0.07	RM	303,601,025.29	/RM	21,252,072
		10.01.225a	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 90' Spacing	0.02	RM	203,223,639.00	/RM	4,064,473
		10.01.225b	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 110' Spacing	1.78	RM	222,164,554.02	/RM	395,452,906
		10.01.225c	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 120' Spacing	0.34	RM	209,447,595.82	/RM	71,212,183
		10.01.226	Elevated Structure - 2 Track (60' Avg. Pier Ht)	0.06	RM	293,401,745.33	/RM	17,604,105
		10.01.226a	Elevated Structure - 2 Track (60' Avg. Pier Ht, 90' Span)	0.15	RM	270,658,585.67	/RM	40,598,788
		10.01.226b	Elevated Structure - 2 Track (60' Avg. Pier Ht, 100' Span)	0.08	RM	234,910,454.00	/RM	18,792,836
		10.01.226c	Elevated Structure - 2 Track (60' Avg. Pier Ht) - 110' Spacing	1.59	RM	230,923,039.21	/RM	367,167,632
		10.01.226d	Elevated Structure - 2 Track (60' Avg. Pier Ht, 120' Span)	0.05	RM	197,175,132.40	/RM	9,858,757

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.08	RM	203,233,643.75	/RM	16,258,692
		10.01.227	Elevated Structure - 2 Track (70' Avg. Pier Ht)	0.06	RM	303,550,783.33	/RM	18,213,047
		10.01.227a	Elevated Structure - 2 Track (70' Avg. Pier Ht, 90' Span)	0.13	RM	291,489,892.69	/RM	37,893,686
		10.01.227b	Elevated Structure - 2 Track (70' Avg. Pier Ht, 110' Span)	1.17	RM	240,572,161.56	/RM	281,469,429
		10.01.227c	Elevated Structure - 2 Track (70' Avg. Pier Ht, 150' Span)	0.06	RM	200,047,340.00	/RM	12,002,840
		10.02.020	BC - 225-225-225-225 - UPRR	0.04	RM	545,286,857.00	/RM	21,811,474
		10.02.021	BC - 155-310-155 Span - Monterey	0.12	RM	253,495,539.42	/RM	30,419,465
		10.02.023	BC - 90-180'-90 Span - Capitol	0.07	RM	304,571,505.86	/RM	21,320,005
		10.02.024	BC - 110-220-220-110 Span - Blossom	0.13	RM	232,033,483.31	/RM	30,164,353
		10.02.025	BC - 205-410-205 Span - Sr85	0.16	RM	195,415,373.00	/RM	31,266,460
		10.02.026	BC - 115-230-115 Span - Bernal	0.09	RM	253,589,523.00	/RM	22,823,057
		10.02.027	BC - 110-220-110 Span - Bailey	0.08	RM	276,816,082.12	/RM	22,145,287
		10.02.028	BC - 260-260 - Cochrane 1	0.10	RM	214,733,967.60	/RM	21,473,397
		10.02.029	BC - 233-233-233-233 - Cochrane 2	0.18	RM	295,980,656.28	/RM	53,276,518

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.030	BC - 260-260 - Dunne	0.10	RM	204,818,595.30	/RM	20,481,860
		10.02.031	BC - 240-240 - Tennant	0.09	RM	244,571,440.11	/RM	22,011,430
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	1.00	EA	1,513,256.49	/EA	1,513,256
		10.09.110	Ballasted Track - 1 Track	0.30	RM	2,373,916.63	/RM	712,175
		10.09.120	Ballasted Track - 2 Track	0.71	RM	4,627,003.04	/RM	3,285,172
		10.09.920	Ballasted Trk Relocation - 1 Trk (Permanent)	1.61	RM	282,902.95	/RM	455,474
		10.10.120	Direct Fixation Track - 2 Track	19.90	RM	4,501,931.75	/RM	89,588,442
		10.14.200	Ballasted Turnout (60 MPH)	1.00	EA	642,929.25	/EA	642,929
		10.14.202	Ballasted Turnout #10	5.00	EA	138,477.07	/EA	692,385
		10.14.203	Ballasted Turnout #11 & #14	5.00	EA	155,433.44	/EA	777,167
		10.15.102	Wildlife Crossing - 30' wide	2.00	EA	393,387.92	/EA	786,776
		10.15.103	Wildlife Crossing - 40' wide	2.00	EA	722,115.53	/EA	1,444,231
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	100,240.00	SF	170.36	/SF	17,076,388
		40.01.110	Demolition Allowance, Asphalt Pavement	392,200.00	SY	13.58	/SY	5,324,725
		40.01.810	Demolition Allowance, Remove Railroad Tracks	1.61	RM	307,562.32	/RM	495,175
		40.02.001	Natural Gas/Oil, 4.5"-8"	760.00	LF	163.82	/LF	124,507
		40.02.002	Natural Gas/Oil, 9"-16"	830.00	LF	194.54	/LF	161,471

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.007	Sanitary Sewer, 49"-54"	15,980.00	LF	436.20	/LF	6,970,517
		40.02.008	Storm Drain, 42"-54"	1,080.00	LF	348.65	/LF	376,545
		40.02.009	Storm Drain, 55"-72"	320.00	LF	371.69	/LF	118,941
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	43,280.00	LF	282.95	/LF	12,246,242
		40.02.014	Telecom/Fiber Optic OH, All Sizes	6,265.00	LF	282.95	/LF	1,772,706
		40.02.015	Telecommunication Facility	1.00	EA	460,771.08	/EA	460,771
		40.02.019	Electric OH, 51-114 kV	230.00	LF	129.63	/LF	29,815
		40.02.020	Electric OH, 115 kV	2,600.00	LF	244.82	/LF	636,541
		40.02.021	Electric OH, 230 kV	5,465.00	LF	194.31	/LF	1,061,878
		40.02.022	Electirc OH, unknown	5,320.00	LF	194.31	/LF	1,033,704
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	8,280.00	LF	244.82	/LF	2,027,140
		40.02.047	Recycled Water, All Sizes	10,050.00	LF	148.54	/LF	1,492,827
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	4,375.00	LF	9,215.42	/LF	40,317,470
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	3,735.00	LF	10,751.33	/LF	40,156,200
		40.08.200.a	Rdwy Underxing HSR (NB Monterey Rd Realignment): 2-Ln Rdwy Under 2 Trk	1.00	EA	1,668,692.62	/EA	1,668,693
	SS9		Morgan Hill & Gilroy: Viaduct (D. Gilroy)					
		10.01.001	Topsoil	84,525.00	CY	4.24	/CY	358,079
		10.01.002	Cut	4,272.00	CY	13.42	/CY	57,334
		10.01.004	Overbreak In Embankment	157,741.00	CY	19.91	/CY	3,141,154

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.005	Embankment	638,406.00	CY	22.60	/CY	14,429,906
		10.01.006	Overbreak Fill In Cut	8,698.00	CY	19.79	/CY	172,123
		10.01.007	Overbreak Fill In Embankment	158,741.00	CY	19.79	/CY	3,141,154
		10.01.008	Subballast	28,716.00	CY	59.35	/CY	1,704,286
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	0.49	RM	132,532,868.37	/RM	64,941,105
		10.01.123	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 110' Spacing	0.16	RM	133,487,810.81	/RM	21,358,050
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	4.80	RM	191,941,597.42	/RM	921,319,668
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	0.05	RM	148,026,114.00	/RM	7,401,306
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	5.15	RM	201,906,854.34	/RM	1,039,820,300
		10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	0.19	RM	211,185,096.11	/RM	40,125,168
		10.01.226c	Elevated Structure - 2 Track (60' Avg. Pier Ht) - 110' Spacing	0.07	RM	178,532,557.71	/RM	12,497,279
		10.01.226d	Elevated Structure - 2 Track (60' Avg. Pier Ht, 120' Span)	0.05	RM	146,943,394.80	/RM	7,347,170
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.03	RM	151,181,812.33	/RM	4,535,454
		10.01.227b	Elevated Structure - 2 Track (70' Avg. Pier Ht, 110' Span)	0.11	RM	174,483,139.27	/RM	19,193,145

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.242	Elevated Structure - 4 Track (20' Avg. Pier Ht) - 110' Spacing	0.27	RM	315,606,100.44	/RM	85,213,647
		10.01.243	Elevated Structure - 4 Track (30' Avg. Pier Ht) - 110' Spacing	0.18	RM	326,287,616.50	/RM	58,731,771
		10.01.248	Elevated Structure - 4 Track + 2 Platforms (20' Avg. Pier Ht)	0.17	RM	314,437,795.94	/RM	53,454,425
		10.02.032	BC - 110-220-110 Span - Llagas	0.08	RM	323,823,750.50	/RM	25,905,900
		10.02.053	BC - 130-260-260-260-130 Span - US101	0.20	RM	198,301,789.60	/RM	39,660,358
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	1.00	EA	295,126.59	/EA	295,127
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	5.00	EA	1,513,256.54	/EA	7,566,283
		10.09.120	Ballasted Track - 2 Track	6.71	RM	4,643,600.66	/RM	31,158,560
		10.09.920	Ballasted Trk Relocation - 1 Trk (Permanent)	2.91	RM	282,902.95	/RM	823,248
		10.10.110	Direct Fixation Track - 1 Track	1.78	RM	2,267,324.31	/RM	4,035,837
		10.10.120	Direct Fixation Track - 2 Track	7.50	RM	4,498,233.41	/RM	33,736,751
		10.14.100	Special Trackwork - Direct Fixation	6.00	EA	706,515.66	/EA	4,239,094
		10.14.135	Direct Fixation Crossover (80 MPH)	2.00	EA	2,119,546.96	/EA	4,239,094
		10.14.201	Ballasted Turnout #9	8.00	EA	127,172.82	/EA	1,017,383

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.203	Ballasted Turnout #11 & #14	6.00	EA	282,701.92	/EA	1,696,212
		10.14.206	Ballasted Turnout #20	2.00	EA	339,127.52	/EA	678,255
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.51	/EA	3,204,755
		10.14.400	Terminal - Bumping Post	2.00	Ea	45,217.00	/Ea	90,434
		10.15.100	Wildlife Crossing	1.00	EA	28,260.63	/EA	28,261
		10.16.100	Drainage	65.00	EA	192,878.77	/EA	12,537,120
		10.16.101	Superficial drainage system for flood plain mitigation	3.80	RM	11,150,083.44	/RM	42,370,317
		20.02.215a	Downtown Gilroy Sta - Viaduct	1.00	LS	139,867,486.54	/LS	139,867,487
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	397,850.00	SF	170.36	/SF	67,775,749
		30.04.010a	MOWF Downtown Gilroy	1.00	EA	251,124,406.97	/EA	251,124,407
		40.02.001	Natural Gas/Oil, 4.5"-8"	270.00	LF	163.82	/LF	44,233
		40.02.003	Potable Water, 10"-16"	2,565.00	LF	307.18	/LF	787,919
		40.02.005	Utility Relocation Allowance, Level 5 Urban	190.00	LF	197.11	/LF	37,451
		40.02.010	Box Culvert, All Sizes	100.00	LF	2,457.45	/LF	245,745
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	18,475.00	LF	282.95	/LF	5,227,572
		40.02.014	Telecom/Fiber Optic OH, All Sizes	380.00	LF	282.95	/LF	107,522
		40.02.020	Electric OH, 115 kV	3,515.00	LF	244.82	/LF	860,555
		40.02.022	Electirc OH, unknown	4,555.00	LF	194.31	/LF	885,060
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	4,810.00	LF	244.82	/LF	1,177,602

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.024	Transmission Tower	1.00	EA	614,361.45	/EA	614,361
		40.02.030	Potable Water, 4"-9"	525.00	LF	66.35	/LF	34,835
		40.02.045	Electric OH & Telecom OH on JP, Unknown	3,005.00	LF	194.31	/LF	583,887
	SS99-1		Alternative 1 Complete					
		40.04.110	Environmental Mitigation Allowance, Heavy	1.00	LS	565,791,999.21	/LS	565,791,999
		40.06.100	Temporary facilities and other indirect costs during construction	1.00	LS	691,523,554.60	/LS	691,523,555
		40.07.100	ROW Procurement Acquisition	1.00	LS	3,577,024,000.00	/LS	3,577,024,000
		50.01.020	Wayside Protection - 2 Track	90.03	RM	2,164,042.47	/RM	194,828,744
		50.05.010	Communications (w/Fiber Optic Backbone) - 2 Track	90.03	RM	897,257.90	/RM	80,780,129
		50.07.020	Hazard Detectors	90.03	RM	623,278.90	/RM	56,113,800
		60.01.020	Traction power transmission: High voltage	90.03	RM	1,822,583.13	/RM	164,087,159
		60.01.030	Distribution Line Pacheco Pass	90.03	RM	763,146.66	/RM	68,706,094
		60.01.040	PG&E Construction Power Drop Sites	90.03	RM	16,359.17	/RM	1,472,816
		60.02.010	Traction Power, Supply Station Site Work	90.03	RM	2,218,839.55	/RM	199,762,125
		60.03.100	Traction Power Distribution - 2 Tracks	90.03	RM	2,660,904.66	/RM	239,561,246

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		60.04.100	Traction power control	90.03	RM	6,133.11	/RM	552,164
		80.00.00	Professional Services	1.00	LS	3,310,096,896.00	/LS	3,310,096,896
		90.00.00	Unallocated Contingency	1.00	LS	995,074,271.59	/LS	995,074,272
			Total					**28,334,448,572**
02			Alternative 02					
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn					
		10.01.001	Topsoil	270,683.00	CY	4.24	/CY	1,146,709
		10.01.002	Cut	4,432,073.00	CY	13.42	/CY	59,477,076
		10.01.004	Overbreak In Embankment	178,617.00	CY	19.79	/CY	3,534,450
		10.01.005	Embankment	1,866,629.00	CY	22.60	/CY	42,191,483
		10.01.006	Overbreak Fill In Cut	55,866.00	CY	19.79	/CY	1,105,468
		10.01.007	Overbreak Fill In Embankment	178,617.00	CY	19.79	/CY	3,534,450
		10.01.008	Subballast	38,915.00	CY	59.35	/CY	2,309,595
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	0.11	RM	130,484,442.64	/RM	14,353,289
		10.01.123	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 110' Spacing	0.06	RM	133,704,872.67	/RM	8,022,292
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.25	RM	139,750,142.20	/RM	34,937,536

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.125	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 110' Spacing	0.03	RM	130,446,730.00	/RM	3,913,402
		10.01.126	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 110' Spacing	1.71	RM	152,272,694.36	/RM	260,386,307
		10.01.127	Elevated Structure - 1 Track (70' Avg. Pier Ht) - 110' Spacing	0.07	RM	148,443,678.86	/RM	10,391,058
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	0.20	RM	206,586,823.35	/RM	41,317,365
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	2.00	EA	191,832.26	/EA	383,665
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	4.00	EA	983,616.75	/EA	3,934,467
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	6.00	EA	2,864,326.53	/EA	17,185,959
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	1.00	EA	295,126.59	/EA	295,127
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	2.00	EA	1,513,256.52	/EA	3,026,513
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	1.57	RM	216,837,944.13	/RM	340,435,572
		10.07.207	D&B Cross Passage Conservative Cost In Rock	1,000.00	lf	33,583.85	/lf	33,583,852
		10.07.950	Allowance For Construction Monitoring	1.57	RM	271,616.00	/RM	426,437
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.04	RM	2,350,177.49	/RM	9,494,717
		10.09.120	Ballasted Track - 2 Track	0.84	RM	4,644,098.76	/RM	3,901,043
		10.10.110	Direct Fixation Track - 1 Track	3.74	RM	2,267,324.31	/RM	8,479,793
		10.16.100	Drainage	59.00	EA	192,878.77	/EA	11,379,848
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	124,230.00	SF	170.36	/SF	21,163,205
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	550.00	lf	3,839.76	/lf	2,111,867
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	582.00	LF	7,679.52	/LF	4,469,479
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	275.00	LF	9,215.42	/LF	2,534,241
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	240.00	LF	10,751.33	/LF	2,580,318
		40.05.028	Retaining Wall In Fill - 1 Wall (50' Avg. Height)	345.00	LF	12,287.23	/LF	4,239,094
		40.05.052	Retaining Wall In Cut - 1 Wall (30' Avg. Exc Depth)	684.00	LF	9,215.42	/LF	6,303,348

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	587.00	LF	12,297.69	/LF	7,218,747
		40.08.100.b	Rdwy Overxing HSR (Bloomfield Ave): 2-Ln Rdwy Over MF	1.00	EA	79,140,313.63	/EA	79,140,314
	SS14		Pacheco Pass Deep Tunnel					
		10.01.001	Topsoil	842,251.83	CY	4.24	/CY	3,568,083
		10.01.002	Cut	15,347,083.00	CY	13.42	/CY	205,953,215
		10.01.004	Overbreak In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.005	Embankment	8,768,515.00	CY	22.37	/CY	196,160,767
		10.01.006	Overbreak Fill In Cut	72,100.00	CY	19.79	/CY	1,426,706
		10.01.007	Overbreak Fill In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.008	Subballast	143,484.00	CY	59.35	/CY	8,515,772
		10.01.122a	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 150' Spacing	0.58	RM	154,200,922.47	/RM	89,436,535
		10.01.123a	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 150' Spacing	0.11	RM	156,620,053.18	/RM	17,228,206
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.08	RM	148,498,029.25	/RM	11,879,842
		10.01.124a	Elevated Structure - 1 Track (40' Avg. Pier Ht) - 150' Spacing	0.93	RM	168,597,657.12	/RM	156,795,821
		10.01.125a	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 150' Spacing	2.38	RM	176,322,161.82	/RM	419,646,745

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.126a	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 150' Spacing	0.02	RM	170,351,048.50	/RM	3,407,021
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	0.07	RM	151,524,442.86	/RM	10,606,711
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.12	RM	171,400,316.42	/RM	20,568,038
		10.01.224b	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 150' Spacing	0.11	RM	186,079,494.09	/RM	20,468,744
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.27	RM	196,606,822.67	/RM	53,083,842
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.27	RM	204,995,325.78	/RM	55,348,738
		10.01.227c	Elevated Structure - 2 Track (70' Avg. Pier Ht, 150' Span)	0.73	RM	210,460,755.08	/RM	153,636,351
		10.02.034	BC - 250-500-250 Span - Cal Aqueduct	0.19	RM	210,576,875.58	/RM	40,009,606
		10.02.035	BC - 160-320-160 Span - Delta Mendota	0.12	RM	203,677,321.58	/RM	24,441,279
		10.02.054	BC-150-240-120 Span - Ccid Outside Canal	0.10	RM	210,836,926.30	/RM	21,083,693
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	4.00	EA	191,832.29	/EA	767,329
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	18.00	EA	983,616.76	/EA	17,705,102
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	20.00	EA	2,864,326.53	/EA	57,286,531

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	4.00	EA	295,126.56	/EA	1,180,506
		10.05.320	Transition Wedge 1 Trk Embankment- Slab	4.00	EA	9,600.28	/EA	38,401
		10.05.321	Transition Wedge 1 Trk Embankment-Cut	4.00	EA	11,513.91	/EA	46,056
		10.05.322	Transition Wedge 2 Trk Embankment-Cut	4.00	EA	14,027.53	/EA	56,110
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	13.61	RM	216,837,944.12	/RM	2,951,164,419
		10.07.207	D&B Cross Passage Conservative Cost In Rock	9,000.00	lf	33,583.85	/lf	302,254,665
		10.07.850	Pumping Sta	1.00	EA	339,520.00	/EA	339,520
		10.07.920	Ventilation Equipment Allowance (INCLUDED w/10.07.902)	4.00	EA	173,849,447.78	/EA	695,397,791
		10.07.950	Allowance For Construction Monitoring	13.61	RM	271,616.00	/RM	3,696,694
		10.07.970	Fault Chamber	2.00	EA	166,409,372.87	/EA	332,818,746
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.24	RM	2,350,177.49	/RM	9,964,753

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.09.120	Ballasted Track - 2 Track	13.30	RM	4,644,098.77	/RM	61,766,514
		10.10.110	Direct Fixation Track - 1 Track	31.00	RM	2,267,324.31	/RM	70,287,054
		10.10.120	Direct Fixation Track - 2 Track	0.24	RM	4,520,631.83	/RM	1,084,952
		10.15.101	Wildlife Crossing	10.00	EA	71,301.56	/EA	713,016
		10.16.100	Drainage	2.00	EA	192,878.77	/EA	385,758
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	777,970.00	SF	170.36	/SF	132,531,103
		40.02.020	Electric OH, 115 kV	455.00	LF	244.82	/LF	111,395
		40.02.021	Electric OH, 230 kV	1,340.00	LF	194.31	/LF	260,369
		40.02.022	Electirc OH, unknown	1,925.00	LF	194.31	/LF	374,037
		40.02.025	Potable Water, 120"	3,800.00	LF	7,679.52	/LF	29,182,168
		40.02.043	Drainage Canal, All Sizes	785.00	LF	502.07	/LF	394,121
		40.02.045	Electric OH & Telecom OH on JP, Unknown	415.00	LF	194.31	/LF	80,637
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	1,629.00	lf	3,839.76	/lf	6,254,967
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	951.00	LF	9,215.42	/LF	8,763,866
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	677.00	LF	10,751.33	/LF	7,278,647
		40.05.029	Retaining Wall In Fill - 1 Wall (60' Avg. Height)	990.00	LF	13,823.13	/LF	13,684,901
		40.05.030	Retaining Wall In Fill - 1 Wall (70' Avg. Height)	1,056.00	LF	18,430.84	/LF	19,462,970

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	3,089.84	LF	12,287.23	/LF	37,965,571
		40.08.200.al	Rdwy Modification (Romero Rd), New AC Paving	1.00	EA	725,071.18	/EA	725,071
		40.08.200.am	Rdwy Modification (Fahey), Restriping	1.00	EA	9,101.33	/EA	9,101
		40.08.200.an	Rdwy Modification (CA152), Restriping	1.00	EA	41,939.97	/EA	41,940
	SS16		San Joaquin Valley					
		10.01.001	Topsoil	447,515.00	CY	4.24	/CY	1,895,411
		10.01.002	Cut	23,638.00	CY	13.42	/CY	317,217
		10.01.004	Overbreak In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.005	Embankment	2,531,377.00	CY	22.60	/CY	57,216,798
		10.01.006	Overbreak Fill In Cut	1,701.00	CY	19.79	/CY	33,657
		10.01.007	Overbreak Fill In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.008	Subballast	128,498.00	CY	59.21	/CY	7,608,550
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	2.71	RM	180,812,350.63	/RM	490,001,470
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	1.63	RM	189,953,839.66	/RM	309,624,759
		10.01.224a	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 120' Spacing	0.67	RM	198,211,318.33	/RM	132,801,583
		10.02.036	BC - 150-275-150 - Cherokee	0.11	RM	224,216,722.18	/RM	24,663,839
		10.02.037	BC - 200-350-200 - San Luis	0.14	RM	178,203,214.43	/RM	24,948,450

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.038	BC - 120-220-120 Span - Los Banos	0.09	RM	262,414,325.78	/RM	23,617,289
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	8.00	EA	1,513,256.54	/EA	12,106,052
		10.09.110	Ballasted Track - 1 Track	0.55	RM	2,350,177.49	/RM	1,292,598
		10.09.120	Ballasted Track - 2 Track	12.75	RM	4,644,098.77	/RM	59,212,259
		10.10.120	Direct Fixation Track - 2 Track	5.37	RM	4,501,074.99	/RM	24,170,773
		10.14.206	Ballasted Turnout #20	3.00	EA	339,127.52	/EA	1,017,383
		10.14.300	Ballasted Crossover (60 MPH)	2.00	EA	2,119,546.97	/EA	4,239,094
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.51	/EA	3,204,755
		10.14.400	Terminal - Bumping Post	1.00	Ea	45,217.00	/Ea	45,217
		10.15.101	Wildlife Crossing	67.00	EA	71,301.56	/EA	4,777,205
		10.16.100	Drainage	42.00	EA	192,878.77	/EA	8,100,909
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	746,920.00	SF	170.36	/SF	127,241,579
		30.04.010c	MOIF Siding	1.00	EA	3,611,952.24	/EA	3,611,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	5,295.00	LF	282.95	/LF	1,498,241
		40.02.014	Telecom/Fiber Optic OH, All Sizes	6,225.00	LF	284.32	/LF	1,769,876
		40.02.019	Electric OH, 51-114 kV	3,770.00	LF	129.63	/LF	488,708
		40.02.022	Electirc OH, unknown	23,930.00	LF	194.31	/LF	4,649,723
		40.02.035	Potable Water Storage Tank	1.00	EA	76,795.18	/EA	76,795

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.043	Drainage Canal, All Sizes	29,515.00	LF	502.07	/LF	14,818,454
		40.02.045	Electric OH & Telecom OH on JP, Unknown	12,265.00	LF	194.31	/LF	2,383,153
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	0.66	lf	3,839.77	/lf	2,534
		40.08.100.d	Rdwy Overxing HSR (Henry Miller Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	51,328,605.99	/EA	51,328,606
		40.08.100.e	Rdwy Overxing HSR (Mercey Springs Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	28,529,153.87	/EA	28,529,154
		40.08.100.f	Rdwy Overxing HSR (Delta Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	26,999,657.46	/EA	26,999,657
		40.08.100.g	Rdwy Overxing HSR (Turner Island Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	27,497,062.73	/EA	27,497,063
		40.08.100.j	Rdwy Overxing HSR (Carlucci Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwys	1.00	EA	30,740,316.49	/EA	30,740,316
	SS2		San Jose Diridon Sta Approach: Viaduct to Scott (Scott to Diridon Sta)					
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	0.23	RM	191,434,988.91	/RM	44,030,047
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	0.16	RM	179,694,590.12	/RM	28,751,134
		10.01.222b	Elevated Structure - 2 Track (20' Avg. Pier Ht, 150' Span)	0.14	RM	172,149,269.79	/RM	24,100,898

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.223	Elevated Structure - 2 Track (30' Avg. Pier Ht, 90' Span)	0.29	RM	241,369,061.03	/RM	69,997,028
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	0.88	RM	200,848,292.20	/RM	176,746,497
		10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	0.31	RM	213,569,428.42	/RM	66,206,523
		10.01.227b	Elevated Structure - 2 Track (70' Avg. Pier Ht, 110' Span)	0.02	RM	251,516,157.50	/RM	5,030,323
		10.02.042	Scott-Diridon - 2 Trk over 3 Trk (30' Avg. Pier Ht) - 110' Spacing	0.23	RM	659,149,080.78	/RM	151,604,289
		10.02.043	Scott-Diridon - 2 Trk over 5 Trk (30' Avg. Pier Ht) - 110' Spacing	0.15	RM	729,926,080.27	/RM	109,488,912
		10.02.044	Scott-Diridon - 4 Trk over 3 Trk (60' Avg. Pier Ht) - 120' Spacing	0.29	RM	773,052,862.72	/RM	224,185,330
		10.02.045	Scott-Diridon - Diridon-Tamien - 4 Trk	0.19	RM	856,527,020.79	/RM	162,740,134
		10.02.046	Scott-Diridon - BC -160-220-160 Span - Lafayette St	0.10	RM	230,392,863.20	/RM	23,039,286
		10.02.047	Scott-Diridon - BC -160-220-160 Span - I-880	0.10	RM	158,284,448.40	/RM	15,828,445
		10.02.048	Scott-Diridon - BC -160-220-160 Span - Taylor St	0.10	RM	145,875,957.00	/RM	14,587,596
		10.02.049	Scott-Diridon - BC-120-240-120 Span - Santa Clara Sta	0.09	RM	239,189,150.67	/RM	21,527,024

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.051	Scott-Diridon - BC -180-180 span - SJ City Market, Wye S Trk	0.14	RM	124,084,901.43	/RM	17,371,886
		10.02.052	Scott-Diridon - 4 Trk BC-150-240-150 Span - Santa Clara Street	0.10	RM	318,439,484.30	/RM	31,843,948
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	0.74	RM	4,125,169.43	/RM	3,052,625
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	0.12	RM	7,223,465.00	/RM	866,816
		10.06.230	At-Grade Track-Bed With Closed Drainage - 3 Track	1.20	RM	7,455,526.53	/RM	8,946,632
		10.06.240	At-Grade Track-Bed With Closed Drainage - 4 Track	0.77	RM	7,696,893.57	/RM	5,926,608
		10.08.421	Ret Fill, Walls Both Sides - 2 Trk (10' Avg. Wall Ht)	0.14	RM	15,224,244.36	/RM	2,131,394
		10.08.422	Retained Fill, Wall Both Sides - 2 Trks (20¦Avg. Wall Ht)	0.20	RM	26,968,498.35	/RM	5,393,700
		10.09.112	Ballasted Track (Track Laying Machine) - 1 Track	0.74	RM	1,575,935.77	/RM	1,166,192
		10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	0.46	RM	3,085,185.20	/RM	1,419,185
		10.09.132	Ballasted Track (Track Laying Machine) - 3 Track	1.20	RM	4,713,558.05	/RM	5,656,270
		10.09.142	Ballasted Track (Track Laying Machine) - 4 Track	0.77	RM	6,238,735.13	/RM	4,803,826
		10.10.120	Direct Fixation Track - 2 Track	2.92	RM	4,494,477.06	/RM	13,123,873
		10.10.140	Direct Fixation Track - 4 Track	0.56	RM	9,101,994.29	/RM	5,097,117

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.321	Ballasted Crossover #10	1.00	EA	720,645.99	/EA	720,646
		10.14.322	Ballasted Crossover #11	3.00	EA	806,840.87	/EA	2,420,523
		10.14.323	Ballasted Crossover #14	4.00	EA	1,003,252.23	/EA	4,013,009
		10.14.324	Ballasted Crossover #20	1.00	EA	1,413,031.31	/EA	1,413,031
		10.14.400	Terminal - Bumping Post	2.00	Ea	45,217.01	/Ea	90,434
		20.02.225	San Jose (Diridon) Sta	1.00	LS	307,339,406.30	/LS	307,339,406
		20.06.120	Ped Access (Cut & Cover)	650.00	LF	35,942.13	/LF	23,362,383
		20.06.172	Ped Brdg Undercrossing HSR (Lafayette St) Alt2:	1.00	EA	3,575,460.29	/EA	3,575,460
		20.06.210	Parking, at Grade	242.00	stl	8,589.07	/stl	2,078,555
		20.07.010	Roadway Modification, New AC Paving	60,800.00	SF	170.36	/SF	10,357,586
		20.07.715	Access Road Entrance Point	1.00	EA	48,632.73	/EA	48,633
		40.02.002	Natural Gas/Oil, 9"-16"	472.00	LF	194.54	/LF	91,824
		40.02.003	Potable Water, 10"-16"	1,703.00	LF	307.18	/LF	523,129
		40.02.005	Utility Relocation Allowance, Level 5 Urban	1,650.00	LF	197.11	/LF	325,236
		40.02.006	Sanitary Sewer, 37"-48"	2,404.00	LF	399.33	/LF	960,001
		40.02.008	Storm Drain, 42"-54"	631.00	LF	348.65	/LF	220,000
		40.02.009	Storm Drain, 55"-72"	1,592.00	LF	371.69	/LF	591,733
		40.02.011	Pump Station (Storm)	2.00	EA	383,975.91	/EA	767,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	29,283.00	LF	282.95	/LF	8,285,737
		40.02.016	Electric UG	3,478.00	LF	309.85	/LF	1,077,674
		40.02.019	Electric OH, 51-114 kV	2,971.00	LF	129.63	/LF	385,133

Alternative	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.020	Electric OH, 115 kV	7,511.00	LF	244.82	/LF	1,838,870
		40.08.200.ae	Rdwy Underxing HSR (West Hedding): 2-Ln Rdwy Under 5 Trk	1.00	EA	11,532,891.28	/EA	11,532,891
		40.08.200.ae1	Rdwy Overxing Rdwy - 2-Ln Rdwy Over 4-Ln Rdwy (Stockton St)				/EA	1,621,339
		40.08.200.ae2	Rdwy Overxing Rdwy- 10-Ln Rdwy Over 4-Ln Rdwy (Bellarmine Pking Lot 1)				/EA	3,715,259
		40.08.200.ae3	Rdwy Overxing Rdwy- 10-Ln Rdwy Over 4-Ln Rdwy (Bellarmine Pking Lot 2)				/EA	3,592,259
		40.08.200.ae4	RR Overxing Rdwy- 5 Trk Over 4-Ln Rdwy				/EA	3,401,167
		40.08.200.ae5	Trench Base Slab - Hedding				/EA	33,195,428
		40.08.200.af	Rdwy Uxing HSR (De La Cruz Blvd): 5-Ln, RF Rdwy Under 7 Trks/6-Ln Rdwy	1.00	EA	17,720,890.33	/EA	17,720,890
		40.08.200.af1	Rdwy Overxing Rdwy- 2 Ln Rdwy Over 1 Ln Rdwy De La Cruz Blvd (South)				/EA	2,264,553
		40.08.200.af2	Rdwy Overxing Rdwy- 1 Ln Rdwy Over 1 Ln Rdwy De La Cruz (North)				/EA	640,758
		40.08.200.af3	Rdwy Overxing Rdwy- 6 Ln Rdwy Over 4 Ln Rdwy De La Cruz (El Camino)				/EA	3,789,932
		40.08.200.af4	RR Overxing Rdwy- 3 Trk Over 4 Ln Rdwy (UPRR)				/EA	3,297,553

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.af5	RR Overxing Rdwy- 2 Trk Over 4 Ln Rdwy (JPB)				/EA	2,153,394
		40.08.200.af6	Trench Base Slab - De La Cruz				/EA	76,721,704
		40.08.200.ah	Rdwy Underxing UPRR (Lafayette St) - 1 Trk (Main) Over 4 Ln Rdwy	1.00	EA	2,008,348.72	/EA	2,008,349
	SS3		San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to					
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.14	RM	197,484,535.43	/RM	27,647,835
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.11	RM	209,654,303.55	/RM	23,061,973
		10.02.040	Diridon-Tamien - 2 Track	1.06	RM	198,673,112.12	/RM	210,593,499
		10.02.041	Diridon-Tamien - 4 Track	0.52	RM	482,156,229.19	/RM	250,721,239
		10.10.120	Direct Fixation Track - 2 Track	1.35	RM	4,495,391.84	/RM	6,068,779
		10.10.140	Direct Fixation Track - 4 Track	0.49	RM	9,005,693.18	/RM	4,412,790
		10.14.150	Direct Fixation Crossover #15				/EA	2,548,376
		20.06.211	Bike Path Realignment (Almaden Expy)	1.00	EA	22,305,800.88	/EA	22,305,801
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	9,800.00	SF	170.36	/SF	1,669,479

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.005	Utility Relocation Allowance, Level 5 Urban	750.00	LF	197.11	/LF	147,834
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	2,040.00	LF	282.95	/LF	577,226
		40.02.020	Electric OH, 115 kV	1,400.00	LF	244.82	/LF	342,753
		40.02.024	Transmission Tower	1.00	EA	614,361.45	/EA	614,361
	SS4		San Jose to Monterey Corridor:Alma Ave to Communication Hill					
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.20	RM	177,019,979.50	/RM	35,403,996
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	0.28	RM	4,050,193.68	/RM	1,134,054
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	2.16	RM	7,163,896.40	/RM	15,474,016
		10.06.230	At-Grade Track-Bed With Closed Drainage - 3 Track	0.27	RM	7,317,025.74	/RM	1,975,597
		10.08.421	Ret Fill, Walls Both Sides - 2 Trk (10' Avg. Wall Ht)	0.14	RM	15,224,244.29	/RM	2,131,394
		10.08.422	Retained Fill, Wall Both Sides - 2 Trks (20¦Avg. Wall Ht)	0.28	RM	27,466,208.18	/RM	7,690,538
		10.09.112	Ballasted Track (Track Laying Machine) - 1 Track	0.28	RM	1,547,292.71	/RM	433,242
		10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	2.59	RM	3,075,034.35	/RM	7,964,339
		10.09.132	Ballasted Track (Track Laying Machine) - 3 Track	0.27	RM	4,622,417.96	/RM	1,248,053
		10.10.120	Direct Fixation Track - 2 Track	0.19	RM	4,531,584.68	/RM	861,001

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.201	Ballasted Turnout #9	2.00	EA	127,172.82	/EA	254,346
		10.14.203	Ballasted Turnout #11 & #14	1.00	EA	155,433.45	/EA	155,433
		10.14.320	Ballasted Crossover	1.00	EA	593,473.15	/EA	593,473
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	53,020.00	SF	170.36	/SF	9,032,224
		40.02.002	Natural Gas/Oil, 9"-16"	1,480.00	LF	194.54	/LF	287,923
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	16,040.00	LF	282.95	/LF	4,538,580
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	2,520.00	LF	244.82	/LF	616,956
		40.08.100.r	Rdwy Overxing HSR (Curtner Ave): 4-Ln Rdwy Over 4 Trk	1.00	EA	16,901,318.54	/EA	16,901,319
		40.08.100.s	Rdwy Overxing HSR (Almaden Expr): 4-Ln Rdwy Over 4 Trk	1.00	EA	12,090,542.80	/EA	12,090,543
		40.08.200.ai	Rdwy Underxing HSR (SR87): 1-Ln Rdwy Under Eight-Ln Highway	1.00	EA	434,561.12	/EA	434,561
		40.08.200.aj	Rdwy Underxing HSR (Almaden Rd): 2-Ln Rdwy Under 4 Trk	1.00	EA	2,145,737.04	/EA	2,145,737
		40.08.200.aj1	HSR Underpass	1.00	EA	9,261,833.85	/EA	9,261,834
		40.08.200.aj2	Caltrain & UPRR Underpass	1.00	EA	2,150,156.81	/EA	2,150,157
	SS5810		Morgan Hill & Gilroy: Embkmt (Com Hill. Thru D. Gilroy)					
		10.01.001	Topsoil	299,423.00	CY	4.24	/CY	1,268,463
		10.01.002	Cut	491,804.00	CY	13.42	/CY	6,599,862

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.004	Overbreak In Embankment	372,489.00	CY	19.79	/CY	7,370,777
		10.01.005	Embankment	1,706,565.00	CY	22.60	/CY	38,573,556
		10.01.006	Overbreak Fill In Cut	167,879.00	CY	19.79	/CY	3,321,969
		10.01.007	Overbreak Fill In Embankment	372,489.00	CY	19.79	/CY	7,370,777
		10.01.008	Subballast	106,357.00	CY	59.35	/CY	6,312,315
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	0.56	RM	200,711,656.77	/RM	112,398,528
		10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	1.43	RM	212,410,841.33	/RM	303,747,503
		10.01.225b	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 110' Spacing	0.34	RM	221,330,519.62	/RM	75,252,377
		10.02.022	BC - 205-205-205-205 Span - Capitol, Alt 2	0.16	RM	397,590,185.50	/RM	63,614,430
		10.05.121	At-Grade Track Bed in cut - 2 Track (5'Avg ExcDepth)	1.21	RM	8,092,553.86	/RM	9,791,990
		10.05.222	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	0.03	RM	7,620,433.67	/RM	228,613
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	5.00	EA	1,513,256.54	/EA	7,566,283
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	7.62	RM	7,154,145.23	/RM	54,514,587
		10.07.215a	Cut & Cover Box - 2 Track / 1 Box (50' Avg. Exc Depth)	0.20	RM	493,579,214.20	/RM	98,715,843
		10.08.221	Retained Cut, Trench - 2 Trk (10¦Avg. Exc Depth)	0.28	RM	85,838,401.14	/RM	24,034,752
		10.08.222	Retained Cut, Trench - 2 Trk (20¦Avg. Exc Depth)	0.38	RM	157,345,908.55	/RM	59,791,445

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.08.222a	Ret Cut, Trench - 2 Trk (20' Avg. Exc Depth)	0.10	RM	199,977,104.80	/RM	19,997,710
		10.08.223	Retained Cut, Trench - 2 Trk (30¦Avg. Exc Depth)	0.23	RM	221,896,672.96	/RM	51,036,235
		10.08.223a	Ret Cut, Trench - 2 Trk (30' Avg. Exc Depth)	0.11	RM	262,867,524.18	/RM	28,915,428
		10.08.224a	Ret Cut, Staged Trench - 2 Trk (40' Avg. Exc Depth)	0.29	RM	399,720,155.55	/RM	115,918,845
		10.08.421	Ret Fill, Walls Both Sides - 2 Trk (10' Avg. Wall Ht)	11.95	RM	15,005,966.35	/RM	179,321,298
		10.08.422	Retained Fill, Wall Both Sides - 2 Trks (20¦Avg. Wall Ht)	5.67	RM	27,245,458.96	/RM	154,481,752
		10.08.423	Ret Fill, Walls Both Sides - 2 Trk (30' Avg. Wall Ht)	0.63	RM	28,335,212.00	/RM	17,851,184
		10.09.110	Ballasted Track - 1 Track	1.80	RM	2,347,704.66	/RM	4,225,868
		10.09.120	Ballasted Track - 2 Track	13.18	RM	4,644,739.43	/RM	61,217,666
		10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	27.11	RM	3,077,097.47	/RM	83,420,112
		10.09.920	Ballasted Trk Relocation - 1 Trk (Permanent)	3.29	RM	282,902.95	/RM	930,751
		10.10.120	Direct Fixation Track - 2 Track	2.54	RM	4,504,028.44	/RM	11,440,232
		10.14.100	Special Trackwork - Direct Fixation	2.00	EA	706,515.66	/EA	1,413,031
		10.14.130	Direct Fixation Crossover (60 MPH)	1.00	EA	2,119,546.96	/EA	2,119,547
		10.14.200	Ballasted Turnout (60 MPH)	8.00	EA	642,929.25	/EA	5,143,434

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.300	Ballasted Crossover (60 MPH)	1.00	EA	2,119,546.96	/EA	2,119,547
		10.14.305	Ballasted Crossover (80 MPH)	4.00	EA	1,602,377.51	/EA	6,409,510
		10.14.400	Terminal - Bumping Post	2.00	Ea	45,217.01	/Ea	90,434
		10.14.500	Ballasted Turnout Caltrain #9	10.00	EA	45,217.00	/EA	452,170
		10.14.600	Ballasted Crossover Caltrain	2.00	EA	45,217.01	/EA	90,434
		10.15.100	Wildlife Crossing	6.00	EA	28,260.62	/EA	169,564
		10.15.102	Wildlife Crossing - 30' wide	2.00	EA	393,387.93	/EA	786,776
		10.15.103	Wildlife Crossing - 40' wide	6.00	EA	722,115.52	/EA	4,332,693
		10.16.100	Drainage	17.00	EA	192,878.78	/EA	3,278,939
		10.16.101	Superficial drainage system for flood plain mitigation	3.80	RM	11,150,083.44	/RM	42,370,317
		20.02.215b	Downtown Gilroy Sta - At Grade	1.00	LS	163,259,298.37	/LS	163,259,298
		20.06.170	Ped Brdg Overcrossing HSR (Branham Ln):	1.00	EA	18,328,886.76	/EA	18,328,887
		20.06.171	Ped Brdg Overcrossing HSR (Blossom Hill Sta):	1.00	EA	7,928,800.99	/EA	7,928,801
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	144,860.00	SF	170.36	/SF	24,677,630
		30.04.010a	MOWF Downtown Gilroy	1.00	EA	251,124,406.96	/EA	251,124,407
		40.02.001	Natural Gas/Oil, 4.5"-8"	1,410.00	LF	256.77	/LF	362,053
		40.02.002	Natural Gas/Oil, 9"-16"	1,570.00	LF	194.54	/LF	305,432
		40.02.003	Potable Water, 10"-16"	1,800.00	LF	307.18	/LF	552,925
		40.02.004	Potable Water, 72"	1,550.00	LF	921.54	/LF	1,428,390

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.005	Utility Relocation Allowance, Level 5 Urban	12,140.00	LF	197.11	/LF	2,392,947
		40.02.006	Sanitary Sewer, 37"-48"	8,910.00	LF	399.33	/LF	3,558,074
		40.02.007	Sanitary Sewer, 49"-54"	8,010.00	LF	436.20	/LF	3,493,983
		40.02.008	Storm Drain, 42"-54"	5,120.00	LF	348.65	/LF	1,785,104
		40.02.011	Pump Station (Storm)	23.00	EA	383,975.90	/EA	8,831,446
		40.02.012	Pump Station (Sanitary)	7.00	EA	560,604.81	/EA	3,924,234
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	194,340.00	LF	282.95	/LF	54,989,250
		40.02.014	Telecom/Fiber Optic OH, All Sizes	12,290.00	LF	282.95	/LF	3,477,503
		40.02.015	Telecommunication Facility	1.00	EA	460,771.10	/EA	460,771
		40.02.019	Electric OH, 51-114 kV	2,430.00	LF	129.63	/LF	315,003
		40.02.020	Electric OH, 115 kV	3,430.00	LF	244.82	/LF	839,745
		40.02.021	Electric OH, 230 kV	2,540.00	LF	194.31	/LF	493,535
		40.02.022	Electirc OH, unknown	101,405.00	LF	194.31	/LF	19,703,516
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	25,770.00	LF	244.82	/LF	6,309,105
		40.02.024	Transmission Tower	3.00	EA	614,361.44	/EA	1,843,084
		40.02.030	Potable Water, 4"-9"	2,305.00	LF	66.35	/LF	152,943
		40.02.045	Electric OH & Telecom OH on JP, Unknown	1,875.00	LF	194.31	/LF	364,322
		40.05.310	Intrusion Protection Barrier	120,815.00	LF	3,245.17	/LF	392,064,675
		40.08.100.l	Rdwy Overxing HSR (Palm Ave): 2-Ln Rdwy Over 4 Trk & 4-Ln Rdwy	1.00	EA	26,269,090.89	/EA	26,269,091

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.100.m	Rdwy Overxing HSR (Live Oak Ave): 2-Ln Rdwy Over 4 Trk & 4-Ln Rdwy	1.00	EA	28,610,048.59	/EA	28,610,049
		40.08.100.n	Rdwy Overxing HSR (E. Middle Ave): 2-Ln Rdwy Over 3 Trk & 4-Ln Rdwy	1.00	EA	48,511,025.19	/EA	48,511,025
		40.08.100.o	Rdwy Overxing HSR (Church Ave): 4-Ln Rdwy Over 3 Trk & 4-Ln Rdwy	1.00	EA	25,672,409.70	/EA	25,672,410
		40.08.100.p	Rdwy Overxing HSR (US101 - NB):	1.00	EA	17,881,473.68	/EA	17,881,474
		40.08.100.q	Rdwy Overxing HSR (US101 - SB):	1.00	EA	29,378,479.37	/EA	29,378,479
		40.08.100.t	Rdwy Overxing HSR (Capitol Expr): 4-Ln Rdwy Over 4-Ln Rdwy	1.00	EA	10,037,908.97	/EA	10,037,909
		40.08.100.u	Rdwy Overxing HSR (Butterfield Blvd): 4-Ln Rdwy Over 2-Ln Rdwy	1.00	EA	9,421,592.04	/EA	9,421,592
		40.08.200.aa	Rdwy Underxing HSR (9Th Street): 2-Ln Rdwy Under 6 Trk	1.00	EA	2,001,300.47	/EA	2,001,300
		40.08.200.aa1	HSR Underpass	1.00	EA	8,634,713.70	/EA	8,634,714
		40.08.200.aa2	UPRR Underpass	1.00	EA	10,233,969.53	/EA	10,233,970
		40.08.200.ab	Rdwy Underxing HSR (10Th Street): 4-Ln Rdwy Under 7 Trk	1.00	EA	3,174,802.55	/EA	3,174,803
		40.08.200.ab1	HSR Underpass	1.00	EA	6,845,042.65	/EA	6,845,043
		40.08.200.ab2	UPRR Underpass	1.00	EA	8,636,944.12	/EA	8,636,944

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.ao	Rdwy Underxing HSR (Cohansey): 4-Ln Rdwy Under 3 Trk	1.00	EA	408,979.97	/EA	408,980
		40.08.200.ao1	HSR Underpass	1.00	EA	4,658,744.77	/EA	4,658,745
		40.08.200.ao2	UPRR Underpass	1.00	EA	3,246,309.01	/EA	3,246,309
		40.08.200.ap	Rdwy Underxing HSR (Casey): 4-Ln Rdwy Under 3 Trk	1.00	EA	460,394.40	/EA	460,394
		40.08.200.ap1	HSR Underpass	1.00	EA	2,942,531.49	/EA	2,942,531
		40.08.200.ap2	UPRR Underpass	1.00	EA	2,769,231.43	/EA	2,769,231
		40.08.200.aq	Rdwy Underxing HSR (Monterey Rd At Morgan Hill): Exist Rd Under 2 Trk	1.00	EA	3,859,766.65	/EA	3,859,767
		40.08.200.as1	HSR Underpass	1.00	EA	4,163,317.51	/EA	4,163,318
		40.08.200.as2	UPRR Underpass	1.00	EA	6,322,757.67	/EA	6,322,758
		40.08.200.b	Rdwy Uxing HSR (Skyway Dr Opt A): 4 Ln, RF Rdwy Under 4 Trks/4 Ln Rdwy	1.00	EA	9,323,700.27	/EA	9,323,700
		40.08.200.b1	HSR Underpass	1.00	EA	2,913,281.41	/EA	2,913,281
		40.08.200.b2	UPRR Underpass	1.00	EA	6,507,867.63	/EA	6,507,868
		40.08.200.b3	Rdwy Underpass	1.00	EA	8,018,804.56	/EA	8,018,805
		40.08.200.c	Rdwy Underxing HSR (Monterey Rd At Skyway Drive): 4-Ln, Ret Fill Rdwy	1.00	EA	17,957,828.62	/EA	17,957,829
		40.08.200.d	Rdwy Underxing HSR (Branham Ln): 4-Ln, Ret Fill Rdwy Under 4 Trk	1.00	EA	9,433,060.75	/EA	9,433,061
		40.08.200.d1	HSR Underpass	1.00	EA	4,981,169.04	/EA	4,981,169

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.d2	UPRR Underpass	1.00	EA	7,049,503.64	/EA	7,049,504
		40.08.200.e	Rdwy Underxing HSR (Monterey Rd At Branham Ln): 4-Ln, Ret Fill Rdwy	1.00	EA	14,359,464.25	/EA	14,359,464
		40.08.200.f	Rdwy Underxing HSR (Chynoweth Ave): 5-Ln, Ret Fill Rdwy Under 4 Trk	1.00	EA	5,895,080.99	/EA	5,895,081
		40.08.200.f1	HSR Underpass	1.00	EA	4,466,492.02	/EA	4,466,492
		40.08.200.f2	UPRR Underpass	1.00	EA	8,380,443.15	/EA	8,380,443
		40.08.200.g	Rdwy Underxing HSR (Monterey Rd At Chynoweth Ave): 4-Ln, Ret Fill Rdwy	1.00	EA	10,856,559.53	/EA	10,856,560
		40.08.200.h	Rdwy Underxing HSR (Madr1 Parkway): 5-Ln Rdwy Under 4 Trk & 4-Ln Rdwy	1.00	EA	13,532,374.73	/EA	13,532,375
		40.08.200.h1	HSR Underpass	1.00	EA	3,515,066.52	/EA	3,515,067
		40.08.200.h2	UPRR Underpass	1.00	EA	4,055,219.45	/EA	4,055,219
		40.08.200.h3	Rdwy Underpass	1.00	EA	11,228,104.96	/EA	11,228,105
		40.08.200.i	Rdwy Underxing HSR (Main Ave): 4-Ln Rdwy Under 3 Trk	1.00	EA	4,470,174.54	/EA	4,470,175
		40.08.200.i1	HSR Underpass	1.00	EA	4,952,515.56	/EA	4,952,516
		40.08.200.i2	UPRR Underpass	1.00	EA	3,989,244.90	/EA	3,989,245
		40.08.200.j	Rdwy Underxing HSR (E. Dunne Ave): 4-Ln Rdwy Under 3 Trk	1.00	EA	5,835,731.64	/EA	5,835,732
		40.08.200.j1	HSR Underpass	1.00	EA	5,105,277.34	/EA	5,105,277
		40.08.200.j2	UPRR Underpass	1.00	EA	4,074,885.10	/EA	4,074,885

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.k	Rdwy Underxing HSR (San Pedro Ave): 2-Ln Rdwy Under 3 Trk	1.00	EA	10,121,703.97	/EA	10,121,704
		40.08.200.k1	HSR Underpass	1.00	EA	4,857,804.11	/EA	4,857,804
		40.08.200.k2	UPRR Underpass	1.00	EA	3,636,061.04	/EA	3,636,061
		40.08.200.k3	Rdwy Underpass (Church St)	1.00	EA	4,517,490.78	/EA	4,517,491
		40.08.200.l	Rdwy Underxing HSR (Tennant Ave): 4-Ln Rdwy Under 3 Trk	1.00	EA	22,746,973.44	/EA	22,746,973
		40.08.200.l1	HSR Underpass	1.00	EA	5,222,234.44	/EA	5,222,234
		40.08.200.l2	UPRR Underpass	1.00	EA	8,592,014.83	/EA	8,592,015
		40.08.200.m	Rdwy Uxing HSR (Monterey Rd/E. Middle Rd): 4-Ln Rdwy Under 2-Ln Rdwy	1.00	EA	5,818,481.13	/EA	5,818,481
		40.08.200.m1	HSR Underpass	1.00	EA	7,341,795.19	/EA	7,341,795
		40.08.200.m2	UPRR Underpass	1.00	EA	5,628,886.75	/EA	5,628,887
		40.08.200.m3	Rdwy Underpass (Monterey Over Llagas)	1.00	EA	32,751,007.95	/EA	32,751,008
		40.08.200.n	Rdwy Uxing HSR (W. San Martin Ave): 2-Ln Rdwy Under 3 Trks/4-Ln Rdwy	1.00	EA	6,715,008.39	/EA	6,715,008
		40.08.200.n1	HSR Underpass	1.00	EA	3,153,081.90	/EA	3,153,082
		40.08.200.n2	UPRR Underpass	1.00	EA	3,060,252.49	/EA	3,060,252
		40.08.200.n3	Rdwy Underpass (Monterey Over San Martin)	1.00	EA	11,862,916.87	/EA	11,862,917
		40.08.200.n4	Rdwy Underpass (Depot Over San Martin)	1.00	EA	5,322,989.86	/EA	5,322,990

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.n5	Rdwy Underpass (San Martin Over Llagas)	1.00	EA	7,621,515.96	/EA	7,621,516
		40.08.200.o	Rdwy Underxing HSR (Mas10 Ave): 4-Ln Rdwy Under 3 Trk & 4-Ln Rdwy	1.00	EA	21,056,757.10	/EA	21,056,757
		40.08.200.o1	HSR Underpass	1.00	EA	4,115,862.92	/EA	4,115,863
		40.08.200.o2	UPRR Underpass	1.00	EA	5,857,675.90	/EA	5,857,676
		40.08.200.p	Rdwy Underxing HSR (Monterey Rd At Mas10 Ave): 4-Ln Rdwy	1.00	EA	13,222,454.31	/EA	13,222,454
		40.08.200.q	Rdwy Underxing HSR (Rucker Ave): 2-Ln Rdwy Under 3 Trk & 4-Ln Rdwy	1.00	EA	11,170,301.99	/EA	11,170,302
		40.08.200.q1	HSR Underpass	1.00	EA	3,074,118.46	/EA	3,074,118
		40.08.200.q2	UPRR Underpass	1.00	EA	2,765,275.25	/EA	2,765,275
		40.08.200.q3	Rdwy Underpass	1.00	EA	6,659,190.59	/EA	6,659,191
		40.08.200.r	Rdwy Underxing HSR (Buena Vista Ave): 4-Ln Rdwy Under 3 Trk	1.00	EA	13,785,656.61	/EA	13,785,657
		40.08.200.r1	HSR Underpass	1.00	EA	4,308,534.42	/EA	4,308,534
		40.08.200.r2	UPRR Underpass	1.00	EA	6,308,336.87	/EA	6,308,337
		40.08.200.s	Rdwy Underxing HSR (Monterey Rd At Buena Vista Ave): 4-Ln Rdwy	1.00	EA	12,707,868.48	/EA	12,707,868
		40.08.200.t1	HSR Underpass	1.00	EA	2,409,690.63	/EA	2,409,691
		40.08.200.t2	UPRR Underpass	1.00	EA	1,696,871.69	/EA	1,696,872
		40.08.200.v	Rdwy Underxing HSR (Leavesley Rd): 4-Ln Rdwy Under 3 Trk	1.00	EA	5,286,464.13	/EA	5,286,464

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.v1	HSR Underpass	1.00	EA	5,234,670.97	/EA	5,234,671
		40.08.200.v2	UPRR Underpass	1.00	EA	4,800,000.56	/EA	4,800,001
		40.08.200.w	Rdwy Underxing HSR (Loof Ave): 4-Ln Rdwy Under 3 Trk	1.00	EA	4,829,024.80	/EA	4,829,025
		40.08.200.w1	HSR Underpass	1.00	EA	3,258,645.90	/EA	3,258,646
		40.08.200.w2	UPRR Underpass	1.00	EA	2,940,312.40	/EA	2,940,312
		40.08.200.x	Rdwy Underxing HSR (Lewis Street): 2-Ln Rdwy Under 3 Trk	1.00	EA	2,309,171.40	/EA	2,309,171
		40.08.200.x1	HSR Underpass	1.00	EA	3,040,081.20	/EA	3,040,081
		40.08.200.x2	UPRR Underpass	1.00	EA	2,940,312.39	/EA	2,940,312
		40.08.200.y	Rdwy Underxing HSR (6Th Street): 2-Ln Rdwy Under 5 Trk	1.00	EA	2,384,492.84	/EA	2,384,493
		40.08.200.y1	HSR Underpass	1.00	EA	5,882,299.72	/EA	5,882,300
		40.08.200.y2	UPRR Underpass	1.00	EA	5,726,032.56	/EA	5,726,033
		40.08.200.z	Rdwy Underxing HSR (Old Gilroy Street): 2-Ln Rdwy Under 6 Trk	1.00	EA	2,902,128.22	/EA	2,902,128
		40.08.200.z1	HSR Underpass	1.00	EA	5,173,019.57	/EA	5,173,020
		40.08.200.z2	UPRR Underpass	1.00	EA	5,854,180.05	/EA	5,854,180
	SS99-2		Alternative 2 Complete					
		40.04.110	Environmental Mitigation Allowance, Heavy	1.00	LS	456,097,316.64	/LS	456,097,317
		40.06.100	Temporary facilities and other indirect costs during construction	1.00	LS	557,452,275.89	/LS	557,452,276

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.07.100	ROW Procurement Acquisition	1.00	LS	4,657,625,000.00	/LS	4,657,625,000
		50.01.020	Wayside Protection - 2 Track	90.80	RM	2,273,228.44	/RM	206,409,142
		50.05.010	Communications (w/Fiber Optic Backbone) - 2 Track	90.80	RM	899,813.87	/RM	81,703,099
		50.07.020	Hazard Detectors	90.80	RM	624,185.08	/RM	56,676,006
		60.01.020	Traction power transmission: High voltage	90.80	RM	1,807,127.31	/RM	164,087,159
		60.01.030	Distribution Line Pacheco Pass	90.80	RM	757,449.78	/RM	68,776,440
		60.01.040	PG&E Construction Power Drop Sites	90.80	RM	24,355.56	/RM	2,211,485
		60.02.010	Traction Power, Supply Station Site Work	90.80	RM	2,339,284.14	/RM	212,407,000
		60.03.100	Traction Power Distribution - 2 Tracks	90.80	RM	2,649,002.37	/RM	240,529,416
		60.04.100	Traction power control	90.80	RM	6,068.04	/RM	550,978
		80.00.00	Professional Services	1.00	LS	2,708,647,236.39	/LS	2,708,647,236
		90.00.00	Unallocated Contingency	1.00	LS	873,273,107.28	/LS	873,273,107
			Total					**25,078,647,419**
03			Alternative 03					
	SS1113		Morgan Hill & Gilroy: Viaduct thru E Gilroy					
		10.01.001	Topsoil	566,208.00	CY	4.24	/CY	2,398,660

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.002	Cut	4,419,287.00	CY	13.42	/CY	59,305,497
		10.01.004	Overbreak In Embankment	535,090.00	CY	19.79	/CY	10,588,311
		10.01.005	Embankment	4,482,346.00	CY	22.60	/CY	101,314,615
		10.01.006	Overbreak Fill In Cut	64,223.00	CY	19.79	/CY	1,270,840
		10.01.007	Overbreak Fill In Embankment	535,090.00	CY	19.79	/CY	10,588,311
		10.01.008	Subballast	114,129.00	CY	59.35	/CY	6,773,540
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	6.10	RM	132,426,082.91	/RM	807,799,106
		10.01.123	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 110' Spacing	0.44	RM	136,625,209.68	/RM	60,115,092
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.68	RM	143,137,797.81	/RM	97,333,703
		10.01.124a	Elevated Structure - 1 Track (40' Avg. Pier Ht) - 150' Spacing	0.14	RM	133,411,888.50	/RM	18,677,664
		10.01.125	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 110' Spacing	1.33	RM	147,393,638.23	/RM	196,033,539
		10.01.126	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 110' Spacing	1.45	RM	152,524,623.12	/RM	221,160,704
		10.01.127	Elevated Structure - 1 Track (70' Avg. Pier Ht) - 110' Spacing	0.12	RM	159,249,929.50	/RM	19,109,992
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	0.06	RM	200,136,576.83	/RM	12,008,195

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	2.55	RM	201,725,946.90	/RM	514,401,165
		10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	0.08	RM	2,128,745,614.47	/RM	161,784,667
		10.01.225b	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 110' Spacing	0.92	RM	220,785,455.97	/RM	203,122,619
		10.01.226c	Elevated Structure - 2 Track (60' Avg. Pier Ht) - 110' Spacing	0.05	RM	223,695,550.00	/RM	11,184,778
		10.02.039	BC - 220-220 Span - US101 - HSR	0.08	RM	192,925,933.62	/RM	15,434,075
		10.02.039a	BC - 220-220 Span - US101 - UPRR	0.08	RM	177,257,624.62	/RM	14,180,610
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	20.00	EA	191,832.27	/EA	3,836,645
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	8.00	EA	983,616.76	/EA	7,868,934
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	2.00	EA	2,864,326.54	/EA	5,728,653
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	7.00	EA	1,513,256.54	/EA	10,592,796
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	1.57	RM	216,837,944.13	/RM	340,435,572
		10.07.207	D&B Cross Passage Conservative Cost In Rock	1,000.00	lf	33,583.85	/lf	33,583,852
		10.07.950	Allowance For Construction Monitoring	1.57	RM	271,616.00	/RM	426,437

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	11.34	RM	2,349,737.87	/RM	26,646,027
		10.09.120	Ballasted Track - 2 Track	6.54	RM	4,643,533.92	/RM	30,368,712
		10.10.110	Direct Fixation Track - 1 Track	4.75	RM	6,262,223.63	/RM	29,745,562
		10.10.120	Direct Fixation Track - 2 Track	3.34	RM	4,498,471.62	/RM	15,024,895
		10.14.200	Ballasted Turnout (60 MPH)	6.00	EA	642,929.25	/EA	3,857,575
		10.14.300	Ballasted Crossover (60 MPH)	1.00	EA	2,119,546.96	/EA	2,119,547
		10.14.305	Ballasted Crossover (80 MPH)	4.00	EA	1,602,377.51	/EA	6,409,510
		10.14.400	Terminal - Bumping Post	2.00	Ea	45,217.00	/Ea	90,434
		10.15.100	Wildlife Crossing	2.00	EA	28,260.63	/EA	56,521
		10.16.100	Drainage	108.00	EA	192,878.77	/EA	20,830,908
		10.16.101	Superficial drainage system for flood plain mitigation	5.39	RM	11,154,752.51	/RM	60,124,116
		20.02.215c	East Gilroy Sta	1.00	LS	138,052,080.33	/LS	138,052,080
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	801,740.00	SF	170.36	/SF	136,580,442

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		30.04.010b	Comb. MOWF & LMF - East Glry	1.00	EA	295,540,600.71	/EA	295,540,601
		40.02.001	Natural Gas/Oil, 4.5"-8"	250.00	LF	163.82	/LF	40,956
		40.02.002	Natural Gas/Oil, 9"-16"	290.00	LF	194.54	/LF	56,417
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	2,000.00	LF	282.95	/LF	565,908
		40.02.022	Electirc OH, unknown	17,290.00	LF	194.31	/LF	3,359,536
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	3,320.00	LF	244.82	/LF	812,814
		40.02.045	Electric OH & Telecom OH on JP, Unknown	20,145.00	LF	194.31	/LF	3,914,278
		40.08.100.a	Rdwy Overxing HSR (SR152): 4-Ln Rdwy Over MF	1.00	EA	147,341,111.90	/EA	147,341,112
		40.08.100.h	Rdwy Overxing HSR (Las Animas Ave): 2-Ln Rdwy Over 2 Trk - Alt 3	1.00	EA	22,735,306.79	/EA	22,735,307
		40.08.100.k	Rdwy Overxing HSR (Leavesley Rd): 4-Ln Rdwy Over 2 Trk - Alt 3	1.00	EA	34,199,854.51	/EA	34,199,855
		40.08.200.ak	Rdwy Underxing HSR (Holsclaw Farm Rd): 2-Ln Rdwy Under 2 Trk	1.00	EA	269,424.49	/EA	269,424
	SS14		Pacheco Pass Deep Tunnel					
		10.01.001	Topsoil	842,251.83	CY	4.24	/CY	3,568,083
		10.01.002	Cut	15,347,083.00	CY	13.42	/CY	205,953,215
		10.01.004	Overbreak In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.005	Embankment	8,678,515.00	CY	22.60	/CY	196,160,767

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.006	Overbreak Fill In Cut	72,100.00	CY	19.79	/CY	1,426,706
		10.01.007	Overbreak Fill In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.008	Subballast	143,484.00	CY	59.35	/CY	8,515,772
		10.01.122a	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 150' Spacing	0.58	RM	154,200,922.47	/RM	89,436,535
		10.01.123a	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 150' Spacing	0.11	RM	156,620,053.09	/RM	17,228,206
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.08	RM	148,498,029.12	/RM	11,879,842
		10.01.124a	Elevated Structure - 1 Track (40' Avg. Pier Ht) - 150' Spacing	0.93	RM	168,597,657.13	/RM	156,795,821
		10.01.125a	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 150' Spacing	2.38	RM	176,322,161.82	/RM	419,646,745
		10.01.126a	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 150' Spacing	0.02	RM	170,351,049.00	/RM	3,407,021
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	0.07	RM	151,524,442.86	/RM	10,606,711
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.12	RM	171,400,316.50	/RM	20,568,038
		10.01.224b	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 150' Spacing	0.11	RM	186,079,494.00	/RM	20,468,744
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.27	RM	196,606,822.59	/RM	53,083,842

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.27	RM	204,995,325.85	/RM	55,348,738
		10.01.227c	Elevated Structure - 2 Track (70' Avg. Pier Ht, 150' Span)	0.73	RM	210,460,755.07	/RM	153,636,351
		10.02.034	BC - 250-500-250 Span - Cal Aqueduct	0.19	RM	210,576,875.68	/RM	40,009,606
		10.02.035	BC - 160-320-160 Span - Delta Mendota	0.12	RM	203,677,321.58	/RM	24,441,279
		10.02.054	BC-150-240-120 Span - Ccid Outside Canal	0.10	RM	210,836,926.20	/RM	21,083,693
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	4.00	EA	191,832.28	/EA	767,329
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	18.00	EA	983,616.76	/EA	17,705,102
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	20.00	EA	2,864,326.54	/EA	57,286,531
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	4.00	EA	295,126.56	/EA	1,180,506
		10.05.320	Transition Wedge 1 Trk Embankment- Slab	4.00	EA	9,600.28	/EA	38,401
		10.05.321	Transition Wedge 1 Trk Embankment-Cut	4.00	EA	11,513.90	/EA	46,056
		10.05.322	Transition Wedge 2 Trk Embankment-Cut	4.00	EA	14,027.54	/EA	56,110
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	13.61	RM	216,837,944.12	/RM	2,951,164,419
		10.07.207	D&B Cross Passage Conservative Cost In Rock	9,000.00	lf	33,583.85	/lf	302,254,665

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.07.850	Pumping Sta	1.00	EA	339,520.00	/EA	339,520
		10.07.920	Ventilation Equipment Allowance (INCLUDED w/10.07.902)	4.00	EA	173,849,447.78	/EA	695,397,791
		10.07.950	Allowance For Construction Monitoring	13.61	RM	271,616.00	/RM	3,696,694
		10.07.970	Fault Chamber	2.00	EA	166,409,372.87	/EA	332,818,746
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.24	RM	2,350,177.49	/RM	9,964,753
		10.09.120	Ballasted Track - 2 Track	13.30	RM	4,644,098.78	/RM	61,766,514
		10.10.110	Direct Fixation Track - 1 Track	31.00	RM	2,267,324.31	/RM	70,287,054
		10.10.120	Direct Fixation Track - 2 Track	0.24	RM	4,520,631.83	/RM	1,084,952
		10.15.101	Wildlife Crossing	10.00	EA	71,301.56	/EA	713,016
		10.16.100	Drainage	2.00	EA	192,878.77	/EA	385,758
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	777,970.00	SF	170.36	/SF	132,531,103
		40.02.020	Electric OH, 115 kV	455.00	LF	244.82	/LF	111,395

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.021	Electric OH, 230 kV	1,340.00	LF	194.31	/LF	260,369
		40.02.022	Electirc OH, unknown	1,925.00	LF	194.31	/LF	374,037
		40.02.025	Potable Water, 120"	3,800.00	LF	7,679.52	/LF	29,182,168
		40.02.043	Drainage Canal, All Sizes	785.00	LF	502.07	/LF	394,121
		40.02.045	Electric OH & Telecom OH on JP, Unknown	415.00	LF	194.31	/LF	80,637
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	1,629.00	lf	3,839.76	/lf	6,254,967
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	951.00	LF	9,215.42	/LF	8,763,866
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	677.00	LF	10,751.33	/LF	7,278,647
		40.05.029	Retaining Wall In Fill - 1 Wall (60' Avg. Height)	990.00	LF	13,823.13	/LF	13,684,901
		40.05.030	Retaining Wall In Fill - 1 Wall (70' Avg. Height)	1,056.00	LF	18,430.84	/LF	19,462,970
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	3,089.00	LF	12,290.57	/LF	37,965,571
		40.08.200.al	Rdwy Modification (Romero Rd), New AC Paving	1.00	EA	725,071.17	/EA	725,071
		40.08.200.am	Rdwy Modification (Fahey), Restriping	1.00	EA	9,101.33	/EA	9,101
		40.08.200.an	Rdwy Modification (CA152), Restriping	1.00	EA	41,939.99	/EA	41,940
	SS16		San Joaquin Valley					
		10.01.001	Topsoil	447,415.00	CY	4.24	/CY	1,895,411
		10.01.002	Cut	23,638.00	CY	13.42	/CY	317,217

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.004	Overbreak In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.005	Embankment	2,531,377.00	CY	22.60	/CY	57,216,798
		10.01.006	Overbreak Fill In Cut	1,701.00	CY	19.79	/CY	33,657
		10.01.007	Overbreak Fill In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.008	Subballast	128,198.00	CY	59.35	/CY	7,608,550
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	2.70	RM	181,482,026.00	/RM	490,001,470
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	1.63	RM	189,953,839.65	/RM	309,624,759
		10.01.224a	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 120' Spacing	0.67	RM	198,211,318.34	/RM	132,801,583
		10.02.036	BC - 150-275-150 - Cherokee	0.11	RM	224,216,722.18	/RM	24,663,839
		10.02.037	BC - 200-350-200 - San Luis	0.14	RM	178,203,214.43	/RM	24,948,450
		10.02.038	BC - 120-220-120 Span - Los Banos	0.09	RM	262,414,325.67	/RM	23,617,289
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	8.00	EA	1,513,256.55	/EA	12,106,052
		10.09.110	Ballasted Track - 1 Track	0.55	RM	2,350,177.51	/RM	1,292,598
		10.09.120	Ballasted Track - 2 Track	12.75	RM	4,644,098.77	/RM	59,212,259
		10.10.120	Direct Fixation Track - 2 Track	5.37	RM	4,501,074.99	/RM	24,170,773
		10.14.206	Ballasted Turnout #20	3.00	EA	339,127.52	/EA	1,017,383
		10.14.300	Ballasted Crossover (60 MPH)	2.00	EA	2,119,546.97	/EA	4,239,094

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.51	/EA	3,204,755
		10.14.400	Terminal - Bumping Post	1.00	Ea	45,217.00	/Ea	45,217
		10.15.101	Wildlife Crossing	67.00	EA	71,301.56	/EA	4,777,205
		10.16.100	Drainage	42.00	EA	192,878.77	/EA	8,100,909
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	746,920.00	SF	170.36	/SF	127,241,579
		30.04.010c	MOIF Siding	1.00	EA	3,611,952.23	/EA	3,611,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	5,295.00	LF	282.95	/LF	1,498,241
		40.02.014	Telecom/Fiber Optic OH, All Sizes	6,255.00	LF	282.95	/LF	1,769,876
		40.02.019	Electric OH, 51-114 kV	3,770.00	LF	129.63	/LF	488,708
		40.02.022	Electirc OH, unknown	23,930.00	LF	194.31	/LF	4,649,723
		40.02.035	Potable Water Storage Tank	1.00	EA	76,795.19	/EA	76,795
		40.02.043	Drainage Canal, All Sizes	295,151.00	LF	50.21	/LF	14,818,454
		40.02.045	Electric OH & Telecom OH on JP, Unknown	12,265.00	LF	194.31	/LF	2,383,153
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	0.66	lf	3,839.76	/lf	2,534
		40.08.100.d	Rdwy Overxing HSR (Henry Miller Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	51,328,605.98	/EA	51,328,606
		40.08.100.e	Rdwy Overxing HSR (Mercey Springs Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	28,529,153.90	/EA	28,529,154

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.100.f	Rdwy Overxing HSR (Delta Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	26,999,657.44	/EA	26,999,657
		40.08.100.g	Rdwy Overxing HSR (Turner Island Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	27,497,062.75	/EA	27,497,063
		40.08.100.j	Rdwy Overxing HSR (Carlucci Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwys	1.00	EA	30,740,316.47	/EA	30,740,316
	SS2		San Jose Diridon Sta Approach: Viaduct to Scott (Scott to Diridon Sta)					
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	0.23	RM	191,434,988.91	/RM	44,030,047
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	0.16	RM	179,694,590.19	/RM	28,751,134
		10.01.222b	Elevated Structure - 2 Track (20' Avg. Pier Ht, 150' Span)	0.14	RM	172,149,269.57	/RM	24,100,898
		10.01.223	Elevated Structure - 2 Track (30' Avg. Pier Ht, 90' Span)	0.29	RM	241,369,061.10	/RM	69,997,028
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	0.88	RM	200,848,292.19	/RM	176,746,497
		10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	0.31	RM	213,569,428.48	/RM	66,206,523
		10.01.227b	Elevated Structure - 2 Track (70' Avg. Pier Ht, 110' Span)	0.02	RM	251,516,156.50	/RM	5,030,323
		10.02.042	Scott-Diridon - 2 Trk over 3 Trk (30' Avg. Pier Ht) - 110' Spacing	0.23	RM	659,149,080.87	/RM	151,604,289

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.043	Scott-Diridon - 2 Trk over 5 Trk (30' Avg. Pier Ht) - 110' Spacing	0.15	RM	729,926,080.13	/RM	109,488,912
		10.02.044	Scott-Diridon - 4 Trk over 3 Trk (60' Avg. Pier Ht) - 120' Spacing	0.29	RM	773,052,862.72	/RM	224,185,330
		10.02.045	Scott-Diridon - Diridon-Tamien - 4 Trk	0.19	RM	856,527,020.84	/RM	162,740,134
		10.02.046	Scott-Diridon - BC -160-220-160 Span - Lafayette St	0.10	RM	230,392,863.10	/RM	23,039,286
		10.02.047	Scott-Diridon - BC -160-220-160 Span - I-880	0.10	RM	158,284,448.50	/RM	15,828,445
		10.02.048	Scott-Diridon - BC -160-220-160 Span - Taylor St	0.10	RM	145,875,956.90	/RM	14,587,596
		10.02.049	Scott-Diridon - BC-120-240-120 Span - Santa Clara Sta	0.09	RM	239,189,150.67	/RM	21,527,024
		10.02.051	Scott-Diridon - BC -180-180 span - SJ City Market, Wye S Trk	0.14	RM	124,084,901.50	/RM	17,371,886
		10.02.052	Scott-Diridon - 4 Trk BC-150-240-150 Span - Santa Clara Street	0.10	RM	318,439,484.20	/RM	31,843,948
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	0.74	RM	4,125,169.45	/RM	3,052,625
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	0.12	RM	7,223,464.92	/RM	866,816
		10.06.230	At-Grade Track-Bed With Closed Drainage - 3 Track	1.20	RM	7,455,526.54	/RM	8,946,632
		10.06.240	At-Grade Track-Bed With Closed Drainage - 4 Track	0.77	RM	7,696,893.56	/RM	5,926,608

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.08.421	Ret Fill, Walls Both Sides - 2 Trk (10' Avg. Wall Ht)	0.14	RM	15,224,244.29	/RM	2,131,394
		10.08.422	Retained Fill, Wall Both Sides - 2 Trks (20¦Avg. Wall Ht)	0.20	RM	26,968,498.40	/RM	5,393,700
		10.09.112	Ballasted Track (Track Laying Machine) - 1 Track	0.74	RM	1,575,935.76	/RM	1,166,192
		10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	0.46	RM	3,085,185.20	/RM	1,419,185
		10.09.132	Ballasted Track (Track Laying Machine) - 3 Track	1.20	RM	4,713,558.06	/RM	5,656,270
		10.09.142	Ballasted Track (Track Laying Machine) - 4 Track	0.77	RM	6,238,735.10	/RM	4,803,826
		10.10.120	Direct Fixation Track - 2 Track	2.92	RM	4,494,477.06	/RM	13,123,873
		10.10.140	Direct Fixation Track - 4 Track	0.56	RM	9,101,994.32	/RM	5,097,117
		10.14.321	Ballasted Crossover #10	1.00	EA	720,645.97	/EA	720,646
		10.14.322	Ballasted Crossover #11	3.00	EA	806,840.88	/EA	2,420,523
		10.14.323	Ballasted Crossover #14	4.00	EA	1,003,252.23	/EA	4,013,009
		10.14.324	Ballasted Crossover #20	1.00	EA	1,413,031.31	/EA	1,413,031
		10.14.400	Terminal - Bumping Post	2.00	Ea	45,217.00	/Ea	90,434
		20.02.225	San Jose (Diridon) Sta	1.00	LS	307,339,406.30	/LS	307,339,406
		20.06.120	Ped Access (Cut & Cover)	650.00	LF	35,942.13	/LF	23,362,383
		20.06.172	Ped Brdg Undercrossing HSR (Lafayette St) Alt2:	1.00	EA	3,575,460.29	/EA	3,575,460
		20.06.210	Parking, at Grade	242.00	stl	8,589.07	/stl	2,078,555

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		20.07.010	Roadway Modification, New AC Paving	60,800.00	SF	170.36	/SF	10,357,586
		20.07.715	Access Road Entrance Point	1.00	EA	48,632.73	/EA	48,633
		40.02.002	Natural Gas/Oil, 9"-16"	472.00	LF	194.54	/LF	91,824
		40.02.003	Potable Water, 10"-16"	1,703.00	LF	307.18	/LF	523,129
		40.02.005	Utility Relocation Allowance, Level 5 Urban	1,650.00	LF	197.11	/LF	325,236
		40.02.006	Sanitary Sewer, 37"-48"	2,404.00	LF	399.33	/LF	960,001
		40.02.008	Storm Drain, 42"-54"	631.00	LF	348.65	/LF	220,000
		40.02.009	Storm Drain, 55"-72"	1,592.00	LF	371.69	/LF	591,733
		40.02.011	Pump Station (Storm)	2.00	EA	383,975.90	/EA	767,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	29,238.00	LF	283.39	/LF	8,285,737
		40.02.016	Electric UG	3,478.00	LF	309.85	/LF	1,077,674
		40.02.019	Electric OH, 51-114 kV	2,971.00	LF	129.63	/LF	385,133
		40.02.020	Electric OH, 115 kV	7,511.00	LF	244.82	/LF	1,838,870
		40.08.200.ae	Rdwy Underxing HSR (West Hedding): 2-Ln Rdwy Under 5 Trk	1.00	EA	11,532,891.27	/EA	11,532,891
		40.08.200.ae1	Rdwy Overxing Rdwy - 2-Ln Rdwy Over 4-Ln Rdwy (Stockton St)	1.00	EA	1,621,338.71	/EA	1,621,339
		40.08.200.ae2	Rdwy Overxing Rdwy- 10-Ln Rdwy Over 4-Ln Rdwy (Bellarmine Pking Lot 1)	1.00	EA	3,715,258.83	/EA	3,715,259
		40.08.200.ae3	Rdwy Overxing Rdwy- 10-Ln Rdwy Over 4-Ln Rdwy (Bellarmine Pking Lot 2)	1.00	EA	3,592,258.81	/EA	3,592,259

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.ae4	RR Overxing Rdwy- 5 Trk Over 4-Ln Rdwy	1.00	EA	3,401,166.87	/EA	3,401,167
		40.08.200.ae5	Trench Base Slab - Hedding	1.00	EA	33,195,427.77	/EA	33,195,428
		40.08.200.af	Rdwy Uxing HSR (De La Cruz Blvd): 5-Ln, RF Rdwy Under 7 Trks/6-Ln Rdwy	1.00	EA	17,720,890.33	/EA	17,720,890
		40.08.200.af1	Rdwy Overxing Rdwy- 2 Ln Rdwy Over 1 Ln Rdwy De La Cruz Blvd (South)	1.00	EA	2,264,553.13	/EA	2,264,553
		40.08.200.af2	Rdwy Overxing Rdwy- 1 Ln Rdwy Over 1 Ln Rdwy De La Cruz (North)	1.00	EA	640,758.25	/EA	640,758
		40.08.200.af3	Rdwy Overxing Rdwy- 6 Ln Rdwy Over 4 Ln Rdwy De La Cruz (El Camino)	1.00	EA	3,789,932.49	/EA	3,789,932
		40.08.200.af4	RR Overxing Rdwy- 3 Trk Over 4 Ln Rdwy (UPRR)	1.00	EA	3,297,552.94	/EA	3,297,553
		40.08.200.af5	RR Overxing Rdwy- 2 Trk Over 4 Ln Rdwy (JPB)	1.00	EA	2,153,393.62	/EA	2,153,394
		40.08.200.af6	Trench Base Slab - De La Cruz	1.00	EA	76,721,703.65	/EA	76,721,704
		40.08.200.ah	Rdwy Underxing UPRR (Lafayette St) - 1 Trk (Main) Over 4 Ln Rdwy	1.00	EA	2,008,348.73	/EA	2,008,349
	SS3		San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to					
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.14	RM	197,484,535.50	/RM	27,647,835

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.10	RM	230,619,733.80	/RM	23,061,973
		10.02.040	Diridon-Tamien - 2 Track	1.06	RM	198,673,112.13	/RM	210,593,499
		10.02.041	Diridon-Tamien - 4 Track	0.52	RM	482,156,229.17	/RM	250,721,239
		10.10.120	Direct Fixation Track - 2 Track	1.35	RM	4,495,391.84	/RM	6,068,779
		10.10.140	Direct Fixation Track - 4 Track	0.48	RM	9,193,311.79	/RM	4,412,790
		10.14.150	Direct Fixation Crossover #15	1.00	EA	2,548,376.00	/EA	2,548,376
		20.06.211	Bike Path Realignment (Almaden Expy)	1.00	EA	22,305,800.86	/EA	22,305,801
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	9,800.00	SF	170.36	/SF	1,669,479
		40.02.005	Utility Relocation Allowance, Level 5 Urban	750.00	LF	197.11	/LF	147,834
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	2,040.00	LF	282.95	/LF	577,226
		40.02.020	Electric OH, 115 kV	1,400.00	LF	244.82	/LF	342,753
		40.02.024	Transmission Tower	1.00	EA	614,361.44	/EA	614,361
	SS4		San Jose to Monterey Corridor:Alma Ave to Communication Hill					
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.20	RM	177,019,979.60	/RM	35,403,996
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	0.28	RM	4,050,193.61	/RM	1,134,054

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	2.16	RM	7,163,896.40	/RM	15,474,016
		10.06.230	At-Grade Track-Bed With Closed Drainage - 3 Track	0.27	RM	7,317,025.70	/RM	1,975,597
		10.08.421	Ret Fill, Walls Both Sides - 2 Trk (10' Avg. Wall Ht)	0.14	RM	15,224,244.36	/RM	2,131,394
		10.08.422	Retained Fill, Wall Both Sides - 2 Trks (20¦Avg. Wall Ht)	0.28	RM	27,466,208.18	/RM	7,690,538
		10.09.112	Ballasted Track (Track Laying Machine) - 1 Track	0.28	RM	1,547,292.68	/RM	433,242
		10.09.122	Ballasted Track (Track Laying Machine) - 2 Track	2.59	RM	3,075,034.35	/RM	7,964,339
		10.09.132	Ballasted Track (Track Laying Machine) - 3 Track	0.27	RM	4,622,417.93	/RM	1,248,053
		10.10.120	Direct Fixation Track - 2 Track	0.19	RM	4,531,584.68	/RM	861,001
		10.14.201	Ballasted Turnout #9	2.00	EA	127,172.82	/EA	254,346
		10.14.203	Ballasted Turnout #11 & #14	1.00	EA	155,433.46	/EA	155,433
		10.14.320	Ballasted Crossover	1.00	EA	593,473.14	/EA	593,473
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	53,020.00	SF	170.36	/SF	9,032,224
		40.02.002	Natural Gas/Oil, 9"-16"	1,480.00	LF	194.54	/LF	287,923
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	16,040.00	LF	282.95	/LF	4,538,580
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	2,520.00	LF	244.82	/LF	616,956
		40.08.100.r	Rdwy Overxing HSR (Curtner Ave): 4-Ln Rdwy Over 4 Trk	1.00	EA	16,901,318.53	/EA	16,901,319

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.100.s	Rdwy Overxing HSR (Almaden Expr): 4-Ln Rdwy Over 4 Trk	1.00	EA	12,090,542.80	/EA	12,090,543
		40.08.200.ai	Rdwy Underxing HSR (SR87): 1-Ln Rdwy Under Eight-Ln Highway	1.00	EA	434,561.12	/EA	434,561
		40.08.200.aj	Rdwy Underxing HSR (Almaden Rd): 2-Ln Rdwy Under 4 Trk	1.00	EA	2,145,737.05	/EA	2,145,737
		40.08.200.aj1	HSR Underpass	1.00	EA	9,261,833.85	/EA	9,261,834
		40.08.200.aj2	Caltrain & UPRR Underpass	1.00	EA	2,150,156.81	/EA	2,150,157
	SS67		Morgan Hill & Gilroy: Viaduct (Com Hill. to D.Gilroy)					
		10.01.001	Topsoil	25,218.00	CY	4.24	/CY	106,834
		10.01.002	Cut	12,217.00	CY	13.42	/CY	163,948
		10.01.004	Overbreak In Embankment	32,019.00	CY	19.79	/CY	633,584
		10.01.005	Embankment	157,306.00	CY	22.60	/CY	3,555,588
		10.01.006	Overbreak Fill In Cut	6,300.00	CY	19.79	/CY	124,655
		10.01.007	Overbreak Fill In Embankment	32,019.00	CY	19.79	/CY	633,584
		10.01.008	Subballast	7,424.00	CY	59.35	/CY	440,603
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	1.77	RM	192,509,396.51	/RM	340,741,632
		10.01.223	Elevated Structure - 2 Track (30' Avg. Pier Ht, 90' Span)	0.09	RM	237,498,371.33	/RM	21,374,853
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	7.05	RM	201,892,892.46	/RM	1,423,344,892

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	0.05	RM	151,524,442.80	/RM	7,576,222
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.04	RM	177,019,975.00	/RM	7,080,799
		10.01.224	Elevated Structure - 2 Track (40' Avg. Pier Ht)	3.72	RM	211,660,245.98	/RM	787,376,115
		10.01.224a	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 120' Spacing	0.16	RM	204,737,338.25	/RM	32,757,974
		10.01.224b	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 150' Spacing	0.11	RM	182,229,568.45	/RM	20,045,253
		10.01.225	Elevated Structure - 2 Track (50' Avg. Pier Ht)	0.07	RM	303,601,025.14	/RM	21,252,072
		10.01.225a	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 90' Spacing	0.02	RM	203,223,639.50	/RM	4,064,473
		10.01.225b	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 110' Spacing	1.78	RM	222,164,554.02	/RM	395,452,906
		10.01.225c	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 120' Spacing	0.34	RM	209,447,595.82	/RM	71,212,183
		10.01.226	Elevated Structure - 2 Track (60' Avg. Pier Ht)	0.06	RM	293,401,745.67	/RM	17,604,105
		10.01.226a	Elevated Structure - 2 Track (60' Avg. Pier Ht, 90' Span)	0.15	RM	270,658,585.67	/RM	40,598,788
		10.01.226b	Elevated Structure - 2 Track (60' Avg. Pier Ht, 100' Span)	0.08	RM	234,910,454.00	/RM	18,792,836

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.226c	Elevated Structure - 2 Track (60' Avg. Pier Ht) - 110' Spacing	1.59	RM	230,923,039.21	/RM	367,167,632
		10.01.226d	Elevated Structure - 2 Track (60' Avg. Pier Ht, 120' Span)	0.05	RM	197,175,132.20	/RM	9,858,757
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.08	RM	203,233,643.75	/RM	16,258,692
		10.01.227	Elevated Structure - 2 Track (70' Avg. Pier Ht)	0.06	RM	303,550,783.50	/RM	18,213,047
		10.01.227a	Elevated Structure - 2 Track (70' Avg. Pier Ht, 90' Span)	0.13	RM	291,489,892.69	/RM	37,893,686
		10.01.227b	Elevated Structure - 2 Track (70' Avg. Pier Ht, 110' Span)	1.17	RM	240,572,161.56	/RM	281,469,429
		10.01.227c	Elevated Structure - 2 Track (70' Avg. Pier Ht, 150' Span)	0.06	RM	200,047,339.67	/RM	12,002,840
		10.02.020	BC - 225-225-225-225 - UPRR	0.04	RM	545,286,857.50	/RM	21,811,474
		10.02.021	BC - 155-310-155 Span - Monterey	0.12	RM	253,495,539.42	/RM	30,419,465
		10.02.023	BC - 90-180'-90 Span - Capitol	0.07	RM	304,571,505.86	/RM	21,320,005
		10.02.024	BC - 110-220-220-110 Span - Blossom	0.13	RM	232,033,483.31	/RM	30,164,353
		10.02.025	BC - 205-410-205 Span - Sr85	0.16	RM	195,415,373.00	/RM	31,266,460
		10.02.026	BC - 115-230-115 Span - Bernal	0.09	RM	253,589,522.89	/RM	22,823,057
		10.02.027	BC - 110-220-110 Span - Bailey	0.08	RM	276,816,082.13	/RM	22,145,287

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.028	BC - 260-260 - Cochrane 1	0.10	RM	214,733,967.70	/RM	21,473,397
		10.02.029	BC - 233-233-233-233 - Cochrane 2	0.18	RM	295,980,656.28	/RM	53,276,518
		10.02.030	BC - 260-260 - Dunne	0.10	RM	204,818,595.40	/RM	20,481,860
		10.02.031	BC - 240-240 - Tennant	0.09	RM	244,571,439.89	/RM	22,011,430
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	1.00	EA	1,513,256.50	/EA	1,513,257
		10.09.110	Ballasted Track - 1 Track	0.30	RM	2,373,916.60	/RM	712,175
		10.09.120	Ballasted Track - 2 Track	0.71	RM	4,627,003.06	/RM	3,285,172
		10.09.920	Ballasted Trk Relocation - 1 Trk (Permanent)	1.61	RM	282,902.94	/RM	455,474
		10.10.120	Direct Fixation Track - 2 Track	9.90	RM	9,049,337.56	/RM	89,588,442
		10.14.200	Ballasted Turnout (60 MPH)	1.00	EA	642,929.24	/EA	642,929
		10.14.202	Ballasted Turnout #10	5.00	EA	138,477.07	/EA	692,385
		10.14.203	Ballasted Turnout #11 & #14	5.00	EA	155,433.44	/EA	777,167
		10.15.102	Wildlife Crossing - 30' wide	2.00	EA	393,387.92	/EA	786,776
		10.15.103	Wildlife Crossing - 40' wide	2.00	EA	722,115.53	/EA	1,444,231
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	100,240.00	SF	170.36	/SF	17,076,388
		40.01.110	Demolition Allowance, Asphalt Pavement	392,200.00	SY	13.58	/SY	5,324,725

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.01.810	Demolition Allowance, Remove Railroad Tracks	1.61	RM	307,562.31	/RM	495,175
		40.02.001	Natural Gas/Oil, 4.5"-8"	760.00	LF	163.82	/LF	124,507
		40.02.002	Natural Gas/Oil, 9"-16"	830.00	LF	194.54	/LF	161,471
		40.02.007	Sanitary Sewer, 49"-54"	15,980.00	LF	436.20	/LF	6,970,517
		40.02.008	Storm Drain, 42"-54"	1,080.00	LF	348.65	/LF	376,545
		40.02.009	Storm Drain, 55"-72"	320.00	LF	371.69	/LF	118,941
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	43,280.00	LF	282.95	/LF	12,246,242
		40.02.014	Telecom/Fiber Optic OH, All Sizes	6,265.00	LF	282.95	/LF	1,772,706
		40.02.015	Telecommunication Facility	1.00	EA	460,771.09	/EA	460,771
		40.02.019	Electric OH, 51-114 kV	230.00	LF	129.63	/LF	29,815
		40.02.020	Electric OH, 115 kV	2,600.00	LF	244.82	/LF	636,541
		40.02.021	Electric OH, 230 kV	5,465.00	LF	194.31	/LF	1,061,878
		40.02.022	Electirc OH, unknown	5,320.00	LF	194.31	/LF	1,033,704
		40.02.023	Electric OH & Telecom OH on JP, 51-114 kV	8,280.00	LF	244.82	/LF	2,027,140
		40.02.047	Recycled Water, All Sizes	10,050.00	LF	148.54	/LF	1,492,827
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	4,375.00	LF	9,215.42	/LF	40,317,470
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	3,735.00	LF	10,751.33	/LF	40,156,200
		40.08.200.a	Rdwy Underxing HSR (NB Monterey Rd Realignment): 2-Ln Rdwy Under 2 Trk	1.00	EA	1,668,692.62	/EA	1,668,693
	SS99-3		Alternative 3 Complete					

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.04.110	Environmental Mitigation Allowance, Heavy	1.00	LS	582,625,058.39	/LS	582,625,058
		40.06.100	Temporary facilities and other indirect costs during construction	1.00	LS	712,097,293.59	/LS	712,097,294
		40.07.100	ROW Procurement Acquisition	1.00	LS	3,242,620,000.00	/LS	3,242,620,000
		50.01.020	Wayside Protection - 2 Track	88.12	RM	2,203,046.85	/RM	194,132,488
		50.05.010	Communications (w/Fiber Optic Backbone) - 2 Track	88.12	RM	909,763.83	/RM	80,168,388
		50.07.020	Hazard Detectors	88.12	RM	628,519.28	/RM	55,385,119
		60.01.020	Traction power transmission: High voltage	88.12	RM	1,862,087.60	/RM	164,087,159
		60.01.030	Distribution Line Pacheco Pass	88.12	RM	734,581.93	/RM	64,731,360
		60.01.040	PG&E Construction Power Drop Sites	88.12	RM	16,720.28	/RM	1,473,391
		60.02.010	Traction Power, Supply Station Site Work	88.12	RM	2,287,080.26	/RM	201,537,512
		60.03.100	Traction Power Distribution - 2 Tracks	88.12	RM	2,704,507.83	/RM	238,321,230
		60.04.100	Traction power control	88.12	RM	5,917.58	/RM	521,457
		80.00.00	Professional Services	1.00	LS	3,402,158,227.04	/LS	3,402,158,227
		90.00.00	Unallocated Contingency	1.00	LS	1,007,465,335.77	/LS	1,007,465,336

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
			Total					**28,698,173,403**
04			Alternative 04					
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn					
		10.01.001	Topsoil	270,683.00	CY	4.24	/CY	1,146,709
		10.01.002	Cut	4,432,073.00	CY	13.42	/CY	59,477,076
		10.01.004	Overbreak In Embankment	178,617.00	CY	19.79	/CY	3,534,450
		10.01.005	Embankment	1,866,629.00	CY	22.60	/CY	42,191,483
		10.01.006	Overbreak Fill In Cut	55,866.00	CY	19.79	/CY	1,105,468
		10.01.007	Overbreak Fill In Embankment	178,617.00	CY	19.79	/CY	3,534,450
		10.01.008	Subballast	38,910.11	CY	59.36	/CY	2,309,595
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	0.11	RM	130,484,442.64	/RM	14,353,289
		10.01.123	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 110' Spacing	0.06	RM	133,704,872.67	/RM	8,022,292
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.25	RM	139,750,142.20	/RM	34,937,536
		10.01.125	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 110' Spacing	0.03	RM	130,446,730.00	/RM	3,913,402
		10.01.126	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 110' Spacing	1.71	RM	152,272,694.36	/RM	260,386,307

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.127	Elevated Structure - 1 Track (70' Avg. Pier Ht) - 110' Spacing	0.07	RM	148,443,678.86	/RM	10,391,058
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	0.20	RM	206,586,823.40	/RM	41,317,365
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	2.00	EA	191,832.25	/EA	383,665
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	4.00	EA	983,616.75	/EA	3,934,467
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	6.00	EA	2,864,326.53	/EA	17,185,959
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	1.00	EA	295,126.59	/EA	295,127
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	2.00	EA	1,513,256.52	/EA	3,026,513
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	1.57	RM	216,837,944.13	/RM	340,435,572
		10.07.207	D&B Cross Passage Conservative Cost In Rock	1,000.00	lf	33,583.85	/lf	33,583,852
		10.07.950	Allowance For Construction Monitoring	1.57	RM	271,616.00	/RM	426,437
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.09.110	Ballasted Track - 1 Track	4.04	RM	2,350,177.49	/RM	9,494,717
		10.09.120	Ballasted Track - 2 Track	0.84	RM	4,644,098.76	/RM	3,901,043
		10.10.110	Direct Fixation Track - 1 Track	3.74	RM	2,267,324.31	/RM	8,479,793
		10.16.100	Drainage	59.00	EA	192,878.77	/EA	11,379,848
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	124,230.00	SF	170.36	/SF	21,163,205
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	550.00	lf	3,839.76	/lf	2,111,867
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	582.00	LF	7,679.52	/LF	4,469,479
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	275.00	LF	9,215.42	/LF	2,534,241
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	240.00	LF	10,751.33	/LF	2,580,318
		40.05.028	Retaining Wall In Fill - 1 Wall (50' Avg. Height)	345.00	LF	12,287.23	/LF	4,239,094
		40.05.052	Retaining Wall In Cut - 1 Wall (30' Avg. Exc Depth)	684.00	LF	9,215.42	/LF	6,303,348
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	587.00	LF	12,297.69	/LF	7,218,747
		40.08.100.b	Rdwy Overxing HSR (Bloomfield Ave): 2-Ln Rdwy Over MF	1.00	EA	79,140,313.63	/EA	79,140,314
	SS14		Pacheco Pass Deep Tunnel					
		10.01.001	Topsoil	842,251.00	CY	4.24	/CY	3,568,083

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.002	Cut	15,647,083.00	CY	13.16	/CY	205,953,215
		10.01.004	Overbreak In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.005	Embankment	8,678,514.60	CY	22.60	/CY	196,160,767
		10.01.006	Overbreak Fill In Cut	72,100.00	CY	19.79	/CY	1,426,706
		10.01.007	Overbreak Fill In Embankment	784,014.86	CY	19.79	/CY	15,514,011
		10.01.008	Subballast	143,484.00	CY	59.35	/CY	8,515,772
		10.01.122a	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 150' Spacing	0.58	RM	154,200,922.47	/RM	89,436,535
		10.01.123a	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 150' Spacing	0.11	RM	156,620,053.18	/RM	17,228,206
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.08	RM	148,498,029.25	/RM	11,879,842
		10.01.124a	Elevated Structure - 1 Track (40' Avg. Pier Ht) - 150' Spacing	0.93	RM	168,597,657.12	/RM	156,795,821
		10.01.125a	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 150' Spacing	2.38	RM	176,322,161.82	/RM	419,646,745
		10.01.126a	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 150' Spacing	0.02	RM	170,351,048.50	/RM	3,407,021
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	0.07	RM	151,524,442.71	/RM	10,606,711
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.12	RM	171,400,316.50	/RM	20,568,038

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.224b	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 150' Spacing	0.11	RM	186,079,494.09	/RM	20,468,744
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.27	RM	196,606,822.67	/RM	53,083,842
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.27	RM	204,995,325.74	/RM	55,348,738
		10.01.227c	Elevated Structure - 2 Track (70' Avg. Pier Ht, 150' Span)	0.73	RM	210,460,755.10	/RM	153,636,351
		10.02.034	BC - 250-500-250 Span - Cal Aqueduct	0.19	RM	210,576,875.58	/RM	40,009,606
		10.02.035	BC - 160-320-160 Span - Delta Mendota	0.12	RM	203,677,321.58	/RM	24,441,279
		10.02.054	BC-150-240-120 Span - Ccid Outside Canal	0.10	RM	210,836,926.40	/RM	21,083,693
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	4.00	EA	191,832.28	/EA	767,329
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	18.00	EA	983,616.76	/EA	17,705,102
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	20.00	EA	2,864,326.53	/EA	57,286,531
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	4.00	EA	295,126.56	/EA	1,180,506
		10.05.320	Transition Wedge 1 Trk Embankment- Slab	4.00	EA	9,600.28	/EA	38,401
		10.05.321	Transition Wedge 1 Trk Embankment-Cut	4.00	EA	11,513.90	/EA	46,056
		10.05.322	Transition Wedge 2 Trk Embankment-Cut	4.00	EA	14,027.54	/EA	56,110

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	13.61	RM	216,837,944.12	/RM	2,951,164,419
		10.07.207	D&B Cross Passage Conservative Cost In Rock	9,000.00	lf	33,583.85	/lf	302,254,665
		10.07.850	Pumping Sta	1.00	EA	339,520.00	/EA	339,520
		10.07.920	Ventilation Equipment Allowance (INCLUDED w/10.07.902)	4.00	EA	173,849,447.78	/EA	695,397,791
		10.07.950	Allowance For Construction Monitoring	13.61	RM	271,616.00	/RM	3,696,694
		10.07.970	Fault Chamber	2.00	EA	166,409,372.87	/EA	332,818,746
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.24	RM	2,350,177.49	/RM	9,964,753
		10.09.120	Ballasted Track - 2 Track	13.30	RM	4,644,098.77	/RM	61,766,514
		10.10.110	Direct Fixation Track - 1 Track	31.00	RM	2,267,324.31	/RM	70,287,054
		10.10.120	Direct Fixation Track - 2 Track	0.24	RM	4,520,631.83	/RM	1,084,952
		10.15.101	Wildlife Crossing	10.00	EA	71,301.56	/EA	713,016

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.16.100	Drainage	2.00	EA	192,878.77	/EA	385,758
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	777,970.00	SF	170.36	/SF	132,531,103
		40.02.020	Electric OH, 115 kV	455.00	LF	244.82	/LF	111,395
		40.02.021	Electric OH, 230 kV	1,340.00	LF	194.31	/LF	260,369
		40.02.022	Electirc OH, unknown	1,925.00	LF	194.31	/LF	374,037
		40.02.025	Potable Water, 120"	3,800.00	LF	7,679.52	/LF	29,182,168
		40.02.043	Drainage Canal, All Sizes	785.00	LF	502.07	/LF	394,121
		40.02.045	Electric OH & Telecom OH on JP, Unknown	415.00	LF	194.31	/LF	80,637
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	1,629.00	lf	3,839.76	/lf	6,254,967
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	951.00	LF	9,215.42	/LF	8,763,866
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	677.00	LF	10,751.33	/LF	7,278,647
		40.05.029	Retaining Wall In Fill - 1 Wall (60' Avg. Height)	990.00	LF	13,823.13	/LF	13,684,901
		40.05.030	Retaining Wall In Fill - 1 Wall (70' Avg. Height)	1,056.00	LF	18,430.84	/LF	19,462,970
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	3,086.00	LF	12,302.52	/LF	37,965,571
		40.08.200.al	Rdwy Modification (Romero Rd), New AC Paving	1.00	EA	725,071.17	/EA	725,071
		40.08.200.am	Rdwy Modification (Fahey), Restriping	1.00	EA	9,101.33	/EA	9,101

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.an	Rdwy Modification (CA152), Restriping	1.00	EA	41,939.98	/EA	41,940
	SS16		San Joaquin Valley					
		10.01.001	Topsoil	447,415.00	CY	4.24	/CY	1,895,411
		10.01.002	Cut	23,638.00	CY	13.42	/CY	317,217
		10.01.004	Overbreak In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.005	Embankment	2,531,377.00	CY	22.60	/CY	57,216,798
		10.01.006	Overbreak Fill In Cut	1,701.00	CY	19.79	/CY	33,657
		10.01.007	Overbreak Fill In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.008	Subballast	128,198.00	CY	59.35	/CY	7,608,550
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	2.71	RM	180,812,350.63	/RM	490,001,470
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	1.63	RM	189,953,839.65	/RM	309,624,759
		10.01.224a	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 120' Spacing	0.67	RM	198,211,318.31	/RM	132,801,583
		10.02.036	BC - 150-275-150 - Cherokee	0.11	RM	224,216,722.27	/RM	24,663,839
		10.02.037	BC - 200-350-200 - San Luis	0.14	RM	178,203,214.50	/RM	24,948,450
		10.02.038	BC - 120-220-120 Span - Los Banos	0.09	RM	262,414,325.67	/RM	23,617,289
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	8.00	EA	1,513,256.54	/EA	12,106,052
		10.09.110	Ballasted Track - 1 Track	0.55	RM	2,350,177.53	/RM	1,292,598

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.09.120	Ballasted Track - 2 Track	12.75	RM	4,644,098.77	/RM	59,212,259
		10.10.120	Direct Fixation Track - 2 Track	5.37	RM	4,501,074.99	/RM	24,170,773
		10.14.206	Ballasted Turnout #20	3.00	EA	339,127.51	/EA	1,017,383
		10.14.300	Ballasted Crossover (60 MPH)	2.00	EA	2,119,546.96	/EA	4,239,094
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.51	/EA	3,204,755
		10.14.400	Terminal - Bumping Post	1.00	Ea	45,217.00	/Ea	45,217
		10.15.101	Wildlife Crossing	67.00	EA	71,301.56	/EA	4,777,205
		10.16.100	Drainage	42.00	EA	192,878.77	/EA	8,100,909
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	746,920.00	SF	170.36	/SF	127,241,579
		30.04.010c	MOIF Siding	1.00	EA	3,611,952.24	/EA	3,611,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	5,295.00	LF	282.95	/LF	1,498,241
		40.02.014	Telecom/Fiber Optic OH, All Sizes	6,255.00	LF	282.95	/LF	1,769,876
		40.02.019	Electric OH, 51-114 kV	3,770.00	LF	129.63	/LF	488,708
		40.02.022	Electirc OH, unknown	23,930.00	LF	194.31	/LF	4,649,723
		40.02.035	Potable Water Storage Tank	1.00	EA	76,795.18	/EA	76,795
		40.02.043	Drainage Canal, All Sizes	29,515.00	LF	502.07	/LF	14,818,454
		40.02.045	Electric OH & Telecom OH on JP, Unknown	12,265.00	LF	194.31	/LF	2,383,153
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	0.66	lf	3,839.79	/lf	2,534

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.100.d	Rdwy Overxing HSR (Henry Miller Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	51,328,605.98	/EA	51,328,606
		40.08.100.e	Rdwy Overxing HSR (Mercey Springs Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	28,529,153.87	/EA	28,529,154
		40.08.100.f	Rdwy Overxing HSR (Delta Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	26,999,657.46	/EA	26,999,657
		40.08.100.g	Rdwy Overxing HSR (Turner Island Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	27,497,062.73	/EA	27,497,063
		40.08.100.j	Rdwy Overxing HSR (Carlucci Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwys	1.00	EA	30,740,316.48	/EA	30,740,316
	SS401		Scott Blvd to Diridon Station					
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	14.00	EA	191,832.41	/EA	2,685,654
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	6.00	EA	688,628.70	/EA	4,131,772
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	1.30	RM	4,101,237.16	/RM	5,331,608
		10.09.110	Ballasted Track - 1 Track	1.30	RM	2,350,177.47	/RM	3,055,231
		10.14.201	Ballasted Turnout #9	2.00	EA	127,172.82	/EA	254,346
		10.14.202	Ballasted Turnout #10	2.00	EA	138,477.08	/EA	276,954
		10.14.320	Ballasted Crossover	3.00	EA	652,820.46	/EA	1,958,461
		10.14.321	Ballasted Crossover #10	3.00	EA	720,645.97	/EA	2,161,938
		10.14.323	Ballasted Crossover #14	2.00	EA	1,003,252.23	/EA	2,006,504

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		20.02.225	San Jose (Diridon) Sta	1.00	LS	142,766,396.57	/LS	142,766,397
		20.02.297	College Park Station	1.00	LS	1,636,316.65	/LS	1,636,317
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	10,800.00	SF	170.36	/SF	1,839,834
		40.02.011	Pump Station (Storm)	1.00	EA	383,975.90	/EA	383,976
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	11,505.00	LF	282.95	/LF	3,255,384
		40.02.016	Electric UG	300.00	LF	309.85	/LF	92,956
		40.02.020	Electric OH, 115 kV	920.00	LF	244.82	/LF	225,238
		40.02.024	Transmission Tower	1.00	EA	614,361.45	/EA	614,361
		40.02.039	Storm Drain, 6"-18"	70.00	LF	217.15	/LF	15,201
		40.02.040	Storm Drain, 19"-30"	620.00	LF	316.39	/LF	196,162
		40.08.200.au	Rdwy Underxing UPRR (Taylor St): Exist Rd Under 1 Trk	1.00	EA	3,575,691.71	/EA	3,575,692
	SS402		Diridon Station to Alma Ave					
		10.01.001	Topsoil	14,929.00	CY	4.24	/CY	63,245
		10.01.002	Cut	27,305.00	CY	13.42	/CY	366,425
		10.01.004	Overbreak In Embankment	8,515.00	CY	19.79	/CY	168,494
		10.01.005	Embankment	27,994.00	CY	22.60	/CY	632,749
		10.01.006	Overbreak Fill In Cut	17,083.00	CY	19.79	/CY	338,037
		10.01.007	Overbreak Fill In Embankment	8,515.00	CY	19.79	/CY	168,494
		10.01.008	Subballast	11,250.00	CY	59.35	/CY	667,688
		10.02.055	Steel Through Girder - I-280	1.00	EA	11,543,530.26	/EA	11,543,530

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.056	Concrete Through Girder - SR-87	1.00	EA	17,998,862.53	/EA	17,998,863
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	1.95	RM	4,101,224.07	/RM	7,997,387
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	1.79	RM	7,151,138.46	/RM	12,800,538
		10.09.110	Ballasted Track - 1 Track	1.95	RM	2,350,177.48	/RM	4,582,846
		10.09.120	Ballasted Track - 2 Track	1.79	RM	4,644,098.79	/RM	8,312,937
		10.14.202	Ballasted Turnout #10	7.00	EA	138,477.07	/EA	969,339
		10.14.323	Ballasted Crossover #14	3.00	EA	1,003,252.23	/EA	3,009,757
		20.06.211	Bike Path Realignment (Almaden Expy)	1.00	EA	22,305,800.85	/EA	22,305,801
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	6,100.00	SF	170.36	/SF	1,039,166
		20.07.801	Quad Gate Prototype A	2.00	EA	2,498,464.50	/EA	4,996,929
		40.02.011	Pump Station (Storm)	2.00	EA	383,975.90	/EA	767,952
		40.02.022	Electirc OH, unknown	370.00	LF	194.31	/LF	71,893
		40.02.045	Electric OH & Telecom OH on JP, Unknown	1,150.00	LF	194.31	/LF	223,451
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	4,584.00	LF	7,679.69	/LF	35,203,678
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	237.94	LF	9,215.42	/LF	2,192,717
		40.05.050	Retaining Wall In Cut - 1 Wall (10' Avg. Exc Depth)	1,966.25	LF	3,071.81	/LF	6,039,941

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.av	Rdwy Underxing HSR (Guadalupe River): Creek Under 1 Trk	1.00	EA	7,794,403.18	/EA	7,794,403
		40.08.200.aw1	Southbound Underpass				/EA	4,245,620
		40.08.200.aw2	Northbound Underpass				/EA	4,913,498
		40.08.200.ax	Rdwy Underxing HSR (Delmas Ave): Exist Rd Under 3 Trk	1.00	EA	4,077,704.11	/EA	4,077,704
		40.08.200.ay	Rdwy Underxing HSR (Prevost St): Exist Rd Under 1 Trk	1.00	EA	1,922,821.52	/EA	1,922,822
		40.08.200.az	Rdwy Underxing HSR (Willow St): Exist Rd Under 1 Trk	1.00	EA	3,617,322.48	/EA	3,617,322
		40.08.200.ba	Rdwy Underxing HSR (Alma Ave): Exist Rd Under 2 Trk	1.00	EA	3,493,536.63	/EA	3,493,537
	SS403		Alma Ave to Gilroy					
		10.01.001	Topsoil	137,499.00	CY	4.24	/CY	582,495
		10.01.002	Cut	1,850,893.00	CY	13.42	/CY	24,838,425
		10.01.004	Overbreak In Embankment	328,081.00	CY	19.79	/CY	6,492,036
		10.01.005	Embankment	1,960,300.00	CY	22.60	/CY	44,308,729
		10.01.006	Overbreak Fill In Cut	1,004,358.00	CY	19.79	/CY	19,874,140
		10.01.007	Overbreak Fill In Embankment	328,081.00	CY	19.79	/CY	6,492,036
		10.01.008	Subballast	375,555.00	CY	59.35	/CY	22,289,207
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	0.33	RM	133,830,205.55	/RM	44,163,968

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.122a	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 150' Spacing	0.06	RM	162,043,916.50	/RM	9,722,635
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	0.50	RM	192,495,002.96	/RM	96,247,501
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	0.03	RM	207,647,111.67	/RM	6,229,413
		10.01.222b	Elevated Structure - 2 Track (20' Avg. Pier Ht, 150' Span)	0.03	RM	160,726,264.33	/RM	4,821,788
		10.02.057	2-Track Steel Truss Over 3 Tracks	1.00	EA	44,373,041.82	/EA	44,373,042
		10.02.057a	1-Track Steel Truss Over 3 Tracks	1.00	EA	27,844,683.19	/EA	27,844,683
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	6.00	EA	191,832.42	/EA	1,150,995
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	4.00	EA	188,855.19	/EA	755,421
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	5.00	EA	1,513,256.59	/EA	7,566,283
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	34.63	RM	4,096,740.41	/RM	141,870,120
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	32.87	RM	7,151,230.25	/RM	235,060,938
		10.09.110	Ballasted Track - 1 Track	34.63	RM	2,350,177.49	/RM	81,386,646
		10.09.120	Ballasted Track - 2 Track	32.87	RM	4,644,098.77	/RM	152,651,527
		10.14.202	Ballasted Turnout #10	10.00	EA	138,477.07	/EA	1,384,771
		10.14.203a	Ballasted Turnout #14	7.00	EA	155,433.44	/EA	1,088,034

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.206	Ballasted Turnout #20	1.00	EA	339,127.50	/EA	339,128
		10.14.300	Ballasted Crossover (60 MPH)	1.00	EA	2,119,546.97	/EA	2,119,547
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.51	/EA	3,204,755
		10.14.321	Ballasted Crossover #10	3.00	EA	720,645.97	/EA	2,161,938
		10.14.324	Ballasted Crossover #20	12.00	EA	1,413,031.31	/EA	16,956,376
		10.14.352	Ballasted Double Crossover #10	1.00	EA	866,404.11	/EA	866,404
		10.14.400	Terminal - Bumping Post	9.00	Ea	45,217.00	/Ea	406,953
		10.15.100	Wildlife Crossing	3.00	EA	28,260.63	/EA	84,782
		10.15.102	Wildlife Crossing - 30' wide	2.00	EA	393,387.92	/EA	786,776
		10.15.103	Wildlife Crossing - 40' wide	6.00	EA	722,115.52	/EA	4,332,693
		10.16.100	Drainage	8.00	EA	192,878.77	/EA	1,543,030
		20.02.216d	Gilroy Station	1.00	LS	68,930,704.80	/LS	68,930,705
		20.07.010	Roadway Modification, New AC Paving	270,900.00	SF	170.36	/SF	46,149,178
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	578,550.00	SF	170.36	/SF	98,558,903
		20.07.021	OCS Portal Protection	1.00	EA	168,949.40	/EA	168,949
		20.07.801	Quad Gate Prototype A	11.00	EA	2,498,464.50	/EA	27,483,110
		20.07.802	Quad Gate Prototype A1	2.00	EA	3,539,157.58	/EA	7,078,315
		20.07.803	Quad Gate Prototype B	1.00	EA	5,742,551.83	/EA	5,742,552
		20.07.804	Quad Gate Prototype C	2.00	EA	3,960,322.10	/EA	7,920,644
		20.07.805	Quad Gate Prototype C1	2.00	EA	6,186,577.53	/EA	12,373,155
		20.07.806	Quad Gate Prototype C2	6.00	EA	3,371,494.10	/EA	20,228,965

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		20.07.807	Quad Gate Prototype D	2.00	EA	6,110,065.02	/EA	12,220,130
		20.07.808	Quad Gate Prototype D1	1.00	EA	6,427,184.97	/EA	6,427,185
		30.04.010d	Comb. MOWF & LMF - Dwtn Glry	1.00	EA	275,196,638.23	/EA	275,196,638
		40.02.001	Natural Gas/Oil, 4.5"-8"	75.00	LF	163.82	/LF	12,287
		40.02.005	Utility Relocation Allowance, Level 5 Urban	5,555.00	LF	197.11	/LF	1,094,960
		40.02.009	Storm Drain, 55"-72"	30.00	LF	371.69	/LF	11,151
		40.02.011	Pump Station (Storm)	13.00	EA	383,975.90	/EA	4,991,687
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	1,179,805.00	LF	282.95	/LF	333,830,362
		40.02.014	Telecom/Fiber Optic OH, All Sizes	1,590.00	LF	282.95	/LF	449,897
		40.02.019	Electric OH, 51-114 kV	380.00	LF	129.63	/LF	49,260
		40.02.020	Electric OH, 115 kV	3,620.00	LF	244.82	/LF	886,262
		40.02.022	Electirc OH, unknown	15,550.00	LF	194.31	/LF	3,021,445
		40.02.030	Potable Water, 4"-9"	480.00	LF	66.35	/LF	31,849
		40.02.036	Sanitary Sewer, 6"-15"	4,130.00	LF	92.15	/LF	380,597
		40.02.039	Storm Drain, 6"-18"	1,770.00	LF	217.15	/LF	384,357
		40.02.040	Storm Drain, 19"-30"	370.00	LF	316.39	/LF	117,064
		40.02.043	Drainage Canal, All Sizes	2,030.00	LF	502.07	/LF	1,019,192
		40.02.045	Electric OH & Telecom OH on JP, Unknown	11,300.00	LF	194.31	/LF	2,195,648
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	7,806.00	LF	7,679.68	/LF	59,947,546

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.05.050	Retaining Wall In Cut - 1 Wall (10' Avg. Exc Depth)	3,020.00	LF	3,072.69	/LF	9,279,530
		40.05.051	Retaining Wall In Cut - 1 Wall (20' Avg. Exc Depth)	4,316.00	LF	7,760.83	/LF	33,495,754
		40.08.200.ar1	HSR Underpass	1.00	EA	9,425,975.54	/EA	9,425,976
		40.08.200.ar2	UPRR Underpass	1.00	EA	5,657,006.88	/EA	5,657,007
		40.08.200.at	Rdwy Underxing HSR (Upper Llagas Creek): Creek Under 3 Trk	1.00	EA	13,059,592.00	/EA	13,059,592
		40.08.200.bb	Rdwy Underxing HSR (Almaden Rd): Exist Rd Under 3 Trk	1.00	EA	7,395,211.99	/EA	7,395,212
		40.08.200.bc	Rdwy Modification (Perimeter Rd): New AC Paving	1.00	EA	672,932.43	/EA	672,932
		40.08.200.bd	Rdwy Modification (Richmond Ave): New AC Paving	1.00	EA	824,368.00	/EA	824,368
		40.08.200.be	Rdwy Modification (Diane Ave): New AC Paving	1.00	EA	44,516.45	/EA	44,516
	SS403R		Gilroy/MOWF to South of D. Gilroy					
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	2.80	RM	191,819,218.21	/RM	537,093,811
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	61,370.00	SF	170.36	/SF	10,454,688
		40.02.020	Electric OH, 115 kV	555.00	LF	244.82	/LF	135,877
		40.02.032	Potable Water, 25"-36"	835.00	LF	423.80	/LF	353,873
	SS99-4		Alternative 04 Complete					

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.04.110	Environmental Mitigation Allowance, Heavy	1.00	LS	369,137,420.85	/LS	369,137,421
		40.06.100	Temporary facilities and other indirect costs during construction	1.00	LS	451,167,958.82	/LS	451,167,959
		40.07.100	ROW Procurement Acquisition	1.00	LS	2,381,700,000.00	/LS	2,381,700,000
		50.01.020	Wayside Protection - 2 Track	89.12	RM	2,277,233.55	/RM	202,947,054
		50.05.010	Communications (w/Fiber Optic Backbone) - 2 Track	89.12	RM	892,764.35	/RM	79,563,159
		50.07.020	Hazard Detectors	89.12	RM	610,093.67	/RM	54,371,548
		60.01.020	Traction power transmission: High voltage	89.12	RM	1,841,193.44	/RM	164,087,159
		60.01.030	Distribution Line Pacheco Pass	89.12	RM	769,779.14	/RM	68,602,717
		60.01.040	PG&E Construction Power Drop Sites	89.12	RM	16,501.34	/RM	1,470,599
		60.02.010	Traction Power, Supply Station Site Work	89.12	RM	1,872,823.25	/RM	166,906,008
		60.03.100	Traction Power Distribution - 2 Tracks	89.12	RM	2,693,285.14	/RM	240,025,572
		60.04.100	Traction power control	89.12	RM	6,353.94	/RM	566,263
		80.00.00	Professional Services	1.00	LS	2,217,975,116.50	/LS	2,217,975,117
		90.00.00	Unallocated Contingency	1.00	LS	656,646,914.34	/LS	656,646,914

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
			Total					**18,964,168,162**
05			Alternative 04 - Diridon Design Variant					
	SS DV1		Diridon Design Variant 1					
		10.09.142	Ballasted Track (Track Laying Machine) - 4 Track	0.51	RM	10,385,657.71	/RM	5,296,685
		10.09.912	Ballasted Track Relocation - 1 Track (Permanent) 1'-10'	1.82	RM	1,248,681.95	/RM	2,272,601
		10.14.202	Ballasted Turnout #10	11.00	EA	138,477.07	/EA	1,523,248
		10.14.320	Ballasted Crossover	1.00	EA	652,820.47	/EA	652,820
		10.14.321	Ballasted Crossover #10	5.00	EA	720,645.97	/EA	3,603,230
		10.14.323	Ballasted Crossover #14	1.00	EA	1,003,252.21	/EA	1,003,252
		20.02.225	San Jose (Diridon) Sta	1.00	LS	6,106,752.71	/LS	6,106,753
		20.06.210	Parking, at Grade	61.00	stl	8,589.07	/stl	523,933
		20.06.210b2	Parking - Deck Structure (1 story, additional 31 stalls)	1.00	LS		/LS	
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn					
		10.01.001	Topsoil	270,683.00	CY	4.24	/CY	1,146,709
		10.01.002	Cut	4,432,073.00	CY	13.42	/CY	59,477,076
		10.01.004	Overbreak In Embankment	178,617.00	CY	19.79	/CY	3,534,450
		10.01.005	Embankment	1,866,629.00	CY	22.60	/CY	42,191,483
		10.01.006	Overbreak Fill In Cut	55,866.00	CY	19.79	/CY	1,105,468
		10.01.007	Overbreak Fill In Embankment	178,617.00	CY	19.79	/CY	3,534,450

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.008	Subballast	38,915.00	CY	59.35	/CY	2,309,595
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	0.11	RM	130,484,442.55	/RM	14,353,289
		10.01.123	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 110' Spacing	0.06	RM	133,704,872.67	/RM	8,022,292
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.25	RM	139,750,142.16	/RM	34,937,536
		10.01.125	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 110' Spacing	0.03	RM	130,446,730.33	/RM	3,913,402
		10.01.126	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 110' Spacing	1.71	RM	152,272,694.36	/RM	260,386,307
		10.01.127	Elevated Structure - 1 Track (70' Avg. Pier Ht) - 110' Spacing	0.07	RM	148,443,679.00	/RM	10,391,058
		10.01.223a	Elevated Structure - 2 Track (30' Avg. Pier Ht) - 110' Spacing	0.20	RM	206,586,823.30	/RM	41,317,365
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	2.00	EA	191,832.26	/EA	383,665
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	4.00	EA	983,616.74	/EA	3,934,467
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	6.00	EA	2,864,326.53	/EA	17,185,959
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	1.00	EA	295,126.59	/EA	295,127

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	2.00	EA	1,513,256.52	/EA	3,026,513
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	1.57	RM	216,837,944.12	/RM	340,435,572
		10.07.207	D&B Cross Passage Conservative Cost In Rock	1,000.00	lf	33,583.85	/lf	33,583,852
		10.07.950	Allowance For Construction Monitoring	1.57	RM	271,616.00	/RM	426,437
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.04	RM	2,350,177.49	/RM	9,494,717
		10.09.120	Ballasted Track - 2 Track	0.84	RM	4,644,098.76	/RM	3,901,043
		10.10.110	Direct Fixation Track - 1 Track	3.74	RM	2,267,324.31	/RM	8,479,793
		10.16.100	Drainage	59.00	EA	192,878.77	/EA	11,379,848
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	124,230.00	SF	170.36	/SF	21,163,205
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	550.00	lf	3,839.76	/lf	2,111,867

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	582.00	LF	7,679.52	/LF	4,469,479
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	275.00	LF	9,215.42	/LF	2,534,241
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	240.00	LF	10,751.33	/LF	2,580,318
		40.05.028	Retaining Wall In Fill - 1 Wall (50' Avg. Height)	345.00	LF	12,287.23	/LF	4,239,094
		40.05.052	Retaining Wall In Cut - 1 Wall (30' Avg. Exc Depth)	684.00	LF	9,215.42	/LF	6,303,348
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	587.00	LF	12,297.69	/LF	7,218,747
		40.08.100.b	Rdwy Overxing HSR (Bloomfield Ave): 2-Ln Rdwy Over MF	1.00	EA	79,140,313.65	/EA	79,140,314
	SS14		Pacheco Pass Deep Tunnel					
		10.01.001	Topsoil	842,251.00	CY	4.24	/CY	3,568,083
		10.01.002	Cut	15,347,083.00	CY	13.42	/CY	205,953,215
		10.01.004	Overbreak In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.005	Embankment	8,678,514.60	CY	22.60	/CY	196,160,767
		10.01.006	Overbreak Fill In Cut	72,100.00	CY	19.79	/CY	1,426,706
		10.01.007	Overbreak Fill In Embankment	784,015.00	CY	19.79	/CY	15,514,011
		10.01.008	Subballast	143,484.00	CY	59.35	/CY	8,515,772
		10.01.122a	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 150' Spacing	0.58	RM	154,200,922.48	/RM	89,436,535

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.123a	Elevated Structure - 1 Track (30' Avg. Pier Ht) - 150' Spacing	0.11	RM	156,620,053.18	/RM	17,228,206
		10.01.124	Elevated Structure - 1 Track (40' Avg. Pier Ht)	0.08	RM	148,498,029.13	/RM	11,879,842
		10.01.124a	Elevated Structure - 1 Track (40' Avg. Pier Ht) - 150' Spacing	0.93	RM	168,597,657.14	/RM	156,795,821
		10.01.125a	Elevated Structure - 1 Track (50' Avg. Pier Ht) - 150' Spacing	2.38	RM	176,322,161.82	/RM	419,646,745
		10.01.126a	Elevated Structure - 1 Track (60' Avg. Pier Ht) - 150' Spacing	0.02	RM	170,351,048.50	/RM	3,407,021
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	0.07	RM	151,524,443.00	/RM	10,606,711
		10.01.223c	Elevated Structure - 2 Track (30' Avg. Pier Ht, 150' Span)	0.12	RM	171,400,316.33	/RM	20,568,038
		10.01.224b	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 150' Spacing	0.11	RM	186,079,494.09	/RM	20,468,744
		10.01.225d	Elevated Structure - 2 Track (50' Avg. Pier Ht) - 150' Spacing	0.27	RM	196,606,822.67	/RM	53,083,842
		10.01.226e	Elevated Structure - 2 Track (60' Avg. Pier Ht, 150' Span)	0.27	RM	204,995,325.78	/RM	55,348,738
		10.01.227c	Elevated Structure - 2 Track (70' Avg. Pier Ht, 150' Span)	0.73	RM	210,460,755.08	/RM	153,636,351
		10.02.034	BC - 250-500-250 Span - Cal Aqueduct	0.19	RM	210,576,875.58	/RM	40,009,606

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.035	BC - 160-320-160 Span - Delta Mendota	0.12	RM	203,677,321.58	/RM	24,441,279
		10.02.054	BC-150-240-120 Span - Ccid Outside Canal	0.10	RM	210,836,926.50	/RM	21,083,693
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	4.00	EA	191,832.28	/EA	767,329
		10.05.301	Transition Wedge - 1 Trk (20' Avg. < Fill Ht < 40' Avg.)	18.00	EA	983,616.75	/EA	17,705,102
		10.05.302	Transition Wedge - 1 Trk (Fill Ht > 40' Avg.)	20.00	EA	2,864,326.53	/EA	57,286,531
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	4.00	EA	295,126.56	/EA	1,180,506
		10.05.320	Transition Wedge 1 Trk Embankment- Slab	4.00	EA	9,600.28	/EA	38,401
		10.05.321	Transition Wedge 1 Trk Embankment-Cut	4.00	EA	11,513.90	/EA	46,056
		10.05.322	Transition Wedge 2 Trk Embankment-Cut	4.00	EA	14,027.53	/EA	56,110
		10.07.102	TBM Single Trk Twin Tunnel 30Ft ID Slurry TBM In Hard Rock	13.61	RM	216,837,944.12	/RM	2,951,164,419
		10.07.207	D&B Cross Passage Conservative Cost In Rock	9,000.00	lf	33,583.85	/lf	302,254,665
		10.07.850	Pumping Sta	1.00	EA	339,520.00	/EA	339,520
		10.07.920	Ventilation Equipment Allowance (INCLUDED w/10.07.902)	4.00	EA	173,849,447.78	/EA	695,397,791
		10.07.950	Allowance For Construction Monitoring	13.61	RM	271,616.00	/RM	3,696,694

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.07.970	Fault Chamber	2.00	EA	166,409,372.87	/EA	332,818,746
		10.07.971	Radio Antenna Area	20,000.00	SF	40.74	/SF	814,848
		10.07.972	Emergency Vehicle Area	22,500.00	SF	81.48	/SF	1,833,408
		10.07.973	Water Supply Area	20,000.00	SF	40.74	/SF	814,848
		10.07.974	Rescue Area	10,000.00	SF	40.74	/SF	407,424
		10.07.975	Traction Power SubSta Area	3,640.00	SF	115.44	/SF	420,190
		10.07.976	Traction Power Facility Area	80,000.00	SF	115.44	/SF	9,234,944
		10.09.110	Ballasted Track - 1 Track	4.24	RM	2,350,177.50	/RM	9,964,753
		10.09.120	Ballasted Track - 2 Track	13.30	RM	4,644,098.77	/RM	61,766,514
		10.10.110	Direct Fixation Track - 1 Track	21.00	RM	3,347,002.55	/RM	70,287,054
		10.10.120	Direct Fixation Track - 2 Track	0.24	RM	4,520,631.83	/RM	1,084,952
		10.15.101	Wildlife Crossing	10.00	EA	71,301.56	/EA	713,016
		10.16.100	Drainage	2.00	EA	192,878.77	/EA	385,758
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	777,970.00	SF	170.36	/SF	132,531,103
		40.02.020	Electric OH, 115 kV	455.00	LF	244.82	/LF	111,395
		40.02.021	Electric OH, 230 kV	1,340.00	LF	194.31	/LF	260,369
		40.02.022	Electirc OH, unknown	1,925.00	LF	194.31	/LF	374,037
		40.02.025	Potable Water, 120"	3,800.00	LF	7,679.52	/LF	29,182,168
		40.02.043	Drainage Canal, All Sizes	785.00	LF	502.07	/LF	394,121

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.045	Electric OH & Telecom OH on JP, Unknown	415.00	LF	194.31	/LF	80,637
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	1,629.00	lf	3,839.76	/lf	6,254,967
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	951.00	LF	9,215.42	/LF	8,763,866
		40.05.027	Retaining Wall In Fill - 1 Wall (40' Avg. Height)	677.00	LF	10,751.33	/LF	7,278,647
		40.05.029	Retaining Wall In Fill - 1 Wall (60' Avg. Height)	990.00	LF	13,823.13	/LF	13,684,901
		40.05.030	Retaining Wall In Fill - 1 Wall (70' Avg. Height)	1,056.00	LF	18,430.84	/LF	19,462,970
		40.05.054	Retaining Wall In Cut - 1 Wall (50' Avg. Exc Depth)	3,086.00	LF	12,302.52	/LF	37,965,571
		40.08.200.al	Rdwy Modification (Romero Rd), New AC Paving	1.00	EA	725,071.17	/EA	725,071
		40.08.200.am	Rdwy Modification (Fahey), Restriping	1.00	EA	9,101.33	/EA	9,101
		40.08.200.an	Rdwy Modification (CA152), Restriping	1.00	EA	41,939.98	/EA	41,940
	SS16		San Joaquin Valley					
		10.01.001	Topsoil	447,415.00	CY	4.24	/CY	1,895,411
		10.01.002	Cut	23,638.00	CY	13.42	/CY	317,217
		10.01.004	Overbreak In Embankment	615,491.00	CY	19.79	/CY	12,179,286
		10.01.005	Embankment	2,531,377.00	CY	22.60	/CY	57,216,798
		10.01.006	Overbreak Fill In Cut	1,701.00	CY	19.79	/CY	33,657
		10.01.007	Overbreak Fill In Embankment	615,491.00	CY	19.79	/CY	12,179,286

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.01.008	Subballast	128,198.00	CY	59.35	/CY	7,608,550
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	2.71	RM	180,812,350.63	/RM	490,001,470
		10.01.223b	Elevated Structure - 2 Track (30' Avg. Pier Ht, 120' Span)	1.63	RM	189,953,839.65	/RM	309,624,759
		10.01.224a	Elevated Structure - 2 Track (40' Avg. Pier Ht) - 120' Spacing	0.67	RM	198,211,318.33	/RM	132,801,583
		10.02.036	BC - 150-275-150 - Cherokee	0.11	RM	224,216,722.18	/RM	24,663,839
		10.02.037	BC - 200-350-200 - San Luis	0.14	RM	178,203,214.57	/RM	24,948,450
		10.02.038	BC - 120-220-120 Span - Los Banos	0.09	RM	262,414,325.56	/RM	23,617,289
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	8.00	EA	1,513,256.54	/EA	12,106,052
		10.09.110	Ballasted Track - 1 Track	0.55	RM	2,350,177.53	/RM	1,292,598
		10.09.120	Ballasted Track - 2 Track	12.75	RM	4,644,098.77	/RM	59,212,259
		10.10.120	Direct Fixation Track - 2 Track	5.37	RM	4,501,074.99	/RM	24,170,773
		10.14.206	Ballasted Turnout #20	3.00	EA	339,127.51	/EA	1,017,383
		10.14.300	Ballasted Crossover (60 MPH)	2.00	EA	2,119,546.96	/EA	4,239,094
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.52	/EA	3,204,755
		10.14.400	Terminal - Bumping Post	1.00	Ea	45,217.01	/Ea	45,217
		10.15.101	Wildlife Crossing	67.00	EA	71,301.56	/EA	4,777,205
		10.16.100	Drainage	42.00	EA	192,878.77	/EA	8,100,909

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	746,920.00	SF	170.36	/SF	127,241,579
		30.04.010c	MOIF Siding	1.00	EA	3,611,952.24	/EA	3,611,952
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	5,295.00	LF	282.95	/LF	1,498,241
		40.02.014	Telecom/Fiber Optic OH, All Sizes	6,255.00	LF	282.95	/LF	1,769,876
		40.02.019	Electric OH, 51-114 kV	3,770.00	LF	129.63	/LF	488,708
		40.02.022	Electirc OH, unknown	23,930.00	LF	194.31	/LF	4,649,723
		40.02.035	Potable Water Storage Tank	1.00	EA	76,795.17	/EA	76,795
		40.02.043	Drainage Canal, All Sizes	29,515.00	LF	502.07	/LF	14,818,454
		40.02.045	Electric OH & Telecom OH on JP, Unknown	12,265.00	LF	194.31	/LF	2,383,153
		40.05.012	Retaining Wall In Fill - 1 Wall (12' Avg. Height)	0.66	lf	3,839.76	/lf	2,534
		40.08.100.d	Rdwy Overxing HSR (Henry Miller Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	51,328,605.99	/EA	51,328,606
		40.08.100.e	Rdwy Overxing HSR (Mercey Springs Rd): 2-Ln Rdwy Over 2 Trk	1.00	EA	28,529,153.87	/EA	28,529,154
		40.08.100.f	Rdwy Overxing HSR (Delta Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	26,999,657.45	/EA	26,999,657
		40.08.100.g	Rdwy Overxing HSR (Turner Island Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwy	1.00	EA	27,497,062.75	/EA	27,497,063

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.100.j	Rdwy Overxing HSR (Carlucci Rd): 2-Ln Rdwy Over 2 Trk & 2-Ln Rdwys	1.00	EA	30,740,316.47	/EA	30,740,316
	SS401		Scott Blvd to Diridon Station					
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	14.00	EA	191,832.41	/EA	2,685,654
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	6.00	EA	688,628.69	/EA	4,131,772
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	1.30	RM	4,101,237.15	/RM	5,331,608
		10.09.110	Ballasted Track - 1 Track	1.30	RM	2,350,177.48	/RM	3,055,231
		10.14.201	Ballasted Turnout #9	2.00	EA	127,172.82	/EA	254,346
		10.14.202	Ballasted Turnout #10	2.00	EA	138,477.07	/EA	276,954
		10.14.320	Ballasted Crossover	3.00	EA	652,820.46	/EA	1,958,461
		10.14.321	Ballasted Crossover #10	3.00	EA	720,645.97	/EA	2,161,938
		10.14.323	Ballasted Crossover #14	2.00	EA	1,003,252.22	/EA	2,006,504
		20.02.225	San Jose (Diridon) Sta	1.00	LS	142,766,396.57	/LS	142,766,397
		20.02.297	College Park Station	1.00	LS	1,636,316.64	/LS	1,636,317
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	10,800.00	SF	170.36	/SF	1,839,834
		40.02.011	Pump Station (Storm)	1.00	EA	383,975.89	/EA	383,976
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	11,505.00	LF	282.95	/LF	3,255,384
		40.02.016	Electric UG	300.00	LF	309.85	/LF	92,956
		40.02.020	Electric OH, 115 kV	920.00	LF	244.82	/LF	225,238

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.024	Transmission Tower	1.00	EA	614,361.45	/EA	614,361
		40.02.039	Storm Drain, 6"-18"	70.00	LF	217.15	/LF	15,201
		40.02.040	Storm Drain, 19"-30"	620.00	LF	316.39	/LF	196,162
		40.08.200.au	Rdwy Underxing UPRR (Taylor St): Exist Rd Under 1 Trk	1.00	EA	3,575,691.70	/EA	3,575,692
	SS402		Diridon Station to Alma Ave					
		10.01.001	Topsoil	14,929.00	CY	4.24	/CY	63,245
		10.01.002	Cut	27,305.00	CY	13.42	/CY	366,425
		10.01.004	Overbreak In Embankment	8,515.00	CY	19.79	/CY	168,494
		10.01.005	Embankment	27,994.00	CY	22.60	/CY	632,749
		10.01.006	Overbreak Fill In Cut	17,083.00	CY	19.79	/CY	338,037
		10.01.007	Overbreak Fill In Embankment	8,515.00	CY	19.79	/CY	168,494
		10.01.008	Subballast	11,250.00	CY	59.35	/CY	667,688
		10.02.055	Steel Through Girder - I-280	1.00	EA	11,543,530.28	/EA	11,543,530
		10.02.056	Concrete Through Girder - SR-87	1.00	EA	17,998,862.53	/EA	17,998,863
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	1.95	RM	4,101,224.07	/RM	7,997,387
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	1.79	RM	7,151,138.45	/RM	12,800,538
		10.09.110	Ballasted Track - 1 Track	1.95	RM	2,350,177.49	/RM	4,582,846
		10.09.120	Ballasted Track - 2 Track	1.79	RM	4,644,098.78	/RM	8,312,937
		10.14.202	Ballasted Turnout #10	7.00	EA	138,477.07	/EA	969,339

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.323	Ballasted Crossover #14	3.00	EA	1,003,252.23	/EA	3,009,757
		20.06.211	Bike Path Realignment (Almaden Expy)	3.00	EA	7,435,266.95	/EA	22,305,801
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	1.00	SF	1,039,165.70	/SF	1,039,166
		20.07.801	Quad Gate Prototype A	6,100.00	EA	819.17	/EA	4,996,929
		40.02.011	Pump Station (Storm)	2.00	EA	383,975.90	/EA	767,952
		40.02.022	Electirc OH, unknown	370.00	LF	194.31	/LF	71,893
		40.02.045	Electric OH & Telecom OH on JP, Unknown	1,150.00	LF	194.31	/LF	223,451
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	4,584.00	LF	7,679.69	/LF	35,203,678
		40.05.026	Retaining Wall In Fill - 1 Wall (30' Avg. Height)	237.94	LF	9,215.42	/LF	2,192,717
		40.05.050	Retaining Wall In Cut - 1 Wall (10' Avg. Exc Depth)	1,966.25	LF	3,071.81	/LF	6,039,941
		40.08.200.av	Rdwy Underxing HSR (Guadalupe River): Creek Under 1 Trk	1.00	EA	7,794,403.19	/EA	7,794,403
		40.08.200.aw1	Southbound Underpass				/EA	4,245,620
		40.08.200.aw2	Northbound Underpass				/EA	4,913,498
		40.08.200.ax	Rdwy Underxing HSR (Delmas Ave): Exist Rd Under 3 Trk	1.00	EA	4,077,704.11	/EA	4,077,704

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.ay	Rdwy Underxing HSR (Prevost St): Exist Rd Under 1 Trk	1.00	EA	1,922,821.52	/EA	1,922,822
		40.08.200.az	Rdwy Underxing HSR (Willow St): Exist Rd Under 1 Trk	1.00	EA	3,617,322.48	/EA	3,617,322
		40.08.200.ba	Rdwy Underxing HSR (Alma Ave): Exist Rd Under 2 Trk	1.00	EA	3,493,536.63	/EA	3,493,537
	SS403		Alma Ave to Gilroy					
		10.01.001	Topsoil	137,499.00	CY	4.24	/CY	582,495
		10.01.002	Cut	1,850,893.00	CY	13.42	/CY	24,838,425
		10.01.004	Overbreak In Embankment	328,081.00	CY	19.79	/CY	6,492,036
		10.01.005	Embankment	1,960,300.00	CY	22.60	/CY	44,308,729
		10.01.006	Overbreak Fill In Cut	1,004,358.00	CY	19.79	/CY	19,874,140
		10.01.007	Overbreak Fill In Embankment	328,081.00	CY	19.79	/CY	6,492,036
		10.01.008	Subballast	375,555.00	CY	59.35	/CY	22,289,207
		10.01.122	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 110' Spacing	0.33	RM	133,830,205.58	/RM	44,163,968
		10.01.122a	Elevated Structure - 1 Track (20' Avg. Pier Ht) - 150' Spacing	0.06	RM	162,043,916.50	/RM	9,722,635
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	0.50	RM	192,495,002.96	/RM	96,247,501
		10.01.222a	Elevated Structure - 2 Track (20' Avg. Pier Ht, 120' Span)	0.03	RM	207,647,111.67	/RM	6,229,413
		10.01.222b	Elevated Structure - 2 Track (20' Avg. Pier Ht, 150' Span)	0.03	RM	160,726,264.33	/RM	4,821,788

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.02.057	2-Track Steel Truss Over 3 Tracks	1.00	EA	44,373,041.82	/EA	44,373,042
		10.02.057a	1-Track Steel Truss Over 3 Tracks	1.00	EA	27,844,683.19	/EA	27,844,683
		10.05.300	Transition Wedge - 1 Trk (Fill Ht < 20' Avg.)	6.00	EA	191,832.42	/EA	1,150,994
		10.05.310	Transition Wedge - 2 Trk (Fill Ht < 20' Avg.)	4.00	EA	188,855.20	/EA	755,421
		10.05.311	Transition Wedge - 2 Trk (20' Avg. < Fill Ht < 40' Avg.)	5.00	EA	1,513,256.59	/EA	7,566,283
		10.06.210	At-Grade Track Bed in Fill - 2 Track (10'Avg fill ht)	34.63	RM	4,096,740.41	/RM	141,870,120
		10.06.220	At-Grade Track Bed w/ closed Drainage - 2 Track	32.87	RM	7,151,230.25	/RM	235,060,938
		10.09.110	Ballasted Track - 1 Track	34.63	RM	2,350,177.49	/RM	81,386,646
		10.09.120	Ballasted Track - 2 Track	32.87	RM	4,644,098.77	/RM	152,651,527
		10.14.202	Ballasted Turnout #10	10.00	EA	138,477.07	/EA	1,384,771
		10.14.203a	Ballasted Turnout #14	7.00	EA	155,433.44	/EA	1,088,034
		10.14.206	Ballasted Turnout #20	1.00	EA	339,127.51	/EA	339,128
		10.14.300	Ballasted Crossover (60 MPH)	1.00	EA	2,119,546.96	/EA	2,119,547
		10.14.305	Ballasted Crossover (80 MPH)	2.00	EA	1,602,377.51	/EA	3,204,755
		10.14.321	Ballasted Crossover #10	3.00	EA	720,645.97	/EA	2,161,938
		10.14.324	Ballasted Crossover #20	12.00	EA	1,413,031.31	/EA	16,956,376
		10.14.352	Ballasted Double Crossover #10	1.00	EA	866,404.11	/EA	866,404

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		10.14.400	Terminal - Bumping Post	9.00	Ea	45,217.00	/Ea	406,953
		10.15.100	Wildlife Crossing	3.00	EA	28,260.63	/EA	84,782
		10.15.102	Wildlife Crossing - 30' wide	2.00	EA	393,387.92	/EA	786,776
		10.15.103	Wildlife Crossing - 40' wide	6.00	EA	722,115.52	/EA	4,332,693
		10.16.100	Drainage	8.00	EA	192,878.77	/EA	1,543,030
		20.02.216d	Gilroy Station	1.00	LS	68,930,704.80	/LS	68,930,705
		20.07.010	Roadway Modification, New AC Paving	270,900.00	SF	170.36	/SF	46,149,178
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	575,550.00	SF	171.24	/SF	98,558,903
		20.07.021	OCS Portal Protection	1.00	EA	168,949.39	/EA	168,949
		20.07.801	Quad Gate Prototype A	11.00	EA	2,498,464.50	/EA	27,483,110
		20.07.802	Quad Gate Prototype A1	2.00	EA	3,539,157.58	/EA	7,078,315
		20.07.803	Quad Gate Prototype B	1.00	EA	5,742,551.83	/EA	5,742,552
		20.07.804	Quad Gate Prototype C	2.00	EA	3,960,322.10	/EA	7,920,644
		20.07.805	Quad Gate Prototype C1	2.00	EA	6,186,577.53	/EA	12,373,155
		20.07.806	Quad Gate Prototype C2	6.00	EA	3,371,494.10	/EA	20,228,965
		20.07.807	Quad Gate Prototype D	2.00	EA	6,110,065.01	/EA	12,220,130
		20.07.808	Quad Gate Prototype D1	1.00	EA	6,427,184.98	/EA	6,427,185
		30.04.010d	Comb. MOWF & LMF - Dwtn Glry	1.00	EA	275,196,638.23	/EA	275,196,638
		40.02.001	Natural Gas/Oil, 4.5"-8"	75.00	LF	163.82	/LF	12,287
		40.02.005	Utility Relocation Allowance, Level 5 Urban	5,555.00	LF	197.11	/LF	1,094,960
		40.02.009	Storm Drain, 55"-72"	30.00	LF	371.69	/LF	11,151

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.02.011	Pump Station (Storm)	13.00	EA	383,975.90	/EA	4,991,687
		40.02.013	Telecomm/Fiber Optic UG, All Sizes	1,179,805.00	LF	282.95	/LF	333,830,362
		40.02.014	Telecom/Fiber Optic OH, All Sizes	1,590.00	LF	282.95	/LF	449,897
		40.02.019	Electric OH, 51-114 kV	380.00	LF	129.63	/LF	49,260
		40.02.020	Electric OH, 115 kV	3,260.00	LF	271.86	/LF	886,262
		40.02.022	Electirc OH, unknown	15,550.00	LF	194.31	/LF	3,021,445
		40.02.030	Potable Water, 4"-9"	480.00	LF	66.35	/LF	31,849
		40.02.036	Sanitary Sewer, 6"-15"	4,130.00	LF	92.15	/LF	380,597
		40.02.039	Storm Drain, 6"-18"	1,770.00	LF	217.15	/LF	384,357
		40.02.040	Storm Drain, 19"-30"	370.00	LF	316.39	/LF	117,064
		40.02.043	Drainage Canal, All Sizes	2,030.00	LF	502.07	/LF	1,019,192
		40.02.045	Electric OH & Telecom OH on JP, Unknown	11,300.00	LF	194.31	/LF	2,195,648
		40.05.025	Retaining Wall In Fill - 1 Wall (20' Avg. Height)	7,806.00	LF	7,679.68	/LF	59,947,546
		40.05.050	Retaining Wall In Cut - 1 Wall (10' Avg. Exc Depth)	3,020.00	LF	3,072.69	/LF	9,279,530
		40.05.051	Retaining Wall In Cut - 1 Wall (20' Avg. Exc Depth)	4,316.00	LF	7,760.83	/LF	33,495,754
		40.08.200.ar1	HSR Underpass	1.00	EA	9,425,975.54	/EA	9,425,976
		40.08.200.ar2	UPRR Underpass	1.00	EA	5,657,006.88	/EA	5,657,007
		40.08.200.at	Rdwy Underxing HSR (Upper Llagas Creek): Creek Under 3 Trk	1.00	EA	13,059,592.00	/EA	13,059,592

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		40.08.200.bb	Rdwy Underxing HSR (Almaden Rd): Exist Rd Under 3 Trk	1.00	EA	7,395,211.99	/EA	7,395,212
		40.08.200.bc	Rdwy Modification (Perimeter Rd): New AC Paving	1.00	EA	672,932.42	/EA	672,932
		40.08.200.bd	Rdwy Modification (Richmond Ave): New AC Paving	1.00	EA	824,368.01	/EA	824,368
		40.08.200.be	Rdwy Modification (Diane Ave): New AC Paving	1.00	EA	44,516.45	/EA	44,516
	SS403R		Gilroy/MOWF to South of D. Gilroy					
		10.01.222	Elevated Structure - 2 Track (20' Avg. Pier Ht)	2.80	RM	191,819,218.21	/RM	537,093,811
		20.07.020	Roadway Modification, New AC Paving (including Curb & Sidewalk)	61,370.00	SF	170.36	/SF	10,454,688
		40.02.020	Electric OH, 115 kV	555.00	LF	244.82	/LF	135,877
		40.02.032	Potable Water, 25"-36"	835.00	LF	423.80	/LF	353,873
	SS99-5		Alternative 04-DV1 Complete					
		40.04.110	Environmental Mitigation Allowance, Heavy	1.00	LS	369,777,659.51	/LS	369,777,660
		40.06.100	Temporary facilities and other indirect costs during construction	1.00	LS	451,950,472.73	/LS	451,950,473
		40.07.100	ROW Procurement Acquisition	1.00	LS	2,383,700,999.99	/LS	2,383,701,000
		50.01.020	Wayside Protection - 2 Track	89.12	RM	2,277,233.55	/RM	202,947,054

Alternativ	Subsection	UPE	Description	Takeoff Quantity		Grand Total Price		Grand Total Amount
		50.05.010	Communications (w/Fiber Optic Backbone) - 2 Track	89.12	RM	892,764.35	/RM	79,563,159
		50.07.020	Hazard Detectors	89.12	RM	610,093.67	/RM	54,371,548
		60.01.020	Traction power transmission: High voltage	89.12	RM	1,841,193.44	/RM	164,087,159
		60.01.030	Distribution Line Pacheco Pass	89.12	RM	769,779.14	/RM	68,602,717
		60.01.040	PG&E Construction Power Drop Sites	89.12	RM	16,501.34	/RM	1,470,599
		60.02.010	Traction Power, Supply Station Site Work	89.12	RM	1,872,823.25	/RM	166,906,008
		60.03.100	Traction Power Distribution - 2 Tracks	89.12	RM	2,693,285.14	/RM	240,025,572
		60.04.100	Traction power control	89.12	RM	6,353.94	/RM	566,263
		80.00.00	Professional Services	1.00	LS	2,221,514,569.17	/LS	2,221,514,569
		90.00.00	Unallocated Contingency	1.00	LS	657,672,491.23	/LS	657,672,491
			Total					**18,993,139,465**

Detail Cost Budget Data (By Major Task)

ALT	Sub Section	SCC Major	Description	Grand Total
01			Alternative 01	
	SS1		San Jose Diridon Sta Approach: Viaduct to I-880 (Scott to Diridon Sta)	
		10.00	Track Structure & Track	643,168,413
		20.00	Stations, Terminal, Intermodal	343,205,672
		40.00	Sitework, Right of Way, Land, Existing Conditions	67,949,196
			SS1 San Jose Diridon Sta Approach: Viaduct to I-880 (Scott to Diridon Sta)	1,054,323,281
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	
		10.00	Track Structure & Track	932,673,132
		20.00	Stations, Terminal, Intermodal	21,163,205
		40.00	Sitework, Right of Way, Land, Existing Conditions	108,597,409
			SS12 Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	1,062,433,746
	SS14		Pacheco Pass Deep Tunnel	
		10.00	Track Structure & Track	6,064,773,315
		20.00	Stations, Terminal, Intermodal	132,531,103
		40.00	Sitework, Right of Way, Land, Existing Conditions	124,589,763
			SS14 Pacheco Pass Deep Tunnel	6,321,894,181
	SS16		San Joaquin Valley	
		10.00	Track Structure & Track	1,215,253,838
		20.00	Stations, Terminal, Intermodal	127,241,579
		30.00	Support Facilities, Yards, and Shops	3,611,952
		40.00	Sitework, Right of Way, Land, Existing Conditions	190,782,281
			SS16 San Joaquin Valley	1,536,889,651
	SS3		San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to	
		10.00	Track Structure & Track	525,054,491
		20.00	Stations, Terminal, Intermodal	23,975,280
		40.00	Sitework, Right of Way, Land, Existing Conditions	1,682,175
			SS3 San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to	550,711,946
	SS4		San Jose to Monterey Corridor:Alma Ave to Communication Hill	
		10.00	Track Structure & Track	75,319,483
		20.00	Stations, Terminal, Intermodal	9,032,224
		40.00	Sitework, Right of Way, Land, Existing Conditions	48,427,609
			SS4 San Jose to Monterey Corridor:Alma Ave to Communication Hill	132,779,315
	SS67		Morgan Hill & Gilroy: Viaduct (Com Hill. to D.Gilroy)	
		10.00	Track Structure & Track	4,354,889,294
		20.00	Stations, Terminal, Intermodal	17,076,388

		40.00	Sitework, Right of Way, Land, Existing Conditions	116,475,867
			SS67 Morgan Hill & Gilroy: Viaduct (Com Hill. to D.Gilroy)	4,488,441,549
	SS9		Morgan Hill & Gilroy: Viaduct (D. Gilroy)	
		10.00	Track Structure & Track	2,572,225,512
		20.00	Stations, Terminal, Intermodal	207,643,235
		30.00	Support Facilities, Yards, and Shops	251,124,407
		40.00	Sitework, Right of Way, Land, Existing Conditions	10,606,742
			SS9 Morgan Hill & Gilroy: Viaduct (D. Gilroy)	3,041,599,897
	SS99-1		Alternative 1 Complete	
		40.00	Sitework, Right of Way, Land, Existing Conditions	4,834,339,554
		50.00	Communications & Signaling	331,722,672
		60.00	Electric Traction	674,141,605
		80.00	Professional Services	3,310,096,896
		90.00	Unallocated Contingency	995,074,272
			SS99-1 Alternative 1 Complete	10,145,374,998
			01 Alternative 01	28,334,448,564
02			**Alternative 02**	
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	
		10.00	Track Structure & Track	932,673,132
		20.00	Stations, Terminal, Intermodal	21,163,205
		40.00	Sitework, Right of Way, Land, Existing Conditions	108,597,409
			SS12 Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	1,062,433,746
	SS14		Pacheco Pass Deep Tunnel	
		10.00	Track Structure & Track	6,064,773,315
		20.00	Stations, Terminal, Intermodal	132,531,103
		40.00	Sitework, Right of Way, Land, Existing Conditions	124,589,763
			SS14 Pacheco Pass Deep Tunnel	6,321,894,181
	SS16		San Joaquin Valley	
		10.00	Track Structure & Track	1,215,253,838
		20.00	Stations, Terminal, Intermodal	127,241,579
		30.00	Support Facilities, Yards, and Shops	3,611,952
		40.00	Sitework, Right of Way, Land, Existing Conditions	190,782,281
			SS16 San Joaquin Valley	1,536,889,651
	SS2		San Jose Diridon Sta Approach: Viaduct to Scott (Scott to Diridon Sta)	
		10.00	Track Structure & Track	1,253,321,181
		20.00	Stations, Terminal, Intermodal	346,762,023
		40.00	Sitework, Right of Way, Land, Existing Conditions	180,722,765
			SS2 San Jose Diridon Sta Approach: Viaduct to Scott (Scott to Diridon Sta)	1,780,805,970
	SS3		San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to	
		10.00	Track Structure & Track	525,054,491

		20.00	Stations, Terminal, Intermodal	23,975,280
		40.00	Sitework, Right of Way, Land, Existing Conditions	1,682,175
			SS3 San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to	550,711,946
	SS4		San Jose to Monterey Corridor:Alma Ave to Communication Hill	
		10.00	Track Structure & Track	75,319,483
		20.00	Stations, Terminal, Intermodal	9,032,224
		40.00	Sitework, Right of Way, Land, Existing Conditions	48,427,609
			SS4 San Jose to Monterey Corridor:Alma Ave to Communication Hill	132,779,315
	SS5810		Morgan Hill & Gilroy: Embkmt (Com Hill. Thru D. Gilroy)	
		10.00	Track Structure & Track	1,678,007,547
		20.00	Stations, Terminal, Intermodal	214,194,616
		30.00	Support Facilities, Yards, and Shops	251,124,407
		40.00	Sitework, Right of Way, Land, Existing Conditions	1,263,360,377
			SS5810 Morgan Hill & Gilroy: Embkmt (Com Hill. Thru D. Gilroy)	3,406,686,946
	SS99-2		Alternative 2 Complete	
		40.00	Sitework, Right of Way, Land, Existing Conditions	5,671,174,593
		50.00	Communications & Signaling	344,788,247
		60.00	Electric Traction	688,562,479
		80.00	Professional Services	2,708,647,236
		90.00	Unallocated Contingency	873,273,107
			SS99-2 Alternative 2 Complete	10,286,445,662
			02 Alternative 02	25,078,647,417
03			**Alternative 03**	
	SS1113		Morgan Hill & Gilroy: Viaduct thru E Gilroy	
		10.00	Track Structure & Track	3,155,858,040
		20.00	Stations, Terminal, Intermodal	274,632,522
		30.00	Support Facilities, Yards, and Shops	295,540,601
		40.00	Sitework, Right of Way, Land, Existing Conditions	213,295,608
			SS1113 Morgan Hill & Gilroy: Viaduct thru E Gilroy	3,939,326,770
	SS14		Pacheco Pass Deep Tunnel	
		10.00	Track Structure & Track	6,064,773,315
		20.00	Stations, Terminal, Intermodal	132,531,103
		40.00	Sitework, Right of Way, Land, Existing Conditions	124,589,763
			SS14 Pacheco Pass Deep Tunnel	6,321,894,181
	SS16		San Joaquin Valley	
		10.00	Track Structure & Track	1,215,253,838
		20.00	Stations, Terminal, Intermodal	127,241,579
		30.00	Support Facilities, Yards, and Shops	3,611,952
		40.00	Sitework, Right of Way, Land, Existing Conditions	190,782,281
			SS16 San Joaquin Valley	1,536,889,651

	SS2		San Jose Diridon Sta Approach: Viaduct to Scott (Scott to Diridon Sta)	
		10.00	Track Structure & Track	1,253,321,181
		20.00	Stations, Terminal, Intermodal	346,762,023
		40.00	Sitework, Right of Way, Land, Existing Conditions	180,722,765
			SS2 San Jose Diridon Sta Approach: Viaduct to Scott (Scott to Diridon Sta)	1,780,805,970
	SS3		San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to	
		10.00	Track Structure & Track	525,054,491
		20.00	Stations, Terminal, Intermodal	23,975,280
		40.00	Sitework, Right of Way, Land, Existing Conditions	1,682,175
			SS3 San Jose to Monterey Corridor:Diridon Sta to Alma Ave Diridon Sta to	550,711,946
	SS4		San Jose to Monterey Corridor:Alma Ave to Communication Hill	
		10.00	Track Structure & Track	75,319,483
		20.00	Stations, Terminal, Intermodal	9,032,224
		40.00	Sitework, Right of Way, Land, Existing Conditions	48,427,609
			SS4 San Jose to Monterey Corridor:Alma Ave to Communication Hill	132,779,315
	SS67		Morgan Hill & Gilroy: Viaduct (Com Hill. to D.Gilroy)	
		10.00	Track Structure & Track	4,354,889,294
		20.00	Stations, Terminal, Intermodal	17,076,388
		40.00	Sitework, Right of Way, Land, Existing Conditions	116,475,867
			SS67 Morgan Hill & Gilroy: Viaduct (Com Hill. to D.Gilroy)	4,488,441,549
	SS99-3		Alternative 3 Complete	
		40.00	Sitework, Right of Way, Land, Existing Conditions	4,537,342,352
		50.00	Communications & Signaling	329,685,995
		60.00	Electric Traction	670,672,109
		80.00	Professional Services	3,402,158,227
		90.00	Unallocated Contingency	1,007,465,336
			SS99-3 Alternative 3 Complete	9,947,324,019
			03 Alternative 03	28,698,173,401
04			**Alternative 04**	
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	
		10.00	Track Structure & Track	932,673,132
		20.00	Stations, Terminal, Intermodal	21,163,205
		40.00	Sitework, Right of Way, Land, Existing Conditions	108,597,409
			SS12 Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	1,062,433,746
	SS14		Pacheco Pass Deep Tunnel	
		10.00	Track Structure & Track	6,064,773,315
		20.00	Stations, Terminal, Intermodal	132,531,103
		40.00	Sitework, Right of Way, Land, Existing Conditions	124,589,763

			SS14 Pacheco Pass Deep Tunnel	6,321,894,181
	SS16		San Joaquin Valley	
		10.00	Track Structure & Track	1,215,253,838
		20.00	Stations, Terminal, Intermodal	127,241,579
		30.00	Support Facilities, Yards, and Shops	3,611,952
		40.00	Sitework, Right of Way, Land, Existing Conditions	190,782,281
			SS16 San Joaquin Valley	1,536,889,651
	SS401		Scott Blvd to Diridon Station	
		10.00	Track Structure & Track	21,862,468
		20.00	Stations, Terminal, Intermodal	146,242,548
		40.00	Sitework, Right of Way, Land, Existing Conditions	8,358,970
			SS401 Scott Blvd to Diridon Station	176,463,986
	SS402		Diridon Station to Alma Ave	
		10.00	Track Structure & Track	69,620,328
		20.00	Stations, Terminal, Intermodal	28,341,896
		40.00	Sitework, Right of Way, Land, Existing Conditions	74,564,539
			SS402 Diridon Station to Alma Ave	172,526,763
	SS403		Alma Ave to Gilroy	
		10.00	Track Structure & Track	1,013,997,214
		20.00	Stations, Terminal, Intermodal	313,281,790
		30.00	Support Facilities, Yards, and Shops	275,196,638
		40.00	Sitework, Right of Way, Land, Existing Conditions	488,278,452
			SS403 Alma Ave to Gilroy	2,090,754,094
	SS403R		Gilroy/MOWF to South of D. Gilroy	
		10.00	Track Structure & Track	537,093,811
		20.00	Stations, Terminal, Intermodal	10,454,688
		40.00	Sitework, Right of Way, Land, Existing Conditions	489,750
			SS403R Gilroy/MOWF to South of D. Gilroy	548,038,249
	SS99-4		Alternative 04 Complete	
		40.00	Sitework, Right of Way, Land, Existing Conditions	3,202,005,380
		50.00	Communications & Signaling	336,881,761
		60.00	Electric Traction	641,658,319
		80.00	Professional Services	2,217,975,117
		90.00	Unallocated Contingency	656,646,914
			SS99-4 Alternative 04 Complete	7,055,167,490
			04 Alternative 04	18,964,168,159
05			**Alternative 04 - Diridon Design Variant**	
	SS DV1		Diridon Design Variant 1	
		10.00	Track Structure & Track	14,351,837
		20.00	Stations, Terminal, Intermodal	6,630,686
			SS DV1 Diridon Design Variant 1	20,982,523
	SS12		Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	
		10.00	Track Structure & Track	932,673,132
		20.00	Stations, Terminal, Intermodal	21,163,205

		40.00	Sitework, Right of Way, Land, Existing Conditions	108,597,409
			SS12 Morgan Hill&Gilroy: Viaduct to Embkmnt(South of D. Gilroy thru Tunn	1,062,433,746
	SS14		Pacheco Pass Deep Tunnel	
		10.00	Track Structure & Track	6,064,773,315
		20.00	Stations, Terminal, Intermodal	132,531,103
		40.00	Sitework, Right of Way, Land, Existing Conditions	124,589,763
			SS14 Pacheco Pass Deep Tunnel	6,321,894,181
	SS16		San Joaquin Valley	
		10.00	Track Structure & Track	1,215,253,838
		20.00	Stations, Terminal, Intermodal	127,241,579
		30.00	Support Facilities, Yards, and Shops	3,611,952
		40.00	Sitework, Right of Way, Land, Existing Conditions	190,782,281
			SS16 San Joaquin Valley	1,536,889,651
	SS401		Scott Blvd to Diridon Station	
		10.00	Track Structure & Track	21,862,468
		20.00	Stations, Terminal, Intermodal	146,242,548
		40.00	Sitework, Right of Way, Land, Existing Conditions	8,358,970
			SS401 Scott Blvd to Diridon Station	176,463,986
	SS402		Diridon Station to Alma Ave	
		10.00	Track Structure & Track	69,620,328
		20.00	Stations, Terminal, Intermodal	28,341,896
		40.00	Sitework, Right of Way, Land, Existing Conditions	74,564,539
			SS402 Diridon Station to Alma Ave	172,526,763
	SS403		Alma Ave to Gilroy	
		10.00	Track Structure & Track	1,013,997,214
		20.00	Stations, Terminal, Intermodal	313,281,790
		30.00	Support Facilities, Yards, and Shops	275,196,638
		40.00	Sitework, Right of Way, Land, Existing Conditions	488,278,452
			SS403 Alma Ave to Gilroy	2,090,754,094
	SS403R		Gilroy/MOWF to South of D. Gilroy	
		10.00	Track Structure & Track	537,093,811
		20.00	Stations, Terminal, Intermodal	10,454,688
		40.00	Sitework, Right of Way, Land, Existing Conditions	489,750
			SS403R Gilroy/MOWF to South of D. Gilroy	548,038,249
	SS99-5		Alternative 04-DV1 Complete	
		40.00	Sitework, Right of Way, Land, Existing Conditions	3,205,429,132
		50.00	Communications & Signaling	336,881,761
		60.00	Electric Traction	641,658,319
		80.00	Professional Services	2,221,514,569
		90.00	Unallocated Contingency	657,672,491
			SS99-5 Alternative 04-DV1 Complete	7,063,156,273
			05 Alternative 04 - Diridon Design Variant	18,993,139,465

APPENDIX D LIST OF DOCUMENTS

The following documents were provided.

- JM 2021_PEPD_AppA-Qty-v11_20211108
- JM-ENG-RS-RPRT-RW-20211011JM-ENG-RS-RPRT-RW-20211011

APPENDIX 6-B: HIGH-SPEED RAIL OPERATING AND MAINTENANCE COST FOR USE IN EIR/EIS PROJECT-LEVEL ANALYSIS

Memorandum

DATE: February 6, 2017

TO: Regional Consultant Teams

FROM: Matt Henley, Travel Demand Forecasting Manager

CC: Bruce Armistead, Director, Operations & Maintenance
Simon Whitehorn, Deputy Director, Operations & Maintenance

SUBJECT: High-Speed Rail Operating and Maintenance Cost for Use in EIR/EIS Project-Level Analysis

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This memo summarizes the assumptions used to estimate full system high-speed rail (HSR) operations and maintenance (O&M) costs published in the *California High-Speed Rail Authority's 2016 Business Plan*. For more information on the operations and maintenance cost model used for cost forecasting, please refer to the *Operations and Maintenance Cost Model Documentation*[1].

A variety of factors drive the cost forecasts, including but not limited to, service planning assumptions, station operations, maintenance facility operations, staffing and energy use. Allocated contingency costs, which are included in each cost category, and unallocated contingency costs are also forecasted in addition to direct O&M costs. In total, nine cost categories comprise total O&M costs that are described in detail in the *Operations and Maintenance Cost Model Documentation*:

1. Train operations
2. Dispatching
3. Maintenance of equipment
4. Maintenance of infrastructure
5. Station and train cleaning
6. Commercial
7. General and administrative
8. Insurance
9. Unallocated contingency

The service plan is a key driver of O&M cost forecasts as it determines the number of trainset miles, bus miles, trainsets, stations and maintenance facilities necessary to support system operations – all of which are inputs to the O&M cost model. The O&M cost forecasts in the *California High-Speed Rail Authority's 2016 Business Plan* rely on a Phase 1 system with key service planning assumptions outlined below:

- The Phase 1 system will open in 2029 and will cover approximately 500 miles
- The Phase 1 system will serve 13 stations, including San Francisco, Millbrae, San Jose, Gilroy, Merced, Fresno, Kings/Tulare, Bakersfield, Palmdale, Burbank, Los Angeles, Gateway Cities/ Orange County, Anaheim

[1] http://www.hsr.ca.gov/docs/about/business_plans/2016_Business_Plan_Operations_and_Maintenance_Cost_Model.pdf

- The Phase 1 system will include 196 revenue service train runs per day with varying stopping patterns between San Francisco and Anaheim, San Francisco and Los Angeles, San Jose and Los Angeles, Merced and Los Angeles, Merced and Anaheim

- The Phase 1 system assumes 6 hours of peak service and 10 hours of off-peak service daily. Phase 1 will include 8 round trip revenue service trains per hour during peak service and 5 round trip trains per hour during off-peak service

- The HSR system will include connecting bus service between Sacramento and Merced during Phase 1 operations

- After full operational ramp-up, high-speed rail operations will include 78 trainsets including spares, 34.5 million total trainset miles, and 2.2 million bus miles per year

To support Phase 1 high-speed train service outlined above, total O&M costs include additional assumptions related to maintenance and train operations. The system will include one operations control center and three terminal control facilities to manage dispatching. A heavy maintenance facility will be located in the Central Valley with three lighter maintenance facilities dispersed across the rest of the system, including one near Gilroy, one in northern California along the Peninsula Corridor at Brisbane and one in southern California, near Los Angeles. O&M will also include five maintenance of infrastructure facilities.

The O&M cost model assumes station staffing and operating costs will be based on station size and the model differentiates between three station sizes. San Francisco and Los Angeles represent the largest stations, and as a result, have the most staff. Other terminal stations represent the middle station sizes (e.g., San Jose) and intermediate stations (e.g., Palmdale) represent the smallest station size and have the lowest staffing levels. For more details on staffing assumptions and associated salaries, please refer to the *Operations and Maintenance Cost Model Documentation*.

Finally, energy costs were updated to $0.074 per kilowatt hour (2015 dollars) for the 2016 Business Plan and are a key driver of train operations costs and station costs based on usage.

Table 1 below outlines total O&M medium, or base case, cost forecasts and personnel forecasts by cost category. It is important to note that the cost model does not attempt to optimize operations to reduce costs, but provides an achievable operating scenario that could be further improved upon by a private operator. Additionally, the 2025 Valley-to-Valley (V2V) forecasts reflect a different set of assumptions than those outlined above for Phase 1, but are not covered in this memo. The cost model also assumes a ramp-up period from the opening of revenue service through five years after the system expands to Phase 1 (i.e., 2025-2033).

Table 1: Annual Operations and Maintenance Medium Case Cost Forecast ($2015 millions)

Cost Category	2025 Medium Case Cost	2029 Medium Case Cost	2040 Medium Case Cost	Personnel in PH1 System
Train Operations	$28	$240	$285	1,210
Dispatching	$13	$29	$30	187
Maintenance of Equipment	$22	$92	$134	603
Maintenance of Infrastructure	$53	$120	$122	579
Station and Train Cleaning	$21	$68	$71	649
Commercial	$42	$51	$94	N/A
General and Administrative	$14	$48	$53	311
Insurance	$26	$52	$52	N/A
Unallocated Contingency	$9	$29	$35	N/A
Total Cost	**$227**	**$730**	**$874**	**3,538**

Note: Numbers may not add due to rounding

As with all model forecasting, risks and uncertainties exist in model inputs and assumptions. For example, salaries or energy costs in 2040 may be lower or higher than those assumed in the model. The *California High-Speed Rail Authority's 2016 Business Plan* O&M forecasts include a Monte Carlo simulation to capture these risks and uncertainties by creating a forecast range with associated probabilities of occurrence. A high O&M cost forecast was developed to reflect the results of these Monte Carlo simulations. For more detail on the O&M risk analysis methodology, please refer to the *Operations and Maintenance Cost Model Documentation*.

The drawback of the methodology used for the O&M risk analysis is that it does not provide high scenarios for specific cost categories, but only identifies total O&M high scenario forecasts. As a result, to estimate high scenario costs by each cost category, medium cost category forecasts are multiplied by the percentage increase of total O&M costs from the medium to high scenario. In other words, if total high scenario costs are 10% higher than total medium costs, each cost category is multiplied by 1.10 to estimate high scenario costs by category.

Table 2 below outlines high scenario O&M costs.

Table 2: Annual Operations and Maintenance High Scenario Cost Forecast ($2015 millions)

Cost Category	2025 High Scenario Cost	2029 High Scenario Cost	2040 High Scenario Cost
Train Operations	$31	$263	$311
Dispatching	$14	$32	$33
Maintenance of Equipment	$24	$101	$146
Maintenance of Infrastructure	$58	$131	$133
Station and Train Cleaning	$23	$74	$77
Commercial	$46	$56	$103
General and Administrative	$15	$53	$58
Insurance	$29	$57	$57
Unallocated Contingency	$10	$32	$38
Total Cost	**$249**	**$798**	**$956**

Note: Numbers may not add due to rounding

For planning, engineering, and design purposes, the 500 mile Phase 1 HSR system has been divided into nine geographic sections. None of the sections would operate independently and any cost number associated with each is not meant to represent the cost to operate and maintain each as a standalone system; rather, geographic sections operate as part of an integrated system. However, to assist the regional teams in their evaluation of environmental impacts associated with future construction and operation of individual HSR projects, total O&M costs have been distributed to each geographic section.

O&M costs in 2015$ are apportioned to each geographic section based on the system-wide total cost per route mile. Table 3 below outlines the cost per route mile by year and scenario.

Table 3: Cost per Route Mile ($2015 millions)

Cost Category	Approx. Route Miles	2025 Medium Cost	2025 High Cost	2029 Medium Cost	2029 High Cost	2040 Medium Cost	2040 High Cost
Valley-to-Valley	250	$0.91/mi	$1.00/mi	N/A	N/A	N/A	N/A
Phase 1	500	N/A	N/A	$1.46/mi	$1.60/mi	$1.75/mi	$1.91/mi

O&M costs by geographic segment are distributed in Table 4 below and are estimated by multiplying costs per route mile by approximate route miles in each geographic section. It is important to note that the O&M costs above for the Valley-to-Valley system do not assume service to Merced. There are approximately 250 total route miles in the Valley-to-Valley system assumed for O&M cost forecasting purposes. Nonetheless, the cost per route mile calculated for Valley-to-Valley in Table 3 is applied to the

geographic segments that include Merced in 2025 in Table 4 (San Jose-Merced, Merced-Fresno). As a result, total 2025 medium and high cost numbers in Table 4 will be higher than Table 1 and Table 2.

Table 4: Annual Operations and Maintenance Costs by Geographic Segment ($2015 millions)

Cost Category	Approx. Route Miles	2025 Medium Cost	2025 High Cost	2029 Medium Cost	2029 High Cost	2040 Medium Cost	2040 High Cost
San Fran-San Jose	48	$0	$0	$70	$77	$84	$92
San Jose-Merced	84	$76	$84	$123	$134	$147	$161
Merced-Fresno	93	$84	$93	$136	$148	$163	$178
Fresno-Bakersfield	109	$99	$109	$159	$174	$191	$208
Bakersfield-Palmdale	80	$0	$0	$117	$128	$140	$153
Palmdale-Burbank	40	$0	$0	$58	$64	$70	$76
Burbank-Los Angeles	13	$0	$0	$19	$21	$23	$25
Los Angeles-Anaheim	31	$0	$0	$45	$49	$54	$59

Note: Total estimates in 2029 and 2040 scenarios may not match previous tables due to rounding.

APPENDIX 9-A: PUBLIC AND AGENCY MEETING LIST

Appendix A: Public and Agency Meetings List

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this appendix.

- The list of meetings was updated to include additional public and agency meetings that have occurred.

Date	Organization/Individual	Topic
12/18/2008	City of San Jose	Project definition and environmental process
1/12/2009	Delmas Park Neighborhood Action Committee	Project definition and environmental process
2/18/2009	City of Gilroy	Project definition and environmental process
2/18/2009	City of Morgan Hill	Project definition and environmental process
2/19/2009	City of Los Banos	Project definition and environmental process
2/23/2009	Silverleaf, San Jose Neighborhood Association	Project definition and environmental process
2/25/2009	Gardner Advisory Council, San Jose	Project definition and environmental process
2/26/2009	Grassland Water District	Project definition and environmental process
2/28/2009	City of San Jose District 2 Town Hall	Project definition and environmental process
3/3/2009	Committee for Green Foothills, Greenbelt Alliance, TNC, Silicon Valley Land Trust, Audubon, Sierra Club	Project definition and environmental process
3/18/2009	Merced EIR/EIS Scoping Meeting	Statewide HSR system, environmental review process, project alternatives, areas of environmental analysis, potential key issues
3/24/2009	North Willow Glen, San Jose Neighborhood Association	Project definition and environmental process
3/25/2009	San Jose EIR/EIS Scoping Meeting	Statewide HSR system, environmental review process, project alternatives, areas of environmental analysis, potential key issues
3/26/2009	Gilroy EIR/EIS Scoping Meeting	Statewide HSR system, environmental review process, project alternatives, areas of environmental analysis, potential key issues
3/26/2009	TAMC	Project definition and environmental process
4/14/2009	City of Morgan Hill Planning Commission	Project definition and environmental process
4/29/2009	Greater Gardner, San Jose community meeting (Spanish and English)	Project definition and environmental process
9/3/2009	TWG Meeting #1 (Gilroy)	Project schedule and study process, alternatives analysis effort, summary of scoping comments, review of current alignment alternatives, review of alternatives analysis and key design objectives

Date	Organization/Individual	Topic
9/10/2009	TWG Meeting #1 (Merced)	Project schedule and study process, alternatives analysis effort, summary of scoping comments, review of current alignment alternatives, review of alternatives analysis and key design objectives
9/12/2009	Diridon Station Area Plan Visioning Workshop	PAA—environmental review process and alternative alignments
9/17/2009	City of Gilroy	PAA—environmental review process and alternative alignments
9/23/2009	USACE, USFWS, RWQCB, CDFG	PAA—environmental review process and alternative alignments
10/5/2009	City of San Jose	PAA—environmental review process and alternative alignments
10/5/2009	USEPA/USACE	PAA—environmental review process and alternative alignments
10/6/2009	Alternatives Analysis Public Meeting, San Jose	Alignment alternatives, impacts on neighborhoods and local roads, concerns about eminent domain and property values, impacts on agriculture
10/7/2009	City of Morgan Hill	PAA—environmental review process and alternative alignments
10/7/2009	The Nature Conservancy	PAA—environmental review process and alternative alignments
10/8/2009	Alternatives Analysis Public Meeting, Merced	Alignment alternatives, impacts on neighborhoods and local roads, concerns about eminent domain and property values, impacts on agriculture
10/12/2009	Alternatives Analysis Public Meeting, Gilroy	Alignment alternatives, impacts on neighborhoods and local roads, concerns about eminent domain and property values, impacts on agriculture
10/12/2009	City of San Jose	PAA—environmental review process and alternative alignments
10/14/2009	Caltrans	PAA—environmental review process and alternative alignments
10/28/2009	Diridon Station Working Group	PAA—environmental review process and alternative alignments
11/2/2009	Gilroy City Council (Study Session)	PAA—environmental review process and alternative alignments
11/12/2009	FRA	PAA—environmental review process and alternative alignments
11/12/2009	HP Pavilion (now SAP Center)	PAA—environmental review process and alternative alignments
11/13/2009	Gilroy Chamber of Commerce Government Relations Committee	PAA—environmental review process and alternative alignments
11/13/2009	VTA	PAA—environmental review process and alternative alignments

Date	Organization/Individual	Topic
11/17/2009	Grassland Water District	PAA—environmental review process and alternative alignments
11/18/2009	South San Jose residents	PAA—environmental review process and alternative alignments
11/18/2009	UPRR	PAA—environmental review process and alternative alignments
11/24/2009	Rotary Club of Gilroy	PAA—environmental review process and alternative alignments
12/1/2009	DWR	PAA—environmental review process and alternative alignments
12/7/2009	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
12/14/2009	TWG Meeting #2 (Merced)	Alternatives analysis process, current alignment alternatives, right-of-way requirements, impacts on biological and water resources, effects on residents
12/15/2009	City of Gilroy	PAA—environmental review process and alternative alignments
12/15/2009	City of San Jose Department of Transportation	PAA—environmental review process and alternative alignments
12/16/2009	TWG Meeting #2 (Gilroy)	Alternatives analysis process, current alignment alternatives, right-of-way requirements, impacts on biological and water resources, effects on residents
12/17/2009	Open House Meeting, Merced	Ongoing alternatives analysis results
12/18/2009	UPRR	PAA—environmental review process and alternative alignments
1/4/2010	California Department of Conservation	PAA—environmental review process and alternative alignments
1/5/2010	City of San Jose	PAA—environmental review process and alternative alignments
1/5/2010	City of San Jose Department of Transportation and Redevelopment Agency	PAA—environmental review process and alternative alignments
1/5/2010	NMFS	PAA—environmental review process and alternative alignments
1/8/2010	City of San Jose	PAA—environmental review process and alternative alignments
1/11/2010	Open House Meeting, Gilroy	Ongoing alternatives analysis results
1/12/2010	Open House Meeting, San Jose	Ongoing alternatives analysis results
1/12/2010	VTA	PAA—environmental review process and alternative alignments
1/14/2010	Peninsula Rail Program	PAA—environmental review process and alternative alignments

Date	Organization/Individual	Topic
1/20/2010	SCVWD	PAA—environmental review process and alternative alignments
1/20/2010	Soap Lake Floodplain Representatives	PAA—environmental review process and alternative alignments
1/30/2010	Shasta-Hanchett Park Neighborhood Association Annual Meeting	PAA—environmental review process and alternative alignments
2/1/2010	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
2/1/2010	Gilroy City Council (Study Session)	PAA—environmental review process and alternative alignments
2/1/2010	Santa Clara County District 1 Supervisor Don Gage	PAA—environmental review process and alternative alignments
2/8/2010	San Jose District 2 Constituents	PAA—environmental review process and alternative alignments
2/9/2010	UPRR	PAA—environmental review process and alternative alignments
2/10/2010	USEPA/USACE	PAA—environmental review process and alternative alignments
2/12/2010	Gilroy Chamber of Commerce Government Relations Committee	PAA—environmental review process and alternative alignments
2/22/2010	Authority Chairman Pringle's Mayors Meeting	PAA—environmental review process and alternative alignments
3/2/2010	Alternatives Analysis Community Workshop, San Jose	Alignment alternatives in the south of Diridon Station to Tamien Station area
3/2/2010	City of San Jose	PAA—environmental review process and alternative alignments
3/3/2010	City of Gilroy	PAA—environmental review process and alternative alignments
3/10/2010	City of Morgan Hill	PAA—environmental review process and alternative alignments
3/17/2010	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
3/27/2010	Diridon Station Area Plan Community Workshop	PAA—environmental review process and alternative alignments
3/29/2010	DWR	PAA—environmental review process and alternative alignments
4/5/2010	TAMC Rail Policy Committee	PAA—environmental review process and alternative alignments
4/9/2010	Merced County	PAA—environmental review process and alternative alignments
4/14/2010	City of Gilroy	PAA—environmental review process and alternative alignments

Date	Organization/Individual	Topic
4/29/2010	SPUR City Trip to San Jose	PAA—environmental review process and alternative alignments
5/3/2010	Gilroy City Council Study Session	Program-level EIR/EIS and the alternatives analysis process
5/5/2010	Open House Meeting, Gardner Community Center, San Jose	South of Diridon Station to Coyote Creek Alternatives Analysis Informational Open House
5/6/2010	Open House Meeting, Santa Teresa Public Library, San Jose	South of Diridon Station to Coyote Creek Alternatives Analysis Informational Open House
5/18/2010	Cities of Los Banos and Dos Palos	PAA—environmental review process and alternative alignments
5/26/2010	Diridon Good Neighbor Committee	PAA—environmental review process and alternative alignments
6/10/2010	Santa Clara County Roads and Airports Department	SAA—presentation on the alternatives analysis
6/10/2010	Santa Clara County Supervisor Don Gage	SAA—Briefing on the alternatives analysis regarding Santa Clara County
6/10/2010	South County Joint Planning Advisory Committee	SAA—presentation on the alternatives analysis, particularly as it affects Morgan Hill, San Martin, and Gilroy
6/15/2010	Los Banos Community Open House	SAA—alignment alternatives and station location options
6/15/2010	Madera County Board of Supervisors	SAA—Avenue 21 and 24 alignment design options through Madera County
6/17/2010	Dos Palos Community Open House	SAA—alignment alternatives and station location options
6/17/2010	Los Banos Unified School District	SAA—impacts of the project on Volta Elementary School
6/17/2010	TWG meeting #3: Merced	SAA—alignment alternatives, station location and design options
6/21/2010	Caltrans	SAA meeting—alternative alignments and overall system summary
6/23/2010	Caltrain	SAA meeting—proposed alignments
6/28/2010	City of Gilroy Police and Fire Chiefs	SAA—safety measures related to train operations and stations
6/28/2010	Gilroy Community Open House	SAA—alignment alternatives and station location options
6/28/2010	TWG meeting #3: Gilroy	SAA meeting—alignment alternatives, station location, and design options
7/6/2010	Chowchilla Water District	SAA—district's irrigation distribution system
7/7/2010	CCID	SAA—district's irrigation distribution system
7/7/2010	Panoche Water and Drainage District	SAA—district's irrigation distribution system
7/9/2010	Gilroy Chamber of Commerce Government Relations Committee	SAA—update on project progress and next steps, with focus on the Morgan Hill and Gilroy area
7/13/2010	San Martin Neighborhood Alliance	SAA—project information in the Morgan Hill/San Martin/Gilroy area

Date	Organization/Individual	Topic
7/15/2010	Merced Community Open House	SAA—alignment alternatives and station location options
7/19/2010	Gilroy City Council Study Session	SAA—update to the Mayor and Council about studies conducted in the Gilroy area
7/20/2010	HP Pavilion (now SAP Center)	SAA—update on the status of the San Francisco to San Jose and San Jose to Merced Project Sections' EIR/EIS processes and their interface at Diridon Station
7/21/2010	San Jose Community Open House	SAA—alignment alternatives and station location options
7/22/2010	Merced County Farm Bureau Board of Directors	SAA—project status report and discussion of alternative alignments
7/29/2010	VTA Executive Briefing	SAA—presentation of the alternatives analysis, with a focus on Caltrain service, BART impacts, and Gilroy alignments
8/16/2010	Santa Clara County Roads and Airports and Planning Departments staff	SAA—project status report and discussion of alternative alignments
8/28/2010	Greenbelt Alliance	SAA—project status report and discussion of alternative alignments
8/30/2010	CDFG, NMFS, USFWS	SAA—project status report and discussion of alternative alignments
9/7/2010	Gilroy Chamber of Commerce and Business Association	SAA—Board member Rod Diridon, Sr., gave a presentation on Gilroy area alignment options
9/9/2010	South County Joint Planning Advisory Committee	SAA—South County HSR alternative alignments
9/14/2010	San Jose City Council	SAA—Dan Leavitt presented a statement regarding development of a Cooperative Agreement
9/15/2010	Preserve Our Heritage	Preliminary and Supplemental AA reports
9/17/2010	Diridon Station Joint Policy Advisory Board	Station Area Development principles
9/28/2010	City of Gilroy Administrator Tom Haglund	SAA—project status report and discussion of alternative alignments
10/5/2010	Caltrain	SAA—in-progress 15% plans and proposed relocation of Caltrain/UPRR tracks
10/7/2010	Gene Zanger, property owner	SAA—Property owner meeting in Casa de Fruta/Pacheco Pass area for project status report and discussion of alternative alignments
10/13/2010	VTA	SAA—VTA support in Gilroy station planning
10/14/2010	San Benito County staff/Airport Land Use Commission	SAA—project status report and habitat mitigation plans
10/18/2010	City of Gilroy staff	SAA—impacts on local roads and traffic
10/20/2010	City of Morgan Hill staff	SAA—Design
10/21/2010	Reclamation	SAA—Overview of the corridor focusing on areas that may affect Reclamation facilities

Date	Organization/Individual	Topic
10/27/2010	City of San Jose Department of Transportation	Project status update and preparation for November 4 community town hall meeting
11/3/2010	Morgan Hill City Council Study Session	SAA—project update regarding alignments being studied in Morgan Hill
11/4/2010	City of San Jose Community Town Hall on HSR	SAA—project update and responses to community questions, as well as information on the Cooperative Agreement between the City and Authority
11/17/2010	Santa Clara County Roads & Airports Department staff with City of Morgan Hill and Gilroy staff	SAA—road connections/realignments being proposed related to road closures
11/18/2010	California Society of Professional Engineers, Monterey Bay Branch	SAA—project status report and discussion of alternative alignments
11/18/2010	SCVWD	SAA—alignment alternatives and flood control facilities within Santa Clara County
11/29/2010	SCVWD, USACE	SAA—top of rail profile grade
12/10/2010	Caltrans Districts 4 and 10	SAA—project status report and discussion of alternative alignments
12/10/2010	Santa Clara County Parks Department	SAA—UPRR alignment alternative, US 101–Downtown Gilroy alignment alternative, countywide trails
12/15/2010	Morgan Hill and Gilroy joint HSR task force	SAA—Introduction of Roelof as HSR CEO, discussion of Morgan Hill and Gilroy concerns regarding alignments and station amenities (including parking)
12/16/2010	City of Gilroy staff	SAA—HSR passenger station concepts
12/20/2010	City of Gilroy staff	SAA—project status report and discussion of alternative alignments
12/20/2010	City of Morgan Hill staff	SAA—US 101 to East Gilroy alignment impacts
12/20/2010	Pacheco Pass Property Owners	SAA—alignments studied in the Pacheco Pass
12/22/2010	Caltrans District 4	SAA—I-280/SR 87 aerial structure
12/23/2010	Santa Clara County	SAA—cross-street grade separations through San Martin
12/28/2010	City of Gilroy staff	SAA—grade separations for at-grade HSR alignment option
1/3/2011	City of Morgan Hill staff	SAA—downtown Morgan Hill at-grade vertical profile option
1/4/2011	Caltrans District 10	SAA—encroachments and Caltrans expectations for future documentation
1/14/2011	City of Morgan Hill staff	SAA—road network and proposed modifications
1/14/2011	City of San Jose staff	SAA—plans for the aesthetics and design process
1/14/2011	Gilroy Chamber of Commerce Government Relations Committee	SAA—economic development opportunities and HSR in South Santa Clara County

Date	Organization/Individual	Topic
1/19/2011	Santa Clara County District 1 Supervisor Mike Wasserman, Santa Clara County Roads & Airports Department	SAA—project updates and south county residents' concerns
1/20/2011	Millpond Mobile Homes Community Briefing	SAA—project status report and discussion of alternative alignments
1/25/2011	Morgan Hill and Gilroy joint HSR task force	SAA—Morgan Hill and Gilroy concerns regarding proposed alignments and station amenities (including parking)
1/25/2011	South Santa Clara County Community Engagement Workshop #1, Gilroy	SAA—information on the evolution of the project in south Santa Clara County, including alignment development
1/27/2011	South Santa Clara County Community Engagement Workshop #1, Morgan Hill	SAA—information on evolution of the project in south Santa Clara County, including alignment development
2/17/2011	City of Gilroy staff	SAA—refined HSR passenger station
2/23/2011	City of Morgan Hill staff	SAA—latest downtown Morgan Hill at-grade vertical profile option
3/7/2011	San Jose Visual Design Guidelines CWG North meeting #1	Visual design guidelines being prepared by the Authority and City of San Jose
3/8/2011	Santa Clara County	SAA—latest downtown San Martin at-grade vertical profile option
3/10/2011	San Jose Visual Design Guidelines CWG South meeting #1	Visual design guidelines being prepared by the Authority and City of San Jose
3/14/2011	Campbell United Methodist Church Men's Club	SAA—updates on the statewide project and the San Francisco to San Jose and San Jose to Merced Project Sections
3/22/2011	City of Gilroy staff	SAA—Direction for downtown Gilroy at-grade vertical profile option
3/22/2011	Preserve Our Heritage	Alternative alignments
3/22/2011	South Santa Clara County Community Meeting (hosted by District 1 Supervisor Mike Wasserman)	SAA—information on the HSR project in south county, including the environmental review process, project status, and eminent domain/property acquisition process
3/29/2011	South Santa Clara County Community Engagement workshop #2, Gilroy	SAA—methodology for evaluating sound and visual impacts and approaches to mitigation
3/30/2011	South Santa Clara County Community Engagement workshop #2, Morgan Hill	SAA—methodology for evaluating sound and visual impacts and approaches to mitigation
4/11/2011	San Jose Visual Design Guidelines CWG North meeting #2	HSR visual design guideline process for San Jose
4/14/2011	San Jose Visual Design Guidelines CWG South meeting #2	Visual design guideline process for San Jose
4/22/2011	Morgan Hill and Gilroy mayors	Discussion with Roelof van Ark on Gilroy station area planning process
4/22/2011	Morgan Hill and Gilroy joint HSR task force	Follow-up on proposed alignments and station amenities (including parking)

Date	Organization/Individual	Topic
5/4/2011	Silicon Valley Economic Development Alliance	Project status report and discussion of alternative alignments
5/5/2011	McCarthy Business Park	Project status report and discussion of alternative alignments
5/6/2011	Congresswoman Zoe Lofgren's staff	Discussion of small and Hispanic business opportunities
5/14/2011	San Jose Visual Design Guidelines CWG North and South meeting #3	Visual design guideline process for San Jose
5/17/2011	Preserve Our Heritage	Concerns regarding alignments under evaluation
5/19/2011	Open House, Gilroy Senior Center	SAA, environmental review process, alternative alignments
5/23/2011	San Jose Visual Design Guidelines CWG North meeting #4	
5/25/2011	Open House, Merced Senior Center	SAA, environmental review process, alternative alignments
5/26/2011	San Jose Visual Design Guidelines CWG South meeting #4	Visual design guideline process for San Jose
5/27/2011	Preserve Our Heritage	SR 152 required Caltrans setbacks for HSR and Preserve Our Heritage's proposed alternative paralleling SR 152
6/13/2011	Open House, Los Banos Community Center	SAA, environmental review process, alternative alignments
6/16/2011	South Santa Clara County Community Engagement Workshop #3, Morgan Hill	Review station design and new at-grade alignments
6/23/2011	South Santa Clara County Community Engagement Workshop #3, Gilroy	Review station design and new at-grade alignments
6/24/2011	Preserve Our Heritage	AA—east-west alignment with SR 152 and Preserve Our Heritage's alternative proposed on 5/27/2011
6/25/2011	Silver Leaf Neighborhood Association "Spring Fling/Festival in the Park" community event (booth)	Project overview and alternative alignments
6/28/2011	San Jose Visual Design Guidelines CWG meeting #5	Visual design guideline process for San Jose
7/18/2011	San Jose Visual Design Guidelines CWG meeting #6	Visual design guideline process for San Jose
8/1/2011	TAMC Rail Policy Committee	Update on SAA Report
8/5/2011	Santa Clara County Fair (booth at weekend event 8/5/11-8/7/11)	Project overview and alternative alignments
9/24/2011	Taste of Morgan Hill (booth at two day event 9/24/11-9/25/11)	Project overview and alternative alignments
9/28/2011	City of Gilroy Mayor and staff	Tour in San Carlos
9/29/2011	South Santa Clara County Community Engagement Workshop # 4, Morgan Hill	Review station design and alignments

Date	Organization/Individual	Topic
10/11/2011	South Santa Clara County Community Engagement Workshop # 4, Gilroy	Review station design and alignments
11/7/2011	Gilroy Unified School District staff	Statewide HSR program, key documents and milestones, alignment maps, vertical and horizontal alignments under consideration
11/7/2011	Spanish-speaking group, San Jose	Project overview and alternative alignments
12/8/2011	San Jose Town Hall	Project updates, visual design guidelines, findings from evaluation of a modified tunnel option
1/9/2012	Joint San Jose to Merced/Merced to Fresno Stakeholder Meeting, Chowchilla	Preferred alignment approved by the HSR Board, potential impacts, project teams
1/17/2012	Gilroy South County Sunrise Rotary	Environmental review process and alternative alignments
1/26/2012	Salinas Valley Chamber of Commerce	Environmental review process and alternative alignments
3/27/2012	Policy aides for Supervisor Ken Yeager of Santa Clara County	Environmental review process and alternative alignments
4/23/2012	Morgan Hill and Gilroy City Managers Tom Haglund and Ed Tewes	Environmental review process and alternative alignments
4/25/2012	Kevin Maitski, Santa Clara County Supervisor Wasserman's office	Environmental review process and alternative alignments
4/26/2012	Quarterly TWG Meeting (webinar)	Environmental review process and alternative alignments
5/16/2012	Caltrans NAAC	HSR program update and tribal involvement overview
5/16/2012	San Jose Chamber of Commerce	Environmental review process and alternative alignments
5/18/2012	San Jose Chamber of Commerce	Environmental review process and alternative alignments
6/9/2012	Silver Leaf Neighborhood Association/Spring Fling Festival (booth)	Environmental review process and alternative alignments
6/11/2012	Meeting with Environmental Groups, San Jose	Environmental review process and alternative alignments
6/13/2012	Caltrans NAAC	HSR program update and tribal involvement overview
6/13/2012	NAHC	Overview and status of the HSR program and tribal involvement were presented to commissioners and public
6/15/2012	Diridon Station Joint Policy Advisory Board	Environmental review process and alternative alignments
6/28/2012	Kevin Maitski, Santa Clara County Supervisor Wasserman's office	Environmental review process and alternative alignments
6/28/2012	Local Agency Formation Commission of Santa Clara County	Environmental review process and alternative alignments

Date	Organization/Individual	Topic
6/29/2012	San Jose Chamber of Commerce	Environmental review process and alternative alignments
7/25/2012	Bay Area Council, Silicon Valley Leadership Group, and San Mateo County Economic Development Association	Environmental review process and alternative alignments
8/1/2012	Caltrans NAAC	HSR statewide project presentation at Quarterly NAAC meeting—HSR program update and tribal involvement overview
8/15/2012	Quarterly TWG meeting (webinar)	Project updates including environmental review process and Central Valley Wye
9/5/2012	Holsclaw Road meeting with historical society, local tribal members, and Holsclaw Road residents, Gilroy	Holsclaw Road options
9/20/2012	San Martin Stakeholder Meeting	Environmental review process and alternative alignments
11/16/2012	Diridon Station Joint Policy Advisory Board	Environmental review process and alternative alignments
12/6/2012	Morgan Hill Unified School District staff	Statewide HSR program, key documents and milestones, alignment maps, vertical and horizontal alignments under consideration
12/21/2012	Santa Clara County Supervisor Wasserman, policy aide Kevin Maitski, and Dawn Cameron	County roads
1/24/2013	Gilroy Mayor Don Gage and City Manager Tom Haglund	Environmental review process, alternative alignments, Gilroy station planning
2/4/2013	TAMC Rail Policy Committee	Status of Central Valley bids, coordination with TAMC, local community outreach
2/4/2013	TAMC staff meeting	Environmental review process, alternative alignments, Gilroy station planning, and TAMC rail projects. Status of Central Valley bids, coordination with TAMC, and local community outreach
2/7/2013	San Benito Council of Government	Environmental review process and alternative alignments
2/8/2013	Caltrain Electrification Team	Caltrain coordination
2/12/2013	Congressman Jeff Denham's staff	Environmental review process, alternative alignments, and ACE project
2/13/2013	Bay Area/MTC Peninsula Working Group	Environmental review process and alternative alignments
2/13/2013	International Right of Way Agents (East Bay Chapter)	Environmental review process and alternative alignments
2/14/2013	California State Rail Plan Open House (information table)	Environmental review process and alternative alignments

Date	Organization/Individual	Topic
2/15/2013	ACE and Capitol Corridor representatives	Environmental review process and alternative alignments
2/16/2013	United Architects of the Philippines	Environmental review process and alternative alignments
2/19/2013	VTA staff	Environmental review process, alternative alignments, and San Jose Diridon Station planning
2/28/2013	Mineta Transportation Institute Student Group	Environmental review process and alternative alignments
3/4/2013	Caltrain Electrification Scoping Meeting	Discuss and receive public comments for the Caltrain Modernization Program, which would be compatible with future HSR blended service
3/20/2013	Caltrans NAAC	Presentation at the Caltrans Quarterly NAAC meeting providing an update on tribal involvement, status of the HSR project
3/20/2013	MTC Commissioner & Santa Clara County Supervisor Dave Cortese	Role of MTC and HSR blended system
4/3/2013	International Right-of-Way Agents Association, San Jose Chapter	Environmental review process and alternative alignments
4/12/2013	City of Gilroy (Tripousis, Mason, Naor, Gimpel)	Environmental review process and alternative alignments
5/1/2013	Dos Palos cotton gin	Potential relocation of cotton gin
5/1/2013	Lower San Joaquin Levee District	Section 408 permitting and infrastructure impacts
5/8/2013	Caltrans NAAC	Presentation at the Caltrans Quarterly NAAC meeting providing an update on tribal involvement, status of the HSR project
6/11/2013	South Bay Transportation Officials Association	Environmental review process and alternative alignments
7/31/2013	Caltrans NAAC	Presentation at the Caltrans Quarterly NAAC meeting providing an update on tribal involvement, status of the HSR project
8/2/2013	Caltrain	2018 Unified Service Modeling
8/20/2013	UPRR	Environmental review process and alignments between San Jose, Gilroy, and Stockton
10/23/2013	Caltrans NAAC	Authority Small Business Advocate, Robert Padilla, gave a presentation about Small/Disadvantaged Business and employment opportunities on the HSR project
11/12/2013	USEPA and USACE (teleconference)	Checkpoint B documents
11/26/2013	USEPA and USACE (teleconference)	Socioeconomic issues associated with Checkpoint B
12/3/2013	USEPA and USACE (teleconference)	Responses to agency comments on Checkpoint B
1/17/2014	California NAHC	HSR program update made at quarterly meeting
3/12/2014	Caltrans NAAC	Update/status of the HSR project for NAAC members

Date	Organization/Individual	Topic
5/28/2014	Caltrans NAAC	Update/status of the HSR project for NAAC members
8/27/2014	Caltrans NAAC	Update/status of the HSR project, systemwide overview of the project
10/17/2014	Caltrans NAAC	Presentation to the Commissioners of the NAHC during public session of their quarterly meeting
11/12/2014	Caltrans NAAC	Overview and update of the HSR program
11/19/2014	San Jose to Merced Project Section Agency Tour	Alignment tour
2/18/2015	Caltrans NAAC	Overview and update of the HSR program
5/13/2015	Caltrans NAAC	Overview and update of the HSR program
8/12/2015	Caltrans NAAC	Overview and update of the HSR program
9/15/2015	San Jose Open House	Alignment alternatives, blended system, planning, environmental review
9/23/2015	Morgan Hill Open House	Alignment alternatives, blended system, planning, environmental review
11/18/2015	Caltrans NAAC	Overview and update of the HSR program
12/17/2015	City of San Jose Planning Department, San Jose Historical Landmarks Commission	Best practices regarding historic preservation
2/9/2016	San Jose Mayor Liccardo	Diridon Station planning
3/9/2016	Caltrans NAAC	Overview of HSR program and status update/schedule of various project sections
3/28/2016	San Jose–Morgan Hill TWG	Purpose of TWG, presentation on 2016 Business Plan, updates on HSR statewide and project section, Q&A
3/29/2016	Gilroy TWG	Purpose of TWG, presentation on 2016 Business Plan, updates on HSR statewide and project section, Q&A
4/12/2016	San Jose CWG	CWG roles, membership, and responsibilities; presentation on 2016 Business Plan; updates on HSR statewide and Project Section; Q&A
4/13/2016	NorCal Legislative Briefing	Briefing covering awareness of the San Francisco to San Jose and San Jose to Merced Project Sections and San Francisco to San Jose section scoping notification
4/14/2016	Morgan Hill–Gilroy CWG	CWG roles, membership, and responsibilities; presentation on 2016 Business Plan; updates on HSR statewide and Project Section; Q&A
4/15/2016	San Jose Walking Tour	Alignment tour
4/18/2016	Los Banos CWG	CWG roles, membership, and responsibilities; presentation on 2016 Business Plan; updates on HSR statewide and Project Section; Q&A
5/3/2016	VTA Meet the Primes, San Mateo	Briefing covering awareness of the San Francisco to San Jose and San Jose to Merced Project Sections and San Francisco to San Jose section scoping notification

Date	Organization/Individual	Topic
5/10/2016	City of San Jose	Development of alternatives in the San Jose area
5/16/2016	Los Banos Open House	HSR statewide overview, San Francisco to San Jose and San Jose to Merced project section updates, environmental review process, right-of-way and permission-to-enter, community involvement
5/17/2016	San Jose Open House	HSR statewide overview, San Francisco to San Jose and San Jose to Merced project section updates, environmental review process, right-of-way and permission-to-enter, community involvement
5/19/2016	Gilroy Open House	HSR statewide overview, San Francisco to San Jose and San Jose to Merced project section updates, environmental review process, right-of-way and permission-to-enter, community involvement
6/1/2016	Morgan Hill City Council	Environmental review process and alternatives refinement
6/6/2016	City of San Jose Transportation and Environment Committee Meeting	San Jose to Merced Project Update: Alignment discussion
6/6/2016	San Jose–Gardner Community Open House	HSR statewide overview, San Jose to Merced project section updates, Diridon station planning, environmental review process
6/7/2016	City of Morgan Hill	Development of alternatives in Morgan Hill Area, including East of UPRR, the Monterrey Viaduct alternative, and the various alternatives along US 101
6/7/2016	San Jose City Council District 6	Environmental review process and alternatives refinement
6/8/2016	City of San Jose	Environmental review process and alternatives refinement in the San Jose area
6/10/2016	Caltrain Blended Infrastructure Working Group	Environmental review process updates and San Francisco to San Jose project scoping
6/10/2016	San Jose Mayor Sam Liccardo and Carl Guardino, Silicon Valley Leadership Group	Environmental review process, alternatives refinement, station planning in the San Jose area
6/13/2016	Santa Clara VTA Event	Small business outreach event
6/14/2016	International Transportation and Health Conference	Project update, milestones and next steps
6/14/2016	South Bay Transportation Officials Association (SBTOA)	Presentation on HSR program, Q&A
6/15/2016	City/County Staff Coordinating Group	Caltrain electrification, HSR project status, state funding update
6/17/2016	Diridon Station Joint Policy Advisory Board	Project update, milestones and next steps
6/20/2016	Congresswoman Zoe Lofgren	Project update and overview of alternatives
6/22/2016	City of San Jose Staff	Development of alternatives in the San Jose area

Date	Organization/Individual	Topic
6/23/2016	City of Gilroy Staff	Development of alternatives in the Gilroy area
6/23/2016	City of Morgan Hill staff	Development of alternatives in the Morgan Hill area
6/24/2016	Caltrain Blended Infrastructure Working Group	Ridership forecasting, station design, curve modifications, environmental review process
6/30/2016	Morgan Hill Downtown Visioning Summit	Information table to collect comments and provide information on statewide program and Project Section
7/5/2016	Merced County District 5 Supervisor Jerry O'Banion	Project update and overview of alternatives
7/13/2016	City of San Jose	Development of alternatives in the San Jose area
7/13/2016	Grassland Water District	Reimbursement agreement and impacts on biological resources, including waterfowl
7/14/2016	City of Morgan Hill	Development of alternatives in the Morgan Hill area
7/18/2016	General Services Administration	Project definition and environmental review process
7/20/2016	Peninsula City Managers Meeting	General briefing on project scope
7/20/2016	Sons in Retirement Branch 32	Environmental review process and alternatives refinement
7/22/2016	Caltrain Blended Infrastructure Working Group	Joint safety/security working group report, status of HSR environmental schedule, station footprints, Caltrain permission-to-enter concerns, curve modifications, passing tracks, curve straightening, station planning
7/23/2016	Small Business Event	HSR presentation and certification session for small and disadvantaged businesses
7/26/2016	Silicon Valley Business Journal event	Project update, milestones and next steps
7/27/2016	City of Gilroy	Scope of work and status of the station area planning effort
7/27/2016	City of San Jose	Development of alternatives in the San Jose area
7/28/2016	Caltrain/Transbay Joint Powers Authority	Coordination efforts
7/28/2016	Capitol Corridor	Diridon operations coordination
7/28/2016	Transportation Authority of Monterey County	Coordination of future rail service to Gilroy
8/2/2016	City of Morgan Hill	Development of alternatives in the Morgan Hill area
8/2/2016	Congresswoman Zoe Lofgren	Project briefing
8/5/2016	City of Gilroy	Status of station area planning
8/5/2016	Diridon/JPA Management Meeting	Attended public meeting to hear items related to future of Diridon Station
8/9/2016	Gilroy–Los Banos TWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/10/2016	City of San Jose	Development of alternatives in the San Jose area

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8/11/2016	Gilroy–Morgan Hill CWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/17/2016	San Jose CWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/17/2016	San Jose–Morgan Hill TWG	Updates on Project Section and public outreach activities, discussion on community priorities exercise, "Walk the Corridor"
8/18/2016	Reclamation	Status of the alternatives crossing the San Luis Reservoir
8/20/2016	Gardner Flea Market, San Jose	Information table to collect comments and provide information on HSR
8/23/2016	City of San Jose	Development of alternatives in the San Jose area
8/23/2016	Small Business Workshop, Menlo Park	HSR presentation and certification session for small and disadvantaged businesses
8/24/2016	City of Morgan Hill	Development of alternatives in the Morgan Hill area
8/24/2016	City of San Jose	Development of alternatives in the San Jose area
8/31/2016	Diridon Communications Working Group	Develop messaging strategies for public outreach
9/7/2016	Morgan Hill Community Presentation	Update on development of alternatives in the Morgan Hill area
9/8/2016	Diridon Station Full Group Working Meeting	Information exchange with agency partners on parking, station area planning, outreach and infrastructure planning
9/9/2016	City of San Jose	Development of alternatives in the San Jose Area, including at-grade, aerial, and tunnel alternatives at Diridon Station
9/12/2016	Gilroy City Council	Project update to City Council
9/13/2016	City of San Jose Councilmember Ash Kalra, City of San Jose staff Ray Salvano and Stacey Lu	Monterey Highway community outreach
9/13/2016	Gilroy Downtown Business Association	Project update presentation
9/14/2016	City of San Jose	Development of alternatives in the San Jose area
9/18/2016	Viva CalleSJ	Information table to collect comments and provide information on HSR
9/20/2016	Morgan Hill Downtown Business Association	Presentation
9/21/2016	City of San Jose	Development of alternatives in the San Jose area
9/27/2016	Morgan Hill Community Meeting with City officials and the public	Updates on statewide HSR program, 2016 Business Plan, Project Section focus on Morgan Hill/Gilroy area, opportunity to provide written comments
9/28/2016	City of San Jose	Development of alternatives in the San Jose area

Date	Organization/Individual	Topic
10/5/2016	California State Assemblymember Evan Low and staff	Update on the Project Section and a schedule update
10/5/2016	San Jose City Council member Raul Peralez	Update on the Project Section and a schedule update
10/5/2016	Southern Pacific Retired Executives Club	Environmental review process, alternatives refinement, and station planning, Q&A
10/6/2016	California State Senator Jim Beall	Project update and overview of alternatives
10/7/2016	Diridon/JPA	Project update at management meeting
10/11/2016	Rail~Volution	Walking tour of Diridon Station area
10/12/2016	Rail~Volution conference	Environmental review process, alternatives refinement, station planning
10/13/2016	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #1: Orientation to the Species Working Group, Species Modeling Methods memo, initial list of species to be included in BA/Section 2081 permit
10/13/2016	Willow Glen Neighborhood Association	Development of alternatives in the San Jose area
10/19/2016	City/County Staff Coordinating Group	Caltrain electrification, HSR project status, State funding update
10/20/2016	City of Gilroy	Gilroy station planning and alignment alternatives
10/20/2016	Gilroy Eliot School Community Meeting	Environmental review process and alternatives refinement in the Gilroy area
10/24/2016	Resource agencies: FRA, CDFW, DWR, SWRCB, NMFS, STB, USACE, USEPA, USFWS	Alignment tour
10/25/2016	City of San Jose Staff Working Group	Station Area Planning funding agreements with City of San Jose and VTA
10/25/2016	SPUR Presentation	HSR statewide program overview, Northern California section updates, small business program
10/27/2016	Office of San Jose Councilmember Ash Kalra and members of the public	Project and schedule update for Monterey Road community members
10/27/2016	USFWS	Permitting needs and various project features
10/28/2016	Caltrain Corridor Engineering	Meeting with Caltrain engineering staff
11/8/2016	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #2: Revisions to the Species Modeling Methods memo and Data Integration memo, review agency comments and responses from October 13, 2016 meeting
11/9/2016	City of San Jose	Development of alternatives in the San Jose area
11/9/2016	Gilroy Station Area Planning Citizens Advisory Committee	Gilroy station area planning
11/10/2016	Morgan Hill Mayor Steve Tate	Alignment alternatives through Morgan Hill
11/10/2016	Pacheco Pass landowners	Permit-to-enter process and geotechnical investigations

Date	Organization/Individual	Topic
11/14/2016	Community leaders in Eliot School Neighborhood, City of Gilroy staff, and Gilroy residents and business owners	Community outreach strategies for downtown Gilroy
11/15/2016	Santa Clara County Board of Supervisors	Updates on statewide program and San Jose to Merced Project Section focusing on unincorporated areas of Santa Clara County, Q&A
11/16/2016	Caltrans NAAC	HSR program updates
11/16/2016	Morgan Hill City Council Meeting	Authority staff provided a project update and discussed concerns from the City Council
11/16/2016	San Jose State University, regional transportation planning class	Updates on statewide program, San Francisco to San Jose and San Jose to Merced Project Sections, Q&A
11/18/2016	#iwillride students from University of California at Berkeley, California State University Fresno, and Fresno City College	Overview of the engineering, environmental and outreach efforts for the statewide program
11/22/2016	City of San Jose	Monterey Corridor project features
11/29/2016	California State Senator Bill Monning	Project update
11/29/2016	Edenvale Public Library, San Jose	Informational table with handouts about HSR statewide program, alignments in the local area, Q&A
12/6/2016	Walnut Grove neighborhood group	Updates on statewide program; ROW acquisition and compensation
12/7/2016	City of San Jose Staff Working Group	Project update, coordinate scope of station area planning funding agreements
12/7/2016	Edenvale Great Oaks Plan Implementation Coalition, Monterey Road (San Jose) community members	Updates on statewide program and San Jose to Merced Project Section, Q&A
12/8/2016	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #3: Unresolved comments on Species Modeling Methods memo, species model description format, tutorial on use of Data Basin to view species models
12/9/2016	City of San Jose Staff	Caltrain blended infrastructure
12/15/2016	San Jose Mayor Sam Liccardo	Diridon Station and Monterey Road alternatives
12/15/2016	San Martin community meeting	Statewide program, 2016 Business Plan, Project Section, Q&A
12/16/2016	California Department of Fish and Wildlife	Project updates
12/16/2016	San Jose Diridon Joint Policy Advisory Board Meeting	Project update, coordinate scope of station area planning funding agreements
12/19/2016	Gilroy Public Library	Information table to collect comments and provide information on the statewide program and local alignment alternatives
12/21/2016	City of San Jose Staff Working Group	Monterey corridor alignment alternatives

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12/21/2016	Pajaro River Watershed Flood Prevention Authority	Permitting requirements, flood plain modeling, mitigation strategies
1/17/2017	Councilmember Sergio Jimenez	Monterey corridor
1/17/2017	Gilroy City Council Study Session	Project alternatives
1/19/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS (two day event 1/19/17-1/20/17)	Species Working Group meeting #4: Workshop to review species models and model descriptions
1/20/2017	Gilroy Unified School District	Project update, impacts on schools
1/20/2017	San Jose SAP Center	Project update, alternatives development in San Jose
1/20/2017	Reclamation	Project coordination
1/23/2017	Congresswoman Zoe Lofgren's staff	Project briefing
1/23/2017	San Jose CWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section, Q&A
1/23/2017	San Jose–Morgan Hill TWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section
1/25/2017	City of San Jose	Development of alternatives in San Jose area, including review of At-Grade Diridon—East Expansion, Monterey Road, and North of Diridon
1/26/2017	Gilroy Sons in Retirement	Statewide program update, Project Section, outreach update
1/26/2017	Gilroy-Los Banos TWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section, Q&A
1/26/2017	Morgan Hill–Gilroy CWG	Updates on statewide program, community priorities exercise, range of alternatives for Project Section, Q&A
1/27/2017	UPRR	Review of proposed environmental documents
1/31/2017	City of San Jose	Development of alternatives in the San Jose area
1/31/2017	FRA	Alignment tour
2/1/2017	International Right-of-Way Association (San Jose)	Project update, milestones and next steps
2/1/2017	Seven Trees Neighborhood Association	Updates on statewide program, Project Section, range of alternatives, Q&A
2/2/2017	County of Santa Clara–San Martin Community Meeting	Project update, milestones and next steps
2/3/2017	Diridon Technical Advisory Group	Project update, milestones and next steps
2/4/2017	Los Paseos Neighborhood Association Community Meeting	HSR statewide overview, Project Section update, Los Paseos neighborhood concerns, upcoming community outreach activities
2/8/2017	City of San Jose	Development of alternatives in the San Jose area
2/9/2017	Caltrans District 10	Project update, milestones and next steps

Date	Organization/Individual	Topic
2/9/2017	Santa Clara County Staff, including Roads, Parks, Planning, and Airport Departments	Impact of project on County facilities
2/9/2017	Santa Clara Joint Planning Advisory Committee	Statewide program update, project section update, community priorities review, outreach update
2/13/2017	Gardner Neighborhood Association	Updates on statewide program, Project Section range of alternatives for the proposed Diridon Station approach and the Gardner area, community outreach
2/13/2017	VTA/BART Phase II Open House	Information table
2/17/2017	Reclamation Working Group	Romero Ranch realignment
2/21/2017	City of Gilroy staff	Gilroy Station and alignment through downtown Gilroy
2/22/2017	City of San Jose staff Working Group	Alignment options in the San Jose area
2/23/2017	Caltrain staff	Environmental review process, alternatives refinement, station planning
2/23/2017	Caltrans District 4	Updates on statewide program and San Francisco to San Jose and San Jose to Merced Project Sections
2/23/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #5: Review agency comment responses, revisions to models and model descriptions
2/23/2017	VTA/BART	Discussion of potential impacts on BART alignment
2/24/2017	CDFW Central Region	Webinar to discuss HSR footprints between San Jose and Carlucci Road
3/8/2017	City of Gilroy	Alignment review, project coordination, schedule discussion
3/8/2017	Goodyear-Mastic Neighborhood Association	Project updates and range of alternatives
3/9/2017	Caltrans District 10	Alignment review and project update
3/10/2017	Gilroy Chamber of Commerce	Project briefing, construction impacts
3/10/2017	Small Business Workshop	HSR presentation and certification session for small and disadvantaged businesses
3/14/2017	Henry Miller Reclamation District, San Joaquin Valley Landowners	San Joaquin Valley PTE landowner meeting
3/14/2017	NorCal FRA Check-In	Engineering and environmental check-in
3/14/2017	Old Quad Residents Association	Updates on statewide program, range of alternatives for San Francisco to San Jose and San Jose to Merced Project Sections, Q&A
3/18/2017	San Jose District 2 including Mayor Liccardo, Councilmember Sergio Jimenez, city staff, and residents	Safety, noise, traffic impacts on Monterey Road; tunneling/trenching through San Jose; potential construction of a commuter lane on Monterey Road
3/22/2017	City of San Jose Staff Working Group	Monterey Road alignment review
3/23/2017	Caltrans District 4	Affected structures in Caltrans ROW; design exceptions

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3/24/2017	CDFW	Title transfers
3/24/2017	City of San Jose	Planning for additional outreach and CWG meetings
3/28/2017	Northern California Legislative Briefing with representatives of federal and state officials	Updates on statewide program, range of alternatives for both San Francisco to San Jose and San Jose to Merced Project Sections, Q&A
3/29/2017	Los Paseos/Metcalf Neighbors	Project update, environmental review schedule, review of alternatives
3/30/2017	San Jose City Council Study Session	Project update, milestones and next steps
4/6/2017	Gilroy Public Library	Information tables to collect comments and provided information on the HSR project
4/7/2017	BART staff	Design discussion including Newhall Yard area for both short and long viaducts, Diridon Station area, and Caltrain stations south of Tamien
4/11/2017	SCVWD	Hydrological resources
4/12/2017	City of Gilroy staff	Alternatives and potential impacts
4/12/2017	City of San Jose Staff Working Group	Alignment options including Monterey Road underground options and at-grade alignments at Diridon Station
4/13/2017	Caltrans District 10	Discussion of Los Banos Bypass and potential traffic impacts
4/17/2017	Arteaga's Food Center	Information tables to collect comments and provide information on HSR
4/18/2017	Gilroy Open House, Irmandade da Festa do Divino Espirito Santo Lodge	Project updates, range of alternatives, environmental update, maps of alignments, opportunities to ask questions and provide comments
4/18/2017	Reclamation	Tour of and alignment considerations for: San Luis Wasteway; San Luis Drain; Delta Mendota Canal; roadside stop (sectionalizing valve); conduit
4/20/2017	San Jose Open House, Southside Community Center	Project updates, range of alternatives, environmental update, maps of alignments, opportunities to ask questions and provide comments
4/20/2017	SPUR	Diridon Station options and their impacts
4/21/2017	Morgan Hill Unified School District	Alignment through Morgan Hill, impacts on school facilities
4/25/2017	Geotechnical and Tunneling Advisory Group	Pacheco Pass-San Joaquin Valley tour
4/25/2017	Los Banos Open House, Los Banos Community Center	Project updates, range of alternatives, environmental update, maps of alignments, opportunities to ask questions and provide comments
4/25/2017	NorCal FRA Check-In	Engineering and environmental check-in, status of project definition, agency coordination, review of updated schedule
4/25/2017	Reclamation	Alignment tour

Date	Organization/Individual	Topic
4/26/2017	City of San Jose Staff Working Group	Alignment options, including scheduling a meeting focused on tunnel option, potential cross-overs from Monterey Road to US 101 (at Blossom Hill and SR-85), HSR outreach process
4/26/2017	Santa Clara County staff	Engineering design and alignment options through Santa Clara County
4/27/2017	Caltrans District 4	Meeting to identify the Caltrans Environmental Oversight team and receive early assessment of Caltrans comments and early information related to environmental review
4/28/2017	TransportCA at Mineta Transportation Institute	Authority staff participated in panel discussing Transportation and Triple Bottom Line at Mineta Transportation institute
5/1/2017	Morgan Hill Open House, Morgan Hill Community and Cultural Center	Updates on project, range of alternatives, status of environmental clearance, environmental issues under study, roll-out maps of alignments, opportunities to ask questions and provide written or verbal comments
5/2/2017	NMFS	Fish and Aquatic Resources Working Group meeting #1: Project status to date, project schedule, informal consultation process, review of draft steelhead model
5/3/2017	City of San Jose staff	Public outreach
5/5/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #6: species impact analysis approach, Wildlife Corridor Assessment Focal Species Selection memo
5/8/2017	San Jose City Council	Diridon Station tunnel alternatives
5/9/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day lookahead for San Francisco to San Jose and San Jose to Merced Project Sections
5/10/2017	City of San Jose staff	Public outreach
5/10/2017	City of San Jose Staff Working Group	Cost estimate for Monterey Road, including viaduct, cut/cover, and bored tunnel options
5/11/2017	Caltrans District 10 and California Highway Patrol	Weigh station along I-5, impacts of noise and vibration on the scales
5/11/2017	Central Valley Mitigation Stakeholders including Grasslands Water District	Presentation of alignment alternatives, regional habitat conservation priorities and mitigation
5/17/2017	City of San Jose staff	Public outreach
5/22/2017	UC Berkeley Symposium	Update on the statewide program
5/23/2017	NorCal FRA Check-In	Status of project definition, agency coordination, and schedule
5/24/2017	City of Gilroy staff	PEPD Station design including Downtown Gilroy Station and East Gilroy Station
5/24/2017	City of San Jose staff	Public outreach

Date	Organization/Individual	Topic
5/24/2017	Morgan Hill City Council meeting	Updates on statewide program, range of alternatives for Morgan Hill to Gilroy Subsection, Q&A
5/24/2017	NorCal FRA/Resource Agency Coordination	Update on technical deliverables
5/24/2017	SCVWD	Irrigation access workshop focused on SCVWD facilities, primarily conduits/pipelines extending from Pacheco Pass to San Jose and pipeline failures
5/25/2017	VTA/BART	Phase II coordination, including project updates and Newhall Yard area
5/31/2017	City of San Jose staff	Public outreach
5/31/2017	San Jose CWG	Range of alternatives, environmental review process, input from CWG members on topic areas where more information is needed and areas for improved communications
5/31/2017	SLDMWA, San Benito County Water District, CCID, Henry Miller Reclamation District	Irrigation access workshop: SLDMWA, CCID, and Henry Miller Reclamation District facilities along Henry Miller Road and SBCWD interface at Casa de Fruta
6/1/2017	Diridon Intermodal Working Group	Station access memoranda
6/7/2017	City of San Jose staff	Public outreach
6/13/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day look-ahead for San Francisco to San Jose and San Jose to Merced project sections, coordination on process for sharing preliminary 4(f) results for San Jose to Merced Project Section
6/14/2017	City of San Jose staff	Public outreach
6/14/2017	City of San Jose Staff Working Group	Communication protocols, Monterey Corridor cost estimate and alternatives, Diridon At-Grade—East Expansion Exhibit, PEPD, and Hedding St. bridge
6/14/2017	Central Valley Mitigation Stakeholders including USFWS, Defenders of Wildlife, Audubon Society, The Nature Conservancy, Ducks Unlimited, Grasslands Water District, California Waterfowl, USDA, and Environmental Defense Fund	Regional conservation efforts and mitigation priorities
6/15/2017	NMFS	Fish and Aquatic Resources Working Group meeting #2: Meeting schedule, Steelhead and Chinook Salmon Habitat Suitability memo, steelhead species model
6/15/2017	SAP Center	Project update, Diridon Station development opportunities, impacts on SAP Center parking
6/20/2017	FRA and USDOT	Tour of alignment and discussion of HSR history and outreach

Date	Organization/Individual	Topic
6/21/2017	Central Valley Mitigation Stakeholders including USFWS, Defenders of Wildlife, Audubon Society, The Nature Conservancy, Ducks Unlimited, Grasslands Water District, California Waterfowl, USDA, Point Blue, and Environmental Defense Fund	Avian protection measures
6/21/2017	City of San Jose staff	Public outreach
6/21/2017	Megaregional Rail Leadership Workshop hosted by Capitol Corridor JPA	Project update, milestones and next steps
6/22/2017	VTA and City of San Jose	VTA needs for running bus service and roadway options along Monterey Road, City of San Jose shared the 100-ft boulevard concept
6/22/2017	VTA/BART	Phase II coordination, including project updates on proposed staging and alternative concepts, and VTA on Newhall Yard area
6/24/2017	Morgan Hill City Council Meeting	Alignment alternatives, community impacts, ROW compensation
6/27/2017	NorCal FRA Check-In	Status of project definition, agency coordination, and 90-day look-ahead for San Francisco to San Jose and San Jose to Merced project sections, review agenda and presentation for next monthly resource agency coordination meeting
6/27/2017	SPUR: How Should High-Speed Rail Travel Through San Jose	Alignments through San Jose and Diridon station
6/28/2017	City of San Jose Staff Working Group	City's request for 100-ft Monterey Road cross section, anticipated ROW requirements for at-grade and aerial alternatives, status of HSR traffic analysis, City comments on the PEPD of City facilities
6/28/2017	NorCal FRA/Resource Agency Coordination	Update on technical deliverables, wildlife crossing overview
6/30/2017	Pacific Gas & Electric	Traction power
6/30/2017	San Jose Councilmember Jimenez	Tunnel and aerial alignments and underground stations
7/7/2017	City of San Jose staff	Public outreach
7/10/2017	City of Gilroy	Conceptual alignments adjacent to US 101
7/11/2017	Morgan Hill Unified School District—teleconference/webinar	Alignment options and impacts on Morgan Hill schools: Enical School, Ann Sobrato High, Barrett Elementary School, and San Martin/Gwinn Elementary School
7/12/2017	City of San Jose staff	Public outreach
7/12/2017	San Jose CWG	Project Section updates, environmental process and evaluation criteria, range of alternatives for Monterey Corridor subsection

Date	Organization/Individual	Topic
7/15/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #7: Project footprint and wildlife corridor analysis
7/19/2017	City of San Jose staff	Public outreach
7/19/2017	Gilroy Community & Neighborhood Revitalization Committee	Updates on Statewide Program, environmental process and evaluation criteria, range of alternatives for Monterey Corridor subsection, future meeting dates and topics, Q&A
7/20/2017	San Martin Neighborhood Alliance	Updates on Project Section, range of alternatives for Morgan Hill to Gilroy subsection, responses to questions submitted to Authority prior to meeting
7/25/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day lookahead for San Francisco to San Jose and San Jose to Merced Project Sections, San Jose to Merced Checkpoint B Addendum process, environmental review process, alternatives refinement, and station planning
7/26/2017	City of San Jose staff	Public outreach
7/27/2017	Caltrans District 4	Traffic impacts along Monterey Road, design exceptions at I-280/SR 87
7/28/2017	SPUR: Urban Innovation Council—Silicon Valley	San Jose State University's expanding campus
8/1/2017	Senator Jim Beall	Central Valley construction tour
8/2/2017	City of Gilroy staff	US 101 alignments
8/2/2017	City of Morgan Hill staff	Reviewed Project Schedule and Draft PEPD plans
8/2/2017	City of San Jose staff	Public outreach
8/2/2017	San Jose CWG	Project Section updates, range of alternatives for the San Jose downtown/Diridon subsection, and review of Hwy 101 alignment elimination
8/2/2017	SPUR Study Tour	Diridon station tour, project integration
8/7/2017	NMFS	Fish and Aquatic Resources Working Group meeting #3: Effects matrix for steelhead, sprint-run Chinook salmon, fall-run Chinook salmon, essential fish habitat
8/8/2017	NorCal FRA Check-In	San Jose to Merced Checkpoint B Addendum comment backcheck, environmental review process, alternatives refinement, station planning
8/9/2017	CCID and Henry Miller Reclamation District	Irrigation access workshop with an overview of design updates in consideration of maintenance access for Henry Miller Reclamation District and CCID facilities
8/9/2017	City of San Jose staff	Public outreach
8/9/2017	City of San Jose Staff Working Group	City generated at-grade alignment concept
8/10/2017	Caltrans District 10	I-5 weigh station and Caltrans initiation of the Draft PEPD
8/16/2017	CDFW Region 3, CDFW Region 4, CDFW HCP Branch, USFWS	Species Working Group meeting #8: Short project description, BA outline, wildlife corridor analysis

Date	Organization/Individual	Topic
8/16/2017	City of San Jose staff	Public outreach
8/22/2017	NorCal FRA Check-In	Status of project definition, agency coordination, and 90-day lookahead for FJ and JM project sections, JM Checkpoint B Addendum Workshop logistics, Environmental review process, alternatives refinement, and station planning
8/23/2017	City of San Jose staff	Public outreach
8/23/2017	NorCal FRA/Resource Agency coordination: CDFW, SGC, STB, USACE, Reclamation, and USEPA	Update on technical report deliverables, NEPA assignment status
8/29/2017	NMFS	Fish and Aquatic Resources Working Group meeting #4: Short project description, BA outline, preliminary compensatory mitigation plan outline, effects matrix for steelhead
8/29/2017	Santa Clara County Board of Supervisors	Approach to Diridon Station, project updates, schedule
8/30/2017	City of Gilroy staff	Alignment alternatives, including US 101
8/30/2017	City of San Jose staff	Public outreach
8/30/2017	Grasslands Water District	Project Section updates, discussion of Draft PEPD in relation to district facilities
8/30/2017	San Jose CWG	Permission-to-enter and ROB processes, construction mitigation, noise impacts, next steps
9/6/2017	City of San Jose staff	Public outreach
9/6/2017	City of San Jose Staff Working Group	Details of City-generated at-grade alignment concept
9/7/2017	Caltrans District 4	Draft PEPD and tunnel construction assumptions
9/8/2017	Caltrain/VTA coordination meeting	Newhall Yard, review of VTA-owned stations, environmental review process, alternatives refinement, station planning
9/9/2017	United Neighborhoods of Santa Clara County Neighborhood Development Conference	San Jose to Merced Project Section and statewide updates
9/11/2017	Senter Monterey Neighborhood Association	Noise, commute, houses, and other impacts along Monterey Road
9/11/2017	Silicon Valley Chamber Coalition	Small business program update
9/12/2017	NorCal FRA Check-In	Status of project definition, agency coordination, 90-day lookahead for San Francisco to San Jose and San Jose to Merced, San Jose to Merced wildlife corridor crossing study
9/14/2017	Caltrans District 10	Section report, project coordination
9/18/2017	Gardner Neighborhood Association	Statewide program overview, Project Section update, review of San Jose Diridon approach alternatives, review of community input, Q&A
9/20/2017	City of San Jose staff	Public outreach

Date	Organization/Individual	Topic
9/20/2017	City of San Jose Staff Working Group	City-generated at-grade alignment concept
9/25/2017	Caltrain, VTA, City of San Jose	Downtown Intermodal Rail Station engineering, design, outreach, legislation
9/26/2017	NorCal FRA Check-In	Project update, outreach update
9/27/2017	City of San Jose staff	Public outreach
9/27/2017	NorCal FRA/Resource Agency Coordination	Agency participation, Project Section status, results of wildlife crossing studies
9/27/2017	San Jose CWG	Overview of and mitigation measures for noise impacts and path of sounds, potential discussion topics for remaining 2017 CWG meetings
9/28/2017	Grasslands Water District	Geographical Information Systems/mapping data
9/28/2017	Station Cities meeting: SPUR, Integral Group	Station area grant review and project update
10/4/2017	City of San Jose staff	Public outreach
10/4/2017	City of San Jose Staff Working Group	City-generated at-grade alignment concept
10/4/2017	SLDMWA	Site tour to review project interface with district facilities
10/10/2017	NorCal FRA Check-In	Project update, outreach update
10/11/2017	City of San Jose staff	Public outreach
10/12/2017	Morgan Hill Unified School District	Project Section update
10/18/2017	City of San Jose staff	Public outreach
10/19/2017	Caltrans District 10	I-5 weigh station
10/24/2017	NorCal FRA Check-In	Project update, outreach update
10/26/2017	Caltrans District 4	?
10/26/2017	City of San Jose staff	Public outreach
10/26/2017	San Jose CWG	Flyover and visual simulations of HSR through San Jose, future meeting schedule and topics
11/1/2017	City of San Jose	Meeting with City of San Jose staff to discuss public outreach
11/1/2017	City of San Jose Staff Working Group	Responses to HSR comments regarding City-generated at-grade alignment concept
11/7/2017	NorCal FRA Check-In	Environmental Review process, alternatives refinement, station planning
11/9/2017	Caltrans District 10	Project update, impacts on I-5 weigh station and temporary access to SR 152
11/15/2017	Morgan Hill City Council Workshop	Project update, outreach update, impacts on Morgan Hill
12/5/2017	NorCal FRA Check-In	Environmental Review process, alternatives refinement, station planning
12/6/2017	City of San Jose staff	Public outreach

Date	Organization/Individual	Topic
12/6/2017	Gilroy City Council Meeting	Project update, outreach update, impacts to City of Gilroy
12/13/2017	City of San Jose	Meeting with City of San Jose staff to discuss public outreach
12/13/2017	Grasslands Water District	Geographical Information Systems/mapping data
12/14/2017	Caltrans District 10	Project update, impacts on I-5 weigh station and temporary access to SR 152
12/19/2017	NorCal FRA Check-In	Environmental Review process, alternatives refinement, station planning
1/4/2018	SCVWD	Responses to SCVWD comments for Draft Floodplain Technical Analysis and Modeling, Llagas Creek, revisions to available hydrologic and hydraulic data, coordination with floodplain managers
1/9/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
1/10/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Northern Wildlife Movement Continuing Preliminary Design Workshop focused on wildlife movement in the Soap Lake area
1/11/2018	Willow Glen Neighborhood Association	Project section update, range of alternatives in Willow Glen community
1/17/2018	CHP and Caltrans	Santa Nella platform scale
1/24/2018	Los Banos Landowners Meeting: Merced County Farm Bureau, San Luis Canal Company, and CCID	Project update, responding to questions regarding ROW
1/31/2018	City of Morgan Hill staff	City's proposed alignment east of US 101, administrative and contracting topics
2/13/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
2/13/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Coyote Valley wildlife crossing webinar
2/14/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Northern Wildlife Movement Continuing Preliminary Design Workshop focused on wildlife movement in the Soap Lake area
2/21/2018	Grassland Water District	Engineering review
2/22/2018	LPMG	Executive leadership appointments, 2018 Business Plan schedule, state legislative audit, NEPA assignment, San Francisco to San Jose Project Section update, project management funding agreement with Caltrain, environmental review process, alternatives refinement, station planning

Date	Organization/Individual	Topic
2/23/2018	Community Floodplain Administrators Meeting with SCVWD, City of Morgan Hill, Santa Clara County Planning Department, City of Gilroy, City of San Jose	Proposed structures and typical sections; floodplain study sources; overview of floodplain crossings
2/28/2018	NorCal FRA Check-In	San Jose to Merced Checkpoint B Addendum, NEPA assignment update, update on wildlife crossing studies, San Jose to Merced geotechnical investigations
2/28/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Workshop on the initial draft of mitigation measures for wildlife crossings and impacts on habitats and species
3/13/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
3/14/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Workshop on the initial draft of mitigation measures for wildlife crossings and impacts on habitats and species
3/15/2018	Romero Ranch Landowners and California Strategic Growth Council	Input on wildlife movement, sensitive habitat, and conserved lands management; ranch input on operations and uses; HSR update on proposed alignment, preliminary design and environmental processes, permission to enter for field reconnaissance
3/23/2018	Grassland Water District	Refined preliminary cost estimates for tunnel guideway beneath Mud Slough, assessment of wildlife impacts, status of property inventory for potential agricultural easement purchases
4/10/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
4/18/2018	City/County Staff Coordinating Group	Caltrain and HSR business plans
4/18/2018	Morgan Hill City Council	2018 Business Plan
4/19/2018	SPUR	2018 Business Plan
4/24/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
4/26/2018	City of Gilroy staff	Revised preliminary engineering for HSR within the city, request review and comments to HSR
4/26/2018	LPMG	HSR Draft Business Plan/Caltrain Business Plan, Caltrain Electrification Project, Caltrain Positive Train Control Project, Public Comment
4/26/2018	NFIP Floodplain Administrators and Managers	Latest preliminary design at floodplain and floodway encroachments, preliminary hydraulic model results, next steps for reviews and feedback

Date	Organization/Individual	Topic
4/27/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Latest preliminary design of HSR wildlife crossing features and request review and comments to HSR
5/1/2018	Northern California CWGs and TWGs	2018 Business Plan
5/2/2018	Caltrans District 2	Latest preliminary design of HSR wildlife crossing features, opportunities for collaboration on wildlife crossing improvements and other complementary mitigation efforts
5/2/2018	San Jose CWG	City-generated option, Caltrain Business Plan, 2018 Business Plan
5/3/2018	San Jose City Councilmember Raul Peralez	Outreach planning for Councilmember Peralez's district, including the Gardner neighborhood
5/8/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
5/18/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Update on 2018 Business Plan, preliminary engineering, wildlife movement and crossings
5/22/2018	Mineta Transportation Institute Seminar: High-Speed Technologies on Railway Systems	2018 Business Plan
5/22/2018	San Jose City Council	2018 Business Plan
5/22/2018	SCVHA	Kick off SCVHA's SR 152 Pacheco Pass Wildlife Permeability and Hazards Study
5/29/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Preliminary engineering and wildlife crossing features, issues of concern, recommended topics for analysis, data sharing
6/4/2018	San Jose City Councilmember Peralez's staff	San Jose District 3 public outreach
6/5/2018	Caltrain	Communications and outreach coordination, design review with Caltrain and local elected officials
6/6/2018	SCVHA	Preliminary engineering and wildlife crossing features, issues of concern, recommended topics for analysis, data sharing, approaches and opportunities for collaborating on HSR mitigation and complementary conservation activities
6/8/2018	Gilroy Mayor Roland Valasco, Gilroy City Administrator Gabriel Gonzalez, Gilroy Chamber of Commerce	2018 Business Plan, Overview of ROW process
6/10/2018	Picnic with San Jose City Councilmember Raul Peralez	Information Table

Date	Organization/Individual	Topic
6/12/2018	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced project definition, agency coordination, workflow discussion including EIR/EIS progress, engineering, and outreach updates
6/13/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Results of preliminary design refinements for wildlife crossing features, crossing configuration issues, update on 2018 Business Plan implementation
6/14/2018	Los Paseos Neighborhood Association	City-generated Option, 2018 Business Plan
6/15/2018	City of Morgan Hill	2018 Business Plan
6/20/2018	City/County Staff Coordinating Group	Caltrain electrification, milestones and technical analysis, 2018 Business Plan, Connecting Communities Strategy
6/26/2018	City of Morgan Hill staff	UPRR alternative review and updated
6/26/2018	FRA Northern California check-in	Environmental review process, alternatives refinement, station planning
6/26/2018	Gilroy Chamber of Commerce	Planning for an ROW workshop
6/26/2018	Gilroy Unified School District	Blended service between San Jose and Gilroy, impacts on schools
6/27/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Lands for agricultural or open space conservation easements, approaches to evaluate potential noise or vibration impacts on waterfowl, wildlife corridor analysis, methods for evaluating bird movement
6/27/2018	NorCal FRA/Resource Agency Coordination	Agency participation, Project Section status, Business Plan 2018 implementation
6/28/2018	LPMG	Caltrain Business Plan, Electrification Project, HSR updates, public comments, LPMG member comments/requests including a grade separation toolkit
6/28/2018	Morgan Hill Chamber of Commerce	Planning for Morgan Hill Caltrain station, planning an ROW workshop
7/2/2018	Oak Grove Neighborhood Association	City-generated option, 2018 Business Plan
7/5/2018	Caltrain	Communications and outreach coordination, PEPD review, restarting CWG, Caltrain Business Plan
7/10/2018	SCVHA	2018 Business Plan; mitigation measures and collaborative implementation, preliminary results of Pacheco Pass wildlife movement analysis
7/12/2018	City of Morgan Hill	Morgan Hill and UPRR right-of-way coordination
7/17/2018	Caltrans District 10	Preliminary design for HSR features near I-5 and state highways in San Joaquin Valley
7/18/2018	City/County Staff Coordinating Group	Environmental review process, PEPD, alternatives refinement, station planning, Caltrain updates on Business Plan and electrification
7/18/2018	SAP Center	Implications for SAP Center resulting from changes to Diridon, including parking plan/analysis

Date	Organization/Individual	Topic
7/18/2018	SCVWD	Preliminary design of UP alternative, 2018 Business Plan
7/18/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Results of preliminary design refinements for HSR wildlife crossing features, reconfiguration of the Gilroy maintenance-of-way facility, preliminary design of 2018 Business Plan study alternative
7/19/2018	Santa Clara County	Preliminary design refinements, reconfiguration of the Gilroy maintenance-of-way facility, initial preliminary design of the 2018 Business Plan study alternative
7/20/2018	Caltrans District 4	Impacts on I-5 crossing and weigh station
7/20/2018	City of Gilroy	UPRR alignment
7/20/2018	Morgan Hill Chamber of Commerce	Planning for upcoming Morgan Hill Day events
7/24/2018	Caltrain and VTA	Caltrain Business Plan, DISC, initial preliminary design of 2018 Business Plan study alternative
7/24/2018	NorCal FRA Check-In	Environmental review process, alternatives refinement, station planning
7/24/2018	North Willow Glen Neighborhood leaders	Neighborhood visit with neighborhood leaders
7/26/2018	LPMG	Environmental milestones and review process, alternatives refinement, station planning, upcoming activities and outreach, Caltrain electrification, 2018 Business Plan
7/27/2018	Gardner Neighborhood leaders	Neighborhood visit with neighborhood leaders
8/1/2018	Caltrain and VTA	Communication and outreach coordination, City/County Staff Coordinating Group and LPMG coordination, Caltrain Business Plan Outreach and Activities, PEPD city review, restarting CWG
8/1/2018	San Jose City Councilmembers Davis and Peralez's staff	Planning meeting for August 8, 2018 meeting with Councilmembers
8/2/2018	City of San Jose	City-generated option, planning for upcoming CWG
8/8/2018	Diridon	Review each agency's outreach plans
8/8/2018	San Jose City Councilmembers Davis and Peralez	Outreach to neighborhoods in Councilmembers' districts
8/9/2018	City of San Jose	Review San Jose CWG Meeting presentation
8/10/2018	San Jose Mayor Liccardo	Interface of HSR and DISC planning
8/14/2018	Morgan Hill Day	2018 Business Plan, Range of Alternatives
8/14/2018	NorCal FRA check-in	Environmental review process, alternatives refinement, station planning
8/15/2018	City of Morgan Hill	Design review of Alternatives 1–3 refinement
8/15/2018	City/County Staff Coordinating Group	2018 Sustainability Report, PEPD update, San Jose to Merced Project Section update

Date	Organization/Individual	Topic
8/15/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Program and project specific mitigation related to crossing Grasslands Ecological Area
8/16/2018	San Jose CWG	CWG Reaffirmation Process, San Jose to Merced Project Section Update, update on Caltrain Business Plan, integration and collaboration of projects and processes, update on HSR alternatives
8/21/2018	Mineta Transportation Institute	Future of Diridon, DISC, and the Caltrain Business Plan
8/22/2018	TNC, SCVOSA, SCVHA, Pathways for Wildlife, Peninsula Open Space Trust, and California Strategic Growth Council	Accommodation of wildlife movement in Santa Clara Valley
8/23/2018	Caltrain	Communications and outreach coordination
8/23/2018	LPMG	Updates on 2018 Sustainability Report, PEPD process, San Jose to Merced Project Section, and outreach; environmental review process, alternatives refinement, station planning
8/23/2018	SCVWD	Design review meeting
8/24/2018	City of Gilroy	Review of at-grade blended alternative
8/28/2018	NorCal FRA check-in	Environmental review process, alternatives refinement, station planning
8/29/2018	San Jose City Councilmembers Davis and Peralez's staff	San Jose CWG Membership and Reaffirmation process
9/5/2018	Caltrain	Communications and outreach coordination, PEPD city review, restarting CWG, July City/County Staff Coordinating Group topics, Caltrain's Business Plan
9/7/2018	San Jose City Councilmember Sergio Jimenez	At-grade blended alternative
9/11/2018	Mineta Transportation Institute National HSR Leadership Summit	Information table covering statewide program and Project Section updates
9/12/2018	Global Climate Action Summit	Statewide program and Project Section updates
9/12/2018	Mineta Transportation Institute National HSR Leadership Summit	Information table covering statewide program and Project Section updates
9/13/2018	Global Climate Action Summit	Statewide program and Project Section updates
9/13/2018	Mineta Transportation Institute National HSR Leadership Summit	Information table covering statewide program and Project Section updates
9/19/2018	City/County Staff Coordinating Group	Connecting Communities Strategy, project section update, October CWG meetings, outreach update
9/19/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Program and project specific mitigation related to crossing Grasslands Ecological Area

Date	Organization/Individual	Topic
9/21/2018	City of Morgan Hill	Connecting Communities Strategy, review California climate investment opportunities to identify local projects supportive of HSR ridership
9/24/2018	Assemblymember Low State of the District	Project update, 2018 Business Plan, Range of Alternatives
9/24/2018	Gilroy City Council and Gilroy Unified School District	Project update, blended at-grade alternative, 2018 Business Plan
9/27/2018	Caltrain	Communications and outreach coordination
10/3/2018	Morgan Hill Realtors	Project update, blended at-grade alternative, ROW process
10/11/2018	Los Paseos Neighborhood	Neighborhood visit, concerns regarding range of alternatives
10/11/2018	SPUR Station Symposium	Lunch panel on the role of train stations in a changing mobility ecosystem
10/17/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Information sharing on stakeholder efforts to inform HSR preliminary design, environmental impact analyses, and potential mitigation actions associated with the Grasslands Ecological Area
10/18/2018	San Martin Neighborhood Alliance	Range of alternatives, Alternative 4 detail, project update
10/23/2018	Delmas Park Neighborhood Association	Update on 2018 Business Plan and alternatives under consideration in San Jose
10/23/2018	NorCal FRA Check-In	Environmental review process, alternatives refinement, station planning
10/25/2018	Caltrain	Outreach coordination meeting
11/7/2018	Gilroy–Los Banos TWG	Project update, alignment alternatives, community engagement and outreach, CWG activity on community resources
11/7/2018	Morgan Hill–Gilroy CWG	Program Updates, San Jose to Merced Project Section, community engagement and outreach, CWG input on community resources
11/28/2018	FRA	Comments on San Francisco to San Jose Draft PEPD
11/28/2018	San Jose CWG	Statewide project update; review of alignment alternatives; outreach and engagement; introduction to CWG activity on community resources, community outreach, project interfaces and integration
11/28/2018	San Jose–Morgan Hill TWG	Statewide project update; review of alignment alternatives; outreach and engagement; introduction to CWG activity on community resources, community outreach, project interfaces and integration
11/29/2018	Caltrain	Communications and outreach coordination

Date	Organization/Individual	Topic
11/29/2018	LPMG	Connecting communities strategy, Project Section update, October CWG meetings, October board meeting, outreach update, Statewide Update, Northern California Update, Environmental Justice Outreach
12/3/2018	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Information sharing on stakeholder efforts to inform HSR preliminary design, environmental impact analyses, and potential mitigation actions associated with the Grasslands Ecological Area
12/14/2018	Diridon Joint Policy Advisory Board	Project update and milestones
12/18/2018	NorCal FRA Check-In	Environmental review process, alternatives refinement, station planning
12/20/2018	Caltrain	Authority and Caltrain communications and outreach coordination meeting
1/4/2019	Santa Clara County Supervisors Chavez and Wasserman, VTA, City of Morgan Hill, City of Gilroy, Caltrain	South Santa Clara County issues: Caltrain service in Santa Clara, Caltrain Business Plan, HSR Business Plan, funding sources for Measure B (fourth Caltrain train)
1/10/2019	VTA	PEPD designs for Alternative 4, project update, project timeline, property impacts
1/11/2019	City of Gilroy	PEPD designs for Alternative 4, project update, project timeline, property impacts
1/14/2019	CDFW Central	Project status, potential impacts in Grasslands Ecological Area, property suitability analysis for Authority's conservation easement obligation
1/14/2019	Los Banos stakeholders: Los Banos Unified School District, City of Los Banos, Grasslands Water District, Henry Miller Reclamation District	Update on Project Section, timeline, property impacts
1/16/2019	ASV Wineries	Project interface with ASV Winery property in San Martin
1/17/2019	City of Morgan Hill	PEPD comment review of designs for Alternative 4, project update, timeline, and property impacts
1/18/2019	City of San Jose	PEPD comment review of designs for Alternative 4, project update, timeline, and property impacts
1/24/2019	Legislative Briefing: Offices of United States Senate, United States Congress, California State Senate, California State Assembly	Why HSR, construction updates, NEPA assignment, ARRA spending, audit, 2018 Business Plan, Northern California Project Sections, UPRR alternative, collaboration with partner agencies, recent and upcoming outreach, Q&A
1/29/2019	Caltrain	Communications and outreach coordination
1/30/2019	SPUR Meeting	CWG process and topics
2/2/19	Shasta/Hanchett Park Neighborhood Association	

Date	Organization/Individual	Topic
2/4/19	South Santa Clara County	Caltrain Business Plan, expansion of Caltrain service to south Santa Clara County
2/12/19	City of Morgan Hill	Responses to City of Morgan Hill's questions regarding the extent of the ROW acquisition required and potential access issues for Alternative 2
2/13/2019	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Grasslands Water District, Point Blue, and Environmental Defense Fund	Information sharing on stakeholder efforts to inform HSR preliminary design, environmental impact analyses, and potential mitigation actions associated with the Grasslands Ecological Area
2/19/2019	San Jose to Merced TWGs	Webinar
2/19/2019	Santa Clara City Council study session	Alternatives and timing of San Francisco to San Jose and San Jose to Merced environmental documents
2/20/2019	City/County Staff Coordinating Group	Rationale and process for identifying the State's Preferred Alternative, role of the early train operator, upcoming Environmental Justice events and CWG meetings
2/21/2019	San Jose CWG	Rationale and process for identifying the State's Preferred Alternative, role of the early train operator, updated flyover video, project benefits, outreach update
2/28/2019	Caltrain	Communications and outreach coordination
2/28/2019	LPMG	Caltrain Business Plan, Caltrain Electrification Project, HSR Updates, Staff Recommended State's Preferred Alternative, early train operator, outreach update, grade Separation toolkit
3/5/2019	Morgan Hill–Gilroy CWG	Rationale and process for identifying the Staff Recommended State's Preferred Alternative, role of the early train operator, updated flyover video, project benefits, outreach update
3/6/2019	City of Morgan Hill	Responses to City of Morgan Hill's questions regarding the extent of the ROW acquisition required and potential access issues for Alternative 2
3/6/2019	Vietnamese Voluntary Foundation (VIVO) Community Meeting	Vietnamese community outreach in San Jose, project update, input on alternatives
3/7/2019	Congresswoman Anna Eshoo staff briefing	Briefing on statewide and project section updates
3/11/2019	Senator Caballero briefing	Briefing on statewide and project section updates
3/20/2019	City/County Staff Coordinating Group	Central Valley construction update; Winter 2019 CWG key themes; recent and upcoming Environmental Justice outreach events
3/26/2019	Volta Community Meeting	Statewide Updates, Governor's State-of-the-State, Status of Federal Funding, San Jose to Merced Project Section updates; community outreach and environmental milestones update, Q&A open house and sharing of project maps

Date	Organization/Individual	Topic
3/28/2019	LPMG	Caltrain Business Plan, Caltrain Electrification Project, key themes from CWGs and Environmental Justice outreach
3/29/2019	Gilroy Mobility Partnership (VTA and Council of San Benito County Governments)	Project coordination between the Authority and SR 152; HSR project update (Gilroy focused) and alternatives
4/9/2019	NorCal FRA Check-In	San Jose to Merced Project Section PEPD footprint validation workshop
4/9/2019	NorCal Legislative Briefing	State of the State, USDOT/FRA letter and HSR response, recap of California State Senate Transportation Committee hearing, construction overview, economic update, 2019 program update report, Staff Recommended State's Preferred Alternative, UPRR negotiation, outreach update, DISC
4/11/2019	West San Jose Kiwanis Club	Statewide and Project Section update, recent and upcoming community outreach
4/17/2019	TWG Webinar	Safety and security characteristics of a high-speed rail system; preview of the format and types of information that will be shared about the Staff Recommended State's Preferred Alternative in summer 2019 and overview of the proposed process for CWG feedback on the Staff Recommended State's Preferred Alternative
4/22/2019	Morgan Hill–Gilroy CWG	Safety and security characteristics of a high-speed rail system; preview of the format and types of information that will be shared about the Staff Recommended State's Preferred Alternative in summer 2019 and overview of the proposed process for CWG feedback on the Staff Recommended State's Preferred Alternative
4/25/2019	Caltrain	Communications and outreach coordination meeting on upcoming City/County Staff Coordinating Group/LPMG meeting topics, HSR visualization approval from Caltrain
4/25/2019	LPMG	Environmental Justice methodology, safety characteristics, outreach update
5/2/2019	San Jose CWG	Safety and security characteristics of a high-speed rail system; preview of the format and types of information that will be shared about the Staff Recommended State's Preferred Alternative in summer 2019 and overview of the proposed process for CWG feedback on the Staff Recommended State's Preferred Alternative
5/7/2019	NorCal FRA	Environmental and Engineering Check-In
5/13/2019	Gardner Neighborhood Association	Spanish-language meeting with the Gardner community discussing coordination between Authority and Caltrain, Union Pacific, and Diridon Integrated Station Concept Plan; mitigation of noise/disruption through municipal quiet zones; property impacts of Alternative 4; project safety features; State's Preferred Alternative selection criteria

Date	Organization/Individual	Topic
5/23/2019	Caltrain	Communications and outreach meeting on upcoming City/County Staff Coordinating Group/LPMG meeting planning
5/23/2019	Los Paseos Neighborhood Association	Environmental milestones and process, roll plan map walkthrough of Alternatives 1, 2, 3, and 4, with specific focus on Los Paseos area
5/28/2019	Gilroy Community Meeting, South Valley Middle School	Statewide update; Project Section overview; outreach and environmental milestones update
5/31/2019	HomeFirst Homeless Walk, Monterey Corridor	Provided project information to and soliciting concerns from homeless providers and homeless community
6/13/2019	Diridon Station Pop Up	Provided DISC information to commuters at Diridon Station
6/13/2019	Homeless Community Dinner, St. Joseph's Family Center, Gilroy	Provided project information to and solicited concerns from homeless providers and homeless community
6/14/2019	PATH Homeless Walk, Diridon Station	Provided project information to and solicited concerns from homeless providers and homeless community
6/19/2019	City/County Staff Coordinating Group	Key themes from CWG meetings on the State's Preferred Alternative, Environmental Justice outreach update
6/25/2019	NorCal Professional Environmental Marketing Association	Statewide Program updates, economic update, Northern California Project Section updates, and schedule/upcoming outreach updates
6/27/2019	Caltrain	Communications and outreach coordination
6/27/2019	LPMG	Staff Recommended State's Preferred Alternative and process for identifying the State's Preferred Alternative
7/2/2019	Northern California Legislative Briefing	Third quarter legislative briefing covering Statewide Program updates, alternatives refinement, identifying the State's Preferred Alternative and its technical analysis, and upcoming outreach
7/5/2019	Music in the Park, Morgan Hill	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
7/8/2019	San Jose–Morgan Hill TWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment
7/8/2019	Gilroy–Los Banos TWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment

Date	Organization/Individual	Topic
7/10/2019	Santa Clara Valley and Pacheco Pass wildlife stakeholders	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming open house meetings
7/10/2019	Morgan Hill–Gilroy CWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment
7/15/2019	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, DWR, Ducks Unlimited, Point Blue, Grassland Water District	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming Open House
7/16/2019	San Jose CWG	Refining the alternatives: collaboration with partner agencies, stakeholders, and members of the public; characteristics of the alternatives; identifying a preferred alternative; discussion of the Staff Recommended State's Preferred Alternative; outreach updates; public comment
7/17/2019	City/County Staff Coordinating Group	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming Open House
7/17/2019	City of Morgan Hill	Statewide Program update, Staff Recommended State's Preferred Alternative, environmental schedule, upcoming Open House
7/24/2019	Bay Area Council Transportation Committee	Statewide Program update
7/24/2019	NorCal FRA/Resource Agency Coordination	San Francisco to San Jose and San Jose to Merced project section status updates; San Francisco to San Jose Staff Recommended State's Preferred Alternative; San Jose to Merced Staff Recommended State's Preferred Alternative
7/25/2019	Caltrain	Communications and outreach coordination
7/25/2019	LPMG	Northern California Project Section updates, outreach update, identification of Staff Recommended State's Preferred Alternative and rationale
8/1/2019	Morgan Hill Chamber of Commerce Breakfast	Project updates including construction in the Central Valley, the Governor's building block approach to completing the project, Caltrain electrification, the alternative alignments and the State's Preferred Alternative
8/8/2019	Transbay Joint Powers Authority Board Meeting	Statewide Program update, Staff Recommended State's Preferred Alternative, Brisbane land use, environmental schedule, upcoming outreach

Date	Organization/Individual	Topic
8/9/2019	USACE and USEPA	Review of data supporting the Staff Recommended State's Preferred Alternative and LEDPA
8/9/2019	San Jose Farmers Market	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
8/15/2019	SPUR, City of San Jose, Caltrain, VTA	Diridon Year in Review, DISC next steps
8/15/2019	San Jose Open House	Update on the statewide program, including the Authority's 2019 Project Update Report, jobs and economic activity generated by the project, alternative alignments, and rationale for the State's Preferred Alternative
8/17/2019	Gilroy Car Show	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
8/20/2019	San Jose City Council	Statewide Program update, Staff Recommended State's Preferred Alternative, Brisbane land use, environmental schedule, upcoming outreach
8/21/2019	City/County Staff Coordinating Group	Caltrain Business Plan
8/21/2019	Los Banos Open House	Update on the statewide program, including the Authority's 2019 Project Update Report, jobs and economic activity generated by the project, alternative alignments and rationale for the State's Preferred Alternative
8/22/2019	LPMG	Caltrain Business Plan and electrification, release of Staff Recommended State's Preferred Alternative, differentiating factors and rationale for selection
8/22/2019	Gilroy Open House	Update on the statewide program, including the Authority's 2019 Project Update Report, jobs and economic activity generated by the project, alternative alignments, and rationale for the State's Preferred Alternative
8/22/2019	SAAG Meeting	Update on the city-wide anti-displacement strategy, presentation on Google's conceptual mixed-use framework
9/3/2019	San Jose State University	Presentation on the background and history of California HSR, status of Northern California project sections, delivery timeline
9/4/2019	Santa Clara City Council	Staff-recommended State's Preferred Alternatives for the San Francisco to San Jose and San Jose to Merced project sections
9/10/2019	NorCal FRA Check-In	San Francisco to San Jose and San Jose to Merced Project Section updates, NEPA assignment team updates, general updates

Date	Organization/Individual	Topic
9/17/2019	Authority Board Meeting	Consideration for concurrence with the Staff Recommended State's Preferred Alternatives for the San Jose to Merced Project Section Draft EIR/EIS and San Francisco to San Jose Project Section Draft EIR/EIS; other Authority business as noticed on meeting agenda
9/20/2019	San Jose Moon Festival	Tabling event to inform the public regarding the identification of the State's Preferred Alternative and respond to associated questions
9/23/2019	International Conference on Ecology and Transportation, Sacramento, CA	Panel discussion on designing the San Jose to Merced Project Section of California's HSR system to support wildlife movement
9/24/2019	NorCal FRA NEPA Assignment Check-In	San Francisco to San Jose and San Jose to Merced Project Section updates, NEPA assignment team updates, general updates
9/25/2019	NorCal FRA/Resource Agency Coordination	Summary of public outreach feedback for San Francisco to San Jose and San Jose to Merced Project Sections, schedule for cooperating agency review and agency technical report review
9/30/2019	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Point Blue, Grassland Water District, CDFW, California Waterfowl Associates	Update on guideway design across Grasslands Ecological Area Important Bird Areas, conservation priority scenario final products, next steps
10/2/2019	Santa Clara County Supervisor Cortese's Chief of Staff	General briefing and status update on Northern California program
10/3/2019	Santa Clara County Supervisor Chavez	General briefing and status update on Northern California program
10/7/2019	Asian Pacific Islander (API) Council	Presentation on HSR background and project updates
10/8/2019	PEPD Walkthrough	Walkthrough of PEPD drawings
10/16/2019	City/County Staff Coordinating Group	Share community feedback and Authority Board concurrence on the San Francisco to San Jose Project Section and San Jose to Merced Project Section State's Preferred Alternatives
10/16/2019	Refugee and Immigrant Forum of Santa Clara County	Project Section and schedule updates
10/18/2019	Central Valley Community Foundation	The Future is Fresno event: statewide and Central Valley program updates
10/24/2019	Caltrain	Communications and outreach coordination
10/24/2019	LPMG	Report on Authority Board concurrence on the State's Preferred Alternatives, 2019 Sustainability Report

Date	Organization/Individual	Topic
10/24/2019	Northern California Legislative Briefing	Fourth quarter legislative briefing covering Statewide Program updates, 2019 Sustainability Report, report on Authority Board concurrence on the San Francisco to San Jose Project Section and San Jose to Merced Project Section State's Preferred Alternatives, schedule update
11/6/2019	Better Tomorrow - Oak Grove High School Community Forum, San Jose	Presentation to provide general project information and updates
11/8/2019	San Jose Councilmember Raul Peralez	Briefing update on the San Jose to Merced Project Section and activities leading to the public release of the Draft EIR/EIS
11/12/2019	Congressmember Ro Khanna's staff	Briefing update on Central Valley construction, status of environmental clearance process, NEPA assignment, MOU advancing work on LA Union Station, 2019 Sustainability Report, and Board concurrence of Preferred Alternatives for the San Francisco to San Jose and San Jose to Merced Project Sections
11/13/2019	Morgan Hill Unified School District Superintendent Steve Betando	Design review workshop of four alignments under study
11/13/2019	San Jose Councilmember Sergio Jimenez	Briefing update on the San Jose to Merced Project Section and activities leading to the public release of the Draft EIR/EIS
11/19/2019	Assemblymember Evan Low	Briefing update on Central Valley construction, status of environmental clearance process, NEPA assignment, MOU advancing work on LA Union Station, 2019 Sustainability Report, Board concurrence of Preferred Alternatives for the San Francisco to San Jose and San Jose to Merced Project Sections, and the San Jose Diridon Integrated Station Concept
11/27/2019	NorCal FRA/Resource Agency Coordination	Overview of agency participation and section status, introduction to San Jose to Merced Administrative Draft EIR/EIS
12/9/2019	California State Senator Bill Monning	General briefing and status update on Northern California program
12/10/2019	NorCal FRA Check-in	Updates on Northern California Project Section environmental documents and updates from FRA
12/11/2019	Congresswoman Zoe Lofgren's staff	Briefing with focus on Greater Gardner Area in San Jose
12/12/2019	Los Banos Unified School District	General Northern California project updates, past and planned engagement in Los Banos
12/12/2019	Pacific Gas & Electric	Informational presentation to PG&E environmental remediation team
12/13/2019	Gardner Academy PTO meeting and community walk	Spanish-language meeting to introduce the project and walk around the community to identify neighborhood impacts
12/13/2019	Sacred Heart Nativity, San Jose	Informational meeting to discuss project impacts

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12/13/2019	La Raza Radio	Project impacts and outreach to Hispanic community
12/13/2019	Univision	Project impacts and outreach to Hispanic community
12/18/2019	Reddit Ask Me Anything (AMA)	Online public forum to answer questions about statewide HSR program
12/19/2019	TWG webinar	Informational webinar to lay out disproportionate effects analysis and offsets process
12/19/2019	Gilroy Unified School District	Community enhancements for disproportionate Environmental Justice impacts
12/20/2019	Los Banos Community Center	Community enhancements for disproportionate Environmental Justice impacts
1/7/2020	Gilroy Mayor Roland Velasco and staff	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
1/7/2020	Morgan Hill Mayor Rich Constantine and staff	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
1/8/2020	San Jose Councilmember Sergio Jimenez	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
1/8/2020	City of San Jose staff	Project updates, Noise & Vibration and Aesthetics & Visual Quality Analysis preview
1/15/2020	City/County Staff Coordinating Group	Project updates, 2019 year in review and update on track and systems procurement
1/15/2020	Morgan Hill Unified School District and CARE	Project updates and community enhancements discussion
1/15/2020	Principal of Gilroy High School	Project overview and update
1/15/2020	Morgan Hill Housing Manager	Project overview and community enhancements discussion
1/16/2020	Gavilan College	Environmental Justice community enhancements and workforce development
1/16/2020	Santa Clara USD	Project overview and community enhancements discussion
1/16/2020	Sacred Heart Nativity, San Jose	Project overview and community enhancements discussion
1/23/2020	LPMG	Project updates, schedule update, 2019 year in review and update on track and systems procurement.
1/23/2020	Santa Clara County Parks	TWG Follow-up, Environmental Justice Enhancements Discussion
1/23/2020	San Jose City College	Environmental Justice community enhancements
1/23/2020	African American Community Services Agency	Project overview, Environmental Justice community enhancements
1/23/2020	Go Kids (formerly Estrella Family Services)	Project overview, environmental justice impacts
1/23/2020	San Jose USD	Environmental Justice community enhancements

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1/28/2020	Gilroy USD	Environmental Justice community enhancements
1/28/2020	City of Gilroy staff	Environmental Justice community enhancements
1/29/2020	Los Banos USD	Environmental Justice community enhancements
1/30/2020	East Side Union High School District	Project overview, environmental justice impacts
1/30/2020	Voices Charter Academy	Project overview, environmental justice impacts
1/30/2020	Santa Clara County Planning Enhancement Meeting	Project overview, environmental justice impacts
1/30/2020	Danny Garza	Project overview briefing
1/30/2020	Celeste Walker	Project overview briefing
2/1/2020	Shasta Hanchett Park Neighborhood Association Fair	Tabling event to inform the public about project updates
2/1/2020	Meet the Black Authors and Artists Event at African American Community Services Agency	Tabling event to inform the public about project updates
2/3/2020	City of San Jose Parks/Trails	Environmental Justice community enhancements
2/6/2020	Homeless Service Providers	Environmental Justice community enhancements
2/6/2020	Oak Grove Elementary School District	Project overview, Environmental Justice community enhancements
2/6/2020	Washington Elementary	Environmental Justice community enhancements
2/6/2020	Santa Clara Unified School District Principals	Project overview, Environmental Justice community enhancements
2/7/2020	Council on American Islamic Relations (CAIR)	Project overview, Environmental Justice community enhancements
2/7/2020	San Jose Word of Faith Christian Center Board	Project overview, Environmental Justice community enhancements
2/7/2020	ICAN Family Resource Center	Environmental Justice community enhancements
2/12/2020	Morgan Hill Unified School District	Project updates and community enhancements discussion
2/19/2020	City/County Staff Coordinating Group	Project updates, upcoming CWG/TWG dates, Draft 2020 Business Plan
2/20/2020	SPUR High-Speed Rail Forum	Statewide overview, NorCal 2019 review and 2020 update, 2020 Draft Business Plan release
2/20/2020	Guadalupe Washington Safety Coalition Community Walk	Community impacts, Environmental Justice community enhancements
2/20/2020	Center for Employment Training	Project overview, Environmental Justice community enhancements, workforce development
2/20/2020	Guadalupe Washington Neighborhood Association	Project overview, Environmental Justice community enhancements
2/21/2020	Concord Rotary Club	Economic benefits of high-speed rail, with a Bay Area focus

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2/21/2020	Family Fun Friday at African American Community Services Agency	Tabling event to inform the public about project updates
2/24/2020	Emergency Assistance Network	Project overview, Environmental Justice community enhancements
2/26/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, Cooperating and Participating Agency review status and Draft 2020 Business Plan
2/26/2020	Rocketship Mateo Sheedy Elementary Site Tour	Environmental Justice community enhancements
2/26/2020	Next Door Solutions/Home Safe Site Tour	Project overview, community impacts, Environmental Justice community enhancements
2/27/2020	LPMG	Project updates, upcoming CWG/TWG dates, Draft 2020 Business Plan
2/27/2020	HomeFirst Service Area Assessment	Community impacts, Environmental Justice community enhancements
2/28/2020	South Bay Islamic Association (SBIA)	Project overview, Environmental Justice community enhancements
2/29/2020	Diridon Station Joint Policy Advisory Board	Presentation on the 2020 Draft Business Plan
3/2/2020	Santa Clara County Parks	Design coordination including Creek Trail Network Master Plan
3/4/2020	Northern California Legislative Briefing	Business Plan and Draft EIR/EIS
3/4/2020	San Jose Fire Department	Project overview, Environmental Justice community enhancements
3/4/2020	Oak Grove High School Latino Parents	Project overview, Environmental Justice community enhancements
3/5/2020	TWG Webinar	Meeting to share the Draft 2020 Business Plan, the Draft EIR/EIS and the process for providing public comment
3/6/2020	Congresswoman Zoe Lofgren	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/6/2020	Assemblymember Kansen Chu	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/6/2020	Mayor Sam Liccardo	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/6/2020	Diridon Station Joint Policy Advisory Board	Presentation on Draft 2020 Business Plan
3/9/2020	Morgan Hill-Gilroy CWG	Meeting to share the Draft 2020 Business Plan, the Draft EIR/EIS and the process for providing public comment
3/10/2020	South Bay Transportation Officials Association	Project overview and update
3/10/2020	Tamien Community Walk	Briefing and community walk

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3/11/2020	San Jose Councilmember Maya Esparza	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/11/2020	San Jose Councilmember Sergio Jimenez	Project briefing and update, 2020 Business Plan, prep for Draft EIR/EIS, schedule update, agency coordination
3/11/2020	City of San Jose Brown Act Group	Briefing on Business Plan and Draft EIR/EIS
3/11/2020	City of Santa Clara	Project overview, Environmental Justice community enhancements
3/11/2020	San Jose CWG	Meeting to share the Draft 2020 Business Plan, the Draft EIR/EIS and the process for providing public comment
3/25/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule and the summary of agency comments and Authority consideration on the San Jose to Merced Project Section Draft EIR/EIS
4/8/2020	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Point Blue, Grassland Water District, CDFW, California Waterfowl Associates	Project briefing, Draft 2020 Business Plan, prep for Draft EIR/EIS, outreach update
4/8/2020	Santa Clara Valley and Pacheco Pass Stakeholders: San Benito Land Trust, Santa Clara Valley Open Space Authority, Santa Clara County, Santa Clara Valley Habitat Agency	Project briefing, Draft 2020 Business Plan, prep for Draft EIR/EIS, outreach update
4/8/2020	American Society of Civil Engineers San Jose Branch	Project overview and update
4/15/2020	Monterey Corridor Working Group	Project overview and update
4/16/2020	Franklin-McKinley School District, San Jose	Project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/17/2020	Gavilan College 1st Annual Economic Symposium	Roundtable discussion on transportation, housing and education
4/19/2020	Muslim Community Association	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/21/2020	Edenvale Great Oaks Plan Implementation Coalition	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/22/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, Draft 2020 Business Plan, stakeholder publication primer for San Jose to Merced Project Section Draft EIR/EIS and outreach update
4/23/2020	Madre-A-Madre	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/24/2020	Congressman Jim Costa	Project briefing, Draft 2020 Business Plan, prep for Draft EIR/EIS, outreach update

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4/28/2020	San Jose Word of Faith Christian Center	Community webinar with project overview and introduction to the Draft EIR/EIS and the process for providing public comment
4/29/2020	City of Morgan Hill Draft EIR/EIS Workshop #1	San Jose to Merced Project Section Draft EIR/EIS Q&A workshop with City staff
4/29/2020	City of Gilroy Draft EIR/EIS Workshop #1	San Jose to Merced Project Section Draft EIR/EIS Q&A workshop with City staff
4/30/2020	DISC Outreach Committee	Diridon Station Concept Plan outreach check-in
4/30/2020	San Jose Councilmember Dev Davis	Project briefing, Draft 2020 Business Plan, prep for Draft EIR/EIS, outreach update
5/1/2020	City of San Jose Draft EIR/EIS Workshop #1	San Jose to Merced Project Section Draft EIR/EIS Q&A workshop with City staff
5/5/2020	Morgan Hill Unified School District Board	Update on 2020 Business Plan, Morgan Hill alternatives, San Jose to Merced Project Section Draft EIR/EIS
5/6/2020	Silicon Valley Leadership Group	Update on 2020 Business Plan and status of environmental clearance in Northern California
5/7/2020	Streetblog - Talking Headways Recording	Recorded interview to discuss project overview, status, benefits and the Draft EIR/EIS
5/11/2020	Open House Webinar #1	Webinar providing an opportunity for public to ask questions of technical staff regarding general topics, Draft EIR/EIS and project alternatives
5/11/2020	Draft EIR/EIS Office Hours	One-on-one call with public to discuss Draft EIR/EIS
5/13/2020	City of Morgan Hill Draft EIR/EIS Workshop #2	San Jose to Merced Project Section Draft EIR/EIS Q&A workshop with City staff
5/14/2020	Open House Webinar #2	Webinar providing an opportunity for public to ask questions of technical staff regarding general topics, Draft EIR/EIS and project alternatives
5/15/2020	HNTB Mega Project Planning Brown Bag	Discussion on Mega Project planning in times of uncertainty (COVID-19)
5/15/2020	Santa Clara Valley and Pacheco Pass Wildlife Stakeholders: San Benito Land Trust, Santa Clara Valley Open Space Authority, The Nature Conservancy, Santa Clara County, Santa Clara Valley Habitat Agency	San Jose to Merced Project Section Draft EIR/EIS Q&A workshop
5/18/2020	Open House Webinar #3	Webinar providing an opportunity for public to ask questions of technical staff regarding general topics, Draft EIR/EIS and project alternatives
5/20/2020	City/County Staff Coordinating Group	Presentation on Draft 2020 Business Plan, Draft EIR/EIS, construction update
5/20/2020	Draft EIR/EIS Office Hours	One-on-one call with public to discuss Draft EIR/EIS
5/21/2020	CWG Webinar	Webinar providing an opportunity for CWG members to ask questions of technical staff regarding general topics, Draft EIR/EIS and project alternatives

Date	Organization/Individual	Topic
5/26/2020	City of San Jose Draft EIR/EIS Workshop #2	San Jose to Merced Project Section Draft EIR/EIS Q&A workshop with City staff
5/27/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, a public outreach update for the San Jose to Merced Project Section Draft EIR/EIS
5/27/2020	Draft EIR/EIS Public Hearing	Webinar providing an opportunity for verbal public comment
5/27/2020	Draft EIR/EIS Office Hours	One-on-one call with public to discuss Draft EIR/EIS
5/28/2020	LPMG	Northern California Project Section updates, outreach update, Draft EIR/EIS
6/4/2020	City of Gilroy Draft EIR/EIS Workshop #2	Draft EIR/EIS Q&A workshop with City staff
6/10/2020	Mobility Partnership	Update on San Jose to Merced Project Section environmental clearance and Draft EIR/EIS outreach
6/17/2020	City/County Staff Coordinating Group	Update on 2020 Business Plan, San Jose to Merced Project Section Draft EIR/EIS, San Francisco to San Jose Project Section Draft EIR/EIS
6/17/2020	SAAG Meeting	Planning update on Diridon Station Area Plan and Google Mixed-Use Plan, updated Civic Engagement Plan, overview of results from Spring 2020 online outreach and survey
6/17/2020	Santa Clara County Refugee and Immigrant Forum	2-minute announcement regarding the end of the San Jose to Merced Project Section Draft EIR/EIS public comment period and announcement on upcoming San Francisco to San Jose Project Section project milestones
6/23/2020	DISC Outreach Sub-Committee	Diridon Station Concept Plan outreach check-in
6/24/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables and schedule, summary of agency comments and Authority consideration for the San Francisco to San Jose Project Section Draft EIR/EIS
6/25/2020	LPMG	Northern California Project Section updates: outreach, Draft EIR/EIS, Final Business Plan (December 2020)
7/1/2020	Northern California Legislative Briefing	Statewide program update (2020 Business Plan, COVID-19 impacts, legislative hearings, construction update, track and systems procurement) and NorCal update (downtown rail extension MOU, environmental document preparation process, environmental milestones, San Jose to Merced Project Section Draft EIR/EIS outreach summary, San Francisco to San Jose Project Section lookahead)
7/15/2020	City/County Staff Coordinating Group	Update on 2020 Business Plan, San Francisco to San Jose Project Section Draft EIR/EIS
7/16/2020	Young Professionals in Infrastructure: Future of Rail Event	Discussion of 2020 Business Plan, Northern California environmental work and project development stages, 4,000 workers milestone

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7/20/2020	Morgan Hill Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/22/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables, Draft EIR/EIS and schedule
7/22/2020	City of Morgan Hill	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/23/2020	LPMG	Northern California Project Section updates: San Francisco to San Jose Project Section Draft EIR/EIS navigation, Final Business Plan (December 2020), Meet/Map HSR NorCal walkthrough
7/23/2020	Santa Clara County Parks & Recreation Department	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/24/2020	Rebekah Children's Services	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/27/2020	San Jose Councilmember Dev Davis	Provided an update on the HSR program
7/27/2020	African American Community Service Agency	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/27/2020	Gavilan College	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/27/2020	San Jose Downtown Residents Association	Project overview and update
7/28/2020	Bay Area Council Transportation Committee HSR Event	Northern California Project Section updates: Draft EIR/EIS, Final Business Plan (December 2020), COVID-19's impact on project timeline and workforce
7/28/2020	City of Gilroy	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/28/2020	City of Santa Clara	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/29/2020	Los Banos Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/29/2020	Gilroy Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/30/2020	Center for Employment Training (CET)	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas

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7/30/2020	City of San Jose and San Jose Department of Parks & Recreation	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/30/2020	VTA	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/31/2020	Transbay Joint Powers Authority	Downtown rail extension U-wall conflict with mainline tracks
7/31/2020	Homeless Service Providers	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
7/31/2020	San Jose Unified School District	A 1-hour discussion with potential implementing partners to review and refine their community enhancement ideas and evaluation of the ideas
8/12/2020	San Jose City Councilmember Maya Esparza	San Jose to Merced Project Section Draft EIR/EIS comment period update, Environmental Justice update, Monterey Corridor Working Group
8/19/2020	City/County Staff Coordinating Group	Comment period extension, public hearing
8/27/2020	LPMG	Comment period extension, public hearing
8/27/2020	Silicon Valley Leadership Group CEO Ahmad Thomas	Briefing on the HSR program
8/28/2020	California State Assembly Candidate Alex Lee	Briefing on the HSR program
9/2/2020	DISC Technical Working Group	Walk through of rail alignment at Diridon Station, agency coordination
9/2/2020	CalWORKS Advisory Council	Presentation to share project updates
9/3/2020	Garden Alameda Village Association	Presented on the San Francisco to San Jose Project Section Draft EIR/EIS public review period, and environmental topics as they relate to the community
9/10/2020	Santa Clara Unified School District	Briefing to update the Superintendent on Environmental Justice enhancements process prior to presenting before the Board of Trustees
9/17/2020	Construction Management Association of America NorCal Chapter	Statewide program and Northern California HSR updates
9/22/2020	Hispanic Chamber of Commerce Silicon Valley	Project update and overview of the CWG
9/23/2020	NorCal FRA/Resource Agency Coordination	Update on technical deliverables, Draft EIR/EIS and schedule
9/24/2020	Santa Clara Unified School District Board	Presentation on Northern California project updates and Santa Clara County specific enhancements

Date	Organization/Individual	Topic
9/30/2020	Northern California Legislative Briefing	Statewide program updates, the 2020 Sustainability Report, and updates on the Northern California Region
10/14/2020	NorCal Resource Agency Coordination	Update on technical deliverables, Draft EIR/EIS and schedule and San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS overview and schedule
10/14/2020	American Society of Civil Engineers-Golden Gate Branch	Project overview presentation
10/14/2020	Stanford University	Class lecture on key decisions taken over last 30 years with California HSR, challenges, and what comes next
10/20/2020	Congressman Josh Harder	Briefing to share project updates
10/29/2020	San Jose State University Institute of Transportation Engineers	Presentation to students on the Program and engineering topics
11/4/2020	SPUR San Jose	Briefing to share project updates
11/5/2020	San Jose City Councilmember Raul Peralez	Briefing to share project updates
11/11/2020	Hispanic Chamber of Commerce Silicon Valley	Project update to the Board
11/18/2020	Northern California Resource Agency	Meeting to discuss technical deliverables and the Cooperating and Responsible Agency Review Kickoff for the San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS
11/18/2020	City/County Staff Coordinating Group	Presentation on outreach survey and international blended systems
11/18/2020	CWG Webinar	Meeting to share project updates, the 2020 Sustainability Report, the Early Train Operators survey primary research, international examples of blended service operations and the results of the Northern California Outreach Survey
11/19/2020	LPMG	Presentation on outreach survey and international blended systems
12/17/2020	Northern California Legislative Briefing	Presentation on 2020 Business Plan, new administration, construction progress, and end of year review

Date	Organization/Individual	Topic
1/5/2021	VTA	Meeting to discuss VTA's plans to develop a transit-oriented development, the Authority's request to match grant funding for the Station Area Plan and ROW needs
1/13/2021	San Jose Councilmember Sergio Jimenez	Briefing to share project updates
1/20/2021	City/County Staff Coordinating Group	Verbal update provided on project updates
1/22/2021	Briefing with State Senator Dave Cortese	Briefing to share project updates
1/28/2021	LPMG	Verbal update on construction and Draft 2020 Business Plan
1/28/2021	San Jose Councilmember Dev Davis	Project update and overview of the Draft 2020 Business Plan
2/8/2021	Valley Christian High School	Presentation on project and NorCal updates and I Will Ride
2/11/2021	Mineta Transportation Institute Student Association	Presentation on project and NorCal updates and I Will Ride
2/17/2021	City/County Staff Coordinating Group	Verbal update on the Draft 2020 Business Plan update, San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS, and Final EIR/EIS & ROD Schedule
2/18/2021	Gilroy City Councilmembers Armendariz and Hilton	Project update and overview of the Draft 2020 Business Plan
2/24/2021	Sierra Club Conservation Committee Presentation	Presentation on sustainability and Envision Award
2/24/2021	NorCal Legislative Briefing	Presentation on the Draft 2020 Business Plan, San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS, Final EIR/EIS ROD schedule
2/24/2021	California High-Speed Rail Authority NorCal Resource Agency Coordination	Presentation on program updates and briefing on the San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS
2/24/2021	Gilroy Mayor Blankley and City Administrator Forbis	Project update and overview of the Draft 2020 Business Plan
2/25/2021	LPMG	Verbal update on the Draft 2020 Business Plan, San Jose to Merced Project Section Revised/Supplemental Draft EIR/EIS, Final EIR/EIS ROD schedule.
2/25/2021	TWG Webinar	Presentation on the Draft 2020 Business Plan and Funding 101
2/26/2021	JPA Board	Presentation on the Draft 2020 Business Plan
3/1/2021	City of San Jose Transportation and Environment Committee	Presentation on the Draft 2020 Business Plan
3/2/2021	SPUR HSR Lunchtime Forum	Presentation on the Draft 2020 Business Plan
3/3/2021	CWG Webinar	Presentation on the Draft 2020 Business Plan and Funding 101

Date	Organization/Individual	Topic
3/9/2021	San Mateo County Economic Development Association HLUT Committee	Revised Draft 2020 Business Plan
3/10/2021	Mobility Partnership	Presentation on the environmental process and revised Draft 2020 Business Plan
3/17/2021	City/County Staff Coordinating Group	Verbal update provided on project updates
3/24/2021	NorCal Resource Agency Coordination	Presentation on San Francisco to San Jose Project Section and San Jose to Merced Project Section updates
3/25/2021	Independence High School/Engineering Academy	Presentation geared to engineering pathway freshmen at Independence High School on project overview, sustainability, operations, engineering and careers
3/25/2021	LPMG	Verbal update provided on project updates
3/30/2021	Silicon Valley Leadership Group	Presentation to provide project updates and to discuss the Revised/Supplemental Draft EIR/EIS
3/30/2021	VTA, SamTrans, and TAMC	Gilroy Station Area coordination
4/1/2021	Pat Mapelli, Granite Rock	Project update
4/8/2021	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Point Blue, Grassland Water District, CDFW, California Waterfowl Associates	Presentation to provide project updates and to discuss the Revised/Supplemental Draft EIR/EIS
4/9/2021	Santa Clara Valley wildlife stakeholders	Presentation to provide project updates and to discuss the Revised/Supplemental Draft EIR/EIS
4/14/2021	Diridon Station Leadership Team	Briefing to provide project updates and to discuss the Revised/Supplemental Draft EIR/EIS
4/14/2021	San Jose Mayor Liccardo	HSR Regional Advocacy
4/20/2021	Pacheco Pass Stakeholder	Discussion of wildlife crossings in Pacheco Pass/Coyote Valley
4/21/2021	City/County Staff Coordinating Group	Update on Revised/Supplemental Draft EIR/EIS and Business Plan
4/22/2021	Gilroy Chamber of Commerce	Project updates and discussion with Mark Turner
4/22/2021	LPMG	Update on Revised/Supplemental Draft EIR/EIS and Business Plan
4/22/2021	USFWS	Bird Electrocution Avoidance Plan presentation
4/23/2021	Caltrans	Briefing on upcoming Revised/Supplemental Draft EIR/EIS publication
4/26/2021	Mineta Transportation Institute program - Lorin Eden Elementary	Presentation to K-3 students on HSR Program
5/5/2021	Pacheco Pass wildlife stakeholders	Discussion of wildlife crossings in Pacheco Pass/Coyote Valley
5/20/2021	Pacheco Pass wildlife stakeholders	Discussion on coordination of wildlife group work and HSR in Pacheco Pass
5/26/2021	NorCal Legislative Briefing	Presentation on project updates, legislative updates (hearings, May Revise/Prop 1A) and federal updates (American Jobs Plan, letters)
5/27/2021	Santa Clara County Parks	Discussion of Section 4(f) de minimis impacts and temporary occupancy exceptions on Santa Clara County parks

Date	Organization/Individual	Topic
6/3/2021	Lorin Eden Elementary School, 4th-6th Graders	Presentation on the Statewide and Northern California HSR Program
06/16/21	City/County Staff Coordinating Group	USDOT Agreement
06/16/21	USFWS	Coordination of USFWS biological opinion
6/23/2021	Salesforce Transit Center Virtual Town Hall	Prerecorded Walking Tour for Q&A Townhall
6/24/2021	LPMG	USDOT Agreement & San Jose to Merced Project Section recirculation
6/30/2021	City of Morgan Hill	Traffic mitigation
7/2/2021	Pacheco Pass wildlife stakeholders	Discussion of potential mitigation or design features to support wildlife movement in Pacheco Pass
7/7/2021	Caltrans	Briefed Caltrans staff on San Jose to Merced Project Section Administrative Final EIR/EIS
7/7/2021	Congresswoman Zoe Lofgren's staff	Project updates and discussion
7/7/2021	San Jose Mayor Liccardo	HSR Regional Advocacy
7/7/2021	VTA/BART	Project coordination
7/8/2021	City of San Jose	Traffic mitigation
7/8/2021	Grasslands Water District	Discussion on Grasslands Water District topics
7/8/2021	Traffic Mitigation Meetings with the City of Gilroy	Traffic mitigation
7/9/2021	Traffic Mitigation Meeting with the County of Santa Clara	Traffic mitigation
7/13/2021	City of San Jose Parks	Discussion of Section 4(f) de minimis impacts in City of San Jose
7/19/2021	San Francisco International Airport	Project briefing with Christopher DiPrima
7/21/2021	City/County Staff Coordinating Group	San Francisco to San Jose Project Section recirculation, Congressional call for dedicated HSR Funding and Bakersfield to Palmdale Final EIR/EIS
7/22/2021	Bay Area Summer Academy	Project overview, Engineering as a career presentation
7/22/2021	LPMG	San Francisco to San Jose Project Section recirculation, Congressional call for dedicated HSR Funding and Bakersfield to Palmdale Final EIR/EIS
7/26/2021	Pat Mapelli, Granite Rock	Project update
7/27/2021	TransForm	Project briefing with Darnell Grisby
7/29/2021	SPUR San Jose	Project briefing with Fred Buzo
8/2/2021	City of Morgan Hill	Traffic mitigation
8/3/2021	SPUR San Jose	Project briefing with Fred Buzo
8/4/2021	Mineta Transportation Institute	Presentation on statewide program and Project Section updates
8/18/2021	Caltrain Citizens Advisory Committee	Statewide and NorCal update
8/18/2021	Center for Biological Diversity	Wildlife connectivity and mitigation measures in San Jose to Merced Project Section
8/18/2021	City/County Staff Coordinating Group	Statewide Update, Revised/Supplemental Draft EIR/EIS, Milbrae Outreach Updates
8/25/2021	NorCal Resources Agency Coordination	Project section updates
8/25/2021	San Jose Councilmember Maya Esparza	Quarterly project check-in

Date	Organization/Individual	Topic
8/26/2021	LPMG	Millbrae meeting brief overview, comment period update, photos from tabling, August construction update, Bakersfield to Palmdale Project Section Final EIR/EIS
9/7/2021	City of Morgan Hill	Phase 3 Outreach Environmental Justice Update
9/8/2021	Gilroy Unified School District	Phase 3 Outreach Environmental Justice Update
9/8/2021	Los Banos Unified School District	Phase 3 Outreach Environmental Justice Update
9/9/2021	City of San Jose	Phase 3 Outreach Environmental Justice Update
9/10/2021	City of Gilroy	Phase 3 Outreach Environmental Justice Update
9/13/2021	African American Community Services Agency (AACSA)	Phase 3 Outreach Environmental Justice Update
9/13/2021	Guadalupe Washington Community Members	Phase 3 Outreach Environmental Justice Update
9/13/2021	Rocketship Schools	Phase 3 Outreach Environmental Justice Update
9/14/2021	City of Santa Clara	Phase 3 Outreach Environmental Justice Update
9/14/2021	Gardner Community Members	Phase 3 Outreach Environmental Justice Update
9/15/2021	NorCal Virtual Town Hall - Salesforce Tower	Answer questions provided via Zoom streaming
9/15/2021	Santa Clara Community Meeting	Phase 3 Outreach Environmental Justice Update
9/15/2021	Santa Clara County agencies	Phase 3 Outreach Environmental Justice Update
9/16/2021	Gavilan College	Phase 3 Outreach Environmental Justice Update
9/16/2021	San Jose Unified School District	Phase 3 Outreach Environmental Justice Update
9/17/2021	Caltrain and City of San Mateo	25th Ave Grade Separation Project Ribbon Cutting Event
9/17/2021	Franklin McKinley School District	Phase 3 Outreach Environmental Justice Update
9/20/2021	San Jose City Councilmember Raul Peralez	Briefing to share project updates
9/20/2021	San Jose Diridon Community Members	Phase 3 Outreach Environmental Justice Update
9/21/2021	Morgan Hill Community Members	Phase 3 Outreach Environmental Justice Update
9/21/2021	Sons In Retirement Branch #125	Statewide and Northern California program update; construction update
9/22/2021	Los Banos Community Members	Phase 3 Outreach Environmental Justice Update
9/22/2021	Northern California Resources Agency Coordination	Presentation on San Francisco to San Jose Project Section and San Jose to Merced Project Section updates
9/22/2021	Santa Clara County Office of Supportive Housing/Homeless Services	Phase 3 Outreach Environmental Justice Update
9/23/2021	Grasslands Ecological Area stakeholders: USFWS, Audubon Society, Ducks Unlimited, Point Blue, Grassland Water District, CDFW, California Waterfowl Associates	Project briefing and updates
9/23/2021	Oak Grove School District	Phase 3 Outreach Environmental Justice Update
9/23/2021	Sacred Heart Nativity, San Jose	Phase 3 Outreach Environmental Justice Update
9/23/2021	South San Jose Community Members	Phase 3 Outreach Environmental Justice Update
9/24/2021	Rebekah Children's Services	Phase 3 Outreach Environmental Justice Update
9/24/2021	Santa Clara Valley Wildlife stakeholders	Project briefing and updates

Date	Organization/Individual	Topic
9/28/2021	Center for Employment Training Workforce Development	Phase 3 Outreach Environmental Justice Update
9/28/2021	Gilroy Community Members	Phase 3 Outreach Environmental Justice Update
9/29/2021	Morgan Hill Unified School District	Phase 3 Outreach Environmental Justice Update
9/29/2021	Northern California Legislative Briefing	Third quarter legislative briefing program and construction updates

Source: Compiled by ICF 2021

AA = alternatives analysis
ACE = Altamont Corridor Express
Authority = California High-Speed Rail Authority
BART = Bay Area Rapid Transit
Caltrans = California Department of Transportation
CARE = Coordinated Advocacy & Resources for Education
CCID = Central California Irrigation District
CDFG = California Department of Fish and Game (to 12/13/2012)
CDFW = California Department of Fish and Wildlife (from 1/1/2013)
CEO = chief executive officer
CWG = community working group
DISC = Diridon Integrated Station Concept
DWR = California Department of Water Resources
EIR = environmental impact report
EIS = environmental impact statement
FRA = Federal Railroad Administration
HLUT = Housing, Land Use, and Transportation
HSR = high-speed rail
I- = Interstate
JPA = joint powers authority
LPMG = Local Policy Maker Group
MOU = memorandum of understanding
MOWF = maintenance of way facility
MTC = Metropolitan Transportation Commission
NAAC = Native American Advisory Committee
NAHC = Native American Heritage Commission
NEPA = National Environmental Policy Act
NFIP = National Flood Insurance Program
NMFS = National Marine Fisheries Service
PAA = Preliminary Alternatives Analysis
PEPD = preliminary engineering for project definition
PTO = Parent Teacher Organization
Project Section = San Jose to Merced Project Section
Q&A = questions and answers
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
ROD = Record of Decision
ROW = right-of-way
RWQCB = Regional Water Quality Control Board
SAA = Supplemental Alternatives Analysis
SAAG = Station Area Advisory Group
SBCWD = San Benito County Water District
SBTOA = South Bay Transportation Officials Association
SCHVA = Santa Clara Valley Habitat Agency
SCVOSA = Santa Clara Valley Open Space Authority
SCVWD = Santa Clara Valley Water District
SLDMWA = San Luis and Delta Mendota Water Authority
SPUR = San Francisco Bay Area Planning and Urban Research Association
SR = State Route
STB = Surface Transportation Board
SWRCB = State Water Resources Control Board
TAMC = Transportation Agency for Monterey County
TNC = The Nature Conservancy
TWG = technical working group
UPRR = Union Pacific Railroad
US = U.S. Highway
USACE = U.S. Army Corps of Engineers
USDOT = U.S. Department of Transportation
USEPA = U.S. Environmental Protection Agency
USFWS = U.S. Fish and Wildlife Service
VTA = (Santa Clara) Valley Transportation Authority